

FEB - 7 2012

Nebraska Dept of Environmental Quality
By: _____ DEQ# 171 _____

**REMEDIAL SYSTEM CONSTRUCTION
REPORT**

**A. GLENN KLUCK COMPANY FEEDLOT
585 ROAD 4
RICHLAND, NEBRASKA**

**NDEQ UG #040894-NH-1100
IIS #061018**

GSI PROJECT NO. 115186

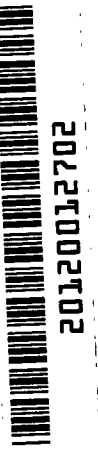
FEBRUARY 6, 2012

PREPARED BY:

**GEOTECHNICAL SERVICES, INC.
2960 NORTH DIERS AVENUE
GRAND ISLAND, NEBRASKA
68803-1243
(308) 381-1987**

PREPARED FOR:

**A. GLENN KLUCK COMPANY
FEEDLOT
MR. GALEN KLUCK
585 ROAD 4
RICHLAND, NEBRASKA 68657**



February 6, 2012

Neal Heil
Nebraska Department of Environmental Quality
Water Quality Division
Petroleum Remediation Section
P.O. Box 98922
Lincoln, Nebraska 68509-8922

RE: Remediation System Construction Report
A. Glenn Kluck Company Feedlot
585 Road 4
Richland, Nebraska
NDEQ UG #040894-NH-1100, IIS #061018
GSI Project No. 115186

Dear Mr. Heil:

Enclosed are one bound and one unbound copy of the above referenced report.

If you have any questions or need additional information, please contact me at 308.381.1987.

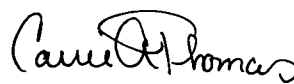
Respectfully,
Geotechnical Services, Inc.

Prepared by,



J. Fred Jones, P.E.
Executive Vice President

Reviewed by,



Carrie A. Thomas
Environmental Scientist

Remedial Construction Report
A. Glenn Kluck Company Feedlot
585 Road 4
Richland, Nebraska
NDEQ UG #040894-NH-1100; IIS #061018
GSI Project #115186
February 6, 2012

1.0 Introduction

This report provides details of the design and construction of the remediation system by Geotechnical Services, Inc. (GSI) at A. Glenn Kluck Company Feedlot, located northeast of Richland, Nebraska. The Soil Vapor Extraction (SVE) and Air Sparge (AS) system was designed and constructed to address free phase and dissolved phase petroleum product in the groundwater beneath the site. The system was constructed in general accordance with the Remedial Action Plan (RAP) prepared by GSI, dated October 28, 2011, and submitted to the Nebraska Department of Environmental Quality (NDEQ) on behalf of Galen Kluck, President of A. Glenn Kluck Company.

The remediation system consists of one trailer with a SVE and AS unit. The SVE unit operates five SVE wells and the AS unit operates four AS wells. Existing equipment obtained from the NDEQ was used. The existing system manifolds have four SVE lines and three AS lines; therefore, two SVE wells were coupled together and two AS wells were coupled together.

As of January 24, 2012, system construction is complete. Power has been brought to the site by Cornhusker Public Power and Sackett Electric was contracted to provide service to the trailer. The system was started on January 24, 2012 and appears to be running properly. GSI will visit the system weekly during the first month of operation. Samples of the SVE discharge were collected on January 24, 2012.

Site Location

The A. Glenn Kluck Company Feedlot is located at 585 Road 4, northeast of Richland, Nebraska. The area is agricultural. The site is located on the west side of Road 4, approximately one-half mile north of Highway 30. The fuel storage building is located on the east side of the property, northwest of the office. The site is located in the Northeast Quarter of Section 9, Township 17 North, Range 2 East of the 6th Principal Meridian, Colfax County, Nebraska.

The assessment site is a commercial cattle feedlot. The wells and equipment trailer are located around the fuel storage building, which contains fuel aboveground storage tanks (ASTs) located in a secondary covered containment system. Two fuel dispensers are located on the west side of the building. An Aerial Photograph is provided in Appendix A.

2.0 Background

Three fuel underground storage tanks (USTs) were removed in 1990 and replaced with fuel ASTs. Three groundwater monitor wells were installed as part of a Step 6 Investigation in 1994. Ten additional wells were installed in 1995 as part of a Step 7 Assessment.

In 2009, a Tier I Investigation was conducted. A single bore hole was drilled at the location of the former USTs to collect soil samples. The ten existing monitor wells were used for gathering free product/groundwater elevation data. Free product was encountered in MW-1 (1.25 inches) and MW-3 (4.5 inches). Groundwater was sampled for laboratory analysis from monitor wells MW-2, MW-4, MW-6, MW-7, MW-11, MW-12, and MW-15. Groundwater was encountered at approximately 42 feet below surface.

Based on the information provided in the Tier I Report, the NDEQ requested the preparation of a remedial action plan (RAP) to remove free phase product and reduce dissolved phase contaminants below site specific target levels (SSTL). The SSTLs have not been established.

3.0 System Overview

The remediation system consists of an equipment trailer containing one SVE and one AS unit. The SVE unit operates five SVE wells and the AS unit operates four AS wells. The equipment was from a former UST site and had been stored by the NDEQ in Lincoln, Nebraska. An Aerial Photograph and Site Map showing the SVE/AS system layout is provided in Appendix A.

3.1 Well Installation

One SVE well (SV-1) was installed on September 23, 2011 as part of a SVE pilot test conducted for preparation of the (RAP). The four remaining SVE wells and the four AS wells were installed on December 20 and 21, 2011. The wells were installed with a Mobile B-61 drill rig using 4.25-inch, inside diameter, hollow stem augers. GSI registered the wells with the Nebraska Department of Natural Resources (NDNR) in January 2012. All auger cuttings were disposed of on-site.

The SVE and AS wells are located along the south and west sides of the fuel storage building.

- The SVE wells are constructed of 2-inch diameter, schedule 40 poly-vinyl chloride (PVC) pipe, with a 20-foot section of 0.010-inch slotted screen from 44 to 24 feet below grade.
- The AS wells are constructed of 2-inch diameter, schedule 40 PVC pipe with a 2-foot section of 0.010-inch slotted screen from 54 to 52 feet below grade.

All wells were finished below grade. A flush mount steel protective cover was placed at the surface. A Site Map with well locations is included in Appendix A. Soil Boring Logs and Monitor Well Construction Diagrams are included in Appendix B.

3.2 Trenching & Piping

Trenching operations to connect wells to the remediation equipment began on January 3, 2012, and were substantially completed on January 11, 2012. SVE wells SV-1, SV-4, and SV-5 were individually piped to the equipment trailer. SVE wells SV-2 and SV-3 were coupled together, and then piped to the trailer. AS wells AS-3 and AS-4 were individually piped to the trailer, while AS-1 and AS-2 were coupled together. The coupled SVE and AS wells were located closest to the equipment trailer, which was located on the northwest corner of the fuel storage building.

The SVE piping consisted of 2-inch diameter, schedule 40 PVC. The AS piping consisted of one-inch diameter CPVC.

