APPLICATION FOR SURFACE COAL MINING AND RECLAMATION OPERATIONS PERMIT – DEER RUN

Part I – Applicant Information

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Part IV – Operations Plan

Part V – Reclamation Plan

Hillsboro Energy LLC
Deer Run Mine

Map Index

PART I

State of Illinois
Department of Natural Resources
Office of Mines and Minerals
Land Reclamation Division
Lincoln Tower Plaza
524 South Second Street
Springfield, IL 62701

APPLICATION FOR SURFACE COAL MINING AND RECLAMATION OPERATIONS
PERMIT - UNDERGROUND OPERATIONS
UCM-1

PART I

(Application to be submitted 120 days (180 days for NPDES) prior to the desired effective date of the permit)

DATE: ***December 20, 2007***

NOTICE
This state agency is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under Ill. Rev. Stat. 1989, ch. 96 1/2, par. 7901 et seq. Disclosure of this information is voluntary, however failure to comply may result in this form not being processed. This form has been approved by the Forms Management Center.

1) A) General Information

(I) (We) (The) ***Hillsboro Energy LLC***
(Name of Company, Corporation, Partnership or Individual)
925 South Main Street Hillsboro, IL 62049 ***(217) 532-3983***
(Address) (Telephone Number)

hereby submit application #***399*** for a permit to mine during a permit term of ***5*** years.

Type of Application:

[X] Underground Mining
[ ] Revision No. _____ to Permit No. _____
[ ] Shadow Area Addition
[ ] Renewal No._____ to Permit No. _____
[ ] Transfer of Permit No. _____
[ ] Acres to be added under renewal

Applicant's Social Security No. _____ (Voluntary) and/or Federal Employer Identification No. ***20-5231639***.

Name of Mine ***Deer Run***.
MSHA ID No. ***1103182***.

List the Mine Safety and Health Administration (MSHA) number(s) for all mine associated structures that require MSHA approval.

Response: ***N/A***

I, *Michael J. Beyer* _____ *Authorized Person*
Name Signature Title

under penalties of perjury declare that I have examined this application, including accompanying statements and documents and to the best of my knowledge it is true, and correct. (Signee must be at least a vice president or duly authorized representative for NPDES 35 Ill. Adm. Code 309.103(e))

This application is also to be used to apply for a:

IEPA Subtitle D (State) Permit Yes *X* No _____ NPDES Yes *X* No _____

New *X*

Renewal No. _____ Date: _____
Renewal No. _____ Date: _____
Modification No. _____ Date: _____
Modification No. _____ Date: _____

If this is an application for a NPDES permit, the Consolidated Permits Program - Application Form 2C (renewal), Form 2D (new), or Form 2E (sanitary) must be completed.

B) I _____
(vice president or his duly authorized representative)

hereby waive my right of the 90-day permit issuance deadline as required by the Illinois Environmental Protection Act, Section 39(a)(4) and the Illinois Pollution Control Board Rules and Regulations, 35 Ill. Adm. Code 309.225(c).

C) Who will be the operator of the permit site?
Name *Hillsboro Energy LLC*

Pursuant to 62 Ill. Adm. Code 1701.5 an operator is any person engaged in coal mining who removes or intends to remove more than 250 tons of coal.

If the operator is different from the applicant, provide the following information.

1) Operator's address *N/A*

2) Operator's telephone No. _____

3) Operator's Social Security No. _____
(voluntary) and/or Federal Employer Identification No. _____.

D) Who will extract coal under this permit?
Name *Hillsboro Energy LLC*

If different from applicant or operator provide the following:

1) Address *N/A*
2) Telephone No. _____.

2) Telephone No. _____.

3) Social Security No. (Voluntary) and/or federal employer identification No. _____.

E) Who will pay abandoned mine land reclamation fees?
Name ***Hillsboro Energy LLC***

If the person paying the abandoned mine land reclamation fee is different from the applicant, provide the following information.

1) Address _____
_____

2) Telephone No. _____

3) Payee's Social Security No. _____
(voluntary) and/or Federal Employer Identification No. _____

F) The permittee requests a permit on the following area as shown on the permit map.

				Location		
Mine Address	Pit No. or Name	Acres to be Permitted	Sec.	Twp.	Range	County
925 South Main Street	***Deer Run***	***803.5***	***7,8,17,18 12,13***	***T8N T8N***	***R3W R4W***	***Montgomery***

Total Acres: ***803.5***

G. Indicate the type of disturbance and associated acreage.

Acres	Type of Disturbance
2.0	Ventilation, Air Shafts
185.0	Mine Waste Areas
53.3	Processing Areas & Support Facilities
78.0	Access, Haul Roads, & Transport Facilities
75.0	Soil Storage Areas
34.5	Main Buildings and Mine Support Facilities
210.7	Other
165.0	Undeveloped Areas

H) For each phase (permit) of the proposed surface coal mining and reclamation operation over the life of the mine provide the anticipated or actual starting and termination date and the anticipated number of acres to be affected. Designate the boundaries of each phase on the pre-mining land use map or other designated map.

Phases (Permits)	Starting Date	Termination Date	Acres to be Affected
I (Surface Construction)	*April 2008*	*July 2010*	*803.5*
II (Active Mining)	*April 2009*		

2) A) Provide name and address of every legal or equitable owner of record of the permit area, and the mineral property to be mined.

Response: ***Refer to Attachment Part I.2.A and Identification of Interests Maps (Maps 2A & 2B) for Information. Hillsboro Energy LLC bases its right to mine coal reserve by means of the terms of that Certain Coal Mining Lease Agreement dated September 21, 2007 between Montgomery Mineral, LLC, as lessor, and Hillsboro Energy LLC, as Lessee.***

B) Provide name and address of the owner of record for all surface and subsurface areas contiguous to any part of the proposed permit area.

Response: ***Refer to Attachment Part I.2.B and Identification of Interests Maps (Maps 2A & 2B) for Information.***

C) Show location of owners of record of those lands, both surface and subsurface, included in or contiguous to the permit area on premining land use map or another map, if necessary.

Response: ***Refer to Identification of Interests Maps (Maps 2A & 2B)***

3) A) Provide name and address of any holder of record of leasehold interest for the permit area, and the mineral property to be mined.

Response: ***Refer to Attachment Part I.2.A and Identification of Interests Maps (Maps 2A & 2B) for Information. Hillsboro Energy LLC bases its right to mine coal reserve by means of the terms of that Certain Coal Mining Lease Agreement dated September 21, 2007 between Montgomery Mineral, LLC, as lessor, and Hillsboro Energy LLC, as Lessee.***

B) Provide a statement of all lands, interest in lands, options or pending bids on interest held or made by the applicant for lands, which are contiguous to the permit area.

Response: ***Refer to Attachment Part I.3.B and Identification of Interests Maps (Maps 2A & 2B) for Information.***

4) Provide name and address of any purchaser of record under a real estate contract of the property for the permit area.

Response: ***Refer to Attachment Part I.3.B and Identification of Interests Maps (Maps 2A & 2B) for Information. Montgomery Land Company, LLC is the purchaser of record and is an affiliate to Hillsboro Energy LLC.***

5) A) The applicant is: _____*X*_____ corporation, _____ partnership,

_____single proprietorship, _____association or other business entity.

B) For the resident agent who will accept service of process for the applicant provide the following information.

1) Name of resident agent *Corporate Service Company*.

2) Address *2711 Centerville Road*
Wilmington, DE 19808

3) Telephone No. _____

4) Social Security No. _____ (voluntary) and/or Federal Employer Identification No. *41-2178049*.

6) OWNERSHIP AND CONTROL INFORMATION

Ownership and control is evidenced by being the permittee of a surface coal mining operation, or by being the owner of record of 50 percent or more of an entity controlling a surface coal mining operation or by having any relationship , which gives direct or indirect authority over an entity controlling a surface coal mining operation.

Ownership and control is presumed if an entity is an officer or director; is an operator of a surface coal mining operation; has the authority to commit the financial or real property assets or working resources of an entity; is the owner of record of ten (10) through fifty (50) percent of an entity; is a general partner of a partnership; owns or controls coal to be mined by another entity and has the right to receive that coal after mining; or has the authority to determine how the surface coal mining operations will be conducted.

For an entity to refute a presumed ownership and control relationship, the entity must demonstrate to the satisfaction of the Department that the entity subject to the presumption does not have the authority directly or indirectly to determine the manner in which the relevant surface coal mining operation is conducted.

A) For each entity who owns or controls the applicant provide the following information.

Response: ***Hillsboro Energy LLC, the Applicant, is a Limited Liability Company registered to do business in the State of Illinois. Its business address is 430 Harper Park Drive, Suite A, Beckley, WV 25801.***

The Authorized Person for Hillsboro Energy LLC is Michael J. Beyer.

One hundred percent of the Membership Interests of Hillsboro Energy LLC are owned by Foresight Reserves LP.

Foresight Reserves LP is a limited partnership in which the voting interest is controlled by Insight Resource, LLC, the General Partner.

Refer to Attachment Part I.6.A – Consent to Company Action

1) Name of entity *Foresight Reserves LP*

2) Address *430 Harper Park Drive*
Beckley, WV 25801

3) Social Security No. _____ (voluntary) and/or Federal Employer Identification No *20-1797073*.

4) The entity's specific ownership and control relationship with the applicant *100% Owner of Applicant*

If more than one ownership and control relationship exists, list each relationship separately under this part providing all information requested.

a) Percentage of ownership if any *N/A*.

b) Location in organizational structure *N/A*.

c) Position title *N/A*.

i) Date position was assumed _____.

ii) Date of departure from position _____.

1) Name of entity *Michael J. Beyer*

2) Address *3801 PGA Blvd., Suite 903*
Palm Beach Gardens, FL 33410

3) Social Security No. _____ (voluntary) and/or Federal Employer Identification No. *N/A*.

4) The entity's specific ownership and control relationship with the applicant *Authorized Person for Applicant*

If more than one ownership and control relationship exists, list each relationship separately under this part providing all information requested.

a) Percentage of ownership if any *N/A*.

b) Location in organizational structure *N/A*.

c) Position title *N/A*.

i) Date position was assumed _____.

ii) Date of departure from position _____.

1) Name of entity *Insight Resource, LLC*

2) Address *430 Harper Park Drive*
Beckley, WV 25801

3) Social Security No. _____ (voluntary) and/or Federal Employer Identification No. *20-1796775*.

4) The entity's specific ownership and control relationship with the applicant *General Partner of Applicant's Owner*

If more than one ownership and control relationship exists, list each relationship separately under this part providing all information requested.

a) Percentage of ownership if any ___*N/A*___.

b) Location in organizational structure ___*N/A*___.

c) Position title ___*N/A*___.

i) Date position was assumed _____.

ii) Date of departure from position _____.

B) For each surface coal mining and reclamation operation in the United States either presently owned or controlled or owned or controlled within the five (5) years preceding the date of the application by the entity listed in (A) above provide the following information.

Response: *N/A*

1) Name _____.

2) Address _____.

3) Name of regulatory authority _____.

4) Identification number.

a) Social security No. _____ (voluntary) and/or federal employer identification No. _____.

b) Federal permit No. _____.

c) State permit No. _____.

d) MSHA No. _____ and date of issuance _____.

7) For each surface coal mining operation in the United States owned or controlled by the applicant provide the following information.

Response: *N/A*

a) Name of Operation _____

b) Address of Operation _____

_____

c) Name of regulatory authority _____

d) Identification number:

i) Social Security No. _____ (voluntary) and/or Federal Employer Identification No. _____.

ii) Federal permit No. _____.

iii) State permit No._____.

iv) MSHA No._____ and date of issuance _____.

8) A) Has the applicant, any subsidiary, affiliate or entity controlled by or under common control with the applicant had:

1) A State or Federal coal mining permit suspended or revoked in the five (5) years prior to the date of submission of the application?

Yes _____ No ___X___

2) A forfeiture of a performance bond under a coal mining permit?

Yes _____ No ___X___

B) If the response to A)1) or 2) was yes, provide the following information:

Response: ***N/A***

1) Provide the identification number of the permit.

2) Provide the date of permit issuance.

3) Provide the date of permit suspension or revocation and/or the date of bond forfeiture.

4) Provide the name of regulatory authority who suspended or revoked the permit and/or forfeited the bond.

5) Provide a statement of the reason for the suspension, revocation and/or forfeiture action.

6) Provide the current status of the permit and/or bond.

7) For any administrative or judicial proceedings initiated concerning the suspension, revocation, and/or forfeiture provide the following:

a) Date of proceeding,

b) Location of proceeding, and

c) Current status of proceedings.

C) If the response to A)2) was yes, provide information on the applicant's present financial condition to provide assurances satisfactory to the Department that forfeiture will not again be necessary.

Response: ***N/A***

9) Violation history

A) For the three (3) year period preceding the date of submission of the application, provide a listing of Notices of Violation received for any provision of the Federal Act or any Federal State law, rule, or regulation pertaining to air or water environmental protection incurred in connection with any surface coal mining operations. The listing shall include the following:

1) Notice of violation number or other identifier.

2) Date of NOV issuance.

3) Permit identification number.

4) MSHA number.

5) Name of entity to whom NOV was written.

6) Name of regulatory authority or agency which issued the NOV.

7) A brief description of the alleged violation.

8) For any administrative or judicial proceedings initiated concerning the violation, provide the following:

   a) Type of proceedings.

   b) Date of proceedings

   c) Location of proceedings.

   d) Current status of proceedings.

9) Actions, if any, to abate the alleged violation.

Response: *N/A*

B) For any unabated cessation orders or unabated air and water quality violation notices received prior to the date of submission of the application for any surface coal mining and reclamation operation owned or controlled by the applicant or by any entity which owns or controls the applicant, provide a listing of the unabated cessation orders or violation notices which include the following:

1) Cessation order or notice of violation number or other identifier.

2) Date of CO or NOV issuance.

3) Permit identification number.

4) MSHA number

5) Name of entity to whom CO or NOV was written

6) Name of regulatory authority or agency which issued the CO or NOV.

7) A brief description of the alleged cessation order or violation.

8) For any administrative or judicial proceedings initiated concerning the cessation order or violation, provide the following:

   a) Type of proceedings.

   b) Date of proceedings

c) Location of proceedings

d) Current status of proceedings.

9) Actions, if any, to abate the alleged cessation order or violation.

Response: *N/A*

10) Affidavits, Certifications, Insurance Certificate

A) Complete affidavit regarding applicant's legal right to enter and begin surface coal mining and reclamation operations in the permit area and whether that right is the subject of pending litigation. Identify the documents upon which affidavit is based by type and date of execution and identify specific lands to which each document pertains and explain the legal rights claimed by the applicant (Section 1778.15(a)). If the private mineral estate to be mined has been severed from the private surface estate, provide copies of the documents required under Section 1778.15(B)(1)-(3). On the permit map or other designated map show the boundaries of land within the permit area upon which the applicant has the legal right to enter and begin mining activities.

Response: ***Refer to Attachment Part I.10.A***

B) Complete certification for engineering aspects of the application. In addition to the general certification, three specific certifications are included which are applicable only if the box in front of each is marked. The first two cover special permit requirements and should be marked only when they occur for the proposed permit. The third certification covers the Illinois Environmental Protection Agency permit requirements. In most cases, an Illinois registered engineer will be required to certify I.E.P.A. permit requirements. Except a otherwise provided all maps, plans and cross-sections included in the permit application shall be prepared by, or under the direction of, and sealed by a qualified registered professional engineer licensed under the Illinois Professional Engineering Act, a qualified registered structural engineer licensed under the Illinois Structural Engineering Act or if authorized by state law, a qualified registered professional land surveyor licensed under the Illinois Land Surveyors Act with assistance from experts in related fields.

Response: ***Refer to Attachment Part I.10.B***

C) A certificate of liability insurance or evidence that the applicant is self-insured is required prior to permit issuance. The certificate may be submitted with the application or when fee and bond are submitted. Minimum insurance coverage required is for bodily injury $300,000 for each occurrence, and $500,000 aggregate and for property damage $300,000 each occurrence, and $500,000 aggregate.

Response: ***Refer to Attachment Part I.10.C***

11) Provide a draft copy of proposed newspaper notice, and the name of local newspaper of general circulation in which advertisement of the application will be published. Certificate of publication is to be submitted not later than four weeks after the last date of publication.

Response: ***Refer to Attachment Part I.11***

12) Areas Designated Unsuitable for Mining

A) Does proposed permit area include and/or shadow area include --

Areas designated unsuitable for surface coal mining and reclamation operations, or under study for designation in an administrative proceeding as unsuitable for surface coal mining and reclamation operations? (Sections 1762 and 1764)

Yes _____ No ___X_____

B) Does proposed permit area include and/or shadow area include --

1) Lands within boundaries of the National Park System, National Wildlife Refuge System, the National System of Trails, the National Wilderness Preservation System, the Wild and Scenic Rivers System, and National Recreation Areas, etc. (Section 1761.11(a))?

Yes _____ No ___X_____

2) National Forest land?

Yes _____ No ___X_____

3) Any land which will adversely affect any publicly-owned park or places included in the National Register of Historic Places, etc. (per Sections 1761.11(c))?

Yes _____ No ___X_____

If yes, complete Part II, Section 10, B) and C).

4) Any public roads, which are to be removed, relocated or temporarily closed?

Yes _____ No ___X_____

Indicate on the pre-mining land use map or other designated map the location of the public roads and attach a copy of the written agreement from the appropriate authority authorizing the relocation, removal or temporary closure. Describe the measures to be used to insure that the interest of the public and land owners affected will be protected.

C) Within the proposed permit area and/or shadow area (for planned subsidence) will Surface Coal Mining and Reclamation operations be located --

1) Within 100 feet of the right-of-way line of any public road?

Yes ___X_____ No _____

If yes, explain proposed procedures for complying with regulation Section 1761.12(c), including request for variance, if relevant. Provide location of public roads on pre-mining land use map or other designated map. Describe the measures to be used to insure that the interest of the public and landowners affected will be protected.

Response: ***A variance is requested to affect within 100 feet of the outside right of way of Ashmore Trail in Section 7, T8N, R3W, refer to Surface Facilities (Map 6 S.F.). The anticipated surface affects will be the construction, maintenance and use of: subsoil and topsoil storage piles; coarse refuse disposal; installation of mine support utilities; internal mine property access roads (that do not necessarily connect to the public road); employee parking lots; sediment control ponds/structures; drainage diversions; ground storage of mining equipment, parts and supplies; railroad, and security fencing and other miscellaneous activities associated with the surface effects of an underground coal mine.***

The public notice may provide for a public hearing in accordance with Section 1761.14. The proposed public notice will include notice of affecting within 100 feet of the outside right of way of the aforementioned roads. The Department may provide a finding that the interests of the affected public and landowner will be protected as required by 1761.11 (d)(2)(B).

The applicant will also obtain the necessary input and approvals from the owners of public roads where the aforementioned proposed surface mining affects will be within 100 feet of the outside right of way of public roads to further assure that surface mining affects will not interfere with visibility of traveling public, and driveway/access road entrances meet the requirements of the owner of the public road.

In addition, for public roads to be impacted by planned subsidence, the applicant will pursue cooperative agreements with the appropriate public road authorities to assure protection of the public during subsidence.

2) Within 300 feet measured horizontally from any occupied dwelling?

Yes _____ No ___X_____

If so, is waiver provided meeting requirements of Section 1761.12(d)?

3) Within 300 feet measured horizontally of any public building, school, church, community or institutional building or public park?

Yes _____ No ___X_____

4) Within 100 feet measured horizontally of a cemetery?

Yes _____No ___X_____

D) Are valid existing rights claimed for any part of the permit area?

Yes _____ No ___X_____

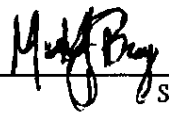
If yes, provide documentation to substantiate claim.

(I) ___*Michael J. Beyer*___
(Individual or Individuals)

under penalties of perjury declare on behalf of the applicant, ___*Hillsboro Energy LLC*___,

that said applicant has valid documents which bestow upon the applicant a legal right to enter and commence surface coal mining and reclamation operations upon lands contained in the proposed permit area, and the shadow area, and such legal right is not in any way the subject of pending court litigation.

Dated this ___20___ day of December, 2007.



Signature

Authorized Person
Title

Attachment I.2.A - Surface and Coal Ownership within and Adjacent to Shadow Area

Attachment I.2.A - Surface and Coal Owners - Within and Adjacent to Shadow Area

Parcel No.	MapNumber	Owner Name	Address	City_State	Home Acres	Farm Acres	Coal Owner**	Inside Permit Area	Adj to Permit Area	Inside Shadow Area	Adjacent to Shadow Area
08-100-229-00	16-12-400-004	MONTGOMERY LAND COMPANY, LLC	430 HARPER PARK DRIVE	BECKLEY WV	0	105.24	MLC	X			
08-100-230-00	16-13-200-002	SCHNEIDER RANDOLPH L & SUSAN C	12056 N 6TH AVE	HILLSBORO IL	0	151.12	No		X	X	
08-100-242-00	16-13-400-002	SCHNEIDER RANDOLPH L &	12056 N SIXTH AVE	HILLSBORO IL	0	2.5	No				X
08-100-238-00	16-13-400-003	MURPHY & FUDOLI	1700 VANDALIA RD	HILLSBORO IL	0	58.5	MLC				X
08-100-243-00	16-13-400-004	KASTEN ALLEN R	13314 IL RT 185	HILLSBORO IL	0	19	MLC				X
08-100-419-00	16-24-200-002	MONTGOMERY COUNTY FARM	P O BOX 596	HILLSBORO IL	0	82.5	MLC			X	
08-100-419-01	16-24-200-003	GRAHAM CORRECTIONAL CENTER	12078 ILLINOIS ROUTE 185	HILLSBORO IL	67.68	0	MLC			X	
08-100-434-00	16-24-400-002	MONTGOMERY COUNTY FARM	P O BOX 596	HILLSBORO IL	0	16	MLC			X	
08-100-435-00	16-24-400-006	OELZE MARION E TRUSTEE	11872 COUNTY HWY 27	NASHVILLE IL	0	33.91	MLC			X	
08-100-435-05	16-24-400-007	BOAS JOSEPH L	8106 BUCKEYE TRL	HILLSBORO IL	0	30.09	MLC			X	
08-100-436-00	16-24-400-009	OELZE MARION E TRUSTEE	11872 COUNTY HWY 27	NASHVILLE IL	0	55.77	MLC			X	
08-100-437-00	16-25-200-001	BOAS JOSEPH L	7291 BUCKEYE TRL	HILLSBORO IL	0	160	MLC			X	
08-100-450-00	16-25-400-004	SCHRAUT LARRY GENE	7199 BUCKEYE TRL	HILLSBORO IL	0.28	39.72	MLC			X	
04-000-694-00	17-07-276-001	WALTER, DIANNE, ROBERT & PHYLLIS KUNZ	10600 EMERALD MOUNT RD	TRENTON IL	0	45.77	MLC		X		
04-000-696-00	17-07-252-001	BLANKENSHIP GEORGE LEE	14001 FILLMORE TRAIL	HILLSBORO IL	0	34.91	MLC		X		
04-000-698-00	17-07-151-002	JUSTISON THOMAS A	15075 N IL RT 127	BUTLER IL	0	24	MLC		X		
04-000-698-05	17-07-151-001	IP COMPANY C/O AMEREN SERVICES	P O BOX 66149 MC 210	ST LOUIS MO	2.06	0	MLC		X		
04-000-700-00	17-07-176-001	BLANKENSHIP GEORGE LEE	14001 FILLMORE TRAIL	HILLSBORO IL		3.56	MLC				
04-000-695-00	17-07-251-001	BLANKENSHIP GEORGE LEE	14001 FILLMORE TRAIL	HILLSBORO IL	0	27.47	MLC		X		
04-000-702-00	17-07-300-002	MONTGOMERY LAND COMPANY, LLC	430 HARPER PARK DRIVE	BECKLEY WV	0	104.12	MLC	X			
04-000-703-00	17-07-400-001	KUNZ & KUNZ	10600 EMERALD MOUNT RD	TRENTON IL	0	142.5	MLC		X		
04-000-703-10	17-07-400-002	CITY OF HILLSBORO	447 S MAIN	HILLSBORO IL	0	8.4	MLC	X			
04-000-703-05	17-07-400-003	CITY OF HILLSBORO	447 S MAIN	HILLSBORO IL	0	15	MLC	X			
04-000-703-20	17-07-400-005	ULLMAN EMERALD J	200 W MECHANIC ST	HILLSBORO IL	0.45	0	No		X		
04-000-703-15	17-07-400-006	CITY OF HILLSBORO	PO BOX 556	HILLSBORO IL	2.05	0	MLC	X			
04-000-716-00	17-08-300-004	WHITE DAVID B	1100 EDGEWOOD DR	HILLSBORO IL	0	1.78	MLC		X		
04-000-711-00	17-08-300-006	SHURE RICHARD & DOROTHY	6805 STATE RT 4	ALHAMBRA IL	0	70	MLC		X		
04-000-712-00	17-08-300-007	KUNZ WALTER & DIANNE & ROBERT	10600 EMERALD MOUND RD	TRENTON IL	0	13.33	MLC		X		
04-000-715-00	17-08-300-009	SHURE RICHARD & DOROTHY	6805 STATE RT 4	ALHAMBRA IL	0	66.44	MLC		X		
04-000-718-00	17-08-400-003	RADEMACHER LON D & MARYANN	P O BOX 138	ELLISON BAY WI		78.15	MLC		X		
04-000-778-00	17-15-100-002	ERNST LESTER A	P O BOX 263	COFFEEN IL	0	60	MLC				X
04-000-780-00	17-15-100-003	ERNST LESTER A	P O BOX 263	COFFEEN IL	0	20	MLC				X
04-000-777-05	17-15-200-004	HUBER EDWARD	9291 COFFEEN RD	HILLSBORO IL	1.07	158.93	MLC				X
04-000-782-00	17-15-300-001	ERNST LESTER A	P O BOX 263	COFFEEN IL	0	40	MLC			X	
04-000-781-00	17-15-300-002	L & L HUBER FARMS LLC	2626 31ST ST	SANTA MONICA CA	0	40	MLC			X	
04-000-783-00	17-15-300-003	L & L HUBER FARMS LLC	2626 31ST ST	SANTA MONICA CA	1.13	78.87	MLC			X	
04-000-784-00	17-15-400-008	SUHRE RICHARD & DOROTHY	6805 STATE ROUTE 4	ALHAMBRA IL	0	124.52	MLC			X	
04-000-792-00	17-16-100-002	MOHR DONNA	R R 1 BOX 46 A	DALLAS CITY IL	0	80	MLC				X
04-000-792-05	17-16-100-003	CRAWFORD DANIEL & MARION TRUST	10223 E COUNTY RD 100 S	AVON IN	0	80	MLC				X
04-000-790-00	17-16-200-002	RADEMACHER LON D & MARYANN	P O BOX 138	ELLISON BAY WI	0	40	MLC				X
04-000-791-00	17-16-200-003	FRAVALA FARM	P O BOX 594	HILLSBORO IL	0	40	MLC				X
04-000-793-00	17-16-300-001	RADEMACHER LON D & MARYANN	P O BOX 138	ELLISON BAY WI	0	160	MLC			X	
04-000-796-00	17-16-400-001	FRAVALA FARM	P O BOX 594	HILLSBORO IL	0	80	MLC			X	
04-000-795-00	17-16-400-002	FRAVALA FARM	P O BOX 594	HILLSBORO IL	0.73	39.27	MLC			X	
04-000-794-00	17-16-400-003	L & L HUBER FARMS LLC	2626 31ST ST	SANTA MONICA CA	0	40	MLC			X	
04-000-799-00	17-17-100-001	WHITE DAVID B	1100 EDGEWOOD DR	HILLSBORO IL	0	160	MLC	X			
04-000-798-00	17-17-200-001	LANE RICHARD R	P O BOX 330	VIRDEN IL	0	80	No		X		X
04-000-797-00	17-17-200-002	GOLDSBOROUGH R C & K M	R R 1 BOX 22	COWDEN IL	0	80	MLC				X
04-000-802-00	17-17-300-001	WISDOM MARY JANE TRUST	123 N BROAD	HILLSBORO IL	0	40	MLC	X			
04-000-800-00	17-17-300-003	BLANKENSHIP GEORGE L	14001 FILLMORE TRAIL	HILLSBORO IL	0	40	No			X	
04-000-801-00	17-17-300-004	AUSTIN ROBERT M TRUST	2794 N HILL AVE	DECATUR IL	0	40	MLC			X	
04-000-803-05	17-17-300-005	HARMS HENRY	12335 N 9TH AVE	HILLSBORO IL	3	0	MLC			X	
04-000-803-00	17-17-300-006	KUNZ WALTER J & DIANNE P	10600 EMERALD MOUND RD	TRENTON IL	0	37	MLC			X	
04-000-805-00	17-17-400-001	BLANKENSHIP GEORGE L	14001 FILLMORE TRAIL	HILLSBORO IL	0	40	No			X	

Attachment I.2.A - Surface and Coal Owners - Within and Adjacent to Shadow Area

Parcel No.	MapNumber	Owner Name	Address	City_State	Home Acres	Farm Acres	Coal Owner**	Inside Permit Area	Adj to Permit Area	Inside Shadow Area	Adjacent to Shadow Area
04-000-806-00	17-17-400-002	AUSTIN ROBERT M TRUST	2794 N HILL AVE	DECATUR IL	0	40	MLC			X	
04-000-804-00	17-17-400-004	SPINNER GEORGE & MARTHA	17047 N 9TH AVE	HILLSBORO IL	0	40	No			X	
04-000-804-05	17-17-400-005	SPINNER GEORGE & MARTHA JR	17047 N 9TH AVE	HILLSBORO IL	0	40	No			X	
04-000-808-00	17-18-100-002	MONTGOMERY LAND COMPANY, LLC	430 HARPER PARK DRIVE	BECKLEY WV	0	100.72	MLC	X			
04-000-808-05	17-18-100-003	MONTGOMERY LAND COMPANY, LLC	430 HARPER PARK DRIVE	BECKLEY WV	0	62.45	MLC	X			
04-000-807-00	17-18-200-001	KUNZ & KUNZ	10600 EMERALD MOUNT RD	TRENTON IL	0	147.88	MLC		X		X
04-000-807-05	17-18-200-002	CITY OF HILLSBORO	447 S MAIN	HILLSBORO IL	0	12.12	No	X			
04-000-809-00	17-18-300-006	SPINNER EDMUND & JAN	733 S MAIN	HILLSBORO IL	0	104.5	MLC	X			
04-000-811-05	17-18-300-007	CITY OF COFFEEN		COFFEEN IL	0	0.69	MLC			X	
04-000-810-00	17-18-300-009	MURPHY & FUDOLI	1700 VANDALIA RD	HILLSBORO IL	0	22	MLC			X	
04-000-810-05	17-18-300-010	MURPHY & FUDOLI	1700 VANDALIA RD	HILLSBORO IL	0	10	MLC			X	
04-000-811-10	17-18-300-011	JUSTISON THOMAS A	15075 N IL RT 127	BUTLER IL	0.64	11.33	MLC			X	
04-000-811-00	17-18-300-012	JUSTISON THOMAS A	15075 N IL RT 127	BUTLER IL	0	19	MLC			X	
04-000-812-00	17-18-400-006	WISDOM MARY JANE TRUST	123 N BROAD	HILLSBORO IL	0	120	MLC*	X			
04-000-820-05	17-19-100-003	STATE HIGHWAY			0	3.9	MLC			X	
04-000-820-00	17-19-100-006	WHITE DORIS M	R R 2 BOX 108	NOKOMIS IL	0	75.3	MLC			X	
04-000-824-05	17-19-100-007	GRAHAM CORRECTIONAL CENTER	DEPT OF CORRECTIONS	HILLSBORO IL	0	50.32	MLC			X	
04-000-822-00	17-19-100-009	SPINNER EDMUND & JAN	733 S MAIN	HILLSBORO IL	0.62	18.63	MLC			X	
04-000-824-00	17-19-100-010	MONTGOMERY COUNTY FARM	P O BOX 122	HILLSBORO IL	0	27	MLC			X	
04-000-817-00	17-19-200-002	SPINNER JAN L	733 S MAIN	HILLSBORO IL	0	40	MLC			X	
04-000-818-00	17-19-200-003	DUNKIRK DOROTHY L	12333 IL RT 185	HILLSBORO IL	0.5	37.7	MLC			X	
04-000-819-05	17-19-200-004	SPINNER DARIN M	12221 ILLINOIS RT 185	HILLSBORO IL	0.96	0	MLC			X	
04-000-819-00	17-19-200-005	SPINNER EDMUND	733 S MAIN	HILLSBORO IL	0	43.34	MLC			X	
04-000-826-00	17-19-300-002	BOAS JOSEPH L	11091 BRUSHY TRAIL	IRVING IL	0	53.25	MLC			X	
04-000-825-00	17-19-300-003	BOAS JOSEPH L	11091 BRUSHY TRAIL	IRVING IL	0	65	MLC			X	
04-000-829-00	17-19-400-001	BOAS JOSEPH L	11091 BRUSHY TRAIL	IRVING IL	0	80	MLC			X	
04-000-828-05	17-19-400-002	REDMAN BRIAN	12418 IL RT 185	HILLSBORO IL	1	0	MLC			X	
04-000-828-00	17-19-400-004	SPINNER KENT	12116 N 9TH AVE	HILLSBORO IL	0	40.57	MLC			X	
04-000-828-10	17-19-400-005	SPINNER DARIN	12221 IL RT 185	HILLSBORO IL	0	38.43	MLC			X	
04-000-835-00	17-20-100-001	KUNZ WALTER J & DIANNE P	10600 EMERALD MOUND RD	TRENTON IL	0	40	MLC			X	
04-000-836-00	17-20-100-002	DUNKIRK DOROTHY L	12333 IL RT 185	HILLSBORO IL	0	40	MLC			X	
04-000-833-00	17-20-100-003	FATH BILL E	13031 N 9TH AVE	HILLSBORO IL	0.75	39.25	MLC			X	
04-000-831-00	17-20-100-005	SPINNER GEORGE J JR	17047 N 9TH AVE	HILLSBORO IL	0	80	MLC			X	
04-000-832-00	17-20-200-001	FATH BILL	13031 N 9TH AVE	HILLSBORO IL	0	40	MLC			X	
04-000-830-00	17-20-200-003	SPINNER DAVID L	14038 N 9TH AVE	HILLSBORO IL	0	80	MLC			X	
04-000-838-00	17-20-300-001	KASTEN ARLEN R	13314 ILLINOIS RT 185	HILLSBORO IL	0	76.5	MLC			X	
04-000-837-00	17-20-300-002	EAST FORK TOWNSHIP			0	3.5	MLC			X	
04-000-839-05	17-20-300-004	KASTEN ARLEN R	13314 ILLINOIS RT 185	HILLSBORO IL	3.4	0	MLC			X	
04-000-839-00	17-20-300-005	SCHRAUT LARRY G	7199 BUCKEYE TRAIL	HILLSBORO IL	0	76.6	MLC			X	
04-000-841-05	17-20-400-002	FULLER BARBARA K	13263 ILLINOIS RT 185	HILLSBORO IL	1.7	0.3	MLC			X	
04-000-840-00	17-20-400-004	SELTZER EARL C TRUSTEE	904 SMITH LANE P O BOX 502	HILLSBORO IL	0	77.46	MLC			X	
04-000-840-05	17-20-400-005	ARMENTROUT MARY F	13383 ILLINOIS RT 185	HILLSBORO IL	3.63	0	MLC			X	
04-000-841-00	17-20-400-006	SCHRAUT LARRY G	7199 BUCKEYE TRAIL	HILLSBORO IL	0	64.5	MLC			X	
04-000-841-10	17-20-400-007	CABELLO JOSE III &	P O BOX 445	WITT IL	9.5	0	MLC			X	
04-000-846-00	17-21-100-001	SPINNER DAVID L	14038 N 9TH AVE	HILLSBORO IL	0	80	MLC			X	
04-000-844-00	17-21-100-002	SPINNER STEPHEN J	1144 S CLAY AVE	JACKSONVILLE IL	0.43	79.57	MLC			X	
04-000-845-00	17-21-200-001	TIMMONS WAYNE	238 N EAST FIRST LANE	LAMAR MO	0	80	MLC			X	
04-000-842-00	17-21-200-002	GRABBE PHILIP R	P O BOX 594	HILLSBORO IL	0.88	39.12	MLC			X	
04-000-843-00	17-21-200-003	GRABBE PHILIP R	P O BOX 594	HILLSBORO IL	0	40	MLC			X	
04-000-848-00	17-21-300-001	BONETTO DEANNE	4441 BUCKEYE TRAIL	HILLSBORO IL	0	30	MLC			X	
04-000-847-00	17-21-300-002	L & L HUBER FARMS LLC	2626 31ST ST	SANTA MONICA CA	0	10	MLC			X	
04-000-849-00	17-21-300-003	L & L HUBER FARMS LLC	2626 31ST ST	SANTA MONICA CA	0	38	MLC			X	
04-000-850-00	17-21-300-004	BONETTO DEANNE	4441 BUCKEYE TRAIL	HILLSBORO IL	0	20	MLC			X	
04-000-851-00	17-21-300-005	BONETTO DEANNE	4441 BUCKEYE TRAIL	HILLSBORO IL	0	20	MLC			X	

Attachment I.2.A - Surface and Coal Owners - Within and Adjacent to Shadow Area

Parcel No.	MapNumber	Owner Name	Address	City_State	Home Acres	Farm Acres	Coal Owner**	Inside Permit Area	Adj to Permit Area	Inside Shadow Area	Adjacent to Shadow Area
04-000-852-00	17-21-300-006	BONETTO DEANNE	4441 BUCKEYE TRAIL	HILLSBORO IL	0	40	MLC			X	
04-000-853-00	17-21-400-001	SELTZER EARL C TRUSTEE	904 SMITH LANE P O BOX 502	HILLSBORO IL	0	82	MLC			X	
04-000-854-00	17-21-400-002	BONETTO DEANNE	4441 BUCKEYE TRAIL	HILLSBORO IL	0	40	MLC			X	
04-000-855-00	17-21-400-003	SELTZER EARL C TRUSTEE	904 SMITH LANE P O BOX 502	HILLSBORO IL	0	40	MLC			X	
04-000-858-00	17-22-100-001	TIMMONS WAYNE	238 N EAST FIRST LANE	LAMAR MO	0.57	159.43	MLC			X	
04-000-856-00	17-22-200-001	SPINNER DIANE	15342 N 9TH AVE	HILLSBORO IL	0.96	79.04	MLC			X	
04-000-857-00	17-22-200-002	GARRETT CONNIE	8601 COFFEEN RD	HILLSBORO IL	0	80	MLC			X	
04-000-856-05	17-22-200-501	SPINNER MIKE	15342 N 9TH AVE	HILLSBORO IL	0	0	MLC			X	
04-000-859-00	17-22-300-001	TIMMONS WAYNE	238 NORTH EAST FIRST LANE	LAMAR MO	0	80	MLC			X	
04-000-860-00	17-22-300-002	IL DEPT OF NATURAL RESOURCES	ONE NATURAL RESOURCES W	SPRINGFIELD IL	0	40	MLC			X	
04-000-861-00	17-22-300-003	IL DEPT OF NATURAL RESOURCES	ONE NATURAL RESOURCES W	SPRINGFIELD IL	0	40	MLC			X	
04-000-862-00	17-22-400-001	GARRETT CONNIE	8601 COFFEEN RD	HILLSBORO IL	0.45	79.55	MLC			X	
04-000-863-00	17-22-400-002	MICENHEIMER ESTELLA & MERRILL	407 S CENTRAL	COFFEEN IL	0	40	MLC			X	
04-000-936-00	17-27-100-002	IL DEPT OF NATURAL RESOURCES	1 NATURAL RESOURCES WAY	SPRINGFIELD IL	0	80	MLC			X	
04-000-937-05	17-27-100-003	IL DEPT OF NATURAL RESOURCES	ONE NATURAL RESOURCES W	SPRINGFIELD IL	0	13.65	MLC			X	
04-000-937-00	17-27-100-004	IL DEPT OF NATURAL RESOURCES	ONE NATURAL RESOURCES W	SPRINGFIELD IL	0	66.35	MLC			X	
04-000-933-00	17-27-200-001	MICENHEIMER ESTELLA & MERRILL	407 S CENTRAL	COFFEEN IL	0	40	MLC			X	
04-000-935-00	17-27-200-007	IL DEPT OF NATURAL RESOURCES	1 NATURAL RESOURCES WAY	SPRINGFIELD IL	0	22.25	MLC				X
04-000-939-00	17-27-300-001	IL DEPT OF NATURAL RESOURCES	ONE NATURAL RESOURCES W	SPRINGFIELD IL	0	51	MLC				X
04-000-942-00	17-27-300-014	BLANKENSHIP KENNETH E &	15039 ILLINOIS RT 185	HILLSBORO IL	1	43	MLC			X	
04-000-944-00	17-27-400-001	BLANKENSHIP KENNETH E	15039 ILLINOIS RT 185	HILLSBORO IL	0	20	MLC				X
04-000-955-00	17-28-100-001	JURGENA HAROLD W & DOLORES I	P O BOX 215	IRVING IL	0	79.33	MLC			X	
04-000-956-00	17-28-100-002	ELAM GEORGE F	14107 IL RT 185	HILLSBORO IL	0.5	0	MLC			X	
04-000-957-05	17-28-100-004	SELTZER EARL C TRUSTEE	904 SMITH LANE P O BOX 502	HILLSBORO IL	0	79.03	MLC			X	
04-000-957-00	17-28-100-005	HAMILTON JOHNNY & RITA	14329 IL RT 185	HILLSBORO IL	0.75	0	MLC			X	
04-000-952-00	17-28-200-001	JURGENA HAROLD W & DOLORES I	P O BOX 215	IRVING IL	0	12.73	MLC			X	
04-000-953-00	17-28-200-002	BONETTO DEANNE	4441 BUCKEYE TRAIL	HILLSBORO IL	0	27.54	MLC			X	
04-000-951-00	17-28-200-003	SELTZER EARL C TRUSTEE	904 SMITH LANE P O BOX 502	HILLSBORO IL	0	40	MLC			X	
04-000-954-00	17-28-200-005	SELTZER EARL C TRUSTEE	904 SMITH LANE P O BOX 502	HILLSBORO IL	0	79.78	MLC			X	
04-000-958-00	17-28-300-003	SELTZER EARL C TRUSTEE	904 SMITH LANE P O BOX 502	HILLSBORO IL	0.2	316.88	MLC				X
04-000-958-05	17-28-400-001	HAMILTON JOHNNY & RITA	14329 IL RT 185	HILLSBORO IL	0.92	0	MLC			X	
04-000-962-00	17-29-100-001	SCHRAUT LARRY G	7199 BUCKEYE TRAIL	HILLSBORO IL	0	80	MLC			X	
04-000-963-00	17-29-100-002	WISDOM MARY JANE TRUST	123 N BROAD	HILLSBORO IL	0	80	MLC			X	
04-000-960-00	17-29-200-001	BOWEN CLAUDE H & LOIS D TRUST	528 OREGON ST	BETHALTO IL	0.5	79.5	MLC			X	
04-000-961-00	17-29-200-003	FIRST NATL BANK VANDALIA	BOX 40	VANDALIA IL	0	68.75	MLC			X	
04-000-959-00	17-29-200-004	SELTZER EARL C TRUSTEE	904 SMITH LANE P O BOX 502	HILLSBORO IL	0	10.16	MLC			X	
04-000-964-00	17-29-300-001	SCHRAUT FLORENCE	13013 N 7TH AVE	HILLSBORO IL	0	40	MLC				X
04-000-966-00	17-29-400-001	SCHRAUT FLORENCE	13013 N 7TH AVE	HILLSBORO IL	1.21	158.79	MLC				X
04-000-966-01	17-29-400-002	SCHRAUT R LEE	425 DEARBORN	HILLSBORO IL	0	40	MLC				X
04-000-966-02	17-29-400-003	SCHRAUT LARRY	7199 BUCKEYE TRAIL	HILLSBORO IL	0	40	MLC				X
04-000-968-00	17-30-100-001	BOAS JOSEPH L	11091 BRUSHY TRAIL	IRVING IL	0	216	MLC			X	
04-000-967-00	17-30-200-001	WISDOM MARY JANE TRUST	123 N BROAD	HILLSBORO IL	0	80	MLC			X	
04-000-969-00	17-30-300-001	ELAM RICHARD A SR	P O BOX 216	TAYLOR SPRINGS IL	0.49	137.51	MLC				X
04-000-971-00	17-30-400-001	BOAS JOSEPH L	11091 BRUSHY TRAIL	IRVING IL	0	40	MLC			X	
04-000-970-00	17-30-400-002	YOUNG GERALD E	12188 N 7TH AVE	HILLSBORO IL	0	40	MLC				X
04-000-972-00	17-30-400-003	YOUNG GERALD E	12188 N 7TH AVE	HILLSBORO IL	0	80	MLC				X

* MARY JANE WISDOM TRUST (17-18-400-06); 1 ACRE AT THE SE CORNER OF PROPERTY COAL RIGHTS ARE NOT OWNED
** Montgomery Land Company, LLC

Attachment I.2.B - Parcels and Structures within and adjacent to Shadow Area

Attachment I.2.B - Parcels and Structures within and adjacent to Shadow Area

Parcel No.	MapNumber	Owner Name	Address	City_State	Home Acres	Farm Acres	Inhabited House	Vacant House	Inhabited Mobile Home	Vacant Mobile Home	Garage	Barn	Grain Bins	Sheds	Ponds	Other	Notes
08-100-238-00	16-13-400-003	MURPHY & FUDOLI	1700 VANDALIA RD	HILLSBORO IL	0	58.5		X			X		X				
08-100-419-01	16-24-200-003	GRAHAM CORRECTIONAL CENTER	12078 ILLINOIS ROUTE 185	HILLSBORO IL	67.68	0										X	Prison Facility
08-100-435-05	16-24-400-007	BOAS JOSEPH L	8106 BUCKEYE TRL	HILLSBORO IL	0	30.09							X	X			
08-100-450-00	16-25-400-004	SCHRAUT LARRY GENE	7199 BUCKEYE TRL	HILLSBORO IL	0.28	39.72	X				X			X			
04-000-698-05	17-07-151-001	IP COMPANY C/O AMEREN SERVICES	P O BOX 66149 MC 210	ST LOUIS MO	2.06	0										X	Sub-Station
04-000-703-00	17-07-400-001	KUNZ & KUNZ	10600 EMERALD MOUNT RD	TRENTON IL	0	142.5							X	X			
04-000-703-10	17-07-400-002	CITY OF HILLSBORO	447 S MAIN	HILLSBORO IL	0	8.4										X	Fire Training Bldg; Airport
04-000-703-20	17-07-400-005	ULLMAN EMERALD J	200 W MECHANIC ST	HILLSBORO IL	0.45	0										X	Airport Hanger
04-000-703-15	17-07-400-006	CITY OF HILLSBORO	PO BOX 556	HILLSBORO IL	2.05	0										X	Airport Bldgs
04-000-777-05	17-15-200-004	HUBER EDWARD	9291 COFFEEN RD	HILLSBORO IL	1.07	158.93	X				X	X	X	X			
04-000-783-00	17-15-300-003	L & L HUBER FARMS LLC	2626 31ST ST	SANTA MONICA CA	1.13	78.87	X				X	X	X	X	X	X	Above Ground Pool
04-000-793-00	17-16-300-001	RADEMACHER LON D & MARYANN	P O BOX 138	ELLISON BAY WI	0	160						X	X				
04-000-795-00	17-16-400-002	FRAVALA FARM	P O BOX 594	HILLSBORO IL	0.73	39.27	X				X	X		X			
04-000-794-00	17-16-400-003	L & L HUBER FARMS LLC	2626 31ST ST	SANTA MONICA CA	0	40						X		X			
04-000-803-05	17-17-300-005	HARMS HENRY	12335 N 9TH AVE	HILLSBORO IL	3	0	X				X		X	X			Abandoned Foundation
04-000-806-00	17-17-400-002	AUSTIN ROBERT M TRUST	2794 N HILL AVE	DECATUR IL	0	40							X				
04-000-809-00	17-18-300-006	SPINNER EDMUND & JAN	733 S MAIN	HILLSBORO IL	0	104.5						X	X	X			
04-000-811-05	17-18-300-007	CITY OF COFFEEN		COFFEEN IL	0	0.69										X	Water Tank Storage
04-000-811-10	17-18-300-011	JUSTISON THOMAS A	15075 N IL RT 127	BUTLER IL	0.64	11.33		X			X			X			
04-000-812-00	17-18-400-006	WISDOM MARY JANE TRUST	123 N BROAD	HILLSBORO IL	0	120							X				
04-000-824-05	17-19-100-007	GRAHAM CORRECTIONAL CENTER	DEPT OF CORRECTIONS	HILLSBORO IL	0	50.32										X	Prison Facility
04-000-822-00	17-19-100-009	SPINNER EDMUND & JAN	733 S MAIN	HILLSBORO IL	0.62	18.63	X				X		X	X			
04-000-818-00	17-19-200-003	DUNKIRK DOROTHY L	12333 IL RT 185	HILLSBORO IL	0.5	37.7	X				X	X		X			
04-000-819-05	17-19-200-004	SPINNER DARIN M	12221 ILLINOIS RT 185	HILLSBORO IL	0.96	0	X					X		X			
04-000-828-05	17-19-400-002	REDMAN BRIAN	12418 IL RT 185	HILLSBORO IL	1	0	X					X		X		X	Above Ground Pool
04-000-833-00	17-20-100-003	FATH BILL E	13031 N 9TH AVE	HILLSBORO IL	0.75	39.25	X					X		X			
04-000-839-05	17-20-300-004	KASTEN ARLEN R	13314 ILLINOIS RT 185	HILLSBORO IL	3.4	0	X					X	X	X			
04-000-841-05	17-20-400-002	FULLER BARBARA K	13263 ILLINOIS RT 185	HILLSBORO IL	1.7	0.3	X						X	X			Grain Bin Foundations Only
04-000-840-05	17-20-400-005	ARMENTROUT MARY F	13383 ILLINOIS RT 185	HILLSBORO IL	3.63	0	X				X	X		X			
04-000-841-10	17-20-400-007	CABELLO JOSE III &	P O BOX 445	WITT IL	9.5	0	X				X				X		Attached Garage
04-000-846-00	17-21-100-001	SPINNER DAVID L	14038 N 9TH AVE	HILLSBORO IL	0	80							X	X			
04-000-844-00	17-21-100-002	SPINNER STEPHEN J	1144 S CLAY AVE	JACKSONVILLE IL	0.43	79.57	X				X			X			
04-000-842-00	17-21-200-002	GRABBE PHILIP R	P O BOX 594	HILLSBORO IL	0.88	39.12	X					X					
04-000-858-00	17-22-100-001	TIMMONS WAYNE	238 N EAST FIRST LANE	LAMAR MO	0.57	159.43	X				X		X	X			
04-000-856-00	17-22-200-001	SPINNER DIANE	15342 N 9TH AVE	HILLSBORO IL	0.96	79.04	X				X	X	X	X			
04-000-862-00	17-22-400-001	GARRETT CONNIE	8601 COFFEEN RD	HILLSBORO IL	0.45	79.55	X				X	X	X	X			
04-000-942-00	17-27-300-014	BLANKENSHIP KENNETH E &	15039 ILLINOIS RT 185	HILLSBORO IL	1	43	X					X		X	X		
04-000-955-00	17-28-100-001	JURGENA HAROLD W & DOLORES I	P O BOX 215	IRVING IL	0	79.33						X	X	X			
04-000-956-00	17-28-100-002	ELAM GEORGE F	14107 IL RT 185	HILLSBORO IL	0.5	0	X				X						Attached Garage - 2 Houses - Above gound pool
04-000-957-00	17-28-100-005	HAMILTON JOHNNY & RITA	14329 IL RT 185	HILLSBORO IL	0.75	0	X							X			Auto Mechanic Garage
04-000-958-00	17-28-300-003	SELTZER EARL C TRUSTEE	904 SMITH LANE P O BOX 502	HILLSBORO IL	0.2	316.88						X	X	X			
04-000-958-05	17-28-400-001	HAMILTON JOHNNY & RITA	14329 IL RT 185	HILLSBORO IL	0.92	0	X							X			Carport

Attachment I.2.B - Parcels and Structures within and adjacent to Shadow Area

Parcel No.	MapNumber	Owner Name	Address	City_State	Home Acres	Farm Acres	Inhabited House	Vacant House	Inhabited Mobile Home	Vacant Mobile Home	Garage	Barn	Grain Bins	Sheds	Ponds	Other	Notes
04-000-960-00	17-29-200-001	BOWEN CLAUDE H & LOIS D TRUST	528 OREGON ST	BETHALTO IL	0.5	79.5	X				X			X			
04-000-966-00	17-29-400-001	SCHRAUT FLORENCE	13013 N 7TH AVE	HILLSBORO IL	1.21	158.79	X					X	X	X			
04-000-966-01	17-29-400-002	SCHRAUT R LEE	425 DEARBORN	HILLSBORO IL	0	40						X	X	X			
04-000-969-00	17-30-300-001	ELAM RICHARD A SR	P O BOX 216	TAYLOR SPRINGS IL	0.49	137.51	X				X	X	X	X			

Attachment I.3.B – Applicant's Interest in Lands in the Permit Area and Contiguous to Permit Area

Attachment I.3.B - Applicant's Interest in Lands in the Permit Area and Contiguous to Permit Area

Parcel No.	MapNumber	Owner Name	Address	City_State	Home Acres	Farm Acres
08-100-229-00	16-12-400-004	MONTGOMERY LAND COMPANY, LLC	430 HARPER PARK DRIVE	BECKLEY WV	0	105.24
08-100-230-00	16-13-200-002	SCHNEIDER RANDOLPH L & SUSAN C	12056 N 6TH AVE	HILLSBORO IL	0	151.12
08-100-242-00	16-13-400-002	SCHNEIDER RANDOLPH L &	12056 N SIXTH AVE	HILLSBORO IL	0	2.5
04-000-702-00	17-07-300-002	MONTGOMERY LAND COMPANY, LLC	430 HARPER PARK DRIVE	BECKLEY WV	0	104.12
04-000-716-00	17-08-300-004	WHITE DAVID B	1100 EDGEWOOD DR	HILLSBORO IL	0	1.78
04-000-799-00	17-17-100-001	WHITE DAVID B	1100 EDGEWOOD DR	HILLSBORO IL	0	160
04-000-802-00	17-17-300-001	WISDOM MARY JANE TRUST	123 N BROAD	HILLSBORO IL	0	40
04-000-808-00	17-18-100-002	MONTGOMERY LAND COMPANY, LLC	430 HARPER PARK DRIVE	BECKLEY WV	0	100.72
04-000-808-05	17-18-100-003	MONTGOMERY LAND COMPANY, LLC	430 HARPER PARK DRIVE	BECKLEY WV	0	62.45
04-000-809-00	17-18-300-006	SPINNER EDMUND & JAN	733 S MAIN	HILLSBORO IL	0	104.5
04-000-812-00	17-18-400-006	WISDOM MARY JANE TRUST	123 N BROAD	HILLSBORO IL	0	120
04-000-822-00	17-19-100-009	SPINNER EDMUND & JAN	733 S MAIN	HILLSBORO IL	0.62	18.63
04-000-817-00	17-19-200-002	SPINNER JAN L	733 S MAIN	HILLSBORO IL	0	40
04-000-819-00	17-19-200-005	SPINNER EDMUND	733 S MAIN	HILLSBORO IL	0	43.34

Attachment I.6.A - Consent to Company Action

CONSENT TO COMPANY ACTION
OF HILLSBORO ENERGY LLC

The undersigned, being the manager of Hillsboro Energy LLC, a limited liability company organized under the laws of the State of Delaware (the "Company") and duly authorized to conduct business in the State of Illinois, does hereby consent to and authorize the following actions by the Company:

WHEREAS, the undersigned, Foresight Management LLC, a limited liability company organized under the laws of the State of Delaware, is the manager of Company (the "Manager");

WHEREAS, Company desires to appoint Mike Beyer as an Authorized Person of Company;

WHEREAS, Company desires to authorize Mike Beyer to execute on Company's behalf all permit applications and other documents incident or necessary to obtain any permits, approvals or authorizations required for Company to conduct any aspect of its coal mining operations, including without limitation, any and all permits, bonds, approvals or authorizations required under federal, state or local surface mining laws or any other laws pertaining to health, safety or the environment;

RESOLVED, that the Manager hereby approves Company's action in appointing Mike Beyer as an Authorized Person of Company, to serve in such capacity until such time as Company may revoke his designation;

RESOLVED, that Mike Beyer at any time during his term as an Authorized Person of Company be and hereby is authorized, empowered and directed for and on behalf of Company and as its act and deed to negotiate, execute, deliver and record all applications, agreements, instruments, certificates and other documents or items and to do all such acts and things as may be necessary to obtain any permits, bonds, approvals or authorizations required for Company to conduct any aspect of its coal mining operations, including without limitation, any and all permits, approvals or authorizations required under federal, state or local surface mining laws or any other laws pertaining to health, safety or the environment;

RESOLVED FURTHER, that Mike Beyer shall have the power to seek appropriate court orders, injunctions, and judgments which may be deemed necessary if a third party refuses to comply with actions taken by him under this document, including the power to sue any party who fails to comply with actions Company has authorized in this document, and to seek actual, punitive, and any other appropriate damages on Company's behalf;

RESOLVED FURTHER, the powers and authorities granted herein shall not be affected, impaired or exhausted by any non-exercise thereof or by any one or more exercises thereof;

RESOLVED FURTHER, that all prior actions taken by Mike Beyer on behalf of Company for the purpose of obtaining any permits, bonds, approvals or authorizations required for Company to conduct any aspect of its coal mining operations are hereby ratified and confirmed;

RESOLVED FURTHER, any person may rely fully, completely, and equally on the original of this document or on a copy of this document.

Executed and effective as of May 21, 2007.

HILLSBORO ENERGY LLC
a Delaware limited liability company

By its Manager,

FORESIGHT MANAGEMENT LLC,
a Delaware limited liability company,

By: _____
Donald R. Holcomb, Authorized Person

Attachment I.10.A - Mining Affidavits

PLANNED SUBSIDENCE AFFIDAVIT
(Required by 62 Ill. Adm. Code 1778.15(f))

I, Michael J. Beyer under penalties of perjury, declare on behalf of the applicant, Hillsboro Energy LLC, which said applicant has or will possess prior to mining each particular parcel, documents which bestow upon the applicant a legal right to conduct planned subsidence coal mining and reclamation operations within the approved and proposed areas of planned subsidence. Documents in support of granting the rights herein claimed by the applicant will be provided to the Department upon request.

Date 9/11/07

Signature _____ Title Authorized Person

Sworn and subscribed before me

this 11 day of September

_____
Notary Public

May 17 2010
My commission expires

RHIANNON SIEGEL
MY COMMISSION # DD553305
EXPIRES: May 17, 2010
(407) 398-0153 Florida Notary Service.com

UNDERGROUND MINING AFFIDAVIT
(Required by 62 Ill. Adm. Code 1778.15(f))

I, Michael J. Beyer, under penalties of perjury, declare on behalf of the applicant, Hillsboro Energy LLC, which said applicant has or will possess prior to mining each particular parcel, documents which bestow upon the applicant all necessary rights to conduct underground mining operations within the approved and proposed shadow area. Documents in support of granting the rights herein claimed by the applicant will be provided to the Department upon request.

Date 9/11/07

Signature _____ Title Authorized Person

Sworn and subscribed before me

this 11 day of September

_____
Notary Public

May 17 2010
My commission expires

RIGHT OF ENTRY AFFIDAVIT
(Required by 62 Ill. Adm. Code 1778.15(f))

I, Michael J. Beyer, under penalties of perjury, declare on behalf of the applicant, Hillsboro Energy LLC, which said applicant has or will possess prior to planned subsidence impacting drainage, documents and all regulatory approval which bestow upon the applicant a legal right to enter upon surface property with the purpose to correct subsidence impacts to drainage. Documents in support of granting the rights herein claimed by the applicant will be provided to the Department upon request.

Date 9/11/07

Signature _____ Title Authorized Person

Sworn and subscribed before me

this 11 day of September

_____
Notary Public

RHIANNON SIEGEL
MY COMMISSION # DD553303
EXPIRES: May 17, 2010
(407) 398-0153 Florida Notary Service.com

May 17, 2010
My commission expires

Attachment I.10.B – Engineering Certification

ENGINEERING CERTIFICATION
Deer Run Mine

I hereby certify the engineering design used in preparation of this application, attachments, and supplements were done by me or under my direct supervision. Exceptions to this certification include UCM-1 Part 1 with attachments, Map 2, and other included documents attributed to other sources by title block or title page.

I further certify to the best of my knowledge all such design is in accordance with all applicable local, state and federal laws, rules and regulations. I have placed an "X" in the box below if that item is relevant.

X	Whereas the Reclamation Plan calls for an alternative land use, I also certify the plans to conform to applicable accepted standards for adequate land stability, drainage, vegetative cover, and aesthetic design appropriate for the post-mining use of the site.
X	Whereas the operation proposes disposal of spoil or waste materials in areas other than mining workings or excavations, I also certify such fills are designed in accordance with recognized professional standards and all applicable laws.
X	Certification of the Illinois Environmental Protection Agency-35 Ill. Adm. Code 405.104(a) Permit. In my professional judgment, the plans and specifications submitted as part of this application describe an operation, which will meet all applicable effluent and water quality standards. I certify that I am familiar with all of the plans, specifications, reports, and maps submitted as part of this application and that said plans, etc. are accurate insofar as they represent existing conditions.

Gary W. Raines
Name

HDR | CWI ENGINEERS
Firm

1339 Walnut Street
Address

Murphysboro, IL 62966

Gary W. Raines
Signature

12/20/2007
Date

Illinois Registration Number (Seal)

November 30, 2009
Expiration Date

(618) 684-5808
Phone Number

ENGINEERING CERTIFICATION

I hereby certify the engineering design used in preparation of this application, attachments, and supplements were done by me or under my direct supervision. Specifically, I was responsible for completing a hydrogeologic investigation for the permit area.

I further certify to the best of my knowledge all such design is in accordance with all applicable local, state and federal laws, rules and regulations. I have placed an "X" in the box below if that item is relevant.

	Whereas the Reclamation Plan calls for an alternative land use, I also certify the plans to conform to applicable accepted standards for adequate land stability, drainage, vegetative cover, and aesthetic design appropriate for the post-mining use of the site.
	Whereas the operation proposes disposal of spoil or waste materials in areas other than mining workings or excavations, I also certify such fills are designed in accordance with recognized professional standards and all applicable laws.
	Certification of the Illinois Environmental Protection Agency-35 Ill. Adm. Code 405.104(a) Permit. In my professional judgment, the plans and specifications submitted as part of this application describe an operation, which will meet all applicable effluent and water quality standards. I certify that I am familiar with all of the plans, specifications, reports, and maps submitted as part of this application and that said plans, etc. are accurate insofar as they represent existing conditions.

David H. Kimmle
Name

062-046871
Illinois Registration Number (Seal)

Hurst-Rosche Engineers, Inc.
Firm

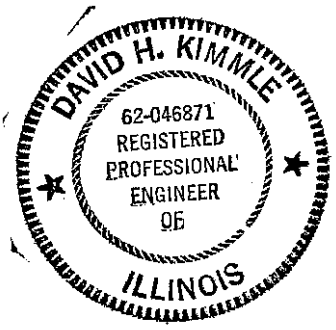
217/532-3959
Phone Number

1400 E. Tremont St.
Address

Hillsboro, IL 62049

Signature

12/20/07
Date



ENGINEERING CERTIFICATION

I hereby certify the engineering design used in preparation of this application, attachments, and supplements were done by me or under my direct supervision. Specifically, I was responsible for documenting current property ownership, and structures present on those properties, including to the best of my knowledge the locations of domestic water wells.

I further certify to the best of my knowledge all such design is in accordance with all applicable local, state and federal laws, rules and regulations. I have placed an "X" in the box below if that item is relevant.

	Whereas the Reclamation Plan calls for an alternative land use, I also certify the plans to conform to applicable accepted standards for adequate land stability, drainage, vegetative cover, and aesthetic design appropriate for the post-mining use of the site.
	Whereas the operation proposes disposal of spoil or waste materials in areas other than mining workings or excavations, I also certify such fills are designed in accordance with recognized professional standards and all applicable laws.
	Certification of the Illinois Environmental Protection Agency-35 Ill. Adm. Code 405.104(a) Permit. In my professional judgment, the plans and specifications submitted as part of this application describe an operation, which will meet all applicable effluent and water quality standards. I certify that I am familiar with all of the plans, specifications, reports, and maps submitted as part of this application and that said plans, etc. are accurate insofar as they represent existing conditions.

Jeremy J. Connor
Name

062-057938
Illinois Registration Number (Seal)

Hurst-Rosche Engineers, Inc.
Firm

217/532-3959
Phone Number

1400 E. Tremont St.
Address

Hillsboro, IL 62049

Signature

12/20/2007
Date

JEREMY J CONNOR
062-057938
LICENSED
PROFESSIONAL
ENGINEER
OF
ILLINOIS

Attachment I.10.C - Certificate of Liability Insurance

ACORD™ CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YY) 9/06/07

PRODUCER

Wells Fargo Ins. Services
of West Virginia, Inc.
11 Eagles Road
Beckley WV 25801
(304) 252-6375

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURED

Hillsboro Energy, LLC
3801 PGA Blvd, Suite 903
Palm Beach Gardens, FL 33410

COMPANIES AFFORDING COVERAGE

COMPANY A: Federal Insurance Company

COMPANY B:

COMPANY C:

COMPANY D:

COVERAGES

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED, NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS	
A	GENERAL LIABILITY	37109251	9/01/07	9/01/08	GENERAL AGGREGATE	$ 2,000,000
	[X] COMMERCIAL GENERAL LIABILITY	$5,000 DEDUCTIBLE			PRODUCTS-COMP/OP AGG	$ 2,000,000
	[ ] CLAIMS MADE [X] OCCUR				PERSONAL & ADV INJURY	$ 1,000,000
	[ ] OWNER'S & CONTRACTOR'S PROT				EACH OCCURRENCE	$ 1,000,000
	[X] Includes Blasting				FIRE DAMAGE (Any one fire)	$ 1,000,000
	[ ] & Subsidence				MED EXP (Any one person)	$ 10,000
	AUTOMOBILE LIABILITY				COMBINED SINGLE LIMIT	$
	[ ] ANY AUTO				BODILY INJURY (Per person)	$
	[ ] ALL OWNED AUTOS				BODILY INJURY (Per accident)	$
	[ ] SCHEDULED AUTOS				PROPERTY DAMAGE	$
	[ ] HIRED AUTOS					
	[ ] NON-OWNED AUTOS					
	[ ]					
	GARAGE LIABILITY				AUTO ONLY - EA ACCIDENT	$
	[ ] ANY AUTO				OTHER THAN AUTO ONLY:	
	[ ]				EACH ACCIDENT	$
	[ ]				AGGREGATE	$
	EXCESS LIABILITY				EACH OCCURRENCE	$
	[ ] UMBRELLA FORM				AGGREGATE	$
	[ ] OTHER THAN UMBRELLA FORM					$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY				[ ] WC STATUTORY LIMITS [ ] OTHER	
	THE PROPRIETOR/ PARTNERS/EXECUTIVE OFFICERS ARE: [ ] INCL [ ] EXCL				EL EACH ACCIDENT	$
					EL DISEASE-POLICY LIMIT	$
					EL DISEASE-EA EMPLOYEE	$
	OTHER					

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS

Evidence of Insurance as respects any and all permits held by the Namad Insured

CERTIFICATE HOLDER

IL Dept of Natural Resources
Land Reclamation Division
Office of Mines & Minerals
One Natural Resources Way
Springfield, IL 62702-1271

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL 10 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

Douglas L. Ball

IMPORTANT

If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

DISCLAIMER

The Certificate of Insurance on the reverse side of this form does not constitute a contract between the issuing insurer(s), authorized representative or producer, and the certificate holder, nor does it affirmatively or negatively amend, extend or alter the coverage afforded by the policies listed thereon.

Attachment I.11 - Public Notice

DRAFT PUBLIC NOTICE

Pursuant to the Surface Coal Mining Land Conservation and Reclamation Act (PA-81-1015, as amended) and the Rules and Regulations of the Act, Hillsboro Energy LLC, 925 South Main Street, Hillsboro IL, 62049 hereby gives notice that on _____a permit application was determined to be complete by the Illinois Department of Resources, Office of Mines and Minerals, to construct a surface facility for underground coal mining under Permit # 399.

The permit area is located in Montgomery County, Township 8 North, Range 3 West, Sections 7, 8, 17and 18 and Township 8 North, Range 4 West, Sections 12 and 13.

The Shadow Area is defined as Montgomery County, Township 8 North, Range 3 West, Sections 10, 15, 16, 17, 18, 19, 20, 21, 22, 27, 28, 29 and 30 and Township 8 North, Range 4 West, Sections 13, 24 and 25.

Hillsboro Energy LLC seeks a permit to conduct surface construction activities (consisting of soil storage, parking lots, sediment ponds, refuse disposal, overhead belts, rail road loop and fencing) within 100 feet of Ashmore Trail.

The application is filed at the County Clerk's Office, Montgomery County Courthouse, Hillsboro, Illinois 62049 and the Illinois Department of Natural Resources, Office of Mines and Minerals, Land Reclamation Division, One Natural Resources Way, Springfield, Illinois 62702-1271.

Comments, objections, or requests for informal conferences or public hearings may be submitted to the Illinois Department of Natural Resources Way, Springfield, Illinois 62702-1271.

Note: the above is to be published in "The Journal-News", 431 South Main Street, PO Box 100, Hillsboro, IL 62049-0100 and/or "Litchfield News-Herald", P.O. Box 160 / 112 E. Ryder, Litchfield, IL 62056-0160

PART II

PART II

PREMINING INFORMATION

Premining information is to be displayed on premining land use map unless otherwise indicated.

1) Describe how the permit area perimeter will be marked and discuss the method or system employed to locate permit area perimeter and set markers along it. Designate a reference point outside the permit area. Provide a description of the reference point and a sketch relating the reference point to the permit area perimeter.

Response: ***The perimeter of the mine permit area will be delineated by using PVC or metal posts, and the posts will be located within eye sight of each other. A reference point will be located along the northern permit boundary, at the intersection of the permit line at Ashmore Trail (CR-1050 N) (E 2,495,271.02; N 905,617.91). A second reference point will be located along the southern permit boundary at the intersection of the permit line and N. 9th Ave (CR-900 N) (E 2,495,331.87; N 900,326.28). These reference points are shown on Surface Facilities Map (Map 6 S.F.)***

2) Provide slope measurements to represent existing land surface configuration of proposed permit area as required under Section 1783.25(a)(11)(A-D). A soils map of medium intensity prepared to SCS specifications or a contoured aerial photo may be submitted in lieu of Section 1782.25(a)(11)(A-D).

Response: ***Refer to Soil Resource Map (Map 5) for the soils information and the slope classifications for the individual map units within the mine permit area.***

3) Has previous mining activity occurred within the permit area and/or adjacent areas?

Yes ☒ No ☐

If yes, provide the following information, if available:

1) Type of mining, surface, underground, or both?

Response: ***Underground; Refer to Attachment II.3 for a listing of all coal mines within the permit area and adjacent areas. Underground Operations Map (Map 6 U.G.) shows the location of the pre-existing mines.***

2) What coal seam or other mineral(s) were extracted?

Response: ***Herrin (#6 Seam); Refer to Attachment II.3 for a listing of all coal mines within the permit area and adjacent areas. Underground Operations Map (Map 6 U.G.) shows the location of the pre-existing mines.***

3) What was the extent of coal or other mineral(s) removed? Delineate on the pre-mining land use map, or other designated map, the areas disturbed by previous mining activities, including active, inactive or abandoned underground mine work along with any mine

opening to the surface. Identify for each area the type of mining and the approximate date of extraction.

Response: ***Unknown; Refer to Attachment II.3 for a listing of all coal mines within the permit area and adjacent areas, including the type of mining, and approximate date of operation. Underground Operations Map (Map 6 U.G.) shows the location of the pre-existing mines.***

4) Identify on all maps submitted with the application areas where surface coal mining operations were conducted prior to August 3, 1977; after August 3, 1977 and prior to May 3, 1978; after May 3, 1978 and prior to February 1, 1983; and any permanent regulatory program permit issued after February 1, 1983.

Response: ***No surface coal mining has been conducted within permit area. Refer to Attachment II.3 for a listing of all coal mines within the permit area and adjacent areas, including the type of mining, and approximate date of operation. Underground Operations Map (Map 6 U.G.) shows the location of the pre-existing mines.***

5) Identify the land uses preceding mining.

Response: ***Refer to Attachment II.4.***

4) Give the acreage of each land use within the proposed permit area, employing land use categories of Section 1701.5 listed below, and delineate on premining land use map existing land uses in the proposed permit area and within 1,000 feet adjacent to it. Include on the premining land use map the location of all buildings and identify the current use of these buildings.

Cropland	Pastureland
Grazing land	Forestry
Residential	Industrial/Commercial
Recreation	Fish and Wildlife Habitat
Developed Water Resources	Undeveloped land or no current use or land management

Response: ***Refer to Attachment II.4 for a listing, with acreages, of the pre-mining land uses within the permit area. The Environmental Resources Map (Map 3) shows the location of the pre-mining land uses.***

5) Have any of the land uses changed within the last five years?

Yes ☐ No ☒

If yes, indicate the acreage and changes of land uses.

6) Provide a narrative of land capability and productivity of the proposed permit area prior to mining which shall provide an analysis of:

1) The capability of the land to support a variety of uses, giving consideration to soil and foundation characteristics, topography, vegetative cover and hydrology;

Response: ***Generally, the soils in the proposed permit area are in one of the following soil associations:***

a) ***Herrick-Piasa: Natural drainage within this association is poor or somewhat poor; however ditches and drainage tiles may improve drainage within these soils. Slopes range from level to nearly level. Level Herrick soils have a 3w land classification, and the level Herrick-Piasa complex soils have a 2w land classification. Corn, soybeans and wheat are the principal crops grown within this association. These soils are generally well suited for cultivated crops and are not likely to be used as woodland. Excessive moisture and wetness is a hazard to growing crops. These soils are poorly suited for dwelling sites, septic tank absorption fields, ponds, dikes and levees. Seasonal wetness, the shrink-swell potential, and the restricted permeability are the major limitations affecting these uses.***

b) ***Cowden-Piasa: Natural drainage within this association is very poor, because the sub-soils are slowly to very slowly permeable and can cause extended periods of wetness. Slopes within this association range from level to gently sloping. Level Cowden and Cowden-Piasa complex soils have a 2w land classification, and the gently sloping Cowden-Piasa complex soils have a 2e land classification. Corn, soybeans and wheat are grown on nearly all acres within this association; however, these soils are only moderately well suited to produce those crops. These soils are within woodland management group seven, and are not likely to be used as woodland. Excessive moisture and wetness is a hazard to growing crops before June most years. These soils are poorly suited for dwelling sites, septic tank absorption fields, ponds, dikes and levees. Seasonal wetness, the shrink-swell potential, and the restricted permeability are the major limitations affecting these uses.***

c) ***Oconee-Velma-Tamalco: This association ranges from somewhat poorly drained to well drained. Slopes within this series range from nearly level to strongly sloping. The nearly level Oconee soil has a land classification of 2w. The gently sloping Oconee soil has a land classification of 2e. The moderate to strongly sloping Oconee, Velma, and Tamalco soils have a land classification of 3e. Corn, soybeans, wheat and alfalfa are grown within this association; however, in more sloping areas pasture is the dominant land use. These soils are within woodland management group seven, and are not likely to be used as woodland. Erosion is a serious hazard, because the subsoil is not suitable for production of crops. These soils are poorly suited for dwelling sites, septic tank absorption fields, ponds, dikes and levees. Seasonal wetness, the shrink-swell potential, piping, and the restricted permeability are the major limitations affecting these uses.***

2) The productivity of the total area expressed as average yield of food, fiber, forage, or wood products under high-level management.

Response: ***Refer to Attachment II.6.A.2 for productivity data of the project permit area.***

B) Where the narrative of land capability and productivity employs the U.S.D.A Natural Resources Conservation Service (NRCS) Land-Capability Classification (Agriculture Handbook No. 210) in conjunction with the soil information provided under Part II 12) of this part, soil interpretation sheets or published soil survey or complete soil information chart for productivity from Circular 1156 are to be submitted for each soil type occurring in the permit area.

Response: ***Refer to Attachment II.6.A.2 for productivity data of the project permit area.***

7) Provide a description of the existing land uses and land classifications under local law, if any, for the proposed permit and adjacent areas.

Response: ***Currently no known laws pertaining to land use and land classification are applicable to the proposed permit and adjacent areas within Montgomery County, Illinois.***

8) Provide fish and wildlife resource information for the proposed permit area and any adjacent areas. Prior to initiation of studies to obtain fish and wildlife resource information, the applicant must contact the Department for a determination of what fish and wildlife resources information will be required. Pursuant to 62 Ill. Adm. Code 1784.21(a)(1) and (2), the Department will determine the level of detail and the areas of study. Site-specific resource information will be required by the Department if either the permit area or adjacent area is likely to include threatened or endangered species or their critical habitats or habitats of unusually high value for fish and wildlife. The applicant should complete the description of plant communities within the permit area and adjacent area, requested in Part II 9), below, prior to contacting the Department for a determination of the fish and wildlife resource information.

Response: ***Terrestrial wildlife present within the permit area includes various songbirds, upland game birds, waterfowl, raptors, bats, small mammals, furbearing mammals, white-tailed deer, reptiles, and amphibians. Faunal species are typical for this part of Illinois, and include species associated with upland forest, riparian forest, wetlands, intermittent stream channels, ephemeral stream channels, open water, grassland, and actively managed agricultural lands. Stream habitat within the permit boundary exists as small ephemeral and intermittent streambeds. These streams exhibit no-flow and dry-bed conditions during substantial periods of each year. Open water habitat provides habitat for several species of amphibians, and may sustain typical minnow and sunfish populations.***

9) Give a description of the plant communities within the proposed permit area and delineate on a vegetation map the vegetative types occurring within the proposed permit area and within any proposed reference area. Where a map or aerial photograph is required provide coverage of sufficient adjacent areas to allow evaluation of vegetation as important habitat for fish and wildlife for those species of fish and wildlife identified under Section 1784.2 1. The description shall include information adequate to predict the potential for reestablishing vegetation.

Response: ***Refer to the Environmental Resources Map (Map 3) for the land-use types and to Attachment II.4 for a listing of the acreages for each land use. About 84% of the permit area is currently used as cropland that is farmed in a corn and soybean rotation. The remainder of the permit area is in mixed between the following land uses: forest 8.7%, undeveloped 6.0%, with the remainder of the permit area in industrial/commercial (roads), fish and wildlife habitat, and residential. The dominant overstory species within the upland forest were oak, hickory, elm, maple, and cherry. Understory species in the upland forested areas included poison ivy, bush honeysuckle, trumpet creeper, and rye grass. The dominant overstory species within the riparian forested areas were hackberry, elm, silver maple, cottonwood, sycamore, shingle oak, and mulberry. The understory of the riparian forested areas was overgrown by the exotic bush honeysuckle and very few native forbs and shrubs were present.***

Wetlands within the permit area occurred within various land-use types including: cropland, forest, and undeveloped areas. Wetland areas were delineated within the permit area and account for 33.78 acres of the permit area, or approximately 4.0% of the total permit area. Refer to Attachment II.9 for wetlands inventory information.

10) Pursuant to 62 Ill. Adm. Code 1783.12(a), provide a description of the cultural, archeological and historic resources listed or eligible for listing on the National Register of Historic Places and any known

archeological features within the proposed permit, adjacent areas, and shadow area (for planned subsidence). The description of the cultural, historic and archeological resources occurring within the permit area and adjacent areas shall be based upon available data, including data of State and local archeological, historical and cultural preservation agencies.

Response: ***A Phase 1 Cultural Resources Survey of the Deer Run Mine Project Area has been prepared and submitted under a separate volume to IDNR Cultural Resources Group.***

1) Pursuant to 62 Ill. Adm. Code 1783.12(b):

a) State whether there is a substantial likelihood of currently unknown resources, which would be eligible for the National Register of Historic places within the proposed permit, or adjacent areas or shadow area (for planned subsidence).

Response: ***A Phase 1 Cultural Resources Survey of the Deer Run Mine Project Area has been prepared and submitted under a separate volume to IDNR Cultural Resources Group.***

b) Provide a plan detailing the manner in which additional information will be gathered by the applicant to enable the Department to identify and evaluate such resources.

Response: ***Not Applicable.***

2) Please Note: If the Department determines that the Part II 10)A) resource information is not adequate to make the required finding under 62 Ill. Adm. Code 1773.15(c)(12) because information available to the Department indicates a substantial likelihood of currently unknown resources within the permit area or adjacent areas, which would be eligible for the National Register of Historic Places, the Department will require the applicant to submit additional information to enable the Department to identify and evaluate the potential resources. Such information might include the results of field investigations of the permit area and adjacent area if it is determined by the Department, in consultation with the Illinois State Historic Preservation Agency, that the field investigation will provide the information required under Part II 10)A).

Response: ***A Phase 1 Cultural Resources Survey of the Deer Run Mine Project Area has been prepared and submitted under a separate volume to IDNR Cultural Resources Group.***

C) For the permit area and/or shadow area (for planned subsidence) locate on the vegetation map or the land use map the following:

The boundaries of any publicly owned parks, locations of any cultural resources, historical resources listed or eligible for listing on the National Register of Historic Places.

Response: ***A Phase 1 Cultural Resources Survey of the Deer Run Mine Project Area has been prepared and submitted under a separate volume to IDNR Cultural Resources Group.***

D) Provide a map showing the location of know/Archeological site(s) listed on or eligible for listing on the National Register of Historic Places. Provide identifying field markings to be employed to

insure that the site(s) will not be disturbed by surface coal mining and reclamation operations. The map is to be submitted in separate cover from the rest of the application. The Department will hold the map as a confidential document.

Response: ***A Phase 1 Cultural Resources Survey of the Deer Run Mine Project Area has been prepared and submitted under a separate volume to IDNR Cultural Resources Group.***

E) Provide a plan for publicly owned park(s), or place(s) identified above in paragraph(c) that may be adversely affected by the proposed operation describing the measures to be employed:

Response: ***Not Applicable.***

1) To prevent adverse impacts caused by underground mining related activities including, but not limited to, loss or destruction of historic artifacts and damage to historic structures or property; or

Response: ***Not Applicable.***

2) If valid existing rights exist or joint agency approval is to be obtained under 62 Ill. Adm. Code 1761.12(e), to minimize adverse impacts.

Response: ***Not Applicable.***

11) For the permit area and/or shadow area (for planned subsidence) locate on the vegetation map or land use map the boundaries of any public or private cemeteries or Indian burial grounds.

Response: ***The locations of public and private cemeteries are shown on Identification of Interests Map (Map 2). There are no known Indian burial grounds.***

12) Provide the location of surface and subsurface man-made features within, passing through, or passing over the proposed permit and shadow areas on the pre-mining land use map or other designated map.

Such features should include but are not limited to major electric transmission lines, pipelines, gas and oil wells, and water wells. For gas, oil and water wells provide the depth, if available, of the well.

Response: ***Refer to Identification of Interests Map (Map 2), Hydro-Geological Map (Map 4) and Underground Operations Map (Map 6 U.G.) for the respective information.***

B) Provide the elevation and location of all monitoring stations used to gather data for water quality and quantity, fish and wildlife, and air in preparation of the application.

Response: ***Refer to Hydro-Geological Map (Map 4) for location.***

13) Soils Information Map

A) Does the submitted soils map represent a map developed by the Natural Resources Conservation Service?

Yes ☒ No ☐

If no, explain. If SCS map has been modified, explain (Example - photographically enlarged; soil map units recorrelated; area affected after initial mapping). Soil map scale must be 1" = 400' unless otherwise approved by the Department.

Response: ***The Soil Resource Map (Map 5) was prepared using the latest information and maps for Montgomery County available from the USDA-NRCS Geospatial Data Gateway http://datagateway.nrcs.usda.gov/.***

B) Are any of the identified map units correlated as prime farmland by SCS criteria?

Yes ☒ No ☐

If yes, provide acreage by completing soil information chart.

Response: ***Refer to Attachment II.6.A.2.***

C) Submit, by completing soils information chart, acreage totals of each map unit (soil type and slope classification) and land use capability classes in the permit area and the percent slope range of each lettered slope classification used on the soil map.

Response: ***Refer to Attachment II.6.A.2.***

D) Indicate the average topsoil thickness of each of the soil map units to be affected. Locate on soils map the test holes for soil horizon thickness sampling. The topsoil replacement thickness (inches) will be _____.

Response: ***For the average topsoil thickness of individual soil map units, refer to Soils Resources Map (Map 5). The topsoil replacement thickness will be 13".***

E) List the soil types and acreages of areas that will require the B and/or portions of the C-horizon to be removed and replaced in order to establish the root medium necessary to achieve soil productivity consistent with the proposed post-mining land use.

Alternatively, a narrative description explaining why specific soil type acres information for reclamation plan achievement is not necessary may be provided instead.

Response: ***B and C-horizons will be removed in the areas of proposed sediment pond construction. In all cases, the respective horizons will be stockpiled separately and appropriately identified. Soil horizon replacement will be in accordance with the respective land uses and land capability as identified on the Mining Reclamation Map (Map 7).***

F) Are selected overburden materials proposed to be used in lieu of or as a supplement to the A-horizon?

Yes ☐ No ☒

If yes, provide t he appropriate information required under Section 1785.21(b). Also, identify source of the substitute materials and the topsoils to be substituted away from on a separate soils map unless the Department grants permission to describe the area in narrative form or to use the soils map provided in Part II 13(A). Explain why the proposed plan will provide the best available material of equal or better quality than present topsoil or surface existing material. This section must be addressed when reaffecting previously disturbed areas.

Attachment II.3

Previous Mining Within and Adjacent to Permit Area

HILLSBORO ENERGY
ATTACHMENT II.3
PREVIOUS MINING WITHIN OR ADJACENT TO THE PERMIT AREA

ISGS INDEX	COMPANY NAME	MINE			EXTRACTION METHOD	YEARS OPERATED	SEAM MINED	COUNTY	LOCATION		
		NAME	NO.	TYPE					TWP	RGE	SEC
291	HILLSBORO CMC	HILLSBORO	1	SHAFT	---	1888-1888	HERRIN	MONTGOMERY	8N	4W	12
291	HILLSBORO COAL CO	HILLSBORO	---	SHAFT	MRP	1888-1937	HERRIN	MONTGOMERY	8N	4W	12
291	HILLSBORO MINING CO	HILLSBORO	---	SHAFT	---	1937-1941	HERRIN	MONTGOMERY	8N	4W	12
77	MONTGOMERY COUNTY CC	TAYLOR SPRING	1	SHAFT	RPP	1909-1913	HERRIN	MONTGOMERY	8N	4W	23
77	PEABODY CC	PEABODY	15	SHAFT	---	1913-1917	HERRIN	MONTGOMERY	8N	4W	23
77	C & E I COAL PROPERTIES	C & E I	15	SHAFT	---	1917-1919	HERRIN	MONTGOMERY	8N	4W	23
77	ILLINOIS COAL PROPERTIES	TAYLOR SPRING	15	SHAFT	---	1919-1920	HERRIN	MONTGOMERY	8N	4W	23
77	INDIANA & ILLINOIS COAL CORP	IND & ILL	15	SHAFT	---	1920-1925	HERRIN	MONTGOMERY	8N	4W	23
197	KORTKAMP CC	KORTKAMP	---	SHAFT	MRP	1905-1913	HERRIN	MONTGOMERY	8N	3W	5
197	PEABODY CC	PEABODY	11	SHAFT	---	1913-1916	HERRIN	MONTGOMERY	8N	3W	5
197	C & E I COAL PROPERTIES	C & E I	11	SHAFT	---	1916-1919	HERRIN	MONTGOMERY	8N	3W	5
197	ILLINOIS COAL PROPERTIES	I C P	11	SHAFT	---	1919-1920	HERRIN	MONTGOMERY	8N	3W	5
197	INDIANA & ILLINOIS COAL CORP	IND & ILL	11	SHAFT	---	1920-1925	HERRIN	MONTGOMERY	8N	3W	5

Attachment II.4 - Pre-Mining Land Uses

HILLSBORO ENERGY
ATTACHMENT II.4
PRE-MINING LAND-USE

LAND USE	INSIDE PERMIT AREA	1,000-FOOT BUFFER AREA	TOTAL AREA
	ACRES	ACRES	ACRES
CROPLAND	676.92	864.43	1541.35
PASTURELAND	0.00	0.00	0.00
GRAZINGLAND	0.00	0.00	0.00
FORESTRY	70.26	160.42	230.68
RESIDENTIAL	1.81	40.26	42.07
INDUSTRIAL/PUBLIC ROADS	0.50	54.11	54.61
RECREATION	0.00	0.00	0.00
FISH & WILDLIFE HABITAT	5.91	16.69	22.60
DEVELOPED WATER RESOURCES	0.00	0.00	0.00
UNDEVELOPED LAND	48.10	58.63	106.73
TOTAL	803.50	1194.55	1998.05

Attachment II.6.A.2 - Soil Productivity Data – Includes various soil property information

HILLSBORO ENERGY
ATTACHMENT II.6.A.2
PRODUCTIVITY YIELD DATA

					CORN		SOYBEANS		WHEAT		HAY			
					1156 HMY	Weighted HMY	1156 HMY	Weighted HMY	1156 HMY	Weighted HMY	1156 HMY	Weighted HMY	Land	
Symbol	Name	Slope	Acres	Percent	bu/ac	bu/ac	bu/ac	bu/ac	bu/ac	bu/ac	ton/ac	ton/ac	Classification[1]	Capability
5C2	Blair silt loam, eroded	5-9%	6.5	0.81%	101.2	0.82	33.1	0.27	40.5	0.33	3.2	0.03	SI	3e
5C3	Blair silt loam, severely eroded	5-9%	5.5	0.68%	92.4	0.63	30.2	0.21	37	0.25	2.9	0.02	SI	4e
8D3	Hickory loam, severely eroded	7-12%	15.1	1.88%	80.6	1.51	27.7	0.52	32.8	0.62	2.7	0.05	SI	4e
46	Herrick silt loam	0-1%	3.4	0.42%	144	0.61	46	0.19	58	0.25	4.4	0.02	P	3w
48	Ebbert silt loam	0-1%	28.8	3.58%	137	4.91	43	1.54	52	1.86	3.5	0.13	P*	3w
50	Virden silty clay loam	0-2%	47.6	5.92%	145	8.59	47	2.78	57	3.38	4.2	0.25	P*	2w
112	Cowden silt loam	0-1%	68.2	8.49%	126	10.69	39	3.31	50	4.24	3.9	0.33	P*	2w
113A	Oconee silt loam	0-2%	13.8	1.72%	131	2.25	40	0.69	50	0.86	4.2	0.07	P*	2w
113B	Oconee silt loam	2-4%	174.3	21.69%	129.7	28.14	39.6	8.59	49.5	10.74	4.2	0.91	P	2e
113B2	Oconee silt loam, eroded	2-4%	4.5	0.56%	124.5	0.70	38	0.21	47.5	0.27	4	0.02	---	2e
113C	Oconee silt loam	4-7%	28.2	3.51%	125.8	4.42	38.4	1.35	48	1.68	4	0.14	---	3e
113C2	Oconee silt loam, eroded	4-7%	34.9	4.34%	120.5	5.23	36.8	1.60	46	2.00	3.9	0.17	---	3e
127B	Harrison silt loam	2-4%	0	0.00%	141.6	0.00	43.6	0.00	55.4	0.00	4.6	0.00	P	1
250C2	Velma loam, eroded	4-7%	33.4	4.16%	112.2	4.66	36.8	1.53	46	1.91	3.2	0.13	---	3e
250D	Velma loam	7-12%	1.3	0.16%	112.2	0.18	36.8	0.06	46	0.07	3.2	0.01	---	3e
250D2	Velma loam, eroded	7-12%	8.1	1.01%	106.1	1.07	34.8	0.35	43.5	0.44	3	0.03	---	3e
287A	Chauncey silt loam	0-3%	0.8	0.10%	128	0.13	41	0.04	50	0.05	3.8	0.00	---	2w
581B	Tamalco silt loam	2-4%	9.4	1.17%	91.1	1.07	33.3	0.39	37.2	0.44	2.7	0.03	SI	3e
993A	Cowden-Piasa complex	0-2%	235.7	29.33%	119	34.91	39	11.44	47	13.79	3.6	1.06	P*	2w
993B2	Cowden-Piasa complex, eroded	2-4%	3.3	0.41%	108.3	0.44	35.5	0.15	42.8	0.18	3.3	0.01	---	2e
994A	Oconee-Tamalco complex	0-2%	32.7	4.07%	116	4.72	38	1.55	45	1.83	3.6	0.15	---	2w
994B	Oconee-Tamalco complex	2-4%	10.9	1.36%	113.7	1.54	37.2	0.50	44.1	0.60	3.6	0.05	---	2e
995	Herrick-Piasa complex	0-2%	34.4	4.28%	130	5.57	43	1.84	52	2.23	3.9	0.17	---	2w
3451	Lawson silt loam, frequently flooded	0-2%	0.4	0.05%	152	0.08	49	0.02	58	0.03	4.6	0.00	P**	3w
8074	Radford silt loam, occasionally flooded	0-2%	0.4	0.05%	148	0.07	47	0.02	58	0.03	4.4	0.00	---	2e
W	Water	---	1.9	0.24%	---	---	---	---	---	---	---	---	---	---
			Total	Total	Average	Weighted Sum	Average	Weighted Sum	Average	Weighted Sum	Average	Weighted Sum		
			803.5	100.00%	121.4	122.9	39.0	39.2	47.7	48.1	3.7	3.8		

[1] Land Classification-P=Prime; P*-Prime farmland if drained; P**-Prime farmland if drained and protected from flooding; SI-Farmland of Statewide importance

Attachment II.8 – Threatened and Endangered Species, Montgomery County, Illinois

HILLSBORO ENERGY
ATTACHMENT II.8
THREATENED AND ENDANGERED SPECIES, MONTGOMERY CO

Scientific Name	Common Name	State Status	# of Occurrences	Last Observed	Likely to occur
Ammodramus henslowii	Henslow's Sparrow	Threatened	2	05-28-2004	Potentially
Calephelis muticum	Swamp Metalmark	Endangered	1	08-09-2003	Not likely
Haliaeetus leucocephalus	Bald Eagle	Threatened	2	05-21-2007	Not likely
Liatris scariosa var. nieuwlandii	Blazing Star	Threatened	3	10-17-2001	Not likely
Silene regia	Royal Catchfly	Endangered	1	7-26-2001	Not likely
Sisyrinchium atlanticum	Eastern Blue-eyed Grass	Threatened	1	6-7-2000	Not likely
Tomanthera auriculata	Ear-leafed Foxglove	Threatened	2	9-2-2003	Not likely
Trifolium reflexum	Buffalo Clover	Threatened	1	06-1991	Not likely

Attachment II.9 – Routine Wetland Determination Data Sheets

Wetland Delineation Report

Deer Run
Montgomery County, Illinois

Prepared for:

Hillsboro Energy, LLC

October 2007

Prepared by:

HDR|CWI, Inc.
5201 South Sixth Street Road
Springfield, Illinois 62703-5143

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1.0 Executive Summary

Hillsboro Energy, LLC is proposing to construct an underground coal mine, Deer Run, in Montgomery County, Illinois. Hillsboro Energy has authorized HDR | Cochran & Wilken, Inc. (HDR | CWI) to review the project site for wetland resources. The project site is located within the SE ¼ of Section 12, and NW ¼ of Section 13, Range 4W; the SW ¼ of Section 7, the NW ¼ of Section 17, and NW ¼ and S ½ of Section 18, Range 3W of Township 8N in Montgomery County, Illinois (Appendix 1; Figure 1). This wetland delineation report documents findings of wetland surveys conducted at the project site on July 18, July 20, July 24, July 26, and September 5, 2007. The land within the project site is primarily used for agricultural purposes and was planted in corn and soybeans at the time of the survey.

Wetland determinations of the project site were conducted in accordance with the 1987 Army Corps of Engineers Wetland Delineation Manual (Routine Wetland Determination, Onsite Inspection Necessary) and subsequent related guidance memoranda. Additionally, because the project site was in agricultural production, it was appropriate to utilize the Illinois NRCS Wetland Mapping Conventions of 1998 as defined in the National Food Security Act Manual (NFSAM) to aid in delineating farmed wetlands. Forty-six (46) wetlands totaling 54.82 acres were delineated within the project site using a combination of these methods. However, only 33.78 acres are located within the proposed project permit boundary (Appendix 1; Figures 9a, 9b, and 9c).

Based on the current mine layout and the information gathered during the wetland delineations, approximately 12.12 acres of impacts to wetlands or other waters of the United States are anticipated due to the proposed mine development. Regulatory authority for wetland impacts within the project permit boundary rests with the Louisville District Army Corps of Engineers (ACOE).

2.0 Introduction

Hillsboro Energy, LLC is proposing to construct an underground coal mine, Deer Run, in Montgomery County, Illinois. The project site is approximately 900 acres and is located west of Hillsboro, south of Schram City, and northwest of Taylor Springs (Appendix 1, Figure 1). Joseph Bartletti, (Environmental Scientist), Ryan Keith (Environmental Scientist), and Meghan Oh (Chemist) performed wetland surveys on July 18, July 20, July 24, July 26, and September 5, 2007 for the proposed underground mine (See Resumes in Appendix 8). The purpose of these surveys was to determine the presence and extent of wetlands and waters of the U.S. within the proposed project site. This wetland delineation report documents findings based on site conditions present at the time of the field delineation and includes several areas outside of the proposed project permit boundary (Appendix 1; Figure 4).

The project site is located within parts of Sections 12, 13, 7, 17, and 18 in Montgomery County, Illinois (Appendix 1; Figure 1). Generally, the site is located directly west of the City of Hillsboro, between the Conrail Railroad and Schoolhouse Road. The project site

is bordered on the north by CR 1050, south by 9th Street and west by Conrail railroad tracks (Appendix 1; Figure 4). Forested areas border several of the major drainage features within the project site, including several unnamed tributaries of the Middle Fork of Shoal Creek. Two small impoundments are located in the northwestern corner of the project site. The site is located within the Cress Creek-Middle Fork Shoal Creek Watershed, HUC 12: 071402030204 (Appendix 1; Figure 3). Currently, the project site is used primarily for agricultural row crops (corn, soybeans).

3.0 Project Description

Hillsboro Energy, LLC has proposed the development of an underground coal mine, Deer Run. The construction of the underground mine and surface facilities will include the excavation of an incline slope to reach the coal seam and the construction of two vertical shafts, constructed by drilling or conventional sinking methods. Initial underground mining will consist of a continuous miner section developing mains with the Room and Pillar mining system. Longwall mining will begin after the headgate, tailgate, and bleeder entries are completed for the first Longwall panel. Longwall mining creates an almost complete extraction of the coal reserve which allows the overburden to subside in a controlled and predictable manner. Additional construction within the permit area will include a coal preparation plant, transportation facilities, refuse disposal areas, reclaim tunnels, drainage control structures, various administrative and storage facilities, elevator facilities, ventilation facilities, overland conveyors, screens, crusher, power distribution facilities, power lines, water lines, and topsoil and subsoil stockpiles areas, among other projects. The proposed permit area is approximately 800 acres and is located southeast of Hillsboro, Illinois (Appendix 1; Figure 4).

