FINAL
Preliminary Assessment Report
Grand Island Army Aviation Support Facility #2
Grand Island, Nebraska

Perfluorooctane-Sulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA) Impacted Sites
ARNG Installations, Nationwide

September 2020

Prepared for:

Army National Guard Bureau
111 S. George Mason Drive
Arlington, VA 22204

UNCLASSIFIED

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Acronyms and Abbreviations

AASF	Army Aviation Support Facility
AECOM	AECOM Technical Services, Inc.
AFFF	Aqueous Film Forming Foam
AOI	Area of Interest
ARNG	Army National Guard
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSM	Conceptual Site Model
EDR™	Environmental Data Resources, Inc.™
°F	degrees Fahrenheit
FTA	Fire Training Area
HA	Health Advisory
NEARNG	Nebraska Army National Guard
PA	Preliminary Assessment
PFAS	per- and poly-fluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
SI	Site Inspection
UCMR3	Unregulated Contaminant Monitoring Rule 3
US	United States
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
WWTP	Waste Water Treatment Plant

Executive Summary

The Army National Guard (ARNG) is performing Preliminary Assessments (PAs) and Site Inspections (SIs) for Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) Impacted Sites at ARNG Facilities Nationwide. A PA for per- and polyfluoroalkyl substances (PFAS)-containing materials was completed for Grand Island Army Aviation Support Facility (AASF; also referred to as the "facility") #2 in Grand Island, Nebraska, to assess potential PFAS release areas and exposure pathways to receptors. The AASF #2 is constructed on a parcel of land that has been owned and operated by the Nebraska ARNG (NEARNG) since 2005. The performance of this PA included the following tasks:

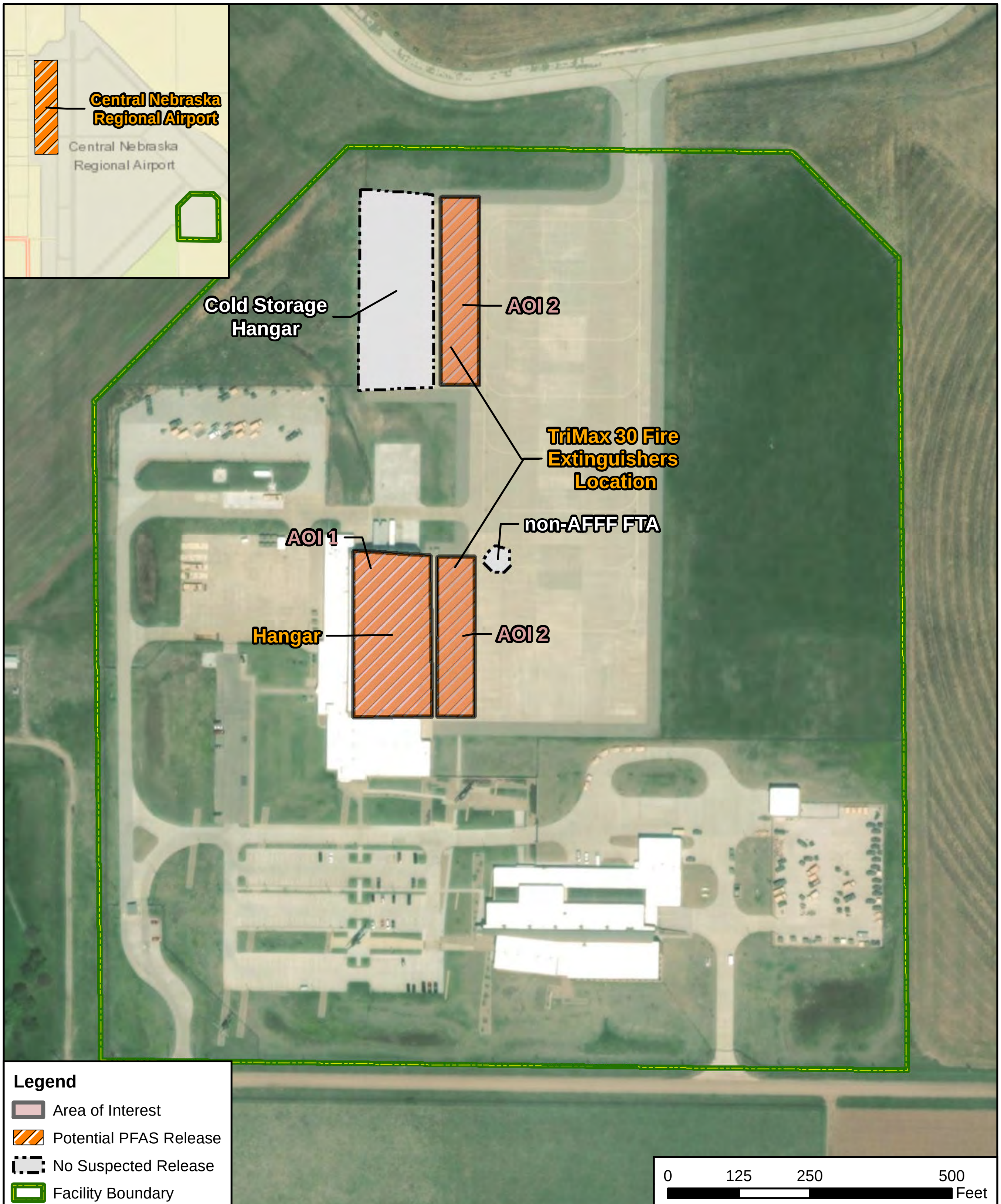
- Reviewed available administrative record documents and Environmental Data Resources, Inc. (EDR)™ report packages to obtain information relevant to potential PFAS releases, such as: drinking water well locations, historical aerial photographs, Sanborn maps, and environmental compliance actions in the area surrounding the facility;
- Conducted a site visit 22 October 2019 and completed visual site inspections at locations where PFAS-containing materials were suspected of being stored, used, or disposed;
- Interviewed a current NEARNG personnel
- Identified Area(s) of Interest (AOIs) and developed a preliminary conceptual site model (CSM) to summarize potential source-pathway-receptor linkages of potential PFAS in soil, groundwater, surface water, and sediment for the AOI.

Two AOIs related to potential PFAS releases were identified at the AASF #2 during the PA. The AOIs are shown on **Figure ES-1** and described below:

Table ES-1: AOIs at Grand Island AASF #2

Area of Interest	Name	Used by	Potential Release Date
AOI 1	Hangar Fire Suppression System	NEARNG	2010
AOI 2	TriMax™ 30 Fire Extinguishers Location	NEARNG	Unknown

Based on potential PFAS releases at the AOIs, there is potential for exposure to PFAS contamination in media at or near the facility. The preliminary CSM for the AASF #2, which presents the potential receptors and media impacted, is shown on **Figure ES-2**. Based on the US Environmental Protection Agency (USEPA) Unregulated Contaminant Monitoring Rule 3 data, it was indicated that no PFAS were detected in a public water system above the USEPA lifetime Health Advisory within 20 miles of the facility. PFAS analyses performed in 2016 had method detection limits that were higher than currently achievable. Thus, it is possible that low concentrations of PFAS were not detected during the UCMR3 but might be detected if analyzed today.



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NOTES	Preliminary Assessment for PFAS at Grand Island AASF #2, NE				
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SCALE	1:3,000	CHK BY	EA	8/19/2020	
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	8/19/2020	

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Summary of Findings

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Figure ES-1

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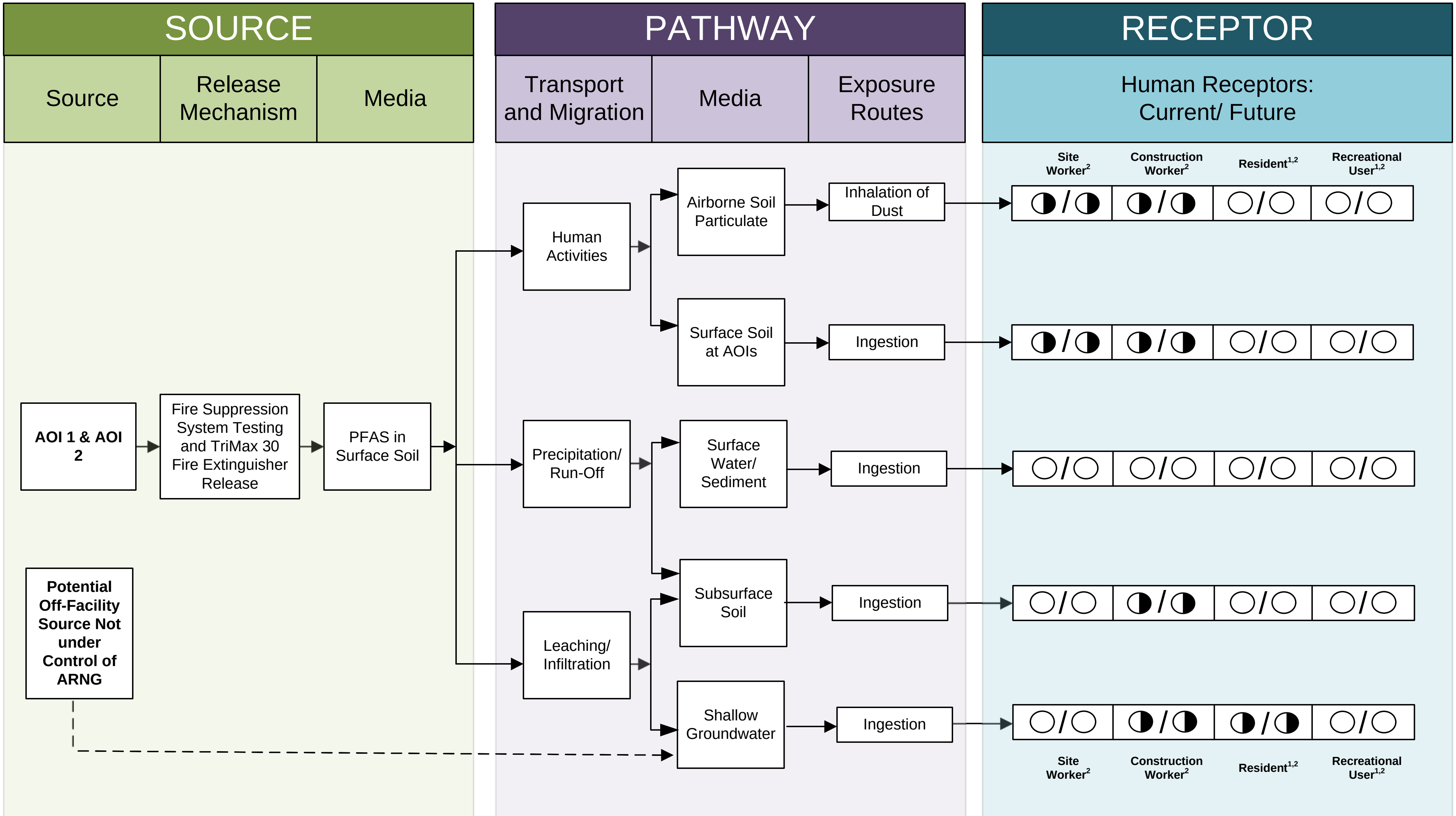


LEGEND

Flow-Chart Stops

Flow-Chart Continues

Partial / Possible Flow

Incomplete Pathway

Potentially Complete Pathway

Complete Pathway

Notes:
1. The resident and recreational users receptors refer to an off-facility resident and off-facility recreational users.
2. Dermal contact exposure pathway is incomplete for PFAS.

Figure ES-2
Preliminary Conceptual Site Model
Grand Island AASF #2

1. Introduction

1.1 Authority and Purpose

The Army National Guard (ARNG) G9 is the lead agency in performing Preliminary Assessments (PAs) and Site Inspections (SIs) for Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) at Impacted Sites at ARNG Facilities Nationwide. This work is supported by the United States (US) Army Corps of Engineers (USACE) Baltimore District and their contractor AECOM Technical Services, Inc. (AECOM) under Contract Number W912DR-12-D-0014, Task Order W912DR17F0192, issued 11 August 2017.

The ARNG is assessing potential effects on human health related to processes at facilities that used per- and poly-fluoroalkyl substances (PFAS), primarily in the form of aqueous film forming foam (AFFF) released as part of firefighting activities, although other PFAS sources are possible. In addition, the ARNG is assessing businesses or operations adjacent to the ARNG facility (not under the control of ARNG) that could potentially be responsible for a PFAS release.

PFAS are classified as emerging environmental contaminants that are garnering increasing regulatory interest due to their potential risks to human health and the environment. PFAS formulations contain highly diverse mixtures of compounds. Thus, the fate of PFAS compounds in the environment varies. The regulatory framework at both federal and state levels continues to evolve. The US Environmental Protection Agency (USEPA) issued Drinking Water Health Advisories (HA) for PFOA and PFOS in May 2016, but there are currently no promulgated national standards regulating PFAS in drinking water. The HA is 70 parts per trillion for PFOS and PFOA, individually or combined.

This report presents the findings of a PA for PFAS-containing materials at the Grand Island Army Aviation Support Facility (AASF; also referred to as the "facility") #2 in Grand Island, Nebraska, in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulations Part 300), and Army requirements and guidance.

This PA documents the known fire training areas (FTAs) as well as additional locations where PFAS may have been released into the environment at the AASF #2. The term PFAS will be used throughout this report to encompass all PFAS chemicals being evaluated, including PFOS and PFOA, which are key components of AFFF.

1.2 Preliminary Assessment Methods

The performance of this PA included the following tasks:

- Reviewed available administrative record documents and Environmental Data Resources, Inc. (EDR)™ report packages to obtain information relevant to potential PFAS releases, such as: drinking water well locations, historical aerial photographs, Sanborn maps, and environmental compliance actions in the area surrounding the facility;
- Conducted a site visit 22 October 2019 and completed visual site inspections at locations where PFAS-containing materials were suspected of being stored, used, or disposed;
- Interviewed a current NEARNG personnel
- Identified Area(s) of Interest (AOIs) and developed a preliminary conceptual site model (CSM) to summarize potential source-pathway-receptor linkages of potential PFAS in soil, groundwater, surface water, and sediment for the AOI.

1.3 Report Organization

This report has been prepared in accordance with the USEPA *Guidance for Performing Preliminary Assessments under CERCLA* (USEPA, 1991). The report sections and descriptions of each are:

- **Section 1 – Introduction:** identifies the project purpose and authority and describes the facility location, environmental setting, and methods used to complete the PA
- **Section 2 – Fire Training Areas:** describes the FTAs at the facility identified during the site visit
- **Section 3 – Non-Fire Training Areas:** describes other locations of potential PFAS releases at the facility identified during the site visit
- **Section 4 – Emergency Response Areas:** describes areas of potential PFAS release at the facility, specifically in response to emergency situations
- **Section 5 – Adjacent Sources:** describes sources of potential PFAS release adjacent to the facility that are not under the control of ARNG
- **Section 6 – Preliminary Conceptual Site Model:** describes the pathways of PFAS transport and receptors for the AOIs and the facility
- **Section 7 –Conclusions:** summarizes the data findings and presents the conclusions of the PA
- **Section 8 – References:** provides the references used to develop this document
- **Appendix A** – Data Resources
- **Appendix B** – Preliminary Assessment Documentation
- **Appendix C** – Photographic Log

1.4 Facility Location and Description

The AASF #2 is in Hall County, approximately 3 miles northeast of Grand Island, Nebraska. The AASF #2 is adjacent to the Central Nebraska Regional Airport. The AASF #2 is accessible from East Airport Road from the south.

The AASF #2 is constructed on a parcel of land that is approximately 49.5 acres and has been owned and operated by the State of Nebraska Military Department since 2005 (**Appendix A**). Before 2005, the Hall County Airport Authority owned and operated the land. In 2009, the AASF #2 was constructed to house the Nebraska Army National Guard maintenance support facility. In 2014, the Grand Island Readiness Center was added to the campus. The Readiness Center is used to train part and fill time soldiers in aviation and skill development. Currently, no other new structures have been added to the AASF #2 facility.

1.5 Facility Environmental Setting

The AASF #2 is in the Platt River Lowlands of Nebraska (**Figure 1-1**). The Platte river flows within 5 miles of the AASF #2. The AASF #2 is surrounded by both agricultural land, and there are three lakes located within 3 miles of the facility. Lake Davis, Crystal Lake and Eagles Lake are all located to the south of the facility. The elevation of the AASF #2 is approximately 1,860 feet above mean sea level.

1.5.1 Geology

The AASF #2 lies within the High Plains section of the Great Plains Province (**Figure 1-2**). The underlying geological features at the facility can be defined by four categories. The first 10 feet underneath the surface is alluvial silty clay and topsoil. There is also alluvial sands and gravel from the Grand Island Formation which have been reported to be approximately 50 to 60 feet thick. A thinner layer of low permeability alluvial silty clay which is about 5 to 15 feet thick from the Fullerton Formation is also located in the area. This clay can also be referred to as "blue clay." The last layer underneath the facility is the deepest layer and can be found up to 200 feet thick. It is an alluvial sand and gravel from the Holdrege Formation (URS, 2006).

Grand Island's geology differs from the typical geological sequence of the High Plains, as there is no Tertiary material present (USGS, 1983). The geology the underlies the AASF #2 consist of material from the Niobrara Formation. This formation consists of argillaceous chalk, limestone and shale (USGS, 2020). There is also substantial Quaternary mantle present in this area, which consists of silts, clays and alluvium. There appears to be no surficial difference between the areas of the High Plains were there is and isn't Tertiary materials present (USGS, 1983).

1.5.2 Hydrogeology

There are two aquifers and an aquitard located in the area of the facility; the Fullerton Formation Aquitard; the Holdrege Formation Aquifer; and the Formation Aquifer. The Grand Island Formation Aquifer is an unconfined water table aquifer within the alluvial sands and gravels of the Grand Island Formation. This allows for shallow groundwater under the facility. The depth to water ranges from 10 to 16 feet below ground surface with a total thickness of water ranging from about 50 to 60 feet. The predominant groundwater flow in the Grand Island Formation Aquifer is to the northeast. The Holdrege Formation Aquifer is a confined aquifer unit within the sands and gravels of the Holdrege Formation. The groundwater flow of the Holdrege Formation Aquifer flows to the northeast, which is a similar direction as the Grand Island Formation Aquifer. The Fullerton Formation Aquitard is an underlying clay unit with low-permeability that acts as a barrier to groundwater flow. This aquitard creates a presence of head differences between the two aquifers (URS, 2006).

The Grand Island Formation aquifer supplies most of the water for the region in the form of irrigation supply and potable water. The City of Grand Island uses 21 wells that lie between two channels of the Platte River, using 3 pumps that allow water to be moved from the basins into town (City of Grand Island Utilities, 2017).

There are no wells located within the boundary of the facility; however, there are domestic wells and several irrigation wells downgradient and side gradient of the AASF #2. There are several additional livestock, irrigation, commercial/industrial wells within a 1-mile radius of the facility (**Figure 1-2**). Drinking water for the AASF #2 is supplied by the City of Grand Island, which sources water from groundwater via sand and gravel aquifers that underlies the area (City of Grand Island Utilities, 2017). Based on the USEPA Unregulated Contaminant Monitoring Rule 3 data, it was indicated that no PFAS were detected in a public water system above the USEPA HA within 20 miles of the facility. PFAS analyses performed in 2016 had method detection limits that were higher than currently achievable. Thus, it is possible that low concentrations of PFAS were not detected during the UCMR3 but might be detected if analyzed today.

1.5.3 Hydrology

The AASF #2 is in the Platte River floodplain (**Figure 1-3**). The primary surface water feature found south of the facility and is an intermittent tributary of the Warm Slough. The Warm Slough generally flows southwest to northeast and eventually drains into the Platte River approximately

24 miles from the facility. Surface water flow direction at the site is to the southeast towards Warm Slough.

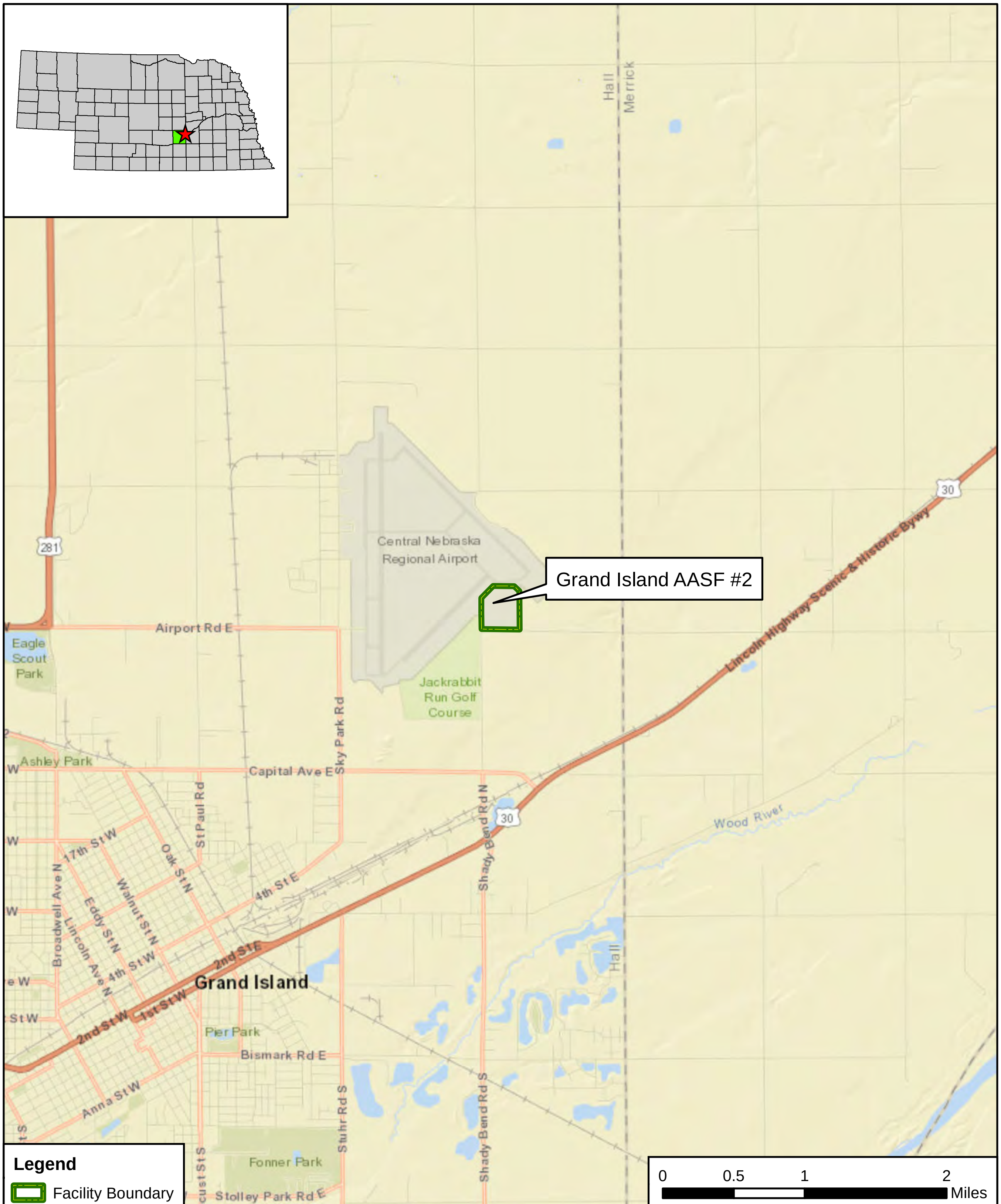
The Platte River is classified as the longest braided river in North America. It flows from the Rocky Mountains in Colorado and Wyoming to the Missouri River, which drains into the Mississippi River. As a braided river, the Platte River is a network of multiple small shallow channels that all flow in the same direction. The Platte River is prone to flooding and has contributed to flooding in Grand Island as recently as 2019 (URS, 2006).

1.5.4 Climate

The climate at the facility has four defined seasons where the summers are warm and mostly clear; the winters are freezing, windy, snowy and typically have a lot of cloud cover. Temperatures vary from average highs of 62.3 degrees Fahrenheit (°F) to average lows of 39.2 °F. The average annual temperature is 50.75 °F. Average precipitation is 26.61 inches of rain (World Climate, 2019).

1.5.5 Current and Future Land Use

The AASF #2 is a controlled access facility with public roads and is adjacent to Central Nebraska Regional Airport. Reasonably anticipated future land use is not expected to change from the current land use; however, future infrastructure improvements, land acquisitions, and land use controls at the Central Nebraska Regional Airport are unknown.



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Grand Island AASF #2, NE			
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Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	2/18/2020

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Facility Location

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Figure 1-1

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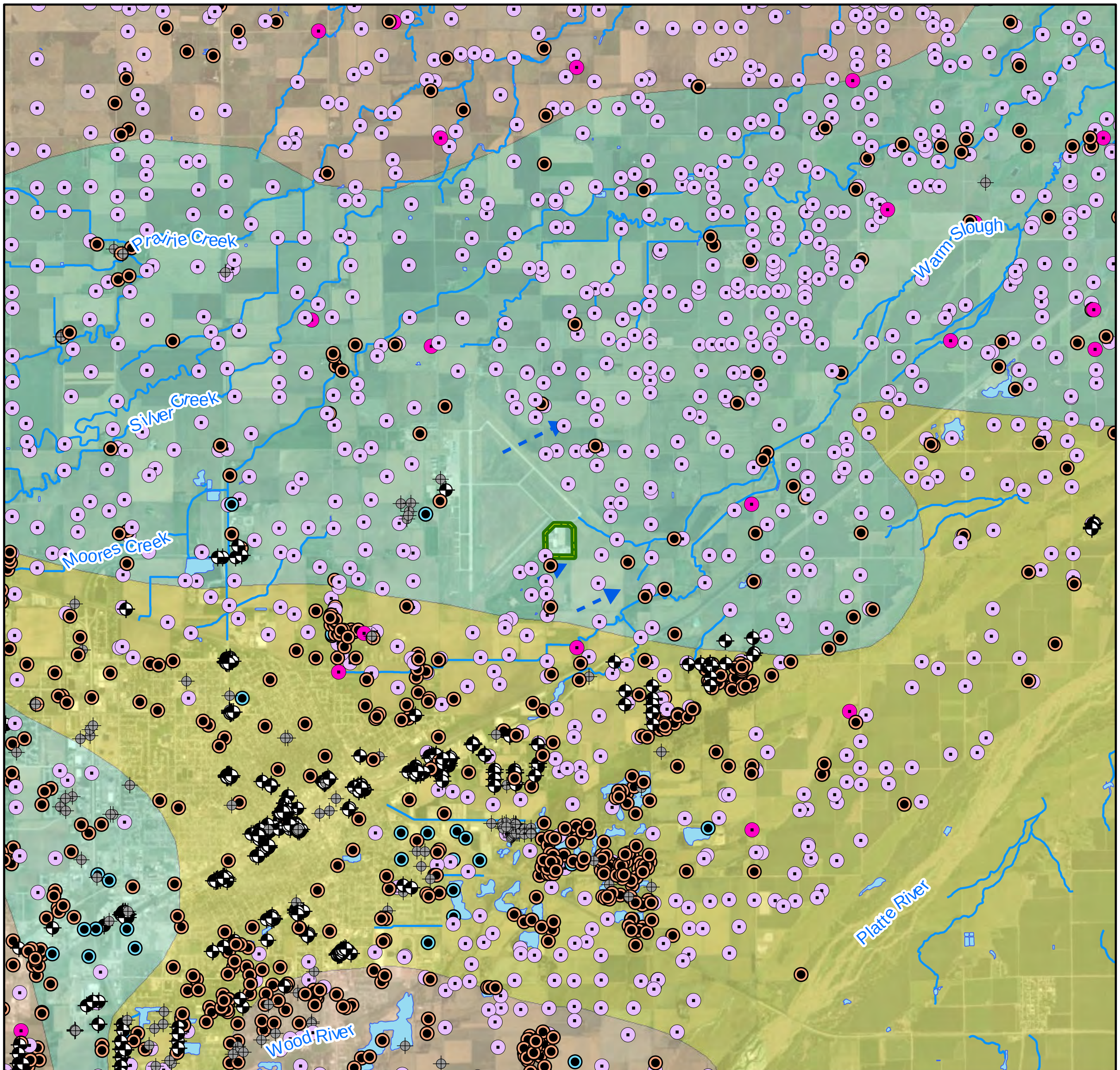

Legend

- Facility Boundary
- Water Body
- River/Stream
- Inferred Groundwater Flow Direction

Geology

- Miocene Ogallala Formation
- Cretaceous Pierre Shale
- Cretaceous Niobrara Formation

Wells

- Domestic Well
- Commercial/Industrial Well
- Irrigation Well
- Livestock Well
- Monitoring/Observation/Recovery Well
- Other/Unknown Well

0 0.75 1.5 3 Miles

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CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Grand Island AASF #2, NE			
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Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	7/29/2020

Groundwater Features

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Figure 1-2

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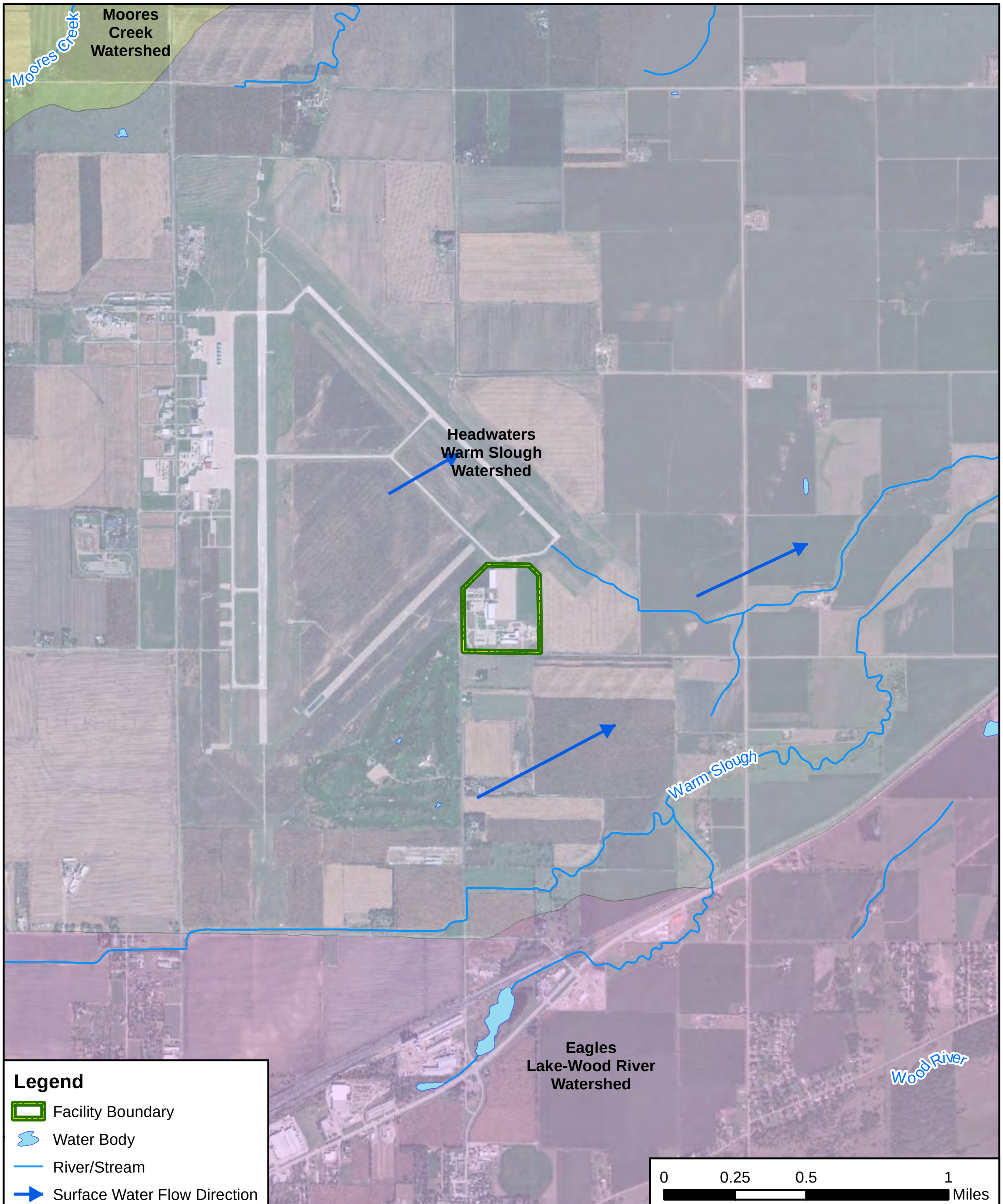

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Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	2/18/2020

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Surface Water Features

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Figure 1-3

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2. Fire Training Areas

One FTA where PFAS was potentially released was identified during the PA. A description of the FTA is presented below and is shown on **Figure 2-1**. Interview records and photographs are included in **Appendix B** and **Appendix C**, respectively.

2.1 Non-AFFF FTA

Since 2010, personnel at the AASF #2 in conjunction with the Grand Island Fire Department, have conducted annual fire training drills. These drills consist of training exercises where ABC hand held fire extinguishers and soap/water filled TriMax™ 30 mobile units were dispensed to the ramp area outside the hangar of the AASF #2 to put out small pan fires. It is reported that the TriMax™ 30 used for fire training exercises arrived at the AASF #2 empty and has never been filled with AFFF. The geographic coordinates are 40°57'43.84"N and 98°17'56.49"W (**Figure 2-1**). There has been no reported use of AFFF during training exercises.

CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Grand Island AASF #2, NE			
REVISED	2/18/2020	GIS BY	MS	2/18/2020
SCALE	1:3,000	CHK BY	EA	2/18/2020
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	2/18/2020

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Fire Training Area

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Figure 2-1

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3. Non-Fire Training Areas

In addition to FTAs, the PA evaluated areas where PFAS-containing materials may have been broadly used, stored, or disposed. This may include buildings with fire suppression systems, paint booths, AFFF storage areas, and areas of compliance demonstrations. Information on these features obtained during the PA are included in **Appendices A** and **B**. Two non-FTAs were identified at the AASF #2 during the PA through interviews or document review. A description of the non-FTA are presented below and shown on **Figure 3-1**. Interview records and photographs are included in **Appendix B** and **Appendix C**, respectively.

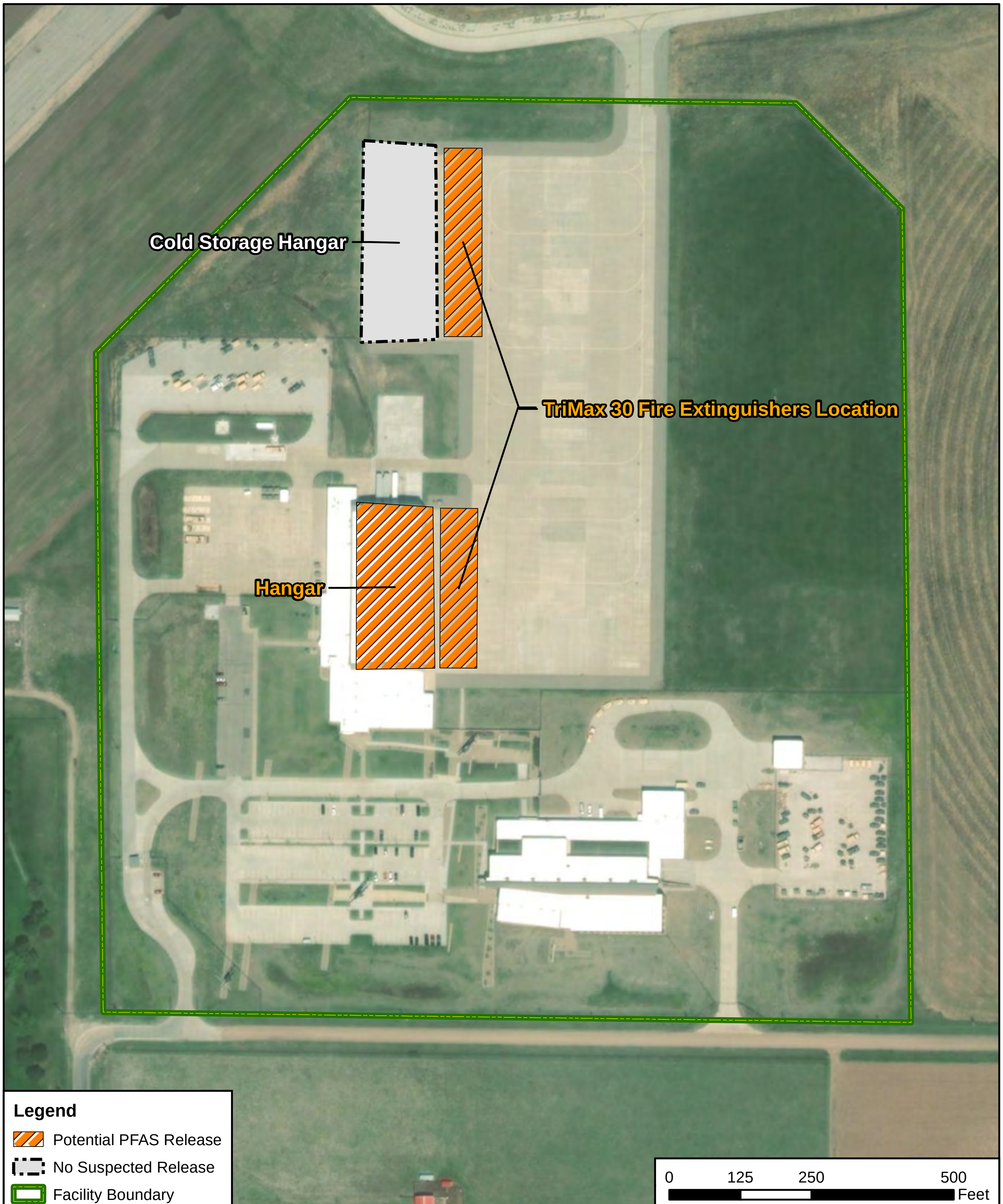
3.1 Hangar Fire Suppression System

The hangar fire suppression system was installed in 2010 when the hangar was constructed. The geographic coordinates of the hangar are 40°57'42.38"N and 98°17'58.43"W (**Figure 3-1**). The hangar fire suppression system consists of a 250-gallon tank filled with 2 percent High Expansion Foam (HEF) concentrate. After installation in 2010, the fire suppression system was tested with a full hanger release. During the fire suppression testing, the hangar doors were closed, which have rubber seals at the bottom of the door to prevent leaks. The HEF was directed to the trench drains in the hangar, which drain to an oil/water separator and eventually discharges to the Grand Island City Sanitary Waste Water Treatment Plant (WWTP). The fire suppression system has been serviced annually by a contractor, where the system pressure is checked without releasing any of the HEF concentrate. The fire suppression system was last serviced in 2017 and is housed in a room with no floors drains adjacent to the hanger. During the visual site inspection, there was visible corrosion and rust stained concrete under valves in the fire suppression system room. The interviewee indicated this was most likely caused by the valve leaking HEF concentrate. Direct interviewee knowledge prior to 2017 is unavailable; therefore, it is unknown if the rubber seals at the bottom of the hangar doors leaked during the 2010 fire suppression system testing.

There is a cold storage hangar located to the north of the main hangar, however it does not contain a fire suppression system.

3.2 TriMax™ 30 Fire Extinguishers

There are six TriMax™ 30 fire extinguishers filled with AFFF located at the AASF #2. It is unknown when the fire extinguishers arrived at the facility. The TriMax™ 30 fire extinguishers are placed in various locations on the ramp area in front of the two hangars. One TriMax™ 30 extinguisher is filled with soap and water for training purposes. There were two additional empty TriMax™ 30 extinguishers found in crates in the cold storage hanger at the facility that were never filled with AFFF. The fire extinguishers were serviced in 2019; the NEARNG sent the AFFF-filled TriMax™ 30 fire extinguishers to the Lincoln AASF #2 in Lincoln, NE where they could be sent to a contractor to undergo hydrostatic testing. There have been no reports or accounts of the TriMax™ 30 extinguishers ever being used or dispensed at the facility.



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Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	8/19/2020	

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Non-Fire Training Areas

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Figure 3-1

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4. Emergency Response Areas

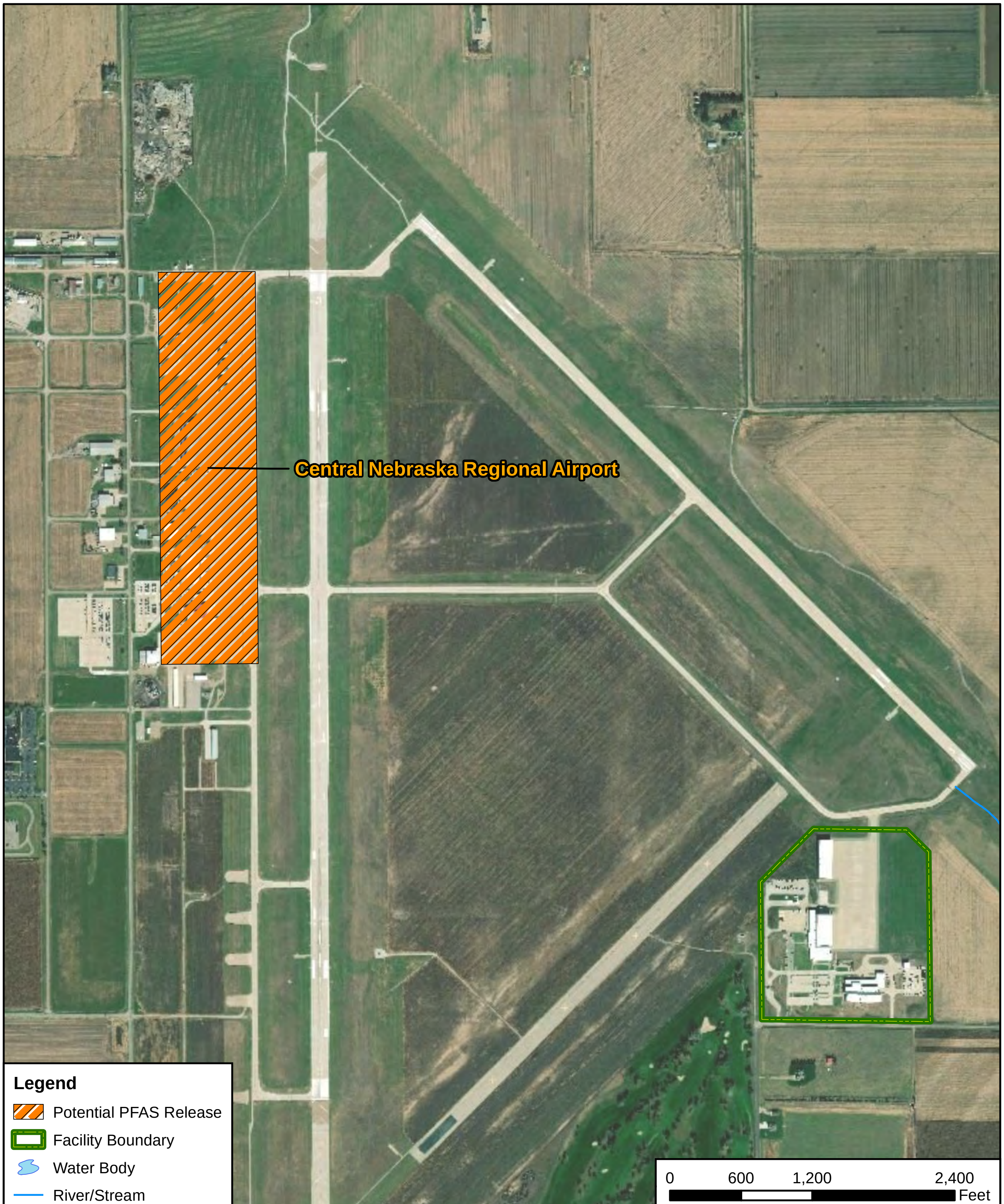
No emergency response areas were identified within AASF #2 during the PA through interviews or document review. The Grand Island Fire Department provides fire emergency services for the AASF #2.

5. Adjacent Sources

One potential off-facility source of PFAS adjacent to the AASF #2, not under the control of the ARNG, was identified during the PA. Based on interviews with NEARNG personnel (**Appendix B**) and historical document review, the identified adjacent area with potential AFFF releases is outside the AASF #2 boundaries. A description of the adjacent source is presented below, and the adjacent source is shown on **Figure 5-1**.

5.1 Central Nebraska Regional Airport

The Central Nebraska Regional Airport geographic coordinates are 40°58'9.22"N; 98°19'7.22"W. The Central Nebraska Regional Airport was constructed in 1937 and is owned and operated by the Hall County Airport Authority. The facility is northwest and side gradient of the Central Nebraska Regional Airport. The airport does not have a fire department. There are public, corporate, and private aircraft hangars, which could potentially have AFFF fire suppression systems.



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Adjacent Sources

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Figure 5-1

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6. Preliminary Conceptual Site Model

Based on the PA findings, two AOIs were identified at the AASF #2: AOI 1 Hangar Fire Suppression System and AOI 2 TriMax™ 30 Fire Extinguishers Location. The AOI locations are shown on **Figure 6-1**. The following sections describe the CSM components and the specific CSM developed for AOI 1 and AOI 2. The CSM identifies the three components necessary for a potentially complete exposure pathway: (1) source, (2) pathway, (3) receptor. If any of these elements are missing, the pathway is considered incomplete.

6.1 Pathways

In general, the potential PFAS exposure pathways are ingestion and inhalation. Human exposure via the dermal contact pathway may occur, and current risk practice suggests it is an insignificant pathway compared to ingestion; however, exposure data for dermal pathways is sparse and continues to be the subject of PFAS toxicological study (National Ground Water Association, 2018).

Potential AFFF releases identified at the AASF #2 may have occurred on paved surfaces and surface soil. AFFF releases to the paved surfaces could have infiltrated the subsurface via cracks in the pavement or joints between areas that are paved with different materials. In addition, potential AFFF releases may have occurred on surface soil; which could have infiltrated subsurface soil. Ground-disturbing activities may result in potential exposure to surface soil, subsurface soil, and groundwater. The preliminary CSM for AOI 1 and AOI 2 are shown on **Figure 6-2**, and **Figure 6-3**, respectively.

PFAS are water soluble and can migrate readily from soil to groundwater via leaching. There are several monitoring, commercial/industrial, irrigation, livestock, and domestic wells that exist within a 4-mile radius. Additionally, it is possible that unregistered private drinking water wells and domestic exist with 4 miles downgradient of the facility and may result in potential exposure via ingestion of groundwater.

6.2 Receptors

Receptors include construction workers and off-facility residents. These receptors as they pertain to the facility are described below:

- Site workers typically work at or use the site and may come into contact with the surface soils.
- Construction workers are considered workers who represent a utility worker or other worker who would be exposed to subsurface conditions and groundwater through ground-disturbing activities.
- Off-facility residents identify receptors who occupy properties outside of the AASF #2. Off-facility residents may come into contact with groundwater using unregistered, private, domestic wells.

The preliminary CSM for the AASF #2 indicates which specific receptors could potentially be exposed to PFAS. The preliminary CSMs for AOI 1 and AOI 2 are shown on **Figure 6-2**, and **Figure 6-3**, respectively.

6.3 AOI 1 Hangar Fire Suppression System

The hangar fire suppression system consists of a 250-gallon tank filled with 2 percent HEF concentrate. After installation in 2010, the fire suppression system was tested with a full hanger release. During the fire suppression testing, the hangar doors were closed, which have rubber seals at the bottom of the door to prevent leaks. The HEF was directed to the trench drains in the hangar, which drain to an oil/water separator and eventually discharges to the Grand Island City Sanitary Waste Water Treatment Plant (WWTP). Direct interviewee knowledge prior to 2017 is unavailable; therefore, it is unknown if the rubber seals at the bottom of the hangar doors leaked during the 2010 fire suppression system testing. Potential PFAS exposure pathways resulting from potential releases at AOI 1 are described in **Table 6-1**.

Table 6-1 Exposure Pathways at AOI 1

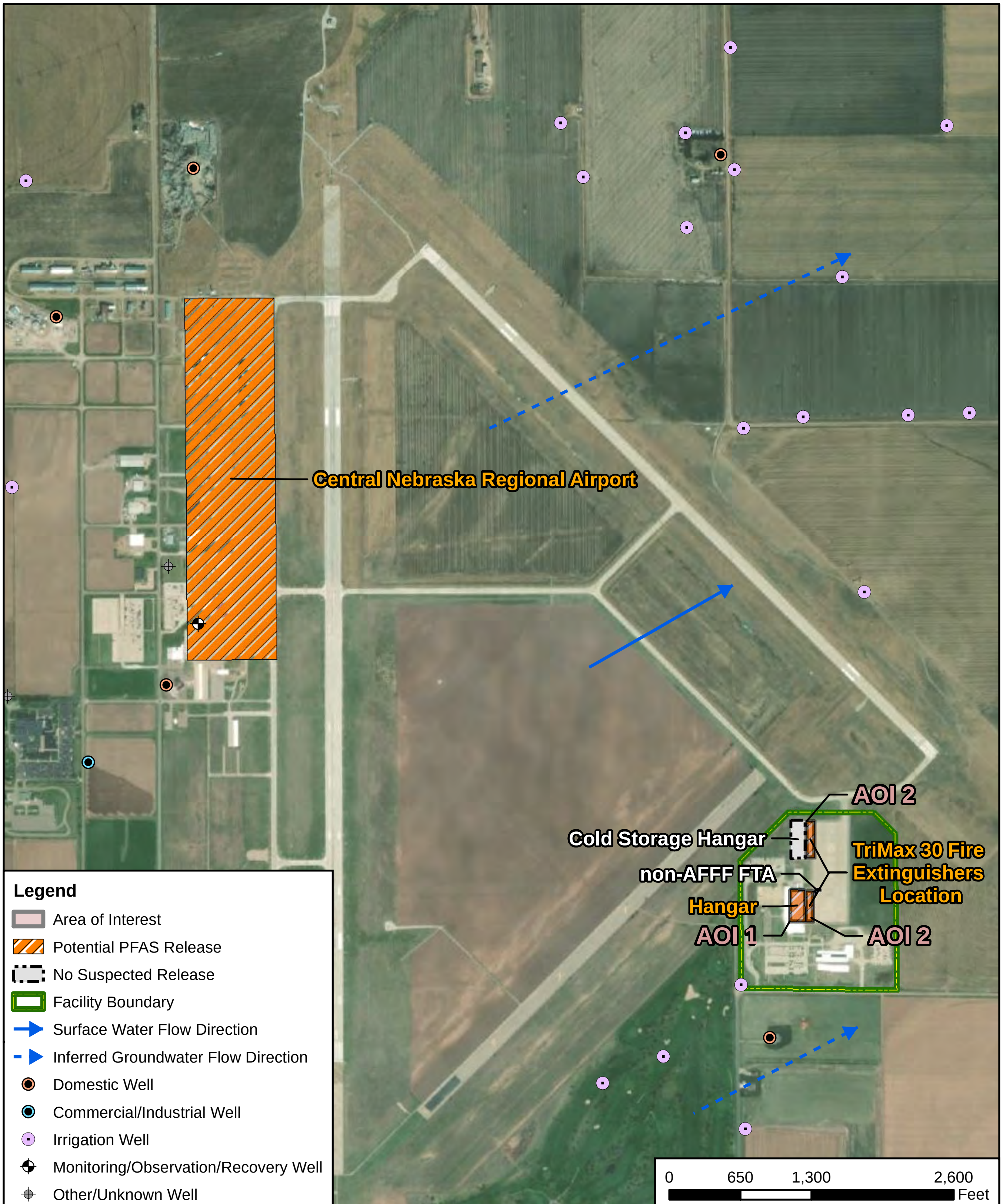
Pathway	Receptor
Subsurface Soil	Considered a potentially complete pathway to construction workers via ingestion or inhalation of dust
Groundwater	Considered a potentially complete pathway to construction workers and residents via ingestion

6.4 AOI 2 TriMax™ 30 Fire Extinguishers Location

There are six TriMax™ 30 fire extinguishers filled with AFFF located at the AASF #2. It is unknown when the fire extinguishers arrived at the facility. The TriMax™ 30 fire extinguishers are placed in various locations on the ramp area in front of the two hangars. There have been no reports or accounts of the TriMax™ 30 extinguishers ever being used or dispensed at the facility; however, it is possible that leaks or spills may have occurred on the ramp area since direct interviewee knowledge from 2010 to 2017 is unavailable. Any potential releases to the paved surfaces could have migrated a short distance onto the surrounding surface soil. Potential PFAS exposure pathways resulting from potential releases at AOI 2 are described in **Table 6-2**.

Table 6-2 Exposure Pathways at AOI 1

Pathway	Receptor
Surface Soil	Considered a potentially complete pathway to site workers, and construction workers via ingestion or inhalation of dust
Subsurface Soil	Considered a potentially complete pathway to construction workers via ingestion or inhalation of dust
Groundwater	Considered a potentially complete pathway to construction workers and residents via ingestion



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Grand Island AASF #2, NE			
REVISED	8/19/2020	GIS BY	MS	8/19/2020
SCALE	1:15,600	CHK BY	EA	8/19/2020
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	8/19/2020

Area of Interest

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 6-1

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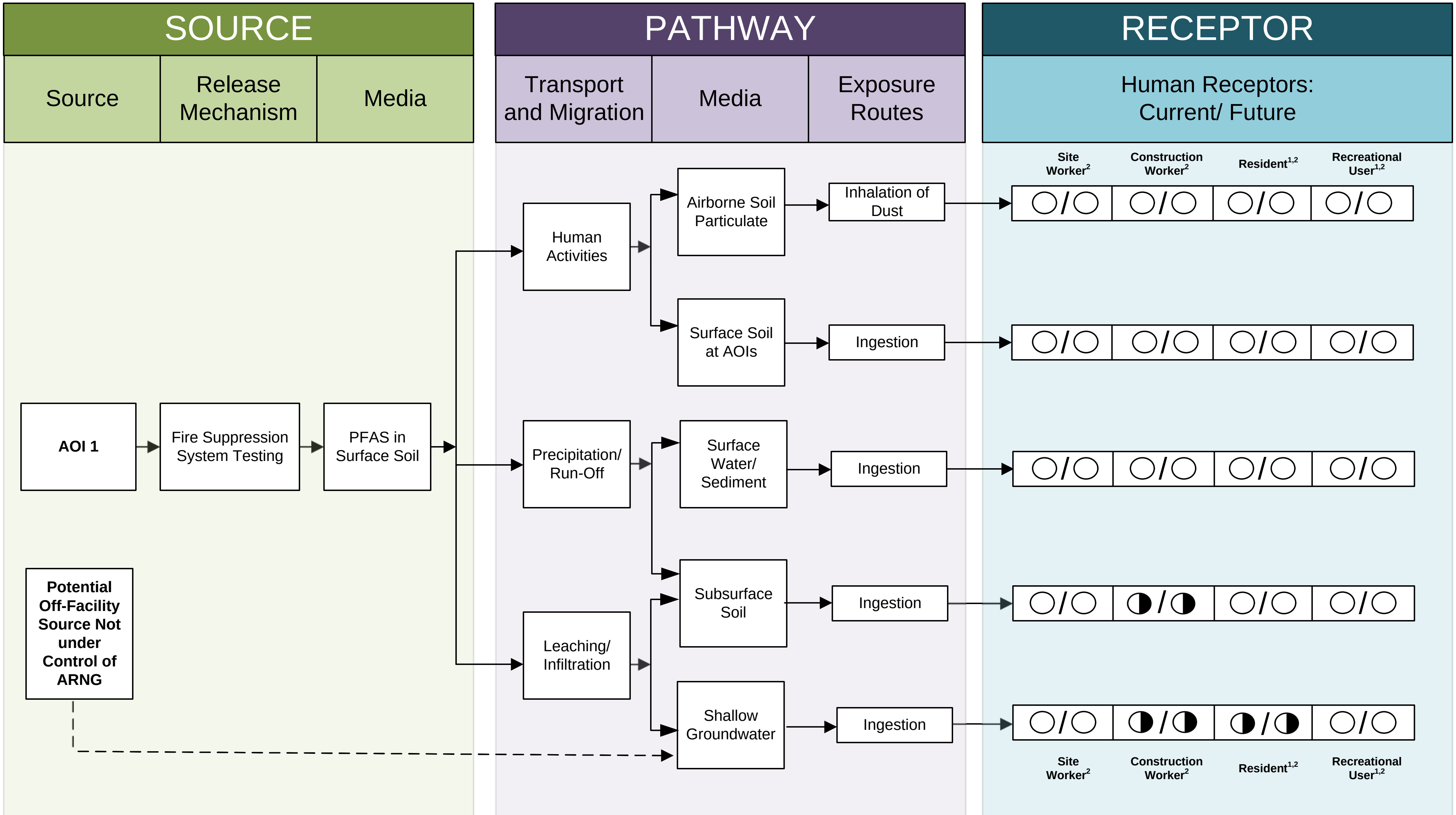


LEGEND

Flow-Chart Stops

Flow-Chart Continues

Partial / Possible Flow

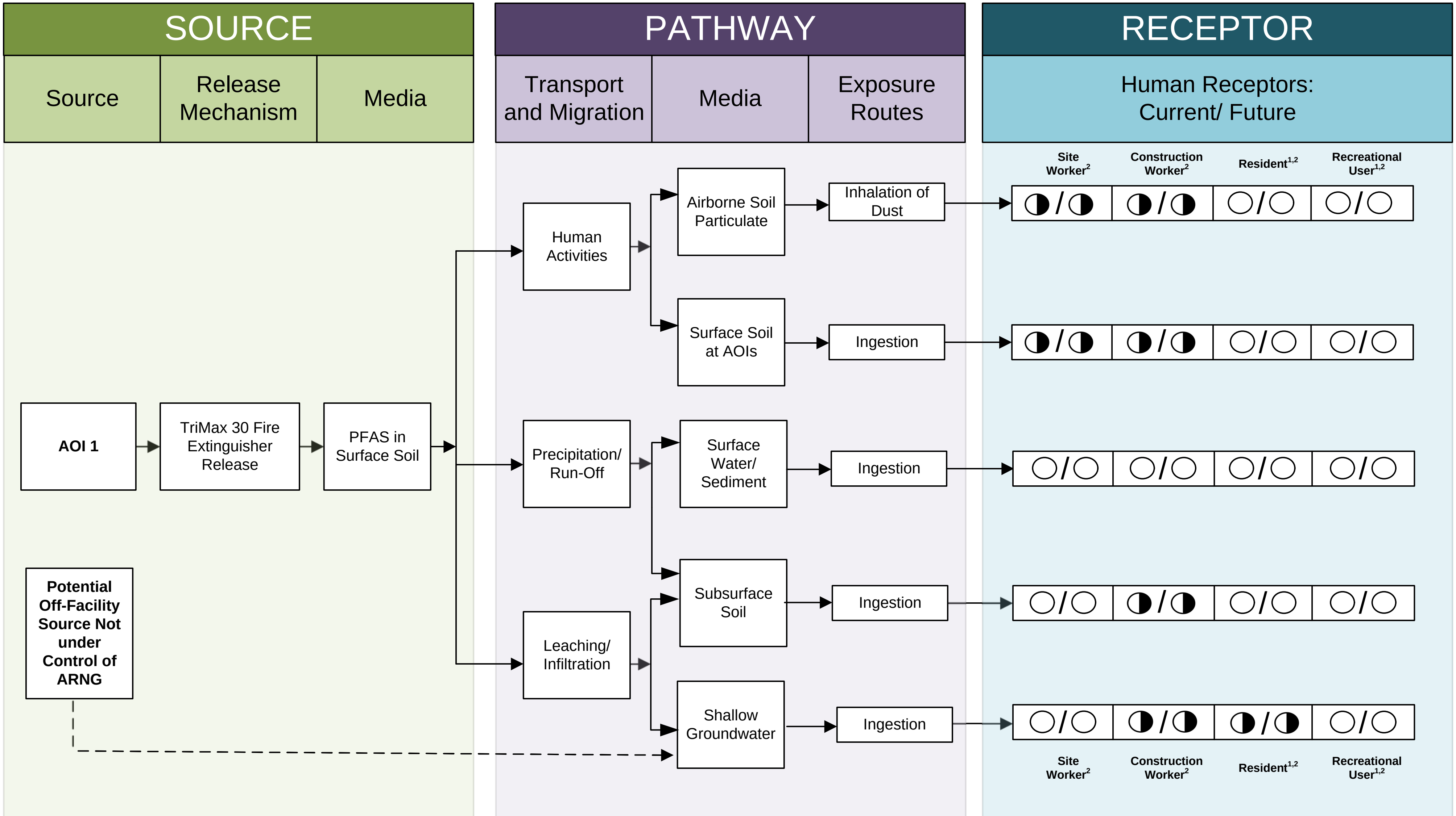
Incomplete Pathway

Potentially Complete Pathway

Complete Pathway

Notes:
1. The resident and recreational users receptors refer to an off-facility resident and off-facility recreational users.
2. Dermal contact exposure pathway is incomplete for PFAS.

Figure 6-2
Preliminary Conceptual Site Model
AOI 1 Hangar Fire Suppression System



LEGEND

- Flow-Chart Stops
- Flow-Chart Continues
- Partial / Possible Flow
- Incomplete Pathway
- Potentially Complete Pathway
- Complete Pathway

Notes:
1. The resident and recreational users receptors refer to an off-facility resident and off-facility recreational users.
2. Dermal contact exposure pathway is incomplete for PFAS.

Figure 6-3
Preliminary Conceptual Site Model
AOI 2 TriMax 30 Fire Extinguishers Location

7. Conclusions

This report presents a summary of available information gathered during the PA on the use and storage of AFFF and other PFAS-related activities at the AASF #2. The PA findings are based on the information presented in **Appendix A** and **Appendix B**.

7.1 Findings

Two AOIs related to a potential PFAS release were identified (**Table 7-1**) at the AASF #2 during the PA (**Figure 7-1**).

Table 7-1: AOIs at the Grand Island AASF #2

Area of Interest	Name	Used by	Potential Release Dates
AOI 1	Hangar Fire Suppression System	NEARNG	2010
AOI 2	TriMax™ 30 Fire Extinguishers Location	NEARNG	Unknown

Based on potential PFAS releases at the AOIs, there is potential for exposure to PFAS contamination in media at or near the facility. The preliminary CSMs for AOI 1 and AOI 2, which presents the potential receptors and media impacted, are shown on **Figure 6-2** and **Figure 6-3**.

The following areas discussed in **Section 2** through **Section 5** were determined to have no suspected PFAS releases (**Table 7-2**).

Table 7-2: No Suspected Release Areas

No Suspected Release Area	Used by	Rationale for No Suspected Release Determination
Non-AFFF FTA	NEARNG	ABC fire extinguishers and TriMax™ 30 extinguishers filled with soap/water were used during training exercises.
Cold Storage Hangar	NEARNG	Two empty TriMax™ 30 fire extinguishers were found on crates in the cold storage hangar. The TriMax™ 30 units have never been filled with AFFF.

7.2 Uncertainties

A number of information sources were investigated during this PA to determine the potential for PFAS-containing materials to have been present, used, or released at the facility. Historically, documentation of PFAS use was not required because PFAS were considered benign. Therefore, records were not typically kept by the facility or available during the PA on the use of PFAS in training, firefighting, or other non-traditional activities, or on its disposition.

The conclusions of this PA are based on all available information, including: previous environmental reports, EDRs™, observations made during the VSI, and interviews. Interviews of personnel with direct knowledge of a facility generally provided the most useful insights regarding a facility's historical and current PFAS-containing materials. Sometimes the provided information was vague or conflicted with other sources. Gathered information has a degree of uncertainty due to the absence of written documentation, the limited number of personnel with direct knowledge due to staffing changes, the time passed since PFAS was first used (1969 to present), and a reliance on personal recollection. Inaccuracies may arise in potential PFAS release locations, dates of release, volume of releases, and the concentration of AFFF used. There is also a possibility the PA has missed a source of PFAS, as the science of how PFAS may enter the environment continually evolves.

In order to minimize the level of uncertainty, readily available data regarding the use and storage of PFAS were reviewed, retired and current personnel were interviewed, multiple persons were interviewed for the same potential source area, and potential source areas were visually inspected. **Table 7-3** summarizes the uncertainties associated with the PA.

Table 7-3: Uncertainties

Area of Interest	Source of Uncertainty
AASF #2	Direct interviewee knowledge is not available before 2017. Whether potential use, storage, or release of PFAS-containing materials occurred at this facility from 2010 to 2017 is unknown.
AASF #2	It is unknown whether the 2 percent C2 HEF contains fluorinated compounds.
AASF #2	It is unknown when the TriMax™ 30 fire extinguishers arrived at the facility. There have been no reports or accounts of the extinguishers ever being used or dispensed at the facility; however, direct interviewee knowledge from 2010 to 2017 is unavailable.

7.3 Potential Future Actions

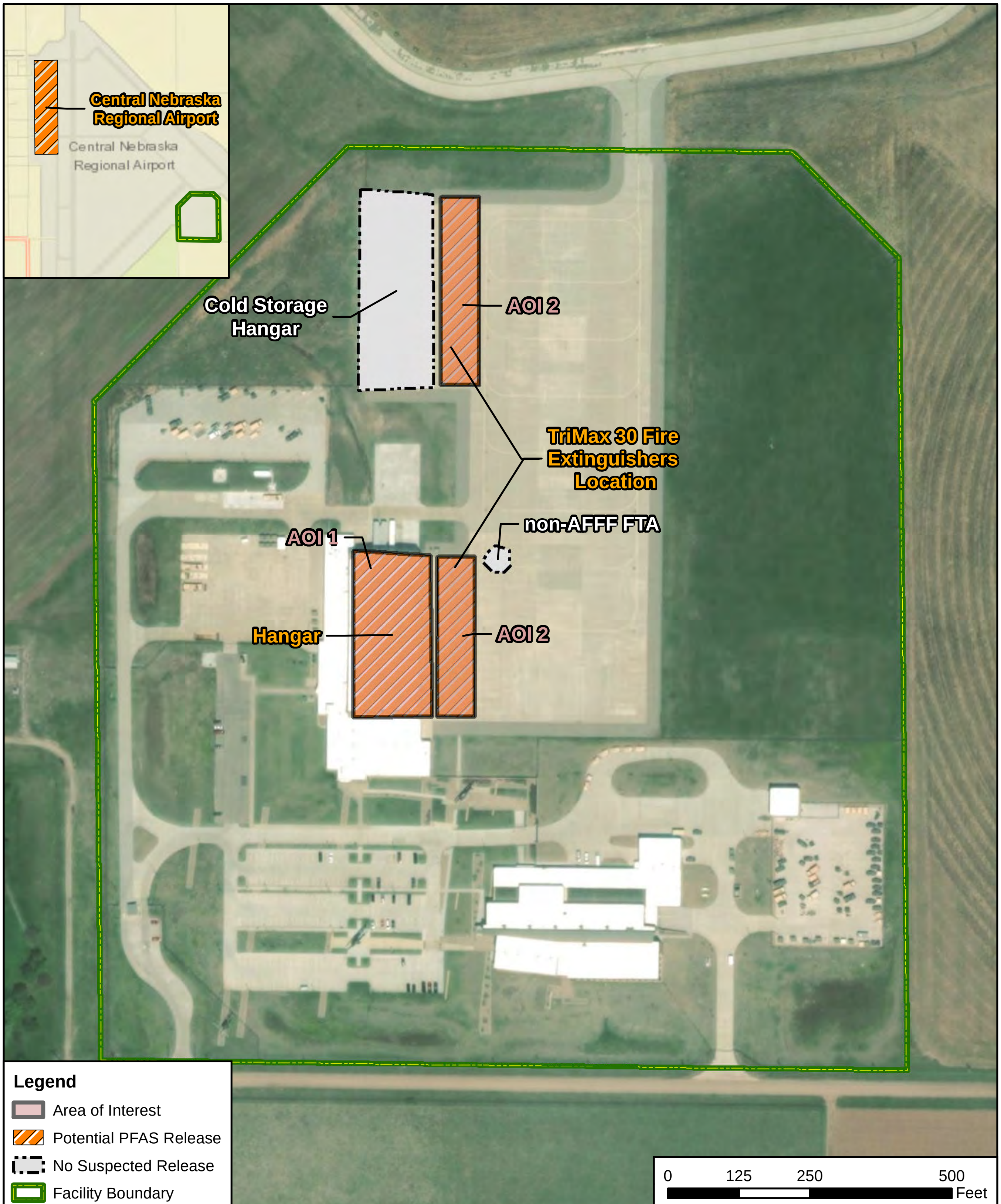
Interviews and records (covering 2017 to present) indicate that activities may have resulted in potential PFAS releases at the AOI identified during the PA, however the environmental media at the AASF #2 was not directly impacted. **Table 7-4** summarizes the rationale used to determine if the AOI should be considered for further investigation under the CERCLA process and undergo an SI.

ARNG will evaluate the need for an SI at the AASF #2 based on the potential receptors, the potential migration of PFAS contamination off the facility, and the availability of resources.

Table 7-4: PA Findings Summary

Area of Interest	AOI Location	Rationale	Potential Future Action
AOI 1 Hangar Fire Suppression System	40°57'42.38"N 98°17'58.43"W	There was a one-time fire suppression system test during installation. The fire suppression system has a 250-gallon tank filled with 2 percent HEF.	Proceed to an SI, focus on soil and groundwater

Area of Interest	AOI Location	Rationale	Potential Future Action
AOI 2 TriMax™ 30 Fire Extinguishers Location	40°57'42.52"N 98°17'57.16"W 40°57'48.31"N 98°17'56.92"W	TriMax™ 30 fire extinguishers are placed in various locations on the ramp area in front of the two hangars. It is possible that leaks or spills may have occurred on the ramp area.	Proceed to an SI, focus on soil and groundwater



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Grand Island AASF #2, NE			
REVISED	8/19/2020	GIS BY	MS	8/19/2020
SCALE	1:3,000	CHK BY	EA	8/19/2020
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	8/19/2020

Summary of Findings

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 7-1

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8. References

City of Grand Island Utilities. 2017. *Annual Water Quality Report, Water Testing Performed in 2017*.

United States Environmental Protection Agency (USEPA). 1991. *Guidance for Performing Preliminary Assessments under CERCLA.* September.

URS. 2006. April 2006 Facility-Wide Work Plan. Final Report. Cornhusker Army Ammunition Plant Grand Island, Nebraska. Prepared for USACE.

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USGS. 2020. *Niobrara Formation*. Available at https://mrdata.usgs.gov/geology/state/sgmc-unit.php?unit=NEKn%3B0. (Accessed February, 17, 2020).

World Climate. 2019. Available at http://www.worldclimate.com/climate/us/nebraska/grand-island (Accessed November 12, 2019).

Appendix A
Data Resources

Data Resources will be provided separately on CD. Data Resources for Grand Island AASF #2.

Grand Island AASF #2 Deed, Leases, Licenses, and Permits

- 2005 Grand Island Property Lease

Grand Island AASF #2 Documentation

- 2017 Spill Prevention, Control and Countermeasure Plan

EDR Report

- 2019 Grand Island AASF #2 EDR Report

Entered As Instrument No 0 200505875

STATE OF NEBRASKA) SS
COUNTY OF HALL)

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Kathy Baack
REG OF DEEDS

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St. of Nebr.

REFUNDS:
CASH
CHECK

Master Planner
Nebraska Army National Guard
1300 Military Rd.
Lincoln NE 68508

200505875

200505875

HALL COUNTY AIRPORT AUTHORITY

and

STATE OF NEBRASKA MILITARY DEPARTMENT

GROUND LEASE AGREEMENT

70.50

THIS GROUND LEASE AGREEMENT, entered into this 24TH day of MAY, 2005, by and between the **HALL COUNTY AIRPORT AUTHORITY** of Grand Island, Nebraska (the "Authority"), and the **STATE of NEBRASKA MILITARY DEPARTMENT** (the "Department").

WITNESSETH

WHEREAS, Authority has the exclusive use and occupancy of the land and property known as Central Nebraska Regional Airport located in Grand Island, Hall County, Nebraska (the "Field") pursuant to the County Airport Authority Act, Section 3-601 et. seq. R.R.S. Nebraska 1997; and

WHEREAS, Department wishes to lease a portion of the Field as more particularly described on attached Exhibit "A" (the "Demised Land") as the site for an Army Aviation Support Facility and armory (the "Facility"); and

WHEREAS, the parties desire to reduce their agreement to writing;

NOW THEREFORE, in consideration of the covenants and agreement contained herein, the parties agree as follows:

ARTICLE I.

PREMISE AND POSSESSION

ARTICLE II.

OBJECTIVES AND PURPOSE OF LEASE

Subsection 2.01 Use of leased Premises.

1. The Demised Land shall be used by the Department as the site for the construction and operation of the Facility, including supporting facilities. The Department's use of the Facility shall be as an Army aviation support facility and armory. The Facility may be used by the Department for administration and training of units, military operations, and maintenance of equipment of the Reserve Forces of the United States; or, in time of war, or national or state emergency, by other units of the Armed Forces of the United States or other use by the Federal Government or the State of Nebraska and Department until termination of this lease.

2. The Department shall consult with Authority's Executive Director in determining standard helicopter approach routes to the Airport which shall be followed as closely as practical, except in case of emergency as determined by Department. All legal consequences of departures from the standard routes shall be borne by the Department to the extent permitted by law.

Subsection 2.02 Prohibited Uses.

The Tenant may not use any part of the Demised Land or the improvements located thereon for any activity or other purpose than as set forth in Section 2.01, unless such use is approved by the Authority. It is understood and agreed that the rights granted by this Agreement will not be exercised by the Department in such a way as to interfere with or adversely affect the use, operation, maintenance, or development of the Field. The Department will not intentionally use radios or other electronic devices that create interference with ground or air communications at the Field. No lights shall be placed on the premises which shine in an upward direction. The Department will operate the Facility in compliance with all federal requirements, including but not limited to noise level requirements, hazardous wastes and fuel storage. The Department, its successors and assigns, shall not sell fuel or provide aeronautical services to the public.

ARTICLE III.

TERM OF LEASE

Subsection 3.01 Term.

1. The term of this lease is fifty (50) years. The lease term shall commence upon a date determined by the Department which date shall be no earlier than November 1, 2005 and no later than January 1, 2006. However, the Department shall provide at least ninety (90) days written notice of its intent to commence the lease term. Upon receipt of written notice of commencement

from the Department, the parties shall execute a Statement of Commencement to confirm the commencement and expiration dates of this Agreement. The lease shall expire without further notice unless previously terminated as provided herein. If expiration of the lease term falls during a time of war, national emergency, or state emergency and continued use of the Facility is necessary or desirable, in such event, the Lease will terminate two (2) years after the termination of the war or emergency.

Subsection 3.02 Rent Waiver.

In consideration of the Department's commitment to construct and operate an Army aviation support facility on the Demised Land, the Authority agrees to provide the Demised Land to the Department without payment of rent.

ARTICLE IV.

TENANT'S FUTURE CONSTRUCTION REQUIREMENTS

Subsection 4.01 Requirements for Construction of Improvements on Demised Land and Off-Site.

