

Flandreau Santee Sioux Tribe
Natural Resources
Brownfields Tribal Response Program
Inventory Questionnaire

Form Number: 0002

Date: Feb 4, 2009

Time: 3:42

Buffalo farm
Anonymous Information?

Yes:

No:

If no, please answer the following questions:

Name: _____

Address: _____

Phone: _____

Description of Site:

Paint cans, empty containers, jugs, solvents,
bed rails, trash, trees, household goods.

Site Location/Directions:

- South Buffalo farm

Other Person(s) that may be knowledgeable of sites past and present uses:

IHS, MAPS - GAP coordinator

Potential/Known Environmental Threats/Hazards existing on site: -

possible soil + ground water contamination

Other important information:

Numerous types of waste including E-waste
Anti freeze, paint cans, Freon, printers, Hazardous
light fixtures

Signature of Person completing questionnaire: _____

**Flandreau Santee Sioux Tribe Natural Resources
Brownfields Tribal Response Program
Site Inventory Information Sheet**

Date: <u>Feb 4, 2009</u>	Site Name: <u>Buffalo farm</u>
Form completed by: <u>Elizabeth Wakeman</u>	
Directions to Site: <u>South Buffalo Farm</u>	
Site Description:	
Address: (county/state) <u>Moody County, South Dakota</u>	
Lat/Long: <u>N 44° 01.256 W 096° 37.457</u>	
Township/Range/Section:	
Parcel/Allotment Number(s):	
Current Property Owner: <u>FSST</u>	
Current Use of Property: <u>Buffalo Farm</u>	
Future Use of Property: <u>Same</u>	
Neighborhood: Residential: <input checked="" type="checkbox"/> Industrial: _____ Rural: <input checked="" type="checkbox"/> Other: _____	
Site & Vicinity general characteristics: (terrain, elevation, general land use in area, vegetation, location to nearest town)	<u>Slope AREA</u>
Physical Setting:	
Geologic Information: -geological formations/thickness -bedrock name/depth -faults/structural features -(within 4 miles)	<u>(DaA) Davis loam, 0 to 2% Slopes consists of deep, well drained and moderately well drained soils formed in loamy sediments on foot slopes, fans and high bottom lands. Permeability is moderate. This soil has high available water capacity and high organic matter content. Flooding is RARE.</u> <u>MARCH, APRIL, MAY, JUNE: WATER TABLE: upper limit 3.0 - 5.0, lower limit > 6.0</u>
Hydraulic Information: -depth to groundwater -aquifers under site -hydraulic conductivity -confined/unconfined -recharge area -interconnections	
Hydrology: -surface water flow direction -annual mean discharge rate of surface water -drainage area up-gradient of site -floodplain information -wetlands or water bodies	
Historical Information:	
Property use Past/Present: <u>Farm Abandon</u>	
Previous owner: <u>unknown</u>	
Potential environmental threats: <u>Soil contaminated</u>	

Site Reconnaissance:

Description of each structure:
(size/condition/construction materials)

open dump possible Hazardous waste

Interior Observations:
(Heating/cooling/stains/
corrosion/drains/sumps/
possible asbestos)

Possible

Fence/Gates: (condition/type/locked):

None

Approximate size of Property (acres):

1 ACRE

General slope of site:

Slop area

Water Supply: Potable Non-Potable Groundwater Surface Water None

Wells: monitoring drinking irrigation none other

Sewage Disposal System: Septic connected to public system none other

Roads: paved gravel dirt stained gates

Containers identified:
(Include number/size/conditions)

Paint cans + other plastic barrels

Drums/small containers:

Paint

Hazardous substances or petroleum products in connection with identified uses:

TV - E-waste

Unidentified substance containers:

yes

Potential contaminants/indicators identified:

Containers w/ unknown substances

Hazardous substances or petroleum products in connection with identified uses:

Old paint cans, Mercury E-waste

Underground tanks (pipe or pipe caps):