Trench depth varied between approximately 36 and 48 inches. Pipes were bedded in approximately six inches of sand and then backfilled with sand. The backfill material was compacted in-place. All debris and excess soil was disposed of on-site. A layer of crushed limestone was placed over the excavation on the west side of the building to firm up the surface.

Wells along the south side of the building were located in concrete paving. A strip of existing pavement approximately 3 feet wide by 65 feet long was removed to facilitate trenching. After trenching and backfilling, the area was repaved. Eighteen inch steel dowels (#4 rebar) were drilled nine inches into the existing pavement to provide structural stiffness between the new and existing pavement. The concrete was covered with plastic sheeting and then insulating blankets to protect the new concrete from freezing.

On January 11, 2012, the GSI crew returned to the site to take up the insulating blankets and plastic sheeting, spread additional crushed rock on the west side of the building, and perform final work site cleanup.

3.3 Equipment

Detailed information about the system components is provided in Appendix C. The system consists of the following:

Soil Vapor Extraction Blower – 230 volt, three phase, explosion proof, 10 horsepower, regenerative blower, rated at 300 cubic feet per minute (cfm) at 50 inches of vacuum. Blower is equipped with a moisture/vapor separator, sound suppressor, moisture transfer pump, and instrumentation for gaging flow, vacuum pressure, and temperature.

Air Sparge Compressor – 230 volt, three phase, explosion proof, 10 horsepower, rotary vane compressor rated at 54 cfm continuous flow at 18 pounds per square inch (psi) pressure. The compressor has an aftercooler, and instrumentation to monitor pressure, flow, and temperature.

Enclosure – Enclosed trailer, 7 x 14 x 7 feet high. Trailer has an explosion proof heater, exhaust fan, and lighting.

Control Panel – Control panel is mounted on the outside of the trailer. The SVE blower and sparge compressor have on/off switches and hour meters. There is an interlock system that prevents the sparge compressor from operating if the SVE blower is not operating.

4.0 System Start-up

Cornhusker Public Power set a power pole and 230 volt three phase service near the trailer on January 19, 2012. Sackett Electric set a meter and main disconnect at the power pole and ran power to the trailer. GSI technician Albert Moeller and engineer Fred Jones attempted to start the equipment on January 23, 2012. The equipment would not run and tripped the contactor each time the units were started.

The front of the SVE blower was removed and we found a layer of ice in the blower. The heat inside the trailer was set on high, and a technician returned to the site on January 24, 2012. The SVE blower was re-assembled and both the SVE blower and AS compressor were started, but failed to run. GSI contacted Sackett Electric, who returned to the site and found the three phase hot legs were reversed. The condition was corrected and the system was successfully started.

Both the SVE and AS units ran properly. The AS unit was shut down and the SVE blower set to operate. The AS blower was shut down because there is a layer of free product to be removed before the AS unit begins to operate to reduce dissolved hydrocarbon levels.

Calculation of Discharge from SVE unit

A sample of the SVE discharge vapors was collected on January 24, 2012. The sample results were not received from the analytical laboratory at the time this report was completed. Results of discharge stack sampling will be provided in the first 2012 quarterly report. A second discharge stack vapor sample will be collected in February 2012, as part of the quarterly monitoring program.

5.0 Proposed Operation, Maintenance, and Monitoring

GSI will visit the site twice each month except in the winter months when visits may be conducted weekly, depending on the weather. During each visit, the following items will be checked and recorded on a field sheet (example provided in Appendix D):

SVE System

- Vacuum pressure on each of the four lines and on the system (vacuum gage is located on the top of the knockout tank).
- Temperature – on the inlet and outlet sides of the blower.
- Flow – an anemometer will be used to measure air velocity in each of the four inlet lines, and on the main manifold line.
- Discharge concentrations – a photoionization detector (PID) will be used to measure volatile organic vapors in the discharge air.
- Hours of operation and electrical meter readings.

Air Sparge System

- Pressure on each of the three lines and on the main manifold line.
- Flow – there is a flow meter on each of the three lines.
- Temperature.

Routine maintenance will include checking the SVE moisture/vapor separator and emptying as needed and changing filters. Routine operation will include adjusting pressure and flow in the SVE and AS lines as needed. Operation and maintenance items outside the routine scope will be submitted for approval by the NDEQ project manager before proceeding.

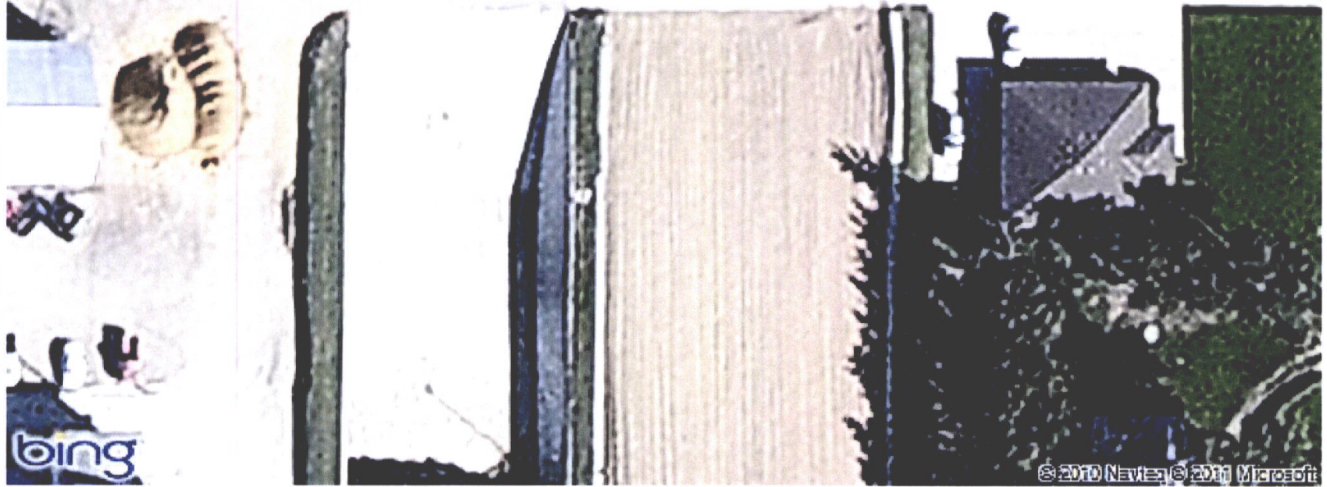
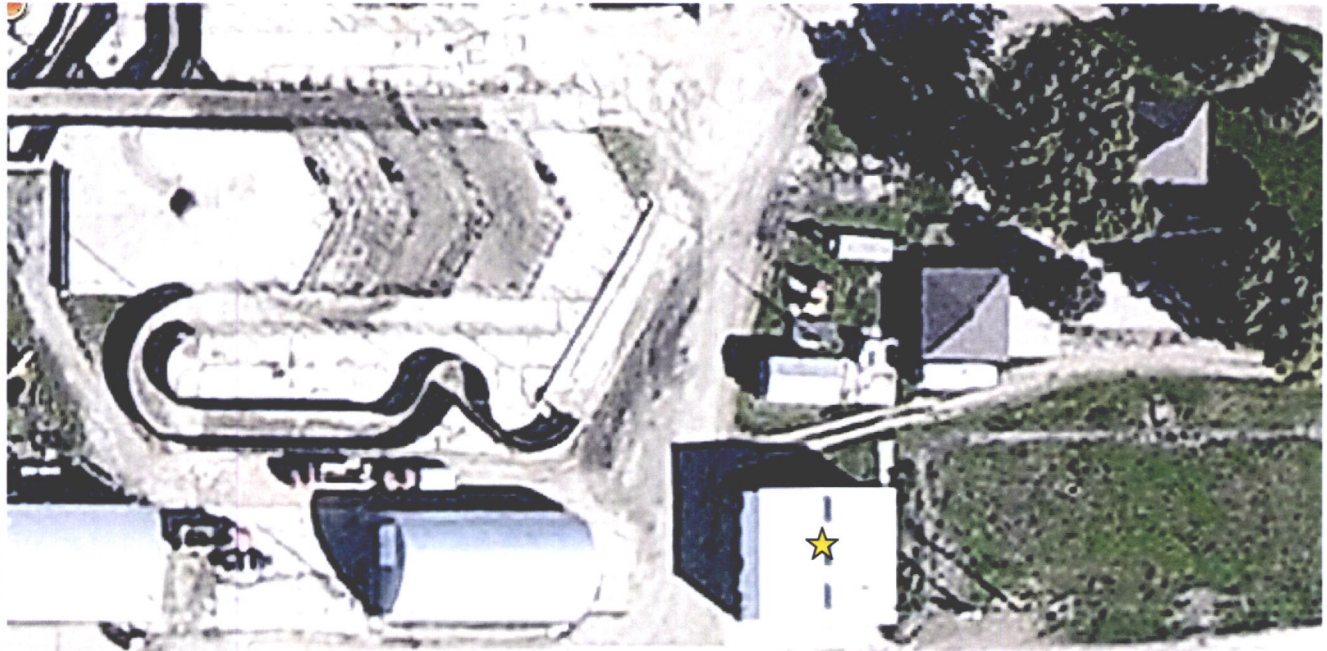
On a quarterly basis, the following readings/data will be gathered and a report will be prepared:

- Air sample from the discharge stack for laboratory analysis will be collected using an absorptive media in a glass tube. The sample will be analyzed for benzene, ethylbenzene, toluene, xylenes, MTBE, and TPH by EPA Method 18.
- Groundwater samples from the site groundwater monitor wells that do not contain free product. We propose to collect groundwater samples from all site monitor wells during the first quarterly monitoring event. The number of wells sampled may be adjusted based on the sample results. Samples will analyzed by EPA Method 8260 and by Method OA-2, for extractable hydrocarbons.

APPENDIX A

Aerial Photograph

Site Map



★ = Fuel Storage Building

Aerial Photograph

Obtained from MSN.com

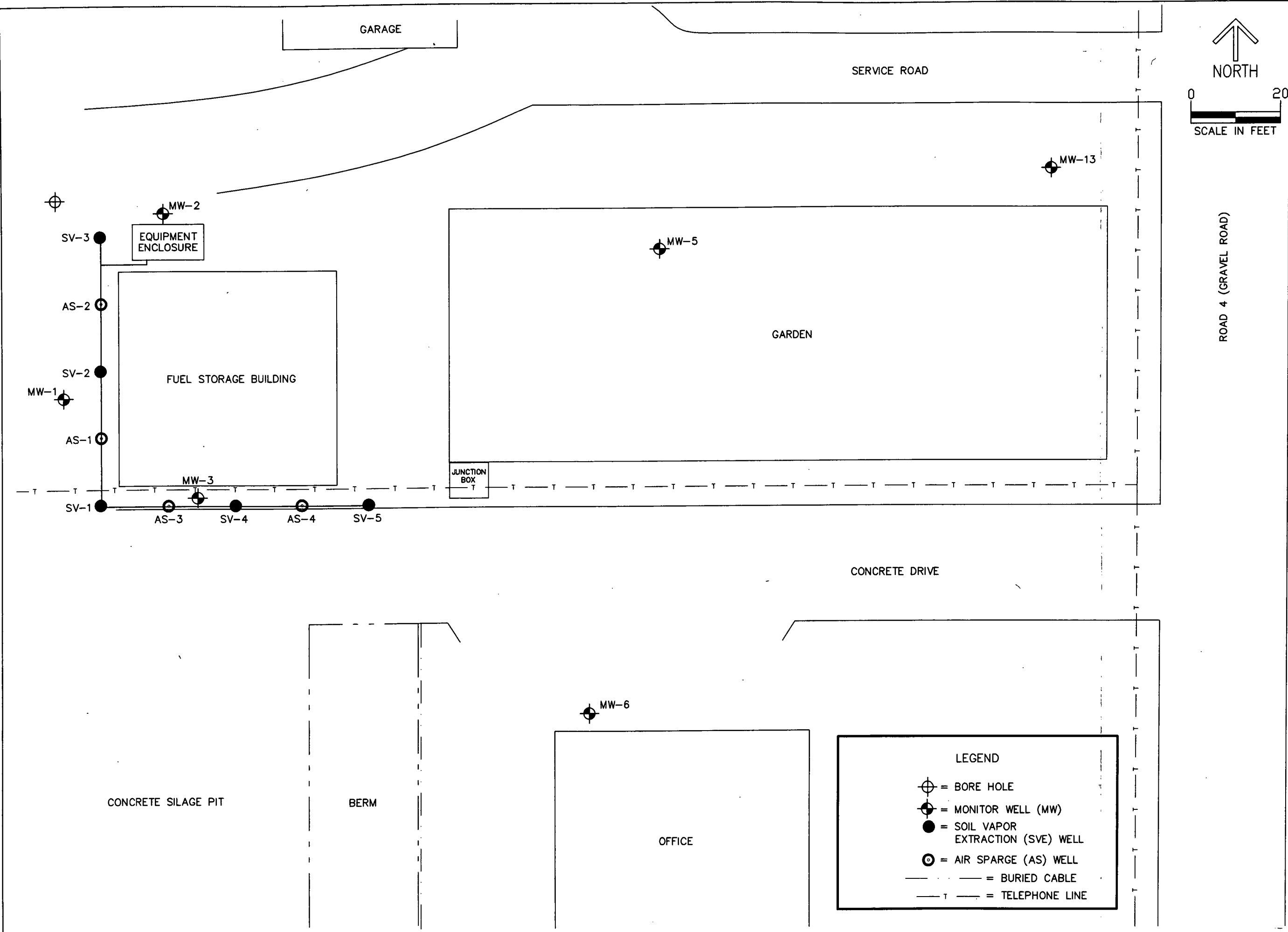
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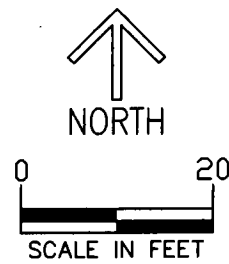
2960 North Diers Avenue, Grand Island, Nebraska