The Department shall construct the Facility without cost to Authority upon the Demised Land and shall construct a ramp north of the Demised Land to the adjacent taxiway. The Guard's use of the ramp and access to the taxiway shall be set forth in an exclusive use easement agreement subject only to emergency temporary use by Authority and aircraft or for immediate temporary air traffic capacity control which shall not interfere with Guard operations. The Department may also construct an Armory on the Demised Land. The Department will not erect, or permit to be erected, any building or other structure on the Demised Land which would limit the usefulness of the Airport or constitute a hazard to aircraft. The Department will submit plans for construction of the Facility, a drainage plan and all plans for modifications to the Authority for prior approval. Provided the plans and specifications comply with all federal, state and local requirements, the Authority agrees that it will not unreasonably withhold its approval. Construction and operation of the Facility and all structures upon the Demised Land shall comply with FAA requirements. The Authority reserves the right to construct the extension of Shady Bend Road in a northerly direction adjacent to the Demised Land as a public or private drive subject to Department's security setbacks and reserves the right to take any legal action it considers necessary to protect the aerial approaches of the airport against obstruction, together with the right to prevent the Department from erecting, or permitting to be erected, any building or other structure on the airport which in the opinion of the Authority would limit the usefulness of the airport or constitute a hazard to aircraft. The Authority shall not be responsible for the costs of off-site improvements directly required by the construction of any building or facility on the Demised Land. Further, the Authority shall not be responsible for the cost of correcting any deficiencies in traffic, lighting, security or other facilities directly related to the construction or operation of the said Facility.

Subsection 4.02 Mortgage on Future Construction.

The Department shall not attempt to place or permit any security lien, pledge, or mortgage, upon the Demised Land, the Facility, or improvements.

Subsection 4.03 Ownership of Improvements.

All buildings, fixtures, structures, additions and permanent improvements shall be the property of the Federal Government or Department during the lease term. However, upon termination of this Lease the rights and obligations of the parties shall be determined in accordance with Section 10.01.

ARTICLE V.

OBLIGATION OF DEPARTMENT

Subsection 5.01 Maintenance and Care of Leased Premises.

The Department will complete its due diligence prior to execution of this Lease and if the Department determines the site to be acceptable, will accept the Demised Land in **"As-Is"** condition without any representation of any nature from Authority as to the condition of the Demised Land. The Authority shall not be responsible, during the lease term, for keeping up any portion of the Demised Land, the interior or exterior of the Facility, including but not limited to maintenance and repair of the structural components of the Facility.

Subsection 5.02 Utilities.

The Authority shall not be responsible for the costs or charges for utilities services furnished to the Department during the lease term.

Subsection 5.03 Trash, Garbage, Snow Removal, Etc.

The Department shall provide for, a complete and proper arrangement for the adequate sanitary handling and disposal, away from the Field, of the Department's trash, garbage, hazardous materials, and other refuse; shall maintain the Demised Land and the Facility in safe, sightly and sanitary condition; shall not permit noxious weeds to grow on the Demised Land; and shall be responsible for mowing and snow removal from the Demised Land.

Subsection 5.04 Signs.

The Department may erect and maintain, or display upon the outside of any improvements on the Demised Land any signage as may be reasonably approved by the Authority subject to City of Grand Island signage ordinances and FAA requirements and limitations as applicable.

Subsection 5.05 Nondiscrimination.

The Department for itself, its successors in interest, and assigns, does, to the extent permitted by law, hereby covenant and agree as a covenant running with the Demised Land that:

(1) No person on the grounds of race, color, national origin or other illegal classification shall be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of the Facility, and

(2) In the construction of any improvements on, over, or under the Demised Land, or the furnishing of services thereon, no person on the grounds of race, color, national origin or other illegal classification shall be excluded from participation in, denied the benefits of, or otherwise be subjected to discrimination, and

(3) The Department shall use the premises in compliance with all other requirements imposed by or pursuant to 49 CFR Part 21, Nondiscrimination in Federally Assisted Programs of the Department of Transportation and said Regulations as may be amended.

Subsection 5.06 Observance of Statutes, etc

The Department shall observe and comply with all laws, statutes and regulations of the United States Government, FAA, State of Nebraska, County of Hall, City of Grand Island, and Authority, which may be applicable to its operations or to the operation, management, maintenance or administration of the Airport, now in effect or hereafter promulgated, unless the Department is exempted by law or regulation.

Subsection 5.07 Airport Security.

The Department recognizes the Authority's required compliance with Federal law, Federal Aviation Rules and Regulations concerning airport security and agrees to comply with all federal mandates with respect to security and will comply with the Authority's Security Plan, to the extent the Department is permitted by law or regulation.

Subsection 5.08 Minimum Standards.

Department acknowledges receipt of a copy of the Authority's Minimum Standards and

Rules and Regulations ("Standards") previously approved by Authority. The Standards as adopted, and as may hereafter be amended or revised by Authority from time to time during the term of this Lease, are incorporated as part of the terms and conditions of this lease agreement as if fully set forth herein. Department agrees to comply with the Standards to the extent the Department is permitted by law or regulation and provided that the changes in the Standards, as applicable to Department, shall not interfere with the purpose of the Department entering into this Lease or with the Department meeting its mission.

ARTICLE VI.

OBLIGATIONS OF THE AUTHORITY

Subsection 6.01 Operation as a Public Airport.

The Authority covenants and agrees that at all times during the term of this Lease it will operate and maintain the Field as a public airport.

Subsection 6.02 Ingress and Egress.

Upon performing the covenants of this Agreement, the Department shall have the right of ingress to, and egress from, the Demised Land. Airport roadways outside of the Demised Land shall be used jointly with other tenants of the airport, and the Department shall not interfere with the rights and privileges of other persons or firms using said facilities and roadways. The Department shall be subject to such weight and type use restrictions on the airport property outside of the Demised Land as the Authority deems necessary which restrictions shall not be unreasonable.

ARTICLE VII.

AUTHORITY'S RESERVATIONS

Subsection 7.01 Improvement, Relocation, or Removal of Structure.

The Authority, at its sole discretion, reserves the right to further develop or improve the Field including but not limited to the aircraft operating area; to repair, maintain or replace the runways, aprons, taxi-ways and appurtenances thereto and other portions of the Field, including the right to remove or relocate any structure on the airport, as it deems appropriate, and to take any action it considers necessary to protect the approaches of the airport against obstructions. There is hereby reserved to the Authority, for the use and benefit of the public, a free and unrestricted right of flight for the passage of aircraft in the airspace above the surface of the Demised Land. When exercising its rights under this paragraph the Authority will not interfere with the Department's use, operation, or development of the Facility. The Authority also reserves to itself, its Tenants, commercial air carriers and other public and private users of the airfield the right to cause in said airspace such noise as may be inherent in the operation of aircraft, now known or hereafter used for navigation of or flight in the air, using said airspace or landing at, taking off from or operating on or about the Airport. The Authority shall in good faith negotiate and pay for the cost of the replacement of any portion of the Facility prior to it being removed or relocated under the provision of this subsection.

Subsection 7.02 Inspection of Leased Premises.

The Authority, through its executive director or other duly authorized agent, shall have upon reasonable times with reasonable prior notice, the right to enter the Demised Land and Facility for the purpose of periodic inspection for fire protection, maintenance and to investigate compliance with the terms of this Agreement. Such entry shall be subject to the Department's security requirements, and will be escorted.

ARTICLE VIII.

INDEMNITY AND INSURANCE

Section 8.01 Indemnification.

Nothing in this Lease shall be construed as an agreement for indemnification by one party of the other for liabilities to a party or third persons for property loss or damage or death or personal injury arising out of and during the performance of this Lease. Any liabilities or claims for property loss or damage or for death or personal injury by a party or its agents, employees, contractors or assigns or by third persons, arising out of and during the performance of this Lease shall be determined according to applicable law.

Subsection 8.02 Liability Insurance.

1. The State of Nebraska, under the provisions of Nebraska Revised Statutes, section 81-8,239.01 (Cum. Supp. 2000), self-insures all such exposures described therein and is financially capable of retaining these losses should they occur. If there is a liability loss under the provisions of any agreement signed by an agency of the State of Nebraska, a claim may be filed with the State Claims Board and, if approved, will be paid from the State Tort Claims Fund. The State retains all rights and immunities under the State Tort Claims Act, R.R.S., 1943, section 81-8,209 et. al. and any other provision of law.

2. Authority retains all rights and immunities under the Nebraska Political Subdivisions Tort Claims Act, Neb. Rev. Stat. §13-901 et seq., as amended, and under any other provision of law. Neither Authority nor Department is required to obtain public liability insurance in connection with the Demised Land, the Facility, fixtures, structures thereon or personal property. This section shall not be construed to prohibit any party from requiring any

maintenance, construction, or other contractor to obtain insurance coverage. Each party, may, if it shall elect to do so, insure its interest in personal property or structures on the Demised Land including but not limited to the Facility.

3. The United States, under the provisions of Federal law, self-insures all such exposures described therein and is financially capable of retaining these losses should they occur. If there is a liability loss under the provisions of any agreement signed by an agency of the Federal Government, a claim may be filed with the United States and, if approved, will be paid from Federal Funds. The United States retains all rights and immunities under Federal law.

Subsection 8.03 Destruction of Premises.

If the Facility is partially or totally destroyed or damaged, the Department, within six (6) months of the damage, shall decide whether or not to proceed with restoration. If the Department elects not to restore the property, this Agreement shall then be canceled without future obligation. If the Facility is not rebuilt, the Department shall remove all debris and improvements. The Department, in its discretion, may leave in place such items that the Authority requests be left in place and ownership shall be transferred according to law.

Subsection 8.04 Environmental Impairment.

1. The Department agrees to comply with all federal, state and local environmental statutes, rules and regulations affecting its operations throughout the term of the lease (specifically including but not limited to noise-related requirements in accordance with 14 CFR Part 150). In the interest of public health and sanitation and welfare, and so that the Demised Land and all of the land in the same locality may be benefited by a decrease in the hazards to ground water and other pollution and by the protection of water supplies, recreation, wildlife and other public uses thereof, the Department agrees not to engage in any use of the Demised Land for any purpose that would result in the intentional pollution of the environment or any waterway or ground water that flows through, adjacent to or under the Demised Land by refuse, sewage, industrial or hazardous wastes, pollutants, chemicals or any other materials. The Department shall capture and properly dispose of all waste oil, fuel and other contaminants and shall NOT dispose of or permit the intentional discharge of any such fluids into the storm water drainage inlets. The Department shall prepare a drainage plan for the Demised Land (subject to Authority approval) and shall comply with the drainage plan. Any discharge in violation of this Agreement, federal, state, or local law, shall be **IMMEDIATELY** reported to the airport Executive Director.

2. Each Party shall be individually responsible for any fines, penalties, fees or costs accessed against their respective agency under this Subsection, and nothing in this agreement shall be considered an indemnity by one party of the other party for the any fines, penalties, fees, or cost accessed under this Subsection. The Department shall, if funds are appropriated and as permitted by law, complete all necessary cleanup and remediation, and pay all costs, fees, fines or other

penalties directed or accessed against the Department by the State of Nebraska or the Federal Government, regardless of the time frame that may be required by any authorities supervising the elimination of the contamination, even if the time necessary to perform such clean up or remediation extends beyond the term of this Lease.

ARTICLE IX.

CANCELLATION OF LEASE BY AUTHORITY

Subsection 9.01 Events of Default by Tenants.

Each of the following events shall constitute an "Event of Default by the Department":

1. The Department defaults under any material term or condition of this Agreement, and such default continues for a period of thirty (30) days after receipt of written notice from the Authority of such default, or

2. The Department fails to commence construction of the Flight Facility on the Demised Land on or before December 31, 2011, and such default continues for a period of six (6) months after receipt of written notice from the Authority of such default, or

3. If funds are not appropriated for construction of the Flight Facility on the Demised Land on or before March 31, 2007, and such default continues for a period of six (6) months after receipt of written notice from the Authority of such default, or

4. The Department fails to provide Authority with written confirmation that National Guard Bureau has approved the lease on or before December 31, 2005 and such default continues for a period of six (6) months after receipt of written notice from the Authority of such default.

5. The Department fails to use the Facility as an active Army Aviation Support Facility, as an armory, as permitted under Article XI or such other use as may be accepted by Authority in writing for a continuous period of Five (5) years and such failure continues for a period of six (6) months after receipt of written notice from the Authority of such default.

Subsection 9.02 Remedies for Tenant's Default.

Upon the occurrence of an Event of Default by the Department, the Authority, in its discretion, may exercise all rights or remedies it may have at law or in equity except termination of the lease or eviction; however, upon the occurrence of an Event of Default of Subsection 9.01 paragraphs 2, 3 or 4, the Authority's rights and remedies specifically include termination of this Agreement.

ARTICLE X.

RIGHTS UPON TERMINATION

Subsection 10.01 Fixed Improvements.

The Facility, leasehold buildings, fixtures, structures, additions, or improvements shall be and remain the property of the Federal Government or the Department during the entire term of this Agreement. Upon termination of this Agreement the Federal Government and the Department may dispose of the buildings and fixtures as permitted by law. If the buildings and fixtures are offered for sale the Authority shall have first right of refusal. If removal is required, and funding can be obtained, all improvements erected thereon will be removed

Subsection 10.02 Personal Property.

Upon termination of this Agreement, the Tenant shall remove all of its personal property and items not affixed from the Demise Land and shall, as permitted by law, repair any damage caused by such removal.

ARTICLE XI.

ASSIGNMENT AND SUBLETTING

1. The Department may assign or sublet this Agreement or any of the privileges recited herein, or any part thereof, in any manner whatsoever to another federal agency or agency of the State of Nebraska. Assignment or subleasing of the property to non-federal agencies or non-state agencies shall only take place after the termination of this Agreement, are subject to approval by the Authority, and in such event, the Department will have no obligation, liability, or responsibility under the assignment or sublease approved by the Authority.

2. The Department shall provide the Authority copies of all assignments and subleases between the Department and its federal and state subtenants or assignees

ARTICLE XII.

QUIET ENJOYMENT

The Authority covenants that the Department, upon the performance of the covenants, agreements and conditions herein, shall and may peaceably and quietly, have, hold and enjoy the Demised Land for the term of the Agreement.

ARTICLE XIII.

GENERAL PROVISIONS

Subsection 13.01 Taxes and Special Assessments.

It is anticipated that there will be no leasehold interest tax, real estate taxes, and or personal property taxes, or other taxes which may be assessed against the Demised Land, the Facility or improvements thereon, the Department's equipment, aircraft, or other personal property belonging to the Department located on the Demised Land; however, the Authority shall not be responsible for any tax obligations that the Department may be responsible for..

Subsection 13.02 Right to Contest.

In the event the Demised Land, Facility or Improvements thereon or any part thereof is taxable, the Department shall have the right to contest the validity, valuation and amount of any tax, assessment or charge, lien or claim of any kind in respect to the Demised Land. The Department, so long as the matter shall remain undetermined by final judgment, shall not be considered in default hereunder by the nonpayment thereof.

Subsection 13.03 License Fees and Permits.

The Department shall obtain and pay for all licenses, permits, fees or other authorizations or charges as required under applicable federal, state or local laws and regulations required for the Departments operations.

Subsection 13.04 Paragraph Headings.

The paragraph headings contained herein are for convenience in reference and are not intended to define or limit the scope of any provision of the Agreement.

Subsection 13.05 Interpretations.

This agreement shall be interpreted in accordance with the laws of the State of Nebraska.

Subsection 13.06 Non-Waiver.

No waiver of any condition or covenant in this instrument contained or of any breach thereof, shall be taken to constitute a waiver of any subsequent condition, covenant, or breach.

Subsection 13.07 Severability.

If any term or provision of this Agreement or the application thereof to any person or circumstance shall, to any extent, be invalid or unenforceable, the remainder of this lease, or the application of such term or provision to persons or circumstances other than those as to which it is held invalid or unenforceable, shall not be affected thereby and every other term and provision of this lease shall be valid and shall be enforced to the fullest extent permitted by law.

Subsection 13.08 Binding Effect.

This lease, including all of its covenants, terms, provisions and conditions, shall be binding upon and inure to the benefit of the parties hereto and their respective successors and assigns. The Parties represent and warrant that they are legally authorized to sign this Agreement; that the signatures subscribed below bind them; and that no additional signatures or commitments by other entities are necessary for this Agreement to be effective and enforceable.

Subsection 13.09 No Partnership.

Nothing contained in this lease shall be deemed to create the relationship of partnership, principal and agent or joint venture or any relationship between the Authority and the Department other than the relationship of landlord and tenant.

Subsection 13.10 Notices.

Whenever any notice or payment is required by this Agreement to be made, given or transmitted to the parties hereto, all notices shall be certified mail, return receipt requested. Notice shall be deemed to have been given upon return of the certified mail receipt to the sender.

Such notices shall be to Authority at:

Executive Director
Hall County Airport Authority
Central Nebraska Regional Airport
3743 Sky Park Road
Grand Island, NE 68801

and such notices shall be to the Department at:

State of Nebraska Military Department
Construction and Facilities Management Office
1300 Military Road,
Lincoln, NE 68508

or such place as either party shall, by written directive, designate in the manner herein provided.

IN WITNESS WHEREOF, the parties have caused this instrument to be executed on their behalf by their duly authorized officers on the day and year above written.

HALL COUNTY AIRPORT AUTHORITY

BY ______________________

ATTEST:

BY ______________________

STATE OF NEBRASKA
MILITARY DEPARTMENT

BY ______________________

ATTEST:

BY ______________________

Exhibit A

A TRACT OF LAND CONSISTING OF PART OF THE SOUTHWEST QUARTER (SW1/4) OF SECTION 36, TOWNSHIP 12 NORTH, RANGE 9 WEST OF THE 6TH P.M., CITY OF GRAND ISLAND, HALL COUNTY, NEBRASKA AND MORE PARTICULARLY DESCRIBED AS FOLLOW:

COMMENCING AT THE SOUTHWEST CORNER OF SEC. 36; THENCE ON A ASSUMED BEARING OF S89°56'37"E ALONG AND UPON THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW1/4) OF SAID SEC. 36 A DISTANCE OF 52.24 FEET; THENCE N00°03'23"E A DISTANCE OF 33.00 FEET TO THE POINT OF BEGINNING, POINT ALSO BEING ON THE NORTH RIGHT-OF-WAY (R.O.W.) LINE OF AIRPORT ROAD; THENCE N01°18'05"W PARALLEL WITH THE WEST LINE OF SAID SW1/4 A DISTANCE OF 1171.87 FEET; THENCE N44°09'51"E A DISTANCE OF 615.35 FEET; THENCE S89°56'37"E PARALLEL WITH THE SOUTH LINE OF SAID SW1/4 A DISTANCE OF 783.92 FEET; THENCE S45°49'47"E A DISTANCE OF 263.11 FEET; THENCE S01°18'05"E PARALLEL WITH SAID WEST LINE OF THE SW1/4 A DISTANCE OF 1430.65 FEET TO SAID NORTH R.O.W. LINE OF AIRPORT ROAD; THENCE N89°56'37"W ALONG AND UPON SAID NORTH LINE AND PARALLEL WITH SAID SOUTH LINE OF THE SW1/4 A DISTANCE OF 1407.24 FEET TO THE POINT OF BEGINNING. SAID TRACT CONTAINS 2,156,598.27 SQUARE FEET OR 49.509 ACRES MORE OR LESS.

Spill Prevention, Control, and Countermeasure Plan

Nebraska Army National Guard
Army Aviation Support Facility 2
3010 Airport Road East

Grand Island, Nebraska

Original Date of Plan:
April 2009

Revisions:
August 2010
May 2013
December 2017

Olsson Project No. 008-0120, 013-0276, and 016-2929

PROFESSIONAL ENVIRONMENTAL ENGINEER
SHANNON
LESLIE
DEVIVO
E-14714
STATE OF NEBRASKA
12-4-17

OLSSON®
ASSOCIATES

SPILL PREVENTION, CONTROL, AND COUNTERMEASURE PLAN

NEBRASKA ARMY NATIONAL GUARD
ARMY AVIATION SUPPORT FACILITY 2
3010 AIRPORT ROAD EAST

GRAND ISLAND, NEBRASKA

ORIGINAL DATE OF PLAN:
APRIL 2009

REVISIONS:
AUGUST 2010
MAY 2013

PROFESSIONAL ENVIRONMENTAL ENGINEER
JEFFREY E. McPEAK
E-12612
5/31/13
STATE OF NEBRASKA

OLSSON PROJECT NO. 008-0120 AND 013-0276

OLSSON®
ASSOCIATES

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PART 1: PLAN ADMINISTRATION

1.1 MANAGEMENT APPROVAL AND DESIGNATED PERSON (40 CFR 112.7)

The Nebraska Army National Guard Army (NEARNG) is committed to the prevention of discharges of oil to navigable waters and the environment. NEARNG maintains the highest standards for spill prevention control and countermeasures through regular review, updating, and implementation of this Spill Prevention Control and Countermeasure (SPCC) Plan for the Army Aviation Support Facility (AASF) 2 located at 3010 Airport Road East, Grand Island, Nebraska.

Authorized Facility Representative: ______________________________

Signature: ______________________ Date: ______________________

1.2 PROFESSIONAL ENGINEER CERTIFICATION (40 CFR 112.3(D))

I hereby certify that I have visited and examined the facility, and being familiar with the provisions of 40 CFR Part 112, attest that this Plan has been prepared in accordance with good engineering practices, including consideration of applicable industry standards, and with the requirements of 40 CFR Part 112. The procedures for required inspections and testing have been established. The Plan is adequate for the facility.

Engineer: Shannon DeVivo
Signature: Shannon DeVivo
Registration Number: E-14714
Date: 12-4-17

1.3 LOCATION OF THE PLAN (40 CFR 112.3(E))

A complete copy of this Plan is maintained at the AASF 2 tech supply room which is attended whenever the facility is operational. An additional copy is maintained at the Construction and Facilities Management Office – Environmental (CFMO-ENV) at the NEARNG office at 2433 NW 24th Street in Lincoln, Nebraska.

1.4 PLAN REVIEW (40 CFR 112.3 AND 112.5)

The following subsections describe when and how the plan needs to be reviewed.

1.4.1 Changes in Facility Operations or Configuration

NEARNG periodically reviews and evaluates this Plan for changes in facility design, construction, operation or maintenance that may affect the potential for an oil discharge, including but not limited to:

- Adding new oil storage containers;
- Reconstruction, replacement or installation of oil piping systems;
- Construction or demolition that might affect secondary containment systems or;
- Change of product or service, revisions to operations, modification of testing/inspection procedures.

These types of changes are technical amendments and must be certified by a professional engineer (PE).

Examples of non-technical amendments which must be documented but do not require PE certification include:

- Change in name or contact information
- Individuals responsible for implementation of the Plan
- Change in the spill response personnel.

Revisions to the Plan must be completed no later than 6 months after the change occurs. CFMO-ENV is responsible for initiating and coordinating revisions to the Plan.

1.4.2 Scheduled Plan Reviews

NEARNG reviews the Plan at least once every 5 years. All reviews and amendments are in the Plan Review Log (see Table 1.1 below). This log is completed after each review, even if no amendments are made as a result of the review.

1.5 FACILITIES, PROCEDURES, METHODS, OR EQUIPMENT NOT FULLY OPERATIONAL (40 CFR 112.7)

Not applicable.

Table 1.1 Plan Review Log*

Review By	Date	Activity	PE Certification Required	Comments
Jeff McPeak and Tara Gilbert	August 2010	Added Out of Use MFTs, removed 6,000 gallon MFT, change future AST location	Yes	Made required changes and PE certification in SPCC Plan Revision 1 dated August 2010
Jeff McPeak and Tara Regan	May 2013	Changed AST to out of use, added four MFTs, updated maps for additional parking and Readiness Center additions	Yes	Made required changes and PE certification in SPCC Plan Revision dated May 2013
Shannon DeVivo and Larry Vrtiska	December 2017	Added new 10,000-gallon AST, added OWS, added four MFT pads listed as non-operational during previous update, updated maps	Yes	Made required changes and PE certification in SPCC Plan Revision dated December 2017

* Make additional copies and insert as required

1.6 CROSS-REFERENCE WITH SPCC PROVISIONS (40 CFR 112.7)

This SPCC Plan has been organized considering the sequence given in 40 CFR 112.7. Table 1.2 cross-references the subsections listed in Part 112.7 with the location where they are addressed in this Plan.

Table 1.2 SPCC Cross Reference

Provision	Requirements	Plan Page
112.3(d)	Professional Engineer Certification	1
112.3(e)	Location of SPCC Plan	1
112.5	Plan Review	1
112.7	Management Approval	1
112.7	Cross-Reference with SPCC Rule	4
112.7(a)(3)	Facility Description	6 Appendix A
112.7(a)(4)	Discharge Notification	8 Appendix B
112.7(a)(5)	Discharge Response	8
112.7(b)	Potential Discharge Volumes and Direction of Flow	10
112.7(c)	Containment and Diversionary Structures	11 Appendix D
112.7(d)	Practicability of Secondary Containment	12
112.7(e)	Inspections, Tests, and Records	12
112.7(f)	Personnel, Training and Discharge Prevention Procedures	13 Appendix F
112.7(g)	Security	13
112.7(h)	Tank Truck Loading/Unloading	14
112.7(i)	Brittle Fracture Evaluation	14
112.7(j)	Conformance with Applicable State and Local Requirements	14
112.7 (k)	Qualified Oil-Filled Operational Equipment	14
112.8(b)	Facility Drainage	15
112.8(c)(1)	Construction of Containers	15
112.8(c)(2)	Secondary Containment	15 Appendix D
112.8(c)(3)	Drainage of Secondary Containment Areas	15
112.8(c)(4)	Corrosion Protection	15

Provision	Requirements	Plan Page
112.8(c)(5)	Partially Buried and Bunkered Storage Tanks	15
112.8(c)(6)	Inspection/Integrity Testing	12, 16 Appendix E
112.8(c)(7)	Heating Coils	16
112.8(c)(8)	Overfill Prevention System	16
112.8(c)(9)	Effluent Treatment Facilities	16
112.8(c)(10)	Visible Discharges	16
112.8(c)(11)	Mobile and Portable Containers	17
112.8(d)	Transfer Operations, Pumping and Facility Processes	17
112.20(e)	Certification of Substantial Harm Determination	17 Appendix H

PART 2: GENERAL FACILITY INFORMATION

Address: Nebraska Army National Guard
Army Aviation Support Facility #2
3010 Airport Road East
Grand Island, NE 68801

Contact: Larry Vrtiska – CFMO-ENV
Office (402) 309-8460
After Hours (402) 309-8120

Dallas Bundy – Facility On-Scene Coordinator (FOSC) Primary
(402) 309-8702

Bob Market – FOSC Alternate
(402) 309-8713

2.1 EVALUATION OF DISCHARGE POTENTIAL

The facility is located northeast of Grand Island, Nebraska adjacent to the Central Nebraska Regional Airport. The facility is approximately 4,000 feet northwest of an intermittent tributary of Warm Slough. Warm Slough generally flows from southwest to northeast (refer to Figure 1, Topographic Map, Appendix A) and eventually drains into the Platte River approximately 24 miles from the facility. Surface water flow direction at the site is to the southeast towards Warm Slough. Detailed descriptions of drainage pathways related to releases are provided in Section 3.7. Based on the volume of oil stored and spill prevention and containment measures at this facility, it is unlikely for a release to reach navigable waters.

2.2 DISCHARGE HISTORY

There have been no releases from containers subject to SPCC regulations at this facility.

PART 3: DISCHARGE PREVENTION - GENERAL SPCC PROVISIONS

3.1 FACILITY DESCRIPTION (40 CFR 112.7(A)(3))

The NEARNG AASF 2 facility consists of the Administration and Maintenance Hangar, Controlled Waste Building, Storage Buildings, Readiness Center, and parking lots. Oil storage in containers greater than 55-gallons includes JP8 jet fuel, used oil, used hydraulic fluid, used fuel, and diesel fuel. Oil is stored in mobile fuel tankers (MFTs), 55-gallon drums, a double-walled generator tank, and a 10,000-gallon double-walled aboveground storage tank (AST). A 1,222-gallon capacity underground oil-water separator (OWS) is also located at the facility. The capacity is below the 42,000-gallon threshold for SPCC requirements.

3.2 OIL STORAGE (40 CFR 112.7(A)(3)(I))

Oil containers at this facility that fall under the SPCC regulations are listed in Table 3.1. The location of oil storage is depicted on Figure 3, Appendix A.

Table 3.1 NEARNG AASF 2 Oil Storage Capacity and Location

Location	Storage Vessel Type	Volume (gallons)	Construction Material	Contents
MFT Containment Pads	MFTs	2,500 each up to 6 total	Steel	JP8 Jet Fuel
Controlled Waste Building	Drums	55 each up to 10 total	Steel	Used Oil, Used Hydraulic Fluid, Used Fuel
Generator	Double-Walled AST	1,080	Steel	Diesel Fuel
MFT Parking Area	Out of Use MFT	100 each up to 5 total	Steel	JP8 Jet Fuel
AST Pad and Truck Offloading	AST	10,000	Steel	Diesel Fuel
Maximum Oil Storage	27,130 gallons			

An electric transformer is located on the west side of the Administration and Maintenance Hangar. The transformer is not included in this plan because the City of Grand Island Utilities is the owner and is responsible for spill prevention of this device.

The facility had a 15,000-gallon AST that never contained fuel. It has been removed from the site.

The facility may store 600-gallon fuel pods, but these pods are always stored empty.

3.3 DISCHARGE PREVENTION MEASURES (40 CFR 112.7(A)(3)(II))

AASF 2 has developed procedures for the routine handling of oil including loading, unloading and transfer of oil stored at the facility. A description of these procedures is provided in Section 3.7.

3.4 DISCHARGE OR DRAINAGE CONTROLS (40 CFR 112.7(A)(3)(III))

AASF 2 has discharge and drainage controls in place to prevent a release of oil or oil-contaminated water from reaching navigable waters. These include secondary containment (see Sections 3.6 and 3.7) and water discharge procedures (see Section 4.1).

3.5 DISCHARGE RESPONSE AND SPILL REPORTING (40 CFR 112.7(A)(3)(IV, V, VI), (4))

Discharge response and spill reporting will be conducted in accordance with the Spill Notification and Response Procedures in Appendix B. A spill accident report form (Appendix B) will be completed upon detection of any release of oil. Additional information on spill response is provided in the Army National Guard Oil Spill Prevention and Contingency Plan, Section 1 (Appendix C).

The following regulatory agencies may need to be contacted in the event of a release. Regulatory agency reporting will be conducted by CFMO-ENV.

3.5.1 NRC Notification Procedure

Any release of oil that reaches waters of the United States (this includes a discharge to a sanitary or storm sewer) must be immediately verbally reported to the National Response Center (NRC) at **1-800-424-8802**. The following information must be provided to the NRC:

1. The exact address or location and phone number of the facility;
2. Date and time of discharge;
3. Type of material discharged;
4. Estimate of the total quantity discharged to navigable waters;
5. Source of the discharge;
6. Description of all affected media;
7. Cause of the discharge;
8. Any damages or injuries caused by the discharge;
9. Actions being used to stop, remove, and mitigate the effects of the discharge;
10. Whether an evacuation may be needed;
11. Names of individuals and/or organizations who have also been contacted.

Table 3.2 NRC Contact Information

Situation	Phone Number	When to Notify
Discharge reaching navigable waters	1-800-424-8802	Immediately (verbal)

3.5.2 EPA Spill Reporting Procedure

If this facility spills more than 1,000 gallons of oil into navigable waters or onto adjoining shorelines in a single incident, or discharges more than 42 gallons of oil into navigable waters in each of any two discharges occurring within a 12-month period, the facility must submit a written report with the following information to the EPA Regional Administrator within 60 days from the time the spill occurs:

1. Name of the facility;
2. Name of the person making the report;
3. Location of the facility;
4. Maximum storage or handling capacity of the facility and normal daily throughput;
5. Corrective action and countermeasures taken, including a description of equipment repairs and replacements;
6. An adequate description of the facility, including maps, flow diagrams, and topographical maps;
7. The cause of the discharge, including a failure analysis of the system or subsystem in which the failure occurred;
8. Additional preventative measures taken or contemplated to minimize the possibility of recurrence;
9. Other information EPA may request.

Table 3.3 EPA Contact Information

Situation	Address	When to Notify
A single discharge of 1,000 gallons or more; or two or more discharges of 42 gallons or more over a 12-month period	US EPA Region 7 11201 Renner Blvd Mail Code AWMD-STOP Lenexa, KS 66219	Written notification within 60 days of discharge

3.5.3 State and Local Release Reporting

The Nebraska Department of Environmental Quality (NDEQ), through Title 126, Chapter 18, requires that any oil release that impacts or threatens waters of the state or threatens the public health to be immediately verbally reported regardless of the quantity of oil released. In addition, the NDEQ requires immediate notification of a release of oil upon the surface of the land in a quantity that exceeds 25 gallons.

A written report must be sent to the NDEQ at the following address:

NDEQ
1200 “N” Street, Suite 400
PO Box 98922
Lincoln, Nebraska 68509

This report shall contain, at a minimum, the following information:

1. Date, time and duration of the release;
2. Location of release;
3. Person or persons causing and responsible for the release;

4. Type and amount of oil or hazardous substance released;
5. Cause of the release;
6. Environmental damage caused by the release;
7. Actions taken to respond, contain and clean up the release;
8. Location and method of ultimate disposal of the oil or hazardous substance and other contaminated materials;
9. Actions being taken to prevent a reoccurrence of the release;
10. Any known or anticipated acute or chronic health risks associated with the release;
11. When appropriate, advice regarding medical attention necessary for exposed individuals.

Table 3.4 NDEQ Contact Information

Situation	Phone Number	When to Notify
(1) Any oil release that impacts or threatens waters of the state or threatens the public health (2) Any release of oil upon the surface of the land in a quantity that exceeds 25 gallons	(402) 471-2186 Normal business hours (877) 253-2603 After Hours	Immediately (verbal) Written Notification within 15 days

3.6 POTENTIAL DISCHARGE VOLUMES AND DIRECTION OF FLOW (40 CFR 112.7(B))

Table 3.5 summarizes the facility's potential spill sources, volumes, rates of release and controls to prevent and/or contain the release.

Table 3.5 Potential Discharge Volumes and Direction of Flow

Source	Type of Failure	Predicted Release Volume (gallons)	Rate (gallons/ hour)	Direction (if not controlled)	Control
MFT when parked	rupture; leakage of main tank	2,500	2,500	West or North to drywell	Secondary Containment
MFT when fueling	rupture; leakage from delivery hose	50[1]	50	East to adjacent land	Spill Kit, Overfill Prevention
55-gallon drums	rupture; leakage	55	55	West to drainage ditch	Controlled Waste Building
Generator	rupture; leakage	1,080	1,080	West to drywell	Double-Walled AST
Out of Use MFT	rupture; leakage	100[2]	100	West to drainage ditch	Drainage ditch with no outlet

Source	Type of Failure	Predicted Release Volume (gallons)	Rate (gallons/ hour)	Direction (if not controlled)	Control
10,000-gallon AST	rupture; leakage	10,000	10,000	South to truck unloading pad	Double-Walled AST, hydraulic high level shutoff control valve with float

1 - Based on fuel unloading rate of 100 gpm, fuel release and fuel delivery is observed by attendant who can respond to a hose rupture or disconnection and close valves within 30 seconds.
2 – Based on fuel remaining in MFT when it is out of use.

3.7 SPILL PREVENTION MEASURES (40 CFR 112.7(C))

The following subsections discuss the control measures in place to prevent and contain releases. Overfill prevention measures are discussed in Section 4.2.8.

3.7.1 MFTs

When not fueling, the MFTs are parked in secondary containment (MFT containment pad, See Figure 3) that is designed to contain 110% of the volume of the largest compartment (see Containment Calculations, Appendix D).

The MFTs will receive fuel from a transport truck or off-site source and deliver fuel to aircraft on the facility apron. When receiving or delivering fuel, the most likely spill is a hose rupture that will take approximately 30 seconds to stop. Based on fuel transfer rate of approximately 100 gallons per minute, a maximum of 50 gallons of fuel may be released. A spill kit located on the MFT could be used to control a spill of this magnitude.

Additional spill prevention measures associated with MFT fueling are discussed in the Army National Guard Oil Spill Prevention and Contingency Plan, Section 3 (Appendix C).

3.7.2 55-gallon Drums

The 55-gallon drums are stored in the Controlled Waste Building. The controlled waste building has raised side walls and a sloped floor that leads to a sump. The building walls, floor, and sump serve as containment for any release from the drums (see Containment Calculations, Appendix D). Spills that may occur during filling of the drums from other small containers would be contained in the building. When the drums are full, a licensed hauler evacuates the drum by vacuum removal of the contents. If a hose located outside of the building were to break during oil removal, the spill volume would be minimal and would be controlled by a spill kit.

3.7.3 Generator

The facility generator has an integral, on-board 1,080-gallon diesel tank which is double walled providing secondary containment. Any spills that may occur during fuel delivery would be controlled by the facility spill kit.

3.7.4 Out of Use MFTs

The facility is used to store four MFTs that are not in use. The MFTs are stored empty except for approximately 100 gallons remaining in the tank to prevent seals from drying out. A release from the out of use MFTs would drain from the paved parking area west to a drainage ditch. The drainage ditch does not have an outlet and thus serves as secondary containment.

To assure the out of use MFTs do not contain more than 100 gallons, access to the fill piping is secured by locks and a sign is placed on the MFT indicating it is out of use.

3.7.5 10,000-gallon AST

A 10,000-gallon double-walled AST is located north of the MFT parking area. A truck offloading pad and pump station are located to the south of the AST. Bollards surround the pump pad and piping extending from the tank to the pump pad. The truck offloading pad slopes to a drain and a containment basin to capture any leaks from the delivery truck. The pump station is contained on a pad with a 6-inch high curb to capture minor leaks from the pump and piping. A curbed concrete gutter runs beneath the piping from the AST pad to the pump station. The piping which runs vertically down the tank, plus one foot of horizontal piping from the tank to the edge of the tank pad (for the loading and offloading line), is not contained within secondary containment. The total amount of fuel contained within the piping that does not have secondary containment is approximately 7.5 gallons. The piping would contain fuel during loading and offloading. The AST will be recirculated regularly. Trained personnel will be present during AST recirculation. The pump is not operational when loading, offloading, or recirculation is not occurring. A tank gauge with overfill alarm and an overfill prevention valve are installed to prevent overfilling the tank during filling of the tank. Trained personnel are present during the entire delivery of fuel. Any spills that may occur during fuel delivery or tank recirculation would be controlled by the facility spill kit located in the Controlled Waste Building. The piping and tank is inspected monthly for leaks.

3.8 PRACTICABILITY OF SECONDARY CONTAINMENT (40 CFR 112.7 (D))

Implementing secondary containment is practicable and feasible for the site; therefore, this section does not apply.

3.9 INSPECTIONS, TESTS AND RECORDS (40 CFR 112.7(E), (K), AND 112.8(C)(6))

NEARNG personnel conduct inspections for the bulk storage containers in accordance with the guidance provided in the Steel Tank Institute (STI) - Standard for the Inspection of Above Ground Storage Tanks, SP001, September 2011, which is an EPA accepted industry standard. Personnel conducting these inspections will meet the following qualifications:

- Knowledgeable of the facility operations and;
- Knowledgeable regarding the type of container, its associated components and the characteristics of the liquid stored.

Based on SP001, the MFTs and the 55-gallon drums are classified as Category 1 portable containers, which do not require integrity testing, only periodic inspections. The generator tank is Category 1 and requires monthly and annual inspections. Due to generator size and containment equipment, no integrity testing of this container is required.

All inspections will be completed using the appropriate inspection forms in Appendix E. Inspections are also conducted any time material repairs to the containers are made. All inspection forms are maintained in the plan for a period of three years. The inspection schedule is summarized on Table 3.6 below.

Table 3.6 AST Classification and Inspection Schedule

Container	Continuous Release Detection Monitoring (CRDM)	Secondary Containment	Inspection Schedule
MFTs	Truck frame and containment	Containment Pad and Spill Kit	Monthly
55-gallon drums	Controlled Waste Building Floor	Controlled Waste Building as Secondary Containment	
Generator	Interstitial Monitoring	Double-Walled Tank	Monthly and Annually
10,000-gallon AST	Interstitial Monitoring, offloading pump and truck pads	Double-Walled Tank, sump at truck offloading pad, pump pad	Monthly and Annually

Additional requirements for inspections are provided in the Army National Guard Oil Spill Prevention and Contingency Plan, Sections 2 and 3 (Appendix C).

3.10 PERSONNEL, TRAINING, AND DISCHARGE PREVENTION PROCEDURES (40 CFR 112.7(F))

NEARNG provides spill prevention training and review to all employees responsible for oil management and implementing this plan. The training and review includes the operation and maintenance of equipment to prevent discharges; monitoring systems; discharge procedure protocols; regulations concerning reporting spills; general facility operations; updating names and phone numbers in the SPCC Plan; and the overall contents of this SPCC Plan. Refresher training is provided for these employees once per year and new employees are trained within 30 days of employment. A list of employees who have received this training is maintained by NEARNG. During each training session, any discharges or failures, malfunctioning components, and any recently developed precautionary measures will be discussed. A typical record training form is provided in Appendix F.

3.11 SECURITY (40 CFR 112.7(G))

The following security measures are in-place at the facility:

- Unauthorized access to the facility is controlled by a fence encompassing the entire property perimeter as well as a security guard. This overall site security is also adequate for all pump controls and drain valves,

- Transfer lines and fill ports (as applicable) are capped for out of use tanks/containers;
- The Controlled Waste Building, where 55-gallon drums are stored, is locked when the facility is unattended;
- Facility lighting is provided near the MFT parking, inside the controlled waste building, and near the generator. Lighting is sufficient to detect a discharge and to deter vandals.

3.12 TANK TRUCK LOADING/UNLOADING ASSOCIATED WITH LOADING RACKS (40 CFR 112.7(H))

The facility does not have a loading rack; therefore, this section is not applicable.

3.13 BRITTLE FRACTURE EVALUATION (40 CFR 112.7(I))

This section is not applicable as the facility does not have field-constructed ASTs.

3.14 CONFORMANCE WITH STATE AND LOCAL APPLICABLE REQUIREMENTS (40 CFR 112.7(J))

The Nebraska State Fire Marshal's office regulates storage of class 1 liquids per NFPA 30 and NFPA 407. All oil storage containers at the facility conform to these standards. The State of Nebraska has not promulgated an SPCC rule that is more stringent than the federal 40 CFR 112 requirements. Therefore, this SPCC Plan is written to conform with 40 CFR part 112 requirements. All discharge notifications are made in compliance with local, state, and federal requirements.

3.15 QUALIFIED OIL-FILLED OPERATIONAL EQUIPMENT (40 CFR 112.7(K))

As was previously mentioned, the oil-filled transformers located on-site are the property of the power company, who is responsible for providing spill prevention measures for the transformers.

PART 4: SITE SPECIFIC REQUIREMENTS

4.1 FACILITY DRAINAGE (40 CFR 112.8(B) AND (C)(3))

The MFT secondary containments can be drained by opening the valve on the containments. The valves are kept closed and can only be opened by authorized personnel.

In the event that water from rainfall or snowmelt accumulates within the secondary containment, it will be visually inspected for the presence of oil. An "SPCC Secondary Containment Drainage Report" form, provided in Appendix G, will be filled out. If no oil or sheen is noted, the water will be discharged to the ground surface. If there is evidence of oil in the containment area, it will be soaked up or pumped into portable storage tanks or drums. Records of all water discharges and/or oil collection are maintained as described in Section 4.5. Additional information on drainage of secondary containment devices is discussed in the Army National Guard Oil Spill Prevention and Contingency Plan, Section 3 (Appendix C).

Oil transfer activities may occur outside containment in undiked areas. Controls of potential spills from these activities are discussed in Section 3.7.

The facility has an underground OWS designed to capture oil in facility discharge. The effluent from the OWS discharges to the sanitary sewer. The OWS is inspected annually and pumped every 1-2 years.

4.2 BULK STORAGE CONTAINERS (40 CFR 112.8(C))

The following discussion demonstrates compliance with the requirements concerning the oil storage containers used at the facility.

4.2.1 Construction (40 CFR 112.8 (c)(1))

All containers are constructed of steel, polyethylene, or fiberglass, which are all compatible with the oil stored. The oil is stored under standard atmospheric conditions and the containers are vented as appropriate to prevent accumulation of pressure.

4.2.2 Secondary Containment (40 CFR 112.8 (c)(2))

All of the secondary containment devices are capable of containing the appropriate capacity of the container (see Appendix D). The secondary containment structures are made of materials compatible with oil and are sufficiently impermeable so that a discharge of oil will be observed.

4.2.3 Drainage of Secondary Containment (40 CFR 112.8 (c)(3))

Refer to Section 4.1.

4.2.4 Corrosion Protection for Buried Metallic Tanks (40 CFR 112.8 (c)(4))

The facility does not operate any underground storage tanks; therefore, this section is not applicable.

4.2.5 Partially Buried and Bunkered Storage Tanks (40 CFR 112.8 (c)(5))

The facility does not operate any partially buried or bunkered storage tanks; therefore, this section is not applicable.

4.2.6 Inspections and Testing (40 CFR 112.8 (c)(6))

Inspections of containers are conducted by facility personnel in accordance with industry guidelines and site-specific conditions (refer to Section 3.8). Additional inspections and testing requirements are discussed in the Army National Guard Oil Spill Prevention and Contingency Plan (Appendix C).

4.2.7 Heating Coils (40 CFR 112.8 (c)(7))

The facility does not operate any containers using heating coils; therefore, this section is not applicable.

4.2.8 Overfill Prevention Systems (40 CFR 112.8 (c)(8))

To prevent overfilling, the MFTs have site gauges, high level shut-offs, and procedures which only allow filling within 50 gallons of capacity.

The 10,000-gallon AST has an overfill prevention valve, installed at the fill port of an aboveground storage tank. The valve terminates flow of product when the liquid level reaches a preset warning level.

When fueling aircraft, overfills are prevented by the aircraft's automatic float shut-off and procedures requiring personnel to be present during all fueling operations.

The used oil, used hydraulic fluid, and used fuel drums are filled in small increments using small containers. The fluid level in the drums can be observed during the filling operations to prevent overfill.

The generator will be filled using a delivery truck equipped with an automatic shut-off nozzle. Additionally, AASF 2 personnel will be present during all fuel transfers.

Additional overfill prevention measures are discussed in the Army National Guard Oil Spill Prevention and Contingency Plan, Section 3 (Appendix C).

4.2.9 Effluent Treatment Facilities (40 CFR 112.8 (c)(9))

An OWS with a 1,222-gallon capacity and a pit is located underground to the west of the hangar. All wastewater lines from AASF #2 lead to the OWS. The OWS is inspected annually and contained oil is pumped out every 1-2 years as needed. If repairs are needed, the OWS will be emptied and repairs will be completed prior to returning the OWS to use. Water from the OWS discharges to the sanitary sewer system.

4.2.10 Visible Discharges (40 CFR 112.8 (c)(10))

Visible discharges from tanks, containers, piping, and other appurtenances will be mitigated immediately. If the discharge cannot be repaired, the container will be emptied.

4.2.11 Mobile or Portable Storage Containers (40 CFR 112.8 (c)(11))

Mobile and portable storage container spill prevention measures are discussed in Section 3.7.

4.3 TRANSFER OPERATIONS, PUMPING, AND FACILITY PROCESSES (40 CFR 112.8(D))

The facility does not have buried or above ground piping. Facility inspections include all components of the oil storage containers as discussed in section 3.8. Because there is no piping, signs warning vehicles are not necessary.

4.4 SUBSTANTIAL HARM CRITERIA (40 CFR 112.20(E))

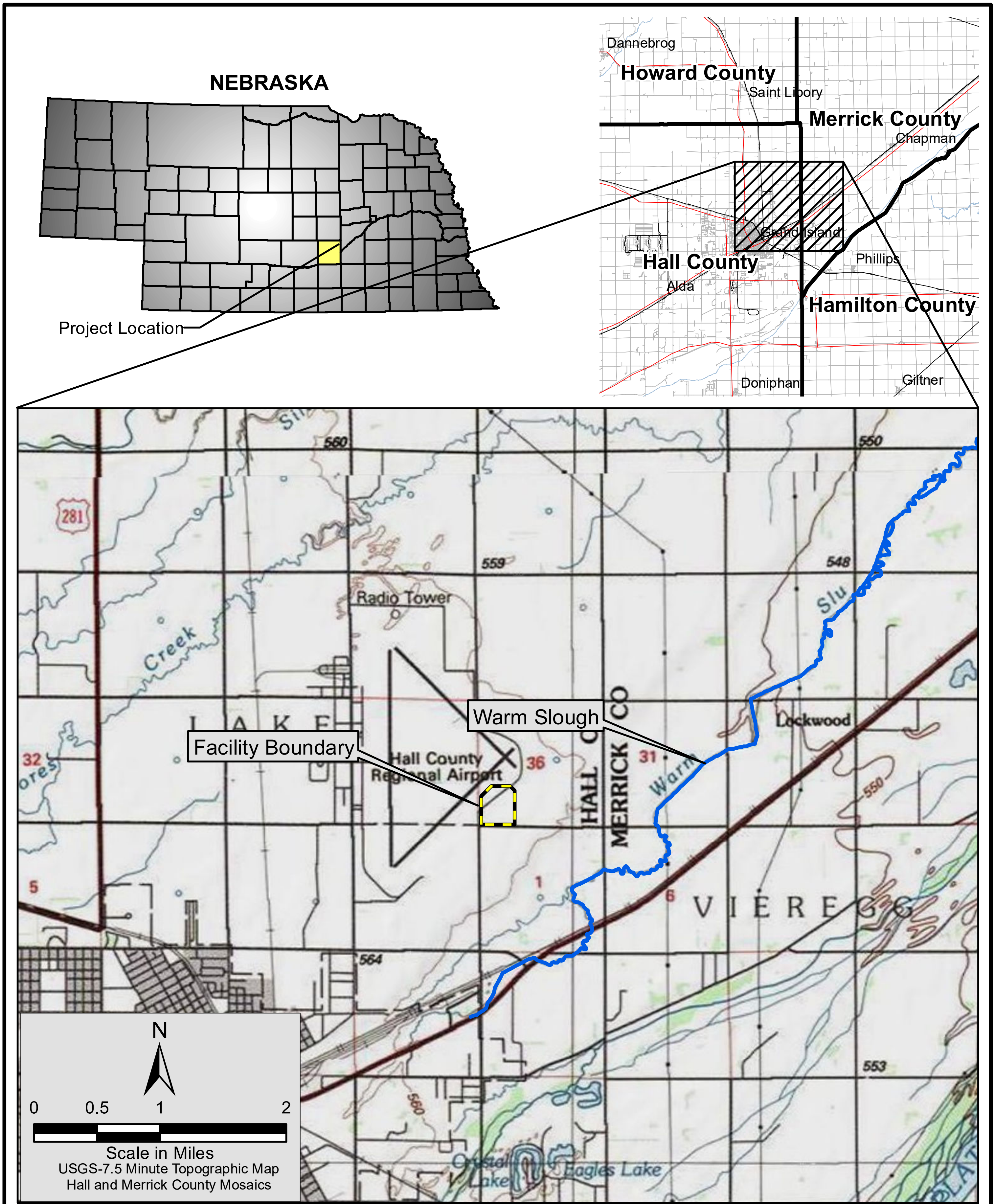
The facility does not meet the Substantial Harm Criteria based on its potential oil storage and other criteria. The approximate maximum volume of the oil storage on site is 27,130 gallons. A completed Certification of the Applicability of the Substantial Harm Criteria Checklist for the facility is included in Appendix H.

4.5 RECORD KEEPING

The inspection, testing, and training records will be maintained in the SPCC Plan for at least three years. Completed forms will be kept in Appendix I of this Plan.

APPENDIX A

Topographic Map
Site Map
Site Plan



PROJECT: 016-2929

DRAWN BY: RD

DATE: October 16, 2017

TOPOGRAPHIC MAP
Nebraska Army National Guard
AASF #2 SPCC Plan
Grand Island, Nebraska

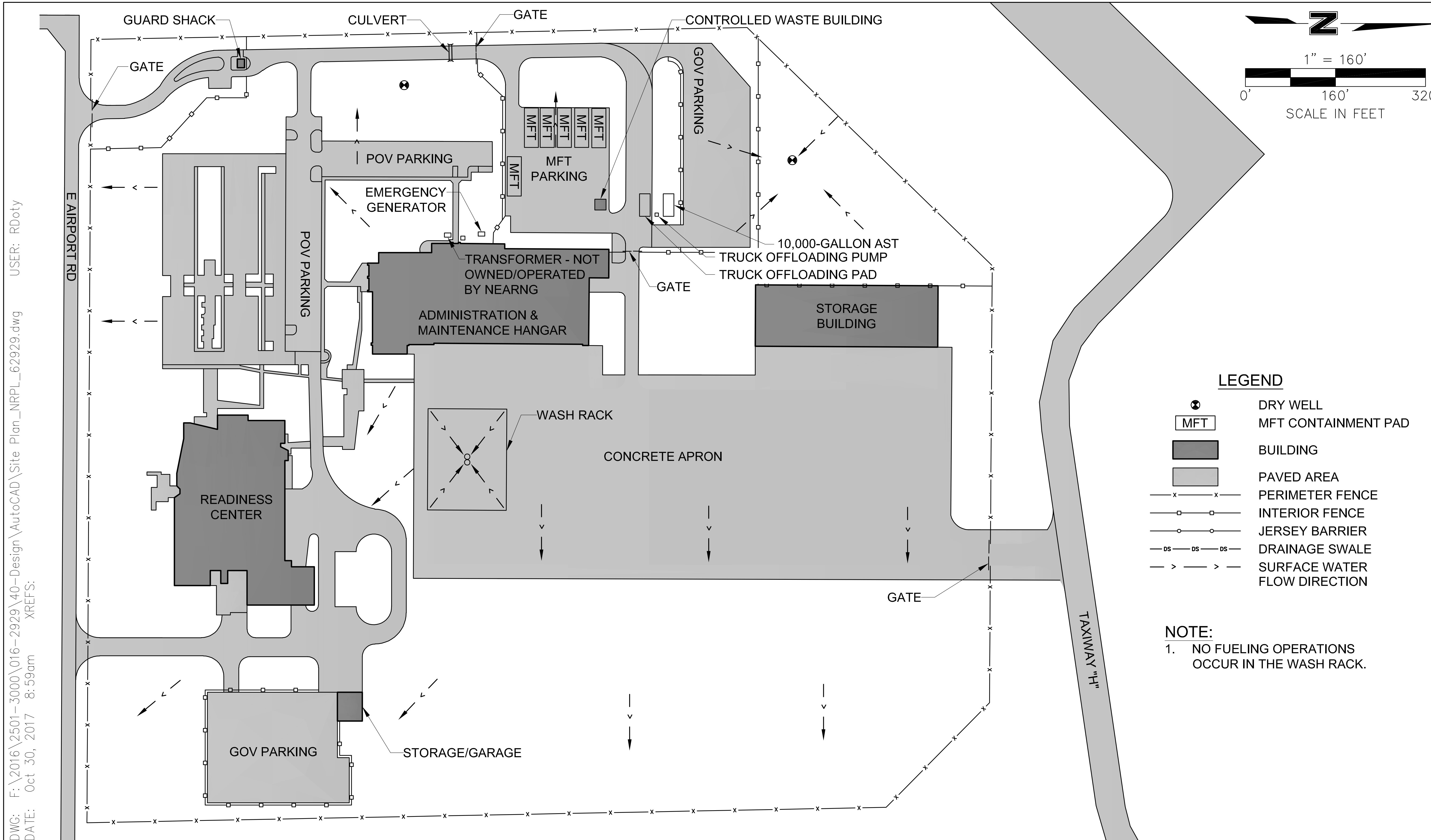
OLSSON® ASSOCIATES

FIGURE
1

F:\2016\2501-3000\016-2929\40-Design\GIS\17-10-10_NRPL_SPCC Maps.mxd User: RDoty

F:\2016\2501-3000\016-2929\40-Design\GIS\17-10-10_NRPL_SPCC Maps.mxd User: RDoty

PROJECT: 016-2929	SITE MAP Nebraska Army National Guard AASF #2 SPCC Plan Grand Island, Nebraska	OLSSON ASSOCIATES	FIGURE
DRAWN BY: RD			2
DATE: October 16, 2017			



PROJECT NO: 016-2929 DRAWN BY: RD DATE: 10/30/2017	SITE PLAN NEBRASKA ARMY NATIONAL GUARD - AASF #2 SPCC PLAN GRAND ISLAND, NEBRASKA	OLSSON ASSOCIATES 601 P Street, Suite 200 P.O. Box 84608 Lincoln, NE 68508 TEL 402.474.6311 FAX 402.474.5160	FIGURE 3

APPENDIX B

Spill Notification and Response Procedures

Spill Notification and Response Procedures (SNRP)

1. EMERGENCY TELEPHONE NUMBERS: CALL 9-1-1 (when needed).

a. CFMO-ENV (NEARNG): (402) 309-8475
(402) 309-8460
(402) 309-8482
(402) 309-8479

b. NEARNG Switchboard Operator (after hours): (402) 309-8210

c. NEARNG Occupational Health Nurse: (402) 309-1832

d. NEARNG Safety Specialist: (402) 309-1854

e. POISON CONTROL CENTER: (800) 222-1222

f. Nebraska Department of Environmental Quality (NDEQ) Emergency:
Response Center: (402) 471-2186 (work hours)
(402) 471-4545 (after hours)

g. Nebraska State Patrol – Emergency Highway Help: (800) 525-5555

h. Nebraska State Fire Marshal: (402) 471-2027

2. SPILL RESPONSE PROCEDURES: In the event of a spill, the course of action for the spill discoverer will be:

a. Assess the situation and know the hazards. Evacuate area if needed.
b. Contain the spill flow by either damming the flow or stopping the source.
c. Clean up the spill with available resources. See Section 8.
d. Report the spill up the chain of command. See Section 3.

NOTE: The above sequence may be altered depending upon the spill situation (i.e., type of spill, quantity of spill, and/or safety hazard involved). The spill discoverer may contain and clean up the spill prior to reporting or, if the spill will pose a safety hazard, he/she may report the spill before trying to stop and contain it. ***DO NOT ENDANGER YOUR PERSONAL SAFETY.*** **CALL 9-1-1, IF NEEDED.**

3. SPILL NOTIFICATION PROCEDURES:

It is the policy of the NEARNG that ALL oil and hazardous substance spills will be immediately reported to the Facility On-Scene Coordinator (FOSC) or designated alternate**.** The FOSC is responsible for reporting any spills greater than 1 gallon to CFMO-ENV. Use the attached notification form (TAG Form 385-40) to report spills.

4. REQUIREMENTS FOR SPILL NOTIFICATION AND RESPONSE PROCEDURES

a. The Department of the Army (DA) requires that all installations with the capability to release oil and/or hazardous substances in quantities which may be harmful to the environment but that do not exceed the 1,320 gallon Spill Prevention, Control and Countermeasures Plan (SPCCP) requirements, maintain written procedures on spill notification to include reporting and response at potential spill sites or at the office responsible for the facility. Spill contingency planning will be commensurate with the operation, quantity, toxicity, and potential for environmental damage from the materials used or stored at a particular site.

5. PURPOSE:

The purpose of these procedures is to establish spill notification and response procedures and resources to be used to contain, report, and cleanup any oil and hazardous substance spills which may occur at any NEARNG facility.

NOTE: These procedures are for immediate response to an oil and/or hazardous substance situation.

6. DUTIES OF FOSC (Facility On-Scene Coordinator):

The FOSC is responsible for coordinating the activities of the Facility Response Team (FRT) relative to containment and cleanup of oil and hazardous substance spills. At least one alternate FOSC will be designated.

7. DUTIES OF FRT (Facility Response Team):

The FRT is the spill response team performing functions and duties as assigned and/or directed by the FOSC. The FRT will follow the SPILL RESPONSE PROCEDURES outlined in #3.

8. MATERIAL RESOURCES:

Each facility is required to have a spill kit and keep sufficient volume, as judged by the FOSC, on hand to contain and cleanup the normal amount of oil or hazardous substances stored and used at that facility.

9. SPILL TRAINING:

As required by AR 200-1, annual spill response training shall be conducted for all personnel who handle, use, store or transport oil and hazardous substances. Training shall include a spill cleanup drill with a simulated spill situation. Members of the FRT are required to be familiar with these procedures. Ensure the training drill is documented with date, time, general description, and participants. Contact CFMO-ENV for certification when training completed.

10. FACILITY SPILL NOTIFICATION AND RESPONSE PLAN MANNING:

a. Each facility shall complete the data, as appropriate, and keep on file and accessible. All facilities are encouraged to reproduce any elements of this plan and place them throughout the facility in areas that are vulnerable to spills. Each facility shall forward a copy of this section to CFMO-ENV no later than **31 January** each year.

b. Facilities that are exempt from SNRP reporting are:

1. Counterdrug (currently located at Bldg 1600) – fall under 1776 RC.
2. FMO – fall under FMS 1.
3. FMO Bldg 680 – fall under JFHQ.
3. FRA/SASMO – fall under USPFO-SB and/or CSMS.
4. Norfolk Fire Station – fall under FMS 7.
5. RTI – fall under CATS and/or FMS 5.

c. Listed below are the Facility Spill Notification and Response Plan Manning. In the event of an in-house spill, responsibility for spill control will rest with the individuals as listed.

Facility: AASF #2_______________ Date: 18DEC2012_____

Facility On-Scene Coordinator (FOSC): Name & Position Phone

Primary: Dallas Bundy___________ 402-309-8702

Alternate: Bob Market _____________ 402-309-8713

Facility Response Team (FRT):

Team Member: John Warner_____ ____ 402-309-8708

Team Member: Scott Spofford_______ 402-309-8703

Team Member: Brandon Modlin______ 402-309-8708

Team Member: Ben Briggs __________ 402-309-8708

Team Member: John Barterl__________ 402-309-8708

FLT OPS: 402-309-8691/8692/8694

TAG Form 385-40

SPILL ACCIDENT REPORT

Complete this information if a spill incident occurs. BE SPECIFIC, "unknown" is not an acceptable answer. Completed copies of this spill report must be forwarded through normal command channels to arrive at CFMO-ENV within 5 working days.

1. Location:

2. Date and Time:

3. Type of Material. Quantity and Duration of Release:

4. Source and Cause:

5. Body of Water Adjacent to Spill (include streams, swamps, and ditches):

6. Injuries (including physical exposure) and Property Damage:

7. Agencies Notified, Contact Person and Phone (fire, police, NEARNG, CFMO-ENV, USPFO-NE, etc.):

8. Responding Agency and Phone (fire, police, Water Board, Emergency Services):

9. Responding Agency Contact Person and Phone:

10. Clean-up Action Taken;

11. If no Clean-up, Why Not?

12. Name and Work Phone of Person Completing this Report

13. Additional Remarks (attach additional sheets if necessary and copies of any reports generated by responding agencies):

APPENDIX C

Army National Guard
Oil Spill Prevention and Contingency Plan

ARMY NATIONAL GUARD OIL SPILL PREVENTION AND CONTINGENCY PLAN

Table of Contents

INTRODUCTION

Mobile Fuel Tankers (MFTs) are used by the Army National Guard (ARNG) for a variety of transportation-related purposes. Based on ARNG history, the most common uses with the potential to adversely affect the environment include fuel transport, refueling operations, fuel transfer, and parking. This plan is designated to address these typical potential spill situations and discuss spill prevention and response contingencies.

ABOUT THIS PLAN

Purpose and Scope

The purpose of this Oil Spill Prevention and Contingency Plan (OSPCP) is to establish procedures for preventing and responding to discharges that may occur from ARNG-owned MFTs. Designed using guidance from the Clean Water Act (CWA), and intended to meet the requirements for a Department of Transportation (DOT) Response Plan for MFTs (49 CFR 130.31), this OSPCP also provides guidance for transporting fuel, conducting refueling operations, transferring fuel, and parking.

Filing This Plan

This OSPCP must be kept in each MFT, as well as one copy must be kept on file at the ARNG's State Environmental Office where the MFT is assigned.

By law this plan only applies to MFTs with a capacity of 3,500 gallons or more (49 CFR 130.31), but may be kept in MFTs with less than a 3,500-gallon capacity as a guidance document for preventing and responding to spills. As a Best Management Practice (BMP) all ARNG MFTs are required to have this OSPCP in them at all times. In order to provide maximum protection to the environment and the general public, the ARNG is instituting the plan to exceed the regulatory standards and provide spill plans to all of its MFTs.

Spill response supplies will also be carried in all ARNG MFTs at all times.

MANAGEMENT RESPONSIBILITY

Unit Commanders are directly responsible for oil spill prevention and control for this MFT. The United States ARNG is committed to providing the necessary resources to prevent spills and, if necessary, to quickly control and remove harmful quantities of oil or hazardous substances discharged from this vehicle.

PRIVATE RESPONSE PERSONNEL

In accordance with (IAW) 49 CFR 130.31(3), a list of private personnel and equipment available to respond to a spill from this vehicle is provided in the plastic folder at the back of this OSPCP. This list may also contain public services that respond to spills, such as the Fire Department. This list must be maintained by the individual states where this plan is employed.

STATE-SPECIFIC REQUIREMENTS

Your state may have adopted regulations or policies that are more stringent than the requirements of this plan. A summary of those requirements, if any, can be found in the plastic folder at the back of this OSPCP. In the event you are hauling fuel in another state and need guidance, refer to the list of all state Departments of Transportation (DOT) and Emergency Response coordinators in Appendix A. This list has the state DOT and emergency contact phone numbers. There is also a list of ARNG Environmental Office phone numbers provided in Appendix B.

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SPILL RESPONSE AND CONTINGENCY

A timely response to a spill is critical. How you respond depends on whether the spill is an emergency or an incidental release.

Responding to Emergency Releases

Emergency spills are spills that CANNOT be absorbed or otherwise controlled at the time of release by personnel in the immediate release area. These include spills that pose a significant safety or health hazard, such as fire or explosion, or that may reach a water source.

Follow these steps when responding to an emergency spill:

Step 1. Evacuate all personnel to a safe distance upwind from the spill. Secure the area, and immediately notify the local Fire Department. If phone number is unavailable, use the phone numbers provided in the plastic folder at the back of this OSPCP or the Appendices. Be prepared to provide the following information:

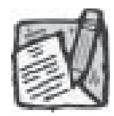
- Your name
- Location of spill
- Substance spilled
- Number of any injured personnel and nature of injuries
- Amount spilled and extent it has traveled
- Amount stored and rate at which substance is spilling (estimated)
- Time spill started

When the Fire Department/Emergency Spill Response arrives, make yourself available to the Senior Emergency Response Official in charge.

SECTION 1

Step 2. As soon as possible, notify by telephone the state ARNG Environmental Section (Appendix A) or the Staff Duty Officer, and the Unit Commander. A list of important phone numbers is provided in the plastic folder at the back of this OSPCP, and/or in the Appendices. Only notify other agencies and/or response organizations if instructed to do so by your chain of command.

Step 3. Complete the Spill Incident Report form located in the plastic folder at the back of this OSPCP and submit it to your state ARNG Environmental Section within 72 hours. An example of the form is provided at the end of this section for you to photocopy and use if no printed copies are available.



Complete Spill Incident Report form

Responding to Incidental Releases

Incidental releases are spills small enough to be handled using personnel and equipment routinely located in the immediate area of the release. These include, but are not limited to, fuel spills of less than 25 gallons that do not pose a significant safety or health hazard such as a fire or an explosion, or that do not pose a risk to a water source.

Follow these steps when responding to an incidental release:

Step 1. If necessary, evacuate all personnel to a safe distance upwind from the spill and secure the area.

Step 2. Remove the source. Turn off all sources of ignition. While wearing the proper personal protective equipment (PPE), and without placing yourself at risk of injury, attempt to stop the source by closing valves or shutting off pumps.

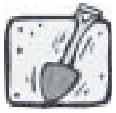
Eliminate ignition sources

Step 3. Using the spill kit maintained on the MFT, envelop the spill. Stop or slow the spread of the spill by diking or by diverting the flow to a natural pit for temporary containment and clean up.

Step 4. Absorb and/or accumulate the spill using a dry sweep, absorbent socks, absorbent pads, soil, etc. Do **not** use metal shovels or rakes or any other equipment that may cause a spark.

Absorb the spill

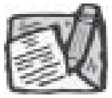
Step 5. Place all spill residue and related waste in containers. Scoop or shovel contaminated media (soil, gravel, etc.) into a DOT-approved container, separating liquids from solids. Make sure you label and mark the container to identify its contents.



Scoop up contaminated soil

Step 6. As soon as possible, notify by telephone the state ARNG Environmental Section or the Staff Duty Officer, and the Unit Commander. A list of important phone numbers is provided in the plastic folder at the back of this OSPCP, or in the Appendices. Only notify other agencies and/or response organizations if instructed to do so by your chain of command.

Step 7. Complete the Spill Incident Report form located in the plastic folder at the back of this OSPCP and submit it to your state ARNG Environmental Section within 72 hours. An example of the form is provided at the end of this section for you to photocopy and use if no printed copies are available.



Complete Spill Incident Report form

SECTION 1

To photocopy the Spill Incident Report Form on the following page, it is recommended that you use the “enlarge” feature on the photocopier and set it to 133%.

SPILL INCIDENT REPORT FORM

Person Reporting (Grade/Name) ____

Title (Responsibility) ____

Organization:____

Address:____

Telephone number: ( ) __________________Fax number: ( )_________________

1. Type of incident: Spill_________ Fire________ Explosion_______ Other _______

1a. Identify source of release:____

2. Location:____

3. Time/Date of Occurrence: ____

4. Hazardous substance(s) involved:____

5. Approximate quantity involved:____

6. Approximate size of area involved:____

7. Number and cause of injuries:____

8. Was facility evacuated? Yes__________ No___________

9. Was surrounding area evacuated? Yes ________No__________

10. Description of the Incident:____

____

11. Describe mitigation actions taken: ____

12. Agencies and persons notified of the incident: _____________________________

____

13. Clean up measures taken after incident was stabilized:_____________________

____

14. Preventive measures that could minimize this type of incident from recurring:____

Fill out and mail this report within 72 hours of the occurrence.

Send a copy of this report to your Commanding Officer and ARNG Environmental Section.

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SPILL PREVENTION IN TRANSPORTING FUEL

MFT operators must comply with state, local, and installation (training areas) regulations when transporting fuel. This section, developed IAW 49 CFR 130 and 177, provides guidelines for transporting fuel.

Before transporting fuel, MFT operators must perform the following self-checks:

1. Ensure that they have a current license to operate the assigned MFT.
2. Ensure that their DOT-required hazardous material (HAZMAT) and safety familiarization training is current. (Defense Dept. [DD] Form 1902 may be used to verify certification & expiration)
3. Ensure that the fuel is compatible with the construction material of the MFT.

Next, MFT operators must perform these tasks:

1. Inspect refueling equipment
2. Prepare DD Form 626 (Vehicle Inspection Form)
3. Prepare the shipping paper (DD Form 836)
4. Prepare placards for the fuel tank

1. Inspect Refueling Equipment

Using the vehicle's -10 Technical Manual (TM), check tanks and piping. Correct any deficiencies immediately. Ensure that you have a complete spill response kit on the MFT. Before moving the MFT check for the following:

- Apparent drip marks or discoloration
- Visible corrosion
- Localized dead vegetation

- Droplets or puddles containing fuel or oil
- Evidence of stored material on valves or seals

2. Prepare Vehicle Inspection Form (DD Form 626)

DD Form 626 is self-explanatory.

3. Prepare Shipping Paper (DD Form 836)

Fill in the following blocks on the DD Form 836 (January 2001 is the current version):

- (Block 2) Shipper Address and Telephone
- (Block 3) Location and Date Prepared
- (Block 4) Date of Travel
- (Block 5) Always "1"
- (Block 6a-h) Cargo Packages
- (Block 6a) Proper Shipping Name
- (Block 6b) Hazard Class
- (Block 6c) Identification Number
- (Block 6d) Packing Group
- (Block 6g) Quantity of Transported Fuel
- (Block 6h) always "NA"
- (Block 10) Remarks
- (Block 11a) Emergency Notification Phone Number
- (Block 12) Certification

Prepare shipping papers

Keep the Shipping Paper with the MFT at all times IAW 49 CFR 177.817(a).

HAZMAT INST//HAZMAT INST//HAZMAT INST//HAZMAT INST

INSTRUCTIONS FOR COMPLETING DD FORM 836, DANGEROUS GOODS SHIPPING PAPER/DECLARATION AND EMERGENCY RESPONSE INFORMATION FOR HAZARDOUS MATERIALS TRANSPORTED BY GOVERNMENT VEHICLES/CONTAINERS OR VESSEL

GENERAL

DD Form 836 shall be completed by a **qualified*** individual from a transportation office, unit or other organization offering hazardous material (HAZMAT) for transportation in areas accessible to the general public.

*An individual is considered qualified to complete and sign (certify) DD Form 836, only after having satisfactorily completed either a DoD authorized HAZMAT Course from one of the DoD-approved schools listed in the Defense Transportation Regulation (DTR) or technical specialist training in accordance with DTR, Part II, Chapter 204, Para (e). This person shall be appointed in writing by the activity or unit commander, to include scope of authority.

Item 1. Fill in the nomenclature, model number, TCN, and bumper number/serial number, of the vehicle/container. For containers carrying sensitive or classified items, the container security seal is required.

Item 2. Enter the shipper's address and telephone number of the HAZMAT origination. Telephone number is for **NOTIFICATION PURPOSES ONLY**. Emergency assistance shall be obtained from the appropriate **24 HOUR EMERGENCY ASSISTANCE TELEPHONE NUMBER(S)** in Item 11c on the first page of this form.

Item 3. Enter the place/date the HAZMAT was certified (e.g., C, Company 66 Armor Motor Pool, Fort Myer, VA 1 Sep 2000).

Item 4. Enter the date the HAZMAT will move.

Item 5. Enter the page number and total number of pages of this form for the vehicle/container carrying the HAZMAT. Example: "Page 1 of 4 Pages". If there are no continuation sheets, annotate "Page 1 of 1".

Item 6a. Enter the proper shipping name of the HAZMAT and if applicable include the technical name. (Enter additional information as required by 49 CFR, 172.203 - Example: RQ, Inhalation Hazard or by the IMDG Code General Introduction 9.3 - Example: Flashpoint.)

Item 6b. Enter the Hazard class/division and, if applicable, the Compatibility Group.

Item 6c. Enter the identification numbers (e.g., NA, UN). The letters "UN" or "NA" must be noted. "NA" may not be used for OCONUS.

Item 6d. Enter the packing group (e.g., I, II, or III) of the HAZMAT.

Item 6e. Enter the total number of packages/items.

Item 6f. Enter the type of packaging (e.g., container, box, drum, pallet), the HAZMAT is packed in.

Item 6g. Enter the total net quantity for non-explosive material in metric measure. U.S. measure may be added in parentheses underneath the metric measure. For vessel shipments, add the total gross mass in metric measure.

Item 6h. Enter total Net Explosive Weight (NEW) in kilograms for ammunition/explosive (Class 1 items). NEW information is found in the Joint Hazard Classification System (JHCS) in the entry for the NEW (Transportation Quantity). Example: 27.231 kg NEW.

Item 7. To be completed by Port Personnel. Enter the name of Port the HAZMAT is being discharged (e.g., Port of Dammam, Saudi Arabia) for OCONUS only.

Item 8. To be completed by Port Personnel. Enter the name of the ship used (e.g., USS Watson) and Voyage number for OCONUS only.

Item 9. Enter the six digit Department of Defense Activity Address Codes (DODACC) and/or the clear geographical location of the ultimate receiver or consignee of the HAZMAT shipment. If this is a unit move, the unit name will be the same as that for Item 2.) Additional information if needed can be annotated in Item 10 or the continuation of Item 10.

Item 10. Additional handling instructions/information.

Item 11. Self explanatory.
NOTE: For Radioactive Material Shipments only: Cross out the non-applicable numbers (e.g. Army shipments - cross out all but Army's radioactive response number.)

Item 12. To be completed by person responsible for packing the vehicle or container. Certifying person must type or print name legibly in 12a. and must sign in writing (longhand) in 12b.

Item 13. Certifying person must type or print name legibly in 13a. and must sign in writing (longhand) in 13b. 13c. - Self explanatory.