4.0 Background Information

Publicly available background information was reviewed prior to conducting the field investigation, including:

- USFWS National Wetlands Inventory (NWI) digital wetlands data (Appendix 1; Figure 5)
- USGS 7.5-minute topographic quadrangle map (Appendix 1; Figure 2)
- Federal Emergency Management Agency (FEMA) Flood Hazard Boundary Map (FHBM) Information (Appendix 5)
- Montgomery County FSA Farmed Wetland Maps (Appendix 1; Figure 6a and 6b)
- Current and Historic Aerial Photography (Appendix 4)
- Montgomery County Soil Survey Information (Appendix 1; Figure 7)
- Illinois Environmental Protection Agency (IEPA) Biological Stream Characterization (BSC) Report (Bertrand et al., 1996)
- Illinois Natural History Survey (INHS) Biologically Significant Streams (BSS) (Illinois Natural History Survey, 1992)
- Illinois NRCS Climate Center WETS Table (Appendix 6)

National Wetlands Inventory (NWI) Map Information

The National Wetlands Inventory (NWI) mapping produced by the U.S. Fish and Wildlife Service (USFWS) was reviewed prior to the field investigation. These maps provide information on the characteristics, extent, and status of the Nation's wetlands and deepwater habitats. NWI Geographic Information Systems (GIS) data was obtained for the project site from the USFWS website using the wetlands data extraction tool (http://wetlandswms.er.usgs.gov/imf/imf.jsp?site=extract_tool).

The NWI map shows numerous potential wetland areas within and adjacent to the project site (Appendix 1; Figure 5). Table 1 below lists the types of NWI sites within the project site.

Table 1: Mapped NWI Wetlands within the Project Site

NWI Map Code	Map Code Description	Acres in Project Site	Linear Feet in Project Site
PFO1A	Palustrine, Forested, Broad-Leaved Deciduous , Temporarily Flooded	0.02	- - -
PUBGH	Palustrine, Unconsolidated Bottom, Intermittently Exposed, Diked/Impounded	15.97	- - -
PUBGH	Palustrine, Unconsolidated Bottom, Intermittently Exposed, Diked/Impounded	1.18	- - -
PABGH	Palustrine, Aquatic Bed, Intermittently Exposed, Diked/Impounded	0.39	- - -
PEMAH	Palustrine, Emergent, Temporarily Flooded, Diked/Impounded	0.59	- - -
PEMAD	Palustrine, Emergent, Temporarily Flooded, Partially Drained/Ditched	1.15	- - -
PFO1A	Palustrine, Forested, Broad-Leaved Deciduous , Temporarily Flooded	2.17	3,155
R4SBFX	Riverine, Intermittent, Stream Bed, Semipermanently Flooded, Excavated	2.19	3,173
R4SBF	Riverine, Intermittent, Stream Bed, Semipermanently Flooded	0.50	720
	TOTALS:	24.16	7,048

United States Geological Survey (USGS) Topographic Map Information

One 7.5-minute (1:24,000) topographic map was reviewed prior to the field investigation (Appendix 1; Figure 2). Topographic maps illustrate elevation contours, intermittent and permanent water features, forests, and other cultural features. Topographic maps can suggest the presence of drainages and depressions where wetlands may occur.

The topographic map indicates the presence of potential wetland areas and waters of the U.S. within the project site. The project site is located entirely within the 1974,

Hillsboro Quadrangle, which depicts six blue line streams and three impoundments within the project site. One of the unnamed tributaries flows to the northeast into a large tributary of Lake Hillsboro. Four of the tributaries flow into the large impoundment in the northwest corner of the project site. The tail waters of the impoundment continue west under the rail road and flow north through the City of Hillsboro, before emptying into the Middle Fork of Shoal Creek. Another tributary flows south into Miller Creek. Additionally, the mapping indicates nearly all of the tributaries are forested.

Federal Emergency Management Agency (FEMA) Flood Hazard Boundary Map (FHBM) Information

The 1981 FHBM for the unincorporated areas of Montgomery County, Illinois (Community-Panel # 1709920006A) was accessed through the FEMA online map store (Appendix 5). The FHBM shows that the project site is not within a 100 year floodplain; however, it does show numerous small tributaries within or adjacent to the project site, and depicts two large impoundments and two smaller depressions within the project site.

Montgomery County FSA Farmed Wetlands Maps

Farmed wetlands maps are produced and maintained by each county's Farm Service Agency (FSA) or Natural Resource Conservation Service (NRCS) office. The maps depict areas of wetlands within agricultural areas. Farmed wetland mapping was obtained for the project site from the Montgomery County FSA/NRCS office in the City of Hillsboro, Illinois (Appendix 1; Figures 6A and 6B). The 1988 farmed wetland map depicts the majority of the project site as prior converted (PC), not-highly erodible (NHEL) or highly erodible (HEL) non-wetland (NW); however, the forested drainages are not listed with a descriptive code. Both impoundments were listed as artificial wetlands (AW) and a small linear area surrounding a drainage in the southern half of the project site was designated as enrolled in the Conservation Reserve Program (CRP).

The 1999 farmed wetland map is of better quality; however, it is very similar to the 1988 map. One major difference is the inclusion of an area designated as a large farmed wetland (FW) in the southeastern portion of the project site. The two impoundments are still designated as artificial wetlands (AW), and the forested drainages are undesignated. In general the farmed wetland mapping does not vary significantly from the NWI mapping, but does provide another tool for confirming the presence of wetlands within the project site.

Current and Historic Aerial Photography

Several vintages of aerial photographs were obtained from the Illinois State Geological Survey (ISGS) and the USDA Geospatial Data Gateway (http://datagateway.nrcs.usda.gov/). Aerial photographs provide a snapshot in time, serving as a historic guide to document natural and anthropogenic changes to a particular site. Photographic resources assist with the identification of wetness signatures, hydrologic features and other natural areas. Five vintages of black and white photography (1938, 1962, 1988, 1998, and 2005) were acquired for the project

site. Additionally, two color vintages were acquired (2004 and 2006). The aerial images obtained for the project site are located in Appendix 4.

Montgomery County Soil Survey Information

The USDA NRCS digital soils data for Montgomery County, Illinois was obtained from the USDA Geospatial Data Gateway and represents the most current soils data for the project site (Appendix 1; Figure 7). To supplement the digital soils data, more specific soil information was obtained from the USDA Soil Data Mart and the USDA National Cooperative Soil Survey (NCSS) Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/). In addition, soils for the project site were mapped and described in the Montgomery County Soil Survey (Downey and Odell, 1969) (Appendix 1, Figure 8). These documents were reviewed prior to field investigations to determine specific information regarding the site soils.

The Montgomery County soil survey (Downey and Odell, 1969) indicates the project site resides within three associations the Herrick-Piasa, Cowden-Piasa, and Oconee-Velma-Tamalco Soil Associations. The Herrick-Piasa Association is located on broad, nearly level upland divides with few depressions. Natural drainage through these soils is poor, and permeability is moderate to very slow. The Cowden Piasa Soil Association is located on broad flats and contains depressions, and small gentle sloping ridges. Natural drainage through these soils is also very poor, because the subsoils are slowly to very slowly permeable and cause extended periods of wetness. The Oconee-Velma-Tamalco Association is located within the rolling glacial drift plain and is found along entrenched streams. Erosion is a serious problem and hazard within this association and permeability is moderate to very slow; however, water does not typically stand on these soils. Numerous ephemral and intermittent drainage features are depicted on the 1969 soil survey maps. Additionally, the maps indicate several areas within the project site as wet spots (Appendix 1; Figure 8).

Thirty specific soil types from seventeen distinct soil series are mapped within the project site (Appendix 1; Figure 7). Table 1 summarizes the acreages and hydric rating of the soils within the project site. Six of the soils within the project site are listed as fully hydric and comprise 40.9% of the total area, while an additional eleven soil types are listed as partially hydric and comprise 40.6% of the total area. Seven of the ten soil series within the project area were encountered during the field observations.

Table 2: Mapped Soils types within the Project Site

Map Unit Symbol	Soil Map Unit Name	Slope	Soil Map Unit Hydric Rating	Acres in Project Site
5C2	Blair silt loam, eroded	5-9%	Not Hydric	6.47
5C3	Blair silt loam, severely eroded	5-9%	Not Hydric	10.32
8D2	Hickory loam, eroded	7-12%	Not Hydric	8.86
8D3	Hickory loam, severely eroded	7-12%	Not Hydric	32.61
8E2	Hickory loam, eroded	12-18%	Not Hydric	7.98
8F	Hickory loam	18-30%	Not Hydric	2.27
46	Herrick silt loam	0-1%	Partially Hydric	3.40
48	Ebbert silt loam	0-1%	Hydric	28.82
50	Virden silty clay loam	0-2%	Partially Hydric	47.58
112	Cowden silt loam	0-1%	Hydric	68.17
113A	Oconee silt loam	0-2%	Partially Hydric	13.85
113B	Oconee silt loam	2-4%	Partially Hydric	191.58
113B2	Oconee silt loam, eroded	2-4%	Partially Hydric	4.48
113C	Oconee silt loam	4-7%	Partially Hydric	30.94
113C2	Oconee silt loam, eroded	4-7%	Not Hydric	35.44
127B	Harrison silt loam	2-4%	Partially Hydric	0.00
214B	Hosmer silt loam	2-4%	Not Hydric	0.87
214D2	Hosmer silt loam, eroded	7-12%	Not Hydric	0.01
250C2	Velma loam, eroded	4-7%	Not Hydric	33.35
250D	Velma loam	7-12%	Not Hydric	1.33
250D2	Velma loam, eroded	7-12%	Not Hydric	8.20
287A	Chauncey silt loam	0-3%	Hydric	0.81
581B	Tamalco silt loam	2-4%	Not Hydric	9.40
993A	Cowden-Piasa complex	0-2%	Hydric	256.30
993B2	Cowden-Piasa complex, eroded	2-4%	Hydric	3.34
994A	Oconee-Tamalco complex	0-2%	Partially Hydric	40.51
994B	Oconee-Tamalco complex	2-4%	Not Hydric	10.86
995	Herrick-Piasa complex	0-2%	Partially Hydric	34.46
3451	Lawson silt loam, frequently flooded	0-2%	Partially Hydric	3.57
8074	Radford silt loam, occasionally flooded	0-2%	Not Hydric	0.36
W	Water	- - -	Hydric	15.33
			TOTAL:	911.5

Illinois Environmental Protection Agency (IEPA) Biological Stream Characterization (BSC)

The Illinois Environmental Protection Agency (IEPA) Biological Stream Characterization (BSC) report (1996) is based on a multi-tiered classification system that rates the quality of Illinois' streams based on their biotic communities and water quality. This classification system groups streams within major watershed basins and rates streams over multiple reaches. Many headwater and unnamed streams were not rated and do not appear in the report. None of the unnamed tributaries within the project site boundary or Miller Creek were rated; however, the Middle Fork of Shoal Creek (mouth up to Glen Shoals Dam) outside of the project site boundaries was rated as a Class C stream or moderate aquatic resource.

Illinois Natural History Survey (INHS) Biologically Significant Streams (BSS)

The Illinois Natural History Survey (INHS) has identified Biologically Significant Streams (BSS) in Illinois by expanding on the IEPA's BSC ratings using additional information on biodiversity, threatened and endangered species, watch list species, and mussel diversity. None of the unnamed tributaries within the project site were rated as BSS. Furthermore, the downstream receiving stream, the Middle Fork Shoal Creek, is not listed as a BSS.

Illinois NRCS Climate Center WETS Table

Illinois NRCS WETS table data was downloaded from the NRCS National Water and Climate Center website (http://www.wcc.nrcs.usda.gov/climate/wetstate.html). This data provides average monthly climatic data for precipitation and temperatures from 1971-2001, and is used to determine average annual precipitation patterns for the period of time prior to the date of the aerial photography that is being used when deciphering wetness signatures. The WETS table data for Montgomery County is listed in Appendix 6.

Shoal Creek Watershed Structure No. 5

A large impoundment was identified within the project site from aerial photographs and USGS topographic mapping. The Illinois Department of Natural Resources, Office of Water Resources (IDNR, OWR) was contacted to gather more information regarding the reservoir. IDNR provided HDR|CWI with a copy of a 1981 Dam Inspection Report, completed by the CORP of Engineers (Department of Army, Chicago District Corp of Engineers, 1981). The reservoir, know as Shoal Creek Reservoir Structure No. 5, is a flood impoundment structure on an intermittent tributary of the Middle Fork of Shoal Creek. The reservoir was designed by the USDA, Soil Conservation Service in 1962 and was completed in 1973 for flood and silt control. The reservoir, when constructed, had a normal pool elevation of 602.0 ft. It is maintained by an uncontrolled R.C.P. drop inlet spillway with a 30 inch pipe. The reservoir at normal pool is 25.8 acres, and is approximately 14 feet deep. This reservoir helps to dictate the hydrology within many of the wetlands and stream channels within the site.

5.0 Methods

Wetland determinations of the project site were conducted in accordance with the 1987 Army Corps of Engineers Wetland Delineation Manual (Routine Wetland Determination, Onsite Inspection Necessary) and subsequent related guidance memoranda. Additionally, because the project site was in agricultural production, it was appropriate to incorporate information into the delineation using the Illinois NRCS Wetland Mapping Conventions of 1998 as defined in the National Food Security Act Manual (NFSAM). Wetland mapping conventions are a set of accepted practices or procedures used in making offsite wetland inventories, and on site determinations.

Routine Wetland Determination, Onsite Inspection Necessary

The Onsite Inspection Necessary determinations and delineations focused on areas both outside and within agricultural production. HDR|CWI personnel surveyed the project site for the three wetland parameters, including (a) hydric soils, (b) surface or subsurface hydrology, and (c) hydrophytic vegetation. If all three indicators were present during the survey, then the area was considered a wetland. Potential "waters of the United States" that were not wetlands were identified using the U.S. Geological Survey (USGS) topographic maps, the Montgomery County FSA aerial photographs, and Montgomery County 1969 Soil Survey mapping.

At each data point location, a soil pit was excavated for observation of soil and hydrologic characteristics. Vegetation was analyzed for plant species dominance in a five-foot radius from the sample pit for herb and shrub stratum, and in a 30-foot radius for the tree stratum. The wetland indicator status of plants was determined using the USFWS 1987 National List of Plant Species that Occur in Wetlands (Region 3), which includes Illinois. Hydric soil characteristics were identified using methods described in the 1987 COE manual and NRCS manual of Field Indicators of Hydric Soils in the United States. Local and national hydric soils lists and soil surveys were also referenced.

Illinois NRCS Wetland Mapping Conventions

Illinois NRCS Wetland Mapping Conventions were used to identify potential wetlands on aerial photographs within the agricultural areas of the project site. Wetland mapping conventions are primarily used for the evaluation of wetness signatures that reflect long term hydrologic conditions. Wetness signatures on the aerial photographs include hydrophytic vegetation, surface water, saturated soils, flooded or drowned-out crops, stressed crops (yellowing), inclusion of wet areas as set-aside, differences in vegetation patterns due to different planting dates, unharvested crops, isolated areas not farmed with the rest of the field, or patches of greener vegetation during dry periods. If wetness signatures are identified on numerous vintages of aerial photographs, the area may be a farmed wetland.

Global Positioning System (GPS) Survey

The locations of sample plots and wetland boundaries were surveyed using a Thales Mobile Mapper CE Global Positioning System (GPS), running ESRI ArcPad software. When operating at a Position Dilution of Precision (PDOP) of 4.0 or less, the unit is capable of collecting real-time data with sub-meter positional accuracy. During the field survey, PDOP values never exceeded 2.5, resulting in a sub-meter survey accuracy of all wetland boundaries. Collected points were uploaded and overlaid on the aerial photography utilizing ESRI ArcGIS and AutoDesk mapping products to provide a permanent record of the wetland delineation boundaries, while also producing the wetland maps provided in this report.

Climatic Data

Appendix 6 presents the summary of historic average climatic data from the Hillsboro, Illinois WETS station, the closest measurement station to the project site for 1971-2001.

Daily temperature and precipitation data for Litchfield, Illinois (the closest station with accessible daily weather records) are presented in Appendix 7 for June, July and August of 2007 (30 days prior to the delineation).

The temperatures during the delineation field days in July were just about average, with maximum temperatures ranging between 93 and 78 (F°) compared to a July average of 89.4 (F°). During the 30 days prior to the July delineation, precipitation totals in Litchfield were approximately 3.23 inches. Average precipitation levels for this area are 4.07 inches and 3.52 inches for June and July, respectively. Therefore, conditions were somewhat drier than average during the July wetland delineation field surveys.

The weather at the time of the delineation field day in September was hot, humid and dry with temperatures ranging from the upper 80s (F°) to the mid to upper 90s (F°). Conditions during the survey were mostly sunny to partly overcast. Very little precipitation occurred in the vicinity of the project area during the 30 days prior to the September delineation field day; precipitation totals in Litchfield were less than 0.5 inches. Average precipitation levels for the Hillsboro area are in August are 3.53 inches. Therefore conditions were much drier than average during the September wetland delineation field survey.

6.0 Wetland Determination and Delineation Results

Background information for the project site indicated the presence of numerous areas of potential wetlands and waters of the U.S., and helped to determine where data points should be taken. A summary of the wetland determination data sheets for the project site is presented in Table 3 below. Copies of the data sheets are included in Appendix 2. Eighty-five (85) wetland determination data sheets were prepared for the project site. Data points were collected within the boundaries of 46 wetland areas and within 37 upland locations outside of the wetland boundaries. The wetland delineation results, including the onsite wetland inspection discussion is presented by section, below. Figures 9a, 9b, and 9c show the data point locations and the delineated wetlands within the project site. Site photographs for each wetland location are presented in Appendix D.

T8N – R3W – Section 17

Ten (10) data points were collected within section 17 of the project site, and 5 wetlands were delineated (Appendix 1, Figure 9c).

Wetlands 1 and 2 were identified as scrub-shrub (PSS) wetlands surrounding two ephemeral stream channels. Wetland 3 was identified as an isolated emergent wetland, within a depressional area identified as a wet spot on the 1969 historic soil survey mapping (Appendix 1; Figure 8). Wetland 4 displayed wetness signatures on all vintages of aerial photography (Appendix 4) and was determined to be a farmed linear depressional feature, connected to wetland 1. Wetland 5 was listed on the NWI as PEMAD (Appendix 1; Figure 5), and is also identified on the 1999 FSA aerial photographs as farmed wetland (FW) (Appendix 1; Figure 6b).

T8N – R3W – Section 18

Twenty-five (25) data points were collected within section 18 of the project site, and twelve (12) wetlands were delineated (Appendix 1, Figures 9b and 9c).

Four of the wetlands (6, 7, 9, 10) delineated within the southern half of section 18, were small linear emergent wetlands that were being farmed. Wetland 8 was listed on the NWI as R4SBfx, indicating this area was an intermittent excavated stream channel dominated by hydrophytes (Appendix 1; Figure 5). Wetland 8 and its surrounding upland buffer area was also listed as enrolled in the CRP program on the FSA aerial photographs (Appendix 1; Figure 6a-6b). One large emergent wetland (wetland 19) associated with an erosional channel was delineated within a corn field. Additionally, another small emergent wetland (wetland 23) was delineated surrounding a small ephemeral channel within a grass waterway.

The remaining 5 wetlands delineated within this section were all classified as forested wetlands and are associated with narrow ephemeral and intermittent stream channels. Wetlands 29, 30, 36, and 37 are narrow, incised, ephemeral 1st or 2nd order stream channels with a small riparian bench surrounding the channel. Erosional down cutting has isolated these streams from the surrounding riparian forest, and flows appear to be very short in duration. Wetland 31 is a forested, intermittent, 3rd order stream channel and is listed on the NWI as a linear forested wetland (PFO1A), measuring 3,155 feet. Wetland 31 contains a small riparian bench surrounding the channel and is deeply incised within the riparian forest. The stream bottom exhibited undulation and was composed of sand, gravel and some cobbles. Most of the channel was dry; however, small pockets of water were located within the deepest pools along the stream. Wetland 31 receives drainage from the other delineated stream channels and flows northwest off the project site before entering into Shoal Creek Reservoir Structure No. 5.

T8N – R3W – Section 7

Twenty-one (21) data points were collected within section 7 of the project site, and eleven wetlands (11) were delineated (Appendix 1, Figure 9a and 9b).

Wetland 11 and wetland 20 were small, linear emergent wetlands that were being farmed during the time of the survey. Five additional wetlands sites (13, 14, 15, 17, and 18) were delineated as non-farmed emergent wetlands. Wetland 13 is located within a small grassed waterway and is mapped as a wet spot on the 1969 historical soil survey aerial photograph (Appendix 1, Figure 8). Wetland 14 was indicated as a former farm pond on the USGS topographic map (Appendix 1, Figure 2), and was also listed on the NWI as PUBGH and PABGH, indicating this area was an impoundment, with a portion of the site being dominated by and aquatic bed (Appendix 1, Figure 5). Currently, the pond holds very little water; however, it maintains a lush littoral zone dominated by a diverse assemblage of hydrophytes. Wetland 15 is located behind wetland 14, and surrounds a small channel within a grass waterway. Wetlands 17 and 18 are emergent wetlands associated with an erosional channel within a corn field.

Three wetlands delineated within this section were classified as forested wetlands and are associated with narrow, ephemeral and intermittent stream channels. Wetlands 24, 25, and 26, are narrow, incised, 2nd order stream channels with a small riparian bench

surrounding the channel. Erosional down cutting has isolated these streams from the surrounding riparian forest, and flows appear to be very short in duration. Wetland 38 is connected to wetland 25 and is located within a riparian floodplain surrounding the intermittent stream channel as it enters Shoal Creek Watershed Reservoir Structure No. 5. The riparian flood zone surrounding the stream becomes much wider as its approaches the lake and supports a lush herbaceous layer of obligate wetland species with a canopy of willows.

T8N – R4W – Section 12

Section 12 within the project site was partially farmed in 2007; however, it also contained Shoal Creek Watershed Structure No. 5. Sixteen (16) data points were collected, and twelve (12) wetlands were delineated within section 12 of the project site.

Wetland 12 was identified on the 1969 historic soil survey aerial photograph as a wet spot and was delineated as a small, emergent farmed wetland. Wetland 16 was located in a small depressional area along the western boundary of the project site, and was dominated by a scrub-shrub wetland community, with a fairly developed understory of herbaceous hydrophytes.

Two wetlands delineated within this section were classified as forested wetlands and are associated with narrow ephemeral stream channels. Wetlands 27 and 28 are narrow, incised, stream channels with a small riparian bench surrounding the channel. Erosional down cutting has isolated these streams from the surrounding riparian forest, and flows appear to be very short in duration.

The remainder of the wetlands delineated in this section were associated with Shoal Creek Watershed Reservoir Structure No. 5. Wetlands 39 and 40 are located within the riparian floodplain surrounding two ephemeral stream channels as they enter Shoal Creek Watershed Reservoir Structure No. 5. The riparian flood zone surrounding the streams becomes much wider as they approach the lake. Both forested wetlands support a lush herbaceous layer of obligate wetland species with a sparse canopy of willows. Wetlands 41, 42, 43, and 44 were delineated as part of the forested riparian flood zone surrounding intermittent stream channels as they become much wider and enter Shoal Creek Watershed Reservoir Structure No. 5. Wetland 45 is a forested riparian drainage behind Shoal Creek Watershed Reservoir Structure No. 5, listed on NWI as R4SBF. Wetland 45 is a narrow, incised, forested riparian stream channel, and appears to maintain relatively permanent flows. Most of the stream channel accommodated the flow; however, a small riparian bench in some parts of the channel was vegetated with hydrophytic species. Wetland 46 encompasses the open water and extensive littoral zones of Shoal Creek Watershed Reservoir Structure No. 5. The littoral zone extends around the entire margin of the lake body and adjoins several other forested wetland drainages as they enter into the reservoir.

T8N – R3W – Section 13

Most of section 13 within the project site was not farmed in 2007 and was fallow during the time of the field survey. Thirteen (13) data points were collected and six (6) wetland sites were delineated within section 13 of the project site (Appendix 1, Figure

9b). Four of the wetlands (32, 33, 34, and 35) delineated were classified as forested wetlands and are associated with narrow ephemeral stream channels. These four wetlands are narrow, incised, ephemeral 1st or 2nd order stream channels with a small riparian bench surrounding the channel. Erosional down cutting has isolated these streams from the surrounding riparian forest, and flows appear to be very short in duration. Wetlands 21 and 22 were classified as linear emergent wetlands surrounding small ephemeral 1st or 2nd order stream channels.

Table 3: Summary of Wetland Observations

Site #	NWI Code[1]	Total Delineated Acres	Acres within Permit Boundary	Classification	Impacted Acreage
1	---	3.41	3.41	PSS	3.41
2	---	1.2	1.2	PSS	1.20
3	---	0.72	0.72	PEMf	0.72
4	---	1.2	1.2	PEMf	1.21
4	---	0.1	0.1	PEMf	0.10
5	PEMAd	5.01	5.01	PEMf	0.00
6	---	0.21	0.21	PEMf	0.00
7	R4SBFx	0.26	0.26	PEMf	0.00
8	R4SBFx	1.89	1.89	R4SBFx	0.26
9	---	0.22	0.22	PEM	0.00
10	---	0.05	0.05	PEM	0.00
11	---	0.31	0.31	PEMf	1.08
12	---	0.58	0.58	PEMf	0.58
13	---	0.1	0.1	PEM	0.10
14	PUBGh-PABGh	1.84	1.84	PEM	0.00
15	---	0.14	0.14	PEM	0.00
16	---	0.96	0.96	PSS	0.03
17	---	0.42	0.42	PEM	0.42
17	---	0.05	0.05	PEM	0.05
18	---	0.07	0.07	PEM	0.42
19	---	0.32	0.32	PEM	0.32
20-A_1	---	0.08	0.08	PEMf	0.08
20-A_2	---	0.08	0.08	PEMf	0.08
20-A_3	---	0.19	0.19	PEMf	0.19
21	---	1.5	1.5	PEM	0.35
22	---	0.04	0.04	PEM	0.00
23	---	0.06	0.06	PEM	0.00
24	---	0.35	0.35	PFO1A	0.05
25	---	0.85	0.85	PFO1A	0.04
26	---	1.35	1.35	PFO1A	0.06
27	---	0.39	0.14	PFO1A	0.00
28	---	0.34	0.34	PFO1A	0.29
29	---	0.97	0.97	PFO1A	0.10
30	---	0.15	0.15	PFO1A	0.10
30	---	0.04	0.04	PFO1A	0.00
30	---	0.08	0.08	PFO1A	0.06
31	PFO1A	4.39	4.39	PFO1A	0.60
32	---	0.07	0.07	PFO1A	0.00
33	---	0.26	0.26	PFO1A	0.00
34	---	0.37	0.37	PFO1A	0.00
35	---	0.01	0.01	PFO1A	0.01
36	---	0.48	0.48	PFO1A	0.04
37	---	0.12	0.12	PFO1A	0.06
38	PUBGh-PEMAh	3.49	1.43	PFO1A	0.00
39	PUBGh	1.55	0.8	PFO1A	0.00
40	PUBGh	1.21	0.46	PFO1A	0.00
41	PUBGh	0.4	0.0	PFO1A	0.00
42	PUBGh	0.41	0.0	PFO1A	0.00
43	---	0.3	0.0	PFO1A	0.00
44	---	0.3	0.0	PFO1A	0.00
45	R4SBF	0.11	0.0	R4SB3F	0.00
46	PUBGh	15.82	0.11	PEM/Open Water	0.11
	TOTALS	**54.82**	**33.78**		**12.12**

[1] National Wetlands Inventory Mapping Wetlands and Deepwater Habitats Classification Code

7.0 Conclusions

Based on the data described above, it was determined that 46 wetland areas are present. A total of 54.82 acres of wetlands were delineated within the project site during the field surveys; however, only 33.78 acres are within the proposed permit boundary. The proposed development will impact in whole or parts of 30 wetland sites for a total of 12.12 acres of impacts. A jurisdictional determination will be required by the Louisville District of Army Corp of Engineers to confirm the boundaries of the delineated wetlands and waters of the U.S. The proposed impacts to waters of the U.S. and/or wetlands will require an Individual 404/401 permit, and will require mitigation for these impacts.

Appendix 1-Figures

APPLICATION FOR SURFACE COAL MINING AND RECLAMATION OPERATIONS PERMIT – DEER RUN

Part I – Applicant Information

Part II – Premining Information

Part III – Hydrogeological Information

Part IV – Operations Plan

Part V – Reclamation Plan

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PART III

Part III

HYDRO-GEOLOGIC INFORMATION

1) Regional Hydrogeologic Characteristics

As described in Illinois State Geological Survey Circulars 105, 225, Circular 519, Open File Series 1996-2, Bulletin 95, etc., other sources or personal knowledge provide the following required hydrogeologic information.

A) Describe the major and minor surficial aquifers of the permit area and adjacent areas.

Response: ***Major surficial aquifers – None***

Minor surficial aquifers - Scattered and discontinuous sand and gravel deposits occur throughout the permit area in northeast to southeast trending belts.

B) List the major and minor drift, bedrock valley, and buried bedrock valley aquifers of the area.

Response: ***Major drift aquifers - None.***

Minor drift aquifers - Drift filled valleys associated with East Fork Shoal Creek and its larger tributaries have been found to contain thicker sand and gravel deposits. Drift deposits to the west and southeast are generally thin with minimal water yields contained within the glacial till.

Major bedrock valley aquifers - None.

Minor bedrock valley aquifers - None.

Major buried bedrock valley aquifers - None.

Minor buried bedrock valley aquifers - None.

C) List the major and minor bedrock aquifers in the area.

Response: ***Major bedrock aquifers - None.***

Minor bedrock aquifers - Pennsylvanian sandstones have been a source of water for small domestic and farm supply throughout the central and south-central portions of the county.

D) List the generalized water yield, supply, and potential use of these aquifers.

Response: ***The proposed mine is located in the glaciated upland area of south-central Montgomery County. It is situated at the headwaters of the major drainage systems of the region. In this area, no specific geologic unit has been identified as a major surficial aquifer. According to Illinois State Geological Survey (ISGS) Circular 225, the best potential sources of groundwater are sand and gravel deposits in the major valley systems. However, many of the surficial sand and gravel deposits throughout the county are narrow and discontinuous. The bottomlands of the East Fork Shoal Creek drainage system has been found to contain thicker deposits and has produced sufficient yields for communities such as Nokomis to the north. Drift aquifers are generally thin with low yields throughout the permit area. The Pennsylvanian age sandstone bedrock aquifers can usually provide only enough water for individual domestic and farm supplies. Yields from wells completed in these formations are usually less than 10 gallons per***

minute with yields less than 5 gallons per minute common. The low permeabilities of the Pennsylvanian System rocks cause the water in the deeper formations to be highly mineralized. Therefore, some deeper bedrock aquifers may contain water whose quality is unsatisfactory without expensive treatment and, generally, are not developed. Recharge to these bedrock aquifers is primarily from precipitation which percolates into and through the overlying unconsolidated materials.

2) Area Specific Hydrogeologic Characteristics

A) 1) Provide a description of the areal and structural geology of the permit, shadow area and adjacent areas for the deeper of either the stratum immediately below the lowest coal seam to be mined, or any aquifer below the lowest coal seam to be mined which may be adversely impacted by mining. Provide logs showing the lithologic characteristics including physical properties and thickness of each stratum and the location of groundwater where encountered. Provide location and elevations of test borings or core samplings on pre-mining land use map or other designated map.

Response: ***Refer to Hydro-Geological Map (Map 4). The proposed mine is located in the south-central part of the Illinois Basin. The two principal coal seams with mineable thickness are the Herrin No. 6 and the Springfield No. 5 Seam, and a part of the Carbondale Formation of the Middle Pennsylvanian Age. All overlying strata up to the unconsolidated soils also belong to the Pennsylvanian System. The soils materials were deposited during the Pleistocene and range from 110 to 155 feet. The soils zone consists of clays, gravels and discontinuous sand deposits and does not perform reliably as an aquifer.***

There are no major aquifers in the mine area or in the adjacent area. The shallower Pennsylvanian sandstones and limestones may be considered as minor aquifers with low permeability and porosity and are more mineralized with depth. Yields are low in the range of 1 to 10 gallons per minute. Use of these resources has been limited to small domestic and farm supplies.

Regional dip for the Herrin No. 6 seam is to the southeast at less than one percent. However, variations occur locally in the strata as evidence from the borings and surrounding mines in the No. 6 Seam. The depth to the No. 6 Seam ranges from 460 vertical feet to 540 vertical feet with seam floor elevations ranging from 146 feet above MSL in the southwest corner of the shadow area and an elevation of 118 feet below MSL in the southeast corner.

The Herrin No. 6 seam is overlain by gray to black carbonaceous and silty shale regionally identified as the Energy Shale. The thickness ranges from zero to 5 feet as found in the drillholes in the mining assignment. Above the Energy Shale is a black shale regionally identified as the Anna Shale. This shale has silty material. The thickness of the Anna Shale is zero to 8 feet as found in the corehole data. The Brereton Limestone is found as the next unit above the Anna Shale. This limestone is described as hard. It ranges in thickness from one foot to 16 feet.

The immediate floor of the Herrin No. 6 seam is described as claystone, underclay and/or shale. This material ranges in particle size from very silty at the top of the material to grainy at the bottom. The thickness ranges from 3 inches to 14 feet. Beneath this material, the floor material grades to sandy shale and then limestone.

Borehole information is provided on Hydro-Geological Map (Map 4), Geologic Section "A" (Map 9), Geologic Section "B" (Map 10). The boreholes were drilled and logged in 2007 by Goff and Pruitt Drilling, Inc. and by Magnum Drilling Services, Inc. Geologic Sections "A, B, C and D" above the Bedrock are located in Part VII, "Hydrogeologic Investigation", Appendix A-Boring Location Map and Cross Sections. The drillers were Atlas Soils, Inc.

2) Provide chemical analyses of each stratum down to and including the deeper of either the stratum immediately below the lowest coal seam to be mined or any aquifer below the lowest coal seam to be mined which may be adversely impacted by mining.

The analyses shall identify those strata that may contain acid or toxic-forming or alkalinity-producing materials and determine their content.

Response: ***A detailed acid/base account has been generated from Corehole 08-03-17-04. The results are labeled as Attachment Part III.2.A.2.***

3) Provide coal seam(s) name and number and an analysis of the coal seam(s) as to total sulfur and pyritic sulfur. On the pre-mining land use, operation, or other designated map show all coal crop lines and the strike and dip of the coal to be mined.

Response: ***Corehole 08-03-17-04 coal quality had the following results:***

	The Herrin No. 6 Seam
Pyritic Sulfur	***2.14% Dry***
Organic Sulfur	***1.97% Dry***
Sulfate Sulfur	***0.19% Dry***
Total Sulfur	***4.03% Dry***

Refer to Attachment III.2.A.3, Sulfur Forms Result Sheet from Appalachian Laboratories, Inc. Refer to Underground Operations Map (Map 6 U.G.).

4) For room and pillar mining operations, the thickness and engineering properties of clay or soft rocks such as clayshale, if any, in the stratum immediately above and below each coal seam to be mined.

Response: ***The Deer Run Mine will be a Longwall Operation.***

5) Applicants may request that the Department waive in whole or in part the information required under questions 2 thru 4 above. Waiver requests should be submitted to the Department for review prior to submission of an application. Applications containing unapproved waiver requests may result in prolonging the application review or in application denial.

Response: ***A waiver of the above information is not requested.***

B) Ground Water Information

1) Provide the location on the hydrologic or other designated map, and ownership of existing wells, springs, and other ground water resources for the permit area and adjacent area.

Response: ***Refer to Identification of Interests Map (Map 2) and Hydro-Geological Map (Map 4) for information regarding the location and ownership of known existing wells and other ground water supplies within the proposed shadow area and within 1/2 mile of the shadow area boundary. Refer to Attachment IV.3.B.5.c-Primary Wells.***

2) Provide a description of seasonal ground water quality including at a minimum the following:

pH
total dissolved solids
hardness
alkalinity
acidity
sulfates
total iron
total manganese
total chlorides

Response: ***Refer to Schedule B Attachment III.2.B.2 for the results of the ground water monitoring completed to date. Future sampling will be used to describe seasonal variations in groundwater quality.***

3) Provide a description of seasonal ground water quantity including at a minimum the appropriate rates of discharge or usage and the elevation of potentiometric surface of the coal to be mined, and in each water-bearing stratum above the coal to be mined, and in each water-bearing stratum below the coal to be mined which may be potentially impacted.

Response: ***The location of the potentiometric surface of the coal to be mined is undetermined. Possible water bearing strata could include discontinuous lenses of the Trivoli Sandstone ranging from approximately 310 to 340 feet vertically above the No. 6 Seam and the Anvil Sandstone intermittently located above the Brereton Limestone (approximately 80 to 135 feet vertically above the No. 6 Seam) appear to be the only identifiable sandstones in the geologic column. ISGS data for the region indicates that the potential of water production is minimal and the potential for groundwater recharge is limited due to the extent of impermeable shales found above and below the sandstones and coal beds.***

C) Surface Water Information

1) Provide the name, location, ownership, and description of all surface water bodies, lakes, streams, impoundments, and springs within and adjacent to the proposed permit and shadow areas. Provide the location of any discharge or drainage into any surface water bodies listed above.

Response: ***The location of the proposed mining area is within the upper reaches of several larger watersheds and provides flat to gentle physical relief. There are a few small water bodies that may be of 20 acre feet capacity or greater within the shadow area. Streams above the shadow area are considered to be intermittent and are charged by runoff from precipitation events. Known springs in the shadow area are listed in Attachment I.2.B and appear to be for farm animal use only. There are also several farm ponds in the area.***

Refer to Hydro-Geological Map (Map 4)

2) Provide for surface water bodies listed under 2)(c)(1) above information on surface water quality and quantity sufficient to demonstrate seasonal variation and water usage.

a) Water quality description shall include at a minimum, baseline information as follows:

pH
total suspended solids
total dissolved solids

alkalinity
acidity
sulfates
total iron
total manganese
total chlorides

Response: ***Refer to Attachment III.2.C.2 for baseline monitoring information of surface water streams in the permit area.***

b) Water quantity description shall include at a minimum base information on seasonal flow rates.

Response: ***Refer to Attachment III.2.C.2 for information on flow rates during the monitoring period. The data reflect significant periods of "no flow" that are typical of ephemeral headwater steams in the area. Most of the streams only flow in direct response to rainfall. Thus, the flow rates vary depending on the size of the watershed, antecedent moisture conditions and the amount of precipitation.***

D) Protection of Hydrologic Balance

1) The applicant shall provide a determination of the probable hydrologic consequences, (PHC) of the proposed shadow operations, on the proposed permit area, and adjacent areas with respect to the hydrologic regime and water quality and quantity in surface and ground water systems under all seasonal conditions. The determination of PHC shall include findings on the following:

a) Will the proposed surface coal mining and reclamation operations have adverse impacts to the hydrologic balance;

Response: ***Construction of the mine facilities and the ongoing surface activities will disturb the land surface and will inevitably result in some changes to the surface water and ground water systems due to changes in drainage patterns and storm water runoff characteristics. However, the proposed surface facilities and underground mining operations have been located and designed to minimize any changes to the prevailing hydrologic balance within the permit and adjacent area. Therefore, the proposed activities are not expected to have significant adverse impacts on the hydrologic balance within the proposed permit and shadow areas as well as the adjacent areas. The impacts that the surface facilities and underground mining operations will have on the surface and ground water regimes are different and, therefore, will be discussed separately.***

The effects on surface water quality will be negligible because the percentage of the watershed to be disturbed by the mining operation is small compared to the watershed of the receiving stream. Surface activities will expose buried strata to the atmosphere and surface water, which will tend to increase the total dissolved solids in surface runoff. Any toxic forming materials excavated during the shaft and slope construction will be carefully handled and covered with soil material to limit their exposure. Coal processing wastes will be placed in the refuse disposal area and during reclamation will be covered with soil materials to minimize contact with surface runoff. Therefore, pH levels should remain relatively unaffected. Should runoff from the refuse disposal area develop acidic characteristics, the runoff will be collected and neutralized to meet water quality standards. During mining and reclamation activities, erosion and sediment control measures will be applied to disturbed areas in order to minimize

contamination of surface runoff. During mining operations, sediment loading could improve over pre-mining conditions as a result of utilizing best management practices such as establishing and maintaining vegetative cover in areas that are currently cropland, construction of sedimentation basins, and decreasing peak flows and velocities by intercepting and retaining storm water runoff. As a result of the increased mineralization discussed above, which tends to cause fine suspended particles to coalesce and settle, suspended solids may be lowered as a result of the proposed activities. Runoff from disturbed areas, except exempted areas, will pass through approved sediment ponds for treatment before release and will meet appropriate water quality criteria (NPDES). Further discussion of the potential impacts of the surface facilities on specific surface water quality parameters is presented below in Part III.2.D.1.D.

Surface Facilities Impacts to Ground Water - Due to the nature of the surface facilities, activities on the surface would be more likely to impact surficial aquifers, if they were present, than the deeper bedrock aquifers. The placement of development waste and coal refuse on the surface is unlikely to have any effect on bedrock aquifers because there is little relationship between these deeper aquifers and local infiltration. The thin mantle of glacial till on the surface consists primarily of clay, gravel and silt sized materials and lacks continuous sand lenses, which severely limits infiltration and the amount of ground water present. A Hydrogeologic Investigation of the permit area prepared by Hurst-Rosche Engineers, Inc., and included herewith as Part VII-Appendix identifies the presence of a sand lense in the area proposed for refuse disposal. This report further suggests that groundwater associated with this sand lense is Class I groundwater. Please refer to Attachment IV.6.D for the proposed construction details of this refuse disposal area and Part IV for a detailed discussion of measures to be take to protect this potential source of groundwater. Considering this information, it is unlikely the proposed operations will adversely impact the quantity or quality of ground water in the permit or adjacent area.

Shaft and slope construction will establish interconnections between the surface, the water-bearing strata and the coal seam. However, utilizing fully-grouted and/or lined mine openings will prevent or minimize the migration of ground water to the coal seam via the openings. Localized, short-term reductions in potentiometric head may occur in water-bearing units encountered during shaft and slope construction. Following completion of the shafts and slope, a return to original water levels should occur in all water-bearing units. The shafts and slope have been located above the 100-year flood level and out of drainage courses to prevent introduction of surface water into the coal seam and ground water system. Shaft and slope development rock will be used for fill material in the supply storage yard, beneath the coal storage areas and for the slope construction pit. Results of the acid/base analysis of the overburden indicate that placement of the shaft and slope materials on the surface will not produce acidic leachate. The development material will be compacted to provide an impervious base for the coal storage sites and limit infiltration. As discussed above and in Part IV of this application, the proposed refuse disposal area will be constructed so as to prevent possible groundwater contamination. During final reclamation, covering the refuse material with earthen materials will protect the material from the effects of oxidation and erosion as well as minimize the potential for impacts to ground water resources by minimizing leachate production.

Underground Mining Operations Impacts to Surface Water – High extraction mining in the proposed shadow area can be expected to cause surface subsidence as detailed in the subsidence control plan contained in Part IV.3.B of this application. Although changes in the surface elevations will occur, adverse impacts to the quantity and quality of surface water in the shadow area and adjacent area are not anticipated.

The shadow area topography is generally characterized as gently rolling with several rounded morainal hills throughout portions of the permit area. Surface elevations ranging from approximately 600 feet along the larger stream channels located in the southwestern and

southeastern portions of the shadow area to over 660 feet at the crest of moraines between adjacent drainage courses in the western and eastern portions of the shadow area. The proposed mining area is located beneath the headwater reaches of the named and unnamed streams that drain the permit area. These streams exhibit dendritic drainage patterns and have relatively gentle gradients typical of upland headwater drainages in the area. The proposed longwall panels are laid out in an east-west direction while the majority of the streams in the shadow area generally flow towards the northwest, south and southeast. Thus, the subsidence troughs generally will be oriented perpendicular, parallel and at angles to the direction of stream flow. Subsidence related changes in the shadow area topography can produce surface depressions with localized ponding of surface water or interception of ground water where the water table is near the surface. The proposed subsidence mitigation plan calls for re-establishing pre-mining drainage patterns by grading and/or tiling to drain areas of trapped or standing water.

Longwall and other high-extraction mining methods cause collapse, fracturing, bed separation, and bedding plane slip in the roof strata above the mined seam. The height of the disturbed zone depends on the thickness of the mined coal, geometry of the mined panel, the rate of mining face advancement, and the geological characteristics of the overburden. The area of disturbance above a high-extraction mining area is generally divided into four zones, based on the extent and type of disturbance. The four zones are: the zone of primary caving where the immediate roof collapses irregularly to fill the mined void; the fractured zone where strata breakage and bed separation occur along existing bedding planes; the continuous bending or deformation zone where strata between the fractured zone and the surface bend downward without breaking; and the surface zone where tensile strain at the surface causes shallow fractures to develop.

Subsidence effects on the quantity of surface water can be created by two mechanisms resulting from the full-extraction mining operations. These two mechanisms are the progression of cracking and caving of the bedrock above the mining area and surface cracking resulting from horizontal strains created by deformation within the subsidence trough.

The combined height of the caved and fractured zones where changes in permeability due to subsidence occur has been described by various investigators to range from 30 to 60 times the thickness of the extracted seam. The lower end of this range is typical of areas where the overburden is composed of a high percentage of weak and more elastic strata similar to the geologic conditions at the proposed Deer Run Mine. On the other hand, the upper end of this range was recorded only in mining with overburden composed entirely of brittle rock (limestone and sandstone). Therefore, considering the presence of mostly more elastic shales in the overburden, it is estimated that the impacts of subsidence on strata permeability would reach up to 40 times the mining height. Based on an average extraction height of 7.5 feet, this would indicate the zone of disturbance could reach up to 300 feet above the mine opening. Therefore, based on the thickness of the consolidated overburden in the permit area, the cracked and caved zone is not likely to reach the surface and cause loss of stream flow.

The other mechanism which could impact creek flow is surface cracking resulting from subsidence-induced strains due to deformation above the caved zone. Infiltration from the creek to the shallow ground water regime through the alluvial deposits along the streams already occurs. The occurrence of tensile cracks on the surface will not necessarily result in increased loss of flow from the streams. Several studies of the impacts of subsidence on surface water bodies have indicated that the subsidence cracks are limited in depth by the development of compressive stresses replacing the tensile stresses that cause surface cracking. Development of this type of crack would be limited due to the thickness of the unconsolidated alluvium material. Further, the presence of the fine-grained sediments in the stream beds will hasten the process of sealing the cracks. The presence of over 400 feet of overburden between the surficial

deposits and mined coal, composed of approximately 60% elastic rock types (shales, siltstones and claystones), will also limit the potential flow of water from the creek.

All underground mining will be below drainage, so no water from the mine voids will gravity flow to surface water. During mining, pumpage from the mine to the surface may increase surface quantities but only marginally given the size of the receiving stream. Since the quantity will be only marginally increased during mining, any effect on quality will also be small. The net effect during mining, although marginal, will be similar to the effects caused by the surface activities (i.e. increased mineralization). After mining, no impacts to the surface water quality are anticipated.

Underground Mining Operations Impacts to Ground Water – No significant, detrimental impacts on drinking, domestic and residential water supplies are anticipated due to the proposed mining operations for several reasons. Although planned subsidence mining methods are proposed, the geologic conditions of the Deer Run Mine are favorable for limiting the impacts of any planned subsidence on both surface and ground water hydrology. The unconsolidated soil deposit which lies at the surface is composed of fine-grained materials consisting primarily of clay and silt with lesser amounts of sand. The soil thickness is generally from about 110 to 155 feet and the minimum thickness of the consolidated overburden between the mined coal and the bottom of the surficial deposits is approximately 310 feet. Based on the nature and thickness of the consolidated overburden in the permit area, subsidence is not likely to have significant, long-term impacts on ground water supplies.

Numerous studies have been conducted to determine the effects of surface subsidence due to underground mining on unconsolidated and bedrock aquifers. Booth and Spande described the impacts of longwall mining the No. 6 Coal Seam in south-central Illinois. At the subject mine location, the coal seam was about 10 feet thick and was being mined at a depth of about 725 feet. The major aquifers above the mined coal seam included the Mt. Carmel Sandstone and alluvial and glacial sediments. The results of the study indicated some increase in permeability of the sandstone strata after undermining, and a temporary decrease in water levels of up to 36 feet. The water levels recovered gradually after the longwall face passed, and within a month returned to the approximate pre-mining levels. Other studies were conducted of a longwall mining operation in Saline County, Illinois where the No. 6 Coal Seam was 5.6 feet thick and about 400 feet below the ground surface. The studies concluded that the subsidence slightly increased the permeability of the Trivoli Sandstone aquifer, located approximately 213 feet above the mined coal. No impacts on permeability or water levels in the glacial drift aquifer were noticed. A third study was conducted of the impacts of a longwall mining operation on glacial and sandstone aquifers at a mine in western Illinois mining the No. 6 Coal Seam. The coal seam at this mine was 6.5 feet thick and the coal is overlain by 140 to 240 feet of bedrock and 70 to 160 feet of unconsolidated glacial sediments. The Trivoli Sandstone, a major aquifer in the area, is located about 150 feet above the mined coal. This study concluded that the subsidence increased the hydraulic conductivity of the Trivoli Sandstone by about one order of magnitude, and by two to three orders of magnitude in the shales. The study also found water levels in the glacial aquifers were increased due to the impacts of subsidence, and water levels in the sandstone decreased. It should be pointed out that the sandstone and shales for this latter case were within the caving and fracture zones described above.

Should subsidence affect a ground water supply, the impacts would be expected to be similar to the impacts described in the first two studies discussed above. Therefore, the potential impacts due to planned subsidence on water supply wells located above a mining panel in the bedrock aquifer could be a temporary lowering of water levels. The water levels should recover to pre-mining levels within a few weeks after subsidence occurs. The possibility of decreasing water levels after subsidence has occurred is typically caused by increasing permeability of the water bearing strata. However, the decrease in water level in most wells is compensated for by an increased well yield. Therefore, the slight decrease of water levels after mining in some wells

does not materially affect the post-mining water availability. The studies have indicated that aquifers in unconsolidated materials are not typically impacted by subsidence, even if shallow bedrock aquifers are impacted. Therefore, wells completed in the surficial deposits are not expected to be impacted by the planned subsidence mining.

b) Are acid forming or toxic forming materials present that could result in contamination of surface and/or ground water supplies;

Response: *The only potential acid-forming strata in the overburden, identified and described in Part III.2.A, are the Carbonaceous Shale and the underclay beneath the coal seam. However, both of these units are relatively thin, constituting a small percentage of the total overburden to be removed during shaft and slope installation. These units also exhibited only slightly negative acid-producing potentials. Because of this, the acid-producing potential will be negated by the alkalinity of the rest of the overburden. Consequently, no acid surface water or groundwater will develop to contaminate water supplies.*

c) Will the proposed surface coal mining and reclamation operations result in contamination, diminution or interruption of an underground or surface source of water within the proposed permit or adjacent areas which is used for legitimate purposes; and

Response: *As stated in Part III.2.D.1.A and B above, the proposed operations are not expected to contaminate, reduce, or interrupt any underground or surface source of water of anyone within the permit or adjacent areas.*

d) What impact(s) will the proposed surface coal mining and reclamation operations have on including, but not limited to the following parameters:

Response: *The following discussions generally address impacts associated with the mine's surface facilities since the underground operations are not expected to impact the majority of the listed parameters.*

i) Sediment yield from the disturbed area;

Response: *Sediment yield could increase somewhat from the disturbed area during construction of the facilities and during reclamation activities. After vegetative cover and drainage controls are in-place, ongoing mining activities could be expected to generate less sediment yield than the premining cropland. Sediment control ponds will limit the off-site sediment movement to an acceptable amount. Ponds will be constructed and maintained to insure the effluent standards will be met. Within a few years after mining has ceased and reclamation is completed, sediment yield is expected to return to approximate pre-mining levels.*

iv) Acidity;

Response: *Previous studies have found that acidity levels increase downstream of surface mined areas. This is likely due to the exposure of acid-producing materials (pyrite and marcasite) by the large areas of disturbance associated with surface mining operations. In contrast, underground mining operations disturb much smaller areas and thus expose less potentially acid-producing materials to the atmosphere. Therefore, acidity levels are expected to be only slightly increased by the proposed mining operation.*

iii) Total suspended solids;

Response: ***Total suspended solids, like sediment yields, will increase somewhat during construction and early reclamation activities. However, drainage from disturbed areas will be passed through sedimentation ponds in insure effluent standards will be met. Within a few years after mining has ceased and reclamation is completed, total suspended solids should return to approximate pre-mining levels. Post- mining suspended solids concentrations may actually be lower due to the conversion of some pre-mining cropland areas to other land uses that are less susceptible to erosion.***

iv) Total dissolved solids;

Response: ***Total dissolved solids will increase in both groundwater and surface water. Major ions will be calcium, magnesium, bicarbonate and sulfate. However, the water quality will be satisfactory for fish, wildlife, waterfowl, livestock, irrigation, and recreation.***

v) Flooding or stream flow alterations;

Response: ***Proposed activities should not cause or aggravate downstream flooding. A relatively small portion of the total named and unnamed tributaries of Middle Fork Shoal Creek, East Fork Shoal Creek and Miller Creek watersheds will be affected. However, minor stream flow alterations are necessary to construct the mine facilities and allow mining of the area. The facilities have been laid out and designed to minimize impacts to stream flows. After reclamation is complete the permanent impoundments should result in lower flood peaks and larger base flows in the named and unnamed tributaries of Middle Fork Shoal Creek, East Fork Shoal Creek and Miller Creek.***

vi) Availability of surface and ground water;

Response: ***Although considerable changes in the surface elevations will occur, no change in the availability of surface water in the shadow area and adjacent area are anticipated. The potential impacts due to planned subsidence on water supply wells in the bedrock aquifer could be a temporary lowering of water levels. The water levels should recover to pre-mining levels within a few weeks after subsidence occurs. The lowering of water levels after subsidence has occurred is typically caused by increasing permeability of the water bearing strata. However, the decrease in water level in most wells is compensated for by an increased well yield. Therefore, the slight decrease of water levels after mining in some wells does not materially affect the post-mining availability of ground water.***

2) The Department will review permit revision applications to determine whether a new or updated PHC determination will be needed. Prior to submission of a permit revision application, applicants must contact the Department for this determination. Sufficient information on the proposed revision must be submitted with the request for the PHC determination to allow the Department to make its determination.

Response: ***This application is for a new permit not a revision of an existing permit.***

3) Surface Water Monitoring Program

a) Has an N.P.D.E.S. permit been applied for?
Yes _____ No ___X___

Response: ***NPDES Permit is being applied for in conjunction with this mining application.***

b) 1) Has an N.P.D.E.S. permit been obtained?
Yes _____ No ___X__

If yes, give the permit number, the date issued, the expiration date, and the number of discharge points monitored. If additional discharge points are proposed by this application, list discharge numbers. Locate on the Water Monitoring Map and number all discharge points for the proposed permit area.

2) In accordance with 35 Ill. Adm. Code 406.101(b), is the applicant requesting that monitoring and reporting be on the basis of grab samples?
Yes __X___ No _____

c) Are N.P.D.E.S. reports to be submitted to satisfy the reporting requirements?
Yes __X___ No _____

If yes, provide the NPDES monitoring program including sampling method, sampling frequency and parameters to be analyzed. If not, submit a proposed monitoring and reporting program. Discharge information sheet is given in Schedule A and/or form 2C or 2D. Schedule A should be completed for all proposed discharge points. An estimate of the expected discharge concentration for each listed parameter must be indicated (or marked N/A) and a basis for that estimation provided.

Response: ***Monitoring for compliance with the NPDES effluent limits will be conducted in accordance with the sampling frequency specified in the final permit document. The NPDES monitoring program will include the collection and analysis of grab samples from all permitted discharge locations at least monthly or at the frequency specified in the approved permit. NPDES permits for coal mining operations generally require the collection of a minimum of nine (9) samples during a calendar quarter when the pond is discharging. Grab samples will be collected and preserved in accordance with IEPA standards and delivered to the laboratory for analysis. Water quality parameters specified for the various discharge locations will be analyzed and the results recorded. Quarterly water quality reports will be prepared and submitted to the Department within one month of the end of each calendar quarter in accordance with the prescribed reporting period. Refer to Schedule A for expected discharge concentrations.***

If ammonia is to be utilized in wastewater treatment, indicate the discharge(s) resulting from this treatment and provide an estimate of the expected concentration (mg/1) of ammonia nitrogen (as N) from the discharge(s).

Response: ***Ammonia will not be used for the treatment of wastewater.***

d) Give a brief description of the water sampling and flow measurement equipment that will be used to monitor the discharges.

Response: ***Water samples will be of the grab type. Discharge rates will be estimated from observations of flow depth and velocity at the discharge tubes, outflow channels, or other structures at the time of sampling.***

e) List the name and address of the laboratories which will perform the effluent and ground water sampling analyses.

Response: ***Teklab, Inc.***
5445 Horseshoe Lake Rd.
Collinsville, Illinois 62234

Standard Labs
8451 River King Drive
Freeburg, Illinois 62243

Or any other approved Lab.

f) Discuss the expected impact this mining operation will have on surface water flows and quality and the effect this will have on downstream water uses.

Response: ***During active mining, the operation is expected to have an attenuating effect on the peak discharges of surface water flows in streams downstream of the mine due to the retention of surface water runoff in sedimentation ponds. The effects on water quality will be negligible because the percentage of the watershed to be disturbed by the mining operation is small compared to the total watershed of receiving stream. Erosion and sediment control measures will be applied to minimize contamination of surface runoff. Sediment loading in wet weather streams may actually improve over pre-mining conditions as a result of good management practices by establishing and maintaining vegetative cover in areas that are currently cropland, construction of sedimentation basins, and decreasing peak flows and velocities by intercepting and retaining storm water runoff. Runoff from disturbed areas will pass through properly designed and approved sediment ponds before release and will meet appropriate quality criteria (NPDES). Therefore, downstream water uses should not be adversely impacted.***

g) Is this proposed mining area covered by existing IEPA Subtitle D permits?

Yes _____ No _X_____

If yes,

1) List the permit number(s)

_____
_____
_____

2) Do the proposed mining boundaries exactly coincide with IEPA permitted boundaries?

Yes _____ No _____
(If no, delineate the IEPA Subtitle D permitted boundaries on the Water Monitoring Map).

h) Are the TDS related conditions requested under 35 Ill. Adm. Code 406.203 (from water quality requirements of Subtitle 3 for the discharge of total dissolved solids, chloride, sulfate, iron and manganese)?

Yes ____X_____ No _____

If yes, provide the following:

1) Show that the discharge(s) will not cause an adverse effect on the environment in and around the receiving stream, by either:

Response: ***Information and demonstrations will be submitted as required by IEPA.***

a) Demonstrating that the discharge will contain a concentration less than or equal to 3,500 mg/1 sulfate and 1,000 mg/1 chloride; or,

Response: ***By utilizing sound engineering and mining practices, no adverse effects on the environment or in the vicinity of the receiving stream will occur. There are no public water supplies within the shadow area of the mine; therefore no adverse effects are anticipated. By complying with the effluent limitations, the minimization of total dissolved solids, chloride, sulfate, iron and manganese will be achieved.***

b) through actual stream studies.

2) Show that the discharge(s) will not adversely affect any public water supply.

Response: ***A portion of the permit area is within the watershed to Hillsboro Lake which serves as a backup water supply to the City of Hillsboro. Since the referenced portion of the permit area is extremely small relative to the total watershed to this impoundment, and since all surface runoff from this portion of the permit area will be treated by sediment control ponds which will have monitored discharge points, now adverse affect to Hillsboro Lake is expected. No other known public water supplies are down gradient from the permit area.***

3) Provide a detailed discussion of how you intend to comply with the good mining practices of 35 Ill. Adm. Code 406.204.

Response: ***Initial disturbance of the permit area will be required for construction of the surface facilities needed to support the underground mining operation. Once constructed, these facilities will remain in place for the life of the mine. The initial phase of the construction will be to establish the drainage control structures such as collection ditches and sediment basins to control runoff from the disturbed areas. Areas disturbed by the initial construction activities will be re-vegetated immediately upon completion of construction to control erosion and sediment losses from the site. Shaft and slope development rock will be used for fill material in the supply storage yard and beneath the coal storage areas. The development material will be compacted to provide an impervious base for the coal storage sites.***

The refuse disposal facilities have been designed so that all surface runoff from the refuse area will be collected and routed to sediment control structures for treatment prior to release. Water quality will be monitored to insure that all discharges from the refuse area comply with the NPDES effluent limitations prior to discharge. Covering the refuse disposal areas with clay, during reclamation, will protect the material from the effects of oxidation and erosion to minimize the potential for impacts to surface and ground water resources.

Schedule A Discharge Location and Characteristics for New and Existing Mines

Discharge Location # **	001	002	003	004	005	006	007
Legal Location	NE ¼, SE ¼, Sec. 12	SE ¼, SW ¼, Sec. 7	SW ¼, SW ¼, Sect. 7	SW ¼, NW ¼, Sect. 18	NE ¼, NW ¼, Sect. 17	NE ¼, NE ¼, Sect. 13	SW ¼, SW ¼, Sect. 7
Township / Range	T8N / R4W	T8N / R4W	T8N / R4W	T8N / R4W	T8N / R3W	T8N / R4W	T9N / R3W
County	Montgomery	Montgomery	Montgomery	Montgomery	Montgomery	Montgomery	Montgomery
Average Flow (gpd) if discharge not from precip.	Precipitation	Precipitation	Precipitation	Precipitation	Precipitation	Precipitation	Precipitation
Max. Flow (gpd) if discharge not from precip.	Precipitation	Precipitation	Precipitation	Precipitation	Precipitation	Precipitation	Precipitation
Source of Discharge (i.e. pit pumpage, plant circuit, surf. runoff, etc.)	Surface Runoff	Surface Runoff	Surface Runoff	Surface Runoff	Surface Runoff	Surface Runoff	Surface Runoff
Sampling Method (24 hr. composite, grab, etc.)	Grab	Grab	Grab	Grab	Grab	Grab	Grab
Acidity (mg/l)	30 - 90	30 - 90	20 - 80	15 - 70	15 - 70	30 - 90	30 - 90
Alkalinity (mg./l)	50 - 150	50 - 150	30 - 120	30 - 150	30 - 150	50 - 150	50 - 150
Lead (mg/l)	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Iron (mg/l)	0.5 - 3.0	0.5 - 3.0	0.5 - 3.0	0.5 - 2.0	0.5 - 2.0	0.5 - 3.0	0.5 - 3.0
Manganese (mg/l)	0.1	0.2	0.1	0.2	0.2	0.2	0.2
pH (range)	6.5 - 8.5	6.5 - 8.5	6.5 - 8.5	6.5 - 8.5	6.5 - 8.5	6.5 - 8.5	6.5 - 8.5
Zinc (mg/l)	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
Fluoride (mg/l)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Total Susp. Solids (mg/l)	10 - 35	10 - 35	10 - 35	10 - 35	10 - 35	10 - 35	10 - 35
Sulfate (mg/l)	100 - 500	100 - 500	100 - 500	100 - 500	100 - 500	100 - 500	100 - 500
Total Diss. Solids (mg/l)	100 - 500	100 - 500	100 - 500	100 - 500	100 - 500	100 - 500	100 - 500
Chloride (mg/l)	50 - 100	50 - 100	50 - 100	50 - 100	50 - 100	50 - 100	50 - 100
Receiving Stream	Unnamed	Unnamed	Unnamed	Unnamed	Unnamed	Unnamed	Unnamed
Tributary to:	M. F. Shoal Creek	M. F. Shoal Creek	M. F. Shoal Creek	M. F. Shoal Creek	M. F. Shoal Creek	M. F. Shoal Creek	M. F. Shoal Creek
Tributary to:	Shoal Creek	Shoal Creek	Shoal Creek	Shoal Creek	Shoal Creek	Shoal Creek	Shoal Creek
Tributary to:	Kaskaskia R.	Kaskaskia R.	Kaskaskia R.	Kaskaskia R.	Kaskaskia R.	Kaskaskia R.	Kaskaskia R.

4) Ground Water Monitoring Program

a) Describe in detail a proposed monitoring plan that will measure the amount and duration of any changes to the ground water system resulting from the mining operation. Parameters to be monitored are given in Schedule B. Monitoring should be on a quarterly basis with reports due within one month of the end of each quarter as follows:

Quarter	Report Due
January, February, March	May 1
April, May, June	August 1
July, August, September	November 1
October, November, December	February 1

Response: ***Twelve (12) monitoring wells were installed around the perimeter of the surface effects area to gather baseline information about the shallow ground water resources in the permit area. Once site development commences and continuing through active mining, these twelve wells will be monitored on a quarterly basis and analyzed for the parameters listed in Schedule B, Attachment III.2.B.2. Additional wells may be installed in the future if necessary to demonstrate compliance with the established ground water quality standards. Future wells will be located and installed at prescribed distances from regulated activities. Samples will be collected and preserved in accordance with IEPA standards and delivered to the laboratory for analysis. Quarterly water quality reports will be prepared and submitted to the Department within one month of the end of the each calendar quarter in accordance with the prescribed reporting period. For sampling and analysis plan refer to Attachment III.4.a.***

b) Provide a drilling log and completion information and/or a diagram of each well proposed as a monitoring well.

Response: ***Refer to Attachment III.3.D.4 and Part VII-Appendix B.***

c) Locate wells and springs, on or within 1/2 mile of the permit area and shadow area on a hydrologic map. If any of these wells are to be employed for monitoring, designate on hydrologic map and complete Schedule B.

Response: ***Refer to Hydro-Geological Map (Map 4).***

d) Discuss any reported problems of maintenance, or ground water quantity and quality which have occurred at the wells and springs listed above.

Response: ***There are no known or reported water quantity or quality problems that have occurred.***

e) Will this operation have any discharges to, or pump water from abandoned underground mines?

Yes _____ No ___X_____

If yes, submit a detailed discussion.

Schedule B Ground Water Monitoring Well Data

Designated Well # (shown on map)	MW24S 08-03-17-08	MW23 08-03-17-07	MW22 08-03-17-06	MW25S 08-03-17-09	MW28 08-03-18-18	MW27S 08-03-18-17	MW32 08-03-07-04	MW26S 08-03-18-16	MW33 08-03-18-22	MW34 08-03-07-05	MW30 08-03-18-20	MW31 08-03-18-21
Legal Location	SE¼, NW¼, Sec. 17, T.8S, R.3E	SE¼, NW¼, Sec. 17, T.8S, R.3E	NE¼, NW¼, Sec. 17, T.8S, R.3E	NW¼, NW¼, Sec. 17, T.8S, R.3E	SE¼, NE¼, Sec. 18, T.8S, R.3E	NW¼, SE¼, Sec. 18, T.8S, R.3E	SE¼, SW¼, Sec. 7, T.8S, R.3E	SE¼, NW¼, Sec. 18, T.8S, R.3E	NW¼, NW¼, Sec. 18, T.8S, R.3E	SW¼, SW¼, Sec. 7, T.8S, R.3E	SW¼, SE¼, Sec. 18, T.8S, R.3E	SE¼, SE¼, Sec. 18, T.8S, R.3E
Ground Elev. (MSL)	630.4	632.2	621.5	629.7	632.4	627	614.4	626.4	611.7	612.5	628.4	636
Water Elev. (MSL)	622.9	618.9	610.4	618.9	624.2	620.2	607.9	613.5	595	601.3	621.8	625.9
Water bearing strata	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Type, size of casing	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC
Type/capacity of pump	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer
Type of pipe	polyethylene	polyethylene	polyethylene	polyethylene	polyethylene	polyethylene	polyethylene	polyethylene	polyethylene	polyethylene	polyethylene	polyethylene
Point of sampling	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer
Water Quality												
Acidity, Total (mgL as $CaCO_3$)	-368	-338	-272	-302	-262	-300	-372	-398	-466	-342	-264	-282
Alkalinity, Total (mgL as $CaCO_3$)	354	334	268	308	264	294	380	396	488	342	270	280
Calcium, Total (mg/L)	4560	2040	343	2120	311	351	1250	1170	533	3280	2620	277
Chloride (mg/L)	52	45	54	40	47	41	33	40	66	62	28	29
Fluoride (mg/L)	0.70	0.26	0.42	0.45	0.34	0.24	0.37	0.45	0.48	0.49	0.35	0.24
Hardness (mg/L as$CaCo_3$)	240	300	280	220	260	300	400	340	380	380	260	280
Iron, Total (mg/L)	2550	1090	101	1790	54.8	73.7	217	160	139	1030	666	92.7
Magnesium, Total	3630	1120	163	1280	146	173	587	479	217	1180	1170	110
Manganese, Total (mg/L)	59.3	22.1	2.1	62.2	1.44	21.6	6.22	5.05	3.05	21.3	11	1.62
Nitrate (mg/L as N)	0.5	0.4	2.62	0.24	0.21	<0.20	0.2	55.4	0.22	<0.20	0.24	5.48
pH	7.05	7.02	7.13	7.15	7.27	7.21	7.23	7.24	7.23	7.32	7.19	7.34
Sodium, Total (mg/L)	74.0	99.2	60	75.2	35.2	32.2	112	55.4	108	75.8	85.1	80
Sulfate, Total (mg/L)	105	103	115	39	52	60	258	67	164	119	105	187
Total Dissolved Solids (mg/L)	534	464	482	398	392	392	740	528	730	594	456	588
Zinc, Total (mg/L as Zn)	9.48	4.82	0.299	5.02	0.12	0.404	0.411	0.42	0.29	2.1	28	0.242

5) Identify the general land uses of the watersheds upstream of the proposed permit area and any potential pollution sources which could significantly affect the stream quality at the mine area.

Response: ***The upstream land uses include pasture, forest, cropland and rural residential. There are no known sources of pollution that could significantly affect stream quality. Runoff from agricultural fields could contain herbicides and pesticides used during the farming operations.***

6) Provide names and addresses of all public water supplies within ten miles of the proposed permit boundaries.

Name	Location	Distance from Permit Boundary	Type (Surface or Well)
City of Hillsboro, IL	***912 St. Louis St., Hillsboro, IL 62049***	***2.0 miles***	***Surface***
Montgomery County Water Co.	***PO. Box 343, Hillsboro, IL 62049***	***2.0 miles***	***Surface***
City of Litchfield	***120 E. Ryder Street, Litchfield, Illinois 62056***	***7.0 miles***	***Surface***
City of Witt	***P.O. Box 281, Witt, IL 62094***	***9.0 miles***	***Well***
City of Fillmore	***222 S. Logan, P.O. Box 106 Fillmore, IL 62032***	***9.0 miles***	***Well***

Response: ***The permit and shadow area is served with public utility water by the City of Hillsboro, the City of Coffeen, the Montgomery County Water Co., the City of Litchfield, the City of Witt, and the City of Fillmore. The source of the water supply for the City of Hillsboro and for the Montgomery County Water Co. is Glenn Shoals Lake, which is approximately 4 miles from the permit area. The source of water for the City of Litchfield is Lake Lou Yaeger, which is approximately 7 miles from the permit area. The source of water for the City of Witt and the City of Fillmore is groundwater and both wells are located approximately 9 miles from the permit area. There are no other known public water supply sources within ten miles of the permit boundary.***

Information obtained for the Illinois State Water Survey website:-

"Community water supplies" ***http://www.sws.uiuc.edu/docs/wsfaq/images/QnA/q13.gif***

"Illinois Community Surface Water Supplies"
http://www.sws.uiuc.edu/docs/wsfaq/addl/q1WRsurfacewater.gif

7) Discuss the possible effects that this mining operation will have on the above-listed public water supplies and explain what precautions will be taken to prevent an adverse impact from occurring.

Response: ***No impacts are expected because the surface and groundwater supplies identified above are not located within the direct watershed of the permit area.***

8) Locate on the hydrologic map or other designated map all private water supplies and private water wells within 1/2 mile of permit area and within the permit and shadow areas itself.

Response: ***Refer to Hydro-Geological Map (Map 4).***

9) Locate on the hydrologic map existing surface and ground water discharges into underground mines.

Response: ***There are no known discharges into underground mines.***

10) Provide the locations of water supply intakes for current users of surface water flowing into, out of, and within a hydrologic area defined by the Department.

Response: ***With the exception of Lake Hillsboro discussed previously, there are no known water supply intakes for current users of surface water flowing into, out of, and within a hydrologic area defined by the Department. Area domestic water use through the Public Service Districts is sourced from the Glenn Shoals Lake.***

Note: For additional information refer to Part VII-Appendix, containing "Hydrologic Investigation", by Hurst-Rosche Engineers, Inc.

Attachment III.1.A.1. – Boring Logs

Goff & Pruitt Drilling, Inc.

Driller's Lithologic Log
Hillsboro Energy 08-03-18-07

From	To	Description
0.0	2.0	Topsoil
2.0	10.0	Brown clay
10.0	49.0	brown clay and ss
49.0	75.0	Gray clay & pea gravel
75.0	100.0	Brown clay
100.0	107.0	Gray clay & pea gravel
107.0	108.0	Limestone
108.0	152.0	Gray clay & sand
152.0	170.0	Gray sandy shale
170.0	179.0	Limey gray shale
179.0	190.0	Limestone
190.0	209.0	Gray shale
209.0	214.0	Sandstone
214.0	215.0	Gray shale
215.0	225.0	Gray sandy shale
225.0	250.0	Gray shale
250.0	252.0	Gray limey shale
252.0	256.0	Dark gray shale
256.0	260.0	Black shale & coal
260.0	263.0	Gray shale
263.0	293.0	Gray sandy shale
293.0	300.0	Limey gray shale
300.0	318.0	Sandy gray shale
318.0	321.0	Brown-tan limestone
321.0	350.0	Gray shale
350.0	352.0	Coal
352.0	361.0	Gray shale
361.0	363.0	Limey shale
363.0	458.0	Gray sandy shale
458.0	465.0	Sandy shale & siderite
465.0	476.5	Muti-colored shale
476.5	479.5	Limestone
479.5	487.0	Multi-colored shale
487.0	488.0	Green shale
488.0	489.5	GRay shale
489.5	490.0	Limestone
490.0	495.0	Black limey shale
495.0	515.0	Core #1
515.0	533.0	Core #2
533.0	535.0	Limey shale
535.0	545.0	Sandy shale
545.0	TD	

MAGNUM DRILLING SERVICES INC
DRILL LOG

08-03-17-04
20070130HE1
HILLSBORO ENERGY

CORE			DRILLING			LITH. CODE NO.	BED	DESCRIPTION OF ROCK / NOTE	RIG # TH-60B	
Run No.	FEET Cut	Rec.	FROM	TO	Thick				CORE GRAPH	CORE DESC.
				10.00	10.00	052.5		UNCONS silty or sandy clay tan or buff		
			10.00	16.00	6.00	056.6		UNCONS clay w/gravel red or brown		
			16.00	20.00	4.00	057.6		UNCONS silt w/gravel red or brown		
			20.00	64.00	44.00	057.3		UNCONS silt w/gravel med gray		
			64.00	67.00	3.00	058		UNCONS sand w/gravel		
			67.00	74.00	7.00	057.3		UNCONS silt w/gravel med gray		
			74.00	84.00	10.00	057.6		UNCONS silt w/gravel red or brown		
			84.00	97.00	13.00	057.3		UNCONS silt w/gravel med gray		
			97.00	98.00	1.00	059		UNCONS gravel		
			98.00	108.00	10.00	056.3		UNCONS clay w/gravel med gray - SILTY		
			108.00	117.00	9.00	058		UNCONS sand w/gravel		
			117.00	127.00	10.00	052.6		UNCONS silty or sandy clay red or brown		
			127.00	137.50	10.50	904		LIMESTONE,w/clay bands - FRACTURED		
			137.50	139.00	1.50	137		UNDERCLAY med gray		
			139.00	140.00	1.00	124		SHALE dark gray - WEATHERED		
1	19.00'	19.00'		140.00		C		START CORING		
			140.00	159.00	19.00	434		LIMEY SANDY SHALE med gray		
2	19.50'	19.50'		159.00		C		START CORING		
			159.00	160.50	1.50	333		SANDY SHALE med gray w/sandstone strks		
			160.50	160.70	0.20	070		SIDERITE NODULE		
			160.70	178.50	17.80	333		SANDY SHALE med gray w/sandstone strks		
3	19.00'	18.00'		178.50		C		START CORING		
			178.50	194.80	16.30	333		SANDY SHALE med gray w/sandstone strks		
			194.80	196.50	1.70	231		LIMEY CLAYSTONE med gray		
			196.50	197.50	1.00	004		LOST CORE-cored no recovery		
4	19.00'	19.00'		197.50		C		START CORING		
			197.50	197.70	0.20	231		LIMEY CLAYSTONE med gray		
			197.70	199.70	2.00	334		SANDY SHALE med gray		
			199.70	201.00	1.30	324		SANDY SHALE dark gray		
			201.00	201.70	0.70	020		**COAL**		
			201.70	202.00	0.30	137		UNDERCLAY med gray		
			202.00	207.00	5.00	431		LIMEY SANDY CLAYSTONE med gray		
			207.00	210.10	3.10	331		SANDY CLAYSTONE med gray		
			210.10	210.60	0.50	431		LIMEY SANDY CLAYSTONE med gray		
			210.60	213.60	3.00	331		SANDY CLAYSTONE med gray		
			213.60	216.50	2.90	431		LIMEY SANDY CLAYSTONE med gray		
5	20.00'	20.00'		216.50		C		START CORING		
			216.50	222.20	5.70	334		SANDY SHALE med gray		
			222.20	222.50	0.30	909		LIMESTONE w/fossils		
			222.50	227.10	4.60	533		SANDSTONE med gray w/shale strks		

HYDROLOGICAL DATA : Depth of Water : 108.00'

DRILL HOLE DATA			
DATE DRILLED	01-26-2007		
DATE COMPLETED	02-01-2007		
DRILLER	MICHAEL	HELPER	CRAIG
SURFACE ELEVATION			
TOTAL DEPTH	477.00'		
CORE SIZE	3.00"		
CASING DEPTH	140.00'		
NUMBER OF CEMENT BAGS	63		

LOCATION

SECTION : 017 TWNSHP : 08N RANGE : 03W QUAD :
COUNTY : MONTGOMERY
STATE : IL
LANDOWNER : DAVID WHITE
MAP NUMBER :
PROJECT AREA : HILLSBORO ENERGY
DRILL HOLE : 017 (SECTION) 08-03-17-04 (HOLE#) (LEASE)

NOTE: CONTINUOUS CORE, WATER AT 108 FEET, ABOUT 3 GALLON PER MINUTE

MAGNUM DRILLING SERVICES INC
DRILL LOG

08-03-17-04
20070130HE1
HILLSBORO ENERGY

CORE			DRILLING			LITH. CODE NO.	BED	DESCRIPTION OF ROCK / NOTE	RIG # TH-60B	
Run No.	FEET Cut	Rec.	FROM	TO	Thick				CORE GRAPH	CORE DESC.
			227.10	236.50	9.40	333		SANDY SHALE med gray w/sandstone strks		
6	20.00'	20.00'		236.50		C		START CORING		
			236.50	253.30	16.80	333		SANDY SHALE med gray w/sandstone strks		
			253.30	256.50	3.20	334		SANDY SHALE med gray		
7	20.00'	20.00'		256.50		C		START CORING		
			256.50	262.90	6.40	338		SANDY SHALE med gray w/siderite nodules		
			262.90	263.80	0.90	239		LIMEY SHALE med gray w/fossils		
			263.80	264.10	0.30	324		SANDY SHALE dark gray		
			264.10	265.00	0.90	239		LIMEY SHALE med gray w/fossils		
			265.00	276.50	11.50	334		SANDY SHALE med gray		
8	20.00'	20.00'		276.50		C		START CORING		
			276.50	289.80	13.30	338		SANDY SHALE med gray w/siderite nodules		
			289.80	290.90	1.10	020		**COAL**		
			290.90	292.50	1.60	371		SANDY CLAYSTONE green-gray		
			292.50	296.50	4.00	431		LIMEY SANDY CLAYSTONE med gray		
9	18.60'	18.60'		296.50		C		START CORING		
			296.50	298.80	2.30	333		SANDY SHALE med gray w/sandstone strks		
			298.80	308.70	9.90	533		SANDSTONE med gray w/shale strks		
			308.70	308.80	0.10	333		SANDY SHALE med gray w/sandstone strks		
			308.80	309.10	0.30	070		SIDERITE NODULE		
			309.10	312.10	3.00	333		SANDY SHALE med gray w/sandstone strks		
			312.10	315.10	3.00	334		SANDY SHALE med gray		
10	18.30'	18.30'		315.10		C		START CORING		
			315.10	333.40	18.30	333		SANDY SHALE med gray w/sandstone strks		
11	20.00'	20.00'		333.40		C		START CORING		
			333.40	353.40	20.00	333		SANDY SHALE med gray w/sandstone strks		
12	20.00'	20.00'		353.40		C		START CORING		
			353.40	357.40	4.00	333		SANDY SHALE med gray w/sandstone strks		
			357.40	373.40	16.00	334		SANDY SHALE med gray		
13	17.70'	17.70'		373.40		C		START CORING		
			373.40	391.10	17.70	334		SANDY SHALE med gray		
14	19.90'	18.90'		391.10		C		START CORING		
			391.10	394.10	3.00	334		SANDY SHALE med gray		
			394.10	394.40	0.30	339		SANDY SHALE med gray w/fossils		
			394.40	395.50	1.10	431		LIMEY SANDY CLAYSTONE med gray		
			395.50	400.50	5.00	371		SANDY CLAYSTONE green-gray		
			400.50	401.70	1.20	324		SANDY SHALE dark gray		
			401.70	402.90	1.20	331		SANDY CLAYSTONE med gray		
			402.90	404.80	1.90	161		CLAYSTONE red or brown		
			404.80	405.90	1.10	271		LIMEY CLAYSTONE green-gray		

HYDROLOGICAL DATA : Depth of Water : 108.00'

DRILL HOLE DATA

DATE DRILLED		01-26-2007	
DATE COMPLETED		02-01-2007	
DRILLER	MICHAEL	HELPER	CRAIG
SURFACE ELEVATION			
TOTAL DEPTH		477.00'	
CORE SIZE		3.00"	
ASING DEPTH		140.00'	
NUMBER OF CEMENT BAGS		63	

LOCATION

SECTION : 017 TWNSHP : 08N RANGE : 03W QUAD :
COUNTY : MONTGOMERY
STATE : IL

LANDOWNER : DAVID WHITE
MAP NUMBER :
PROJECT AREA : HILLSBORO ENERGY
DRILL HOLE : 017 (SECTION) 08-03-17-04 (HOLE#) (LEASE)

NOTE: CONTINUOUS CORE, WATER AT 108 FEET, ABOUT 3 GALLON PER MINUTE

MAGNUM DRILLING SERVICES INC
DRILL LOG

08-03-17-04
20070130HE1
HILLSBORO ENERGY

CORE			DRILLING			LITH. CODE NO.	BED	DESCRIPTION OF ROCK / NOTE	RIG # TH-60B	
Run No.	FEET Cut	FEET Rec.	FROM	TO	Thick				CORE GRAPH	CORE DESC.
			405.90	408.40	2.50	261		LIMEY CLAYSTONE red or brown		
			408.40	410.00	1.60	331		SANDY CLAYSTONE med gray		
			410.00	411.00	1.00	004		LOST CORE-cored no recovery		
15	11.00'	11.00'		411.00		C		START CORING		
			411.00	412.10	1.10	331		SANDY CLAYSTONE med gray		
			412.10	416.40	4.30	900		LIMESTONE		
			416.40	417.50	1.10	471		LIMEY SANDY CLAYSTONE green-gray		
			417.50	419.80	2.30	371		SANDY CLAYSTONE green-gray		
			419.80	421.70	1.90	121		CLAYSTONE dark gray		
			421.70	422.00	0.30	171		CLAYSTONE green-gray		
16	18.60'	18.60'		422.00		C		START CORING		
			422.00	424.60	2.60	271		LIMEY CLAYSTONE green-gray		
			424.60	425.60	1.00	331		SANDY CLAYSTONE med gray		
			425.60	426.50	0.90	139		SHALE med gray w/fossils		
			426.50	427.40	0.90	124		SHALE dark gray		
			427.40	428.00	0.60	114		BLACK SHALE		
			428.00	429.20	1.20	124		SHALE dark gray		
			429.20	431.40	2.20	900		LIMESTONE		
			431.40	433.80	2.40	271		LIMEY CLAYSTONE green-gray		
			433.80	436.40	2.60	231		LIMEY CLAYSTONE med gray		
			436.40	437.90	1.50	171		CLAYSTONE green-gray		
			437.90	438.80	0.90	900		LIMESTONE		
			438.80	440.60	1.80	904		LIMESTONE,w/clay bands		
17	17.90'	17.90'		440.60		C		START CORING		
			440.60	441.20	0.60	371		SANDY CLAYSTONE green-gray		
			441.20	442.30	1.10	331		SANDY CLAYSTONE med gray		
			442.30	443.90	1.60	114		BLACK SHALE		
			443.90	451.50	7.60	020		**COAL**		
			451.50	453.70	2.20	101		CLAYSTONE - ROOTED		
			453.70	458.50	4.80	431		LIMEY SANDY CLAYSTONE med gray		
18	18.50'	15.50'		458.50		C		START CORING		
			458.50	459.10	0.60	114		BLACK SHALE		
			459.10	460.00	0.90	020		**COAL**		
			460.00	460.20	0.20	114		BLACK SHALE		
			460.20	460.60	0.40	224		LIMEY SHALE dark gray		
			460.60	465.00	4.40	431		LIMEY SANDY CLAYSTONE med gray		
			465.00	472.00	7.00	331		SANDY CLAYSTONE med gray		
			472.00	474.00	2.00	431		LIMEY SANDY CLAYSTONE med gray		
			474.00	477.00	3.00	004		LOST CORE-cored no recovery		
				477.00		TD		TOTAL DEPTH		

HYDROLOGICAL DATA : Depth of Water : 108.00'

DRILL HOLE DATA

DATE DRILLED	01-26-2007		
DATE COMPLETED	02-01-2007		
DRILLER	MICHAEL	HELPER	CRAIG
SURFACE ELEVATION			
TOTAL DEPTH	477.00'		
CORE SIZE	3.00"		
CASING DEPTH	140.00'		
NUMBER OF CEMENT BAGS	63		

LOCATION

SECTION : 017 TWNSHP : 08N RANGE : 03W QUAD :
COUNTY : MONTGOMERY
STATE : IL

LANDOWNER : DAVID WHITE
MAP NUMBER :
PROJECT AREA : HILLSBORO ENERGY
DRILL HOLE : 017 (SECTION) **08-03-17-04** (HOLE#) (LEASE)

NOTE: CONTINUOUS CORE, WATER AT 108 FEET, ABOUT 3 GALLON PER MINUTE

MAGNUM DRILLING SERVICES INC
DRILL LOG

08-03-21-01
20070130HE1
HILLSBORO ENERGY

CORE			DRILLING			LITH. CODE NO.	BED	DESCRIPTION OF ROCK / NOTE	RIG # TH-60R	
Run No.	FEET Cut	FEET Rec.	FEET FROM	FEET TO	FEET Thick				CORE GRAPH	CORE DESC.
				13.00	13.00	052.5		UNCONS silty or sandy clay tan or buff		
			13.00	17.00	4.00	057.5		UNCONS silt w/gravel tan or buff		
			17.00	67.00	50.00	057.3		UNCONS silt w/gravel med gray		
			67.00	104.00	37.00	057.5		UNCONS silt w/gravel tan or buff		
			104.00	143.00	39.00	057.3		UNCONS silt w/gravel med gray		
			143.00	145.00	2.00	137		UNDERCLAY med gray		
			145.00	151.00	6.00	360		SANDY SHALE red or brown		
			151.00	152.00	1.00	560		SANDSTONE red or brown		
			152.00	168.00	16.00	630		SANDSTONE, LIMEY med gray - LIME BANDS		
			168.00	183.00	15.00	334		SANDY SHALE med gray		
			183.00	183.10	0.10	020		**COAL**		
			183.10	191.00	7.90	131		CLAYSTONE med gray		
			191.00	194.00	3.00	431		LIMEY SANDY CLAYSTONE med gray		
			194.00	204.00	10.00	900		LIMESTONE		
			204.00	205.00	1.00	231		LIMEY CLAYSTONE med gray		
			205.00	206.50	1.50	114		BLACK SHALE		
			206.50	242.00	35.50	334		SANDY SHALE med gray		
			242.00	242.20	0.20	020		**COAL**		
			242.20	245.50	3.30	124		SHALE dark gray		
			245.50	246.00	0.50	020		**COAL**		
			246.00	279.00	33.00	331		SANDY CLAYSTONE med gray		
			279.00	315.00	36.00	334		SANDY SHALE med gray		
			315.00	317.00	2.00	600		SANDSTONE, LIMEY		
			317.00	326.00	9.00	530		SANDSTONE med gray		
			326.00	336.00	10.00	533		SANDSTONE med gray w/shale strks		
			336.00	348.00	12.00	333		SANDY SHALE med gray w/sandstone strks		
			348.00	376.00	28.00	334		SANDY SHALE med gray		
			376.00	398.00	22.00	530		SANDSTONE med gray		
			398.00	400.00	2.00	600		SANDSTONE, LIMEY		
			400.00	430.00	30.00	530		SANDSTONE med gray		
			430.00	467.00	37.00	334		SANDY SHALE med gray		
			467.00	471.00	4.00	331		SANDY CLAYSTONE med gray		
			471.00	472.00	1.00	900		LIMESTONE		
			472.00	475.00	3.00	431		LIMEY SANDY CLAYSTONE med gray		
			475.00	478.00	3.00	361		SANDY CLAYSTONE red or brown		
			478.00	487.50	9.50	334		SANDY SHALE med gray		
			487.50	488.00	0.50	114		BLACK SHALE		
			488.00	491.00	3.00	124		SHALE dark gray		
			491.00	498.00	7.00	434		LIMEY SANDY SHALE med gray		
1	19.60'	19.60'		498.00		C		START CORING		

HYDROLOGICAL DATA : Depth of Water : _____

DRILL HOLE DATA			
DATE DRILLED	01-31-2007		
DATE COMPLETED	02-01-2007		
DRILLER	DANNY S	HELPER	JOEY
SURFACE ELEVATION			
TOTAL DEPTH	530.80'		
CORE SIZE	3.00"		
CASING DEPTH	160.00'		
NUMBER OF CEMENT BAGS	66		

LOCATION

SECTION : 021 TWNSHP : 08N RANGE : 03W QUAD : _____
COUNTY : MONTGOMERY
STATE : IL

LANDOWNER : THURMAN DAVID
MAP NUMBER : _____
PROJECT AREA : HILLSBORO ENERGY
DRILL HOLE : 021 (SECTION) **08-03-21-01** (HOLE#) _____ (LEASE)

NOTE:

MAGNUM DRILLING SERVICES INC
DRILL LOG

08-03-21-01
20070130HE1
HILLSBORO ENERGY

CORE			DRILLING			LITH. CODE NO.	BED	DESCRIPTION OF ROCK / NOTE	RIG # TH-60R	
Run No.	FEET Cut	Rec.	FROM	TO	Thick				CORE GRAPH	CORE DESC.
			498.00	498.60	0.60	434		LIMEY SANDY SHALE med gray		
			498.60	501.70	3.10	471		LIMEY SANDY CLAYSTONE green-gray		
			501.70	502.80	1.10	371		SANDY CLAYSTONE green-gray		
			502.80	503.90	1.10	439		LIMEY SANDY SHALE med gray w/fossils		
			503.90	504.40	0.50	324		SANDY SHALE dark gray		
			504.40	505.50	1.10	231		LIMEY CLAYSTONE med gray - FOSSILS		
			505.50	506.30	0.80	900		LIMESTONE - W/ SHALE BANDS		
			506.30	506.60	0.30	131		CLAYSTONE med gray		
			506.60	508.00	1.40	114		BLACK SHALE		
			508.00	515.60	7.60	027		**COAL** w/pyrite strks or cleat pyrite		
			515.60	517.60	2.00	231		LIMEY CLAYSTONE med gray		
2	13.20'	13.20'		517.60		C		START CORING		
			517.60	525.70	8.10	271		LIMEY CLAYSTONE green-gray		
			525.70	525.90	0.20	124		SHALE dark gray		
			525.90	526.70	0.80	371		SANDY CLAYSTONE green-gray		
			526.70	528.10	1.40	124		SHALE dark gray		
			528.10	530.10	2.00	171		CLAYSTONE green-gray		
			530.10	530.80	0.70	800		SHALEY LIMESTONE		
				530.80		TD		TOTAL DEPTH		

HYDROLOGICAL DATA : Depth of Water : _____

DRILL HOLE DATA

DATE DRILLED	01-31-2007		
DATE COMPLETED	02-01-2007		
DRILLER	DANNY S	HELPER	JOEY
SURFACE ELEVATION			
TOTAL DEPTH	530.80'		
CORE SIZE	3.00"		
CASING DEPTH	160.00'		
NUMBER OF CEMENT BAGS	66		

NOTE:

LOCATION

SECTION : 021 TWNSHP : 08N RANGE : 03W QUAD :
COUNTY : MONTGOMERY
STATE : IL

LANDOWNER : THURMAN DAVID
MAP NUMBER :
PROJECT AREA : HILLSBORO ENERGY
DRILL HOLE : 021 (SECTION) 08-03-21-01 (HOLE#) _____ (LEASE)

08-03-26-09

1/6

HAWKEY & KLINE
CORING & DRILLING, INC.

Phone 618-349-6113
Sonny - 618-349-6256 Carroll - 618-245-3567
R. R. 1 - Box 37AA St. Peter, Illinois 62880

Date 6/14/06

Job Colt LLC Hole No. # 9

Property Owner ..... Casing Set 116' Size 6 5/8

From	To	Feet Drilled	Core Recovery	Non-Core	Sludge Color	Description
0	16					Tan Clay
16	18					Sand / Gravel
18	20					Gray clay / Rocks
20	21					Boulder
21	42					Gray clay / Rocks
42	45					Sand Gravel
45	112					Gray clay / Rocks
112	116					Gray Shale

Core .....

Non-Core .....

Driller .....

9sat
12' NW of
hole location
Lat 39068882
Lon 8923 8820

EDWIN E. HARDT
Consulting Geologist
13105 E. 1st Rd.
Litchfield, IL 62056-4059
Home (217) 324-3870
Mobile (217) 254-8682

08-03-26-09

2/6

WELL #9 LOC NE¼ NW NW NW ELEV 652 GPS
CO Montgomery SEC 26 T 8N R 3W DATE 6-15-06

116-23	Soft gray shale, (123-24 coal)
124-130	gray shale
130-51	silty shale
151-55	sandy gray shale
155-62	silty gray shale, very minor broken limestone
162-71	green shale, little silty
171-75	gray brown sandy limestone, little broken limestone at base
175-92	green gray shale, grading to gray silty shale
192-95	little calcitic sandstone, siderite (not very porous)
195-206	gray shale + siderite, minor (calcitic silty) limestone
206-30	gray sandy shale to silty sandstone, sl
230-63	gray silty shale grading to sandy gray shale to silty sandstone (not very porous)
263-71	gray siltstone to silty shale
271-72	black shale
272-90	gray shale w/siderite, little silty
290-94	dark gray shale
294-95	coal
295-98	light gray greenish shale
298-01	gray limestone
301-325	light greenish gray shale grading to gray, little silty
325-30	gray sandy shale
330-71	silty gray shale, traces of sandstone
371-72	limestone
372-75	black shale
375-89	gray shale, siderite
389-91	coal
391-98	light gray greenish shale, little sandy w/depth
398-506	gray shale, little silty, siderite, traces of fine sand
506-07	limestone
507-510	varigated shale
510-15	limestone brown, grading to gray to buff (Piasa limestone)
515-22	dark gray shale grading to calcareous claystone
522-29	gray shaly limestone grading to black calcitic shale @ 524-29 (core)

EDWIN E. HARDT
Consulting Geologist
13105 E. 1st Rd.
Litchfield, IL 62056-4059
Home (217) 324-3870
Mobile (217) 254-8682

Hole 12' SE of GPS (9sal)

NE NW NW NW

3/6

Elev 652.6 ps

Hole No. # 9 Lat 3906 8882

Page 1 of 4

Prospect Colt Coal Lon 8923 8840

State Illinois County Montgomery

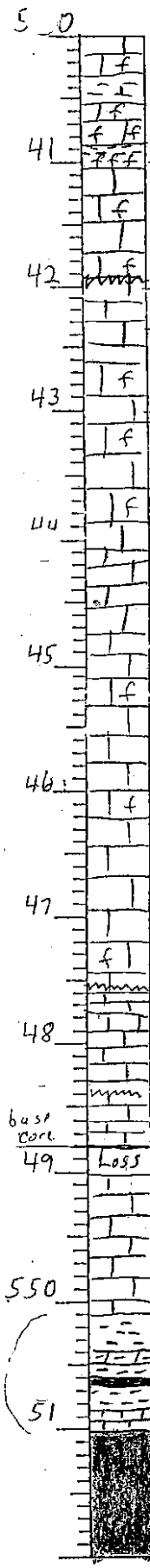
Location: Sec. 26 T 8N R 3W

Core Description By: Ed Hardt

Date 6-15-06

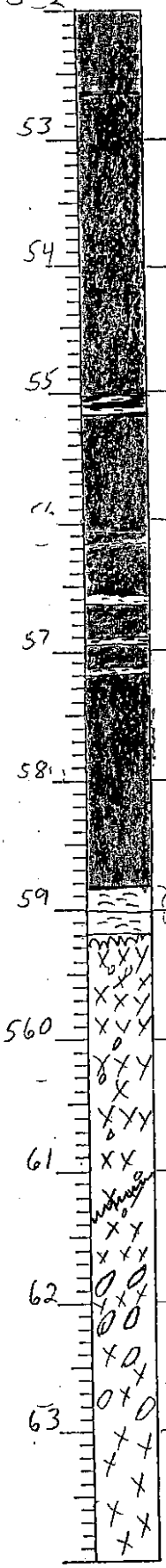
From	To	Thick.	
529	530		Cored 20' Rec 19.8' Black calcitic shale
529.9			fracture
530	532.65		greenish gray argillaceous limestone
530.2			fracture
31.67			fracture
532.65	538.9		greenish to green calcitic shale to limy shale
533.9	535.25		green shaly limestone
535.25	536.65		greenish gray fine limestone
			fractured 35.9-36
536.65	537.8		green shale w/abundant small IS nodules
		37.8	fracture
537.8	38.95		green limy shale to shaly limestone
538.95	540.3		gray lightly fossilized limestone

Hole No. #9 Page 2 of 4 **EDWIN E. HARDT** 4/6

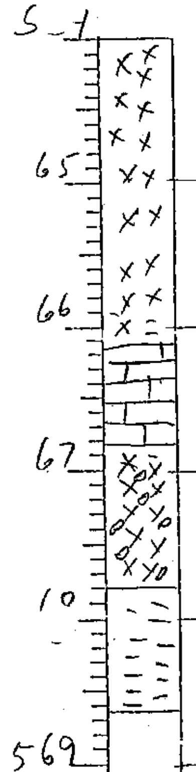


From	To	Thick.	
540.3	40.55		dk gray to brown calcitic shale
540.55	41.05		brown fossil hash zone, shale break 40.87-40.92
541.05	41.93		Jaw sl fossilized limestone
41.93			fracture
541.93	544.05		gray argillaceous sl fossiliferous limestone, sl greenish
544.05	44.75		gray dense fine limestone
544.75	47.60		dark gray argillaceous limestone sl fossilized
547.55			fracture
547.6	47.90		gray fine limestone argillaceous
547.90	48.3		dk gray fine ls argillaceous
48.35	Fractures		
548.3	548.8		SAA, light and dark gray
			20' cored 19.65 recovered
549	550.1		dark gray to light gray argillaceous limestone fine
550.1	550.4		dark gray + black shale, calcitic
550.4	50.5		Lime + shale
550.5	50.6		black shale
550.6	50.65		coal
550.65	50.87		shale black
50.87	551.03		dk gray limestone
551.03	558.85		coal (7.82)
551.03	51.6		3 2% pyrite in vertical fractures

Hole No. # 9 Page 3 of 4 EDWIN E. HARDT 5/6



From	To	Thick.	
			Coal cont
552.68	52.68		pyrite
553.7	53.8		Traces of pyrite
555.03	555.15		sandy shale
555.40	55.46		pyrite
555.80	.82		pyrite
556.17			Trace of shale
556.4	6.41		pyrite
556.57	6.60		shale
556.9	6.95		shale + pyrite
556.95	557.15		coal
557.15	57.20		shale
			(7.49' net coal)
			* coal appears to be of poorer quality than first 3 cores in project
558.85	559.2		black shale
559.2	566.15		claystone, soft, a few small limestone nodules, somewhat calcitic w/ thin shaly @ 565.7-66.15
559.23	fracture		
			fracture



From	To	Thick.	
566.15	66.86		green gray limestone, little sandy in spots
	566.86		fracture
566.86	567.80		green gray claystone w/small nodules calcitic, not real soft
567.8	568.65		green gray shale, not calcareous

Goff & Pruitt Drilling, Inc.