**A. Glenn Kluck Co. Feedlot
585 Road 4
Richland, Nebraska**

Job Number:	Date:	Initials:
115186	01-31-12	EAD



REVISED/REPRINTED	
DATE	BY
01/31/12	EAD



GSI
 Geotechnical Services, Inc.
 2960 North Diers Avenue
 Grand Island, Nebraska

SITE MAP
 A. GLENN KLUCK CO. FEEDLOT
 585 ROAD 4
 RICHLAND, NEBRASKA

GSI PROJECT#	115186
DRAWN	EAD
CHECKED	JFJ
DATE	10/26/11
NDEQ ID	061018
NDEQ PROGRAM ID	040894-NH-1100

APPENDIX B

Soil Boring Log & Monitoring Well Construction Diagrams

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

WELL NO.	LOCATION OF WELL	DATUM	TOC ELEV	GROUND SURF ELEV	DRILLER	LOGGER	
SV-1	See Site Map	100.00'			James Tinnell	J. Fred Jones	
WATER LEVEL OBSERVATIONS			TYPE OF SURFACE		DRILL RIG		
WHILE DRILLING	END OF DRILLING		Gravel		Mobile B-61		
42.0'			4.25" Hollow Stem Augers		44'		
NDEQ SPILL #		NDEQ IIS#		DRILLING START		DRILLING STOP	
040894-NH-1100		061018		DATE: 09/23/2011		DATE: 09/23/2011	

Depth (feet)	Well Construction Details	SAMPLE NO. & TYPE*	Rec. (%)	Head Space Reading	GRAPHIC LOG	Rock Formations, Soil, Color and Classifications, Observations (moisture, odor, etc.) First column for USCS	Depth (feet)
0	PROTECTIVE COVER Type: <u>Steel Flush</u> Size: <u>8" diameter</u> Pad Size: _____ WELL SEAL Type: <u>Benseal</u> Amount: <u>200 Pounds</u> Water: <u>60 Gallons</u> Type: <u>3/8" Bentonite</u> Amount: <u>50 Pounds</u> Water: <u>5 Gallons</u> WELL PACK Type: <u>16/30 Silica Sand</u> Amount: <u>700 Pounds</u> RISER Type: <u>PVC</u> Schedule: <u>40</u> Inside Dia.: <u>2"</u> Length: <u>23.8'</u> SCREEN Type: <u>PVC</u> Schedule: <u>40</u> Slot: <u>0.01</u> Inside Dia.: <u>2"</u> Length: <u>20'</u> END CAP Type: <u>PVC</u> Length: <u>0.2'</u> NOTES All Pipes and Fittings are Flush Threaded Borehole Diameter 8"					CL Black, moist, firm, lean clay Grayish brown Brown Gray SP Light gray, moist, firm, poorly graded sand Medium dense, fine sand with some coarse sand Saturated Bottom of Boring @ 44'	0
10							10
20							20
30							30
40							40
50							50
60							60

* SS (split spoon) HS (hollow stem auger) HA (hand auger) MC (macro-core)



Project:	A. Glenn Kluck Co. Feedlot
Location	585 Road 4, Richland, Nebraska
Project No.:	115186
Date:	1/12/2012

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

WELL NO.	LOCATION OF WELL	DATUM	TOC ELEV.	GROUND SURF. ELEV.	DRILLER	LOGGER
SV-2	See Site Map	100.00'			James Tinnell	J. Fred Jones
WATER LEVEL OBSERVATIONS			TYPE OF SURFACE		DRILL RIG	
WHILE DRILLING	END OF DRILLING		Concrete		Mobile B-61	
41.0'			4.25" Hollow Stem Augers		TOTAL DEPTH	
NDEQ SPILL #		NDEQ IIS#		DRILLING START DATE	DRILLING STOP DATE	
040894-NH-1100		061018		12/20/2011	12/20/2011	

Depth (feet)	Well Construction Details	SAMPLE NO. & TYPE*	Rec. (%)	Head Space Reading	GRAPHIC LOG	Rock Formations, Soil, Color and Classifications, Observations (moisture, odor, etc.) First column for USCS	Depth (feet)
0	PROTECTIVE COVER Type: <u>Steel Flush</u> Size: <u>8" diameter</u> Pad Size: _____ WELL SEAL Type: <u>BH-20</u> Amount: <u>75 Pounds</u> Water: <u>42 Gallons</u> Type: <u>3/8" Bentonite</u> Amount: <u>50 Pounds</u> Water: <u>5 Gallons</u> WELL PACK Type: <u>16/30 Silica Sand</u> Amount: <u>550 Pounds</u> RISER Type: <u>PVC</u> Schedule: <u>40</u> Inside Dia.: <u>2"</u> Length: <u>23.5'</u> SCREEN Type: <u>PVC</u> Schedule: <u>40</u> Slot: <u>0.01</u> Inside Dia.: <u>2"</u> Length: <u>20'</u> END CAP Type: <u>PVC</u> Length: <u>0.2'</u> NOTES All Pipes and Fittings are Flush Threaded Borehole Diameter 8"					CL Concrete Dark brown, moist, firm, lean clay Light brown SP Light brown, moist, medium dense, poorly graded sand, fine sand Saturated Bottom of Boring @ 44.2'	0
10							10
20							20
30							30
40							40
50							50
60							60

* SS (split spoon) HS (hollow stem auger) HA (hand auger) MC (macro-core)



Project:	A. Glenn Kluck Co. Feedlot
Location	585 Road 4, Richland, Nebraska
Project No.:	115186
Date:	1/12/2012

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

WELL NO.	LOCATION OF WELL	DATUM	TOC ELEV.	GROUND SURF. ELEV.	DRILLER	LOGGER
SV-3	See Site Map	100.00'			James Tinnell	J. Fred Jones
WATER LEVEL OBSERVATIONS				TYPE OF SURFACE		DRILL RIG
WHILE DRILLING	END OF DRILLING			Concrete		Mobile B-61
41.5'				DRILLING METHOD		TOTAL DEPTH
				4.25" Hollow Stem Augers		44.2'
NDEQ SPILL#		NDEQ IIS#		DATE	TIME	DATE
040894-NH-1100		061018		12/20/2011		12/20/2011

Depth (feet)	Well Construction Details	SAMPLE NO. & TYPE*	Rec. (%)	Head Space Reading	GRAPHIC LOG	Rock Formations, Soil, Color and Classifications, Observations (moisture, odor, etc.) First column for USCS	Depth (feet)
0	PROTECTIVE COVER Type: <u>Steel Flush</u> Size: <u>8" diameter</u> Pad Size: _____ WELL SEAL Type: <u>BH-20</u> Amount: <u>75 Pounds</u> Water: <u>42 Gallons</u> Type: <u>3/8" Bentonite</u> Amount: <u>50 Pounds</u> Water: <u>5 Gallons</u> WELL PACK Type: <u>16/30 Silica Sand</u> Amount: <u>550 Pounds</u> RISER Type: <u>PVC</u> Schedule: <u>40</u> Inside Dia.: <u>2"</u> Length: <u>23.5'</u> SCREEN Type: <u>PVC</u> Schedule: <u>40</u> Slot: <u>0.01</u> Inside Dia.: <u>2"</u> Length: <u>20'</u> END CAP Type: <u>PVC</u> Length: <u>0.2'</u> NOTES All Pipes and Fittings are Flush Threaded Borehole Diameter 8"					CL Concrete Dark brown, moist, firm, lean clay Light brown SP Light brown, moist, medium dense, poorly graded sand, fine sand Saturated Petroleum odor Bottom of Boring @ 44.2'	0
10							10
20							20
30							30
40							40
50							50
60							60