Item 14. For CONUS movements: (X) 49 CFR
For OCONUS movements: (X) 49 CFR and (X) IMDG

NOTES:
1. Units returning from firing range must have a certified or qualified person to ensure that all HAZMAT is properly repackaged and secured (i.e. braced, blocked, and tied down) prior to being transported back to base. **See exception below.**

2. Completion of a new DD Form 836 is not required. Original DD Form 836 may be used provided that:

a. Change Item 3. (Date Prepared) and Item 4. (Date of Travel) as needed.

b. Change Item 6. (Cargo):
(i) HAZMAT used shall be deleted from form by crossing out or lining through.
(ii) HAZMAT which remains, but is in different quantities shall have the correct amounts entered in the appropriate section(s).

EXCEPTION:
c. Change Item 13b.:
(i) A qualified individual (if available) shall sign in writing (longhand). If a qualified individual is not available, then the Officer-In-Charge (OIC) or Non-Commissioned Officer-In-Charge (NCOIC) shall sign in writing (longhand) to verify that the above procedures have been performed for the return trip to base.
(ii) Cross out original signature if different certifier will be used.

DD FORM 836 INSTRUCTIONS, JAN 2001 PREVIOUS EDITION IS OBSOLETE.

HAZMAT INST//HAZMAT INST//HAZMAT INST//HAZMAT INST

HAZMAT//HAZMAT//HAZMAT//HAZMAT//HAZMAT//HAZMAT

1.a. NOMENCLATURE: b. MODEL NO.:	c. CONTAINER SEAL NO.: d. SERIAL NO.:	e. TCN NUMBER: f. BUMPER NO.

DANGEROUS GOODS SHIPPING PAPER/DECLARATION AND EMERGENCY RESPONSE INFORMATION FOR HAZARDOUS MATERIALS TRANSPORTED BY GOVERNMENT VEHICLES/CONTAINERS OR VESSEL

2. SHIPPER/ADDRESS/TELEPHONE NO.	3. LOCATION AND DATE SHIPMENT PREPARED	4. DATE OF TRAVEL	5. PAGE 1 OF _____ PAGES

6. CARGO *(To be completed by the unit or shipper Transportation Office (T.O.))*

PROPER SHIPPING NAME *(Include RQ, Technical Names, Additional Information per 49 CFR172.203, as required.)* a.	HAZARD CLASS/ DIVISION b.	UN/ID NUMBER c.	PACKING GROUP d.	PACKAGES NUMBER e.	PACKAGES KIND f.	NET TOTAL QUANTITY & GROSS WT. *(kg)* g.	TOTAL AMMO (NEW) h.

(Port personnel complete Items 7 and 8.)

7. PORT OF EMBARKATION *(OCONUS only)*	8a. SHIP NAME *(OCONUS only)*	b. VOYAGE NUMBER

9. CONSIGNEE

10. REMARKS

11 a. COPY OF EMERGENCY GUIDE NUMBER(S) ______________________ ATTACHED *(See back of this form.)*

b. EMERGENCY NOTIFICATION. In all cases of accident, breakdown or fire, prompt notification must be given to shipper as noted in Item 2.

c. 24-HOUR EMERGENCY ASSISTANCE TELEPHONE NUMBERS:

DOD NON-EXPLOSIVE HAZMAT:	DOD HAZ CLASS 1 (EXPLOSIVES) ONLY:	SAFE HAVEN:	DOD RADIOACTIVE MATERIALS:
1-800-851-8061 AT SEA: 804-279-3131 (COLLECT)	703-697-0218/0219 (COLLECT) (WATCH OFFICER)	1-800-524-0331 NATIONAL RESPONSE CENTER (NRC): 1-800-424-8802 AT SEA: 202-267-2675 (COLLECT)	ARMY: (703) 697-0218 (COLLECT) USAF: (202) 767-4011 USN/MC: (757) 887-4692/ 1-888/528-0148 DLA: (717) 770-5283

12. CONTAINER PACKING CERTIFICATE OR VEHICLE PACKING DECLARATION

It is hereby declared that the goods described above have been packed/loaded into the container/vehicle identified above in accordance with applicable provisions. *(Must be completed and signed for all container/vehicle loads by person responsible for packing/loading.)*

☐ CONTAINER NO. ____________________________ ☐ VEHICLE NO. ____________________________

a. TYPE OR PRINT NAME	b. SIGNATURE	c. DATE *(YYYYMMDD)*

13. SHIPPER'S CERTIFICATION

This is to certify that the above named materials are properly classified, described, packaged, marked and labled, and are in proper condition for transportaion according to the applicable regulations of the Department of Transportation, international and national governmental regulations.

a. TYPE OR PRINT NAME OF SHIPPER CERTIFIER	c. SIGNATURE(S) OF VEHICLE OPERATOR(S)
b. SIGNATURE OF SHIPPER CERTIFIER	

14. *(X as appropriate)* PREPARED IN ACCORDANCE WITH: ☐ 49 CFR ☐ IMDGC

DD FORM 836, JAN 2001 PREVIOUS EDITION IS OBSOLETE.

This form meets the requirements of SOLAS 74 Chapter VII, Regulation 5: MARPOL 73/78 Annex III, Regulation 4 and IMDG Code, General Introduction, Section 9.

HAZMAT//HAZMAT//HAZMAT//HAZMAT//HAZMAT//HAZMAT

HAZMAT EMERGENCY RESPONSE INFO

EMERGENCY RESPONSE INFORMATION

Guide Numbers 112 and 114 from the U.S. Department of Transportation North American Emergency Response Guide Book (RSPA P 5800.7) are reproduced hereon. These guides are applicable to Hazard Class 1 Materials (Explosives).
Mark an X in the appropriate box:

☐ **USE GUIDE 112 FOR EXPLOSIVES: (1.1), (1.2), (1.3), (1.5) or (1.6) Class A or B**

☐ **USE GUIDE 114 FOR EXPLOSIVES: (1.4) Class C**

For all other hazardous materials or substances, annotate appropriate Emergency Response Guide Book Guide Number in the block below, and attach a copy of the guide number page or pages.

GUIDE 112

POTENTIAL HAZARDS
FIRE OR EXPLOSION:
MAY EXPLODE AND THROW FRAGMENTS 1600 METERS (1 MILE) OR MORE IF FIRE REACHES CARGO.

HEALTH HAZARDS:
- Fire may produce irritating, corrosive and/or toxic gases.

PUBLIC SAFETY:
CALL CHEMTREC AT 1-800-424-9300.
- Isolate spill or leak area immediately for at least 500 meters (1/3 mile) in all directions. Move people out of line of sight of the scene and away from windows.
- Keep unauthorized personnel away and stay upwind.
- Ventilate closed spaces before entering.

PROTECTIVE CLOTHING:
- Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.

EVACUATION:
LARGE SPILL
- Consider initial evacuation for 800 meters (1/2 mile) in all directions.

FIRE
- If rail car or trailer is involved in a fire and heavily encased explosives such as bombs or artillery projectiles are suspected, ISOLATE for 1600 meters (1 mile) in all directions; also, initiate evacuation including emergency responders for 1600 meters (1 mile) in all directions.
- When heavily encased explosives are involved, evacuate the area for 800 meters (1/2 mile) in all directions.

EMERGENCY RESPONSE:
FIRE:
CARGO Fires: DO NOT FIGHT FIRE WHEN IT REACHES CARGO! CARGO MAY EXPLODE!
- Stop all traffic and clear the area for at least 1600 meters (1 mile) in all directions and let burn. Do not move cargo or vehicle if cargo has been exposed to heat.

TIRE or VEHICLE Fires:
- Use plenty of water - FLOOD it! If water is not available, use CO2, dry chemical or dirt. If possible, and WITHOUT RISK, use unmanned hose holders or monitor nozzles from maximum distance to prevent fire from spreading to cargo area.
- Pay special attention to tire fires as re-ignition may occur. Stand by with extinguisher ready.

SPILL OR LEAK:
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- All equipment used when handling the product must be grounded.
Do not touch or walk through spilled material.
- **DO NOT OPERATE RADIO TRANSMITTERS WITHIN 100 METERS (330 feet) OF ELECTRIC DETONATORS.**
- **DO NOT CLEAN UP OR DISPOSE OF, EXCEPT UNDER SUPERVISION OF A SPECIALIST.**

FIRST AID:
- SEE GUIDE 114 FOR INSTRUCTIONS.

GUIDE 114

POTENTIAL HAZARDS
FIRE OR EXPLOSION:
MAY EXPLOSE AND THROW FRAGMENTS 500 METERS (1/3 MILE) OR MORE IF FIRE REACHES CARGO.

HEALTH HAZARDS:
- Fire may produce irritating, corrosive and/or toxic gases.

PUBLIC SAFETY:
CALL Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer,
CALL CHEMTREC AT 1-800-424-9300.
- Isolate spill or leak area immediately for at least 100 meters (330 feet) in all directions. Move people out of line of sight of the scene and away from windows.
- Keep unauthorized personnel away and stay upwind.
- Ventilate closed spaces before entering.

PROTECTIVE CLOTHING:
- Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.

EVACUATION:
LARGE SPILL
- Consider initial evacuation for 250 meters (800 feet) in all directions.

FIRE
- If rail car or trailer is involved in a fire, ISOLATE for 500 meters (1/3 mile) in all directions; also, initiate evacuation including emergency responders for 500 meters (1/3 mile) in all directions.

CARGO Fires: DO NOT FIGHT FIRE WHEN IT REACHES CARGO! CARGO MAY EXPLODE!
- Stop all traffic and clear the area for at least 500 meters (1/3 mile) in all directions and let burn. Do not move cargo or vehicle if cargo has been exposed to heat.

TIRE or VEHICLE Fires:
- Use plenty of water - FLOOD it! If water is not available, use CO2, dry chemical or dirt. If possible, and WITHOUT RISK, use unmanned hose holders or monitor nozzles from maximum distance to prevent fire from spreading to cargo area.
- Pay special attention to tire fires as re-ignition may occur. Stand by with extinguisher ready.

SPILL OR LEAK:
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- All equipment used when handling the product must be grounded.
Do not touch or walk through spilled material.
- **DO NOT OPERATE RADIO TRANSMITTERS WITHIN 100 METERS (330 feet) OF ELECTRIC DETONATORS.**
- **DO NOT CLEAN UP OR DISPOSE OF, EXCEPT UNDER SUPERVISION OF A SPECIALIST.**

FIRST AID:
- Move victim to fresh air. Call emergency medical care.
- Apply CPR if victim is not breathing.
- Administer oxygen if necessary.
- Remove and isolate contaminated clothing and shoes.
- Flush skin or eyes with running water for at least 20 minutes.
- Ensure that medical personnel are aware of the materials involved, and take precautions to protect themselves.

SUPPLEMENTAL INFORMATION:
Packages bearing the 1.4S label contain explosive substances or articles that are designed of packaged in such a manner that when involved in a fire, may burn vigorously with localized detonations and projection of fragments. Effects are usually confined to immediate vicinity of packages.
If fire threatens cargo area containing packages bearing the 1.4S label, consider initial isolation of at least 15 meters (50 feet) in all directions. Fight fire with normal precaution from a distance.

DD FORM 836 (BACK), JAN 2001

HAZMAT EMERGENCY RESPONSE INFO

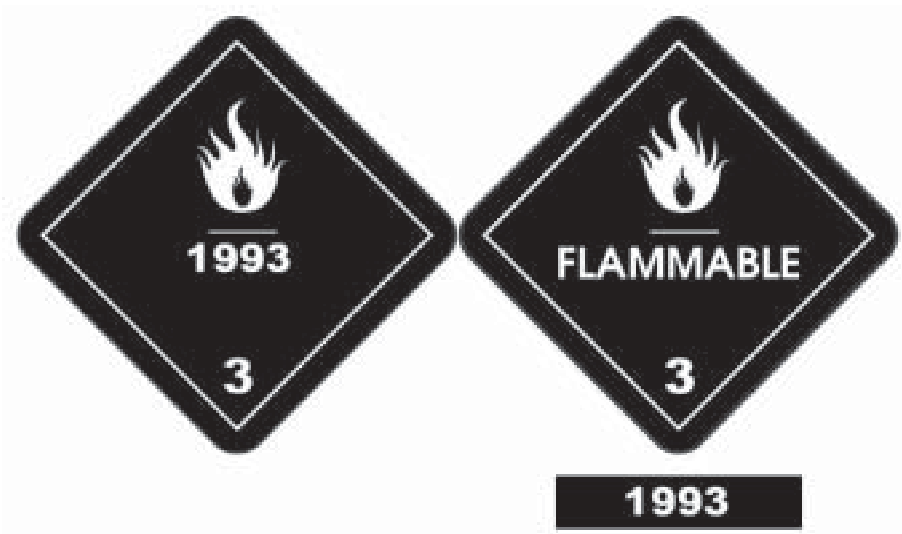
4. Prepare Placards

All MFTs must be marked with the words "FLAMMABLE" and "NO SMOKING WITHIN 50 FEET." The word "FLAMMABLE" must be in block letters that measure six inches in height. The phrase "NO SMOKING WITHIN 50 FEET" must be in block letters that measure three inches in height, and must be located directly under "FLAMMABLE," or to the right on the same line. For MOGAS shipments, the word "GASOLINE" may be used in place of "FLAMMABLE." The tank must be marked on two sides.

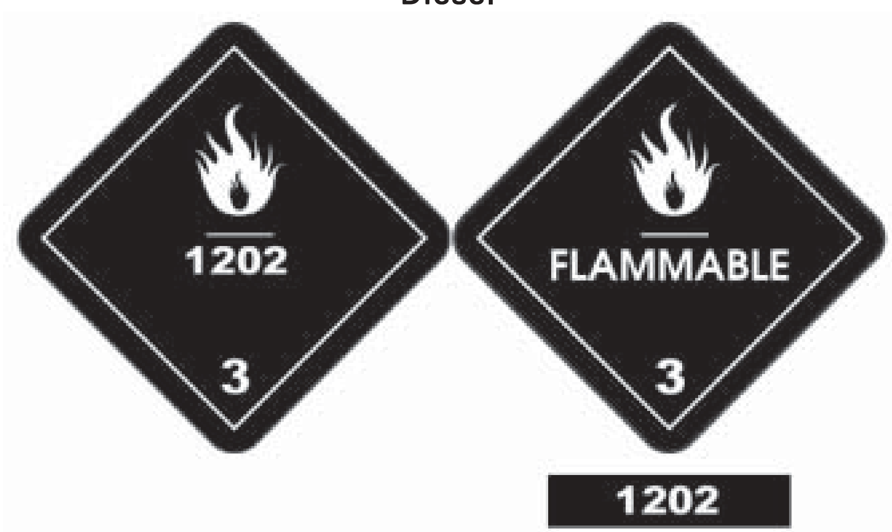
The MFT must also display one of the Hazard Class 3 placard combinations shown on pages 2-6 through 2-8. A placard must be affixed on each side and each end of the fuel tank.

MOGAS

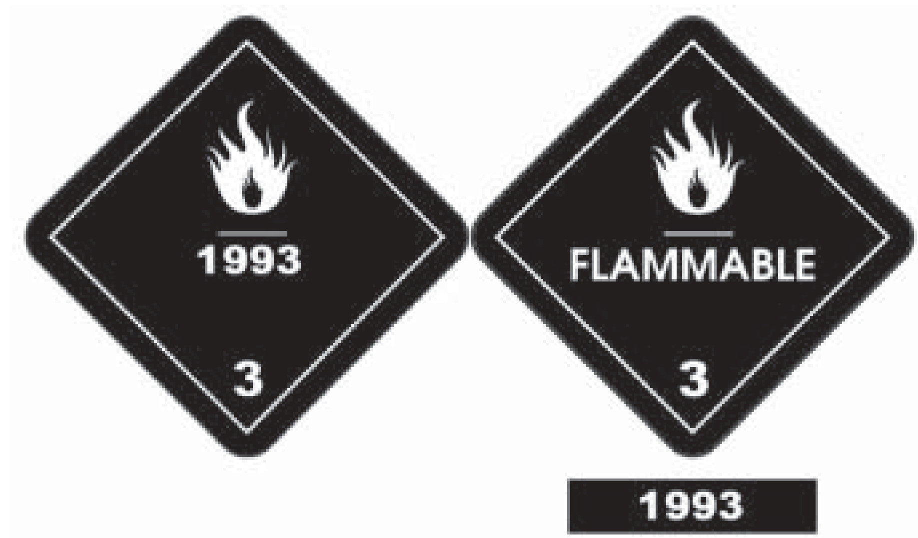
MOGAS



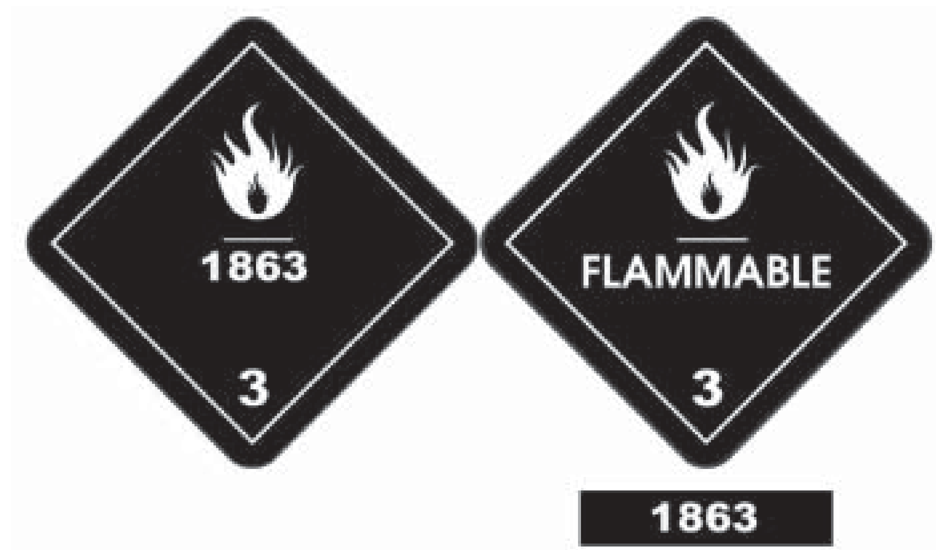
Diesel



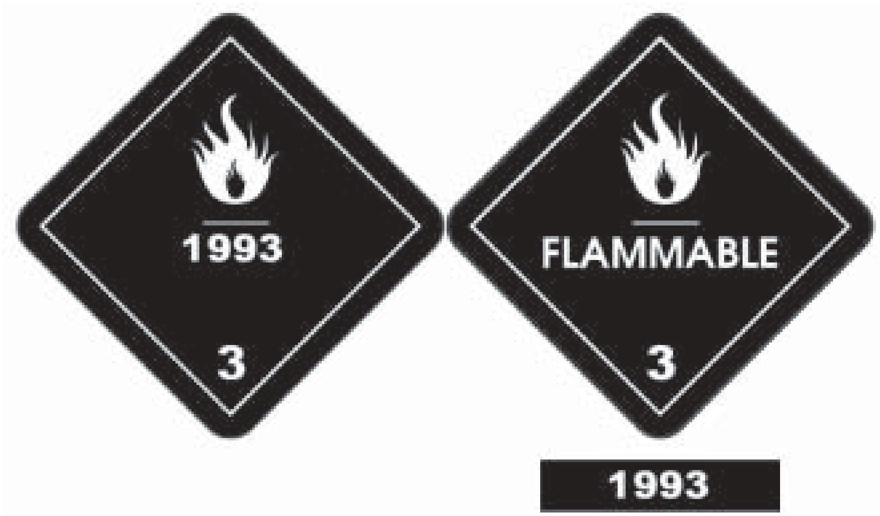
Diesel



JP-4



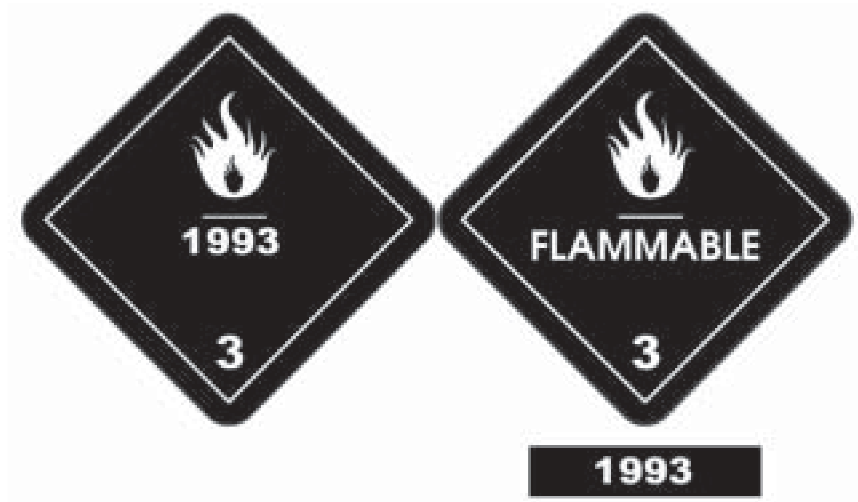
JP-4



JP-8

SECTION 2

JP-8



United Nations/North America (UN/NA) identification numbers for the fuels used by the ARNG are listed in the table below. Marking requirements can be found in the North American Emergency Response Guidebook and/or 49 CFR 172.300.

Fuel	UN ID Number	NA ID Number
MOGAS	UN 1203	NA 1993
Diesel Fuel	UN 1202	NA 1993
JP-4	UN 1863	NA 1993
JP-8	UN 1863	NA 1993

Drive Carefully!
Obey All Traffic Laws!

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SPILL PREVENTION IN REFUELING & FUEL TRANSFER OPERATIONS

MFT operators must comply with state, local, and installation (training area) regulations when performing refueling and all other types of fuel transfer operations. Other types of fuel transfer operations may include loading of bulk fuel to or from an aboveground storage tank (AST). This section, developed IAW 49 CFR 130 and 177, provides guidelines for selecting and setting up a refueling site, conducting refueling and other fuel transfer operations, and closing a refueling site.

Selecting a Refueling Site

When selecting a refueling site, the driver must consider SAFETY and the ENVIRONMENT. Important criteria in selecting a refueling site include the location, surface characteristics and elevation, and natural obstacles and accessibility at the site.

Location

The driver should look for a site AWAY from environmentally sensitive areas, and ensure that the refueling location is **NOT** near any of the following:

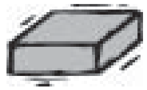
- Ditches, streams, lakes, and other bodies of water
- Drainage Swales
- Drinking water or other water supply wells
- Wetlands and animal habitats
- Living and dining areas
- Ammunition storage areas
- High-traffic areas

Locate in a safe area

Do not park the MFT closer than 300 feet away from any open fire.

Surface Characteristics and Elevation

When possible, select a refueling site where the fuel truck can be parked on a FLAT, IMPERVIOUS surface, such as concrete or asphalt pavement. If such a surface is not available, choose a site where the terrain will direct a spill into a natural pit for temporary containment and allow for easier clean-up.



Locate on a flat, solid surface

Natural Obstacles and Accessibility

Select a refueling site that is readily accessible for the vehicles and equipment being refueled. Make sure that it's clear of debris such as equipment, shrubs, rocks, and tree limbs. Make sure the site is large enough to handle the expected volume of traffic, and that it includes a waiting area for vehicles to be refueled.

Setting Up a Refueling Site

Posting Signs

Once you have selected a suitable site, mark the perimeter of the refueling area with signs that are readable from 50 feet. The signs must say "FLAMMABLE" and "NO SMOKING WITHIN 50 FEET."

Containment for Spills

Before conducting refueling operations, MFT operators should construct diking by using dirt, sandbags, plastic sheeting, absorbent booms, or some other method that will stop or slow the spread of a spill. Limiting the spill will minimize the impact to the environment. When practicable, use the natural terrain to direct potential spill to plastic lined pits or berms.

Refueling Procedures

General

MFTs must be operated in accordance with their respective Technical Manuals (TMs). These are the minimum training qualifications necessary for personnel to conduct refueling operations:

- Knowledge of fuel hazards and emergency procedures
- Knowledge of the proper PPE and how to use it
- Authorization and ability to move the vehicle being refueled

Operating Practices to Prevent Spills

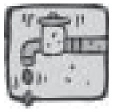
Handling fuel can be very dangerous. Improper handling can result in spills, fires, and explosions. Before conducting refueling and other fuel transfer operations, review the following precautions to minimize spills and hazards. The practices listed below do not replace the requirements of the vehicles -10 Technical Manual (TM).

Work Area Precautions

1. Eliminate any hazards and keep the work area free of equipment, tools, lumber, debris, and other objects that may cause accidents.
2. Keep refueling equipment and supplies in good working condition.
3. Replace worn or broken parts immediately.

Refueling Precautions

1. Check all drains, outlets, valves, lines, fittings, issue/receiving points, and around the tank area for leaks before, during, and after all fueling operations. Equipment failure is the primary spill danger during refueling: a high-pressure line break, loose/broken fittings or valves, supply or vent line rupture, a vehicle accident, or by overfilling a tank.
2. Ensure that the vehicle is turned off and that no one remains in it during refueling and other fuel transfer operations.
3. Carefully open hatches, vents, and valves, as pressure may have built up within the system.
4. Ensure that the fuel attendant stays within 25 feet of



Check valves and fittings for leaks

SECTION 3

the MFT and keeps an unobstructed view of the hoses, connections, and vehicle being refueled.

5. Never perform refueling or other fuel transfer operations when electrical storms threaten.
6. Provide a positive means to load a predetermined quantity of fuel when bottom-loading an MFT vehicle.
7. Leave 1% headspace in every flammable or combustible liquid tank or compartment for content expansion when temperatures rise.

Fire Precautions

1. Supply all MFTs with at least one portable fire extinguisher rated *20-B, C* or with two portable fire extinguishers rated *10-B, C*.
2. Always place fire extinguishers and firefighting equipment in a safe location within easy reach.
3. If a fire occurs in a tank compartment, stop the flow of fuel, if possible, and close the manhole cover.

Never refuel during electrical storms

Personal Protective Equipment Precautions

- Use PPE, such as gloves, apron, boots, goggles, and protective clothing, when working directly with fuel.
- Wear cotton clothing with no metal zippers. NEVER wear nylon, wool, or rayon clothing when handling petroleum products, as static electricity can build up in such fabrics.
- If clothing gets soaked with fuel, thoroughly wet the clothes and immediately remove them. If no water is available, hold a piece of grounding equipment with both hands to ground yourself for a moment before removing your clothing.

Managing Accumulated Rainwater

This section provides guidance for managing rainwater that may accumulate in secondary containment systems.

Visually inspect the accumulated rainwater surface for the presence of an oily sheen.

- If the water's surface does not display an oily sheet, discharge it onto the ground.
- If the water's surface does display a visible oily sheen indicating fuel contamination, perform the following actions:

Step 1. Obtain a closed-top 55-gallon DOT approved drum.

Step 2. Label the drum with a "Non-Hazardous Waste" label marked 'FUEL WATER WASTE'. Indicate the name of the unit and the date the waste was placed in the container. Attach the fuel's MSDS to the drum in a clear plastic bag with tape or adhesive.

Step 3. Put on rubber boots, rubber gloves, safety goggles, and splash suit. Remove the oil sheen by using absorbent pads, absorbent socks, a skimmer or similar method and put it in the labeled drum. If you cannot remove the sheen, then collect all of the water using a pail or bucket and put it in the drum.

Step 4. Turn in the wastewater at the training installation. Do not take it back to the home station.

SECTION 3

Closing a Refueling Site

Follow these steps to close a refueling site.

Step 1. Inspect Refueling Area

1. Inspect the entire site for any leaks or spills as a result of the refueling operation.
2. Look for stained or fuel-smelling soil and dead or stressed vegetation.
3. If any contaminated soils are identified, notify your commander and clean up the site IAW step 3 below.

Step 2. Dismantle Containment Structures

1. If plastic, sandbags, bricks, or concrete blocks were used, remove them.
2. If a pit was dug, fill it in and regrade the area.
3. If an earthen berm was constructed, level it and spread the soil over the site.

Step 3. Site Restoration

1. Before leaving the site, ensure that it is clean and the area is restored to its original condition.
2. Don the proper PPE and dig up any contaminated soil. Place the soil in an approved drum or other container. Properly containerize and label all fuel wastes, stained or fuel-smelling soil and/or rainwater, used PPE, and plastic liners.
3. Turn in the waste at the installation where the spill occurred. If refueling occurred on public property, contaminated soil must be taken back to the home station for disposal.

SPILL PREVENTION IN PARKING THE MOBILE FUEL TANKER

MFT operators must comply with state, local, and installation (training areas) regulations when parking the fuel tanker. This section has been prepared IAW 49 CFR 397.7. It explains the actions to take when parking at a rest stop, home station, or the cantonment area.

Driver's Requirements

Complete the following actions when parking this MFT.

1. Park in a designated MFT parking area, if available, away from all overhead power lines.
2. Block the wheels with chocks.
3. Display placards of the appropriate type for the fuel in the tank or, if empty, the last type of fuel hauled. Placards must remain on the vehicle unless it is cleaned of ALL residual matter (49 CFR 172.514).

Note: Purging the tanker or triple-rinsing it are examples of cleaning ALL residual matter from the MFT storage volume. For the ARNG, a MFT is considered empty when, while parked on a level surface, no more fuel can be removed from the bulk storage tank using the vehicles normal fuel unloading delivery system. This should leave enough fuel in the MFT to ensure seals do not dry out and also pose minimal threat to the environment.

4. Connect the required grounding wires for the vehicle or tank.
5. Do not park the MFT on or within five feet of the traveled portion of a public street or highway, except when absolutely necessary.
6. If parking with fuel in the tank, check with your supervisor or Unit Environmental Compliance Officer (UECO) for additional guidance.

SECTION 4

When In Maintenance

When this MFT is in maintenance for shop-level repairs and/or service (e.g., transmission, engine, etc.), the fuel storage tank must be empty. An MFT is considered empty when, while parked on a level surface, no more fuel can be removed using the vehicle's normal unloading delivery system.

Mobile Fuel Tankers at sites that do not have approved secondary containment structures may have their bulk storage tanks filled with fuel up to three calendar days prior to Annual Training or an Individual Duty Training (IDT) weekend, and they can remain parked at their Home Station. The MFT's vehicle records must indicate the date the bulk storage tank was filled. MFTs will be in the "transport" status under Department Of Transportation (DOT) regulations. These MFTs do not have to be parked in a secondary containment structure. However, all efforts will be made to ensure the MFTs are parked in a safe condition (away from water sources, or adjacent property, and on level land with a spill containment kit available).

All convoy vehicles should have full fuel tanks prior to the start of the convoy. However, full MFTs may be used to fuel convoy vehicles prior to the start of the convoy. The MFT may also be used to fuel vehicles during the convoy to the Training Site. Secondary containment for the MFT is not required for these operations. These actions are considered to be Refueling On the Move (ROMs), and are not an EPA regulated activity. Upon arrival at the Training Site, parking and refueling operations will be conducted according to installation regulations and Army requirements. The fuel transported from the Training Site back to Home Station in the MFT should be only the necessary volume for distribution during the convoy so that the MFT is returned empty.

APPENDIX A

Army National Guard
State Environmental Office Contacts

State of Alabama Military Department
1751 Cong William Dickinson Drive
Montgomery, AL 36109
Emergency (334) 271-7266
Office (334) 271-7427
Fax (334) 213-7669

Alaska Army National Guard
Facilities Management Division
PO Box 5-549, Building 57-040 Camp Carroll
Fort Richardson, AK 99505
Emergency (907) 428-6294
Office (907) 428-6760
Fax (907) 428-6767

Military Department of Arkansas
Building 1301, PO Box 5, Camp J.T. Robinson
North Little Rock, AR 72199
Emergency (501) 484-2226
Office (501) 212-5873
Fax (501) 212-5859

APPENDIX A

Arizona Army National Guard
Attn: AZAA-FME
Building M5330
5636 East McDowell Road
Phoenix, AZ 85008
Emergency (602) 267-2665
Office (602) 267-2742
Fax (602) 267-2643

California Military Department
Attn: CASE
PO Box 269101
Sacramento, CA 95826
Emergency (916) 854-3485
Office (916) 854-3093
Fax (916) 854-3365

Colorado Army National Guard
Attn: Environmental Office
Box 34
6848 South Revere Parkway
Englewood, CO 80112
Emergency (303) 677-8951
Office (303) 677-8907
Fax (303) 677-8900

Connecticut Army National Guard
Attn: CTDE-ENV
360 Broad Street
Hartford, CT 06105
Emergency (860) 566-3313
Office (860) 524-4945
Fax (860) 524-4937

Delaware Army National Guard
Attn: DE-AEN-E
First Regiment Road
Wilmington, DE 19808
Emergency (302) 326-7170
Office (302) 326-7132
Fax (302) 7140

DCARNG-Director of Engineering
Attn: DCARNG-DE-E (Environmental Office)
2001 East Capitol Street
Washinton, DC 20003
Emergency (202) 685-9660
Office (202) 685-9654
Fax (202) 685-9659

State of Florida Department of Military Affairs
Attn: FMO-ENVIR
PO Box 1008
St. Augustine, FL 32086
Emergency (904) 823-0471
Office (904) 823-0277
Fax (904) 823-0189

APPENDIX A

Department of Defense Military Division
Attn: FMO-ENV
PO Box 17965
Atlanta, GA 30316
Emergency (404) 675-5065
Office (404) 724-6113
Fax (404) 624-6514

Guam Army National Guard
Attn: GU-AEN-E
Fort Juan Muna
622 East Harmon Industrial Park
Tamuning, GU 96911
Emergency (671) 472-3304
Office (671) 647-2742
Fax (671) 647-6018

Hawaii Department of Defense, Hawaii Army National Guard
Environmental Office
3649 Diamond Head Road
Honolulu, HI 96816
Emergency (808) 733-4140
Office (808) 733-4214
Fax (808) 737-3575

Idaho Army National Guard
Attn: IDEV-Z, Gowen Field
4715 South Byrd Street, Bldg 518
Boise, ID 83705
Emergency (208) 846-7610
Office (208) 422-4170
Fax (208) 422-4169

Iowa Army National Guard
Attn: AGIA-FAC-E
Building B-61, Camp Dodge
Johnston, IA 50131
Emergency (515) 252-4308
Office (515) 252-4557
Fax (515) 252-4589

Illinois Department of Military Affairs
Attn: DMAIL-FE
1301 North MacArthur Boulevard
Springfield, IL 62702
Emergency (217) 761-3702
Office (217)761-3973
Fax (217) 761-3790

Military Department of Indiana
Attn: MDI-FE-EN
2002 South Holt Road
Indianapolis, IN 46241
Emergency (317) 247-3463
Office (317) 247-3105
Fax (317) 247-3414

The Adjutant General's Office of Kansas
Attn: AGKS-DOFE-E
131 Southwest 27th Street, Building 101
Topeka, KS 66604
Emergency (785) 274-1513
Office (785)785) 274-1147
Fax (913) 274-1619

APPENDIX A

Kentucky Department of Military Affairs
Attn: Environmental Branch
1121A Louisville Road, Pinehill Plaza
Frankfort, KY 40601
Emergency (502) 607-1638
Office (502) 607-5741
Fax (502) 607-5740

State of Louisiana Military Department
Attn: LANG-DFE-E
Building 223, Jackson Barracks
New Orleans, LA 70146
Emergency (504) 278-8261
Office (504) 278-8267
Fax (504) 278-8795

Department of Defense Veterans & Emergency Management
Building #8, DFE, Camp Keyes
Augusta, ME 04333
Emergency (207) 622-9331
Office (207) 626-4479
Fax (207) 626-4553

Maryland Army National Guard
Attn: CFMO-ENV
29th Division Street
Baltimore, MD 21201
Emergency (410) 576-6759
Office (410) 576-6132
Fax (410) 576-6070

Massachusetts Army National Guard
50 Maple Street
Milford, MA 01757
Emergency (508)233-6520
Office (508) 233-6520
Fax (508) 233-6571

Michigan Department of Military and Veterans Affairs
Attn: MITAG-CFO
2500 Washington Avenue
Lansing, MI 48913
Emergency (517) 483-5655
Office (517) 483-5646
Fax (517) 483-5538

Department of Military Affairs
Attn: MNAG-FMO-E
15000 Highway 115, Building 11-1
Littlefalls, MN 56345
Emergency (320) 632-7000
Office (320) 632-7447
Fax (632) 7473

Mississippi Military Department
Attn: NGMS-FMO-E
PO Box 5027
Jackson, MS 39296
Emergency (601) 313-6204
Office (601) 313-6228
Fax (601) 313-6143

APPENDIX A

Missouri National Guard
Attn: NGMO-EM Environmental Office
2302 Militia Drive
Jefferson City, MO 65101
Emergency (573) 638-9552
Office (573) 638-9910
Fax (573) 638-9511

Montana Department of Military Affairs
Attn: Environmental Program
Fort Harrison, Building 230, Williams Road
Helena, MT 59604
Emergency (406) 841-3402
Office (406) 841-3080
Fax (406) 841-3081

State of Nebraska Military Department
Attn: ~~FMO- E~~ CFMO-ENV
1300 Military Road
Lincoln, NE 68508
Emergency ~~(402) 471-3241~~ 911 (402) 309-7474
Office ~~(402) 471-7136~~ (402) 309-7468
Fax ~~(402) 471-7143~~ (402) 309-7432

North Carolina National Guard
Attn: AGEO/E
4105 Reedy Creek Road
Raleigh, NC 27607
Emergency (919) 664-6000
Office (919) 664-6186
Fax (919) 664-6479

North Dakota Army National Guard
Attn: AGND-IRE-ENV
PO Box 5511
Building 030, Fraine Barracks
Bismark, ND 58506
Emergency (701) 333-2066
Office (701) 333-2070
Fax (701) 333-2067

Office of Nevada Military
Attn: USPFO-FMO-ENV
2601 South Carson
Carson City, NV 89701
Emergency (800) 520-0895
Office (800) 887-7379
Fax (800) 884-8450

New Hampshire State Military Reservation
Attn: NHAG-FM-EV
4 Pembroke Road
Concord, NH 03301
Emergency (603) 227-1439
Office (603) 228-1135
Fax (603) 225-1212

New Jersey Department of Military & Veteran Affairs
Attn: ID-OEC
101 Eggert Crossing Road, PO Box 340
Trenton, NJ 08625
Emergency (609) 530-7088
Office (609) 530-7133
Fax (609) 530-6880

APPENDIX A

Department of Military Affairs
Attn: NMAG-FMO-EV
10 Bataan Boulevard
Santa Fe, NM 87508
Emergency (505) 474-1882
Office (505) 474-1879
Fax (505) 474-1599

New York Division of Military and Naval Affairs
Attn: MNFE-EC
330 Old Niskayuna Road
Latham , NY 12110
Emergency (518) 786-4500
Office (518) 766-4495
Fax (518) 766-4400

Ohio Army National Guard
Attn: AGOH-FM-EN
2825 Dublin Grandville Road
Columbus, OH 43235
Emergency (614) 336-7095
Office (614) 336-7395
Fax (614) 336-7154

Oklahoma Military Department
Attn: OKDE-ENV
3515 Military Circle
Oklahoma City, OK 73111
Emergency (405) 228-5333
Office (405) 228-5521
Fax (405) 425-8590

Oregon Military Department
Attn: AGI-ENV
PO Box 14350, 1776 Miltia Way
Salem, OR 97309
Emergency (503) 584-3852
Office (503) 584-3868
Fax (503) 584-3584

Department of Military & Veteran Affairs
Attn: Environmental Office
Fort Indiantown Gap
Annville, PA 17003
Emergency (717) 861-5002
Office (717) 861-8250
Fax (717) 861-8249

Puerto Rico Army National Guard
PO Box 9023786
Stop 3 1/2, Puerta de Tierra
San Juan, PR 00902
Emergency (787) 289-1658
Office (787) 289-1658
Fax (787) 289-1652

HQ, Rhode Island Army National Guard
CMD Readiness Center
645 New London Avenue
Cranston, RI 02920
Emergency (401) 275-4146
Office (401) 457-4211
Fax (401) 457-4269

APPENDIX A

The Adjutant General of South Carolina
Attn: FMO-ENV
One National Guard Road
Columbia, SC 29201
Emergency (803) 806-4490
Office (803) 806-4410
Fax (803) 806-4329

Department of Military & Veteran Affairs
2823 West Main Street, Building 602
Rapid City, SD 57702
Emergency (605) 737-6200
Office (605) 737-6670
Fax (605) 703-6204

Tennessee Army National Guard
Houston Barracks
3041 Sidco Drive
Nashville, TN 37204
Emergency (615) 741-0001
Office (615) 313-0628
Fax (615) 313-0766

Adjutant General's Department of Texas
AGTX-EV
PO Box 5218
2210 West 35th Street Building 1, Camp Mabry
Austin, TX 78763
Emergency (512) 465-5227
Office (512) 465-5001
Fax (512) 465-5141

Utah Army National Guard
12953 South Minuteman Drive
Draper, UT 84020
Emergency (801) 523-4352
Office (801) 523-4454
Fax (801) 523-4741

The Adjutant General of Vermont
ATTN: VT-FE-EV (Building 14)
789 NT National Guard Road
Colchester, VT 05446
Emergency (802) 338-3306
Office (802) 338-3306
Fax (802) 338-3401

The Adjutant General of Virginia
Building 316, Fort Pickett
Blackstone, VA 23824
Emergency (804) 674-2400 / (800) 468-8892
Office (804) 298-6401
Fax (804) 298-6400

HQ, Virgin Island National Guard
Attn: VI-CFMO-E
4031 La Grand Princesse Lot 1B
Christiansted, VI 00820
Emergency (340) 773-7782
Office (340) 712-7725
Fax (340) 773-7711

APPENDIX A

Washington Army National Guard
Attn: Environmental Office
Camp Murray, Building 36
Tacoma, WA 98430
Emergency (253) 512-8000
Office (253) 512-8466
Fax (253) 512-8904

West Virginia Army National Guard
Attn: WVARNG-F-EP
1703 Coonskin Drive
Charleston, WV 25311
Emergency (304) 238-1010
Office (304) 561-6445
Fax (304) 561-6458

Wisconsin Department of Military Affairs
Attn: WIAR-F-EN
2400 Wright Street
Madison, WI 53714
Emergency (608) 242-3355
Office (608) 242-3356
Fax (608) 242-3371

Wyoming Military Department
Attn: CFMO-EEB
5500 Bishop Boulveard
Cheyenne, WY 82009
Emergency (307) 772-5051
Office (307) 772-5036
Fax (307) 772-5221

APPENDIX B

State-by-State Directory of Emergency Response Organizations

Alabama Emergency Management Agency
5898 County Road 41
Post Office Drawer 2160
Clanton, AL 35046-2160
(205) 280-2212
(205) 280-2495 FAX

Alaska Division of Emergency Services
Post Office Box 5750
Bldg. 49, 200-Warehouse
Ft. Richardson, AK 99505-5750
(907) 428-7023
(907) 429-7009 FAX

Arkansas Fire Training Academy
100 Carr Road
Camden, AR 71711
(870) 574-2996
(870) 574-0817 FAX

Arkansas Department of Emergency Management
Post Office Box 758
Conway, AR 72032
(501) 730-9750
(501) 730-9754 FAX

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Arizona Emergency Response Commission
5636 East McDowell Road, Building 341
Phoenix, AZ 85008
(602) 231-6345
(602) 392-7519 FAX

California County Fire District
3012 Gold Canal
Rancho Cordova, CA 95670
(916) 636-1871

CSTI - Camp San Luis Obispo
Highway 1, Building 904
San Luis Obispo, CA 93403
(805) 542-4704

Armed Forces Reserve Station
11200 Lexington Drive
Building 283
Los Alamitos, CA 90720
(562) 795-2912

San Diego Office of Emergency Services
1350 Front Street
Suite 2041
San Diego, CA 92101
(619) 525-4289

Los Angeles Fire C/O Training Center
1320 Northeastern Avenue
Los Angeles, CA 90063
(323) 881-2436

Colorado Office of Emergency Management
15075 South Golden Road
Golden, CO 80401-3979
(303) 273-1619
(303) 273-1799 FAX

Connecticut Bureau of the State Fire Marshal
1111 Country Club Road
Middletown, CT 06450
(860) 685-8350
(860) 685-8359 FAX

District of Columbia Emergency Management Agency
2000 14th Street, NW, 8th Floor
Washington, DC 20009
(202) 673-2101 x 6159
(202) 673-2290 FAX

Delaware State Fire School
1461 Chestnut Grove Road
Dover, DE 19904
(302) 739-4773
(302) 739-6245 FAX

Florida Division of Emergency Management
1190 D Capitol Circle, NE
Tallahassee, FL 32301
(850) 413-9892
(850) 488-7841 FAX

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NE Florida Regional Planning Council
9143 Phillips Highway, Suite 350
Jacksonville, FL 32256
(904) 363-6350
(904) 363-6356 FAX

East Central Florida Regional Planning Council
1011 Wymore Road, Suite 105
Winter Park, FL 32789
(407) 623-1075
(407) 623-1084 FAX

Tampa Bay Regional Planning Council
9455 Koger Boulevard, Room 103
St. Petersburg, FL 33702
(727) 570-5151 x 248
(727) 570-5118 FAX

South Florida Regional Planning Council
3440 Hollywood Boulevard, Suite 140
Hollywood, FL 33021
(954) 985-4416
(954) 985-4417 FAX

Georgia Emergency Management Agency
1000 Indian Springs Drive
Forsyth, GA 31029
(912) 993-4618
(912) 993-4260 FAX

Guam Fire Department
Post Office Box 2950
Agana, Guam, USA 96910
(671) 472-3304
(671) 472-3360 FAX

Hawaii State Civil Defense/HAZMAT Training
3949 Diamond Head Road
Honolulu, HI 96816
(808) 733-4300
(808) 733-4287 FAX

Idaho Bureau of Hazardous Materials
4040 Guard Street, Building 600
Boise, ID 83705-5004
(208) 334-3263
(208) 334-3267 FAX

Iowa DOT Office of Motor Vehicle Enforcement
Park Fair Mall, 100 Euclid Avenue
Des Moines, IA 50306-0473
(515) 237-3278
(515) 237-3387 FAX

Illinois Fire Service Institute
11 Gerty Drive
Champaign, IL 61820
(217) 244-5108

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Illinois Emergency Management Agency
301 West Madison
Springfield, IL 62702-5017
(217) 557-4896

Northeast Illinois Public Safety Training Academy
2350 2nd Avenue
Glenview, IL 60025
(847) 982-5300

Public Safety Training Institute
Indiana Government Center South
302 West Washington Street, Room C239
Indianapolis, IN 46204
(800) 666-7784
(317) 233-0497 FAX

Kansas Emergency Preparedness
Technological Hazard Section
2800 S.W. Topeka Blvd.
Topeka, KS 66611-1287
(785) 274-1409
(785) 274-1426 FAX

Division of Emergency Management
EOC Building
100 Minuteman Parkway - Boone Center
Frankfort, KY 40601
(502) 607-5732
(502) 607-5730 FAX

Louisiana State Police - TESS
7901 Independence Boulevard
Baton Rouge, LA 70896
(225) 925-6113
(225) 922-1588 FAX

Maine Emergency Management Agency
State House Station, #72
Augusta, ME 04333-0072
(207) 626-4504
(207) 626-4499 FAX

Maryland Emergency Management Agency
5401 Rue Saint Lo Drive
Reisterstown, MD 21136
(410) 517-5128
(410) 517-3610 FAX

Massachusetts Emergency Management
P.O. Box 1496
400 Worcester Road
Framingham, MA 01701-0317
(508) 820-2000
(508) 820-2030 FAX

Michigan State Police
Fire Marshal Division
7150 Harris Drive
Lansing, MI 48913
(517) 322-1681
(517) 322-2908 FAX

Minnesota Department of Public Safety
Division of Emergency Management
444 Cedar Street, Suite 223
St. Paul, MN 55155-6223
(651) 296-0453
(651) 296-0452 FAX

Missouri Department of Public Safety - MERC
2303 Militia Drive
Jefferson City, MO 65101
(573) 526-9237
(573) 526-9261 FAX

Mississippi Emergency Management Agency
Post Office Box 4501
Jackson, MS 39296-4501
(601) 352-9100
(601) 352-8314 FAX

Montana Disaster and Emergency Services
1100 North Main
Helena, MT 59620-2111
(406) 841-3956

Nebraska State Patrol
1600 Highway 2
Lincoln, NE 68502
(402) 471-4545
(402) 479-4002 FAX

North Carolina Division of Emergency Management
Administration Building
116 West Jones
Raleigh, NC 27603-1335
(919) 733-1361
(919) 733-2860 FAX

North Dakota Fire Marshal Office
Office of the Attorney General
4205 North State Street
Bismarck, ND 58502-1054
(701) 328-5555
(701) 328-5510 FAX

New Hampshire Department of Safety
Bureau of Highway Enforcement
10 Hazen Drive
Concord, NH 03305
(603) 271-3339
(603) 271-3903 FAX

Emergency Management Section
New Jersey State Police
Box 7068, River Road
West Trenton, NJ 08628-0068
(609) 882-2000
(609) 538-0345 FAX

APPENDIX B

New Mexico Department of Public Safety
Emergency Management Bureau
4491 Cerrillos Road
Santa Fe, NM 87505
(505) 476-9620
(505) 476-9695 FAX

New Mexico Firefighters Training Academy
200 Aspen Road
Socorro, NM 87801
(505) 835-7500

Nevada Division of Emergency Management
2525 South Carson Street
Carson City, NV 89701
(775) 687-4240
(775) 687-6788 FAX

New York State Emergency Management Office
State Office Building 22, Suite 101
1220 Washington Avenue
Albany, NY 12226-2251
(518) 457-9958
(518) 457-9963 FAX

Ohio Fire Academy
8895 East Main Street
Reynoldsburg, OH 43068
(614) 752-7208
(614) 752-7111 FAX

Oklahoma Department of Civil Emergency Management
Post Office Box 53365
Oklahoma City, OK 73152
(405) 521-2481
(405) 521-4053 FAX

Oregon State Fire Marshal's Office
4760 Portland Road, NE
Salem, OR 97305
(503) 373-1540
(503) 373-1825 FAX

Pennsylvania Emergency Management
Post Office Box 3321
Harrisburg, PA 17105-3321
(717) 651-2199
(717) 651-2125 FAX

Public Service Commission
Avenue Munoz Rivera #50
Arteriac B
Hato Rey, Puerto Rico 00919
(787) 756-1453
(787) 758-6264 FAX

State Emergency Management Agency
Avenue Ponce DeLeon #958
Parada 15
Miramar, Puerto Rico 00906
(707) 724-0124

APPENDIX B

Rhode Island Emergency Management
645 New London Avenue
Cranston, RI 02920
(401) 946-9996
(401) 944-1891 FAX

South Carolina Emergency Preparedness Division
1429 Senate Street
Columbia, SC 29201
(803) 734-8020
(803) 734-8062 FAX

South Dakota Emergency Management
500 East Capitol
Pierre, SD 57501-5070
(605) 773-3231
(605) 773-3580 FAX

Tennessee Emergency Management Agency
3041 Sidco Drive
P.O. Box 41502
Nashville, TN 37204-1502
(615) 741-2924
(615) 741-4173 FAX

Texas A&M Fire Academy
Brayton Training Field
1595 Nuclear Science Road
College Station, TX 77843
(409) 845-7641
(409) 847-9304 FAX

Texas Emergency Management
Texas Department of Public Safety
5805 North Lamar Boulevard
Austin, TX 78752
(512) 424-2138
(512) 424-2444 FAX

Department of Public Safety
UT Division of C.E.M
State Office Building, Room 1110
Salt Lake City, UT 84114
(801) 538-3400
(801) 538-3772 FAX

Vermont Emergency Management Agency
Department of Public Safety
103 South Main Street
Waterbury, VT 05621-2101
(802) 244-8721
(802) 244-8655 FAX

MCSAP Coordinator
#84 Krondprinsens Gade
St. Thomas, U.S. Virgin Islands 00802
(340) 776-5820
(340) 774-0023 FAX

Virginia Department of Emergency Services
10501 Trade Court
Richmond, VA 23236
(804) 897-6578
(804) 897-6576 FAX
(340) 774-0023 FAX

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Emergency Management Division
Building 5, Camp Murray
Tacoma, WA 98430-5122
(253) 512-7069
(253) 512-7207 FAX

West Virginia Office of Emergency Services
State Capitol Complex
Room EB-80
Charleston, WV 25305
(304) 558-5380
(304) 344-4538 FAX

Division of Emergency Management
2400 Wright Street
Madison, WI 53707-7865
(608) 242-3228
(608) 242-3249 FAX

Emergency Management Agency
Radiological Maintenance Facility
624 East Pershing
Cheyenne, WY 82001
(307) 777-4920
(307) 635-6017 FAX

APPENDIX C

State-by-State Directory of DOT Offices

Alabama Department of Transportation
1409 Coliseum Boulevard
Montgomery, AL 36110
(334) 242-6358

Alaska Department of Transportation and Public Facilities
Headquarters
3132 Channel Drive
Juneau, AK 99801-7898
(907) 465-3900

Arizona Department of Transportation
206 South 17th Avenue
Phoenix, AZ 85007
(602) 712-7227

Arkansas State Highway and Transportation Department
10324 Interstate 30
Little Rock, AR 72209
(501) 569-2000

California Department of Transportation
Headquarters
Post Office Box 942873
Sacramento, CA 94273-0001

(916) 654-5266

Colorado Department of Transportation
Office of Public Information
4201 E Arkansas Avenue
Denver, CO 80222
(303) 757-9448 (Environmental Services Office)

Connecticut Department of Transportation
2800 Berlin Turnpike
Newington, CT 06131-7546
(860) 594-2000

Delaware Department of Transportation
Post Office Box 778
Dover, DE 19903
(302) 760-2080 or (800) 652-5600

Florida Department of Transportation
605 Suwannee Street
Tallahassee, FL 32399-0450
(850) 414-4100

Georgia Department of Transportation – Operations Division
935 East Confederate Avenue
Atlanta, GA 30316
(404) 656-5428

Hawaii Department of Transportation
Aliiaimoku Building
869 Punchbowl Street
Honolulu, HI 96813

(808) 587-2164

Idaho Transportation Department – Department of Motor Vehicles
3311 West State Street
Post Office Box 7129
Boise, ID 83707-1129
(208) 334-8606

Illinois Department of Transportation
2300 South Dirksen Parkway
Springfield, IL 62764
(217) 782-7231

Indiana Department of Transportation
100 North Senate Avenue
Room IGCN 755
Indianapolis, IN 46204
(317) 232-5533

Iowa Department of Transportation
800 Lincoln Way
Ames, IA 50010
(515) 239-1101

Kansas Department of Transportation
915 Harrison, Room 754 - Docking State Office Building
Topeka, KS 66612-1568
(785) 296-3585

APPENDIX C

Kentucky Transportation Cabinet
501 High Street
Frankfort, KY 40622
(502) 564-4890

Louisiana Department of Transportation and Development
Post Office Box 94245
Baton Rouge, LA 70804-9245
(225) 379-1100

Maine Department of Transportation
16 Statehouse Station
Augusta, ME 04333
(207) 287-2551

Maryland Department of Transportation
Post Office Box 8755
BWI Airport, MD 21240
(888) 713-1414

Massachusetts Executive Office of Transportation and Construction
10 Park Plaza, Suite 3170
Boston, MA 02116
(617) 973-7000

Michigan Department of Transportation
State Transportation Building
425 West Ottawa Street, PO Box 30050
Lansing, MI 48909
(517) 373-2090

Minnesota Department of Transportation
Transportation Building
395 John Ireland Boulevard
Saint Paul, MN 55155
(651) 296-3000

Mississippi Department of Transportation
PO Box 1850
Jackson, MS 39215-1850
(601) 359-7001

Missouri Department of Transportation
105 West Capital Avenue, PO Box 270
Jefferson, MO 85102
(573) 751-2551

Montana Department of Transportation
PO Box 201001 2701, Prospect Avenue
Helena, MT 59620-1001
(406) 444-6200

Nebraska Department of Motor Vehicles
State Office Building,
301 Centennial Mall South
Lincoln, NE 68509
(402) 471-2281

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

(775) 888-7000

New Hampshire Department of Transportation
John O. Morton Building
1 Hazen Drive
Concord, NH 03302-0483
(603) 271-3734

New Jersey Department of Transportation
1035 Parkway Avenue, PO Box 600
Trenton, NJ 08625
(609) 530-2000

New Mexico Highway and Transportation Department
1120 Cerrillos Road, PO Box 1149
Santa Fe, NM 87504-1149
(505) 827-5100

New York Department of Transportation – Motor Carrier Safety
Building 7A, Room 501A
1220 Washington Avenue
Albany, NY 12232
(518) 457-1016

North Carolina Department of Transportation
1501 Mail Service Center
Raleigh, NC 27699-1501
(919) 733-2520

North Dakota Department of Transportation
608 East Boulevard Avenue
Bismarck, ND 58505-0700

(701) 328-2500
Ohio Department of Transportation
1980 West Broad Street
Columbus, OH 43223
(614) 466-7170

Oklahoma Department of Transportation
Regulatory Services Division
200 NE 21st Street
Oklahoma City, OK 73105
(405) 521-6046

Oregon Department of Transportation
Motor Carrier Transportation Division
550 Capitol Street NE
Salem, OR 97301-2530
(503) 378-5849 or (800) 248-6782

Pennsylvania Department of Transportation
Forum Place
555 Walnut Street
Harrisburg, PA 17101-1900
(717) 787-5367

Rhode Island Department of Transportation
Two Capitol Hill
Providence, RI 02903-1124
(401) 222-1362

South Carolina Department of Transportation
955 Park Street, PO Box 191
Columbia, SC 29202-0191

(803) 737-2314

South Dakota Department of Transportation
700 East Broadway Avenue, Becker-Hansen Building
Pierre, SD 57501
(605) 773-3265

Tennessee Department of Transportation
700 James K. Polk Building
Nashville, TN 37243-3049
(615) 741-2848

Texas Department of Transportation
Motor Carrier Division
125 East 11th Street
Austin, TX 78701-2483
(512) 465-3500

Utah Department of Transportation
Office of Motor Carriers
Box 148240
Salt Lake City, UT 84114-8240
(801) 965-4559

Vermont Agency of Transportation
133 State Street
Montpelier, VT 05633
(802) 828-2657

Virginia Department of Transportation
1401 East Broad Street
Richmond, VA 23219

(804) 786-2716

Washington State Department of Transportation
Transportation Building
310 Maple Park Avenue SE
PO Box 47300
Olympia, WA 98504-7300
(360) 705-7000

West Virginia Department of Transportation – Division of Highways
Building 5, Room A-110
1900 Kanawha Boulevard East
Charleston, WV 25305-0430
(304) 558-3505

Wisconsin Department of Transportation
Motor Carrier Services
PO Box 7967
Madison, WI 53707-7067
(608) 266-1356

Wyoming Department of Transportation
5300 Bishop Boulevard
Cheyenne, WY 82009-3340
(307) 777-4375

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APPENDIX D

Acronyms

ARNG - Army National Guard
AST - Aboveground Storage Tank
BMP - Best Management Practice
CWA - Clean Water Act
DD - Defense Department
DOT - Department of Transportation
HAZMAT - Hazardous Material
IAW - In Accordance With
IDT - Inactive Duty Training
MFT - Mobile Fuel Tankers
MOGAS - Military Operations Gasoline
OSPCP - Oil Spill Prevention and Contingency Plan
PPE - Personal Protective Equipment
TM - Technical Manual
UECO - Unit Environmental Compliance Officer
UN/NA - United Nations/North America

APPENDIX D

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APPENDIX D

Secondary Containment Calculations

NEARNG AASF #2 - Grand Island, NE

Mobile Refueler Containment Area

Containment Specifications

Length	40.00	ft	
Width	12.83	ft	
Height of Wall	9.00	in	
Height of Wall	0.75	ft	
Volume of Containment	384.90	ft^3	
Volume of Containment	2,879.05	gallons	

Sufficient Freeboard - Not required per 112.8(11), only general spill contianment requirements apply

Largest Mobile Refueler Compartment

	2,500.00	gallons	
Excess Capacity	379.05	gallons	Volume of Containment - Largest Mobile Refueler Compartment

Drum Spill Containment (Controlled Waste Building)

Containment Specifications

Length	18.00	ft	
Width	18.00	ft	
Height	0.50	ft	
Volume of Containment	162.00	ft^3	
Volume of Containment	1,211.76	gallons	(Sufficient to hold 55 gallon drum contents)
Largest Container	55.00	gallons	

APPENDIX E

Container Inspection Forms

STI SP001 Annual Inspection Checklist

General Inspection Information:

Inspection Date: ____________________	Retain Until Date: ______________________	(36 months from inspection date)
Prior Inspection Date: ____________________	Inspector Name: ____________________________________	
Tanks Inspected (ID #'s): ____		

Inspection Guidance:

- For equipment not included in this Standard, follow the manufacturer recommended inspection/testing schedules and procedures.
- The periodic AST Inspection is intended for monitoring the external AST condition and its containment structure. This visual inspection does not require a Certified Inspector. It shall be performed by an owner's inspector who is familiar with the site and can identify changes and developing problems.
- Remove promptly upon discovery standing water or liquid in the primary tank, secondary containment area, interstice, or spill container. Before discharge to the environment, inspect the liquid for regulated products or other contaminants and disposed of it properly.
- In order to comply with EPA SPCC (Spill Prevention, Control and Countermeasure) rules, a facility must regularly test liquid level sensing devices to ensure proper operation (40 CFR 112.8(c)(8)(v)).
- (*) designates an item in a non-conformance status. This indicates that action is required to address a problem.
- Non-conforming items <u>important to tank or containment integrity</u> require evaluation by an engineer experienced in AST design, a Certified Inspector, or a tank manufacturer who will determine the corrective action. Note the non-conformance and corresponding corrective action in the comment section.
- Retain the completed checklists for 36 months.
- Complete this checklist on an annual basis supplemental to the owner monthly-performed inspection checklists.
- **Note: If a change has occurred to the tank system or containment that may affect the SPCC plan, the condition should be evaluated against the current plan requirement by a Professional Engineer knowledgeable in SPCC development and implementation.**

Item	Task	Status	Comments
1.0 Tank Containment			
1.1 Containment structure	Check for: • Holes or cracks in containment wall or floor • Washout • Liner degradation • Corrosion • Leakage • Paint failure • Tank settling	☐Yes* ☐No ☐N/A	
2.0 Tank Foundation and Supports			
2.1 Foundation	Settlement or foundation washout?	☐Yes* ☐No	
2.2 Concrete pad or ring wall	Cracking or spalling?	☐Yes* ☐No ☐N/A	

Item	Task	Status	Comments
2.3 Supports	Check for corrosion, paint failure, etc.	□Yes* □No □N/A	
2.4 Water drainage	Water drains away from tank?	□Yes □No* □N/A	
2.5 Tank grounding	Strap secured and in good condition?	□Yes □No* □N/A	
3.0 Cathodic Protection			
3.1 Gavlvanic cathodic protection system	Confirm system is functional, includes the wire connections for galvanic systems	□Yes □No* □N/A	
3.2 Impressed current system	a. Inspect the operational components (power switch, meters, and alarms).	□Yes □No* □N/A	
	b. Record hour meter, ammeter and voltmeter readings.	□Yes □No* □N/A	
4.0 Tank Shell, Heads, Roof			
4.1 Coating	Check for coating failure	□Yes* □No	
4.2 Steel condition	Check for: • Dents • Buckling • Bulging • Corrosion • Cracking	□Yes* □No	
4.3 Roof slope	Check for low points and standing water	□Yes* □No □N/A	
5.0 Tank Equipment			
5.1 Vents	Verify that components are moving freely and vent passageways are not obstructed for: • Emergency vent covers • Pressure/vacuum vent poppets • Other moving vent components	□Yes* □No	

Item	Task	Status	Comments
5.2 Valves	Check the condition of all valves for leaks, corrosion and damage.	□Yes* □No	
5.2.1 Anti-siphon, check and gate valves	Cycle the valve open and closed and check for proper operation.	□Yes □No* □N/A	
5.2.2 Pressure regulator valve	Check for proper operation. (Note that there may be small, 1/4 inch drain plugs in the bottom of the valve that are not visible by looking from above only)	□Yes □No* □N/A	
5.2.3 Expansion relief valve	Check that the valve is in the proper orientation. (Note that fuel must be discharged back to the tank via a separate pipe or tubing.)	□Yes □No* □N/A	
5.2.4 Solenoid valves	Cycle power to valve to check operation. (Electrical solenoids can be verified by listening to the plunger opening and closing. If no audible confirmation, the valve should be inspected for the presence and operation of the plunger.)	□Yes □No* □N/A	
5.2.5 Fire and shear valves	a. Manually cycle the valve to ensure components are moving freely and that the valve handle or lever has clearance to allow valve to close completely.	□Yes □No* □N/A	
	b. Valves must not be wired in open position.	□Yes □No* □N/A	

Item	Task	Status	Comments
	c. Make sure fusible element is in place and correctly positioned.	□Yes □No* □N/A	
	d. Be sure test ports are sealed with plug after testing is complete and no temporary test fixture or component remains connected to valve.	□Yes □No* □N/A	
5.3 Interstitial leak detection equipment	Check condition of equipment, including: • The window is clean and clear in sight leak gauges. • The wire connections of electronic gauges for tightness and corrosion • Activate the test button, if applicable.	□Yes □No* □N/A	
5.4 Spill containment boxes on fill pipe	a. If corrosion, damage, or wear has compromised the ability of the unit to perform spill containment functions, replace the unit.	□Yes* □No □N/A	
	b. Inspect the connections to the AST for tightness, as well as the bolts, nuts, washers for condition and replace if necessary.	□Yes* □No □N/A	
	c. Drain valves must be operable and closed	□Yes* □No □N/A	
5.5 Strainer	a. Check that the strainer is clean and in good condition.	□Yes □No* □N/A	

Item	Task	Status	Comments
5.5 Strainer	b. Access strainer basket and check cap and gasket seal as well as bolts.	☐Yes ☐No* ☐N/A	
5.6 Filter	a. Check that the filter is in good condition and is within the manufacturer's expected service life. Replace, if necessary.	☐Yes ☐No* ☐N/A	
	b. Check for leaks and decreased fuel flow	☐Yes ☐No* ☐N/A	
5.7 Flame arrestors	Follow manufacturer's instructions. Check for corrosion and blockage of air passages.	☐Yes* ☐ No ☐N/A	
5.8 Leak detector for submersible pump systems	Test according to manufacturer's instructions and authority having jurisdiction (AHJ). Verify leak detectors are suited and properly installed for aboveground use.	☐Yes ☐No* ☐N/A	
5.9 Liquid level equipment	a. Has equipment been tested to ensure proper operation?	☐Yes ☐No* ☐N/A	
	b. Does equipment operate as required?	☐Yes ☐No* ☐N/A	
	c. Follow manufacturer's instructions	☐Yes ☐No* ☐N/A	
5.10 Overfill equipment	a. Follow manufacturer's instructions and regulatory requirements for inspection and functionality verification.	☐Yes ☐No* ☐N/A	
	b. Confirm device is suited for above ground use by the manufacturer	☐Yes ☐No* ☐N/A	

Item	Task	Status	Comments
6.0 Insulated Tanks			
6.1 Insulation	Check condition of insulation for: • Missing sections • Areas of moisture • Mold • Damage	□Yes* □ No □N/A	
6.2 Insulation cover or jacket	Check for damage that will allow water intrusion	□Yes* No □N/A	
7.0 Miscellaneous			
7.1 Electrical wiring and boxes	Are they in good condition?	□Yes □No* □N/A	
7.2 Labels and tags	Ensure that all labels and tags are intact and readable.	□Yes □No* □N/A	

Additional Comments:

STI SP001 Portable Container Monthly Inspection Checklist

General Inspection Information:

Inspection Date: ____________	Retain Until Date: ____________ (36 months from inspection date)
Prior Inspection Date: ____________	Inspector Name: ____________
Containers Inspected (ID #'s): ____________	

Inspection Guidance:

- For equipment not included in this Standard, follow the manufacturer recommended inspection/testing schedules and procedures.
- The periodic AST Inspection is intended for monitoring the external AST condition and its containment structure. This visual inspection does not require a Certified Inspector. It shall be performed by an owner's inspector who is familiar with the site and can identify changes and developing problems.
- (*) designates an item in a non-conformance status. This indicates that action is required to address a problem.
- Non-conforming items <u>important to tank or containment integrity</u> require evaluation by an engineer experienced in AST design, a Certified Inspector, or a tank manufacturer who will determine the corrective action. Note the non-conformance and corresponding corrective action in the comment section.
- Retain the completed checklists for 36 months.

Item	Area: ____________	Area: ____________	Area: ____________	Area: ____________
1.0 AST Containment/Storage Area				
1.1 ASTs within designated storage area?	☐Yes ☐No*	☐Yes ☐No*	☐Yes ☐No*	☐Yes ☐No*
1.2 Debris, spills, or other fire hazards in containment or storage area?	☐Yes* ☐No	☐Yes* ☐No	☐Yes* ☐No	☐Yes* ☐No
1.3 Water in outdoor secondary containment?	☐Yes* ☐No	☐Yes* ☐No	☐Yes* ☐No	☐Yes* ☐No
1.4 Drain valves operable and in a closed position?	☐Yes ☐No*	☐Yes* ☐No	☐Yes* ☐No	☐Yes* ☐No
1.5 Egress pathways clear and gates/doors operable?	☐Yes ☐No*	☐Yes* ☐No	☐Yes* ☐No	☐Yes* ☐No

Item	Area: ________	Area: ________	Area: ________	Area: ________
2.0 Leak Detection				
2.1 Visible signs of leakage around the container or storage area?	☐Yes* ☐No	☐Yes* ☐No	☐Yes* ☐No	☐Yes* ☐No
3.0 Container				
3.0 Noticeable container distortions, buckling, denting or bulging?	☐Yes* ☐No	☐Yes* ☐No	☐Yes* ☐No	☐Yes* ☐No

Comments:

STI SP001 Monthly Inspection Checklist

General Inspection Information:

Inspection Date: ______________________ Retain Until Date: _________________________ (36 months from inspection date)

Prior Inspection Date: ______________________ Inspector Name: ____

Tanks Inspected (ID #'s): ____

Inspection Guidance:

- For equipment not included in this Standard, follow the manufacturer recommended inspection/testing schedules and procedures.
- The periodic AST Inspection is intended for monitoring the external AST condition and its containment structure. This visual inspection does not require a Certified Inspector. It shall be performed by an owner's inspector who is familiar with the site and can identify changes and developing problems.
- Upon discovery of water in the primary tank, secondary containment area, interstice, or spill container, remove promptly or take other corrective action. Before discharge to the environment, inspect the liquid for regulated products or other contaminants and disposed of it properly.
- (*) designates an item in a non-conformance status. This indicates that action is required to address a problem.
- Non-conforming items <u>important to tank or containment integrity</u> require evaluation by an engineer experienced in AST design, a Certified Inspector, or a tank manufacturer who will determine the corrective action. Note the non-conformance and corresponding corrective action in the comment section.
- Retain the completed checklists for 36 months.
- **In the event of severe weather (snow, ice, wind storms) or maintenance (such as painting) that could affect the operation of critical components (normal and emergency vents, valves), an inspection of these components is required as soon as the equipment is safely accessible after the event.**

Item	Task	Status	Comments
1.0 Tank Containment			
1.1 Containment structure	Check for water, debris, cracks or fire hazard	☐Yes* ☐No ☐N/A	
1.2 Primary tank	Check for water	☐Yes* ☐No	
1.3 Containment drain valves	Operable and in a closed position	☐Yes ☐No* ☐N/A	
1.4 Pathways and entry	Clear and gates/doors operable	☐Yes ☐No* ☐N/A	
2.0 Leak Detection			
2.1 Tank	Visible signs of leakage	☐Yes* ☐No	
2.2 Secondary Containment	Visible signs of leakage from tank into secondary containment	☐Yes* ☐No	
2.3 Surrounding soil	Visible signs of leakage	☐Yes* ☐No ☐N/A	
2.4 Interstice	Visible signs of leakage	☐Yes* ☐No ☐N/A	

Item	Task	Status	Comments
3.0 Tank Equipment			
3.1 Valves	a. Check for leaks.	☐Yes* ☐No ☐N/A	
	b. Tank drain valves must be kept locked.	☐Yes* ☐No ☐N/A	
3.2 Spill containment boxes on fill pipe	a. Inspect for debris, residue, and water in the box and remove.	☐Yes* ☐No ☐N/A	
	b. Drain valves must be operable and closed.	☐Yes* ☐No ☐N/A	
3.3 Liquid level equipment	a. Both visual and mechanical devices must be inspected for physical damage.	☐Yes ☐No* ☐N/A	
	b. Check that the device is easily readable	☐Yes ☐No* ☐N/A	
3.4 Overfill equipment	a. If equipped with a "test" button, activate the audible horn or light to confirm operation. This could be battery powered. Replace the battery if needed	☐Yes ☐No* ☐N/A	
	b. If overfill valve is equipped with a mechanical test mechanism, actuate the mechanism to confirm operation.	☐Yes ☐No* ☐N/A	
3.5 Piping connections	Check for leaks, corrosion and damage	☐Yes* ☐No	
4.0 Tank Attachments and Appurtenances			
4.1 Ladder and platform structure	Secure with no sign of severe corrosion or damage?	☐Yes ☐No* ☐N/A	
5.0 Other Conditions			
5.1 Are there other conditions that should be addressed for continued safe operation or that may affect the site spill prevention plan?		☐Yes* ☐No	

Additional Comments:

APPENDIX F

Training Records

SPCC TRAINING RECORD
NEARNG AASF 2 – Grand Island, Nebraska

The following employees are responsible for implementing the SPCC Plan and have received SPCC training.

Employee Name (print)	Signature	Date

APPENDIX G

Secondary Containment Drainage Report

SECONDARY CONTAINMENT DRAINAGE REPORT

NEARNG AASF 2, GRAND ISLAND, NE

INSPECTION AREA :____________________________

Date	Inspector[1]	Water Depth (inch)	Oil Sheen Present?[2] (Yes/no)	Time Valve Opened[3]	Time Valve Closed	Water Depth (inch)

Notes:

1. Inspection, draining of water, and closing of valve must be conducted under supervision of designated person accountable for spill prevention.
2. If oil sheen is present, water cannot be discharged. Refer to Section 4.1 of the SPCC Plan, and complete the Secondary Containment Detailed Drainage Report.
3. Valve is only to be opened if water does not appear to contain an oil sheen.

SECONDARY CONTAINMENT DETAILED DRAINAGE REPORT

____
(LIST SPECIFIC AREA FOR REPORT)

Inspector____________________________ Date_______________ Time________________

Containment_______________________________________

Amount of Oil Present (indicate presence of sheen or give the thickness of the oil):____________

____

____

Was the Oil Removed From Off the Water? Yes______ No_______

Describe the oil removal process:____

____

____

____

Identify how and where the contaminated materials were disposed of:___________________

____

____

____

____

Was the Oil/Water Pumped Out? Yes_______ No_______

Describe the pump and materials used:____

____

____

____

Identify how and where the oil/water was disposed of:_________________________________

____

____

____

____

Date Action Completed__________________

Personnel Completing Action________________________________

APPENDIX H

Certification of the Applicability of the Substantial Harm Criteria Checklist

CERTIFICATION OF THE APPLICABILITY OF THE SUBSTANTIAL HARM CRITERIA CHECKLIST

NEARNG AASF 2
Grand Island, Nebraska

1. Does the facility transfer oil over water to or from vessels and does the facility have a total oil storage capacity greater than or equal to 42,000 gallons?

   Yes _____ No __X__

2. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and does the facility lack secondary containment that is sufficiently large to contain the capacity of the largest above ground storage tank plus sufficient freeboard to allow for precipitation within any above ground oil storage tank area?