NA

Above ground tanks/lines:

NA

Buried waste (line of new asphalt, disturbed/subsided soil):

NA

Fresh/imported cap soil, road base, wood chips:

YES

PCBs (including transformers, fluorescent light fixtures):

UNSURE

Odors:

TOO COLD

Pools of liquid:

TOO COLD

Pits, ponds, trenches, and lagoons:

NA

Stained soil or pavement:

yes

Stressed vegetation:

2

Sea level

Solid waste/debris: (check if present)

- White goods
- Metal debris
- barrels
- containers (list) paint cans
- carpet
- glass
- untreated wood
- treated wood
- plumbing materials
- tires
- wire
- sheet rock, construction debris
- plastics
- concrete
- household radiators
- fiberglass
- automobile/parts (list)
- household appliances (list)
- medicine bottles/other medical debris
- Other (list): _____

unknown

Waste water:

Adjacent Properties:



Farm across road

Property Use/Condition:



Fair, Farming

Targets:

Across road

Nearest resident, drinking water well:

? feet away

Human/indicators present:

Farming on going

Animal indicators present:

Buffalo in fields

Surface water bodies/location:

Surface Water drainage from site:

Rain/storm drainage patterns:

Evidence of fishing/location:

NONE

Dust blowing off site:

POSSIBLE

Summary of recognized environmental conditions:



1546

Site no# 0002 2-5-09



Site no# 0003 2-4-09

1463

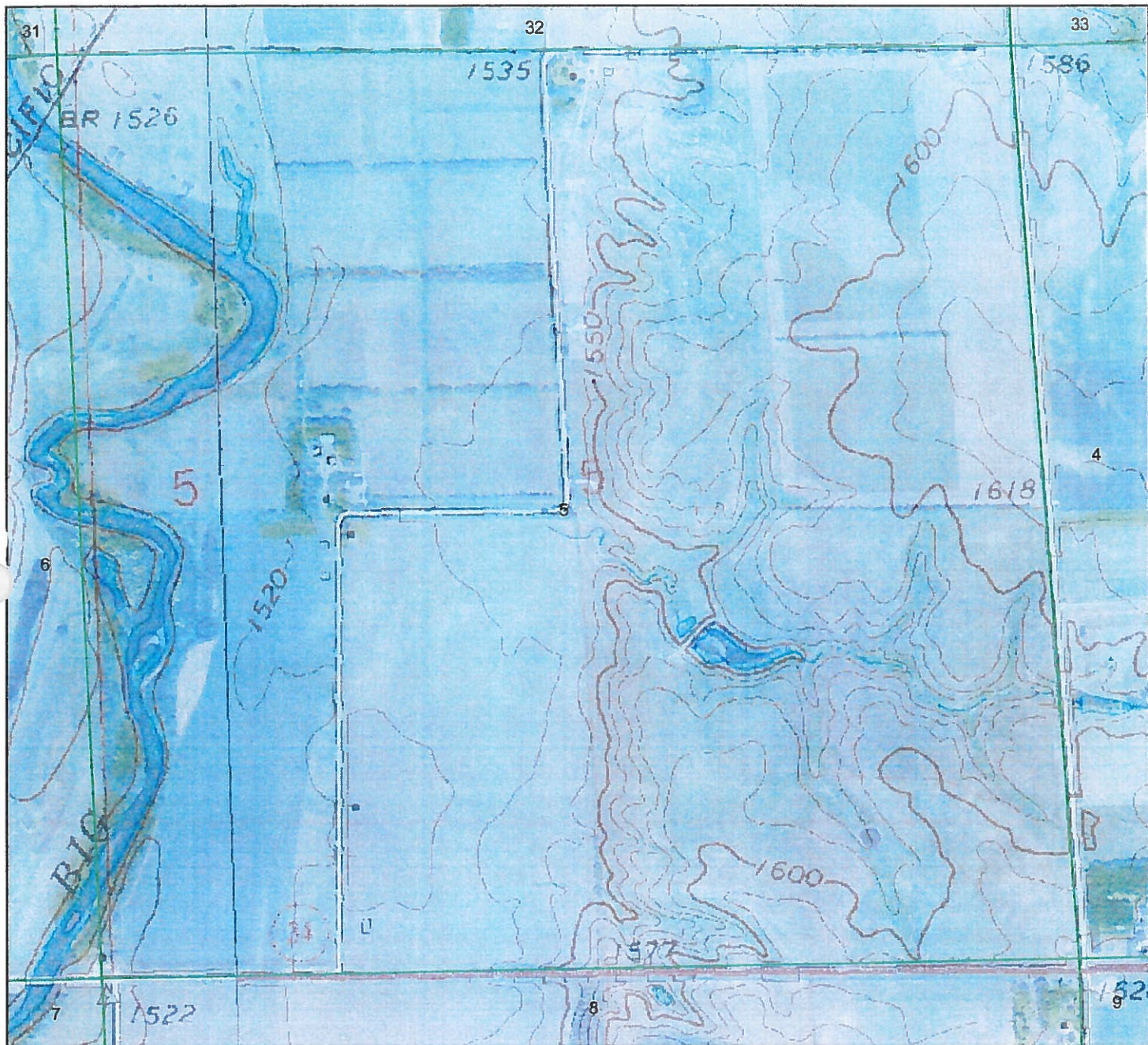


... SITE NO #0003 2-4-09

PH1

Customer(s): MOODY COUNTY CONSERVATION DISTRICT

Field Office:
Agency:



Legend

□ Sections

















2005-07-09

7/9/2005

Red



2004-07-13

7/13/2004

2004



2003-08-26

8/26/2003

FIG.

1971



1976

WREQC

Wind River Environmental Quality Commission
Eastern Shoshone and Northern Arapaho Tribes
Wind River Indian Reservation

Ground Penetrating Radar (GPR) Survey For the Flandreau Santee Sioux Buffalo Pasture

**Flandreau Santee Sioux Tribe
Flandreau, South Dakota**



Wind River Environmental Quality Commission
Don Aragon, Executive Director
P.O. Box 217
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(307) 332-3164

Prepared By:
Steve Babits, P.G.
WREQC Geologist

September 26, 2011

**Ground Penetrating Radar (GPR) Survey
For the FSST Buffalo Pasture**

**Flandreau Santee Sioux Tribe
Flandreau, South Dakota**

Introduction

The Flandreau Santee Sioux Tribe (Tribe) Brownfields Program requested the Wind River Environmental Quality Commission (WREQC) Brownfields Program to complete a Ground Penetrating Radar (GPR) Survey on a parcel of land owned by the Tribe. This parcel of land (Site) is used for the Tribes' buffalo pasture and farm operations. This is the report on WREQC's GPR survey of the Site and describes the survey methods, results, and conclusions.

The purpose of the GPR survey was to document the environmental condition of the Site. Specifically, the Tribe's objective was to determine if any buried solid waste disposal areas are present at the Site which may have caused contamination of the property, affecting future property use.

The scope of services for this project is contained in the Consulting Contract dated August 11, 2011, which was signed on August 18, 2011. The scope of services requires WREQC to provide the equipment and personnel to complete a GPR survey of the Tribe's Buffalo Pasture and to provide a report to the Tribe describing the results of the survey. The GPR survey was completed during the week of September 19, 2011.

Site Description

The Site consists of approximately 70 acres of Tribal land about 2 miles south of Flandreau, SD. A Site Location Map is shown on Figure 1. The Site is located about one half mile west of Moody County Highway J on the south side of 232nd Street. The property is located in a rural residential and agricultural area.

The property has been designated as a Brownfield Site by the FSST Brownfield Program. The Tribal Brownfield Program has already conducted Phase I and Phase II Environmental Site Assessments of the Property. Additional information on the Site history, use, and physical setting is described in the Phase II Environmental Site Assessment Report (URS, 2010).