Driller's Lithologic Log
Hillsboro Energy 08-03-18-14
Started 7-17-07 Finished 7-19-07

From	To	Description
Set 166' of 5 1/2 casing		
166.0	173.0	Limestone
173.0	175.0	Black shale
175.0	192.0	Gray shale
192.0	215.0	Shale with sand
215.0	230.0	Shale
230.0	234.0	Shaley limestone
234.0	250.0	Black & gray shale
250.0	253.0	Gray sandy shale
253.0	255.0	Limestone
255.0	268.0	Shale
268.0	269.0	Sandy shale
269.0	273.0	Limey shale
273.0	285.0	Gray shale
285.0	290.0	Sandy gray shale
290.0	300.0	Gray shale
300.0	302.0	Limestone
302.0	305.0	Dark gray shale
305.0	330.0	Light gray shale
330.0	339.0	Gray shale
339.0	345.0	Shale
345.0	351.0	Limey shale
351.0	366.0	Shale
366.0	378.0	Sandy shale
378.0	415.0	Shale
415.0	419.0	Sandy shale
419.0	426.0	Light gray shale
426.0	428.0	Sandy shale
428.0	430.0	Green sandy shale
430.0	441.0	Gree-brown shale
441.0	446.0	Limestone
446.0	450.0	Green-gray shale
450.0	469.5	Core #1
469.5	489.5	Core #2
489.5	509.0	Core #3
509.0	TD	

Goff & Pruitt Drilling, Inc.

Driller's Lithologic Log
Hillsboro Energy 08-04-24-03

From	To	Description
0.0	2.0	Subsoil
2.0	10.0	Brown Clay
10.0	24.0	Sand & gravel & loose sand
24.0	154.0	Gray muddy sandy clay
154.0	159.0	Limestone
159.0	180.0	Gray sandy shale(Set 180' Casing)
180.0	190.0	Gray shale & gray sandstone
190.0	200.0	Gray shale
200.0	226.0	Black shale
226.0	230.0	Gray shale
230.0	233.5	Sandy gray shale
233.5	234.0	Limestone
234.0	250.0	Sandy shale
250.0	257.0	Limey sandy shale
257.0	289.0	Sandy shale
289.0	290.0	Limey sandstone
290.0	294.0	Shaley sandstone
294.0	300.0	Sandy shale
300.0	320.0	Gray shale
320.0	324.0	Black shale
324.0	336.0	Gray shale
336.0	340.0	Sandy shale
340.0	348.0	Sandstone
348.0	395.0	Sandy shale
395.0	420.0	Shaley sandstone
420.0	436.0	Light gray shale
436.0	442.0	Gray sandy shale
442.0	450.0	Limey shale
450.0	452.0	Dark sandy shale
452.0	455.0	Gray & black shale
455.0	460.0	Red sandy shale
460.0	463.0	Red & gray shale
463.0	467.0	Dark shale
467.0	469.0	Limestone
469.0	471.0	Limey shale
471.0	472.0	Limestone
472.0	474.0	Limey sandstone
474.0	475.0	Sandy shale
475.0	477.0	Dark sandy shale
477.0	478.0	Limestone
478.0	479.0	Green limey sandstone
479.0	480.0	Gray limestone
480.0	481.0	Green limey shale
481.0	481.5	Black limestone
481.5	483.0	Gray limestone
483.0	488.0	Black limestone
488.0	495.0	Black shale & coal
495.0	496.0	Limestone
496.0	501.0	Gray sandy shale
501.0	506.0	Black shale
506.0	508.0	Coal
508.0	516.0	Limey sandstone
516.0	520.0	Sandy shale
520.0	524.0	Limey shale
524.0	531.0	Sandy shale
531.0	TD	
TD		

Goff & Pruitt Drilling, Inc.

Driller's Lithologic Log
Hillsboro Energy 08-04-24-04

From	To	Description
0.0	3.0	Subsoil
3.0	19.0	Brown Sandy Clay
19.0	21.0	Gray clay
21.0	26.0	Sandy gray clay
26.0	30.0	Sand-gravel
30.0	168.0	Sand & gray mud, gray clay (Set 168' of 5 1/2 casing)
168.0	210.0	Sandy shale
210.0	212.0	Dark gray shale
212.0	218.0	Black shale
218.0	222.0	Gray shale
222.0	228.0	Sandy shale
228.0	228.5	Limestone
228.5	240.0	Limey Shale
240.0	280.0	Sandy shale
280.0	281.0	Limestone
281.0	283.0	Limey sandstone
283.0	300.0	Gray shale
300.0	314.0	Gray shale
314.0	314.5	Coal and shale
314.5	326.0	Gray shale
326.0	330.0	Limestone
330.0	336.0	Limey sandstone
336.0	420.0	Sandy shale
420.0	426.0	Gray shale
426.0	430.0	Sandy green shale
430.0	433.0	Limey shale
433.0	440.0	Gray sandy shale
440.0	442.0	Limey sandstone
442.0	444.0	Gray sandy shale
444.0	446.0	Limey sandstone
446.0	450.0	Gray limey sandy shale
450.0	452.0	Limestone
452.0	468.0	Limey shale
468.0	471.0	Limestone
471.0	473.0	Black shale
473.0	481.0	Coal
481.0	483.0	Gray shale
483.0	486.0	Gray limey shale
486.0	489.0	Limestone
489.0	499.0	Black shale
499.0	500.0	Limey shale
500.0	TD	
TD		

Goff & Pruitt Drilling, Inc.

Driller's Lithologic Log
Hillsboro Energy 08-04-25-06
Started 7-31-07 Finished 8-1-07

From	To	Description
0.0	2.0	Subsoil
2.0	10.0	Brown Clay
10.0	20.0	Brown & gray sandy clay
20.0	145.0	Sand & gravel & muddy clay
145.0	152.0	Limestone
152.0	157.0	Black shale
157.0	170.0	Gray sandy shale (Set 157' of 5 1/2 casing)
170.0	180.0	Gray sandy shale
180.0	185.0	Dark gray sandy shale
185.0	195.0	Sandy shale
195.0	209.0	Black shale
209.0	212.0	Sandy limestone
212.0	250.0	Sandy gray shale
250.0	270.0	Sandy shale
270.0	290.0	Gray shale
290.0	300.0	Sandy gray shale
300.0	305.0	Black shale
305.0	310.0	Gray shale
310.0	320.0	Sandstone
320.0	335.0	Sandy gray shale
335.0	360.0	Sandstone
360.0	370.0	Sandy shale
370.0	405.0	Gray shale
405.0	410.0	Sandy gray shale
410.0	443.0	Light gray shale
443.0	461.0	Limey sandstone & limestone
461.0	464.0	Black shale
464.0	472.0	Coal
472.0	474.0	Underclay
474.0	482.0	Limey shale
482.0	493.0	Sandy shale
493.0	TD	

Attachment III.2.A.2 - Acid-Base Accountability Data

Sample for Chemical Analysis

Core Number: 08-03-17-04

Unit	Lithology	From	To	Thickness in Feet	Unit Sample Number and Depth Taken												
					1	2	3	4	5	6	7	8	9	10	11	12	13
1	Limestone	128.30	138.30	10.00	Drilled												
2	Claystone	138.30	139.50	1.20	Drilled												
3	Silty Shale	139.50	161.00	21.50	145.0	150.0	155.0	160.0									
4	Silty Shale	161.00	169.00	8.00	165.0												
5	Silty Shale and Sandstone Interbeds	169.00	179.00	10.00	170.0	175.0											
6	Silty Shale and Sandstone Interbeds	179.00	194.80	15.80	180.0	185.0	190.0										
7	Shale	194.80	198.40	3.60	196.5												
8	Carbonaceous Shale	198.40	201.95	3.55	200.0												
9	Coal	201.95	202.35	0.40	202.2												
10	Claystone	202.35	206.00	3.65	205.0												
11	Silty Shale	206.00	222.00	16.00	210.0	215.0	220.0										
12	Siltstone and Sandstone Interbeds	222.00	252.40	30.40	225.0	230.0	235.0	240.0	245.0	250.0							
13	Siltstone	252.40	256.70	4.30	255.0												
14	Silty Shale	256.70	260.30	3.60	258.5												
15	Shale	260.30	263.45	3.15	262.0												
16	Shale and Limestone Interbeds	263.45	265.50	2.05	265.0												
17	Silty Shale	265.50	273.00	7.50	270.0												
18	Shale	273.00	290.50	17.50	275.0	280.0	285.0	290.0									
19	Coal	290.50	291.60	1.10	291.0												
20	Claystone	291.60	293.60	2.00	292.5												
21	Siltstone and Sandstone Interbeds	293.60	299.00	5.40	297.0												
22	Sandstone	299.00	310.00	11.00	302.0	307.0											
23	Silty Shale	310.00	319.00	9.00	311.0	315.0											
24	Siltstone	319.00	380.00	61.00	320.0	325.0	330.0	335.0	340.0	345.0	350.0	355.0	360.0	365.0	370.0	375.0	379.0
25	Silty Shale	380.00	395.90	15.90	385.0	390.0	395.0										
26	Claystone	395.90	396.85	0.95	396.5												
27	Silty shale	396.85	401.10	4.25	399.0												
28	Shale and Siltstone Interbeds	401.10	403.05	1.95	402.0												
29	Claystone	403.05	413.05	10.00	405.0	410.0											
30	Limestone	413.05	418.50	5.45	415.0												
31	Claystone	418.50	420.75	2.25	420.0												
32	Carbonaceous Shale	420.75	423.05	2.30	422.0												
33	Claystone	423.05	425.70	2.65	424.5												
34	Silty Shale	425.70	428.80	3.10	427.5												
35	Carbonaceous Shale	428.80	430.00	1.20	429.5												
36	Claystone	430.00	431.80	1.80	431.0												
37	Limestone	431.80	434.50	2.70	433.0												
38	Shale	434.50	438.00	3.50	436.0												
39	Limestone	438.00	439.10	1.10	438.5												
40	Claystone	439.10	440.50	1.40	440.0												
41	Limestone	440.50	441.40	0.90	441.0												
42	Limestone	441.40	443.30	1.90	442.5												
43	Carbonaceous Shale	443.30	446.60	3.30	445.0												
44	Coal	446.60	454.10	7.50	Removed												
45	Siltstone	454.10	456.00	1.90	455.0												

Appalachian Laboratories, Inc.

P.O. BOX 392
BECKLEY, WEST VIRGINIA 25802

PHONE 304-253-8677
FAX 304-253-4157
E-mail: applab1@charter.net

Client: Hillsboro Energy, LLC
P.O. Box 455
Hillsboro, Il 62049

Date Sampled: 2/1/2007
Date Received: 8/3/2007
Date Analyzed: 8/6/2007

Hole # 08-03-17-04
ACID BASE ACCOUNTABILITY
CAC03 Equiv. (Tons/1000 Tons of Material)

Lab No.	SAMPLE ID	Color	Fizz	% Sulfur	Max. From % Sulfur	Amount Present	Max. Needed pH 7	Excess	Paste pH
11282	Unit 3 Sample 1	5y/6/1	slight	0.0009	0.0281	23.5000	-0-	23.4719	8.71
11283	Unit 3 Sample 2	5y/6/1	none	0.0100	0.3125	4.5000	-0-	4.1875	8.80
11284	Unit 3 Sample 3	5y/6/1	none	0.0013	0.0406	3.7500	-0-	3.7095	8.59
11285	Unit 3 Sample 4	5y/6/1	slight	0.0130	0.4063	11.2500	-0-	10.8437	8.79
11286	Unit 4 Sample 1	5y/6/1	slight	0.0243	0.7594	7.2500	-0-	6.4906	8.79
11287	Unit 5 Sample 1	5y/5/2	moderate	0.0085	0.2656	15.0376	-0-	14.7720	8.36
11288	Unit 5 Sample 2	5y/5/2	moderate	0.0055	0.1719	17.5439	-0-	17.3720	8.74
11289	Unit 6 Sample 1	5y/5/2	moderate	0.0124	0.3875	22.5564	-0-	22.1689	8.40
11290	Unit 6 Sample 2	2.5y/5/1	moderate	0.0059	0.1844	18.7970	-0-	18.6126	8.77
11291	Unit 6 Sample 3	2.5y/5/1	slight	0.0033	0.1031	15.5000	-0-	15.3969	8.58
11292	Unit 7 Sample 1	5y/4/1	strong	0.1970	6.1563	140.7035	-0-	134.5472	8.04
11293	Unit 8 Sample 1	2.5y/2.5/1	slight	1.3090*	40.9063	212500	19.6563	-0-	7.08
11294	Unit 9 Sample 1	2.5y/2.5/1	slight	0.7300*	22.8125	18.2500	4.5625	-0-	6.21
11295	Unit 10 Sample 1	2.5y/7/1	strong	0.1090	3.4063	513.8191	-0-	510.4128	9.08
11296	Unit 11 Sample 1	5y/7/1	strong	0.0003	0.0094	65.3266	-0-	65.3172	9.37
11297	Unit 11 Sample 2	5y/7/1	none	0.0040	0.1250	10.2500	-0-	10.1250	9.02
11298	Unit 11 Sample 3	5y/6/1	none	0.0032	0.1000	6.7500	-0-	6.6500	9.19
11299	Unit 12 Sample 1	5y/6/1	none	0.0063	0.1969	8.7500	-0-	8.5531	9.09
11300	Unit 12 Sample 2	5y/5/2	moderate	0.0140	0.4375	28.8221	-0-	28.3846	8.12

*Calculated from the Pyritic Sulfur Content
See Attachment
hillsboro acid base 8-6-07.xls

Respectively Submitted:

Appalachian Laboratories, Inc.

P.O. BOX 392
BECKLEY, WEST VIRGINIA 25802

PHONE 304-253-8677
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E-mail: applabs@charter.net

Client: Hillsboro Energy, LLC
P.O. Box 455
Hillsboro, Il 62049

Date Sampled: 2/1/2007
Date Received: 8/3/2007
Date Analyzed: 8/6/2007

Hole # 08-03-17-04
ACID BASE ACCOUNTABILITY
CAC03 Equiv. (Tons/1000 Tons of Material)

Lab No.	SAMPLE ID	Color	Fizz	% Sulfur	Max. From % Sulfur	Amount Present	Max. Needed pH 7	Excess	Paste pH
11301	Unit 12 Sample 3	5y/4/2	slight	0.0302	0.9438	14.0000	-0-	13.0562	8.03
11302	Unit 12 Sample 4	5y/4/2	moderate	0.0387	1.2094	18.7970	-0-	17.5876	8.02
11303	Unit 12 Sample 5	5y/5/2	slight	0.0655	2.0469	23.0000	-0-	20.9531	8.04
11304	Unit 12 Sample 6	5y/5/2	slight	0.0056	0.1750	14.2500	-0-	14.0750	8.60
11305	Unit 13 Sample 1	5y/5/2	slight	0.0027	0.0844	13.7500	-0-	13.6656	8.86
11306	Unit 14 Sample 1	5y/5/2	slight	0.0050	0.1563	16.5000	-0-	16.3437	9.17
11307	Unit 15 Sample 1	5y/5/2	slight	0.0006	0.0188	16.7500	-0-	16.7312	8.96
11308	Unit 16 Sample 1	2.5y/7/1	strong	0.0014	0.0438	683.4171	-0-	683.3733	8.89
11309	Unit 17 Sample 1	5y/5/1	slight	0.4670	14.5938	14.0000	0.5938	-0-	8.54
11310	Unit 18 Sample 1	5y/6/1	slight	0.1430	4.4688	16.7500	-0-	12.2812	8.48
11311	Unit 18 Sample 2	5y/5/1	slight	0.2180	6.8125	12.7500	-0-	5.9375	8.77
11312	Unit 18 Sample 3	2.5y/5/2	moderate	0.4240	13.2500	27.5689	-0-	14.3189	8.37
11313	Unit 18 Sample 4	2.5y/5/2	moderate	0.0959	2.9969	16.2907	-0-	13.2938	8.92
11314	Unit 19 Sample 1	2.5/	none	0.7320*	22.8700	12.7500	10.1250	-0-	5.79
11315	Unit 20 Sample 1	5y/6/1	none	0.1840	5.7500	2.2500	3.5000	-0-	6.92
11316	Unit 21 Sample 1	5y/7/1	none	0.0024	0.0750	8.2500	-0-	8.1750	8.64
11317	Unit 22 Sample1	5y/6/1	slight	0.0027	0.0844	16.5000	-0-	16.4156	9.02
11318	Unit 22 Sample 2	5y/6/1	slight	0.0019	0.0594	0.5000	-0-	0.4406	9.08
11319	Unit 23 Sample 1	5y/5/2	slight	0.4300	13.5313	14.0000	-0-	0.4687	8.11

*Calculated from the Pyritic Sulfur Content
See Attachment
hillsboro acid base,8-6-07.xls

Respectively Submitted: John A. Brewer

Appalachian Laboratories, Inc.

P.O. BOX 382
BECKLEY, WEST VIRGINIA 25802

PHONE 304-253-8677
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E-mail: applabs@charter.net

Client: Hillsboro Energy, LLC
P.O. Box 455
Hillsboro, Il 62049

Date Sampled: 2/1/2007
Date Received: 8/3/2007
Date Analyzed: 8/6/2007

Hole # 08-03-17-04
ACID BASE ACCOUNTABILITY
CACO3 Equiv. (Tons/1000 Tons of Material)

Lab No.	SAMPLE ID	Color	Fizz	% Sulfur	Max. From % Sulfur	Amount Present	Max. Needed pH 7	Excess	Paste pH
11320	Unit 23 Sample 2	5y/5/2	slight	0.0038	0.1188	15.0000	-0-	14.8812	8.90
11321	Unit 24 Sample 1	5y/5/2	slight	0.3910	12.2188	14.7500	-0-	2.5312	8.09
11322	Unit 24 Sample 2	5y/5/2	slight	0.2770	8.6563	13.7500	-0-	5.0937	8.64
11323	Unit 24 Sample 3	5y/5/2	moderate	0.0030	0.0938	21.3033	-0-	21.2095	8.99
11324	Unit 24 Sample 4	5y/5/2	moderate	0.0020	0.0625	27.5689	-0-	27.5064	9.03
11325	Unit 24 Sample 5	5y/5/2	moderate	0.0078	0.2438	35.0877	-0-	34.8439	9.08
11326	Unit 24 Sample 6	5y/5/2	slight	0.0014	0.0438	14.7500	-0-	14.7062	9.03
11327	Unit 24 Sample 7	5y/5/2	slight	0.0014	0.0438	17.0000	-0-	16.9562	8.97
11328	Unit 24 Sample 8	5y/5/2	slight	0.0071	0.2219	18.5000	-0-	18.2781	9.02
11329	Unit 24 Sample 9	5y/5/2	slight	0.0086	0.2688	16.0000	-0-	15.7312	9.05
11330	Unit 24 Sample 10	5y/5/2	slight	0.0006	0.0188	21.7500	-0-	21.7312	8.78
11331	Unit 24 Sample 11	5y/5/2	slight	0.0182	0.5688	17.0000	-0-	16.4312	9.03
11332	Unit 24 Sample 12	5y/5/2	moderate	0.0012	0.0375	28.8221	-0-	28.7846	9.02
11333	Unit 24 Sample 13	5y/5/2	slight	0.0027	0.0844	35.7500	-0-	35.6656	9.13
11334	Unit 25 Sample 1	5y/5/2	slight	0.0016	0.0500	18.5000	-0-	18.4500	9.10
11335	Unit 25 Sample 2	5y/5/2	slight	0.0029	0.0906	17.0000	-0-	16.9094	8.98
11336	Unit 25 Sample 3	5y/5/2	none	0.0067	0.2094	9.2500	-0-	9.0406	9.11
11337	Unit 26 Sample 1	5y/6/1	strong	0.0678	2.1188	149.4975	-0-	147.3787	8.94
11338	Unit 27 Sample 1	5y/7/1	slight	0.0268	0.8375	19.5000	-0-	18.6625	9.25

*Calculated from the Pyritic Sulfur Content
See Attachment
hillsboro acid base,8-6-07.xls

Respectively Submitted: John A. Brown

Appalachian Laboratories, Inc.

P.O. BOX 392
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PHONE 304-253-8677
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Client: Hillsboro Energy, LLC
P.O. Box 455
Hillsboro, Il 62049

Date Sampled: 2/1/2007
Date Received: 8/3/2007
Date Analyzed: 8/6/2007

Hole # 08-03-17-04
ACID BASE ACCOUNTABILITY
CAC03 Equiv. (Tons/1000 Tons of Material)

Lab No.	SAMPLE ID	Color	Fizz	% Sulfur	Max. From % Sulfur	Amount Present	Max. Needed pH 7	Excess	Paste pH
11339	Unit 28 Sample 1	5y/7/1	slight	0.0180	0.5625	25.7500	-0-	25.1875	9.41
11340	Unit 29 Sample 1	10yr/5/4	none	0.0012	0.0375	4.7500	-0-	4.7125	8.26
11341	Unit 29 Sample 2	2.5y/7/1	none	0.0023	0.0719	14.2500	-0-	14.1781	9.13
11342	Unit 30 Sample 1	2.5y/8/1	strong	0.0019	0.0594	866.8342	-0-	866.7748	9.28
11343	Unit 31 Sample 1	2.5y/5/4	none	0.0018	0.0563	11.2500	-0-	11.1937	9.30
11344	Unit 32 Sample 1	2.5y/3/1	none	0.2080	6.5000	1.7500	4.7500	-0-	7.43
11345	Unit 33 Sample 1	5y/5/1	strong	0.0410	1.2813	124.3719	-0-	123.0906	9.17
11346	Unit 34 Sample 1	2.5y/7/1	none	0.0012	0.0375	13.5000	-0-	13.4625	8.46
11347	Unit 35 Sample 1	10yr/2/1	moderate	2.2300*	69.6875	63.9098	5.7777	-0-	7.41
11348	Unit 36 Sample 1	2.5y/7/1	moderate	1.4750*	46.0938	22.5564	23.5374	-0-	8.85
11349	Unit 37 Sample 1	2.5y/8/1	strong	0.1340	4.1875	597.9899	-0-	593.8024	9.24
11350	Unit 38 Sample 1	5Gy7/1	slight	1.3500*	42.1875	58.0000	-0-	15.8125	9.06
11351	Unit 39 Sample 1	2.5y/8/1	strong	0.0086	0.2688	816.5829	-0-	816.3141	8.63
11352	Unit 40 Sample 1	2.5/5/1	strong	2.2670*	70.8438	236.1809	-0-	165.3371	7.81
11353	Unit 41 Sample 1	2.5y/7/1	strong	0.0114	0.3563	817.8392	-0-	817.4829	7.69
11354	Unit 42 Sample 1	2.5y/7/1	strong	0.0195	0.6094	741.2060	-0-	740.5966	7.97
11355	Unit 43 Sample 1	10yr/2/1	none	1.2720*	39.7500	10.0000	29.7500	-0-	6.47
11356	Unit 44 Sample 1	REMOVED							
11357	Unit 45 Sample 1	2.5/7/1	none	0.5343*	16.6969	-1.0000	17.6969	-0-	6.65

*Calculated from the Pyritic Sulfur Content
See Attachment
hillsboro acid base,8-6-07.xls

Respectively Submitted: John A. Brown

Attachment III.2.A.3 - Sulfur Forms Result Sheet

Sample for Chemical Analysis

Core Number: 08-03-17-04

Unit	Lithology	From	To	Thickness in Feet	Unit Sample Number and Depth Taken												
					1	2	3	4	5	6	7	8	9	10	11	12	13
1	Limestone	128.30	138.30	10.00	Drilled												
2	Claystone	138.30	139.50	1.20	Drilled												
3	Silty Shale	139.50	161.00	21.50	145.0	150.0	155.0	160.0									
4	Silty Shale	161.00	169.00	8.00	165.0												
5	Silty Shale and Sandstone Interbeds	169.00	179.00	10.00	170.0	175.0											
6	Silty Shale and Sandstone Interbeds	179.00	194.80	15.80	180.0	185.0	190.0										
7	Shale	194.80	198.40	3.60	196.5												
8	Carbonaceous Shale	198.40	201.95	3.55	200.0												
9	Coal	201.95	202.35	0.40	202.2												
10	Claystone	202.35	206.00	3.65	205.0												
11	Silty Shale	206.00	222.00	16.00	210.0	215.0	220.0										
12	Siltstone and Sandstone Interbeds	222.00	252.40	30.40	225.0	230.0	235.0	240.0	245.0	250.0							
13	Siltstone	252.40	256.70	4.30	255.0												
14	Silty Shale	256.70	260.30	3.60	258.5												
15	Shale	260.30	263.45	3.15	262.0												
16	Shale and Limestone Interbeds	263.45	265.50	2.05	265.0												
17	Silty Shale	265.50	273.00	7.50	270.0												
18	Shale	273.00	290.50	17.50	275.0	280.0	285.0	290.0									
19	Coal	290.50	291.60	1.10	291.0												
20	Claystone	291.60	293.60	2.00	292.5												
21	Siltstone and Sandstone Interbeds	293.60	299.00	5.40	297.0												
22	Sandstone	299.00	310.00	11.00	302.0	307.0											
23	Silty Shale	310.00	319.00	9.00	311.0	315.0											
24	Siltstone	319.00	380.00	61.00	320.0	325.0	330.0	335.0	340.0	345.0	350.0	355.0	360.0	365.0	370.0	375.0	379.0
25	Silty Shale	380.00	395.90	15.90	385.0	390.0	395.0										
26	Claystone	395.90	396.85	0.95	396.5												
27	Silty shale	396.85	401.10	4.25	399.0												
28	Shale and Siltstone Interbeds	401.10	403.05	1.95	402.0												
29	Claystone	403.05	413.05	10.00	405.0	410.0											
30	Limestone	413.05	418.50	5.45	415.0												
31	Claystone	418.50	420.75	2.25	420.0												
32	Carbonaceous Shale	420.75	423.05	2.30	422.0												
33	Claystone	423.05	425.70	2.65	424.5												
34	Silty Shale	425.70	428.80	3.10	427.5												
35	Carbonaceous Shale	428.80	430.00	1.20	429.5												
36	Claystone	430.00	431.80	1.80	431.0												
37	Limestone	431.80	434.50	2.70	433.0												
38	Shale	434.50	438.00	3.50	436.0												
39	Limestone	438.00	439.10	1.10	438.5												
40	Claystone	439.10	440.50	1.40	440.0												
41	Limestone	440.50	441.40	0.90	441.0												
42	Limestone	441.40	443.30	1.90	442.5												
43	Carbonaceous Shale	443.30	446.60	3.30	445.0												
44	Coal, Herrin #6	446.60	454.10	7.50	Removed												
45	Siltstone	454.10	456.00	1.90	455.0												

Appalachian Laboratories, Inc.

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Client: Hillsboro Energy, LLC
P.O. Box 455
Hillsboro, Il 62049

Date Sampled: 2/1/2007
Date Received: 8/3/2007
Date Analyzed: 8/6/2007

Hole# 08-03-17-04
%
SULFUR FORMS

Lab No.	I.D. No.	% Pyritic Sulfur	% Organic Sulfur	% Sulfate Sulfur	% Total Sulfur
11293	Unit 8 Sample 1	1.3090	0.1810	<0.0001	1.4900
11294	Unit 9 Sample 1	0.7300	1.0300	<0.0001	1.7600
11314	Unit 19 Sample 1	0.7320	0.9180	<0.0001	1.6500
11347	Unit 35 Sample 1	2.2300	0.8900	<0.0001	3.1200
11348	Unit 36 Sample 1	1.4750	0.1050	<0.0001	1.5800
11350	Unit 38 Sample 1	1.3500	0.1000	<0.0001	1.4500
11352	Unit 40 Sample 1	2.2670	0.2130	<0.0001	2.4800
11355	Unit 43 Sample 1	1.2720	0.2980	0.3500	1.9200
11357	Unit 45 Sample	0.5343	0.0427	0.0510	0.6280

*Calculated from the Pyritic Sulfur Content
See Attachment
hillsobor SULFUR,8-6-07.xls

Respectively Submitted: John A. Brum

PRECISION Testing Laboratory
COAL ANALYSIS, INSPECTION AND SAMPLING

P.O. BOX 1985 • BECKLEY, WEST VIRGINIA 25802 • TELEPHONE (304) 252-2539

COMPANY: Hillsboro Energy LLC
ADDRESS: 925 S. Main Street, Hillsboro, Il. 62049

DESCRIPTION: 1.70 Float Composite

SAMPLE ID:
Core Sample Montgomery Co.
Hole#: 08-03-17-04
T/C (ft): 443.90
B/C (ft): 451.60
Total: 7.70

LABORATORY NUMBER: 332,274

DATE RECEIVED: 6-Feb-07
DATE ANALYZED: 1-Mar-07

Herrin #6 Coal

Sulfur Forms

% Total Sulfur	4.30
% Pyritic Sulfur	2.14
% Sulfate Sulfur	0.19
% Organic Sulfur	1.97

Fusing Temperature of Ash (Degrees Fah.)	Reducing	Oxidising
Initial Deformation Point	1936	2287
Softening Temperature, Spherical	2000	2371
Softening Temperature, Hemispherical	2129	2459
Fluid Temperature	2288	2497

PRECISION TESTING LABORATORY, INC.

Steven H. Lilly, Laboratory Manager

QUALITY Precision Testing Laboratory ISO - 9002 Analytical Services To the Coal Industry ASSURANCE

Attachment III.2.B.2. – Groundwater Monitoring Data

ATTACHMENT III.2.B.2

Schedule B Ground Water Monitoring Well Data

NOTE: DATA IS FROM SAMPLE No. 1 FOR EACH WELL CONDUCTED SEPTEMBER, 2007

Schedule B Ground Water Monitoring Well Data - Continued

Ownership: Name Address	Hillsboro Energy, LLC. 925 South Main, Hillsboro, IL 62049						Ownership: Name Address	Hillsboro Energy, LLC. 925 South Main, Hillsboro, IL 62049					
Designated Well #	MW24S 08-03-17-08	M23 08-03-17-07	MW22 08-03-17-06	MW25S 08-03-17-09	MW28 08-03-18-18	MW27S 08-03-18-17	Designated Well #	MW32 08-03-07-04	MW26S 08-03-18-16	MW33 08-03-18-22	MW34 08-03-07-05	MW30 08-03-18-20	MW31 08-03-18-21
Legal Location	Sec. 17, T.8S, R.3E	Sec. 17, T.8S, R.3E	Sec. 17, T.8S, R.3E	Sec. 17, T.8S, R.3E	Sec. 18, T.8S, R.3E	Sec. 18, T.8S, R.3E	Legal Location	Sec. 18, T.8S, R.3E	Sec. 18, T.8S, R.3E	Sec. 18, T.8S, R.3E	Sec. 7, T.8S, R.3E	Sec. 18, T.8S, R.3E	Sec. 18, T.8S, R.5E
Ground Elevation (MSL)	630.4	632.2	621.5	629.7	632.4	627	Ground Elevation (MSL)	614.4	626.4	611.7	612.5	628.4	636
Water Elevation (MSL)	622.9	618.9	610.4	618.9	624.2	620.2	Water Elevation (MSL)	607.9	613.5	595	601.3	621.8	625.9
Water bearing strata	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Water bearing strata	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Type, size of casing	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC	Type, size of casing	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC	2" PVC
Type/capacity of pump	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer	Type/capacity of pump	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer
Type of pipe	polyethylene	polyethylene	polyethylene	polyethylene	polyethylene	polyethylene	Type of pipe	polyethylene	polyethylene	polyethylene	polyethylene	polyethylene	polyethylene
Point of sampling	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer	Point of sampling	Bailer	Bailer	Bailer	Bailer	Bailer	Bailer
Water Quality							Water Quality						
Acidity, Total (mg/L as $CaCO_3$)	-368	-338	-272	-302	-262	-300	Acidity, Total (mg/L as $CaCO_3$)	-372	-398	-466	-342	-264	-282
Alkalinity, Total (mg/L as $CaCO_3$)	354	334	268	308	264	294	Alkalinity, Total (mg/L as $CaCO_3$)	380	396	488	342	270	280
Calcium, Total (mg/L)	4560	2040	343	2120	311	351	Calcium, Total (mg/L)	1250	1170	533	3280	2620	277
Chloride (mg/L)	52	45	54	40	47	41	Chloride (mg/L)	33	40	66	62	28	29
Fluoride (mg/L)	0.70	0.26	0.42	0.45	0.34	0.24	Fluoride (mg/L)	0.37	0.45	0.48	0.49	0.35	0.24
Hardness (mg/L as $CaCO_3$)	240	300	280	220	260	300	Hardness (mg/L as $CaCO_3$)	400	340	380	380	260	280
Iron, Total (mg/L)	2550	1090	101	1790	54.6	73.7	Iron, Total (mg/L)	217	160	139	1030	666	92.7
Magnesium, Total	3630	1120	163	1280	146	173	Magnesium, Total	587	479	217	1180	1170	110
Manganese, Total (mg/L)	59.3	22.1	2.1	62.2	1.44	21.6	Manganese, Total (mg/L)	6.22	5.05	3.05	21.3	11	1.62
Nitrate (mg/L as N)	0.5	0.4	2.62	0.24	0.21	<0.20	Nitrate (mg/L as N)	0.2	55.4	0.22	<0.20	0.24	5.48
pH	7.05	7.02	7.13	7.15	7.27	7.21	pH	7.23	7.24	7.23	7.32	7.19	7.34
Sodium, Total (mg/L)	74.0	99.2	60	75.2	35.2	32.2	Sodium, Total (mg/L)	112	55.4	108	75.8	85.1	80
Sulfate, Total (mg/L)	105	103	115	39	52	60	Sulfate, Total (mg/L)	258	67	164	119	105	187
Total Dissolved Solids (mg/L)	534	464	482	398	392	392	Total Dissolved Solids (mg/L)	740	528	730	594	456	588
Zinc, Total (mg/L as Zn)	9.48	4.82	0.299	5.02	0.12	0.404	Zinc, Total (mg/L as Zn)	0.411	0.42	0.29	2.1	28	0.242

Attachment III.2.C.2 - Baseline Surface Water Sample Site Data

Attachment III.2.C.2. Baseline Surface Water Sample Site Data

Ownership: Name Address	Hillsboro Energy, LLC. 925 South Main, Hillsboro, IL 62049					
Discharge Location #	D-1	D-1	D-1	D-1	D-1	D-1
Date	01/09/07	02/28/07	03/29/07	04/25/07	05/31/07	06/26/07
Water Quality						
Acidity, Total (mg/L $CaCO_3$)		-20	-39	-68	-83	-104
Alkalinity, Total (mg/L $CaCO_3$)		34	74	98	122	128
Chloride (mg/L)		6	15	16	18	17.5
Hardness (mg/L $CaCO_3$)		50	98	116	129	130
Iron, Total (mg/L)		1.86	3.04	1.12	0.44	0.402
Manganese, Total (mg/L)		0.1	0.256	0.3	0.2	0.688
pH		8.50	8.10	8.50	8.80	8.30
Sulfate, Total (mg/L)		8	26	24	14	10
Total Dissolved Solids (mg/L)		100	120	175	170	175
Total Suspended Solids (mg/L)		13	65	16	7	44
Flow Rate, gpm	0	0	0	0	0	0
Discharge Location #	D-2	D-2	D-2	D-2	D-2	D-2
Date	9-Jan	28-Feb	29-Mar	25-Apr	31-May	26-Jun
Water Quality						
Acidity, Total (mg/L $CaCO_3$)	-102	-88	-176	-207	-230	-50
Alkalinity, Total (mg/L $CaCO_3$)	135	111	244	264	292	62
Chloride (mg/L)	25	15	26.3	24	21	5.7
Hardness (mg/L $CaCO_3$)	154	131	259	280	273	71
Iron, Total (mg/L)	1.92	2.09	0.951	0.803	0.57	1.18
Manganese, Total (mg/L)	0.1	0.1	0.36	0.2	1.2	0.157
pH	7.80	7.40	7.70	7.90	7.80	7.80
Sulfate, Total (mg/L)	43	36	35	66	43	16
Total Dissolved Solids (mg/L)	290	205	360	405	385	125
Total Suspended Solids (mg/L)	4	12	13	8	6	13
Flow Rate, gpm	60	65	50	10	5	10
Discharge Location #	D-3	D-3	D-3	D-3	D-3	D-3
Date	9-Jan	28-Feb	29-Mar	25-Apr	31-May	26-Jun
Water Quality						
Acidity, Total (mg/L $CaCO_3$)	-124	-105	-165	-146	-166	-33
Alkalinity, Total (mg/L $CaCO_3$)	141	119	206	215	248	52
Chloride (mg/L)	35	24	40.1	28	15	6.2
Hardness (mg/L $CaCO_3$)	169	166	246	214	211	65
Iron, Total (mg/L)	0.46	0.21	0.26	1.82	5.05	0.903
Manganese, Total (mg/L)	0.0	0.0	0.065	0.4	2.6	0.034
pH	8.00	7.50	7.80	7.80	7.90	7.70
Sulfate, Total (mg/L)	34	36	34	37	20	21
Total Dissolved Solids (mg/L)	260	210	340	330	325	140
Total Suspended Solids (mg/L)	3	1	1	11	51	14
Flow Rate, gpm	0	5	5	2	0	0

Note: Samples for July & August were not obtained due to no flow and no pooled water at sampling points.

Attachment III.3.D.4. – Monitoring Well Completion Reports

ATTACHMENT III.3.D.4
MONITORING WELL DESIGNATIONS CORELLATED WITH BOREHOLE NUMBERS

Well # / Borehole #	MW24S 08-03-17-08	M23 08-03-17-07	MW22 08-03-17-06	MW25S 08-03-17-09	MW28 08-03-18-18	MW27S 08-03-18-17

Well # / Borehole #	MW32 08-03-07-04	MW26S 08-03-18-16	MW33 08-03-18-22	MW34 08-03-07-05	MW30 08-03-18-20	MW31 08-05-18-21

Note: "S" designations stand for shallow well.

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 903057.9; E 2499696.0

Well No.: MW 22 (08-03-17-06)
Date Started: August 15, 2007
Date Completed: August 15, 2007
Drilling Tech: A. Staggemeyer
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

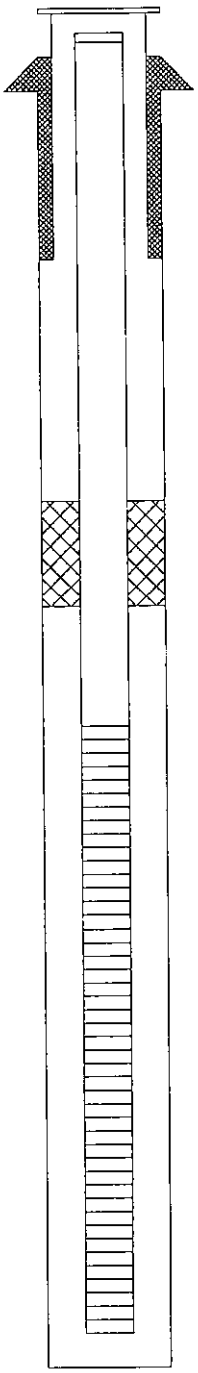
to 0.01 ft (where applicable)

Riser pipe length	7.5 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	5 gal.
Other	

Well Recovery = 0.2 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
623.36 Top of Riser Pipe
621.9 Ground Surface
620.9 Top of Annular Sealant

618.9 Top of Seal

2' Total Seal Interval
616.9 Top of Sand

615.9 Top of Screen

10 Total Screen Interval

605.9 Bottom of Screen
604.9 Bottom of Borehole

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 901711.7; E 2500581.4

Well No.: MW 23 (08-03-17-07)
Date Started: August 20, 2007
Date Completed: August 20, 2007
Drilling Tech: A. Staggemeyer
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

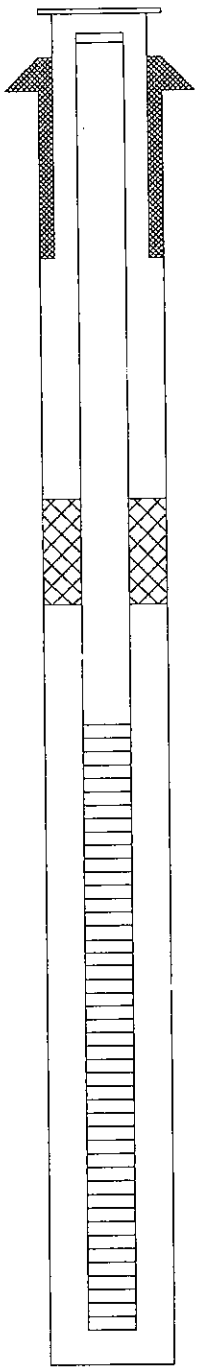
to 0.01 ft (where applicable)

Riser pipe length	7.5 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	5 gal.
Other	

Well Recovery = 0.4 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
633.52 Top of Riser Pipe
632.2 Ground Surface
631.2 Top of Annular Sealant

629.0 Top of Seal

2' Total Seal Interval
627.0 Top of Sand

626.0 Top of Screen

10' Total Screen Interval

616.0 Bottom of Screen
615.0 Bottom of Borehole

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 900419.0; E 2499331.5

Well No.: MW 24 (08-03-17-08) (Shallow)
Date Started: August 23, 2007
Date Completed: August 23, 2007
Drilling Tech: A. Staggemeyer
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

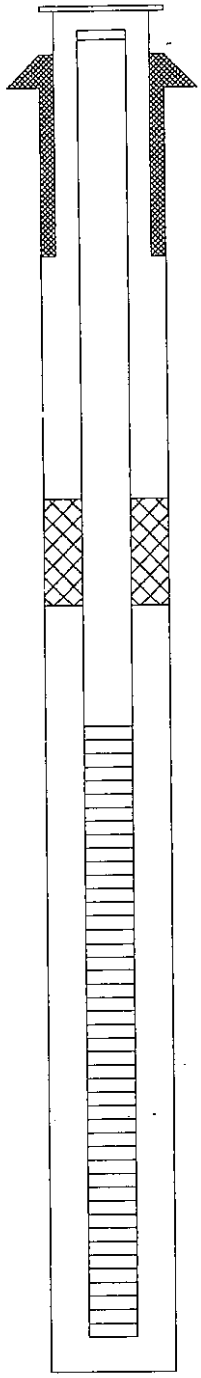
to 0.01 ft (where applicable)

Riser pipe length	10.0 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	5 gal.
Other	

Well Recovery = 0.4 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
635.69 Top of Riser Pipe
630.6 Ground Surface
629.6 Top of Annular Sealant

628.7 Top of Seal

2' Total Seal Interval
626.7 Top of Sand

625.7 Top of Screen

10' Total Screen Interval

615.7 Bottom of Screen
614.7 Bottom of Borehole

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 901760.8; E 2497968.1

Well No.: MW 25 (08-03-17-09) (Shallow)
Date Started: August 23, 2007
Date Completed: August 24, 2007
Drilling Tech: A. Staggemeyer
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

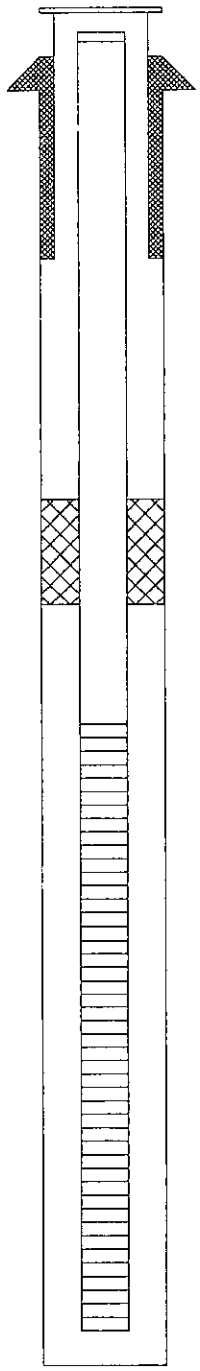
to 0.01 ft (where applicable)

Riser pipe length	10.0 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	5 gal.
Other	

Well Recovery = 0.5 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
633.61 Top of Riser Pipe
629.7 Ground Surface
628.7 Top of Annular Sealant

626.6 Top of Seal

2' Total Seal Interval
624.6 Top of Sand

623.6 Top of Screen

10' Total Screen Interval

613.6 Bottom of Screen
612.6 Bottom of Borehole

Well Completion Report

Site Name: Hillsboro Energy
Well No.: MW 26 (08-03-18-16)
Drilling Contractor: Atlas Soils
Date Started: August 30, 2007
Driller: M. Hough
Date Completed: August 30, 2007
Drilling Method: Hollow Stem Augers
Drilling Tech: A. Staggemeyer
Location: N 900316.8; E 2494316.0
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

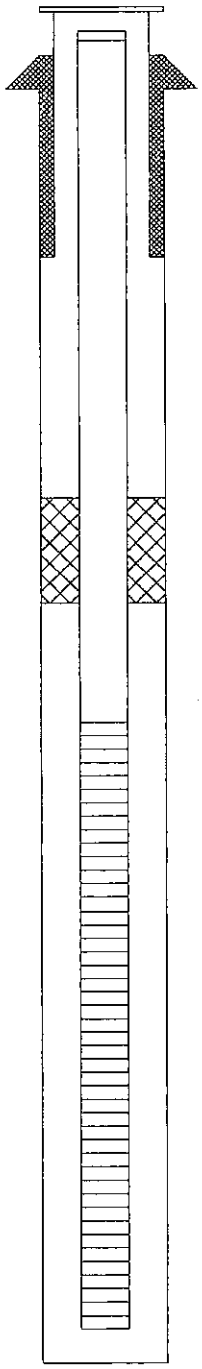
to 0.01 ft (where applicable)

Riser pipe length	12.5 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	10 gal.
Other	

Well Recovery = 0.5 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
628.69 Top of Riser Pipe
626.5 Ground Surface
625.5 Top of Annular Sealant

617.0 Top of Seal

2' Total Seal Interval
615.0 Top of Sand

614.0 Top of Screen

10' Total Screen Interval

604.0 Bottom of Screen
603.0 Bottom of Borehole

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 900250.6; E 2496029.8

Well No.: MW 27 (08-03-18-17) (Shallow)
Date Started: August 23, 2007
Date Completed: August 23, 2007
Drilling Tech: A. Staggemeyer
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

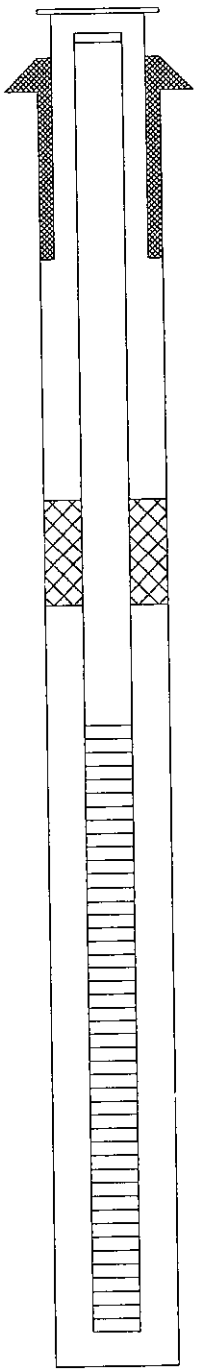
to 0.01 ft (where applicable)

Riser pipe length	7.5 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	5 gal.
Other	

Well Recovery = 0.7 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
628.69 Top of Riser Pipe
626.9 Ground Surface
625.9 Top of Annular Sealant

624.2 Top of Seal

2' Total Seal Interval
622.2 Top of Sand

621.2 Top of Screen

10' Total Screen Interval

611.2 Bottom of Screen
610.2 Bottom of Borehole

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 900325.1; E 2497976.7

Well No.: MW 28 (08-03-18-18)
Date Started: August 23, 2007
Date Completed: August 23, 2007
Drilling Tech: A. Staggemeyer
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

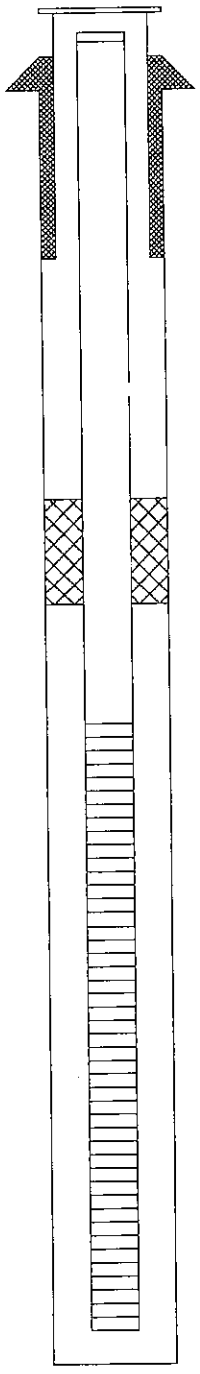
to 0.01 ft (where applicable)

Riser pipe length	12.5 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	5 gal.
Other	

Well Recovery = 1.0 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
634.30 Top of Riser Pipe
632.5 Ground Surface
631.5 Top of Annular Sealant

624.8 Top of Seal

2' Total Seal Interval
622.8 Top of Sand

621.8 Top of Screen

10' Total Screen Interval

611.8 Bottom of Screen
610.8 Bottom of Borehole

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 897704.5; E 2496053.1

Well No.: MW 30 (08-03-18-20)
Date Started: September 4, 2007
Date Completed: September 4, 2007
Drilling Tech: A. Staggemeyer
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

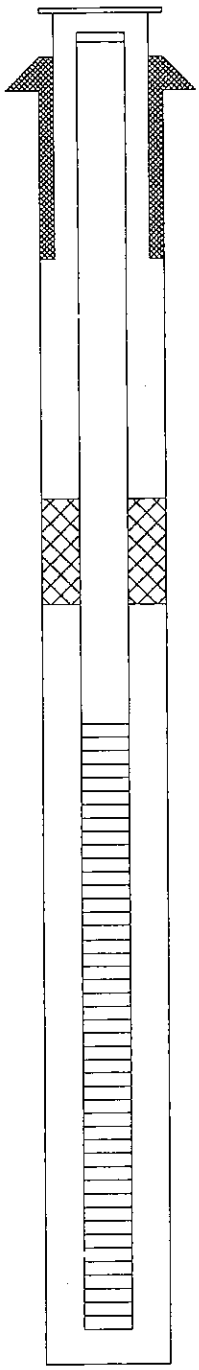
to 0.01 ft (where applicable)

Riser pipe length	7.5 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	5 gal.
Other	

Well Recovery = 0.7 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
630.48 Top of Riser Pipe
628.2 Ground Surface
627.2 Top of Annular Sealant

626.0 Top of Seal

2' Total Seal Interval
624.0 Top of Sand

623.0 Top of Screen

10' Total Screen Interval

613.0 Bottom of Screen
612.0 Bottom of Borehole

Well Completion Report

Site Name: Hillsboro Energy
Well No.: MW 31 (08-03-18-21)
Drilling Contractor: Atlas Soils
Date Started: September 4, 2007
Driller: M. Hough
Date Completed: September 4, 2007
Drilling Method: Hollow Stem Augers
Drilling Tech: A. Staggemeyer
Location: N 897936.9; E 2497977.6
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

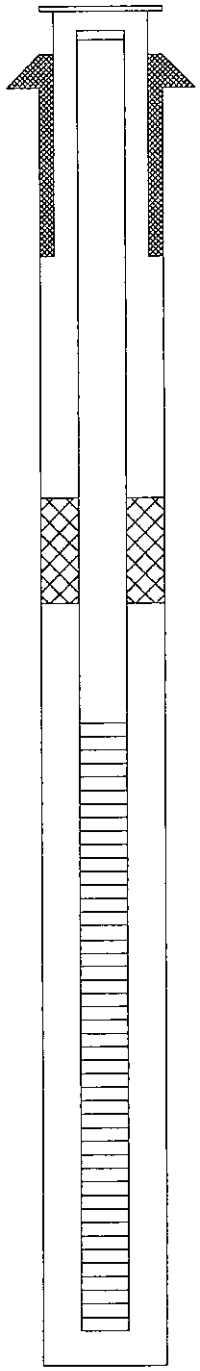
to 0.01 ft (where applicable)

Riser pipe length	12.5 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	5 gal.
Other	

Well Recovery = 0.8 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
639.05 Top of Riser Pipe
636.4 Ground Surface
635.4 Top of Annular Sealant

629.6 Top of Seal

2' Total Seal Interval
627.6 Top of Sand

626.6 Top of Screen

10' Total Screen Interval

616.6 Bottom of Screen
615.6 Bottom of Borehole

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 903994.3; E 2494125.3

Well No.: MW 32 (08-03-07-04)
Date Started: September 1, 2007
Date Completed: September 1, 2007
Drilling Tech: D. Kimmle
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

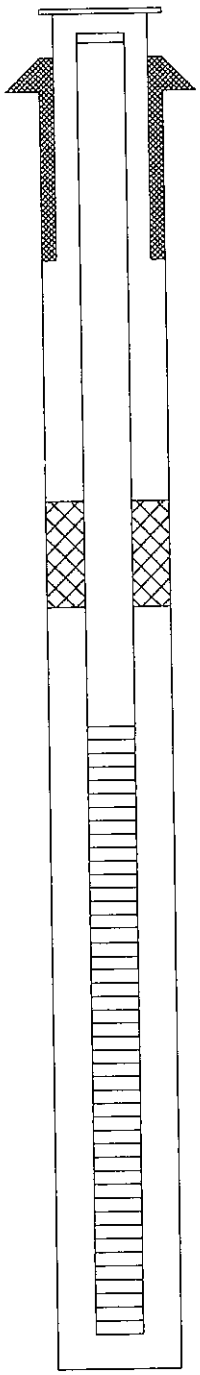
to 0.01 ft (where applicable)

Riser pipe length	12.5 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	5 gal.
Other	

Well Recovery = 0.8 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
616.98 Top of Riser Pipe
614.5 Ground Surface
613.5 Top of Annular Sealant

607.5 Top of Seal

2' Total Seal Interval
605.5 Top of Sand

604.5 Top of Screen

10' Total Screen Interval

594.5 Bottom of Screen
593.5 Bottom of Borehole

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 902191.0; E 2493596.7

Well No.: MW 33 (08-03-18-22)
Date Started: September 5, 2007
Date Completed: September 5, 2007
Drilling Tech: D. Kimmle
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

to 0.01 ft (where applicable)

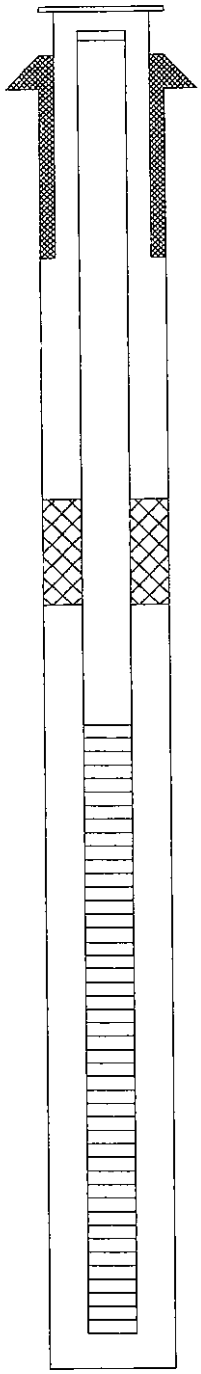
Riser pipe length	12.5 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	2.5 gal.
Other	

Note: Well bailed dry during development.

Well Recovery = 0.8 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
614.31 Top of Riser Pipe
611.7 Ground Surface
610.7 Top of Annular Sealant

604.8 Top of Seal

2' Total Seal Interval
602.8 Top of Sand

601.8 Top of Screen

10' Total Screen Interval

591.8 Bottom of Screen
591.8 Bottom of Borehole

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 903337.0; E 2494041.6

Well No.: MW 34 (08-03-07-05)
Date Started: September 6, 2007
Date Completed: September 6, 2007
Drilling Tech: D. Kimmle
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

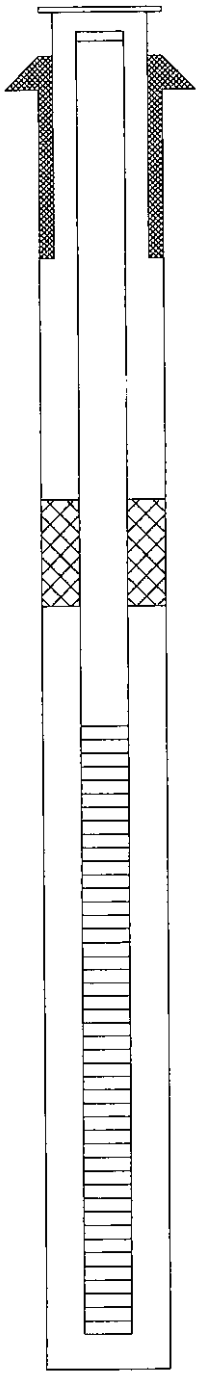
to 0.01 ft (where applicable)

Riser pipe length	12.5 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	5 gal.
Other	

Well Recovery = 0.6 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
615.90 Top of Riser Pipe
612.5 Ground Surface
611.5 Top of Annular Sealant
606.4 Top of Seal
2' Total Seal Interval
604.4 Top of Sand
603.4 Top of Screen
10' Total Screen Interval
593.4 Bottom of Screen
589.5 Bottom of Borehole

Attachment III.4.a – Sampling and Analysis Plan

Sampling and Analysis Plan
Deer Run Mine
Hillsboro, Montgomery County, Illinois

Prepared for

Hillsboro Energy, LLC
Hillsboro, Illinois

November 15, 2007

TABLE OF CONTENTS

I. SAMPLING PROCEDURES

The sampling plan for groundwater monitoring at the proposed mine site has been described below. This sampling plan addresses procedures and techniques for sample collection, preservation and shipment; chain-of-custody control; and proper field documentation. The procedures set forth in this plan are widely recognized as industry standards and when applicable, have been referenced to published documents.

A. Initial Documentation

The number of samples to be collected and analyzed shall be determined prior to mobilization to the site. Sampling jars and sampling equipment should be inspected to insure serviceability and cleanliness. Upon arrival at each well location, the condition of the well and the surrounding area should be observed and recorded. Specific items to observe should include the condition of the well riser, well cap and concrete seal; detection of any physical activity or disturbance of the well; evidence of any surface contamination; or evidence of local settlement or erosion.

B. Depth Measurements

Prior to groundwater purging and sample withdrawal, an accurate measurement of the top of groundwater and well depth are to be taken. These measurements shall be referenced to the top of well riser; and, based on the riser elevation, shall be referenced to MSL elevations. Water level measurements shall be taken with a portable electronic measuring device or a properly weighted fiberglass tape measure.

C. Sample Collection

Sample collection shall be completed with proper sampling equipment. Samples shall be retrieved with a stainless steel bailer, peristallic pump, bladder pump system, or other approved method. All contact parts of the sampling device shall be appropriately cleaned with deionized water between monitor wells and sampling events. Sampling protocol shall include properly purging the well prior to the sampling event. The equivalent of three standing water volumes (measured from the depth of water, to the bottom of the well) shall be removed from the well prior to sampling. This procedure shall be completed to insure that samples are drawn from the aquifier, not from the stagment water left in the well between sampling events. If additional purging is deemed necessary to accomplish this intent, it shall be completed. If a monitoring well does not recharge sufficient for sampling within a 24-hour to 72-hour period, the well should be considered dry for the sampling event. The site manager shall be notified when a well is dry during a sampling event.

D. Sample Preservation and Shipment

Since many different analysis may be required, various types of containers and preservatives may be necessary. The appropriate containers and preservatives shall be supplied by the contract laboratory for each sampling point and each sampling event. Plastic or glass containers shall be utilized for sample shipment and storage.

All samples except those collected for the analysis of constituents listed below shall be field filtered through a 0.45 micron filter. Samples to be analyzed for the following constituents are not to be field filtered (Note that constituents presented in Attachment A do not require to be field filtered).

- Alkalinity/Acidity
- Total suspended solids/Total dissolved solids
- Volatile organics
- Coliform bacteria
- Oil and grease
- Total organic halogen
- Total heavy metals
- PH, specific conductance
- Hardness

If applicable, chemical preservatives are to be added immediately after the sample has been obtained. After sample collection and chemical preservation has been completed, the sample is to be placed in an insulated container and stored at low temperatures (4° C.). All samples shall be restricted from sunlight and extreme temperatures during shipment to the laboratory. Shipment to the laboratory should be completed the day of sampling or the following day. The holding times used should be in accordance with those recommended in "Methods for Chemical Analysis of Water and Wastes," EMSL-EPA, March 1983.

E. Chain of Custody

At the time of sample collection, at least two chain-of-custody records shall be completed. Generally chain-of-custody documents are provided by the testing laboratory. The individual completing sample collection shall complete the forms and sign as the initial custodian of the samples. Upon delivery to the contract laboratory, the recipient of the samples shall sign as the subsequent custodian. One signed form is to be retained by the individual completing the sampling, while the other form is to remain with the sample and is to be retained by the laboratory. If the contract laboratory subcontracts work, a copy of the chain-of-custody record shall be made and retained by the primary laboratory. The original signature form shall remain with the samples being transferred.

All sampling procedures, measurements and observations are to be recorded on field information logs, or chain-of-custody forms, as appropriate. These documents are to be transferred to the laboratory with delivery of the samples.

II. LABORATORY PROCEDURES

Laboratory procedures to be followed have been generally addressed below. The laboratory(s) to be used for sample analysis is to be certified by the IEPA. Detailed discussion of the laboratory procedures and protocol have not been addressed herein since certification from regulatory agencies generally assures the complete and proper operation of the laboratory and laboratory procedures.

A. Analytical Procedures

Constituents to be analyzed will be specified by the site manager. Analysis, analytical results, and quality criteria are to be based on guidelines from the following authorative sources:

1. "Methods of Chemical Analysis of Water and Wastes," EMSL-EPA, March 1987.

2. "Standard Method for the Examination of Water and Wastewater," American Public Health Association, American Waterworks Association, Water Pollution Control Federation, 16th Edition, 1985.

3. "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," USEPA, SW-846, (Revised 1984).

Other references required by the site manager, IDNR, or IEPA may be specified for future testing. It is the responsibility of the contract laboratory to remain up to date and knowledgeable of changes in laboratory procedures and policies.

B. Laboratory Records and Reporting

The contract laboratory is to maintain complete records which, at a minimum, outline sample preparation, analysis conditions, QA/QC information, test results, batch and test method identification, and completed calculations or computer printouts. Records may be kept on suitable forms prepared by the laboratory. All records are to be kept for a minimum of one year or longer if requested by the site manager.

After analytical results have been checked, formal laboratory report sheets are to be prepared. The formal report sheets are to be signed by an appropriate representative of the contract laboratory. The original report sheets and chemical analysis forms are to b submitted to the site manager by the required deadline. It shall be the ultimate responsibility of the laboratory to ensure that report forms are submitted by the required deadline. If it is anticipated that the deadline cannot be met, the site manager shall be contacted immediately.

Laboratory personnel shall insure that laboratory data is assessed for precision, accuracy and completeness. This assessment should be completed in accordance with guidelines presented in "Standard Methods for the Examination of Water and Wastewater," 16th Edition, 1985 or other recognized publications.

PART IV

PART IV

OPERATIONS PLAN

1) Proposed Operational Procedures and Methods for the Mine Over Its Projected Life

Describe the type and method of mining procedures and proposed engineering techniques to be employed in the operation of the proposed mine. Describe the major equipment to be employed and how such equipment will be used in the different aspects of the mining operation. Provide an estimation of the anticipated annual coal production and anticipated coal production by tonnage once the mine is at full operational capacity.

Response: ***This application addresses the surface effects of an underground coal mine, coal preparation plant, transportation facilities and refuse disposal areas. The construction of the mine and surface facilities will include the excavation of an incline slope to reach the coal seam and the construction of two vertical shafts which are to be constructed by drilling or conventional sinking methods. Additional construction will include a coal preparation plant, reclaim tunnels, rail loading loop, rail loadout, parking lots, access roads, drainage control structures, office buildings, change rooms, assembly rooms, warehousing facilities, administration building, storage facilities, elevator facilities, ventilation facilities, refuse disposal areas, overland conveyors, screens, crusher, power distribution facilities, power lines, water lines, parking lots, topsoil and subsoil stockpile areas, among other projects.***

Excavation equipment will include but not be limited to dozers of various sizes, trucks, loaders, excavators, scrapers, and drills. Erection equipment will include cranes and forklifts of various sizes and configurations.

Underground mining will begin when the slope and shafts are completed to the coal seam and connected. Initial underground mining will consist of a continuous miner section developing mains with a non-subsidence Room and Pillar mining system. As the mains are developed additional continuous miner sections will be added to develop the headgate, tailgate and bleeder entries for the Longwall equipment. Longwall mining will begin after the headgate, tailgate and bleeder entries are completed for the first Longwall panel. Longwall mining will result in planned, predictable surface subsidence. Annual coal production once mining starts will range in the 1 million tons per year range and will ramp up to a possible capacity of 8 million tons per year at optimum capacity.

2) Mining Operations Plan for the Proposed Permit Area

Describe the proposed mining operations plan for the permit area in terms of the mining sequence, the employment of facilities, establishment and maintenance of erosion control facilities, air pollution control facilities, coal storage, cleaning and loading areas, location and placement of topsoil, spoil, coal waste, or other storage facilities.

Response: ***Construction of the mining facilities as indicated on the Surface Facilities Map (Map 6 S.F.) will proceed in a planned sequence, with many of the facilities undergoing concurrent construction. Sediment ponds and collection ditches will be installed in accordance with the surface drainage control plan so as to collect all surface runoff from the respective construction areas. Removal of topsoil will immediately follow any necessary clearing for such construction. Shaft and Slope construction areas are anticipated to be the first areas where sediment ponds and collection ditches will be installed. For shaft and slope construction temporary sediment and drainage controls will be used for the affected area until permanent controls are constructed.***

It is anticipated that potential air pollution will be controlled by the application of surface watering as necessary on the construction areas and to coal handling and storage areas. Dust control on future haulage roads will also be controlled by application of surface water.

Removed topsoil and subsoils will be placed in designated areas, properly marked, and protected from erosion. Coal waste, both coarse refuses and slurried refuse, will be placed as indicated on the Surface Facilities Map (Map 6 S.F.). All refuse areas are contained within the surface drainage control plan.

A) 1) Describe how each type of overburden (soil horizons, glacial drift and consolidated material) will be handled with regards to shaft excavations.

Response: *In the areas of shaft and slope construction, topsoil material will be removed and placed in stockpile for future reclamation. Excavated material will be stockpiled, utilized for road and parking area base construction or filling the slope construction pit back in.*

2) If toxic materials have been identified as occurring in the overburden, describe how these materials will be handled to insure proper disposal.

Response: *In the event possible toxic forming materials are encountered, such material will be segregated and stored in designated areas for future use in shaft or slope backfilling during final reclamation. Such possible toxic forming material will be covered with suitable clay materials, and vegetated so as to preclude air and water entrance.*

B) 1) Locate on the operations map all soil horizon storage areas and/or root medium stockpiles. Identify each storage area as to its content.

Response: *Refer to Surface Facilities Map (Map 6 S.F.) for the location of all soil stockpiles. Stockpiles will have signs to identify the contents of the pile to prevent possible contamination or mixing of the soil materials.*

2) Describe measures to be employed to prevent or minimize exposure of soil stockpiles to excessive water and wind erosion, unnecessary compaction and contamination by undesirable materials.

Response: *Soil storage stockpiles will be situated on stable sites outside of drainageways to minimize soil erosion. Soil stockpiles will be seeded with grasses, legumes, and small grain cover crops to minimize exposure to excessive water and wind erosion. Organic mulch or chemical binders will be used as required by the Department on the side slopes on the stockpiles. Surface compaction of such piles will be relieved by soil preparation such as disking prior to seeding. For soil stockpiles that are located in areas outside the surface drainage collection system, alternative erosion control systems will be used as detailed in 62 Ill. Adm. Code 1817.45 b).*

3) Describe methods and treatment measures to be used on exposed areas where topsoil has been removed to prevent excess air and water pollution.

Response: *Seeding with small grain or grass cover crops and applying straw or hay mulch will be used where practicable and the installation of sediment basins will be used as a means of controlling suspended solids from exposed areas where topsoil has been removed.*

C) The permit map and plans shall show the lands proposed to be affected within the proposed permit through the operation, according to the sequence of mining and reclamation and any change in a facility or feature to be caused by the proposed operations if the facility or feature was shown under 62 Ill. Adm. Code Sections 1783.24 through 1783.25.

Response: ***Refer to Surface Facilities Map (Map 6 S.F.) for the location of all lands proposed to be affected with the permit area.***

D) Show on the permit map or other designated map each area of land for which a performance bond will be posted under 62 Ill. Adm. Code 1800.

Response: ***Refer to Surface Facilities Map (Map 6 S.F.) the areas of performance bonding, and the areas scheduled for permitting for future use and not proposed for bonding at this time.***

E) Mining Operations Plan for the Proposed Shadow Area

1) Provide a map at a scale of 1 inch to 1,000 feet or other scales as approved by the Department identifying the limits of the proposed shadow area (area from which coal is proposed to be extracted by underground mining methods).

Response: ***Refer to Underground Operations Map (Map 6 U.G.) for areas of planned extraction.***

2) Within the limits of the proposed shadow area identify all areas projected to be mined, at a minimum, during the term of the permit showing the proposed size, sequence and yearly projections for the development of underground workings.

Response: ***Refer to Underground Operations Map (Map 6 U.G.) for this information.***

3) Subsidence Control Plan

A) General Requirements

1) Within the permit, shadow and adjacent areas are there structures or renewable resource lands?

Yes ___X___ No _____

If yes, on the shadow area map described in 2.E above, or other designated map, provide survey information which identifies all structures and renewable resource lands. Include all topographic features at a maximum contour interval of 10 feet. Identify all surface and subsurface man made features within, passing through, or passing over the area in which underground mining operations are located or will be projected to be located. Such features shall include but are not limited to all buildings, facilities, roads, bridges, major electric transmission lines, pipelines, agricultural drainage tile fields, gas and oil wells and water wells.

Response: ***Refer to Post-Subsidence Map (Map 8) for the referenced information. Also refer to the property owner spread sheets included herein under Part I for additional information.***

If no, provide evidence and support documentation that no structures or renewable resource lands exist as a result of a survey conducted within these areas.

2) Within the proposed permit, shadow or adjacent areas does the applicant intend to adopt mining technologies which provide for planned subsidence in a predictable and controlled manner?

Yes ___X___ No _____

If yes, provide information requested under "Planned Subsidence", Subsection B.

If no, provide information requested under "Subsidence Unplanned", Subsection C.

If the applicant intends to conduct both planned and unplanned subsidence-mining operations both subsections B and C must be addressed.

3) Provide geologic descriptions characterizing the thickness and lithology of the coal and overburden geological units throughout the shadow area. Provide stratigraphy test boring and core sampling log descriptions from the shadow area. Include the elevation and locations of the boring logs.

Response: ***The Hydro-Geologic Map (Map 4) provides the location of the test borings. The geologic logs are included on the Geologic Section Maps (Maps 9 & 10)***

B) Planned Subsidence

1) Provide a detailed description of the mining technology used to produce planned and predictable subsidence?

Response: ***Planned subsidence will occur through the use of longwall mining technology. Longwall mining creates an almost complete extraction of the coal reserve which allows the overburden to subside in a controlled and predictable manner.***

In longwall mining, continuous miner units are used to drive the entryways around the perimeter of the defined longwall panels. These entryways provide access for workers, ventilation, and mining equipment. No subsidence is anticipated with this phase of the mining since the percent extraction is small.

Longwall mining machinery includes roof supports (shields), a conveyor system and a coal shearer. A cut of the longwall panel is made by the shearer and is transported by the conveyor system. The shields are advanced as the shearer cuts the coal to allow for a safe workspace for the miners.

The removal of the coal sequentially allows the overburden to fill the void with a resultant movement of the surface. This movement is predictable and uniform and allows for the protection of the surface structures as mining progresses.

2) Provide a description of factors (i.e. drift thickness variations, expected variations in extraction height, or presence of faults and their direction (strike & dip) in relation to mine panels, etc.) with supporting documentation which may influence the magnitude, extent and predictability of planned subsidence. Include data on predicted subsidence profiles and post_ subsidence contours, including calculations on the predicted angle of draw. Provide a description of measures taken in the field to confirm the accuracy and reliability of predicted subsidence profiles.

Response: ***Coal seam thickness is expected to range from slightly under seven feet to over nine feet in other locations. Coal depth is expected to range from 460 feet to 540 feet. The surface elevations of the area to be mined ranges from a low of 600' to a high of 660' mean sea level. The surface topography can be described as gently rolling.***

Overburden materials consist of glacial deposits of up to 170 feet in thickness, with shales, sandstones, and limestones comprising the rest of the overburden material thickness. The predicted angle of draw for these conditions is 25 degrees from vertical.

Predicated subsidence profiles and post subsidence contours have been created by using the Surface Deformation Prediction System (SDPS) as developed by Virginia Tech University for

the U.S. Office of Surface Mining and distributed by the Carlson Software Company. This program has been developed using information from the Illinois coal region to establish parameters to model the subsidence patterns of the area. A predicted subsidence profile has been created for the first panel. Field measurements will be taken on the first two panels to verify the assumptions made to construct the profiles and contours. Refer to Underground Operations Map (Map 6 U.G.) for planned monitoring points; refer to Attachment IV.3.B.2 for details of subsidence monitoring plan. If necessary, modifications to the subsidence model will be made after the first panel has been completed.

3) On a plan base map(s), at a map scale of 1 inch to 400 feet provide a map of underground workings which locates all areas where planned subsidence mining operations are to be conducted. Include detailed information in regard to the location, length, width and height of projected panel development and extraction areas. Give typical percentage of coal removed in planned subsidence extraction areas.

Response: *Refer to the Mining Operations-Underground Map. Planned longwall panel width is 1200 feet, planned panel length is up to 17,600 feet, and average height of extraction is 8 feet. Total percentage of coal to be removed in the longwall panel extraction areas is approximately 90%.*

4) On the 1 inch to 400 feet plan base map(s) the information regarding the location of features required in Parts A - D below is to be provided in relation to areas of planned subsidence.

a) Identify all topographic features at a maximum contour interval of 10 feet.

Response: *Refer to the Pre-Mining Contour Map (Map 11) for surface contour intervals. These contours have been mapped at an interval of 2 feet.*

b) Identify and label all impoundments with a storage capacity of 20 acre-feet or more, or bodies of water with a volume of 20 acre feet or more. In a written narrative provide information which assures compliance with the requirement of Title 62 Ill. Adm. Code 1817.121(d) to permit such proposed mining operations. If no such features exist provide a specific statement indicating such.

Response: *The physical ground survey of the shadow area as well as the review of aerial photographs of the area indicate the presence of impoundments of 20 acre-feet capacity is unlikely over the area planned for subsidence. If, however, during the mining of the area impoundments of this capacity are identified, the subsidence control plan will be modified to assure the planned subsidence will not cause material damage to, or reduce the reasonably foreseeable use of such structures or facilities.*

c) Identify and label all public road right-of-ways and cemeteries located within 100 feet measured horizontally of surface areas of predicted planned subsidence. In a written narrative provide information which assures compliance with the requirements of Title 62 Ill. Adm. Code 1761.11 and 12 as may be necessary to permit planned subsidence mining operations within the prohibited area. If no such features exist provide a specific statement indicating such.

Response: *Refer to Underground Operations Map (Map 6 U.G.) for the location of public roadways within 100 feet horizontally of surface areas of planned subsidence. Prior to such planned mining, the requirements of the referenced Code 1761.11 will be complied with, including the measures to minimize inconvenience to the users of such public roadways, and necessary waivers from the authority governing the use of these roads.*

Refer to Identification of Interests Map (Map 2) for known cemeteries. In the event that cemeteries are to be affected by subsidence, an agreement will be reached with the respective

cemetery trustees or responsible party or parties, prior to subsidence occurring. In order to minimize possible damage to monuments, a professional monument company will be contracted to prepare the cemetery for subsidence. After mining, all damages to the cemeteries and monuments will be repaired.

Other places denoted by 1761.11 have not been identified within the shadow area of the permit.

d) Identify and label all occupied dwellings, public buildings and facilities, schools, churches, hospitals, community or institutional buildings, or public parks located within 300 feet measured horizontally of surface areas of predicted planned subsidence. If no such features exist provide a specific statement indicating such. If such features do exist include the following information as may be necessary:

Response: ***Refer to Post-Subsidence Map (Map 8) for the referenced information.***

i) Provide a written narrative with support documentation which assures compliance with the requirements of Title 62 Ill. Adm. Code 1761.11 and 12 as may be necessary to permit planned subsidence mining operations within the prohibited area.

Response: ***Planned subsidence in areas designated by Title 62 Ill. Adm. Code 1761.11 (Areas Where Mining is Prohibited or Limited) will occur within 100 feet measured horizontally of the outside right of way line of public roads. The necessary waivers from the public authority governing these roads will be obtained.***

Planned subsidence is also anticipated within 300 feet of occupied dwellings. Where the right to subside does not exist, the necessary rights will be obtained prior to subsidence occurring. Other places denoted by 1761.11 have not been identified within the area of planned subsidence of the permit.

There are no public buildings and facilities, schools, churches, hospitals, community or institutional buildings, or public parks located within 300 feet measured horizontally of surface areas of predicted planned subsidence. The prison structures located in the Shadow area will not be located within 300 feet measured horizontally of surface areas of predicted planned subsidence.

ii) Provide a written narrative which assures compliance with the requirements of Title 62 Ill. Adm. Code 1817.121(d) as may be necessary to permit such proposed mining operations in relation to public buildings and facilities, schools, churches and hospitals.

Response: ***There are no public buildings and facilities, schools, churches, hospitals, community or institutional buildings, or public parks located within 300 feet measured horizontally of surface areas of predicted planned subsidence. The prison structures located in the Shadow area will not be located within 300 feet measured horizontally of surface areas of predicted planned subsidence.***

Digital images have been taken of every structure in the Shadow Area and are contained on a CD that has been submitted to the responsible person at IDNR.

5) Describe the anticipated effects of planned subsidence.

a) Using the predicted magnitude, extent of planned subsidence profiles, post subsidence contours and angle of draw provided in response to 4.B above,

provide a list of all structures and facilities located within the projected area of influence of the planned subsidence. The list provided must correspond to each panel or extraction area to be mined by planned subsidence-mining methods and must cross-reference with surface structures and feature map(s).

Response: ***Refer to the list of structures provided in the Table identified as Attachment I.2.B. and shown on Identification of Interests Map (Map 2).***

b) Using the predicted magnitude, extent of planned subsidence profiles and post subsidence contours provided in response to B, 2, above, locate and identify all areas of where surface subsidence impacts are projected to cause disruptions of surface drainage or drainage problems on a map(s) at a 1" to 400' scale.

Response: ***Refer to Post-Subsidence Map (Map 8).***

c) Describe any other anticipated effects of planned subsidence.

Response: ***Planned subsidence can be expected to have a positive effect on water bearing sandstones or limestones by increasing the porosity of the zones. This Fracture Porosity will increase well yields if wells were drilled into these zones. With the generous amount of shales surrounding these zones, groundwater can be expected to migrate horizontally but not vertically.***

Planned subsidence will cause surface areas to change elevation. Most of the subsidence will not be noticeable due to the general relief of the terrain over the shadow area. This terrain is gently rolling, with standing timber areas as well as cultivated fields.

The uniform subsidence that occurs with longwall mining will give a predictable pattern. Structures within the subsidence area will experience movement. This movement will occur uniformly and predictably.

Surface monitoring is proposed on the first two longwall panels in the subsidence control plan area. This will provide information on planned subsidence. The monitoring will be performed by using surface surveying methods to compare pre-subsidence conditions with post subsidence movement. Survey stations will be established along a line parallel with the longwall panel as well as perpendicular to the panel. Monitoring will occur at different times depending on the location of the advancing longwall face. Information to be gathered will be the amount of subsidence movement, timing of the movement and the calculation of the angle of draw. This information will be used to verify the assumptions in creating the subsidence computer model. In the event such monitoring indicates adjustments in the predictive model is necessary, such documentation and revised subsidence predictions will be provided to the Department.

6) Describe, if any, measures to be taken on the surface to prevent or minimize the effects of planned subsidence.

Response: ***Measures to be taken on the surface to prevent or minimize the effects of planned subsidence may include the following:***

- ***Recontouring and drainage correction in agricultural areas***
- ***Temporary support for surface structures, flexible utility connections***
- ***Exposure of pipelines***
- ***Regrading and re-ditching for roadways***

Specific actions will be determined for each structure prior to subsidence occurring.

As required by 1817.121(a)(3), Hillsboro Energy LLC will implement damage minimization to all surface structures unless a pre-mining agreement with the structure owner is reached that precludes the need to minimize damage. Refer to Part VI, II.A, responses for additional detail.

7) Describe measures to be taken to mitigate or remedy any subsidence related material damages.

a) Provide a description of mitigation measures to be taken to repair or compensate the owners of structures or facilities which sustain material damage caused by subsidence, including but not limited to the following:

i) Compensate the owner of structures or facilities in the full amount of the diminution in value resulting from the subsidence.

ii) Repair, restore, rehabilitate or replace damaged structures or facilities.

iii) Compensation may be accomplished by the purchase prior to mining of a noncancelable premium prepaid insurance policy payable to the surface owner in the full amount of the possible material damage. Documentation of the purchase of such qualifying insurance must be provided.

Response: ***The permittee will pursue a premining agreements with owners of all structures potentially impacted by planned subsidence. The agreements will detail measures designed to prevent or minimize subsidence damages and/or to outline an orderly procedure for the repair or replacement of damaged structures following subsidence. The Permittee may also pursue a written waiver from the structure Owner to not perform minimization procedures per 62 ILL. Adm. Code 17817.121(a)(3).***

Regardless of the existence of premining agreements with structure Owners, the Permittee will propose a presubsidence condition survey on all structures to determine the current condition. The condition surveys will be performed a minimum of 120 days in advance of projected subsidence impacts unless a shorter time frame is justified and approved by IDNR. A certified appraiser will conduct an appraisal to establish the value of each structure. After subsidence, a condition survey will be repeated to document all material damage caused by planned subsidence. A contractor will then be employed to provide estimates of the total cost of repair to presubsidence conditions. The Permittee will then propose a plan to repair or replace the structure to presubsidence condition or compensate the Owner for the amount of repair up to the presubsidence appraised value. All costs associated with condition surveys, appraisals and repair estimates will be the responsibility of the Permittee.

Refer to Part VI, Addendum No. 1 to the UCM1 Application Part II, for additional information concerning damage minimization, repair, replacement or compensation of structures impacted by subsidence.

b) Provide a description of measures adapted to control and correct material damage resulting from subsidence caused to surface lands, to the extent technologically and economically feasible, by restoring the land to a condition capable of maintaining the value and reasonable foreseeable uses which it was capable of supporting before subsidence. Also provide descriptions of specific repair measures recommended to remedy anticipated material damages detailed in 7,a above.

Response: *In general, surface land impacts will be limited to the drainage interruptions projected by the subsidence model (Model used is the Surface Deformation Prediction System, SDPS), and shown on the Post Subsidence Map (Map 8) of the permit application.*

Hillsboro Energy LLC will promptly inspect the lands affected by subsidence in order to determine the extent of the subsidence impacts. Hillsboro Energy LLC will take the necessary measures to restore proper field drainage including but not limited to deepening existing drainage ways, creating new drainage ways where necessary, repair or replace any exiting field tile and if necessary installation of supplemental drainage tile.

Hillsboro Energy LLC will develop appropriate mitigation plans for all necessary drainage repairs on a site specific basis. Drainage restoration plans will be made in consultation with the land owners and appropriate National Resource Conservation Service (NRCS) personnel and/or NRCS guidelines for surface and subsurface drainage.

For farm production lands where subsidence impacts crop production, Hillsboro Energy LLC will compensate the land owner for acreage temporarily taken out of production or any crop loss resulting from subsidence, until such time that the lands drainage is restored.

Lands taken out of production due to creation of newly designed drainage ways will be minimized where ever practical by working with existing drainage ways. Where this is not practical, any area taken out of production to facilitate placement of permanent drainage ways, compensation will be made to the landowner at an agreed upon value.

Similar to crop land, any wooded areas impacted by subsidence will be properly drained to preserve the pre-mining land use and prevent tree damage.

c) In conjunction with subsidence control plans to mitigate subsidence related material damage to land and structures, provide a description of measures to be taken to determine the degree of material damage or diminution of value or reasonable foreseeable use of the surface.

Response: *FOR LAND: Longwall mining provides predictable and uniform subsidence patterns. Premining contours have been documented by aerial mapping from 2007. This mapping provides a basis to determine the extent of subsidence to the lands. Any impacts that may impair the value or use of the lands will be mitigated to insure the land reaches a condition capable of maintaining the value and reasonable foreseeable uses which it was capable of supporting prior to subsidence.*

FOR STRUCTURES: A pre-subsidence survey will be performed on structures, with owner's consent, prior to subsidence occurring. This survey will include photographic and sketched documentation of the condition of the structures in a pre-subsidence condition. The survey will be performed by a person trained and experienced in performing such surveys.

A report will be generated including a description of the structure including photographs and documentation of the physical condition of the structure. A copy will be provided to the structure owner and any comments to the survey will be addressed.

After subsidence has occurred, a post subsidence survey will be performed in the same manner and procedure as the pre-subsidence survey. Any changes to the structure due to subsidence will be noted and will provide a basis to determine the extent of material damage to the structure.

FOR ROADWAYS, PIPELINES, TRANSMISSION LINES, UTILITIES: The Permittee will pursue agreements, based on existing subsidence rights, contracts and agreements, with governmental bodies and utility companies responsible for all public roadways, utility lines, and

buried pipelines expected to be affected by subsidence. Such agreements, to be negotiated in advance of subsidence, will allow the implementation of measures designed to prevent or minimize subsidence damage and/or outline a timely procedure for the repair or replacement of damaged facilities following subsidence. These agreements will vary in scope and content, and will be site specific for each such facility. The intent of the agreement is to define the measures to be taken by the government bodies and utilities to protect the public.

In accordance with 62 ILL. Adm. Code 1784.20 b) 8), the convenience and safety of the public will be a high priority in the development and implementation of such cooperative agreements.

C) Subsidence Unplanned (Maximize Mine Stability)

1) Describe the method of coal removal which is designed consistent with known technology to maximize mine stability to prevent or minimize subsidence and subsidence related damage so that if subsidence does occur it cannot be considered planned subsidence.

Response: ***Where mains are mined under the prison, the minimum pillar size will be 100 feet by 150 feet, center to center, with maximum entry widths of 20 feet. This is a 30% extraction rate, which will ensure that there is no unplanned subsidence under the prison structures.***

2) On the shadow area map(s) describe in 2,E, above, or other designated map show all areas where coal extraction as described above in 3,C,1 is to occur. Include the following detailed information:

a) Provide the location of mains, submains and extraction panels giving geometric sizes, dimensions and orientation including lengths, widths, and extraction heights of each.

b) Identify and label all impoundments with a storage capacity of 20 acre-feet or more, or bodies of water with a volume of 20 acre feet or more, public buildings and facilities, churches, schools and hospitals. In a written narrative provide information which assures compliance with the requirements of Title 62 Ill. Adm. Code 1817.121(d) as may be necessary to permit such proposed mining operations. If no such features exist provide a specific statement indicating such.

c) Provide calculations for the estimated potential angle of draw.

Response: ***Unplanned Subsidence is not applicable in this permit application.***

3) Provide information regarding proposed mining extraction geometries, including information on the dimensions of pillars, extraction widths of rooms, entries, and crosscuts, etc., for all mains, submains, panel entries and all development areas. Provide information regarding the highest extraction percentage for each of the mining geometries proposed by the operator, if variations are proposed. Information is to include specific details of the effects of any proposed second mining operations on final mining geometries and extraction percentages. Map(s) at a scale of 1 inch to 400 feet (other scales as approved by the Department) are to be provided representing all proposed extraction geometries, including any proposed second mining.

Provide information regarding the design engineering of the various mining geometries proposed in 3,C,3 above in maximizing mine stability to prevent subsidence. Include the following:

i) Detailed information regarding the specific methodology used to calculate mine stability with support documentation and design calculations.

ii) Data concerning actual coal strengths typical of the coal to be mined and as this information relates to pillar design and stability.

iii) Data regarding the strength and geotechnical characteristics of the actual mine floor and subfloor as it relates to mine design and stability. Information is to be included describing the thickness and lithology of the floor and subfloor units.

Response: ***Unplanned Subsidence is not applicable in this permit application.***

4) Provide detailed descriptions of subsidence control measures that will be taken to prevent or minimize subsidence and subsidence related damage which includes, but is not limited to the following:

a) Backstowing or backfilling, include map locations;

b) Leaving areas in which no coal is removed within the shadow area, including a description of the overlying area to be protected by solid coal blocks left in place. Identify any such areas by map locations;

c) Surface measures taken to prevent material damage or lessening of the value of reasonably foreseeable uses of the surface;

d) Monitoring, if any, to determine the commencement and degree of subsidence so that other appropriate measures can be taken to prevent or reduce material damage. Include map locations of any proposed monitoring sites.

Response: ***Unplanned Subsidence is not applicable in this permit application.***

5) Describe measures to be taken to mitigate or remedy any subsidence related material damages.

a) Provide a description of mitigation measures taken to repair or compensate the owners of structures or facilities which may be materially damaged by subsidence, including but, not limited to the following:

i) Compensate the owner of structures or facilities in the full amount of diminution in value resulting from the subsidence.

ii) Repair, restore, rehabilitate or replace damaged structures or facilities.

iii) Compensation may be accomplished by the purchase prior to mining of a noncancelable premium prepaid insurance policy payable to the surface owner in the full amount of the possible material damage. Documentation of the purchase of such qualifying insurance must be provided.

b) Provide a description of measures adapted to control and correct material damage resulting from subsidence caused to surface lands, to the extent technologically and economically feasible, by restoring the land to a condition capable of maintaining the value and reasonably foreseeable uses which it was capable of supporting before subsidence.

c) In conjunction with the requirements to mitigate subsidence related material damage to land, and structures provide a description of measures to be taken to determine the degree of material damage or diminution of value or reasonable foreseeable uses of the surface.

Response: ***Unplanned Subsidence is not applicable in this permit application.***

4) Existing Structures

Response: ***No existing structures are proposed to be used in connection with or to facilitate the surface coal mining and reclamation operations.***

A) Provide a description of each existing structure proposed to be used in connection with or to facilitate the surface coal mining and reclamation operations. The description shall include the following:

1) Locate the structure on the operations map or other designated map,

2) Provide plans of the structure detailing its current, premining condition,

3) Provide approximate dates, beginning and completion for construction of the structure, and

4) Provide a showing that the structure meets the performance standards of either 62 Ill. Adm. Code Sections 1810 through 1828 or 62 Ill. Adm. Code Sections 280_300 (Interim Regulation Program). The showing shall monitor data or other substantiating evidence.

Response: ***No existing structures are proposed to be used in connection with or to facilitate the surface coal mining and reclamation operations.***

B) For each structure proposed to be modified or reconstructed for use in connection with or to facilitate the surface coal mining and reclamation operations a compliance plan is required which shall include the following:

1) Design specifications for reconstruction or modification of the structure to meet the design and performance standards of 62 Ill. Adm. Code Sections 1810 through 1828.

2) A schedule for reconstruction or modification of the structure showing dates for beginning and completing interim steps as well as final reconstruction,

3) Provisions for monitoring the structure during and after modification to ensure that the performance standards of 62 Ill. Adm. Code Sections 1810 through 1828 are met, and

4) A showing that the risk of harm of the environment or to public health or safety is not significant during the period of modification or reconstruction.

Response: ***No existing structures are proposed to be used in connection with or to facilitate the surface coal mining and reclamation operations.***

5) Support Facilities

A) Locate on a mining operations map each of the areas to be permitted for surface disturbance to facilitate the mining operation. Map shall include all support facilities including buildings,

structures, conveyors, parking areas, coal preparation plants, yards, railroad spurs, on-site rail yards, each air pollution collection and control facility, each facility to be used to protect and enhance fish and wildlife and related environmental values, and each explosive storage and handling facility.

Response: ***Refer to the Surface Facilities Map (Map 6 S.F.) for the planned location of the above facilities.***

B) Indicate acreage of each type of facility within permit area such as: buildings, roads, railroads, parking areas, pavements, loading an unloading facilities, sanitary facilities, and undeveloped areas. (Summation of above areas should equal total support facility area.)

Response: ***Refer to the Surface Facilities Map (Map 6 S.F.)***

SUPPORT AREA		ACRES
Main Buildings		***2.0***
Mine Office Parking		***2.5***
Mine Yard		***12.0***
Preparation Plant Buildings		***1.5***
Prep Plant Parking		***0.5***
Prep Plant Yard		***15.0***
Refuse Area		***185.0***
Railroad		***32.0***
Access Roads (Roads and Shoulders)		***46.0***
Subsoil & Topsoil Storage		***75.0***
Coal Storage		***16.3***
Mine Support Areas		***20.0***
Plant Support Areas		***20.0***
Other		***210.7***
Undeveloped Areas		***165.0***
TOTAL		***803.5***

C) Transportation Facilities

1) Provide a detailed description on mining operations map or other map and show location of the following:

a) Proposed road(s), conveyor system(s), or rail system.

b) Related sediment control facilities.

c) Earth borrow locations and/or locations for deposition of excess excavation.

Response: ***Refer to the Surface Facilities Map (Map 6 S.F.) for the planned location of the above facilities.***

2) Provide specifications and plan profiles of existing gradeline, proposed road centerline, ditch flow lines, road cut, fill embankment, culvert, bridge and drainage structures. Provide typical cross sections where appropriate.

Response: ***Refer to Attachment IV.5.C.2.***

3) For all transportation facilities to be constructed, provide construction details for all sediment control facilities to be constructed to prevent additional contributions of suspended solids to stream flow or to runoff outside the permit area.

Response: ***Proposed roadways and rail lines are to be constructed within areas which are tributary to the erosion control collection ditches and sediment ponds with some exceptions. Concerning the some portions of proposed roadways and rail lines that do not report to a surface drainage control system, alternative erosion control systems will be used as detailed in 62 Ill. Adm. Code 1817.45 b). Such measures will include the installation of silt fencing, straw bale or riprap ditch checks, and in-ditch sediment basins. Refer to Attachments IV.5.C.2, IV.7.D and IV.7.F for ditches and sediment pond details.***

4) Discuss the revegetation of ditch and borrow areas involved in construction.

Response: ***Borrow areas resulting from construction that will not be used as sediment basins, as well as cut and fill slopes and roadside ditches, will be mulched and seeded with a permanent species to prevent erosion.***

5) Discuss the estimated life of each facility and how materials will be removed when the facility becomes inactive.

Response: ***The access roads, conveyor systems and railroad loop have been designed to provide life-of-mine service. Mine facilities and structures not required to support the approved post-mining land use will be removed. All usable materials and structures will be salvaged and sold, if economically possible. Obsolete structures and equipment will be scrapped and removed from the mine site.***

6) Provide a report of appropriate geotechnical analysis where approval from the Department is required for alternative specifications or steep cut slopes under 62 Ill. Adm. Code 1817.150.

Response: ***Alternate specifications or steep cut slopes are not proposed.***

7) Provide a description of measures to be taken to protect the inlet end of a ditch relief culvert, other than use of a rock headwall, and for alteration or relocation of a natural drainageway for approval by the Department under 62 Ill. Adm. Code 1817.150.

Response: ***Where transportation facilities cross drainageways, culvert installations will be properly designed to ensure that erosion around inlets and outlets does not occur. Where necessary, riprap will be placed around the culvert inlets and outlets to provide further protection. Culverts and sizes are indicated on the profiles for the respective roads and railroads, Attachment IV.5.C.2.***

6) Waste Material

A) Identify the nature of all waste material including shaft excavation material and non-coal waste to be disposed of within the permit area. Give the net neutralization potential.

Response: ***Disposal of non-coal waste is not proposed to occur within the permit area. Suitable material excavated from the shafts and slope will be placed as base material for roadways and rail lines, and beneath the supply storage area and the coal storage areas. Based on the analyses of materials from borehole #08-03-17-04, the overall net neutralization potential of the shaft and slope development waste is in excess of 84 tons per 1000 tons. Coarse and fine refuse generated from coal processing will be disposed of in the permit area. Since this application is for a new mine, samples of the coal refuse materials are not available for geochemical analysis. Sources of coal refuse are primarily roof and floor lithologies associated with the coal seam. Therefore, the refuse is expected to be primarily composed of gray to black shale and underclay or claystone. Because of the type rock, coal and mineral matter involved, net neutralization potentials can be expected to range from both the positive to negative side of the acid-base spectra. When the refuse consists primarily of a combination of black or gray shale, coal shale parting, and pyritic materials, negative (acid) net neutralization potentials can be expected. Since this is a new mine, coal processing refuse characterization can be better predicted after the operation has commenced.***

B) Coal processing waste bank dams shall be designed to comply with requirements of 62 Ill. Adm. Code 1817.81 through 1817.84. For coal processing waste dams and embankments each plan shall comply with the requirements of MSHA, 30 CFR 77.216_1 and 77.216_2, and shall contain the results of a geotechnical investigation as prescribed under 62 Ill. Adm. Code 1784.16(e).

Response: ***See Attachment IV.6.D, Slurry Pond Construction Details.***

The proposed slurry cell will be constructed by excavating material from the interior of the impoundment area to provide storage volume for the disposal of slurry material. Coarse refuse material will be placed as embankments around the perimeters of the slurry cell. These structures have been designed so as to not exceed the requirements of 30 CFR 77.216-1 necessitating MSHA review and approval.

The long-term plan for refuse disposal at the mine envisions using coarse refuse material to construct a series of slurry cells. The conceptual design incorporates downstream placement of the coarse refuse material to develop the disposal area in a logical and efficient manner. The engineering design of such structures must take into account the rates and volumes the various refuse streams are being generated to ensure the development maximizes the disposal life. Design plans for the subsequent development of the refuse disposal area will be prepared throughout the life of the mine as operational information is obtained regarding the rates of refuse generation. Design plans for subsequent refuse disposal structures will be submitted to the Department and MSHA for review and approval prior to construction. Development of a schedule for the submittal of the final designs is not practical at this time due to the many unknowns associated with prep plant operation and refuse generation rates.

Prior to excavation for the slurry impoundment and placement of coarse refuse material, all topsoil, vegetation, and organic material will be removed and properly stockpiled for use in final reclamation.

A Hydro-geologic Investigation of the area prepared by Hurst-Rosche Engineers, Inc. and included herewith as Part VII-Appendix identifies that a sand lense underlies the area of the proposed refuse disposal. Future additional drilling can better define the extent, depth, and thickness of this material. Present information suggests that groundwater associated with this san lense is Class I groundwater as defined in 35 IAC 620.210. Considering this, it is planned to protect this sand lense from disturbance or contamination. Excavation to be performed in construction of the proposed impoundment will not be to depths that would penetrate or otherwise compromise this material.

The referenced Hydro-geologic Investigation further identifies that the existing material at the planned depth of excavation may reach the required permeability of 1 X 10^{-7} Cm/Sec after recompaction. During mine development, the existing materials will be recompacted to a minimum density to achieve this level of permeability as recommended by the geotechnical firm using sheepsfoot rollers. This material will be tested after compaction. Should areas fail to required compaction test; the area will be reworked, re-compacted, and re-tested. Should the existing material not meet the required permeability, suitable material will be obtained and hauled in. Based on the present information, it is the intent of the applicant to construct an earthen liner to a thickness of 4 feet compacted thickness, with the permeability of 1 X 10^{-7} Cm/Sec. Such earthen liner will be constructed under all proposed refuse deposition and in the bottoms of all sediment ponds which will receive surface runoff from refuse areas and coal storage areas. Should additional drilling and laboratory analyses indicate a liner of lesser extent or thickness would be equally effective, the applicant will submit this information for consideration prior to construction.