* SS (split spoon) HS (hollow stem auger) HA (hand auger) MC (macro-core)



Project:	A. Glenn Kluck Co. Feedlot	
Location	585 Road 4, Richland, Nebraska	
Project No.:	115186	Date:
		1/12/2012

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

WELL NO.	LOCATION OF WELL	DATUM	TOC ELEV.	GROUND SURF. ELEV.	DRILLER	LOGGER
SV-4	See Site Map	100.00'			James Tinnell	Aaron Kreifels
WATER LEVEL OBSERVATIONS			TYPE OF SURFACE		DRILL RIG	
WHILE DRILLING	END OF DRILLING		Concrete		Mobile B-61	
41.0'			4.25" Hollow Stem Augers		TOTAL DEPTH	
NDEQ SPILL #		NDEQ IIS#		DRILLING START DATE		DRILLING STOP DATE
040894-NH-1100		061018		12/21/2011		12/21/2011

Depth (feet)	Well Construction Details	SAMPLE NO. & TYPE*	Rec. (%)	Head Space Reading	GRAPHIC LOG	Rock Formations, Soil, Color and Classifications, Observations (moisture, odor, etc.) First column for USCS	Depth (feet)
0	PROTECTIVE COVER Type: <u>Steel Flush</u> Size: <u>8" diameter</u> Pad Size: _____ WELL SEAL Type: <u>BH-20</u> Amount: <u>75 Pounds</u> Water: <u>42 Gallons</u> Type: <u>3/8" Bentonite</u> Amount: <u>50 Pounds</u> Water: <u>5 Gallons</u> WELL PACK Type: <u>16/30 Silica Sand</u> Amount: <u>550 Pounds</u> RISER Type: <u>PVC</u> Schedule: <u>40</u> Inside Dia.: <u>2"</u> Length: <u>23.5'</u> SCREEN Type: <u>PVC</u> Schedule: <u>40</u> Slot: <u>0.01</u> Inside Dia.: <u>2"</u> Length: <u>20'</u> END CAP Type: <u>PVC</u> Length: <u>0.2'</u> NOTES All Pipes and Fittings are Flush Threaded Borehole Diameter 8"					CL Concrete Dark brown, moist, firm, lean clay Light brown SP Light brown, moist, medium dense, poorly graded sand, fine sand Saturated Bottom of Boring @ 44.2'	0
10							10
20							20
30							30
40							40
50							50
60							60

* SS (split spoon) HS (hollow stem auger) HA (hand auger) MC (macro-core)



Project: A. Glenn Kluck Co. Feedlot	
Location: 585 Road 4, Richland, Nebraska	
Project No.: 115186	Date: 1/12/2012

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

WELL NO.	LOCATION OF WELL	DATUM	TOC ELEV.	GROUND SURF. ELEV.	DRILLER	LOGGER
SV-5	See Site Map	100.00'			James Tinnell	Aaron Kreifels
WATER LEVEL OBSERVATIONS			TYPE OF SURFACE		DRILL RIG	
WHILE DRILLING	END OF DRILLING		Concrete		Mobile B-61	
41.0'			4.25" Hollow Stem Augers		TOTAL DEPTH	
NDEQ SPILL #		NDEQ IIS#	DATE	TIME	DATE	TIME
040894-NH-1100		061018	12/21/2011		12/21/2011	

Depth (feet)	Well Construction Details	SAMPLE NO. & TYPE*	Rec. (%)	Head Space Reading	GRAPHIC LOG	Rock Formations, Soil, Color and Classifications, Observations (moisture, odor, etc.) First column for USCS	Depth (feet)
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10							10
20							20
30							30
40							40
50	NOTES All Pipes and Fittings are Flush Threaded Borehole Diameter 8"						50
60							60

* SS (split spoon) HS (hollow stem auger) HA (hand auger) MC (macro-core)



Project:	A. Glenn Kluck Co. Feedlot
Location	585 Road 4, Richland, Nebraska
Project No.:	115186
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SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

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WATER LEVEL OBSERVATIONS			TYPE OF SURFACE		DRILL RIG		
WHILE DRILLING	END OF DRILLING		Concrete		Mobile B-61		
			DRILLING METHOD		TOTAL DEPTH		
41.0'			4.25" Hollow Stem Augers		54.2'		
NDEQ SPILL #		NDEQ IIS#		DRILLING START		DRILLING STOP	
040894-NH-1100		061018		12/20/2011		12/20/2011	

Depth (feet)	Well Construction Details	SAMPLE NO. & TYPE*	Rec. (%)	Head Space Reading	GRAPHIC LOG	Rock Formations, Soil, Color and Classifications, Observations (moisture, odor, etc.) First column for USCS	Depth (feet)
0	PROTECTIVE COVER Type: <u>Steel Flush</u> Size: <u>8" diameter</u> Pad Size: _____ WELL SEAL Type: <u>BH-20</u> Amount: <u>125 Pounds</u> Water: <u>70 Gallons</u> Type: <u>Bentonite</u> Amount: <u>50 Pounds</u> Water: <u>5 Gallons</u> WELL PACK Type: <u>16/30 Silica Sand</u> Amount: <u>100 Pounds</u> RISER Type: <u>PVC</u> Schedule: <u>40</u> Inside Dia.: <u>2"</u> Length: <u>51.5'</u> SCREEN Type: <u>PVC</u> Schedule: <u>40</u> Slot: <u>0.01</u> Inside Dia.: <u>2"</u> Length: <u>2'</u> END CAP Type: <u>PVC</u> Length: <u>0.2'</u> NOTES All Pipes and Fittings are Flush Threaded Borehole Diameter 8"					CL Concrete Dark brown, moist, firm, lean clay Light brown SP Light brown, moist, medium dense, poorly graded sand, fine sand Saturated Bottom of Boring @ 54.2'	0
10							10
20							20
30							30
40							40
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60							60

* SS (split spoon) HS (hollow stem auger) HA (hand auger) MC (macro-core)



Project:	A. Glenn Kluck Co. Feedlot	
Location	585 Road 4, Richland, Nebraska	
Project No.:	115186	Date: 1/12/2012