A Site Detail Map is presented on the July 6, 2010, air photo presented as Figure 2. The majority of the Site is undeveloped pasture land used by the Tribe's Buffalo Herd. The northern portion of the Site is developed with a large barn, stock pens, and corrals where the buffalo are kept and fed. There are currently two residences located on the west side of the buffalo pasture. A third residence was formerly located near the northwest corner of the Site but has been removed.

The buffalo pasture is surrounded by a barbed wire fence to control animal movement. Access to the buffalo pasture is from 232nd Street, by a gravel road through a locked gate near the

northwest corner of the Site. The Tribe reported that an open dump site was formerly located outside of the buffalo pasture gate on the northwest corner of the Site. Some cleanup of this area has already been completed.

Methods

WREQC completed the GPR survey during the week of September 19, 2011. A site walkover was held on September 20, 2011. Personnel present at the walkover were Elizabeth Wakeman, FSST Brownfields Coordinator, Brent Rohlf, IHS Engineer, and Steve Babits, WREQC Geologist. The purpose of the Site walkover was to look over the areas of the property to be surveyed and to identify priority areas for GPR investigation.

The GPR survey was completed on September 21 and 22, 2011. The GPR survey was completed using WREQC's GSSI SIR-3000 Utility Scan system with a 400 MHz antenna. The 400 MHz antenna is ideally suited for detecting metallic and non-metallic buried debris at depths of less than 12 feet. The GPR system was mounted on the GSSI utility scan cart.

The GPR system was operated by Steve Babits, WREQC Geologist, who is a licensed professional geologist in the State of Wyoming. Mr. Babits has completed a training course from GSSI on the Utility Scan GPR system.

The GSSI Utility Scan system allows for two-dimensional real-time continuous GPR data collection, data review, and interpretation. The GPR data profiles were reviewed in the field by the GPR operator as they were collected to identify any potential targets of interest. Additional GPR data collection was performed in the areas where potential targets were identified. The GPR survey did not include any post-collection data processing. Photographs taken during the GPR survey showing equipment operation and examples of data profiles and targets are contained in Attachment 1.

Weather conditions were favorable for completing the survey with cloudy skies, air temperature in the 50's, and no precipitation. The only limitations to the GPR survey were due to the presence of surface obstacles (buildings, trees, excessive vegetation, uneven terrain, etc) which prevented access to the GPR utility scan cart in some areas. GPR data was not collected around the two residential areas on the west side of the Site nor within the buffalo pens, corrals, or barn areas.

Focused GPR survey was completed at the priority areas that were identified during the walkover. These priority areas included a natural spring and the surrounding drainage area near the southeast corner of the pasture and an excavated area and stock pond located immediately southeast of the buffalo pasture gate. Focused GPR survey was also completed on the northwest corner of the Site outside of the buffalo pasture, where the former residence and a dump site were located. Focused survey was also completed in other areas where potential targets were identified during profiling. GPR profiles were completed in these focused areas with approximately 10 feet spacing.

Random GPR survey profiles and spot checks were completed on the remainder of the site. Spot

checks were made on low/high areas of the Site and the many areas where vegetation was absent and/or ground disturbance was suspected.

Historic air photos were also obtained for several years between 1972 and 2010 from the USDA field office in Flandreau. These air photos are presented in Attachment 2 and were reviewed by the WREQC geologist for evidence of past ground disturbance to identify potential dump sites.

Results

Several areas of interest were identified during the GPR survey where buried material is suspected. These areas were marked in the field with orange pin flags and are also indicated on the Site Map on Figure 2. These areas are described in more detail below.

GPR profiling indicated additional buried metallic debris in an area west of the spring near the southeast corner of the buffalo pasture. Some solid waste was already reportedly removed from the spring area and scattered debris is visible on the surface and partially buried within the flagged area. Another potential buried target was located further to the south on the west side of the drainage downstream of the spring, near the buffalo pasture boundary fence.