Refuse will be delivered to the sites via overland belt and trucked or dozed to final placement location. Refuse will be deposited in thin lifts, and compacted to a minimum of 90% Standard Proctor density, and shaped so as to prevent ponding. In the event the overland belt is out of service for maintenance, provision will be made at the plant for direct loading of coarse refuse to truck for hauling to the refuse sites.

The course refuse stockpiles will be constructed with side slopes at three horizontal to one vertical. Temporary terrace systems and down drains will be used as necessary to minimize side slope erosion.

Final reclamation of the refuse areas will include the shaping so as to enhance runoff of surface water to prevent ponding. Final cover will consist of a minimum of four feet of removed topsoil and B-horizon material. Terraces and down drains will be constructed as necessary to prevent erosion. Final vegetation will be established as detailed in Part V of this permit application.

C) Indicate location of all areas in which such materials including shaft excavation material and non-coal waste (including those under Subtitle C of RCRA) are to be disposed of on the mining operations map. Indicate all streams, creeks, and surface water impoundments within such areas or which receive runoff from such areas. Provide acreage of disposal area and borrow areas. Indicate location of borrow area on mining operations map.

Response: *The locations of areas where shaft/slope material will be placed and refuse disposal areas, including cover borrow areas, are shown on the Surface Facilities Map (Map 6 S.F.). In the event potentially toxic-forming materials are encountered in the construction of shafts or slope, such material will be stockpiled in a suitable area, covered as referenced above, and marked as such.*

D) Provide construction details for all impoundments and structures to contain such waste material. Provide typical cross-sections of all proposed levees, dams and excavations.

Response: *Refer to Attachment IV.6.D for the details for Slurry Pond 1.*

E) Indicate location and provide details for diversions as necessary to divert surface water around such areas on the mining operations map.

Response: *No surface water diversions are planned.*

F) Provide details of diversions or other devices designed to collect surface runoff from waste

disposal sites and transport same to appropriate treatment facility.

Response: ***Refer to Surface Facilities Map (Map 6 S.F.) and Attachment IV.7.F for the design of these facilities.***

G) Provide details of such treatment facilities and identify points of discharge.

Response: ***Refer to Surface Facilities Map (Map 6 S.F.) and Attachment IV.7.G for the design of these facilities.***

H) For disposal areas explain measures to be taken to avoid pollution of surface or groundwater due to leaching through levees or dams and through underlying soil.

Response: ***The proposed slurry cell will be constructed by excavating material from the interior of the impoundment area to provide storage volume for the disposal of slurry material. Coarse refuse material will be placed as embankments around the perimeters of the slurry cell. These structures have been designed so as to not exceed the requirements of 30 CFR 77.216-1 necessitating MSHA review and approval.***

The long-term plan for refuse disposal at the mine envisions using coarse refuse material to construct a series of slurry cells. The conceptual design incorporates downstream placement of the coarse refuse material to develop the disposal area in a logical and efficient manner. The engineering design of such structures must take into account the rates and volumes the various refuse streams are being generated to ensure the development maximizes the disposal life. Design plans for the subsequent development of the refuse disposal area will be prepared throughout the life of the mine as operational information is obtained regarding the rates of refuse generation. Design plans for subsequent refuse disposal structures will be submitted to the Department and MSHA for review and approval prior to construction. Development of a schedule for the submittal of the final designs is not practical at this time due to the many unknowns associated with prep plant operation and refuse generation rates.

Prior to excavation for the slurry impoundment and placement of coarse refuse material, all topsoil, vegetation, and organic material will be removed and properly stockpiled for use in final reclamation.

A Hydro-geologic Investigation of the area prepared by Hurst-Rosche Engineers, Inc. and included herewith as Part VII-Appendix identifies that a sand lense underlies the area of the proposed refuse disposal. Future additional drilling can better define the extent, depth, and thickness of this material. Present information suggests that groundwater associated with this san lense is Class I groundwater as defined in 35 IAC 620.210. Considering this, it is planned to protect this sand lense from disturbance or contamination. Excavation to be performed in construction of the proposed impoundment will not be to depths that would penetrate or otherwise compromise this material.

The referenced Hydro-geologic Investigation further identifies that the existing material at the planned depth of excavation may reach the required permeability of 1 X 10^{-7} Cm/Sec after recompaction. During mine development, the existing materials will be recompacted to a minimum density to achieve this level of permeability as recommended by the geotechnical firm using sheepsfoot rollers. This material will be tested after compaction. Should areas fail the required compaction test, the area will be reworked, recompacted, and retested. Should the existing material not meet the required permeability, suitable material will be obtained and hauled in. Based on the present information, it is the intent of the applicant to construct an earthen liner to a thickness of 4 feet compacted thickness, with the permeability of 1 X 10^{-7} Cm/Sec. Such earthen liner will be constructed under all proposed refuse deposition and in the bottoms of all sediment ponds which will receive surface runoff from refuse areas and coal storage areas. Should additional drilling and laboratory analyses indicate a liner of lesser

extent or thickness would be equally effective, the applicant will submit this information for consideration prior to construction.

Refuse will be delivered to the sites via overland belt and trucked or dozed to final placement location. Refuse will be deposited in thin lifts, and compacted to a minimum of 90% Standard Proctor density, and shaped so as to prevent ponding. In the event the overland belt is out of service for maintenance, provision will be made at the plant for direct loading of coarse refuse to truck for hauling to the refuse sites.

The course refuse stockpiles will be constructed with side slopes at three horizontal to one vertical. Temporary terrace systems and down drains will be used as necessary to minimize side slope erosion.

Final reclamation of the refuse areas will include the shaping so as to enhance runoff of surface water to prevent ponding. Final cover will consist of a minimum of four feet of removed topsoil and B-horizon material. Terraces and down drains will be constructed as necessary to prevent erosion. Final vegetation will be established as detailed in Part V of this permit application.

I) Describe estimated life of each area.

Response:

Slurry Pond 1	*10 years*
Coarse refuse	*10 years*

J) Coal preparation:

1) Give a general description of the coal processing operation at this facility.

Response: *The coal processing operation at this facility will include raw coal screening, crushing and raw coal stockpiling. The coal preparation (cleaning plant) washer building will include heavy media washers, heavy media cyclones, spiral circuits and froth flotation. Clean coal stockpiles will feed to a railroad or truck loadout facility.*

2) Describe the fresh water (makeup) and slurry circuits for this operation and indicate if a discharge occurs. If a discharge does occur, it should be included on Schedule A. If a discharge does not occur, a detailed description of how this will be accomplished must be submitted.

Response: *Make-up water will be obtained: from the Existing Lake (owned by Montgomery Land Company LLC, an affiliate company to Hillsboro Energy LLC) as indicated on the Surface Facilities Map (Map 6 S.F.), slurry cell and sediment ponds. Water will be pumped to the preparation plant area. These structures will provide water for the coal preparation plant as well as for fire protection, dust suppression and the underground mine water supply.*

Raw water is distributed to the different coal cleaning circuits within the preparation plant. Water is recirculated within the circuits from dewatering processes. Refuse fines are accumulated in the thickeners. From the thickeners, clarified water is returned to the circuits and the underflow is pumped to the refuse area slurry cells for clarification.

Clear water from the slurry cells is directed to the refuse area sedimentation ponds. Water from the slurry cells will also be pumped back to the preparation plant for reuse.

3) What safeguards are provided to prevent the discharge of slurry fines and untreated slurry water during emergency situations (e.g. power outages, mechanical equipment breakdown, plant shutdowns, etc.)? Also indicate where the slurry would go by gravity

flow in the event of an emergency discharge, and the environmental impact this would have.

Response: ***Discharge of slurry fines and untreated slurry water from the permit area has been addressed by designing the drainage control system with large sedimentation ponds in optimal locations that would intercept undesired discharges.***

7) Surface Drainage Control

A) 1) Locate on the mining operations map or on a separate drainage map all proposed drainage control systems. Show drainage patterns of all affected mining areas.

Response: ***Refer to Surface Facilities Map (Map 6 S.F.)***

2) Will all surface drainage from the affected mining area be collected and treated prior to leaving the permit area?

Yes _____ No __X____

If yes, delineate how and where surface drainage will be collected and treated, and list permit numbers and type of permit that the drainage control systems are operated under. If above answer is no, explain how regulatory compliance will be achieved without treatment, i.e., address the requirements of Section 1817.46(e).

Response: ***Runoff from the majority of affected areas will be collected and passed through sediment ponds for treatment prior to leaving the permit area. However, runoff from some areas along the rail lines, mine roads, and soil storage areas will not be passed through sediment basins. These areas are small areas generally consisting of embankment or cut and fill slopes and stockpiles to be permanently seeded and stabilized. These areas will be seeded and mulched to provide a vegetative cover to prevent erosion. During construction, sediment control measures such as silt fences, straw bale dikes, riprap check dams and mulching will be used to minimize erosion and prevent sediment from leaving the permit area.***

B) Will all surface drainage from unaffected areas be intercepted and diverted around the affected mining area?

Yes _____ No __X_____

If no, please discuss.

Response: ***No diversions of unaffected surface drainage are planned for this permit area.***

C) Describe the timing in which all construction of the sediment ponds and surface drainage control structures will be complete. Include a discussion of the vegetation stabilization of these structures.

Response: ***Construction of each sediment basin and surface drainage control structures will be completed before any mine related disturbance occurs in the watershed for the affected sediment basin. For shaft and slope construction temporary sediment and drainage controls will be used for the affected area until permanent controls are constructed. Upon completion of the drainage control structures, areas disturbed during the construction, including embankments, cut and fill slopes, and soil stockpiles, will be mulched and seeded with a permanent grass species to stabilize the exposed areas. Depending on the season, a cover crop may be used to provide temporary protection until a permanent cover can be established.***

D) Overland Flow Diversions

For all diversions of overland flow, shallow groundwater flow, and ephemeral streams which divert surface water around the mining area, and all collection drains that transport affected area runoff into water treatment facilities, provide the following:

1) Typical cross sections bottom width, side slopes and depth.

Response: ***No such diversions are planned.***

2) Proposed flow line slopes.

Response: ***No such diversions are planned.***

3) Runoff and diversion capacity calculations.

Response: ***No such diversions are planned.***

4) Details of proposed erosion and sediment control measures to be employed.

Response: ***No such diversions are planned.***

For permanent diversion also include:

5) Watershed limits upstream from the diversions.

Response: ***No permanent diversions are planned.***

6) Plan profile drawings of the proposed diversion showing existing gradeline, proposed diversion bottom gradeline and water surface at design storm.

Response: ***No permanent diversions are planned.***

E) Sediment pond Design:

NPDES
MSHA#
Total Drainage Area (Acres)
Total Disturbed Drainage Area (Acres)
Total Calculated Inflow From Design Storm (AC-FT)
Sediment Storage Volume (AC_ FT)
Total Volume Below Primary Spillway Elevation (AC-FT)
Total Volume Below Emergency Spillway Elevation (AC-FT)

Response:

NPDES	MSHA #	Total Drainage Area (ac.)	Total Disturbed Area (ac.)	Total Calculated Inflow from Design Storm (ac-ft)	Sediment Storage Volume (ac-ft)	Total Volume Below primary Spillway (ac-ft)	Total Volume Below Emergency Spillway (ac-ft)	Embankment Height from Upstream Toe to Emergency Spillway (ft)
001	*N/A*	*96.4*	*96.4*	*24.4*	*3.4*	*14.3*	*14.3**	*1.5'****

002	*N/A*	*27.0.*	*27.0*	*10.0*	*2.7*	*6.9*	*6.9**	*0.0****
003	*N/A*	*35.1*	*35.1*	*10.4*	*4.2*	*8.5*	*8.5**	*0.0****
004	*N/A*	*57.0*	*30.0*	*13.6*	*1.1*	*7.8*	*7.8**	*0.0****
005	*N/A*	*158.0*	*158.0*	*40.8*	*10.0*	*39.6*	*39.6**	*2.5'****
006	*N/A*	*65.0*	*47.0*	*16.0*	*4.2*	*10.9*	*10.9**	*0.0****
007	*N/A*	*28.4*	*28.4*	*6.0*	*1.0*	*4.3*	*4.3**	*0.0****

** Basin has single, open-channel spillway.*

*** Embankment height is from U/S toe to open-channel spillway.*

**** Total Pond Volume is incised.*

F) 1) Discuss the design basis for the sediment pond(s) calculations.

Submit calculations used in spillway designs and determination of inflow volume and pond volume.

Response: *Refer to Attachment IV.7.F for individual pond calculations. The basis of the design for the ponds is as follows:*

- *Pond Locations: Sediment ponds are located so as to be down-gradient so as to receive runoff from a substantial area of the anticipated areas of disturbance. Collection ditches were located so as to contain the entire runoff from the anticipated areas of disturbance, with the exception of minor areas from transportation facilities and soil storage areas, and to convey the runoff to the various sediment control ponds.*

- *Storm runoff: pond designs are based on the precipitation and runoff expected from a ten (10) year, twenty-four (24) hour storm, type II distribution. For this area, this storm generates 4.7 inches of rainfall. The ponds and spillway configurations were then checked for capacity for the expected rainfall and runoff from the twenty-five (25) year, six-hour storm, as most ponds are proposed for retention as permanent impoundments. Collection ditches and sediment control ponds conveying and treating runoff from the refuse disposal areas were designed to accommodate the expected runoff generated by a 100 year, six (6) hour storm which generates 4.9 inches of rainfall.*

- *Pond volumes: volumes were determined by summing the expected storm runoff with estimated sediment volume calculated on the basis of 0.035 acre-feet of sediment storage per disturbed acre within the respective watersheds. Ponds are designed for a ten (10) hour detention time for the design inflow. Sediment storage volume design was increased for the ponds to receive runoff from refuse and coal storage areas.*

- *Spillway configuration: all flood routing and design was developed using Sedcad 4 software.*

- *Additional sediment storage volume: where terrain and conditions permit, it is planned to develop sediment storage within the collection ditches which will convey runoff to the ponds. This will be done to facilitate sediment removal, prior to sediment reaching the ponds. These sediment traps will be constructed to top widths of approximately 50*

feet, with depths of 2-5 feet below the necessary ditch flow line.

- *Mine pumpage: where applicable, pumpage from mine dewater pumps are added to the required pond volumes.*

2) Submit a typical section of the embankment(s), details of the principal and emergency spillways and a plan view of each pond at a scale of 1 inch = 200 ft. or larger showing pond bottom contours and points of inflow.

Response: *Refer to Attachment IV.7.F.*

3) For all sedimentation ponds provide design information showing compliance with the requirements of 62 Ill. Adm. Code 1817.46. Each plan shall, at minimum, comply with the requirements of MSHA, 30 CFR 77.216-1 and 77.216-2.

Response: ***Refer to Attachment IV.7.F and the table in response IV.7.E confirming compliance with these requirements.***

G) If sediment removal becomes necessary, explain how the sediment will be removed, where it will be disposed of, and what disposal methods will be used.

Response: ***The sediment basins have been designed to provide adequate sediment storage volume. Therefore, if removal of sediment from basins becomes necessary, the following procedure will be used: the pool level will be lowered by pumping to the lowest possible level; after the pool level is sufficiently lowered, a small dragline or some other appropriate piece of equipment, will be used to remove sediment from the basin; the sediment removed from the basin will be disposed of in the Refuse Impoundment.***

H) Will pH adjustment be necessary on any of the discharges in order to meet the applicable State and Federal Standards?

Yes _____ No __X____

If yes, a discussion of the situation is necessary, along with a detailed basis of design. The basis should include a detailed description of the proposed treatment facilities, process flow diagrams, and design calculations.

Response: ***Treatment of discharges to adjust pH is not anticipated. However, should treatment become necessary, a plan to insure applicable water quality standards are met will be developed. If pH control should be required in the future it could be done with a liquid sodium hydroxide solution dispensed by gravity from a portable tank or, hydrated lime (dry or slurry) and/or, soda ash could be easily and quickly applied.***

I) Does a perennial or intermittent stream occur within the proposed permit area?

Yes _____ No __X____

If yes, is an exception to the 100-foot buffer zone being requested or is a stream diversion being proposed. For exception to the 100 foot buffer zone, indicate how compliance with Section 1817.57 will be assured. For a stream diversion, complete Part V 6) of the application form.

J) Permanent and Temporary Impoundments, Ponds, Banks, Dams and Embankments

1) All temporary and permanent impoundments must meet the requirements of 62 Ill. Adm. Code 1817.49. Will the mining operation involve the construction of any impoundments

other than those waste retention?

Yes ___X___ No _____

If yes, include the following information:

a) Locate on mining operations map all impoundments, dam locations, and watershed limits, indicate which impoundments are proposed to be permanent and complete Part V 3)D) of the application.

Response: ***Refer to the Mining Reclamation Map (Map 7) for sediment ponds proposed to be permanent. Refer to the Hydro-Geological Map (Map 4) for watershed limits.***

b) Provide construction and maintenance details of dams, spillways, seepage control measures, and erosion control measures for inlets and outlets. Employ maps and cross sections where necessary. Where design plans for proposed structures are not provided, submit a certification statement providing a schedule for submission of detailed design plans for each structure.

Response: ***See pond construction details, Attachment IV.7.F- Maintenance of ponds prior to final bond release may include sediment removal.***

2) Describe proposed reclamation plans for each structure, including a timetable and plans for removal and disposal of material. Each plan shall:

a) Be prepared by or under the direction of, and sealed by a qualified registered professional engineer licensed under the Illinois Professional Engineering Act,

b) Contain a description, map, and cross-section of the structure and its location,

c) Contain preliminary hydrologic and geologic information required to assess the hydrologic impact of the structure,

d) If underground mining has occurred, the plan shall contain a survey describing the potential effect on the structure from subsidence of the subsurface strata resulting from the post underground mining operations,

e) For structures where the detailed design plans are not submitted to the Department with the general plan, the plan shall contain a certification statement which includes a schedule setting forth the dates that detailed design plans are to be submitted. For these structures, the detailed design plans must be submitted to the Department and approved in writing prior to the beginning of construction.

Response: ***Sediment basins proposed to be retained as permanent impoundments are indicated on the Reclamation Plan Map. There will be no excess material to be disposed of. Slurry cells will be reclaimed by covering the final slurry surface with coarse refuse or other appropriate fill material to prevent future impoundment of water or slurry. The coarse refuse will be reclaimed by covering with soil material and vegetated as indicated on the Mining Reclamation Map (Map 7) in accordance with applicable regulations.***

An Engineering Certification is contained in Part I herein.

No significant impacts from these structures are anticipated on surface or groundwater, see Part III.

No structures are located within planned subsidence areas.

All structures will remain in place until coal production is ceased and final reclamation of the surface facilities is initiated. The life of the mine is currently projected through 2016 in this application; however future underground expansion is anticipated.

All detailed plans for the construction of structures can be found in Attachment IV.6.D-Slurry Pond Details and Attachment IV.7.F-Sediment Pond Designs except for the design of the area labeled as "Future Refuse Area". A separate permit application will provide detailed designs for IDNR approval when finalized. No refuse disposal or disturbance will occur within this area, other than placement of necessary drainage control structures, until all appropriate permits are secured.

Underground mining has occurred under the facility in the north western corner of the permit area. The applicant is not aware of any past unplanned subsidence events occurring within the boundaries of the permit area. After closure and reclamation of the facility, the only structures that will remain that could be potentially impacted by unplanned subsidence are permanent ponds 2 and 3 and a future course refuse disposal area. The permanent ponds would have minimal impacts as impounding structures, are minimal in size, and the thick glacial material would self heal and prevent loss of water. Details on the future course refuse area will be evaluated in more detail at the time a request is made. No disposal will occur in the area labeled "Future Course Refuse Disposal Area" until a permit request is made and approved by IDNR.

3) For each structure that meets or exceeds the size or other criteria of MSHA, 30 CFR 77.216(a), the detailed design plan shall:

   a) Be prepared by or under the direction of and sealed by a qualified registered professional engineer licensed under the Illinois Professional Engineering Act,

   b) Include any design and construction requirements for the structure, including any required geotechnical information,

   c) Describe the operation and maintenance requirements for each structure, and

   d) Describe the timetable and plans for removal of each structure if appropriate.

Response: *No structures exceeding size requirements of 30 CFR 77.216 (a) are proposed within this permit application.*

4) For each structure that does not meet the size or other criteria of MSHA, 30 CFR 77.216(a), the detailed plan shall:

   a) Be prepared by or under the direction of and sealed by a qualified registered professional engineer licensed under the Illinois Professional Engineering Act,

   b) Include any design and construction requirements for the structure, including any required geotechnical information,

   c) Describe the operation and maintenance requirements for each structure, and

   d) Describe the timetable and plans for removal of each structure if appropriate.

Response: ***Refer to Attachment IV.6.D for details of Slurry Pond 1 and Attachment IV.7.F for information related to sediment basin design.***

K) If any of the following questions are answered yes, a permit may be needed from Illinois Department of Natural Resources, Office of Water Resource Management.

1) Will the mining operation involve the construction of any levees, dikes, haul roads or other similar structures or the placement of any fill along or in the flood plain of any stream serving a drainage area of ten (10) square miles or greater at the point of construction?

Yes _____ No ___X___

2) Will the mining operation involve any relocation or diversion of or any construction activity in, over, under or along the banks of any stream serving a drainage area of ten (10) square miles or greater at the point of construction?

Yes _____ No ___X___

3) Is there any urban development (residential, commercial or industrial uses) in the areas immediately surrounding the mining operation?

Yes _____ No ___X___

(If yes, please re-answer questions 1 and 2 above applying a one (1) square mile drainage area limit.)

4) Will the mining operation involve the construction, major modification, or removal of any dam which in the event of failure would have probability for loss of life or additional economic loss in excess of that which would occur downstream of the dam in the absence of the dam?

Yes _____ No ___X___

5) Will the mining operation involve the construction, major modification, or removal of any dam 25 feet or more in height?

Yes _____ No ___X___

6) Will the mining operation involve construction, major modification, or removal of any dam which would have an impounding capacity of 50 acre feet or more?

Yes _____ No ___X___

8) Provide a plan detailing fugitive dust control practices to be employed during proposed surface coal mining and reclamation operations as required under 62 Ill. Adm. Code 1817.95.

Response: ***Fugitive particulate emissions will be controlled by applying water or other IEPA approved dust suppressants on an as-needed basis. All construction areas will be stabilized with permanent vegetative species, graded stone and/or paving material. Haul roads and other unpaved roads will be sprinkled with water to control fugitive dust. Conveyor transfer points will be provided with enclosed hoods over the discharge roller, and will employ chutes and be enclosed to control emissions.***

Attachment IV.3.B.2 - Surface Monitoring Plan, Longwall Panels

ATTACHMENT IV.3.B.2
Surface Monitoring Plan
Longwall Panels 1 and 2

With the purpose of gathering information to verify assumptions made in creating the post subsidence contours, physical surveying will be performed on surface control points on the first two longwall panels.

Installation

Control Monuments will be installed away from areas of suspected ground movement. The monument will be constructed to minimize the impact of frost heave. A typical construction print has been attached.

Baseline Stations will be installed on 25 foot spacing in locations as described below. Each Station will be constructed to prevent frost heave as shown on the attached construction print.

Baseline A will be installed along the centerline of the first panel. The direction of the baseline will be east to west and will start at a point 700 feet west of the initial longwall face. The baseline will extend 600 feet to the west.

Baseline B will be installed at a point 700 feet west of the initial longwall face. Baseline B will run from north to south. The baseline will begin at a point 500 feet north of the tail entry of the longwall panel and extend south to a point 600 feet south of the tail entry.

Baseline C will be installed at a point 500 feet north of the tail entry for Panel 2 and extend south to a point 600 feet south of the Panel 2 tail entry. The purpose for this baseline is to determine the effect on the chain pillars left between the longwall panels after mining on both sides of the chain pillars.

Baseline D will be installed in the Northeast corner of Panel 1 and extend at an Azimuth of 45 degrees for a distance of 500 feet. It will extend to the southwest at an Azimuth of 225 degrees for a distance of 500 feet. This baseline provides information on surface subsidence in the panel corners.

Control points will be installed beyond the baselines in locations that will not feel effects from subsidence. The base control points will be iron pin monuments constructed as shown in the attached drawing "Typical Surface Monitoring Station" to prevent movement from frost heave or machinery.

Baseline stations will consist of 48-inch long 5/8-inch diameter iron pins driven into the ground. Stations will be installed at 25 ft intervals. See "Typical Surface Monitoring Station" drawing for details.

Monitoring

The monitoring will consist of collecting data including elevation, coordinates in east and north planes, date of monitoring, time of monitoring and the location of the longwall face by its underground survey station.

Baselines A and B will be monitored at the following intervals:

- When the longwall face is within 300 feet of Baseline B;
- When the longwall face is near Baseline B;
- When the longwall face is 300 feet beyond Baseline B.
- Additional data will be collected based at the following events:
  - Four Consecutive days after the Longwall Face has reached Baseline B;
  - Two weeks after the Longwall Face has reached Baseline B;
  - Four weeks after the Longwall Face has reached Baseline B;
  - Three Months after the Longwall Face has reached Baseline B:
  - Six Months after the Longwall Face has reached Baseline B;
  - Nine Months after the Longwall Face has reached Baseline B;
  - One Year after the Longwall Face has reached Baseline B.

Baseline C will be monitored at the following intervals for Longwall Panel 1:

- When the longwall face is within 300 feet of Baseline C;
- When the longwall face is near Baseline C;
- When the longwall face is 300 feet beyond Baseline C.
- Additional data will be collected based on the following:
  - Four Consecutive days after the Longwall Face has reached Baseline C;
  - Two weeks after the Longwall Face has reached Baseline C;
  - Four weeks after the Longwall Face has reached Baseline C;
  - Three Months after the Longwall Face has reached Baseline C:
  - Six Months after the Longwall Face has reached Baseline C;
  - Nine Months after the Longwall Face has reached Baseline C;
  - One Year after the Longwall Face has reached Baseline C.

Baseline C will be monitored at the following intervals for Longwall Panel 2:

- When the longwall face is within 300 feet of Baseline C;
- When the longwall face is near Baseline C;
- When the longwall face is 300 feet beyond Baseline C.
- Additional data will be collected based on the following:
  - Four Consecutive days after the Longwall Face has reached Baseline C;
  - Two weeks after the Longwall Face has reached Baseline C;
  - Four weeks after the Longwall Face has reached Baseline C;
  - Three Months after the Longwall Face has reached Baseline C:

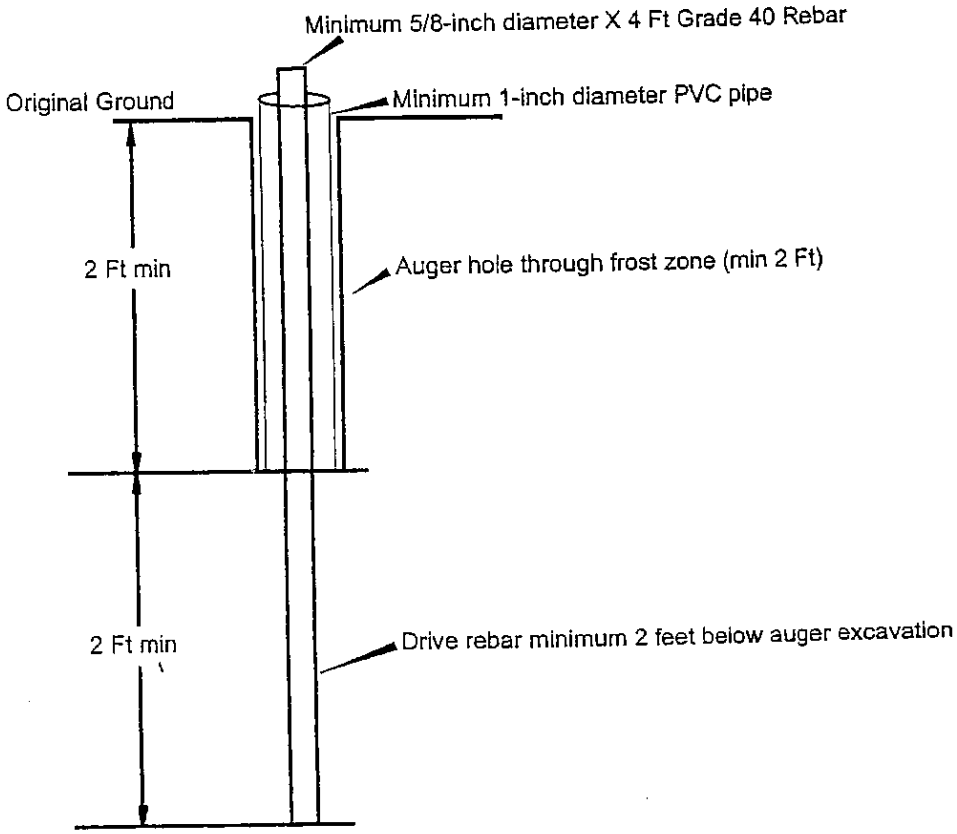
Six Months after the Longwall Face has reached Baseline C;
Nine Months after the Longwall Face has reached Baseline C;
One Year after the Longwall Face has reached Baseline C.

Baseline D will be monitored at the following schedule:

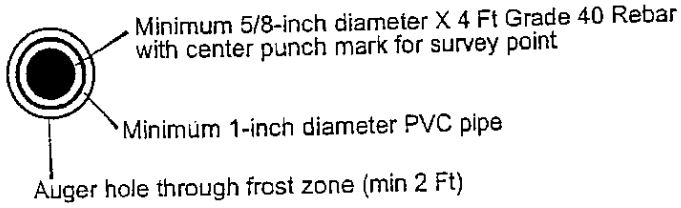
- Before the longwall face begins production in the first panel;
- Weekly until the face is within 300 feet of Baseline B;
- Additional data will be collected based on the following:

  Two weeks after the Longwall Face has reached Baseline B;
  Four weeks after the Longwall Face has reached Baseline B;
  Three Months after the Longwall Face has reached Baseline B:
  Six Months after the Longwall Face has reached Baseline B;
  Nine Months after the Longwall Face has reached Baseline B;
  One Year after the Longwall Face has reached Baseline B.

TYPICAL SURFACE MONITORING STATION
Construction Details
Not To Scale



Section View



Plan View

Attachment IV.3.B.5.c – Primary Wells

Attachment IV.3.B.5.C - Surface and Coal Owners - Water Well Survey (revised November 15, 2007)

Key ID	Map	Name	City_State	Well on Property	Inhabited House	Mobile Home	Primary Supply	Secondary Supply	Water Use	Well Dia. (in)	Well Depth (ft)	Notes
1	17-07-252-001,	BLANKENSHIP GEORGE LEE	HILLSBORO IL									
2	17-07-151-002,	JUSTISON THOMAS A	BUTLER IL									
3	17-07-151-001,	IP COMPANY C/O AMEREN SERVICES	ST LOUIS MO									
	17-07-300-002,	RADEMACHER TRUST	ELLISON BAY WI	No								
5	17-07-276-001,	WALTER, DIANNE, ROBERT & PHYLLIS KUNZ	TRENTON IL									
6*	17-07-400-002,	CITY OF HILLSBORO	HILLSBORO IL	Yes					Other	?	?	40 years old
7	17-07-400-005	ULLMAN EMERALD J	HILLSBORO IL	No								
8	17-08-300-009,	SHURE RICHARD & DOROTHY	ALHAMBRA IL	No								
9	17-08-400-002,	GOLDSBOROUGH R C & K M	COWDEN IL									
10	17-08-400-004	SNODDY RONALD H	WESTLAKE TX									
11	17-15-100-002,	ERNST LESTER A	COFFEEN IL	No								
12	17-15-200-004	HUBER EDWARD	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Garden	72	35	100 years old
13	17-15-300-002,	L & L HUBER FARMS LLC	SANTA MONICA CA									
14	17-15-400-001	MANSHOLT FARMS INC	LITCHFIELD IL									
15	17-15-400-009	MERANO SCOTT & STACIE	WITT IL									
	17-16-100-002	MOHR DONNA	DALLAS CITY IL	Yes	No		No		Stock Watering	36	25	
17	17-16-100-003	CRAWFORD DANIEL & MARION TRUST	AVON IN	Yes	No		No		Stock Watering	?	? - Deep	70 years old; Used to water 140 head dairy herd in previous years. Not used for last 20 years
18	17-16-200-003,	FRAVALA FARM	HILLSBORO IL									
19	17-17-100-001	WHITE DAVID B	HILLSBORO IL									
20	17-17-200-001	LANE RICHARD R	VIRDEN IL									
21	17-17-300-001,	WISDOM MARY JANE TRUST	HILLSBORO IL	Yes			No		None			Not Used
22	17-17-300-004,	AUSTIN ROBERT M TRUST	DECATUR IL									
23	17-17-300-005	HARMS HENRY	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Garden	36	25	85 years old; It is the only source of water and have never ran dry even when they had 150 head of hogs
24	17-17-400-004,	SPINNER GEORGE & MARTHA	HILLSBORO IL	No								
25	17-18-300-006,	SPINNER EDMUND & JAN	HILLSBORO IL	Yes	Yes		No		Bathing	?	?	50-60 years old;
26	17-18-300-009,	MURPHY & FUDOLI	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing	?	?	
27	17-19-100-006	WHITE DORIS M	NOKOMIS IL									
28	17-19-100-007,	GRAHAM CORRECTIONAL CENTER	HILLSBORO IL	No								
29	17-19-100-010,	MONTGOMERY COUNTY FARM	HILLSBORO IL	No								
30	17-19-200-003,	DUNKIRK DOROTHY L	HILLSBORO IL									
31	17-19-200-004,	SPINNER DARIN M	HILLSBORO IL	No								
32	17-19-300-002,	BOAS JOSEPH L	IRVING IL	Yes	No		No		None	?		
33	17-19-400-002	REDMAN BRIAN	HILLSBORO IL	Yes	Yes		No		Garden, Animals	60	17	70+ years old
34	17-19-400-004	SPINNER KENT	HILLSBORO IL									
35	17-20-100-003,	FATH BILL E	HILLSBORO IL	No								
36	17-20-200-003,	SPINNER DAVID L	HILLSBORO IL	No								
37	17-20-300-001,	KASTEN ARLEN R	HILLSBORO IL									
38	17-20-300-005,	SCHRAUT LARRY G	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Stock Watering, Garden, Laundry	?	?	
	17-20-400-002	FULLER BARBARA K	HILLSBORO IL	Yes	Yes		No		Bathing, Garden	?	?	There are 2 wells. One not in use.
40	17-20-400-004,	SELTZER EARL C TRUSTEE	HILLSBORO IL									
41	17-20-400-005	ARMENTROUT MARY F	HILLSBORO IL	No								
42	17-20-400-007	CABELLO JOSE III &	WITT IL	No								
43	17-21-100-002	SPINNER STEPHEN J	JACKSONVILLE IL									
44	17-21-200-001,	TIMMONS WAYNE	LAMAR MO									
45	17-21-200-002,	GRABBE PHILIP R	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Garden	36	25	

Attachment IV.3.B.5.C - Surface and Coal Owners - Water Well Survey (revised November 15, 2007)

Key ID	Map	Name	City_State	Well on Property	Inhabited House	Mobile Home	Primary Supply	Secondary Supply	Water Use	Well Dia. (in)	Well Depth (ft)	Notes
46	17-21-300-001,	BONETTO DEANNE	HILLSBORO IL									
47	17-22-200-001,	SPINNER DIANE	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Garden	30	40	17 years old; A 2nd well is on the property - no longer used 30' deep (30" Dia) - City water available never hooked up
48	17-22-200-002,	GARRETT CONNIE	HILLSBORO IL									
49	17-22-300-002,	IL DEPT OF NATURAL RESOURCES	SPRINGFIELD IL									
50	17-22-400-002,	MICENHEIMER ESTELLA & MERRILL	COFFEEN IL									
51	17-27-200-003	HUBER FERDINAND J	COFFEEN IL									
52	17-27-300-014,	BLANKENSHIP KENNETH E &	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing	36	18	40+ years old
53	17-28-100-001,	JURGENA HAROLD W & DOLORES I	IRVING IL	No								
54	17-28-100-002	ELAM GEORGE F	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Stock Watering, Garden	30	30	35 years old
55	17-28-100-005,	HAMILTON JOHNNY & RITA	HILLSBORO IL	Yes	Yes		Yes		Drinking, Stock Watering	48	20	30 years old
56	17-29-200-001	BOWEN CLAUDE H & LOIS D TRUST	BETHALTO IL									
57	17-29-200-003	FIRST NATL BANK VANDALIA	VANDALIA IL									
58	17-29-300-001,	SCHRAUT FLORENCE	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Stock Watering, Garden	?	?	
59	17-29-400-002	SCHRAUT R LEE	HILLSBORO IL	Yes	Yes		Yes		Drinking, Stock Watering, Garden	60	30	100 years old; 2nd well - 12", depth 100', 35 years old
60	17-30-300-001	ELAM RICHARD A SR	TAYLOR SPRINGS IL									
[redacted]	17-30-400-002,	YOUNG GERALD E	HILLSBORO IL	Yes	No		No		Stock Water	36	50	15 years old
62*	17-14-100-001	TUETKEN MYRON & LESTER	IRVING IL	Yes	Yes		Yes		Drinking	36	50	15 years old
63	17-14-100-002	MC LEAN JAMES & HELEN	STAUNTON IL									
64	17-14-300-003	KABURICK GEORGE W	TEXARKANA TX									
65	17-15-100-001	RAPP AGLAND INC	HIGHLAND IL									
66	17-15-400-007	HUBER JAMES & KRISTA	HILLSBORO IL	No	Yes							
67	17-16-200-004	JACOBS ROBERT & MARSHA	DES MOINES IA	Yes	Yes		Yes		Drinking, Bathing, Stock Watering, Garden, Laundry	?	?	20 years old
68	17-22-400-003, 17-26-100-001	CLARK JOHN A	HILLSBORO IL	Yes	Yes		Yes		Drinking, Garden, Cooking, Laundry	?	22	170 years old; Abe Lincoln drank from this well when traveling from SPFLD to the state house in Vandalia. There are 2 wells.
69	17-23-300-001	PARISH HOLDINGS L P	MINNEAPOLIS MN									
70	17-26-100-005	EARNEST LEONARD SCOTT & MEGAN	HILLSBORO IL									
71	17-26-100-006	BOCKSTRUCK CHARLES	ALBUQUERQUE NM									
72	17-26-300-001	WHITTEN CLARA MAE	COFFEEN IL									
73	17-27-200-005	HUBER DEAN	COFFEEN IL									
74	17-27-200-006	HUBER FERDINAND J	COFFEEN IL									
75	17-27-300-005	GARRETT ELZIE L	COFFEEN IL									
[redacted]	17-27-300-010,	HUBER BERNARD J & GERALDINE A	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Stock Watering, Garden	72	24	100 years old.
77	17-27-300-011	BRANCH CARL	HILLSBORO IL									
78	17-27-300-012,	BICKFORD CELENE M	COFFEEN IL									
79	17-27-400-003,	ARNEY MARY & MARTHA LYNCH	HILLSBORO IL									
80	17-28-400-002	HUGHES HELEN L	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Stock Watering, Garden	48	80	50+ years old
[redacted]	17-31-100-002,	YOUNG GERALD E	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Stock Watering	?	18	57 Years old
82*	17-32-100-002,	KASTEN ROY B	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Garden	3 @ 48	18, 20, 65	3 wells on the property, 15 years, 18 years, ?

Attachment IV.3.B.5.C - Surface and Coal Owners - Water Well Survey (revised November 15, 2007)

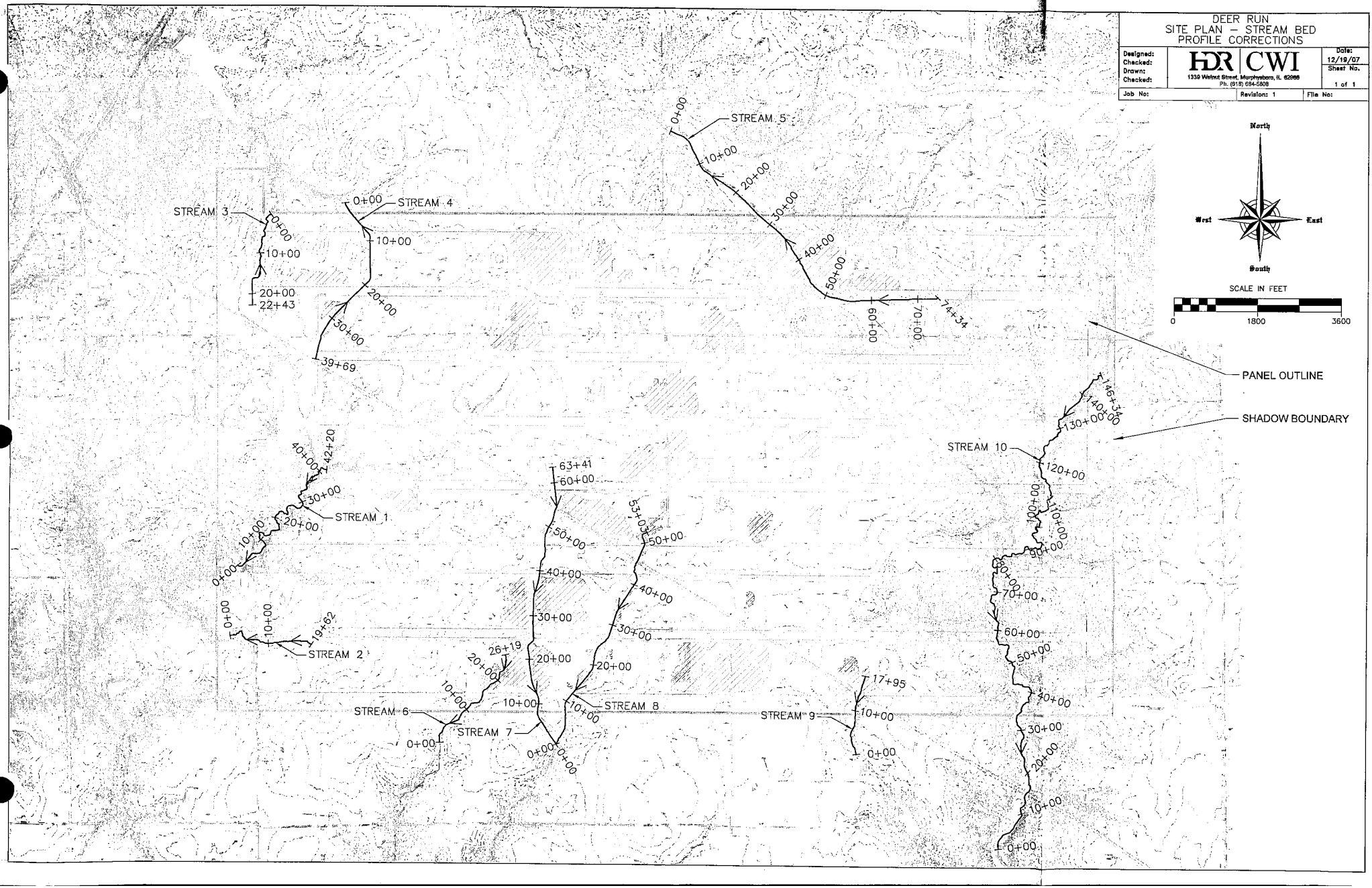
Key ID	Map	Name	City_State	Well on Property	Inhabited House	Mobile Home	Primary Supply	Secondary Supply	Water Use	Well Dia. (in)	Well Depth (ft)	Notes
83*	17-32-100-004	CLARK JOHN E & SHARON	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Stock Watering, Garden	10	60	28 years old;
84*	17-32-100-005	YOUNG BRAD & DAWN	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Garden	36	50	25 years old
85	17-33-100-001	EARL SELTZER ENTERPRISES	HILLSBORO IL									
86	17-34-100-004	MC DAVID POINT CEMETERY	HILLSBORO IL									
87*	17-34-100-005	NULL KENNETH & LINDA	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Stock Watering, Garden	?	25	9 years old; We have two spings that feed the well. Do not want City Water
88	17-34-100-006	RAY ROBERT & RALPH	ST LOUIS MO									
89	17-34-200-001	TITSWORTH SHAWN L SR	COFFEEN IL									
90	16-13-200-002	SCHNEIDER RANDOLPH L & SUSAN C	HILLSBORO IL									
91	16-24-400-006	OELZE MARION E TRUSTEE	NASHVILLE IL	No								
[redacted]	16-13-177-002	SLEPICKA RICHARD & NANCY	HILLSBORO IL	Yes	Yes		No		Garden	36	40	Not that I know of
93	16-13-177-005	B/R WRIGHT INVESTMENTS INC	HILLSBORO IL	No								50 years old
94	16-13-327-004	MONTGOMERY COUNTY HEALTH DEPT	HILLSBORO IL	No								
95	16-13-328-003	SMITH PATSY J	HILLSBORO IL	No								
96	16-13-328-008	HOME FUNDING ASSOCIATION	HILLSBORO IL									
97	16-13-328-009	ERNST PAUL L & CHRISTINE J	HILLSBORO IL									
98	16-13-379-001	MONTGOMERY NURSING & REHAB	HILLSBORO IL									
99	16-13-379-004	HUBER RANDALL B	HILLSBORO IL	No								
100	16-13-379-009	VOILS BROS INT INC	HILLSBORO IL									
101	16-13-379-010	HILLSBORO TOWNSHIP	HILLSBORO IL	No								
102	16-24-127-005	LESSMAN JAMES E	HILLSBORO IL									
103	16-24-127-007	MIKESKA MARY C	HILLSBORO IL									
104	16-24-127-008	V F W OF THE U S	TAYLOR SPRINGS IL	No								
105	16-24-176-002	BRAUER BARBARA A	HILLSBORO IL									
106	16-24-300-002	FENTON DOUG	HILLSBORO IL									
107	16-24-300-005	MURPHY JOANN	PEORIA IL	No								
108	16-24-300-013	HUBER RICHARD & JEANNE	HILLSBORO IL									
109	16-24-400-011	MC FARLIN ROGER C TRUST	HILLSBORO IL									
110	16-25-100-005	MC FARLIN BETTY LANGSTON	HILLSBORO IL									
111	16-25-100-012	COBETTO WILLIAM D	TAYLOR SPRINGS IL	No								
112	16-25-100-013	COBETTO WILLIAM & KELLY	HILLSBORO IL	No								
113*	16-25-300-005	FINLEY BRUCE R	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Stock Watering, Garden	36	65	10 years old
114	16-25-300-010	PRICE CECIL W	HILLSBORO IL									
115	16-25-300-017	CHAPPELEAR DANIEL	HILLSBORO IL	No								
116	16-25-300-512	SANDERS SETH	HILLSBORO IL									
117	16-25-400-006	SCHLUCKEBIER DAVID & CAROL	DONNELLSON IL									

[redacted] Added Information November 15, 2007

Num* - Well out of 1/2 mile offset

Note: If the question "Well on Property" is left blank then there was no response returned.

Attachment IV.3.B.6 – Stream Flow Restoration Plan


DEER RUN
SITE PLAN – STREAM BED
PROFILE CORRECTIONS
Designed:
Checked:
Drawn:
Checked:
HDR CWI
1339 Walnut Street, Murphysboro, IL 62966
Ph. (618) 684-5909
Date: 12/19/07
Sheet No. 1 of 1
Job No:
Revision: 1
File No:
North
West
East
South
SCALE IN FEET
0
1800
3600
PANEL OUTLINE
SHADOW BOUNDARY
STREAM 1
STREAM 2
STREAM 3
STREAM 4
STREAM 5
STREAM 6
STREAM 7
STREAM 8
STREAM 9
STREAM 10

DEER RUN
STREAM BED
PROFILE CORRECTIONS

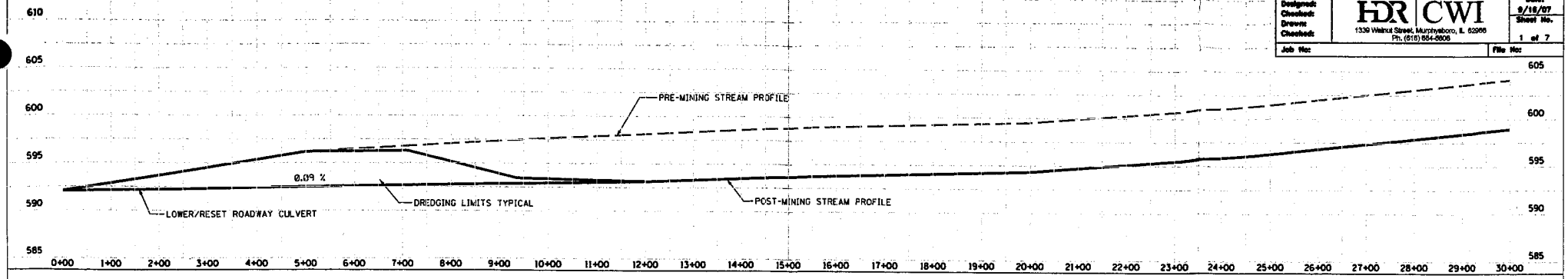
Designed:
Checked:
Drawn:
Checked:

HDR | CWI
1339 Walnut Street, Murphysboro, IL 62966
Ph. (618) 684-5606

Date: 9/18/07
Sheet No. 1 of 7

Job No:
File No:

STREAM 1 PROFILE



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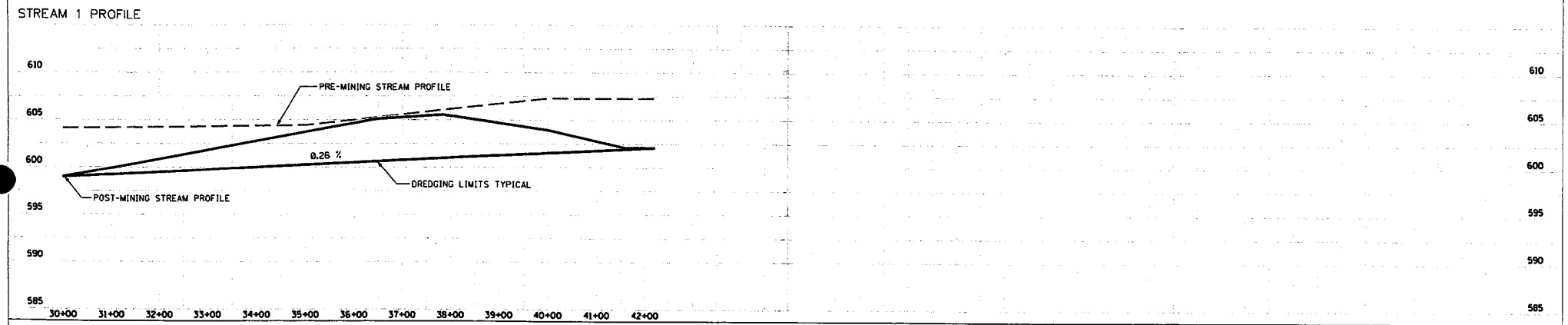

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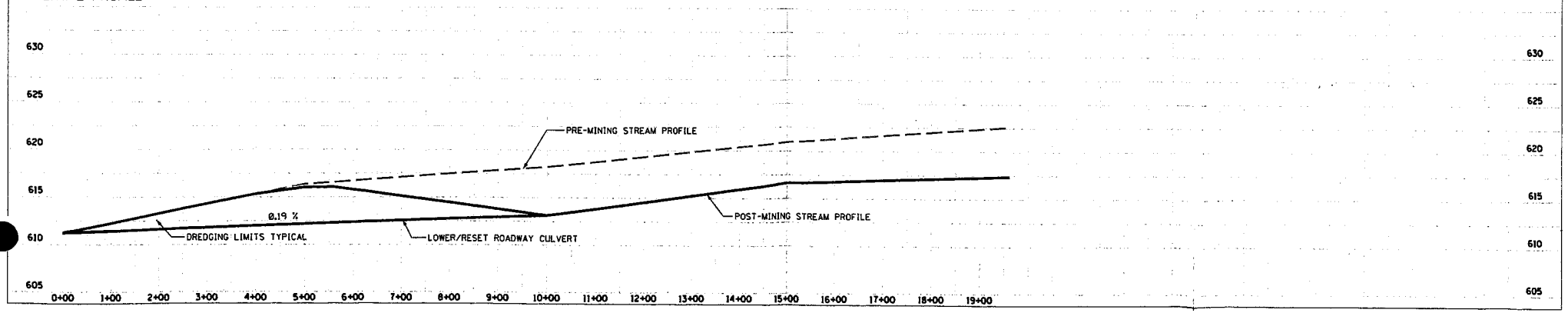


DEER RUN
STREAM BED
PROFILE CORRECTIONS

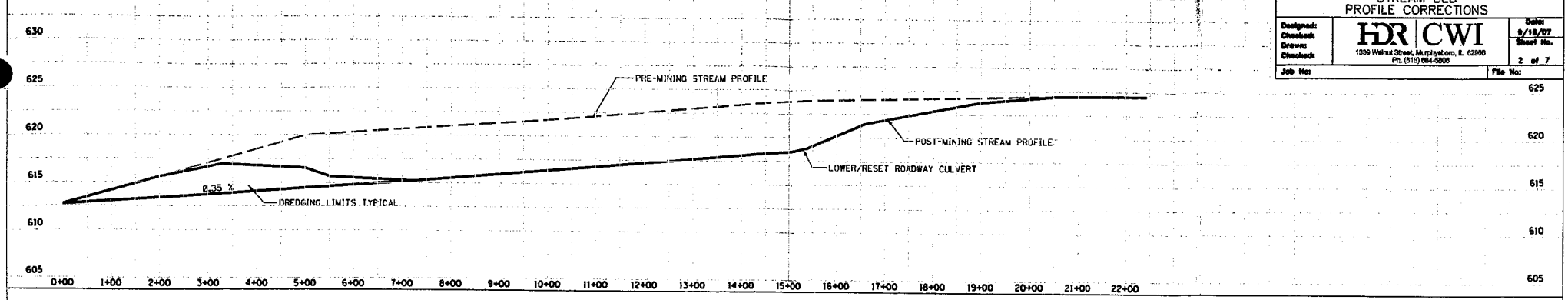
Designed:
Checked:
Drawn:
Checked:

HDR | CWI
1339 Walnut Street, Murphysboro, IL 62966
Ph. (618) 684-5806

Date: 9/18/07
Sheet No. 2 of 7

Job No:
File No:

STREAM 3 PROFILE



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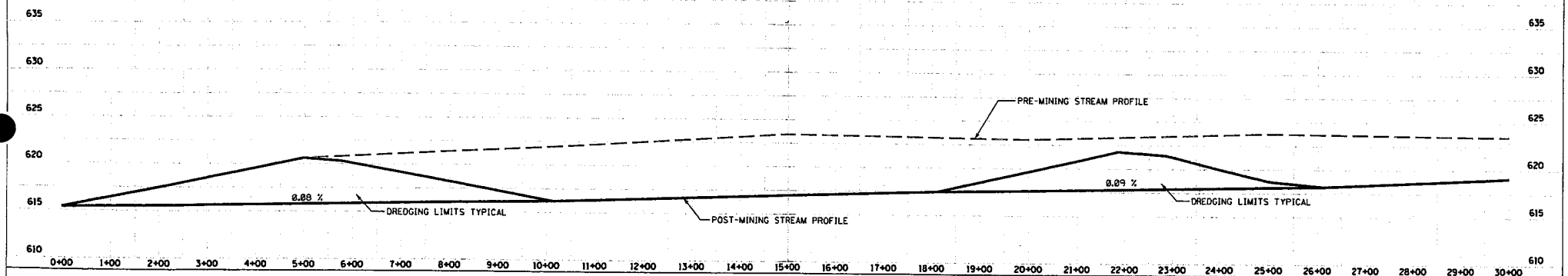

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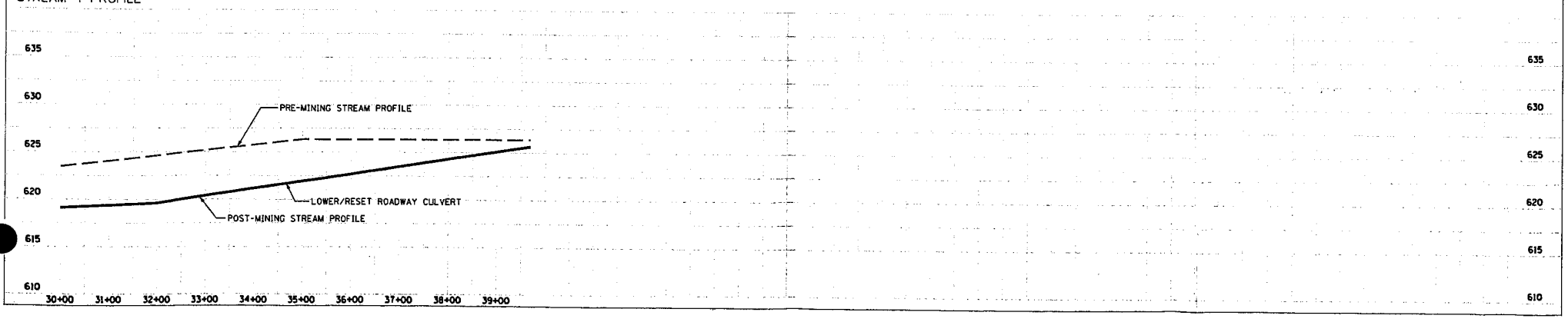
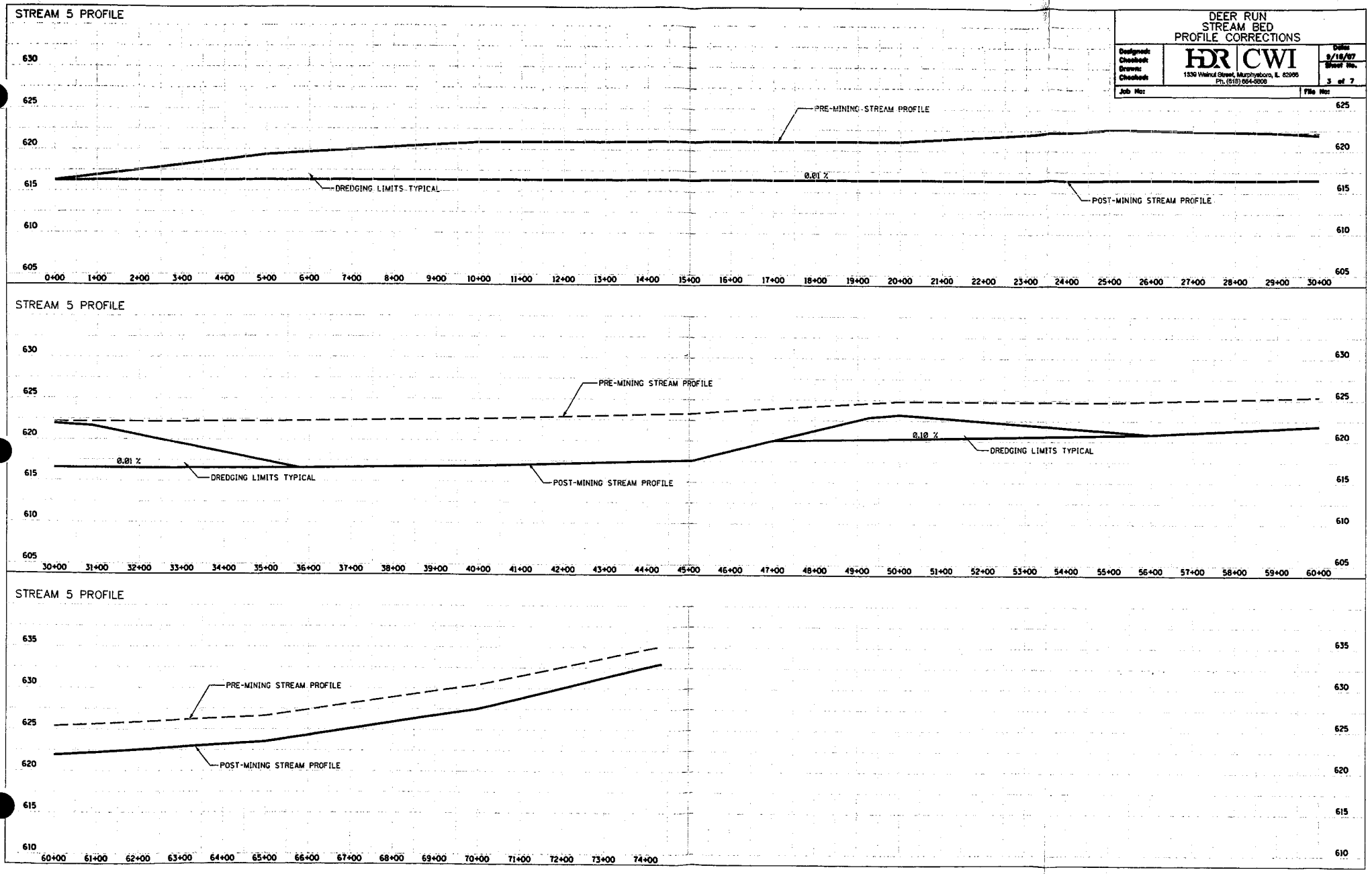




DEER RUN
STREAM BED
PROFILE CORRECTIONS

Designed:
Checked:
Drawn:
Checked:

HDR | CWI
1339 Walnut Street, Murphysboro, IL 62966
Ph. (618) 684-5806

Date: 9/18/07
Sheet No. 3 of 7

Job No:
File No:

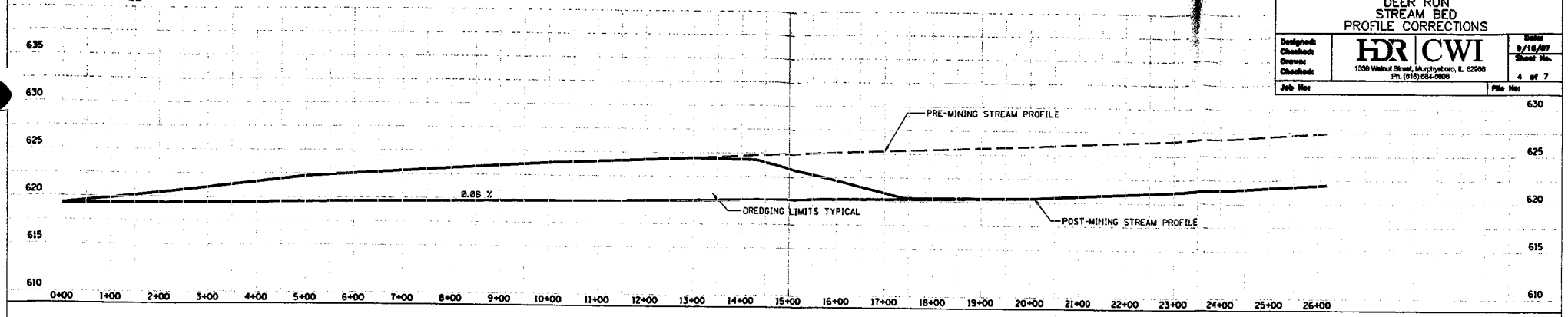
DEER RUN
STREAM BED
PROFILE CORRECTIONS

Designed:
Checked:
Drawn:
Checked:

HDR | CWI
1339 Walnut Street, Murphysboro, IL 62966
Ph. (618) 684-6806

Date: 9/18/07
Sheet No. 4 of 7
Job No:
File No:

STREAM 6 PROFILE



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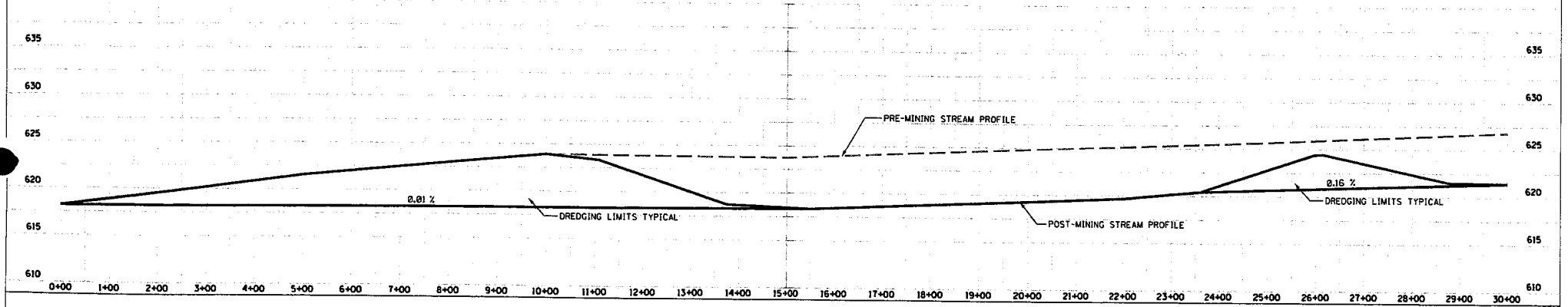

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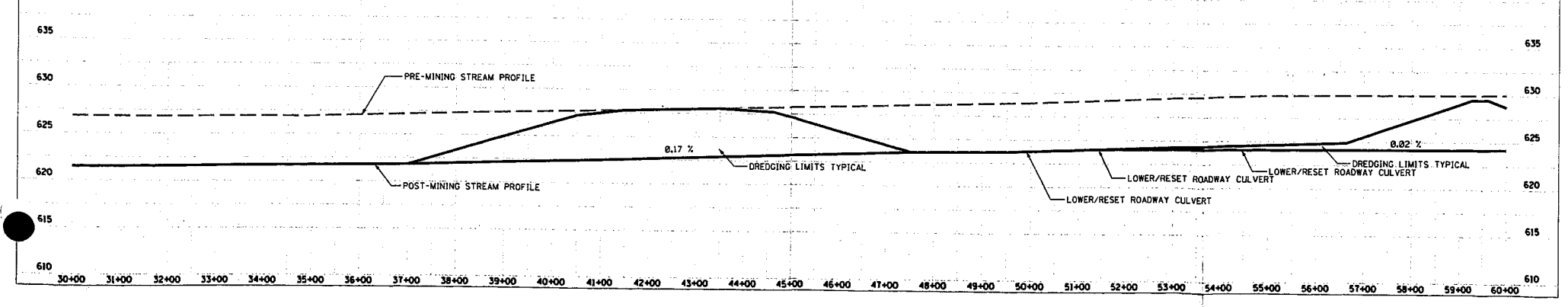


DEER RUN
STREAM BED
PROFILE CORRECTIONS

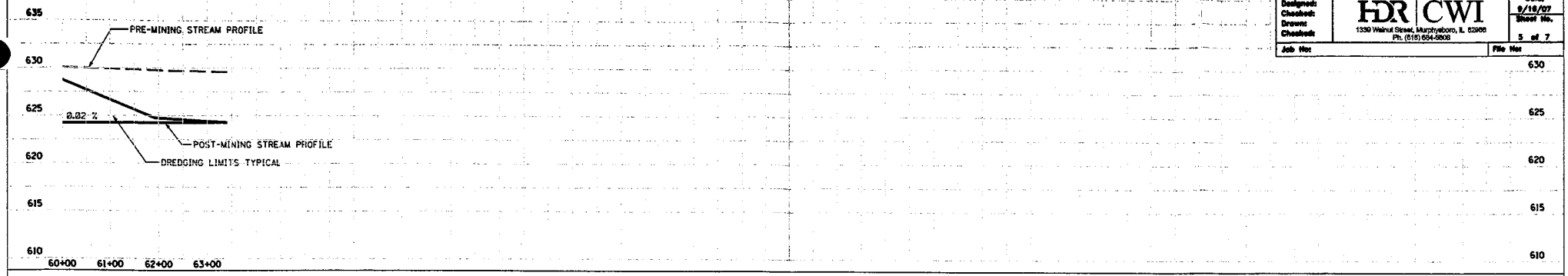
Designed:
Checked:
Drawn:
Checked:

HDR | CWI
1330 Walnut Street, Murphysboro, IL 62966
Ph. (618) 684-5808

Date: 9/10/07
Sheet No. 5 of 7

Job No:
File No:

STREAM 7 PROFILE



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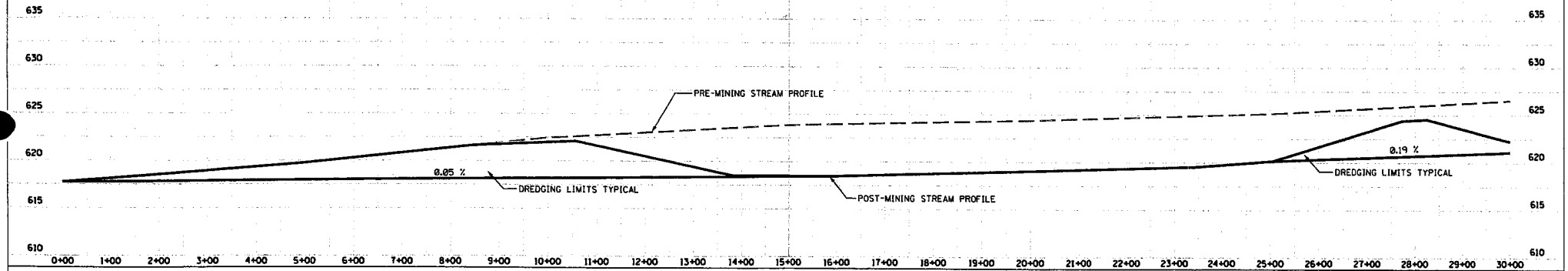

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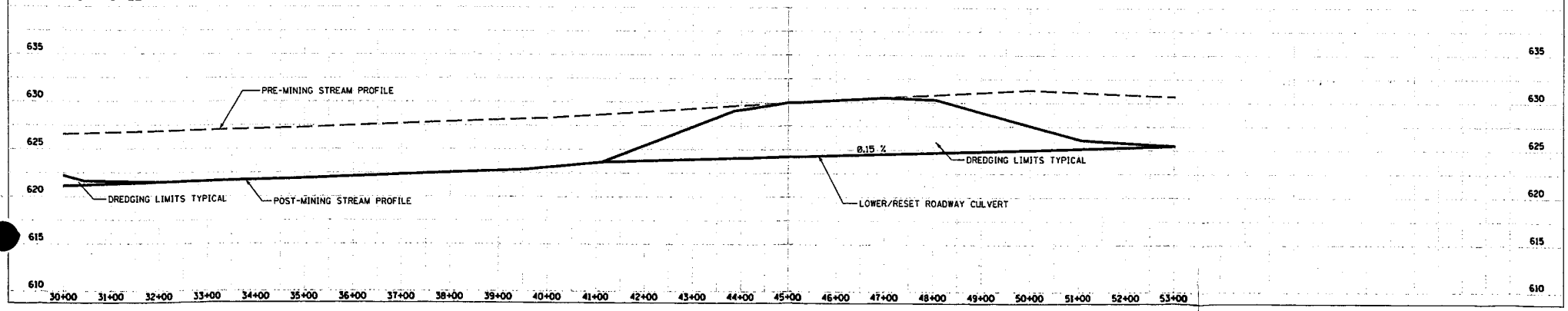


DEER RUN
STREAM BED
PROFILE CORRECTIONS

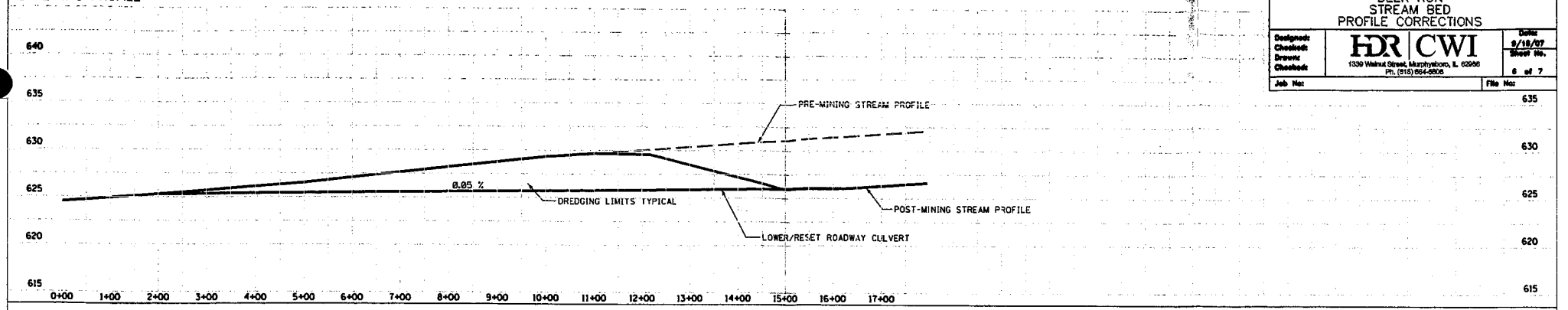
Designed:
Checked:
Drawn:
Checked:

HDR | CWI
1339 Walnut Street, Murphysboro, IL 62966
Ph. (618) 684-3808

Date: 9/18/97
Sheet No. 6 of 7

Job No:
File No:

STREAM 9 PROFILE



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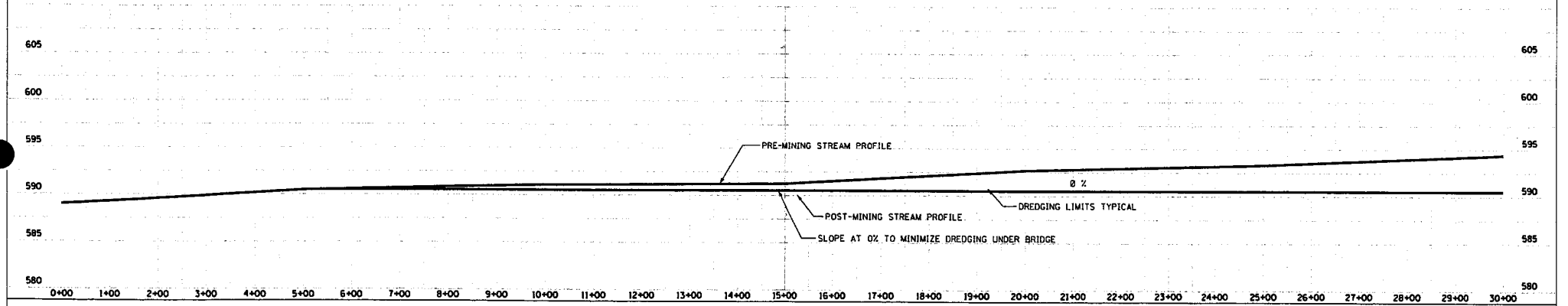

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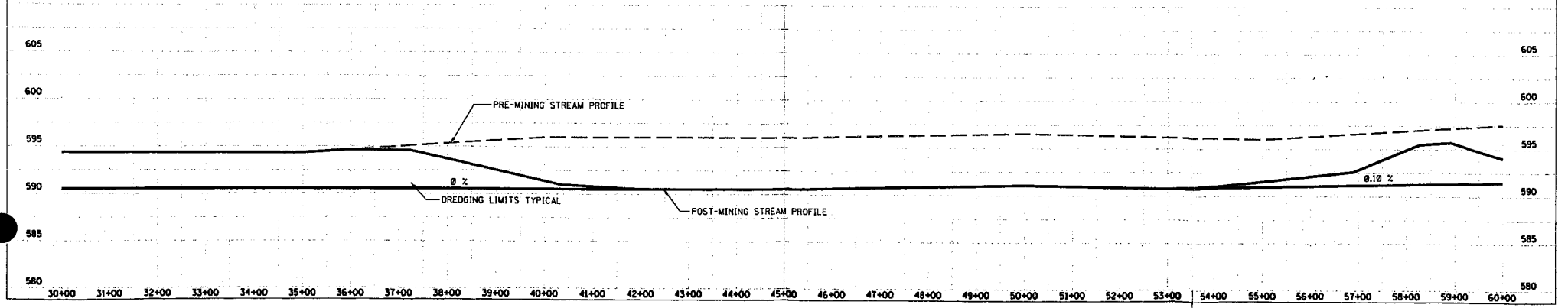


DEER RUN
STREAM BED
PROFILE CORRECTIONS

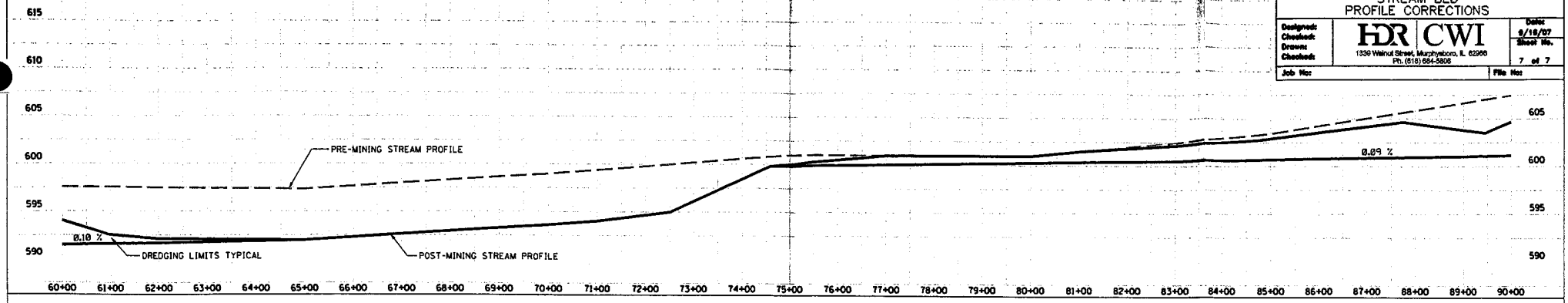
Designed:
Checked:
Drawn:
Checked:

HDR | CWI
1339 Walnut Street, Murphysboro, IL 62966
Ph. (618) 684-5808

Date: 9/18/07
Sheet No. 7 of 7

Job No:
File No:

STREAM 10 PROFILE



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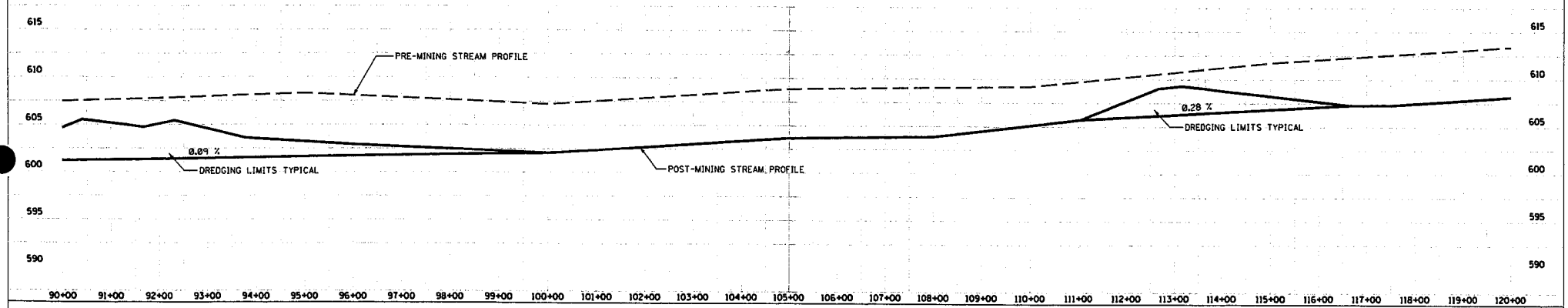

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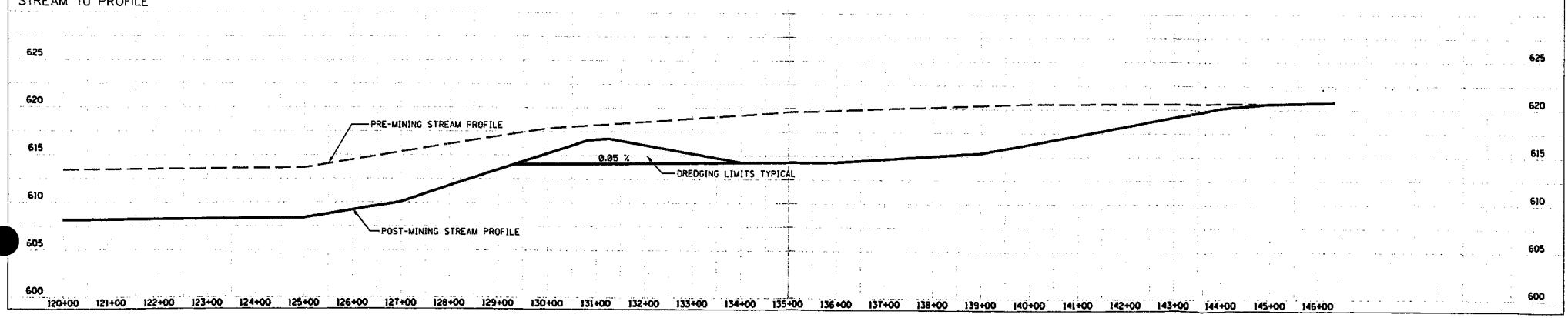
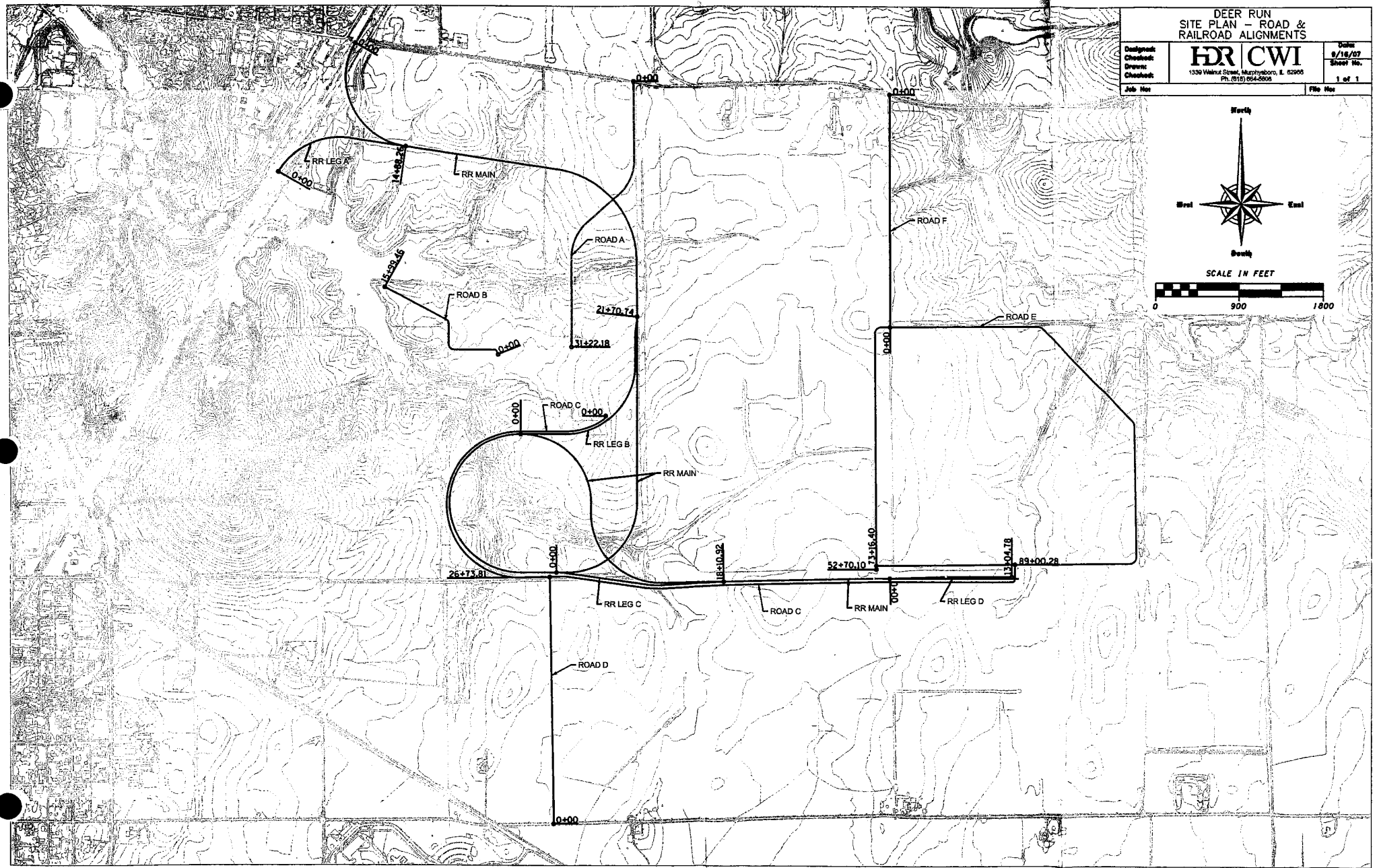
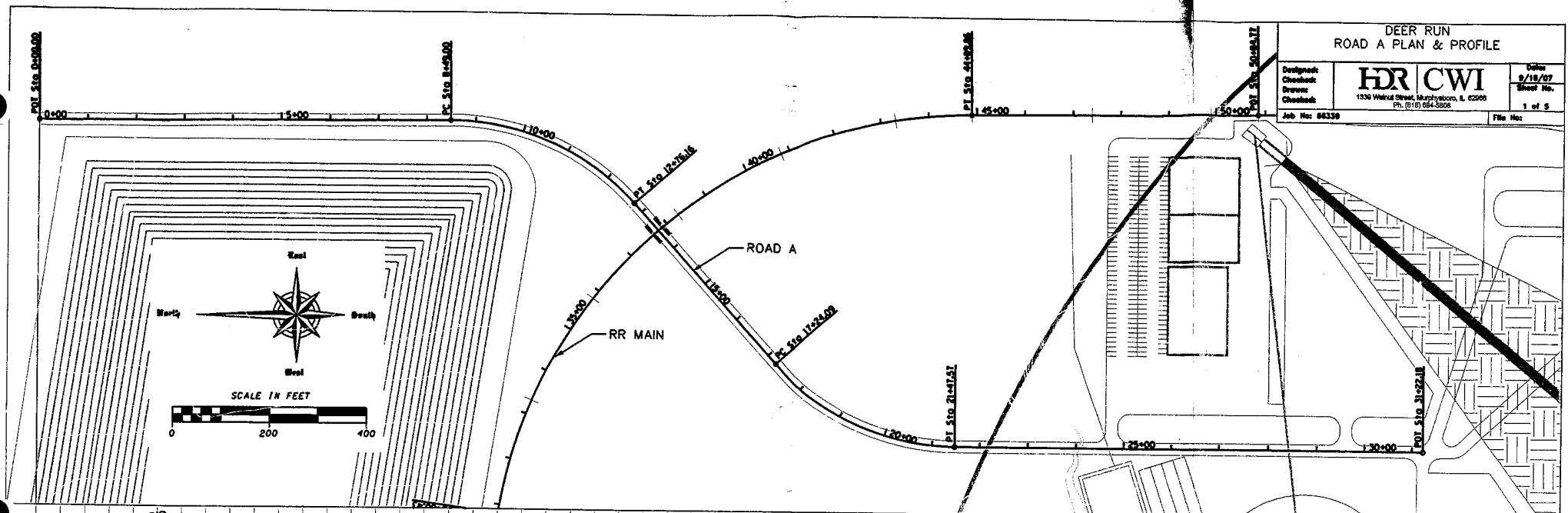


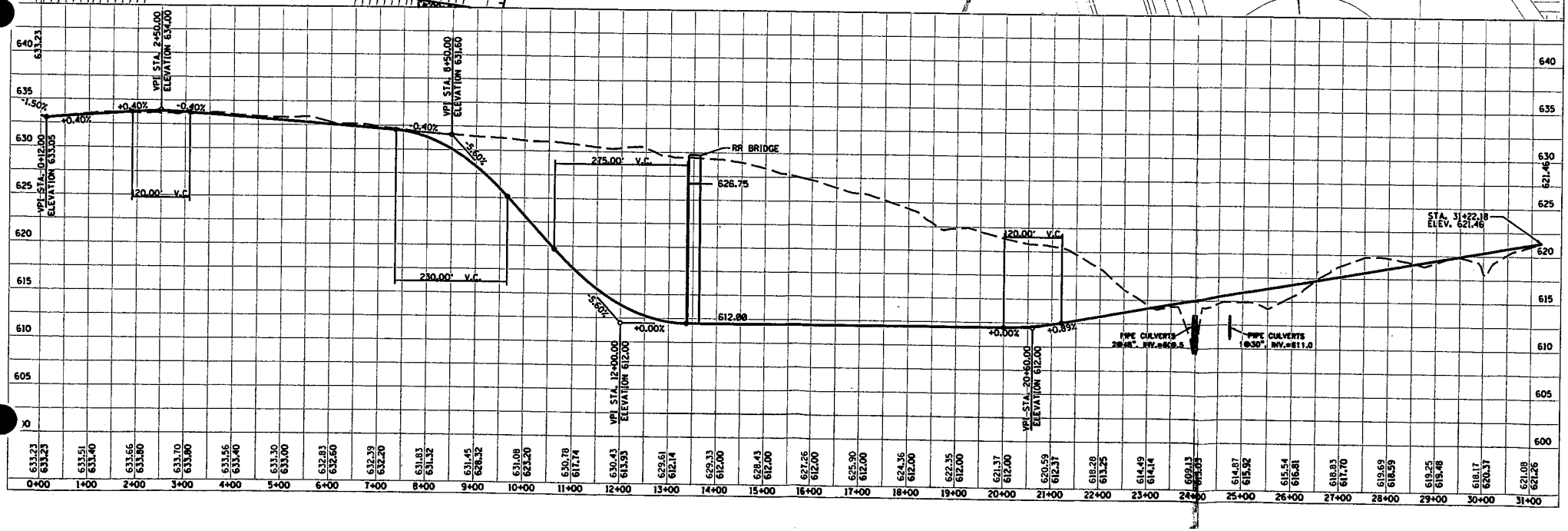
Attachment IV.5.C.2 - Road / Railroad Details


DEER RUN
SITE PLAN – ROAD & RAILROAD ALIGNMENTS
Designed:
Checked:
Drawn:
Checked:
HDR | CWI
1339 Walnut Street, Murphysboro, IL 62966
Ph. (618) 684-5806
Date: 9/16/07
Sheet No. 1 of 1
Job No:
File No:
North
West
East
South
SCALE IN FEET
0
900
1800
RR LEG A
0+00
14+88.25
RR MAIN
ROAD A
15+09.46
ROAD B
0+00
21+70.14
31+22.18
ROAD F
ROAD E
0+00
0+00
ROAD C
0+00
RR LEG B
RR MAIN
0+00
18+10.92
26+73.81
0+00
RR LEG C
ROAD C
52+70.10
73+16.40
0+00
RR MAIN
89+00.28
13+04.78
RR LEG D
ROAD D
0+00

DEER RUN
ROAD A PLAN & PROFILE

Designed:	HDR CWI	Date: 9/18/07
Checked:	1339 Walnut Street, Murphysboro, IL 62966 Ph. (618) 684-5808	Sheet No. 1 of 5
Drawn:		
Checked:	Job No: 66350	File No:

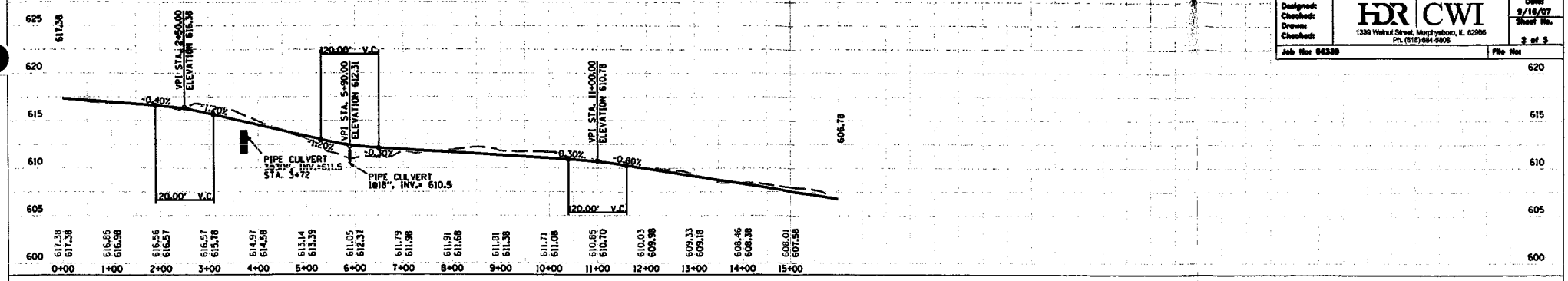




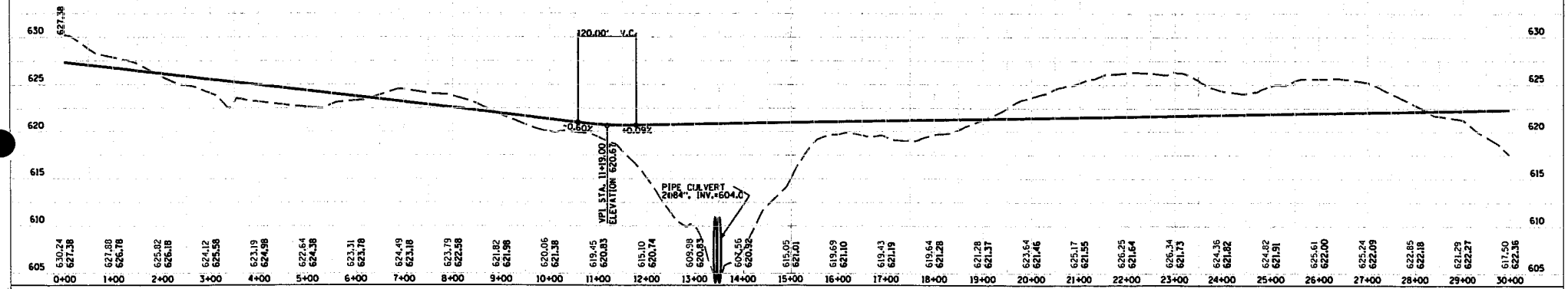
DEER RUN
ROAD PROFILES

Designed:	HDR | CWI	Date: 9/18/07
Checked:	1339 Walnut Street, Murphysboro, IL 62966	Sheet No. 2 of 3
Drawn:	Ph. (618) 684-8806	
Checked:		
Job No: 66339		File No:

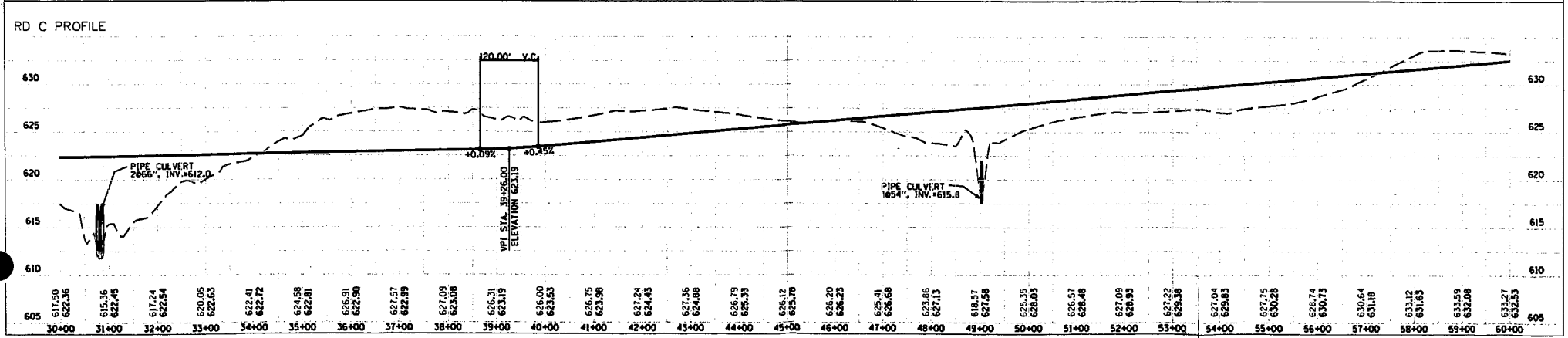
RD B PROFILE

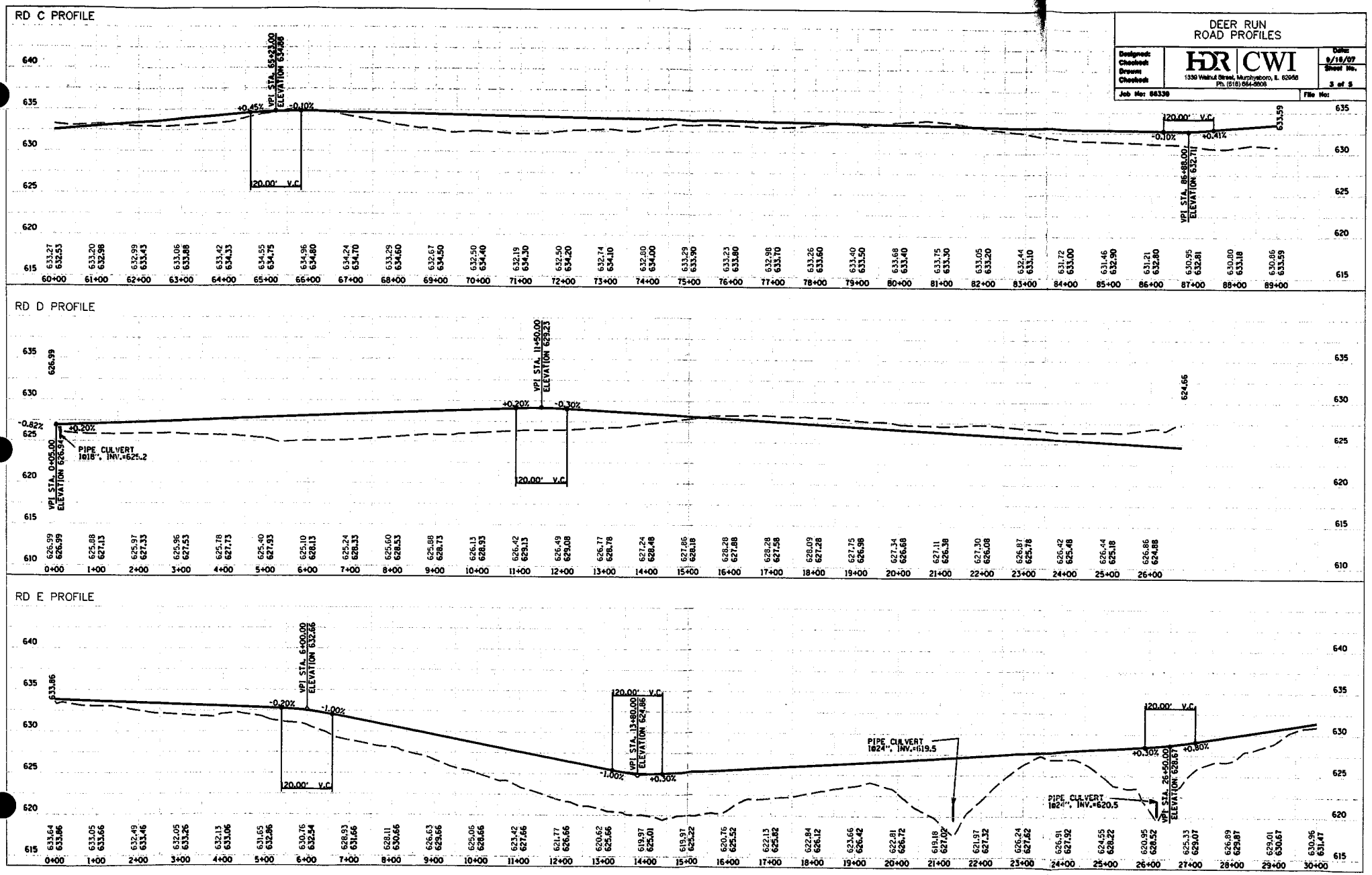


RD C PROFILE

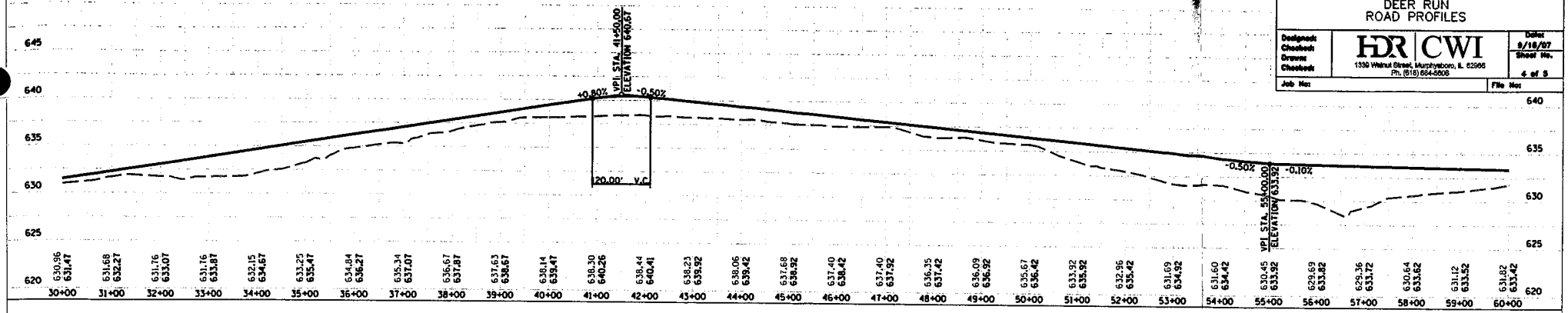


RD C PROFILE




RD C PROFILE
DEER RUN
ROAD PROFILES
HDR | CWI
1339 Walnut Street, Murphysboro, IL 62966
Ph. (618) 684-3808
Designed:
Checked:
Drawn:
Checked:
Date: 9/18/07
Sheet No. 3 of 5
Job No: 66339
File No:
VPI STA. 65+21.00
ELEVATION 634.88
+0.45%
-0.10%
20.00' V.C.
120.00' V.C.
-0.10%
+0.41%
VPI STA. 86+88.00
ELEVATION 632.71
633.59
RD D PROFILE
626.99
VPI STA. 11+50.00
ELEVATION 629.23
+0.20%
-0.30%
624.66
-0.62%
+0.20%
PIPE CULVERT
1018", INV.=625.2
VPI STA. 0+05.00
ELEVATION 626.94
20.00' V.C.
RD E PROFILE
633.86
VPI STA. 6+00.00
ELEVATION 632.66
-0.20%
-1.00%
20.00' V.C.
120.00' V.C.
VPI STA. 13+80.00
ELEVATION 624.66
-1.00%
+0.30%
PIPE CULVERT
1824", INV.=619.5
120.00' V.C.
+0.30%
+0.80%
PIPE CULVERT
1824", INV.=620.5
VPI STA. 26+50.00
ELEVATION 628.67