   Yes _____ No __X__

3. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the formula in Attachment C-III, Appendix C, 40 CFR 112) such that a discharge from the facility could cause injury to fish and wildlife and sensitive environments?

   Yes _____ No __X__

4. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the formula in Attachment C-III, Appendix C, 40 CFR 112) such that a discharge from the facility would shut down a public drinking water intake?

   Yes _____ No __X__

5. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and has the facility experienced a reportable oil spill in an amount greater than or equal to 10,000 gallons within the last 5 years?

   Yes _____ No __X__

CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based upon my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate and complete.

__________________________ __________________________
Name Signature

__________________________ __________________________
Title Date

APPENDIX I

Completed Inspection Forms and Reports

PROFESSIONAL ENVIRONMENTAL ENGINEER
JEFFREY E.
McPEAK
E-12612
5/31/13
STATE OF NEBRASKA

PROFESSIONAL ENVIRONMENTAL ENGINEER
SHANNON
LESLIE
DEVIVO
E-14714
STATE OF NEBRASKA

Shannon Leslie DeVivo
12-4-17

HYDROGEOLOGY OF PARTS OF THE CENTRAL PLATTE AND LOWER LOUP NATURAL RESOURCES DISTRICTS, NEBRASKA

By J. M. Peckenpaugh and J. T. Dugan

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations Report 83-4219

Prepared in cooperation with the

CENTRAL PLATTE AND LOWER LOUP NATURAL RESOURCES DISTRICTS

Lincoln, Nebraska

1983

UNITED STATES DEPARTMENT OF THE INTERIOR

JAMES G. WATT, Secretary

GEOLOGICAL SURVEY

Dallas L. Peck, Director

For additional information
write to:

District Chief, WRD
U.S. Geological Survey
406 Federal Building
100 Centennial Mall, North
Lincoln, Nebraska 68508

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ILLUSTRATIONS

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PLATES

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CONVERSION OF U.S. CUSTOMARY UNITS TO
INTERNATIONAL SYSTEM OF UNITS (SI)

Multiply U.S. customary units	By	To obtain SI units
acre	0.0040	square kilometer
acre-foot (acre-ft)	1,233	cubic meter
acre-foot per year (acre-ft/yr)	1,233	cubic meter per year
cubic foot per second (ft^3/s)	0.02832	cubic meter per second
foot (ft)	0.3048	meter
foot per day (ft/d)	0.3048	meter per day
foot per year (ft/yr)	0.3048	meter per year
inch (in.)	25.4	millimeter
mile (mi)	1.609	kilometer
square mile (mi^2)	2.509	square kilometer
degree Fahrenheit (°F)	(°F -32)/1.8	degree Celsius

DEFINITION OF HYDROGEOLOGIC TERMS

Aquifer - A geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

Base flow - The component of total streamflow attributable to ground-water discharge into the stream channel.

Confined aquifer - An aquifer that is overlain by a confining bed that restricts the vertical movement of water from or to the aquifer; water levels in wells that are screened within the aquifer stand above the confining bed.

Constant head - The condition used in ground-water modeling where water levels are not allowed to change unless the stream or aquifer goes dry.

Consumptive-irrigation requirements (CIR) - The amount of water required to meet evapotranspiration demand of a plant and to maintain soil moisture at an arbitrary level after soil moisture and infiltrated precipitation have been drawn upon.

Crop coefficient - The monthly ratio of actual to potential evapotranspiration based on field experimentation.

Deep percolation - Water that leaves the soil zone and goes into the underlying part of the unsaturated zone.

Discharge from an aquifer is the transfer of water from the aquifer to the unsaturated zone or to the land surface.

Evapotranspiration (ET) - The combined process of evaporation from free water and bare soil surfaces and transpiration by plants.

Evapotranspiration salvage - The reduction in the amount of evapotranspiration from the aquifer resulting from a lowering of the water table.

Flux - The rate of water movement into or out of the aquifer.

Hydraulic conductivity (K) - A measure of the volume of fluid that will move in unit time under a unit hydraulic gradient through a unit area measured at right angles to the direction of flow.

Hydraulic head, or head - An expression for the potential energy of a fluid, frequently expressed as the water level altitude.

Infiltration (I) - The part of precipitation and applied surface water that enters the soil zone.

Isotropic - All significant properties of the aquifer are independent of direction.

Nonhomogeneous - The hydrologic properties of the aquifer vary throughout the aquifer.

DEFINITION OF HYDROGEOLOGIC TERMS

Permeability of a rock or soil is a measure of its ability to transmit a fluid, such as water, under a gradient.

Potential evapotranspiration (PET) - The amount of water that would evaporate from bare soil and transpire by plants if neither were under moisture stress.

Recharge to an aquifer is that part of deep percolation that reaches the aquifer.

Saturated zone - That part of the water-bearing material in which all voids, large and small, are ideally filled with water under pressure greater than atmospheric.

Seepage measurements - Streamflow measurements made during periods of low flows, when surface-water runoff is at a minimum.

Soil zone - The unconsolidated mineral and organic material from the land surface to the depth reached by the plants' root systems.

Specific yield of a rock or soil is the ratio of volume of water that the rock or soil, after being saturated, will yield by gravity to the volume of the rock or soil.

Surface runoff - The component of runoff that enters the stream channel by flowing over the land surface.

Sustained cultivation - Dryland or irrigated cultivation that can be maintained for an extensive period of time.

Transmissivity (T) - A product of the thickness of the saturated zone and the hydraulic conductivity of that zone.

Unconfined aquifer - An aquifer not overlain by a confining bed, referred to as a water-table aquifer.

Underflow - The lateral movement of ground water across a specified boundary.

Unsaturated zone - The zone between the land surface and the water table, including the capillary fringe.

Water table - The surface in a groundwater body (unconfined aquifer) at which the water pressure is atmospheric.

HYDROGEOLOGY OF PARTS OF THE CENTRAL PLATTE AND LOWER LOUP NATURAL RESOURCES DISTRICTS, NEBRASKA

By J. M. Peckenpaugh and J. T. Dugan

ABSTRACT

Water-level declines of at least 15 feet have occurred in this heavily irrigated area of central Nebraska since the early 1930's, and potential for additional declines is high. To test the effects of additional irrigation development on water levels and streamflow in the area, computer programs were developed that represent the surface-water system, soil zone, and saturated zone of the hydrogeologic system. A two-dimensional, finite-difference ground-water flow model of the 3,374 square-mile study area was developed and calibrated using steady-state and transient conditions, and three management alternatives were examined. Results indicate that significant additional water-level declines will occur even if there is no additional ground-water development.

The first management alternative examined is diversion of an additional 125,000 acre-feet of water per year from the Platte River. This alternative would have a substantial effect on flows in the Platte River. During a water year in which flows are similar to those in 1957, months of zero streamflow at Grand Island and near Duncan would increase from the historical 2 and 3, respectively, to 7. Projected declines in ground-water levels based on this alternative and the 1976 level of ground-water development are small. After 5 years of such low flows, in 36 model nodes (997.4 acres per node) water levels would decline more than 5 feet, and the maximum decline would be 10.7 feet.

The second alternative examined is to allow no new ground-water development after 1980, but to apply irrigation water at five different rates ranging from a low of 80 percent of consumptive-irrigation requirements (CIR) to a high of 16.0 inches per year (about 125 to 150 percent of CIR) for the western part of the study area. With a medium application rate of 100 percent CIR, water-level declines of more than 20 feet are projected for 20 percent of the study area by the year 2000; maximum projected declines are between 60 and 79 feet. For the same application rate, maximum projected declines by the year 2020 are between 100 and 119 feet.

The third alternative is to allow potentially irrigable but unirrigated land to be developed at an annual rate of 2, 5, and 8 percent and to apply irrigation water at 80, 100, and 120 percent of CIR. Compared to water levels of August 31, 1976, maximum projected declines by the year 2000 for each of the development rates and for 100 percent of CIR are between 60 and 79 feet.

Thirty variations of the last two alternatives were evaluated, and maps showing results of 17 are included in this report. Also included are 10 maps delineating and describing the hydrogeologic characteristics of the aquifer.

Modeling results indicate that water levels will decline. The declines in shallow-water areas will increase the amount of evapotranspiration salvage, will cause more surface water to move into the aquifer, and will cause less ground water to move into the streams.

INTRODUCTION

During the past several decades, the availability of ground water for irrigation has enabled the farmers and ranchers in much of Nebraska to greatly increase productivity. This has been particularly true in this study area (fig. 1). Irrigation itself is not new to the area; both the Platte and the Loup Rivers, between which the study area lies in central Nebraska, have been used as sources of surface water for irrigation since the 1890's. However, limitations on the availability of surface water, the widespread availability of ground water and other factors spurred the use of and dependence on ground water for irrigation, so that now part of this area has the highest irrigation-well density of any comparable area of the State.

Ground-water supplies, while rechargeable in most instances, are not infinite, and in several areas of the State intensive withdrawals of ground water severely strain the capacity of the ground-water system so that water levels are declining. Although no severe problems of water-level decline have as yet been identified, progressive water-level declines are occurring in parts of the study area. Declines of at least 15 feet have been measured in parts of Dawson and Buffalo Counties.

The potential for additional water-level declines is high for several reasons. First, current ground-water pumpage for irrigation, which caused the present declines, will continue. Second, within the area, additional development that will accelerate current declines is likely. Finally, additional ground-water irrigation west of the study

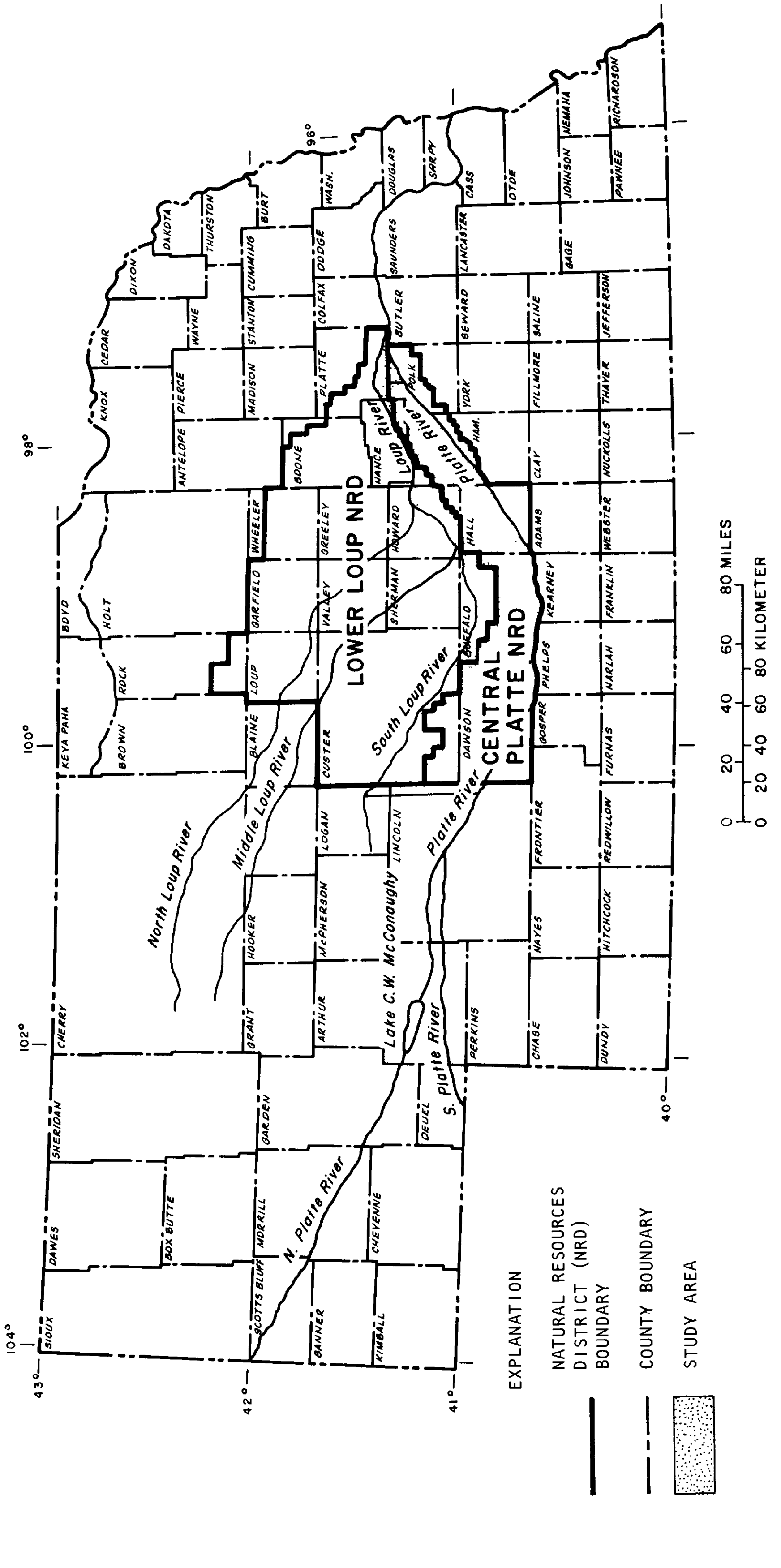

Figure 1.--Locations of the study area.

area and additional surface-water diversions from the Platte River may result in additional water-level declines, but only if these developments reduce the annual flows of the Platte River within the study area below a critical level. Fred Otradovsky of the U.S. Bureau of Reclamation, Grand Island, Nebr. (personal communication, 1983), believes a reduction of 50 percent in streamflow would cause less than a 1-foot drop in river stage. Such a drop in stage would produce additional but only small declines in ground-water levels.

The continuation of additional water-level declines is predictable; however, the location and magnitude of future declines are less predictable. Realizing this, the Central Platte and the Lower Loup Natural Resources Districts, in 1977, entered into an agreement with the U.S. Geological Survey to do a quantitative hydrogeologic study of the area. The results of this study are to serve as a basis for testing the effects of various management alternatives for additional irrigation development on water levels and streamflow in the study area and are the subject of this report.

Purpose and Scope

There are two principal purposes for this study. The first is to describe the hydrogeologic system of the study area. The second is to develop and demonstrate a capability for evaluating, quantitatively, the effects of different management alternatives on water levels and on streamflow in the study area.

In this study, the different components of the hydrologic system -- surface-water system, soil zone, unsaturated zone, and saturated zone -- were analyzed using mathematical programs whenever possible. These programs are linked to form a single model of the system so that the responses of the entire system to variations imposed on it can be simulated mathematically. The surface-water system is included in the model only to the extent necessary to determine the effects of surface water on recharge to the ground-water reservoir, or the converse.

Few new field data were obtained for this study. Hydrologic and geologic data obtained by previous investigators were reviewed and reinterpreted using numerical techniques. Also, large amounts of data on land use, climate, and water use were obtained from others. Such data are essential input in evaluating the effects of different management alternatives on the water resources of the study area.

Management alternatives for evaluation were selected in consultation with the Central Platte and the Lower Loup Natural Resources Districts. A total of 30 variations of alternatives were examined. Of these, results of the 17 most representative variations are shown in maps and tables of this report.

Previous Studies

Several previous investigations were made to determine the geology and hydrology of this area. Three cover nearly all of the present study area that lies within the Platte Valley -- the flood plains and terraces between the Platte and Loup Rivers -- and provide historic records, such as those of water levels, critical to this study. Reports on studies of smaller areas provide insight into special problems of local interest. Most of the previous studies were limited to terraces and flood plains of the Platte and Loup Rivers.

Lugn and Wenzel (1938), in an early study of south-central Nebraska, describe in detail the geology and hydrology of nearly all of the Platte Valley included in this study area. They discuss the origin, character, and thickness of the Pleistocene water-bearing materials in the Platte Valley, present logs of about 75 test holes, provide maps showing depth to water from the land surface and elevation of the water table during the summers of 1931 and 1932. They also discuss development of both surface- and ground-water irrigation up to 1932.

Wenzel (1940) investigated declining water levels beneath the city of Grand Island. He concluded that the cause was excessive pumping from wells too closely spaced and recommended that wells be installed outside the city so that pumping stress could be distributed over a larger area.

Several studies were made in the 1940's and 1950's as part of the program of the Department of the Interior for development of the Missouri River Basin. Waite and others (1949) supplemented existing hydrogeologic information on the Platte Valley from North Platte to Fremont, Nebr. Maps were presented that show net changes in water levels from 1930 to 1939 and from 1939 to 1946 and that show the elevation and configuration of the water table in March 1947.

Several areas investigated under the Missouri River Basin Program were being considered for project development by the U.S. Bureau of Reclamation. These areas cover a major part of the present study area. Keech (1952) describes the ground-water resources of the Wood River Unit from near Kearney to near Wood River, Nebr., a 233 square-mile area proposed for a balanced surface- and ground-water irrigation system.

Sniegocki (1955) describes the ground-water resources of the Prairie Creek Unit, a 650 square-mile area between the Loup and Platte Rivers extending from near Grand Island to Columbus. Schreurs (1956) describes the geology and ground-water resources of Buffalo County and parts of adjacent Dawson and Hall Counties, where consideration also was being given to development of a balanced surface- and ground-water irrigation system. Keech and Dreeszen (1964), in a report on the availability of ground water in Hall County, include a map showing the elevation and configuration of the water table in 1961. Their study, however, was not a part of the Missouri River Basin Program.

Several hydrogeologic studies have been conducted in the Loup River basin, but only one included any of the present study area. In that one, Hyland and Keech (1964) describe the ground-water resources of the Cedar Rapids Division in southeastern Howard and northwestern Merrick Counties.

More recently, hydrogeologic studies have been conducted for parts of the study area using ground-water flow models. Marlette and Lewis (1973) and Marlette and others (1974) discuss the development and results of a study using such a model for the Platte River valley of Dawson County. Also, Lappala and others (1979) used such a model in a study of the entire Platte River basin, which included all of the study area.

Bentall (1975a) describes the physiography, geology, soil, and agriculture of a large part of the study area. Bentall (1975b) also describes the hydrology of the study area and upstream reaches of the Platte River. In his reports, Bentall reviews previous studies and discusses the above items as they relate to a proposed surface-water diversion project in this area.

General Methodology

The general methodology for this study was first to subdivide the hydrogeologic system into four components -- surface-water system, soil zone, unsaturated zone, and saturated or ground-water zone. Computer programs were developed or obtained to represent each of the components except the unsaturated zone, for which this was not possible.

A ground-water flow model was developed to represent the hydrogeologic conditions in the area over time. Hydrogeologic data, necessary for the model, were obtained mainly from previous investigations. However, data on recharge and consumptive-irrigation requirements (CIR) were obtained either from existing files or were generated, in part, through use of computer programs. The model was then calibrated using the above data, and several management alternatives were simulated with the calibrated model.

The hydrogeologic data are those needed to describe the characteristics of the ground-water system. They include but are not limited to hydraulic conductivity, specific yield, base of the aquifer, and elevation of the water table. Recharge and CIR data, hereafter called "recharge-CIR data", are those necessary to generate data on deep percolation and discharge required for the ground-water flow model. Recharge-CIR data provide information on soils, climate, water requirements of plants, land use, irrigation-well distributions, acres irrigated per well, surface-water irrigation and seepage, and stream flow.

Acknowledgments

The authors appreciate the cooperation given by the Central Platte and Lower Loup Natural Resources Districts during this study. Also appreciated is the assistance of representatives of the U.S. Bureau of Reclamation and of the Nebraska Natural Resources Commission in obtaining data and programs. Special thanks are extended to Eric G. Lappala, the first project leader of this study, who worked with the cooperators in developing the study, developed numerous procedures, programs, and data used in the study, and provided technical guidance on many occasions.

PHYSICAL SETTING

The physiography, geology, climate, soils, natural vegetation, and land use of the study area are extremely important in influencing the surface-water and ground-water developments of the area. These features have also been instrumental in determining urban and rural development and the general economic systems of this area, which are strongly dependent upon agriculture, especially irrigated agriculture.

Location and Extent

The study area is shown in figure 1. It comprises all of the Central Platte Natural Resources District (NRD) north of the Platte River and all of the Lower Loup NRD south of the South Loup, Middle Loup, and Loup Rivers. The study area was extended 3 miles west of the western borders of Dawson and Custer Counties so that modeling errors near these borders could be minimized. The study area includes 3,374 square miles. Its maximum east-west distance is 155.7 miles and its maximum north-south distance is 59.3 miles.

Physiography

The study area lies within the High Plains section of the Great Plains Province. From central Hall County eastward, the study area does not fit the standard geologic description of the High Plains because the Tertiary materials are absent. A substantial Quaternary mantle is present in this area, and there is no surficial difference between areas where the Tertiary materials are present or absent.

Significant contrasts exist between the topography in the valleys and uplands of the study area. Three major topographic types are present: (1) uplands, (2) terraces, and (3) flood plains. Figure 2 delineates the location of these types. This figure was developed from soil maps of the area (Hayes and others, 1924, 1925, 1926, 1928; Veatch and Seabury, 1918; Paine and others, 1929).

The uplands are predominantly loess-mantled, highly dissected, and generally not suitable for sustained cultivation. However, relatively large tablelands are found in Custer County and small, flat interfluves occur in Dawson and Buffalo Counties. Both of these land forms support irrigated agriculture. Significant areas of the uplands and high terraces in southwestern Custer County, southeastern Howard County, and northern Merrick County are mantled with dune sand stabilized by grass. Most of this sandy material exists as a relatively thin veneer over loess (wind-blown silt) or as silty deposits that have drifted in from the Sand Hills or other nearby sources of sand.

The terraces and flood plains are the result of entrenchment of the Platte and Loup Rivers and their tributaries at elevations from 50 to 150 feet below the uplands and tablelands. The Platte River was superimposed on the existing Tertiary landscape, and Quaternary materials were deposited during periods of aggradation, while some of these materials and other units were eroded during periods of degradation. The terraces are primarily covered by a loess mantle with a sandy or gravelly substratum. The loess in some areas is reworked with sandy alluvium; whereas, in other areas it is eroded so that the terraces are covered by a silty and clayey alluvium.

The flood plains along the Platte River gradually blend into the terraces. Those along the north side of the river are more extensive than those on the south side. The flood plains in all but the downstream reaches of the Wood and South Loup Rivers are so narrow that they are not mappable at the scale used in figure 2. The flood plain of both streams widens toward the east, that of the Wood River as it merges with the flood plain of the Platte River and that of the South Loup River as it nears its confluence with the Middle Loup River. The flood plains

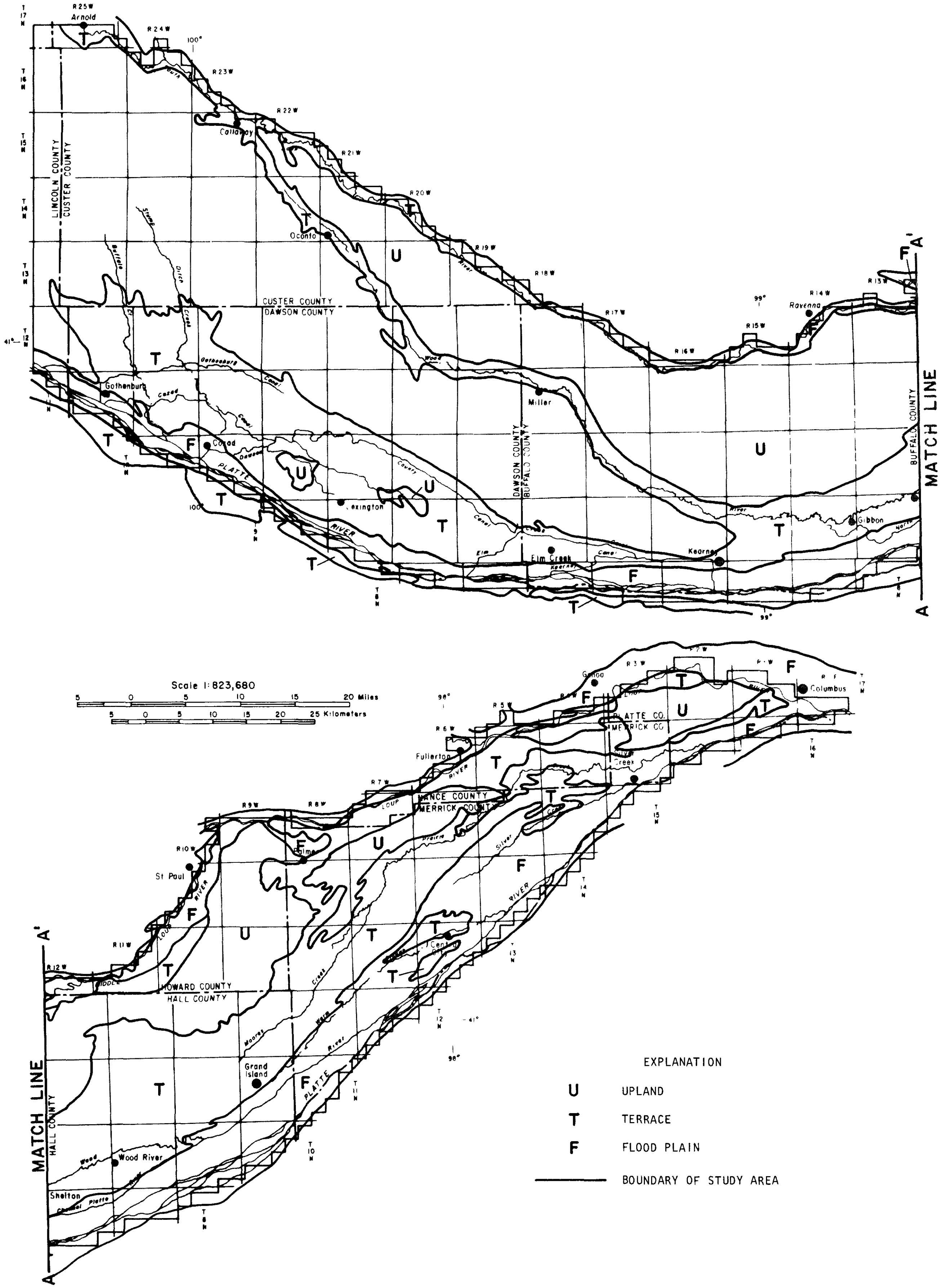

Figure 2.--Distribution of topographic types.

are usually covered by sandy, silty, and clayey materials that reflect the energy, or carrying capacity, of the moving water and their depositional history. However, some of the terraces and flood plains, near Shelton and west of Grand Island, are mantled with dune sands.

The width of the Platte Valley varies throughout the study area. It is about 12 miles wide east of Gothenburg, but narrows to about 6 miles near Elm Creek and to 3 miles west of Kearney. From there to western Merrick County it widens to a maximum of 17 miles. The terraces and flood plains of the Middle Loup and Loup Rivers, beginning in western Hall County, increase significantly in width from upstream reaches in which the valley is 1 to 4 miles wide. From Merrick County eastward to the confluence of the Loup and Platte Rivers, the Loup and Platte River valleys merge but are separated in two areas by uplands where dune sands have been deposited forming sandhills.

Land-surface elevation of the study area varies from 3,088 feet in the west to 1,405 feet in the east. From west to east, the Platte Valley declines from 2,400 feet to about 1,550 feet, which is an average slope of 7 feet per mile. West of Kearney the topography is rougher and has a steeper riverward slope than east of Kearney. From Merrick County eastward, the topography is nearly level, having slopes only slightly greater than those of the Platte River, except in northern Merrick County where rough sand dunes occur. Throughout most of the valley, the terraces merge gradually into the flood plains.

Geology

Quaternary deposits comprise the land surface in the study area and form the most significant portion of the saturated zone from the middle of Hall County eastward. These deposits are sands, gravels, silts, and clays of fluvial origin and silts and clays of eolian origin. The thickness of these deposits varies from about 20 feet in the Platte Valley of southwestern Buffalo County to about 350 feet in the upland of eastern Dawson County.

In the study area, several episodes of fluvial and eolian deposition were followed by periods of erosion and soil formation during Quaternary time. These events were related to the advancing and retreating (melting) of continental ice sheets in eastern Nebraska. These ice sheets blocked the valleys of eastward-flowing streams and diverted their flow southward and southeastward along the ice margins.

The diversion of these streams lowered their gradients and reduced their sediment-carrying capability. The streams aggraded their valleys and eventually constructed alluvial plains in front of the ice sheets. After melting of the ice sheets, the sediment load of these streams decreased. The level to which the streams could erode valleys into the alluvial plain lowered, and subsequent erosion produced a new landscape of valleys and uplands.

Within each depositional sequence, the lower part is generally coarse-textured sediments, sands and gravels, while the upper part is finer-textured sediments, silts and clays, which, in some cases, were largely removed during the erosional intervals. Thus, in many places the sand and gravel deposits of one sequence occur vertically adjacent to those of another sequence, or are separated only by thin layers of clay or silt.

The Quaternary deposits in the upland areas contain thicker intervals of silts and clays than in the flood plains and terraces, because the silts and clays in uplands were less subject to removal during erosional intervals. As a result, thick units of silts and clays, primarily loess, still remain beneath the uplands. However, only a few feet of loess remain beneath the flood plains and terraces because most of it has been removed by erosion or has been reworked into alluvium. The loess and loess-like alluvial deposits are the most extensive surface deposits in the study area.

Upper Quaternary dune sand covers parts of southwestern Custer County and extensive areas between the Platte and Loup River valleys in Hall, Merrick, Howard, Nance, and Platte Counties. These dune sands usually rest on loess. In several small areas, dune sand has been reworked from existing sand deposits to form areas of rough topography.

Alluvium, consisting primarily of reworked loess, mantles most terraces in the Platte Valley. Its deposition probably alternated with the deposition of silt and fine sand blown from the loess-mantled uplands. The thickness of the alluvium ranges from 50 feet, adjacent to the uplands, to zero feet at the margins of the terraces and flood plains. Alluvium extends up the Wood River valley and other stream valleys that drain the uplands.

The Tertiary Ogallala Formation lies immediately below the Quaternary deposits in the study area from the middle of Hall County westward. The Ogallala Formation, fluvial in origin, consists of semiconsolidated calcareous silt, sand, and sandstone with some interbedded marly zones, and with a basal gravel at some locations. The thickness of the Ogallala Formation ranges from zero feet at its eastern extent in Hall County to over 540 feet in Dawson and Custer Counties and is related to the topography of the underlying Cretaceous bedrock.

Cretaceous bedrock units, which are thick beds of shale with some thinner beds of shaley chalk and chalk are not considered hydrologically important to this study. These units directly underlie the Ogallala Formation and the Quaternary deposits where the Ogallala Formation is not present. The bedrock surface, which was produced by erosion, consists of valleys and intervalley ridges that are unrelated to the present land surface. The total relief of this buried surface is about twice the present land surface.

Climate

The climate of the study area, which has irregular precipitation, low to moderate humidity, hot summers, and severe winters, is typical of regions within large continents in the mid latitudes. The average temperature of the warmest month, July, ranges from 75° to 78° F across the study area, whereas, that of the coldest month, January, ranges from 22° to 26° F. Extreme temperatures range from -40° F to 117° F. The winters are slightly milder in the western part of the study area, and the summers are warmer and more humid in the eastern part. The growing season (period between killing frosts) averages from 150 days in the west to 160 days in the east.

Variability characterizes precipitation in the study area. Mean annual precipitation from 1931 to 1976 ranged from about 19.3 inches in the western part to about 24.8 inches in the extreme east. Annual precipitation frequently varies from the mean by 50 percent. Drought periods can last for several years. Noteworthy droughts since the last century occurred in the mid-1890's, 1930's, mid-1950's, and mid-1970's. The dry periods were accompanied by warmer-than-average temperatures, and increases in desiccating winds increased evapotranspiration losses and intensified drought conditions. Frequent short-term deficiencies of precipitation during the growing season often have serious effects on crop production. Although from 70 to 80 percent of the annual precipitation normally occurs during the growing season of April through September, it often is irregularly distributed. Precipitation generally is uniformly distributed over the study area from September through April because of its cyclonic or frontal origin. From May through August; however, most precipitation is the result of convective activity (thunderstorms); thus, it is distributed nonuniformly.

Potential evapotranspiration (PET) in the study area exceeds average annual precipitation. Although precipitation ordinarily exceeds PET from October through May, PET exceeds precipitation from June through September. Low humidity, periods of persistent winds, and a high incidence of sunshine contribute to high PET rates.

Soils

The soils of the study area are indicative of the climatic, geologic, and biotic factors that influence their development. The major soil characteristics resulted from the development of the soils on loess, or loess-like fluvial silts, in a semiarid to subhumid climate with a grassland regime. Development under such conditions produced dark, granular, relatively thin topsoils. Several of the soils possess an argillic horizon, which is an accumulation of clays in the upper subsoil resulting from downward movement of fine-grained materials (clays) during soil development.

The soils and topography of an area are strongly related. This is apparent from a comparison of the soils and topographic-types maps (fig. 3 and 2, respectively). On figure 3, the soils in the study area have been grouped according to hydrologic properties. The following discussion illustrates the relationships between soil groups and topography.

Dissected uplands are composed of soils possessing minimal development that are formed on loess. These soils comprise the Coly-Colby-Uly-Ulysses group (map symbol "F" on fig. 3).

Level uplands and high terraces exhibit much deeper soil development. They are formed on loess and reworked loess, with the major group being Holdrege-Hord-Hall-Kenesaw (map sumbol "E"). The substrata of some terrace soils may be sandy alluvium. These soils have moderate to low permeabilities and are well suited for irrigation.

Extensive areas of the uplands and terraces are mantled with highly permeable soils as a result of their formation in sandy alluvium or eolian sands. The Ortello-Blendon group (map symbol "D") and the Valentine-Thurman group (map symbol "G") are these types of soils.

Parts of the lower terraces that formed in loess and silty alluvium have a well-defined claypan and are slowly permeable and, in places, poorly drained. These soils form the Wood River - Silver Creek group (map symbol "H"). The Inavale-Loup-Alda-Platte group (map symbol "A") and the O'Neill-Sarpy group (map symbol "I") also occupy the lower terraces, but have been derived from sandy materials and are highly permeable and well drained.

Flood-plain soils include a variety of textural types ranging from silty or clayey to sandy, with the more sandy soils predominating. The Gibbon-Lamo group (map symbol "C") occupies clayey bottomlands; whereas, the Wann-Cass-Leshara group (map symbol "B") occupies sandy bottomlands. All of these soils are poorly drained as a result of seasonal high-water tables.

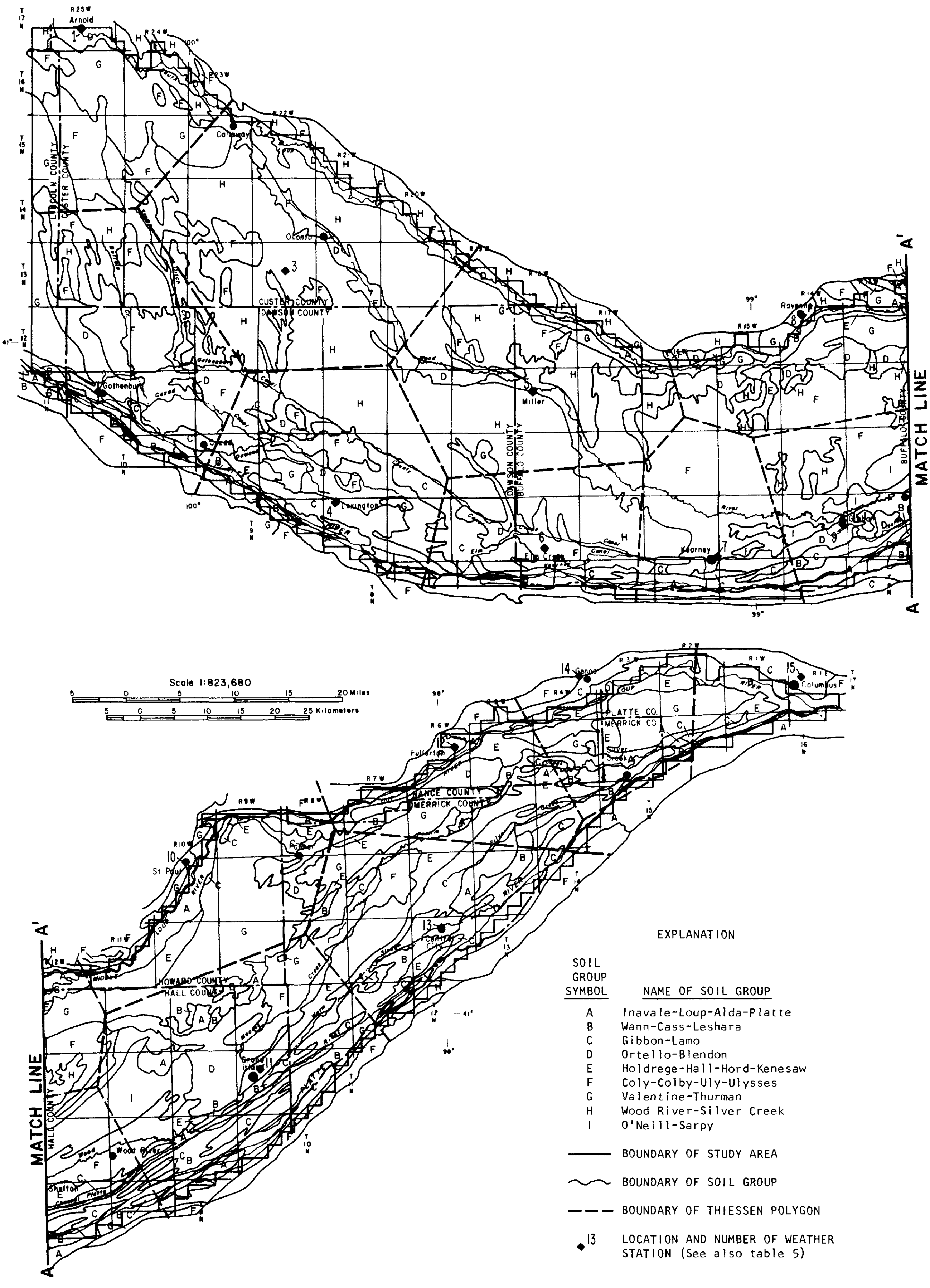

Figure 3.--Distribution of soil groups and Thiessen polygons used to distribute point climatic data.

The agricultural potential of most soils in the study area is high. Only the soils of the dissected uplands, which are thin and sloping, and of certain bottomlands, which are poorly drained because of frequent high-water table conditions or presence of a clay layer, have low agricultural potential.

Natural Vegetation

The natural vegetation of the study area has largely been replaced by cultivated crops. Only in the dissected uplands and along the streams, where conditions are not conducive to cultivation, do large tracts of natural vegetation remain.

The natural vegetation consists primarily of grasslands known as the mixed prairie. Weaver and Albertson (1956) divide the natural vegetation of the study area into three principal plant communities. Short grasses capable of thriving with low soil moisture predominate on the hilltops of the uplands. Tall and midgrasses of the true prairie occupy the bottoms, low terraces, and lower slopes of the hills where more moisture is available. Mixed short and taller grasses occupy the side slopes between hilltops and bottoms.

The mixed prairie gradually gives way to the true prairie to the east of Grand Island. Here the taller grasses become dominant as mean annual precipitation increases.

Most of the grasses, particularly the short varieties, have extensive root systems in relation to top growth. Roots often extend 4 to 7 feet downward with significant lateral expansion. Many of these grasses produce dense, tough sod that stabilizes the soil and limits runoff. Consumptive water requirements of the native grasses are nearly the same as those of legumes.

Along permanent streams, woodlands are present that contain both natural and introduced species. Many of these species, such as willows, are phreatophytes that have high consumptive water requirements.

Land Use

Agriculture is the predominant land use for at least 90 percent of the study area. Forty percent of the agricultural lands are unsuitable for cultivation and are left as rangeland. Most of the remaining agricultural lands are irrigated or are potentially irrigable. More than 600,000 acres in the study area are irrigated with ground water from more than 12,000 wells (Nebraska Department of Agriculture, annual report for 1976). About 44,000 acres in Dawson and Buffalo Counties are irrigated with surface water.

Land use within the study area, for selected years from 1931 through 1976, is listed in table 1. Information for this table was developed from county data on harvested crop acreages published by the Nebraska Department of Agriculture (annual reports, 1931-1976). Even though the information is for entire counties, it represents, adequately, land use in the study area.

Alfalfa acreage has not changed significantly during the period of study. Approximately 20 percent of the alfalfa in Dawson and Buffalo Counties receives supplemental irrigation water, and large acreages of alfalfa are subirrigated in the high-water table areas of the Platte River valley.

The acreage of small grains has declined significantly since the 1930's from about 20 percent to about 5 percent of the land area. Virtually no small grain is irrigated.

Acreages of irrigated row crops increased over time at the expense of dryland row crops and small grains. In Hall and Merrick Counties, irrigated row crops occupy about 50 percent of the land area. Total acreages of dryland and irrigated row crops increased since the 1930's for Platte, Hall, and Merrick Counties, but decreased, or remained about the same, for the other counties.

The principal row crop of both irrigated and dryland is corn; other row crops, in order of decreasing acreages are soybeans, grain sorghum, sugar beets, and potatoes. Most of these row crops, with grain sorghum being the principal exception, are irrigated.

Pasture and range acreages increased over time for most of the study area. Only in Merrick County have acreages of pasture and range decreased. During this period of 1931 to 1976, fluctuations in the acreages of pasture and range were numerous.

Table 1.--Land-use percentages for selected years

Year	Alfalfa Irri-gated	Alfalfa Non-irri-gated	Small grain	Row crops Irri-gated	Row crops Non-irri-gated	Pasture and range	Year	Alfalfa Irri-gated	Alfalfa Non-irri-gated	Small grain	Row crops Irri-gated	Row crops Non-irri-gated	Pasture and range
			Buffalo County							Custer County			
1931	0	7	17	1	35	40	1931	0	3	9	0	22	66
1935	0	8	18	1	30	43	1935	0	3	10	0	19	68
1940	0	2	10	1	21	66	1940	0	< .5	4	0	18	78
1945	0	3	17	1	34	45	1945	0	1	10	0	18	71
1950	< .5	6	18	8	21	47	1950	< .5	4	10	1	14	71
1955	1	9	10	10	18	52	1955	< .5	7	5	1	7	80
1960	1	7	10	17	15	50	1960	< .5	6	5	3	9	77
1965	1	7	5	13	9	65	1965	< .5	5	3	2	6	84
1970	2	6	5	20	7	60	1970	< .5	4	3	4	5	83
1976	2	5	5	29	6	53	1976	1	4	2	7	3	83
			Dawson County							Hall County			
1931	0	8	11	< .5	33	48	1931	0	8	26	< .5	35	31
1935	0	10	14	< .5	27	49	1935	0	10	27	< .5	28	35
1940	0	7	6	1	22	64	1940	0	3	18	1	21	57
1945	0	10	11	1	28	50	1945	0	4	23	< .5	35	38
1950	1	12	10	14	12	51	1950	< .5	5	23	17	16	39
1955	3	13	5	18	6	55	1955	< .5	8	16	22	16	38
1960	4	10	4	23	4	55	1960	2	4	10	36	2	46
1965	2	15	3	18	2	60	1965	1	6	6	32	6	49
1970	2	14	2	19	2	61	1970	1	4	4	36	5	50
1976	4	13	2	26	2	53	1976	1	4	3	50	5	37

Table 1.--Land-use percentages for selected years--Continued

Year	Alfalfa		Small grain	Row crops		Pasture and range	Year	Alfalfa		Small grain	Row crops		Pasture and range
	Irri-gated	Non-irri-gated		Irri-gated	Non-irri-gated			Irri-gated	Non-irri-gated		Irri-gated	Non-irri-gated	
			Howard County							Merrick County			
1931	0	7	20	0	28	45	1931	0	5	21	0	33	41
1935	0	7	18	0	25	50	1935	0	5	22	0	30	43
1940	0	1	13	< .5	22	64	1940	0	2	18	< .5	27	53
1945	0	4	21	0	25	50	1945	0	3	26	< .5	33	38
1950	< .5	7	19	1	22	51	1950	< .5	5	23	12	21	39
1955	< .5	10	14	1	19	56	1955	< .5	8	17	16	17	42
1960	< .5	6	11	5	19	59	1960	< .5	6	10	28	15	41
1965	< .5	7	6	10	12	65	1965	1	5	6	27	8	53
1970	< .5	6	4	16	7	67	1970	1	5	5	30	6	53
1976	1	5	3	16	9	66	1976	1	3	3	45	6	42
			Nance County							Platte County			
1931	0	7	19	0	37	37	1931	0	5	21	0	45	29
1935	0	7	22	0	34	37	1935	0	6	26	0	40	28
1940	0	2	16	0	30	52	1940	0	2	21	0	38	39
1945	0	3	20	0	32	45	1945	0	5	25	0	46	24
1950	< .5	6	21	< .5	29	44	1950	< .5	6	28	1	36	29
1955	< .5	8	16	1	27	48	1955	< .5	9	23	2	35	31
1960	< .5	6	13	3	29	49	1960	< .5	6	17	6	43	28
1965	< .5	7	8	5	21	59	1965	< .5	7	9	7	33	44
1970	< .5	6	8	7	18	61	1970	< .5	6	8	10	35	41
1976	< .5	5	6	14	22	53	1976	< .5	5	7	20	38	30

Short-term increases and decreases in some land-use categories usually represent either abnormal climatic conditions, significant variations in crop prices, or governmental policy changes. Long-term changes in some land-use categories reflect variations in ground-water irrigation development. The flood plain and terrace lands were irrigated for crop production earlier than the uplands. Thus land-use changes occurred first in the valleys and later in the uplands. The land-use changes also reflect the economics of producing and marketing different crops.

DESCRIPTION OF THE HYDROGEOLOGIC SYSTEM

For this study, the hydrogeologic system is divided into four components: Surface-water system, soil zone, unsaturated zone, and saturated or ground-water zone. Computer programs have been developed to represent and describe three of these components; however, there are neither appropriate data nor an adequate computer program to represent the unsaturated zone satisfactorily.

Surface-Water System

The surface-water system consists of streams and canals. This system and the ground-water zone are interrelated where the aquifer is connected hydraulically with streams and where canals provide passageways either for diversions or return flows to the streams.

Streams

Most of the major streams in the study area flow nearly parallel to the Platte or Loup Rivers. In areas having shallow water tables, several streams, particularly in Hall and Merrick Counties, frequently cease to flow during the irrigation season as ground-water pumpage lowers water levels. Other streams have no base flow and carry only surface runoff from precipitation.

Live reaches of the streams in the study area, that is, reaches interconnected with the saturated zone and in which there is perennial flow, are shown on figure 4. Each square, or node, on this model grid map represents an area of 6,525 by 6,525 feet, or 997.4 acres, and is identified by a row and column number. The nodes marked with "X" represent stream nodes and have live streams touching or flowing through them. For modeling purposes, the entire node is treated as a stream. Nodes corresponding to intermittent reaches are not marked with "X". Neither are the nodes corresponding to streams that are constantly flowing but not connected with the saturated zone.

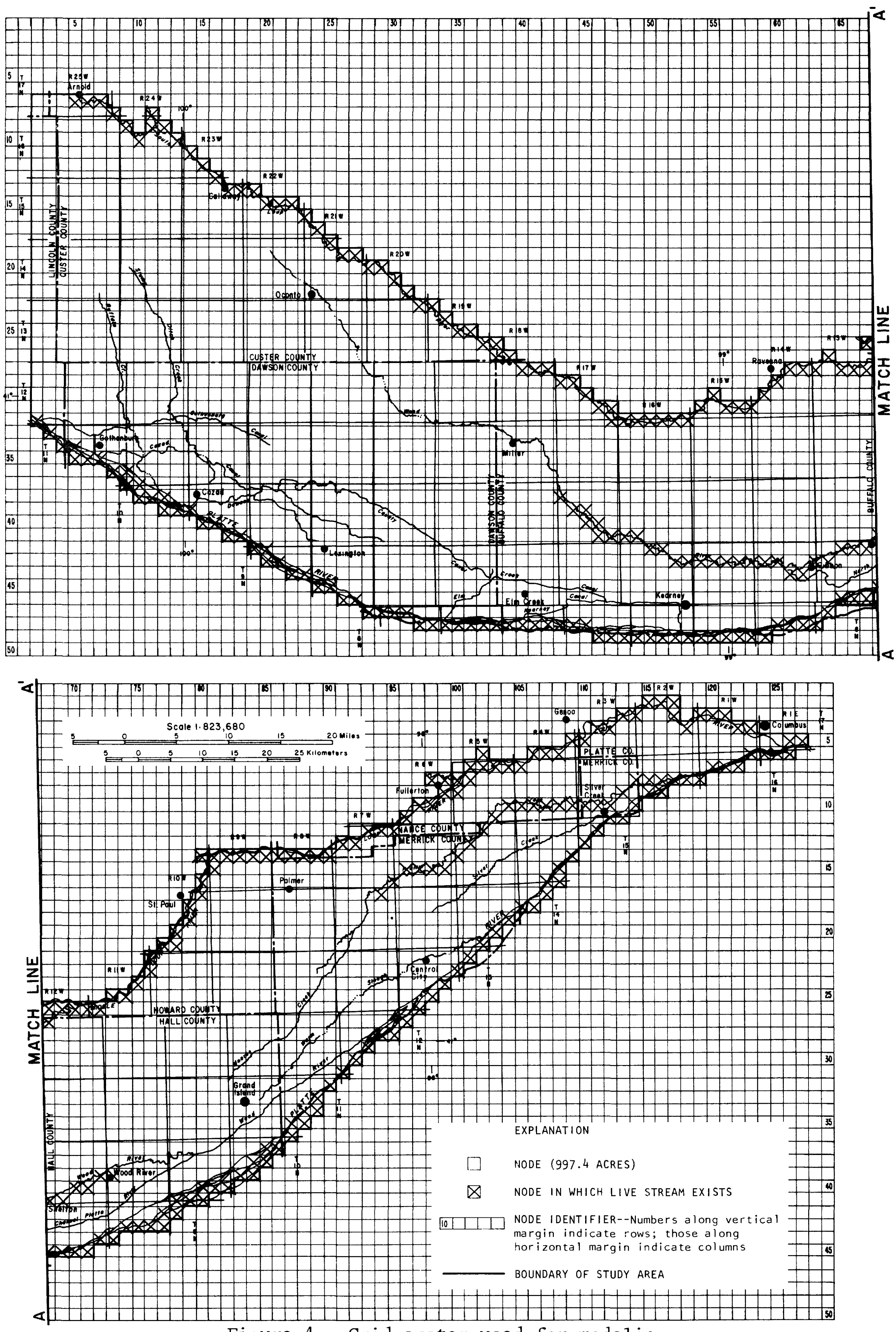

Figure 4.--Grid system used for modeling.

Stream reaches can either gain water from the ground-water system or lose water to it at different times during the year. Some reaches of the Platte River, for example, gain water from the ground-water system at certain times of year, but lose water to the ground-water system at other times. Streamflow in the Loup River system is relatively constant because it is derived almost entirely from ground-water discharge that is nearly constant throughout the year. Thus, in most of the Loup River system, the streams are gaining ones.

In the ground-water flow model for this study, average rates of streamflow were used whenever possible. However, the level of detail necessary in the model for handling the stream-aquifer relationship along the Platte River requires the use of streamflow rates for each 3-month irrigation pumping period (from June through August) and for each 9-month nonirrigation pumping period (from September through May).

Figure 5 is a schematic of the surface-water system showing the live streams, stream-gaging sites, canal diversions, and canal returns. The average annual flows at stream-gaging sites and of inflow from tributary streams are indicated. Also indicated are the average annual canal diversions and returns.

Base flows, calculated for stream-gaging sites at which flows are neither regulated by upstream reservoirs nor affected by canal diversions or return flows, are given in table 2. These flows were calculated by averaging streamflows in October, November, and December for the period of record. Streamflows caused by surface runoff from heavy precipitation were excluded in the calculations.

Seepage measurements were performed to supplement the base-flow data. Both base-flow data and seepage data indicate in what stream reaches and in what amounts water moves as seepage through the streambeds into the underlying saturated zone, or the converse. The results of seepage measurements for the Loup River system, Prairie Creek, Silver Creek, Wood River, and Warm Slough are listed in table A of "Additional Information."

Data on average streamflows, base flows, and seepage gains or losses help improve our understanding of the stream-aquifer relationships. For example, streamflows in the Wood River have declined since the 1930's, and the number and lengths of live reaches of this stream have also decreased. Analysis of flow, seepage, and ground-water pumpage data indicate that these changes are related to ground-water development near the Wood River. Decreases in streamflow also have occurred in Prairie and Silver Creeks because of ground-water development and drainage of high water-table areas. Effects of ground-water development on the Loup River system, however, appear to have been relatively minor.

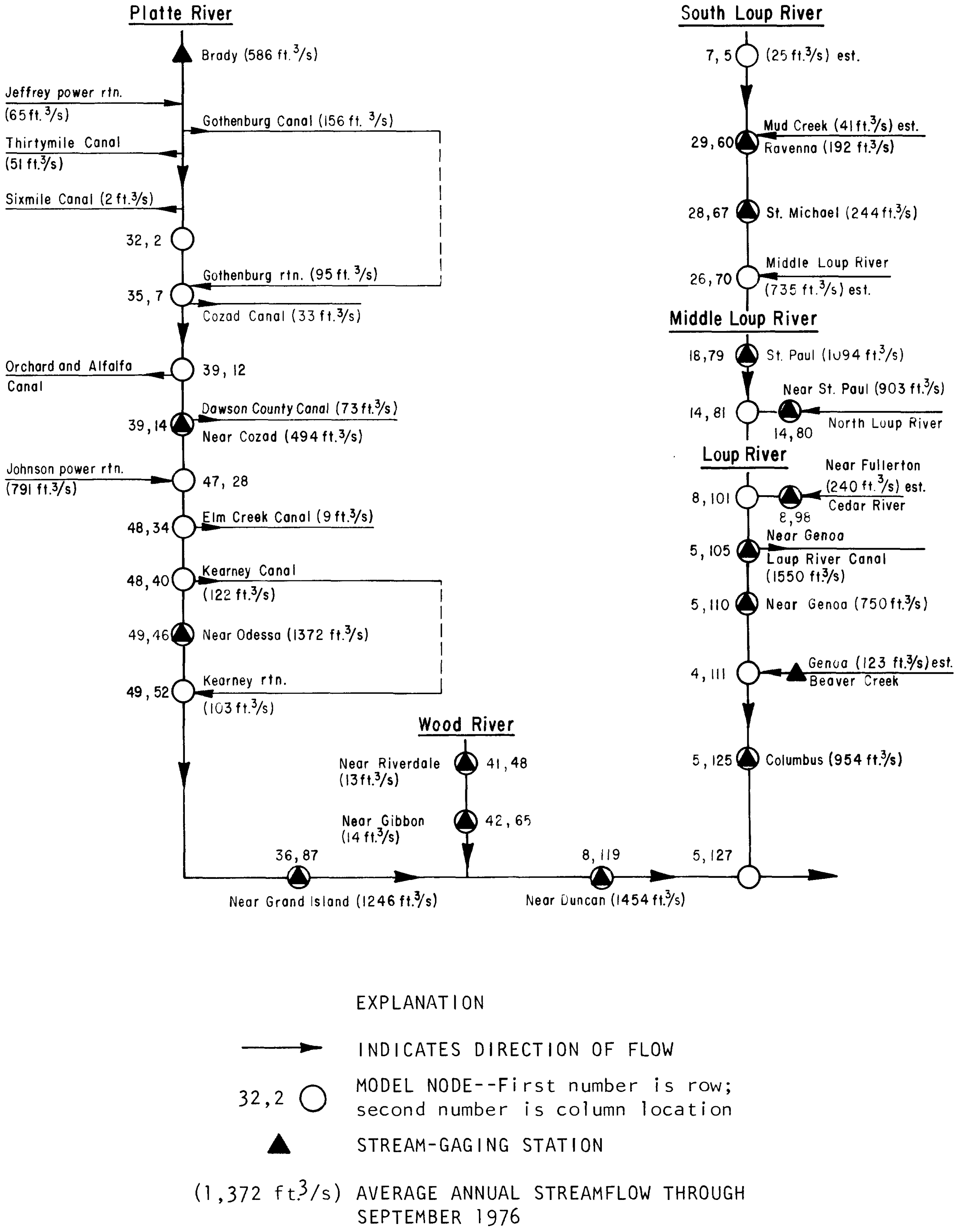

Figure 5.--Schematic diagram of the surface-water system and average annual flows at selected sites.

Table 2.--Base flows for stream-gaging sites not affected by upstream regulation

[Stream node: first number is row; second number is column]

Station name and identification number	Stream node	Period of record	Base flow in cubic feet per second
Wood River near Riverdale - 06771000	(41, 48)	1947-1973	1.2
Wood River near Gibbon - 06771500	(42, 65)	1950-1976	.8
Wood River near Alda - 06772000	[1](38, 78)	1954-1978	.0
South Loup River at Ravenna - 06782500	(29, 60)	1941-1975	146.8
Mud Creek near Sweetwater - 06783500	[2](29, 60)	1947-1978	20.0
South Loup River at St. Michael - 06784000	[2](28, 67)	1944-1978	173.3
Middle Loup River at St. Paul - 06785000	[2](18, 79)	1929-1978	987.9
North Loup River near St. Paul - 06790500	[2](14, 80)	1929-1978	860.9
Beaver Creek at Genoa - 06794000	[2](4, 110)	1941-1978	75.8

[1]Not a stream node because streamflow is zero for most of the year.
[2]Stream gage is outside study area.

Effects of ground-water development in the study area on flows in the Platte River are masked by the regulation of flow from upstream reservoirs along the Platte River and its tributaries.

Canals

In the study area, four canals currently are used for irrigation. These canals, from west to east on figure 5, are the Gothenburg, Cozad, Dawson County, and Kearney Canals. All were in full operation prior to 1931, as was the Elm Creek Canal, abandoned in 1963. The Kearney Canal is used for hydroelectric-power generation. Until 1974, this was true also of the Gothenburg Canal. Figure 5 shows the main canals, but not the laterals or field-distribution systems.

Other canals either divert or return water to the south side of the Platte River and thus are outside the study area. These include Jeffrey Power Return and Johnson Power Return of the Tri-County Canal, Thirtymile Canal, Sixmile Canal, and Orchard and Alfalfa Canal. The Loup River Canal, also outside the study area, diverts water from the north side of the Loup River. Data on averages of water diverted or returned and on acres irrigated are given in table 3. As for streamflows previously discussed, annual canal flows were divided into a 3-month irrigation pumping period and a 9-month nonirrigation pumping period for use in the ground-water model. Flow volumes of the canals were evenly divided between these two pumping periods for each year from 1931 through 1976.

Soil Zone

The soil-zone component of the hydrogeologic system consists of the soils extending from the land surface through the plants' root systems. Of the water from precipitation and applied irrigation that infiltrates the soil zone, some is stored within the soil zone, some is withdrawn from the soil zone by evapotranspiration, some percolates to drains and is carried away as surface runoff, and some percolates to the underlying unsaturated zone or directly to the saturated zone, if no unsaturated zone exists.

Hydrologic Properties of the Soils

The soils in the study area have been delineated into nine soil groups (fig. 3) based on hydrologic properties of the soils. Each soil group was differentiated by soil texture, topographic position, slope, available water capacity, and average profile permeability of the soils. A listing of the hydrologic properties for the soil groups is provided in table 4. The source materials for information on these properties are available in published form from the Soil Conservation Service.

The available water capacity and the average profile permeability are important parameters in determining the amount of water stored in the soil and the amount that percolates downward to the saturated zone. Soils with higher permeabilities allow the water to move downward more rapidly than soils with lower permeabilities. Also, soils with high permeabilities have low available water capacity, which is the capacity of the soil to hold water for use by plants. The available water capacity is essentially the inverse of permeability. Thus, soils with high permeabilities and low available water capacities have a high potential for recharging the saturated zone, but soils with low permeabilities and high available water capacities, because they hold more water in the soil profile, have a low potential for recharging the saturated zone.

Infiltration of water and surface runoff are important in determining the amount of water stored in the soil profile and the amount recharged to the saturated zone. Soils with higher permeabilities normally have higher infiltration rates and lower surface runoff rates than soils with lower permeabilities. However, the intensity of rainfall, the amount of water in the soil profile, the vegetation cover, and whether the ground is frozen also influence infiltration rates.

Water Requirements of the Vegetation

Because different types of plants have different water requirements, it is necessary to distinguish between natural and cultivated vegetation and between the types of cultivated crops. Water requirements of land-use groups in table 1 in decreasing order are: irrigated alfalfa; dryland alfalfa (alfalfa and tame hay); irrigated row crops (corn, soybeans, grain sorghum, sugar beets, and potatoes); dryland row crops; pasture and range (fallow, urban lands, farmsteads, roads, woodlands, and predominantly pasture and range); and small grains (wheat, oats, barley, and rye).

Input to and Output from the Soil Zone

Precipitation and water applied in irrigation are inputs to the soil zone; whereas, evapotranspiration, surface runoff, and deep percolation are outputs from the soil zone.

Monthly precipitation data from 15 weather stations for the period January 1931 to December 1976 were compiled for this study. Missing monthly precipitation data were estimated from two or three surrounding weather stations using simple linear regression. Locations of these 15 weather stations are shown on figure 3, and the average annual precipitation for each station is listed in table 5.

Table 5.--Average annual precipitation for weather stations

Weather station	Identification number on figure 3	Node	Average annual precipitation from 1931-1976 (inches)
Arnold------------------	1	6, 5	20.76
Gothenburg--------------	2	34, 7	20.50
Oconto 6SW--------------	3	25, 21	19.34
Lexington --------------	4	42, 25	21.68
Miller------------------	5	34, 40	21.47
Elm Creek 1SSW----------	6	46, 40	21.67
Kearney-----------------	7	46, 54	23.28
Ravenna-----------------	8	28, 60	22.74
Gibbon------------------	9	43, 63	22.34
St. Paul----------------	10	17, 79	22.81
Grand Island WSO AP-----	11	32, 85	22.42
Fullerton---------------	12	8, 99	24.34
Central City------------	13	22, 98	23.73
Genoa 2W----------------	14	3, 108	24.30
Columbus 3NE------------	15	2, 126	24.81

Polygons (fig. 3) were constructed around each weather station using the Thiessen method (Linsley and others, 1958) to areally distribute the point measurements of precipitation. The area within each polygon is assumed to receive the same monthly precipitation as the weather station.

The study area contains both lands that are irrigated with surface water and with ground water. Those irrigated with surface water, the distribution of which has not changed appreciably since 1970, are all in Dawson and Buffalo Counties; those irrigated with ground water are dispersed throughout the study area. Figure 6 shows the distribution of the lands irrigated with surface water in 1970, and figure 7 shows the distribution of all lands irrigated in 1980, whether by surface water or ground water.

The amount of irrigation water applied depends on land use, varying with type of crop grown, as previously discussed. Where lands are irrigated with surface water, approximately 50 percent of the water diverted into canals is assumed to percolate from the canals to the saturated zone; the remaining 50 percent is applied to the crops (Fred J. Otradovsky, U.S. Bureau of Reclamation, personal commun., 1979).

The largest component of discharge from the soil zone is evapotranspiration (ET). The Jensen-Haise procedures for calculating potential evapotranspiration (PET), which are described by Jensen, Wright, and Pratt (1969) and Lappala (1978), were used for this study. The PET data were used with appropriate crop coefficients, which are monthly ratios of actual ET to PET, to obtain the ET values for the different crops. Additional details on the ET procedures will be given in the section on recharge-CIR.

The other components of discharge from the soil zone -- deep percolation (recharge) and surface runoff -- are discussed further in the section on recharge-CIR.

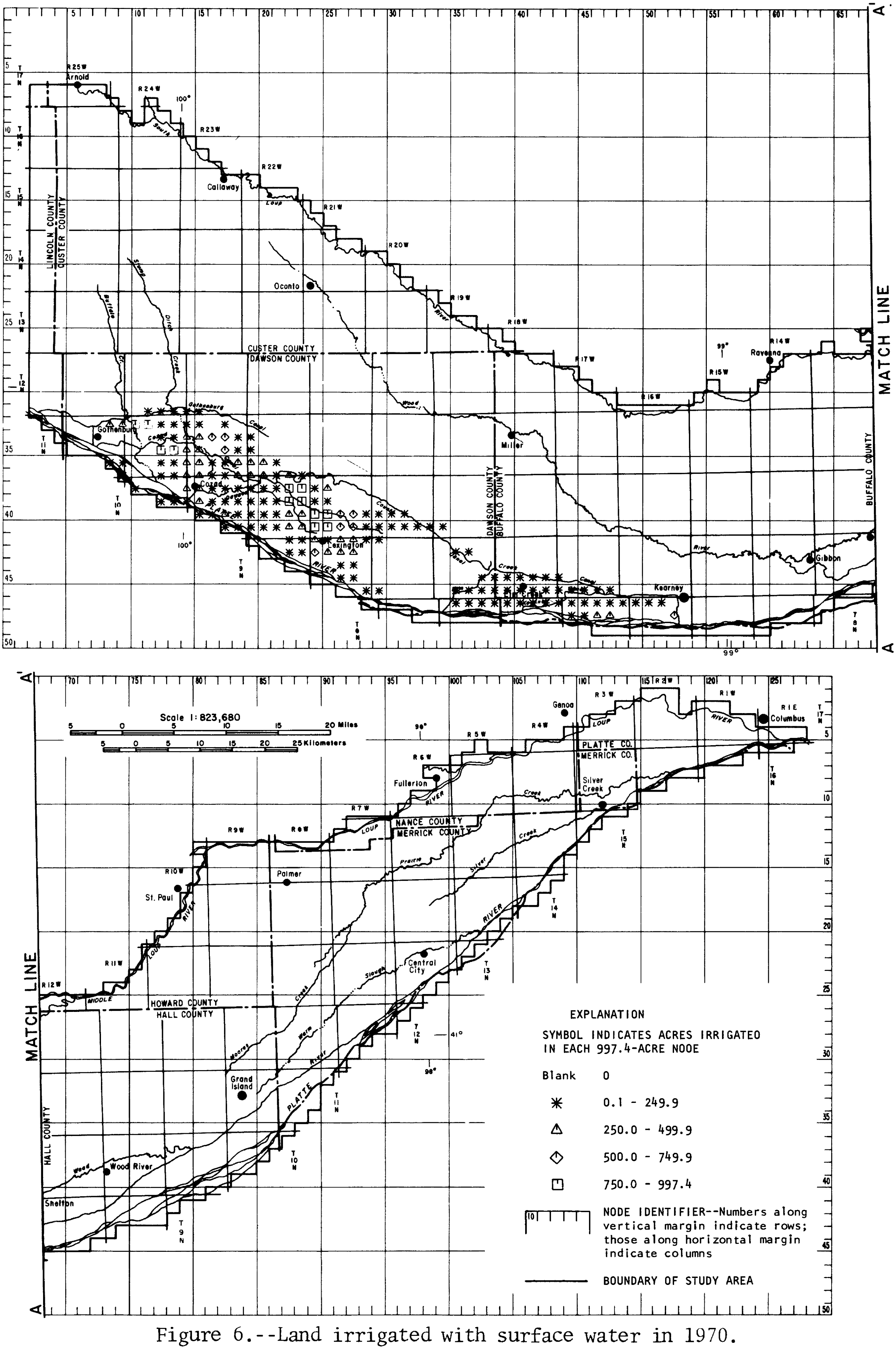

Figure 6.--Land irrigated with surface water in 1970.

Table 3.--Canal diversions, returns, and acreages

[Use of water: I, irrigation; P, power generation. Stream-node location blank if no specific return exists]

Canal	Use of water	Stream-node location		Average annual diversion		Average annual return (acre-ft)	Average acres irrigated
		Diversion	Return	Irrigation (acre-ft)	Power (acre-ft)		
Gothenburg-------------	I, P[1]	([2])	35, 7	33,370	80,000	68,580	7,940
Cozad------------------	I	35, 7	------	23,620	------	------	8,850
Dawson County----------	I	39, 14	------	52,820	------	------	20,830
Elm Creek[3]-------------	I	48, 34	------	6,850	------	------	3,000
Kearney----------------	I, P	48, 40	49, 52	13,240	74,990	74,990	3,420
Jeffrey Power Return----	P	([2])	([2])	------	------	46,840	-----
Thirtymile-------------	I	([2])	------	37,180	------	------	([2])
Sixmile----------------	I	([2])	------	1,370	------	------	([2])
Orchard and Alfalfa-----	I	39, 12	------	8,140	------	------	([2])
Johnson Power Return----	P	([2])	47, 28	------	------	573,400	-----
Loup River-------------	P	7, 105	([2])	------	1,123,000	------	-----

[1]Power generation discontinued in 1974.
[2]Outside study area.
[3]Abandoned in 1963.

Table 4.--Soil groups and their hydrologic properties

Map Symbol	Soil group	Topographic position	Texture	Range in slope (percent)	Available water capacity (inch per inch)	Average profile permeability (inch per hour)	Permeability of least permeable horizon (inch per hour)
A	Inavale-Loup-Alda-Platte.	Bottomland - low terraces.	Sand to loamy sand.	0 - 3	0.10	12.50	6.90
B	Wann-Cass-Leshara	Bottomlands	Sandy loam to loam.	0 - 3	.13	7.40	3.40
C	Gibbon-Lamo	Bottomlands	Silt loam to silty clay loam.	0 - 3	.21	4.70	.30
D	Ortello-Blendon	Uplands - terraces.	Sandy loam	0 - 10	.12	8.50	2.90
E	Holdrege-Hall-Hord-Kenesaw.	Level uplands, high terraces.	Silt loam to silty clay loam.	0 - 3	.20	1.20	1.07
F	Coly-Colby-Uly-Ulysses.	Dissected uplands.	Silt loam to silty clay loam.	0 - 30	.16	1.30	1.30
G	Valentine-Thurman.	Uplands, terraces.	Sand	2 - 30	.07	13.0	13.0
H	Wood River-Silver Creek.	Low terraces	Silt loam to silty clay loam.	0 - 3	.23	.95	.13
I	O'Neill-Sarpy	Low terraces	Sand	0 - 3	.10	11.50	4.50

Source: U.S. Soil Conservation Service, Soil Survey publications for selected counties.

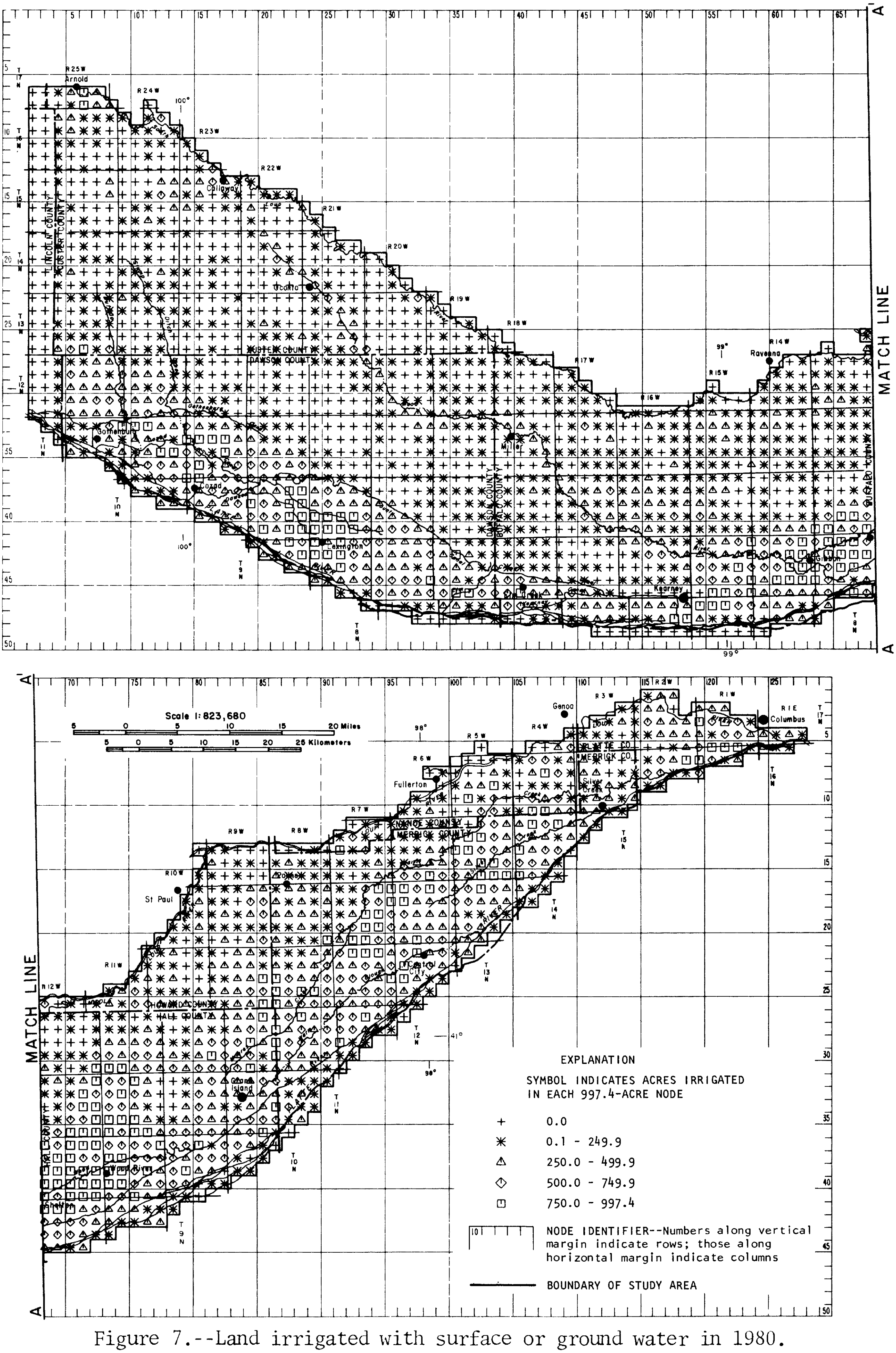

Figure 7.--Land irrigated with surface or ground water in 1980.

Unsaturated Zone

The unsaturated zone extends from the soil zone to the saturated zone, or ground-water zone. Water in the unsaturated zone may move downward, upward, or laterally, and it may be stored for limited periods. The physics of water movement within the unsaturated zone is complex and not completely understood. For this study the unsaturated zone is treated simplistically as a conduit through which water moves upward and downward with no storage. Major assumptions are that all water leaving the soil zone reaches the ground-water zone, that water moving up from the ground-water zone through the unsaturated zone reaches the soil zone, and that lateral movement of water within the unsaturated zone is negligible.

Saturated Zone

The saturated zone, also called the ground-water zone, hereafter will be referred to as the aquifer. It extends from the water table to the base of the lowest coarse-grained materials -- sand or gravel -- above the Cretaceous bedrock. The aquifer is composed of an upper part, which is primarily Quaternary materials, and a lower part, which is primarily the Ogallala Formation of Tertiary age, from eastern Hall County westward and fine-grained Quaternary materials from eastern Hall County eastward. For this study, the aquifer is divided into two parts because the materials have significantly different hydrogeologic properties. The Quaternary materials generally have higher hydraulic conductivities and storage capacities than the Ogallala Formation or the fine-grained Quaternary materials in the eastern part of the study area.

Boundaries of the Aquifer

The boundaries of the aquifer are important in delineating the occurrence of ground water in the study area. Water levels and changes in water levels over time define the upper surface of the aquifer; whereas, the configuration and elevation of the bases of two aquifer parts define the lower surfaces of the aquifer. The saturated thickness of the aquifer and the depths to water provide additional information on the boundaries of the aquifer.

Water Levels

The water table, which constitutes the upper boundary of the aquifer, fluctuates in response both to short-term and long-term variations, mainly in recharge but also in discharge. By comparing maps showing the configuration and elevation of the water table before and after large-scale irrigation development, it is possible to determine the effects of the development on the water table and to project probable future effects.