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

WELL NO.	LOCATION OF WELL	DATUM	TOC ELEV.	GROUND SURF. ELEV.	DRILLER	LOGGER	
AS-2	See Site Map	100.00'			James Tinnell	J. Fred Jones	
WATER LEVEL OBSERVATIONS			TYPE OF SURFACE		DRILL RIG		
WHILE DRILLING	END OF DRILLING		Concrete		Mobile B-61		
41.0'			4.25" Hollow Stem Augers		TOTAL DEPTH		
					54.2'		
NDEQ SPILL #		NDEQ IIS#		DRILLING START		DRILLING STOP	
040894-NH-1100		061018		DATE	TIME	DATE	TIME
				12/20/2011		12/20/2011	

Depth (feet)	Well Construction Details	SAMPLE NO. & TYPE*	Rec. (%)	Head Space Reading	GRAPHIC LOG	Rock Formations, Soil, Color and Classifications, Observations (moisture, odor, etc.) First column for USCS	Depth (feet)
0	PROTECTIVE COVER Type: <u>Steel Flush</u> Size: <u>8" diameter</u> Pad Size: _____ WELL SEAL Type: <u>BH-20</u> Amount: <u>125 Pounds</u> Water: <u>70 Gallons</u> Type: <u>Bentonite</u> Amount: <u>50 Pounds</u> Water: <u>5 Gallons</u> WELL PACK Type: <u>16/30 Silica Sand</u> Amount: <u>100 Pounds</u> RISER Type: <u>PVC</u> Schedule: <u>40</u> Inside Dia.: <u>2"</u> Length: <u>51.5'</u> SCREEN Type: <u>PVC</u> Schedule: <u>40</u> Slot: <u>0.01</u> Inside Dia.: <u>2"</u> Length: <u>2'</u> END CAP Type: <u>PVC</u> Length: <u>0.2'</u> NOTES All Pipes and Fittings are Flush Threaded Borehole Diameter 8"					CL Concrete Dark brown, moist, firm, lean clay Light brown SP Light brown, moist, medium dense, poorly graded sand, fine sand Saturated Bottom of Boring @ 54.2'	0
10							10
20							20
30							30
40							40
50							50
60							60

* SS (split spoon) HS (hollow stem auger) HA (hand auger) MC (macro-core)



Project:	A. Glenn Kluck Co. Feedlot
Location	585 Road 4, Richland, Nebraska
Project No.:	115186
Date:	1/12/2012

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

WELL NO.	LOCATION OF WELL	DATUM	TOC ELEV.	GROUND SURF. ELEV.	DRILLER	LOGGER
AS-3	See Site Map	100.00'			James Tinnell	Aaron Kreifels
WATER LEVEL OBSERVATIONS				TYPE OF SURFACE		DRILL RIG
WHILE DRILLING	END OF DRILLING			Concrete		Mobile B-61
				DRILLING METHOD		TOTAL DEPTH
41.0'				4.25" Hollow Stem Augers		54.2'
NDEQ SPILL #		NDEQ IIS#		DRILLING START		DRILLING STOP
040894-NH-1100		061018		DATE	TIME	DATE
				12/21/2011		12/21/2011

Depth (feet)	Well Construction Details	SAMPLE NO. & TYPE*	Rec. (%)	Head Space Reading	GRAPHIC LOG	Rock Formations, Soil, Color and Classifications, Observations (moisture, odor, etc.) First column for USCS	Depth (feet)
0	PROTECTIVE COVER Type: <u>Steel Flush</u> Size: <u>8" diameter</u> Pad Size: _____ WELL SEAL Type: <u>BH-20</u> Amount: <u>125 Pounds</u> Water: <u>70 Gallons</u> Type: <u>Bentonite</u> Amount: <u>50 Pounds</u> Water: <u>5 Gallons</u> WELL PACK Type: <u>16/30 Silica Sand</u> Amount: <u>100 Pounds</u> RISER Type: <u>PVC</u> Schedule: <u>40</u> Inside Dia.: <u>2"</u> Length: <u>51.5'</u> SCREEN Type: <u>PVC</u> Schedule: <u>40</u> Slot: <u>0.01</u> Inside Dia.: <u>2"</u> Length: <u>2'</u> END CAP Type: <u>PVC</u> Length: <u>0.2'</u> NOTES All Pipes and Fittings are Flush Threaded Borehole Diameter 8"					CL Concrete Dark brown, moist, firm, lean clay Light brown SP Light brown, moist, medium dense, poorly graded sand, fine sand Saturated Bottom of Boring @ 54.2'	0
10							10
20							20
30							30
40							40
50							50
60							60

* SS (split spoon) HS (hollow stem auger) HA (hand auger) MC (macro-core)



Project:	A. Glenn Kluck Co. Feedlot
Location	585 Road 4, Richland, Nebraska
Project No.:	115186
Date:	1/12/2012

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

WELL NO	LOCATION OF WELL	DATUM	TOC ELEV	GROUND SURF ELEV.	DRILLER	LOGGER	
AS-4	See Site Map	100.00'			James Tinnell	Aaron Kreifels	
WATER LEVEL OBSERVATIONS			TYPE OF SURFACE		DRILL RIG		
WHILE DRILLING	END OF DRILLING		Concrete		Mobile B-61		
			DRILLING METHOD		TOTAL DEPTH		
41.0'			4.25" Hollow Stem Augers		54.2'		
NDEQ SPILL #		NDEQ IIS#		DRILLING START		DRILLING STOP	
040894-NH-1100		061018		DATE	TIME	DATE	TIME
				12/21/2011		12/21/2011	

Depth (feet)	Well Construction Details	SAMPLE NO. & TYPE*	Rec. (%)	Head Space Reading	GRAPHIC LOG	Rock Formations, Soil, Color and Classifications (moisture, odor, etc.) First column for USCS	Depth (feet)
0	PROTECTIVE COVER Type: <u>Steel Flush</u> Size: <u>8" diameter</u> Pad Size: _____ WELL SEAL Type: <u>BH-20</u> Amount: <u>125 Pounds</u> Water: <u>70 Gallons</u> Type: <u>Bentonite</u> Amount: <u>50 Pounds</u> Water: <u>5 Gallons</u> WELL PACK Type: <u>16/30 Silica Sand</u> Amount: <u>100 Pounds</u> RISER Type: <u>PVC</u> Schedule: <u>40</u> Inside Dia.: <u>2"</u> Length: <u>51.5'</u> SCREEN Type: <u>PVC</u> Schedule: <u>40</u> Slot: <u>0.01</u> Inside Dia.: <u>2"</u> Length: <u>2'</u> END CAP Type: <u>PVC</u> Length: <u>0.2'</u> NOTES All Pipes and Fittings are Flush Threaded Borehole Diameter 8"					CL Concrete Dark brown, moist, firm, lean clay Light brown SP Light brown, moist, medium dense, poorly graded sand, fine sand Saturated	0
10							10
20							20
30							30
40							40
50							50
60						Bottom of Boring @ 54.2'	60

* SS (split spoon) HS (hollow stem auger) HA (hand auger) MC (macro-core)



Project: A. Glenn Kluck Co. Feedlot	
Location: 585 Road 4, Richland, Nebraska	
Project No.: 115186	Date: 1/12/2012