RD E PROFILE



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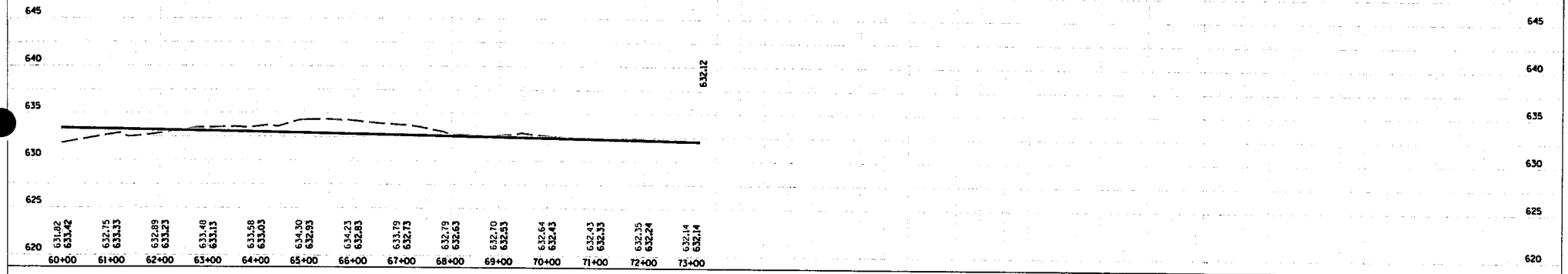

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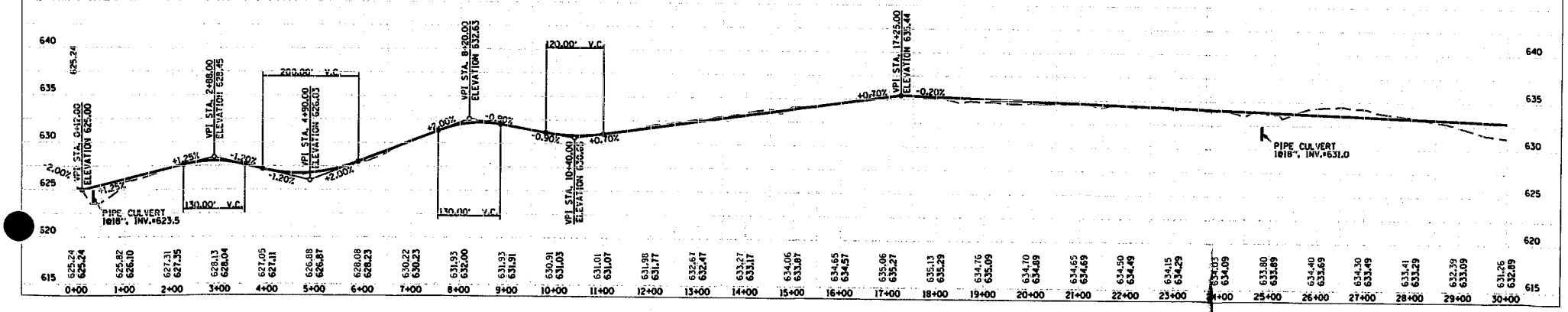
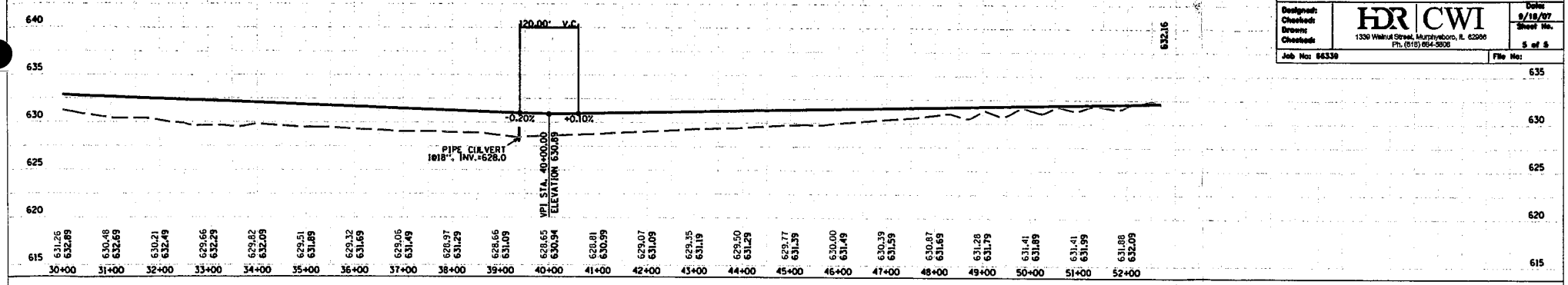


DEER RUN
ROAD PROFILES

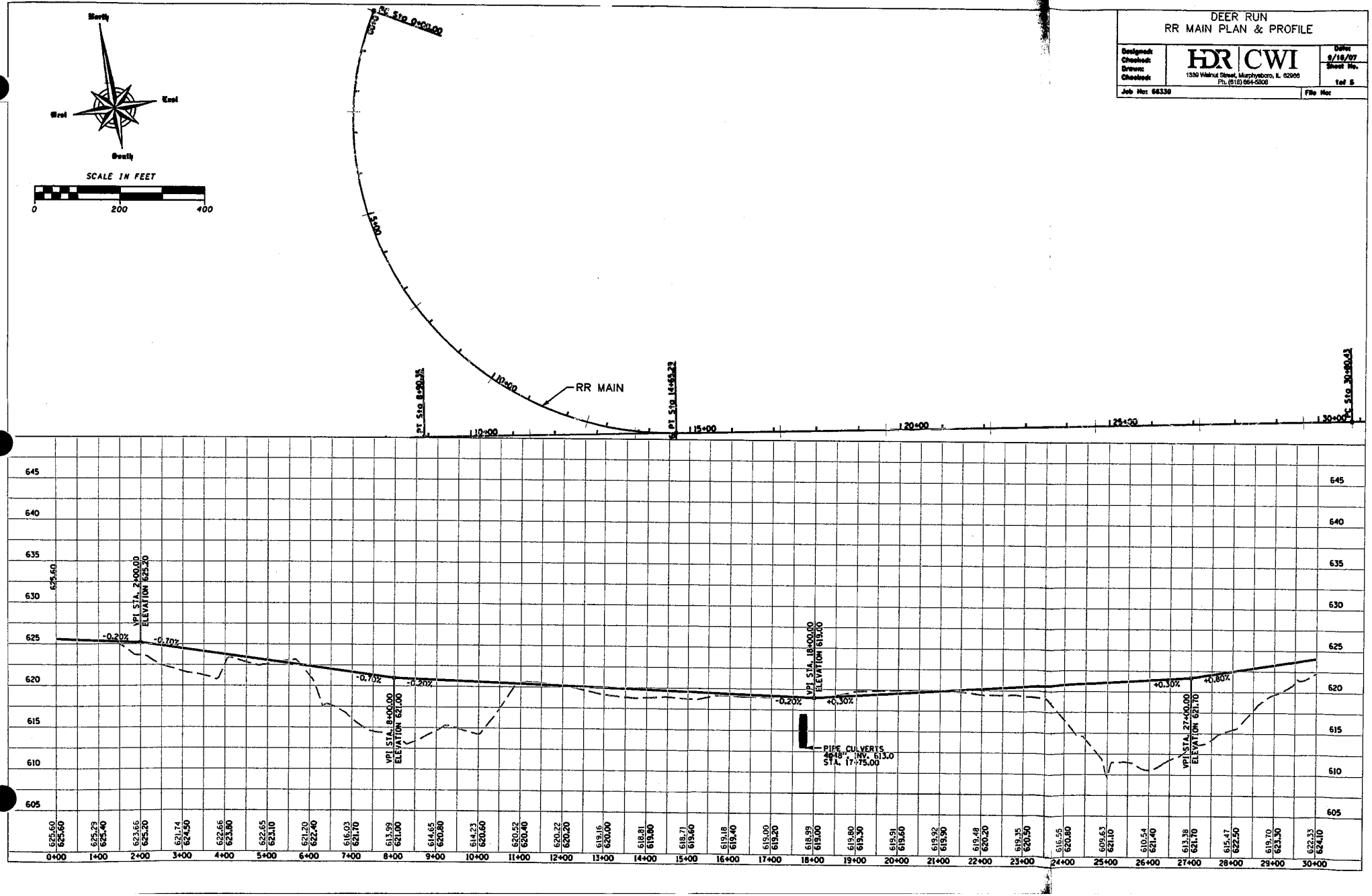
Designed:	HDR CWI	Date: 9/16/07
Checked:	1339 Walnut Street, Murphysboro, IL 62966	Sheet No. 4 of 5
Drawn:	Ph. (618) 684-5008	
Checked:		
Job No:		File No:

RD F PROFILE



DEER RUN
ROAD PROFILES

Designed:	HDR | CWI	Date: 9/18/07
Checked:	1339 Walnut Street, Murphysboro, IL 62966 Ph. (618) 684-3808	Sheet No. 5 of 5
Drawn:		
Checked:		
Job No: 86339		File No:


DEER RUN
RR MAIN PLAN & PROFILE
HDR | CWI
1339 Walnut Street, Murphysboro, IL 62966
Ph. (618) 684-5806
Job No: 66339
Sheet No. 1 of 5
North
East
West
South
SCALE IN FEET
0
200
400
PC Sta 0+00.00
1500
10+00
RR MAIN
PT Sta 8+90.75
PT Sta 14+45.23
PC Sta 30+80.43
10+00
15+00
20+00
25+00
30+00
645
640
635
630
625
620
615
610
605
625.60
VPI STA. 2+00.00
ELEVATION 625.20
-0.20%
-0.70%
-0.70%
-0.20%
VPI STA. 8+00.00
ELEVATION 621.00
VPI STA. 18+00.00
ELEVATION 619.00
-0.20%
+0.30%
PIPE CULVERTS
4@18", INV. 613.0
STA. 17+75.00
+0.30%
+0.80%
VPI STA. 27+00.00
ELEVATION 621.70
625.60 625.60
625.29 625.40
623.65 625.20
621.74 624.50
622.66 623.80
622.65 623.10
621.20 622.40
616.03 621.70
613.99 621.00
614.65 620.80
614.23 620.60
620.52 620.40
620.22 620.20
619.16 620.00
618.81 619.80
618.71 619.60
619.18 619.40
619.00 619.20
618.99 619.00
619.80 619.30
619.91 619.60
619.32 619.90
619.48 620.20
619.35 620.50
616.55 620.80
609.63 621.10
610.54 621.40
613.38 621.70
615.47 622.50
619.70 623.30
622.33 624.10
0+00
1+00
2+00
3+00
4+00
5+00
6+00
7+00
8+00
9+00
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
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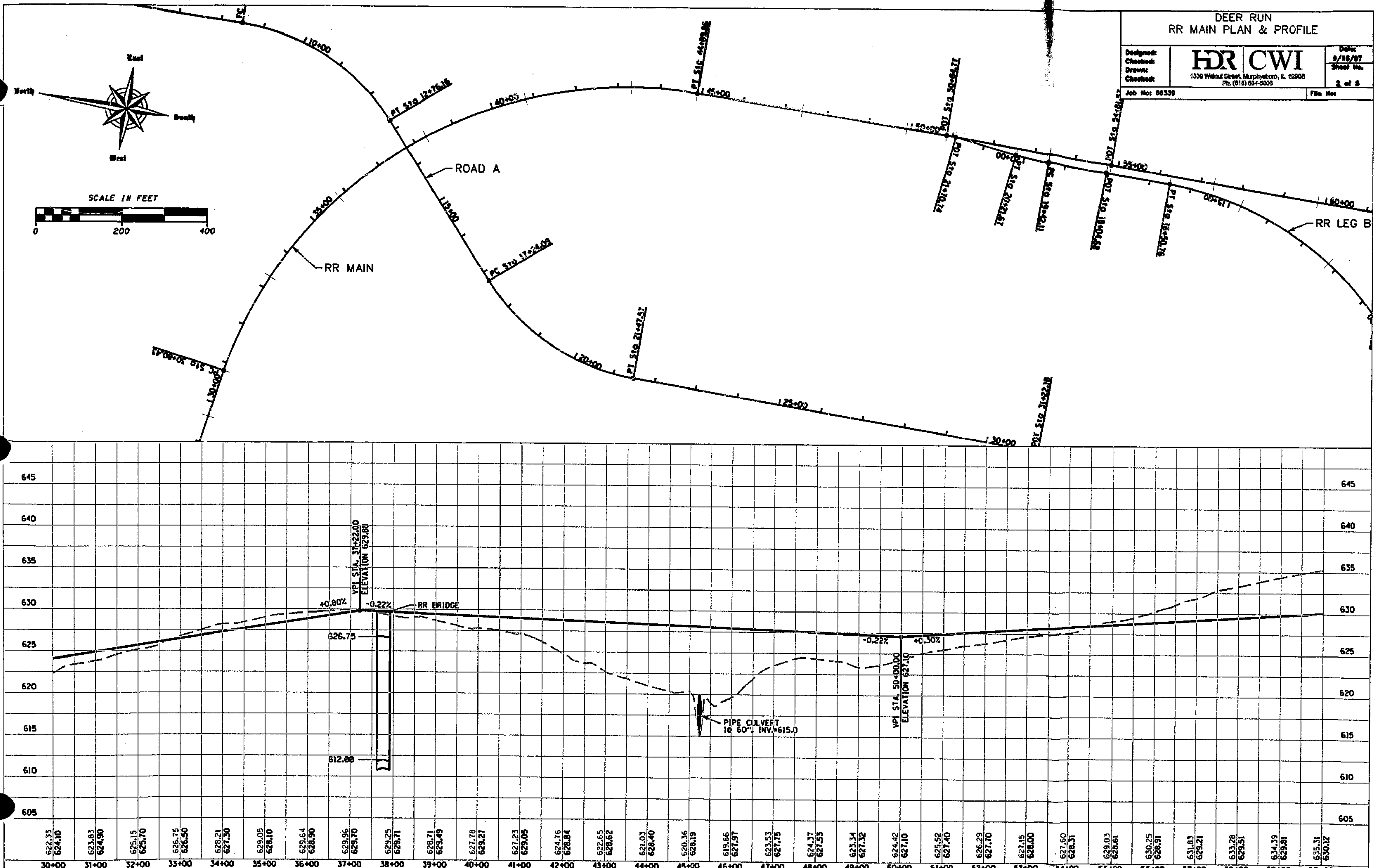
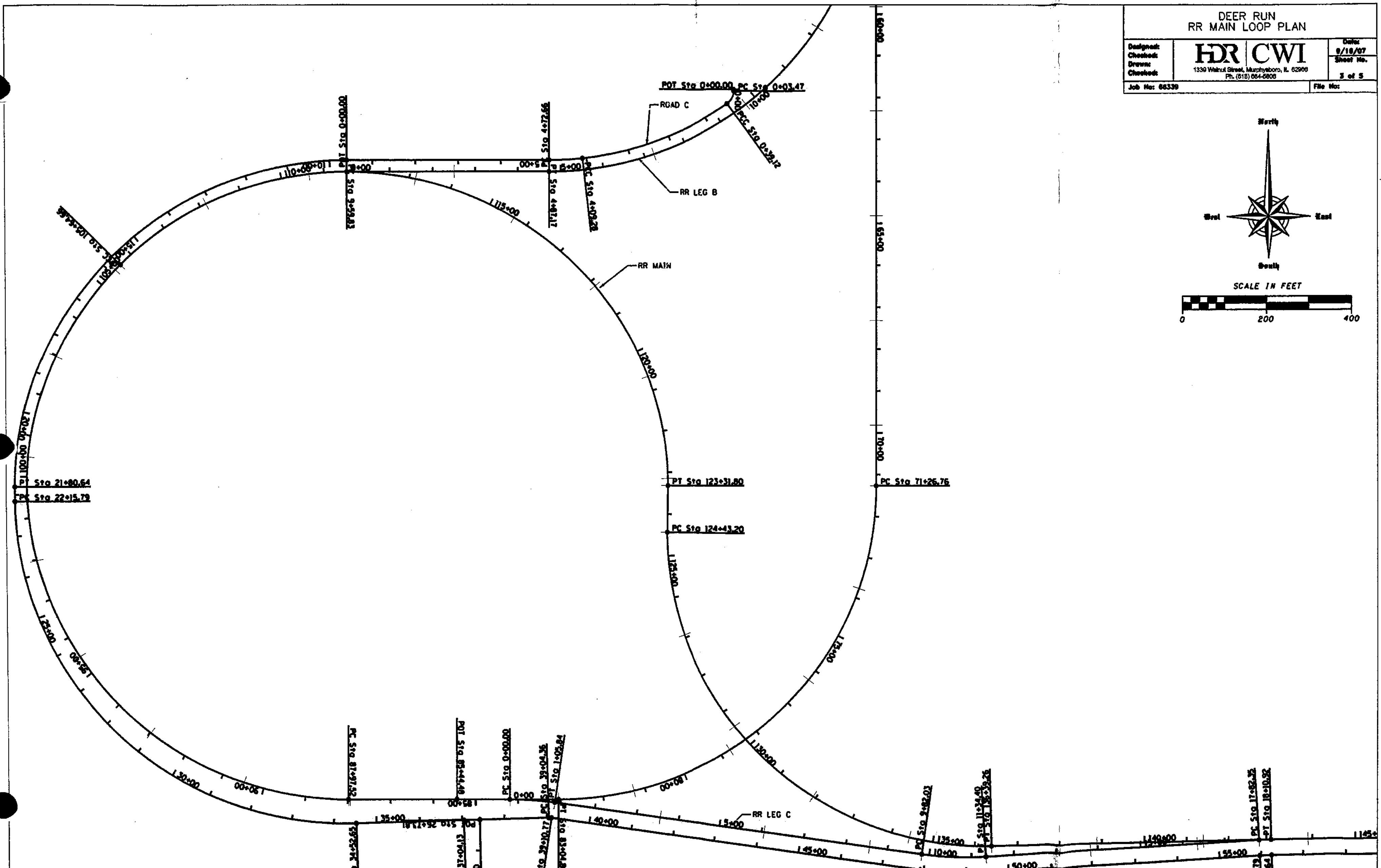
26+00
27+00
28+00
29+00
30+00


DEER RUN
RR MAIN PLAN & PROFILE
Designed:
Checked:
Drawn:
Checked:
HDR CWI
1330 Walnut Street, Murphysboro, IL 62966
Ph. (618) 684-5806
Date: 9/18/07
Sheet No. 2 of 5
Job No: 66338
File No:
North
East
South
West
SCALE IN FEET
0
200
400
RR MAIN
ROAD A
RR LEG B
PC Sta 30+80.43
PT Sta 12+76.18
PC Sta 17+24.09
PT Sta 21+47.57
PT Sta 44+89.86
POT Sta 31+22.18
POT Sta 50+84.77
POT Sta 21+70.14
PT Sta 20+21.67
PC Sta 19+42.11
POT Sta 54+81.57
POT Sta 18+04.68
PT Sta 16+50.76
1 10+00
1 15+00
1 20+00
1 25+00
1 30+00
1 35+00
1 40+00
1 45+00
1 50+00
1 55+00
1 60+00
VPI STA. 37+22.00
ELEVATION 629.80
+0.80%
-0.22%
RR BRIDGE
626.75
612.00
PIPE CULVERT
1@ 60"; INV.=615.0
VPI STA. 50+00.00
ELEVATION 627.10
-0.22%
+0.30%
645
640
635
630
625
620
615
610
605
622.33 624.10 30+00
623.83 624.90 31+00
625.15 625.70 32+00
626.75 626.50 33+00
628.21 627.30 34+00
629.05 628.10 35+00
629.64 628.90 36+00
629.96 629.70 37+00
629.25 629.71 38+00
628.71 629.49 39+00
627.78 629.27 40+00
627.23 629.05 41+00
624.76 628.84 42+00
622.65 628.62 43+00
621.03 628.40 44+00
620.36 628.19 45+00
619.66 627.97 46+00
623.53 627.75 47+00
624.37 627.53 48+00
623.34 627.32 49+00
624.42 627.10 50+00
625.52 627.40 51+00
626.29 627.70 52+00
627.15 628.00 53+00
627.60 628.31 54+00
629.03 628.61 55+00
630.25 628.91 56+00
631.83 629.21 57+00
633.28 629.51 58+00
634.39 629.81 59+00
635.31 630.12 60+00



DEER RUN
RR MAIN LOOP PLAN

Designed:
Checked:
Drawn:
Checked:

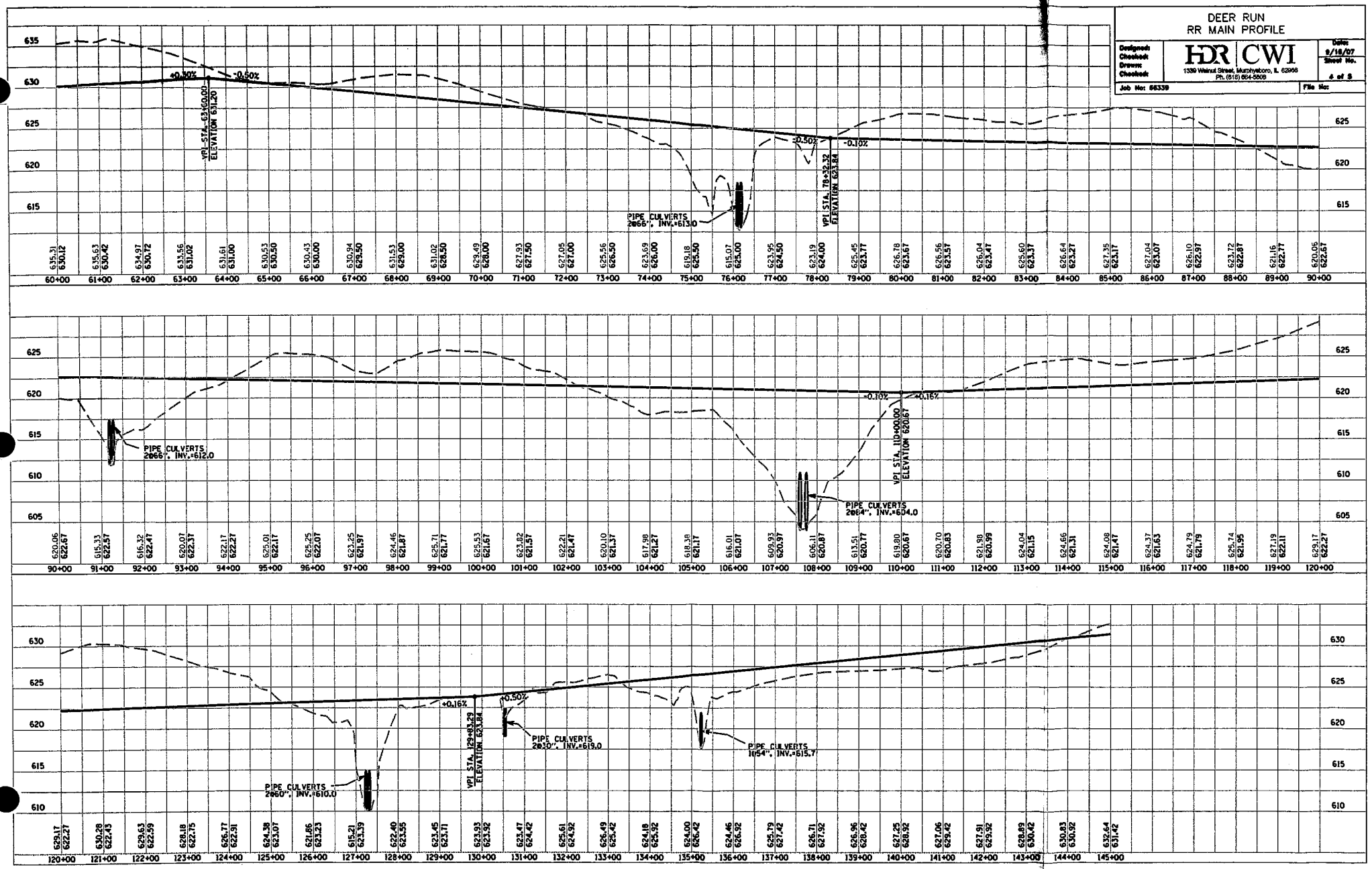
HDR | CWI
1339 Walnut Street, Murphysboro, IL 62966
Ph. (618) 684-6806

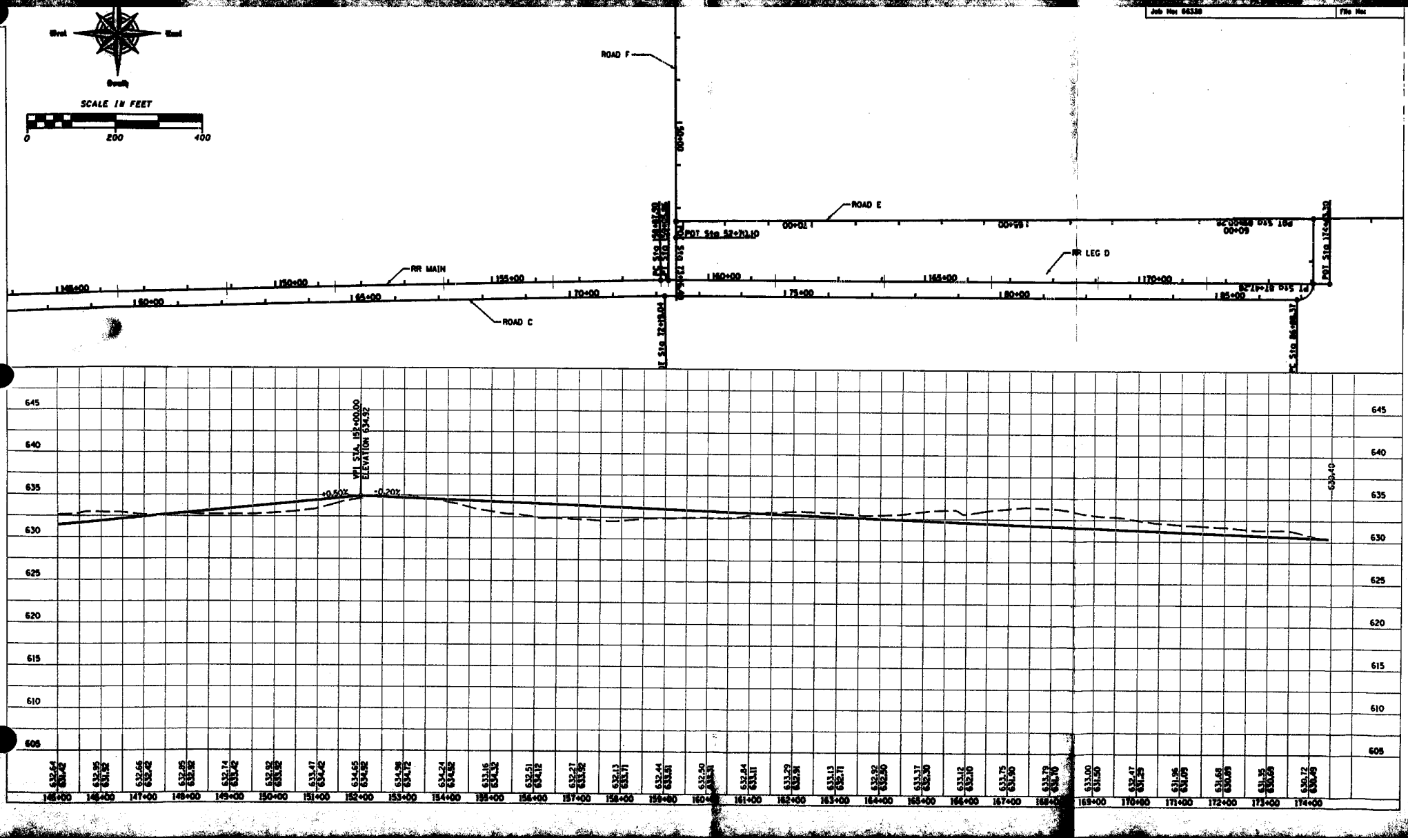
Date: 9/18/07
Sheet No. 3 of 5

Job No: 66339
File No:

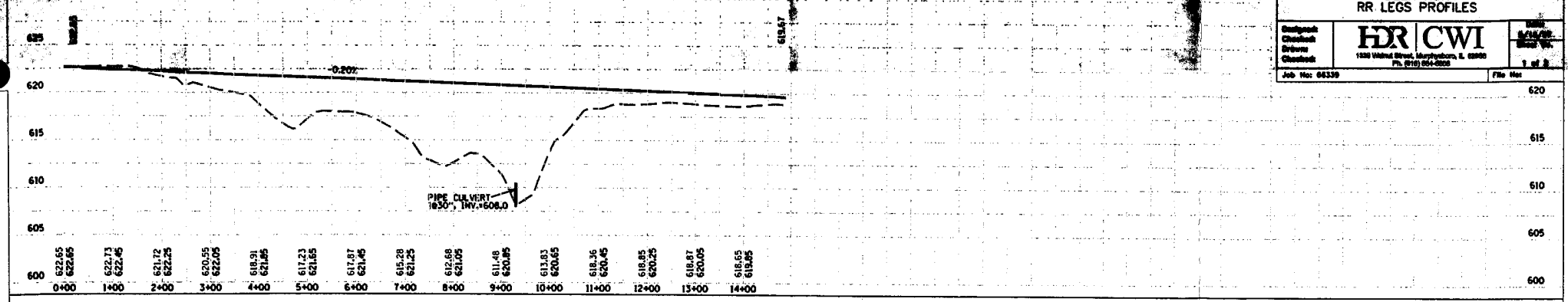
DEER RUN
RR MAIN PROFILE

Designed:	HDR | CWI	Date: 9/18/07
Checked:	1339 Walnut Street, Murphysboro, IL 62966 Ph. (618) 684-5809	Sheet No. 6 of 8
Drawn:		
Checked:		
Job No: 66339		File No:




West
East
South
SCALE IN FEET
0
200
400
ROAD F
ROAD E
RR MAIN
RR LEG D
ROAD C
PVI Sta 152+00.00
ELEVATION 634.92
+0.50%
-0.20%
630.40
645
640
635
630
625
620
615
610
605

RR LEG A PROFILE



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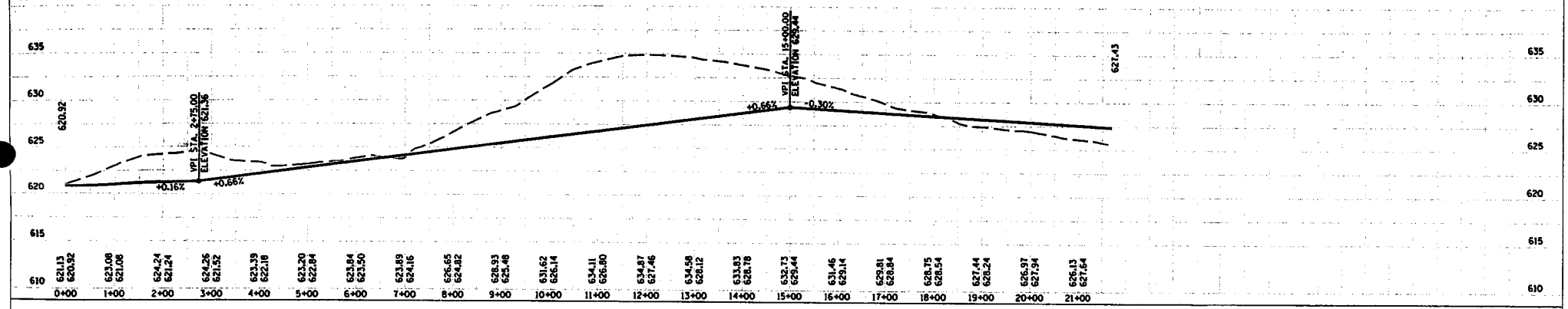

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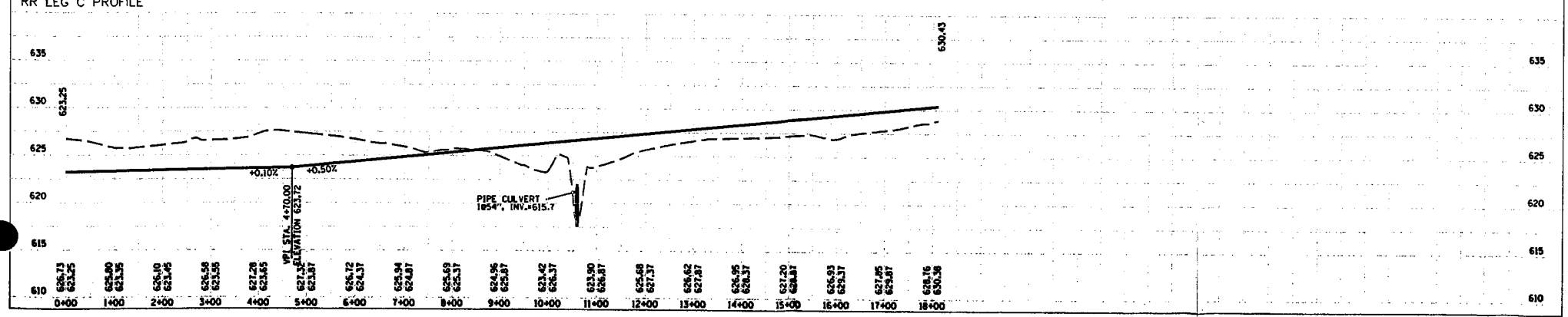
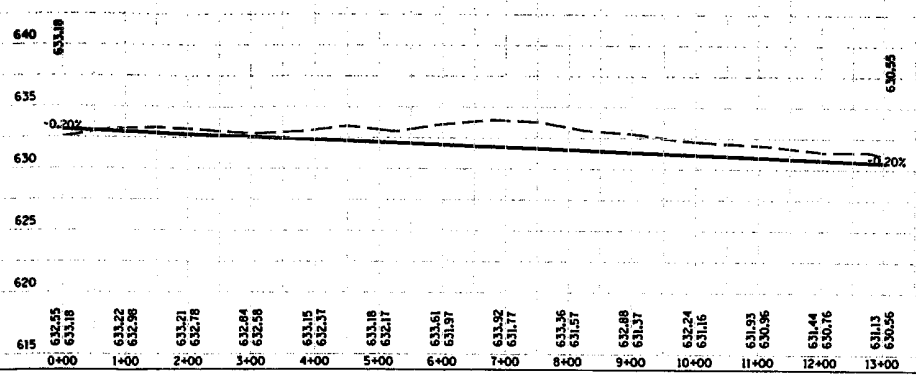


DEER RUN
RR LEGS PROFILES

HDR | CWI
1530 Walnut Street, Murphysboro, IL 62966
Ph. (618) 684-8808

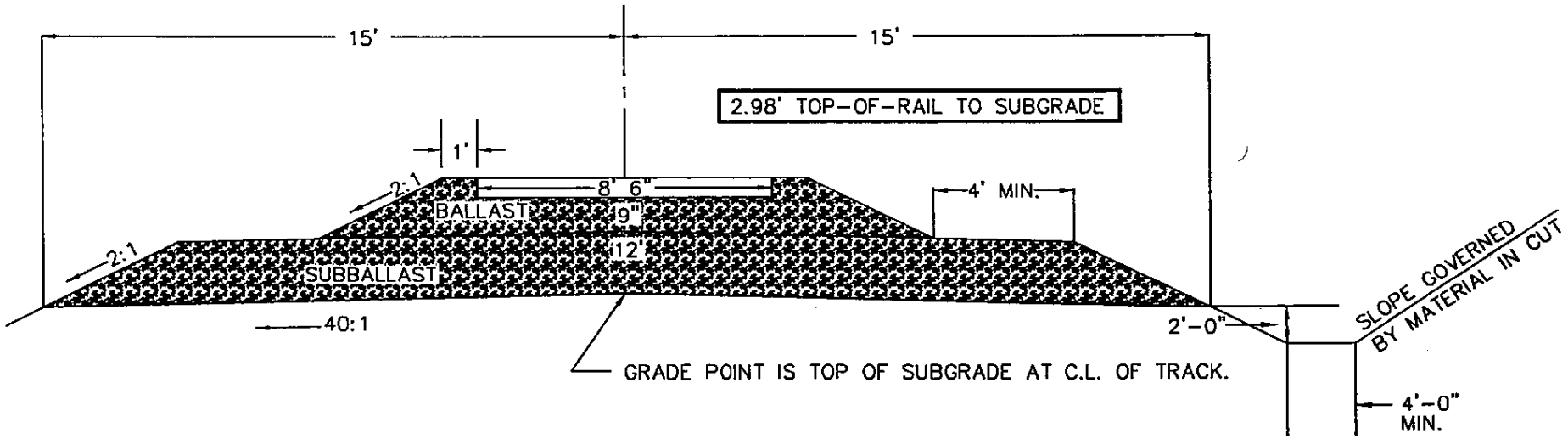
Job No: 64339

RR LEG D PROFILE



DEER RUN
RR LEGS PROFILES

Designed:	HDR | CWI	Date: 9/18/97
Checked:	1300 Walnut Street, Murphysboro, IL 62966	Sheet No. 2 of 2
Drawn:	Ph. (618) 684-3809	
Checked:		
Job No: 64339		File No:

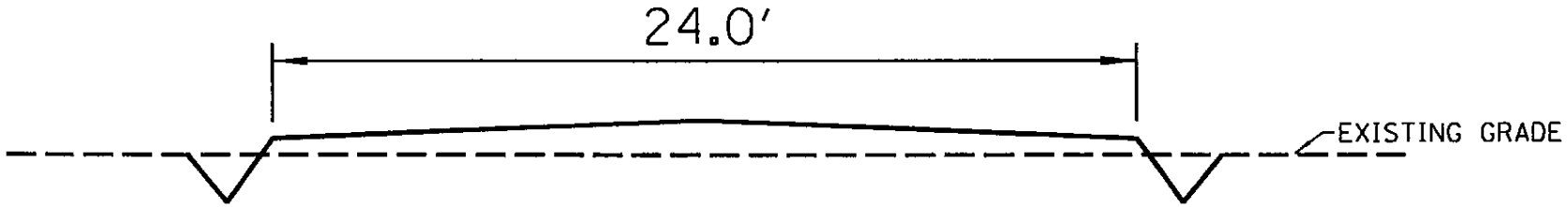


TYPICAL SLOPE 2:1 IN BOTH CUT AND FILL.

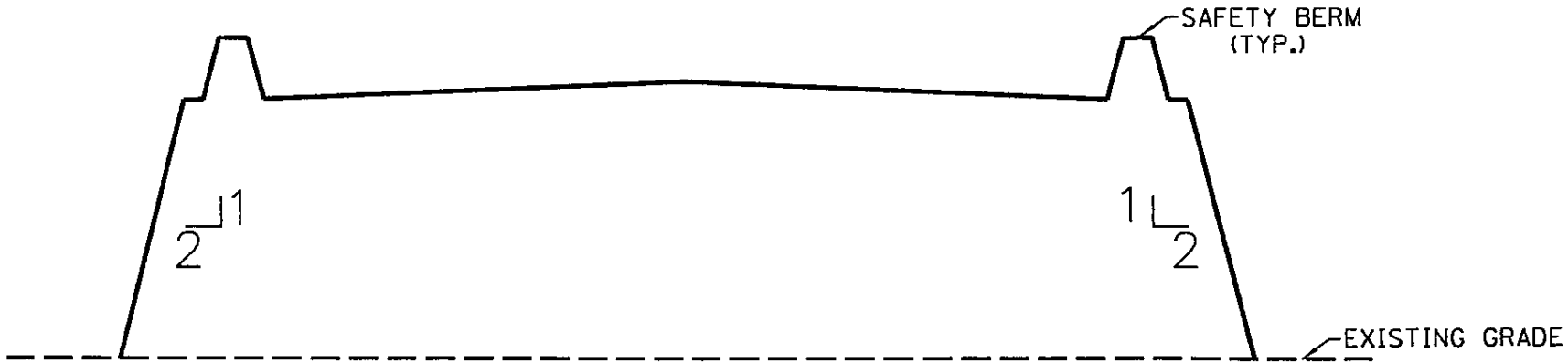
TYPICAL SECTION /RAILROAD ROADBED

NOT TO SCALE

...\RR ROADBED TYPICAL SECT.dwg 9/16/2007 9:14:39 PM



TYPICAL ROADWAY SECTION–
AT GRADE OR CUT AREAS

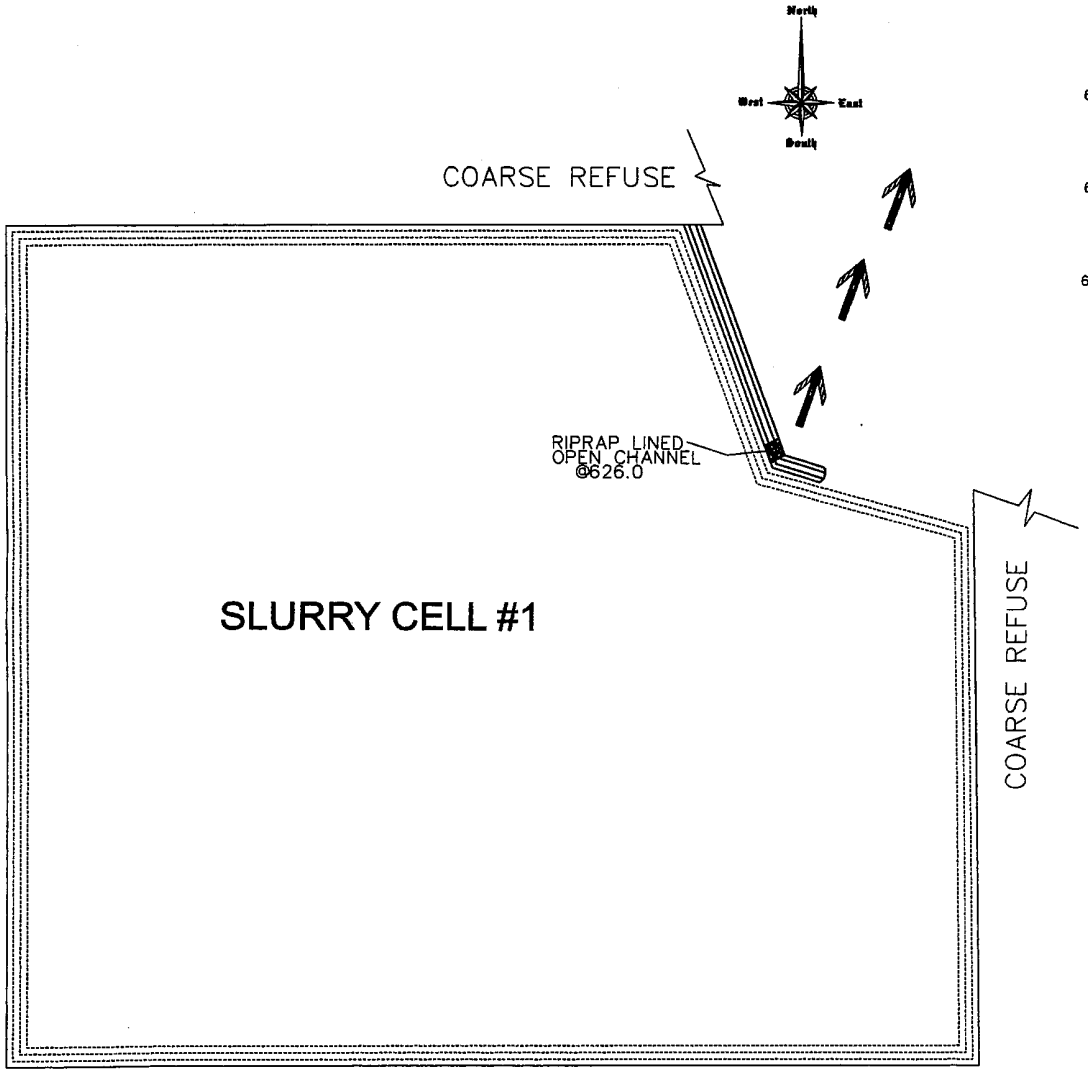


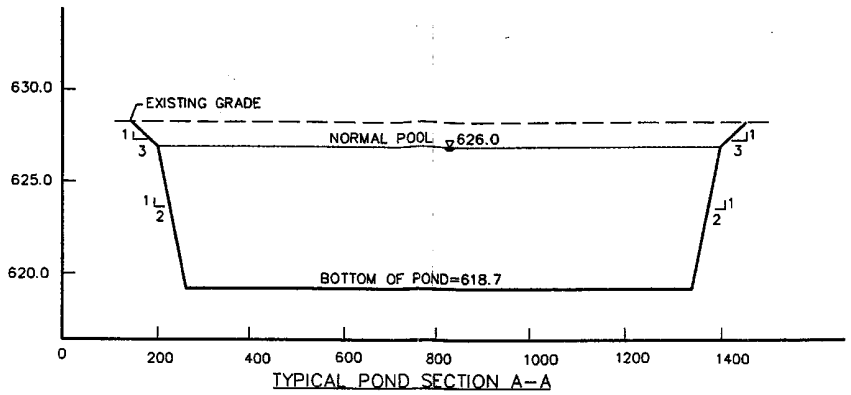
TYPICAL ROADWAY SECTION–
FILL AREAS

DEER RUN
TYPICAL SECTIONS FOR ACCESS ROADS

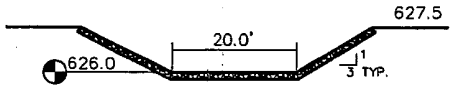
Designed: Checked: Drawn: Checked:	HDR | CWI 1339 Walnut Street, Murphysboro, IL 62966 Ph. (618) 684-5808	Date: 09/18/07 Sheet No. 1 of 1
Job No: 86339		File No:

Attachment IV.6.D - Slurry Pond Details



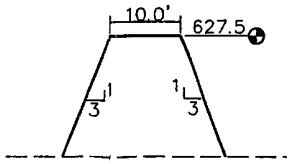


TYPICAL POND SECTION A–A



OUTLET CHANNEL TYP. SECTION

NTS



TYPICAL BERM SECTION

NTS

DEER RUN

SLURRY CELL #1

Designed	HDR | CWI	Date 09/12/07
Checked	1330 Walnut St. Murphysboro, IL 62966 5201 S. Sixth St. Rd. Springfield, IL 62703	
Drawn		
Checked		
Job No. 66339		File No.

...\SHEETS\SLURRY POND 1.dgn 9/16/2007 2:57:33 PM

Hillsboro Energy LLC
Slurry Impoundment No. 1

Gary Raines

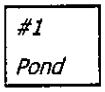
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	25 yr - 6 hr
Rainfall Depth:	4.000 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Pond	#1	==>	End	0.000	0.000	Slurry Pond No. 1



Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	In	82.000	82.000	352.20	25.93
	Out			17.33	24.82

Structure Detail:

Structure #1 (Pond)

Slurry Pond No. 1

Pond Inputs:

Initial Pool Elev:	626.00 ft
Initial Pool:	106.90 ac-ft

Broad-crested Weir

Weir Width (ft)	Spillway Elev (ft)
20.00	626.00

Pond Results:

Peak Elevation:	626.40 ft
Dewater Time:	2.49 days

Dewatering time is calculated from peak stage to lowest spillway

Elevation-Capacity-Discharge Table

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
624.00	53.300	0.000	0.000		
624.50	53.375	26.669	0.000		
625.00	53.450	53.375	0.000		
625.50	53.525	80.119	0.000		
626.00	53.600	106.900	0.000		Spillway #1
626.40	53.682	128.195	17.329	44.90	Peak Stage
626.50	53.700	133.725	21.828		
627.00	53.800	160.600	61.740		
627.50	53.900	187.525	113.424		
628.00	54.000	214.500	174.627		

**Designates time(s) to dewater have been extrapolated beyond the 50 hour hydrograph limit.*

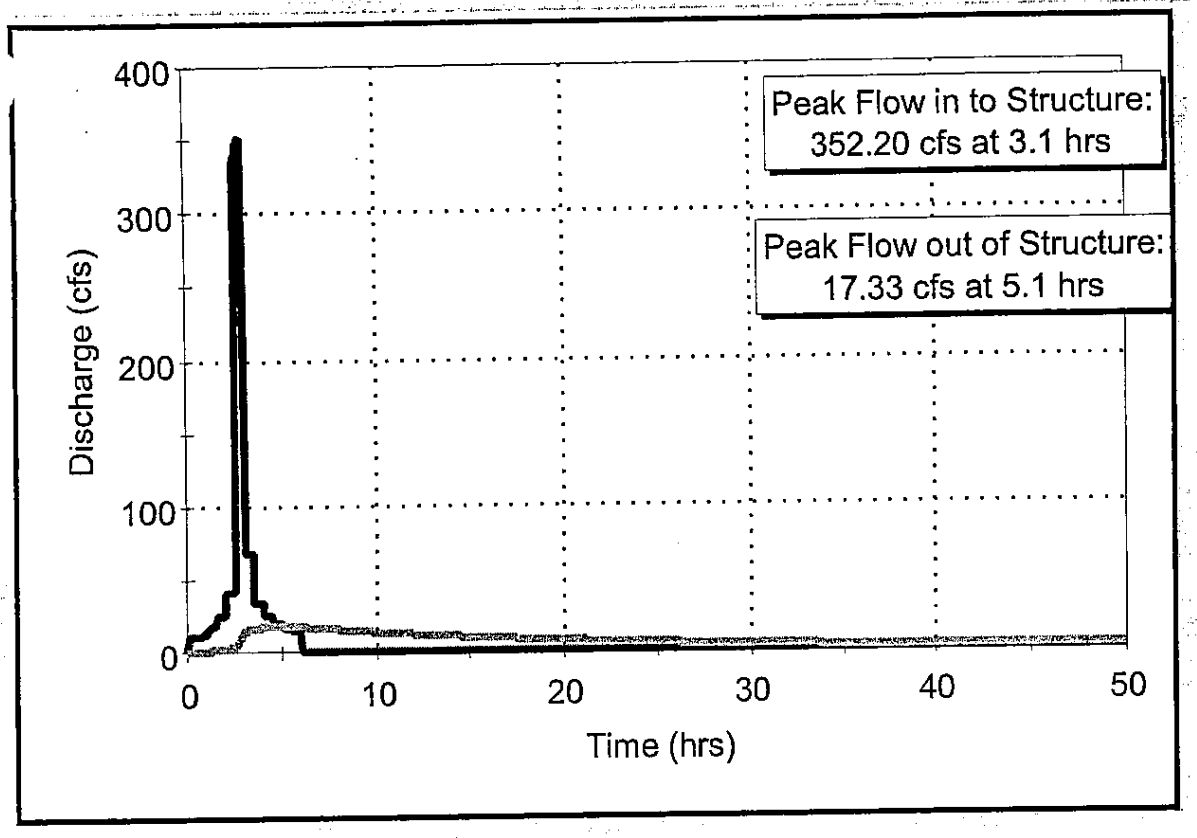
Detailed Discharge Table

Elevation (ft)	Broad-crested Weir (cfs)	Combined Total Discharge (cfs)
624.00	0.000	0.000
624.50	0.000	0.000
625.00	0.000	0.000
625.50	0.000	0.000
626.00	0.000	0.000
626.50	21.828	21.828
627.00	61.740	61.740
627.50	113.424	113.424
628.00	174.627	174.627

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	53.600	0.000	0.000	0.000	100.000	F	232.39	17.826
	2	28.400	0.000	0.000	0.000	95.000	F	119.84	8.099
	Σ	**82.000**						**352.20**	**25.925**

Inflow/Outflow Hydrographs for Structure # 1



Attachment IV.7.D - Collector Ditch Designs

DEER RUN

DITCH 001-A PROFILE

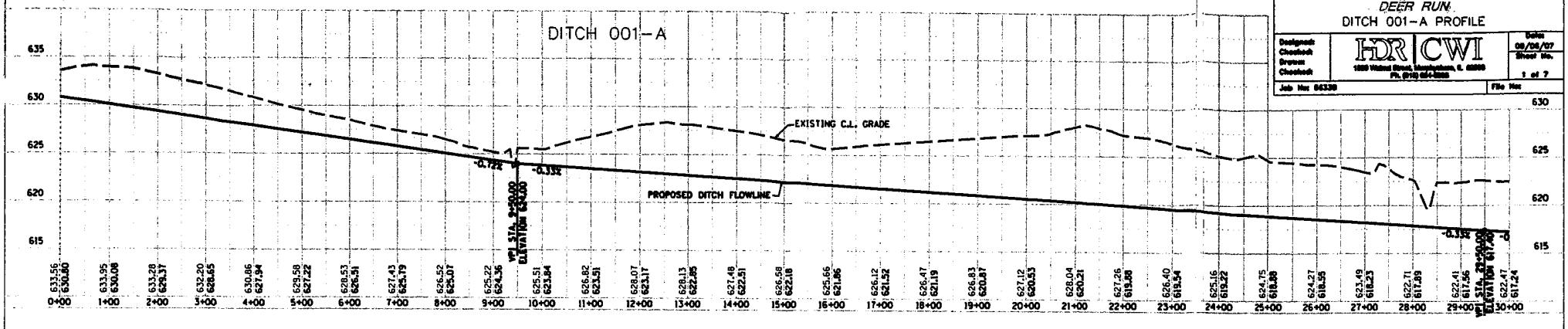
HDR | CWI

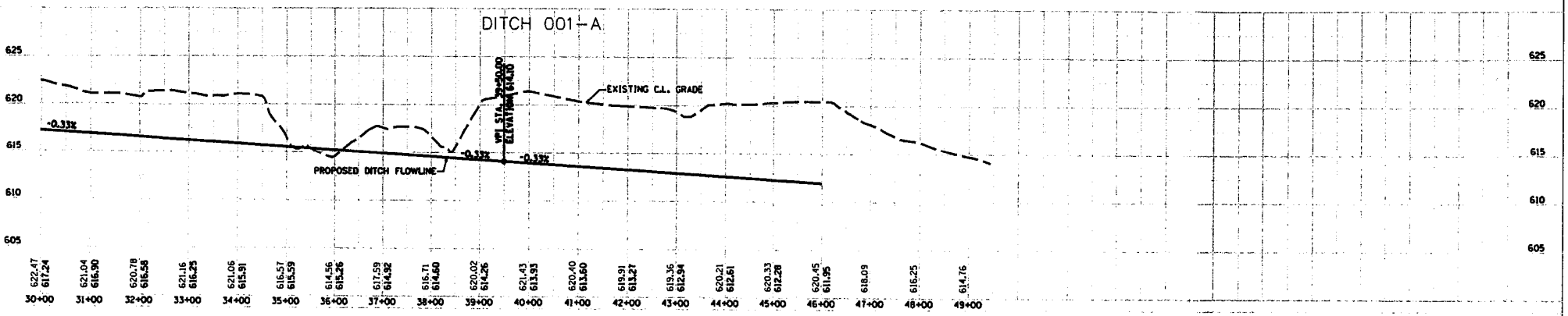
Designed:
Checked:
Drawn:
Checked:

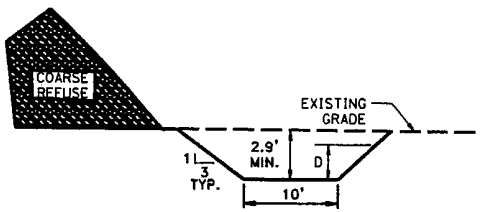
Date: 08/06/07
Sheet No.: 1 of 7

Job No: 86338

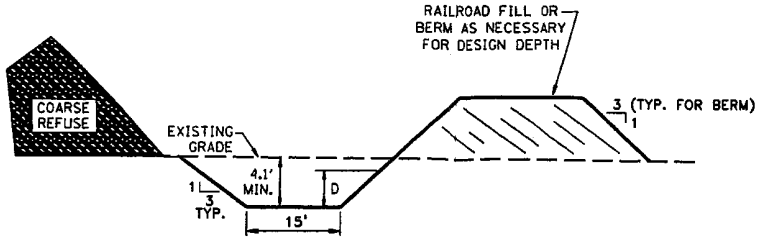
File No:







DITCH 001-A
TYPICAL SECTION
STA.00+00 TO 09+50
D=1.84' @ DESIGN FLOW
NTS



DITCH 001-A
TYPICAL SECTION
STA.09+50 TO END
D=3.07' @ DESIGN FLOW
NTS

Hillsboro Energy LLC
Collector Ditch 001 A

Gary Raines

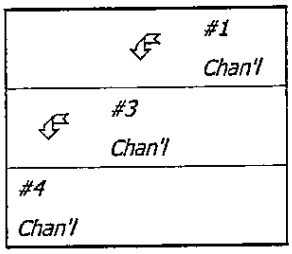
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	100 yr - 6 hr
Rainfall Depth:	4.900 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	#3	0.207	0.214	Sta 0 - 9+50
Channel	#3	==>	#4	1.114	0.168	Sta 9+50 to 33+50
Channel	#4	==>	End	0.000	0.000	Sta 33+50 to end



Structure Routing Details:

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	6. Grassed waterway	0.72	6.84	950.00	1.27	0.207
#1	**Muskingum K:**					**0.207**
#3	6. Grassed waterway	0.33	11.38	3,450.00	0.86	1.114
#3	**Muskingum K:**					**1.114**

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	12.000	12.000	60.25	0.00
#3	61.000	73.000	295.38	0.00
#4	10.300	83.300	218.46	0.00

Structure Detail:

Structure #1 (Vegetated Channel)

Sta 0 - 9+50

Trapezoidal Vegetated Channel Inputs:

Material: Grass mixture

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
10.00	3.0:1	3.0:1	0.4	C, C				5.0

Vegetated Channel Results:

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Design Discharge:	60.25 cfs		60.25 cfs	
Depth:	1.84 ft		1.84 ft	
Top Width:	21.02 ft		21.02 ft	
Velocity:	2.11 fps		2.11 fps	
X-Section Area:	28.49 sq ft		28.49 sq ft	
Hydraulic Radius:	1.318 ft		1.318 ft	
Froude Number:	0.32		0.32	
Roughness Coefficient:	0.0555		0.0555	

Structure #3 (Vegetated Channel)

Sta 9+50 to 33+50

Trapezoidal Vegetated Channel Inputs:

Material: Grass mixture

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
15.00	3.0:1	3.0:1	0.3	C, C				5.0

Vegetated Channel Results:

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Design Discharge:	295.38 cfs		295.38 cfs	
Depth:	3.07 ft		3.07 ft	
Top Width:	33.42 ft		33.42 ft	
Velocity:	3.97 fps		3.97 fps	
X-Section Area:	74.32 sq ft		74.32 sq ft	
Hydraulic Radius:	2.160 ft		2.160 ft	
Froude Number:	0.47		0.47	
Roughness Coefficient:	0.0360		0.0360	

Structure #4 (Vegetated Channel)

Sta 33+50 to end

Trapezoidal Vegetated Channel Inputs:

Material: Grass mixture

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
15.00	3.0:1	3.0:1	0.3	C, C				5.0

Vegetated Channel Results:

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Design Discharge:	218.46 cfs		218.46 cfs	
Depth:	2.75 ft		2.75 ft	
Top Width:	31.52 ft		31.52 ft	
Velocity:	3.41 fps		3.41 fps	
X-Section Area:	64.03 sq ft		64.03 sq ft	
Hydraulic Radius:	1.976 ft		1.976 ft	
Froude Number:	0.42		0.42	
Roughness Coefficient:	0.0395		0.0395	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	12.000	0.037	0.000	0.000	91.000	M	60.25	3.874
	Σ	**12.000**						**60.25**	**0.000**
#3	1	26.000	0.312	0.000	0.000	85.000	M	71.89	5.674
	2	35.000	0.031	0.000	0.000	91.000	M	175.72	11.300
	Σ	**73.000**						**295.38**	**0.000**
#4	1	10.300	0.037	0.000	0.000	91.000	M	51.71	3.325
	Σ	**83.300**						**218.46**	**0.000**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	5. Nearly bare and untilled, and alluvial valley fans	14.00	70.00	500.00	3.740	0.037
#1	**1**	**Time of Concentration:**					**0.037**
#3	1	4. Cultivated, straight row	1.00	10.00	1,000.00	0.890	0.312
#3	**1**	**Time of Concentration:**					**0.312**
#3	2	5. Nearly bare and untilled, and alluvial valley fans	15.56	70.00	450.00	3.940	0.031
#3	**2**	**Time of Concentration:**					**0.031**
#4	1	5. Nearly bare and untilled, and alluvial valley fans	14.00	70.00	500.00	3.740	0.037
#4	**1**	**Time of Concentration:**					**0.037**

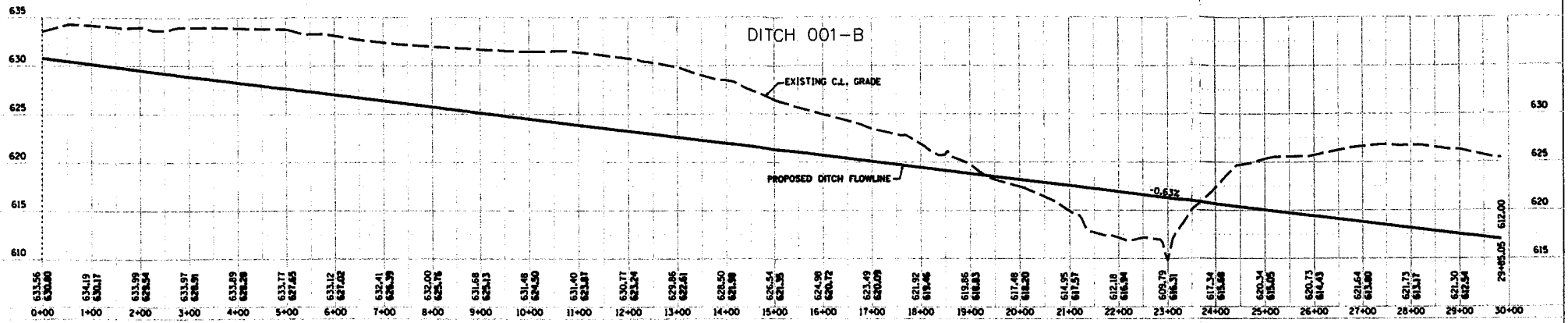
DEER RUN

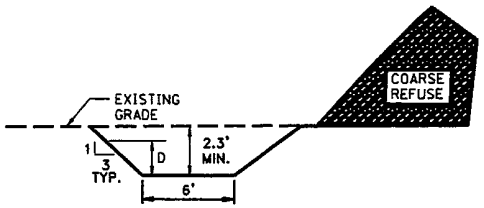
DITCH 001-B PROFILE

HDR | CWI

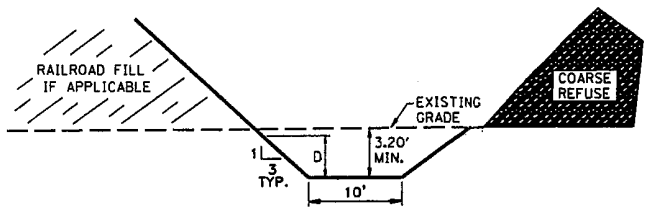
Date: 08/28/07

Sheet No. 2 of 7





DITCH 001-B
TYPICAL SECTION
STA.00+00 TO 09+50
D=1.26' @ DESIGN FLOW
NTS



DITCH 001-B
TYPICAL SECTION
STA.09+50 TO END
D=2.15' @ DESIGN FLOW
NTS

Hillsboro Energy LLC
Collector Ditch 001 B

Gary Raines

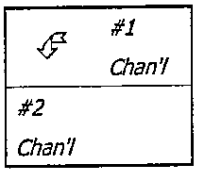
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	100 yr - 6 hr
Rainfall Depth:	4.900 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	#2	0.225	0.204	Sta 0 - 9+50
Channel	#2	==>	End	0.000	0.000	Sta 9+50 to end



Structure Routing Details:

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	6. Grassed waterway	0.61	5.79	949.18	1.17	0.225
#1	**Muskingum K:**					**0.225**

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	6.500	6.500	32.63	0.00
#2	18.600	25.100	123.79	0.00

Structure Detail:

Structure #1 (Vegetated Channel)

Sta 0 - 9+50

Trapezoidal Vegetated Channel Inputs:

Material: Grass mixture

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.00	3.0:1	30.0:1	0.6	C, C				5.0

Vegetated Channel Results:

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Design Discharge:	32.63 cfs		32.63 cfs	
Depth:	1.26 ft		1.26 ft	
Top Width:	47.55 ft		47.55 ft	
Velocity:	0.97 fps		0.97 fps	
X-Section Area:	33.71 sq ft		33.71 sq ft	
Hydraulic Radius:	0.708 ft		0.708 ft	
Froude Number:	0.20		0.20	
Roughness Coefficient:	0.0954		0.0954	

Structure #2 (Vegetated Channel)

Sta 9+50 to end

Trapezoidal Vegetated Channel Inputs:

Material: Grass mixture

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
10.00	3.0:1	3.0:1	0.6	C, C				5.0

Vegetated Channel Results:

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Design Discharge:	123.79 cfs		123.79 cfs	
Depth:	2.15 ft		2.15 ft	
Top Width:	22.89 ft		22.89 ft	
Velocity:	3.50 fps		3.50 fps	
X-Section Area:	35.35 sq ft		35.35 sq ft	
Hydraulic Radius:	1.498 ft		1.498 ft	
Froude Number:	0.50		0.50	
Roughness Coefficient:	0.0435		0.0435	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	6.500	0.037	0.000	0.000	91.000	M	32.63	2.099
	Σ	**6.500**						**32.63**	**0.000**
#2	1	18.600	0.031	0.000	0.000	91.000	M	93.38	6.005
	Σ	**25.100**						**123.79**	**0.000**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	5. Nearly bare and untilled, and alluvial valley fans	14.00	70.00	500.00	3.740	0.037
#1	**1**	**Time of Concentration:**					**0.037**
#2	1	5. Nearly bare and untilled, and alluvial valley fans	15.56	70.00	450.00	3.940	0.031
#2	**1**	**Time of Concentration:**					**0.031**

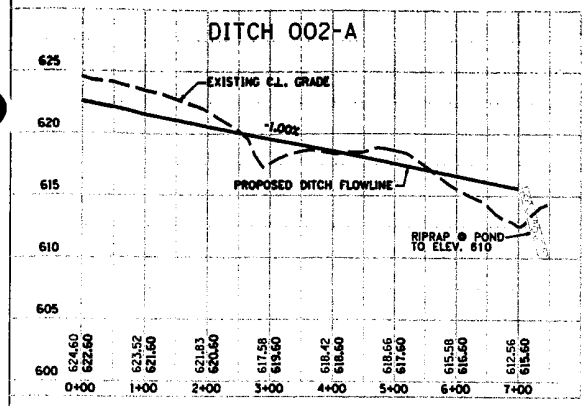
DEER RUN
DITCH 002A, 002B, 003A, 003B PROFILE'S

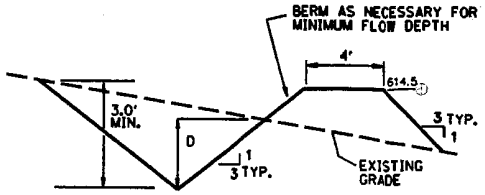
HDR | CWI

Designed
Checked
Drawn
Checked

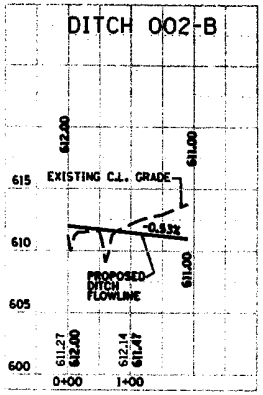
Date: 08/08/07
Sheet No. 3 of 7

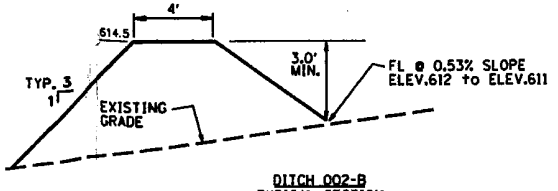
Job No: 06339
File No:



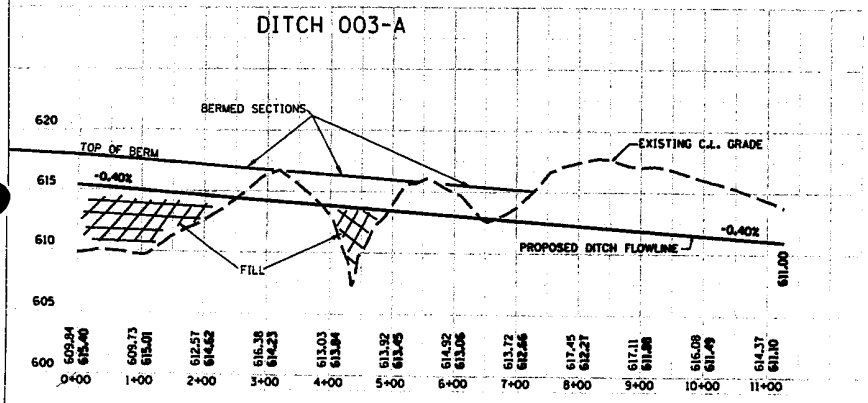


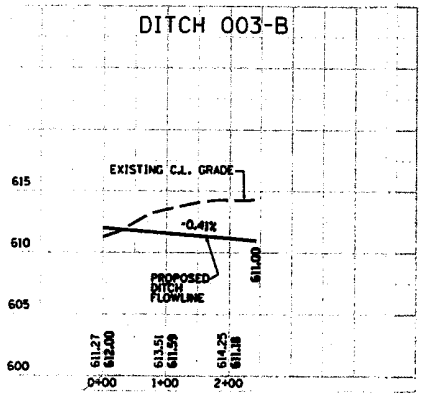
DITCH 002-A
TYPICAL SECTION
STA.00+00 to END
D=1.85' @ DESIGN FLOW
NTS

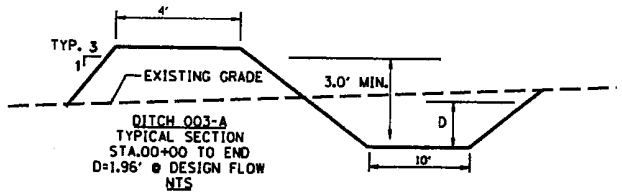




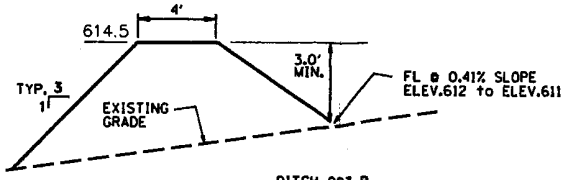
DITCH 002-B
TYPICAL SECTION
STA.00+0 to END
D=1.85' @ DESIGN FLOW
NTS







DITCH 003-A
TYPICAL SECTION
STA.00+00 TO END
D=1.96' @ DESIGN FLOW
NTS



DITCH 003-B
TYPICAL SECTION
STA.00+0 to END
D=1.85' @ DESIGN FLOW
NTS

Hillsboro Energy LLC
Collector Ditch No. 002 A

Gary Raines

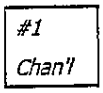
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	10 yr - 24 hr
Rainfall Depth:	4.700 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Ditch 002 A



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	6.000	6.000	21.51	0.00

Structure Detail:

Structure #1 (Vegetated Channel)

Ditch 002 A

Triangular Vegetated Channel Inputs:

Material: Grass mixture

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. X (VxD)	Limiting Velocity (fps)
3.0:1	3.0:1	1.0	C, C				5.0

Vegetated Channel Results:

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Design Discharge:	21.51 cfs		21.51 cfs	
Depth:	1.85 ft		1.85 ft	
Top Width:	11.10 ft		11.10 ft	
Velocity:	2.10 fps		2.10 fps	
X-Section Area:	10.27 sq ft		10.27 sq ft	
Hydraulic Radius:	0.878 ft		0.878 ft	
Froude Number:	0.38		0.38	
Roughness Coefficient:	0.0652		0.0652	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	6.000	0.071	0.000	0.000	98.000	M	21.51	2.230
	Σ	**6.000**						**21.51**	**0.000**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	7. Paved area and small upland gullies	1.33	8.00	600.00	2.320	0.071
#1	**1**	**Time of Concentration:**					**0.071**

Hillsboro Energy LLC
Collector Ditch 003 A

Gary Raines

General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	10 yr - 24 hr
Rainfall Depth:	4.700 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Ditch 003 A

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	25.000	25.000	68.27	0.00

Structure Detail:

Structure #1 (Vegetated Channel)

Ditch 003 A

Trapezoidal Vegetated Channel Inputs:

Material: Grass mixture

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
10.00	3.0:1	3.0:1	0.4	C, C				5.0

Vegetated Channel Results:

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Design Discharge:	68.27 cfs		68.27 cfs	
Depth:	1.96 ft		1.96 ft	
Top Width:	21.78 ft		21.78 ft	
Velocity:	2.19 fps		2.19 fps	
X-Section Area:	31.19 sq ft		31.19 sq ft	
Hydraulic Radius:	1.391 ft		1.391 ft	
Froude Number:	0.32		0.32	
Roughness Coefficient:	0.0536		0.0536	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	25.000	0.135	0.000	0.000	98.000	M	68.27	7.557
	Σ	**25.000**						**68.27**	**0.000**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	7. Paved area and small upland gullies	1.50	18.00	1,200.00	2.460	0.135
#1	**1**	**Time of Concentration:**					**0.135**

DEER RUN

DITCH 004-A, 004-B PROFILE'S

Designed | Checked | Drawn | Checked

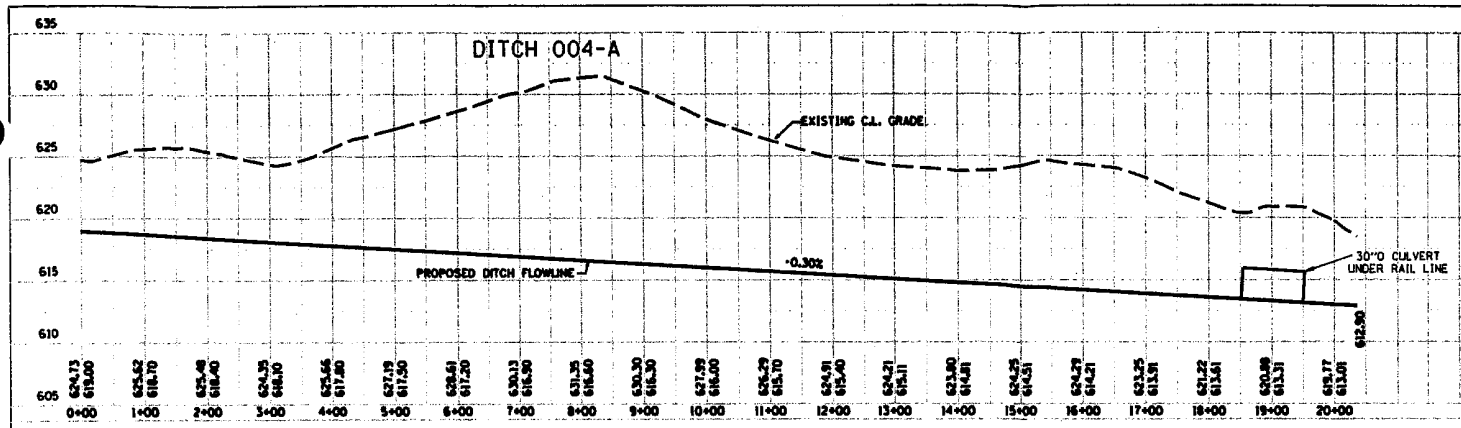
HDR | CWI

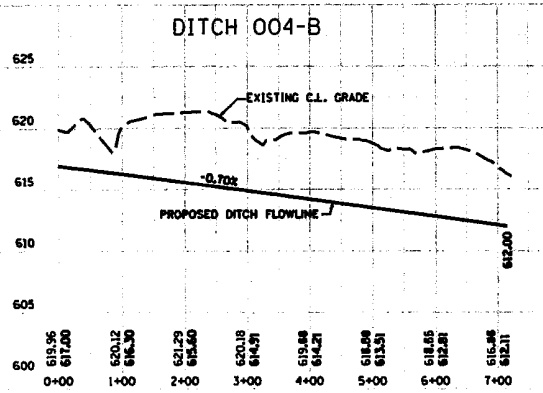
Date: 6/28/07

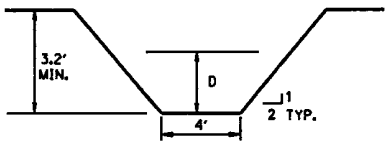
Sheet No. 6 of 7

Job No: 06330

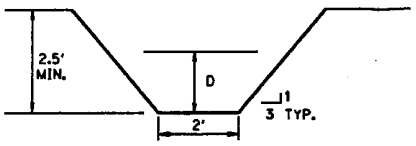
File No:







DITCH 004-A
TYPICAL SECTION
STA.00+00 to END
D=2.12' @ DESIGN FLOW
NTS



DITCH 004-B
TYPICAL SECTION
STA.00+00 to END
D=1.36' @ DESIGN FLOW
NTS

Hillsboro Energy LLC
Collector Ditch 004 A

Gary Raines

General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	10 yr - 24 hr
Rainfall Depth:	4.700 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Ditch 004 A

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	18.800	18.800	26.78	0.00

Structure Detail:

Structure #1 (Vegetated Channel)

Ditch 004 A

Trapezoidal Vegetated Channel Inputs:

Material: Grass mixture

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
4.00	2.0:1	2.0:1	0.3	C, C				5.0

Vegetated Channel Results:

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Design Discharge:	26.78 cfs		26.78 cfs	
Depth:	2.12 ft		2.12 ft	
Top Width:	12.48 ft		12.48 ft	
Velocity:	1.53 fps		1.53 fps	
X-Section Area:	17.47 sq ft		17.47 sq ft	
Hydraulic Radius:	1.296 ft		1.296 ft	
Froude Number:	0.23		0.23	
Roughness Coefficient:	0.0633		0.0633	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	18.800	0.414	0.000	0.000	79.000	M	26.78	3.187
	Σ	**18.800**						**26.78**	**0.000**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	0.64	6.00	940.00	0.630	0.414
#1	**1**	**Time of Concentration:**					**0.414**

Hillsboro Energy LLC
Collector Ditch 004 B

Gary Raines

General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	10 yr - 24 hr
Rainfall Depth:	4.700 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Ditch 004 B

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	4.700	4.700	10.45	0.00

Structure Detail:

Structure #1 (Vegetated Channel)

Ditch 004 B

Trapezoidal Vegetated Channel Inputs:

Material: Grass mixture

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
2.00	3.0:1	3.0:1	0.7	C, C				5.0

Vegetated Channel Results:

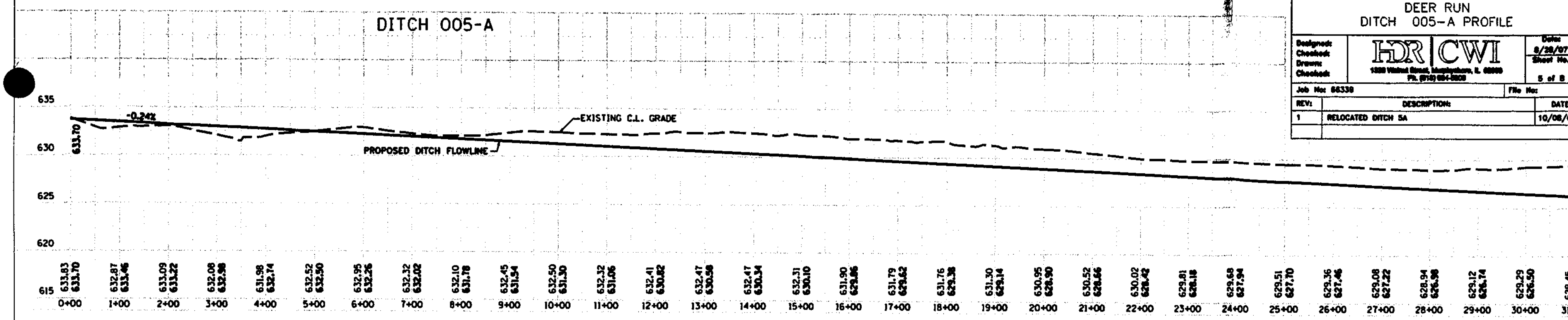
	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Design Discharge:	10.45 cfs		10.45 cfs	
Depth:	1.36 ft		1.36 ft	
Top Width:	10.13 ft		10.13 ft	
Velocity:	1.27 fps		1.27 fps	
X-Section Area:	8.22 sq ft		8.22 sq ft	
Hydraulic Radius:	0.778 ft		0.778 ft	
Froude Number:	0.25		0.25	
Roughness Coefficient:	0.0828		0.0828	

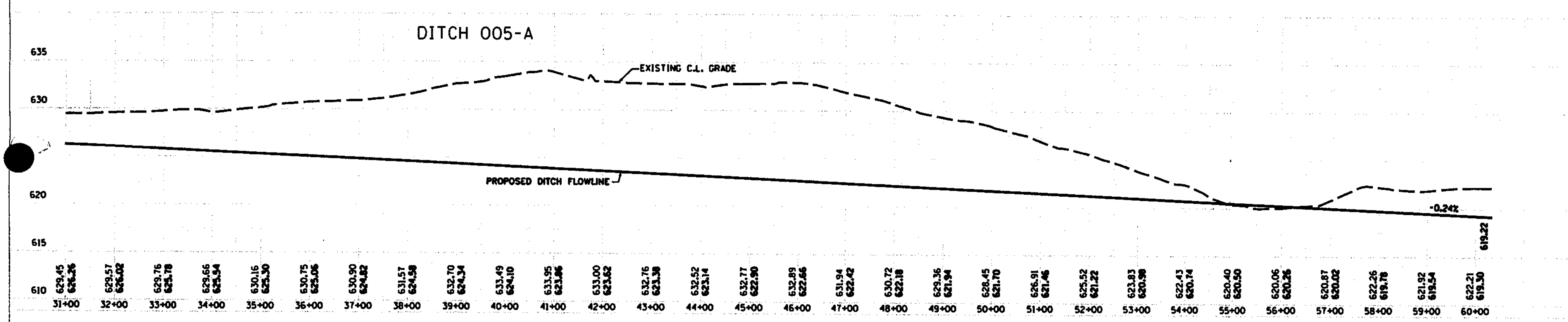
Subwatershed Hydrology Detail:

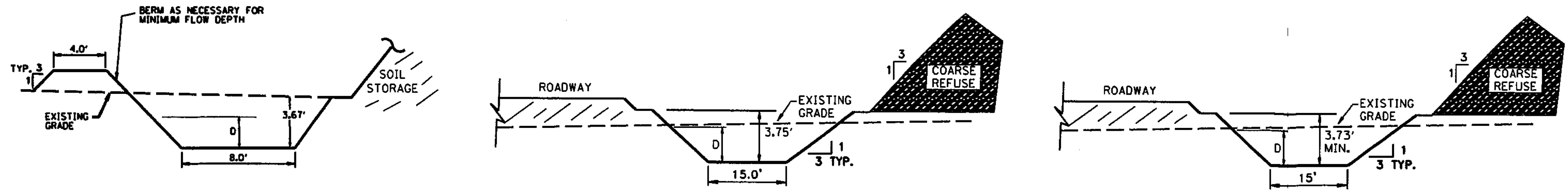
Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	4.700	0.127	0.000	0.000	86.000	M	10.45	1.015
	Σ	**4.700**						**10.45**	**0.000**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	1.40	6.00	430.00	0.940	0.127
#1	**1**	**Time of Concentration:**					**0.127**







DITCH 005-A
TYPICAL SECTION
STA.00+00 to 16+50
D=2.67' @ DESIGN FLOW
NTS

DITCH 005-A
TYPICAL SECTION
STA.16+50 TO STA. 29+50
D=2.75' @ DESIGN FLOW
NTS

DITCH 005-A
TYPICAL SECTION
STA.29+50 TO END
D=2.73' @ DESIGN FLOW
NTS

DEER RUN
DITCH 005-A PROFILE

Designed:
Checked:
Drawn:
Checked:

HDR | CWI

Date: 8/28/07
Sheet No. 5 of 8

Job No: 66338
File No:

REV:	DESCRIPTION:	DATE:
1	RELOCATED DITCH 5A	10/08/07

Hillsboro Energy LLC
Collection Ditch 005 A

Revised 10-9-07

Gary Raines

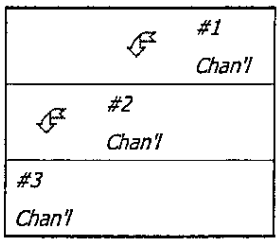
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	100 yr - 6 hr
Rainfall Depth:	4.900 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	#2	0.627	0.150	Sta 0 - 16+50
Channel	#2	==>	#3	5.158	0.020	Sta 16+50 - 29+50
Channel	#3	==>	End	0.000	0.000	Sta 29+50 to end



Structure Routing Details:

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	6. Grassed waterway	0.24	3.95	1,650.00	0.73	0.627
#1	**Muskingum K:**					**0.627**
#2	6. Grassed waterway	0.00	0.03	1,300.00	0.07	5.158
#2	**Muskingum K:**					**5.158**

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	19.000	19.000	89.02	0.00
#2	30.700	49.700	167.65	0.00
#3	45.000	94.700	165.50	0.00

Structure Detail:

Structure #1 (Vegetated Channel)

Sta 0 - 16+50

Trapezoidal Vegetated Channel Inputs:

Material: Grass mixture

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
8.00	3.0:1	3.0:1	0.2	C, C				5.0

Vegetated Channel Results:

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Design Discharge:	89.02 cfs		89.02 cfs	
Depth:	2.67 ft		2.67 ft	
Top Width:	24.05 ft		24.05 ft	
Velocity:	2.08 fps		2.08 fps	
X-Section Area:	42.87 sq ft		42.87 sq ft	
Hydraulic Radius:	1.720 ft		1.720 ft	
Froude Number:	0.27		0.27	
Roughness Coefficient:	0.0504		0.0504	

Structure #2 (Vegetated Channel)

Sta 16+50 - 29+50

Trapezoidal Vegetated Channel Inputs:

Material: Grass mixture

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
15.00	3.0:1	3.0:1	0.2	C, C				5.0

Vegetated Channel Results:

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Design Discharge:	167.65 cfs		167.65 cfs	
Depth:	2.75 ft		2.75 ft	

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Top Width:	31.48 ft		31.48 ft	
Velocity:	2.63 fps		2.63 fps	
X-Section Area:	63.84 sq ft		63.84 sq ft	
Hydraulic Radius:	1.972 ft		1.972 ft	
Froude Number:	0.32		0.32	
Roughness Coefficient:	0.0437		0.0437	

Structure #3 (Vegetated Channel)

Sta 29+50 to end

Trapezoidal Vegetated Channel Inputs:

Material: Grass mixture

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
15.00	3.0:1	3.0:1	0.2	C, C				5.0

Vegetated Channel Results:

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Design Discharge:	165.50 cfs		165.50 cfs	
Depth:	2.73 ft		2.73 ft	
Top Width:	31.41 ft		31.41 ft	
Velocity:	2.61 fps		2.61 fps	
X-Section Area:	63.47 sq ft		63.47 sq ft	
Hydraulic Radius:	1.965 ft		1.965 ft	
Froude Number:	0.32		0.32	
Roughness Coefficient:	0.0439		0.0439	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	19.000	0.071	0.000	0.000	86.000	M	89.02	5.325
	Σ	**19.000**						**89.02**	**0.000**
#2	1	30.700	0.048	0.000	0.000	91.000	M	154.13	9.912
	Σ	**49.700**						**167.65**	**0.000**
#3	1	45.000	0.138	0.000	0.000	91.000	M	165.50	11.839
	Σ	**94.700**						**165.50**	**0.000**

Subwatershed Time of Concentration Details:

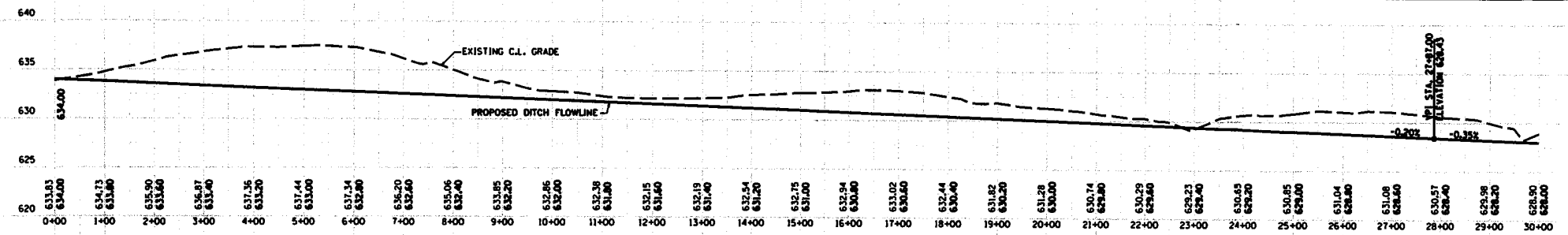
Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	6.00	30.00	500.00	1.950	0.071
#1	**1**	**Time of Concentration:**					**0.071**
#2	1	5. Nearly bare and untilled, and alluvial valley fans	11.67	70.00	600.00	3.410	0.048
#2	**1**	**Time of Concentration:**					**0.048**
#3	1	5. Nearly bare and untilled, and alluvial valley fans	5.83	70.00	1,200.00	2.410	0.138
#3	**1**	**Time of Concentration:**					**0.138**

DEER RUN
DITCH 005-B PROFILE

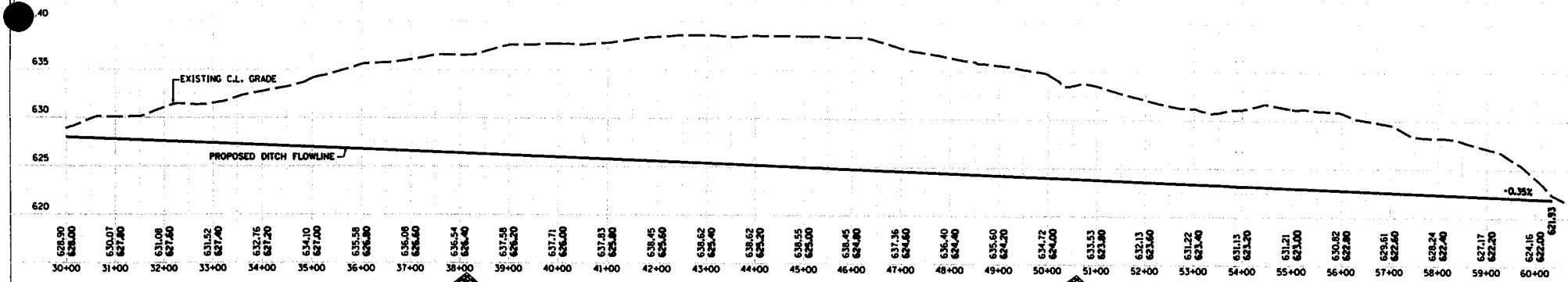
Designed:	HDR | CWI	Date: 6/28/07
Checked:		Sheet No. 8 of 8
Drawn:		
Checked:		
Job No:		File No:

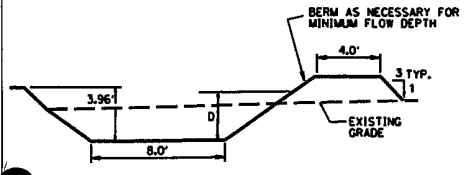
REV:	DESCRIPTION:	DATE:
1	RELOCATED DITCH 005-B	10/08/07

DITCH 005-B

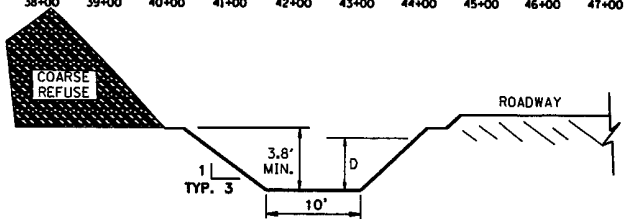


DITCH 005-B

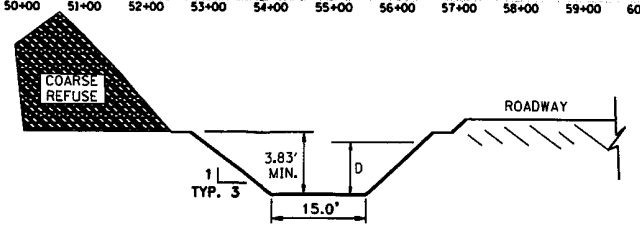




DITCH 005-B
TYPICAL SECTION
STA.00+00 TO 27+75
D=2.96' @ DESIGN FLOW
NTS



DITCH 005-B
TYPICAL SECTION
STA.27+75 TO STA. 40+75
D=2.80' @ DESIGN FLOW
NTS



DITCH 005-B
TYPICAL SECTION
STA.40+75 TO END
D=2.83' @ DESIGN FLOW
NTS

Hillsboro Energy LLC
Collection Ditch 005 B

Revised 10-9-07

Gary Raines

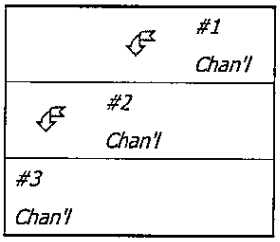
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	100 yr - 6 hr
Rainfall Depth:	4.900 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	#2	1.150	0.141	Sta 0-27+75
Channel	#2	==>	#3	0.410	0.171	Sta 27+75 to 40+75
Channel	#3	==>	End	0.000	0.000	Sta 40+75 to end



Structure Routing Details:

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	6. Grassed waterway	0.20	5.55	2,775.00	0.67	1.150
#1	**Muskingum K:**					**1.150**
#2	6. Grassed waterway	0.35	4.54	1,300.00	0.88	0.410
#2	**Muskingum K:**					**0.410**

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	22.000	22.000	103.08	0.00
#2	32.700	54.700	166.53	0.00
#3	30.600	85.300	248.02	0.00

Structure Detail:

Structure #1 (Vegetated Channel)

Sta 0-27+75

Trapezoidal Vegetated Channel Inputs:

Material: Grass mixture

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
8.00	3.0:1	3.0:1	0.2	C, C				5.0

Vegetated Channel Results:

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Design Discharge:	103.08 cfs		103.08 cfs	
Depth:	2.96 ft		2.96 ft	
Top Width:	25.75 ft		25.75 ft	
Velocity:	2.06 fps		2.06 fps	
X-Section Area:	49.94 sq ft		49.94 sq ft	
Hydraulic Radius:	1.869 ft		1.869 ft	
Froude Number:	0.26		0.26	
Roughness Coefficient:	0.0490		0.0490	

Structure #2 (Vegetated Channel)

Sta 27+75 to 40+75

Trapezoidal Vegetated Channel Inputs:

Material: Grass mixture

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
10.00	3.0:1	3.0:1	0.3	C, C				5.0

Vegetated Channel Results:

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Design Discharge:	166.53 cfs		166.53 cfs	
Depth:	2.80 ft		2.80 ft	

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Top Width:	26.81 ft		26.81 ft	
Velocity:	3.23 fps		3.23 fps	
X-Section Area:	51.57 sq ft		51.57 sq ft	
Hydraulic Radius:	1.860 ft		1.860 ft	
Froude Number:	0.41		0.41	
Roughness Coefficient:	0.0413		0.0413	

Structure #3 (Vegetated Channel)

Sta 40+75 to end

Trapezoidal Vegetated Channel Inputs:

Material: Grass mixture

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
15.00	3.0:1	3.0:1	0.3	C, C				5.0

Vegetated Channel Results:

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Design Discharge:	248.02 cfs		248.02 cfs	
Depth:	2.83 ft		2.83 ft	
Top Width:	32.00 ft		32.00 ft	
Velocity:	3.73 fps		3.73 fps	
X-Section Area:	66.57 sq ft		66.57 sq ft	
Hydraulic Radius:	2.022 ft		2.022 ft	
Froude Number:	0.46		0.46	
Roughness Coefficient:	0.0378		0.0378	

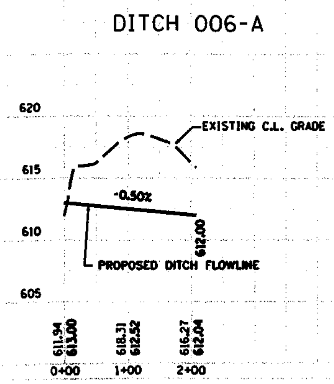
Subwatershed Hydrology Detail:

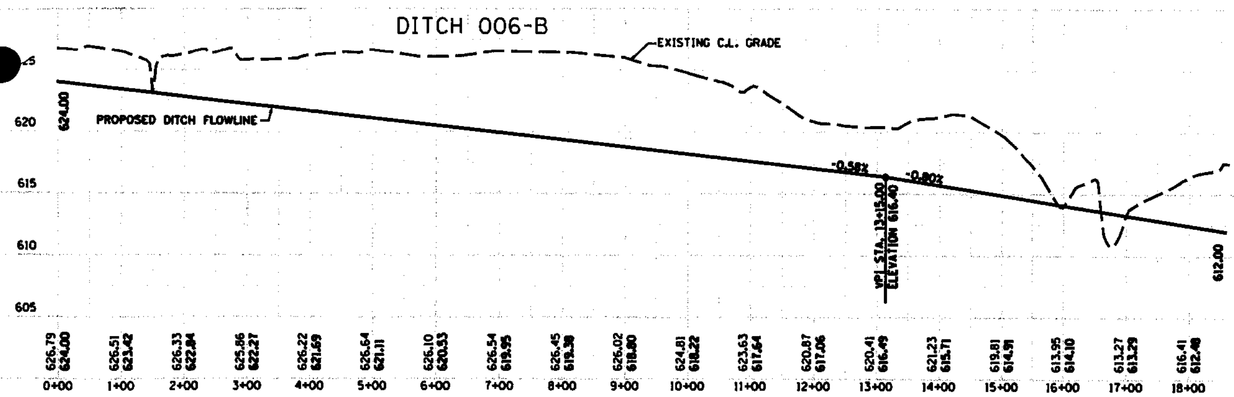
Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	22.000	0.071	0.000	0.000	86.000	M	103.08	6.166
	Σ	**22.000**						**103.08**	**0.000**
#2	1	32.700	0.048	0.000	0.000	91.000	M	164.17	10.557
	Σ	**54.700**						**166.53**	**0.000**
#3	1	30.600	0.138	0.000	0.000	91.000	M	112.54	8.051
	Σ	**85.300**						**248.02**	**0.000**