Figure 8 shows the configuration and elevation of the water table in the study area prior to the extensive ground-water development that began in the mid 1950's. The configuration shown for most of the Platte Valley was prepared from water-level data obtained during the summers of 1931 and 1932 by Lugn and Wenzel (1938). The configuration shown for the uplands, however, was developed from all water-level data available through 1978. These data were used because almost no water-level data were available for the uplands prior to the 1960's. No irrigation wells existed in the uplands in 1931 (fig. 9) and few existed prior to the 1950's. Most of the development of ground-water irrigation in the uplands followed the introduction in the late 1960's of center-pivot systems. Thus, the water-level data obtained are assumed to represent predevelopment water levels.

Although the water-table contours on figure 8 represent water-level conditions in the Platte Valley prior to large-scale ground-water development, surface-water development beginning in the 1890's had an impact on water levels in these counties prior to the 1930's. Lugn and Wenzel (1938) report that by 1931 irrigation with surface water had already caused water levels to rise, especially under terrace lands. Also, by 1931 about 600 irrigation wells were in operation in the Platte Valley from mid-Buffalo County through Hall County. As of 1931, there were no measurable water-level declines attributable to pumpage of ground water from these wells. Evidently, pumpage by these wells was offset by the interception of ground water that might otherwise have been lost to evapotranspiration.

Since 1931, the increase in the number of irrigation wells in the Platte Valley has been extraordinary. Figure 10 shows the distribution of irrigation wells registered with the Nebraska Department of Water Resources through December 31, 1976. Where well density is still low, water levels today probably do not differ greatly from those of predevelopment days. However, in many places, well density is so great that water levels today are bound to differ significantly from those predating development.

A second map showing configuration and elevation of the water table was required so that the ground-water flow model could be calibrated. The map prepared (fig. 11) is for the fall of 1976. Additional measurements of water levels were made to supplement those made in the fall of 1976 in the uplands of Buffalo County (fall 1977) and Custer County (spring 1978), and in southeastern Howard County (spring 1978).

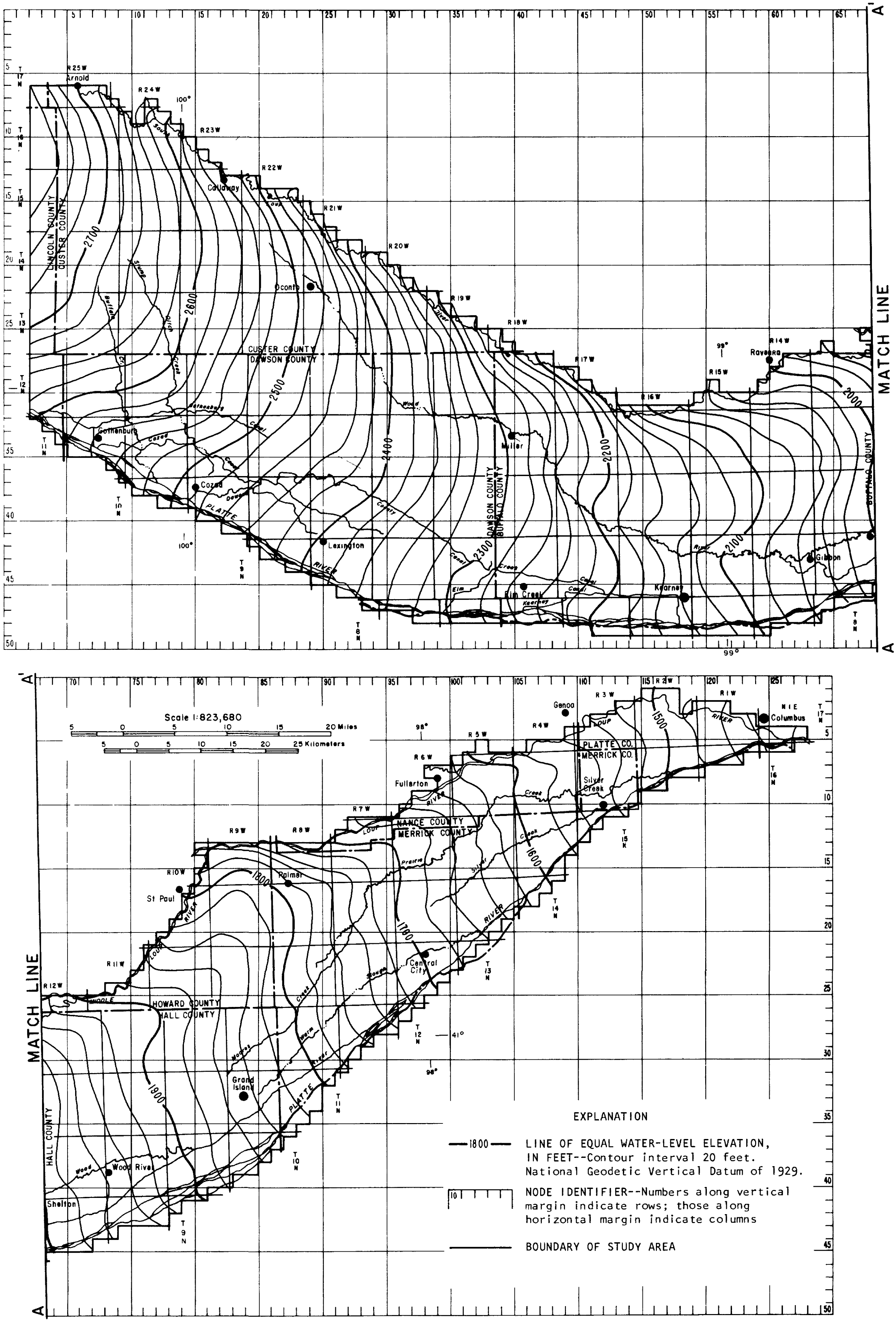

Figure 8.--Configuration and elevation of water table in summers of 1931 and 1932 prior to large-scale ground-water development.

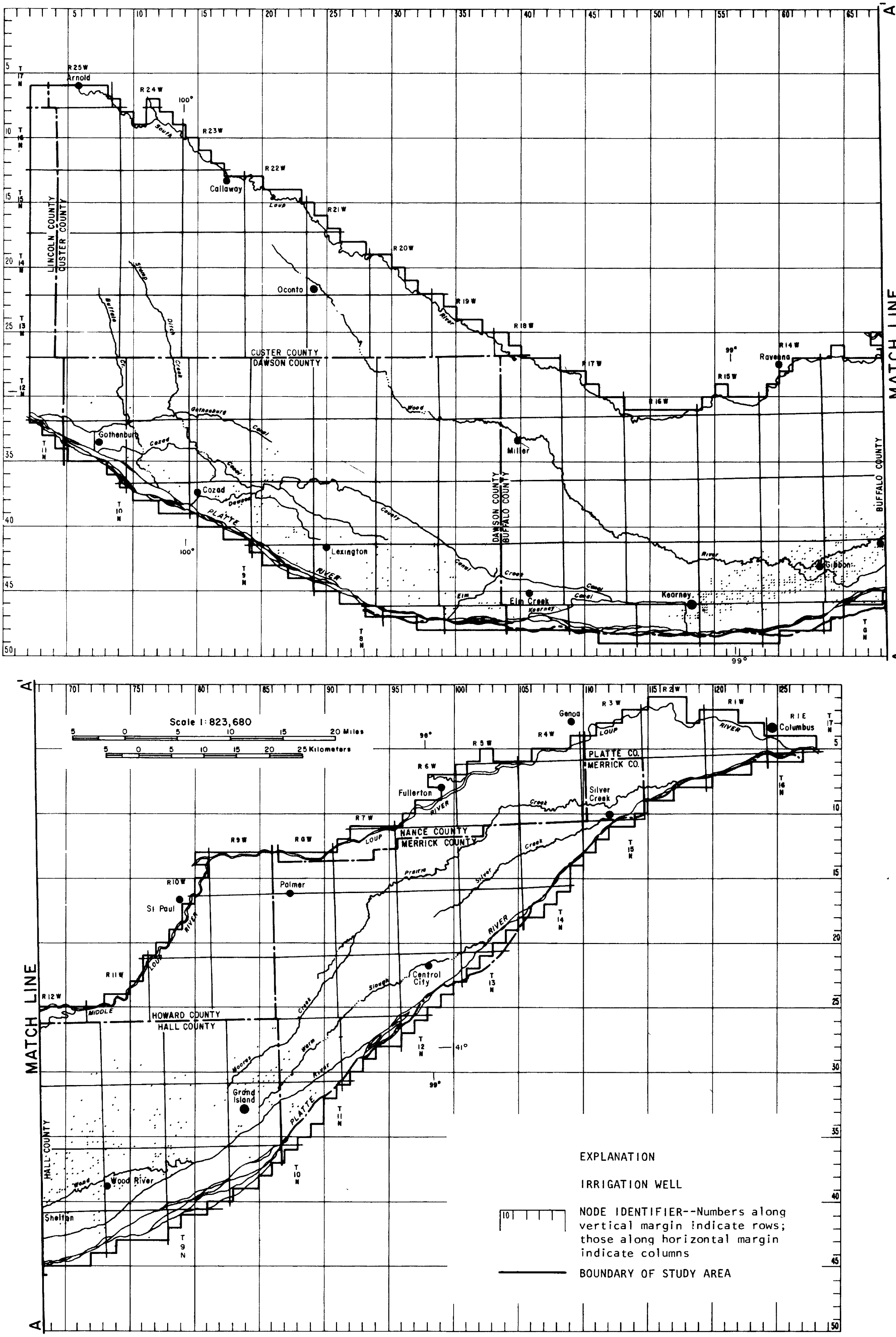

Figure 9.--Distribution of irrigation wells drilled through 1931.

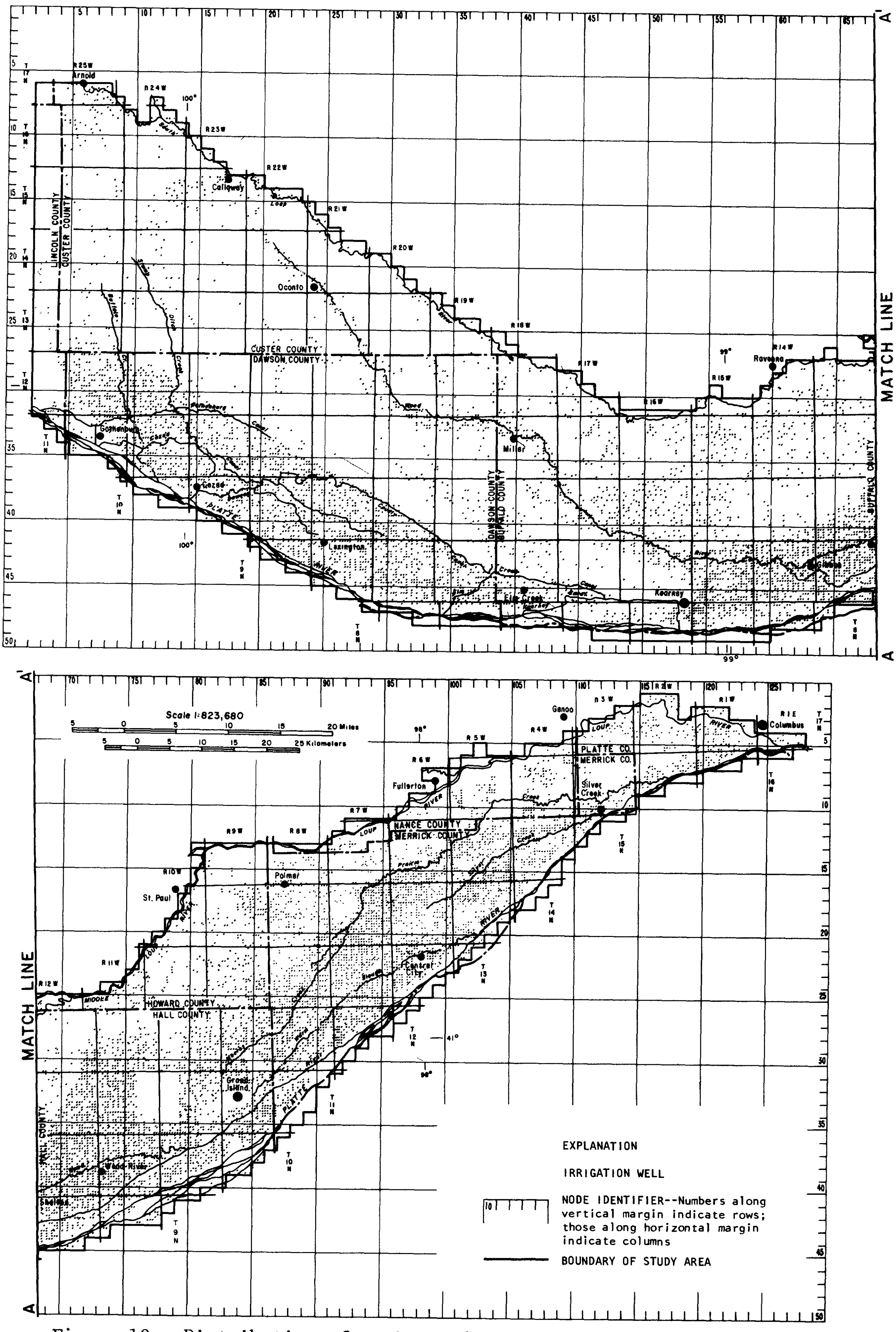

Figure 10.--Distribution of registered irrigation wells drilled through December 31, 1976.

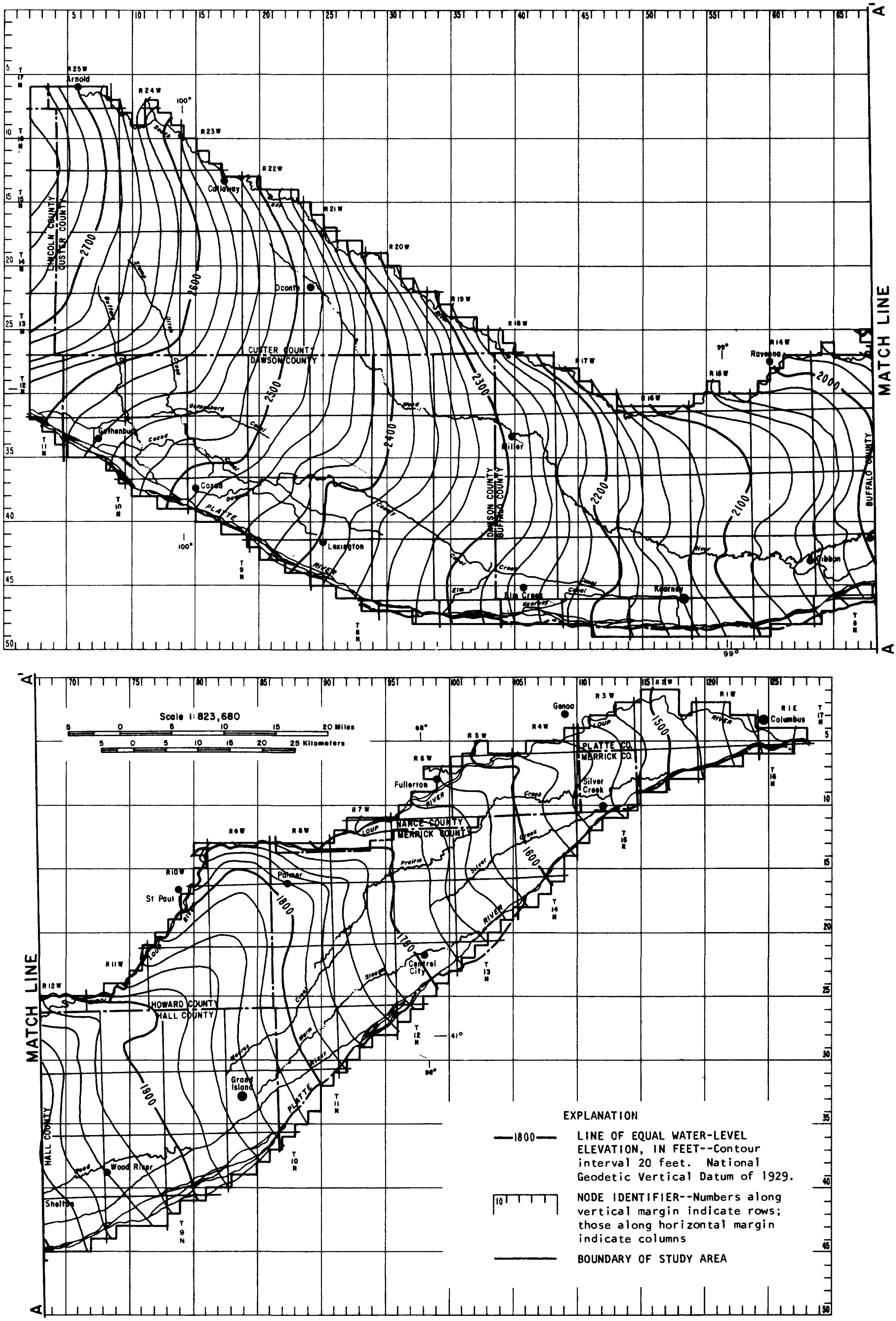

Figure 11.--Configuration and elevation of the water table, fall of 1976, prepared from measured water levels.

An examination of the water-level configuration maps of 1931 (fig. 8) and 1976 (fig. 11) shows both similarities and differences. Ground-water flow directions, which are perpendicular to water-table contour lines in an isotropic aquifer, are similar for most of the area. Major differences in the directions of ground-water flow are evident in south-eastern Howard County. There are also a few minor changes in the direction of ground-water flow along some reaches of the Platte River, where formerly gaining segments of the stream are now losing segments. Inadequacies in the predevelopment water-level map may account for the differences in southeastern Howard County.

Differences between figures 8 and 11 indicate that noticeable changes occurred in the relationship between stream and aquifer along the Wood River. Locations of gaining and losing segments of the stream changed significantly from 1931 to 1976. Also, although not evident on the figures, in 1931, the Wood River was live or flowing about 3 miles further upstream than in 1976. Also, water levels declined noticeably since 1931. The most significant decline occurred in the Platte River valley of Dawson, Buffalo, and western Hall Counties. Water-level declines in the valley are illustrated by the upgradient positions of the 1976 water-level contour lines with respect to their positions in 1931.

Depth to Water

Depth to water is delineated on figure 12; depths in excess of 100 feet are not differentiated further. First, land-surface elevations were obtained for the center of each grid node using Geological Survey 7½-minute quadrangle topographic maps. These maps have a scale of 1:24,000 and contour intervals of 10 feet. Then, depth to water for each node was computed by subtracting the 1931 water level (fig. 8) from the land-surface elevation at the node.

An examination of figure 12 together with figure 2 (topographic types) indicates that shallow depths to water occur in the flood plains and terraces. Substantial increases in the elevation of water levels may occur shortly after major recharge events in the fall and spring of each year. The areas where the depth to water is 5 feet or less probably are more extensive following such events than is indicated on figure 12, especially during the spring. Likewise, in some areas where depths to water are shown to be between 6 and 10 feet below land surface, water levels may occasionally rise to within 5 feet of the land surface.

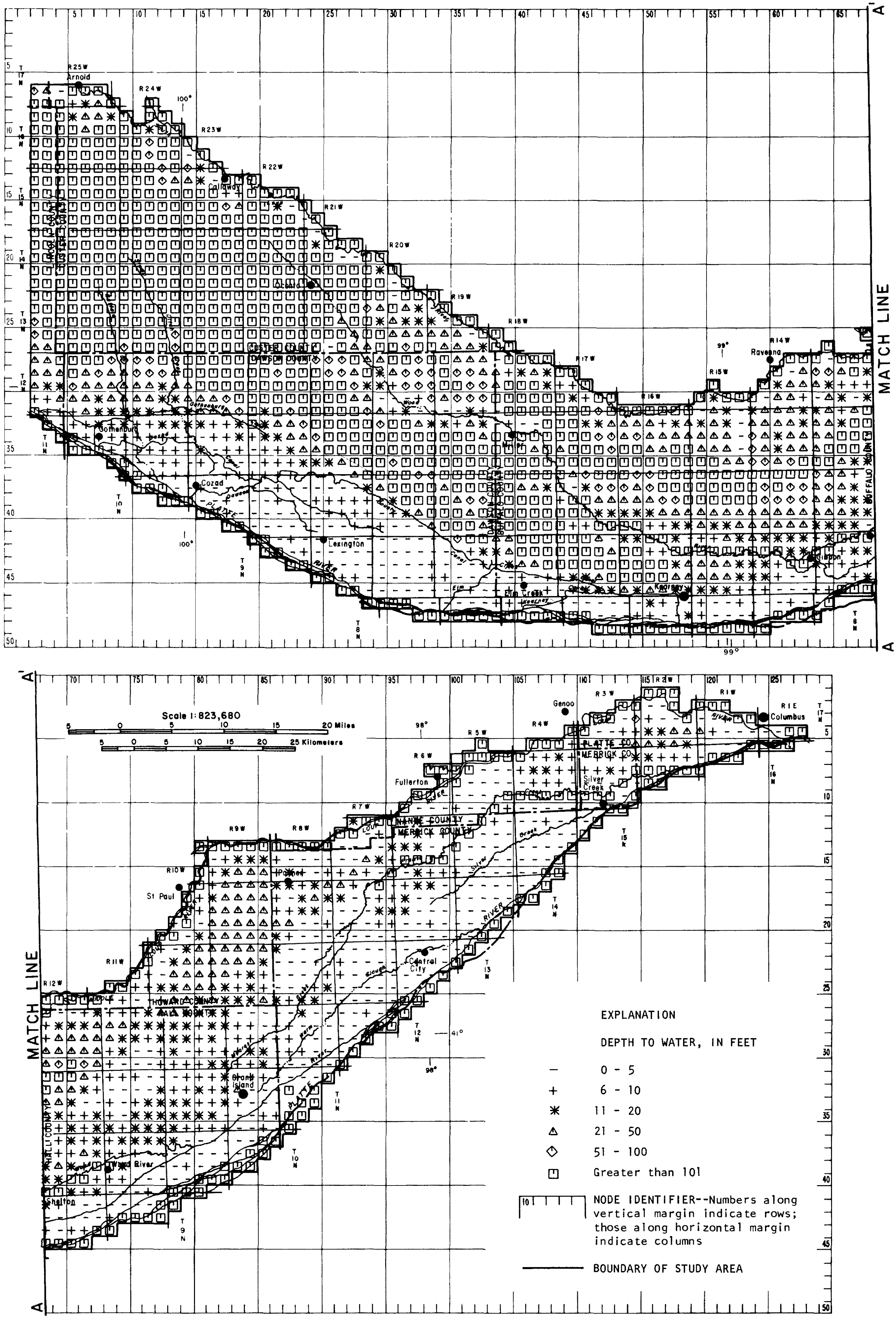

Figure 12.--Depth to water from land surface, summer 1931 and 1932.

Base of the Aquifer

As previously mentioned, the aquifer is divided into an upper and lower part, and the bases of the two parts are delineated on plate 1a and 1b, respectively. The base of the upper part slopes toward the east, with a decrease in elevation of about 1,400 feet -- from about 2,700 to 1,300 feet. The base of the lower part of the aquifer also slopes toward the east, but with a decrease in elevation of only about 950 feet. Elevations of this part vary from 2,250 feet in the west to 1,300 feet in the east.

Saturated Thickness

Plate 1c and 1d shows the variations in aquifer thickness with location of the upper and lower parts of the aquifer, respectively. The saturated thickness of the upper part ranges from zero feet in northern Buffalo County to 250 feet along the South Loup River in Custer County. The saturated thickness of the lower part of the aquifer ranges from less than 25 feet in the eastern part of the study area to more than 500 feet in the western part.

The areas of zero saturated thickness for the upper part of the aquifer in 1931, primarily in Buffalo County, occurred naturally and were not due to dewatering of the aquifer. At that time, no irrigation wells had yet been developed in the upper part of the aquifer; all subsequent development has been in the lower part.

Hydraulic Characteristics

The hydraulic characteristics of the aquifer indicate the availability and volume of ground water. For this study, hydraulic conductivity and specific yield are the parameters necessary to define the hydraulic properties of the aquifer.

Hydraulic Conductivity

The distribution of hydraulic conductivity, K, of the upper and lower parts of the aquifer is shown in plate 1e and 1f, respectively. Hydraulic conductivity of the upper part ranges from 1 to 300 feet per day, and that of the lower part from 1 to 79 feet per day. On plate 1e, a hydraulic conductivity of zero feet per day is indicated where the upper part of the aquifer was unsaturated. On plate 1f, however, a hydraulic conductivity of zero feet per day is indicated where the lower part of the aquifer is not present.

The hydraulic-conductivity maps were prepared starting with lithologic logs of test holes. For each lithologic unit described in the test-hole logs, a hydraulic-conductivity value was assigned according to the grain size of material comprising the unit and its degree of sorting and (or) silt content using table B given in "Additional Information." Each value, so assigned, was then multiplied by the thickness of the lithologic unit it represented. The sum of the products was divided by the saturated thickness of all the lithologic units to yield a weighted-average hydraulic conductivity for each of the two parts of the aquifer at each test-hole site. The weighted-average values were then plotted, and maps were developed showing lines of equal hydraulic conductivity. It is from these maps that the ranges in hydraulic conductivity shown for individual nodes in plate 1e and 1f eventually were obtained.

Hydraulic-conductivity values determined from aquifer tests (Lugn and Wenzel, 1938) and those derived from specific-capacity data for irrigation-wells were used to check and, in a few cases, modify the weighted-average values obtained as described in the previous paragraph. Aquifer-test data pertained only to the upper part of the aquifer; whereas, specific-capacity data pertained to the entire aquifer.

During the modeling process, the need for some modifications in the assigned weighted-average hydraulic-conductivity values became apparent. The modified values have been incorporated into plate 1e and 1f.

Hydraulic conductivity shown in plate 1e and 1f, if multiplied by the appropriate saturated thickness from plate 1c and 1d, can be used to compute the transmissivity of the aquifer at each node. The transmissivity is a good indicator of potential well yield at a given location. Areas where transmissivity is large are favorable for developing wells having high yields.

Specific Yield

The specific yield, Sy, or drainable porosity of the upper and lower parts of the aquifer is indicated in plate 1g and 1h, respectively. The range in Sy for the upper part of the aquifer is 0.16 to 0.26, and that for the lower part is 0.12 to 0.21.

Specific-yield values were developed, as were the hydraulic-conductivity values, from lithologic logs of test holes. For each lithologic unit, a specific-yield value was assigned depending on grain-size class or range, using table B given in "Additional Information." A weighted-average Sy for the saturated materials at each test hole was computed in the same manner described earlier for hydraulic conductivity. Values for individual test-hole sites were plotted, maps with lines of equal specific yield were prepared, and the specific-yield values shown on plate 1g and 1h for individual nodes were selected. The need for some changes in the original Sy values selected became evident during the modeling procedure; these changes have been incorporated into the illustrations.

Flow in the Aquifer

Ground water flows in the direction of decreasing hydraulic head, or approximately normal to the water-table contours (figs. 8 and 11). The regional ground-water flow pattern is modified near discharge and recharge areas. The flow paths converge toward areas of discharge and diverge from areas of recharge.

The velocity of ground-water movement through an aquifer is a function of the hydraulic conductivity and the gradient of hydraulic head, which is the potential energy of the water. The velocities are usually low and they are expressed as follows (Lappala, 1978):

$$\hat{q}_i = K\left(\frac{\partial h}{\partial x_i}\right) \qquad (1)$$

where

$\hat{q}_i$ = the average unit area rate of volume flux, LT^{-1},

K = hydraulic conductivity, LT^{-1},

h = total hydraulic head, L,

x_i = a coordinate direction, L.

Rates of ground-water movement in the study area range from less than 10 feet per year to slightly more than 100 feet per year.

Underflow of ground water into the study area is along the western border of Dawson and Custer Counties and can be calculated as follows (Lappala, 1978):

$$Q = \sum_{i=1}^{m} \hat{K}_i b_i w_i \left(\frac{\partial h}{\partial n}\right)_i \qquad (2)$$

where

Q = underflow across the study area boundary, L^3T^{-1},

i = an index on the interval used,

m = total number of increments,

$\hat{K}_i$ = average hydraulic conductivity over b_i and w_i, LT^{-1},

b_i = average aquifer thickness over interval i, L,

w_i = width of the increment i, L,

$(\frac{\partial h}{\partial n})_i$ = hydraulic gradient normal to the boundary, dimensionless.

The underflow into the study area was determined by the above equation to be 28,700 acre-feet in 1931 and 39,600 acre-feet in 1976.

The average volume of water in storage in the summers of 1931 and 1932 within the two parts of the aquifer were calculated by multiplying average saturated thickness by specific yield. The volume in storage in the upper part of the aquifer was 58,300,000 acre-feet, and that in the lower part was 62,500,000 acre-feet.

Outflows from the aquifer consist of discharge from domestic, municipal, industrial, and irrigation wells, ET losses from shallow water-table areas, and ground-water discharge to the surface-water system. ET losses and ground-water discharge to streams are handled within the ground-water flow model. The net recharge or discharge, which is entered into the flow model, will be discussed in the Recharge-CIR section. Underflow of ground water to areas outside the study area is negligible, and for modeling purposes, is assumed to be intercepted by the surface-water system.

PROCEDURES FOR ESTIMATING RECHARGE-CIR DATA

Hydrologic data seldom are in a form directly usable in a ground-water flow model. Ordinarily, "raw" data must be converted, combined with other data, or operated upon in some other manner before it can become usable. This section provides information on the procedures adopted to prepare data for use in the model and on simplifying assumptions made with regard to the data.

Soil-Zone Programs

The movement of water through and within the soil zone is represented by two computer programs: one is called the potential-evapotranspiration program (PET), and the other is called the soil-water program. These programs require input of climatic, soil, and crop data to calculate the CIR of the crops and the amount of water that will pass through the soil zone to become recharge to the aquifer.

The physical basis for, and operational procedures of the soil-zone programs were discussed by Lappala (1978). No changes were made in the PET program for this study, but two major changes were made in the soil-water program. The first change was the addition of a method to handle the nonuniform distribution of rainfall with respect to time. This involved adding a regression equation to the soil-water program (Fred J. Otradovsky, U.S. Bureau of Reclamation, written commun., 1979) in an attempt to account for the temporal errors that result from using monthly instead of daily precipitation data. The results of this change were increases in the values used for precipitation and deep percolation or recharge.

The second change in the soil-water program was the addition of a method to account for recharge that results because of seepage from road ditches, ponds, low areas, and intermittent drains. Originally, the rainfall-runoff curves in the soil-water program were developed from data collected on 4-acre watersheds and reflected only initial surface runoff. However, when larger areas are considered, much of the original surface runoff reaches road ditches, ponds, swales, etc., from which water percolates downward to become recharge to the aquifer. The fraction of the original surface runoff that is subsequently retained and percolates downward to become recharge is referred to as "seep" and is treated as additional deep percolation in the soil-water program (Fred J. Otradovsky, U.S. Bureau of Reclamation, written commun., 1979).

The PET program computes the monthly PET for the 15 weather stations in the study area. Inputs to the program are: (1) Monthly values for precipitation, air temperature, and percent possible sunshine; (2) the mean minimum and maximum air temperatures for the warmest month of the year (July); and (3) the mean daily solar radiation values on cloudless days for each month.

The locations of the weather stations are shown on figure 3. The areas for which records from a given station are assumed to apply are shown on the figure by Thiessen polygons. The station locations and polygons are shown on figure 3 because of the close relationship in the modeling process between climatic data and the soil properties.

Precipitation data were available for each weather station; however, air temperature data were not, and those for the Gothenburg, Kearney, and Central City stations were assigned to the other weather stations according to their location. If air temperature and precipitation data were missing, they were estimated by linear regression with data from nearby stations. Data on percent possible sunshine and mean daily solar radiation on cloudless days were available only for the National Weather Service station at North Platte, about 35 miles west of this study area.

Monthly output from the PET program and mean monthly precipitation and air temperature for each weather station were used as input to the soil-water program. Additional inputs to this program are: (1) Crop coefficients (fig. 13), which are the monthly ratios of actual to PET for row crops, alfalfa, small grain, and pasture and range; (2) infiltration-curve coefficients coupled with infiltration-curve numbers (fig. 14) that are dependent on the soils, lithology, topography, and crop types; and (3) water-holding capacity of the soil.

Figure 13 shows crop coefficients for different times of the year. These coefficients were modified from Lappala (1978). Modifications are the use of a coefficient of 1.0 for row crops during July, and a lowering of the coefficient for pasture and range from July through October when the grasses are dormant.

Figure 14 shows the relationship between monthly precipitation and monthly infiltration. The relationship differs markedly for different combinations of soil, vegetation, and topography, and therefore is expressed using four different curves. Selecting the appropriate curve is simple. For example, for sandy soils on flat topography, monthly infiltration is determined using curve 1. Table 6 gives the available water capacity, curve number, and seep values used for the nine soil groups in the study area.

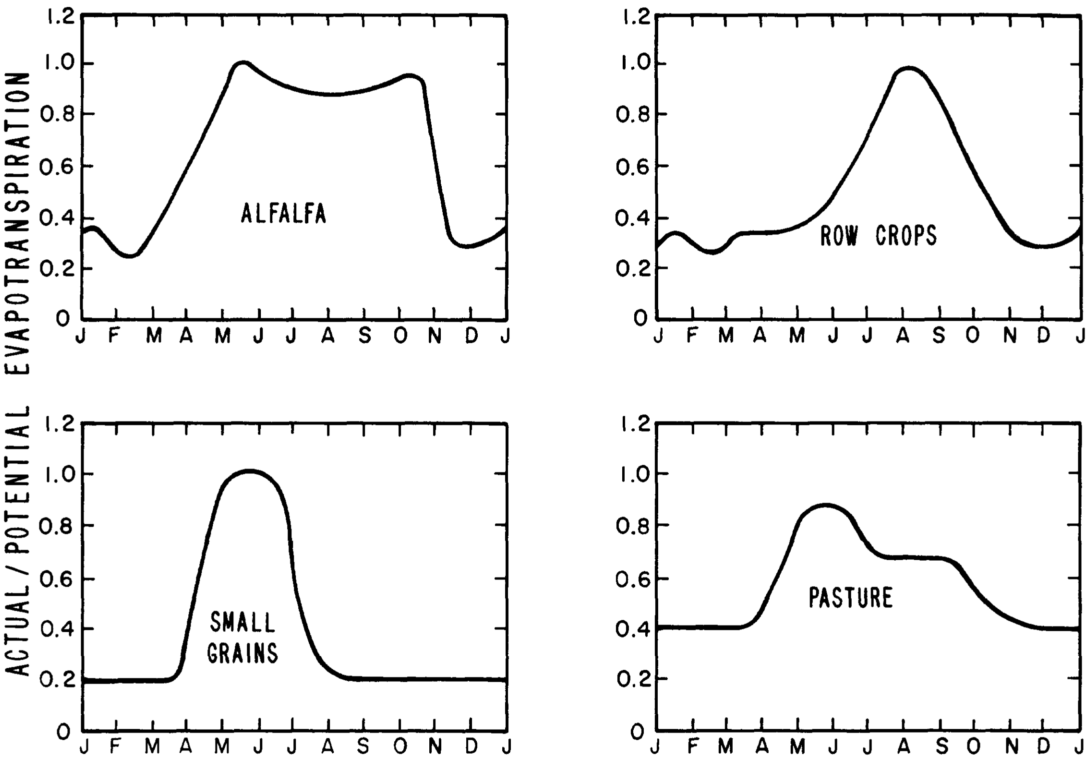

Figure 13.--Crop coefficients--the monthly ratio of actual to potential evapotranspiration--for four crop types. (Modified from Lappala, 1978).

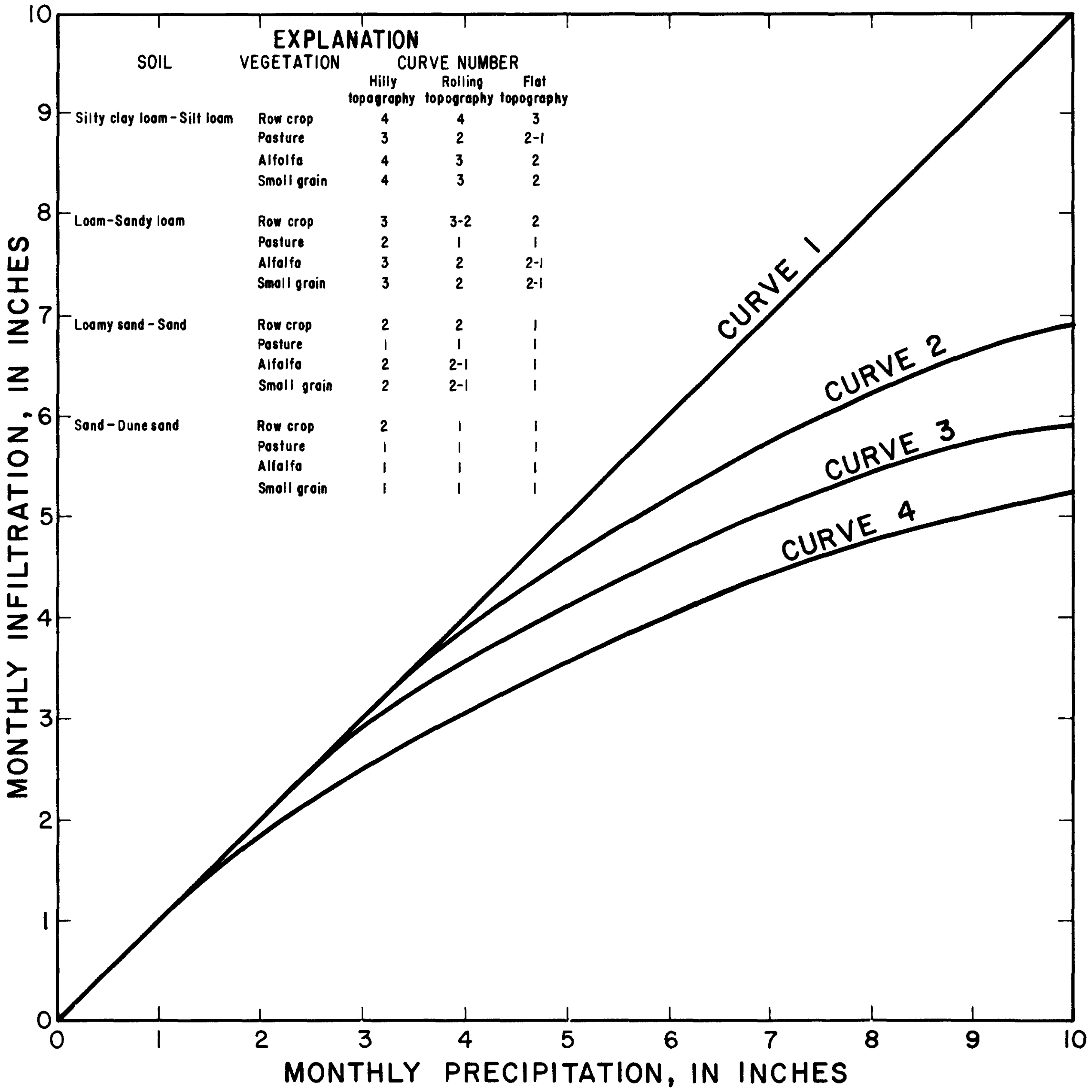

Figure 14.--Relationship of monthly precipitation to monthly infiltration for various combinations of crops, soils, and topography. (Modified from Lappala, 1978.)

Table 6.--Available water capacity, curve numbers, and seep values for the soil groups

Map symbol	Soil group	Available water capacity (inch per inch)	Curve number for: Row crop	Alfalfa	Small grain	Pasture	Seep[1]
A	Inavale-Loup-Alda-Platte	0.10	1	1	1	1	0.75
B	Wann-Cass-Leshara	.13	2	2	1	1	.50
C	Gibbon-Lamo	.21	2	2	2	1	.25
D	Ortello-Blendon	.12	2	2	1	1	.50
E	Holdrege-Hall-Hord-Kenesaw	.20	2	2	2	1	.25
F	Coly-Colby-Uly-Ulysses	.16	3	3	3	2	.10
G	Valentine-Thurman	.07	2	1	1	1	1.00
H	Wood River-Silver Creek	.23	2	2	2	1	.15
I	O'Neill-Sarpy	.10	1	1	1	1	.75

[1]Dimensionless; the fraction of the surface runoff generated in an area that percolates from ditches, drains, and swales in the area and eventually becomes recharge to the aquifer.

Output from the soil-water program includes data on the following items for each soil, crop, and weather station: (1) Infiltration, (2) ET, (3) surface runoff, (4) irrigated land deep percolation, (5) CIR, (6) irrigated land soil moisture, (7) dryland deep percolation, (8) dryland water shortage, and (9) dryland soil moisture. Deep percolation from dryland areas entirely from precipitation and seepage from ditches, drains, and swales; whereas, deep percolation from irrigation areas is from precipitation, excess irrigation, and seepage from ditches, drains, and swales. Output from the soil-water program for the soils that are found in the area enclosed by the Thiessen polygons, identified with the Gothenburg, Kearney, and Central City weather stations, is given in table C of "Additional Information." Ninety-two different combinations of weather stations and soils exist in the study area; table C presents a representative subset of these data.

Recharge-Discharge Programs

Computation of recharge to the ground-water system and of discharge from it requires data for a variety of parameters. Unfortunately, very few of these parameters are measurable directly; thus, procedures were developed by which their magnitudes could be estimated. These procedures comprise tne recharge-discharge programs.

For this study the recharge-discharge programs consist of computer programs and the ET subroutine in the ground-water flow model. The Pumpage and Flowx programs, developed by the authors, compute the recharge-discharge values and streamflow data needed as input to the ground-water flow model. The Pumpage program uses recharge-CIR data from the soil-water program, together with data on additional parameters, to compute net recharge to the aquifer or discharge from the aquifer at each node for each pumping period. The Flowx program computes either the inflow to or the outflow from stream nodes using data from nodes just outside the study area but adjacent to the stream nodes. The ET subroutine by Trescott and others (1976) computes the discharges from shallow ground-water nodes for each time step within each pumping period.

Assumptions in the Procedures

Numerous assumptions are incorporated in the recharge-discharge program. Those believed to be most significant are discussed in the following paragraphs.

The first group of assumptions pertain to development of the Pumpage program. No measurements were available on the volumes of surface water diverted by canals that reach irrigated fields. After discussions with cooperators and personnel of the U.S. Bureau of Reclamation, the assumption was made that only 50 percent of the surface water diverted actually is applied in irrigation; the other 50 percent is assumed to be seepage loss that recharges the aquifer (Fred J. Otradovsky, U.S. Bureau of Reclamation, personal commun., 1979). Another assumption pertaining to surface water is that the acres irrigated with surface water have remained unchanged since 1970, both in location and extent.

The assumption that only 50 percent of the surface water diverted is actually applied in irrigation leads to still other assumptions. If the 50 percent applied is more than the CIR for a given node, the residual water is assumed to become recharge to the aquifer. If, on the other hand, the 50 percent applied is less than the CIR for the node, the deficit is assumed to be made up by pumping of ground water if an irrigation well exists in the node.

Data available on acreages of alfalfa do not distinguish between irrigated and nonirrigated acres. After discussions with cooperators, 20 percent of the alfalfa lands in the Platte River valley from Gothenburg to west of Kearney is assumed to be irrigated with ground water each year, and the remaining 80 percent is assumed to be subirrigated with shallow ground water.

The acres irrigated with ground water in each study are computed as the number of irrigation wells per node multiplied by the acres irrigated per well. The number of wells per node for each year was computed from the file of registered irrigation wells of the Nebraska Department of Water Resources, and the acres irrigated per well were computed for each county for 5-year intervals from data on registered irrigation wells given in "Nebraska Agricultural Statistics" (Nebraska Department of Agriculture, annual reports). The number of registered irrigation wells and acres irrigated per well for each county for 5-year intervals are given in table 7.

Procedures used to determine the acres irrigated with ground water have been substantiated by comparing computed results with results of field data collected by the Bureau of Reclamation for Buffalo, Hall, and Merrick Counties during 1946, 1970, and 1971. Results of this comparison are given in table 8. The greater number of wells and the lesser acres per well computed for this study from the Agricultural Statistics probably can be attributed to the inclusion of all registered irrigation wells drilled through the end of each year, even though not all such wells were used during the year.

Withdrawals of ground water for domestic, stock, industrial, and most municipal purposes are assumed to be insignificant with respect to regional water-level changes. Thus, ground-water usages for these purposes, except that for the cities of Grand Island and Kearney (table 9),

Table 7.--Registered irrigation wells and acres irrigated per well by county

Period	Number of wells	Acres irri-gated per well	Number of wells	Acres irri-gated per well	Number of wells	Acres irri-gated per well	Number of wells	Acres irri-gated per well
	Custer County		Dawson County		Buffalo County		Hall County	
1931-35	10	0.0	149	50.0	298	55.0	185	55.0
1936-40	17	0.0	294	50.0	307	60.0	255	55.0
1941-45	36	40.0	507	50.0	428	65.0	554	62.0
1946-50	84	40.0	763	50.0	618	70.0	855	60.0
1951-55	193	44.0	1,116	47.0	894	56.0	1,119	58.0
1956-60	467	67.0	1,931	53.0	1,507	55.0	2,182	61.0
1961-65	532	72.0	2,070	34.0	1,673	50.0	1,994	54.0
1966-70	711	82.0	2,222	32.0	1,958	52.0	2,294	51.0
1971-75	1,050	91.0	2,485	43.0	2,278	61.0	2,588	55.0
1976	1,325	104.0	2,763	47.0	2,641	62.0	2,927	57.0
	Merrick County		Howard County		Nance County		Platte County	
1931-35	49	30.0	1	0.0	0	0.0	7	50.0
1936-40	208	31.0	6	75.6	1	0.0	10	77.0
1941-45	415	36.0	14	50.0	5	40.0	49	50.0
1946-50	734	38.3	29	52.0	12	40.0	81	50.0
1951-55	1,052	38.0	72	39.0	24	43.0	126	42.0
1956-60	1,806	37.0	236	45.8	89	41.0	390	49.0
1961-65	2,042	35.0	277	50.0	136	46.0	462	59.0
1966-70	2,439	36.2	364	55.0	225	61.0	582	62.0
1971-75	2,910	38.0	461	65.0	353	68.0	818	72.0
1976	3,300	41.0	611	70.0	480	75.0	1,101	85.3

Table 8.--Comparison of registered irrigation-well statistics computed for this study with those of the U.S. Bureau of Reclamation

County and year	Computed for this study			Computed by U.S. Bureau of Reclamation		
	Acres irrigated	Number of wells	Acres per well	Acres irrigated	Number of wells	Acres per well
Buffalo:						
1946	39,200	548	71.5	41,700	503	82.9
1970	110,700	2,061	53.7	101,000	1,861	54.3
1971	123,300	2,128	57.9	116,000	1,947	59.5
Hall:						
1946	46,500	746	62.3	51,600	703	73.4
1970	117,000	2,383	49.1	117,000	2,241	52.1
1971	131,600	2,459	53.5	133,000	2,322	57.3
Merrick:						
1946	23,200	582	39.9	16,500	437	37.7

Table 9.--Municipal pumpage -- Grand Island and Kearney

Year	Grand Island	Kearney
	(acre-feet)	
1931	4,654	1,786
1935	6,057	1,839
1940	6,135	1,929
1945	9,079	2,176
1950	9,818	2,423
1955	14,902	2,633
1960	8,225	2,842
1965	[1]9,369	3,673
1970	[1]16,424	3,947
1971	[1]11,185	3,637
1975	[1]9,585	4,484

[1]Does not include pumpage from the Platte River well field, which was first used in 1965.

were not included in the recharge-discharge model. Of the withdrawals for Grand Island, only those from the well field within the city were included; those from the well field along the Platte River that fall within a stream node were not included because stream nodes are modeled as constant-head nodes.

To determine the volume of ground water pumped, the number of irrigated acres is multiplied by the CIR for a particular land use. An assumption is made that sufficient irrigation water will be applied to satisfy the CIR for that particular use. Thus, land use is the only unknown factor in this procedure for determining the pumpage.

Although information is available to indicate acres for each land-use category -- row crop, alfalfa, small grain, pasture and range -- by counties each year, comparable information on a farm-by-farm basis is not available. Therefore, assignment of acreages to different land-use categories for individual nodes for different periods clearly is impossible. The Conservation and Survey Division of the University of Nebraska developed land-use data for 1974 for the Central Platte Natural Resources District, and the U.S. Soil Conservation Service developed, but did not publish, a 1977 land-use map that covers the entire study area. Using information from these sources, acreages were assigned to each of the four land-use categories for each node. The acreages so assigned were not allowed to vary.

Additional lands brought under irrigation are assumed to have been used for growing dryland row crops and small grains. It is also assumed that all additional irrigated lands are irrigated row crops. Thus, as irrigated row-crop acreages increase, dryland row-crop and small-grain acreages decrease.

Calculations in the Flowx program also involve some assumptions. This program is used to quantify the movement of water between boundary streams and the aquifer immediately outside the study area.

The rate of water movement, in cubic feet per second, was calculated by using the summers of 1931 and 1932 water levels (fig. 8), the hydraulic conductivity for the entire aquifer at each node, the saturated thickness for the entire aquifer at each node, and the area of each node. The rate of water movement equals the product of the following: (1) hydraulic conductivity, (2) saturated thickness, (3) differences in hydraulic head between the stream node and the adjacent node outside the study area, and (4) the area of the node.

The output from the Flowx program -- the rate of water movement -- was input into the ground-water flow model and held constant for the entire calibration and predictive time intervals. An assumption was made that hydraulic-head changes from 1931-32 to 1976 did not significantly affect the rate of water movement. The rate of water movement was from +7.14 to -3.28 cubic feet per second, where positive values represent flow into streams from the ground-water system and negative values represent flow out of streams into the ground-water system.

The procedures that are used for computing evapotranspiration from the aquifer are based, in part, on assumptions. The physical processes that control ET losses from ground water are difficult to represent in a mathematical equation. For this study, the ET losses from ground water are assumed to be represented by the linear relationship,

$$q_{et_{(i,j,k)}} = ETr - \frac{ETr}{ETz} (G_{i,j} - h_{i,j,k}) \qquad (3)$$

The terms in this equation, modified from Trescott and others (1976), are as follows:

$q_{et_{(i,j,k)}}$ is the ET from ground water for node (i,j) and time (k), in inches per year;

ETr is the maximum evapotranspiration rate from ground water, in inches per year;

ETz is the depth below the land surface at which ET ceases, in feet;

$G_{i,j}$ is the elevation of the land surface, in feet; and

$h_{i,j,k}$ is the elevation of the water table, in feet.

Use of the terms ETr and ETz is based on assumptions that the ET rate decreases linearly with depth, and that ET ceases at one depth regardless of type of soil or crop.

The ET values calculated by equation (3) represent ET losses or discharges from the aquifer. ETr and ETz were selected as 9 inches per year and 5 feet, respectively, after extensive experimentation with the values utilizing steady-state conditions in the ground-water flow model. When water levels at any node drop below ETz (5 feet), the ET losses are zero at that node.

ET salvage occurs when the water table is lowered by ground-water pumpage. The amount of ET salvaged equals the amount represented by the reduction in the water table down to ETz, which for this study is 5 feet. If the water table is maintained at a lowered level, ET salvage resulting from the original lowering of the water table becomes a continuing process. For this study, ET salvage is approximated as a linear function. It is zero when the water table is from 0 to 1 foot below land surface and increases linearly with depth to a maximum of 9 inches (ETr) at 5 feet below land surface. At depths to water greater than 5 feet, ET salvage remains at its maximum.

Input and Output

The input data differ for the various components of the recharge-discharge programs. Input data for the Pumpage program are as follows: Canal diversions (table 3); municipal ground-water pumpage for Grand Island and Kearney (table 9); number of wells per node; output from the soil-water program (table C of "Additional Information); land-use data; and acres irrigated per well (table 8). This program is run once for each pumping period and the output data are the net recharge or discharge for each node, which in turn become input data to the ground-water flow model.

The Flowx program uses as input water levels of the summers of 1931 and 1932, the average hydraulic conductivity, and the average saturated thickness of the aquifer. This program is run once for the entire simulation, and the output data, which are the flux values for the stream nodes, are read into the ground-water flow model for each pumping period.

The ET-loss procedures are performed within the model for each time step within the pumping period. Input data are the water levels, which may change after each time step; the land surface elevation; ETr; and ETz. Output data are ET flux values, which are handled as discharge from the aquifer.

The annual streamflows and canal diversions are computed and read into the ground-water flow model for each pumping period.

SIMULATION OF THE GROUND-WATER SYSTEM

The development of the ground-water flow model includes the selection of a type of model that can adequately represent the ground-water system, the generation of the necessary hydrogeologic and recharge-CIR data, and the calibration of the model and data against known changes in the water levels.

Description of the Ground-Water Flow Model

The type of model used in this study to simulate both the ground-water system and streamflow is the U.S. Geological Survey's two-dimensional, finite-difference model of ground-water flow developed by Trescott and others (1976). For this study, four modifications were made in the model. First, the model was modified to handle relationships between ground water and streamflow where streams are connected to the aquifer. Streamflow was handled by considering the stream network to be represented by a binary-tree structure. Surface water discharging into or from streams is processed by this accounting procedure. In addition, surface water that flows from the stream into the aquifer (inflow) or ground water that flows from the aquifer into the stream (outflow) are handled by this accounting procedure (Lappala, 1979). Second, it was modified by the addition of constant-gradient boundary nodes where water is added or removed from such nodes to maintain a constant water-table gradient (Lappala, 1979). Third, the procedures for storing hydrogeologic parameters were modified by Eric G. Lappala and Joe S. Downey (written correspondence, 1978) so that data for only the active nodes in the model are stored within the computer's central processing unit. Finally, the model was modified to permit the use of two values each for hydraulic conductivity, specific yield, and top and base of the aquifer for each node. This final modification, developed by Eric G. Lappala (written correspondence, 1978), allowed the use of hydrogeologic parameters required to describe both the upper and lower parts of the aquifer. This final modification was tested during this study by running the model as both one- and two-layer cases with the maximum possible pumpage; that is, with 100 percent of the study area irrigated with ground water. No stability or numerical problems occurred, indicating that the model was functioning properly with this modification.

The north, south, and east boundaries of this study area are streams (fig. 4). Nodes in which the streams are present are treated as constant-head nodes -- nodes in which water levels are not permitted to vary unless the streamflow in the node is zero. The west boundary lies approximately 3 miles west of the Central Platte NRD's boundary. Nodes along this boundary are constant-gradient nodes, in which gradient across them remains constant throughout time, but changes in saturated thickness of the aquifer are permitted. The extension of the study to the west was required to eliminate potential water-level problems at the NRD's boundary caused by the use of the constant-gradient nodes.

Assumptions in the Ground-Water Flow Model

Some assumptions necessary in developing and running the ground-water flow model pertain to the required input data; whereas, others pertain to the development and operation of the model. Assumptions pertaining to input data have already been discussed. Discussions that follow pertain to assumptions in the development and operation of the model.

1. The entire ground-water system can be represented as a non-homogeneous, isotropic, unconfined aquifer. There may be small areas in which the ground-water system responds like a confined aquifer; however, the regional response is that of an unconfined aquifer.

2. The vertical ground-water flow component is negligible; thus, ground-water flow is assumed to occur only in the horizontal plane.

3. Irrigation wells penetrate, and are open to, the entire thickness of the upper and lower portions of the aquifer.

4. Pumping rates of irrigation wells are not affected by the saturated thickness of the aquifer. Thus, in model operation, the pumping rates are not adjusted as the aquifer is dewatered until the aquifer is completely dewatered and pumping ceases.

5. Underflow does not exist in nodes where the streams are connected to the aquifer.

6. The boundary conditions -- constant-head nodes and constant-gradient nodes -- represent the aquifer at their locations.

Calibration of the Ground-Water Flow Model

Calibration of a model is the process of adjusting model input so that model output will be both realistic and valid. Commonly, calibration is accomplished by trial-and-error adjustment of input data until differences between model-output data and measured data are within acceptable limits. The calibration of the model usually involves operating the model under steady-state and transient conditions. Steady-state conditions are those in which the model results are independent of time and in which the elements of the hydrogeologic system are assumed to be in balance. Transient conditions are those in which the model results are dependent upon time and in which the elements of the hydrogeologic system are not required to be in balance.

For this study, the ground-water flow model was calibrated using the steady-state procedures to check the validity of data for hydraulic conductivity, recharge, water levels, and ET losses from ground water, and to determine the sensitivity of model results to changes in the various input data. Also, the model was calibrated using transient procedures occurring between 1931 and 1976. Model input values were adjusted until a reasonable fit occurred between the computed and measured 1976 water levels.

Steady-State Procedures

In operating the model using steady-state procedures, water levels from the summers of 1931 and 1932 (fig. 8) were used as the initial water levels, together with the weighted-average hydraulic conductivity and the elevations of the top and base of each part of the aquifer. With steady-state procedures, no storage of water is allowed in the model; thus, the specific-yield values were set at zero. Also, with steady-state conditions, model results are independent of time; therefore, the model was run for only one time step.

The ground-water model was run using steady-state procedures to check and, if necessary, to adjust some of the input data. Results from different runs in which selected input data were varied were compared; adjustments were then made in the original input data so as to produce model results that successfully simulated more closely the true response of the ground-water system.

The recharge data were modified, as necessary, by adjusting the soil, climate, crop, and seep values. For a few soils, the available water capacity (table 6) was adjusted to provide either more or less recharge. These adjustments were within a plausible range of available water capacities for the individual soils that comprise the soil group.

Due to the spatial variability of the climatic data, some adjustments were necessary so as either to raise or lower recharge. However, most were to lower recharge by 20-25 percent.

The only adjustment made in the crop data was to lower the coefficient (fig. 21) for pasture and range, because grasses become dormant during the summer. The effect was to lower the dryland and irrigated water requirements for pasture and range.

Adjustments in seep values (table 6) were made using information provided by Fred J. Otradovsky, U.S. Bureau of Reclamation (personal commun., 1979), who has developed procedures for testing input parameters to the soil-water program. These adjustments were made so that the seep values represented more accurately the seepage losses of the different soil groups. The effect of these changes were to increase recharge in some places, and to decrease it in others.

Steady-state procedures also were used to adjust the hydraulic conductivity for some of the nodes and the ET rate. The model was run using hydraulic conductivities ranging from 0.4 to 2.0 times the initial conductivities for both parts of the aquifer. The hydraulic conductivities selected were those that yielded water levels that most nearly matched those of the summers of 1931 and 1932. The average change in hydraulic conductivities was approximately 1.3 times the initial values. Similar techniques were used in selecting an ET rate; in this case, the model was run using ET rates ranging from 6 to 12 inches.

A major assumption in the procedures for adjusting input data so that computed and measured water levels were in agreement was that the summer 1931 and 1932 water levels were the most accurate input data. These water levels, therefore, were the last data to be adjusted. Water levels in the upland areas, which were not developed from the summer 1931 and 1932 measurements, were adjusted a number of times.

Transient Procedures

In running the model using the transient procedures, the water levels for the summers of 1931 and 1932 (fig. 8) were used as the initial water levels. The model was then run for the period January 1931 to September 1976 with the adjusted hydraulic conductivity, specific yield, elevations of the top and base of each part of the aquifer, and with other adjusted input data.

Normally, the initial water levels used in the model would have been smoothed by running the steady-state procedures to eliminate water-level irregularities that are caused by inadequacies in measurement, contouring, and coding. This was not done, however, because complete precipitation records for 1895 to 1931 are available for only 3 of the 15 weather stations in the study area. Therefore, recharge-discharge data necessary for generating the 1931-32 water levels are incomplete, and additional errors in the water levels would have occurred because of the inadequate climatic data. Thus steady-state procedures were used only to check and adjust some of the input values.

Output from the Flowx program, streamflows, and discharge from the Pumpage program were not modified while running the transient procedures. However, values for recharge (deep percolation) for parts of southwestern Custer County and southeastern Howard County were decreased by about 50 percent during the running of the transient procedures. Excessive simulated water-level rises were indicated for these areas when running the model for the calibration period of January 1931 to September 1976. Fine-grained materials beneath the surficial Valentine soils (fig. 3), which could not be directly included in the soil-water program, prevented complete deep percolation of water to the aquifer.

Hydraulic conductivity and specific-yield values were changed for a few nodes during running of the transient procedures. Plate 1e, 1f, 1g, and 1h indicate the final values used for these parameters.

Calibration of the ground-water model was considered complete when the computed 1976 water levels compared favorably with the measured 1976 water levels. Comparison of lines of equal water-level elevation prepared using computed water levels (fig. 15 with those measured water levels (fig. 11) shows good agreement, especially from Hall County eastward. West of Hall County the contour lines on the two figures are similar but show some divergence. The lines prepared from the computed water levels are more generalized and do not reflect the local effects of pumping and recharge as well as do the lines prepared from measured water levels.

Differences between computed water levels (fig. 15 and those derived from measurements in 1976 (fig. 11) are shown for each node on figure 16. For most nodes, the differences are less than 10 feet. Nodes for which differences are more than 10 feet are mostly in uplands where depths to water exceed 100 feet and where measured water-level data are sparse. The accuracy of water levels for individual nodes derived from measurements is plus or minus 5 feet, or one-half the contour interval of 10 feet used on work maps from which figure 11 was prepared.

A root-mean-square (RMS) analysis was performed on the 1976 computed and measured water levels as a check on the calibration of the model. This analysis involved the following: (1) Subtracting the computed from the measured 1976 water levels for each node, (2) squaring the differences,

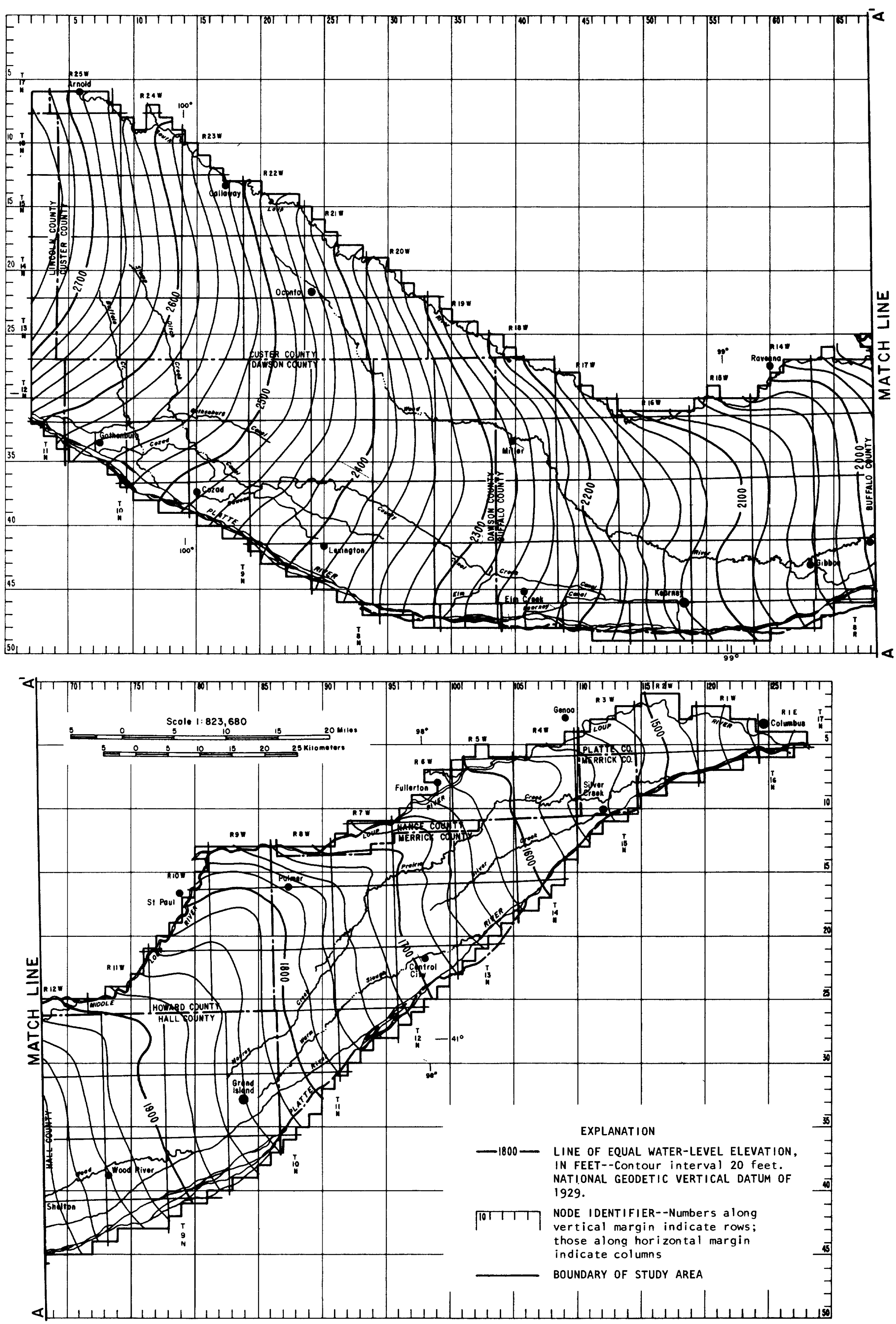

Figure 15.--Configuration and elevation of the water table, August 31, 1976, prepared from computed water levels.

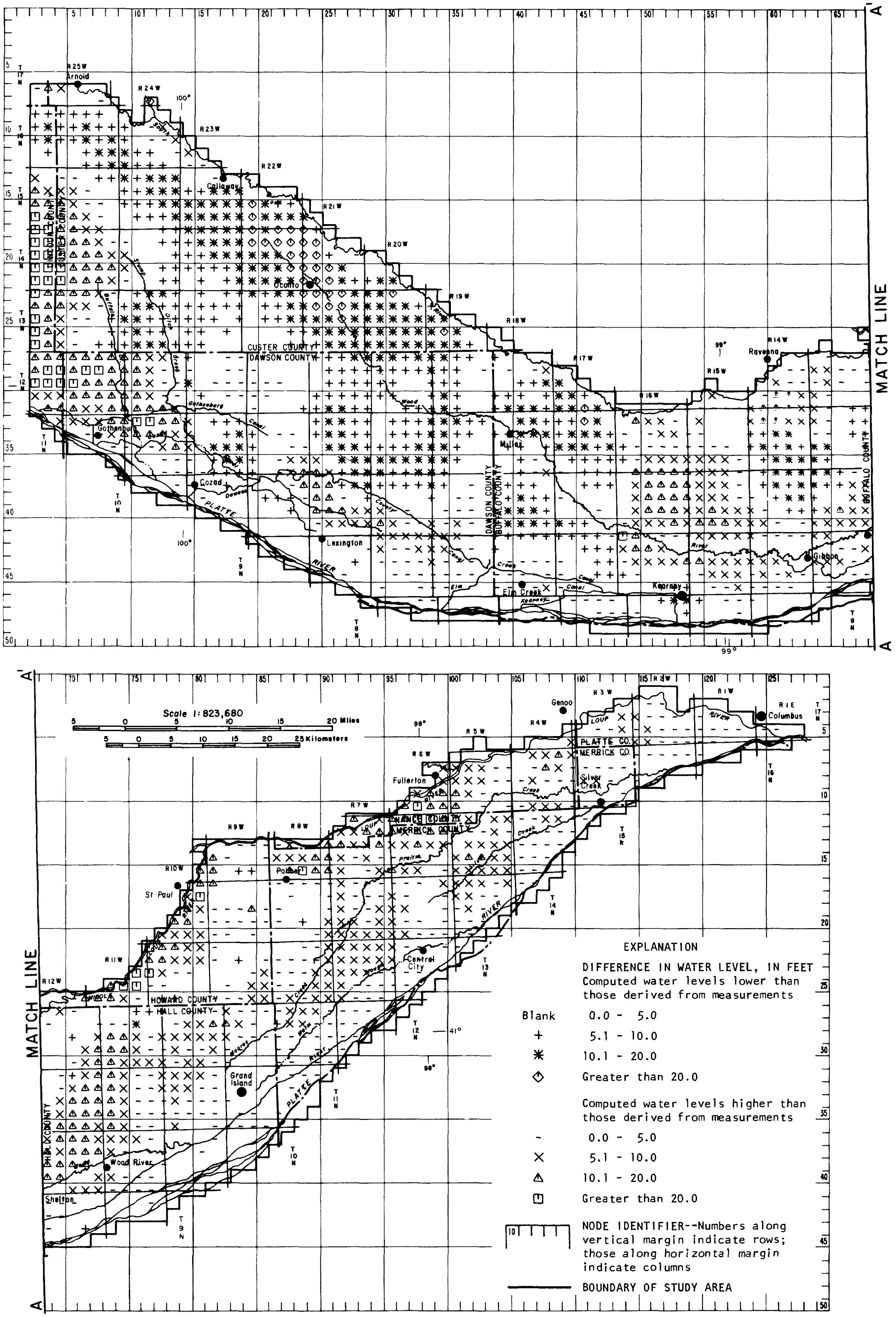

Figure 16.--Differences for individual nodes between computed water levels and those derived from measurements, 1976.

(3) adding all the squared differences for all the nodes, and (4) dividing this sum by the number of nodes and taking the square root of the result. The results of the RMS analysis, excluding the constant-head nodes, for all flood plain, terrace, and upland nodes, for flood plain and terrace nodes, and for upland nodes were 8.84, 7.76, and 9.66 feet, respectively. The lower RMS values (7.76) occur in the flood plain and terrace areas where both the 1931-32 and 1976 water-level data are more plentiful. Such RMS values, which are less than a water-level contour interval of 10 feet, indicate that water levels generated by the model are acceptable for this study.

Model-computed streamflows are compared to measured streamflows -- those computed from measurements and gaging records -- in table 10. The model-computed flows were generated using data on precipitation and on surface water (averaged for the nonirrigation pumping period of September through May) flowing into the study area. The model-computed flows represent streamflow for May 31; whereas, the measured flows are mean daily flows for the month of May.

It is unrealistic to expect that the computed flows for May 31 would match individual daily flows published for May 31. This is because individual daily flows are dependent upon the time relationship between precipitation, surface runoff, and surface-water discharges, and thus are highly variable. However, one might expect them to match the mean daily flows for May in which the time component is not as critical. This they do reasonably well.

Model-computed and measured streamflows for the irrigation pumping period of June through August compare less favorably than do the flows for the nonirrigation pumping period. This is due principally to the extreme variability in measured streamflows during this period, which is caused by variable precipitation and snowmelt along the upper reaches of the Platte River.

A check of the computational performance of the model was made by examining the balance of fluxes (flows) into and out of the aquifer. Table 11 indicates the rates of the different types of flux that were generated by the model for the irrigation pumping periods during 1931, 1950, 1960, 1970, and 1976. The sums of the rates in the last column are all extremely small, indicating that the model was not encountering stability or other numerical problems and that the model was properly processing and tabulating flux values. The negative storage values (ground water added to storage) and the large recharge values for 1950 and 1960 represent time periods during which precipitation was much higher than average.

Table 10.--Comparison of measured streamflows, in cubic feet per second, to those computed by the model

[Measured flow: Mean daily flow from published records. Computed flow: Model-generated flow for May 31]

Stream node	Gaging station reference site	May 1950		May 1956		May 1960	
		Measured flow	Computed flow	Measured flow	Computed flow	Measured flow	Computed flow
	South Loup River						
29, 60	At Ravenna	260	263	138	244	([1])	256
28, 67	At St. Michael	338	270	186	250	536	263
	Middle Loup River						
18, 79	At St. Paul	1,501	1,022	1,075	1,000	1,764	1,015
	North Loup River						
14, 80	Near St. Paul	1,223	903	930	903	1,481	903
	Loup River						
5, 110	Near Genoa	551	634	174	610	1,268	627
5, 125	At Columbus	906	775	332	748	1,990	770
	Wood River						
41, 48	Near Riverdale	16	19	1	10	21	27
42, 65	Near Gibbon	26	25	0	16	36	34
	Platte River						
39, 14	Near Cozad	289	147	24	76	336	188
48, 34	----------------	1,261	991	171	489	1,011	860
49, 46	Near Odessa	1,418	913	120	392	889	809
36, 87	Near Grand Island	1,646	980	169	471	1,400	859
8, 119	Near Duncan	1,885	990	288	474	2,244	872

Table 10.--Comparison of measured streamflows, in cubic feet per second, to those computed by the model--Continued

Stream node	Gaging station reference site	May 1965		May 1970		May 1976	
		Measured flow	Computed flow	Measured flow	Computed flow	Measured flow	Computed flow
	South Loup River						
29, 60	At Ravenna	([1])	252	143	248	([1])	241
28, 67	At St. Michael	547	258	201	256	217	250
	Middle Loup River						
18, 79	At St. Paul	1,532	1,009	708	1,008	888	1,003
	North Loup River						
14, 80	Near St. Paul	1,141	903	811	903	949	903
	Loup River						
5, 110	Near Genoa	1,148	621	49	621	259	618
5, 125	At Columbus	2,028	764	202	763	575	765
	Wood River						
41, 48	Near Riverdale	86	27	3	12	([1])	16
42, 65	Near Gibbon	129	31	2	18	.10	19
	Platte River						
39, 14	Near Cozad	149	419	548	572	130	244
48, 34	-----------------	896	1,116	1,921	1,668	936	971
49, 46	Near Odessa	1,065	1,022	1,720	1,554	845	857
36, 87	Near Grand Island	1,241	1,093	1,841	1,656	1,080	956
8, 119	Near Duncan	1,550	1,105	1,994	1,669	1,348	979

[1]No value reported.

Table 11.--Rates of water movement during irrigation pumping periods for selected years

[Rates, in cubic feet per second]

Period	Storage[1]	Constant gradient[2]	Recharge[3]	Pumping[4]	Evapotranspiration[5]	Constant head[6]		Sum
						Inflow	Outflow	
June-August 1931	566.28	40.06	34.62	-266.69	-133.17	78.00	-318.71	0.38
June-August 1950	-260.80	47.66	832.93	-181.84	-197.23	72.79	-313.12	.39
June-August 1960	-220.17	50.07	716.03	-92.04	-207.57	65.35	-313.26	-1.59
June-August 1970	1,090.04	52.64	78.34	-879.11	-138.30	85.29	-288.21	.69
June-August 1976	1,072.79	55.03	207.32	-925.29	-193.99	81.50	-296.52	.83

[1]Positive values indicate ground water removed from storage; negative values indicate ground water added to storage.

[2]Rate of underflow into western edge of study area along constant gradient nodes.

[3]Recharge to aquifer. Does not include recharge from excess surface water on surface-water irrigated lands.

[4]Total withdrawal during irrigation season from pumping of irrigation and municipal wells.

[5]Rate at which water is lost to evapotranspiration where water levels are within 5 feet of land surface.

[6]Rate of inflow or outflow through constant-head (stream) nodes. Inflow is water moving from stream to aquifer; outflow is water moving from aquifer to stream.

The cumulative water balance resulting from model computations for the entire calibration period, which ended on August 31, 1976, is given in table 12. The percent difference between inflow and outflow was less than 1 percent, which again indicates that the model encountered no problems in processing the fluxes.

Table 12.--Cumulative water balance resulting from computations for the calibration period 1931-1976

Inflow, in millions of cubic feet		
From storage	46,822	
From constant gradient flux[1]	68,866	
From recharge[2]	583,872	
From constant head, inflow[3]	107,291	
Total gains		806,851
Outflow, in millions of cubic feet		
To evapotranspiration[4]	239,878	
To constant head, outflow[3]	440,655	
To pumpage	126,258	
Total losses		806,791
Difference between gains and losses		60
Percent difference		0.01

[1]Underflow into western edge of study area across the constant-gradient nodes.