Trash was reportedly disposed in the excavated area southeast of the buffalo pasture entry gate. GPR profiling in this location indicated an area of metallic and non-metallic buried debris west of the small pond within the excavated area.

No targets of interest were found around the stock pond east of the excavated area or within and around the large soil stockpile in the center of the site. No targets were found within the many other areas of bare ground scattered across the Site. These bare areas are likely created by the buffalo and probably do not indicate recent ground disturbance or stressed vegetation due to contamination from buried debris.

Another area of interest was found near the northeast corner of the site. Many non-metallic targets were identified and marked here. It is also possible that these targets are buried boulders. Potential targets were also found within the buffalo pasture just north of the gate, as shown on Figure 2.

Outside of the buffalo pasture, several areas of interest were identified and marked on the northwest corner of the Site. Some solid waste items such as paint cans were observed on the surface and partially buried, and additional buried waste is possible.

Conclusions

The several areas of interest that were marked in the field during the GPR survey and which are indicated on Figure 2 should be investigated further to determine if buried debris is present. Direct excavation of these areas to a depth of at least 3 or 4 feet using a backhoe or other suitable equipment is recommended.

References

URS Operating Services, Inc. 2010. Analytical Results Report for Phase II Environmental Site Assessment, Flandreau Santee Sioux Targeted Brownfields Assessment (TBA), Property FSST-002, Flandreau, Moody County, South Dakota. February 11, 2010.



Figure 1. Site Location Map, GPR Survey, Flandreau Santee Sioux Tribe Buffalo Pasture.