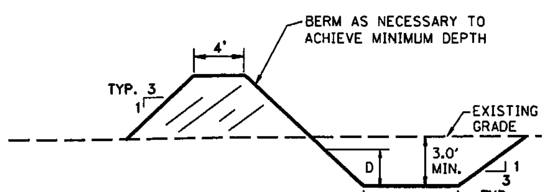
Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	6.00	30.00	500.00	1.950	0.071
#1	**1**	**Time of Concentration:**					**0.071**

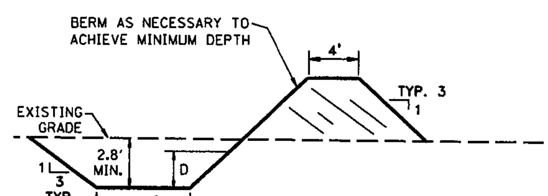
DEER RUN DITCH 006-A, 006-B PROFILE'S		
Designed: Checked: Drawn: Checked:	HDR | CWI	Date: 8/28/07 Sheet No. 7 of 8
Job No: 66330		File No:
REV:	DESCRIPTION:	DATE:
1	RELOCATED DITCH 006-B	10/08/07



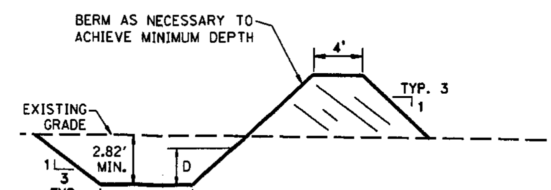




DITCH 006-A
TYPICAL SECTION
STA. 0+00 TO END
D=1.88' @ DESIGN FLOW
NTS



DITCH 006-B
TYPICAL SECTION
STA. 0+00 TO 13+15
D=1.80' @ DESIGN FLOW
NTS



DITCH 006-B
TYPICAL SECTION
STA. 13+15 TO END
D=1.82' @ DESIGN FLOW
NTS

Hillsboro Energy LLC
Collector Ditch 006 A

Gary Raines

General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	10 yr - 24 hr
Rainfall Depth:	4.700 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Ditch 006 A

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	32.500	32.500	73.11	0.00

Structure Detail:

Structure #1 (Vegetated Channel)

Ditch 006 A

Trapezoidal Vegetated Channel Inputs:

Material: Grass mixture

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
10.00	3.0:1	3.0:1	0.5	C, C				5.0

Vegetated Channel Results:

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Design Discharge:	73.11 cfs		73.11 cfs	
Depth:	1.88 ft		1.88 ft	
Top Width:	21.30 ft		21.30 ft	
Velocity:	2.48 fps		2.48 fps	
X-Section Area:	29.49 sq ft		29.49 sq ft	
Hydraulic Radius:	1.346 ft		1.346 ft	
Froude Number:	0.37		0.37	
Roughness Coefficient:	0.0518		0.0518	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	32.500	0.271	0.000	0.000	91.000	M	73.11	8.007
	Σ	**32.500**						**73.11**	**0.000**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	4. Cultivated, straight row	3.82	65.00	1,700.00	1.740	0.271
#1	**1**	**Time of Concentration:**					**0.271**

Hillsboro Energy LLC
Collection Ditch 006 B

Revised 10-9-07

Gary Raines

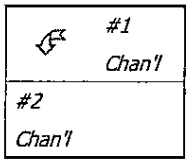
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	10 yr - 24 hr
Rainfall Depth:	4.700 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	#2	0.387	0.190	sta 0 - 13+15
Channel	#2	==>	End	0.000	0.000	13+15 to end



Structure Routing Details:

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	6. Grassed waterway	0.48	7.00	1,450.00	1.04	0.387
#1	**Muskingum K:**					**0.387**

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	15.600	15.600	33.41	0.00
#2	30.000	45.600	78.59	0.00

Structure Detail:

Structure #1 (Vegetated Channel)

sta 0 - 13+15

Trapezoidal Vegetated Channel Inputs:

Material: Grass mixture

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
4.00	3.0:1	3.0:1	0.6	C, C				5.0

Vegetated Channel Results:

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Design Discharge:	33.41 cfs		33.41 cfs	
Depth:	1.80 ft		1.80 ft	
Top Width:	14.79 ft		14.79 ft	
Velocity:	1.98 fps		1.98 fps	
X-Section Area:	16.91 sq ft		16.91 sq ft	
Hydraulic Radius:	1.099 ft		1.099 ft	
Froude Number:	0.33		0.33	
Roughness Coefficient:	0.0611		0.0611	

Structure #2 (Vegetated Channel)

13+15 to end

Trapezoidal Vegetated Channel Inputs:

Material: Grass mixture

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
8.00	3.0:1	3.0:1	0.8	C, C				5.0

Vegetated Channel Results:

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Design Discharge:	78.59 cfs		78.59 cfs	
Depth:	1.82 ft		1.82 ft	

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Top Width:	18.90 ft		18.90 ft	
Velocity:	3.22 fps		3.22 fps	
X-Section Area:	24.42 sq ft		24.42 sq ft	
Hydraulic Radius:	1.253 ft		1.253 ft	
Froude Number:	0.50		0.50	
Roughness Coefficient:	0.0481		0.0481	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	15.600	0.347	0.000	0.000	91.000	M	33.41	3.840
	Σ	**15.600**						**33.41**	**0.000**
#2	1	30.000	0.480	0.000	0.000	91.000	M	57.50	7.363
	Σ	**45.600**						**78.59**	**0.000**

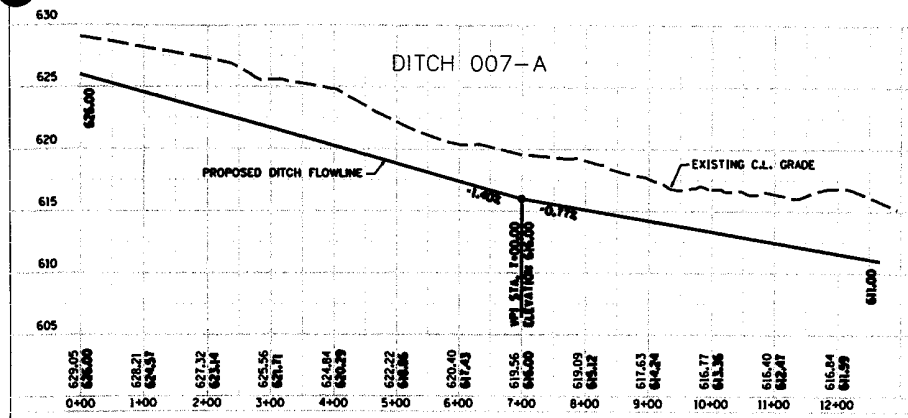
Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	4. Cultivated, straight row	1.17	14.00	1,200.00	0.960	0.347
#1	**1**	**Time of Concentration:**					**0.347**
#2	1	4. Cultivated, straight row	3.14	86.00	2,735.00	1.580	0.480
#2	**1**	**Time of Concentration:**					**0.480**

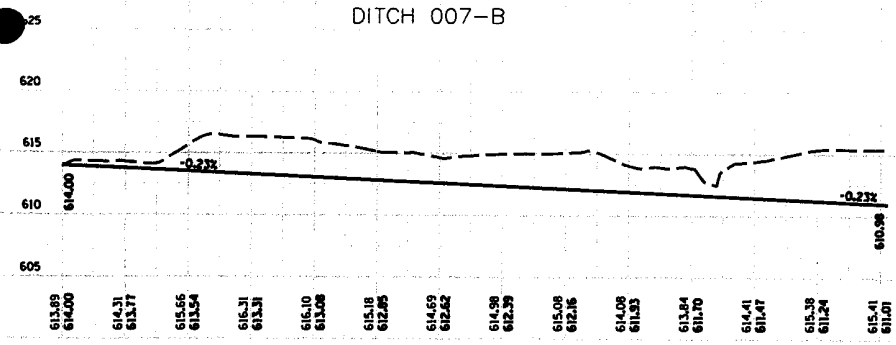
DEER RUN
DITCH 007-A, 007-B PROFILE'S

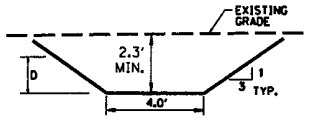
Designed:	HDR | CWI	Date: 10/22/07
Checked:		Sheet No. 8 of 8
Drawn:		
Checked:		
Job No: 68339		File No:

DITCH 007-A

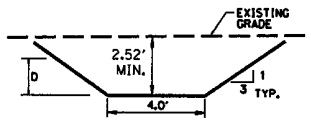


DITCH 007-B

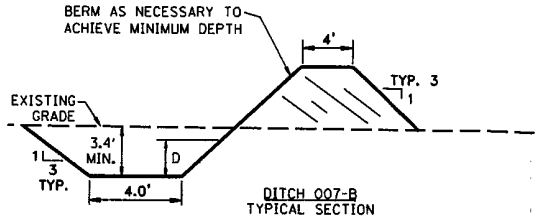




DITCH 007-A
TYPICAL SECTION
STA. 00+00 to 07+00
D=1.30' MIN.
NTS



DITCH 007-A
TYPICAL SECTION
STA. 07+00 to END
D=1.52' MIN.
NTS



DITCH 007-B
TYPICAL SECTION
STA. 0+00 TO END
D=2.39' @ DESIGN FLOW
NTS

Hillsboro Energy LLC
Collection Ditch 007 A

Gary Raines

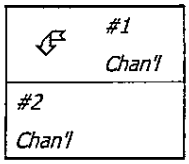
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	10 yr - 24 hr
Rainfall Depth:	4.700 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	#2	0.109	0.255	Sta 0 - 7+00
Channel	#2	==>	End	0.000	0.000	Sta 7+00 to end



Structure Routing Details:

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	6. Grassed waterway	1.40	9.79	700.00	1.77	0.109
#1	**Muskingum K:**					**0.109**

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	8.500	8.500	26.27	0.00
#2	0.000	8.500	25.34	0.00

Structure Detail:

Structure #1 (Vegetated Channel)

Sta 0 - 7+00

Trapezoidal Vegetated Channel Inputs:

Material: Grass mixture

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
4.00	3.0:1	3.0:1	1.4	C, C				5.0

Vegetated Channel Results:

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Design Discharge:	26.27 cfs		26.27 cfs	
Depth:	1.30 ft		1.30 ft	
Top Width:	11.80 ft		11.80 ft	
Velocity:	2.56 fps		2.56 fps	
X-Section Area:	10.27 sq ft		10.27 sq ft	
Hydraulic Radius:	0.840 ft		0.840 ft	
Froude Number:	0.48		0.48	
Roughness Coefficient:	0.0614		0.0614	

Structure #2 (Vegetated Channel)

Sta 7+00 to end

Trapezoidal Vegetated Channel Inputs:

Material: Grass mixture

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
4.00	3.0:1	3.0:1	0.8	C, C				5.0

Vegetated Channel Results:

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Design Discharge:	25.34 cfs		25.34 cfs	
Depth:	1.52 ft		1.52 ft	

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Top Width:	13.10 ft		13.10 ft	
Velocity:	1.95 fps		1.95 fps	
X-Section Area:	12.97 sq ft		12.97 sq ft	
Hydraulic Radius:	0.954 ft		0.954 ft	
Froude Number:	0.35		0.35	
Roughness Coefficient:	0.0648		0.0648	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	8.500	0.093	0.000	0.000	86.000	M	26.27	2.256
	Σ	**8.500**						**26.27**	**0.000**
#2	Σ	**8.500**						**25.34**	**0.000**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	5.00	30.00	600.00	1.780	0.093
#1	**1**	**Time of Concentration:**					**0.093**

Hillsboro Energy LLC
Collection Ditch 007 B

Gary Raines

General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	10 yr - 24 hr
Rainfall Depth:	4.700 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Total length

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	17.500	17.500	37.37	0.00

Structure Detail:

Structure #1 (Vegetated Channel)

Total length

Trapezoidal Vegetated Channel Inputs:

Material: Grass mixture

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
4.00	3.0:1	3.0:1	0.2	C, C				5.0

Vegetated Channel Results:

	Stability Class C w/o Freeboard	Stability Class C w/ Freeboard	Capacity Class C w/o Freeboard	Capacity Class C w/ Freeboard
Design Discharge:	37.37 cfs		37.37 cfs	
Depth:	2.39 ft		2.39 ft	
Top Width:	18.33 ft		18.33 ft	
Velocity:	1.40 fps		1.40 fps	
X-Section Area:	26.66 sq ft		26.66 sq ft	
Hydraulic Radius:	1.396 ft		1.396 ft	
Froude Number:	0.20		0.20	
Roughness Coefficient:	0.0636		0.0636	

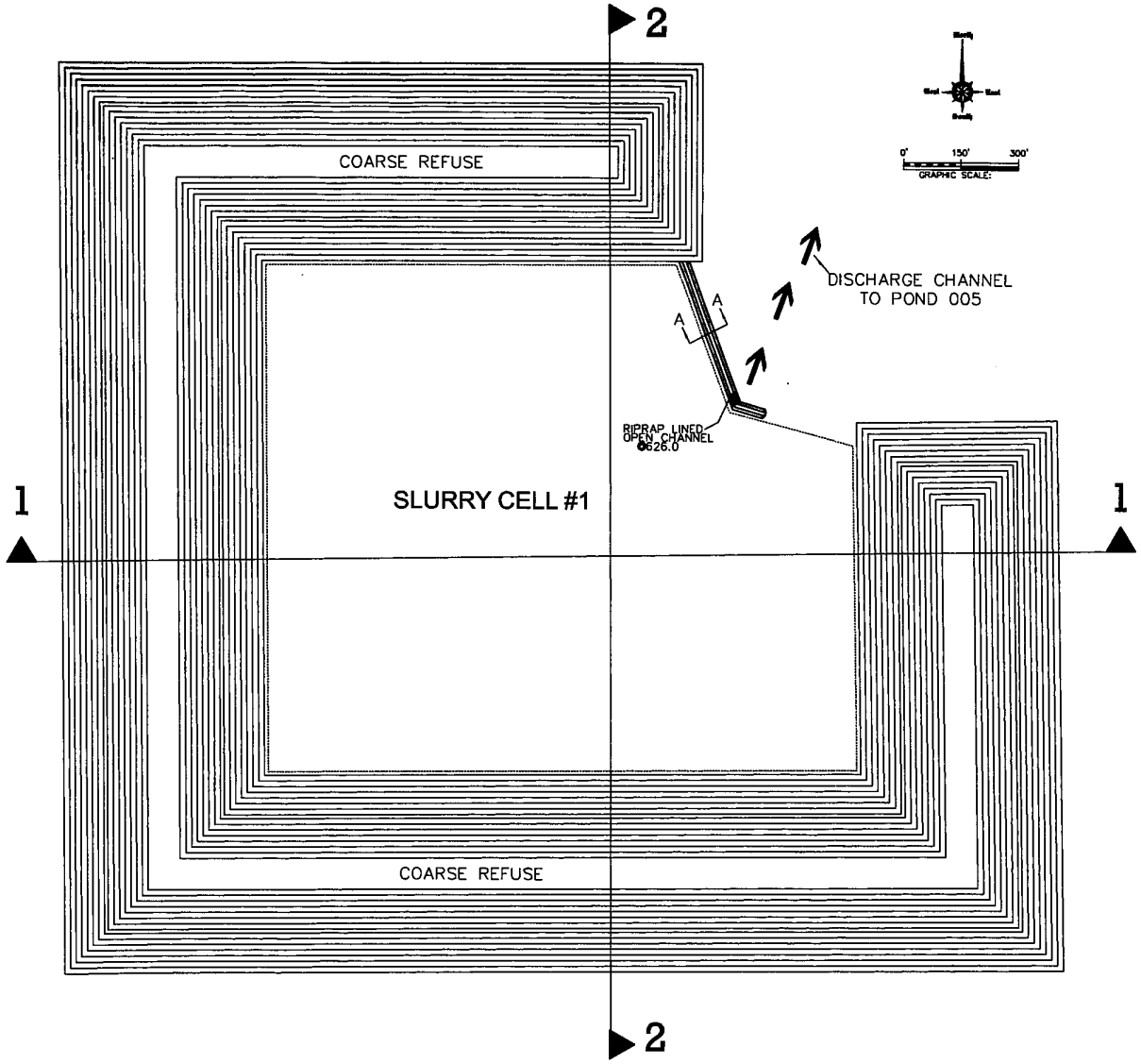
Subwatershed Hydrology Detail:

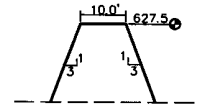
Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	17.500	0.201	0.000	0.000	86.000	M	37.37	3.712
	Σ	**17.500**						**37.37**	**0.000**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	3.00	30.00	1,000.00	1.380	0.201
#1	**1**	**Time of Concentration:**					**0.201**

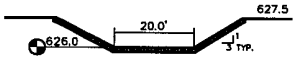
Attachment IV.7.F - Sediment Pond Designs





BERM SECTION A–A

NTS



OUTLET CHANNEL TYP. SECTION

NTS

REV.#	DATE:	
1	11/14/07	SECTION CUTS. INCLUDE PAGE'S 2 & 3.

DEER RUN

SLURRY CELL #1
PLAN & SECTIONS

Designed:
Checked:
Drawn:
Checked:

HDR | CWI

1336 Walnut St. Murphysboro, IL 62966
5201 S. Sixth St. Rd. Springfield, IL 62703

Date: 11/14/07

Sheet No. 1 of 3

Job No: 66339

File No:

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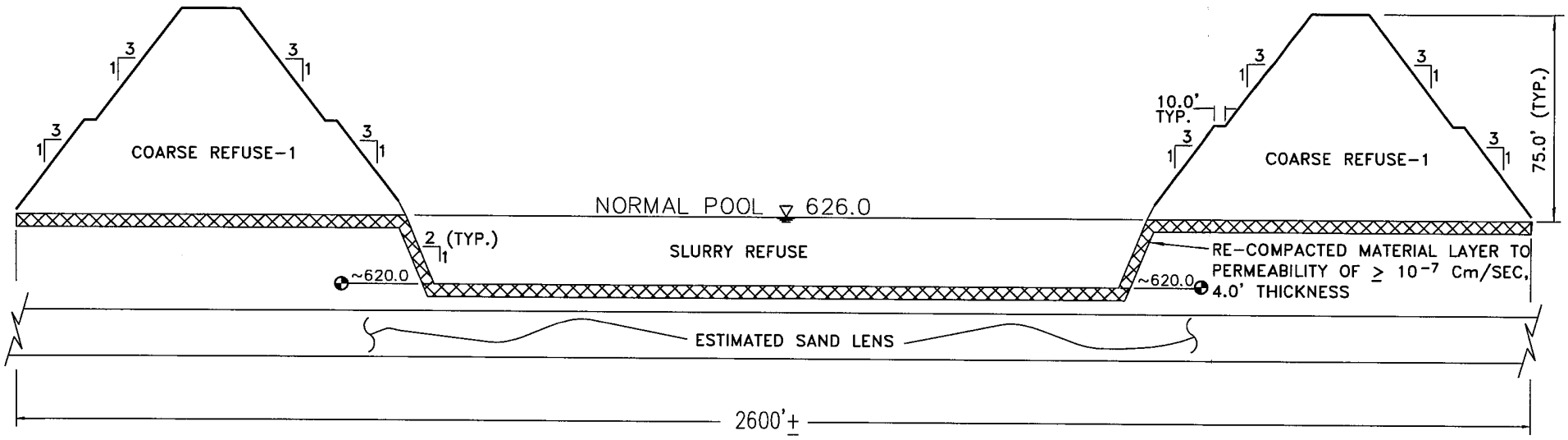

COARSE REFUSE/SLURRY DISPOSAL AREA
SECTION 1-1
TYPICAL E-W SECTION

(NTS)

DEER RUN		
COARSE REFUSE/SLURRY TYPICAL SECTION		
Designed:	HDR | CWI	Date: 11/14/07
Checked:		
Drawn:		Sheet No. 2 of 3
Checked:		
Job No: 66339		File No:

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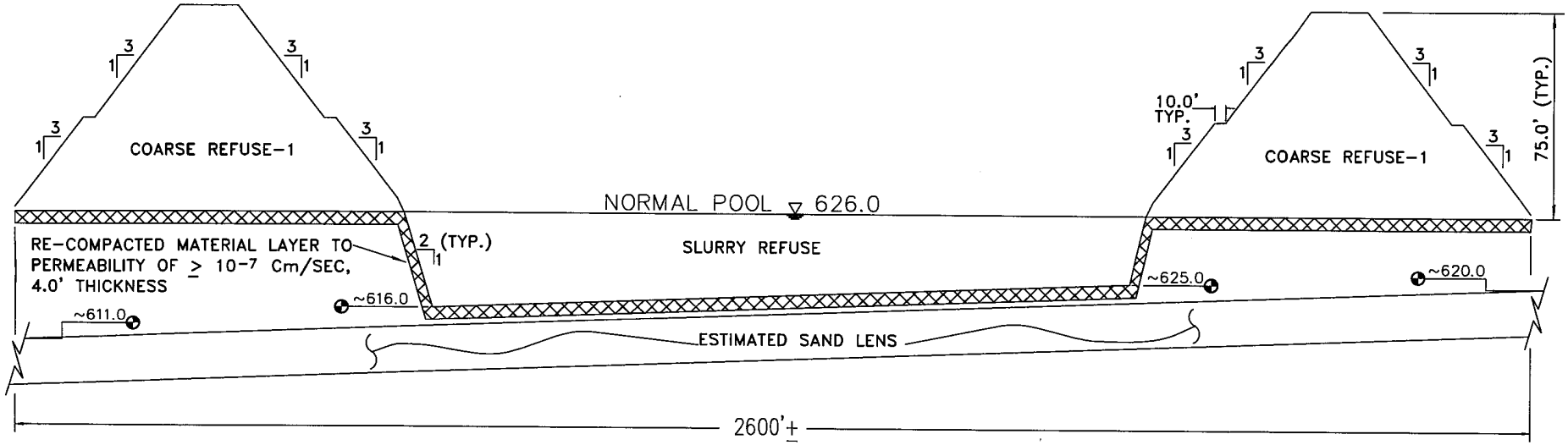

COARSE REFUSE/SLURRY DISPOSAL AREA
SECTION 2-2
TYPICAL N-S SECTION

(NTS)

DEER RUN

COARSE REFUSE/SLURRY TYPICAL SECTION

Designed:	HDR | CWI	Date: 11/14/07
Checked:		
Drawn:		Sheet No. 3 of 3
Checked:		
Job No: 66339		File No:

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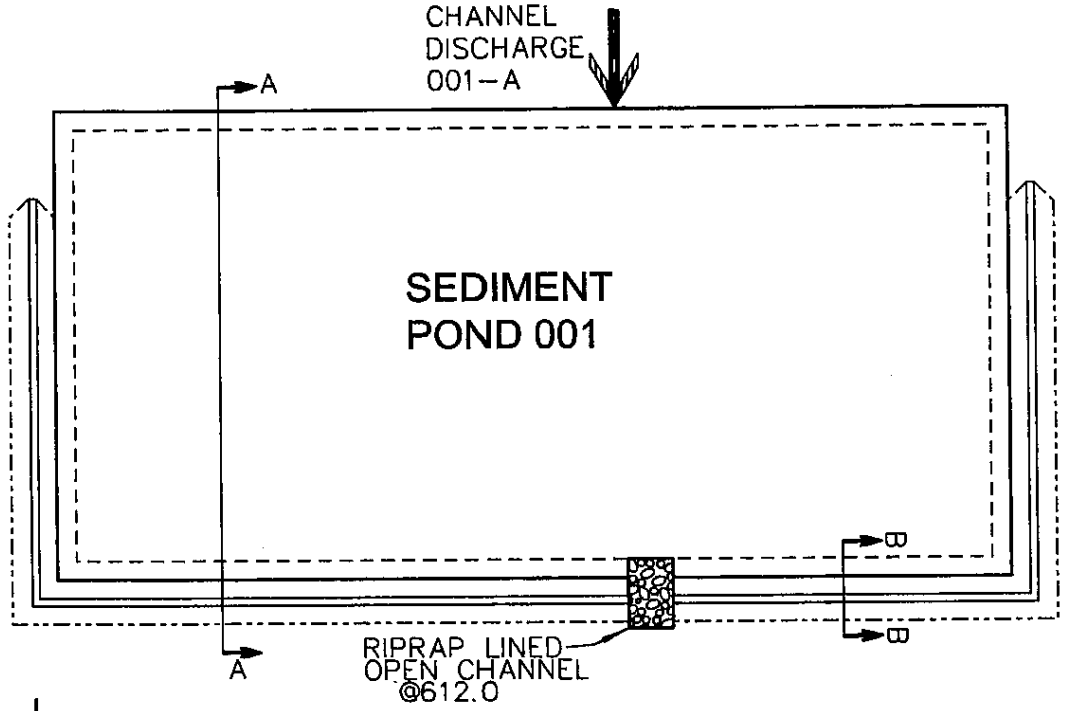
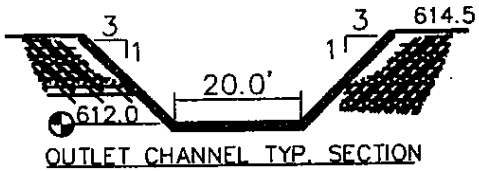
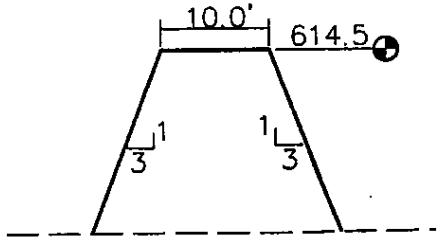




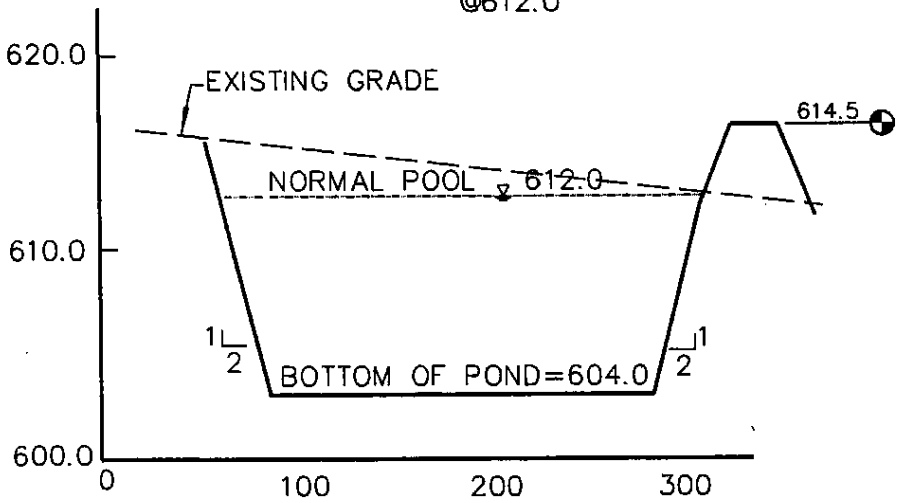
OUTLET CHANNEL TYP. SECTION

NTS

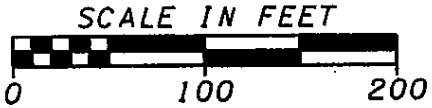


TYPICAL BERM SECTION B-B

NTS



TYPICAL POND SECTION A-A



DEER RUN

SEDIMENT POND 001

HDR | CWI

Date 09/10/07

Job No. 66339

...\DRAWINGS\66339-PONDS.dgn 9/12/2007 7:50:04 PM

Hillsboro Energy LLC
Sediment Pond No. 001

Gary Raines

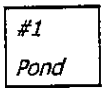
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	100 yr - 6 hr
Rainfall Depth:	4.900 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Pond	#1	==>	End	0.000	0.000	Sed Pond 001



Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	In	96.400	96.400	124.90	24.39
	Out			109.35	24.39

Structure Detail:

Structure #1 (Pond)

Sed Pond 001

Pond Inputs:

Initial Pool Elev:	612.00 ft
Initial Pool:	14.37 ac-ft

Broad-crested Weir

Weir Width (ft)	Spillway Elev (ft)
20.00	612.00

Pond Results:

Peak Elevation:	613.46 ft
Dewater Time:	0.43 days

Dewatering time is calculated from peak stage to lowest spillway

Elevation-Capacity-Discharge Table

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
604.00	1.350	0.000	0.000		
604.50	1.436	0.696	0.000		
605.00	1.524	1.436	0.000		
605.50	1.615	2.220	0.000		
606.00	1.708	3.051	0.000		
606.50	1.737	3.912	0.000		
607.00	1.767	4.788	0.000		
607.50	1.797	5.679	0.000		
608.00	1.827	6.585	0.000		
608.50	1.856	7.506	0.000		
609.00	1.886	8.442	0.000		
609.50	1.915	9.392	0.000		
610.00	1.945	10.357	0.000		
610.50	1.975	11.337	0.000		
611.00	2.005	12.332	0.000		
611.50	2.035	13.342	0.000		
612.00	2.066	14.367	0.000		Spillway #1

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
612.50	2.088	15.406	21.828	7.40	
613.00	2.111	16.455	61.740	1.85	
613.46	2.132	17.433	109.355	1.00	Peak Stage
613.50	2.133	17.516	113.424		
614.00	2.156	18.589	174.627		
614.50	2.245	19.689	244.049		
615.00	2.335	20.834	320.810		

Detailed Discharge Table

Elevation (ft)	Broad-crested Weir (cfs)	Combined Total Discharge (cfs)
604.00	0.000	0.000
604.50	0.000	0.000
605.00	0.000	0.000
605.50	0.000	0.000
606.00	0.000	0.000
606.50	0.000	0.000
607.00	0.000	0.000
607.50	0.000	0.000
608.00	0.000	0.000
608.50	0.000	0.000
609.00	0.000	0.000
609.50	0.000	0.000
610.00	0.000	0.000
610.50	0.000	0.000
611.00	0.000	0.000
611.50	0.000	0.000
612.00	0.000	0.000
612.50	21.828	21.828
613.00	61.740	61.740
613.50	113.424	113.424
614.00	174.627	174.627
614.50	244.049	244.049
615.00	320.810	320.810

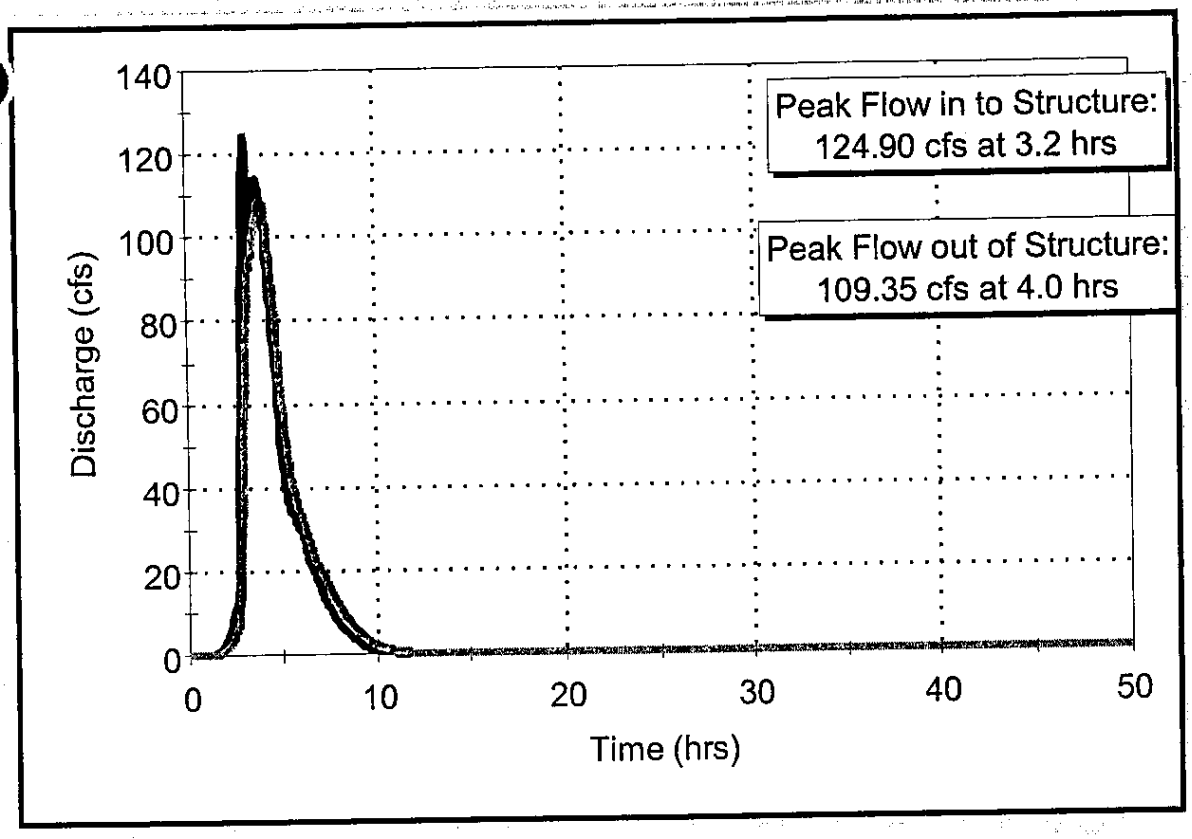
Subwatershed Hydrology Detail:

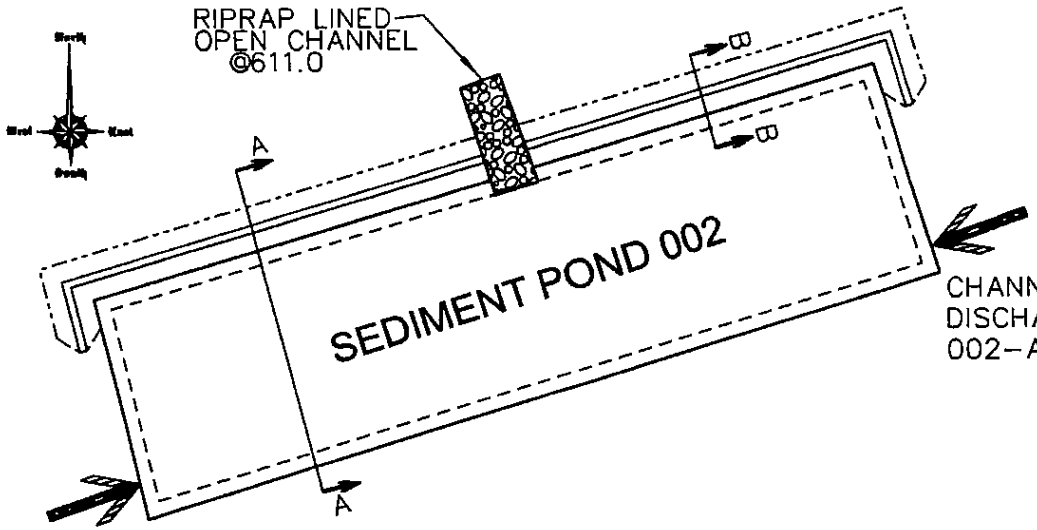
Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	26.000	0.185	0.000	0.000	88.000	M	88.30	6.248
	2	70.400	1.512	0.000	0.000	91.000	M	99.11	18.144
	Σ	**96.400**						**124.90**	**24.391**

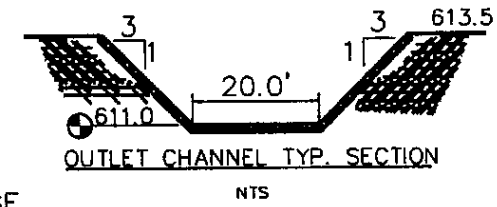
Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	6. Grassed waterway	1.00	10.00	1,000.00	1.500	0.185
#1	**1**	**Time of Concentration:**					**0.185**
#1	2	6. Grassed waterway	0.37	18.00	4,900.00	0.900	1.512
#1	**2**	**Time of Concentration:**					**1.512**

Inflow/Outflow Hydrographs for Structure # 1

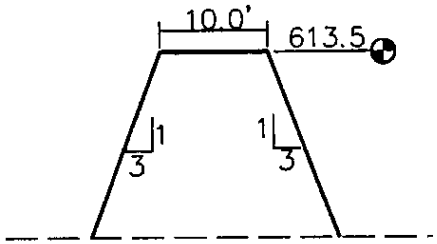






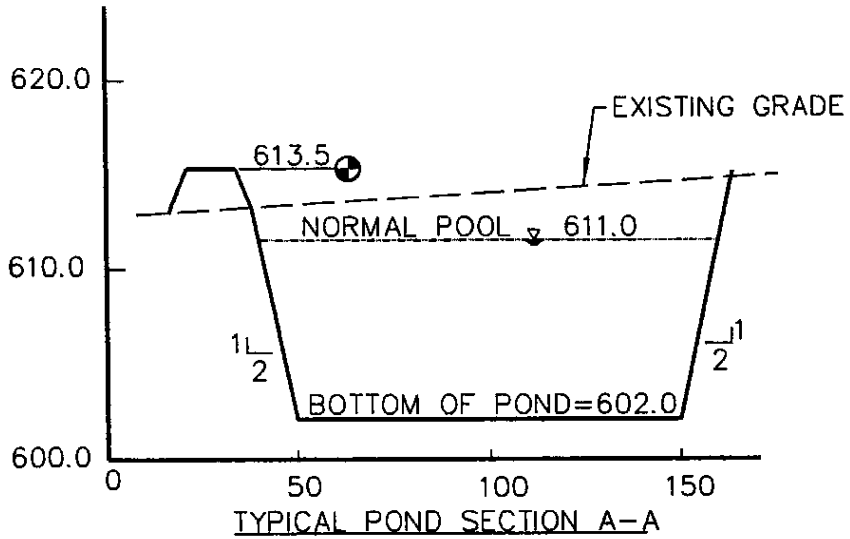
OUTLET CHANNEL TYP. SECTION

NTS



TYPICAL BERM SECTION B-B

NTS



TYPICAL POND SECTION A-A

DEER RUN

SEDIMENT POND 002

HDR | CWI

Date 09/10/07

Job No 66339

File No

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Hillsboro Energy LLC
Sediment Pond No. 002

Gary Raines

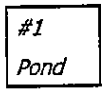
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	100 yr - 24 hr
Rainfall Depth:	4.700 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Pond	#1	==>	End	0.000	0.000	Sediment Pond 002



Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	In	27.000	27.000	96.81	10.04
	Out			93.88	10.04

Structure Detail:

Structure #1 (Pond)

Sediment Pond 002

Pond Inputs:

Initial Pool Elev:	611.00 ft
Initial Pool:	6.96 ac-ft

Broad-crested Weir

Weir Width (ft)	Spillway Elev (ft)
20.00	611.00

Pond Results:

Peak Elevation:	612.31 ft
Dewater Time:	0.56 days

Dewatering time is calculated from peak stage to lowest spillway

Elevation-Capacity-Discharge Table

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)
602.00	0.570	0.000	0.000	
602.50	0.591	0.290	0.000	
603.00	0.613	0.591	0.000	
603.50	0.635	0.903	0.000	
604.00	0.657	1.226	0.000	
604.50	0.680	1.560	0.000	
605.00	0.703	1.906	0.000	
605.50	0.726	2.263	0.000	
606.00	0.750	2.632	0.000	
606.50	0.772	3.012	0.000	
607.00	0.794	3.404	0.000	
607.50	0.817	3.807	0.000	
608.00	0.840	4.221	0.000	
608.50	0.864	4.647	0.000	
609.00	0.889	5.085	0.000	
609.50	0.913	5.536	0.000	
610.00	0.939	5.999	0.000	

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
610.50	0.964	6.474	0.000		
611.00	0.990	6.963	0.000		Spillway #1
611.50	1.025	7.467	21.828	13.10	
612.00	1.060	7.988	61.740	0.40	
612.31	1.081	8.323	93.880	0.05	Peak Stage
612.50	1.095	8.526	113.424		
613.00	1.130	9.083	174.627		

Detailed Discharge Table

Elevation (ft)	Broad-crested Weir (cfs)	Combined Total Discharge (cfs)
602.00	0.000	0.000
602.50	0.000	0.000
603.00	0.000	0.000
603.50	0.000	0.000
604.00	0.000	0.000
604.50	0.000	0.000
605.00	0.000	0.000
605.50	0.000	0.000
606.00	0.000	0.000
606.50	0.000	0.000
607.00	0.000	0.000
607.50	0.000	0.000
608.00	0.000	0.000
608.50	0.000	0.000
609.00	0.000	0.000
609.50	0.000	0.000
610.00	0.000	0.000
610.50	0.000	0.000
611.00	0.000	0.000
611.50	21.828	21.828
612.00	61.740	61.740
612.50	113.424	113.424
613.00	174.627	174.627

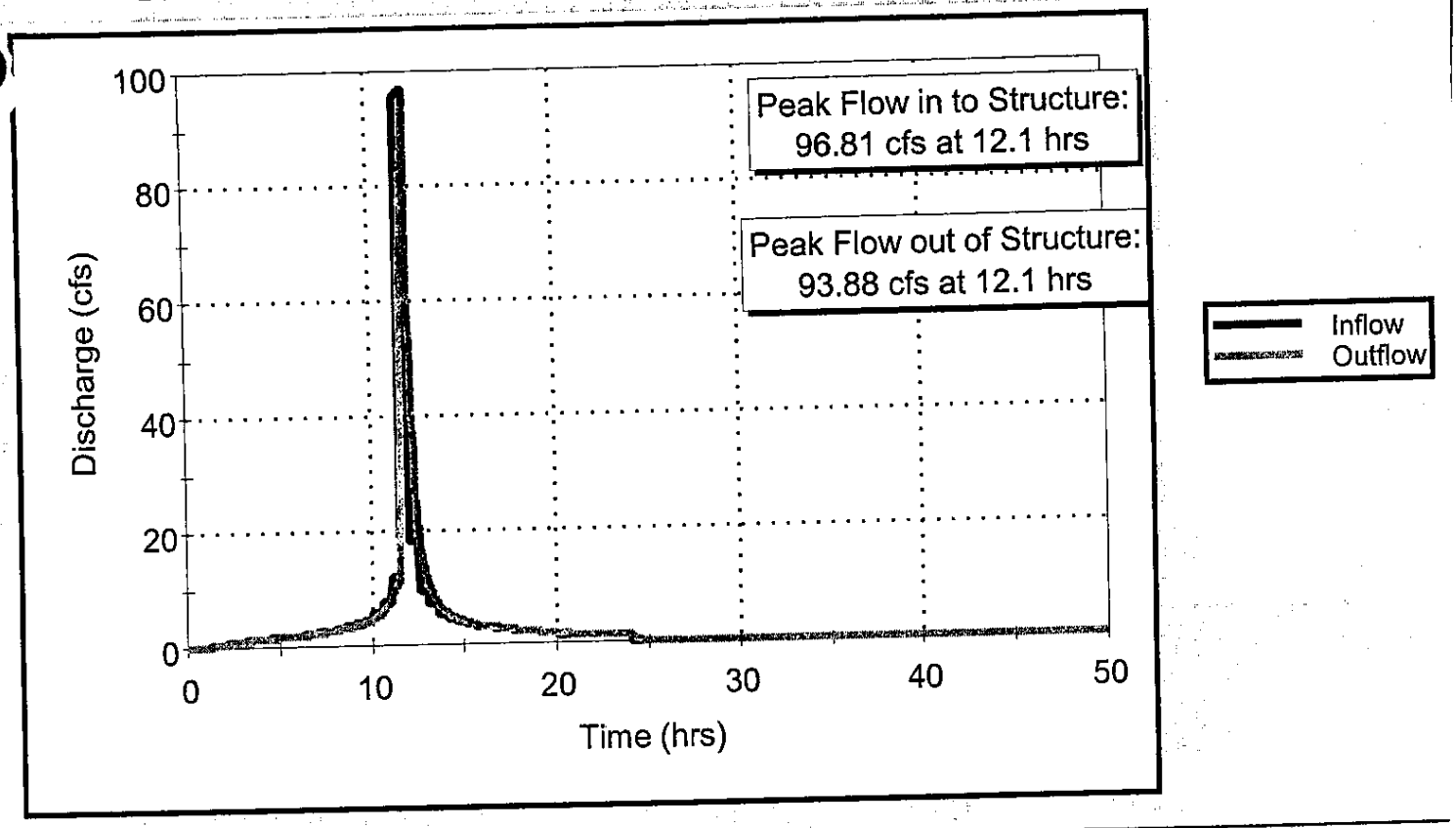
Subwatershed Hydrology Detail:

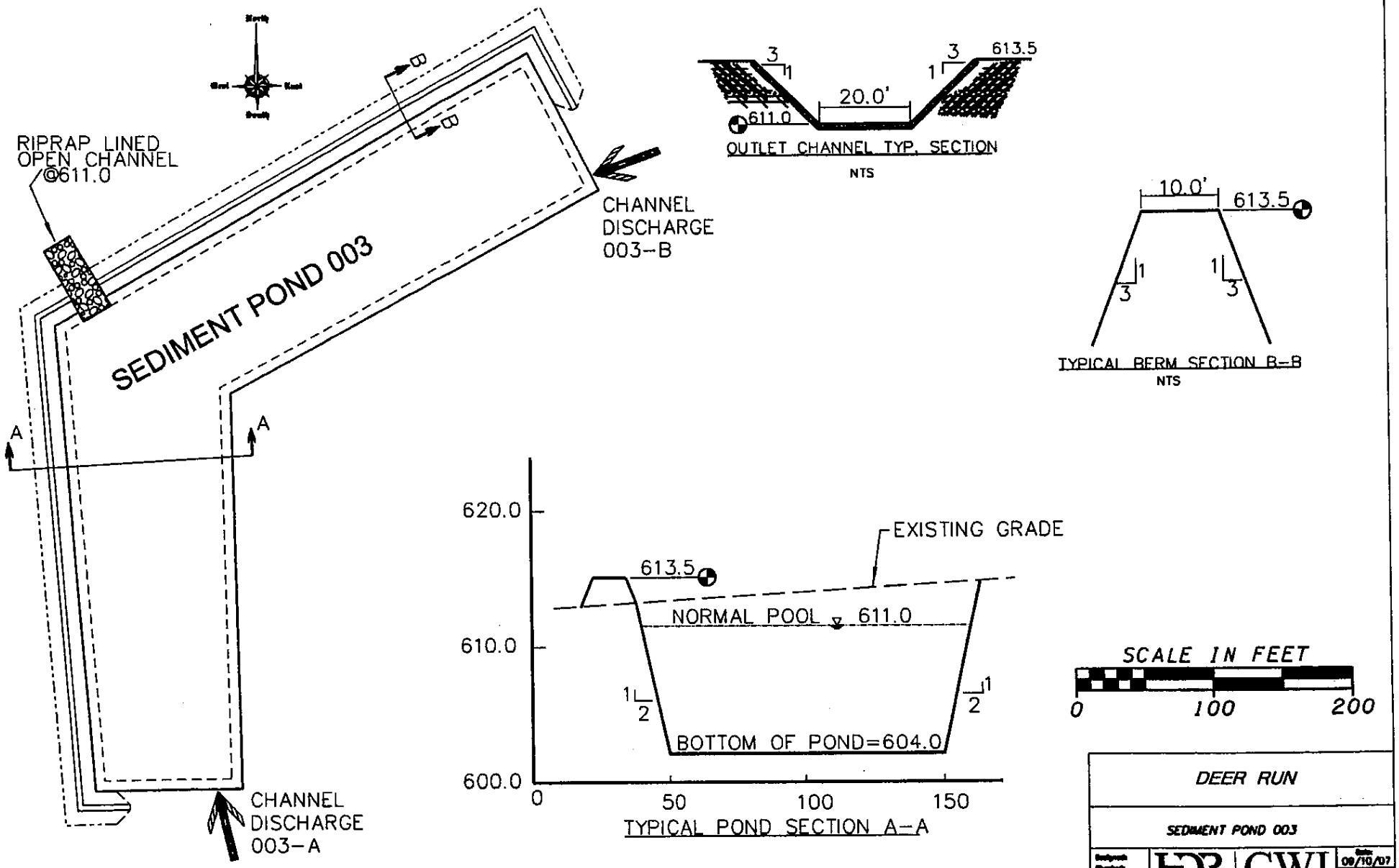
Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	27.000	0.117	0.000	0.000	98.000	M	96.81	10.037
	Σ	**27.000**						**96.81**	**10.037**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	7. Paved area and small upland gullies	2.00	24.00	1,200.00	2.840	0.117
#1	**1**	**Time of Concentration:**					**0.117**

Inflow/Outflow Hydrographs for Structure # 1





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Hillsboro Energy LLC
Sediment Pond No. 003

Gary Raines

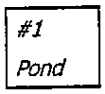
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	10 yr - 24 hr
Rainfall Depth:	4.700 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Pond	#1	==>	End	0.000	0.000	Pond 003



Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	In	35.100	35.100	68.06	10.41
	Out			57.19	10.41

Structure Detail:

Structure #1 (Pond)

Pond 003

Pond Inputs:

Initial Pool Elev:	611.00 ft
Initial Pool:	8.50 ac-ft

Broad-crested Weir

Weir Width (ft)	Spillway Elev (ft)
20.00	611.00

Pond Results:

Peak Elevation:	611.94 ft
Dewater Time:	0.63 days

Dewatering time is calculated from peak stage to lowest spillway

Elevation-Capacity-Discharge Table

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
604.00	1.070	0.000	0.000		
604.50	1.087	0.539	0.000		
605.00	1.105	1.087	0.000		
605.50	1.122	1.644	0.000		
606.00	1.140	2.210	0.000		
606.50	1.157	2.784	0.000		
607.00	1.175	3.367	0.000		
607.50	1.192	3.959	0.000		
608.00	1.210	4.559	0.000		
608.50	1.244	5.173	0.000		
609.00	1.278	5.803	0.000		
609.50	1.313	6.451	0.000		
610.00	1.348	7.116	0.000		
610.50	1.384	7.799	0.000		
611.00	1.420	8.500	0.000		Spillway #1
611.50	1.469	9.222	21.828	14.20	
611.94	1.513	9.884	57.188	0.80	Peak Stage

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)
612.00	1.518	9.969	61.740	
612.50	1.569	10.741	113.424	
613.00	1.620	11.538	174.627	

Detailed Discharge Table

Elevation (ft)	Broad-crested Weir (cfs)	Combined Total Discharge (cfs)
604.00	0.000	0.000
604.50	0.000	0.000
605.00	0.000	0.000
605.50	0.000	0.000
606.00	0.000	0.000
606.50	0.000	0.000
607.00	0.000	0.000
607.50	0.000	0.000
608.00	0.000	0.000
608.50	0.000	0.000
609.00	0.000	0.000
609.50	0.000	0.000
610.00	0.000	0.000
610.50	0.000	0.000
611.00	0.000	0.000
611.50	21.828	21.828
612.00	61.740	61.740
612.50	113.424	113.424
613.00	174.627	174.627

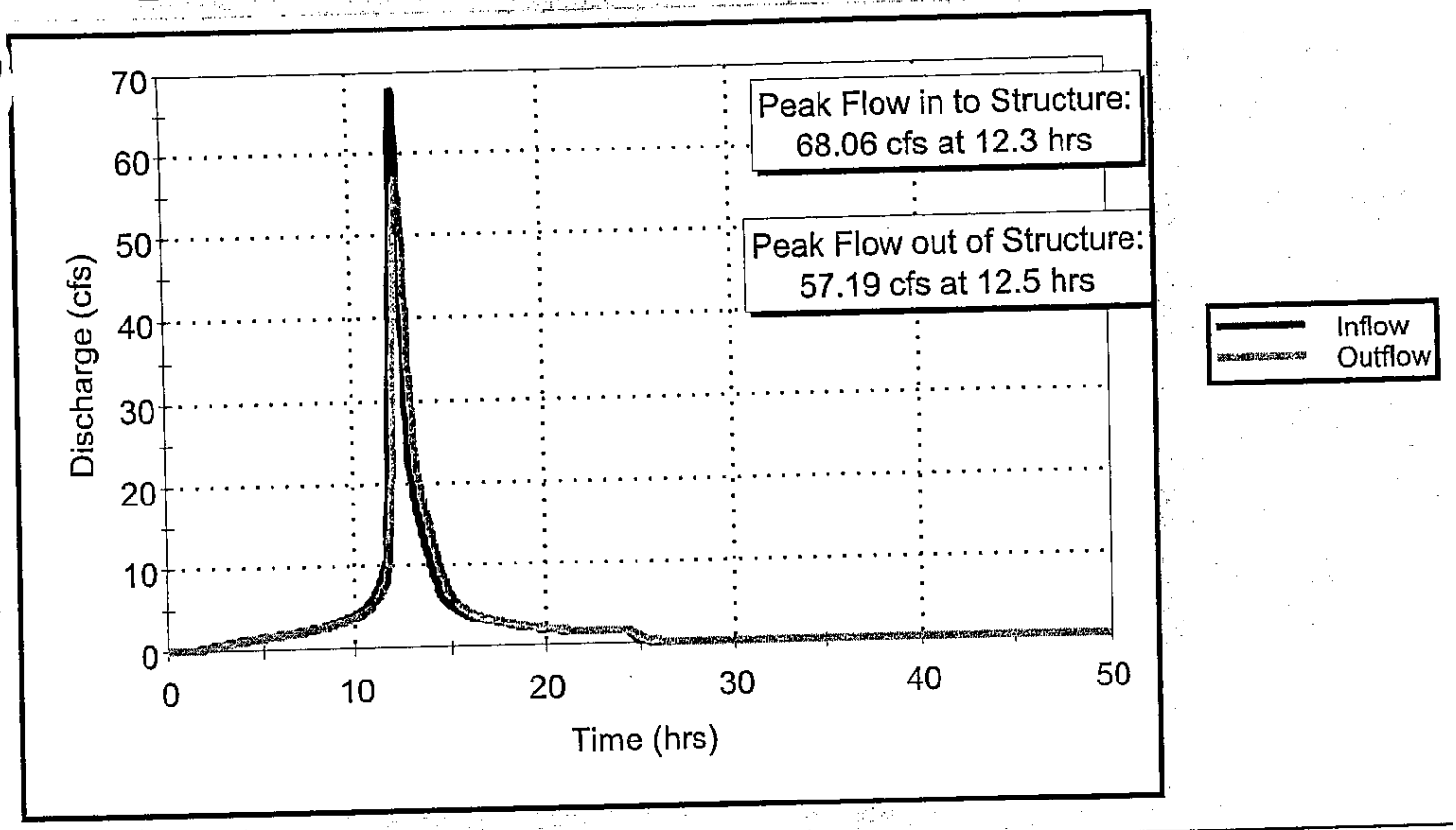
Subwatershed Hydrology Detail:

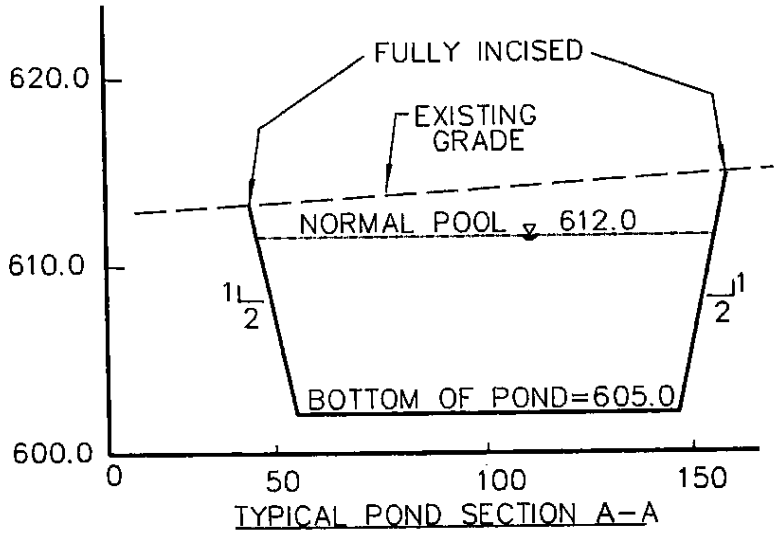
Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	35.100	0.598	0.000	0.000	98.000	M	68.06	10.411
	Σ	**35.100**						**68.06**	**10.411**

Subwatershed Time of Concentration Details:

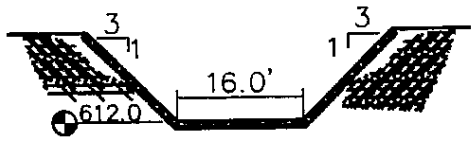
Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	7. Paved area and small upland gullies	0.69	25.00	3,600.00	1.670	0.598
#1	**1**	**Time of Concentration:**					**0.598**

Inflow/Outflow Hydrographs for Structure # 1



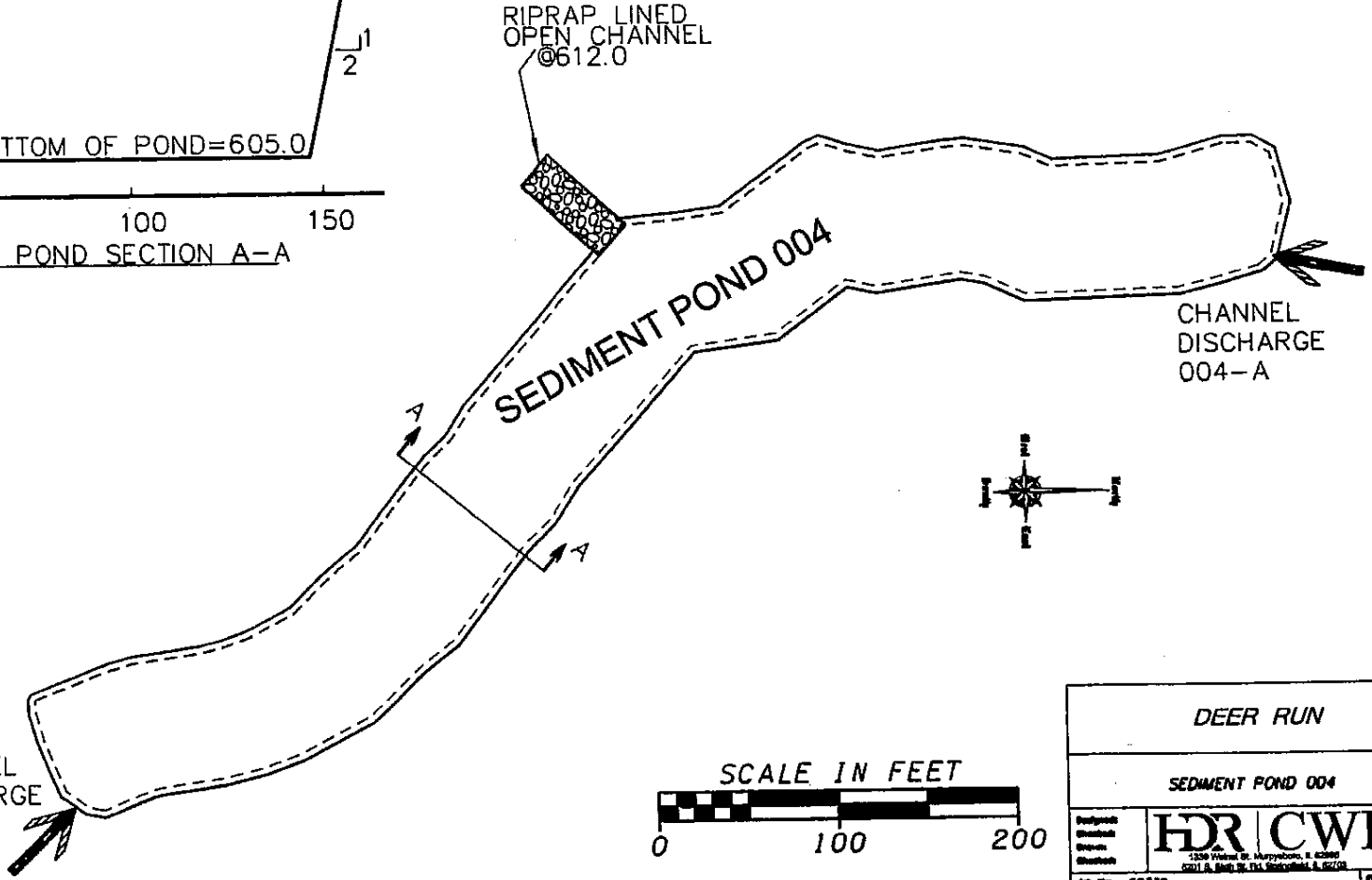


TYPICAL POND SECTION A–A



OUTLET CHANNEL TYP. SECTION

NTS



DEER RUN

SEDIMENT POND 004

HDR | CWI

09/10/07

66339

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Hillsboro Energy LLC
Sediment Pond No. 004

Gary Raines

General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	10 yr - 24 hr
Rainfall Depth:	4.700 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Pond	#1	==>	End	0.000	0.000	Pond 004

Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	In	57.000	57.000	109.61	13.58
	Out			87.90	13.58

Structure Detail:

Structure #1 (Pond)

Pond 004

Pond Inputs:

Initial Pool Elev:	612.00 ft
Initial Pool:	7.78 ac-ft

Broad-crested Weir

Weir Width (ft)	Spillway Elev (ft)
16.00	612.00

Pond Results:

Peak Elevation:	613.47 ft
Dewater Time:	0.64 days

Dewatering time is calculated from peak stage to lowest spillway

Elevation-Capacity-Discharge Table

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
605.00	0.850	0.000	0.000		
605.50	0.885	0.434	0.000		
606.00	0.920	0.885	0.000		
606.50	0.956	1.354	0.000		
607.00	0.994	1.841	0.000		
607.50	1.031	2.348	0.000		
608.00	1.070	2.873	0.000		
608.50	1.109	3.418	0.000		
609.00	1.149	3.982	0.000		
609.50	1.189	4.566	0.000		
610.00	1.230	5.171	0.000		
610.50	1.267	5.795	0.000		
611.00	1.304	6.438	0.000		
611.50	1.342	7.099	0.000		
612.00	1.380	7.780	0.000		Spillway #1
612.50	1.436	8.484	17.463	13.90	
613.00	1.493	9.216	49.392	1.00	

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
613.47	1.547	9.924	87.904	0.50	Peak Stage
613.50	1.551	9.976	90.739		
614.00	1.610	10.767	139.702		

Detailed Discharge Table

Elevation (ft)	Broad-crested Weir (cfs)	Combined Total Discharge (cfs)
605.00	0.000	0.000
605.50	0.000	0.000
606.00	0.000	0.000
606.50	0.000	0.000
607.00	0.000	0.000
607.50	0.000	0.000
608.00	0.000	0.000
608.50	0.000	0.000
609.00	0.000	0.000
609.50	0.000	0.000
610.00	0.000	0.000
610.50	0.000	0.000
611.00	0.000	0.000
611.50	0.000	0.000
612.00	0.000	0.000
612.50	17.463	17.463
613.00	49.392	49.392
613.50	90.739	90.739
614.00	139.702	139.702

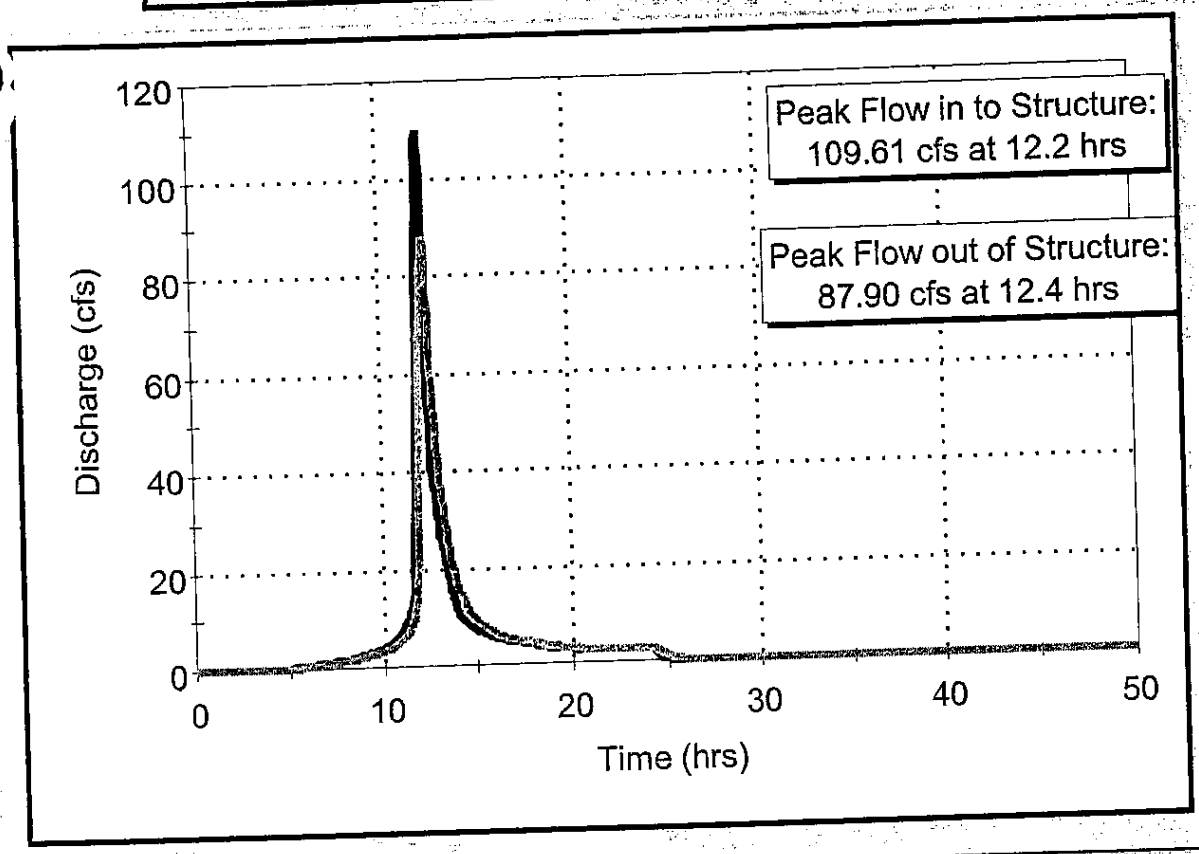
Subwatershed Hydrology Detail:

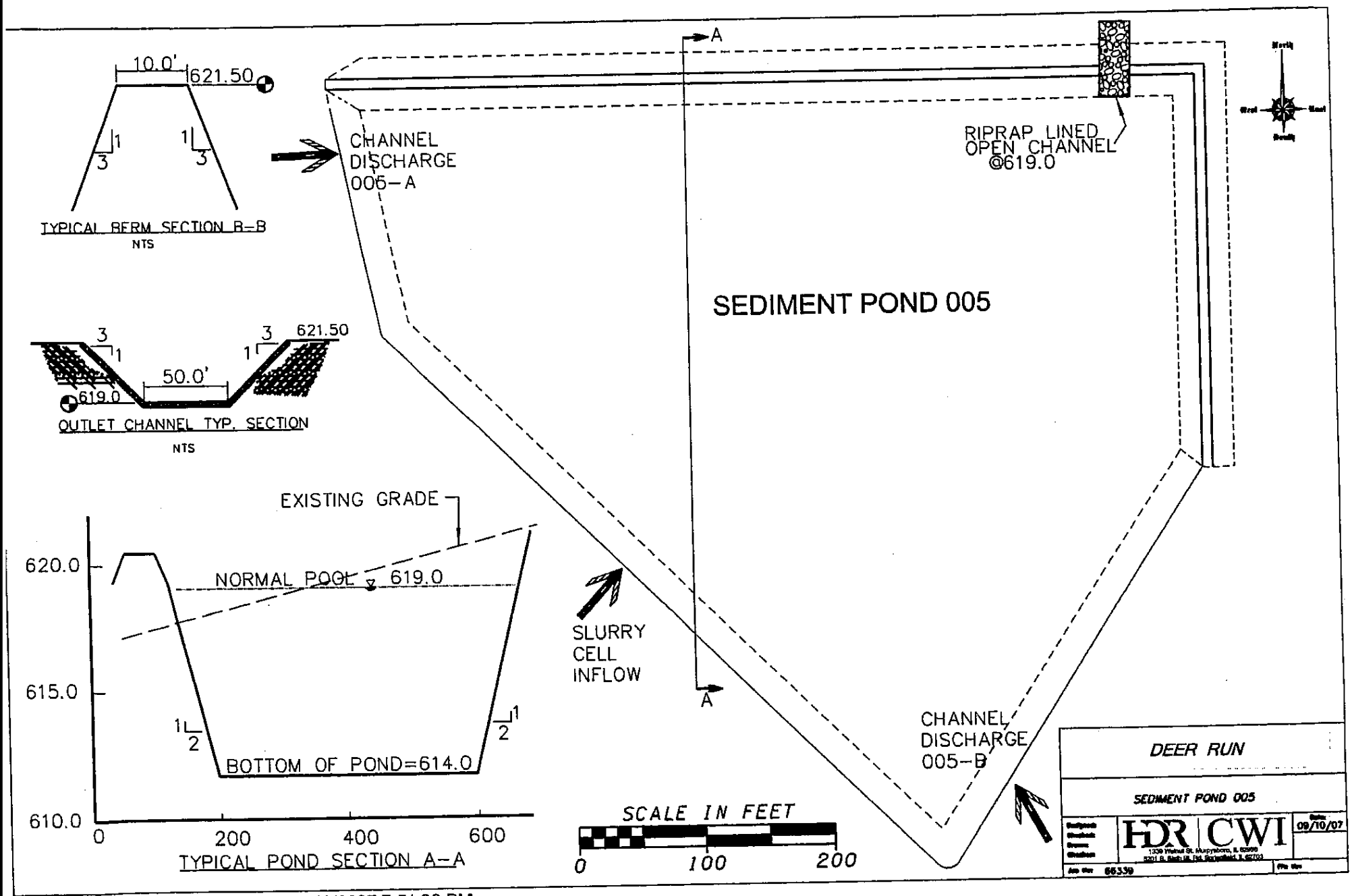
Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	57.000	0.450	0.000	0.000	90.000	M	109.61	13.581
	Σ	**57.000**						**109.61**	**13.581**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	6. Grassed waterway	0.56	10.00	1,800.00	1.110	0.450
#1	**1**	**Time of Concentration:**					**0.450**

Inflow/Outflow Hydrographs for Structure # 1





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Hillsboro Energy LLC
Sediment Pond No. 005

Gary Raines

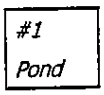
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	100 yr - 6 hr
Rainfall Depth:	4.900 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Pond	#1	==>	End	0.000	0.000	Sed Pond No. 005



Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	In	158.000	158.000	442.19	40.82
	Out			283.20	40.82

Structure Detail:

Structure #1 (Pond)

Sed Pond No. 005

Pond Inputs:

Initial Pool Elev:	619.00 ft
Initial Pool:	39.65 ac-ft

Broad-crested Weir

Weir Width (ft)	Spillway Elev (ft)
50.00	619.00

Pond Results:

Peak Elevation:	620.50 ft
Dewater Time:	0.47 days

Dewatering time is calculated from peak stage to lowest spillway

Elevation-Capacity-Discharge Table

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
614.00	7.800	0.000	0.000		
614.50	7.825	3.906	0.000		
615.00	7.850	7.825	0.000		
615.50	7.875	11.756	0.000		
616.00	7.900	15.700	0.000		
616.50	7.925	19.656	0.000		
617.00	7.950	23.625	0.000		
617.50	7.975	27.606	0.000		
618.00	8.000	31.600	0.000		
618.50	8.050	35.612	0.000		
619.00	8.100	39.650	0.000		Spillway #1
619.50	8.200	43.725	54.571	9.20	
620.00	8.300	47.850	154.350	1.30	
620.50	8.399	52.013	283.196	0.75	Peak Stage
620.50	8.399	52.024	283.559		
621.00	8.499	56.249	436.568		
621.50	8.599	60.523	610.122		

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)
622.00	8.700	64.848	802.026	

Detailed Discharge Table

Elevation (ft)	Broad-crested Weir (cfs)	Combined Total Discharge (cfs)
614.00	0.000	0.000
614.50	0.000	0.000
615.00	0.000	0.000
615.50	0.000	0.000
616.00	0.000	0.000
616.50	0.000	0.000
617.00	0.000	0.000
617.50	0.000	0.000
618.00	0.000	0.000
618.50	0.000	0.000
619.00	0.000	0.000
619.50	54.571	54.571
620.00	154.350	154.350
620.50	283.559	283.559
621.00	436.568	436.568
621.50	610.122	610.122
622.00	802.026	802.026

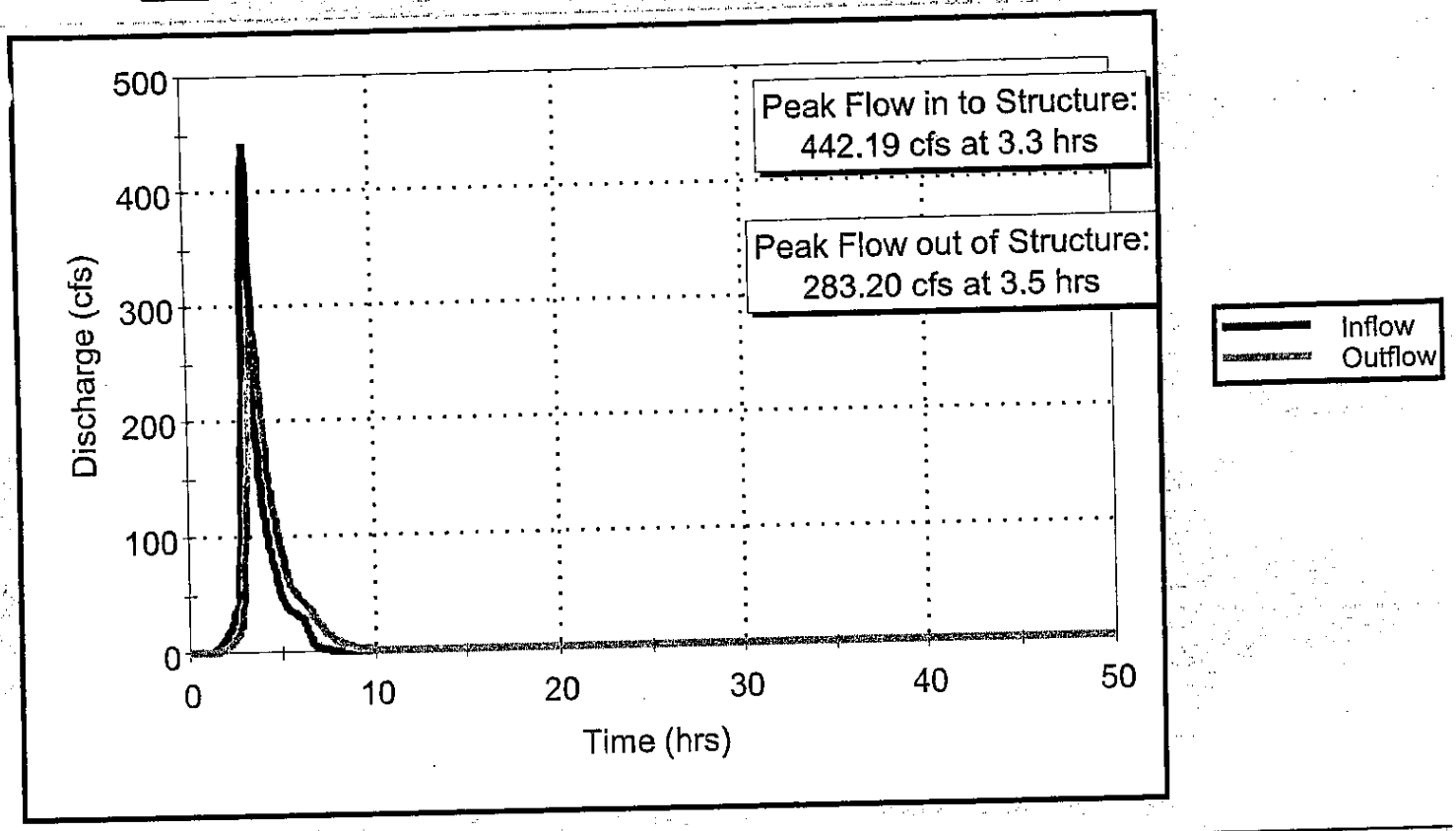
Subwatershed Hydrology Detail:

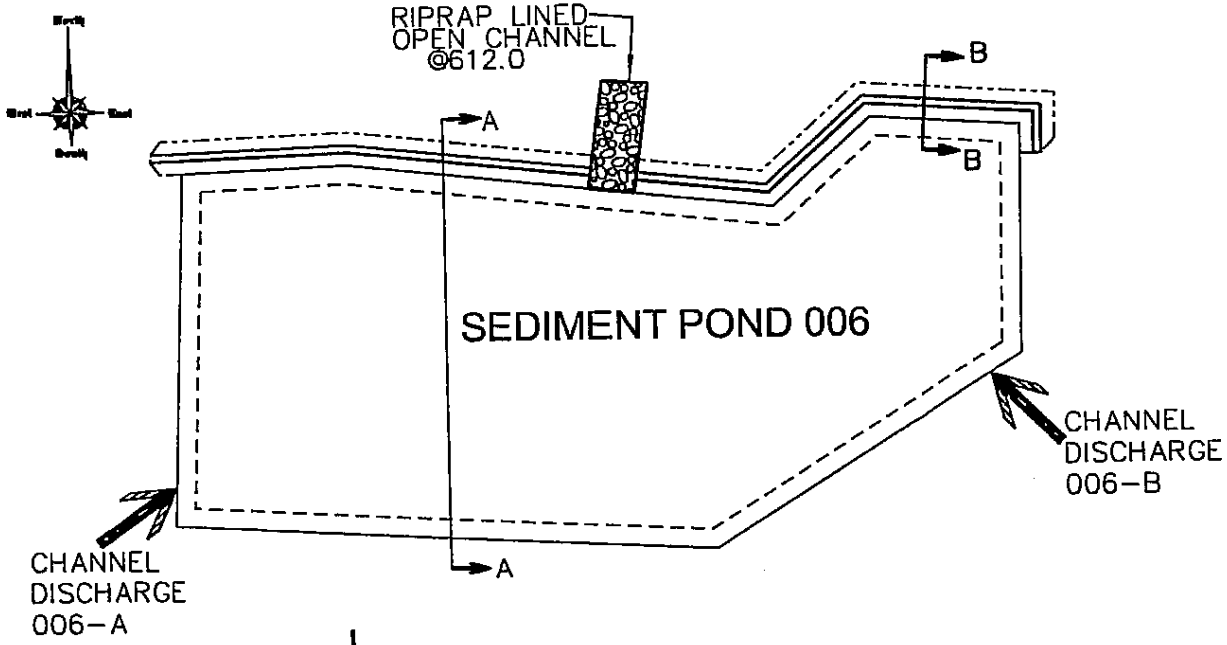
Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	158.000	0.477	0.000	0.000	91.000	M	442.19	40.817
	Σ	**158.000**						**442.19**	**40.817**

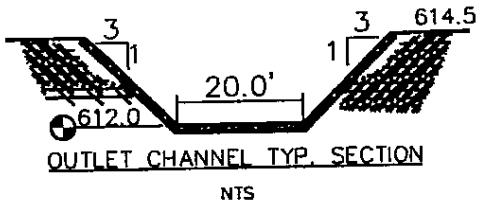
Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	5. Nearly bare and untilled, and alluvial valley fans	2.68	75.00	2,800.07	1.630	0.477
#1	**1**	**Time of Concentration:**					**0.477**

Inflow/Outflow Hydrographs for Structure # 1

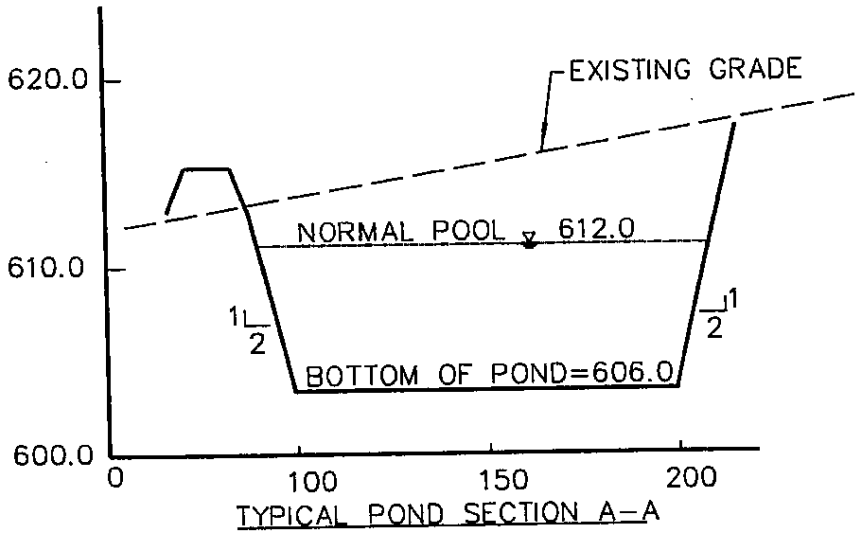




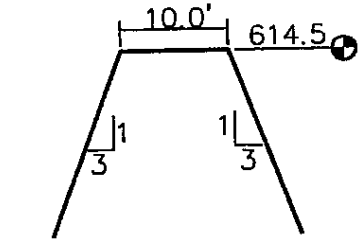


OUTLET CHANNEL TYP. SECTION

NTS



TYPICAL POND SECTION A-A



TYPICAL BERM SECTION B-B

NTS

SCALE IN FEET

0 100 200

DEER RUN

SEDIMENT POND 006

HDR | CWI

09/10/07

66339

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Hillsboro Energy LLC
Sediment Pond 006

(Revised Location)

Gary Raines

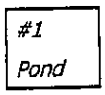
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	10 yr - 24 hr
Rainfall Depth:	4.700 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Pond	#1	==>	End	0.000	0.000	Pond 006 rev.



Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	In	65.000	65.000	146.21	16.01
	Out			111.70	16.01

Structure Detail:

Structure #1 (Pond)

Pond 006 rev.

Pond Inputs:

Initial Pool Elev:	612.00 ft
Initial Pool:	10.89 ac-ft

Broad-crested Weir

Weir Width (ft)	Spillway Elev (ft)
20.00	612.00

Pond Results:

Peak Elevation:	613.48 ft
Dewater Time:	0.65 days

Dewatering time is calculated from peak stage to lowest spillway

Elevation-Capacity-Discharge Table

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
606.00	1.630	0.000	0.000		
606.50	1.660	0.822	0.000		
607.00	1.689	1.660	0.000		
607.50	1.720	2.512	0.000		
608.00	1.750	3.379	0.000		
608.50	1.782	4.262	0.000		
609.00	1.814	5.161	0.000		
609.50	1.847	6.077	0.000		
610.00	1.880	7.009	0.000		
610.50	1.910	7.956	0.000		
611.00	1.940	8.918	0.000		
611.50	1.970	9.895	0.000		
612.00	2.000	10.888	0.000		Spillway #1
612.50	2.044	11.899	21.828	14.50	
613.00	2.089	12.932	61.740	0.75	
613.48	2.133	13.953	111.700	0.45	Peak Stage
613.50	2.134	13.988	113.424		

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)
614.00	2.180	15.067	174.627	

Detailed Discharge Table

Elevation (ft)	Broad-crested Weir (cfs)	Combined Total Discharge (cfs)
606.00	0.000	0.000
606.50	0.000	0.000
607.00	0.000	0.000
607.50	0.000	0.000
608.00	0.000	0.000
608.50	0.000	0.000
609.00	0.000	0.000
609.50	0.000	0.000
610.00	0.000	0.000
610.50	0.000	0.000
611.00	0.000	0.000
611.50	0.000	0.000
612.00	0.000	0.000
612.50	21.828	21.828
613.00	61.740	61.740
613.50	113.424	113.424
614.00	174.627	174.627

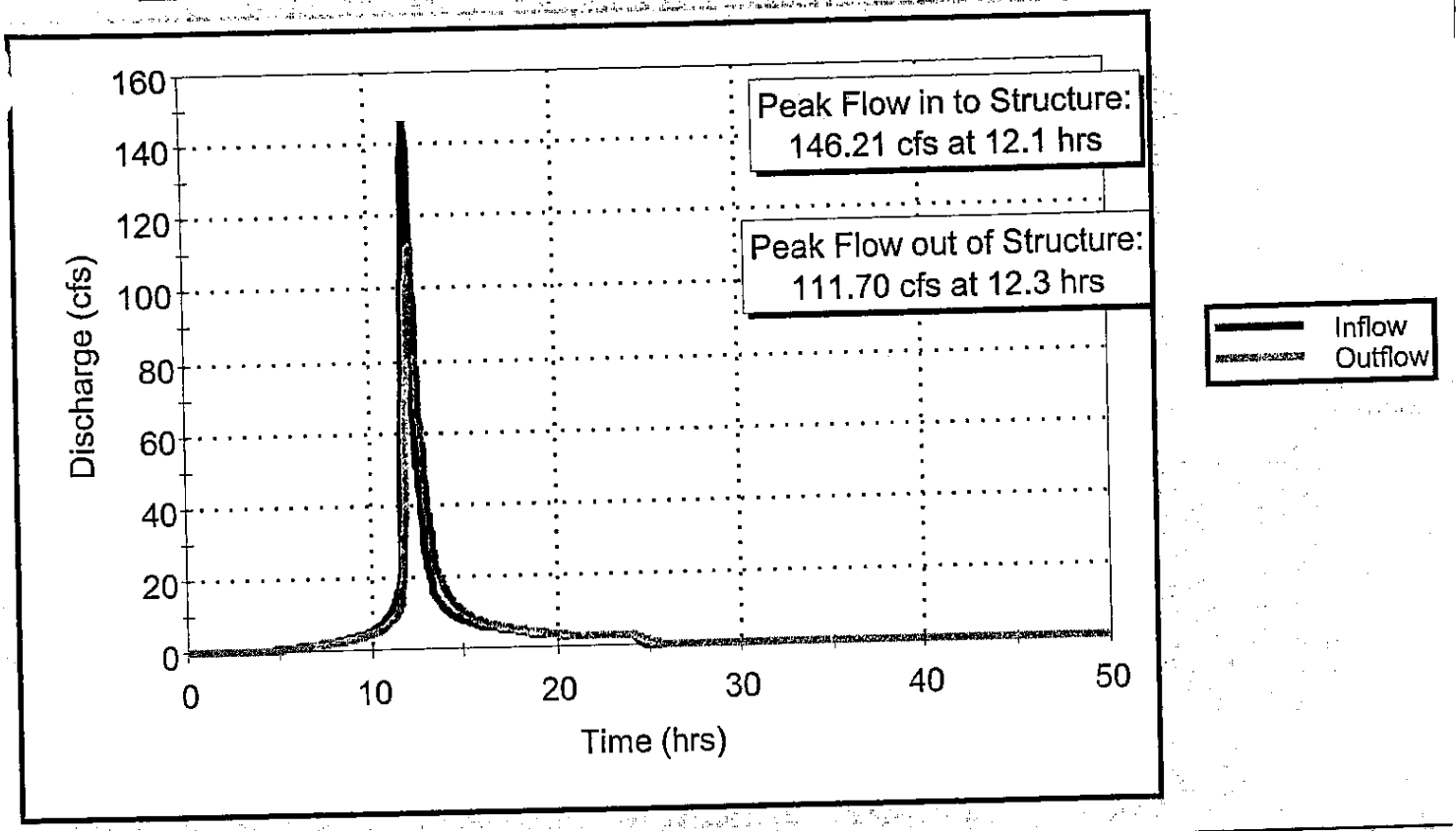
Subwatershed Hydrology Detail:

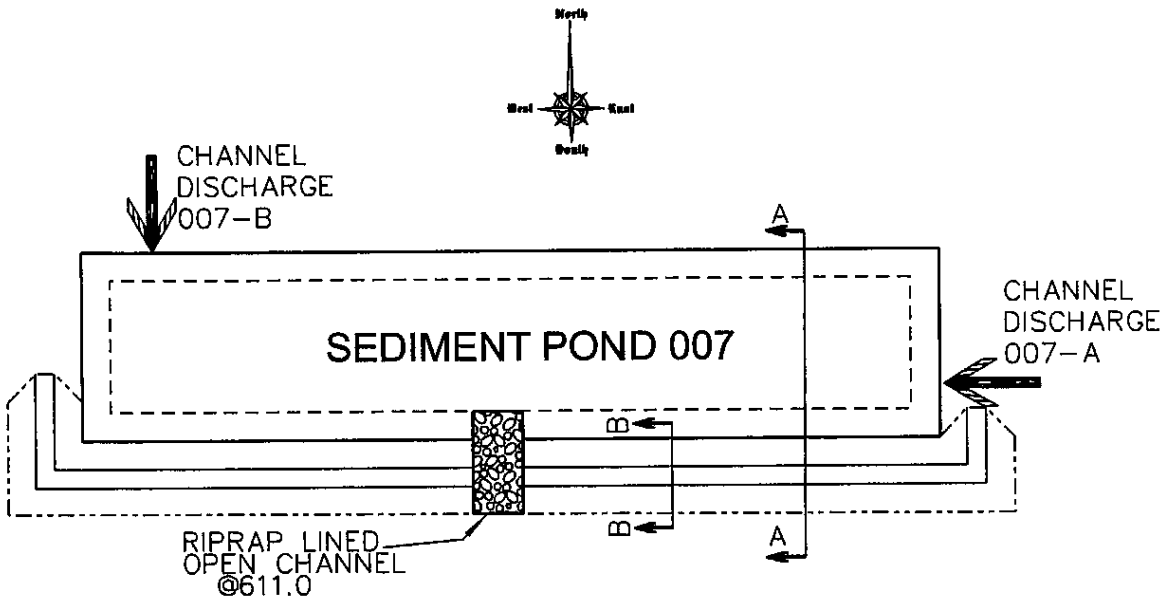
Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	65.000	0.271	0.000	0.000	91.000	M	146.21	16.013
	Σ	**65.000**						**146.21**	**16.013**

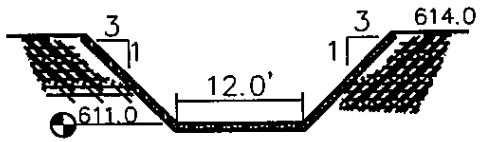
Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	4. Cultivated, straight row	3.82	65.00	1,700.00	1.740	0.271
#1	**1**	**Time of Concentration:**					**0.271**

Inflow/Outflow Hydrographs for Structure # 1

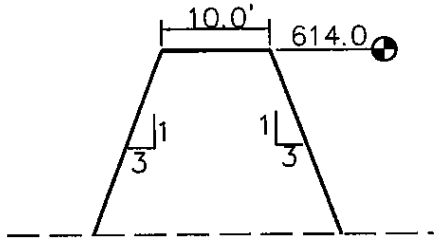






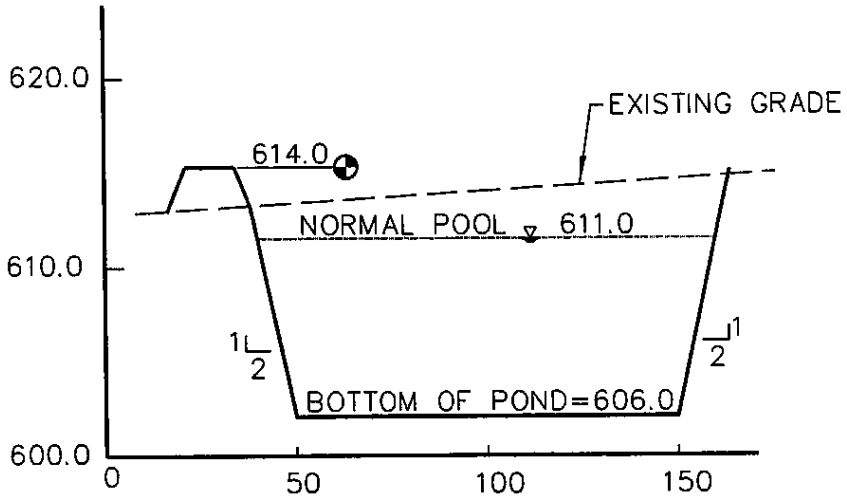
OUTLET CHANNEL TYP. SECTION

NTS



TYPICAL BERM SECTION B-B

NTS



TYPICAL POND SECTION A-A

NTS

SCALE IN FEET

0 100 200

DEER RUN

SEDIMENT POND 007

HDR | CWI

1330 Walnut St. Murphysboro, IL 62966
6201 S. Sixth St. Rd. Springfield, IL 62703

Date 10/09/07

Job No. 66339

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Sediment Pond # 007
Hillsboro Energy, LLC

Gary Raines

General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	25 yr - 6 hr
Rainfall Depth:	4.000 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Pond	#1	==>	End	0.000	0.000	Pond 007

Structure Summary:

		Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	In	28.400	28.400	68.63	0.00
	Out			50.19	0.00

Structure Detail:

Structure #1 (Pond)

Pond 007

Pond Inputs:

Initial Pool Elev:	611.00 ft
Initial Pool:	4.37 ac-ft

Broad-crested Weir

Weir Width (ft)	Spillway Elev (ft)
12.00	611.00

Pond Results:

Peak Elevation:	612.21 ft
Dewater Time:	0.26 days

Dewatering time is calculated from peak stage to lowest spillway

Elevation-Capacity-Discharge Table

Elevation	Area (ac)	Capacity (ac-ft)	Discharge (cfs)	Dewater Time (hrs)	
606.00	0.750	0.000	0.000		
606.50	0.775	0.381	0.000		
607.00	0.800	0.775	0.000		
607.50	0.824	1.181	0.000		
608.00	0.849	1.599	0.000		
608.50	0.874	2.030	0.000		
609.00	0.900	2.474	0.000		
609.50	0.925	2.930	0.000		
610.00	0.949	3.398	0.000		
610.50	0.975	3.879	0.000		
611.00	1.000	4.373	0.000		Spillway #1
611.50	1.037	4.882	13.097	5.35	
612.00	1.074	5.410	37.044	0.70	
612.21	1.090	5.641	50.193	0.20	Peak Stage
612.50	1.112	5.956	68.054		
613.00	1.150	6.521	104.776		

Detailed Discharge Table

Elevation (ft)	Broad-crested Weir (cfs)	Combined Total Discharge (cfs)
606.00	0.000	0.000
606.50	0.000	0.000
607.00	0.000	0.000
607.50	0.000	0.000
608.00	0.000	0.000
608.50	0.000	0.000
609.00	0.000	0.000
609.50	0.000	0.000
610.00	0.000	0.000
610.50	0.000	0.000
611.00	0.000	0.000
611.50	13.097	13.097
612.00	37.044	37.044
612.50	68.054	68.054
613.00	104.776	104.776

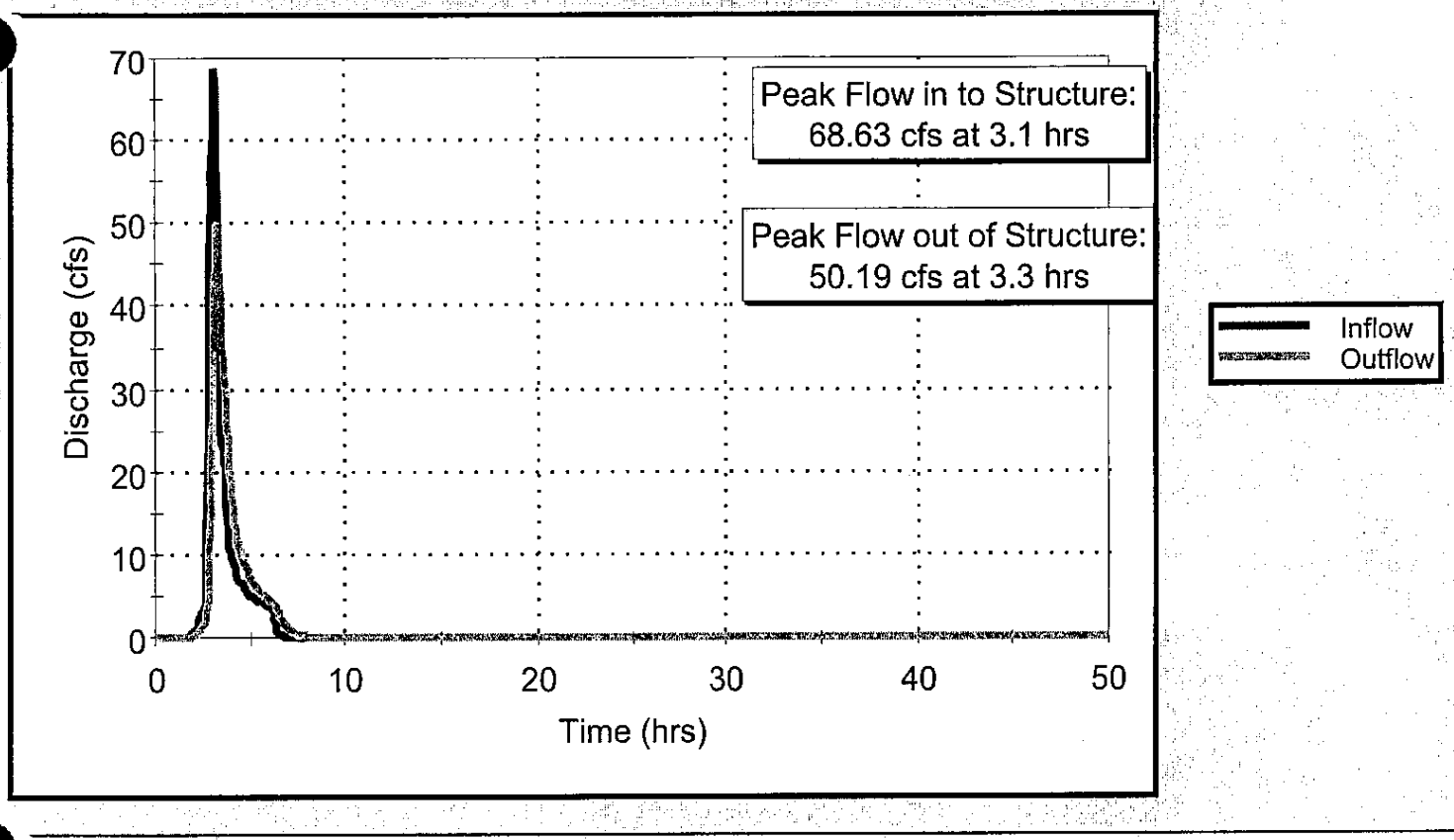
Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	28.400	0.205	0.000	0.000	86.000	M	68.63	4.811
	Σ	**28.400**						**68.63**	**0.000**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	6. Grassed waterway	2.35	40.00	1,700.00	2.300	0.205
#1	**1**	**Time of Concentration:**					**0.205**

Inflow/Outflow Hydrographs for Structure # 1



PART V

PART V

RECLAMATION PLAN

1) Provide a reclamation plan outlining proposed reclamation of the lands within the proposed permit area. The reclamation plan shall include the following:

A) Provide for each major step in the proposed reclamation plan a detailed timetable for completion.

Response: ***When permanent cessation of operations occurs, final reclamation of the mine site will commence immediately and be completed in accordance with the approved reclamation plan and the permit conditions developed in accordance with Chapter I, Section 1817.62 Illinois Administrative Code. The timeframes and limits established in 62 IAC 1817.01 and 1817.113 will govern the reclamation Activities. If variances or extensions are necessary, timely requests will be made to the Department for approval.***

Following the recovery of useable underground mining equipment, the mine ventilation shafts and slope portal will be backfilled and sealed in accordance with pertinent state and federal regulations. Mine facilities and structures not required to support the approved post-mining land use will be removed. All usable materials and structures will be salvaged and sold if economically possible. Obsolete structures and equipment will be scrapped and removed from the mine site. Disturbed areas will be graded to conform to the approved configuration and slopes required to support the post-mining land use. See Part V.1.F for a discussion of the final coverage of potentially toxic areas.