APPENDIX C

SVE/AS Equipment Details

1. Equipment Description

Air Sparge System

- (1) Sparge discharge manifold with 1 1/2" main and (3) 1" takeoffs
 - Schedule 40 galvanized steel header and fittings
 - (3) Flow control valves, 1" brass gate valve
 - (3) Pressure gages, 0-30 psi liquid filled, ss WIKA Type 213.53
 - (3) Flow meters, 1" Dwyer rotameters, 5-50 scfm, model #UV-C112

- (1) Rotary Vane air compressor, Rietschle model DTA 100
 - Cast iron housing, carbide vane construction
 - 10hp, 208VAC, 3Ø, EXP motor
 - 54 icfm air at 18 psi (50scfm, 34 acfm discharge at 2560' elev. corrected for disch. temp)
 - Oilless compressor
 - Inlet air filter with replaceable element
 - Pressure gage on blower discharge, 0-30 psi, ss liquid filled, WIKA Type 213.53
 - Temperature gage on blower discharge, WIKA Type TI.30
 - Temperature switch on blower discharge, Barksdale model ML1H-GH354S
 - Pressure relief valve
 - Air bleed valve with silencer, 1", Solberg model SLCR 1"
 - Check valve on blower discharge
 - Pressure transmitter, United electric Series One, 4-20 maDC output, local LCD display
4-20mA = 0-30 psi

- (1) Air cooled aftercooler, American Industrial Heat Transfer Inc. Model ACA3182-X
 - Copper tube aluminum finned heat exchanger
 - Steel stand with shroud, horizontal discharge
 - 1/4 hp, 208VAC, 3Ø, EXP motor
 - Approximately 30F approach temperature at 50 scfm flow rate
 - <10" wc pressure drop at 50 scfm
 - 1 psi operating pressure, 200 psi max pressure

SVE System

- (1) Vacuum inlet manifold with 4" main and (4) 4" takeoffs
 - Schedule 80 PVC header and fittings
 - (4) Isolation valves, 4" PVC Ball valves
 - (4) Vacuum ports with isolation valves
 - (4) Sample ports
 - (1) Magnehelic gage with tubing for connection to four vacuum points, Dwyer model 2100

- (1) H2K model RGN 858 soil vapor extraction system
 - Blower, Rotron model EN858BD72WL regenerative blower
 - 300 ICFM at 50" wc vacuum at separator inlet (238 scfm at 2560' elevation)
 - 10 HP, 208-230/460 VAC, 3Ø, EXP motor
 - Flexible couplings for vibration isolation on blower inlet and outlet
 - Vacuum relief valve, Rotron model 523230
 - Vacuum gage on inlet, 0-100" wc vacuum
 - Sample port on blower discharge, WIKA Type 610.10
 - Silencer on blower discharge, SLCR 2 1/2"
 - Air flow meter, Rotron FM30C350Q venturi with minihelic gage, on blower discharge
 - Temperature gage on blower discharge, WIKA Type TI.30
 - Pressure gage on blower discharge, WIKA Type 610.10
 - Vacuum transmitter, United Electric Series One, 4-20 maDC output, local LCD display
4-20 mA = 0-100" wc
 - Blower discharge through wall with moisture trap and drain valve
 - Discharge stack, 15' aboveground with support
- (1) Moisture separator tank, H2K model VLS-100
 - Tangential inlet for 95%+ moisture removal
 - 55 gallon holding capacity
 - 4" NPT inlet & outlet
 - 1" Drain ball valve
 - PVC site glass with high/high-high-low level switches, Dwyer model L6EPB-B-S-3-0
 - Inlet filter with 10 micron replaceable element, integral with moisture separator
Solberg model CSL-239-300C
 - DP gage across filter element, Magnehelic 2015
 - Vacuum gage on separator inlet
 - 2" Air bleed valve with silencer on separator inlet, Solberg SLCR 2"
 - Sample port on separator inlet
- (1) Condensate pump, Meyers model CT-053
 - 10 gpm at 72' TDH
 - 3/4 hp, 208 VAC, 3Ø, EXP motor
 - Cast iron bronze fitted pump construction
 - Throttle valve, check valve and pressure gage on pump discharge

Controls

(1) Control System

For operation on 120/208 VAC, 3Ø, 4 wire incoming electrical service. To control 10HP sparge blower, 10 Hp SVE blower, 3/4HP transfer pump and ¼ hp aftercooler. Furnished mounted and wired on the trailer exterior wall. To include:

QTY DESCRIPTION

- 1 Enclosure, NEMA 4, 36"h, 36"w, 12"d with inner door for switches and indicators
- 1 Lightning arrestor; 230 volt, 3 wire with bracket-mounted in load center
- 1 Motor starter: Contactor 23A FLA/Overload relay 1.6-5.0A, 3Ø; pump
- 1 Motor starter: Contactor 23A FLA/Overload relay 1.0-2.9A, 3Ø; aftercooler
- 2 Motor starter: Contactor 37A FLA/Overload relay 12-37A, 3Ø; SVE, sparge
- 2 Contactor 23A FLA for building heater and vent fan
- 1 120/208 VAC, load center with 125amp main circuit breaker with the following:
 - 1 Circuit breaker 230V 1P15A 10K; control power
 - 2 Circuit breaker 230V 1P15A 15K; vent fan, lighting
 - 1 Circuit breaker 230V 1P20A 10K; receptacle(s)
 - 2 Circuit breaker 230V 3P15A 10K; pump, aftercooler
 - 2 Circuit breaker 230V 3P50A 10K; sparge, SVE
- 4 Switch; three position; Hand-Off-Auto with integral Run (green/LED) indication
- 4 Light (red/LED); alarms
- 3 Hour meters
- 1 Pushbutton (red/NO); alarm Reset
- 3 Intrinsically safe barriers, discrete , 2 channel
- 1 Intrinsically safe pump down relay
- 1 24VDC power supply for transmitter
- 1 EOS Procontroller PLC/Telemetry unit for system control and alarm dial out
- Engraved laminated legends for all door mounted devices
- Terminal blocks for external connections and fusing as required
- Color-coded wiring with wire markers at all terminations
- Fully documented, assembled, wired, programmed and pre-shipment test
- 1 UL 698A serialized label
- 1 Panel heater, 120VAC, 250Watt with thermostat
- 1 GFIC 20A outlet with and weatherproof cover; (mounted adjacent to control panel)