[2]Does not include recharge from excess surface water on surface-water irrigated lands.

[3]Inflow or outflow through the constant-head (stream nodes). Inflow is water moving from stream to aquifer; outflow is water moving from aquifer to stream.

[4]Rate by which water is lost to evapotranspiration where water levels are within 5 feet of land surface.

Sensitivity Analysis

The effects of data uncertainties on simulation results can be assessed, to a certain degree, by performing sensitivity analyses on the various types of input data for both steady-state and transient conditions. The sensitivity of the model was examined by adjusting hydraulic conductivity, specific yield, and recharge within their expected ranges and observing the resulting changes in computed water levels.

Results of sensitivity analyses indicated that water levels were more responsive to adjustments in recharge than to adjustments in hydraulic conductivity or in specific yield by a factor of at least 2. Also, the magnitude of changes in water levels in response to adjustments in discharge and in ET losses are similar to the magnitude of changes in response to adjustments in recharge.

Potential Uses and Limitations of the Calibrated Model

A variety of management alternatives or predictive schemes can be examined utilizing the calibrated model. However, careful construction and application of the predictive schemes must be followed or erroneous results will be produced. Also, there are limitations on what the model can predict with reasonable accuracy even if good techniques are employed.

The calibrated model can be used to examine effects on the hydrogeologic system of a variety of ground-water development rates, irrigation-application rates, surface-water irrigation projects, and streamflow changes. Alternatives in ground-water development might include: no additional development, cutbacks in development, or additional development at different rates estimated by a variety of procedures.

Alternatives in rates of applying irrigation water might be based on existing technology, future technology, or expected changes in farm practices. An examination of literature on existing technology reveals that the irrigation-application rates vary significantly with type of cultivation, of weed-control programs, and of irrigation-scheduling procedures. Future technology may reduce rates at which irrigation water must be applied through development of more drought-resistant varieties of plants and through the use of more water-efficient farming practices. Changes in farming practices might include the growing of crops that require less water or deliberately using less irrigation water than is required to achieve maximum yield.

Numerous alternatives relating to surface-water use are possible for the study area. Present surface-water irrigated acreage in Dawson and Buffalo Counties might be altered so that more or less ground water for irrigation may be required. Irrigation projects using surface water have been proposed for Buffalo and Hall Counties that might provide recharge to the ground-water system and reduce ground-water pumping by converting some ground-water irrigated lands to surface-water irrigation.

Variations in the flows of the boundary streams are possible in the future because of additional diversions either within the study area or upstream, or because of additional ground-water irrigation in upstream areas, or both. The probable effects of these variations on the hydrology of the study area can be examined in the ground-water flow model by varying flows in the boundary streams.

The model should not be used to examine management alternatives that it was not designed to handle. For example, this model was not designed to handle relationships between streamflows and bank storage in the ground-water system during floods. Nor was it designed to handle alternatives relating to economics, government policies, and numerous other items.

MANAGEMENT ALTERNATIVES EXAMINED

Selecting management alternatives to be examined with a ground-water flow model is often difficult because water-resources development is uncertain. A technique commonly used is to identify a type of development likely to take place and to describe the effects on the hydrology of the area for both an assumed lowest and assumed highest probable rate of development. At least tentative management decisions can be made using results of interpolation between the effects of the assumed lowest and highest probable rates of development.

Also, the number of alternatives that can be examined is limited by practicable considerations of cost and time. It is important, therefore, that the alternatives selected for examination be realistic and meet the perceived needs of planning agencies. To assure this, the alternatives were selected in close consultation with personnel of both cooperating agencies.

The management alternatives examined pertain to three major areas of concern. These are as follows: (1) The effects on ground-water levels and on streamflows that might result from diverting annually within the study area an additional large volume of water from the Platte River; (2) the effects on water levels and on streamflow if no new ground-water irrigation development takes place from 1980 through

2020, but if five different irrigation-application rates are used; and (3) the effects on water levels and on streamflow if the annual rate of irrigation development of irrigable but unirrigated land is 2, 5, or 8 percent and if the irrigation-application rates are less than, equal to, or greater than CIR.

Additional Diversion of Water from the Platte River

The first management alternative examined is the diversion of an additional 125,000 acre-feet of water per year from the Platte River. This alternative is based on a plan to divert as much as 125,000 acre-feet per year for a proposed irrigation project outside the Platte River Basin. Water for the proposed irrigation project would be diverted from the Central Nebraska Public Power and Irrigation District's Tri-County Canal. Without this diversion, this water would be returned to the Platte River at stream node 47,28 -- the Johnson Power Return on figures 4 and 5. The maximum rate of diversion is set at 450 cubic feet per second, and at no time would it be allowed to exceed 75 percent of the flow of the Platte River. Diversions are to be permitted between September 1 and January 15, with additional diversions permitted after April 1, if necessary to obtain 125,000 acre-feet. However, for modeling purposes, all diversions are made between September 1 and January 15.

The first step in analyzing this management alternative was to run the ground-water model using steady-state procedures. The 1976 water-level configuration map (fig. 11) was used as the initial water levels. The net recharge or discharge values used were the average values for the 1931 to 1976 climatic period with 1976 irrigation-well distribution and land use. Output from running the steady-state procedures were "smoothed" 1976 water levels. Irregularities in the measured 1976 water levels and errors and irregularities in hydraulic conductivity and recharge-discharge values were lessened by developing the "smoothed" water levels.

The final step was to run the ground-water flow model with transient procedures. In this step, the "smoothed" 1976 water levels were used as the initial water levels. The 1957 water-year streamflow and climatic data and the 1976 irrigation-well distribution and land-use data were used to generate net recharge or discharge values for each node for a 1-year period. This was repeated five times using the same data to generate 5 years of data.

The rationale for the previous procedures is as follows: First, this alternative has been examined earlier using a ground-water flow model developed for the Platte River Basin, Nebraska Level B Study (Lappala and others, 1979). The purpose of this current examination is to update the earlier results to 1976 ground-water conditions. Second, this current examination of the alternative was performed before the present ground-water flow model was completely calibrated. Therefore, steady-state procedures were used to develop the "smoothed" 1976 water levels used as input for the transient procedures instead of model-computed 1976 water levels. Third, 1976 data on irrigation-well distribution and land use were used to generate recharge-discharge data because they correspond in time to the 1976 water levels. Fourth, climatic data for the 1931-76 period were used in order to include a wide variety of climatic conditions. Finally, streamflow values used for stations along the Platte River were those of the 1957 water year, because they are typical of those one might expect during a prolonged period of low flow. This is indicated by the fact that the 1957 annual flow at Grand Island was 483,000 acre-feet, which is close to the 479,000 acre-feet average for the 1953-57 period -- the period of lowest prolonged streamflow on record since closure of the dam on Lake McConaughy.

The output from two model runs using transient procedures are two sets of data, one indicating what the water levels would be with the diversion, and the other indicating what the water levels would be without the diversion. The differences between these sets of water levels for March 31, after 5 years of simulation are shown on figure 17 It should be noted that the differences are those that developed following a prolonged 5-year period of low flow. They clearly would be less following shorter prolonged periods of low flow, or periods of normal or high flows. It should also be noted that a diversion of 125,000 acre-feet of water represents 26 percent of the annual flow at Grand Island for the 1957 water year. However, this diversion would represent only 12 percent to less than 5 percent of the annual flow for normal- or high-flow years, respectively.

An evaluation of figure 17 indicates that the declines in water levels greater than 5 feet would occur in 36 nodes, and that declines greater than 10 feet would occur in 3 nodes. The maximum decline would be 10.7 feet in node 33,87. The pattern of declines was well established within the first 2 years of the 5-year period; during the remaining 3 years, both the amount of decline and the areal extent of the decline increased.

The slight decline in water level just south of Elm Creek, near stream node 48,40, at the Kearney Canal diversion site would be the result of the decrease in return flows from the Johnson Power Return at stream node 47,28.

The effects of pumpage in the Grand Island well field, which is on an island in the Platte River near stream node 39,84, were not evaluated. Inclusion of this well field would most likely produce increased water-level declines in this area because of the additional water pumped from the aquifer.

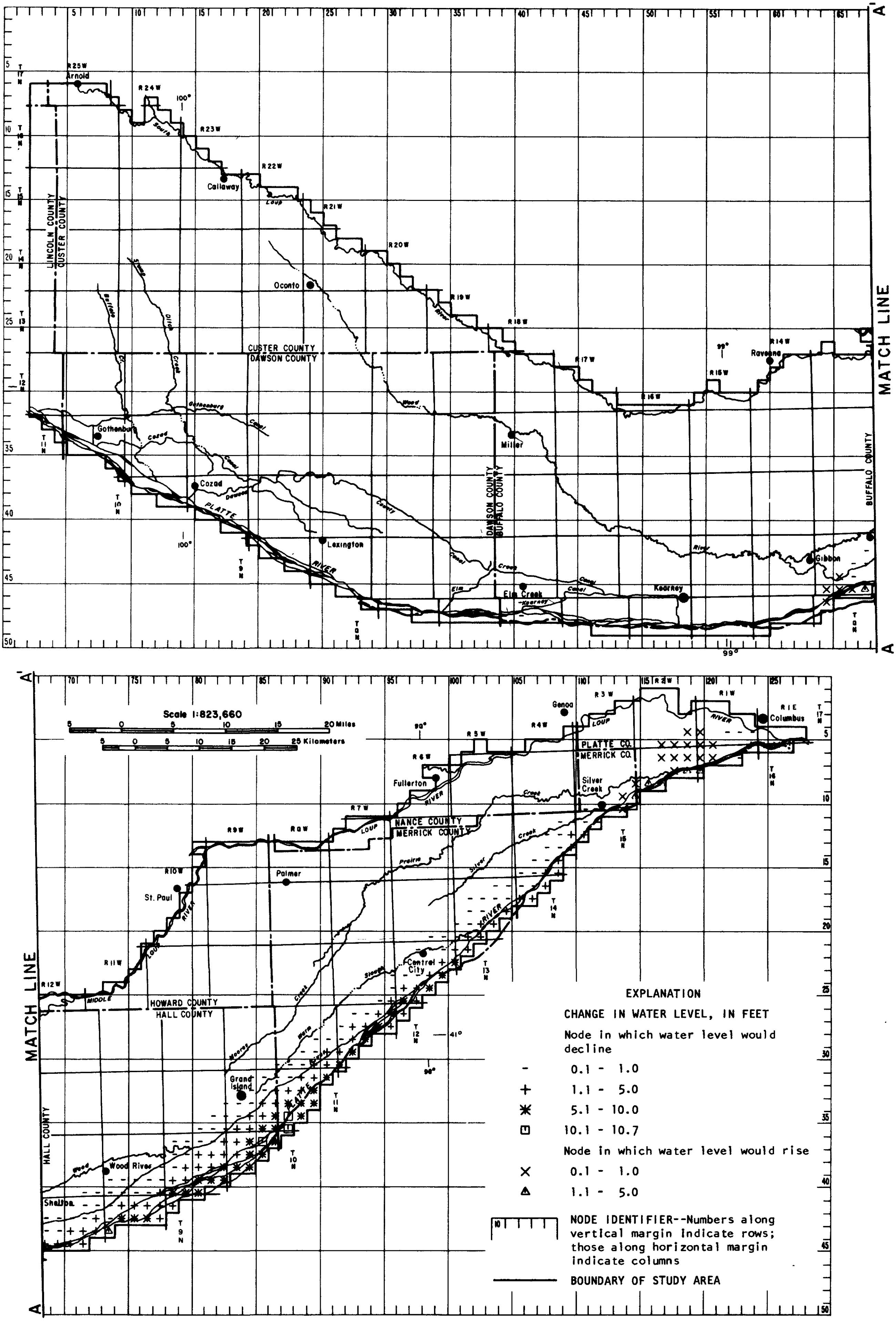

Figure 17.--Effects on March 31 water levels of diverting an additional 125,000 acre-feet of water from the Platte River for 5 years.

Recharge from the Loup River affects the area from columns 113 through 126 when the Platte River is dry. Evidently, when the Platte River is dry, water flows from the Loup River through the aquifer toward the dry channel of the Platte River.

The effects that the additional diversion would have on flow in the Platte River are shown in table 13. The measured flows are the mean daily flows reported for each of the months in the U.S. Geological Survey annual water-data report for 1957. The computed flows by the ground-water model and by other procedures (State of Nebraska, 1978) are those that would have occurred in 1957 had there been diversion of an additional 125,000 acre-feet that year. Whereas, without the diversion, the Platte River was dry at Grand Island in September and October and near Duncan in December. Had there been the diversion, it would have been dry the entire period of September through March.

The declines in water levels and streamflows projected as a result of additional diversion are for a period following 5 years of low streamflow in which the Platte River was dry for as much as 6 months annually. The declines projected would have been less had they been applied to a period of normal streamflow.

No New Ground-Water Irrigation Development After 1980

Before this set of management alternatives could be examined, the calibrated ground-water flow model had to be extended from September 1, 1976, to August 31, 1980. Data on irrigated acres from 1977 to 1980 were generated by the same procedures used in generating data on irrigated acres from 1931 to 1976. Climatic and streamflow data for the 1951 through 1954 period were used in the recharge-discharge model to represent the 1977 through 1980 period. The use of the existing 1951-54 data instead of the 1977-80 data allowed a considerable savings in time and effort in running this and the final management alternative. The use of this shortcut does not impair the predictive results, since the objective of the predictive schemes was not 1980 water levels but water levels in the 1990's through 2020.

To examine this management alternative, it was necessary to know the acres irrigated in 1980 (fig. 7). In addition, the acres suitable for irrigation (fig. 18) and acres suitable but not irrigated as of 1980 (table 14) were developed for each node. The acres suitable for irrigation were determined by examining both the hydrologic properties of the soils and the hydrogeologic limitations of the aquifer. Urban areas were excluded, but no areas were excluded because of hydrogeologic limitations of the aquifer.

Table 13.--Effect of diversion of an additional 125,000 acre-feet on streamflows in the Platte River had the diversion occurred during the 1957 water year

[Measured streamflows are actual flows without diversion. Computed streamflows are flows that would have occurred with diversion.]

Month and year	Average flow, in cubic feet per second								
	Platte River at Overton[1]			Platte River at Grand Island[2]			Platte River near Duncan[3]		
	Measured	Computed by others[4]	Computed by model	Measured	Computed by others[4]	Computed by model	Measured	Computed by others[4]	Computed by model
September 1956	55	14	13	0	0	0	0	0	0
October 1956	404	111	110	0	0	0	0	0	0
November 1956	641	192	191	139	0	0	0	0	0
December 1956	573	203	202	267	0	0	128	0	0
January 1957	607	157	156	200	0	0	154	0	0
February 1957	723	360	359	683	0	0	564	0	0
March 1957	665	665	664	769	0	0	820	0	0
April 1957	802	677	676	958	827	630	979	587	629
May 1957	2,479	2,479	2,478	2,444	2,444	2,400	2,293	2,293	2,367
June 1957	1,636	1,636	1,635	2,233	2,233	1,530	2,453	2,453	1,495
July 1957	339	339	338	307	307	233	409	409	200
August 1957	157	157	156	6	6	67	4	4	32

[1]Stream node 48, 34
[2]Stream node 36, 87
[3]Stream node 8, 119
[4]From State of Nebraska, 1978

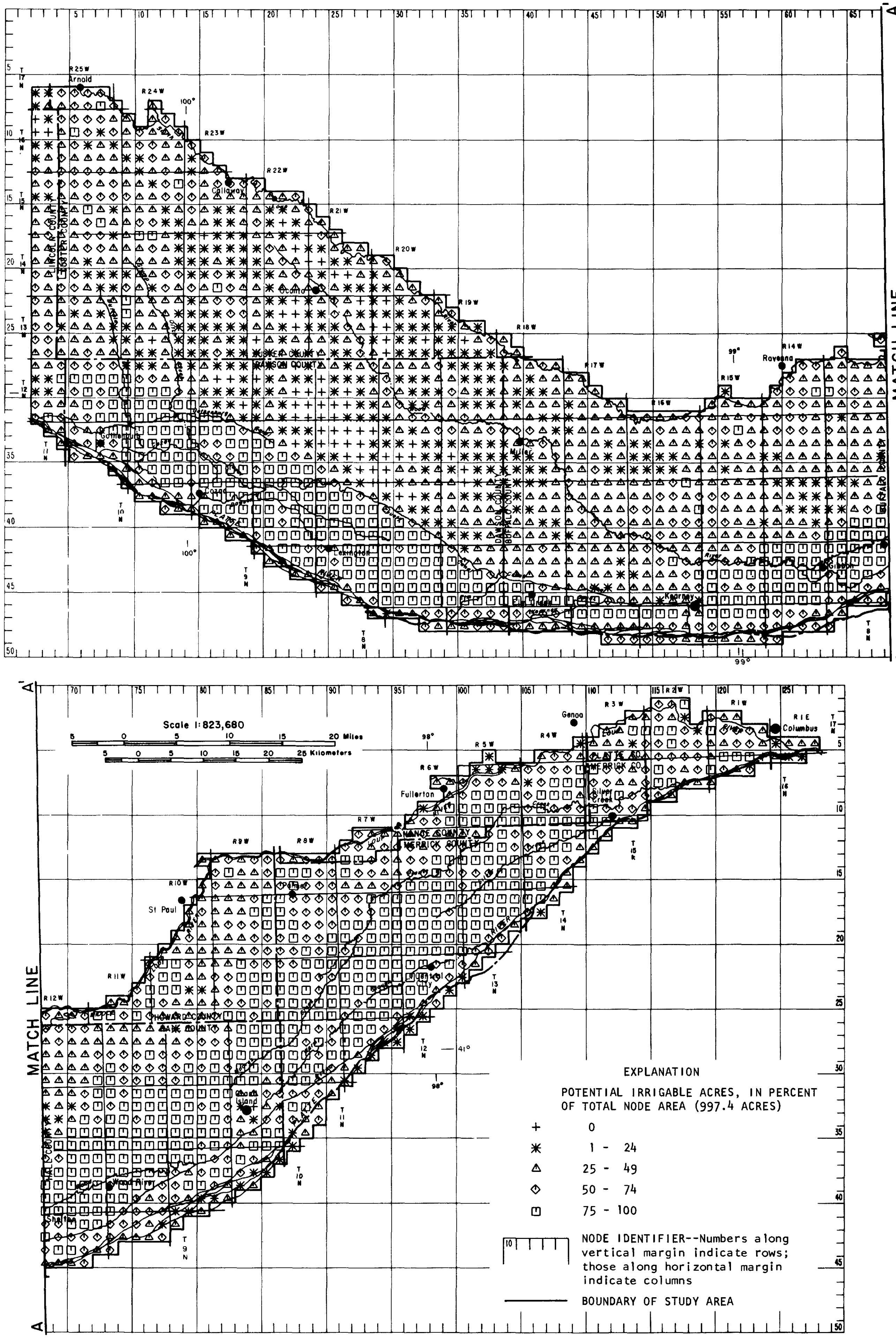

Figure 18.--Land suitable for irrigation.

Table 14.--Irrigation status in 1980 of land, in acres, within study area

County	Land suitable for irrigation	Land irrigated	Land suitable for irrigation but not irrigated
Custer	160,000	50,000	110,000
Dawson	300,000	160,000	140,000
Buffalo	280,000	150,000	130,000
Hall	200,000	140,000	60,000
Merrick	240,000	140,000	100,000
Howard	77,000	30,000	47,000
Nance	65,000	26,000	39,000
Platte	58,000	33,000	25,000

The 1980 level of ground-water irrigation development is considered to be the zero or the no-additional-development management alternative. The following procedures and conditions applied in the examination of this alternative:

(1) The 1951 to 1970 climatic and streamflow data were used to obtain 1 through 20 years and 21 through 40 years of predictive data to be used, in turn, as input for the 40-year predictive period. Data for this period were selected because this period occurred after the Tri-County Canal system and Lake McConaughy became operational in the early 1940's. Also, it contained wet, normal, and dry periods, and thus appeared to have been a representative period. The average annual precipitation for all the weather stations for the period was 0.65 inches more than for the 1931-76 period -- a period that included the very dry 1930's.

(2) Five different irrigation-application rates recommended by cooperators, in order of increasing magnitude, were considered: (a) 80 percent of CIR; (b) low rates of 8.8 inches per year in Buffalo County eastward and 10.2 inches per year in Dawson and Custer Counties; (c) CIR; (d) medium rates of 11.0 inches per year in Buffalo County eastward and 12.75 inches per year in Dawson and Custer Counties; and (e) high rates of 13.75 inches per year in Buffalo County eastward and 16.0 inches per year in Dawson and Custer Counties. CIR differs with soil group and crop. Specifically, how it differs in this study area can be seen in table C of "Additional Information."

Following the procedures and conditions mentioned, a modified Pumpage program was used to generate recharge and discharge data for the predictive period. The ground-water flow model then was run to simulate the 40-year predictive period, and output results indicate projected water levels for each of the application rates. Literally hundreds of combinations of time spans and application rates might have been examined. For this report, however, results of examination of only a few such combinations have been chosen for presentation and are given in plate 2a, 2b, 2c, and 2d.

Plate 2a and 2b bracket the range of application rates and show what is likely to happen to water levels by the year 2000 at a low rate of irrigation application (80 percent of CIR) and a high rate. Plate 2c indicates what is likely to happen at a medium rate (CIR) of irrigation application. Similar illustrations could have been presented for the remaining two application rates indicated in (b) and (d) above; they would have shown intermediate water-level declines relative to those on the plate presented.

The projected water-level declines shown in the plate are relative to water levels of August 31, 1976. Water levels of 1976 were used as the base for comparison rather than those for 1980 because they are calibrated water levels and, thus, are more accurately defined. The time span involved is about 24 years.

The declines in water level that might be expected by May 31, 2020, which marks the end of a predictive time span of 44 years, are indicated on plate 2d. The further we project into the future, the greater the uncertainty. Thus, no attempt is made to "bracket" a range in application rates, as was done for the shorter predictive period. Instead, the CIR application rate, which is the rate that will satisfy the consumptive-irrigation requirements of the crops, is used for the longer predictive period.

Comparison of plate 2a, 2b, and 2c clearly shows that both the areas and magnitudes of water-level declines will differ significantly depending on which irrigation-application rate is used. If an application rate of 80 percent of CIR is used (fig. 2a), declines of more than 20 feet below 1976 levels can be expected in several areas comprising about 10 percent of the study area. The maximum decline to be expected will be between 40 and 59 feet in an area north of the city of Wood River.

If an application rate exceeding CIR (fig. 2b) is used, declines of more than 20 feet below 1976 levels can be expected in nearly half the study area; declines of more than 40 feet will be common. The maximum decline will be between 120 and 139 feet in the area north of the city of Wood River.

If an application rate equal to CIR is used (fig. 2c), declines of more than 20 feet below 1976 levels can be expected in about 20 percent of the study area; declines of more than 40 feet can be expected in two areas. The maximum decline expected will be between 60 and 79 feet, again in the area north of the city of Wood River.

Plate 2d shows projected water-level declines by 2020, assuming an application rate equal to CIR. This plate can be compared logically only with plate 2c, with which it shares a common application rate. Areas and magnitudes of water-level decline on plate 2d are greater than those on plate 2c simply because the predictive period involved is longer.

Water-level declines that may be expected if the higher application rates are used will be so great that parts of the aquifer from Hall County eastward will be completely dewatered. The number of nodes that will be dewatered by the year 2020 for the CIR and the high irrigation-application rates are 11 and 99, respectively.

Balance in the rates of flux into and out of the aquifer for the CIR application rate is indicated in table 15. A comparison of this table with table 11 indicates that much less water would be lost to ET from the shallow water-table areas under this alternative than has been lost historically. This is to be expected, because ET from the shallow water-table areas ceases when the depth to water exceeds 5 feet, and with the greater water-level declines, the areas within 5 feet of the land surface become smaller.

The projected effects that the different irrigation-application rates would have on streamflow in the years 2000 and 2020 are presented in table 16. The model-computed streamflow for May 31, 1970, represents the 20th year of the 1951 to 1970 climate and streamflow data that were used to generate the predictive recharge-discharge data for the model. Depletions shown, therefore, are the amounts by which the flows in 2000 and 2020 will fail to match those in 1970.

Most of the stream nodes for which depletions are given are at stream-gaging locations. The first stream node listed for the Platte River is node 32,2 on the western edge of the study area; so, as indicated by the zeros in table 16, there will be no depletions at this stream node if this management alternative is followed. Likewise, no depletions will occur at stream nodes 14,80 along the North Loup River and 8,98 along the Cedar River. At each of the remaining stream nodes, the expected depletions increased with the irrigation-application rate. Also, in nearly all cases, depletions will be higher in 2020 than in 2000. The exception will be for the Wood River near Gibbon and near Chapman, where the model indicates that there would be little or no flow on May 31 in either year as projected depletions equal computed flows.

Table 15.--Rates of water movement for the alternative that assumes no new ground-water irrigation development after 1980 and an application rate equal to consumptive-irrigation requirements

[Rates, in cubic feet per second]

Period	Storage[1]	Constant gradient[2]	Recharge[3]	Pumping[4]	Evapotranspiration[5]	Constant head[6]		Sum
						Inflow	Outflow	
June-August 1990	1,783.71	65.89	206.35	-2,020.27	-18.52	159.82	-176.23	0.75
June-August 2000	4,007.80	70.08	39.19	-4,120.71	-11.77	164.33	-156.96	-8.05
June-August 2010	1,714.79	75.78	206.35	-2,027.95	-11.56	187.53	-143.98	.97
June-August 2019	1,187.68	78.12	100.03	-1,364.40	-13.89	164.04	-150.60	.97
September-May 2020	-394.29	78.09	358.76	-19.88	-16.19	152.91	-160.15	.75

[1] Positive values indicate ground water removed from storage; negative values indicate ground water added to storage.

[2] Rate of underflow into western edge of study area along constant gradient nodes.

[3] Recharge to aquifer. Does not include recharge from excess surface water on surface-water irrigated lands.

[4] Total withdrawal during irrigation season from pumping of irrigation and municipal wells.

[5] Rate at which water is lost to evapotranspiration where water levels are within 5 feet of land surface.

[6] Rate of inflow or outflow through constant-head (stream) nodes. Inflow is water moving from stream to aquifer; outflow is water moving from aquifer to stream.

Table 16.--Projected streamflow depletions for the years 2000 and 2020 compared to computed streamflow of 1970 for three rates of ground-water irrigation application assuming no new ground-water development after 1980

[Streamflow and depletions, in cubic feet per second]

Stream node	Gaging station reference site	Model computed stream-flow, May 31, 1970	Depletions					
			Applying 80 percent of CIR		Applying CIR		Applying at a high rate[1]	
			May 31, 2000	May 31, 2020	May 31, 2000	May 31, 2020	May 31, 2000	May 31, 2020
	South Loup River							
29, 60	At Ravenna	248	33	41	38	49	49	64
28, 67	At St. Michael	256	35	45	41	53	53	71
	Middle Loup River							
18, 79	At St. Paul	1,008	41	53	47	63	64	87
	North Loup River							
14, 80	Near St. Paul	903	0	0	0	0	0	0
	Cedar River							
8, 98	Near Fullerton	240	0	0	0	0	0	0
	Loup River							
5, 110	Near Genoa	621	47	61	55	74	78	106
5, 125	At Columbus	763	51	65	60	78	90	119
	Wood River							
41, 48	Near Riverdale	12	7	9	8	10	11	12
42, 65	Near Gibbon	18	17	17	17	17	18	18
39, 70	Near Chapman	16	16	16	16	16	16	16
	Platte River							
32, 2	----------------	560	0	0	0	0	0	0
39, 14	Near Cozad	572	6	8	9	12	13	17
48, 34	----------------	1,668	16	19	23	30	36	48
49, 46	Near Odessa	1,554	19	24	29	38	47	62
36, 87	Near Grand Island	1,656	49	61	66	87	121	153
8, 119	Near Duncan	1,669	67	77	93	123	176	219
5, 127	-----------------	2,433	119	152	154	202	267	342

[1]High rate is 13.75 inches in Buffalo County and eastward and 16.0 inches in Dawson and Custer Counties.

The depletions projected in table 16 apply only to May 31. However, they are typical of the magnitude of the depletions that can be expected for any day during the nonirrigation period of September through May.

Irrigation Development at Selected Rates from 1981 to 2020

To assume no new irrigation development after 1980, as was done in the previous section, is instructive but somewhat unrealistic. New lands will undoubtedly be brought under irrigation using ground water, but the rate at which this will occur is uncertain. Recognizing this uncertainty, both cooperators agreed that we should bracket what they believed to be a high development rate and a low development rate, and that we should consider, in addition, one intermediate rate. Thus, a decision was reached to examine the effects on ground-water levels of development rates that would annually convert to irrigation 2, 5, or 8 percent of the acres irrigable but unirrigated at the end of each predictive year. The period simulated was from 1981 to 2020.

The effects on ground-water levels will depend significantly on the rate at which irrigation water will be applied. Irrigation application rates of 80 percent of CIR, CIR, and 120 percent of CIR were examined. Results are presented for all three application rates in 2000 and the CIR application rate in 2020.

Climatic and streamflow data for the period 1951 to 1970 were used to represent equivalent data for the periods 1981 to 2000 and 2001 to 2020.

New acres assumed to be developed for irrigation each year were selected by counties using a random-procedures program provided by Richard A. Kern, Nebraska Natural Resources Commission (personal commun., 1981). This program selected nodes and tested whether they contained the minimum acres required for development -- at least 10 acres of irrigable but unirrigated lands in terraces and flood plains, or at least 100 acres in uplands. If a randomly-selected node did not contain the minimum required acres, the node was not used and another was randomly selected. The selection and testing process continued until the required percentage of acres was selected for each county. This procedure was repeated for each year of the predictive period or until all irrigable plots of adequate size in the county had been placed under irrigation.

Table 17 contains information on the projected irrigated acres and projected irrigable but not irrigated acres for 1990, 2000, 2010, and 2019 (the last irrigation pumping period used in the predictive period)

Table 17.--Projected irrigated acreages for selected years for 2, 5, or 8 percent annual ground-water irrigation development rates

County	Suitable for irrigation (acres)	Rates of develop-ment (Percent)	1990		2000		2010		2019	
			Suitable for irri-gation but not irrigated (acres)	Projected for irri-gation (acres)	Suitable for irri-gation but not irrigated (acres)	Projected for irri-gation (acres)	Suitable for irri-gation but not irrigated (acres)	Projected for irri-gation (acres)	Suitable for irri-gation but not irrigated (acres)	Projected for irri-gation (acres)
Custer	160,000	2	92,000	68,000	75,000	85,000	62,000	98,000	52,000	108,000
		5	68,000	92,000	41,000	119,000	26,000	134,000	17,000	143,000
		8	50,000	110,000	23,000	137,000	11,000	149,000	6,000	154,000
Dawson	300,000	2	114,000	186,000	93,000	207,000	76,000	224,000	64,000	236,000
		5	84,000	216,000	50,000	250,000	30,000	270,000	19,000	281,000
		8	61,000	239,000	26,000	274,000	11,000	289,000	5,000	295,000
Buffalo	280,000	2	106,000	174,000	87,000	193,000	71,000	209,000	59,000	221,000
		5	78,000	202,000	47,000	233,000	28,000	252,000	18,000	262,000
		8	56,000	224,000	25,000	255,000	11,000	269,000	5,000	275,000
Hall	200,000	2	49,000	151,000	40,000	160,000	33,000	167,000	28,000	172,000
		5	36,000	164,000	22,000	178,000	14,000	186,000	9,000	191,000
		8	27,000	173,000	12,000	188,000	6,000	194,000	3,000	197,000
Merrick	240,000	2	82,000	158,000	68,000	172,000	56,000	184,000	47,000	193,000
		5	61,000	179,000	35,000	202,000	24,000	216,000	16,000	224,000
		8	45,000	195,000	21,000	219,000	11,000	229,000	7,000	233,000
Howard	77,000	2	38,000	39,000	31,000	46,000	26,000	51,000	21,000	56,000
		5	28,000	49,000	17,000	60,000	10,000	67,000	6,000	71,000
		8	20,000	57,000	9,000	68,000	4,000	73,000	2,000	75,000
Nance	65,000	2	32,000	33,000	26,000	39,000	22,000	43,000	18,000	47,000
		5	24,000	41,000	15,000	50,000	9,000	56,000	6,000	59,000
		8	17,000	48,000	8,000	57,000	4,000	61,000	3,000	62,000
Platte	58,000	2	20,000	38,000	16,000	42,000	13,000	45,000	11,000	47,000
		5	15,000	43,000	8,000	50,000	5,000	53,000	3,000	55,000
		8	10,000	48,000	4,000	54,000	1,000	57,000	0	58,000

for annual ground-water irrigation development rates of 2, 5, and 8 percent. An examination of this table shows significant differences in the projected irrigable acres, especially between the 2 and 8 percent development rates.

Data obtained as just described were used in a modified version of the Pumpage program discussed in an earlier section. Outputs from the Pumpage program were recharge and discharge data that were used in the calibrated ground-water model. Output from the ground-water model was then used to construct plate 3a to 3h.

Plate 3a and 3b show areas and magnitudes of water-level declines to be expected by the year 2000 if the rate of irrigation development is 2 percent. Both the area and the magnitude of the declines increases with the rate of application.

Plate 3c and 3d show areas and magnitude of water-level declines to be expected by 2000 if the rate of irrigation development is 5 percent, and plate 3e and 3f show areas and magnitude of water-level declines to be expected by 2000 if the rate of irrigation development is 8 percent. The same pattern of increased area and increased severity of decline are evident in these illustrations as was mentioned for plate 3a and 3b.

Maximum water-level decline, regardless of which plate is consulted, will occur north of the city of Wood River. As for the previous management alternative, declines are projected from August 31, 1976, instead of 1980. By the year 2000, the maximum decline below the August 31, 1976, water levels, for each development rate with an application rate of 120 percent of CIR, will be between 80 and 99 feet. Also, by 2000 declines of 60 to 79 feet will develop northwest of Cozad and northeast of Grand Island if water is applied at 120 percent of CIR.

Water-level declines that may be expected by 2020, if rates of irrigation development are 2 percent and 8 percent, respectively, are shown in plate 3g and 3h. For each rate of development, only the CIR application rate was presented. Because of the tentative nature of a 40-year projection and the need for economizing space in this report, illustrations are not included for the 5-percent development rate nor for application rates of 80 and 120 percent of CIR.

In plate 3g water-level declines of 100 to 119 feet are projected for the year 2020 north of the city of Wood River and along the western boundary of Merrick County. Such declines are more extensive and up to 40 feet greater than declines projected through the year 2000 for the same development and application rates (plate 3b).

As plate 3h indicates, a development rate of 8 percent through the year 2020 will result in much more extensive water-level declines than any of the management alternatives previously described. These declines are up to 60 feet greater than those representing the same development and application rates for the year 2000. Also, declines of 80 to 99 feet will occur in a small area northwest of Cozad. Maximum water-level declines by the year 2020 will be 120 to 139 feet north of the city of Wood River and northeast of Grand Island.

The rates of flux generated by the ground-water model, assuming an application rate equal to CIR and annual irrigation-development rates of 2, 5, and 8 percent, are listed in table 18. The rates are for the 1990, 2000, 2010, and 2019 irrigation pumping periods and for the 2020 nonirrigation pumping period. A comparison of data in this table to data in table 14 indicates the projected effects of additional ground-water irrigation development. The amount of pumping will have increased by, in some cases, as much as a factor of two.

Fluctuations in pumping, recharge, storage, and the other parameters listed in table 18 can be explained, in part, by variations in the climatic data used as input for the 40-year interval. Thus, it is useful to compare rates of flux for years for which the same climatic and streamflow data were used. These are, in one case, the years 1960 (from table 11), 1990, and 2010 and, in another case, the years 1970 (from table 11), 2000, and 2020. Such comparisons indicate that with additional development the volume of pumpage and water removed from the aquifer (storage) increase, that flow from the stream to the ground-water system (inflow) likewise increases, and that recharge from infiltration through the soil zone to the aquifer decreases. Also, the amount of water loss to ET decreases as development increases. The net effect is a decrease in the volume of ground water stored in the aquifer and a lowering of water levels.

The water-level declines will become larger as the application rates and the irrigation-development rates increase, and parts of the aquifer east of the Buffalo-Hall County line will be dewatered. The number of nodes that will be dewatered by the year 2020 with 2, 5, and 8 percent irrigation-development rates and with an application rate equal to CIR will be 15, 25, and 28, respectively.

The projected effects of different rates of irrigation development and of different rates of application on streamflow are shown in table 19. The depletions are compared to computed streamflow of May 1970 for reasons discussed previously in the section "No New Ground-Water Irrigation Development after 1980." Data in this table indicate that increased streamflow depletions accompany increased development and application rates.

Table 18.--Rates of water movement for ground-water irrigation development rates of 2, 5, and 8 percent and a rate of application equal to consumptive-irrigation requirements

[Rates, in cubic feet per second]

Period	Storage[1]	Constant gradient[2]	Recharge[3]	Pumping[4]	Evapotranspiration[5]	Constant head[6]		Sum
						Inflow	Outflow	
			2 percent development rate					
June-August 1990	2,254.95	64.36	136.86	-2,433.87	-15.16	160.39	-166.26	1.26
June-August 2000	5,135.36	68.00	27.10	-5,268.77	-6.85	172.64	-134.96	-7.45
June-August 2010	1,963.21	71.18	31.54	-2,102.47	-8.03	173.84	-128.71	.55
June-August 2019	2,047.90	72.81	48.67	-2,226.09	-7.36	180.16	-116.15	-.07
September-May 2020	-492.37	73.35	394.91	-5.04	-9.49	166.03	-128.47	-1.09
			5 percent development rate					
June-August 1990	2,785.46	64.14	103.08	-2,951.24	-11.36	163.81	-154.23	-.34
June-August 2000	6,108.74	67.58	24.87	-6,299.33	-4.62	191.31	-114.71	-26.17
June-August 2010	2,436.60	69.24	23.89	-2,622.47	-5.08	203.25	-104.10	1.33
June-August 2019	2,457.27	69.81	41.28	-2,691.32	-4.62	220.81	-92.05	1.18
September-May 2020	-569.11	70.40	413.72	-5.03	-6.26	200.31	-105.05	-1.02
			8 percent development rate					
June-August 1990	3,107.44	65.12	71.63	-3,263.91	-9.06	171.78	-145.81	-2.81
June-August 2000	6,572.92	69.17	24.70	-6,793.91	-3.25	209.83	-101.57	-22.11
June-August 2010	2,568.49	70.05	22.82	-2,790.80	-3.87	226.79	-93.36	.11
June-August 2019	2,552.44	69.74	39.90	-2,820.13	-3.78	245.54	-83.24	.48
September-May 2020	-603.64	70.17	419.07	-5.03	-5.01	220.10	-96.66	-.99

[1]Positive values indicate ground water removed from storage; negative values indicate ground water added to storage.

[2]Rate of underflow into western edge of study area along constant gradient nodes.

[3]Recharge to aquifer. Does not include recharge from excess surface water on surface-water irrigated lands.

[4]Total withdrawal during irrigation season from pumping of irrigation and municipal wells.

[5]Rate at which water is lost to evapotranspiration where water levels are within 5 feet of land surface.

[6]Rate of inflow or outflow through constant-head (stream) nodes. Inflow is water moving from stream to aquifer; outflow is water moving from aquifer to stream.

Table 19.--Projected streamflow depletions for the years 2000 and 2020 compared to computed streamflow of 1970 if annual rate of ground-water irrigation development is 2, 5, or 8 percent

[Streamflow and depletions, in cubic feet per second]

Stream node	Gaging station reference site	Computed streamflow, May 31, 1970	Rate of development (Percent)	Depletions: Applying 80 percent of CIR, May 31, 2000	Depletions: Applying 80 percent of CIR, May 31, 2020	Depletions: Applying CIR, May 31, 2000	Depletions: Applying CIR, May 31, 2020	Depletions: Applying 120 percent of CIR, May 31, 2000	Depletions: Applying 120 percent of CIR, May 31, 2020
	South Loup River								
29, 60	At Ravenna	248	2	41	59	48	71	55	83
			5	48	72	57	87	66	102
			8	54	79	64	95	77	112
28, 67	At St. Michael	256	2	44	64	52	77	59	90
			5	51	79	61	95	71	112
			8	58	85	69	104	81	122
	Middle Loup River								
18, 79	At St. Paul	1,008	2	50	75	60	90	69	106
			5	59	92	71	112	82	131
			8	67	100	80	122	94	143
	North Loup River								
14, 80	Near St. Paul	903	2	0	0	0	0	0	0
			5	0	0	0	0	0	0
			8	0	0	0	0	0	0
	Cedar River								
8, 98	Near Fullerton	240	2	0	0	0	0	0	0
			5	0	0	0	0	0	0
			8	0	0	0	0	0	0
	Loup River								
5, 110	Near Genoa	621	2	59	88	70	107	82	126
			5	70	110	84	134	98	158
			8	79	120	96	147	113	172
5, 125	At Columbus	763	2	64	94	76	115	89	136
			5	76	117	92	144	108	169
			8	86	127	105	157	133	184
	Wood River								
41, 48	Near Riverdale	12	2	8	9	9	10	10	11
			5	9	10	10	11	10	12
			8	9	10	10	11	11	12
42, 65	Near Gibbon	18	2	18	17	17	17	17	17
			5	18	18	18	17	18	17
			8	17	17	18	17	18	18
39, 70	Near Chapman	16	2	16	16	16	16	16	16
			5	16	16	16	16	16	16
			8	16	16	16	16	16	16

Table 19.--Projected streamflow depletions for the years 2000 and 2020 compared to computed streamflow of 1970 if annual rate of ground-water irrigation development is 2, 5, or 8 percent--Continued

Stream node	Gaging station reference site	Computed streamflow, May 31, 1970	Rate of development (Percent)	Depletions: Applying 80 percent of CIR, May 31, 2000	Depletions: Applying 80 percent of CIR, May 31, 2020	Depletions: Applying CIR, May 31, 2000	Depletions: Applying CIR, May 31, 2020	Depletions: Applying 120 percent of CIR, May 31, 2000	Depletions: Applying 120 percent of CIR, May 31, 2020
	Platte River								
32, 2	--------------	560	2	0	0	0	0	0	0
			5	0	0	0	0	0	0
			8	0	0	0	0	0	0
39, 14	Near Cozad	572	2	9	12	12	18	16	23
			5	12	19	17	26	21	33
			8	14	22	19	30	24	38
48, 34	--------------	1,668	2	20	25	30	39	40	53
			5	26	36	38	53	39	69
			8	30	42	42	60	54	77
49, 46	Near Odessa	1,554	2	35	31	36	47	48	61
			5	31	43	45	63	58	82
			8	35	50	49	71	63	92
36, 87	Near Grand Island	1,656	2	51	66	70	94	91	122
			5	59	82	80	115	103	147
			8	64	91	89	127	111	160
8, 119	Near Duncan	1,669	2	71	92	95	130	125	167
			5	80	114	110	158	141	200
			8	88	126	122	174	152	217
5, 127	--------------	2,433	2	135	187	174	246	215	305
			5	158	232	203	303	250	371
			8	175	253	227	331	277	403

SUMMARY OF CONCLUSIONS

Maps and tables presented in this report indicate that water levels will decline in the future throughout much of the study area even without additional development beyond the 1980 level unless reductions are made in the volume of ground water used. These reductions might be attained either through cutbacks in the acreages irrigated or through cutbacks in the amount of ground water applied per acre. A variety of methods can be employed to accomplish these reductions; some have been previously discussed.

Declines ranging from 0 to about 139 feet will occur in Hall County and in Merrick County before 2020, depending on the assumed rate of ground-water development (up to 8 percent per year). Similarly, declines ranging from 0 to about 79 feet will occur before 2020 from Buffalo County westward. Declines of up to about 99 feet will occur by the year 2020 a few miles northeast of Gothenburg for the development rate of 8 percent per year.

Water-level declines occur in areas where aquifer discharge exceeds aquifer recharge. As areas where the depth to water exceeds 5 feet increase, the volume of ET salvage will reach a maximum, and ET losses from the ground water will decrease and approach a minimum. Also, additional ground water will be removed from storage in order to satisfy pumpage requirements. Finally, as water levels decline, more surface water will move into the aquifer and less ground water will move into the streams.

The pumpage, storage (water removed from storage), and inflow (water moving from the stream to the aquifer) rates will increase with additional ground-water development; however, the rates of recharge, ET losses from ground water, and outflow (water moving from the aquifer to the stream) will decrease.

The relationship between the aquifer and the surface-water system is important in determining future water levels in the study area. The simulations indicate that the movement of water from the streams to the aquifer will increase with time and that the rate of increase will be proportional to the rate of new irrigation development. Also, decreases in streamflow probably will occur because of additional surface-water diversions, additional ground-water development west of the study area, and changing farming practices west of the study area. These decreases in streamflow may affect water levels if the streamflow reductions are large enough to significantly lower the stream stages.

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ADDITIONAL INFORMATION

The following tables provide data pertaining to the report area, or to methodology used in the report that may be useful but not essential for an understanding of the report.

Table A gives results of discharge measurements made during seepage surveys of streams in the report area. These results have been used in the calibration of the model and in interpreting ground-water/surface-water relationships.

Table B indicates the methods used in estimating hydraulic conductivity and specific yield from descriptions of materials comprising a lithologic unit. Specific yield is estimated from grain-size class or range alone. Hydraulic conductivity, however, is estimated from grain-size class or range and either the estimated degree of sorting or the estimated silt content. Judgment is exercised in determining which of the values to use, or whether to use some intermediate value.

Table C is presented to show the type of output data generated by the soil-water program for the 15 weather stations in the report area. Data are given in the table for only three of the weather stations -- Gothenburg, Kearney, and Central City. Data for the Gothenburg station typically represents weather conditions in the western part of the report area; those from the Kearney station, weather conditions in the central part; and those from the Central City station, weather conditions in the eastern part.

Table A.--Seepage measurements for parts of the Loup River system, Prairie Creek, Silver Creek, Wood River, and Warm Slough

Stream	Node	Observation of zero flow or measured discharge, in cubic feet per second
		September 21, 1978
South Loup River	6, 4	11
	7, 5	20
Sand Creek[1]	8, 6	0
	7, 6	.26
Devils Gulch[1]	6, 7	0
South Loup River[2]	7, 8	35
	9, 11	43
Powell Canyon[1]	7, 11	0
	9, 11	0
South Loup River	10, 13	52
	12, 15	60
Sand Creek[1]	14, 16	0
	14, 17	.03
	14, 17	.36
Cottonwood Creek[1]	14, 18	0
South Loup River	14, 18	61
	15, 20	68
	15, 22	71
Spring Creek[1]	14, 22	0
	14, 21	.29
Yellow Dog Canyon[1]	13, 22	0
	14, 22	.02
Tributary to South Loup River	16, 22	.01
South Loup River	17, 24	81
Tributary to South Loup River	19, 24	0
	19, 25	.31
South Loup River	19, 26	87
Ash Creek[1]	17, 27	0
	20, 28	0
South Loup River	20, 29	90
Tributary to South Loup River	20, 30	0
South Loup River	21, 30	100
Burr Oak Creek[1]	22, 30	.03
South Loup River	23, 32	87
Deer Creek[1]	23, 34	0
Warm Swamp[1]	25, 31	0
	34, 33	.02

Table A.--Seepage measurements for parts of the Loup River system, Prairie Creek, Silver Creek, Wood River, and Warm Slough--Continued

Stream	Node	Observation of zero flow or measured discharge, in cubic feet per second
		September 21, 1978
South Loup River	25, 35	88
Box Elder Creek[1]	24, 35	0
Tributary to South Loup River	25, 35	0
South Loup River	26, 37	94
	27, 40	98
Otter Creek[1]	28, 40	0
Elk Creek[1]	27, 42	0
South Loup River	28, 42	90
	29, 44	94
Death Creek[1]	31, 44	0
South Loup River	31, 47	87
		September 20, 1978
Swenson Creek[1]	31, 47	0
Deer Creek[1]	32, 47	0
	32, 47	0
South Loup River	32, 49	96
Rusco Creek[1]	32, 50	0
South Loup River	32, 52	90
Dry Creek[1]	31, 53	0
Sand Creek[1]	31, 57	0
South Loup River	31, 57	86
Cedar Creek[1]	33, 57	0
	31, 57	.17
South Loup River	29, 60	90
Tributary to South Loup River	27, 55	15
	27, 56	13
	28, 57	14
Dry Creek[1]	27, 58	0
Tributary to South Loup River	28, 59	16
Beaver Creek[1]	28, 61	0
South Loup River	27, 63	103
	28, 67	99
Sweet Creek[1]	29, 67	0
	27, 68	0
Middle Loup River	26, 68	427
	26, 72	516

Table A.--Seepage measurements for parts of the Loup River system, Prairie Creek, Silver Creek, Wood River, and Warm Slough--Continued

Stream	Node	Observation of zero flow or measured discharge, in cubic feet per second
		September 20, 1978
South Loup River	26, 68	94
Loup River	23, 75	529
Oak Creek[3]	22, 75	34
Turkey Creek[3]	20, 74	7.2
	20, 76	11
Loup River	18, 79	469
Lake Creek[3]	19, 79	0
	17, 80	.04
	17, 80	0
Tributary to Lake Creek	17, 80	.01
		September 19, 1978
North Loup River	14, 79	823
Loup River	14, 82	1,290
Spring Creek[3]	13, 82	4.3
Loup River	14, 87	1,280
Cottonwood Creek[3]	14, 88	0
Elk Creek[3]	15, 88	0
Loup River	13, 90	1,230
Tributary to Loup River	14, 90	.02
Horse Creek[3]	11, 92	.07
Tributary to Loup River	11, 93	0
	11, 94	0
	13, 94	0
Loup River	12, 95	1,320
	10, 98	1,160
Cedar River	8, 99	171
Loup River	8,101	1,320
Plum Creek[3]	7,102	.62
Council Creek[3]	6,104	0
Loup River	7,105	1,280
		November 11, 1978
Silver Creek	18, 99	0
	16,101	0
	14,103	0
	13,105	0
	13,106	0

Table A.--Seepage measurements for parts of the Loup River system, Prairie Creek, Silver Creek, Wood River, and Warm Slough--Continued

Stream	Node	Observation of zero flow or measured discharge, in cubic feet per second
		November 11, 1978
Tributary to Silver Creek-----------------	15,105	0
	14,106	0
	13,108	0
Silver Creek-----------------------------	12,108	0
	12,110	0
	11,111	.02
Tributary to Silver Creek-----------------	11,111	0
Silver Creek-----------------------------	11,111	.18
		November 14, 1978
Prairie Slough---------------------------	17, 93	0
Prairie Creek----------------------------	16, 95	.02
	15, 97	.61
	15, 98	0
	14, 99	.11
	13,100	.38
	13,101	.95
	12,102	.85
	11,103	.35
	10,104	2.6
	10,106	0
	10,108	0
	10,110	.64
	10,112	.33
	9,113	.73
	8,115	2.6
Wood River-------------------------------	41, 48	0
Tributary to Wood River------------------	41, 49	0
Wood River-------------------------------	41, 48	0
	42, 51	0
Wood River tributary---------------------	42, 51	0
Wood River-------------------------------	43, 52	0
Wood River tributary---------------------	43, 52	0
	43, 58	0
Wood River-------------------------------	43, 54	0
	43, 56	0
Wood River tributary---------------------	43, 56	0
	43, 56	0

Table A.--Seepage measurements for parts of the Loup River system, Prairie Creek, Silver Creek, Wood River, and Warm Slough--Continued

Stream	Node	Observation of zero flow or measured discharge, in cubic feet per second
		November 14, 1978
Wood River	43, 57	0
	43, 57	.01
Wood River tributary	43, 57	0
Wood River	43, 59	.05
	43, 60	0
	43, 61	0
Wood River tributary	43, 62	0
Wood River	43, 62	0
	43, 63	1.5
	42, 65	1.0
	42, 66	.20
	42, 67	.22
	41, 69	.04
	40, 70	.40
	39, 72	.43
	38, 73	.48
	38, 75	.19
	38, 77	0
	38, 78	0
	37, 79	.17
	37, 81	.09
	36, 83	0
	35, 85	0
	33, 86	0
Wood River tributary	33, 85	.33
Wood River	32, 88	11
	30, 90	9.3
	29, 92	9.6
Warm Slough	22, 99	0
	21,100	0
	20,102	0

[1]South Loup River tributary.
[2]Outside study area.
[3]Loup River tributary.

Table B - Hydraulic conductivity and specific yield estimated from description of materials comprising a lithologic unit

Grain-size class or range from sample description	Hydraulic conductivity, in feet per day[1]						Specific yield[2]
	Estimated from degree of sorting			Estimated from silt content			
	Poor	Moderate	Well	Slight	Moderate	High	
Fine-grained materials:							
Clay	----	-------	----	1.0	---	----	1.0
Silt, slightly clayey	----	-------	----	10.0	---	----	10.0
Silt, moderately clayey	----	-------	----	8.0	---	----	8.0
Silt, very clayey	----	-------	----	4.0	---	----	3.0
Silt; loess; sandy silt	----	-------	----	15.0	---	----	15.0
Sands and gravels[3]:							
Very fine sand	13	20	27	23	19	13	20.0
Very fine to fine sand	27	27	----	24	20	13	20.2
Very fine to medium sand	36	41- 47	----	32	27	21	20.4
Very fine to coarse sand	48	-------	----	40	31	24	20.5
Very fine to very coarse sand	59	-------	----	51	40	29	20.6
Very fine sand to fine gravel	76	-------	----	67	52	38	20.7
Very fine sand to medium gravel	99	-------	----	80	66	49	20.8
Very fine sand to coarse gravel	128	-------	----	107	86	64	20.9
Fine sand	27	40	53	33	27	20	21.0
Fine to medium sand	53	67	----	48	39	30	21.5
Fine to coarse sand	57	67- 72	----	53	43	32	22.0
Fine to very coarse sand	70	-------	----	60	47	35	23.0
Fine sand to fine gravel	88	-------	----	74	59	44	24.0
Fine sand to medium gravel	114	-------	----	94	75	57	25.0
Fine sand to coarse gravel	145	-------	----	107	87	72	25.5
Medium sand	67	80	94	64	51	40	26.0
Medium to coarse sand	74	94	----	72	57	42	26.1
Medium to very coarse sand	84	98-111	----	71	61	49	26.3
Medium sand to fine gravel	103	-------	----	84	68	52	26.5
Medium sand to medium gravel	131	-------	----	114	82	66	26.7
Medium sand to coarse gravel	164	-------	----	134	108	82	26.9
Coarse sand	80	107	134	94	74	53	27.0
Coarse to very coarse sand	94	134	----	94	75	57	26.9
Coarse sand to fine gravel	116	136-156	----	107	88	68	26.7
Coarse sand to medium gravel	147	-------	----	114	94	74	26.5
Coarse sand to coarse gravel	184	-------	----	134	100	92	26.0
Very coarse sand	107	147	187	114	94	74	25.9
Very coarse sand to fine gravel	134	214	----	120	104	87	25.5
Very coarse sand to medium gravel	1,270	199-227	----	147	123	99	25.3
Very coarse sand to coarse gravel	207	-------	----	160	132	104	25.1
Fine gravel	160	214	267	227	140	107	25.0
Fine to medium gravel	201	334	----	201	167	134	24.0
Fine to coarse gravel	245	289-334	----	234	189	144	23.5
Medium gravel	241	321	401	241	201	160	23.0
Medium to coarse gravel	294	468	----	294	243	191	22.5
Coarse gravel	334	468	602	334	284	234	22.0

[1]Hydraulic conductivity values are from an unpublished and undated paper by E. C. Reed and R. Piskin, Conservation and Survey Division, University of Nebraska.
[2]Specific yield values are modified from Johnson (1967).
[3]Reduce hydraulic conductivity by 10 percent if grains are subangular.

Table C - Output from soil-water program using data for Gothenburg, Kearney, and Central City weather stations
[I, infiltration; ET, evapotranspiration; RO, surface runoff; DPI, deep percolation (recharge from irrigated lands; CIR, consumptive irrigation requirements; SMI, soil moisture of irrigated lands; DPD, deep percolation (recharge) from drylands; STD, water shortage of dryland; SMD, soil moisture of drylands]

Map symbol	Soil group	Land use	Soil-water program output, in inches: I	ET	RO	DPI	CIR	SMI	DPD	STD	SMD
			Gothenburg								
A	Inavale-Loup-Alda-Platte	Row crop	20.50	31.03	0.0	3.37	12.50	3.97	3.04	13.56	2.13
		Alfalfa	20.50	38.55	0.0	.56	14.72	3.72	.37	18.39	.63
		Small grain	20.50	23.59	0.0	5.00	6.00	2.24	3.78	6.90	1.29
		Pasture	20.50	31.36	0.0	2.14	10.23	1.88	1.76	12.61	.39
B	Wann-Cass-Leshara	Row crop	19.98	31.03	.52	2.61	12.60	5.11	2.18	13.22	2.65
		Alfalfa	19.98	38.55	.52	.59	15.99	4.70	.53	19.07	.54
		Small grain	20.50	23.59	0.0	4.53	6.09	3.19	3.11	6.24	1.81
		Pasture	20.50	31.36	0.0	1.75	10.29	2.62	1.30	12.14	.68
C	Gibbon-Lamo	Row crop	19.72	31.03	.78	1.36	12.32	8.07	.80	12.08	3.55
		Alfalfa	19.72	38.55	.78	.26	17.46	8.02	.26	19.03	.55
		Small grain	19.72	23.59	.78	3.10	6.35	5.96	1.44	5.34	2.68
		Pasture	20.50	31.36	0.0	1.09	10.58	4.63	.51	11.34	1.26
D	Ortello-Blendon	Row crop	19.98	31.03	.52	2.77	12.65	4.73	2.38	13.42	2.48
		Alfalfa	19.98	38.55	.52	.62	15.77	4.32	.55	19.09	.53
		Small grain	20.50	23.59	0.0	4.68	6.07	2.86	3.33	6.45	1.64
		Pasture	20.50	31.36	0.0	1.86	10.26	2.37	1.44	12.28	.58
E	Holdrege-Hall-Hord-Kenesaw	Row crop	19.72	31.03	.78	1.36	12.32	8.07	.80	12.08	3.55
		Alfalfa	19.72	38.55	.78	.26	17.46	8.02	.26	19.03	.55
		Small grain	19.72	23.59	.78	3.10	6.35	5.96	1.44	5.34	2.68
		Pasture	20.50	31.36	0.0	1.09	10.58	4.63	.51	11.34	1.26
F	Coly-Colby-Uly-Ulysses	Row crop	18.77	31.03	1.73	1.39	12.89	6.15	.97	13.21	2.93
		Alfalfa	18.77	38.55	1.73	.19	17.34	5.64	.19	19.92	.36
		Small grain	18.77	23.59	1.73	3.19	6.85	3.92	1.65	6.49	1.73
		Pasture	19.56	31.36	.94	1.06	10.90	3.23	.57	12.35	.74
G	Valentine-Thurman	Row crop	19.46	31.03	1.04	4.35	13.07	2.60	4.16	14.69	1.34
		Alfalfa	20.50	38.55	0.0	1.01	14.26	2.46	.80	18.83	.35
		Small grain	20.50	23.59	0.0	5.55	5.83	1.40	4.64	7.75	.79
		Pasture	20.50	31.36	0.0	2.77	10.16	1.20	2.45	13.30	.15
			Kearney								
A and I	Inavale-Loup-Alda-Platte; O'Neill-Sarpy	Row crop	23.28	29.01	0.0	5.92	10.87	4.50	5.32	11.03	2.66
		Alfalfa	23.28	35.96	0.0	1.77	12.41	4.76	1.23	13.88	1.70
		Small grain	23.28	21.93	0.0	7.76	5.13	2.61	6.48	5.11	1.70
		Pasture	23.28	29.18	0.0	4.47	8.90	2.32	3.83	9.71	.90
B	Wann-Cass-Leshara	Row crop	22.45	29.01	.83	4.75	10.79	5.86	4.05	10.58	3.34
		Alfalfa	22.45	35.96	.83	1.37	13.37	6.01	.13	14.43	1.64
		Small grain	23.28	21.93	0.0	7.28	5.03	3.74	5.79	4.42	2.55
		Pasture	23.28	29.18	----	3.89	8.76	3.28	3.10	8.98	1.40
C	Gibbon-Lamo	Row crop	22.03	29.01	1.25	3.08	9.94	9.46	1.88	8.81	4.95
		Alfalfa	22.03	35.96	1.25	.58	13.94	10.22	.41	14.27	1.77
		Small grain	22.03	21.93	1.25	5.33	4.93	6.86	3.39	3.25	4.48
		Pasture	23.28	29.18	.00	2.88	8.32	6.12	1.82	7.68	2.75
D	Ortello-Blendon	Row crop	22.45	29.01	.83	4.96	10.93	5.39	4.32	10.85	3.09
		Alfalfa	22.45	35.96	.83	1.46	13.28	5.50	1.02	14.49	1.59
		Small grain	23.28	21.93	.00	7.44	5.07	3.36	6.02	4.65	2.25
		Pasture	23.28	29.18	.00	4.06	8.80	2.96	3.32	9.20	1.24

Table C - Output from soil-water program using data for Gothenburg, Kearney, and Central City weather stations--Continued

Map symbol	Soil group	Land use	Soil-water program output, in inches								
			I	ET	RO	DPI	CIR	SMI	DPD	STD	SMD
			Kearney--Continued								
E	Holdrege-Hall-Hord-Kenesaw	Row crop	22.03	29.01	1.25	3.08	9.94	9.46	1.88	8.81	4.95
		Alfalfa	22.03	35.96	1.25	.58	13.94	10.22	.41	14.27	1.77
		Small grain	22.03	21.93	1.25	5.33	4.93	6.86	3.39	3.25	4.48
		Pasture	23.28	29.18	.00	2.88	8.32	6.12	1.82	7.68	2.75
F	Coly-Colby-Uly-Ulysses	Row crop	20.75	29.01	2.53	2.92	10.85	7.16	2.11	10.33	3.90
		Alfalfa	20.75	35.96	2.53	.51	14.60	7.10	.29	15.44	1.34
		Small grain	20.75	21.93	2.53	5.09	5.63	4.56	3.25	4.40	2.76
		Pasture	21.79	29.18	1.49	2.43	9.07	4.15	1.54	8.91	1.69
H	Wood River-Silver Creek	Row crop	21.87	29.01	1.41	2.69	9.75	10.34	1.38	8.47	5.32
		Alfalfa	21.87	35.96	1.41	.36	13.98	11.38	.25	14.26	1.78
		Small grain	21.87	21.93	1.41	4.94	4.76	7.77	2.98	3.00	5.00
		Pasture	23.28	29.18	.00	2.70	8.20	6.84	1.59	7.45	3.06
			Central City								
A	Inavale-Loup-Alda-Platte	Row crop	23.73	29.01	.00	5.79	10.36	4.56	5.11	10.37	2.71
		Alfalfa	23.73	36.10	.00	1.71	12.12	4.66	1.13	13.47	1.52
		Small grain	23.73	22.12	.00	8.00	5.10	2.54	6.64	5.01	1.67
		Pasture	23.73	29.30	.00	4.40	8.64	2.22	3.61	9.17	.79
B	Wann-Cass-Leshara	Row crop	22.97	29.01	.76	4.77	10.31	5.94	3.91	9.91	3.43
		Alfalfa	22.97	36.10	.76	1.34	12.99	6.08	.93	14.01	1.56
		Small grain	23.73	22.12	.00	7.52	5.09	3.61	5.87	4.24	2.37
		Pasture	23.73	29.30	.00	3.85	8.47	3.23	2.91	8.46	1.28
C	Gibbon-Lamo	Row crop	22.59	29.01	1.14	3.18	9.46	9.53	1.80	8.15	4.96
		Alfalfa	22.59	36.10	1.14	.58	13.45	10.41	.39	13.81	1.76
		Small grain	22.59	22.12	1.14	5.66	4.91	6.85	3.48	2.96	4.26
		Pasture	23.73	29.30	.00	2.87	7.99	6.08	1.64	7.18	2.65
D	Ortello-Blendon	Row crop	22.97	29.01	.76	4.98	10.44	5.47	3.42	10.19	3.18
		Alfalfa	22.97	36.10	.76	1.43	12.92	5.56	1.01	14.09	1.48
		Small grain	23.73	22.12	.00	7.68	5.10	3.23	6.11	4.48	2.12
		Pasture	23.73	29.30	.00	4.03	8.53	2.88	3.13	8.68	1.12
E	Holdrege-Hall-Hord-Kenesaw	Row crop	22.59	29.01	1.14	3.18	9.46	9.53	1.80	8.15	4.96
		Alfalfa	22.59	36.10	1.14	.58	13.45	10.41	.39	13.81	1.76
		Small grain	22.59	22.12	1.14	5.66	4.91	6.85	3.48	2.96	4.26
		Pasture	23.73	29.30	.00	2.87	7.99	6.08	1.64	7.18	2.65
F	Coly-Colby-										
F	Coly-Colby-Uly-Ulysses	Row crop	21.34	29.01	2.39	3.03	10.39	7.21	2.07	9.71	3.94
		Alfalfa	21.34	36.10	2.39	.50	14.18	7.24	.31	15.02	1.29
		Small grain	21.34	22.12	2.39	5.48	5.69	4.49	3.51	4.27	2.65
		Pasture	22.37	29.30	1.36	2.55	8.75	4.14	1.59	8.50	1.55
G	Valentine-Thurman	Row crop	23.73	29.01	.00	6.90	11.17	3.00	6.48	11.75	1.73
		Alfalfa	23.73	36.10	.00	2.48	12.15	2.97	2.01	14.36	.86
		Small grain	23.73	22.12	.00	8.57	5.08	1.56	7.53	5.91	.97
		Pasture	23.73	29.30	.00	5.12	8.75	1.36	4.54	10.10	.35

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Grand Island AASF

3010 East Airport Road

Grand Island, NE 68801

Inquiry Number: 5872123.40

November 18, 2019

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Contact: Hans Sund

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Search Results:

Year	Scale	Details	Source
2016	1"=500'	Flight Year: 2016	USDA/NAIP
2012	1"=500'	Flight Year: 2012	USDA/NAIP
2009	1"=500'	Flight Year: 2009	USDA/NAIP
2006	1"=500'	Flight Year: 2006	USDA/NAIP
1999	1"=500'	Acquisition Date: April 07, 1999	USGS/DOQQ
1993	1"=750'	Flight Date: May 13, 1993	USGS
1988	1"=750'	Flight Date: June 20, 1988	USGS
1981	1"=500'	Flight Date: July 13, 1981	USDA
1957	1"=500'	Flight Date: December 09, 1957	USGS
1951	1"=500'	Flight Date: May 08, 1951	USGS

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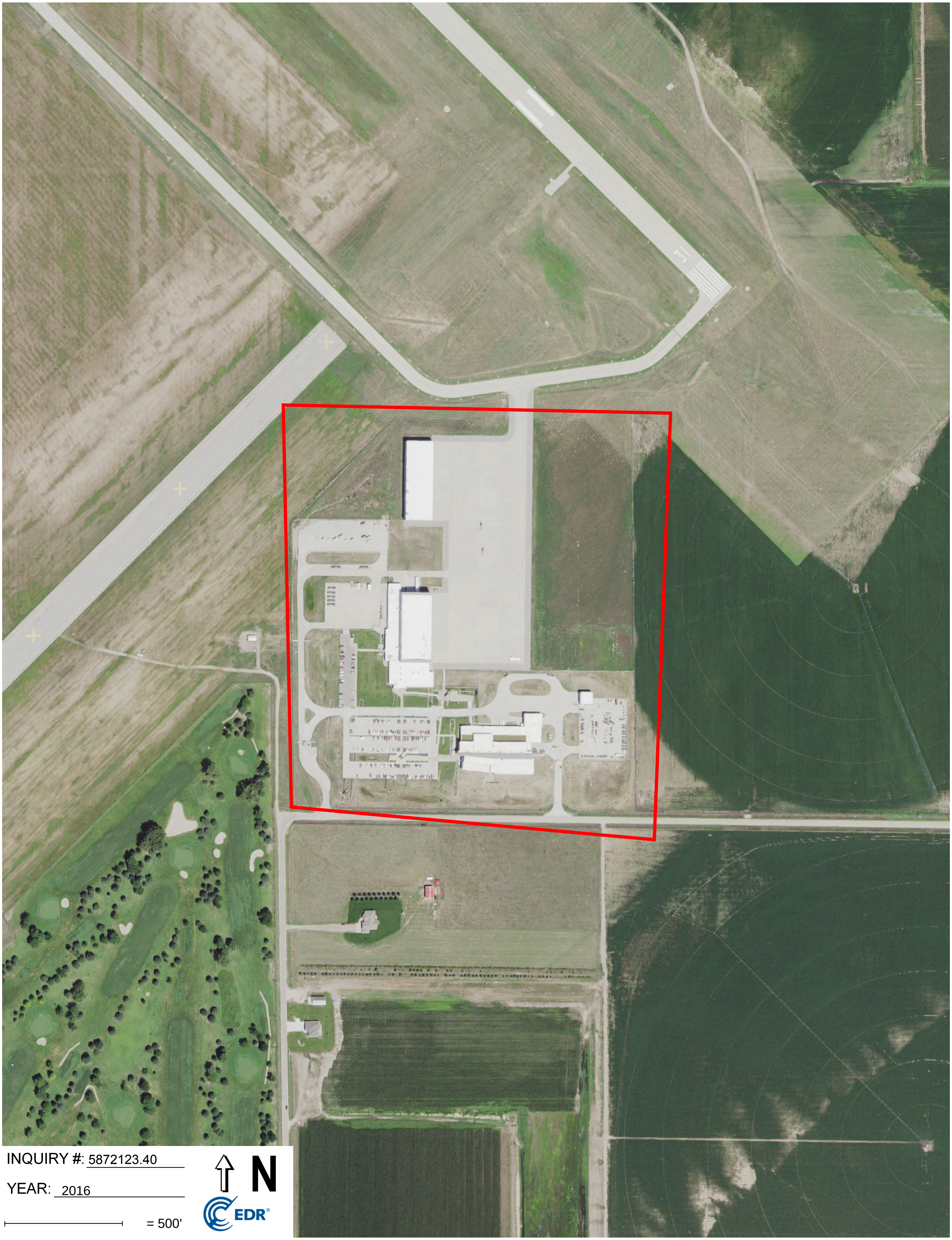

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YEAR: 2016

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EDR

INQUIRY #: 5872123.40

YEAR: 2012

= 500'

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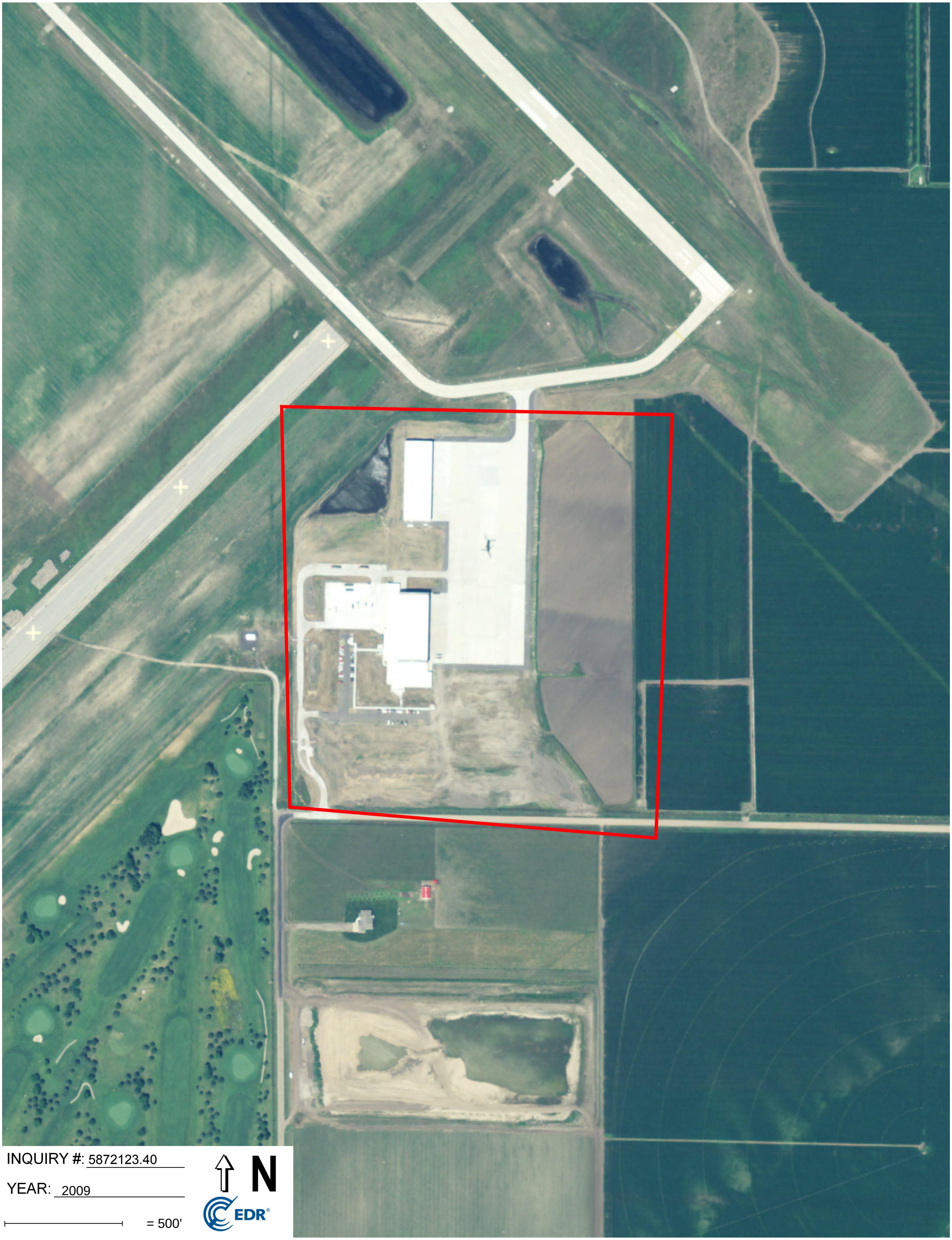
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YEAR: 2009
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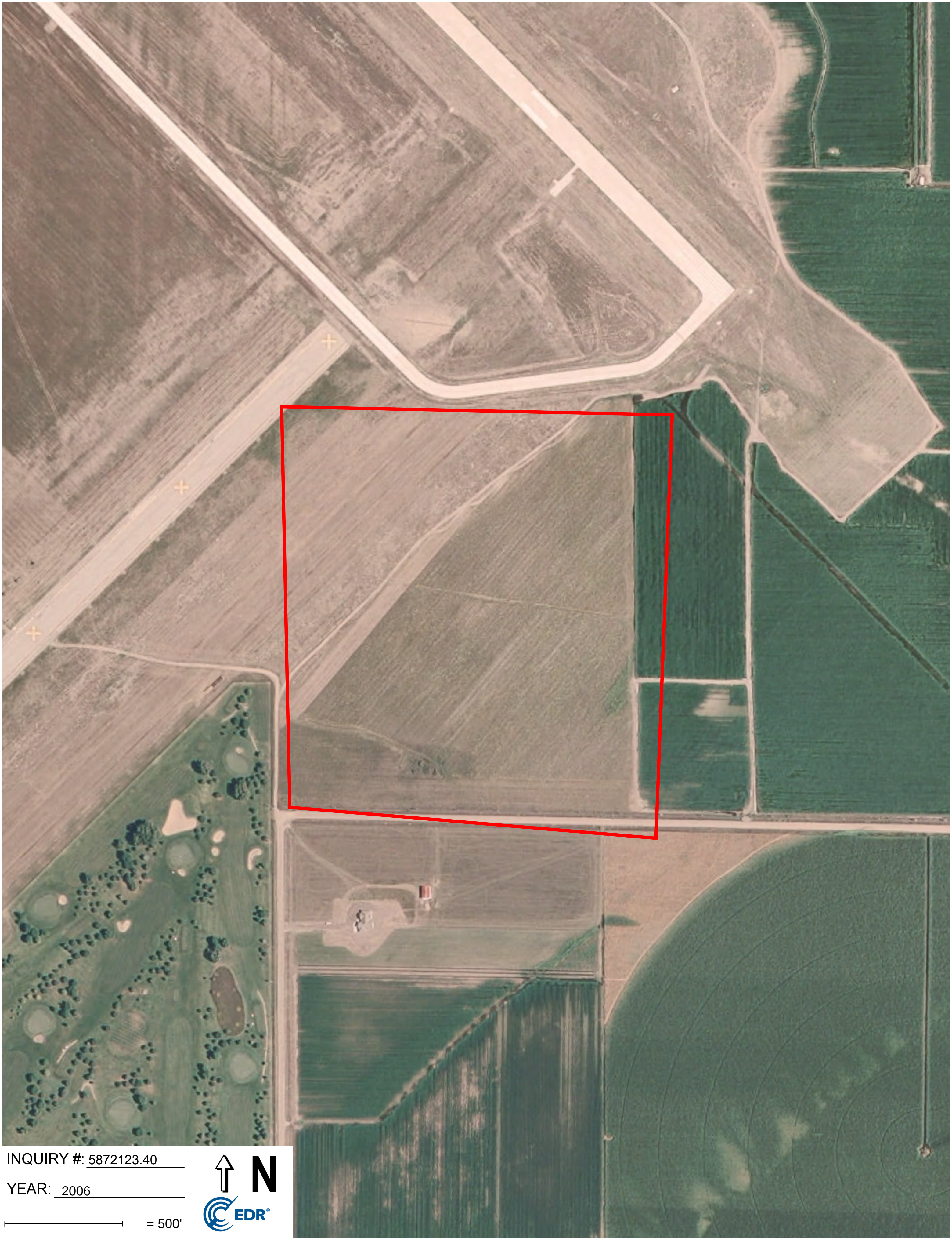

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YEAR: 2006

= 500'

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INQUIRY #: 5872123.40

YEAR: 1999

= 500'

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INQUIRY #: 5872123.40
YEAR: 1993
= 750'
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EDR
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INQUIRY #: 5872123.40

YEAR: 1988

= 750'

N

EDR

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INQUIRY #: 5872123.40

YEAR: 1981

= 500'

N

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INQUIRY #: 5872123.40

YEAR: 1957

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INQUIRY #: 5872123.40

YEAR: 1951

= 500'

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Grand Island AASF
3010 East Airport Road
Grand Island, NE 68801

Inquiry Number: 5872123.37s
November 18, 2019

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TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

3010 EAST AIRPORT ROAD
GRAND ISLAND, NE 68801

COORDINATES

Latitude (North):	40.9612440 - 40˚ 57' 40.47''
Longitude (West):	98.2987690 - 98˚ 17' 55.56''
Universal Tranverse Mercator:	Zone 14
UTM X (Meters):	559010.9
UTM Y (Meters):	4534479.5
Elevation:	1841 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	6713680 GRAND ISLAND, NE
Version Date:	2014

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140813
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
3010 EAST AIRPORT ROAD
GRAND ISLAND, NE 68801

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
A1	ARMY AVIATION SUPPOR	3010 AIRPORT RD E	AST		TP
A2	ARMY AVIATION SUPPOR	3010 E AIRPORT RD	FINDS		TP
A3	ARMY AVIATION SUPPOR	3010 E AIRPORT RD	NPDES, TIER 2		TP
A4	NEARNG AASF-2	3010 AIRPORT ROAD EA	RCRA-VSQG, FINDS, ECHO		TP
5	GRAND ISLAND AAF		FUDS	Higher	2342, 0.444, NW

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following records. For more information on this property see page 8 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
ARMY AVIATION SUPPOR 3010 AIRPORT RD E GRAND ISLAND, NE 68801	AST Facility Id: 2105	N/A
ARMY AVIATION SUPPOR 3010 E AIRPORT RD GRAND ISLAND, NE 68801	FINDS Registry ID:: 110045942897	N/A
ARMY AVIATION SUPPOR 3010 E AIRPORT RD GRAND ISLAND, NE 68801	NPDES Facility Id: 88577 TIER 2 Facility Id: 88577	N/A
NEARNG AASF-2 3010 AIRPORT ROAD EA GRAND ISLAND, NE 68801	RCRA-VSQG EPA ID:: NER000511212 FINDS Registry ID:: 110055931611 ECHO Registry ID: 110055931611	NER000511212

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL.......................... National Priority List
Proposed NPL.............. Proposed National Priority List Sites
NPL LIENS.................. Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL............... National Priority List Deletions

EXECUTIVE SUMMARY

Federal CERCLIS list

FEDERAL FACILITY Federal Facility Site Information listing
SEMS Superfund Enterprise Management System

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE Superfund Enterprise Management System Archive

Federal RCRA CORRACTS facilities list

CORRACTS Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG RCRA - Large Quantity Generators
RCRA-SQG RCRA - Small Quantity Generators

Federal institutional controls / engineering controls registries

LUCIS Land Use Control Information System
US ENG CONTROLS Engineering Controls Sites List
US INST CONTROL Sites with Institutional Controls

Federal ERNS list

ERNS Emergency Response Notification System

State- and tribal - equivalent CERCLIS

SHWS Superfund State Program List

State and tribal landfill and/or solid waste disposal site lists

SWF/LF Licensed Landfill List

State and tribal leaking storage tank lists

LAST Leaking Aboveground Storage Tank Sites
LUST Leaking Underground Storage Tank Sites
INDIAN LUST Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

FEMA UST Underground Storage Tank Listing
UST Facility and Tank Data
INDIAN UST Underground Storage Tanks on Indian Land

State and tribal institutional control / engineering control registries

INST CONTROL Nebraska’s Institutional Control Registry

EXECUTIVE SUMMARY

State and tribal voluntary cleanup sites

INDIAN VCP - - - - - - - - Voluntary Cleanup Priority Listing
VCP - - - - - - - - RAPMA Sites

State and tribal Brownfields sites

BROWNFIELDS - - - - - - - - Potential Brownfields Inventory Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS - - - - - - - - A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

SWRCY - - - - - - - - Recycling Resource Directory
INDIAN ODI - - - - - - - - Report on the Status of Open Dumps on Indian Lands
ODI - - - - - - - - Open Dump Inventory
DEBRIS REGION 9 - - - - - - - - Torres Martinez Reservation Illegal Dump Site Locations
IHS OPEN DUMPS - - - - - - - - Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL - - - - - - - - Delisted National Clandestine Laboratory Register
US CDL - - - - - - - - National Clandestine Laboratory Register

Local Lists of Registered Storage Tanks

HIST UST - - - - - - - - Underground Storage Tank Database Listing
HIST AST - - - - - - - - Aboveground Storage Tank Database Listing

Local Land Records

LIENS 2 - - - - - - - - CERCLA Lien Information

Records of Emergency Release Reports

HMIRS - - - - - - - - Hazardous Materials Information Reporting System
SPILLS - - - - - - - - Surface Spill List
SPILLS 90 - - - - - - - - SPILLS 90 data from FirstSearch
SPILLS 80 - - - - - - - - SPILLS 80 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR - - - - - - - - RCRA - Non Generators / No Longer Regulated
DOD - - - - - - - - Department of Defense Sites
SCRD DRYCLEANERS - - - - - - - - State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR - - - - - - - - Financial Assurance Information
EPA WATCH LIST - - - - - - - - EPA WATCH LIST
2020 COR ACTION - - - - - - - - 2020 Corrective Action Program List
TSCA - - - - - - - - Toxic Substances Control Act

EXECUTIVE SUMMARY

TRIS	Toxic Chemical Release Inventory System
SSTS	Section 7 Tracking Systems
ROD	Records Of Decision
RMP	Risk Management Plans
RAATS	RCRA Administrative Action Tracking System
PRP	Potentially Responsible Parties
PADS	PCB Activity Database System
ICIS	Integrated Compliance Information System
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS	Material Licensing Tracking System
COAL ASH DOE	Steam-Electric Plant Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER	PCB Transformer Registration Database
RADINFO	Radiation Information Database
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS	Incident and Accident Data
CONSENT	Superfund (CERCLA) Consent Decrees
INDIAN RESERV	Indian Reservations
FUSRAP	Formerly Utilized Sites Remedial Action Program
UMTRA	Uranium Mill Tailings Sites
LEAD SMELTERS	Lead Smelter Sites
US AIRS	Aerometric Information Retrieval System Facility Subsystem
US MINES	Mines Master Index File
ABANDONED MINES	Abandoned Mines
DOCKET HWC	Hazardous Waste Compliance Docket Listing
UXO	Unexploded Ordnance Sites
FUELS PROGRAM	EPA Fuels Program Registered Listing
AIRS	Air State Program List
ASBESTOS	ASBESTOS
DRYCLEANERS	Drycleaner Facility Listing
Financial Assurance	Financial Assurance Information Listing
UIC	Undergound Injection Control Database
MINES MRDS	Mineral Resources Data System

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	EDR Proprietary Manufactured Gas Plants
EDR Hist Auto	EDR Exclusive Historical Auto Stations
EDR Hist Cleaner	EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS	Recovered Government Archive State Hazardous Waste Facilities List
RGA LUST	Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

EXECUTIVE SUMMARY

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

ADDITIONAL ENVIRONMENTAL RECORDS

Other Ascertainable Records

FUDS: The Listing includes locations of Formerly Used Defense Sites Properties where the US Army Corps Of Engineers is actively working or will take necessary cleanup actions.