Soil replacement and vegetation establishment are dictated by seasonal weather conditions. Soil placement will generally be accomplished during the drier months of the year to avoid undesirable compaction. Soil materials required for the reclamation effort will be obtained from stockpiled soils removed prior to disturbance by the mining operations, borrow areas in the vicinity of the refuse disposal areas or from material dredged from local lakes or stream channels. Borrow areas used as sources for cover material will be graded to approximate original contour to blend into the surrounding topography and revegetated in accordance with the proved post-mining land use plan. Soil materials will be replaced and vegetation established in accordance with the approved post-mining land uses. Reclaimed areas will be planted during the first normal period of favorable planting conditions following replacement of the soil materials. All surface and groundwater monitoring will continue until the agencies with authority over this function approve discontinuing the monitoring.

Refer to Attachment V.1.B for the detailed itemization of the cost of reclamation for the proposed surface mining operations to be covered by a performance bond.

B) Provide a detailed estimate of the cost of reclamation for the proposed surface mining operation required to be covered by a performance bond. Provide calculations and/or drawings, cross sections, maps, etc. to support the reclamation cost estimate.

Provide extra calculations for multiple portals or refuse areas.

The estimate of the cost of reclamation should be based on the following:

1) REFUSE

a.

Gob Pile(s)	*1*	
Initial Height	*0*	
Final Height	*75'*	
Average Bottom Diameter	*7,430'*	
Lime Appl. (Tons/Ac)	*7*	

Cover Thickness	*4'*	
Method of Replacement	*Haulage Equip*	
Average Haul Distance	*1,800'*	

Response: ***Refer to Attachment V.I.B.***

b. Gob and Slurry Disposal * Below grade or in levees

Cover Thickness	*4'*	
Method of Replacement	*Haulage Equip*	
Average Haul Distance	*2,500'*	
Lime Appl. (Tons/Ac)	*7*	

2) SUPPORT AREAS (Use separate sheets for each portals)

Support Structure Dimensions

a.

Structure	Height ft.	Width ft.	Length ft.
Prep Plant	*70'*	*88'*	*400'*
Prep Plant			
Pole Barn 1			
Pole Barn 2			
Misc. Bldg Wood & Metal 1	*30'*	*150'*	*225'*
Misc. Bldg Wood & Metal 2	*30'*	*100'*	*130'*
Misc. Bldg Wood & Metal 3	*30'*	*150'*	*225'*
Misc. Bldg Masonry 1			
Misc. Bldg Masonry 2			
Misc. Bldg Masonry 3			
Misc. Bldg Steel 1	*40'*	*130'*	*190'*
Misc. Bldg Steel 2	*30'*	*130'*	*190'*
Misc. Bldg Steel 3			

b.

Concrete Structures	Structure ID	Height ft.	Width ft.	Length ft.
Reinforced	*Thickeners (2)*	*20'*	*120'*	*120' (circle)*
Reinforced				
Reinforced				

c.

Silos	Structure ID	Height ft.	Diameter ft.	Thickness ft.
	None			

d.

Paving	Structure ID	Width ft.	Length ft.
Concrete	*None*		
Concrete			
Concrete			
Asphalt			
Asphalt			
Asphalt			

e.

Conveyors	Length
Conveyor 1	*280'*
Conveyor 2	*930'*
Conveyor 3	*960'*
Conveyor 4	*1,014'*
Conveyor 5	*990'*
Conveyor 6	*1,495'*
Conveyor 7	*5,520'*

3) Railroads to be Removed Length *25,150'*

4) Haul Roads to be Removed

Width	Length	Thickness
24'	*8,900'*	*2'*

5) Support Area Liming (Acres) Non-Refuse (for areas required to have more than topsoil replaced) *None*

Lime Appl. (Tons/Ac) _____
Subsoil Cover Thickness _____
Method of Replacement _____
Average Haul Distance _____

6) Indicate location and size of buried volatile material storage facilities.

Response: ***There are no buried volatile material storage facilities. All fuel storage facilities will be above ground tanks.***

C) Backfilling and Grading

Provide a plan for backfilling, soil stabilization, compacting and grading, with contour map or cross-sections showing the anticipated final surface configuration of the proposed permit area (in accordance with 62 Ill. Adm. Code 1817.102 through 1817.107). The plan shall include the following:

1) Describe how approximate original contour will be achieved. Discuss method(s) to be employed for overburden removal, spoil placement, and grading, including the removal and redistribution of soil. Mention type of equipment to be used for each phase of work.

Response: ***Backfilling and regrading procedures will be accomplished by using scrapers, dozers, loaders, and/or trucks to grade the disturbed areas and to re-distribute the stored subsoil and topsoil. Rough regrading will restore the areas to the approximate original contour and final grading will be performed using the topsoil material. In permitted areas adjacent to undisturbed areas, regrading will be blended with the adjacent undisturbed grades.***

Approximate original contour will not be achieved in the vicinity of the refuse disposal areas. The refuse areas will be at a higher elevation than the natural ground elevation. The out slopes of the refuse disposal areas will be graded no steeper than 3H:1V. After toxic and/or potentially toxic material from the mine site has been disposed of in the refuse area, the refuse area will be covered with stored soil and topsoil. Soils from the storage areas adjacent to the refuse areas will be trucked to the sites and dozers will spread the topsoil material to a depth of capable of supporting the post mining vegetation.

Backfilling and regrading operations will be achieved by using scrapers, dozers, loaders and/or trucks. Topsoil material (topsoil and subsoil) will be redistributed throughout the permitted area in a method that will allow for proper soil depth placement and minimize soil compaction.

The minimization of soil compaction will allow for a better root medium and promote plant growth. In the mine site area, topsoil depth will be the approximate thickness of pre-mining conditions.

2) Provide sufficient contour maps and cross-sections to show the anticipated final surface configuration of the proposed permit area when reclamation work is completed.

Response: ***All the area affected by the installation of surface facilities will be final graded to approximate original contour except for those areas to be reclaimed to water facilities and the refuse areas. Typical cross sections of the anticipated final configuration of the refuse areas are included herein as Attachment V.1.C.3.***

3) The areas other than those reclaimed to the standards of high capability lands and prime farmlands, describe all water and erosion control structures to be constructed such as terraces, diversions, etc.

Response: ***Methods to deter erosion of the reclaimed area will include, but not be limited to, the use of terraces, ditches, hay bales, silt fence, vegetation, erosion control matting, and/or riprap. Other methods may be used for site-specific situations. Design criteria for these alternate means of sediment control will be in accordance with the NRCS design criteria and shall meet post construction certification requirements.***

4) Describe the timing in which all grading and the construction and removal or renovation of water and erosion control structures will be complete and the sequence for accomplishing the work in relation to seasonal weather conditions.

Response: ***Grading and construction and the removal or renovation of water and erosion control structures will occur between April 1 and November 15. This time schedule will allow for revegetation and mulching of the disturbed areas. Unforeseen situations may require for the construction of structures during adverse weather conditions. If this should occur, a temporary vegetation seed mixture will be used until the area can be seeded with a permanent seed mixture.***

The same time schedule of April 1 through November 15 will be used for the removal and/or renovation of structures. Prior to this type of work being conducted, approval will be received from the appropriate regulatory agencies. Work will be performed in accordance with accepted engineering and conservation practices.

5) Are any roads constructed to facilitate surface coal mining operations proposed to be permanent?

Yes ___*X*___ No _____

If yes, locate on the reclamation map. Provide the information required for Part IV 5)C)2) to describe each post-mining road if it is to be modified. Include appropriate discussion how modifications will be accomplished including the removal and disposition of any excess road material.

Response: ***Refer to Mining Reclamation Map (Map 7). For roads to be as part of the final reclamation of the area, the basic road configuration will not be changed during the reclamation process. Such roads will, however, be cleaned of any potentially toxic forming materials, with such material to be disposed of in the refuse areas prior to reclamation of these areas. The remaining roads will be given a final grading, and any areas which require maintenance will be brought up to standards consistent with applicable regulations.***

D) Provide a plan for revegetation of the proposed permit area including but not limited to the following:

1) Provide a schedule of revegetation for each reclamation area or subarea within the permit area.

Response: ***Upon completion of grading activities, areas will be stabilized using cover crops, as stated below, and/or by applying mulch. The approved species will then be seeded to provide vegetative cover in accordance with the post-mining land use.***

2) a) For areas other than forest and/or wildlife habitat planting, list the species and seeding rates on a per acre basis for each species proposed to be utilized.

Response:

Seed	***Rate (lb/ acre)***
Redtop	***10***
Perennial Rye Grass	***5***
Orchard Grass	***10***
Korean Lespedeza	***5***
Red Clover	***15***
Spring Oats (spring seeding)	***50***
Winter Wheat (fall seeding)	***40***
Mulch (straw or mixed hay)	***2 tons/ acre***

Note: mulch application in critical areas only

b) For forestry and/or wildlife habitat areas, list the planned species and density on a per acre basis of trees, shrubs and herbaceous cover to be seeded and planted.

Response: ***Refer to the above list for herbaceous cover to be established.***

Wildlife Trees	
Green/White Ash	***15%***
Red/Silver/Sugar Maple	***15%***
Sweet/Red Gum	***15%***
Sycamore	***15%***
Oaks (Pin, Red, Black, Swamp, White, Shingle, Sawtooth, Burr)	***15%***
Other*	***25%***

Other* ***(to be selected from the following list dependent on availability and conditions)***

Button Bush	***Hackberry***	***Cypress***
Bicolor Lespedeza	***Red Bud***	***Mulberry***
Dogwood	***Sumac***	***Chestnut***
Crabapple	***Red Cedar***	***Pecan***
Hawthorn	***Persimmon***	***Elm***
River Birch	***Black Walnut***	***Elm***

Density per acre: wildlife tree plantings will be made on an 8' X 8' spacing, for a planting rate of 680 trees per acre.

3) Describe the methods to be used in planting and seeding. Include the type of equipment to be used for seeding and seedbed preparation.

Response: ***Method of application will include the used of conventional seed drills, Brillion seeders, broadcast seeders, or aerial seeding, depending upon soil conditions. Fertilization rates will typically include agricultural lime at 3 t/ac, phosphorus (P_2O_5) at 150 lb/ac, potassium (K_2O) at***

200 lb/ac, and nitrogen at 120 lb/ac. These are typical cover crop application rates and will be adjusted based upon soil chemical analysis and yield requirements. Prior to conventional seeding, areas will be worked by disking and/or harrowing.

4) Is irrigation proposed? If so discuss. Are pest and disease control measures proposed? If so discuss.

Response: *No irrigation is proposed. No pest or disease control measures are proposed other than the typical agronomic practices employed for production of agricultural crops.*

5) Are areas to be temporarily seeded and/or mulched to control erosion?

Yes ___X___ No _____

If no, explain. If yes discuss in detail, including species, seeding rate by species per acre, mulching methods, mulching rates and type of mulch.

Response: *Straw mulch will be spread by hand or mechanically at a rate of 2.0 tons per acre. Where the situation dictates, straw and hay mulch will be applied between the dates of November 01 through March 01. Between March 01 and November 01, areas will be protected with quick-growing standing mulch (annual ryegrass, spring oats, pearl millet, etc.). During the growing season, straw or hay mulch will be applied as needed or as directed by the Department.*

6) Provide Measures proposed to be used to determine success of revegetation required under 62 Ill. Adm. Code 1817.117.

Response: *A minimum of 250 live stems per acre and sufficient herbaceous cover to control erosion will be used as the success criteria for wildlife land use areas. No trees will be planted on the covered refuse piles, and the standard for success will be the groundcover standard used for herbaceous wildlife. A minimum of 450 live stems per acre and sufficient herbaceous cover to control erosion will be used as the success criteria for reclaimed forestry land use.*

7) If any of the post-mining land uses are to include industrial or residential uses, describe revegetation measures to control erosion.

Response: *No post-mining land use of industrial or residential are proposed within the surface facilities permit area.*

8) Are there any plans to use nurse crops or crop rotations to improve future rowcrop productivity?

Yes _____ No ___X___

If yes describe type, duration and management of these areas.

9) Describe soil-testing plan for evaluation of soil nutrients and amendments necessary for revegetation.

Response: *Composite soil samples will be collected and analyzed for pH, P1 and K. One representative composite sample will be collected from approximately every four acres. Laboratory analyses of the samples combined with the vegetative being planted will be used to determine the appropriate amendments and quantities to be applied to the reclaimed areas.*

E) Describe measures to be employed to maximize the use and conservation of the coal resources per regulation Section 1817.59.

Response: ***Maximization of resource will be achieved by using the currently acceptable mining methods. Longwall mining will be utilized and the on-site preparation plant will process the coal. Conveyers will then transport the coal to the load-out facility. These coal-handling procedures will minimize coal loss and maximize the recovery of coal resources.***

F) Describe measures to be employed to ensure that all debris, acid-forming and toxic-forming materials, and materials constituting a fire hazard are disposed of in accordance with Section 1817.89 and 1817.102(f). Provide a description of contingency plans, which have been developed to preclude sustained combustion of such materials.

Response: ***All non-coal mining waste, including office and shop waste, will be collected and temporarily stored on-site. Removal of the waste will be contracted to a licensed waste hauler for disposal in a licensed off-site waste disposal facility. Part III.2.A.2 of this permit application identifies select overburden materials that exhibit negative net neutralization potentials. Part IV.2.A.3 defines specific material handling plans for such material. During shaft and slope excavation, care will be exercised in handling the potentially acid-producing materials to ensure the materials are adequately covered in a timely manner to minimize development of undesirable acid conditions. However, if potentially acidic materials are inadvertently encountered on the final graded surface, additional actions will be taken to adequately evaluate the acid-producing character. If necessary, further remedial stops involving either lime treatment, covering and/or burial activities will be undertaken. At a minimum, all acid-producing materials, including coal refuse material, will be covered with four (4) feet of non-toxic, non-combustible soil materials.***

On-Site Management will monitor the surface area of the Mine and take action to extinguish fires. Burning coal refuse, and/or exposed coal materials will be dispersed with a tractor, compacted and subsequently covered with non-combustible soil and/or rock.

G) Describe the measures including cross-sections and maps to be used to seal or manage mine openings, and to plug, case, or manage exploration holes, other bore holes, wells and other openings within the proposed permit area.

Response: ***All slopes, shafts and boreholes will be sealed in compliance with Section 1817.13 and 1817.15. Refer to Attachment V.1.G.***

H) Provide a description of the steps to be taken to comply with the requirements of the Clean Air Act (42 U.S.C. 7401 et seq.), and other health and safety standards.

Response: ***Air quality standards will be maintained by controlling fugitive dust at the operations. Conveyors and transfer points will be enclosed to control fugitive dust in these areas. Steps to be taken will include the use of water and/or dust control chemicals on access/haul roads during prolonged dry weather conditions.***

2) Post Mining Land Use

A) Provide a detailed description of proposed post-mining land uses employing the land use categories listed below. Provide acreage figures for each post-mining land use proposed and designate the post-mining land uses on the Post Mining Land Use Map.

Land Uses	Affected Area	Unaffected Area
Cropland	***0.0***	***181.6***
Pasture Land	***0.0***	***0.0***
Grazing Land	***0.0***	***0.0***
Forestry	***0.0***	***0.0***
Residential	***0.0***	***1.8***
Industrial, Commercial (Roads)	***9.0***	***0***
Recreation	***0.0***	***0.0***
Fish and Wildlife Habitat	***601.0***	***0.0***
Developed Water Resources	***10.1***	***0.0***
Undeveloped Land	***51.9***	***0***
	620.1	***183.4***
Total		***803.5***

B) 1) Provide a description of how the proposed post-mining land uses are to be achieved, and describe any necessary support activities which w ill be needed to achieve the proposed land uses.

Response: ***The post-mining land use will be achieved by a coordinated effort combining the operational aspects of site reclamation, landowner comments, and Department suggestions and regulations. The support facilities and refuse disposal areas are planned for the existing cropland areas to both avoid and minimize the impact on the identified wetlands in the forested stream valleys. Thus, the proposed plan will involve a conversion from cropland to wildlife habitat when the refuse pile and facilities area are reclaimed.***

2) Discuss the utility and capacity of the reclaimed lands to support a variety of alternative uses and the relationship of the proposed uses to existing land use policies and plans.

Response: ***The utility and capacity of the reclaimed lands in the surface facilities area will be somewhat limited by the nature of the soil and refuse materials and the topography. The reclaimed area will be well suited to wildlife habitat and possibly to pasture or forestry, but the areas will not be suitable for crop production due to the topography changes resulting from the refuse storage piles..***

3) Where grazing is the proposed post-mining land use, explain the detailed management plans to be implemented, if any.

Response: ***Grazing is not proposed as a post-mining land use.***

4) Where a post-mining land use different from a pre-mining land use is proposed alternate post mining land uses may be approved by the Department after considering the relationship of the intended uses to the existing land use policies and plans and the comments of any owner of the surface, and land use agency having jurisdiction over the land.

Provide a discussion explaining the consideration, which has been given to making all of the proposed surface mining activities consistent with surface owner plans and applicable State and local land use plans and programs.

Response: ***Attachment V.2.A shows the planned changes from pre-mine to post-mining land uses. All acreage from the surface facilities and refuse area will be reclaimed as low capability lands. Acid or toxic material area will be treated with lime and covered with up to 48 inches or rooting media, and non-acid/toxic areas will be covered with an average of 13 inches of soil. Wildlife habitat will be the land use, and trees will be planted in random blocks for the areas outside the refuse disposal area. The steeper slopes will be reclaimed as herbaceous wildlife. The landowner is in agreement with this conversion from forestry and cropland to wildlife habitat for the areas affected by the surface facilities for this underground mining operation. These changes in land use do not present any actual and probable hazard to the public health and safety, nor do they pose any threat of water diminution or pollution. The changes will allow for recovery of the coal resources and will facilitate both practicable and reasonable land management in the future.***

C) Provide a copy of the comments concerning the proposed land use by the owner of the surface of the proposed permit area and by the State or local government agencies which would have to initiate, implement, approve or authorize the proposed uses of the land following reclamation.

Response: ***The landowner of the surface is the permittee, and is in favor of the stated land use conversions. No state or local government holds jurisdiction over land use planning for the permit area.***

3) A) Provide a fish and wildlife protection and enhancement plan meeting the requirements of 62 Ill. Adm. Code 1817.97 and which shall include the following:

1) A statement of the protective measures that will be used to minimize disturbances and adverse impacts on fish and wildlife and related environmental values during surface coal-mining operations.

Response: ***Mining operations at this facility will be carried out in compliance with 62 IAC 1700-1850, which specifies a comprehensive set of environmental protection measures for the control of adverse ecological impacts resultant from coal mining.***

Included are considerations for air, water, acid and toxic materials, soils, landform, vegetation, etc., in both special and temporal capacities. As such, general protective measures for all environmental values are inherent within the regulatory program. Specific to this facility, the expanse of mining and mining-related disturbances will be limited to that acreage necessary for conducting mining operations in compliance with the applicable land reclamation regulatory requirements. Disturbances to sites not required for mining or mining-related activities will be held to a minimum.

2) Discuss the enhancement measures that will be used during the reclamation and post mining phase of the operation to develop aquatic and terrestrial habitat.

Response: ***During reclamation, an integrated wildlife habitat enhancement plan with upland and lowland habitat types will be reconstructed to provide food, cover, and maximum edge. These habitat enhancement features include the type and configuration of vegetative components reestablished, as well as the retention of water bodies in the post-mine landscape. These efforts will provide food, water, and cover for wildlife. Woody plants will be arranged in two forms (1) strip plantings and (2) group plantings. Strip plantings will be composed of plantings on an 8' x 8' spacing, with associated rows of wildlife type shrubs. Shrub rows will consist of species such as dogwood, hawthorns, sumacs, elderberry, crabapple, etc. Shrubs will be planted on 6' x 6' spacing. The strip plantings are intended to break up large open areas, furnish travel lanes, and provide food and cover. They will be established along field drain ways, fencerows, and property lines. Group plantings will be composed of deciduous trees, primarily oak, ash, walnut, locust, and maple on 8' x 8' spacing, or a combination of wildlife shrubs and conifers (red, white, Virginia or Jackpine). Group plantings will be of random species mix and pattern. The groupings may be of variable size and furnish islands and block of habitat.***

3) If the applicant's fish and wildlife plan finds it impracticable to provide for enhancement of fish and wildlife and related environmental values, the applicant shall provide a statement, which establishes why it is not practical to achieve enhancement.

Response: ***The fish and wildlife plan in this section is practicable and will provide for the enhancement of fish and wildlife and related environmental values.***

B) The applicant shall provide a statement explaining how impact control measures, management techniques, and monitoring methods will be utilized to protect or enhance the following, if they are to be affected by the proposed surface coal mining and reclamation operations:

1) Threatened or endangered species of plants or animals listed by the Secretary of the United States Department of the Interior (Secretary) under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) and their critical habitats.

Response: ***No Federal threatened or endangered species, whether listed or proposed for the listings are known to occur within the permit area. Similarly, no associated critical habitats designated under 16 USC 1531 et seq. are present within the permit area. The forested habitat in and adjacent to the permit area does provide potential habitat for the Indiana Bat (Myotis sodalist). Although the Indiana Bat is not known to occur within or near the project site, measures will be taken to comply with the Department policy for tree removal as discussed below.***

2) Species such as eagles, migratory birds or other animals protected by State or Federal law, and their habitats; or other species identified through the consultation process pursuant to 62 Ill. Adm. Code 1784.21; or

Response: ***No species such as eagles, migratory birds, or other animal protected by State or Federal law are known to occur within the permit area.***

3) Habitats of unusually high value for fish and wildlife, such as wetlands, riparian areas, cliffs supporting raptors, areas offering special shelter or protection, reproduction and nursery areas, and wintering areas.

Response: ***Extensive efforts have been made to both avoid and minimize construction activities in areas designated as wetlands. Refer to Attachment II.9 for the Routine Wetland Determination Data Sheets on the Wetland Assessment conducted by HDR-CWI personnel. However, it will be necessary to affect approximately 12 acres of wetlands for the construction of mine support facilities. In order to mitigate this impact, it is proposed to construct, during the mining and reclamation process, approximately 22 acres of wetland in the general area of those being impacted under this permit. Final details on the location, quantity and details of wetland reconstruction will be determined upon review and approval of all necessary permits for this process.***

4) For the Indiana Bat, *Myotis sodalis*, include an assessment of potential or known breeding and/or wintering habitat in the proposed permit area. Identify any mitigation measures necessary to prevent loss of critical habitat, and to prevent potential "taking" (killing) of the animal, i.e., restricting timber removal to those seasons when the bat is not present in Illinois.

Response: ***No known breeding and/or wintering Indiana Bat (Myotis sodalist) habitat exists within the permit area. Based upon recent scientific investigations, forested areas in both upland and bottomland settings have the potential to be suitable habitat for the Indiana Bat. In response, timber disturbances within the permit area will be conducted from September 30 through April 1, annually, in an effort to prevent harming any unknown individuals or populations residing in the permit area.***

4) Pond, impoundments, banks, dams and embankments.

A) Permanent impoundments, including sedimentation ponds, must be authorized by the Regulatory Authority based upon the requirements of Section 1817.49(a) and (b).

Response: ***Refer to Attachment IV.7.F for design details of the sediment ponds.***

1) Include sufficient design data and calculations to substantiate that the design is in accordance with SCS engineering standard 378 "Ponds" or SCS technical release #60 "Earth Dams and Reservoirs".

2) Provide evidence that water quality is to be suitable for the intended use.

3) Indicate the relationship of the impoundment to the post-mining land use.

4) Describe methods of dropping surface runoff over excavated impoundment side slopes. Discuss design criteria to be employed for down drain structures and perimeter diversions.

5) Provide plans of access roads and other use related facilities.

B) Describe proposed reclamation for all refuse disposal areas including timing of final coverage, depth of final cover, restoration planned for disposal area and restoration planned for borrow areas.

Response: ***Slurry cells will be removed by covering the final slurry surface with coarse refuse or other appropriate material to prevent future impoundment of water or slurry. Coarse refuse materials will be reclaimed by covering with soil material and vegetate to a wildlife land use. Prior to covering, the refuse materials will be sampled and analyzed for acid-producing potential to determine the amount of lime necessary to neutralize any acid generation. Sufficient lime will be spread on the final refuse surface and incorporated into the refuse prior to covering with soil. At a minimum, all acid-producing materials, including coal refuse material, will be covered with four (4) feet of non-toxic, non-combustible soil materials. Material to be used for this cover will be the original soil material removed in the construction of the various incised impoundments within the permit area, borrow areas or material dredged from lakes or waterways.***

C) If any structure is 20 feet or higher or impounds more than 20 acre-feet, provide a stability analysis of each structure, which shall include strength parameters, pore pressures, and long-term seepage conditions. Also, to be included is a description of each engineering design assumption and calculation with a discussion of each alternative considered in selection design parameters and construction methods.

Response: ***No impoundment meeting the referenced criteria is scheduled for retention as a reclamation item under this permit application.***

D) Submission of MSHA certification documents for a detailed design plan shall satisfy the requirements, in so far as; the MSHA informational and design standard requirements are duplicative of the requirements.

Response: ***Refer to Item C) above regarding submittal of MSHA design information.***

5) Area closure or abandonment.

A) Describe all reclamation efforts to be expended to satisfy the requirements of abandonment. If an exemption request is to be made, it should be included.

1) Include the timing to meet the final grading and revegetation requirements.

2) Include a description of the final graded slopes, and the type of seed and seeding.

3) Explain final coverage of treatment of toxic areas and locate all borrow pits.

Response: ***If temporary cessation of this operation occurs, grading will be completed to meet the appropriate requirements with the exception of areas delineated in any grading extension requests. Soil stockpiles and exposed soil areas will be stabilized and protected as necessary to prevent erosion. Drainage control structures will be maintained to insure they continue to function properly. All surface and groundwater monitoring will continue according to the approved plans during any temporary cessation.***

When permanent cessation of operations occurs, final reclamation of the mine site will be completed in accordance with the approved reclamation plan and the permit conditions developed in accordance with Chapter I, Section 1817.62 Illinois Administrative Code. Mine facilities and structures not required to support the approved post-mining land use will be removed. All usable materials and structures will be salvaged and sold if economically possible. Obsolete structures and equipment will be scrapped and removed from the mine site. Disturbed areas will be graded to conform to the approved configuration and slopes required to support the post-mining land use. Refer to Part V.1.F. for a discussion of the final coverage of toxic areas. Soil materials for the reclamation effort will be obtained from stockpiled soils removed in advance of the mining operations. Soil materials will be replaced and vegetation established in accordance with the approved post-mining land uses. All surface and groundwater monitoring will continue until the agencies with authority over this function approve discontinuing the monitoring.

The average topsoil replacement thickness shall be 13".

B) Describe in detail a rehabilitation design plan for each siltation structure, diversion, impoundment and treatment facility to be implemented and completed prior to abandonment. Any departures from detailed design plan requirements must be designated as such and be accompanied by supporting documentation.

Response: ***Upon permanent cessation of operations, rehabilitation of the above mentioned structures will be evaluated individually. In the event a structure needs rehabilitation, design plans will be submitted to the Department for approval. Items to be considered include, but are not limited to, accumulated sediment volumes, condition and functionality of outlet devises, condition of vegetation or other surface protection, and long-term stability of cut and fill slopes. Future structures meeting MSHA requirements will be abandoned in accordance with plans approved by the MSHA District Manager.***

6) Perennial and Intermittent Stream Diversion Note: If stream diversion is not planned, indicate N/A.

Response: ***Not Applicable.***

A) Overview, Alternative, Justification:

1) Discuss in detail the reasons for diverting the stream. Include justification and possible alternatives to relocating it.

2) Discuss the general overview of the proposed diversion project. General information should include: temporary, permanent; time length of diversion; single phase, multiphase; restore on place land, restore in approximately original location after mining; etc.

B) Pre-disturbance information

1) The following general information shall be provided for the stream to be diverted:

a) Name of the stream to be diverted,

b) Classification (intermittent, perennial),

c) Total length of segment affected,

d) Total drainage area of existing stream at the point w here relocation begins (miles) and ends (miles),

e) Depth of the water table adjacent to the stream and yearly fluctuation.

2) An aerial photograph or map (scale at 1 in = 400 ft or other approved scale) shall be provided illustrating the following for the existing stream:

a) Existing stream channel and adjacent land use,

b) Watershed limits upstream of the proposed relocation,

c) Proposed permit area; property boundaries,

d) An outline of the 100-year and 2-year frequency flood plains along the existing channel; include the acreage inundated by each storm event,

e) Locations where representative cross-sections have been taken

f) Riparian habitat (vegetation),

g) Riffles, list total number and locate on the map or photo,

h) Pools; list total number and locate on the map or photo,

i) Meanders; list total number and locate on the map or photo.

3) Plan-profile and cross-sectional drawings of the existing stream shall be provided showing the following information:

a) Stream bed and significant drops,

b) Water surface at low flow,

c) Water surface at the 100-year and 2 year flood event. Include the calculated flow rate (cfs) and velocity (ft/sec) at the representative locations for low flow and the 100-year flood conditions.

4) Describe the habitat of the existing stream including the following information at a minimum:

a) Canalization or other disturbances,

b) Shade provided by stream bank vegetation,

c) Stream substrate composition,

d) Steepness and elevation of the banks,

e) Riparian vegetation (species, relative abundance),

f) Aquatic vegetation (species, relative abundance),

g) Potential Indiana bat habitat shall be addressed with a plan to prevent "taking" of the animal during breeding seasons.

C) The following design and construction plan information shall be provided for TEMPORARY STREAM CHANNEL DIVERSIONS. If none are proposed, indicate N/A.

Response: ***Not Applicable.***

1) The following estimated construction-planting dates shall be provided:

a) Begin construction _____.
b) End construction _____.
c) Begin planting _____.

Give a detailed description of the construction practices to be followed, and the equipment to be employed.

2) After stabilization of the temporary diversion and prior to diversion of the existing stream into the temporary stream channel, the applicant will be required to contact the Department and gain approval. The applicant shall provide an estimation of the date when erosion control structures and vegetation will be sufficiently established to allow diversion of the water into the temporary channel.

3) Discuss the erosion control practices to be followed during construction of the temporary diversion and the features of the proposed channel, which will help minimize erosion of the stream banks in the future. Discuss the necessity, if any, of using a stilling basin to aid in reducing siltation.

4) Discuss the impacts the temporary diversion ditch will have on downstream water quality, biological communities and water users and describe a monitoring program to measure these impacts.

5) Describe reclamation of temporary stream diversions when no longer needed.

6) A detailed revegetation plan shall be proposed, including soil preparation procedures, plant species and rates, fertilizer rates and mulching rates.

7) Describe how the temporary diversion ditch spoil will be handled to minimize the impact on the surrounding area.

8) Provide an aerial photo or map (scale of 1 in = 400 ft) illustrating the following:

a) Proposed temporary stream channel diversion.

b) Proposed spoil locations.

c) An outline of the 10-year frequency flood plain along the proposed temporary diversion.

d) Locations where representative cross-sections have been taken.

9) Design information shall be provided as follow s:

a) Plan-profile drawings clearly depicting locations and flow line slopes.

b) Sufficient cross-sections to depict side slopes and inflection points such as cuts and fills.

c) A clearly outlined drainage area, which the temporary diversion ditch will serve including hydrologic characteristics such as slopes, soil types, vegetative cover, etc.

d) Detailed calculations of runoff volumes from the drainage area upon which to base ditch sizing calculations.

e) Detailed ditch sizing calculations to demonstrate the projected temporary stream channel diversion ditch is adequate to convey the 10-year 24-hour storm event pursuant to Sections 1817.43(c) and (f).

D) The following design, construction and restoration plan information shall be provided for the PERMANENT RESTORED STREAM (_____) or the PERMANENT RELOCATED STREAM CHANNEL (_____), which ever is applicable. Check the appropriate category.

1) The following estimated construction dates shall be provided:

a) Begin construction _____.

b) End construction _____.

c) Give a detailed description of the construction practices to be followed, and the equipment to be employed.

d) A program shall be established to regularly rep ort on the progress of the permanent stream channel reconstruction including as-built designs of the channel and flood plain and a description of habitat restoration. Discuss the timing and content of the proposed restoration progress report program.

2) Describe how the new channel spoil will be graded and handled to minimize the impact on the surrounding area, including the flood plain capacity, flooding and the riparian zone.

3) After the restored channel is adequately stabilized and prior to diversion of the temporary diversion ditch into the permanently restored stream channel, the applicant will be required to contact the Department and gain approval. The applicant shall provide an

estimation of the date when erosion control structures and vegetations will be sufficiently established to allow diversion of the water into the permanent channel.

4) Discuss the erosion control practices to be followed during construction of the permanent stream restoration and the features of the proposed channel when will help minimize erosion and enhance stability of the stream banks in the future.

5) Discuss the impacts the permanently restored stream channel will have on downstream water quality, biological communities and water users and describe a monitoring program to measure these impacts.

6) Provide an aerial photo or map (scale of 1 in = 400 ft) illustrating the following:

   a) Proposed permanently restored stream channel,

   b) Proposed spoil locations,

   c) An outline of the 100-year and two (2)-year frequency flood plains along the proposed perm anent restored channel,

   d) Locations where representative cross-sections have been taken,

   e) Riparian habitat (vegetation),

   f) Riffles; list total number and locate on the map or photo,

   g) Pools; list total number and locate on the map or photo,

   h) Meanders; list total number and locate on the map or photo,

7) Design information shall be provided as follows:

   a) Stream bed and significant drops,

   b) Water surface elevations at low flow,

   c) Water surface elevations at the 100-year and 2-year floods,

   d) Gradeline for the proposed restored stream channel,

   e) Plan-profile drawings clearly depicting locations and flow line slopes,

   f) Sufficient cross-sections to depict side slopes and inflection points such as cuts, fills, curves and straight sections,

   g) A clearly outlined drainage area, which the permanent channel will serve including hydrologic characteristics such as slopes, soil types, vegetative cover, etc.,

   h) Detailed calculations of runoff volumes from the drainage area upon which to base channel sizing calculations,

   i) Detailed channel-sizing calculations to demonstrate the projected permanent channel and flood plain are adequate to covey the 100-year 24-hour storm event.

j) Include the calculated flow rate (cfs) and velocity (ft/sec) at the representative locations for low flow and the 100-year flood condition.

8) Describe other habitat restoration methods to be employed as follows:

a) Provide typical plans, maps and drawings for boulder deflectors, check dams, current deflectors or other in-stream habitat structures, if any,

b) Provide typical plans, profiles and cross-sections for proposed floodplain potholes and/or wetlands, if any,

c) A detailed revegetation plan shall be proposed, including soil preparation procedures, plant species and rates, fertilizer rates and mulching rates. Provide details on riparian habitat revegetation including a discussion of the herbaceous ground cover, woody species to be planted and the number and distribution of the stem s to be planted. The riparian zone must be reclaimed to forest with a minimum of 450 trees/acre necessary for bond release,

d) If the restored stream will traverse inclines or final cuts, provide measures to be employed to enhance the diversity of the impoundments.

8) Are coal processing wastes proposed to be returned to abandoned underground workings?

Yes _____ No ___X___

If the response above is yes, provide information required under 62 Ill. Adm. Code 1784.25(a) through (f).

Attachment V.1.B - Reclamation Cost Estimate

ATTACHMENT V.1.B

The estimate of the cost of reclamation should be based on the following:

B) Provide a detailed estimate of the cost of reclamation for the proposed surface mining operation required to be covered by a performance bond. Provide calculations and/or drawings, cross sections, maps, etc. to support the reclamation cost estimated. Provide extra calculations for multiple pits or refuse areas.

The estimate of the cost of reclamation should be based on the following:

Note: Items indicated at zero (0) cost indicates these items for which salvage cost exceeds removal cost.

MINE SITE

Reclamation Item	No.	Width	Length	Height	Description	Units	Price	COST
Facilities Buildings	2	152	225	30	Modular Buildings	2 Each	$0	$0
Facilities Building	1	100	130	30	Modular Buildings	2 Each	$0	$0
Storage Building	1	130	190	40	Steel Frame Building	1 Each	$0	$0
Shop	1	130	190	40	Steel Frame Building	1 Each	$0	$0
Rock Dust Tank	1	8	8	40	8 ft. Dia. Tank	1 Each	$0	$0
Mine Substation	2	100	100	0	Elec. Sub.	1 Each	$0	$0
Parking and Yard (7.0 Acres total)	4			1.5	Base Material	17,000 Yds	$2	$34,000
Mine Fan	1	20	10	1.5	Concrete Base	11 Yds	$200	$2,222
Intake Shaft Area	1	350	600	1.5	Base Material	11,667 Yds	$2	$23,333
Intake Shaft	1	19	19	450	19 Ft. Dia. Shaft Backfill	4,725 Yds	$2	$9,450
Intake Collar	1	19	19	2	Remove 4-Ft. Ht.	15 Yds	$200	$2,979
Seal	1	1	1	1	Install Surface Cap	1 Each	$5,000	$5,000
Return Shaft Backfill	1	19	19	450	19-Ft. Dia. Shaft Backfill	4,725 Yds	$2	$9,450
Return Collar	1	19	19	2	Remove 4-ft. Ht.	15 Yds	$200	$2,979
Seal	1	1	1	1	Install Surface Cap	1 Each	$5,000	$5,000
Topsoil	1	15 Acres		1.0	Remove from Storage	24,195 Yds.	$2	$48,390
Lime	1	15 Acres		7	7-tons per acre	105 Tons	$28	$2,940
Revegetation	1	15 Acres			Revegetate	15 Acres	$500	$7,500
Mine Site Total								$153,243

PLANT SITE

Reclamation Item	No.	Width	Length	Height	Description	Units	Price	COST
Plant Facilities Building	1	100	130		Modular Buildings	1	$0	$0
Storage Building	1	90	130	30	Steel Frame Building	1	$0	$0
Thickener	2	120	120	20	Concrete Tank	2,095 Yds	$100	$209,500
Plant Substation	1	100	100	0	Elec. Sub	1	$0	$0
Parking	1	130	130	1.5	Base Material	940 Yds	$2	$1,880
Yard (2 acres)	1			1.5	Base Material	4,839 Yds	$2	$9,678
Plant Apron	1	550	600	2	Base Material	24,444 Yds	$2	$36,667
Truck Loadout Belt	1	N/A	960	1	Conveyor Demolition	960 Feet	$0	$0
Slope Belt	1	280	1	1	Conveyor Demolition	280 Feet	$0	$0
Plant Feed Belt	1	N/A	930	1	Conveyor Demolition	930 Feet	$0	$0
Refuse Belt	1	N/A	5,520	1	Conveyor Demolition	5,520 Feet	$0	$0
Clean Coal Belt	1	N/A	1,014	1	Conveyor Demolition	1,014 Feet	$0	$0
Rail Loadout Belt	1	N/A	1,493	1	Conveyor Demolition	1,493 Feet	$0	$0
Raw Coal Belt	1	N/A	990	1	Conveyor Demolition	990 Feet	$0	$0
Plant Building	1	100	80	70	Structural Steel Frame	1 Lot	$0	$0
Rail Loadout	1	20	40	97	Structural Steel Frame	1 Lot	$0	$0
Refuse Bin	1	20	20	50	Structural Steel Frame	1 Lot	$0	$0
ROM Stacking Tube	1	8		150	Concrete Tube	209 Yds	$200	$41,800
ROM Tunnel	1	12	390	1.5	Concrete Roof	260 Yds	$200	$52,000
Clean Stacking Tube	3	8		200	Concrete Tube	837 Yds	$200	$167,400
Clean Tunnel	1	14	800	15	Concrete Roof	622 Yds	$200	$124,400
Raw Stockpile	1	390	820	2	Coal Base Removal	23,683 Yds	$2	$47,367
Clean Stockpile	1	400	1,040	2	Coal Base Removal	30,808 Yds	$2	$61,617
Railroad Ballast				2	Removal	12,575 Yds	$2	$25,150
Road Base (All Roads)		24	8,920	2	Removal	15,860 Yds	$2	$31,720
Plant Pad		100	400	2	Removal	2,963 Yds	$2	$5,926
Rail Grade Removal	Haul and Doze to Rail Grade Cut					71,200 CY	$1.50	$106,800
Topsoil	1		50 Acres	1.0	Remove from Storage	80,650 Yds	$2	$161,300
Lime	1		50 Acres	7	7 tons per acre	350 Tons	$28	$9,800
Revegetation	1		50 Acres		Revegetate	50 Acres	$500	$25,000
Plant Site Total								$1,118,005

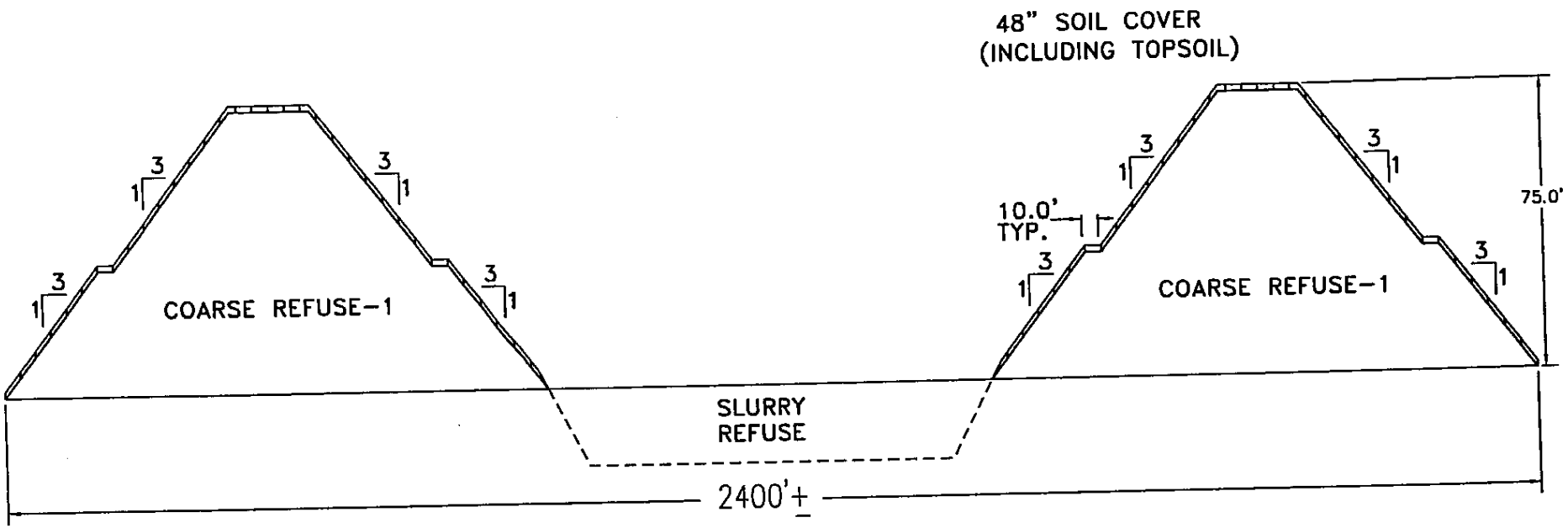
REFUSE SITES

Reclamation Item	No.	Width	Length	Height	Description	Units	Price	COST
Slurry Cells Cover			124.0 Acres	3.3	Soil Cover	660,039 CY	$2	$1,320,079
Slurry Cells Cover				0.7	Topsoil	140,008 CY	$2	$280,016
Coarse Refuse			55.6 Acres	3.3	Soil Cover	295,953 CY	$2	$591,906
Cover				0.7	Topsoil	62,778 CY	$2	$125,555
Lime Refuse Areas			180 Acres	7	Tons per Acre	1,260 Tons	$28	$35,280
Revegetate Refuse Area			180 Acres				$500	$90,000
Refuse Grading			180 Acres				$1,000	$180,000
Refuse Sites Total								$2,622,836

Reclamation Estimate
Permit No. 382
Summary

Mine Site	$ 153,243
Plant Site	$1,118,005
Refuse Site	$2,622,836
TOTAL	$3,894,084

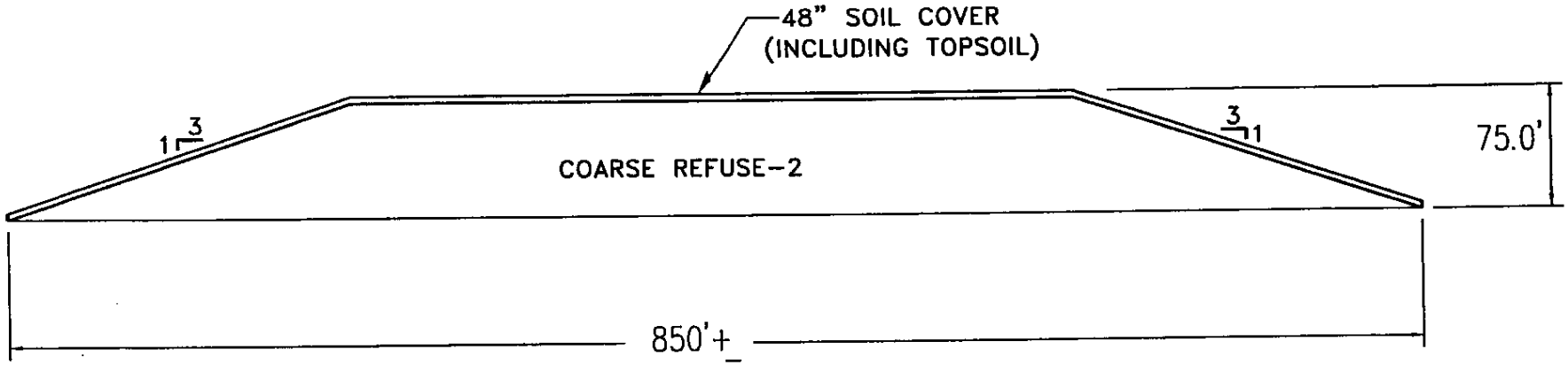
Attachment V.1.C3 – Coarse Refuse Typical Section



COARSE REFUSE-1 DISPOSAL AREA
TYPICAL N-S SECTION

DEER RUN
COARSE REFUSE-1 TYPICAL SECTION

Designed:	HDR | CWI	Date: 08/11/07
Checked:		Sheet No.
Drawn:	1339 Walnut Street, Murphysboro, IL 62966	1 of 1
Checked:	Ph. (618) 684-5808	
Job No: 66339		File No:

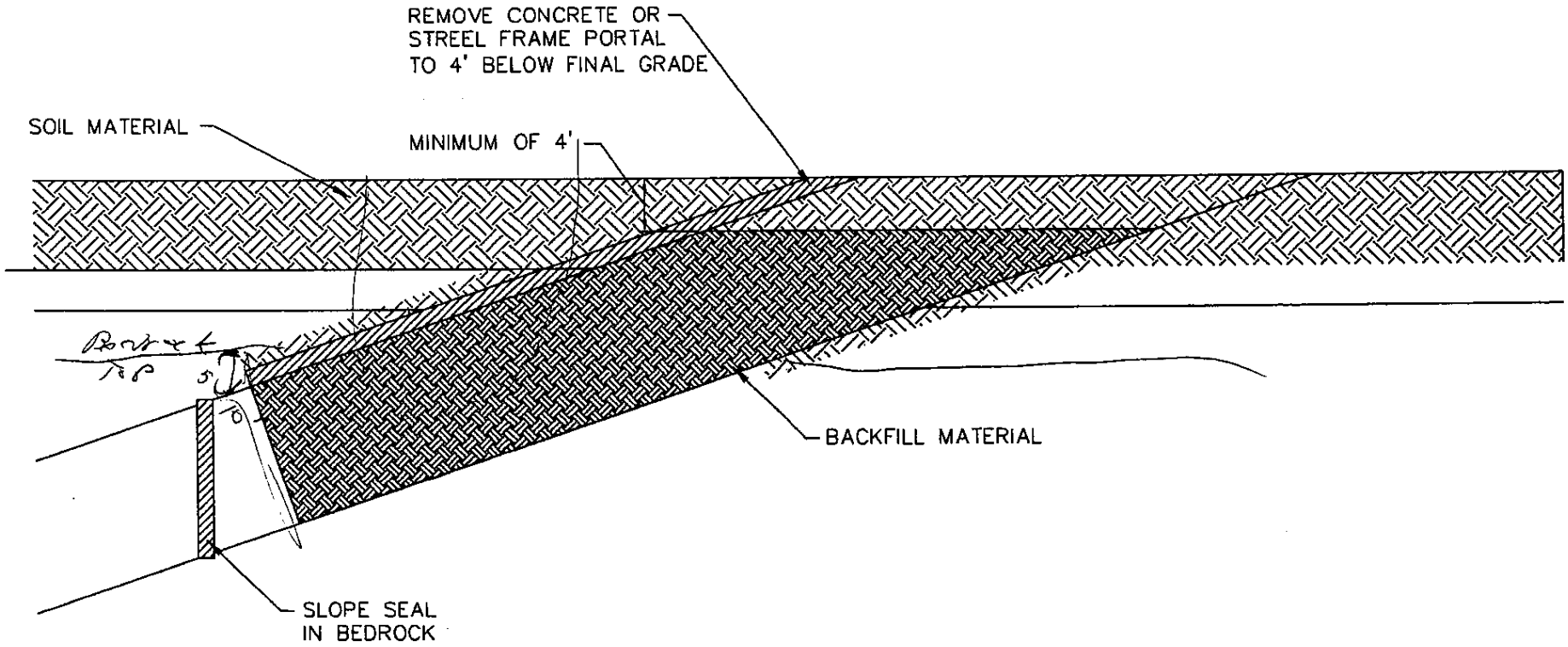


COARSE REFUSE-2 DISPOSAL AREA
TYPICAL N-S SECTION

DEER RUN
COARSE REFUSE-2 TYPICAL SECTION

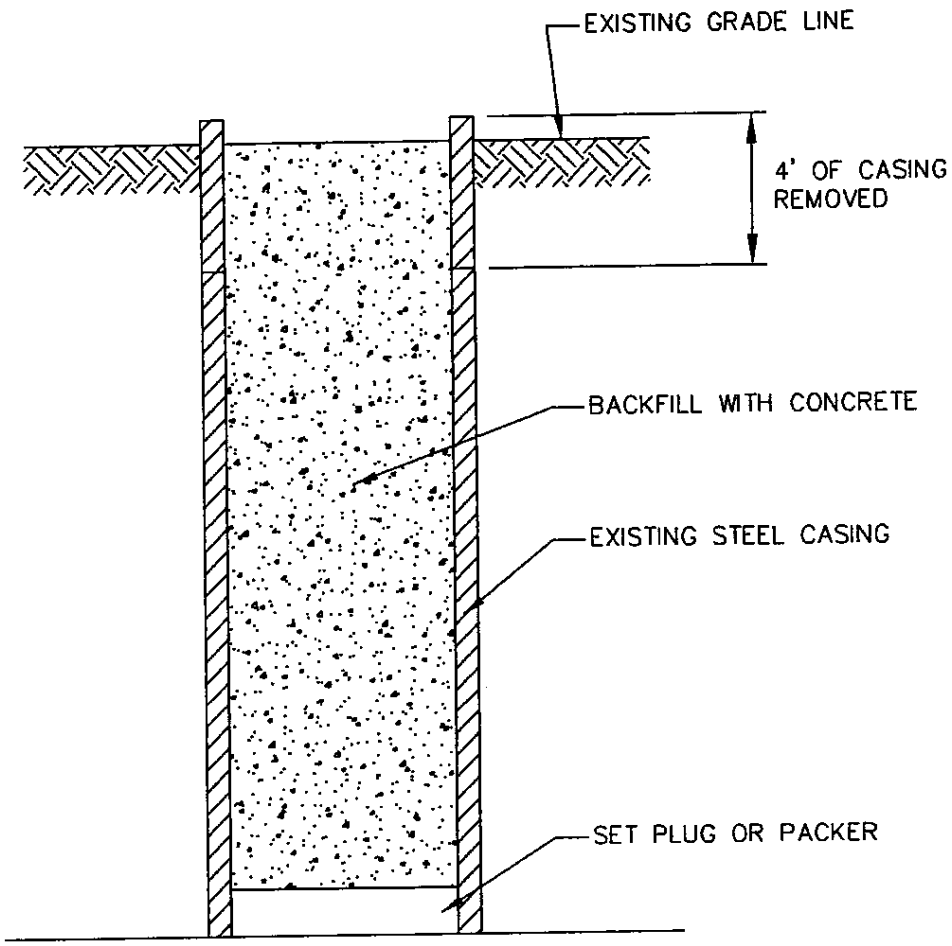
Designed: Checked: Drawn: Checked:	HDR | CWI 1339 Walnut Street, Murphysboro, IL 62966 Ph. (618) 684-5808	Date: 08/11/07 Sheet No. 1 of 1
Job No: 68339		File No:

Attachment V.1.G - Sealing of Openings



SLOPE SEAL
NOT TO SCALE

DEER RUN		
SLOPE SEAL DETAIL		
Designed:	HDR | CWI	Date: 8/28/07
Checked:		
Drawn:	1339 Walnut Street, Murphysboro, IL 62966 Ph. (618) 684-5808	Sheet No. 1 of 1
Checked:		
Job No:		File No:



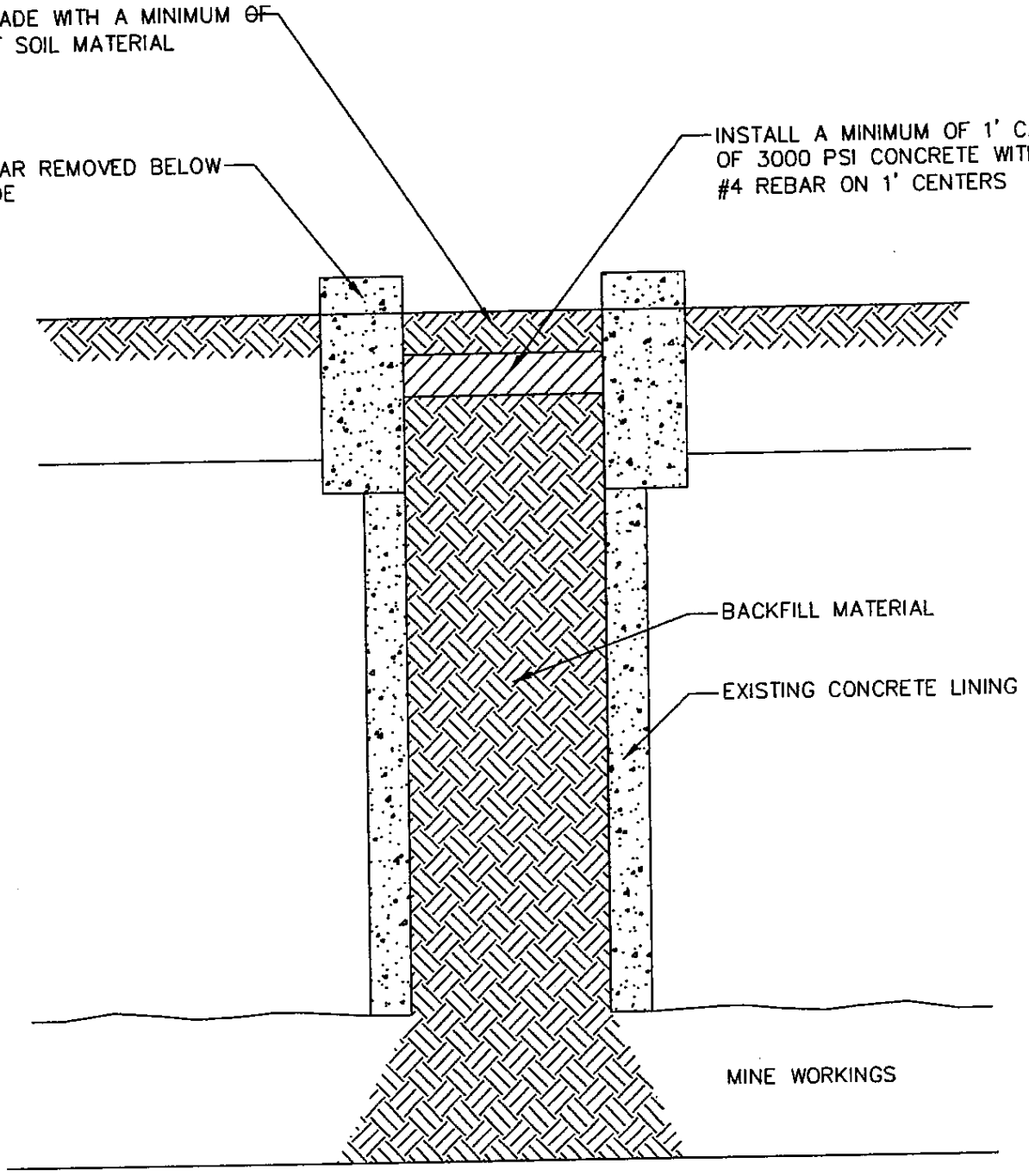
DRILL HOLE SEALING PLAN

NOT TO SCALE

DEER RUN

DRILL HOLE SEAL DETAIL

Designed:	HDR | CWI	Date: 8/28/07
Checked:		
Drawn:	1339 Walnut Street, Murphysboro, IL 62966 Ph. (618) 684-5808	Sheet No. 1 of 1
Checked:		
Job No:		File No:



VERTICAL SHAFT MINE SEAL DETAIL

NOT TO SCALE

DEER RUN		
MINE SHAFT SEAL DETAIL		
Designed:	HDR | CWI	Date: 8/28/07
Checked:		Sheet No.
Drawn:	1339 Walnut Street, Murphysboro, IL 62966 Ph. (618) 684-5808	1 of 1
Checked:		
Job No:		File No:

Attachment V.2.A - Post Mining Land Use

DEER RUN mine
Attachment V.2.A
Post-Mining Land Uses
September, 2007

Pre-Mining Land Use			
Land Use	Affected & Bonded Area (Acres)	Inside Permit Unaffected & Unbonded (Acres)	Overall Area (Acres)
Cropland	495.3	181.6	676.9
Pastureland	0.0	0.0	0.0
Grazingland	0.0	0.0	0.0
Forestry	70.3	0.0	70.3
Residential	0.0	1.8	1.8
Industrial/Commercial	0.5	0.0	0.5
Recreation	0.0	0.0	0.0
Fish & Wildlife Habitat	5.9	0.0	5.9
Developed Water Resources	0.0	0.0	0.0
Undeveloped Land	48.1	0.0	48.1
Total	620.1	183.4	803.5

Proposed Post-Mining Land Use			
	Affected & Bonded Area (Acres)	Inside Permit Unaffected & Unbonded (Acres)	Overall Area (Acres)
Cropland	0.0	181.6	181.6
Pastureland	0.0	0.0	0.0
Grazingland	0.0	0.0	0.0
Forestry	0.0	0.0	0.0
Residential	0.0	1.8	1.8
Industrial/Commercial	9.0	0.0	9.0
Recreation	0.0	0.0	0.0
Fish & Wildlife Habitat	601.0	0.0	601.0
Developed Water Resources	10.1	0.0	10.1
Undeveloped Land	0.0	0.0	0.0
Total	620.1	183.4	803.5

Land Use Net Balance			
	Affected & Bonded Area (Acres)	Inside Permit Unaffected & Unbonded (Acres)	Overall Area (Acres)
Cropland	-495.3	0.0	-495.3
Pastureland	0.0	0.0	0.0
Grazingland	0.0	0.0	0.0
Forestry	-70.3	0.0	-70.3
Residential	0.0	0.0	0.0
Industrial/Commercial	-24.7	0.0	-24.7
Recreation	0.0	0.0	0.0
Fish & Wildlife Habitat	632.1	0.0	632.1
Developed Water Resources	10.1	0.0	10.1
Undeveloped Land	-51.9	0.0	-51.9
Total	0.0	0.0	0.0

PART VI

UCM 1 APPLICATION ADDENDUM NO. 1
Deer Run Mine

I. DRINKING DOMESTIC AND RESIDENTIAL WATER SUPPLIES

A. For all underground operations: Shadow area water supply background information.

Compliance with 62 Ill. Adm. Code 1784.14(b)(1): The operator shall provide the location and ownership of all existing drinking, domestic and residential water supplies, including private wells, municipal wells and springs. This information shall be provided for all areas within the proposed shadow area and within 1/2 mile of the boundaries of the proposed shadow area.

Response: ***Refer to Attachment IV.3.B.5.c and the Hydro-Geological Map (Map 4) for information regarding the location and ownership of existing water supplies within the proposed shadow area and within 1/2 mile of the shadow area boundary. It should be pointed out the majority of the residents in the vicinity of the shadow area obtain their water supply from rural and municipal water systems that serve the area. Out of the approximately 49 residents who responded to the water use survey, there were 3 residents within the shadow area that reported using groundwater as their primary source of water and an additional 14 residents within 1/2 mile of the shadow area that reported using a well for their primary water supply.***

1. Compliance with 62 Ill. Adm. Code 1784.14(b)(1)(A)(ii): Provide adequate ground water quality descriptions for the shadow area and its adjacent area (half mile). The information shall include, at a minimum, pH, total dissolved solids, total iron and total manganese. The Department may require additional parameters based on site-specific conditions.

Response: ***Monitoring of water quality specific to the shadow area and its adjacent area (1/2 mile) was initiated for three surface sampling points. Data on pH collected from the surface sampling points indicates the surface water in the shadow area ranges from 7.40 to 8.80. Total dissolved solids results for samples from the on-site wells ranged from 100 to 405 mg/ liter, total manganese ranged from 0.0 to 2.6 mg/ liter, and total iron ranged from 0.21 to 5.05 mg/ liter.***

In addition, twelve (12) monitoring wells were installed around the perimeter of the surface effects area to gather baseline information about the shallow ground water resources in the permit area. Data on pH collected from the monitoring wells in the surface effects area indicates the ground water in the shadow area ranges from 7.02 to 7.34. Total dissolved solids results for samples from the on-site wells ranged from 392 to 740 mg/ liter, total manganese ranged from 1.44 to 62.2 mg/ liter, and total iron ranged from 54.8 to 2550 mg/ liter .

Refer to attachments III.2.C.2-Baseline Surface Sample Site Data and III.2.B.2-Schedule B Groundwater Monitoring Well Data for the detailed data on all water sampling.

2. Compliance with 62 Ill. Adm. Code 1784.14(b)(1)(B): Respond to UCM-1 Application Part III(2)(B)(3).

Response: ***See Part III.2.B.3 of the permit application text.***

B. For all underground operations: Qualification for exemption from performing individual water quantity and quality data collection.

1. Compliance with 62 Ill. Adm. Code 1784.20(b)(7) and (b)(8)(B): Provide sufficient documentation concerning site-specific geologic, geotechnical and historical performance to demonstrate that existing wells and springs will not be impacted by the operation. Stratigraphic locations of drinking, domestic and residential water supplies relative to the seam to be mined

shall also be discussed in relation to potential impacts from mine level instabilities such as roof falls.

Response: ***Based on the results of the water use survey conducted of residents within the permit area and adjacent area (1/2 mile), the majority of the residents obtain their drinking water from rural and municipal water systems that serve the area. Out of the approximately 49 residents who responded to the water survey, 3 residents within the shadow area reported using ground water as their primary source of water and 14 additional residents within 1/2 mile of the shadow area reported using a well for their primary water supply. Several residents reported the presence of dug wells. These water sources either were not used or were used only infrequently for secondary purposes such as lawn and gardening or, occasionally, stock watering. The absence of wide spread reliance on ground water for domestic use in such rural areas is indicative of the limited availability and poor quality of the ground water resources in the vicinity of the mining operation.***

According to Illinois State Geological Survey (ISGS) Circular 225, the best potential sources of groundwater are sand and gravel deposits in the major valley systems. However, many of the surficial sand and gravel deposits throughout the county are narrow and discontinuous. The bottomlands of the East Fork Shoal Creek drainage system has been found to contain thicker deposits and has produced sufficient yields for communities such as Nokomis to the north. Drift aquifers are generally thin with low yields throughout the permit area. The Pennsylvanian age sandstone bedrock aquifers can usually provide only enough water for individual domestic and farm supplies. Yields from wells completed in these formations are usually less than 10 gallons per minute with yields less than 5 gallons per minute common. The mantle of unconsolidated materials at the ground surface (which generally ranges from 110 to 155 feet thick) does not contain substantial sand and gravel deposits capable of yielding sufficient quantities of water for a dependable domestic supply. The shallow drilled wells and cisterns generally have depths of 30 to 40 feet. These wells may tap discontinuous sand lenses contained in the upper part of the unconsolidated strata that are recharged directly by percolation of precipitation within the immediate area. These wells may be supplemented by directing runoff from nearby structures into the well bore.

The other source of ground water is the consolidated rock materials in the Pennsylvanian bedrock. The bedrock surface in the permit area consists of rocks in the Modesto Formation which overlies the Carbondale Formation, the unit containing the coal seam proposed to be mined. In general, rocks of these formations consist of alternating sandstone, limestone, shales and coal. Among these deposits, the best aquifer candidates are the relatively thin sandstones and the fractured or partially dissolved limestone beds. ISGS Circular 225 states that the low permeabilities of the Pennsylvanian System rocks cause the water in the deeper formations to be highly mineralized. Therefore, some deeper bedrock aquifers may contain water whose quality is unsatisfactory without expensive treatment and, generally, are not developed. Recharge to these bedrock aquifers is primarily from precipitation which percolates into and through the overlying unconsolidated materials.

Longwall and other high extraction mining methods cause collapse, fracturing, bed separation, and bedding plane slip in the roof strata above the mined seam. All of these impacts on the overlaying strata can result in changes to ground water availability if a major water resource is within reach of the mining disturbance. The height of the disturbed zone depends on the thickness of the mined coal, geometry of the mined panel, the rate of mining face advancement, and the geological characteristics of the overburden. The area of disturbance above a high extraction mining area is generally divided into four zones, based on the extent and type of disturbance. The four zones are: the zone of primary caving where the immediate roof collapses irregularly to fill the mined void; the fractured zone where strata breakage and bed separation occur along existing bedding planes; the continuous bending or deformation zone where strata between the fractured zone and the surface bend downward without breaking; and the surface zone where tensile strain at the surface causes shallow fractures to develop.

The combined height of the caved and fractured zone where changes in permeability due to subsidence occur has been described by various investigators to range from 30 to 60 times the thickness of the extracted seam. The lower end of this range is typical of areas where the overburden is composed of a high percentage of weak and more elastic strata. On the other hand, the upper end of this range was recorded only in mining with overburden composed entirely of brittle rock (limestone and sandstone). The presence of approximately 310 feet of overburden between the surficial deposits and mined coal, composed of approximately 60% elastic rock types (shales, siltstones, and claystones), will limit the height of the caved and fractured zone. Therefore, considering the presence of mostly more elastic shales in the overburden for the Deer Run Mine, it is estimated that the impacts of subsidence on strata permeability could reach up to 40 times the mining height. Based on an average extraction height of 7.5 feet, this would indicate the zone of disturbance could reach a maximum of 300 feet above the mine opening.

Numerous studies have been conducted to determine the effects of surface subsidence due to underground mining on unconsolidated and bedrock aquifers. Booth and Spande described the impacts of longwall mining the No. 6 Coal Seam in south-central Illinois. At the subject mine location, the coal seam was about 10 feet thick and was being mined at a depth of about 725 feet. The major aquifers above the mined coal seam included the Mt. Carmel Sandstone and alluvial and glacial sediments. The results of the study indicated some increase in permeability of the sandstone strata after undermining, and a temporary decrease in water levels of up to 36 feet. The water levels recovered gradually after the longwall face passed, and within a month returned to the approximate pre-mining levels. Other studies were conducted of a longwall mining operation in Saline County, Illinois where the No. 6 Coal Seam was 5.6 feet thick and about 400 feet below the ground surface. The studies concluded that the subsidence slightly increased the permeability of the Trivoli Sandstone aquifer, located approximately 213 feet above the mined coal. No impacts on permeability or water levels in the glacial drift aquifer were noticed. A third study was conducted of the impacts of a longwall mining operation on glacial and sandstone aquifers at a mine in western Illinois mining the No. 6 Coal Seam. The coal seam at this mine was 6.5 feet thick and the coal was overlain by 140 to 240 feet of bedrock and 70 to 160 feet of unconsolidated glacial sediments. The Trivoli Sandstone, a major aquifer in the area, is located about 150 feet above the mined coal. This study concluded that the subsidence increased the hydraulic conductivity of the Trivoli Sandstone by about one order of magnitude, and by two or three orders of magnitude in the shales. The study also found water levels in the glacial aquifers were increased due to the impacts of subsidence, and water levels in the sandstone decreased. It should be pointed out that the sandstone and shales for this latter case were within the caving and fracture zones described above.

No significant, detrimental impacts on drinking, domestic and residential water supplies are anticipated due to the proposed mining operations for several reasons. Although planned subsidence mining methods are proposed, the geologic conditions of the Deer Run Mine are favorable for limiting the impacts of any planned subsidence on both surface and ground water hydrology. The unconsolidated soil deposit which lies at the surface is composed of fine-grained materials consisting primarily of clay, gravel and silt with lesser amounts of sand. The soil thickness is generally from about 110 to 155 feet and the minimum thickness of the consolidated overburden between the mined coal and the bottom of the surficial deposits is approximately 310 feet. Based on the nature and thickness of the consolidated overburden in the permit area, subsidence is not likely to have significant, long-term impacts on ground water supplies.

Should subsidence affect a ground water supply, the impacts would be expected to be similar to the impacts described in the first two studies discussed above. Therefore, the potential impacts due to planned subsidence on water supply wells located above a mining panel in the bedrock aquifer could be temporary lowering of water levels. The water levels should recover to pre-mining levels within a few weeks after subsidence occurs. The possibility of decreasing water levels after subsidence has occurred is typically caused by increased permeability of the water

bearing strata. However, the decrease in water level in most wells is compensated for by an increased well yield. Therefore, the slight decrease of water levels after mining in some wells does not materially affect the post-mining water availability. The studies have indicated that aquifers in unconsolidated materials are not typically impacted by subsidence, even if shallow bedrock aquifers are impacted. Therefore, wells completed in the surficial deposits are not expected to be impacted by the planned subsidence mining.

Based on the significant overburden depth and its high percentage of elastic rocks, the distance from the mined coal to the surface deposits and the fine texture of the unconsolidated materials, no significant, long-term impacts to any drinking, domestic or residential water supplies are anticipated due to the planned subsidence resulting from the proposed mining.

2. Provide the locations of any water supplies that will be specifically monitored for water quality and quantity based on the potential for adverse impacts from the underground mining operations.

Response: ***The presence of groundwater wells within the subsidence control plan zone is limited. The groundwater surveys that were returned indicated only three structures that used a well as a primary water source. Two well reports were obtained from the ISGS and ISWS records, but the records do not indicate what the wells are used for.***

At least six months prior to longwall mining subsidence occurring at a property, the Illinois Department of Natural Resources, Office of Mines and Minerals and Reclamation Division will be notified of any groundwater sources that should be monitored. Quarterly progress reports shall be submitted to IDNR that will describe the location of the longwall face during the previous quarter and the predicted longwall face progress for the following six months. Surface property tracts will be identified that have been subsided during the past quarter as well as those tracts anticipated to be subsided in the next six months. Within the quarterly report will be information on groundwater wells that have been identified within the shadow area and the plans to monitor prior to and after subsidence.

Notification of residents will occur at least six months prior to subsidence occurring and the notification will be mailed in accordance to 62 ILL. Adm. 1817.122. The notification will contain all items required by the regulation and will also request information on any groundwater sources that the owners and occupants may be aware of on the surface property.

The vast majority of the residents utilize a public water source for their water supply. However, when sources of groundwater such as water wells, springs and/or cisterns have been identified; presubsidence monitoring for quality and quantity will be made, with the permission of the land owners. Data will be collected on the location, use, construction, depth, elevation, capacity, water quality, water quantity and the general geology of the water supply.

A presubsidence agreement may be entered into to describe what compensation may be provided if a water source is damaged.

Once subsidence has occurred, the water source will be monitored to determine the effect of subsidence. If the water source has been damaged by subsidence, the water source will be repaired or a new water source will be provided or the land owner will be compensated.

C. For all operations where water supplies have not been exempt from monitoring requirements under B, above: Water quality and quantity monitoring plan.

Response: ***Hillsboro Energy LLC is requesting an exemption from the requirements of 62 Ill. Adm. Code 1817.121(a)(2) to conduct surveys and monitoring of water supplies. Details of the monitoring***

plan, including a timetable, will be provided should the Department determine that water supplies must be monitored to collect pre-mining quality and quantity data.

1. Provide a plan for obtaining adequate pre-mining water quality and quantity data from wells and springs potentially impacted by subsidence. Specific parameters to be monitored and method(s) for defining approximate water supply quantities shall be detailed.

2. Provide a timetable for collection of data sufficiently in advance of underground mine development to document pre-mining quality and quantity. Data collection should reflect seasonal fluctuations.

D. For all underground operations: Replacement of impacted water supplies.

1. Compliance with 62 Ill. Adm. Code 1784.20(b)(9): Provide a general plan for replacing any contaminated, diminuend, or interrupted drinking, domestic or residential water supply. The plan should include possible contingencies for emergency, temporary and permanent replacement of affected water supplies. Replacement of water supplies must comply with the definition found under 62 Ill. Adm. Code 1701.Appendix A Definitions: "Replacement of Water Supply".

Response: ***If any drinking, domestic or residential water supplies are adversely affected due to the planned subsidence caused by the mining activities. Hillsboro Energy LLC will provide a suitable alternative water supply of equivalent quantity and quality as the original supply. Emergency or temporary water replacement will be provided within 24 hours of confirmation of loss of water due to subsidence. A temporary water supply could be established by hauling water, until the affected water supply returns to normal or a permanent supply is established. Owners of adversely affected water supplies will be reimbursed for actual out-of-pocket expenses caused by the temporary disruption of their water supply. Alternative permanent water supplies in the area include extension and connection to a public water supply system, drilled wells in the bedrock aquifer, and surface water impoundments. Permanent replacement includes providing an equivalent water delivery system and reimbursement for operation and maintenance costs in excess of the customary and reasonable delivery costs for the pre-mining water supplies.***

2. Compliance with 62 Ill. Adm. Code 1784.20(b)(9)(A): Provide a procedural plan for determining the existence and degree of material damage, loss or diminution of water quality and quantity. Address resolution of disputes over the existence, amount or level of water quality and quantity such as third party arbitration.

Response: ***If Deer Run Mine personnel are contacted by a resident or owner alleging that a drinking, domestic, or residential water supply has been adversely affected by subsidence, mine personnel will meet with the person as soon as practicable to investigate the claim and collect information documenting the details of the claimed damage. Based on the results of the initial investigation and in areas of alleged damages not clearly defined, Deer Run Mine will retain appropriate experts or other qualified persons, such as hydrologists, geologists, well drilling contractors, and plumbers, to inspect and evaluate the property and provide a written report, stating the conditions of the alleged damages. Procedures to determine the existence and degree of material damage, loss or diminution of water quality and quantity will be selected based on the findings of the experts evaluation. The procedures may include comparing information from unaffected, nearby residents who use the same water source, such as analyzing samples for water quality or conducting pump tests to determine aquifer yield characteristics. Once the details of the damage have been identified and documented, Deer Run Mine will appraise the alleged claim and propose a resolution or compensation. If the property owner is dissatisfied with the proposed resolution, differences will be resolved through third party arbitration or litigation.***

3. Compliance with 62 Ill. Adm. Code 1784.20(b)(9)(B): Provide a plan for determining the present worth of the cost to replace a water supply if the operator wishes to pursue a one-time lump sum

payment for costs associated with provisions for an equivalent water delivery system and payment of operation and maintenance costs in excess of customary and reasonable delivery costs for pre-mining water supplies. Any lump sum payments for future costs must be agreed to by the water supply owner.

Response: ***In the event Hillsboro Energy LLC wishes to pursue a one-time lump sum payment for costs associated with providing an equivalent water delivery system and payment of operation and maintenance costs in excess of customary and reasonable delivery costs for the pre-mining water supply, accepted economic analysis procedures will be used to determine the amount of the lump sum payment. A discounted cash flow analysis using accepted compound interest formulas will be performed to determine the net differences in the present value of the installation, operating and maintenance costs between the pre-mining water supply system and an equivalent water delivery system. Installation costs will be determined based on estimates or bids prepared by qualified contractors experienced in the installation of the selected water supply system. All equipment, components and construction necessary for installation and hookup of the replacement system will be included. Operating and maintenance costs over the expected life or the pre-mining system for both the pre-mining and replacement systems will be computed based on actual costs incurred by the owner, if available, or by estimates provided by a qualified contractor. Operating costs will include the reasonable and customary expenses for power, treatment chemicals, filters, and other consumable items related to the ongoing provisions of the water supply. If the replacement system involves connection to a municipal water supply, the operating costs will include the periodic charges imposed by the utility for the expected water usage. Maintenance costs will include expenses required for the repair and replacement of system components such as pumps, pressure tanks, and treatment systems. As indicated in Item I.D.1 in this addendum, the lump sum payment may also include reimbursement for actual out-of-pocket expenses caused by the temporary disruption of the water supply. Any proposal for lump sum payments for future costs will be presented to the water supply owner and their approval obtained.***

II. STRUCTURES, FACILITIES AND OCCUPIED DWELLINGS

A. For operations proposing planned subsidence.

1. Compliance with 62 Ill. Adm. Code 1784.20(b)(8)(A) and 1817.121(a)(3): Provide a general plan for the following:

a. A description of the methods that will be employed to minimize damage from planned subsidence to structures and facilities.

Please note that if minimization methods are not proposed for a given structure or facility, the written consent of the owner must be obtained and provided to the Department in advance of any planned subsidence impacts.

Response: ***At a minimum, Hillsboro Energy LLC will pursue a pre-mining agreement with the structure owner prior to subsidence occurring. The agreement will allow the implementation of measures designed to prevent or minimize subsidence damages and/or outline an orderly procedure for the repair or replacement of damaged structures following subsidence. These agreements will vary in content in accordance with each structure's site-specific conditions. A site-by-site determination will be made prior to subsidence occurring.***

Pre-subsidence activities could include the following:

- ***Reinforcement of sensitive structures or features;***

- ***Installation of footers or other techniques designed to reduce damages caused by movement;***
- ***Change location of pipelines, utility lines or other features;***
- ***Exposure of buried structures such as water lines or gas lines prior to subsidence;***
- ***Relocation of moveable improvements to sites outside the angle of draw;***
- ***Monitoring, to determine the commencement and degree of subsidence so that appropriate measures can be taken to prevent or reduce damage;***

b. A description of the procedure that will be used to demonstrate that the costs of minimizing damages exceeds the anticipated cost of repair. This option is not possible if subsidence material damage would constitute a threat to health or safety.

Response: ***A waiver of the requirements of minimization of subsidence damages may be obtained from the owner of the structure; or,***

The structure will be appraised of its value by a qualified appraiser. An estimate of the subsidence minimization cost will be made by a person qualified and experienced in subsidence related construction estimates. If the cost of minimization exceeds the value of the property or the cost of the repair, the Company may opt to not minimize the subsidence damage but may reimburse the owner of the structure.

c. A time table for submitting to the Department the specific minimization method for each structure or facility sufficiently in advance of underground mine development to comply with 62 Ill. Adm. Code 1784.20(b)(8)(A).

Response: ***Presubsidence agreements are being pursued in advance of mining. The presubsidence agreement provides the owners of structures or facilities a means of understanding the effects of subsidence upon their structures or facilities well in advance of the subsidence occurring. The Permittee is provided assurance that mining will continue without interruption.***

The Presubsidence Agreement is provided as a means to communicate with the Owner of the Structure or Facility what events will occur during the subsidence event, what techniques will be utilized to minimize subsidence damage and how the health and safety of the Residents of the Structure will be assured during the subsidence event.

The negotiation prior to the Presubsidence Agreement between the Owner of the Structure and Facility and the Permittee will provide the decision of whether to: minimize the damage to the structure or facility, provide the Owner the opportunity to not have minimization measures taken or provide a method to discover if the minimization costs would exceed the anticipated costs of repair.

If a Presubsidence Agreement cannot be agreed upon between the Structure Owner and the Permittee prior to 120 days before subsidence is to occur, then the Permittee shall submit to the Illinois Department of Natural Resources, Division of Mines and Minerals a site specific written plan of minimization of damage to surface structures.

B. For operations proposing planned subsidence: Qualification for exemption from performing individual structural condition surveys.

1. Compliance with 62 Ill. Adm. Code 1784.20(b)(7) and (b)(8)(B): Provide sufficient documentation concerning site-specific geologic, geotechnical and historical performance to demonstrate that a given structure or facility will not be impacted by the operation.

2. Provide the locations of any structures and facilities for which an exemption to conduct condition surveys is requested in B.1. above.

Based on the analysis provided under B above, the Department will determine if any structures qualify for an exemption. In the event the Department determines structures can be exempted, the operator will be specifically notified of such determination.

Response: ***An exemption from performing individual structural surveys condition surveys is not requested.***

C. Compliance with 62 Ill. Adm. Code 1784.20(b)(8)(B): Conducting pre-subsidence condition surveys. Provide a description of procedures to determine the condition of structures and facilities in accordance with 62 Ill. Adm. Code 1817.121(a)(2).

Response: ***The pre-subsidence survey will be conducted by a person qualified in evaluating structures and the effects of subsidence on structures. The survey must be performed with the consent of the Property Owner. The survey will be preformed at least 120 days prior to subsidence occurring unless approved by the Department after justification by the Permittee in writing. The survey will include a detailed documentation of the condition of the structure supported by either photographs and/ or drawings. The Permittee shall provide the Department verification that copies of the survey and technical assessment or engineering evaluation have been provided to the Owner.***

Much of the shadow area above the Deer Run Mine is supplied by public water supply systems. If a property owner utilizes other water sources, testing of the water quality of the drinking, domestic and residential water supply will be conducted and submitted at least 120 days prior to the water delivery system being undermined. A lesser time may be approved by the Department if justified by the Permittee in writing. A copy of the water survey will be provided to the property owner and to the Department.

D. For all underground operations, compliance with 62 Ill. Adm. Code 1817.121(c)(3): Adjustment of bond due to material damage from subsidence. When material damage resulting from subsidence occurs to land, structures and facilities, the operator must comply with 1817.121(c)(3). Describe how the operator will adjust the bond or alternatively assure financial responsibility with appropriate liability insurance if repair, replacement or compensation is not accomplished within the allocated time frames.

Response: ***Where practicable, repair, replacement or compensation for damage to land, structures and facilities will be completed within 90 days of the damage. However, if repair, replacement or compensation of material damage resulting from subsidence cannot be accomplished within 90 days of the occurrence of such damage, Hillsboro Energy LLC will rely on the property damage provisions of its liability insurance to demonstrate the required assurance of financial responsibility. Hillsboro Energy LLC will maintain its general liability insurance required by 62 IAC 1800.60 in full force and affect for the duration of its mining operations and until all subsidence related damage is repaired, replaced or compensated. When a claim is paid, the insurance company is obligated to pay the damaged party the full amount of the agreed settlement up to the policy limits. The $5,000 deductible will be paid by the insured (Hillsboro Energy LLC) to the insurance company, and whether or not it is paid, it will have no effect on the claimant's settlement. Refer to Attachment I.10.C-Certificate of Liability Insurance.***

III. Mining Operations Blasting

A) Will the applicant be conducting any surface blasting activities incident to underground mining, including, but not limited to, initial rounds of slopes or shafts that are within 50 vertical feet of the original ground surface?
[ ] Yes [X] No

Response: ***No regulated blasting is expected to occur within 50 feet of ground surface for construction of the shafts and slope.***

B.) If the answer to the above is "yes", please describe how the applicant will comply with 62 Ill. Adm. Code 1817.61 through 68.

Response: ***No regulated blasting is expected to occur.***

1) A copy of the proposed blasting schedule(s) and a list of persons to whom the schedule will be distributed for each blasting area described.

Response: ***No regulated blasting is expected to occur.***

2) A copy of the format used to notify persons within one-half (1/2) mile of the permit area as to how to obtain a pre-blast or condition survey.

Response: ***No regulated blasting is expected to occur.***

3.) A brief description of procedures to be used to perform pre-blast or condition surveys and for distributing copies of the survey reports to owner's residents and the Department.

Response: ***No regulated blasting is expected to occur.***

4.) A copy of the blasting report form.

Response: ***No regulated blasting is expected to occur.***

5.) The distance to, and the names and addresses of the owners of, all dwellings or other structures within one half (1/2) mile of the proposed permit area.

Response: ***Attachment I.2.B provides the name and addresses of owners of all dwellings or structures within one half (1/2) mile of the proposed permit area.***

6) a.) Will blasting be conducted within one thousand (1,000) feet of any building used as a dwelling, public building, school, church community building or institutional building outside the permit area?

Yes _____ No ___*X*___

b.) Will blasting be conducted within five hundred (500) feet of an active or abandoned underground mine?

Yes _____ No ___*X*___

If the answer to a) and b) is NO, then continue to Item c) below; if the answer to either a) or b) is YES, an anticipated blast design shall be submitted as described below:

Response: ***No regulated blasting is expected to occur.***

The blast design shall contain sketches of the drill patterns, delay periods, and decking and shall indicate the type and amount of explosives to be used, critical dimensions and the location and general description of the structures to be protected, as well as a discussion o the design factors to be used, which protect the public man meet the application air blast, flyrock, and ground vibration standards in Section 1819.67.

The blast design shall be prepared and signed by a certified blaster.

Response: ***No regulated blasting is expected to occur.***

If the blast design is not included with this application please state when you plan to submit the blast design:

_____

_____

c.) Include information setting forth the limitations the operator will meet with regard to ground vibration and airblast, the basis for those limitations, and the methods to be applied in controlling the adverse effects of blasting operations.

Response: ***No regulated blasting is expected to occur.***

d.) Include a description of any system to be used to monitor compliance with the standards of 62 Ill. Adm. Code 1816.67, including the type, capability, and sensitivity of any blast monitoring equipment and proposed procedures and locations of monitoring.

Response: ***No regulated blasting is expected to occur.***

e.) Blasting operations within five hundred (500) feet of active underground mines require approval of the Department and Federal Mine Safety and Health Administrations (MSHA). If blasting operations are expected to occur within five hundred (500) feet of an active underground mine, please include the written approvals of the Department and MSHA, or state when the written approvals will be submitted prior to conducting blasting operations.

Response: ***There are no active underground mines within 500 feet of the proposed Permit Area.***

PART VII

HURST-ROSCHE ENGINEERS, INC.

Hydrogeologic Investigation
Portions of Sections 7, 8, 17, and 18
East Fork Township
Montgomery County, Illinois

Prepared for

Hillsboro Energy, LLC
Hillsboro, Illinois

September 14, 2007
Revised November 15, 2007

HURST-ROSCHE ENGINEERS INC.
1400 E. TREMONT ST. P.O. BOX 130 HILLSBORO, IL 62049 217/532-3959

Hydrogeologic Investigation
Portions of Sections 7, 8, 17, and 18
East Fork Township
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TABLE OF CONTENTS

I. INTRODUCTION

Hurst-Rosche Engineers, Inc. has completed subsurface borings and piezometer/monitor well installations at selected locations within Sections 7, 8, 17 and 18 of East Fork Township, Montgomery County, Illinois. These sections and/or the project site are located immediately southeast of the City of Hillsboro. A map identifying the specific project area has been presented in Appendix A. Soil samples have also been collected at selected locations and these samples have been analyzed for classification and permeability characteristics. In addition, water samples have been collected from selected well locations. These activities have been completed with the purpose of identifying subsurface conditions and characterizing hydrogeologic conditions within the project area.

II. FIELD INVESTIGATION

Multiple field investigations have been completed in the project area. Nineteen borings were completed at intermittent times from November 2006 to June 2007. These borings were completed using solid stem, hollow stem, or wash boring techniques. The borings were completed for the primary purpose of identifying top of bedrock topography, and initially characterizing hydrogeologic conditions of unconsolidated deposits. During the drilling process, split-spoon samples were collected at selected locations. A map identifying boring locations has been presented in Appendix A, and boring logs have been presented in Appendix B.

An additional thirteen borings were completed in August and early September 2007. These borings were generally completed using continuous sampling techniques down to a 30 ft. depth, and then split-spoon sampling was completed at 5 ft. intervals to an 80 ft. depth. The borings were completed for the primary purpose of identifying and characterizing hydrogeologic conditions associated with the uppermost aquifer at the site. Piezometer/monitor wells were installed at twelve of the supplemental boring locations, and additional piezometers were installed at three of the boring locations. Wells screened within a 10 ft. interval, varying from the 5 ft. to 20 ft. depth, were installed at each of the supplemental boring locations, and the three additional piezometers were installed at depth to evaluate hydrogeologic conditions associated with isolated and intermittent granular outwash units. Locations of the supplemental borings have been shown on the site map in Appendix A, and logs of the borings have been presented in Appendix B. Also presented in Appendix B are well completion reports for each of the installed piezometer/monitor wells.

Six Shelby tube samples were collected at selected depths at selected boring locations. Collected samples were used to complete classification and permeability testing. Sample locations have been identified on the boring logs.

Piezometer/monitor well installations were completed in accordance with industry recognized procedures. Two inch diameter pre-manufactured PVC well screens and risers were utilized for all well installations. A sand pack was placed around each well screen, and the well screen area was sealed with a bentonite plug. The well anulus above the bentonite plug was filled with a cement/bentonite slurry. Following well installations, each well was developed by removing a minimum of five gallons of water from the well. Water was removed using a PVC or stainless steel bailer. In some cases, less than 5 gallons of water was removed during the development process as the well would not immediately produce 5 gallons of water. Groundwater samples were collected from each of the shallow wells, and these samples were transported for analytical testing the same day as collected. Results of the analytical testing

have been discussed in Section VII below. Static water level measurements have also been recorded for each well location. A table summarizing the measurements has been presented in Appendix C.

Slug testing was completed in the three deep well locations for the purpose of identifying in-situ permeability of the respective sand units. Results for this testing have been presented in Appendix D, and the results have been discussed in Section VI below.

Geologic cross sections have been developed from the boring information. These cross sections present anticipated subsurface conditions at the project site. Stratigraphic horizons have been delineated on the cross sections based on the geologic history of Montgomery County, site topographic features, and subsurface conditions encountered at the boring locations.

The numbering system for borings and wells is based on sectional location (e.g. 08-03-17-01). The first and second numbers in the sequence identify the township and range, respectively. The third number in the sequence identifies the section within the township, and the last number in the sequence identifies the number of the boring within the section as completed in chronological order.

III. LABORATORY TESTING

The six Shelby tube samples collected during the August/September investigation have been used to complete classification and permeability testing. Specifically, mechanical analysis (ASTM D422) has been completed and index properties (ASTM D4318) have been determined to classify the samples; and permeability testing (ASTM D5084) has been completed to determine conductivity characteristics of the samples. Laboratory test results have been summarized and presented in Appendix E.

As indicated in Section II above, groundwater samples were collected from the shallow well locations. These samples were delivered to Teklab, Inc. in Collinsville, Illinois for analysis of total metals and other selected parameters. Analytical results have been presented in Appendix F.

IV. PHYSIOGRAPHIC LOCATION AND SITE TOPOGRAPHY

The project site is located in the Springfield Plain of the Till Plains Section, Central Lowland Province. The Springfield Plain generally consists of flat to gently rolling plains which were formed during glacial advancements into Illinois. The glacial advancements left behind large amounts of glacial remnants and have produced extensive till plains. Subsequent or later glacial activity produced morainic ridges and outwash plains. Most of the steep and long ridges as originally deposited have been reduced by erosion to rounded hills. The moronic topography is characteristic of the immediate Hillsboro area, and other areas throughout the county.

The site topography is generally described as flat, with overall relief throughout the area less than 20 ft. Surface water runoff in the western portion of the project area is westward toward a pond identified as Shoal Creek Watershed Structure No. 5. Surface water runoff in the eastern area of the site is northeastward toward a tributary to the Big Four Reservoir. This reservoir, or lake, is approximately 0.5 miles north of the project site. Drainage in the southwestern portion of the site is northwestward via a tributary to the Shoal Creek Watershed Structure, and drainage in the southeastern portion of the site is generally southward via a

tributary to Miller Creek. A majority of the site is tillable, with timbered areas immediately adjacent to local drainageways and/or tributaries.

V. GEOLOGIC CHARACTERISTICS

Geologic maps suggest that unconsolidated deposits in the project area are expected to be in excess of 100 ft. thick. The primary subsurface soils are identified as Vandalia Till. These soils are characteristically compact, hard, silty till with intercolated sand and gravel. Due to depositional history, the till may contain intermittent and discontinuous sand seams. Loessial soils up to approximately 5 ft. thick may be present at ground surface.

Reference to the boring logs and geologic cross sections suggest that subsurface conditions are generally characterized as a medium stiff to stiff, silty clay to clay loam (ablation till) being present down to approximately 15 ft. to 25 ft. below ground surface. The compact, very stiff to hard Vandalia till (basal till) was present beneath the ablation till soils. The Vandalia till extends down to bedrock. Depth to bedrock in the project area varies from approximately 100 ft. to 175 ft. below ground surface.

A saturated sand seam(s) was generally encountered within the ablation till and was generally encountered in lower sections of the upper till unit. Sand thickness varied from approximately 2 ft. up to approximately 10 ft. thick. The sand was absent at some boring locations, and greater thicknesses were identified at two isolated locations. As expected, intermittent sand seams were also encountered on occasion within the Vandalia till. The thickness of the isolated sand seams was generally 5 ft. or less.

Classification testing of collected Shelby tube samples suggests that the fine grained ablation till soils classify as a clay loam (CL), and generally contained approximately 25% clay, 40% silt, and 35% sand, with a liquid limit of 30 and a plasticity index of 10. Laboratory permeability testing resulted in hydraulic conductivities ranging from 2×10^{-6} cm/sec to 1×10^{-7} cm/sec. Gradational characteristics and index properties suggest the fine-grained soil could be recompacted to form a soil liner with a permeability of 1×10^{-7} cm/sec. or less, however this should be verified through additional testing.

Classification testing of Shelby tube samples collected from upper portions of the Vandalia till suggest this soil classifies as a sandy silt (ML) to sandy clay (CC), with conductivity test results ranging from 6×10^{-7} cm/sec to 3×10^{-9} cm/sec.

VI. HYDROGEOLOGIC CHARACTERISTICS

As indicated in Section V above, a saturated sand seam(s) was generally encountered within 20 ft. to 25 ft. of ground surface. Accordingly, the uppermost aquifer at the site appears to be associated with this sand and/or the upper ablation till soils. Shallow piezometer/monitoring wells installed in August/September have been screened within the sand units, and screened to intercept the surface of the apparent water table.

Initial water level measurements suggest that flow direction of groundwater in the eastern area of the project site is northeastward in conjunction with surface topography. Groundwater flow direction in southern and western areas of the site appear to be in a west to northwesterly direction toward the Shoal Creek watershed structure, however piezometric data for the southern area is not consistently conclusive. Additional water level measurements are to be obtained to better assess groundwater flow direction.

As indicated in Section V above, apparent intermittent and discontinuous granular outwash deposits were encountered within the Vandalia till. Reference to the boring logs and geologic cross sections will indicate that the depth and thickness of the outwash units does not suggest that the sand was uniformly deposited throughout the area in a manner to form a consistent aquifer.

Piezometer wells were installed at the Borings 17-08, 17-09 and 18-17 locations. Sand units and/or well screens at these locations were near the 60 ft. depth at the well 17-08 and 17-09 locations, and near the 25 ft. depth at the well 18-17 location. Sand thickness was identified as less than 10 ft. at each of these locations. Slug testing was completed at each of these well locations and results suggest in-situ permeabilities ranging from 6×10^{-5} cm/sec to 9×10^{-5}cm/sec. Initial water level measurements indicate that static water levels within deep wells at the 17-08 and 18-17 locations are consistent with static water levels in adjacent shallow wells, suggesting that hydraulic connection may exist between the upper aquifer and deeper outwash units. It is noted that minimal vertical separation exists between the upper sand seam(s) and the deeper well at the 18-17 location, thus hydraulic connection is not unexpected. An approximate 4 ft. head difference has been identified from initial water level measurements at the well 17-09 location. Again, additional measurements are necessary to verify the initial groundwater information.

VII. GROUNDWATER QUALITY AND CLASSIFICATION

Groundwater samples were collected from each shallow well and analyzed for selected parameters. Results of these analyses have been presented in Appendix F. Constituent concentrations did vary from well to well, particularly inorganic concentrations (e.g. calcium varied from 277 mg/l at the Well 18-21 location to 4,560 mg/l at the Well 17-08 location). Variation in water quality is common, and is generally the result of natural hydrogeologic conditions of the aquifer. It is noted that total concentrations for inorganic parameters have been analyzed. Additional sampling and analyses are scheduled to be completed to further characterize existing groundwater quality, and to identify any seasonal fluctuations.

Hydrogeologic information suggests that groundwater associated with the uppermost aquifer and greater than 10 ft. below ground surface is Class I groundwater as defined in 35 IAC 620.210. Information also suggests that isolated sand lenses within the Vandalia till unit do not appear to be capable of providing sufficient and consistent water for potable purposes. Further, these units are generally less than 5 ft. thick, and as suggested by in-situ conductivity testing, maintain conductivities less than 1×10^{-4} cm/sec. Accordingly, water contained within the isolated sand lenses is Class II (general resource) groundwater as defined in 35 IAC 620.220.

VIII. GROUNDWATER MONITORING PROGRAM

Given the hydrogeologic conditions described herein, it is recommended that the groundwater monitoring program for site development activities be focused on monitoring the uppermost aquifer. Accordingly, it is recommended that site monitoring wells be screened within the upper ablation till soils, and specifically the upper sand units. Wells which have been installed in conjunction with this investigation may continue to be used for monitoring purposes. Additional wells may become necessary based on finalized development plans and ultimate groundwater flow direction determined from future supplemental information.

Well records available for domestic water wells near the project area indicate that large diameter (30 inch to 44 inch), shallow (15 ft. to 40 ft.) wells have typically been installed for water supply. This information suggests that the proposed groundwater monitoring network will monitor the historical supply aquifer for the local area. It is further noted that the local area is currently being serviced by a rural water district. Well records obtained from the ISGS and ISWS have been presented in Appendix G.

IX. LIMITATIONS OF REPORT

This assessment and report have been completed with the intent of determining hydrogeologic characteristics at the project site, and presenting analyses and recommendations based on those characteristics. The information presented in this report is based on data obtained from site reconnaissance, the 32 borings completed at the site, laboratory test results, well and water level data, published information, and other pertinent information presented in this report. Information presented is not intended to be a guarantee that all geologic and hydrogeologic conditions described herein will be consistent. There may be, and often is, a considerable variation in subsurface conditions within the same general area.

Appendix A
Boring Location Map and Cross Sections

Appendix B
Boring Logs and Well Completion Reports

Hillsboro Energy Borings
Section 17, East Fork Township
Southeast Corner White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: November 20-28, 2006
BORING TECH.: M. Hough
DRILLING TECH.: D. Jenkins

FOUNDATION BORING LOG

BORING NO.: 1 (08-03-17-01)
COORDINATES: N 900500.0
E 2500570.6
SURFACE ELEV.: 637.2 ft.

GROUNDWATER ELEV.
COMP.: --
AFTER 20 DAYS: -7.9 ft.;
Bridge at -13.6 ft.