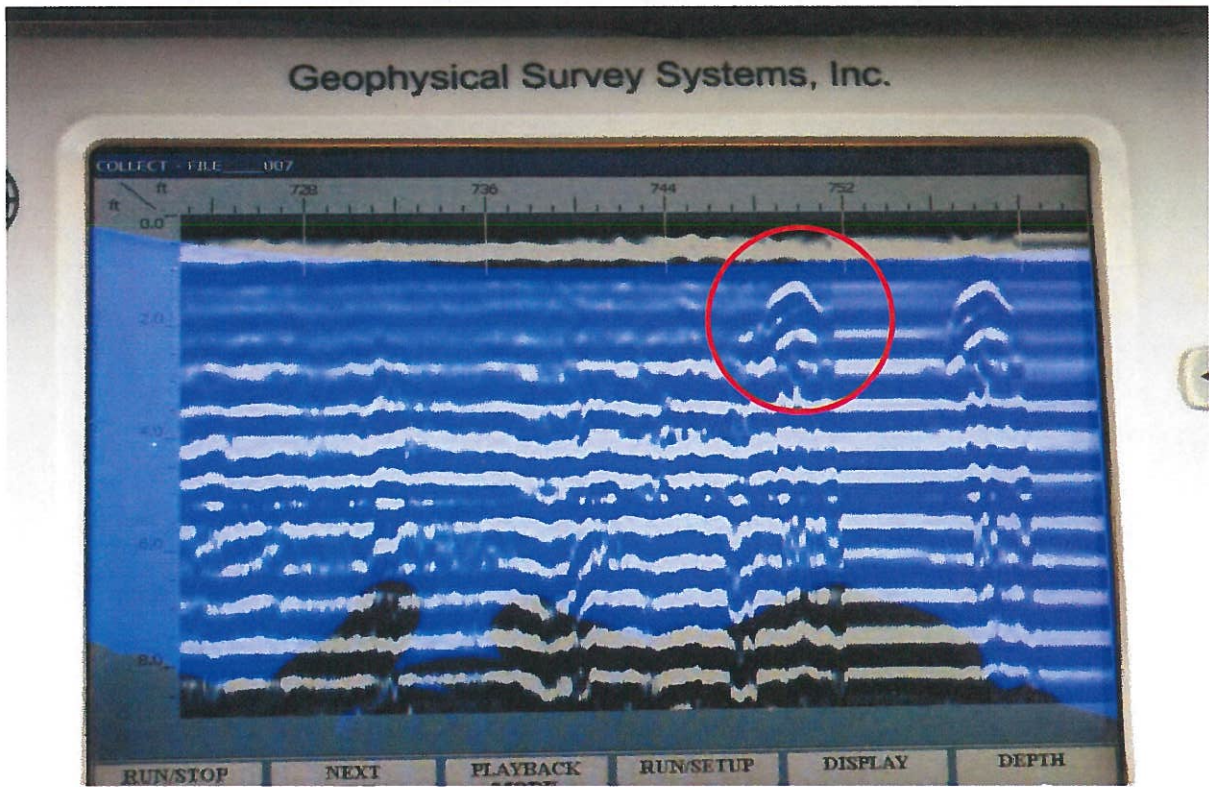
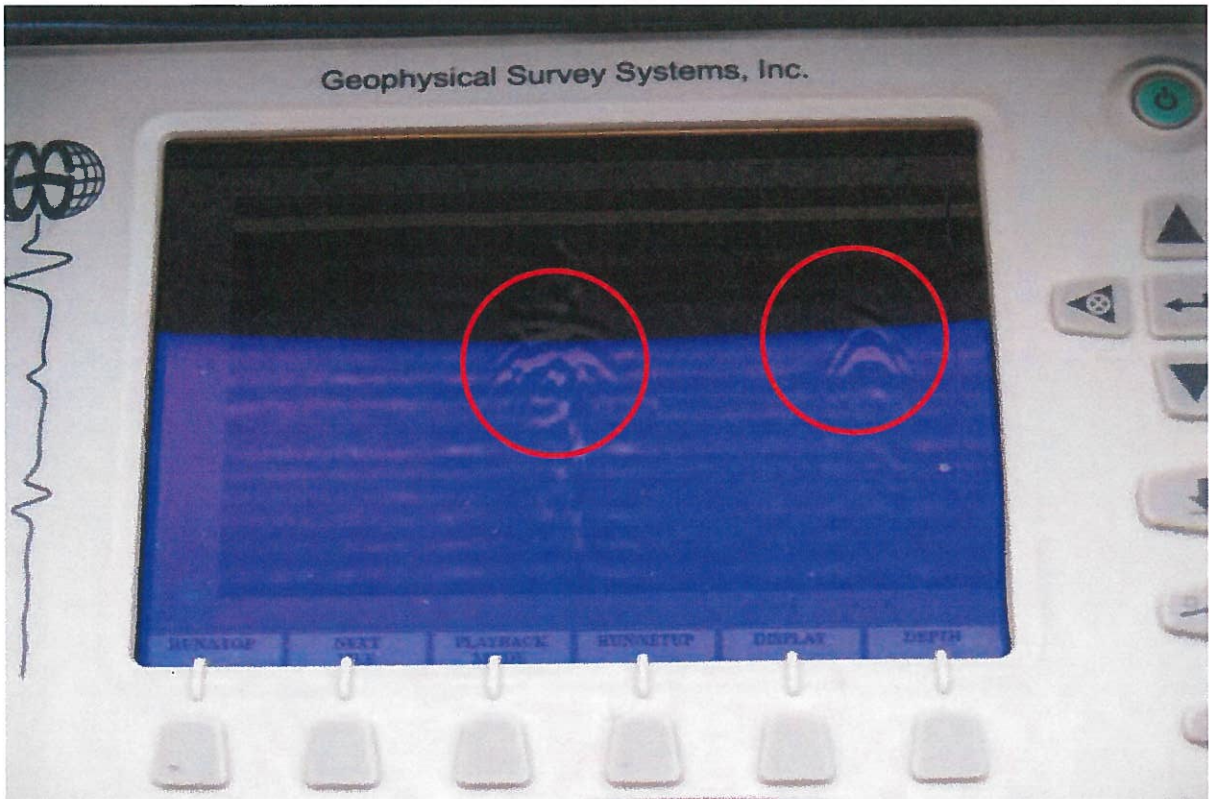
Figure 2. Site Detail Map, GPR Survey, Flandreau Santee Sioux Tribe Buffalo Pasture. Areas of interest are shown in red. Based on July 6, 2010 aerial photograph.