A review of the FUDS list, as provided by EDR, and dated 05/15/2019 has revealed that there is 1 FUDS site within approximately 1 mile of the target property.

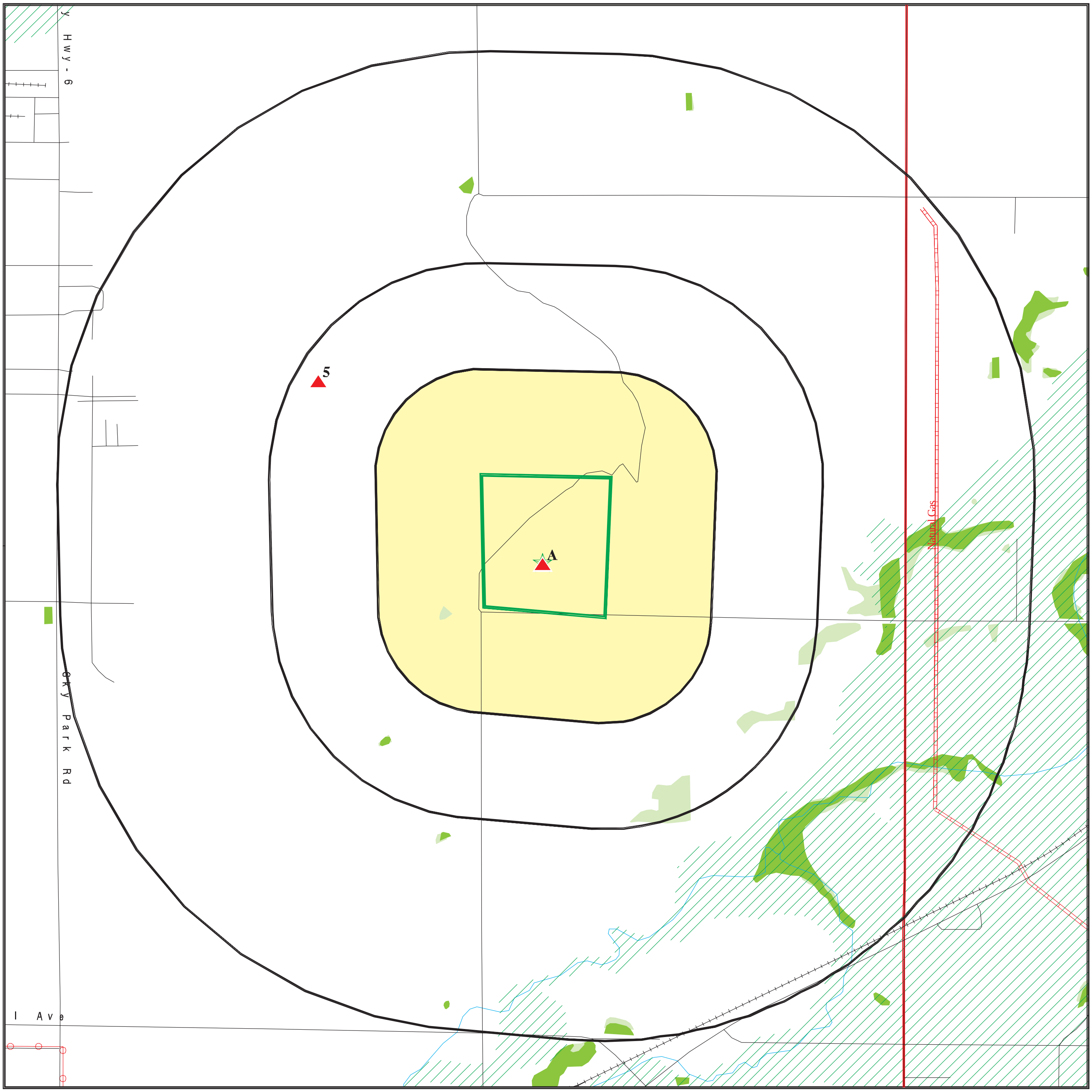
Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
GRAND ISLAND AAF		NW 1/4 - 1/2 (0.444 mi.)	5	29

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 7 records.

Site Name	Database(s)
	LAST
GRAND ISLAND MUNICIPAL DUMP	SHWS
E 4TH STREET & SKY PARK ROAD	SHWS
HALL COUNTY AIRPORT AUTH	LUST
CENTRAL NE REG AIRPORT	LUST
FAA VORTAC - GRAND ISLAND	LUST
CORNHUSKER RENT-A-CAR	LUST

OVERVIEW MAP - 5872123.37S



0 1/4 1/2 1 Miles

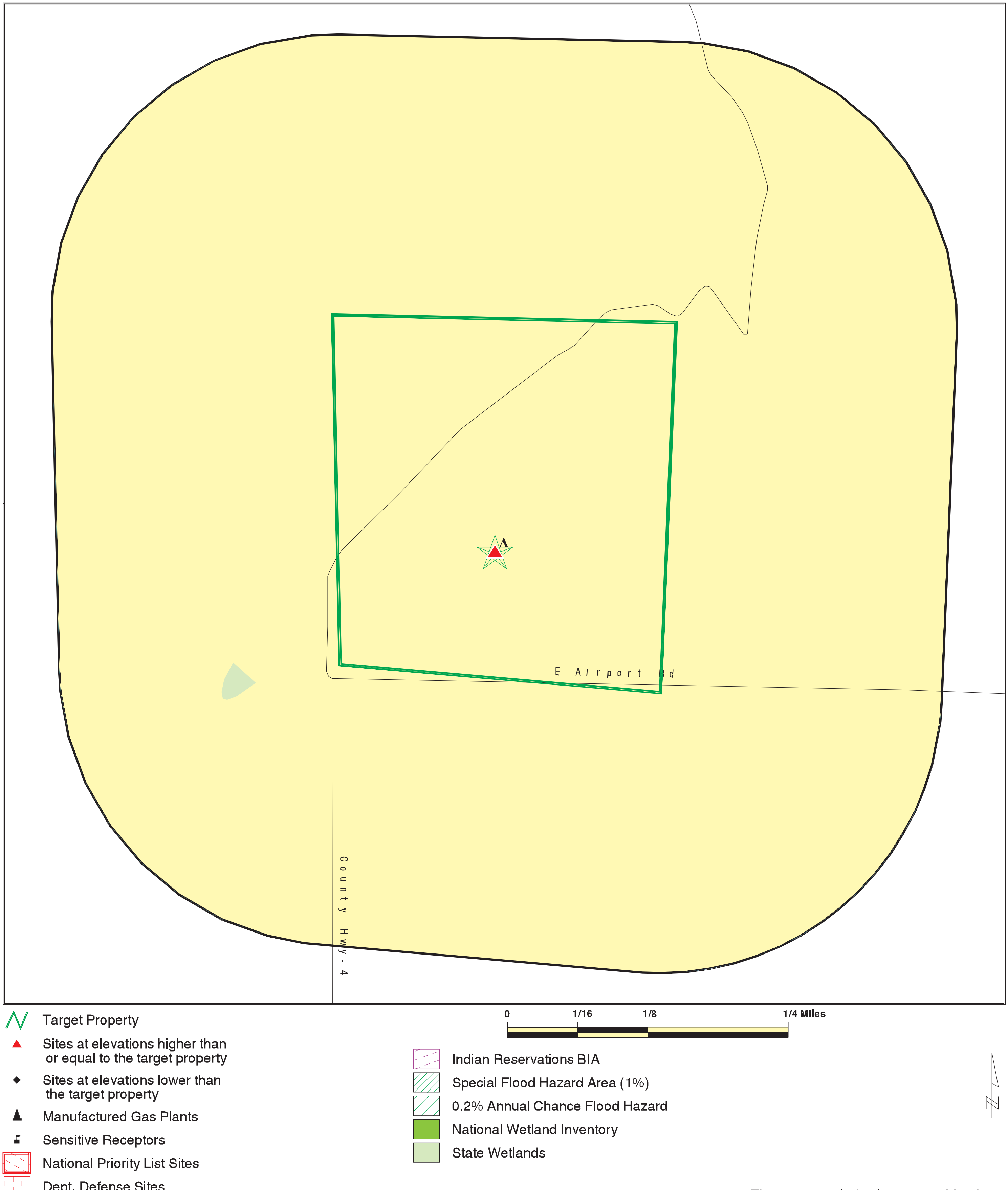
- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites

- Indian Reservations BIA
- County Boundary
- Power transmission lines
- Pipelines
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- National Wetland Inventory
- State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Grand Island AASF	CLIENT:	AECOM
ADDRESS:	3010 East Airport Road	CONTACT:	Hans Sund
	Grand Island NE 68801	INQUIRY #:	5872123.37s
LAT/LONG:	40.961244 / 98.298769	DATE:	November 18, 2019 9:12 am

DETAIL MAP - 5872123.37S



This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Grand Island AASF ADDRESS: 3010 East Airport Road Grand Island NE 68801 LAT/LONG: 40.961244 / 98.298769	CLIENT: AECOM CONTACT: Hans Sund INQUIRY #: 5872123.37s DATE: November 18, 2019 9:12 am

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-VSQG	0.250	1	0	0	NR	NR	NR	1
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent CERCLIS								
SHWS	1.000		0	0	0	0	NR	0
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LAST	0.500		0	0	0	NR	NR	0
LUST	0.500		0	0	0	NR	NR	0
INDIAN LUST	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
UST	0.250		0	0	NR	NR	NR	0
AST	0.250	1	0	0	NR	NR	NR	1
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
INST CONTROL	0.500		0	0	0	NR	NR	0
State and tribal voluntary cleanup sites								
INDIAN VCP	0.500		0	0	0	NR	NR	0
VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
SWRCY	0.500		0	0	0	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	TP		NR	NR	NR	NR	NR	0
US CDL	TP		NR	NR	NR	NR	NR	0
Local Lists of Registered Storage Tanks								
HIST UST	0.250		0	0	NR	NR	NR	0
HIST AST	TP		NR	NR	NR	NR	NR	0
Local Land Records								
LIENS 2	TP		NR	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
SPILLS	TP		NR	NR	NR	NR	NR	0
SPILLS 90	TP		NR	NR	NR	NR	NR	0
SPILLS 80	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
FUDS	1.000		0	0	1	0	NR	1
DOD	1.000		0	0	0	0	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	TP	2	NR	NR	NR	NR	NR	2
DOCKET HWC	TP		NR	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
ECHO	TP	1	NR	NR	NR	NR	NR	1
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
AIRS	TP		NR	NR	NR	NR	NR	0
ASBESTOS	TP		NR	NR	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
NPDES	TP	1	NR	NR	NR	NR	NR	1
TIER 2	TP	1	NR	NR	NR	NR	NR	1
UIC	TP		NR	NR	NR	NR	NR	0
MINES MRDS	TP		NR	NR	NR	NR	NR	0

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
RGA LUST	TP		NR	NR	NR	NR	NR	0
- Totals --		7	0	0	1	0	0	8

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

A1 Target Property	**ARMY AVIATION SUPPORT FACILITY #2 3010 AIRPORT RD E GRAND ISLAND, NE 68801**	**AST**	**A100457882 N/A**

Site 1 of 4 in cluster A

Actual: 1841 ft.

AST:

Name:	ARMY AVIATION SUPPORT FACILITY #2
Address:	3010 AIRPORT RD E
City,State,Zip:	GRAND ISLAND, NE 68801
Facility Id:	2105
Facility Telephone:	402-309-8690
Owner Type:	Not reported
Owner Name:	Not reported
Owner Address:	Not reported
Owner Addr 2:	Not reported
Owner City,St,Zip:	Not reported
Owner County:	Not reported
Owner Phone:	Not reported
Owner Rep Signature:	Not reported
Contact Person:	Not reported
Contact Title:	Not reported
Contact Phone:	Not reported
Official Title:	Not reported
Fire Department:	Not reported
Fire Department Phone:	Not reported
Notification:	Not reported
Tank Location:	Not reported
Tank Description:	Not reported
Substance:	Not reported
Date Registration Is Received:	Not reported
Comments:	Not reported

A2 Target Property	**ARMY AVIATION SUPPORT FACILITY 3010 E AIRPORT RD GRAND ISLAND, NE 68801**	**FINDS**	**1016619043 N/A**

Site 2 of 4 in cluster A

Actual: 1841 ft.

FINDS:

Registry ID: 110045942897

Environmental Interest/Information System
STATE MASTER

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

A3 **Target** **Property**	**ARMY AVIATION SUPPORT FACILITY** **3010 E AIRPORT RD** **GRAND ISLAND, NE 68801**	**NPDES** **TIER 2**	**S108785439** **N/A**

Site 3 of 4 in cluster A

Actual:
1841 ft.

NE NPDES:

Name:	ARMY AVIATION SUPPORT FACILITY
Address:	3010 E AIRPORT RD
City,State,Zip:	GRAND ISLAND, NE
Facility ID:	88577
Directions to Facility:	Not reported
Program Acronym:	Not reported
Permit:	NPDES Construction Stormwater
Application Number:	NER105488
Issued:	06/12/2007
Expires:	07/31/2002
Extended:	07/31/2002

Name:	ARMY AVIATION SUPPORT FACILITY
Address:	3010 E AIRPORT RD
City,State,Zip:	GRAND ISLAND, NE
Facility ID:	88577
Directions to Facility:	Not reported
Program Acronym:	Not reported
Permit:	NPDES Construction Stormwater
Application Number:	NER110906
Issued:	05/13/2008
Expires:	12/31/2012
Extended:	12/31/2012

Name:	ARMY AVIATION SUPPORT FACILITY
Address:	3010 E AIRPORT RD
City,State,Zip:	GRAND ISLAND, NE 68801
Facility ID:	88577
Directions to Facility:	3010-90 E Airport; Gunbarrel,Airport-0.5W,N Side
Program Acronym:	PCS
Permit:	Not reported
Application Number:	Not reported
Issued:	Not reported
Expires:	Not reported
Extended:	Not reported

TIER 2:

Name:	ARMY AVIATION SUPPORT FACILITY
Address:	3010 E AIRPORT RD
City,State,Zip:	GRAND ISLAND, NE 68801-9144
Year:	2018
Facility ID:	88577
Location:	Not reported
SR No:	Not reported
Mailing Name:	Amy Dirks
Mailing Address:	2433 NW 24th St
Mailing Address 2:	Not reported
Mailing Suite:	Not reported
Mailing City:	Lincoln
Mailing State:	NE
Mailing Zip:	68524-1801
Latitude:	40.960047

ARMY AVIATION SUPPORT FACILITY (Continued) **S108785439**

Longitude:	98.300953

Chemical:

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Not reported
Year:	2016
Gas:	Not reported
SR Number:	Not reported
Case Number:	0
imm:	Not reported
EHS:	Not reported
Liquid:	Not reported
Storage Location:	AASF 2
Mix:	Not reported
Max. Amount:	Not reported
Pressure:	Not reported
Pure:	Not reported
Average Amount:	Not reported
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	Not reported
Solid:	Not reported
Storage Code:	Not reported
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	Not reported
trdsec:	Not reported

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Not reported
Year:	2015
Gas:	Not reported
SR Number:	Not reported
Case Number:	0
imm:	Not reported
EHS:	Not reported
Liquid:	Not reported
Storage Location:	AASF 2
Mix:	Not reported
Max. Amount:	Not reported
Pressure:	Not reported
Pure:	Not reported
Average Amount:	Not reported
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	Not reported
Solid:	Not reported
Storage Code:	Not reported
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	Not reported
trdsec:	Not reported

Facid:	88577

ARMY AVIATION SUPPORT FACILITY (Continued) **S108785439**

conf:	Not reported
del:	Not reported
Fire:	Y
Year:	2018
Gas:	Not reported
SR Number:	Not reported
Case Number:	Not reported
imm:	Y
EHS:	Not reported
Liquid:	Y
Storage Location:	AASF 2
Mix:	Y
Max. Amount:	25,000 - 49,999
Pressure:	1
Pure:	Not reported
Average Amount:	25,000 - 49,999
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	JET FUELS, (JP-4)
Solid:	Not reported
Storage Code:	A
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	4
trdsec:	Not reported

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Not reported
Year:	2017
Gas:	Not reported
SR Number:	Not reported
Case Number:	0
imm:	Not reported
EHS:	Not reported
Liquid:	Not reported
Storage Location:	AASF 2
Mix:	Not reported
Max. Amount:	25,000 - 49,999
Pressure:	Not reported
Pure:	Not reported
Average Amount:	25,000 - 49,999
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	JET FUELS, (JP-4)
Solid:	Not reported
Storage Code:	Not reported
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	Not reported
trdsec:	Not reported

Contact:

Facility ID:	88577
Facility Name:	Army Aviation Support Facility
302 Contact:	Amy Dirks

ARMY AVIATION SUPPORT FACILITY (Continued) **S108785439**

302 Phone:	402-309-8485
Primary Contact:	Dallas Bundy
Primary Contact Phone:	402-309-8702
Primary Contact 24 HR:	402-309-8210
Secondary Contact:	Whisper Harris
Secondary Contact Phone:	402-309-8695
Secondary Contact 24 HR:	402-309-8210

Name:	ARMY AVIATION SUPPORT FACILITY
Address:	3010 E AIRPORT RD
City,State,Zip:	GRAND ISLAND, NE 68801-9144
Year:	2017
Facility ID:	88577
Location:	Not reported
SR No:	Not reported
Mailing Name:	Not reported
Mailing Address:	Not reported
Mailing Address 2:	Not reported
Mailing Suite:	Not reported
Mailing City:	Not reported
Mailing State:	Not reported
Mailing Zip:	Not reported
Latitude:	Not reported
Longitude:	Not reported

Chemical:

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Not reported
Year:	2016
Gas:	Not reported
SR Number:	Not reported
Case Number:	0
imm:	Not reported
EHS:	Not reported
Liquid:	Not reported
Storage Location:	AASF 2
Mix:	Not reported
Max. Amount:	Not reported
Pressure:	Not reported
Pure:	Not reported
Average Amount:	Not reported
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	Not reported
Solid:	Not reported
Storage Code:	Not reported
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	Not reported
trdsec:	Not reported

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Not reported

ARMY AVIATION SUPPORT FACILITY (Continued) **S108785439**

Year:	2015
Gas:	Not reported
SR Number:	Not reported
Case Number:	0
imm:	Not reported
EHS:	Not reported
Liquid:	Not reported
Storage Location:	AASF 2
Mix:	Not reported
Max. Amount:	Not reported
Pressure:	Not reported
Pure:	Not reported
Average Amount:	Not reported
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	Not reported
Solid:	Not reported
Storage Code:	Not reported
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	Not reported
trdsec:	Not reported

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Y
Year:	2018
Gas:	Not reported
SR Number:	Not reported
Case Number:	Not reported
imm:	Y
EHS:	Not reported
Liquid:	Y
Storage Location:	AASF 2
Mix:	Y
Max. Amount:	25,000 - 49,999
Pressure:	1
Pure:	Not reported
Average Amount:	25,000 - 49,999
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	JET FUELS, (JP-4)
Solid:	Not reported
Storage Code:	A
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	4
trdsec:	Not reported

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Not reported
Year:	2017
Gas:	Not reported
SR Number:	Not reported

ARMY AVIATION SUPPORT FACILITY (Continued) **S108785439**

Case Number:	0
imm:	Not reported
EHS:	Not reported
Liquid:	Not reported
Storage Location:	AASF 2
Mix:	Not reported
Max. Amount:	25,000 - 49,999
Pressure:	Not reported
Pure:	Not reported
Average Amount:	25,000 - 49,999
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	JET FUELS, (JP-4)
Solid:	Not reported
Storage Code:	Not reported
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	Not reported
trdsec:	Not reported

Contact:

Facility ID:	88577
Facility Name:	Army Aviation Support Facility
302 Contact:	Amy Dirks
302 Phone:	402-309-8485
Primary Contact:	Dallas Bundy
Primary Contact Phone:	402-309-8702
Primary Contact 24 HR:	402-309-8210
Secondary Contact:	Whisper Harris
Secondary Contact Phone:	402-309-8695
Secondary Contact 24 HR:	402-309-8210

Name:	ARMY AVIATION SUPPORT FACILITY
Address:	3010 E AIRPORT RD
City,State,Zip:	GRAND ISLAND, NE 68801-9144
Year:	2015
Facility ID:	88577
Location:	3010-90 E Airport; Gunbarrel,Airport-0.5W,N Side
SR No:	127
Mailing Name:	Not reported
Mailing Address:	Not reported
Mailing Address 2:	Not reported
Mailing Suite:	Not reported
Mailing City:	Not reported
Mailing State:	Not reported
Mailing Zip:	Not reported
Latitude:	Not reported
Longitude:	Not reported

Chemical:

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Not reported
Year:	2016
Gas:	Not reported

ARMY AVIATION SUPPORT FACILITY (Continued) **S108785439**

SR Number:	Not reported
Case Number:	0
imm:	Not reported
EHS:	Not reported
Liquid:	Not reported
Storage Location:	AASF 2
Mix:	Not reported
Max. Amount:	Not reported
Pressure:	Not reported
Pure:	Not reported
Average Amount:	Not reported
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	Not reported
Solid:	Not reported
Storage Code:	Not reported
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	Not reported
trdsec:	Not reported

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Not reported
Year:	2015
Gas:	Not reported
SR Number:	Not reported
Case Number:	0
imm:	Not reported
EHS:	Not reported
Liquid:	Not reported
Storage Location:	AASF 2
Mix:	Not reported
Max. Amount:	Not reported
Pressure:	Not reported
Pure:	Not reported
Average Amount:	Not reported
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	Not reported
Solid:	Not reported
Storage Code:	Not reported
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	Not reported
trdsec:	Not reported

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Y
Year:	2018
Gas:	Not reported
SR Number:	Not reported
Case Number:	Not reported
imm:	Y

ARMY AVIATION SUPPORT FACILITY (Continued) **S108785439**

EHS:	Not reported
Liquid:	Y
Storage Location:	AASF 2
Mix:	Y
Max. Amount:	25,000 - 49,999
Pressure:	1
Pure:	Not reported
Average Amount:	25,000 - 49,999
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	JET FUELS, (JP-4)
Solid:	Not reported
Storage Code:	A
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	4
trdsec:	Not reported

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Not reported
Year:	2017
Gas:	Not reported
SR Number:	Not reported
Case Number:	0
imm:	Not reported
EHS:	Not reported
Liquid:	Not reported
Storage Location:	AASF 2
Mix:	Not reported
Max. Amount:	25,000 - 49,999
Pressure:	Not reported
Pure:	Not reported
Average Amount:	25,000 - 49,999
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	JET FUELS, (JP-4)
Solid:	Not reported
Storage Code:	Not reported
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	Not reported
trdsec:	Not reported

Contact:

Facility ID:	88577
Facility Name:	Army Aviation Support Facility
302 Contact:	Amy Dirks
302 Phone:	402-309-8485
Primary Contact:	Dallas Bundy
Primary Contact Phone:	402-309-8702
Primary Contact 24 HR:	402-309-8210
Secondary Contact:	Whisper Harris
Secondary Contact Phone:	402-309-8695
Secondary Contact 24 HR:	402-309-8210

ARMY AVIATION SUPPORT FACILITY (Continued) **S108785439**

Name:	ARMY AVIATION SUPPORT FACILITY
Address:	3010 E AIRPORT RD
City,State,Zip:	GRAND ISLAND, NE 68801-9144
Year:	2014
Facility ID:	88577
Location:	3010-90 E Airport; Gunbarrel,Airport-0.5W,N Side
SR No:	1303
Mailing Name:	Not reported
Mailing Address:	Not reported
Mailing Address 2:	Not reported
Mailing Suite:	Not reported
Mailing City:	Not reported
Mailing State:	Not reported
Mailing Zip:	Not reported
Latitude:	Not reported
Longitude:	Not reported

Chemical:

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Not reported
Year:	2016
Gas:	Not reported
SR Number:	Not reported
Case Number:	0
imm:	Not reported
EHS:	Not reported
Liquid:	Not reported
Storage Location:	AASF 2
Mix:	Not reported
Max. Amount:	Not reported
Pressure:	Not reported
Pure:	Not reported
Average Amount:	Not reported
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	Not reported
Solid:	Not reported
Storage Code:	Not reported
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	Not reported
trdsec:	Not reported

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Not reported
Year:	2015
Gas:	Not reported
SR Number:	Not reported
Case Number:	0
imm:	Not reported
EHS:	Not reported
Liquid:	Not reported
Storage Location:	AASF 2
Mix:	Not reported

ARMY AVIATION SUPPORT FACILITY (Continued) **S108785439**

Max. Amount:	Not reported
Pressure:	Not reported
Pure:	Not reported
Average Amount:	Not reported
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	Not reported
Solid:	Not reported
Storage Code:	Not reported
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	Not reported
trdsec:	Not reported

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Y
Year:	2018
Gas:	Not reported
SR Number:	Not reported
Case Number:	Not reported
imm:	Y
EHS:	Not reported
Liquid:	Y
Storage Location:	AASF 2
Mix:	Y
Max. Amount:	25,000 - 49,999
Pressure:	1
Pure:	Not reported
Average Amount:	25,000 - 49,999
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	JET FUELS, (JP-4)
Solid:	Not reported
Storage Code:	A
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	4
trdsec:	Not reported

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Not reported
Year:	2017
Gas:	Not reported
SR Number:	Not reported
Case Number:	0
imm:	Not reported
EHS:	Not reported
Liquid:	Not reported
Storage Location:	AASF 2
Mix:	Not reported
Max. Amount:	25,000 - 49,999
Pressure:	Not reported
Pure:	Not reported

ARMY AVIATION SUPPORT FACILITY (Continued) **S108785439**

Average Amount:	25,000 - 49,999
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	JET FUELS, (JP-4)
Solid:	Not reported
Storage Code:	Not reported
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	Not reported
trdsec:	Not reported

Contact:

Facility ID:	88577
Facility Name:	Army Aviation Support Facility
302 Contact:	Amy Dirks
302 Phone:	402-309-8485
Primary Contact:	Dallas Bundy
Primary Contact Phone:	402-309-8702
Primary Contact 24 HR:	402-309-8210
Secondary Contact:	Whisper Harris
Secondary Contact Phone:	402-309-8695
Secondary Contact 24 HR:	402-309-8210

Name:	ARMY AVIATION SUPPORT FACILITY
Address:	3010 E AIRPORT RD
City,State,Zip:	GRAND ISLAND, NE 68801-9144
Year:	2013
Facility ID:	88577
Location:	3010-90 E Airport; Gunbarrel,Airport-0.5W,N Side
SR No:	120
Mailing Name:	Not reported
Mailing Address:	Not reported
Mailing Address 2:	Not reported
Mailing Suite:	Not reported
Mailing City:	Not reported
Mailing State:	Not reported
Mailing Zip:	Not reported
Latitude:	Not reported
Longitude:	Not reported

Chemical:

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Not reported
Year:	2016
Gas:	Not reported
SR Number:	Not reported
Case Number:	0
imm:	Not reported
EHS:	Not reported
Liquid:	Not reported
Storage Location:	AASF 2
Mix:	Not reported
Max. Amount:	Not reported
Pressure:	Not reported

ARMY AVIATION SUPPORT FACILITY (Continued) **S108785439**

Pure:	Not reported
Average Amount:	Not reported
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	Not reported
Solid:	Not reported
Storage Code:	Not reported
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	Not reported
trdsec:	Not reported

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Not reported
Year:	2015
Gas:	Not reported
SR Number:	Not reported
Case Number:	0
imm:	Not reported
EHS:	Not reported
Liquid:	Not reported
Storage Location:	AASF 2
Mix:	Not reported
Max. Amount:	Not reported
Pressure:	Not reported
Pure:	Not reported
Average Amount:	Not reported
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	Not reported
Solid:	Not reported
Storage Code:	Not reported
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	Not reported
trdsec:	Not reported

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Y
Year:	2018
Gas:	Not reported
SR Number:	Not reported
Case Number:	Not reported
imm:	Y
EHS:	Not reported
Liquid:	Y
Storage Location:	AASF 2
Mix:	Y
Max. Amount:	25,000 - 49,999
Pressure:	1
Pure:	Not reported
Average Amount:	25,000 - 49,999
Chemical ID:	3929

ARMY AVIATION SUPPORT FACILITY (Continued) **S108785439**

Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	JET FUELS, (JP-4)
Solid:	Not reported
Storage Code:	A
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	4
trdsec:	Not reported

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Not reported
Year:	2017
Gas:	Not reported
SR Number:	Not reported
Case Number:	0
imm:	Not reported
EHS:	Not reported
Liquid:	Not reported
Storage Location:	AASF 2
Mix:	Not reported
Max. Amount:	25,000 - 49,999
Pressure:	Not reported
Pure:	Not reported
Average Amount:	25,000 - 49,999
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	JET FUELS, (JP-4)
Solid:	Not reported
Storage Code:	Not reported
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	Not reported
trdsec:	Not reported

Contact:

Facility ID:	88577
Facility Name:	Army Aviation Support Facility
302 Contact:	Amy Dirks
302 Phone:	402-309-8485
Primary Contact:	Dallas Bundy
Primary Contact Phone:	402-309-8702
Primary Contact 24 HR:	402-309-8210
Secondary Contact:	Whisper Harris
Secondary Contact Phone:	402-309-8695
Secondary Contact 24 HR:	402-309-8210

Name:	ARMY AVIATION SUPPORT FACILITY
Address:	3010 E AIRPORT RD
City,State,Zip:	GRAND ISLAND, NE 68801-9144
Year:	2012
Facility ID:	88577
Location:	3010-90 E Airport; Gunbarrel,Airport-0.5W,N Side
SR No:	119
Mailing Name:	Not reported

ARMY AVIATION SUPPORT FACILITY (Continued) **S108785439**

Mailing Address:	Not reported
Mailing Address 2:	Not reported
Mailing Suite:	Not reported
Mailing City:	Not reported
Mailing State:	Not reported
Mailing Zip:	Not reported
Latitude:	Not reported
Longitude:	Not reported

Chemical:

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Not reported
Year:	2016
Gas:	Not reported
SR Number:	Not reported
Case Number:	0
imm:	Not reported
EHS:	Not reported
Liquid:	Not reported
Storage Location:	AASF 2
Mix:	Not reported
Max. Amount:	Not reported
Pressure:	Not reported
Pure:	Not reported
Average Amount:	Not reported
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	Not reported
Solid:	Not reported
Storage Code:	Not reported
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	Not reported
trdsec:	Not reported

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Not reported
Year:	2015
Gas:	Not reported
SR Number:	Not reported
Case Number:	0
imm:	Not reported
EHS:	Not reported
Liquid:	Not reported
Storage Location:	AASF 2
Mix:	Not reported
Max. Amount:	Not reported
Pressure:	Not reported
Pure:	Not reported
Average Amount:	Not reported
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	Not reported
Solid:	Not reported

ARMY AVIATION SUPPORT FACILITY (Continued) **S108785439**

Storage Code:	Not reported
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	Not reported
trdsec:	Not reported

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Y
Year:	2018
Gas:	Not reported
SR Number:	Not reported
Case Number:	Not reported
imm:	Y
EHS:	Not reported
Liquid:	Y
Storage Location:	AASF 2
Mix:	Y
Max. Amount:	25,000 - 49,999
Pressure:	1
Pure:	Not reported
Average Amount:	25,000 - 49,999
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	JET FUELS, (JP-4)
Solid:	Not reported
Storage Code:	A
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	4
trdsec:	Not reported

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Not reported
Year:	2017
Gas:	Not reported
SR Number:	Not reported
Case Number:	0
imm:	Not reported
EHS:	Not reported
Liquid:	Not reported
Storage Location:	AASF 2
Mix:	Not reported
Max. Amount:	25,000 - 49,999
Pressure:	Not reported
Pure:	Not reported
Average Amount:	25,000 - 49,999
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	JET FUELS, (JP-4)
Solid:	Not reported
Storage Code:	Not reported
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported

ARMY AVIATION SUPPORT FACILITY (Continued) **S108785439**

tempcd:	Not reported
trdsec:	Not reported

Contact:

Facility ID:	88577
Facility Name:	Army Aviation Support Facility
302 Contact:	Amy Dirks
302 Phone:	402-309-8485
Primary Contact:	Dallas Bundy
Primary Contact Phone:	402-309-8702
Primary Contact 24 HR:	402-309-8210
Secondary Contact:	Whisper Harris
Secondary Contact Phone:	402-309-8695
Secondary Contact 24 HR:	402-309-8210

Name:	ARMY AVIATION SUPPORT FACILITY
Address:	3010 E AIRPORT RD
City,State,Zip:	GRAND ISLAND, NE 68801-9144
Year:	2016
Facility ID:	88577
Location:	3010-90 E Airport; Gunbarrel,Airport-0.5W,N Side
SR No:	114
Mailing Name:	Not reported
Mailing Address:	Not reported
Mailing Address 2:	Not reported
Mailing Suite:	Not reported
Mailing City:	Not reported
Mailing State:	Not reported
Mailing Zip:	Not reported
Latitude:	Not reported
Longitude:	Not reported

Chemical:

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Not reported
Year:	2016
Gas:	Not reported
SR Number:	Not reported
Case Number:	0
imm:	Not reported
EHS:	Not reported
Liquid:	Not reported
Storage Location:	AASF 2
Mix:	Not reported
Max. Amount:	Not reported
Pressure:	Not reported
Pure:	Not reported
Average Amount:	Not reported
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	Not reported
Solid:	Not reported
Storage Code:	Not reported
Chemical Reporting Name(Trade Name):	JP-8

ARMY AVIATION SUPPORT FACILITY (Continued) **S108785439**

sudrel:	Not reported
tempcd:	Not reported
trdsec:	Not reported
Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Not reported
Year:	2015
Gas:	Not reported
SR Number:	Not reported
Case Number:	0
imm:	Not reported
EHS:	Not reported
Liquid:	Not reported
Storage Location:	AASF 2
Mix:	Not reported
Max. Amount:	Not reported
Pressure:	Not reported
Pure:	Not reported
Average Amount:	Not reported
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	Not reported
Solid:	Not reported
Storage Code:	Not reported
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	Not reported
trdsec:	Not reported
Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Y
Year:	2018
Gas:	Not reported
SR Number:	Not reported
Case Number:	Not reported
imm:	Y
EHS:	Not reported
Liquid:	Y
Storage Location:	AASF 2
Mix:	Y
Max. Amount:	25,000 - 49,999
Pressure:	1
Pure:	Not reported
Average Amount:	25,000 - 49,999
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	JET FUELS, (JP-4)
Solid:	Not reported
Storage Code:	A
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	4
trdsec:	Not reported

ARMY AVIATION SUPPORT FACILITY (Continued) **S108785439**

Facid:	88577
conf:	Not reported
del:	Not reported
Fire:	Not reported
Year:	2017
Gas:	Not reported
SR Number:	Not reported
Case Number:	0
imm:	Not reported
EHS:	Not reported
Liquid:	Not reported
Storage Location:	AASF 2
Mix:	Not reported
Max. Amount:	25,000 - 49,999
Pressure:	Not reported
Pure:	Not reported
Average Amount:	25,000 - 49,999
Chemical ID:	3929
Reaction:	Not reported
Chemical Reporting Name(Active Ingredient):	JET FUELS, (JP-4)
Solid:	Not reported
Storage Code:	Not reported
Chemical Reporting Name(Trade Name):	JP-8
sudrel:	Not reported
tempcd:	Not reported
trdsec:	Not reported

Contact:

Facility ID:	88577
Facility Name:	Army Aviation Support Facility
302 Contact:	Amy Dirks
302 Phone:	402-309-8485
Primary Contact:	Dallas Bundy
Primary Contact Phone:	402-309-8702
Primary Contact 24 HR:	402-309-8210
Secondary Contact:	Whisper Harris
Secondary Contact Phone:	402-309-8695
Secondary Contact 24 HR:	402-309-8210

A4	**NEARNG AASF-2**	**RCRA-VSQG**	**1016169484**
Target	**3010 AIRPORT ROAD EAST**	**FINDS**	**NER000511212**
Property	**GRAND ISLAND, NE 68801**	**ECHO**	

Site 4 of 4 in cluster A

Actual:
1841 ft.

RCRA-VSQG:

Date form received by agency:	2013-09-30 00:00:00.0
Facility name:	NEARNG AASF-2
Facility address:	3010 AIRPORT ROAD EAST GRAND ISLAND, NE 68801
EPA ID:	NER000511212
Mailing address:	AIRPORT ROAD EAST GRAND ISLAND, NE 68801
Contact:	MARCUS GROETZINGER
Contact address:	AIRPORT ROAD EAST GRAND ISLAND, NE 68801

NEARNG AASF-2 (Continued) **1016169484**

Contact country:	US
Contact telephone:	402-309-8697
Contact email:	MARCUS.A.GROETZINGER.MIL@MAIL.MIL
EPA Region:	07
Classification:	Conditionally Exempt Small Quantity Generator
Description:	Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:

Owner/operator name:	STATE OF NEBRASKA
Owner/operator address:	PO BOX 98940 LINCOLN, NE 68509
Owner/operator country:	US
Owner/operator telephone:	Not reported
Owner/operator email:	Not reported
Owner/operator fax:	Not reported
Owner/operator extension:	Not reported
Legal status:	State
Owner/Operator Type:	Owner
Owner/Op start date:	2009-05-28 00:00:00.0
Owner/Op end date:	Not reported

Owner/operator name:	NEBRASKA MILITARY DEPARTMENT
Owner/operator address:	Not reported Not reported
Owner/operator country:	US
Owner/operator telephone:	Not reported
Owner/operator email:	Not reported
Owner/operator fax:	Not reported
Owner/operator extension:	Not reported
Legal status:	State
Owner/Operator Type:	Operator
Owner/Op start date:	2009-05-28 00:00:00.0
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No

NEARNG AASF-2 (Continued) **1016169484**

Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Historical Generators:

Date form received by agency:	2013-07-29 00:00:00.0
Site name:	NEBRASKA ARMY NATIONAL GUARD ARMY AVIATION SUPPORT FACILITY 2 - NE ARNG
Classification:	Conditionally Exempt Small Quantity Generator

Hazardous Waste Summary:

. Waste code: D001
. Waste name: IGNITABLE WASTE

. Waste code: D002
. Waste name: CORROSIVE WASTE

. Waste code: D003
. Waste name: REACTIVE WASTE

. Waste code: D004
. Waste name: ARSENIC

. Waste code: D005
. Waste name: BARIUM

. Waste code: D006
. Waste name: CADMIUM

. Waste code: D007
. Waste name: CHROMIUM

. Waste code: D008
. Waste name: LEAD

. Waste code: D009
. Waste name: MERCURY

Violation Status: No violations found

FINDS:

Registry ID: 110055931611

Environmental Interest/Information System

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

NEARNG AASF-2 (Continued) **1016169484**

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:

Envid:	1016169484
Registry ID:	110055931611
DFR URL:	http://echo.epa.gov/detailed-facility-report?fid=110055931611

5
NW
1/4-1/2
0.444 mi.
2342 ft.

GRAND ISLAND AAF
GRAND ISLAND, NE

FUDS **1024898684**
N/A

Relative: Higher
Actual: 1842 ft.

FUDS:

EPA Region:	7
Installation ID:	NE79799F042700
Congressional District Number:	3
Facility Name:	GRAND ISLAND AAF
FUDS Number:	B07NE0046
City:	GRAND ISLAND
State:	NE
County:	HALL
Telephone:	402-995-2416
USACE Division:	Northwestern Division (NWD)
USACE District:	Omaha District (NWO)
Status:	Properties without projects
Current Owner:	Local Government
X Coord:	-98.308888889609904
Y Coord:	40.967500000425503
Latitude:	40.967500000000001
Longitude:	-98.308888890000006

Count: 7 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
GRAND ISLAND	S105528840	HALL COUNTY AIRPORT AUTH	RT 3, E OF AIRPORT MAINT. SHOP		LUST
GRAND ISLAND	S105238020		AIRPORT		LAST
GRAND ISLAND	S108785105	GRAND ISLAND MUNICIPAL DUMP	E CAPITAL AVE	68801	SHWS
GRAND ISLAND	S117716343	CENTRAL NE REG AIRPORT	CENTRAL NE REG AIRPORT		LUST
GRAND ISLAND	S105172923	FAA VORTAC - GRAND ISLAND	GRAND ISLAND MUNI AIRPORT		LUST
GRAND ISLAND	S102420229	CORNHUSKER RENT-A-CAR	HALL CO. AIRPORT #44		LUST
GRAND ISLAND	S109896774	E 4TH STREET & SKY PARK ROAD	JCT E 4TH ST & SKY PARK RD	68801	SHWS

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: N/A
Last EDR Contact: 11/07/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 5
Telephone 312-886-6686

EPA Region 10
Telephone 206-553-8665

EPA Region 6
Telephone: 214-655-6659

EPA Region 7
Telephone: 913-551-7247

EPA Region 8
Telephone: 303-312-6774

EPA Region 9
Telephone: 415-947-4246

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: N/A
Last EDR Contact: 11/07/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

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.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: N/A
Last EDR Contact: 11/07/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 04/03/2019
Date Data Arrived at EDR: 04/05/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 10/04/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA’s Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 11/07/2019
Next Scheduled EDR Contact: 01/27/2020
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates 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 the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The 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 potential NPL site.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 11/07/2019
Next Scheduled EDR Contact: 01/27/2020
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report
CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/26/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 113

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 10/28/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal
RCRAInfo is EPA's 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. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/26/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 113

Source: Environmental Protection Agency
Telephone: 913-551-7003
Last EDR Contact: 10/28/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators
RCRAInfo is EPA's 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. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/26/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 113

Source: Environmental Protection Agency
Telephone: 913-551-7003
Last EDR Contact: 10/28/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's 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. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/26/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 113

Source: Environmental Protection Agency
Telephone: 913-551-7003
Last EDR Contact: 10/28/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

RCRAInfo is EPA's 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. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/26/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 113

Source: Environmental Protection Agency
Telephone: 913-551-7003
Last EDR Contact: 10/28/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 08/13/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 08/26/2019
Number of Days to Update: 6

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 11/07/2019
Next Scheduled EDR Contact: 02/24/2020
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 08/19/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 08/26/2019
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 08/19/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 08/26/2019
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System
Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/09/2019
Date Data Arrived at EDR: 09/09/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 14

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 09/09/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

SHWS: Superfund State Program List
The Nebraska Department of Environmental Quality is providing this information from it's own database. The data, although not verified to be the most current or accurate for any specific site, is generally based on the contents of the physical documents in the files. You may contact the Records Management Unit at (402) 471-3557 to make arrangements to view or to get a photocopy of the physical file.

Date of Government Version: 09/13/2019
Date Data Arrived at EDR: 09/13/2019
Date Made Active in Reports: 11/15/2019
Number of Days to Update: 63

Source: Dept. of Environmental Quality
Telephone: 402-471-3557
Last EDR Contact: 09/12/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Varies

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: Licensed Landfill List
Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 09/09/2019
Date Data Arrived at EDR: 09/13/2019
Date Made Active in Reports: 11/15/2019
Number of Days to Update: 63

Source: Department of Environmental Quality
Telephone: 402-471-4210
Last EDR Contact: 09/12/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Varies

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank Sites
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 04/08/2019
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 34

Source: Department of Environmental Quality
Telephone: 402-471-3557
Last EDR Contact: 10/08/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Quarterly

LAST: Leaking Aboveground Storage Tank Sites
Releases from an aboveground storage tank system.

Date of Government Version: 07/09/2019
Date Data Arrived at EDR: 07/09/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 76

Source: Department of Environmental Quality
Telephone: 402-471-3557
Last EDR Contact: 10/08/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Quarterly

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 04/12/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 04/08/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 79

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/11/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 05/02/2019
Date Data Arrived at EDR: 10/22/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 20

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 04/16/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 04/08/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 07/02/2019
Date Data Arrived at EDR: 10/16/2019
Date Made Active in Reports: 10/24/2019
Number of Days to Update: 8

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 08/27/2019
Date Data Arrived at EDR: 08/28/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 75

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 10/11/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Varies

UST: Facility and Tank Data
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 07/23/2019
Date Data Arrived at EDR: 07/31/2019
Date Made Active in Reports: 10/09/2019
Number of Days to Update: 70

Source: Nebraska State Fire Marshal
Telephone: 402-471-9664
Last EDR Contact: 10/30/2019
Next Scheduled EDR Contact: 02/10/2020
Data Release Frequency: Annually

AST: AST Data
A listing of aboveground storage tank site locations. Aboveground storage tanks dispensing hazardous substances must register such tank with this office. Storage tanks of 1000 gallons or less are exempt from this requirement.

Date of Government Version: 09/03/2019
Date Data Arrived at EDR: 09/05/2019
Date Made Active in Reports: 11/14/2019
Number of Days to Update: 70

Source: State Fire Marshal
Telephone: 402-471-9465
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: No Update Planned

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 05/02/2019
Date Data Arrived at EDR: 10/22/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 20

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 04/08/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 04/08/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 04/12/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 05/02/2019
Date Data Arrived at EDR: 07/29/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 80

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 04/11/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 79

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 04/16/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 79

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

INST CONTROL: Nebraska's Institutional Control Registry

A list of sites within Nebraska that have institutional controls. According to the Environmental Protection Agency (EPA), institutional controls are "non-engineering measures designed to prevent or limit exposure to hazardous substances left in place at a site, or assure effectiveness of the chosen remedy. Institutional controls are usually, but not always, legal controls, such as easements, restrictive covenants, and zoning ordinances." In short, institutional controls are a type of environmental covenant typically used when property is to be cleanup to a level determined by the potential environmental risks posed by a planned use, rather than to unrestricted use standards. This method of control has proven to be both environmentally and economically beneficial.

Date of Government Version: 03/19/2019
Date Data Arrived at EDR: 06/20/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 75

Source: Department of Environmental Quality
Telephone: 402-471-2214
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Annually

State and tribal voluntary cleanup sites

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

VCP: RAPMA Sites

The Remedial Action Plan Monitoring Act (RAPMA), initially created in 1995, provides property owners and parties responsible for contamination with a mechanism for developing voluntary environmental cleanup plans which are reviewed and approved by the Department.

Date of Government Version: 03/19/2019
Date Data Arrived at EDR: 06/20/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 75

Source: Department of Environmental Quality
Telephone: 402-471-2186
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Annually

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Varies

State and tribal Brownfields sites

BROWNFIELDS: Potential Brownfields Inventory Listing

"NDEQ defines a brownfields site as subpart (A) of CERCLA ? 101(39): '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.' This is a broad-based approach to capture all potential brownfields sites. In the event that CERCLA 128(a) State Response Program funds are utilized - for example, conducting a Section 128(a) Assessment - the exclusions, site-by-site determinations, and further definitions as provided by the law would need to be met. This would be done on a site-by-site basis." A preliminary Survey and Inventory of Brownfields Sites in Nebraska was constructed based on previously submitted information including sites named specifically by city representatives. The list was built on facility characteristics, which were founded on previous, broad-based contamination experience. Additions to the inventory were made by looking for other sources of potential brownfields sites using Standard Industrial Classification (SIC) codes. A general sector list was constructed to serve as an inventory guide. This list shows all of the different types of sites that are within the inventory (sorted by SIC code), and the number of sites there are of each type. Color-coated blocks, which group together similar SIC codes and the sites that they encompass also sort the sectors.

Date of Government Version: 06/18/2019
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 76

Source: Department of Environmental Quality
Telephone: 402-471-2186
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites

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 takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 06/03/2019
Date Data Arrived at EDR: 06/04/2019
Date Made Active in Reports: 08/26/2019
Number of Days to Update: 83

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

SWRCY: Recycling Resource Directory

A listing of recycling facilities.

Date of Government Version: 05/07/2018
Date Data Arrived at EDR: 05/07/2018
Date Made Active in Reports: 05/14/2018
Number of Days to Update: 7

Source: Department of Environmental Quality
Telephone: 402-471-6974
Last EDR Contact: 09/12/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: No Update Planned

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 10/28/2019
Next Scheduled EDR Contact: 02/10/2020
Data Release Frequency: Varies

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 10/17/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land

A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 11/01/2019
Next Scheduled EDR Contact: 02/10/2020
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/13/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 82

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: No Update Planned

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site 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. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 06/11/2019
Date Data Arrived at EDR: 06/13/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 82

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Quarterly

Local Lists of Registered Storage Tanks

HIST UST: Underground Storage Tank Database Listing

A listing of underground storage tank locations. This listing contains detail information that the UST listing does not. It is no longer updated by the agency. For current information see the UST listing.

Date of Government Version: 02/28/2005	Source: State Fire Marshal
Date Data Arrived at EDR: 09/01/2006	Telephone: 402-471-2027
Date Made Active in Reports: 10/11/2006	Last EDR Contact: 02/23/2009
Number of Days to Update: 40	Next Scheduled EDR Contact: 05/25/2009
	Data Release Frequency: No Update Planned

HIST AST: Aboveground Storage Tank Database Listing

A listing of aboveground storage tank locations. This listing contains detail information that the AST listing does not. It is no longer updated by the agency. For current information see the AST listing.

Date of Government Version: 10/19/2004	Source: State Fire Marshal
Date Data Arrived at EDR: 09/01/2006	Telephone: 402-471-2027
Date Made Active in Reports: 10/11/2006	Last EDR Contact: 03/23/2009
Number of Days to Update: 40	Next Scheduled EDR Contact: 06/22/2009
	Data Release Frequency: No Update Planned

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 07/30/2019	Source: Environmental Protection Agency
Date Data Arrived at EDR: 07/30/2019	Telephone: 202-564-6023
Date Made Active in Reports: 09/03/2019	Last EDR Contact: 11/07/2019
Number of Days to Update: 35	Next Scheduled EDR Contact: 01/13/2020
	Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 06/24/2019	Source: U.S. Department of Transportation
Date Data Arrived at EDR: 06/26/2019	Telephone: 202-366-4555
Date Made Active in Reports: 09/23/2019	Last EDR Contact: 09/24/2019
Number of Days to Update: 89	Next Scheduled EDR Contact: 01/06/2020
	Data Release Frequency: Quarterly

SPILLS: Surface Spill List

Releases of petroleum or hazardous substances to the air, land, or water.

Date of Government Version: 07/09/2019	Source: Department of Environmental Quality
Date Data Arrived at EDR: 07/09/2019	Telephone: 402-471-2186
Date Made Active in Reports: 09/23/2019	Last EDR Contact: 10/08/2019
Number of Days to Update: 76	Next Scheduled EDR Contact: 01/20/2020
	Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 10/09/2012	Source: FirstSearch
Date Data Arrived at EDR: 01/03/2013	Telephone: N/A
Date Made Active in Reports: 03/06/2013	Last EDR Contact: 01/03/2013
Number of Days to Update: 62	Next Scheduled EDR Contact: N/A
	Data Release Frequency: No Update Planned

SPILLS 80: SPILLS80 data from FirstSearch

Spills 80 includes those spill and release records available from FirstSearch databases prior to 1990. Typically, they may include chemical, oil and/or hazardous substance spills recorded before 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 80.

Date of Government Version: 04/15/2003
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 03/06/2013
Number of Days to Update: 62

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's 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. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/26/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 113

Source: Environmental Protection Agency
Telephone: 913-551-7003
Last EDR Contact: 10/28/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 05/15/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 79

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 08/23/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 10/11/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/11/2018
Date Made Active in Reports: 11/06/2019
Number of Days to Update: 574

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 10/07/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 11/11/2019
Next Scheduled EDR Contact: 02/24/2020
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 06/24/2019
Date Data Arrived at EDR: 06/26/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 89

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 09/24/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 10/31/2019
Next Scheduled EDR Contact: 02/17/2020
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 11/08/2019
Next Scheduled EDR Contact: 02/17/2020
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/21/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 198

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 09/19/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 01/10/2018
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 2

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 08/23/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 09/30/2018
Date Data Arrived at EDR: 04/24/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 106

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 10/23/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 07/19/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 35

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 11/07/2019
Next Scheduled EDR Contact: 02/17/2020
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 04/25/2019
Date Data Arrived at EDR: 05/02/2019
Date Made Active in Reports: 05/23/2019
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 10/21/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 08/20/2019
Date Data Arrived at EDR: 09/05/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 18

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 11/07/2019
Next Scheduled EDR Contact: 02/17/2020
Data Release Frequency: Quarterly

PADS: PCB Activity Database System
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 03/20/2019
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 34

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 10/11/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 10/07/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 06/20/2019
Date Data Arrived at EDR: 06/20/2019
Date Made Active in Reports: 08/08/2019
Number of Days to Update: 49

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 10/25/2019
Next Scheduled EDR Contact: 02/03/2020
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 11/06/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 01/12/2017
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 251

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 09/03/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 05/24/2017
Date Data Arrived at EDR: 11/30/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 15

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 11/06/2019
Next Scheduled EDR Contact: 02/17/2020
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/01/2019
Date Data Arrived at EDR: 07/01/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 84

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 11/12/2019
Next Scheduled EDR Contact: 01/13/2020
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/01/2019
Date Data Arrived at EDR: 07/31/2019
Date Made Active in Reports: 10/24/2019
Number of Days to Update: 85

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 10/29/2019
Next Scheduled EDR Contact: 02/10/2020
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 06/30/2019
Date Data Arrived at EDR: 07/16/2019
Date Made Active in Reports: 10/02/2019
Number of Days to Update: 78

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 10/02/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 09/28/2017
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 09/16/2019
Next Scheduled EDR Contact: 01/06/2020
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 10/06/2019
Next Scheduled EDR Contact: 01/19/2020
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 08/08/2017
Date Data Arrived at EDR: 09/11/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 3

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 11/04/2019
Next Scheduled EDR Contact: 02/17/2020
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 08/01/2019	Source: Department of Energy
Date Data Arrived at EDR: 08/21/2019	Telephone: 505-845-0011
Date Made Active in Reports: 11/11/2019	Last EDR Contact: 11/15/2019
Number of Days to Update: 82	Next Scheduled EDR Contact: 03/02/2020
	Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 07/19/2019	Source: Environmental Protection Agency
Date Data Arrived at EDR: 07/30/2019	Telephone: 703-603-8787
Date Made Active in Reports: 09/03/2019	Last EDR Contact: 11/07/2019
Number of Days to Update: 35	Next Scheduled EDR Contact: 01/13/2020
	Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001	Source: American Journal of Public Health
Date Data Arrived at EDR: 10/27/2010	Telephone: 703-305-6451
Date Made Active in Reports: 12/02/2010	Last EDR Contact: 12/02/2009
Number of Days to Update: 36	Next Scheduled EDR Contact: N/A
	Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016	Source: EPA
Date Data Arrived at EDR: 10/26/2016	Telephone: 202-564-2496
Date Made Active in Reports: 02/03/2017	Last EDR Contact: 09/26/2017
Number of Days to Update: 100	Next Scheduled EDR Contact: 01/08/2018
	Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016	Source: EPA
Date Data Arrived at EDR: 10/26/2016	Telephone: 202-564-2496
Date Made Active in Reports: 02/03/2017	Last EDR Contact: 09/26/2017
Number of Days to Update: 100	Next Scheduled EDR Contact: 01/08/2018
	Data Release Frequency: Annually

MINES VIOLATIONS: MSHA Violation Assessment Data

Mines violation and assessment information. Department of Labor, Mine Safety & Health Administration.

Date of Government Version: 06/06/2019	Source: DOL, Mine Safety & Health Admi
Date Data Arrived at EDR: 06/06/2019	Telephone: 202-693-9424
Date Made Active in Reports: 10/24/2019	Last EDR Contact: 09/12/2019
Number of Days to Update: 140	Next Scheduled EDR Contact: 12/16/2019
	Data Release Frequency: Quarterly

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/01/2019
Date Data Arrived at EDR: 08/27/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 76

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 08/27/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 04/18/2008
Number of Days to Update: 49

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 08/30/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 08/30/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory 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.

Date of Government Version: 09/10/2019
Date Data Arrived at EDR: 09/10/2019
Date Made Active in Reports: 10/17/2019
Number of Days to Update: 37

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 09/10/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 05/03/2019
Date Data Arrived at EDR: 06/05/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 90

Source: EPA
Telephone: (913) 551-7003
Last EDR Contact: 09/04/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 07/26/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 71

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 08/21/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

UXO: Unexploded Ordnance Sites
A listing of unexploded ordnance site locations

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 01/17/2019
Date Made Active in Reports: 04/01/2019
Number of Days to Update: 74

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 10/10/2019
Next Scheduled EDR Contact: 01/27/2020
Data Release Frequency: Varies

ECHO: Enforcement & Compliance History Information
ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 07/06/2019
Date Data Arrived at EDR: 07/09/2019
Date Made Active in Reports: 10/02/2019
Number of Days to Update: 85

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 10/08/2019
Next Scheduled EDR Contact: 01/20/2020
Data Release Frequency: Quarterly

FUELS PROGRAM: EPA Fuels Program Registered Listing
This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 08/19/2019
Date Data Arrived at EDR: 08/20/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 83

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 08/20/2019
Next Scheduled EDR Contact: 12/02/2019
Data Release Frequency: Quarterly

AIRS: Air State Program List
A listing of air program facilities.

Date of Government Version: 06/17/2019
Date Data Arrived at EDR: 06/18/2019
Date Made Active in Reports: 08/30/2019
Number of Days to Update: 73

Source: Department of Environmental Quality
Telephone: 402-471-3389
Last EDR Contact: 09/12/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Quarterly

ASBESTOS: Asbestos Notification Listing
Asbestos notification sites

Date of Government Version: 07/23/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/11/2019
Number of Days to Update: 43

Source: Department of Health & Human Services
Telephone: 402-471-0549
Last EDR Contact: 11/04/2019
Next Scheduled EDR Contact: 02/17/2020
Data Release Frequency: Varies

DRYCLEANERS: Drycleaner Facility Listing
A listing of drycleaner facilities in Nebraska.

Date of Government Version: 09/13/2019
Date Data Arrived at EDR: 09/13/2019
Date Made Active in Reports: 11/15/2019
Number of Days to Update: 63

Source: Department of Environmental Quality
Telephone: 402-471-3557
Last EDR Contact: 09/12/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Varies

Financial Assurance: Financial Assurance Information Listing
Financial assurance information for solid and hazardous waste sites.

Date of Government Version: 12/01/2018
Date Data Arrived at EDR: 12/19/2018
Date Made Active in Reports: 02/05/2019
Number of Days to Update: 48

Source: Department of Environmental Quality
Telephone: 402-471-2186
Last EDR Contact: 09/12/2019
Next Scheduled EDR Contact: 12/30/2019
Data Release Frequency: Annually

NPDES: Wastewater Database Listing
A listing of permitted wastewater facilities.

Date of Government Version: 08/30/2019
Date Data Arrived at EDR: 09/03/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 69

Source: Department of Environmental Quality
Telephone: 402-471-3557
Last EDR Contact: 08/30/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Quarterly

TIER 2: Tier 2 Facility Listing
A listing of facilities which store or manufacture hazardous materials that submit a chemical inventory report.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 06/05/2019
Date Made Active in Reports: 07/12/2019
Number of Days to Update: 37

Source: Department of Environmental Quality
Telephone: 402-471-3557
Last EDR Contact: 08/30/2019
Next Scheduled EDR Contact: 12/16/2019
Data Release Frequency: Varies

UIC: Undergound Injection Control Database
A listing of underground injection well locations. The UIC Program is responsible for regulating the construction, operation, permitting, and closure of injection wells that place fluids underground for storage or disposal.

Date of Government Version: 07/25/2019
Date Data Arrived at EDR: 07/30/2019
Date Made Active in Reports: 09/11/2019
Number of Days to Update: 43

Source: Department of Environmental Quality
Telephone: 402-471-2186
Last EDR Contact: 10/28/2019
Next Scheduled EDR Contact: 02/10/2020
Data Release Frequency: Varies

MINES MRDS: Mineral Resources Data System
Mineral Resources Data System

Date of Government Version: 04/06/2018
Date Data Arrived at EDR: 10/21/2019
Date Made Active in Reports: 10/24/2019
Number of Days to Update: 3

Source: USGS
Telephone: 703-648-6533
Last EDR Contact: 08/30/2019
Next Scheduled EDR Contact: 12/09/2019
Data Release Frequency: Varies

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations
EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS: Recovered Government Archive State Hazardous Waste Facilities List

The EDR Recovered Government Archive State Hazardous Waste database provides a list of SHWS incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environmental Quality in Nebraska.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/03/2014
Number of Days to Update: 186

Source: Department of Environmental Quality
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environmental Quality in Nebraska.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/03/2014
Number of Days to Update: 186

Source: Department of Environmental Quality
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 05/14/2019
Date Data Arrived at EDR: 05/14/2019
Date Made Active in Reports: 08/05/2019
Number of Days to Update: 83

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 11/11/2019
Next Scheduled EDR Contact: 02/24/2020
Data Release Frequency: No Update Planned

NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 01/01/2019
Date Data Arrived at EDR: 05/01/2019
Date Made Active in Reports: 06/21/2019
Number of Days to Update: 51

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 10/29/2019
Next Scheduled EDR Contact: 02/10/2020
Data Release Frequency: Quarterly

WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 76

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 09/06/2019
Next Scheduled EDR Contact: 12/23/2019
Data Release Frequency: Annually

Oil/Gas Pipelines

Source: Endeavor Business Media

Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Electric Power Transmission Line Data

Source: Endeavor Business Media

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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:

Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association’s annual survey of hospitals.

Medical Centers: Provider of Services Listing

Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes

Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools

Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics’ primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics’ primary database on private school locations in the United States.

Daycare Centers: Child Care Listing
Source: Department of Health & Human Srevices
Telephone: 402-471-2306

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: National Wetlands Inventory
Source: Department of Natural Resources
Telephone: 402-471-2363

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

GRAND ISLAND AASF
3010 EAST AIRPORT ROAD
GRAND ISLAND, NE 68801

TARGET PROPERTY COORDINATES

Latitude (North):	40.961244 - 40˚ 57’ 40.48’’
Longitude (West):	98.298769 - 98˚ 17’ 55.57’’
Universal Tranverse Mercator:	Zone 14
UTM X (Meters):	559010.9
UTM Y (Meters):	4534479.5
Elevation:	1841 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	6713680 GRAND ISLAND, NE
Version Date:	2014

EDR’s GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

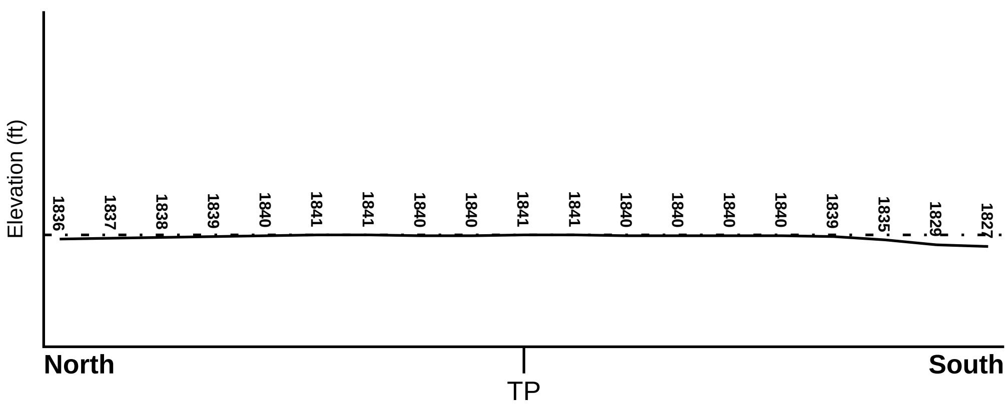
TOPOGRAPHIC INFORMATION

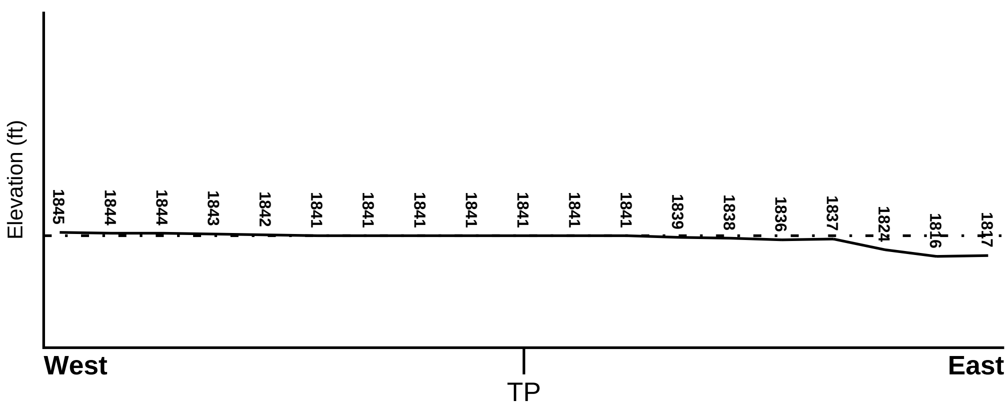
Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General SE

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES





Target Property Elevation: 1841 ft.