Enclosure

- (1) Trailer enclosure system, 7' wide x 14' long x 7' high

Includes equipment installation and wiring

6" steel I beam frame

Plywood floor decking, aluminum & fiberglass exterior

R-5 fiberglass wall and ceiling insulation with plywood interior

Tandem axle, 7,000lb GVWR, 7,000 lb axles, radial tires

Double rear doors with cam lock

Pintle hitch coupler with jack stand

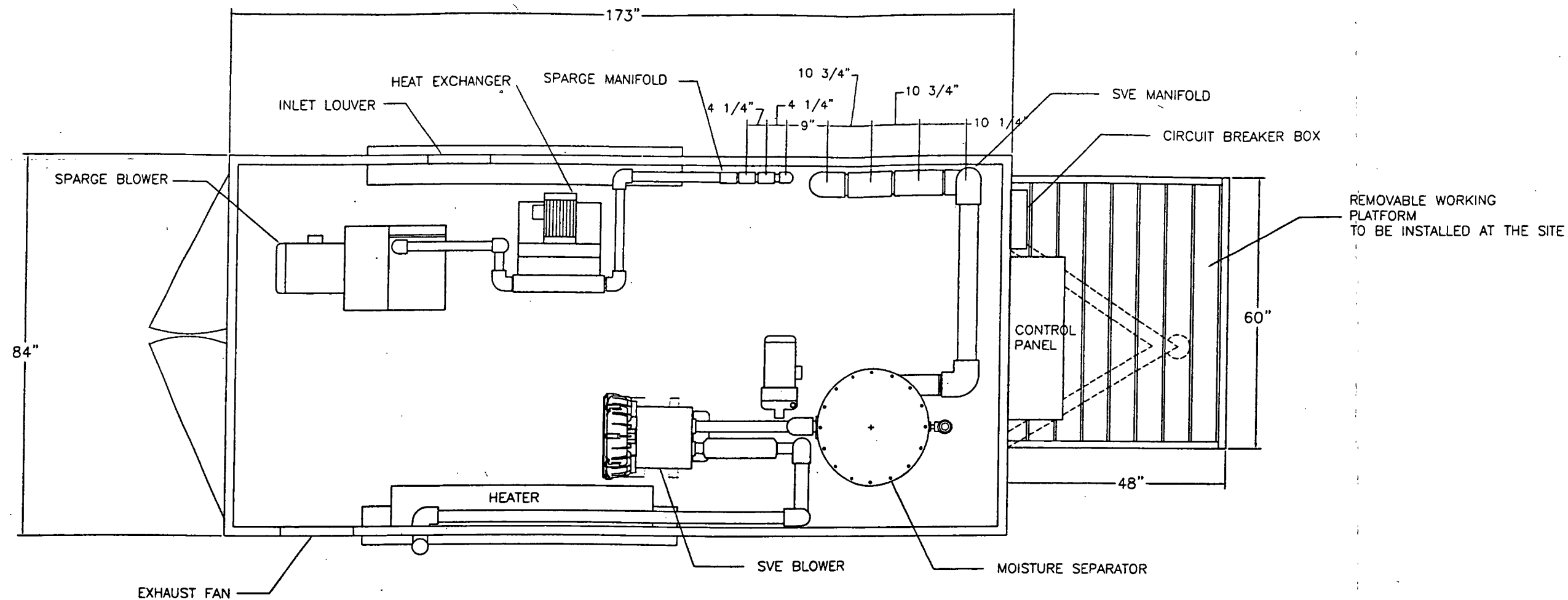
(2) Rear stabilizer jacks

Electric brakes, ICC lighting

- (1) Explosion proof vent fan with inlet & outlet louvers and thermostat, LFI 12
- (1) Explosion proof electric convection heater with thermostat, Fostoria model FEP-3820 1R-A
- (1) Explosion proof ceiling mounted incandescent lights with vapor globe with wall switch

SVE systems & sparge systems will be installed, piped and wired in trailer, wiring will be per NEC for a Class I, Division II, Group D area. Piping will be PVC schedule 80 for SVE inlet and water and schedule 40 galvanized steel for air sparge and vapor discharge. Control panel, and breaker panel will be mounted and wired outside of trailer per NEC for a non-classified area.

Entire trailer System Certification by third party independent testing laboratory per UL standards
(Note control panel carries a separate UL certification on its own)



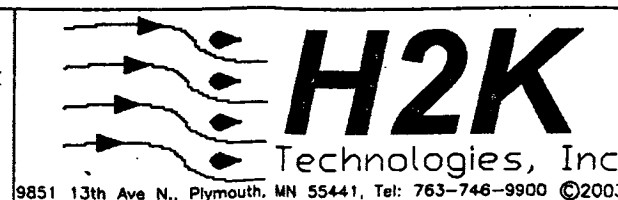
Note:
 1. 7' wide x 14' long x 7' interior height enclosed trailer with tandem axles, R-5 insulation walls and ceiling, 7000 lb. GVWR.
 2. Headers to be high off the floor to allow flexibility for field connections.

REVISIONS		
DESCRIPTION	DATE	DWN
RE-SUBMITTAL	4/04	MK

UNLESS SPECIFIED OTHERWISE
 * DIMENSIONS ARE IN INCHES
 * DO NOT SCALE DRAWING

DRAWN BY: MK
 DESIGNED BY: MK
 PROJECT MGR.: MK
 DATE: 3/24/04
 PROJECT NO.: 1338

THESE MATERIALS ARE PROPRIETARY AND SHALL REMAIN THE PROPERTY OF H2K TECHNOLOGIES, INC. BUYER SHALL HAVE THE USE OF MATERIALS AND INFORMATION FOR THE LIMITED PURPOSE OF INSTALLING AND MAINTAINING THE EQUIPMENT SOLD BY H2K TECHNOLOGIES, INC. NOT TO BE REPRODUCED WITHOUT WRITTEN PERMISSION.



PROJECT TITLE:
 Terracon
 Crazy Dicks
 ERCS Site

DRAWING TITLE:
 Trailer
 Layout Drawing

SHEET 1 OF 1
 DRAWING NO.:
 1338-02

APPENDIX D

O&M Field Sheet

A. Glenn Kluck Co. Feedlot
585 Road 4
Richland, Nebraska
NDEQ UG #040894-NH-1100
GSI Project No. 115186

Date _____

SVE 1, Hour Reading _____

Air Sparge Hour Reading _____

GSI Personnel On-site

Power Meter Reading _____

Moisture Transfer Pump, Hr. _____

SVE Blower Unit #1	
Circle those that apply:	System Running, Not Running, Restarted
VT 100 (in.)	
Pre-Knockout Vacuum (in. of H ₂ O)	
Inlet Air Flow (CFM)	
Filter(s) Checked	Yes or No
Pre-Blower Temperature (in °F)	
Knockout Tank Magnehelic Gauge (in. of H ₂ O)	
Post Knockout	
Exhaust Air Flow (CFM)	
Post Blower Pressure (in. of H ₂ O)	
Post Blower Temperature (in °F)	
Exhaust PID	
Gallons of knockout tank water	

SVE Lines	Flow (CFM) outside of trailer	Vacuum (in. H ₂ O) on lines outside of trailer
2 & 3		
1		
4		
5		

Sparge Unit	
Is system running?	Yes or No
Bleed-Air	Open or Closed
Temperature	
Post- Pressure (PSI) 0-30	
PT 200	
Air Sparge Greased	Yes or No
Air Filters Checked	Yes or No
Air Filters Changed	Yes or No
Screens Cleaned	Yes or No

Sparge Lines	(SCFM) 0-10	Pressure (PSI) 0-30
1 & 2		
3		
4		

	Product Level	Groundwater Level
Measure groundwater/free product in MW-3		

Comments