Attachment 1

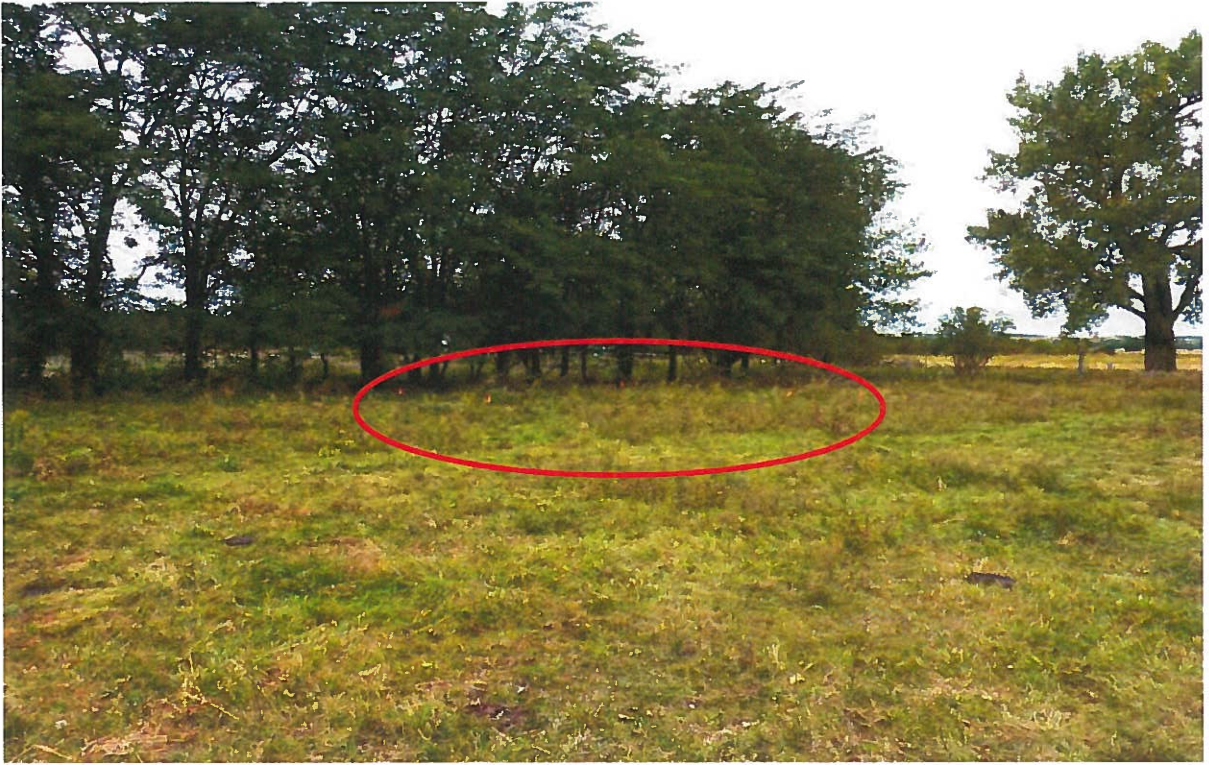
GPR Survey Photographs



GPR data collection using the GSSI Utility Scan System in the buffalo pasture near the excavated area and stock pond.



Examples of GPR data profiles with potential targets circled. Vertical scale is depth in feet.



Examples of areas of interest that were identified in the northeast corner of the Site and north of the gate into the buffalo pasture. Such areas were marked with pin flags.

Attachment 2

Historic Air Photos

7/6/2010

2010-07-06



7/14/2008

20080714



47

7/6/2006

2006-07-06