0 1/2 1 Miles

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
31121C0550D	FEMA FIRM Flood data

Additional Panels in search area:	FEMA Source Type
Not Reported	

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
GRAND ISLAND	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

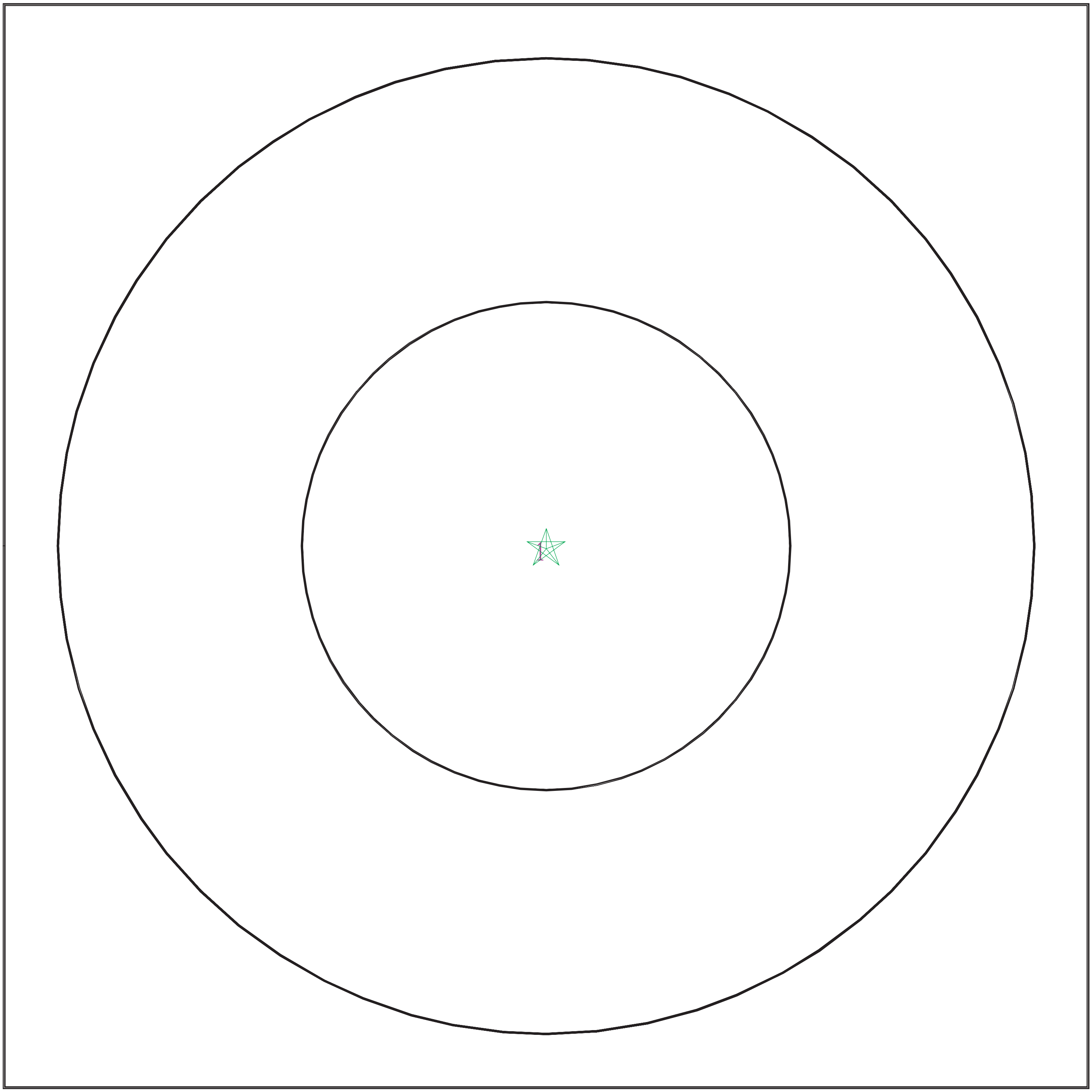
Era:	Mesozoic
System:	Cretaceous
Series:	Austin and Eagle Ford Groups
Code:	uK2 *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratified Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

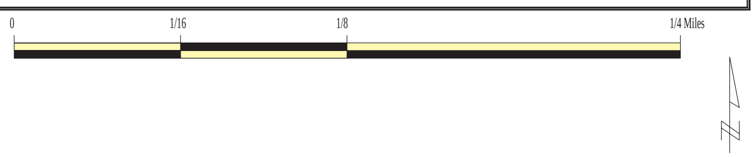
SSURGO SOIL MAP - 5872123.37s



Target Property

SSURGO Soil

Water



SITE NAME:	Grand Island AASF	CLIENT:	AECOM
ADDRESS:	3010 East Airport Road Grand Island NE 68801	CONTACT:	Hans Sund
LAT/LONG:	40.961244 / 98.298769	INQUIRY #:	5872123.37s
		DATE:	November 18, 2019 9:12 am

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture’s (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: O’Neill

Soil Surface Texture: loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	loam	Not reported	Not reported	Max: 141 Min: 141	Max: 7.3 Min: 5.6
2	5 inches	13 inches	loam	Not reported	Not reported	Max: 141 Min: 141	Max: 7.3 Min: 5.6
3	13 inches	18 inches	loam	Not reported	Not reported	Max: 141 Min: 141	Max: 7.3 Min: 5.6
4	18 inches	22 inches	loam	Not reported	Not reported	Max: 141 Min: 141	Max: 7.3 Min: 5.6
5	22 inches	25 inches	coarse sandy loam	Not reported	Not reported	Max: 141 Min: 141	Max: 7.3 Min: 5.6
6	25 inches	35 inches	sand	Not reported	Not reported	Max: 141 Min: 141	Max: 7.3 Min: 5.6
7	35 inches	79 inches	coarse sand	Not reported	Not reported	Max: 141 Min: 141	Max: 7.3 Min: 5.6

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A1	USGS40000737484	1/8 - 1/4 Mile SW
B7	USGS40000737395	1/4 - 1/2 Mile SW
30	USGS40000737429	1/2 - 1 Mile East
H39	USGS40000737701	1/2 - 1 Mile North
51	USGS40000737458	1/2 - 1 Mile East

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

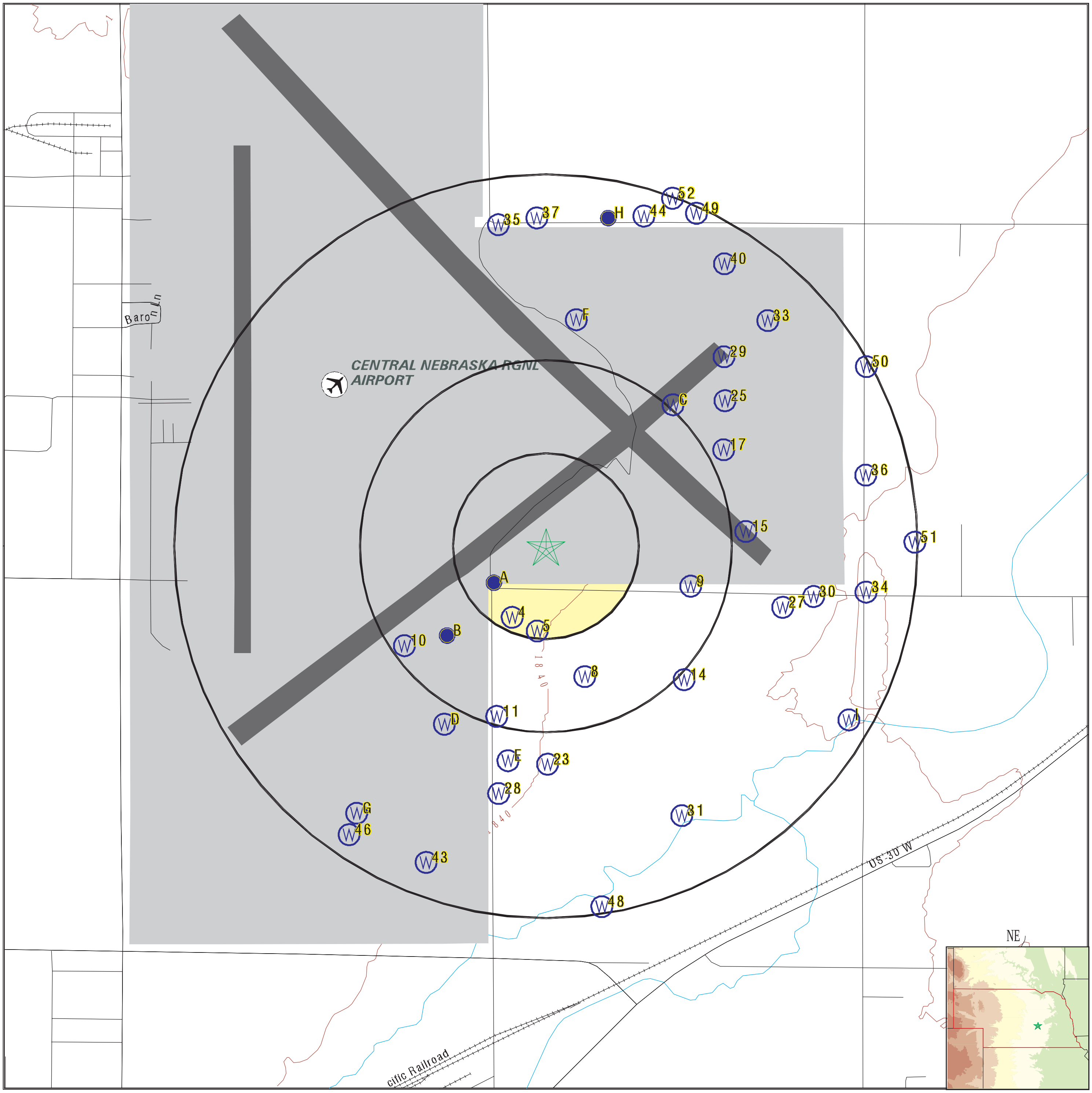
MAP ID	WELL ID	LOCATION FROM TP
A2	NE7000000024078	1/8 - 1/4 Mile SW
A3	NE7000000162795	1/8 - 1/4 Mile SW
4	NE7000000162553	1/8 - 1/4 Mile SSW
5	NE7000000088587	1/8 - 1/4 Mile South
B6	NE7000000053636	1/4 - 1/2 Mile SW
8	NE7000000028092	1/4 - 1/2 Mile SSE
9	NE7000000024178	1/4 - 1/2 Mile ESE
10	NE7000000024041	1/4 - 1/2 Mile SW
11	NE7000000220565	1/4 - 1/2 Mile SSW
C12	NE7000000024284	1/2 - 1 Mile NE
C13	NE7000000024296	1/2 - 1 Mile NE
14	NE7000000076592	1/2 - 1 Mile SE
15	NE7000000067863	1/2 - 1 Mile East
D16	NE7000000158783	1/2 - 1 Mile SSW
17	NE7000000076135	1/2 - 1 Mile ENE
D18	NE7000000053606	1/2 - 1 Mile SSW

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
D19	NE7000000158963	1/2 - 1 Mile SSW
D20	NE7000000158738	1/2 - 1 Mile SSW
E21	NE7000000013465	1/2 - 1 Mile South
F22	NE7000000195493	1/2 - 1 Mile North
23	NE7000000013179	1/2 - 1 Mile South
E24	NE7000000160386	1/2 - 1 Mile South
25	NE7000000027146	1/2 - 1 Mile NE
F26	NE7000000065644	1/2 - 1 Mile North
27	NE7000000144141	1/2 - 1 Mile ESE
28	NE7000000011865	1/2 - 1 Mile South
29	NE7000000074093	1/2 - 1 Mile NE
31	NE7000000138320	1/2 - 1 Mile SSE
G32	NE7000000024043	1/2 - 1 Mile SSW
33	NE7000000027143	1/2 - 1 Mile NE
34	NE7000000110599	1/2 - 1 Mile East
35	NE7000000190833	1/2 - 1 Mile North
36	NE7000000026544	1/2 - 1 Mile ENE
37	NE7000000092102	1/2 - 1 Mile North
G38	NE7000000053607	1/2 - 1 Mile SW
40	NE7000000068568	1/2 - 1 Mile NNE
H41	NE7000000039485	1/2 - 1 Mile NNE
G42	NE7000000013508	1/2 - 1 Mile SW
43	NE7000000104713	1/2 - 1 Mile SSW
44	NE7000000132676	1/2 - 1 Mile NNE
I45	NE7000000139825	1/2 - 1 Mile ESE
46	NE7000000226823	1/2 - 1 Mile SW
I47	NE7000000015729	1/2 - 1 Mile ESE
48	NE7000000215354	1/2 - 1 Mile South
49	NE7000000044704	1/2 - 1 Mile NNE
50	NE7000000018667	1/2 - 1 Mile ENE
52	NE7000000218046	1/2 - 1 Mile NNE

PHYSICAL SETTING SOURCE MAP - 5872123.37s



County Boundary
Major Roads
Contour Lines
Airports
Earthquake epicenter, Richter 5 or greater
Water Wells
Public Water Supply Wells
Cluster of Multiple Icons

0 1/4 1/2 1 Miles

Groundwater Flow Direction
Indeterminate Groundwater Flow at Location
Groundwater Flow Varies at Location
Oil, gas or related wells

SITE NAME: Grand Island AASF	CLIENT: AECOM
ADDRESS: 3010 East Airport Road Grand Island NE 68801	CONTACT: Hans Sund
LAT/LONG: 40.961244 / 98.298769	INQUIRY #: 5872123.37s
	DATE: November 18, 2019 9:12 am

Map ID Direction Distance Elevation	Database	EDR ID Number
A1 **SW** **1/8 - 1/4 Mile** **Higher**	**FED USGS**	**USGS40000737484**

Organization ID:	USGS-NE	Organization Name:	USGS Nebraska Water Science Center
Monitor Location:	12N 9W36CC 1	Type:	Well
Description:	Not Reported	HUC:	10200103
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	Not Reported
Well Depth:	Not Reported	Well Depth Units:	Not Reported
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

Ground water levels,Number of Measurements: 86

		Level reading date:	2003-04-02
Feet below surface:	19.85	Feet to sea level:	Not Reported
Note:	Not Reported		
Level reading date:	2002-04-04	Feet below surface:	17.51
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-04-09	Feet below surface:	16.45
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-04-17	Feet below surface:	15.73
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-04-23	Feet below surface:	14.42
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-04-20	Feet below surface:	12.47
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1997-10-09	Feet below surface:	15.11
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1997-04-14	Feet below surface:	14.77
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1996-10-08	Feet below surface:	15.47
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1996-04-11	Feet below surface:	15.72
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1995-10-19	Feet below surface:	16.52
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1995-04-13	Feet below surface:	15.55
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1994-10-22	Feet below surface:	15.41
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1994-04-22	Feet below surface:	14.10
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1993-10-12	Feet below surface:	12.27

Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1993-04-23	Feet below surface:	12.81
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1992-10-06	Feet below surface:	14.44
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1992-04-10	Feet below surface:	14.37
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1991-10-04	Feet below surface:	17.90
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1990-10-05	Feet below surface:	17.55
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1990-03-26	Feet below surface:	16.34
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1989-10-21	Feet below surface:	17.32
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1989-04-13	Feet below surface:	17.03
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1988-11-12	Feet below surface:	17.69
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1988-04-14	Feet below surface:	15.60
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1987-10-21	Feet below surface:	15.04
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1987-04-15	Feet below surface:	12.66
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1986-10-07	Feet below surface:	15.31
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1986-05-02	Feet below surface:	13.90
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-10-25	Feet below surface:	13.04
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-05-09	Feet below surface:	14.78
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-10-27	Feet below surface:	13.50
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-05-02	Feet below surface:	10.98
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-10-12	Feet below surface:	15.23
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-04-27	Feet below surface:	13.92
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1982-09-29	Feet below surface:	14.41
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-05-08	Feet below surface:	16.80
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-10-02	Feet below surface:	20.22
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-04-22	Feet below surface:	18.08
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-10-09	Feet below surface:	19.30
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-05-08	Feet below surface:	15.99
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-10-19	Feet below surface:	17.35
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-05-23	Feet below surface:	14.75
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-10-23	Feet below surface:	17.08
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-05-26	Feet below surface:	15.22
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-10-11	Feet below surface:	16.45
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-05-19	Feet below surface:	19.28
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-11-23	Feet below surface:	20.76
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-05-19	Feet below surface:	17.39
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-10-29	Feet below surface:	19.25
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-05-21	Feet below surface:	17.28
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-10-29	Feet below surface:	16.71
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-05-23	Feet below surface:	13.84
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-11-09	Feet below surface:	13.70
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-05-17	Feet below surface:	14.53
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-10-19	Feet below surface:	18.70
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1972-05-19	Feet below surface:	17.24
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-10-12	Feet below surface:	19.63
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-05-26	Feet below surface:	19.09
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-10-23	Feet below surface:	19.58
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-05-22	Feet below surface:	16.97
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-10-21	Feet below surface:	17.06
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-05-19	Feet below surface:	15.68
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1968-10-31	Feet below surface:	16.99
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1968-06-03	Feet below surface:	17.62
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-10-27	Feet below surface:	18.67
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-05-11	Feet below surface:	19.47
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-10-13	Feet below surface:	20.75
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-05-06	Feet below surface:	16.88
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-10-13	Feet below surface:	17.46
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-04-30	Feet below surface:	18.92
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-09-21	Feet below surface:	21.12
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-04-21	Feet below surface:	18.90
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-09-27	Feet below surface:	20.00
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-04-24	Feet below surface:	18.42
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1962-10-02	Feet below surface:	18.81
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1962-04-28	Feet below surface:	17.33
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1961-09-25	Feet below surface:	18.60
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1961-06-11	Feet below surface:	18.13
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1959-10-13	Feet below surface:	19.69
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1959-05-27	Feet below surface:	18.80
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-10-28	Feet below surface:	20.74
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-05-05	Feet below surface:	20.60
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1957-09-26	Feet below surface:	22.90
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1957-06-04	Feet below surface:	22.18
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1956-11-05	Feet below surface:	23.83
Feet to sea level:	Not Reported	Note:	Not Reported

A2
SW
1/8 - 1/4 Mile
Higher

NE WELLS **NE7000000024078**

Well ID:	26088	Registration Code:	G-019912
Well Replaced:	0	Well Status:	Abandoned
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	50
Series Type:	Single Project	Series End Date:	2010 6 1
Pump Rate (gal/min):	1000	Column Diameter:	8
Pump Depth:	0	Well Depth:	85
Static Water Level:	19	Pumping Water Level:	40
Contractor ID:	0	Owner ID:	21932
Registration Date:	1959 2 9	Completion Date:	1921 425
Date Abandoned:	2006 2 1		

A3
SW
1/8 - 1/4 Mile
Higher

NE WELLS **NE7000000162795**

Well ID:	174757	Registration Code:	G-019912
Well Replaced:	1	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	4006008	Acres Irrigated:	65
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	700	Column Diameter:	8
Pump Depth:	70	Well Depth:	80
Static Water Level:	23	Pumping Water Level:	50
Contractor ID:	39269	Owner ID:	21932
Registration Date:	2006 331	Completion Date:	2006 228

Date Abandoned: 0

4
SSW
1/8 - 1/4 Mile
Higher

NE WELLS NE7000000162553

Well ID:	174906	Registration Code:	G-138983
Well Replaced:	0	Well Status:	Active
Well Use:	Domestic	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	0
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	25	Column Diameter:	1.25
Pump Depth:	65	Well Depth:	87
Static Water Level:	21	Pumping Water Level:	23
Contractor ID:	19216	Owner ID:	87307
Registration Date:	2006 3 2	Completion Date:	2006 228
Date Abandoned:	0		

5
South
1/8 - 1/4 Mile
Lower

NE WELLS NE7000000088587

Well ID:	71679	Registration Code:	G-063763
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	75
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	1200	Column Diameter:	8
Pump Depth:	0	Well Depth:	82
Static Water Level:	13	Pumping Water Level:	45
Contractor ID:	0	Owner ID:	62885
Registration Date:	1980 514	Completion Date:	1980 5 5
Date Abandoned:	0		

B6
SW
1/4 - 1/2 Mile
Higher

NE WELLS NE7000000053636

Well ID:	56819	Registration Code:	G-049336
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	174
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	1000	Column Diameter:	8
Pump Depth:	0	Well Depth:	102
Static Water Level:	20	Pumping Water Level:	41
Contractor ID:	0	Owner ID:	21932
Registration Date:	1976 414	Completion Date:	1976 316
Date Abandoned:	0		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation	Database	EDR ID Number
B7 **SW** **1/4 - 1/2 Mile** **Higher**	**FED USGS**	**USGS40000737395**

Organization ID:	USGS-NE	Organization Name:	USGS Nebraska Water Science Center
Monitor Location:	11N 9W 2AA 1	Type:	Well
Description:	Not Reported	HUC:	10200103
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Unconfined single aquifer	Construction Date:	Not Reported
Well Depth:	25	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

Ground water levels,Number of Measurements:	63	Level reading date:	1942-10-13
Feet below surface:	20.25	Feet to sea level:	Not Reported
Note:	Not Reported		
Level reading date:	1942-07-17	Feet below surface:	21.08
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1942-06-18	Feet below surface:	20.84
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1942-04-09	Feet below surface:	21.00
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1942-02-20	Feet below surface:	21.17
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-11-12	Feet below surface:	21.54
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-07-19	Feet below surface:	24.75
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-06-18	Feet below surface:	21.35
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-03-26	Feet below surface:	21.70
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1940-12-24	Feet below surface:	22.00
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1940-09-24	Feet below surface:	21.10
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1940-06-25	Feet below surface:	21.55
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1940-04-09	Feet below surface:	21.24
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-12-12	Feet below surface:	21.30
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-11-07	Feet below surface:	21.10

Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-08-12	Feet below surface:	21.00
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-06-14	Feet below surface:	20.50
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-05-07	Feet below surface:	20.60
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-03-21	Feet below surface:	20.70
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-01-28	Feet below surface:	20.45
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-12-11	Feet below surface:	20.85
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-10-15	Feet below surface:	20.75
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-09-11	Feet below surface:	20.75
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-08-13	Feet below surface:	20.45
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-07-02	Feet below surface:	20.20
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-06-18	Feet below surface:	20.25
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-06-11	Feet below surface:	20.40
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-06-05	Feet below surface:	20.30
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-05-29	Feet below surface:	20.25
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-05-22	Feet below surface:	20.30
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-05-15	Feet below surface:	20.55
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-05-08	Feet below surface:	20.55
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-05-01	Feet below surface:	20.55
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-04-24	Feet below surface:	20.60
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-04-17	Feet below surface:	20.75
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1938-04-10	Feet below surface:	20.70
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-04-03	Feet below surface:	20.85
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-03-27	Feet below surface:	20.85
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-03-20	Feet below surface:	20.70
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-03-06	Feet below surface:	20.80
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-01-15	Feet below surface:	20.80
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-12-12	Feet below surface:	20.70
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-11-02	Feet below surface:	20.95
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-09-08	Feet below surface:	20.15
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-08-29	Feet below surface:	20.24
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-08-11	Feet below surface:	20.70
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-07-25	Feet below surface:	22.45
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-07-18	Feet below surface:	19.60
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-05-12	Feet below surface:	18.90
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-05-02	Feet below surface:	18.90
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-04-14	Feet below surface:	18.75
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-04-07	Feet below surface:	18.90
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-03-31	Feet below surface:	18.87
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-03-15	Feet below surface:	19.40
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-03-07	Feet below surface:	19.30
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-02-28	Feet below surface:	19.20
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1936-02-01	Feet below surface:	19.28
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1935-12-28	Feet below surface:	19.15
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1935-12-21	Feet below surface:	19.05
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1935-12-15	Feet below surface:	19.20
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1935-12-07	Feet below surface:	19.15
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1935-12-02	Feet below surface:	19.20
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1935-12	Feet below surface:	19
Feet to sea level:	Not Reported	Note:	Not Reported

8
SSE
1/4 - 1/2 Mile
Lower

NE WELLS **NE7000000028092**

Well ID:	14381	Registration Code:	G-009647
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	200
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	1200	Column Diameter:	9
Pump Depth:	0	Well Depth:	86
Static Water Level:	24	Pumping Water Level:	50
Contractor ID:	0	Owner ID:	33702
Registration Date:	1957 914	Completion Date:	1945 6 1
Date Abandoned:	0		

9
ESE
1/4 - 1/2 Mile
Lower

NE WELLS **NE7000000024178**

Well ID:	26093	Registration Code:	G-019916
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	80
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	1000	Column Diameter:	0
Pump Depth:	0	Well Depth:	80
Static Water Level:	19	Pumping Water Level:	45
Contractor ID:	0	Owner ID:	21932
Registration Date:	1959 2 9	Completion Date:	1920 7 2
Date Abandoned:	0		

Map ID Direction Distance Elevation	Database	EDR ID Number
10 **SW** **1/4 - 1/2 Mile** **Higher**	**NE WELLS**	**NE7000000024041**

Well ID:	26091	Registration Code:	G-019914
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	50
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	1000	Column Diameter:	8
Pump Depth:	0	Well Depth:	80
Static Water Level:	19	Pumping Water Level:	40
Contractor ID:	0	Owner ID:	21932
Registration Date:	1959 2 9	Completion Date:	1920 7 1
Date Abandoned:	0		

11 **SSW** **1/4 - 1/2 Mile** **Higher**	**NE WELLS**	**NE7000000220565**

Well ID:	237651	Registration Code:	G-176742
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	4015010	Acres Irrigated:	20
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	1100	Column Diameter:	8
Pump Depth:	40	Well Depth:	85
Static Water Level:	20	Pumping Water Level:	34
Contractor ID:	39407	Owner ID:	62885
Registration Date:	2015 615	Completion Date:	2015 429
Date Abandoned:	0		

C12 **NE** **1/2 - 1 Mile** **Lower**	**NE WELLS**	**NE7000000024284**

Well ID:	26094	Registration Code:	G-019917
Well Replaced:	0	Well Status:	Abandoned
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	80
Series Type:	Single Project	Series End Date:	2010 6 1
Pump Rate (gal/min):	1000	Column Diameter:	0
Pump Depth:	0	Well Depth:	80
Static Water Level:	19	Pumping Water Level:	40
Contractor ID:	0	Owner ID:	21932
Registration Date:	1959 2 9	Completion Date:	1920 7 1
Date Abandoned:	0		

Map ID Direction Distance Elevation		Database	EDR ID Number
C13 **NE** **1/2 - 1 Mile** **Lower**		**NE WELLS**	**NE7000000024296**

Well ID:	26089	Registration Code:	G-019917
Well Replaced:	1	Well Status:	Abandoned
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	80
Series Type:	Single Project	Series End Date:	2006 2 1
Pump Rate (gal/min):	600	Column Diameter:	6
Pump Depth:	0	Well Depth:	85
Static Water Level:	18	Pumping Water Level:	50
Contractor ID:	0	Owner ID:	21932
Registration Date:	1975 917	Completion Date:	1975 616
Date Abandoned:	2006 2 1		

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14 **SE** **1/2 - 1 Mile** **Lower**		**NE WELLS**	**NE7000000076592**

Well ID:	80224	Registration Code:	G-072061
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	4089010	Acres Irrigated:	139
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	850	Column Diameter:	8
Pump Depth:	0	Well Depth:	85
Static Water Level:	12	Pumping Water Level:	50
Contractor ID:	39096	Owner ID:	31752
Registration Date:	19891218	Completion Date:	1989 5 4
Date Abandoned:	0		

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15 **East** **1/2 - 1 Mile** **Lower**		**NE WELLS**	**NE7000000067863**

Well ID:	71502	Registration Code:	G-063597
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	25
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	1000	Column Diameter:	8
Pump Depth:	0	Well Depth:	80
Static Water Level:	16	Pumping Water Level:	31
Contractor ID:	0	Owner ID:	106609
Registration Date:	1980 411	Completion Date:	1980 325
Date Abandoned:	0		

Map ID Direction Distance Elevation	Database	EDR ID Number
D16 **SSW** **1/2 - 1 Mile** **Higher**	**NE WELLS**	**NE7000000158783**

Well ID:	170603	Registration Code:	G-135875A
Well Replaced:	0	Well Status:	Abandoned
Well Use:	Monitoring (Ground Water Quality)	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	0
Series Type:	Single Project	Series End Date:	2010 6 1
Pump Rate (gal/min):	0	Column Diameter:	0
Pump Depth:	0	Well Depth:	26
Static Water Level:	20.2000007629395	Pumping Water Level:	0
Contractor ID:	39436	Owner ID:	83781
Registration Date:	2005 913	Completion Date:	2005 826
Date Abandoned:	200512 1		

Map ID Direction Distance Elevation	Database	EDR ID Number
17 **ENE** **1/2 - 1 Mile** **Lower**	**NE WELLS**	**NE7000000076135**

Well ID:	79752	Registration Code:	G-071590
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	4089024	Acres Irrigated:	100
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	900	Column Diameter:	8
Pump Depth:	0	Well Depth:	85
Static Water Level:	20	Pumping Water Level:	45
Contractor ID:	39096	Owner ID:	106609
Registration Date:	1989 713	Completion Date:	1989 625
Date Abandoned:	0		

Map ID Direction Distance Elevation	Database	EDR ID Number
D18 **SSW** **1/2 - 1 Mile** **Higher**	**NE WELLS**	**NE7000000053606**

Well ID:	56818	Registration Code:	G-049335
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	174
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	1000	Column Diameter:	8
Pump Depth:	0	Well Depth:	93
Static Water Level:	18	Pumping Water Level:	34
Contractor ID:	0	Owner ID:	21932
Registration Date:	1976 414	Completion Date:	1976 316
Date Abandoned:	0		

Map ID Direction Distance Elevation	Database	EDR ID Number
D19 **SSW** **1/2 - 1 Mile** **Higher**	**NE WELLS**	**NE7000000158963**

Well ID:	170605	Registration Code:	G-135875C
Well Replaced:	0	Well Status:	Abandoned
Well Use:	Monitoring (Ground Water Quality)	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	0
Series Type:	Single Project	Series End Date:	2010 6 1
Pump Rate (gal/min):	0	Column Diameter:	0
Pump Depth:	0	Well Depth:	26
Static Water Level:	20	Pumping Water Level:	0
Contractor ID:	39436	Owner ID:	83781
Registration Date:	2005 913	Completion Date:	2005 829
Date Abandoned:	200512 1		

D20 **SSW** **1/2 - 1 Mile** **Higher**	**NE WELLS**	**NE7000000158738**

Well ID:	170604	Registration Code:	G-135875B
Well Replaced:	0	Well Status:	Abandoned
Well Use:	Monitoring (Ground Water Quality)	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	0
Series Type:	Single Project	Series End Date:	2010 6 1
Pump Rate (gal/min):	0	Column Diameter:	0
Pump Depth:	0	Well Depth:	26
Static Water Level:	17.1000003814697	Pumping Water Level:	0
Contractor ID:	39436	Owner ID:	83781
Registration Date:	2005 913	Completion Date:	2005 829
Date Abandoned:	200512 1		

E21 **South** **1/2 - 1 Mile** **Higher**	**NE WELLS**	**NE7000000013465**

Well ID:	14380	Registration Code:	G-009646
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	200
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	1000	Column Diameter:	9
Pump Depth:	0	Well Depth:	85
Static Water Level:	24	Pumping Water Level:	50
Contractor ID:	0	Owner ID:	33702
Registration Date:	1957 914	Completion Date:	1944 6 1
Date Abandoned:	0		

Map ID Direction Distance Elevation		Database	EDR ID Number
F22 **North** **1/2 - 1 Mile** **Lower**		**NE WELLS**	**NE7000000195493**

Well ID:	209912	Registration Code:	G-061603
Well Replaced:	1	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	4011011	Acres Irrigated:	72
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	600	Column Diameter:	6
Pump Depth:	70	Well Depth:	80
Static Water Level:	16	Pumping Water Level:	50
Contractor ID:	39298	Owner ID:	21932
Registration Date:	2014 618	Completion Date:	2011 317
Date Abandoned:	0		

23 **South** **1/2 - 1 Mile** **Lower**		**NE WELLS**	**NE7000000013179**

Well ID:	14383	Registration Code:	G-009649
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	120
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	1000	Column Diameter:	9
Pump Depth:	0	Well Depth:	92
Static Water Level:	24	Pumping Water Level:	40
Contractor ID:	0	Owner ID:	33702
Registration Date:	1957 914	Completion Date:	1955 7 8
Date Abandoned:	0		

E24 **South** **1/2 - 1 Mile** **Higher**		**NE WELLS**	**NE7000000160386**

Well ID:	172299	Registration Code:	G-137178
Well Replaced:	0	Well Status:	Active
Well Use:	Domestic	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	0
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	20	Column Diameter:	1.25
Pump Depth:	60	Well Depth:	108
Static Water Level:	30	Pumping Water Level:	33
Contractor ID:	39269	Owner ID:	85230
Registration Date:	20051031	Completion Date:	2005 5 4
Date Abandoned:	0		

Map ID Direction Distance Elevation	Database	EDR ID Number
25 **NE** **1/2 - 1 Mile** **Lower**	**NE WELLS**	**NE7000000027146**

Well ID:	29095	Registration Code:	G-022710
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	160
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	900	Column Diameter:	8
Pump Depth:	0	Well Depth:	65
Static Water Level:	18	Pumping Water Level:	40
Contractor ID:	0	Owner ID:	33201
Registration Date:	1964 214	Completion Date:	1948 3 1
Date Abandoned:	0		

F26 **North** **1/2 - 1 Mile** **Lower**	**NE WELLS**	**NE7000000065644**

Well ID:	69438	Registration Code:	G-061603
Well Replaced:	0	Well Status:	Abandoned
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	72
Series Type:	Single Project	Series End Date:	2010 615
Pump Rate (gal/min):	1000	Column Diameter:	8
Pump Depth:	0	Well Depth:	78
Static Water Level:	14	Pumping Water Level:	43
Contractor ID:	0	Owner ID:	21932
Registration Date:	1979 529	Completion Date:	1979 519
Date Abandoned:	2011 511		

27 **ESE** **1/2 - 1 Mile** **Lower**	**NE WELLS**	**NE7000000144141**

Well ID:	154414	Registration Code:	G-124527
Well Replaced:	0	Well Status:	Active
Well Use:	Domestic	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	0
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	20	Column Diameter:	1.25
Pump Depth:	20	Well Depth:	75
Static Water Level:	7	Pumping Water Level:	8
Contractor ID:	39168	Owner ID:	74852
Registration Date:	20031120	Completion Date:	2003 622
Date Abandoned:	0		

Map ID Direction Distance Elevation		Database	EDR ID Number

28
South
1/2 - 1 Mile
Higher

NE WELLS **NE7000000011865**

Well ID:	14448	Registration Code:	G-009705
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	80
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	1000	Column Diameter:	9
Pump Depth:	0	Well Depth:	87
Static Water Level:	24	Pumping Water Level:	0
Contractor ID:	0	Owner ID:	43974
Registration Date:	1957 916	Completion Date:	1947 1 1
Date Abandoned:	0		

29
NE
1/2 - 1 Mile
Lower

NE WELLS **NE7000000074093**

Well ID:	77599	Registration Code:	G-069447
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	70
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	1000	Column Diameter:	8
Pump Depth:	0	Well Depth:	78
Static Water Level:	18	Pumping Water Level:	59
Contractor ID:	0	Owner ID:	33201
Registration Date:	1984 612	Completion Date:	1977 629
Date Abandoned:	0		

30
East
1/2 - 1 Mile
Lower

FED USGS **USGS40000737429**

Organization ID:	USGS-NE	Organization Name:	USGS Nebraska Water Science Center
Monitor Location:	11N 9W 1AAB 1	Type:	Well
Description:	Not Reported	HUC:	10200103
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	19641007
Well Depth:	26	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

Ground water levels,Number of Measurements:	236	Level reading date:	2003-04-02
Feet below surface:	5.21	Feet to sea level:	Not Reported
Note:	Not Reported		
Level reading date:	2002-04-03	Feet below surface:	2.58
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	2001-04-09	Feet below surface:	2.38
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-04-17	Feet below surface:	2.04
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-04-23	Feet below surface:	1.58
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-04-20	Feet below surface:	1.82
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1997-10-09	Feet below surface:	3.10
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1997-04-14	Feet below surface:	2.01
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1996-10-08	Feet below surface:	3.66
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1996-04-11	Feet below surface:	3.34
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1995-10-19	Feet below surface:	4.88
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1995-04-13	Feet below surface:	2.59
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1994-10-22	Feet below surface:	3.86
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1994-04-22	Feet below surface:	2.62
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1993-10-12	Feet below surface:	12.03
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1993-04-23	Feet below surface:	1.83
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1992-10-06	Feet below surface:	2.13
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1992-04-10	Feet below surface:	1.62
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1991-10-04	Feet below surface:	5.10
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1991-04-04	Feet below surface:	2.56
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1990-10-05	Feet below surface:	4.19
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1990-03-26	Feet below surface:	1.96
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1989-10-11	Feet below surface:	3.15
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1989-04-13	Feet below surface:	2.99
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1988-11-14	Feet below surface:	3.58
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1988-04-14	Feet below surface:	2.45
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1987-10-21	Feet below surface:	2.71
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1987-04-15	Feet below surface:	0.52
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1986-10-07	Feet below surface:	2.37
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1986-05-01	Feet below surface:	1.31
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-10-25	Feet below surface:	0.68
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-05-09	Feet below surface:	1.75
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-10-27	Feet below surface:	1.68
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-05-02	Feet below surface:	0.36
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-10-20	Feet below surface:	2.79
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-04-27	Feet below surface:	1.18
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-09-28	Feet below surface:	1.89
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-05-08	Feet below surface:	1.52
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-10-01	Feet below surface:	5.09
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-04-22	Feet below surface:	3.46
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-10-08	Feet below surface:	5.54
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-05-20	Feet below surface:	1.81
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-11-07	Feet below surface:	3.18
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-05-23	Feet below surface:	1.44
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1978-10-23	Feet below surface:	3.53
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-05-26	Feet below surface:	1.80
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-10-11	Feet below surface:	1.75
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-05-19	Feet below surface:	3.22
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-11-23	Feet below surface:	6.29
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-06-22	Feet below surface:	4.37
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-05-19	Feet below surface:	3.10
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-04-20	Feet below surface:	2.98
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-03-17	Feet below surface:	3.04
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-02-24	Feet below surface:	3.25
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-01-22	Feet below surface:	3.80
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-12-31	Feet below surface:	3.86
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-12-04	Feet below surface:	4.42
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-12-02	Feet below surface:	4.48
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-11-05	Feet below surface:	5.02
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-10-29	Feet below surface:	5.44
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-10-01	Feet below surface:	6.47
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-09-25	Feet below surface:	6.92
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-09-02	Feet below surface:	9.35
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-08-21	Feet below surface:	8.48
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-08-04	Feet below surface:	7.53
Feet to sea level:	Not Reported	Note:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Level reading date:	1975-07-15	Feet below surface:	4.78
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-07-01	Feet below surface:	2.03
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-06-26	Feet below surface:	1.33
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-06-02	Feet below surface:	2.90
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-05-21	Feet below surface:	3.00
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-05-01	Feet below surface:	2.33
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-04-22	Feet below surface:	2.14
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-04-01	Feet below surface:	2.60
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-03-17	Feet below surface:	2.70
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-03-03	Feet below surface:	2.65
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-02-14	Feet below surface:	3.34
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-02-03	Feet below surface:	3.38
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-01-29	Feet below surface:	3.40
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-01-06	Feet below surface:	3.30
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-12-19	Feet below surface:	3.75
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-12-02	Feet below surface:	4.03
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-11-28	Feet below surface:	3.93
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-10-30	Feet below surface:	4.68
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-10-29	Feet below surface:	4.72
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-10-02	Feet below surface:	5.81
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-09-26	Feet below surface:	5.79
Feet to sea level:	Not Reported	Note:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Level reading date:	1974-09-04	Feet below surface:	8.20
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-08-28	Feet below surface:	9.63
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-08-01	Feet below surface:	11.06
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-07-19	Feet below surface:	10.68
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-07-03	Feet below surface:	5.90
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-06-25	Feet below surface:	1.98
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-06-05	Feet below surface:	1.73
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-05-23	Feet below surface:	1.55
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-05-06	Feet below surface:	1.60
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-04-22	Feet below surface:	1.54
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-04-08	Feet below surface:	1.10
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-03-19	Feet below surface:	1.10
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-03-05	Feet below surface:	1.01
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-02-14	Feet below surface:	0.60
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-02-05	Feet below surface:	0.64
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-01-15	Feet below surface:	0.94
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-12-28	Feet below surface:	0.87
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-12-11	Feet below surface:	0.93
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-11-29	Feet below surface:	0.69
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-11-09	Feet below surface:	1.58
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-11-07	Feet below surface:	1.39
Feet to sea level:	Not Reported	Note:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Level reading date:	1973-10-12	Feet below surface:	0.84
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-09-20	Feet below surface:	4.34
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-09-14	Feet below surface:	5.22
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-08-15	Feet below surface:	8.58
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-08-13	Feet below surface:	9.33
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-07-23	Feet below surface:	6.51
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-07-12	Feet below surface:	6.55
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-06-25	Feet below surface:	2.17
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-06-12	Feet below surface:	1.74
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-05-17	Feet below surface:	1.88
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-05-08	Feet below surface:	1.35
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-04-25	Feet below surface:	1.25
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-04-05	Feet below surface:	1.08
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-03-13	Feet below surface:	1.08
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-03-08	Feet below surface:	1.41
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-02-21	Feet below surface:	2.15
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-02-05	Feet below surface:	1.53
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-01-26	Feet below surface:	1.88
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-12-20	Feet below surface:	2.96
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-12-11	Feet below surface:	3.18
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-11-22	Feet below surface:	2.85
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1972-10-19	Feet below surface:	4.86
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-10-11	Feet below surface:	4.87
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-09-21	Feet below surface:	5.94
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-09-11	Feet below surface:	6.69
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-08-23	Feet below surface:	8.69
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-08-09	Feet below surface:	4.28
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-07-26	Feet below surface:	6.10
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-07-06	Feet below surface:	4.12
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-06-13	Feet below surface:	2.84
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-06-09	Feet below surface:	2.71
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-05-19	Feet below surface:	2.30
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-05-10	Feet below surface:	1.97
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-04-25	Feet below surface:	3.55
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-04-07	Feet below surface:	3.54
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-03-30	Feet below surface:	3.63
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-03-10	Feet below surface:	3.48
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-02-16	Feet below surface:	3.68
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-01-26	Feet below surface:	3.27
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-12-17	Feet below surface:	4.24
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-12-06	Feet below surface:	4.00
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-11-16	Feet below surface:	4.78
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1971-11-05	Feet below surface:	4.82
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-10-12	Feet below surface:	5.77
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-10-04	Feet below surface:	6.02
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-09-22	Feet below surface:	14.60
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-09-03	Feet below surface:	7.99
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-08-26	Feet below surface:	8.87
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-08-04	Feet below surface:	7.73
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-07-22	Feet below surface:	5.37
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-07-06	Feet below surface:	1.73
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-06-23	Feet below surface:	2.59
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-06-03	Feet below surface:	2.09
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-05-26	Feet below surface:	2.30
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-04-22	Feet below surface:	2.74
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-04-01	Feet below surface:	2.31
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-02-10	Feet below surface:	3.91
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-01-15	Feet below surface:	4.34
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-12-16	Feet below surface:	4.26
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-11-19	Feet below surface:	4.69
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-10-23	Feet below surface:	5.20
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-09-21	Feet below surface:	6.68
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-08-13	Feet below surface:	7.42
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1970-07-24	Feet below surface:	9.12
Feet to sea level:	Not Reported		
Note:	A nearby site that taps the same aquifer was being pumped.		
Level reading date:	1970-06-23	Feet below surface:	3.10
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-05-22	Feet below surface:	2.72
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-04-22	Feet below surface:	1.86
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-03-25	Feet below surface:	2.19
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-02-19	Feet below surface:	2.37
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-01-20	Feet below surface:	2.90
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-12-11	Feet below surface:	2.65
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-11-19	Feet below surface:	2.76
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-10-21	Feet below surface:	2.79
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-09-23	Feet below surface:	4.24
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-08-21	Feet below surface:	5.75
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-07-23	Feet below surface:	3.34
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-05-19	Feet below surface:	1.77
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-04-23	Feet below surface:	1.79
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-03-14	Feet below surface:	1.83
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-02-25	Feet below surface:	2.21
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-01-21	Feet below surface:	2.05
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1968-12-12	Feet below surface:	2.53
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1968-11-20	Feet below surface:	2.49
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1968-10-31	Feet below surface:	2.56

Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1968-09-30	Feet below surface:	3.76
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1968-08-28	Feet below surface:	5.63
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1968-07-25	Feet below surface:	5.03
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1968-06-19	Feet below surface:	3.68
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1968-06-03	Feet below surface:	3.50
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1968-04-19	Feet below surface:	3.42
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1968-03-13	Feet below surface:	3.43
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1968-02-21	Feet below surface:	3.67
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1968-01-25	Feet below surface:	3.64
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-12-29	Feet below surface:	4.08
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-11-27	Feet below surface:	4.52
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-10-27	Feet below surface:	5.08
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-09-27	Feet below surface:	6.52
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-08-31	Feet below surface:	9.21
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-07-26	Feet below surface:	4.99
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-07-07	Feet below surface:	2.49
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-05-11	Feet below surface:	4.74
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-04-20	Feet below surface:	4.84
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-03-21	Feet below surface:	5.06
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-02-15	Feet below surface:	5.38
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1967-01-19	Feet below surface:	5.75
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-12-19	Feet below surface:	6.19
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-11-17	Feet below surface:	6.79
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-10-13	Feet below surface:	7.48
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-09-04	Feet below surface:	7.59
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-08-10	Feet below surface:	7.09
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-07-19	Feet below surface:	6.04
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-06-14	Feet below surface:	2.90
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-05-06	Feet below surface:	2.85
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-04-12	Feet below surface:	2.55
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-03-08	Feet below surface:	2.35
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-02-09	Feet below surface:	2.09
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-01-11	Feet below surface:	2.48
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-12-02	Feet below surface:	2.41
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-11-09	Feet below surface:	2.71
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-10-13	Feet below surface:	2.62
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-09-08	Feet below surface:	4.64
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-08-06	Feet below surface:	5.84
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-07-09	Feet below surface:	2.99
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-05-21	Feet below surface:	3.17
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-04-20	Feet below surface:	2.66
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1965-03-20	Feet below surface:	3.85
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-02-26	Feet below surface:	4.28
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-01-22	Feet below surface:	4.78
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-10-07	Feet below surface:	6.07
Feet to sea level:	Not Reported	Note:	Not Reported

31
SSE
1/2 - 1 Mile
Lower

NE WELLS NE7000000138320

Well ID:	148323	Registration Code:	G-120523
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	40
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	800	Column Diameter:	0
Pump Depth:	0	Well Depth:	0
Static Water Level:	0	Pumping Water Level:	0
Contractor ID:	2	Owner ID:	31752
Registration Date:	2003 318	Completion Date:	1960 1 1
Date Abandoned:	0		

G32
SSW
1/2 - 1 Mile
Higher

NE WELLS NE7000000024043

Well ID:	26095	Registration Code:	G-019918
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	53
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	1000	Column Diameter:	8
Pump Depth:	0	Well Depth:	98
Static Water Level:	25	Pumping Water Level:	50
Contractor ID:	0	Owner ID:	21932
Registration Date:	1959 2 9	Completion Date:	1949 514
Date Abandoned:	0		

33
NE
1/2 - 1 Mile
Lower

NE WELLS NE7000000027143

Well ID:	29045	Registration Code:	G-022661
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	160
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	700	Column Diameter:	6

Pump Depth:	0	Well Depth:	81
Static Water Level:	21	Pumping Water Level:	48
Contractor ID:	0	Owner ID:	33201
Registration Date:	1964 120	Completion Date:	1963 627
Date Abandoned:	0		

34
East
1/2 - 1 Mile
Lower

NE WELLS **NE7000000110599**

Well ID:	117376	Registration Code:	G-099720
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	65
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	900	Column Diameter:	8
Pump Depth:	40	Well Depth:	51
Static Water Level:	14	Pumping Water Level:	35
Contractor ID:	39188	Owner ID:	39637
Registration Date:	1999 3 4	Completion Date:	1940 5 1
Date Abandoned:	0		

35
North
1/2 - 1 Mile
Lower

NE WELLS **NE7000000190833**

Well ID:	205441	Registration Code:	G-156283
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	33
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	425	Column Diameter:	0
Pump Depth:	0	Well Depth:	0
Static Water Level:	0	Pumping Water Level:	0
Contractor ID:	2	Owner ID:	21932
Registration Date:	2010 630	Completion Date:	1976 1 1
Date Abandoned:	0		

36
ENE
1/2 - 1 Mile
Lower

NE WELLS **NE7000000026544**

Well ID:	28317	Registration Code:	G-021981
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	60
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	1000	Column Diameter:	8
Pump Depth:	0	Well Depth:	72
Static Water Level:	10	Pumping Water Level:	30
Contractor ID:	0	Owner ID:	39637
Registration Date:	1962 8 7	Completion Date:	1962 525
Date Abandoned:	0		

Map ID Direction Distance Elevation	Database	EDR ID Number
37 **North** **1/2 - 1 Mile** **Lower**	**NE WELLS**	**NE7000000092102**

Well ID:	75029	Registration Code:	G-066997
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	40
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	1300	Column Diameter:	8
Pump Depth:	0	Well Depth:	78
Static Water Level:	15	Pumping Water Level:	70
Contractor ID:	0	Owner ID:	47983
Registration Date:	1981 910	Completion Date:	1981 427
Date Abandoned:	0		

G38 **SW** **1/2 - 1 Mile** **Higher**	**NE WELLS**	**NE7000000053607**

Well ID:	56820	Registration Code:	G-049337
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	174
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	1000	Column Diameter:	8
Pump Depth:	0	Well Depth:	93
Static Water Level:	19	Pumping Water Level:	51
Contractor ID:	0	Owner ID:	21932
Registration Date:	1976 414	Completion Date:	1976 318
Date Abandoned:	0		

H39 **North** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000737701**

Organization ID:	USGS-NE	Organization Name:	USGS Nebraska Water Science Center
Monitor Location:	12N 9W25CD 1	Type:	Well
Description:	Not Reported	HUC:	10200103
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	Not Reported
Well Depth:	Not Reported	Well Depth Units:	Not Reported
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

Ground water levels,Number of Measurements:	99	Level reading date:	2003-04-02
Feet below surface:	20.17	Feet to sea level:	Not Reported
Note:	Not Reported		
Level reading date:	2002-04-03	Feet below surface:	17.29
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	2001-04-09	Feet below surface:	16.27
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-04-17	Feet below surface:	14.34
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-04-23	Feet below surface:	13.22
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-04-20	Feet below surface:	11.23
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1997-10-09	Feet below surface:	14.45
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1997-04-15	Feet below surface:	14.23
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1996-10-08	Feet below surface:	14.52
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1996-04-11	Feet below surface:	14.51
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1995-10-19	Feet below surface:	15.57
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1995-04-13	Feet below surface:	14.27
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1994-10-22	Feet below surface:	14.49
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1994-04-22	Feet below surface:	12.19
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1993-10-16	Feet below surface:	11.24
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1993-04-23	Feet below surface:	11.47
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1992-10-06	Feet below surface:	12.88
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1992-04-10	Feet below surface:	12.96
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1991-10-04	Feet below surface:	17.49
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1991-04-04	Feet below surface:	15.62
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1990-10-05	Feet below surface:	16.56
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1990-03-29	Feet below surface:	15.36
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1989-10-21	Feet below surface:	16.91
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1989-04-13	Feet below surface:	15.52
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1988-11-14	Feet below surface:	13.94
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1988-05-23	Feet below surface:	14.31
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1987-10-24	Feet below surface:	13.06
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1987-05-07	Feet below surface:	10.75
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1986-10-31	Feet below surface:	12.81
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1986-05-02	Feet below surface:	11.56
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-10-24	Feet below surface:	12.01
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-05-09	Feet below surface:	12.32
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-10-27	Feet below surface:	12.19
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-05-02	Feet below surface:	7.96
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-10-12	Feet below surface:	13.71
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-04-27	Feet below surface:	12.52
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-09-29	Feet below surface:	14.45
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-05-08	Feet below surface:	16.42
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-10-02	Feet below surface:	17.89
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-05-22	Feet below surface:	17.00
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-10-09	Feet below surface:	18.49
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-05-08	Feet below surface:	13.46
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-11-07	Feet below surface:	14.57
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-05-03	Feet below surface:	12.53
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1978-10-23	Feet below surface:	14.18
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-05-26	Feet below surface:	12.52
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-10-11	Feet below surface:	16.94
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-05-19	Feet below surface:	18.00
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-11-23	Feet below surface:	20.50
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-05-19	Feet below surface:	15.72
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-05-21	Feet below surface:	17.11
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-10-29	Feet below surface:	15.42
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-05-23	Feet below surface:	11.27
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-11-09	Feet below surface:	12.93
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1973-05-17	Feet below surface:	12.60
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-10-19	Feet below surface:	18.25
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-05-19	Feet below surface:	16.20
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-10-12	Feet below surface:	18.95
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-05-26	Feet below surface:	16.74
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-10-23	Feet below surface:	18.54
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-05-22	Feet below surface:	16.53
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-10-21	Feet below surface:	15.68
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-05-19	Feet below surface:	14.20
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1968-10-31	Feet below surface:	15.22
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1968-06-03	Feet below surface:	16.89
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1967-10-27	Feet below surface:	18.13
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-05-11	Feet below surface:	23.34
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-10-13	Feet below surface:	20.55
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-05-06	Feet below surface:	18.94
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-10-13	Feet below surface:	16.98
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-04-30	Feet below surface:	17.65
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-09-21	Feet below surface:	21.60
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-08-27	Feet below surface:	21.76
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-04-21	Feet below surface:	17.38
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-09-27	Feet below surface:	19.32
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-04-24	Feet below surface:	15.62
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1962-10-02	Feet below surface:	18.02
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1962-04-28	Feet below surface:	16.41
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1961-11-01	Feet below surface:	13.90
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1961-09-25	Feet below surface:	18.20
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1961-06-11	Feet below surface:	17.30
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1960-09-29	Feet below surface:	17.96
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1960-05-02	Feet below surface:	23.40
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1959-10-13	Feet below surface:	25.76
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1959-05-27	Feet below surface:	16.25
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-10-28	Feet below surface:	19.10
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1958-05-05	Feet below surface:	18.75
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1957-09-26	Feet below surface:	23.27
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1957-05-27	Feet below surface:	20.65
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1956-11-05	Feet below surface:	23.61
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1956-05-24	Feet below surface:	18.82
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1955-06-17	Feet below surface:	16.99
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1952-10-01	Feet below surface:	15.54
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1951-05-03	Feet below surface:	14.68
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1950-02-28	Feet below surface:	15.79
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1949-04-29	Feet below surface:	15.35
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1948-03-29	Feet below surface:	15.92
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1947-03-29	Feet below surface:	15.68
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1946-07-24	Feet below surface:	22.96
Feet to sea level:	Not Reported	Note:	Not Reported

40
NNE
1/2 - 1 Mile
Lower

NE WELLS **NE7000000068568**

Well ID:	71965	Registration Code:	G-064041
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	40
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	1200	Column Diameter:	8
Pump Depth:	0	Well Depth:	80
Static Water Level:	13	Pumping Water Level:	50
Contractor ID:	0	Owner ID:	33201
Registration Date:	1980 7 1	Completion Date:	1980 5 7
Date Abandoned:	0		

Map ID
Direction
Distance
Elevation

	Database	EDR ID Number
H41 **NNE** **1/2 - 1 Mile** **Lower**	**NE WELLS**	**NE7000000039485**

Well ID:	41720	Registration Code:	G-034662
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	80
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	950	Column Diameter:	8
Pump Depth:	0	Well Depth:	70
Static Water Level:	15	Pumping Water Level:	45
Contractor ID:	0	Owner ID:	47983
Registration Date:	1971 618	Completion Date:	1935 6 1
Date Abandoned:	0		

	Database	EDR ID Number
G42 **SW** **1/2 - 1 Mile** **Higher**	**NE WELLS**	**NE7000000013508**

Well ID:	14449	Registration Code:	G-009706
Well Replaced:	0	Well Status:	Abandoned
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	40
Series Type:	Single Project	Series End Date:	2016 831
Pump Rate (gal/min):	1000	Column Diameter:	9
Pump Depth:	0	Well Depth:	91
Static Water Level:	26	Pumping Water Level:	0
Contractor ID:	0	Owner ID:	135046
Registration Date:	1957 916	Completion Date:	1949 1 1
Date Abandoned:	2016 831		

	Database	EDR ID Number
43 **SSW** **1/2 - 1 Mile** **Higher**	**NE WELLS**	**NE7000000104713**

Well ID:	111044	Registration Code:	G-095098
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	36
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	0	Column Diameter:	0
Pump Depth:	0	Well Depth:	0
Static Water Level:	0	Pumping Water Level:	0
Contractor ID:	2	Owner ID:	21190
Registration Date:	1998 3 9	Completion Date:	1957 1 1
Date Abandoned:	0		

Map ID Direction Distance Elevation		Database	EDR ID Number
44 **NNE** **1/2 - 1 Mile** **Lower**		**NE WELLS**	**NE7000000132676**

Well ID:	141311	Registration Code:	G-119691
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	4002028	Acres Irrigated:	80
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	350	Column Diameter:	6
Pump Depth:	60	Well Depth:	67
Static Water Level:	22	Pumping Water Level:	52
Contractor ID:	39269	Owner ID:	47983
Registration Date:	2003 123	Completion Date:	2002 7 9
Date Abandoned:	0		

		Database	EDR ID Number
I45 **ESE** **1/2 - 1 Mile** **Lower**		**NE WELLS**	**NE7000000139825**

Well ID:	149553	Registration Code:	G-121234
Well Replaced:	0	Well Status:	Active
Well Use:	Domestic	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	0
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	20	Column Diameter:	1.25
Pump Depth:	20	Well Depth:	85
Static Water Level:	8	Pumping Water Level:	13
Contractor ID:	39168	Owner ID:	72488
Registration Date:	2003 430	Completion Date:	2002 825
Date Abandoned:	0		

		Database	EDR ID Number
46 **SW** **1/2 - 1 Mile** **Higher**		**NE WELLS**	**NE7000000226823**

Well ID:	244231	Registration Code:	G-009706
Well Replaced:	1	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	4016014	Acres Irrigated:	26.7900009155273
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	1000	Column Diameter:	8
Pump Depth:	50	Well Depth:	80
Static Water Level:	15	Pumping Water Level:	45
Contractor ID:	39298	Owner ID:	135046
Registration Date:	201610 3	Completion Date:	2016 8 4
Date Abandoned:	0		

Map ID Direction Distance Elevation	Database	EDR ID Number
I47 **ESE** **1/2 - 1 Mile** **Lower**	**NE WELLS**	**NE7000000015729**

Well ID:	17180	Registration Code:	G-012068
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	55
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	1000	Column Diameter:	9
Pump Depth:	0	Well Depth:	70
Static Water Level:	9	Pumping Water Level:	39
Contractor ID:	0	Owner ID:	29804
Registration Date:	1957 920	Completion Date:	1956 8 4
Date Abandoned:	0		

48 **South** **1/2 - 1 Mile** **Lower**	**NE WELLS**	**NE7000000215354**

Well ID:	231603	Registration Code:	G-172159
Well Replaced:	0	Well Status:	Active
Well Use:	Livestock	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	0
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	8	Column Diameter:	1.25
Pump Depth:	20	Well Depth:	75
Static Water Level:	5	Pumping Water Level:	6
Contractor ID:	39489	Owner ID:	126498
Registration Date:	2014 513	Completion Date:	2014 3 6
Date Abandoned:	0		

49 **NNE** **1/2 - 1 Mile** **Lower**	**NE WELLS**	**NE7000000044704**

Well ID:	47936	Registration Code:	G-040693
Well Replaced:	0	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	40
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	1200	Column Diameter:	8
Pump Depth:	0	Well Depth:	71
Static Water Level:	9	Pumping Water Level:	50
Contractor ID:	0	Owner ID:	48087
Registration Date:	1974 3 7	Completion Date:	1973 618
Date Abandoned:	0		

Map ID Direction Distance Elevation	Database	EDR ID Number
50 **ENE** **1/2 - 1 Mile** **Lower**	**NE WELLS**	**NE7000000018667**

Well ID:	20707	Registration Code:	G-015141
Well Replaced:	1	Well Status:	Active
Well Use:	Irrigation	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	66.0999984741211
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	1100	Column Diameter:	8
Pump Depth:	0	Well Depth:	80
Static Water Level:	20	Pumping Water Level:	55
Contractor ID:	39096	Owner ID:	75524
Registration Date:	1989 7 7	Completion Date:	1989 5 5
Date Abandoned:	0		

51 **East** **1/2 - 1 Mile** **Lower**	**FED USGS**	**USGS40000737458**

Organization ID:	USGS-NE	Organization Name:	USGS Nebraska Water Science Center
Monitor Location:	12N 8W31CC 1	Type:	Well
Description:	Not Reported	HUC:	10200103
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Unconfined single aquifer	Construction Date:	Not Reported
Well Depth:	Not Reported	Well Depth Units:	Not Reported
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

Ground water levels,Number of Measurements:	1	Level reading date:	1959-10
Feet below surface:	6.35	Feet to sea level:	Not Reported
Note:	A nearby site that taps the same aquifer was being pumped.		

52 **NNE** **1/2 - 1 Mile** **Lower**	**NE WELLS**	**NE7000000218046**

Well ID:	234828	Registration Code:	G-173973
Well Replaced:	0	Well Status:	Inactive
Well Use:	Domestic	NRD Name:	Central Platte
NRD Permit:	Not Reported	Acres Irrigated:	0
Series Type:	Single Project	Series End Date:	0
Pump Rate (gal/min):	0	Column Diameter:	0
Pump Depth:	0	Well Depth:	70
Static Water Level:	15	Pumping Water Level:	0
Contractor ID:	39489	Owner ID:	47983
Registration Date:	201410 6	Completion Date:	2014 711
Date Abandoned:	0		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: NE Radon

Radon Test Results

Num Tests	Avg pCi/L	# > pCi/L	% > pCi/L	Max pCi/L
249	2.8	49	20%	13.0

Federal EPA Radon Zone for HALL County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 68801

Number of sites tested: 35

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	1.433 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	2.543 pCi/L	91%	9%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5’ Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5’ Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: National Wetlands Inventory
Source: Department of Natural Resources
Telephone: 402-471-2363

HYDROGEOLOGIC INFORMATION

AQUIFLOW[R] Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture’s (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Registered Groundwater Wells Database
Source: Department of Natural Resources
Telephone: 402-471-2363
Water use types include Aquaculture, Commercial/Industrial, Domestic, Ground Heat Exchanger, Heat Pump (Ground Water Source), Irrigation, Injection, Observation (Ground Water Levels); Other - Lake Supply, Fountain, Geothermal, Wildlife, Wetlands, Recreation, Plant and Lagoon, Sprinkler, Test, Vapor Monitoring; Public Water Supply with Spacing Protection, Monitoring (Ground Water Quality), Recovery, Livestock, Geothermal, Public Water Supply without Spacing Protection, Dewatering (Over 90 Days).

OTHER STATE DATABASE INFORMATION

Oil and Gas Well Data
Source: Oil and Gas Conservation Commission
Telephone: 308-254-6919

RADON

State Database: NE Radon
Source: Department of Environmental Quality
Telephone: 402-471-0594
Summary of Radon Data

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

Earthquake Fault Lines: The fault lines displayed on EDR’s Topographic map are digitized quaternary faultlines, prepared in 1975 by the United State Geological Survey

STREET AND ADDRESS INFORMATION

Grand Island AASF

3010 East Airport Road

Grand Island, NE 68801

Inquiry Number: 5872123.38

November 15, 2019

Certified Sanborn® Map Report

EDR®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

11/15/19

Site Name:	**Client Name:**
Grand Island AASF	AECOM
3010 East Airport Road	12120 Shamrock Plaza
Grand Island, NE 68801	Omaha, NE 68154
EDR Inquiry # 5872123.38	Contact: Hans Sund

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by AECOM were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Certification # 8336-406A-ADAC

PO # NA

Project Grand Island AASF

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results

Certification #: 8336-406A-ADAC

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ✔ Library of Congress
- ✔ University Publications of America
- ✔ EDR Private Collection

The Sanborn Library LLC Since 1866™

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Appendix B
Preliminary Assessment Documentation

Appendix B.1
Interview Records

PA Interview Questionnaire - Other

Facility: Grand Island AASF #2
Interviewer: [redacted]
Date/Time: October 22, 2019

Interviewee: NEARNG Personnel **Title:** [redacted] **Phone Number:** **Email:**	Can your name/role be used in the PA Report? Y or **N** Can you recommend anyone we can interview? Y or **N** __________________________

Roles or activities with the Facility/Years working at the Facility:

1.5 years at the facility

PFAS Use: Identify accidental/intentional release locations, time frame of release, frequency of releases, storage container size (maintenance, fire training, firefighting, buildings with suppression systems (as builts), fueling stations, crash sites, pest management, recreational, dining facilities, metals plating, or waterproofing). How are materials ordered/purchased/disposed/shared with others?

- **<u>Hanger Fire Suppression System</u>**
  - Built in 2010
  - Full hanger release up to 6 ft in hangar upon installation
  - Fire suppression tank filled with 2% High Expansion Foam Concentrate in a 250-gallon tank
  - Annual servicing by a contractor which entails checking system pressure without releasing any of the concentrate
  - Last services in 2017
  - Fire suppression system is kept in a room adjacent to the hangar
  - There is a cold storage hangar, but it doesn't have a fire suppression system
  - The fire suppression system room has no drains
  - Trench drains in the hangar lead to oil/water separator then to the city sanitary WWTP (waste water treatment plant)
- **<u>TriMax30™ Fire Extinguishers</u>**
  - They have 6 total fire extinguishers filled with AFFF
  - Unknown when they arrived on facility
  - The first servicing took place this year (2019) where they sent their mobile TriMax30™ units to Lincoln full, for the Lincoln AASF to have them hydrostatically tested
  - The facility keep one TriMax30™ with soap and water only for fire training activities
  - Two empty additional TriMax30™'s were found on crates in the cold storage hanger
  - No emergency responses to AASF or Airport
  - Grand Island Fire Department responds to all emergencies

Known Uses
Use
Procurement
Disposition
Storage (Mixed)
Storage (Solution)
Inventory, Off-Spec
Containment
SOP on Filling
Leaking Vehicles
Nozzle and Suppression System Testing
Dining Facilities
Vehicle Washing
Ramp Washing
Fuel Spill Washing and Fueling Stations
Chrome Plating or Waterproofing

Appendix B.2
Visual Site Inspection Checklists

Visual Site Inspection Checklist

Names(s) of people performing VSI: [redacted]

Recorded by: [redacted]

ARNG Contact: [redacted]

Date and Time: 10/22/2019

Method of visit (walking, driving, adjacent): walking, driving

Source/Release Information

Site Name / Area Name / Unique ID: Grand Island AASF #2

Site / Area Acreage: approximately 49.5 acres

Historic Site Use (Brief Description):

The Grand Island AASF is constructed on a parcel of land that is approximately 49.5 acres has been owned and operated by the State of Nebraska Military Department since 2005. Before 2005, the Hall County Airport Authority owned and operated the land. The Grand Island Army Aviation Support Facility was constructed in 2009 and the Readiness Center was added to the campus in 2014.

Current Site Use (Brief Description):

The AASF provides maintenance support for the NEANRG.

Physical barriers or access restrictions:

Access to the area is restricted to NEARNG.

1. Was PFAS used (or spilled) at the site/area? **Y** / N

   1a. If yes, document how PFAS was used and usage time (e.g., fire fighting training 2001 to 2014):

   Hangar fire suppression system release in 2010

2. Has usage been documented? Y / **N**

   2a. If yes, keep a record (place electronic files on a disk):

   N/A

3. What types of businesses are located near the site? **Industrial** / **Commercial** / **Plating** / **Waterproofing** / **Residential**

   3a. Indicate what businesses are located near the site

   Central Nebraksa Regional Airport and two golf courses are located adjacent to the facility and there are residential properties located to the south.

4. Is this site located at an airport/flightline? **Y** / N

   4a. If yes, provide a description of the airport/flightline tenants:

   Central Nebraksa Regional Airport

Visual Site Inspection Checklist

Other Significant Site Features:

1. Does the facility have a fire suppression system? **Y** / N

1a. If yes, indicate which type of AFFF has been used:

Yes, AFFF fire suppression system

1b. If yes, describe maintenance schedule/leaks:

Serviced annually since 2010 and was last serviced in 2017

1c. If yes, how often is the AFFF replaced:

Unkown

1d. If yes, does the facility have floor drains and where do they lead? Can we obtain an as built drawing?

Yes, the hangar has trench drains that lead to a oil/water separator then leads to the city sanitary waste water treatment plant.

Transport / Pathway Information

Migration Potential:

1. Does site/area drainage flow off installation? **Y** / N

1a. If so, note observation and location:

Surface water flows to the northeast towards the Warm Slough which drains into the Platte River.

2. Is there channelized flow within the site/area? Y / **N**

2a. If so, please note observation and location:

3. Are monitoring or drinking water wells located near the site? **Y** / N

3a. If so, please note the location:

There is one well along the site boundary and over 100 different wells within a 2 mile radius.

4. Are surface water intakes located near the site? Y / **N**

4a. If so, please note the location:

5. Can wind dispersion information be obtained? Y / **N**

5a. If so, please note and observe the location.

N/A

6. Does an adjacent non-ARNG PFAS source exist? Y / **N**

6a. If so, please note the source and location.

N/A

6b. Will off-site reconnaissance be conducted? Y / **N**

Visual Site Inspection Checklist

Significant Topographical Features:

1. Has the infrastructure changed at the site/area? Y / **N**

1a. If so, please describe change (ex. Structures no longer exist):

N/A

2. Is the site/area vegetated? Y / **N**

2a. If not vegetated, briefly describe the site/area composition:

Vegetated except for ramp and parking areas

3. Does the site or area exhibit evidence of erosion? Y / **N**

3a. If yes, describe the location and extent of the erosion:

4. Does the site/area exhibit any areas of ponding or standing water? Y / **N**

4a. If yes, describe the location and extent of the ponding:

Receptor Information

1. Is access to the site restricted? **Y** / N

1a. If so, please note to what extent:

The facility has controlled access to the NEARNG.

2. Who can access the site? **Site Workers / Construction Workers / Trespassers / Residential / Recreational Users / Ecological**

2a. Circle all that apply, note any not covered above:

3. Are residential areas located near the site? **Y** / N

3a. If so, please note the location/distance:

Residents to the south and east.

4. Are any schools/day care centers located near the site? **Y** / N

4a. If so, please note the location/distance/type:

There is multiple schools located within 2 miles of the facility.

5. Are any wetlands located near the site? **Y** / N

5a. If so, please note the location/distance/type:

The Grand Island AASF is located in the Silver Creek drainage area. The stormwater that is collected at this site drains off into the Silver Creek in areas located to the west and north sides of the Grand Island AASF. The surface water drains into the Silver Creek area through various drainage ditches. There are also three lakes located within 3 miles of the facility. Lake Davis, Crystal Lake and Eagles Lake are all located to the south of the Grand Island AASF.

Visual Site Inspection Checklist

Additional Notes

Photographic Log

Photo ID/Name	Date & Location	Photograph Description
1	10/22/19, Hangar	An ABC hand held fire extinguisher found on site. There are fire drills conducted annually on the ramp area outside the hanger of the AASF where ABC hand held fire extinguishers are used.
2	10/22/19, Fire Suppression System Room	The hangar fire suppression system which consists of a 250-gallon tank filled with 2 percent High Expansion Foam Concentrate.
3	10/22/19, Fire Suppression System Room	A closeup of the label on the 250-gallon tank for the fire suppression system in the main hangar.
4	10/22/19, Hangar	Trench drains located in the main hangar. The trench drains lead to an oil/water separator, then to the sanitary WWTP.

Appendix B.3
Conceptual Site Model Information

Preliminary Assessment – Conceptual Site Model Information

Site Name: Grand Island AASF #2

Why has this location been identified as a site?

The AASF provides maintenance support for the NEANRG. AFFF was stored and potentially released at several locations.

Are there any other activities nearby that could also impact this location?

The Central Nebraska Regional Airport Pioneer is located adjacent to the facility.

Training Events

Have any training events with AFFF occurred at this site? No

If so, how often? N/A

How much material was used? Is it documented? N/A

Identify Potential Pathways: Do we have enough information to fully understand over land surface water flow, groundwater flow, and geological formations on and around the facility? Any direct pathways to larger water bodies?

Surface Water:

Surface water flow direction? North-east.

Average rainfall? 26.61 inches of rain

Any flooding during rainy season? unknown

Direct or indirect pathway to ditches? Yes

Direct or indirect pathway to larger bodies of water? Yes, creeks and river tributaries lead to the Platte River

Does surface water pond any place on site? No

Any impoundment areas or retention ponds? No

Any NPDES location points near the site? No

How does surface water drain on and around the flight line? North-east.

Preliminary Assessment – Conceptual Site Model Information

Groundwater:

Groundwater flow direction? Groundwater flow is to the northeast.

Depth to groundwater? The depth to water ranges from 10 to 16 feet below ground surface.

Uses (agricultural, drinking water, irrigation)? Drinking, irrigation, agricultural

Any groundwater treatment systems? No

Any groundwater monitoring well locations near the site? Yes

Is groundwater used for drinking water? The Grand Island Formation aquifer supplies most of the water for the region in the form of irrigation supply and potable water. The City of Grand Island uses private domestic water and the city's municipal well field can be located southeast of the city near the Platte River.

Are there drinking water supply wells on installation? No

Do they serve off-post populations? No

Are there off-post drinking water wells downgradient Yes; The City of Grand Island uses private domestic water and the city's municipal well field can be located southeast of the city near the Platte River.

Waste Water Treatment Plant:

Has the installation ever had a WWTP, past or present? No

If so, do we understand the process and which water is/was treated at the plant? N/A

Do we understand the fate of sludge waste? N/A

Is surface water from potential contaminated sites treated? N/A

Equipment Rinse Water

1. Is firefighting equipment washed? Where does the rinse water go?

Unknown

2. Are nozzles tested? How often are nozzles tested? Where are nozzles tested? Are nozzles cleaned after use? Where does the rinse water flow after cleaning nozzles?

Unknown

3. Other? N/A

Preliminary Assessment – Conceptual Site Model Information

Identify Potential Receptors:

Site Worker N/A

Construction Worker N/A

Recreational User: N/A

Residential N/A

Trespasser: N/A

Farmer: N/A

Child N/A

Ecological N/A

Note what is located near by the site (e.g. daycare, schools, hospitals, churches, agricultural, livestock)?
Agriculture and residents

Documentation

Ask for Engineering drawings (if applicable). Done

Has there been a reconstruction or changes to the drainage system? When did that occur?
Unknown

Appendix C
Photographic Log

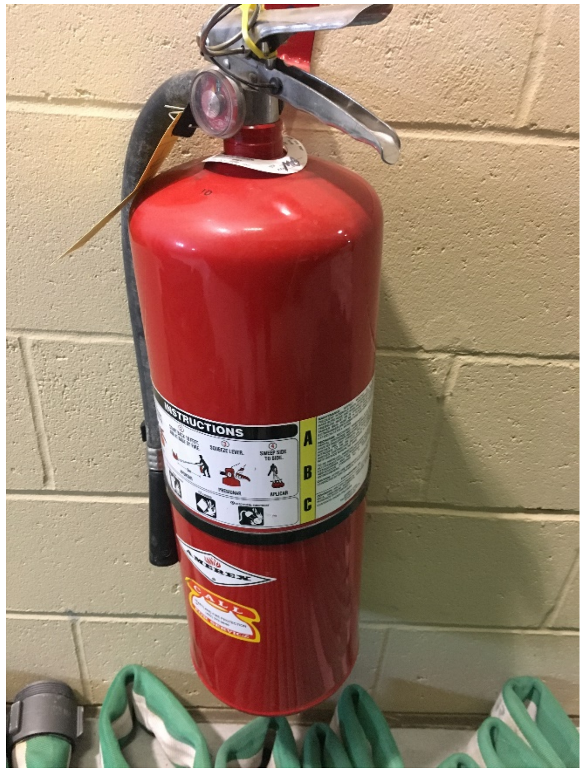
APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Grand Island AASF #2	Nebraska

Photograph No. 1

Description:

An ABC hand held fire extinguisher found on site. There are fire drills conducted annually on the ramp area outside the hanger of the AASF where ABC hand held fire extinguishers are used.



Photograph No. 2

Description:

The hangar fire suppression system which consists of a 250-gallon tank filled with 2 percent High Expansion Foam Concentrate.

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Grand Island AASF #2	Nebraska

Photograph No. 3

Description:

A closeup of the label on the 250-gallon tank for the fire suppression system in the main hangar.

Photograph No. 4

Description:

Trench drains located in the main hangar. The trench drains lead to an oil/water separator, then to the sanitary WWTP.