	N Value	Qu (tsf)	W (%)	REC (%)
0 SILTY LOAM (ML), Gray, Moist, Medium Stiff				
SILTY CLAY LOAM (CL-ML), Brown, Gray, Mottled, Moist, Stiff		P		
5	18	2.0	--	85
CLAY (CL), Brown, Gray, Mottled, Moist, Medium Stiff, Little Sand & Gravel		P		
10	8	1.5	--	90
Gray, Moist To Wet		P		
15	6	0.5	--	80
With Saturated Sand Seams				
SILTY LOAM TILL (ML), Gray, Moist To Wet, Hard, Trace Gravel		P		
20	60	1.0	--	80
20 With Intermittent Saturated Sand Seams To 25.0 Ft.		P		
	81	>4.5	--	80
		P		
25	101	>4.5	--	90
		P		
	73	>4.5	--	90
SAND (SP), Medium Coarse To Coarse, Gray, Saturated, Very Dense With Intermittent Clay Till Seams				
30	75	NP	--	90
	See Note 2			
35 CLAY TILL (CL), Gray, Moist, Hard	60	NP	--	85
SAND (SP), Medium Coarse To Coarse, Gray, Saturated, Medium Dense	23	NP	--	85
Clay Till Seam at 37.0 ft.		P		
40 CLAY TILL (CL), Dk. Gray, Moist, Hard	48	4.0	--	90

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 17, East Fork Township
Southeast Corner White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: November 20-28, 2006
BORING ENG.: M. Hough
DRILLING TECH.: D. Jenkins

FOUNDATION BORING LOG

BORING NO.: 1 (08-03-17-01) COORDINATES: N 900500.0 E 2500570.6 SURFACE ELEV.: 637.2 ft.	N Value	Qu (tsf)	W (%)	REC (%)
40				
CLAY TILL (CL), Dk. Gray, Moist To Dry, Hard		P		
Thin Saturated Sand Seam At 42.0 Ft.	72	>4.5	--	90
Dry, Trace Gravel		P		
45	91	>4.5	--	90
		P		
SAND (SP), Medium Coarse To Coarse, Gray, Moist To Wet, Very Dense	100/11"	>4.5	--	60
		P		
CLAY TILL (CL), Gray, Moist To Dry, Hard				
50	100/11"	>4.5	--	60
		P		
	100/11"	>4.5	--	60
		P		
55	27	>4.5	--	70
		P		
	37	>4.5	--	90
		P		
60	33	>4.5	--	90

GROUNDWATER ELEV. COMP.: -- AFTER 20 DAYS: -7.9 ft.; Bridge at -13.6 ft.	N Value	Qu (tsf)	W (%)	REC (%)
60				
SAND (SP), Fine To Medium Coarse, Gray, Saturated, Very Dense, With Intermitten Layers of Clay Till	83	NP	--	90
65	63	NP	--	90
SILTY LOAM TILL (ML), Dk. Gray, Moist To Dry, Hard	31	NP	--	90
CLAY TILL (CL), Dk. Gray, Moist To Dry, Very Stiff, Trace Sand & Gravel		P		
70	20	3.0	--	90
		P		
Gray, Brown, Mottled	18	3.5	--	90
		P		
75	19	3.0	--	90
		P		
Gray, Brown, Mottled, Dry, Hard, Trace Sand & Gravel	62	>4.5	--	90
		P		
With Thin, Medium Coarse, Sand Seams	99	>4.5	--	90
80				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 17, East Fork Township
Southeast Corner White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: November 20-28, 2006
BORING ENG.: M. Hough
DRILLING TECH.: D. Jenkins

FOUNDATION BORING LOG

BORING NO.: 1 (08-03-17-01)
COORDINATES: N 900500.0
E 2500570.6
SURFACE ELEV.: 637.2 ft.

GROUNDWATER ELEV.
COMP.: –
AFTER 20 DAYS: -7.9 ft.;
Bridge at -13.6 ft.

	N Value	Qu (tsf)	W (%)	REC (%)
80				
CLAY TILL (CL), Gray, Brown, Mottled, Dry, Hard, Trace Sand & Gravel		P		
	59	>4.5	--	90
		P		
Little Gravel, With Thin Layer Of Coarse Sand				
85	100/11"	>4.5	--	90
		P		
	71	>4.5	--	80
		P		
90	63	>4.5	--	90
Trace Of Gravel		P		
	68	>4.5	--	90
		P		
95	34	>4.5	--	90
		P		
	22	3.5	--	90
	100/1"	--	--	--
Auger Refusal At 98.6 ft.				
100				

Notes:
1) Borehole backfilled with soil cuttings intermixed with bentonite chips after completion of final water table measurement.
2) Blowcount value and sample not obtained at this depth due to sand blow-in.
3) Methane gas was encountered at the 78 ft. depth at 10:15 a.m. on 11/22/06. Rigorous venting continued for approximately 2 hrs. Venting was still occurring at 2:00 p.m. Continued drilling on 11/27/06.

	N Value	Qu (tsf)	W (%)	REC (%)
100				
105				
110				
115				
120				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Boring Nos. 2 and 3 have been intentionally omitted. These borings were completed outside of the area encompassed by this hydrogeologic investigation.

Hillsboro Energy Borings
Section 17, East Fork Township
Northwest Corner White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: January 2-3, 2007
BORING TECH.: D. Jenkins / C. Greenwood
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 4 (08-03-17-02)
COORDINATES: N903013.3 E2498019.6
SURFACE ELEV.: 633.5 ft.

GROUNDWATER ELEV.
COMP.: - -
AFTER 48 HRS.: 0.0 ft.;
Bridge at -8.6 ft.

	N Value	Qu (tsf)	W (%)	REC (%)
0 SILTY CLAY LOAM (CL-ML), Brown, Moist				
Brown, Gray, Mottled, Stiff		P		
5	20	2.0	–	70
		P		
10	41	2.3	--	100
CLAY (CL), Brown, Gray, Mottled, Stiff, Little Sand & Gravel				
With Saturated Sand Seams		P		
15	11	0.5	–	100
		P		
SILTY LOAM TILL (ML), Gray, Dry To Moist, Hard, Trace Gravel 20	100/4.5"	1.5	–	75
20 CLAY TILL (CL), Gray, Moist, Hard, Little Sand		P		
Coarse Sand Seam At 25 Ft. 25	100/2"	>4.5	–	90
		P		
Gray, Dry, Hard, Trace Sand & Gravel 30	100/2"	>4.5	–	90
		P		
35	80	>4.5	--	85
		P		
40	55	>4.5	–	100

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 17, East Fork Township
Northwest Corner White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: January 2-3, 2007
BORING TECH.: D. Jenkins / C. Greenwood
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 4 (08-03-17-02)
COORDINATES: N903013.3
E2498019.6
SURFACE ELEV.: 633.5 ft.

GROUNDWATER ELEV.
COMP.: - -
AFTER 48 HRS.: 0.0 ft.;
Bridge at -8.6 ft.

	N Value	Qu (tsf)	W (%)	REC (%)
40				
CLAY TILL (CL), Gray, Dry, Hard, Trace Sand & Gravel		P		
45	43	>4.5	--	100
		P		
50	37	>4.5	--	100
		P		
Very Stiff 55	29	>4.5	--	95
		P		
60	29	3.8	--	100
60				
Hard				
65	19	- -	--	35
		P		
70	17	3.0	--	100
		P		
75	35	>4.5	--	100
		P		
80	56	>4.5	--	100

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 17, East Fork Township
Northwest Corner White Property
Job # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: January 2-3, 2007
BORING TECH.: D. Jenkins / C. Greenwood
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 4 (08-03-17-02)
COORDINATES: N903013.3
E2498019.6
SURFACE ELEV.: 633.5 ft.

GROUNDWATER ELEV.
COMP.: --
AFTER 48 HRS.: 0.0 ft.;
Bridge at -8.6 ft.

	N Value	Qu (tsf)	W (%)	REC (%)
80 CLAY TILL (CL), Brown, Dry, Hard, Trace Sand & Gravel		P		
85	45	>4.5	--	100
		P		
90 Gray, Little Sand	52	>4.5	--	100
		P		
Fine Sand Seam At 94 Ft.				
95	46	>4.5	--	80
		P		
100	47	>4.5	--	100
100		P		
Notes: 1) Borehole backfilled with soil cuttings intermixed with bentonite chips after completion of final water table measurement. 2) Precipitation and/or surface water may have impacted final groundwater reading.				
105	32	>4.5	--	100
		P		
Very stiff 110	19	2.5	--	90
		P		
Hard				
115 Thin Gravel Seam At 115 Ft.	33	2.0	--	100
	100/1"	--	--	--
Auger Refusal at 117.0' 120				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler
" with 140 lb. Hammer falling 30"
tandard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 17, East Fork Township
Northeast Corner White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: January 25-30, 2007
BORING ENG.: C. Greenwood / M. Emken
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 5 (08-03-17-03)
COORDINATES: N902988.1 E2500369.5
SURFACE ELEV.: 616.2 ft.

GROUNDWATER ELEV.
COMP.: --
AFTER 24 HRS.: -19.2 ft.

	N Value	Qu (tsf)	W (%)	REC (%)
0 CLAY (CL), Dark Gray, Moist, Stiff		P		
5	8	2.0	--	78
SILTY CLAY (CL), Dark Gray, Moist, Medium Stiff, Trace of Sand		P		
10	5	1.5	--	100
SILTY LOAM (ML), Gray, Moist, Very Soft		P		
15	2	1.5	--	100
SILTY CLAY LOAM (CL), Gray, Moist to Wet, Very Soft		P		
20	2	0.1	--	67
SAND (SW), Gray, Saturated, Medium Dense, Fine to Coarse, Trace of Fine Gravel				
25	16	NP	--	100
Dense				
30	37	NP	--	NS
Loose				
35	7	NP	--	28
SAND (SP), Gray, Saturated, Dense, Fine, Trace of Fine Gravel				
40	35	NP	--	100

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 17, East Fork Township
Northeast Corner White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: January 25-30, 2007
BORING ENG.: C. Greenwood / M. Emken
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 5 (08-03-17-03) COORDINATES: N902988.1 E2500369.5 SURFACE ELEV.: 616.2 ft.	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -- AFTER 24 HRS.: -19.2 ft.	N Value	Qu (tsf)	W (%)	REC (%)
40 SAND (SP), Gray, Saturated, Dense, Fine, Trace of Fine Gravel					60		P		
						12	2.5		100
SILTY SAND (SM), Gray, Moist to Saturated, Dense, Fine,					Medium Stiff		P		
Trace of Gravel 45	35	NP	--	100	65	4	3.0		55
					Olive, Hard		P		
						38	>4.5	--	100
Loose							P		
50	8	NP	--	100	70	31	>4.5	--	100
					Methane Gas Encountered				
CLAY TILL (CL), Gray, Moist,		P			(See Note 1)		P		
Hard, Trace of Sand & Gravel					Silt Seam (4") Gray		>4.5		
	72	2.0	--	100	SAND (SP), Brown, Dry to	74	NP	--	100
		P			Moist, Fine		P		
55	48	4.5	--	100	SILTY LOAM TILL (ML), Gray, Dry to Moist, Very Stiff, 75	22	3.0	--	100
					Trace of Sand				
Very Stiff		P			SANDY LOAM (SP), Light Gray, Moist, Fine				
	15	5.0	--	83		Omitted due to methane gas			
					SILTY LOAM TILL (ML), Gray,				
Moist to Dry		P			Moist to Wet, Very Stiff,		P		
					Trace of Sand & Gravel				
60	16	3.5	--	100	80	16	1.0	--	100

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 17, East Fork Township
Northeast Corner White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: January 25-30, 2007
BORING ENG.: C. Greenwood / M. Emken
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 5 (08-03-17-03) COORDINATES: N902988.1 E2500369.5 SURFACE ELEV.: 616.2 ft.	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: - - AFTER 24 HRS.: -19.2 ft.	N Value	Qu (tsf)	W (%)	REC (%)
80					100				
SILTY LOAM TILL (ML), Gray, Moist to Wet, Very Stiff, Trace of Sand & Gravel		P			SILTY CLAY TILL (CL), Gray, Moist, Very Stiff, Trace of Sand		P		
Dry with Coarse Gravel	38	>4.5	--	100		21	1.5	--	100
		P					P		
85	29	>4.5	--	100	Thin Sand Seam (2")	105 27	4.0	--	100
		P					P		
	26	>4.5	--	100	Thin Sand Seam (1")	16	3.75	--	100
		P			Trace of Sand & Gravel		P		
Medium Stiff 90	6	2.0	--	100		110 21	2.75	--	100
		P					P		
Very Stiff with Fine Gravel	27	3.75	--	100		23	4.5	--	100
		P					P		
95	17	4.25	--	100		115 22	3.0	--	100
		P			Medium Stiff		P		
	22	1.75	--	100		14	1.0	--	100
Possible Cobbles Encountered While Drilling		P			Very Stiff		P		
Moist to Wet, Medium Stiff 100	6	1.0	--	100		120 21	1.0	--	100

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 17, East Fork Township
Northeast Corner White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: January 25-30, 2007
BORING ENG.: C. Greenwood / M. Emken
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 5 (08-03-17-03)
COORDINATES: N902988.1
E2500369.5
SURFACE ELEV.: 616.2 ft.

GROUNDWATER ELEV.
COMP.: - -
AFTER 24 HRS.: -19.2 ft.

	N Value	Qu (tsf)	W (%)	REC (%)
120 SILTY CLAY TILL (CL), Gray, Moist, Hard, Trace of Sand & Gravel		P		
	45	1.0	--	100
Very Stiff		P		
125	20	1.0	--	100
SAND (SP), Gray, Moist, Medium Dense				
	26	NP	--	100
		P		
SILTY CLAY TILL (CL), Dark Gray, Moist to Wet, Very Stiff, Trace of Sand & Gravel 130	24	0.5	--	83
		P		
SILTY LOAM (ML), Gray, Moist, Very Stiff	20	1.5	--	100
		P		
SILTY CLAY TILL (CL), Gray, Moist, Hard, Trace of Sand 135	56	0.5	--	94
		P		
	58	0.75	--	89
		P		
140	74	1.25	--	100
140 Very Stiff		P		
	17	1.0	--	100
Hard		P		
145	33	3.0	--	100
		P		
	38	1.5	--	100
SILTY LOAM TILL (ML), Dark Gray, Moist, Very Stiff, Trace of Sand & Gravel 150		P		
	29	2.0	--	100
		P		
SILTY CLAY TILL (CL), Gray, Moist, Very Stiff, Trace of Sand & Gravel 155	22	1.5	--	72
		P		
SILTY LOAM (ML), Gray, Moist, Hard				
160	32	3.5	--	100

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 17, East Fork Township
Northeast Corner White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: January 25-30, 2007
BORING ENG.: C. Greenwood / M. Emken
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 5 (08-03-17-03) COORDINATES: N902988.1 E2500369.5 SURFACE ELEV.: 616.2 ft.	N Value	Qu (tsf)	W (%)	REC (%)
160 SILTY LOAM (ML), Gray, Moist, Hard		P		
SILTSTONE, Light Gray, Hard	100/8"	>4.5	--	100
165		P		
SHALE, Gray, Fissile Apparent Bedrock	100/12"	>4.5	--	100
Auger refusal at 168 ft. 170 175 180				

GROUNDWATER ELEV. COMP.: -- AFTER 24 HRS.: -19.2 ft.	N Value	Qu (tsf)	W (%)	REC (%)
180 185 190 200 210				

Notes:
1) Methane gas was encountered at the approximate depth of 71 ft. at 9:45 a.m. (1/26/07) and vented vigorously for approx. 30 minutes. A lesser amount of methane gas was present throughout the rest of the drilling day.
2) Borehole backfilled with soil cuttings intermixed with bentonite chips after completion of final groundwater table measurement.

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 17, East Fork Township
East Edge White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: February 8 & 9, 2007
BORING ENG.: C. Greenwood
DRILLING TECH.: M. Hough

AUGER BORING LOG

BORING NO.: 6 (08-03-17-05)
COORDINATES: N900966.3
E2500569.1
SURFACE ELEV.: 638.0 ft.

GROUNDWATER ELEV.
COMP.: --
AFTER 24 HRS.: --

	N Value	Qu (tsf)	W (%)	REC (%)
0 CLAY (CL), Dark Gray, Moist, Stiff, Easy Drilling				
		This boring completed as an auger boring. No sampling completed.		
5				
10 Dry, Brown				
15				
20				
20				
25				
30 Slower Drilling, Possible Horizon Change, No Cuttings Recovered				
35				
40				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 17, East Fork Township
East Edge White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: February 8 & 9, 2007
BORING ENG.: C. Greenwood
DRILLING TECH.: M. Hough

AUGER BORING LOG

BORING NO.: 6 (08-03-17-05) COORDINATES: N900966.3 E2500569.1 SURFACE ELEV.: 638.0 ft.	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: - - AFTER 24 HRS.: –	N Value	Qu (tsf)	W (%)	REC (%)
40 45 Faster Drilling, Possible Horizon Change, No Cuttings Recovered 50 55 60					60 65 70 75 80				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 17, East Fork Township
East Edge White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: February 8 & 9, 2007
BORING ENG.: C. Greenwood
DRILLING TECH.: M. Hough

AUGER BORING LOG

BORING NO.: 6 (08-03-17-05) COORDINATES: N900966.3 E2500569.1 SURFACE ELEV.: 638.0 ft.	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -- AFTER 24 HRS.: --	N Value	Qu (tsf)	W (%)	REC (%)
80 Slower Drilling, Hard, Possible Horizon Change, No Cuttings Recovered 85 90 95 100					100 105 110 115 120				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 17, East Fork Township
East Edge White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: February 8 & 9, 2007
BORING ENG.: C. Greenwood
DRILLING TECH.: M. Hough

AUGER BORING LOG

BORING NO.: 6 (08-03-17-05) COORDINATES: N900966.3 E2500569.1 SURFACE ELEV.: 638.0 ft.	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -- AFTER 24 HRS.: –	N Value	Qu (tsf)	W (%)	REC (%)
120					140				
125					145				
Faster Drilling, Possible Horizon Change, No Cuttings Recovered									
130					150				
135					155				
140					160				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 17, East Fork Township
East Edge White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: February 8 & 9, 2007
BORING ENG.: C. Greenwood
DRILLING TECH.: M. Hough

AUGER BORING LOG

BORING NO.: 6 (08-03-17-05)
COORDINATES: N900966.3
E2500569.1
SURFACE ELEV.: 638.0 ft.

GROUNDWATER ELEV.
COMP.: --
AFTER 24 HRS.: –

N Value	Qu (tsf)	W (%)	REC (%)	N Value	Qu (tsf)	W (%)	REC (%)

160
165
170

Very Hard Drilling at 170 ft.
(Apparent Soft Bedrock or
Residual Bedrock)

175

Auger Refusal at 175.0 ft.

180

Note: Borehole backfilled with soil cuttings intermixed with bentonite chips after completion of borehole.

180
185
190
195
200

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler
12" with 140 lb. Hammer falling 30"
(Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 8, East Fork Township
Northernmost Boring Along
White Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: January 22, 2007
BORING TECH: R.Ruhmann
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 7 (08-03-08-01) COORDINATES: N905080.3 E2497952.7 SURFACE ELEV.: 626.1	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -85 ft. AFTER 24 HRS.: --	N Value	Qu (tsf)	W (%)	REC (%)

This boring completed as an auger boring.
No sampling completed.

Possible Boulders or Cobbles Encountered, Possible Clay Till or Horizon Change

5
10
15
20
25
30
35
40

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 8, East Fork Township
Northernmost Boring Along
White Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: January 22, 2007
BORING TECH: R.Ruhmann
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 7 (08-03-08-01)
COORDINATES: N905080.3
E2497952.7
SURFACE ELEV.: 626.1

GROUNDWATER ELEV.
COMP.: -85 ft.
AFTER 24 HRS.: --

	N Value	Qu (tsf)	W (%)	REC (%)		N Value	Qu (tsf)	W (%)	REC (%)
45					65				
50					70				
Soft Drilling 55					75				
60					80				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler
12" with 140 lb. Hammer falling 30"
(Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 8, East Fork Township
Northernmost Boring Along
White Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: January 22, 2007
BORING TECH: R.Ruhmann
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 7 (08-03-08-01) COORDINATES: N905080.3 E2497952.7 SURFACE ELEV.: 626.1	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -85 ft. AFTER 24 HRS.: --	N Value	Qu (tsf)	W (%)	REC (%)
85					Auger Refusal at 101 ft.				
90					Note: Borehole backfilled with soil cuttings and bentonite mix.				
95									
100									
					105				
					110				
					115				
					120				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 8, East Fork Township
South of B-11 Along
White Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: January 23, 2007
BORING TECH: R.Ruhmann
DRILLING TECH.: M. Hough

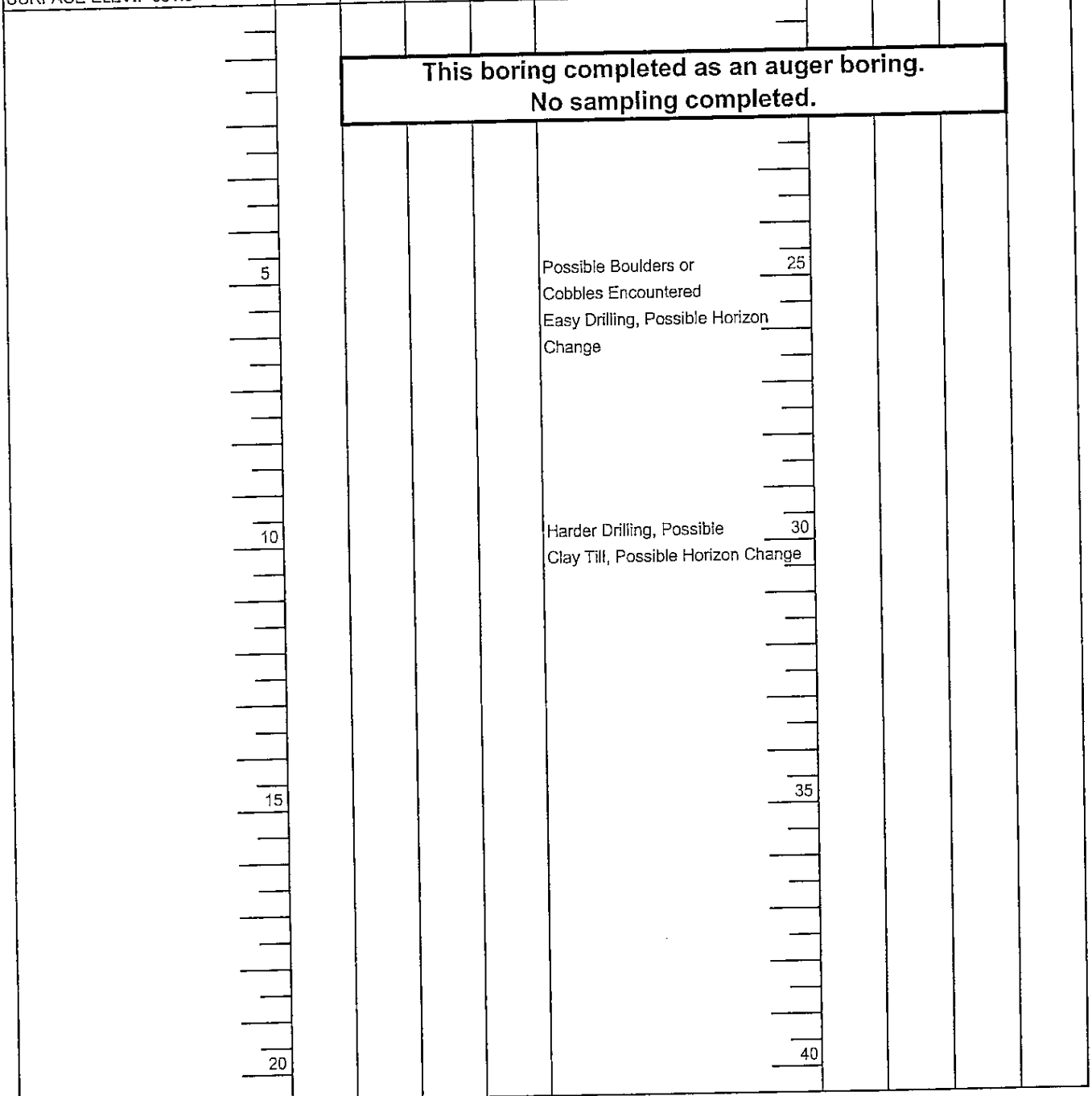
FOUNDATION BORING LOG

BORING NO.: 8 (08-03-08-02)
COORDINATES: N904558.1
E2497955.9
SURFACE ELEV.: 631.3

GROUNDWATER ELEV.
COMP.: -85 ft.
AFTER 24 HRS.: --

N Value	Qu (tsf)	W (%)	REC (%)	N Value	Qu (tsf)	W (%)	REC (%)

This boring completed as an auger boring.
No sampling completed.



N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler
12" with 140 lb. Hammer falling 30"
(Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

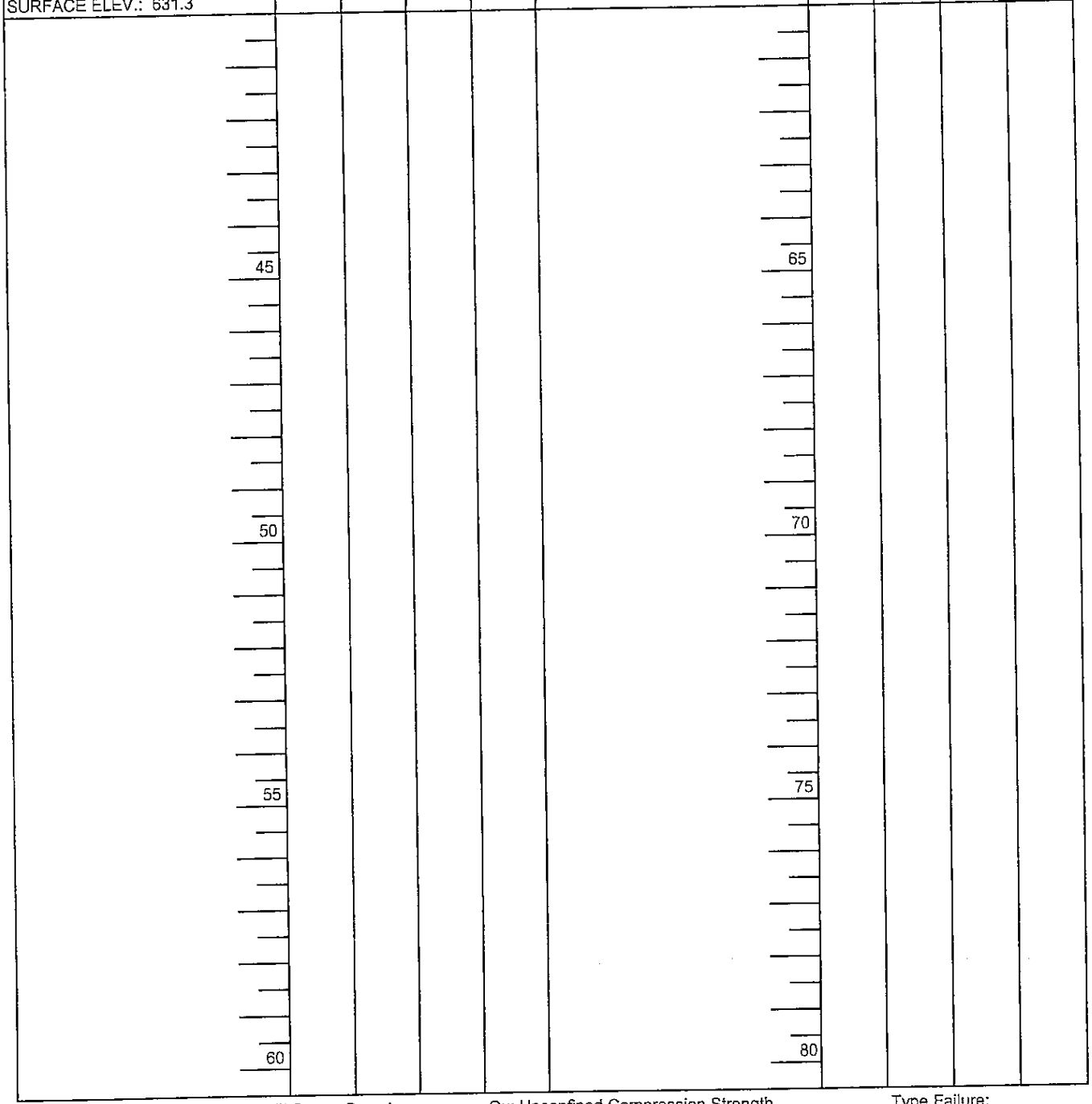
Hillsboro Energy Borings
Section 8, East Fork Township
South of B-11 Along
White Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: January 23, 2007
BORING TECH: R.Ruhmann
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 8 (08-03-08-02) COORDINATES: N904558.1 E2497955.9 SURFACE ELEV.: 631.3	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -85 ft. AFTER 24 HRS.: –	N Value	Qu (tsf)	W (%)	REC (%)



N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler
12" with 140 lb. Hammer falling 30"
(Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 8, East Fork Township
South of B-11 Along
White Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: January 23, 2007
BORING TECH: R.Ruhmann
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 8 (08-03-08-02)

COORDINATES: N904558.1
E2497955.9

SURFACE ELEV.: 631.3

GROUNDWATER ELEV.
COMP.: -85 ft.
AFTER 24 HRS.: –

	N Value	Qu (tsf)	W (%)	REC (%)
85				
90				
95				
100				
105				
Auger Refusal at -108 ft.				
110				
115				
120				

Note:
Borehole backfilled with soil cuttings and bentonite mix.

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler
12" with 140 lb. Hammer falling 30"
(Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 7, East Fork Township
Near Intersection of
Fillmore Ave. & 22nd St.
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: January 27, 2007
BORING TECH: R.Ruhmann
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 9 (08-03-07-01) COORDINATES: N905560.7 E2495298.6 SURFACE ELEV.: 632.2	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -85 ft. AFTER 24 HRS.: –	N Value	Qu (tsf)	W (%)	REC (%)

This boring completed as an auger boring.
No sampling completed.

Possible Boulder or Cobbles Encountered
Easy Drilling, Possible Horizon Change

Harder Drilling, Possible Clay Till, Possible Horizon Change

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 7, East Fork Township
Near Intersection of
Fillmore Ave. & 22nd St.
Project # 180-3366

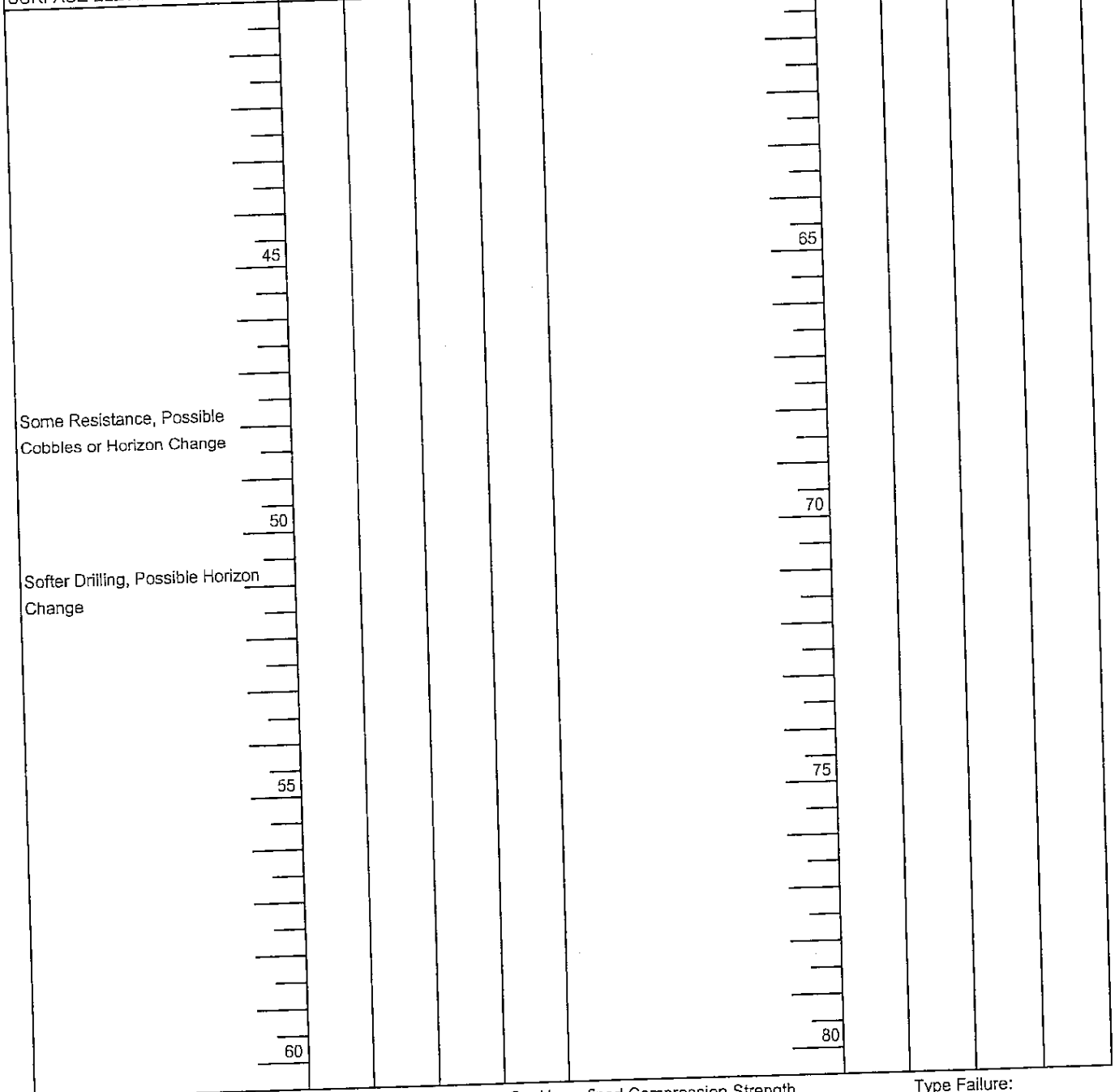
ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: January 27, 2007
BORING TECH: R.Ruhmann
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 9 (08-03-07-01)
COORDINATES: N905560.7
E2495298.6
SURFACE ELEV.: 632.2
GROUNDWATER ELEV.
COMP.: ~85 ft.
AFTER 24 HRS.: --

N Value	Qu (tsf)	W (%)	REC (%)



N Value	Qu (tsf)	W (%)	REC (%)

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 7, East Fork Township
Near Intersection of
Fillmore Ave. & 22nd St.
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: January 27, 2007
BORING TECH: R.Ruhmann
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 9 (08-03-07-01) COORDINATES: N905560.7 E2495298.6 SURFACE ELEV.: 632.2	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -85 ft. AFTER 24 HRS.: --	N Value	Qu (tsf)	W (%)	REC (%)
85 90 95 100					105 Softer Drilling, Possible Horizon Change 110 115 120				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 8, East Fork Township
Northernmost Boring Along
White Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: January 27, 2007
BORING TECH: R.Ruhmann
DRILLING TECH.: M. Hough

AUGER BORING LOG

BORING NO.: 9 (08-03-07-01) COORDINATES: N905560.7 E2495298.6 SURFACE ELEV.: 632.2	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -85 ft. AFTER 24 HRS.: –	N Value	Qu (tsf)	W (%)	REC (%)
Auger Refusal at 123 ft.									
125					145				
130					150 Note: Borehole backfilled with soil cuttings and bentonite mix.				
135					155				
140					160				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 8, East Fork Township
Southernmost Boring Along White Property Line
White Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: February 28, 2007
BORING TECH: R.Ruhmann
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 10 (08-03-08-03) COORDINATES: N903536.4 E2497961.2 SURFACE ELEV.: 634.7	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -85 ft. AFTER 24 HRS.: –	N Value	Qu (tsf)	W (%)	REC (%)
					Harder Drilling, Possible Clay Till, Possible Horizon Change				

This boring completed as an auger boring.
No sampling completed.

5
10
15
20
30
35
40

Easier Drilling, Possible Horizon Change

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 8, East Fork Township
Southernmost Boring Along White Property Line
White Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: February 28, 2007
BORING TECH: R.Ruhmann
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

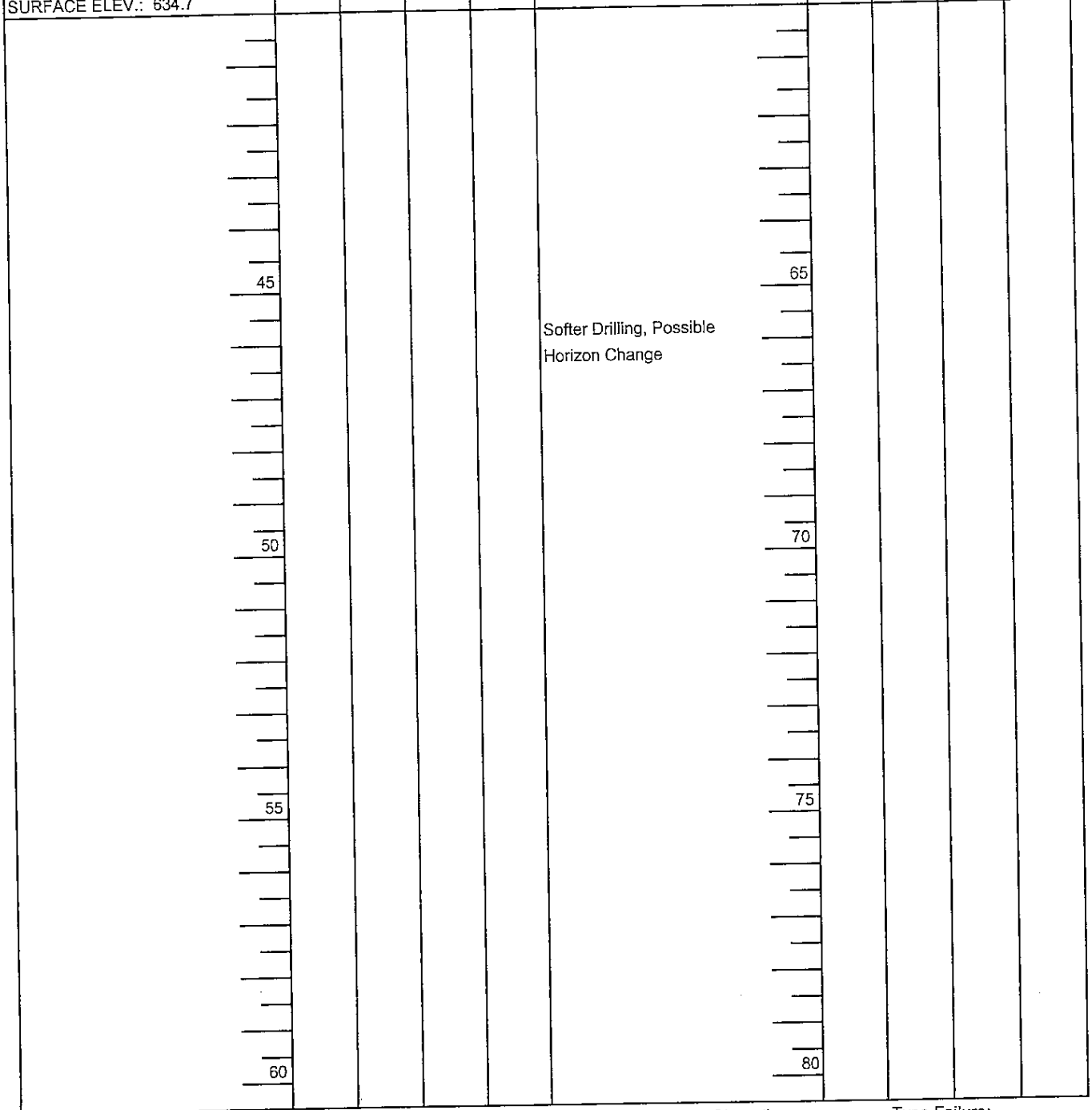
BORING NO.: 10 (08-03-08-03)

COORDINATES: N903536.4
E2497961.2

SURFACE ELEV.: 634.7

GROUNDWATER ELEV.
COMP.: -85 ft.
AFTER 24 HRS.: –

N Value	Qu (tsf)	W (%)	REC (%)



N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler
12" with 140 lb. Hammer falling 30"
(Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 8, East Fork Township
Southernmost Boring Along White Property Line
White Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: February 28, 2007
BORING TECH: R.Ruhmann
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 10 (08-03-08-03) COORDINATES: N903536.4 E2497961.2 SURFACE ELEV.: 634.7	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -85 ft. AFTER 24 HRS.: –	N Value	Qu (tsf)	W (%)	REC (%)
85 Little Resistance, Harder Drilling 90 95 100					Soft Drilling 105 110 115 120				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler
12" with 140 lb. Hammer falling 30"
(Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 8, East Fork Township
Southernmost Boring Along White Property Line
White Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: February 28, 2007
BORING TECH: R.Ruhmann
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 10 (08-03-08-03)
COORDINATES: N903536.4
E2497961.2
SURFACE ELEV.: 634.7

GROUNDWATER ELEV.
COMP.: -85 ft.
AFTER 24 HRS.: --

	N Value	Qu (tsf)	W (%)	REC (%)
Auger Refusal at 121 ft.				
125				
130				
135				
140				
145				
Note: Borehole backfilled with soil cuttings and bentonite mix. 150				
155				
160				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler
12" with 140 lb. Hammer falling 30"
(Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 7, East Fork Township
Southernmost Boring Along
Rademacher Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: March 12, 2007
BORING TECH: S. Davidson
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 11 (08-03-07-02)

COORDINATES: N 903593
E 2494276

SURFACE ELEV.: 612.7

GROUNDWATER ELEV.
COMP.: --
AFTER 24 HRS.: --

N Value	Qu (tsf)	W (%)	REC (%)	N Value	Qu (tsf)	W (%)	REC (%)

0

Soft drilling

This boring completed as an auger boring.
No sampling completed.

5

10

15

20

20

25

30

35

40

Hard drilling, possible cobbles encountered, possible clay fill or horizon change.

Methane gas encountered

Soft drilling, possible horizon change.

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 7, East Fork Township
Southernmost Boring Along
Rademacher Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: March 12, 2007
BORING TECH: M. Hough
DRILLING TECH.: S. Davidson

FOUNDATION BORING LOG

BORING NO.: 11 (08-03-07-02) COORDINATES: N 903593 E 2494276 SURFACE ELEV.: 612.7	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -- AFTER 24 HRS.: --	N Value	Qu (tsf)	W (%)	REC (%)
40 Easy drilling 45 50 55 60					60 65 70 75 80				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

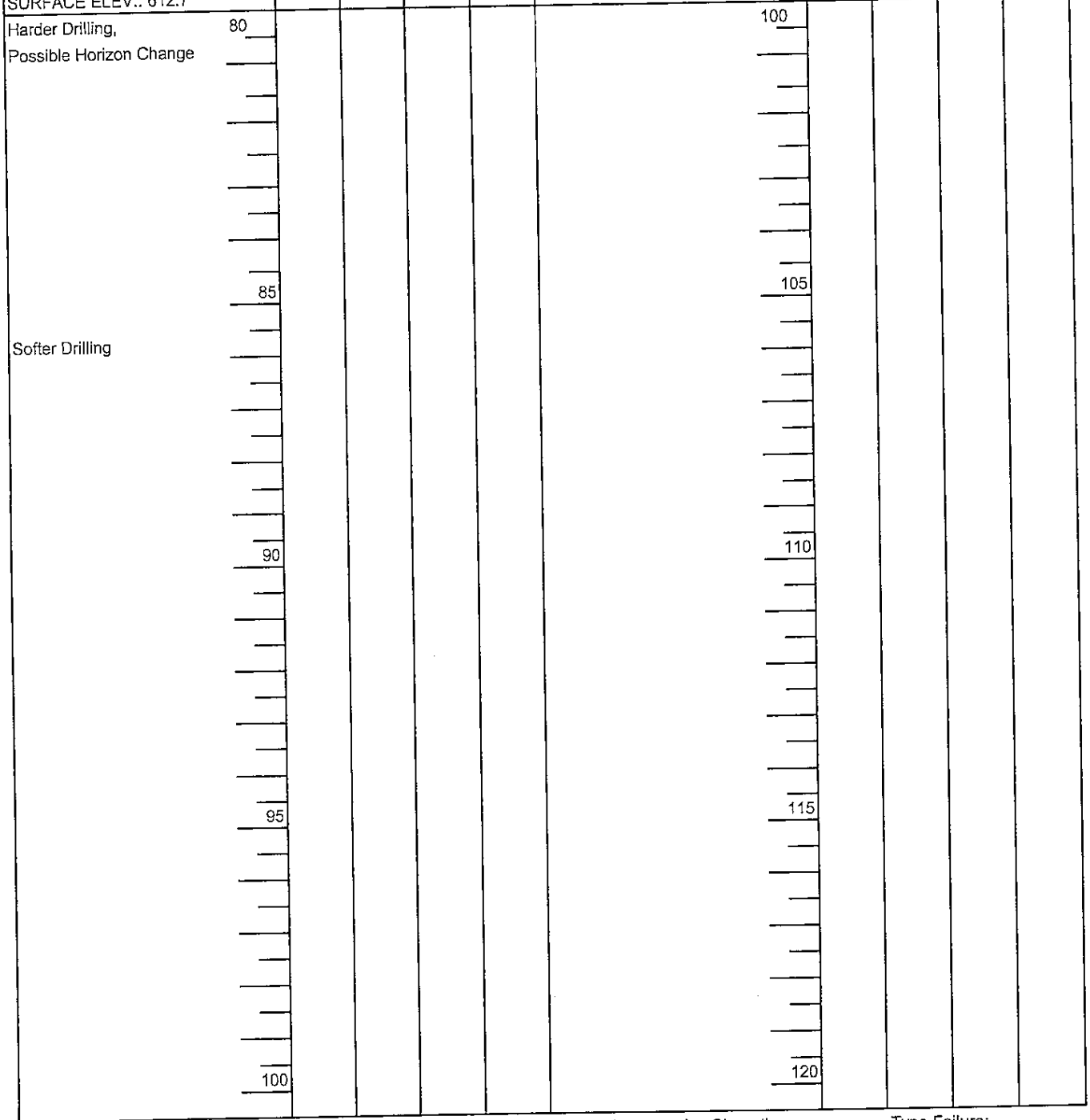
Hillsboro Energy Borings
Section 7, East Fork Township
Southernmost Boring Along
Rademacher Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: March 12, 2007
BORING TECH: M. Hough
DRILLING TECH.: S. Davidson

FOUNDATION BORING LOG

BORING NO.: 11 (08-03-07-02) COORDINATES: N 903593 E 2494276 SURFACE ELEV.: 612.7	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -- AFTER 24 HRS.: --	N Value	Qu (tsf)	W (%)	REC (%)
Harder Drilling, Possible Horizon Change Softer Drilling									



N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler
12" with 140 lb. Hammer falling 30"
(Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 7, East Fork Township
Southernmost Boring Along
Rademacher Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: March 12, 2007 & March 13, 2007
BORING TECH: M. Hough
DRILLING TECH.: S. Davidson

FOUNDATION BORING LOG

BORING NO.: 11 (08-03-07-02) COORDINATES: N 903593 E 2494276 SURFACE ELEV.: 612.7	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -- AFTER 24 HRS.: --	N Value	Qu (tsf)	W (%)	REC (%)
120 125 130 135 140					140 145 Auger Refusal at -148 ft. 150 Note: Borehole backfilled with soil cuttings and bentonite mix upon completion. 155 160				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 7, East Fork Township
North of B-11 Along
Rademacher Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: March 14, 2007
BORING TECH: S. Davidson
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 12 (08-03-07-03) COORDINATES: N 904076 E 2494257 SURFACE ELEV.: 616.7	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -- AFTER 24 HRS.: --	N Value	Qu (tsf)	W (%)	REC (%)

0 — Soft drilling.

This boring completed as an auger boring.
No sampling completed.

5

10

15 — Harder drilling, possible horizon change

20

20

25

30

35

40

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 7, East Fork Township
North of B-11 Along
Rademacher Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: March 13, 2007 - March 14, 2007
BORING TECH: S. Davidson & M. Emker
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 12 (08-03-07-03) COORDINATES: N 904076 E 2494257 SURFACE ELEV.: 616.7	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -- AFTER 24 HRS.: --	N Value	Qu (tsf)	W (%)	REC (%)
40 Softer drilling, possible horizon change. 45 50 55 60					60 65 70 75 80				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler
12" with 140 lb. Hammer falling 30"
(Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 7, East Fork Township
North of B-11 Along
Rademacher Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: March 15, 2007
BORING TECH: M. Emken & R. Ruhmann
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 12 (08-03-07-03) COORDINATES: N 904076 E 2494257 SURFACE ELEV.: 616.7	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: – AFTER 24 HRS.: –	N Value	Qu (tsf)	W (%)	REC (%)
80 85 90 95 100					100 105 110 115 120 Harder drilling, possible horizon change				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler
12" with 140 lb. Hammer falling 30"
(Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 7, East Fork Township
North of B-11 Along
Rademacher Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: March 15, 2007
BORING TECH: M. Emken & R. Ruhmann
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 12 (08-03-07-03)

COORDINATES: N 904076
E 2494257

SURFACE ELEV.: 616.7

GROUNDWATER ELEV.
COMP.: --
AFTER 24 HRS.: --

	N Value	Qu (tsf)	W (%)	REC (%)		N Value	Qu (tsf)	W (%)	REC (%)
120					140				
125					145				
Possible boulders/cobbles encountered.									
130					150				
					Auger refusal at -152 ft.				
135					155				
Hard drilling, drilled through possible boulder/cobble or thin limestone seam.					Note: Borehole backfilled with soil cuttings and bentonite mix upon completion.				
140					160				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
Southernmost Boring Along
Kunz Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: March 26, 2007
BORING TECH: M. Emken & R. Ruhmani
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 13 (08-03-18-01)

COORDINATES: N 900389
E 2495382

SURFACE ELEV.: 624.5

GROUNDWATER ELEV.
COMP.: –
AFTER 24 HRS.: –

N Value	Qu (tsf)	W (%)	REC (%)	N Value	Qu (tsf)	W (%)	REC (%)

0

Soft drilling.

5

10

15

Harder drilling, possible boulders/cobbles encountered.

20

20

This boring completed as an auger boring.
No sampling completed.

25

Hard drilling.

30

35

40

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
Southernmost Boring Along
Kunz Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: March 26, 2007
BORING TECH: M. Emken
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 13 (08-03-18-01) COORDINATES: N 900389 E 2495382 SURFACE ELEV.: 624.5	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -- AFTER 24 HRS.: --	N Value	Qu (tsf)	W (%)	REC (%)
40 45 50 Softer drilling, possible horizon change. 55 60					60 65 Methane gas encountered 70 75 80				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler
12" with 140 lb. Hammer falling 30"
(Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 18, East Fork Township
Southernmost Boring Along
Kunz Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: March 26, 2007
BORING TECH: M. Emken
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 13 (08-03-18-01) COORDINATES: N 900389 E 2495382 SURFACE ELEV.: 624.5	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -- AFTER 24 HRS.: --	N Value	Qu (tsf)	W (%)	REC (%)
80 Easy drilling 85 90 95 100					100 105 110 115 120				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler
12" with 140 lb. Hammer falling 30"
(Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 18, East Fork Township
Southernmost Boring Along
Kunz Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: March 26, 2007
BORING TECH: M. Emken
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 13 (08-03-18-01)

COORDINATES: N 900389
E 2495382

SURFACE ELEV.: 624.5

GROUNDWATER ELEV.
COMP.: --
AFTER 24 HRS.: --

	N Value	Qu (tsf)	W (%)	REC (%)
120				
Easy drilling				
125				
130				
135				
140				
140				
Harder drilling, possible horizon change.				
145				
150				
Very hard drilling, possible soft/residual weathered limestone or hard shale.				
155				
Auger Refusal at 156 ft.				
Note: Borehole backfilled with soil and bentonite mix upon completion.				
160				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
North of B-13 Along
Kunz Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: March 27, 2007
BORING TECH: M. Emken
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 14 (08-03-18-02)

COORDINATES: N 902931
E 2495317

SURFACE ELEV.: 628.4

GROUNDWATER ELEV.
COMP.: --
AFTER 24 HRS.: --

N Value	Qu (tsf)	W (%)	REC (%)	N Value	Qu (tsf)	W (%)	REC (%)

0

Soft drilling.

5

10

15

20

This boring completed as an auger boring.
No sampling completed.

20

Harder drilling, possible boulders or cobbles encountered

25

Hard drilling.

30

35

40

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
North of B-13 Along
Kunz Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: March 27, 2007
BORING TECH: M. Emken
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 14 (08-03-18-02) COORDINATES: N 902931 E 2495317 SURFACE ELEV.: 628.4	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -- AFTER 24 HRS.: --	N Value	Qu (tsf)	W (%)	REC (%)
40 Easy drilling 45 50 55 60					60 65 70 75 Softer drilling, possible horizon change. 80				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
North of B-13 Along
Kunz Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: March 27, 2007
BORING TECH: M. Emken
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 14 (08-03-18-02) COORDINATES: N 902931 E 2495317 SURFACE ELEV.: 628.4	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: – AFTER 24 HRS.: –	N Value	Qu (tsf)	W (%)	REC (%)
80 85 90 95 100					Methane gas encountered Very hard drilling, possible hard till, shale, or residual limestone. Auger Refusal at -116 ft. Note: Borehole backfilled with soil cuttings and bentonite mix upon completion. 100 105 110 115 120				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
North of B-13 and South of B-14
Along Kunz Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: April 9, 2007 - April 11, 2007
BORING TECH: M. Emken
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 15 (08-03-18-03)
COORDINATES: N902502, E2495329
SURFACE ELEV.: 633.5 ft.

GROUNDWATER ELEV.
COMP.: --
AFTER 24 HRS.: --

N Value	Qu (tsf)	W (%)	REC (%)

0
SILTY CLAY, Brown, Moist
Dry to Moist
5
Possible CLAY TILL, Brown, Medium Stiff to Stiff, Trace of Sand, Dry to Moist
10
Moist
15
Possible SANDY LOAM, Light Brown, Moist, Medium Stiff
Possible CLAY TILL, Brown, Dry to Moist, Stiff to Very Stiff, Trace of Sand and Small Gravel
20
Few Small Gravel, Very Stiff to Hard
This boring completed as an auger boring.
No sampling completed down to 119 ft depth.
Boulder/Cobble
Hard
25
30
35
40

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
North of B-13 and South of B-14
Along Kunz Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: April 9, 2007 - April 11, 2007
BORING TECH: M. Emken
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 15 (08-03-18-03)

COORDINATES: N902502, E2495329

SURFACE ELEV.: 633.5 ft.

GROUNDWATER ELEV.
COMP.: –
AFTER 24 HRS.: --

	N Value	Qu (tsf)	W (%)	REC (%)		N Value	Qu (tsf)	W (%)	REC (%)
40					60				
Possible CLAY TILL, Brown, Dry to Moist, Stiff to Very Stiff, Trace of Sand and Gravel									
45					65				
50					70				
55					75				
Medium Stiff to Stiff					Stiff to Very Stiff				
60					80				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
North of B-13 and South of B-14
Along Kunz Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: April 9, 2007 - April 11, 2007
BORING TECH: M. Emken
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 15 (08-03-18-03)

COORDINATES: N902502, E2495329

SURFACE ELEV.: 633.5 ft.

GROUNDWATER ELEV.
COMP.: --
AFTER 24 HRS.: --

	N Value	Qu (tsf)	W (%)	REC (%)
80				
Medium Stiff				
Boulder/Cobble				
85				
90				
95				
Methane Gas Encountered				
100				
100				
105				
110				
Soft to Medium Stiff				
115				
SHALE, Gray, Dry, Slightly Fissile, Hard	100/ 7.5"	--	--	100
120				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
North of B-13 and South of B-15
Along Kunz Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: May 5, 2007 - May 10, 2007
BORING ENG.: A. Staggemeyer
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 16 (08-03-18-08)
COORDINATES: N900996, E2495349
SURFACE ELEV.: 626.2
GROUNDWATER ELEV.
COMP.: –
AFTER 24 HRS.: –

Depth	N Value	Qu (tsf)	W (%)	REC (%)
0				
Silty Clay, Brown, Moist				
5				
10				
15				
Harder drilling, possible horizon change				
20				

This boring completed as an auger boring to 85 ft depth and rotary wash boring to 110.5 ft depth. No sampling completed down to 80 ft depth.

Depth	N Value	Qu (tsf)	W (%)	REC (%)
20				
25				
30				
Continued hard drilling				
35				
40				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 18, East Fork Township
North of B-13 and South of B-15
Along Kunz Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: May 5, 2007 - May 10, 2007
BORING ENG.: A. Staggemeyer
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 16 (08-03-18-08)

COORDINATES: N900996, E2495349

SURFACE ELEV.: 626.2

GROUNDWATER ELEV.
COMP.: –
AFTER 24 HRS.: –

	N Value	Qu (tsf)	W (%)	REC (%)		N Value	Qu (tsf)	W (%)	REC (%)
40 Hard drilling, wet to saturated soil					60 Harder drilling, possible horizon change				
45					65 Softer drilling, possible horizon change				
50					70				
55 Softer drilling, possible horizon change					75				
60					80				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
North of B-13 and South of B-15
Along Kunz Property Lane
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: May 5, 2007 - May 10, 2007
BORING ENG.: A. Staggemeyer
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 16 (08-03-18-08)
COORDINATES: N900996, E2495349
SURFACE ELEV.: 626.2
GROUNDWATER ELEV.
COMP.: --
AFTER 24 HRS.: --

	N Value	Qu (tsf)	W (%)	REC (%)
80 SILTY CLAY TILL (CL), Brown, Dry to MoistHard, Trace of Sand	55	--	--	100
85 Gray, Very Stiff	24	--	--	60
90 SAND (SP), Light Brown, Fine, Saturated, Very Dense	66	--	--	75
95 Trace of Fines	83	--	--	75
100 Hard drilling				
100	29	--	--	65
SILTY CLAY TILL (CL), Gray, Moist to Dry, Very Stiff, Trace of Sand				
105 Brown & Gray, Moist, Very Stiff, Trace of Sand and Gravel.	23	--	--	55
110	100/3"	--	--	65
Roller Bit Refusal at 110' 6"	100/1.5"	--	--	65
115				
120				

Notes:
1) Mud rotary drilling completed between 85 ft. depth and end of exploration.
2) Borehole backfilled with soil and bentonite cuttings, upon completion.
3) At 110ft depth, a split spoon sample was obtained. Borehole was then advanced approximately 4 inches where refusal occurred. A split spoon sample was then advanced from the 110' 4" to 110' 6" depth and retrieved.

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
Southernmost Boring on
Lademacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: May 14, 2007 - May 16, 2007
BORING TECH.: A. Staggemeyer, R. Paller
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 17 (08-03-18-09) COORDINATES: N901050 E2494257 SURFACE ELEV.: 618.0	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -- AFTER 24 HRS.: --	N Value	Qu (tsf)	W (%)	REC (%)
SILTY CLAY, Brown, Moist.					THIS BORING COMPLETED AS A ROTARY WASH BORING. NO SAMPLING COMPLETED DOWN TO 80 FT. DEPTH.				

0 5 10 15 20 25 30 35 40

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler
12" with 140 lb. Hammer falling 30"
(Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 18, East Fork Township
Southernmost Boring on
Rademacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: May 14, 2007 - May 16, 2007
BORING TECH.: A. Staggemeyer, R. Paller
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 17 (08-03-18-09) COORDINATES: N901050 E2494257 SURFACE ELEV.: 618.0	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -- AFTER 24 HRS.: --	N Value	Qu (tsf)	W (%)	REC (%)
40					60				
45					65				
50					70				
55					75				
60					80				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler
12" with 140 lb. Hammer falling 30"
(Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
Southernmost Boring on
Rademacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: May 14, 2007 - May 16, 2007
BORING TECH.: A. Staggemeyer, R. Paller
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 17 (08-03-18-09)
COORDINATES: N901050
E2494257
SURFACE ELEV.: 618.0

GROUNDWATER ELEV.
COMP.: –
AFTER 24 HRS.: --

Depth	Description	N Value	Qu (tsf)	W (%)	REC (%)
80	SILTY CLAY LOAM TILL (CL), Dark Gray, Moist, Very Stiff to Hard, Trace of Sand	16	--	--	100
85	Light Gray, Trace of Sand and Large Gravel	62	--	--	75
90	Light Gray, No Gravel, Intermittent Sand	28	--	--	80
95	No Sand Seams	30	--	--	70
100					
100		57	--	--	80
105	Trace of Large Gravel	21	--	--	100
110	Intermittent Sand Seams	17	--	--	100
115	Dark Gray, No Sand Seams	16	--	--	30
120					

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
Southernmost Boring on
Rademacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: May 14, 2007 - May 16, 2007
BORING TECH.: A. Staggemeyer, R. Paller
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 17 (08-03-18-09)

COORDINATES: N901050
E2494257

SURFACE ELEV.: 618.0

GROUNDWATER ELEV.
COMP.: --
AFTER 24 HRS.: --

	N Value	Qu (tsf)	W (%)	REC (%)
120				
	18	--	--	0
125				
	19	--	--	70
130				
SANDY LOAM (SaL), Gray, Saturated, Fine, Layers of Wood	33	--	--	70
135				
SILTY TILL (ML), Brown, Moist, Very Stiff	17	--	--	100
140				
	13	--	--	100
145				
Roller Bit Refusal at 145.0 ft. SHALE, Gray, Dry, Fissile.	200/5"	--	--	100
End of exploration at 145.5 ft.				
150				
155				
160				

Notes:
1) Borehole backfilled with soil cuttings and bentonite upon completion.
2) Boring completed using mud rotary drilling techniques.
3) Drilling refusal occurred at 145 ft. depth and a split spoon sample was then obtained from 145 to 145'5" depth.

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
North of B-17
on Rademacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: May 16, 2007 - May 18, 2007
BORING TECH.: A. Staggemeyer, R. Paller
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 18 (08-03-18-10) COORDINATES: N901899 E2494257 SURFACE ELEV.: 623.7	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -- AFTER 24 HRS.: --	N Value	Qu (tsf)	W (%)	REC (%)
SILTY CLAY, Brown, Moist									

THIS BORING COMPLETED AS A ROTARY WASH BORING.
NO SAMPLING COMPLETED DOWN TO 80 FT. DEPTH.

0 5 10 15 20 25 30 35 40

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
North of B-17
on Rademacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: May 16, 2007 - May 18, 2007
BORING TECH.: A. Staggemeyer, R. Paller
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 18 (08-03-18-10) COORDINATES: N901899 E2494257 SURFACE ELEV.: 623.7	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -- AFTER 24 HRS.: --	N Value	Qu (tsf)	W (%)	REC (%)
40 45 50 55 60					60 65 70 75 80 Notes: 1) Borehole backfilled with soil cuttings and bentonite upon completion. 2) Boring completed using mud rotary drilling techniques.				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
North of B-17
on Rademacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: May 16, 2007 - May 18, 2007
BORING TECH.: A. Staggemeyer, R. Paller
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 18 (08-03-18-10)
COORDINATES: N901899 E2494257
SURFACE ELEV.: 623.7
GROUNDWATER ELEV.
COMP.: --
AFTER 24 HRS.: --

Depth	Description	N Value	Qu (tsf)	W (%)	REC (%)
80	SILTY CLAY TILL (CL), Dark Gray, Moist, Very Stiff, Trace of Sand	20	--	--	100
85	Gray	19	--	--	100
90		20	--	--	100
95		17	--	--	80
100					
100		19	--	--	100
105	Trace of Gravel	27	--	--	100
110	SAND (SM), Gray, Moist, Fine	53	--	--	100
115	SILTY CLAY TILL (CL), Greenish Gray, Moist, Hard, Trace of Sand.	57	--	--	100
	Mudstone/Siltstone, Gray, Moist, Hard				
	SHALE, Gray, Slightly Fissile, Hard, Dry to Moist				
120	Roller Bit Refusal at 119.0 ft.	100	--	--	100
	End of Exploration at 120 ft.				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
North of B-18
on Radamacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: May 19, 2007 - May 22, 2007
BORING TECH.: R. Paller
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 19 (08-03-18-11) COORDINATES: N902747 E2494257 SURFACE ELEV.: 617.9	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -- AFTER 24 HRS.: --	N Value	Qu (tsf)	W (%)	REC (%)
0 SILTY CLAY, Brown, Moist					20 Very Hard Drilling				
THIS BORING COMPLETED AS A ROTARY WASH BORING. NO SAMPLING COMPLETED DOWN TO 80 FT. DEPTH.									
5					25 Hard Drilling, Possible Horizon Change				
10					30				
15					35				
20					40				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
North of B-18
on Radamacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: May 19, 2007 - May 22, 2007
BORING TECH.: R. Paller
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 19 (08-03-18-11) COORDINATES: N902747 E2494257 SURFACE ELEV.: 617.9	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -- AFTER 24 HRS.: --	N Value	Qu (tsf)	W (%)	REC (%)
40					60				
45					65				
50					70				
55					75				
60					80				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
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Type Failure:
B: Bulge Failure
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Hillsboro Energy Borings
Section 18, East Fork Township
North of B-18
on Radamacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: May 19, 2007 - May 22, 2007
BORING TECH.: R. Paller
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 19 (08-03-18-11)
COORDINATES: N902747 E2494257
SURFACE ELEV.: 617.9

GROUNDWATER ELEV.
COMP.: –
AFTER 24 HRS.: –

	N Value	Qu (tsf)	W (%)	REC (%)
80				
SILTY CLAY TILL (CL), Dark Gray, Moist, Very Stiff, Trace of Sand	22	--	--	100
85	28	--	--	15
90	18	--	--	100
95 SAND, Gray, Moist, Very Dense, Trace of Gravel	50	--	--	75
100				
100				
SILTY CLAY TILL (CL), Brown and Gray, Moist, Hard, Trace Sand	41	--	--	95
105 Brown, Trace of Sand and Gravel	33	--	--	100
110				
SILTY CLAY LOAM TILL (CL), Dry to Moist, Very Stiff	29	--	--	70
115				
Mudstone, Brown and Gray, Dry to Moist, Hard, Slightly Fissile	35	--	--	100
SHALE, Gray, Dry to Moist, Hard, Sligtly Fissile	80	--	--	100
120				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
North of B-18
on Radamacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: May 19, 2007 - May 22, 2007
BORING TECH.: R. Paller
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 19 (08-03-18-11) COORDINATES: N902747 E2494257 SURFACE ELEV.: 617.9	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: – AFTER 24 HRS.: --	N Value	Qu (tsf)	W (%)	REC (%)
120 SHALE, Gray, Dry to Moist, Hard, Slightly Fissile					140				
	100/16"	--	--	80					
End of Exploration at 121.3 ft.					Notes: 1) Borehole backfilled with soil cuttings and bentonite upon completion. 2) Boring completed using mud rotary drilling techniques				
125					145				
130					150				
135					155				
140					160				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
West of B-18
on Radamacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: May 30-2007 - June 1, 2007
BORING TECH. R. Paller
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 20 (08-03-18-12)
COORDINATES : N901640
E2494243
SURFACE ELEV.: 624.8

GROUNDWATER ELEV.
COMP.: --
AFTER 24 HRS.: --

	N Value	Qu (tsf)	W (%)	REC (%)		N Value	Qu (tsf)	W (%)	REC (%)
SILTY CLAY, Brown, Moist									

THIS BORING COMPLETED AS A ROTARY WASH BORING.
NO SAMPLING COMPLETED DOWN TO 80 FT. DEPTH.

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler
12" with 140 lb. Hammer falling 30"
(Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 18, East Fork Township
West of B-18
on Radamacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: May 30, 2007 - June 1, 2007
BORING TECH.: R. Paller
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 20 (08-03-18-12) COORDINATES : N901640 E2494243 SURFACE ELEV.: 624.8	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: – AFTER 24 HRS.: –	N Value	Qu (tsf)	W (%)	REC (%)
40 45 50 55 60					60 65 70 75 80 Methane Gas Encountered				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler
12" with 140 lb. Hammer falling 30"
(Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 18, East Fork Township
West of B-18
on Radamacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: May 30, 2007 - June 1, 2007
BORING TECH.: R. Paller
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 20 (08-03-18-12)
COORDINATES : N901640
E2494243
SURFACE ELEV.: 624.8
GROUNDWATER ELEV.
COMP.: --
AFTER 24 HRS.: --

	N Value	Qu (tsf)	W (%)	REC (%)
80				
CLAY TILL (CL), Dk. Gray, Dry to Moist, Trace of Sand and Gravel	29	--	--	90
85				
SILTY LOAM TILL (ML), Dark Gray, Dry to Moist, Trace of Sand and Small Gravel	41	--	--	90
90				
SILTY CLAY TILL (CL), Dark Gray, Dry to Moist, Trace of Sand and Gravel	45	--	--	70
95				
Very stiff	28	--	--	80
100				
100				
CLAY TILL (CL), Gray, Moist, Stiff, No Gravel or Sand	15	--	--	100
105				
SILTY CLAY LOAM TILL (CL), Gray, Moist, Trace of Sand, Stiff	16	--	--	90
110				
CLAY TILL (CL), Gray, Brown, Dry to Moist, Hard, Trace of Sand	33	--	--	90
115				
Traces of Sand and Gravel	52	--	--	100
120				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
West of B-18
on Radamacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: May 30, 2007 - June 1, 2007
BORING ENG.: R. Paller
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 20 (08-03-18-12)
COORDINATES : N901640
E2494243
SURFACE ELEV.: 624.8

GROUNDWATER ELEV.
COMP.: --
AFTER 24 HRS.: --

	N Value	Qu (tsf)	W (%)	REC (%)
120				
SILTY CLAY TILL (CL), Brown and Gray, Dry to Moist, Hard, Trace of Sand	34	--	--	100
125				
SILTY LOAM (ML), Brown, Moist, Very Stiff	21	--	--	90
130				
CLAY, Mudstone, Gray, Blocky	25	--	--	100
135				
SHALE, Dk. Gray, Dry , Fissured	85	--	--	100
	200/13"	--	--	100
End of exploration at 137.6 ft.				
140				

	N Value	Qu (tsf)	W (%)	REC (%)
140				
145				
150				
155				
160				

Notes:
1) Borehole backfilled with soil cuttings and bentonite on June 6, 2007.
2) Boring completed using mud rotary drilling techniques.
3) Methane gas encountered at 75 ft. Dissipated quickly.

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
East of B-18 on
Rademacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: June 19, 2007 - June 20, 2007
BORING TECH.: R. Paller
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 21 (08-03-18-13)
COORDINATES: N902266 E2494599
SURFACE ELEV.:624.7

GROUNDWATER ELEV.
COMP.: --
AFTER 24 HRS.: --

	N Value	Qu (tsf)	W (%)	REC (%)
0 SILTY CLAY LOAM (CL), Brown, Moist, Soft		B		
5	4	1.5	--	80
		B		
Brown, Medium Stiff, Trace of Sand and Gravel 10	5	1.9	--	85
		S		
SILTY CLAY LOAM TILL (CL), Brown, Dry, Hard, Little Sand 15	38	5.0	--	90
		S		
Gray, Saturated, Trace of Gravel 20	36	4.2	--	90
20		S		
25	43	4.3	--	100
		S		
30	28	4.2	--	100
		S		
35	30	4.4	--	100
		S		
40	24	>5.0	--	100

Dry
Very Stiff

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
East of B-18 on
Rademacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: June 19, 2007 - June 20, 2007
BORING TECH.: R. Paller
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 21 (08-03-18-13)

COORDINATES: N902266
E2494599

SURFACE ELEV.:624.7

GROUNDWATER ELEV.
COMP.: --
AFTER 24 HRS.: --

		N Value	Qu (tsf)	W (%)	REC (%)
SILTY CLAY LOAM TILL (CL), Gray, Dry, Very Stiff to Hard, Trace of Sand and Gravel	40		S		
	45	38	>5.0	--	95
			S		
	50	29	5.0	--	95
SAND (SP), Gray, Fine, Saturated			S		
SILTY CLAY LOAM TILL (CL), Gray, Dry, Hard, Trace of Sand and Gravel	55	72	>5.0	--	100
			S		
	60	42	>5.0	--	80
	60		S		
Very Stiff	65	26	>5.0	--	65
			S		
	70	20	4.9	--	95
			B		
Moist, Medium Stiff, Trace of Sand	75	19	3.2	--	100
			S		
	80	11	2.8	--	95

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
East of B-18 on
Rademacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: June 19, 2007 - June 20, 2007
BORING TECH.: R. Paller
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 21 (08-03-18-13)
COORDINATES: N902266 E2494599
SURFACE ELEV.:624.7

GROUNDWATER ELEV.
COMP.: --
AFTER 24 HRS.: --

	N Value	Qu (tsf)	W (%)	REC (%)
80 SILTY CLAY LOAM TILL (CL), Gray, Moist, Stiff to Very Stiff, Trace of Sand		S		
85	14	3.4	--	100
	16	3.8	--	100
		S		
90	13	2.0	--	95
SILTY CLAY TILL (CL), Bluish Gray, Dry to Moist, Very Stiff, Trace of Sand and Gravel		S		
	20	3.4	--	95
95	19	3.2	--	95
Gray		B		
	23	3.8	--	95
Hard 100	32	3.4	--	90
100 SILTY CLAY LOAM TILL (CL), Gray, Moist, Very Stiff, Trace of Gravel and Sand (With Layers of Sand and Gravel)	24	4.4	--	95
CLAY TILL (CL), Greenish Gray, Moist, Very Stiff, No Sand or Gravel Layers 105	30	4.9	--	90
	31	--	--	90
MUDSTONE to SHALE, Bluish Gray, Dry to Moist, Hard 110	43	5.0	--	100
Gray	100/11"	--	--	100
	100/9"	--	--	100
115 End of Exploration at 114.3 ft.				
Notes: 1) Borehole backfilled with soil cuttings and bentonite upon completion. 2) Boring completed using hollow stem augers. 3) Drilling refusal occurred at 113.5 ft. depth and a split spoon sample was then obtained 120 from 113.5 ft. to 114. 3 ft. depth.				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 17, East Fork Township
North Edge of
White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 6, 2007 - August 8, 2007
BORING TECH.: A. Staggemeyer
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 22 (08-03-17-06) COORDINATES: N 903060.0 E 2499695.5 SURFACE ELEV.: 621.5	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: -- AFTER 72 HRS.: 11.1'	N Value	Qu (tsf)	W (%)	REC (%)
0					20				
SILTY CLAY (CL), Light Brown, Dry	CTS No. 1			10%	SANDY CLAY LOAM (SC), Gray, Wet, Trace of Gravel SAND (SP), Wet SILTY CLAY LOAM TILL (CL), Gray, Few Sand, Trace of Gravel SAND (SP), Brown, Saturated, Fine to Coarse	CTS No. 5			50%
5					25				
SILTY CLAY LOAM TILL(CL), Gray, Moist, Few Sand, Trace of Gravel Reddish-Brown, Mottled No Mottling	CTS No. 2			100%	SILTY CLAY LOAM TILL (CL), Gray, Moist to Dry, Very Stiff to Hard, Trace of Sand and Gravel CTS Refusal at 26 ft.	CTS No. 6			100%
10					30				
SAND (SP), Brown, Saturated, Fine to Medium Coarse, Trace of Fines No Fines, Trace of Gravel Hard Drilling at 13.0'	CTS No. 3			50%		28 37 35			85%
15					35	19 41 40			80%
SILTY CLAY LOAM TILL (CL), Gray, Moist, Trace of Sand and Gravel	CTS No. 4			85%		11 15 24			85%
20					40	24 32 44			90%

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 17, East Fork Township
North Edge of
White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 6, 2007 - August 8, 2007
BORING TECH.: A. Staggemeyer
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 22 (08-03-17-06)

COORDINATES: N 903060.0
E 2499695.5

SURFACE ELEV.: 621.5

GROUNDWATER ELEV.
COMP.: --
AFTER 24 HRS.: 11.1'

	N Value	Qu (tsf)	W (%)	REC (%)
40				
SILTY CLAY LOAM TILL (CL), Gray, Moist to Dry, Very Stiff to Hard, Trace of Sand and Gravel				
	26			
45	24			
	37			80%
50				
	9			
	16			
	27			90%
55				
	8			
	16			
	22			95%
60				
60				
	3			
	5			
65	8			100%
	3			
	4			
70	9			100%
	10			
	16			
75	26			100%
	8			
	14			
80	23			100%
End of Exploration at 80 ft.				

Notes:
1) Boring completed with a continuous tube sampler to the 26 ft. depth, then wash boring and split spoon sampling to the 80 ft. depth.
2) Borehole backfilled with soil cuttings and bentonite mix following final groundwater measurement.

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 903057.9; E 2499696.0

Well No.: MW 22 (08-03-17-06)
Date Started: August 15, 2007
Date Completed: August 15, 2007
Drilling Tech: A. Staggemeyer
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

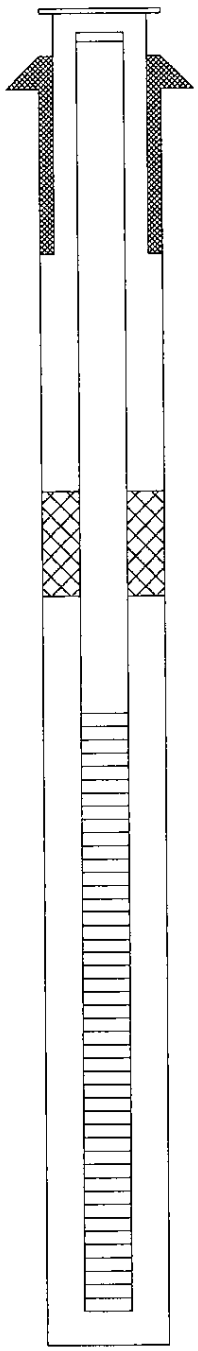
to 0.01 ft (where applicable)

Riser pipe length	7.5 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	5 gal.
Other	

Well Recovery = 0.2 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
623.36 Top of Riser Pipe
621.9 Ground Surface
620.9 Top of Annular Sealant

618.9 Top of Seal

2' Total Seal Interval
616.9 Top of Sand

615.9 Top of Screen

10 Total Screen Interval

605.9 Bottom of Screen
604.9 Bottom of Borehole

Hillsboro Energy Borings
Section 17, East Fork Township
East Edge of
White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 9, 2007 - August 11, 2007
BORING TECH.: A. Staggemeyer/M. Emken
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 23 (08-03-17-07) COORDINATES: N 901703.5 E 2500583.0 SURFACE ELEV.: 632.2	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: - 9.8' AFTER 48 HRS.: - 11.3'	N Value	Qu (tsf)	W (%)	REC (%)
0					20				
SILTY CLAY LOAM (CL), Light Brown, Dry to Moist	CTS No. 1			40%		CTS No. 5			100%
5					SAND (SP), Wet 25				
SILTY CLAY LOAM TILL (CL), Gray, Reddish-Brown, Mottled, Moist, Trace of Sand and Gravel.					SILTY CLAY LOAM TILL (CL), Gray, Dry to Moist, Stiff to Very Stiff, Trace of Sand and Gravel				
Gray	CTS No. 2			80%		CTS No. 6			90%
10					30				
SILT (ML), Gray, Moist									
SANDY LOAM (SP), Gray, Saturated, Trace of Gravel	CTS No. 3			60%					
SAND (SP)						11 18			
15					35	29			80%
SILTY CLAY LOAM TILL (CL), Gray, Brown, Mottled, Moist to Wet, Trace of Sand and Gravel									
SANDY LOAM (SM), Gray, Saturated	CTS No. 4			90%					
						8 10			
SILTY CLAY LOAM TILL (CL), Gray, Dry to Moist, Trace of Sand and Gravel 20					40	13			80%

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 17, East Fork Township
East Edge of
White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 9, 2007 - August 11, 2007
BORING TECH.: A. Staggemeyer/M. Emken
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 23 (08-03-17-07)

COORDINATES: N 901703.5
E 2500583.0

SURFACE ELEV.: 632.2

GROUNDWATER ELEV.
COMP.: - 9.8'
AFTER 48 HRS.: - 11.3'

	N Value	Qu (tsf)	W (%)	REC (%)
40 SILTY CLAY LOAM TILL (CL), Gray, Moist to Dry, Very Stiff to Hard, Trace of Sand and Gravel				
	6 11 45 17			70%
	24 24 50 24			70%
SILTY CLAY TILL (CL), Gray, Dry, Very Stiff to Hard, Trace of Sand and Gravel	17 30 55 55			95%
	24 48 60 52			100%
60				
	10 16 65 23			100%
	9 10 70 21			80%
SILTY CLAY LOAM TILL (CL), Brown, Dry, Hard, Trace of Gravel, Few Sand 75	16 23 38			85%
	10 19 80 26			100%
End of Exploration at 80.0 ft.				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 17, East Fork Township
East Edge of
White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 9, 2007 - August 11, 2007
BORING TECH.: A. Staggemeyer/M. Emken
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 23 (08-03-17-07) COORDINATES: N 901703.5 E 2500583.0 SURFACE ELEV.: 632.2	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: - 9.8' AFTER 48 HRS.: - 11.3'	N Value	Qu (tsf)	W (%)	REC (%)
80					100				
85					105				
90					110				
95					115				
100					120				

Notes:
1) Boring completed with a continuous tube sampler to the 30 ft. depth, then wash boring and split spoon sampling to the 80 ft. depth.
2) Borehole backfilled with soil cuttings and bentonite mix following final groundwater measurement.

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 901711.7; E 2500581.4

Well No.: MW 23 (08-03-17-07)
Date Started: August 20, 2007
Date Completed: August 20, 2007
Drilling Tech: A. Staggemeyer
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

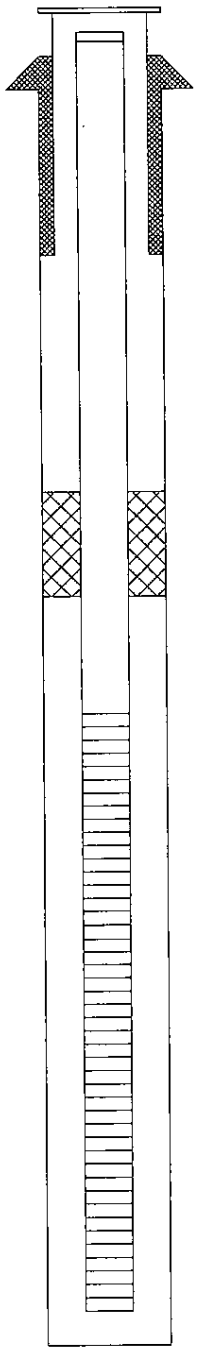
to 0.01 ft (where applicable)

Riser pipe length	7.5 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	5 gal.
Other	

Well Recovery = 0.4 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
633.52 Top of Riser Pipe
632.2 Ground Surface
631.2 Top of Annular Sealant

629.0 Top of Seal

2' Total Seal Interval
627.0 Top of Sand

626.0 Top of Screen

10' Total Screen Interval

616.0 Bottom of Screen
615.0 Bottom of Borehole

Hillsboro Energy Borings
Section 17, East Fork Township
South Edge of
White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 16, 2007 - August 17, 2007
BORING TECH.: M. Emken
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 24 (08-03-17-08)
COORDINATES: N 900422.5
E 2499331.4
SURFACE ELEV.: 630.4

GROUNDWATER ELEV.
COMP.: - 19.0'
AFTER 64 HRS.: - 9.0'

Depth	Description	N Value	Qu (tsf)	W (%)	REC (%)
0	SILTY CLAY LOAM (CL), Light Gray, Dry	CTS No. 1			80%
5	SILTY LOAM (ML), Gray, Dry to Moist Brown, Mottled				
10	SILTY CLAY LOAM (CL), Dark Gray/Black, Moist, Trace of Sand Some Sand, Trace of Gravel	CTS No. 2			100%
15	SANDY CLAY (SC), Light Gray, Moist Brown, Mottled, Trace of Gravel Wet SILTY LOAM TILL (ML), Light Gray, Moist to Wet, Trace of Sand and Gravel	CTS No. 3			90%
20	Soft Very Stiff	CTS No. 4			90%
	SILTY CLAY LOAM TILL (CL), Gray, Dry to Moist, Hard, Trace of Sand and Gravel				
20	Trace of Large Gravel 4" Sand Seam at 22.0 ft.	CTS No. 5			90%
25	SILTY CLAY LOAM TILL (CL), Gray, Moist to Dry, Very Stiff to Hard, Some Sand and Gravel				
30		CTS No. 6			100%
35		6 8 12			100%
40		4 7 9			90%

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 17, East Fork Township
South Edge of
White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 16, 2007 - August 17, 2007
BORING TECH.: M. Emken
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 24 (08-03-17-08)

COORDINATES: N 900422.5
E 2499331.4

SURFACE ELEV.: 630.4

GROUNDWATER ELEV.
COMP.: - 19.0'
AFTER 64 HRS.: - 9.0'

	N Value	Qu (tsf)	W (%)	REC (%)
40 SILTY CLAY LOAM TILL (CL), Gray, Moist to Dry, Very Stiff to Hard, Trace of Sand and Gravel				
	2			
	11			
45	12			90%
	10			
	12			
50	16			90%
	4			
	19			
55	26			100%
SAND (SP), Gray, Very Dense, Saturated, Fine, Trace of Gravel				
	22			
	35			
60	42			85%
60				
	27			
	34			
	42			100%
	26			
SILTY CLAY TILL (CL), Gray, Dry to Moist, Hard, Trace of Sand	24			
	16			95%
65				
Stiff	3			
	5			
70	7			100%
Brown, Very Stiff	8			
	11			
75	18			100%
Few Sand	20			
	17			
80	21			95%
End of Exploration at 80.0'				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
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RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 17, East Fork Township
South Edge of
White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 16, 2007 - August 17, 2007
BORING TECH.: M. Emken
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 24 (08-03-17-08)

COORDINATES: N 900422.5
E 2499331.4

SURFACE ELEV.: 630.4

GROUNDWATER ELEV.
COMP.: - 19.0'
AFTER 64 HRS.: - 9.0'

N Value	Qu (tsf)	W (%)	REC (%)	N Value	Qu (tsf)	W (%)	REC (%)

Notes:
1) Boring completed with a continuous tube sampler to the 30 ft. depth, then wash boring and split spoon sampling to the 80 ft. depth.
2) Borehole backfilled with soil cuttings and bentonite mix following final groundwater measurement.
3) A Shelby tube sample was collected from 15 ft. - 17 ft. in an adjacent borehole.
4) Additional split spoon samples were retrieved from the 55 ft. to 59.5 ft. depth at the time of piezometer/monitor well intallation to confirm location of top of sand unit.

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 900419.0; E 2499331.5

Well No.: MW 24 (08-03-17-08) (Shallow)
Date Started: August 23, 2007
Date Completed: August 23, 2007
Drilling Tech: A. Staggemeyer
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

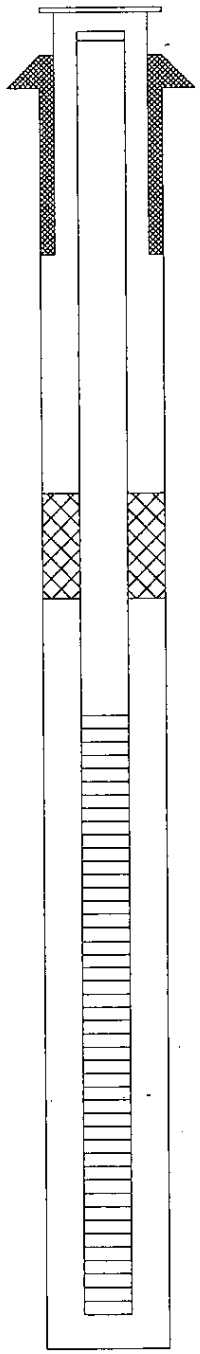
to 0.01 ft (where applicable)

Riser pipe length	10.0 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	5 gal.
Other	

Well Recovery = 0.4 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
635.69 Top of Riser Pipe
630.6 Ground Surface
629.6 Top of Annular Sealant

628.7 Top of Seal

2' Total Seal Interval
626.7 Top of Sand

625.7 Top of Screen

10' Total Screen Interval

615.7 Bottom of Screen
614.7 Bottom of Borehole

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 900424.1; E 2499342.8

Well No. MW 24 (08-03-17-08) (Deep)
Date Started: August 29, 2007
Date Completed: August 30, 2007
Drilling Tech: A. Staggemeyer
Drilling Fluids (type): Water added during drilling process

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

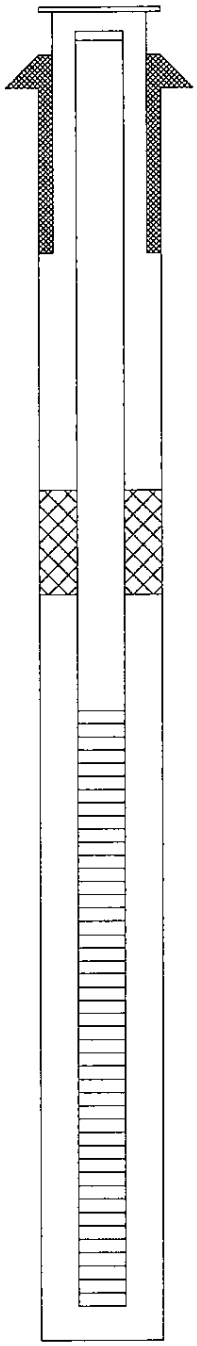
to 0.01 ft (where applicable)

Riser pipe length	57.5 ft.
Screen length	5 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	5 gal.
Other	

Well Recovery = 0.4 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
634.54 Top of Riser Pipe
630.3 Ground Surface
629.3 Top of Annular Sealant

579.0 Top of Seal

2' Total Seal Interval
577.0 Top of Sand

576.0 Top of Screen

5' Total Screen Interval

571.0 Bottom of Screen
570.5 Bottom of Borehole

Hillsboro Energy Borings
Section 17, East Fork Township
West Edge of
White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 13, 2007
BORING TECH.: A. Staggameyer
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 25 (08-03-17-09)
COORDINATES: N 901754.5
E 2497974.5
SURFACE ELEV.: 629.2

GROUNDWATER ELEV.
COMP.: - 11.3'
AFTER 24 HRS.: - 7.3'

Depth	Description	N Value	Qu (tsf)	W (%)	REC (%)
0	SILTY CLAY (CL), Light Gray, Stiff				
		CTS No. 1			100%
	Reddish-Brown, Mottled				
5					
	SILTY CLAY LOAM TILL (CL), Gray, Moist, Trace of Sand	CTS No. 2			100%
10					
	Reddish-Brown, Mottled	CTS No. 3			80%
	Trace of Gravel Wet, Some Sand, Soft				
15		CTS No. 4			100%
	CTS Refusal at 16.0 ft.	11 27 38			85%
	SAND (SP), Gray, Saturated, Loose, Trace of Gravel and Fines	2 5			
20		7			100%
20	SILTY CLAY TILL (CL), Gray, Dry to Moist, Hard, Few Sand, Trace of Gravel	4 11 27			100%
		15 24 26			85%
	2" Sand Seam with Gravel at 23.5 ft.	15 27 30			85%
25	Trace of Gravel	10 20 26			100%
		7 11 16			90%
		9 14 19			80%
30		9 12 20			80%
35		10 12 18			90%
40		20 26 26			95%

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 17, East Fork Township
West Edge of
White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 13, 2007
BORING TECH.: A. Staggameyer
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 25 (08-03-17-09)

COORDINATES: N 901754.5
E 2497974.5

SURFACE ELEV.: 629.2

GROUNDWATER ELEV.
COMP.: - 11.3'
AFTER 24 HRS.: - 7.3'

	N Value	Qu (tsf)	W (%)	REC (%)
40 SILTY CLAY TILL (CL), Gray, Very Stiff to Hard, Trace of Sand and Gravel				
	27			
	42			
45	55			100%
	22			
	35			
50	54			95%
	6			
	13			
55	20			100%
	5			
	8			
Trace of Sand 60	14			80%
60				
SAND (SP), Brown to Gray, Saturated, Very Dense, Fine 65	100/9"			80%
Light Gray, Medium Dense, Fine to Medium Coarse	19			
	11			
SILTY CLAY TILL (CL), Gray, Dry to Moist, Hard, Trace of Gravel 70	17			80%
	6			
	11			
Trace of Wood, Trace of Green Mottling 75	15			100%
Gray, Brown, Mottled, Trace of Sand and Gravel	6			
	7			
80	12			100%
End of Exploration at 80.0 ft.				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler
12" with 140 lb. Hammer falling 30"
(Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 17, East Fork Township
West Edge of
White Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 13, 2007
BORING TECH.: A. Staggameyer
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 25 (08-03-17-09)

COORDINATES: N 901754.5
E 2497974.5

SURFACE ELEV.: 629.2

GROUNDWATER ELEV.
COMP.: - 11.3'
AFTER 24 HRS.: - 7.3'

	N Value	Qu (tsf)	W (%)	REC (%)		N Value	Qu (tsf)	W (%)	REC (%)
80					100				
85					105				
90					110				
95					115				
100					120				

Notes:
1) Boring completed with a continuous tube sampler to the 16 ft. depth, then wash boring and split spoon sampling to the 80 ft. depth.
2) Borehole backfilled with soil cuttings and bentonite mix following final groundwater measurement.
3) A Shelby tube sample was collected from 10 ft. - 12 ft. in an adjacent borehole. An attempt was made to collect a Shelby tube sample from 22 ft. - 24 ft., however the tube could not be pushed due to the stiffness of the till soil.

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 901760.8; E 2497968.1

Well No.: MW 25 (08-03-17-09) (Shallow)
Date Started: August 23, 2007
Date Completed: August 24, 2007
Drilling Tech: A. Staggemeyer
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

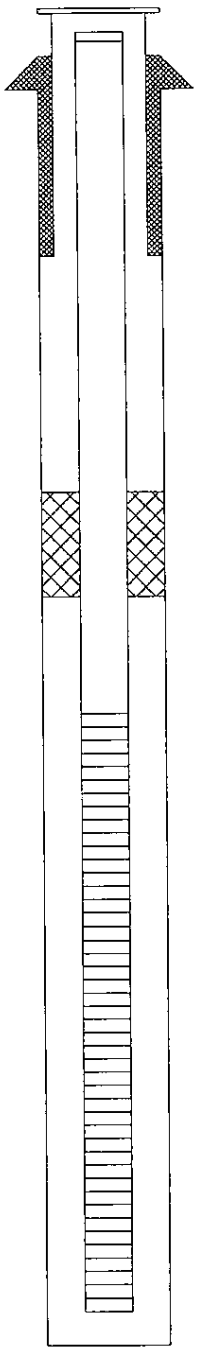
to 0.01 ft (where applicable)

Riser pipe length	10.0 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	5 gal.
Other	

Well Recovery = 0.5 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
633.61 Top of Riser Pipe
629.7 Ground Surface
628.7 Top of Annular Sealant

626.6 Top of Seal

2' Total Seal Interval
624.6 Top of Sand

623.6 Top of Screen

10' Total Screen Interval

613.6 Bottom of Screen
612.6 Bottom of Borehole

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 901747.0; E 2497967.9

Well No.: MW 25 (08-03-17-09) (Deep)
Date Started: August 27, 2007
Date Completed: August 29, 2007
Drilling Tech: A. Staggemeyer
Drilling Fluids (type): Water added during drilling process

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

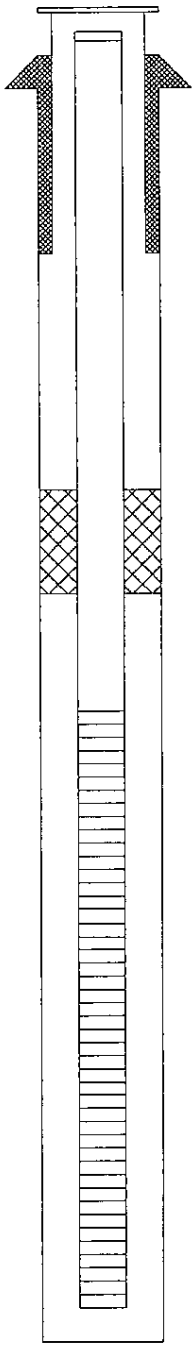
to 0.01 ft (where applicable)

Riser pipe length	67.5 ft.
Screen length	5.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	6 gal.
Other	

Well Recovery = 0.1 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- \- Top of Protective Casing
- 631.81 Top of Riser Pipe
- 629.6 Ground Surface
- 628.6 Top of Annular Sealant
- 567.3 Top of Seal
- 2' Total Seal Interval
- 565.3 Top of Sand
- 564.3 Top of Screen
- 5' Total Screen Interval
- 559.3 Bottom of Screen
- 558.8 Bottom of Borehole

Hillsboro Energy Borings
Section 18, East Fork Township
South Edge of
Rademacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 21, 2007 - August 22, 2007
BORING TECH.: A. Staggameyer
DRILLING TECH.: Terra Drill, Inc.

FOUNDATION BORING LOG

BORING NO.: 26 (08-03-18-16)
COORDINATES: N 900322.6
E 2494326.7
SURFACE ELEV.: 626.4
GROUNDWATER ELEV.
COMP.: - 13.6'
AFTER 48 HRS.: - 13.0 ft.

	N Value	Qu (tsf)	W (%)	REC (%)
SILTY LOAM (ML), Topsoil, Light Brown, Dry, Soft				
SILTY CLAY (CL), Brown, Orange, Black, Mottled, Dry, Stiff, Trace of Sand	Macro Core No. 1			90%
Brown, Gray, Orange, Mottled, Dry to Moist, Medium Stiff to Soft, Trace of Sand and Gravel	Macro Core No. 2			95%
SAND (SP), Brown, Saturated, Fine to Medium Coarse	Macro Core No. 3			60%
SILTY CLAY (CL), Gray, Mottled, Dry to Moist, Medium Stiff, Trace of Sand				
SAND (SP), Gray, Saturated, Dense, Fine to Medium Coarse, Trace of Gravel	Macro Core No. 4			60%
SILTY CLAY TILL (CL), Gray, Dry to Moist, Stiff, Trace of Sand and Gravel				
Core Refusal at 20.0 ft.				

	N Value	Qu (tsf)	W (%)	REC (%)
Very Stiff to Hard	14			
	20			
	25			
	17			100%
	15			
	20			
	22			
	14			100%
	6			
	24			
	50/4"			90%
	18			
	17			
	21			
	14			100%
	5			
	7			
	11			
	14			100%
	8			
	10			85%
	7			
	14			
	18			85%
	16			
	16			
	22			90%

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
South Edge of
Rademacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 21, 2007 - August 22, 2007
BORING TECH.: A. Staggameyer
DRILLING TECH.: Terra Drill, Inc.

FOUNDATION BORING LOG

BORING NO.: 26 (08-03-18-16)

COORDINATES: N 900322.6
E 2494326.7

SURFACE ELEV.: 626.4

GROUNDWATER ELEV.
COMP.: - 13.6'
AFTER 48 HRS.: - 13.0 ft.

	N Value	Qu (tsf)	W (%)	REC (%)		N Value	Qu (tsf)	W (%)	REC (%)
40					60				
SILTY CLAY TILL (CL), Gray, Dry to Moist, Very Stiff to Hard, Trace of Sand and Gravel									
	13					4			
	17					8			
45	21			100%	Some Sand, Methane Gas	65 13			100%
					Encountered				
	20				SAND (SP), Gray, Saturated,	2			
	25				Very Dense, Fine to Medium	30			
50	38			100%	Coarse	70 50/4"			90%
					SILTY CLAY TILL (CL), Gray,				
	8				Moist, Medium Stiff, Trace of Sand	5			
	18				and Gravel	8			
55	30			100%	Methane Gas Encountered	75 13			100%
					Gray, Green, and Brown, Trace				
	5				of Wood Chips	3			
	9					6			
60	18			100%		80 10			100%
					End of Exploration at 80.0 ft.				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
South Edge of
Rademacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 21, 2007 - August 22, 2007
BORING TECH.: A. Staggemeyer
DRILLING TECH.: Terra Drill, Inc.

FOUNDATION BORING LOG

BORING NO.: 26 (08-03-18-16) COORDINATES: N 900322.6 E 2494326.7 SURFACE ELEV.: 626.4	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: - 13.6' AFTER 48 HRS.: - 13.0 ft.	N Value	Qu (tsf)	W (%)	REC (%)
80					100				
Notes: 1) Boring completed with a Macro-Core sampler to the 20 ft. depth, then hollow stem augers and split spoon sampling to the 80 ft. depth. 2) Borehole backfilled with soil cuttings and bentonite mix following final groundwater measurement. 3) Methane gas was encountered at the 65 ft. depth at 5 p.m. on August 21, 2007. Rigorous venting continued for over one hour. Continued drilling on August 22, 2007. Methane gas was also encountered at									
85					105				
90					110				
3) A Shelby tube sample was collected from 6 ft. - 8 ft. in an adjacent borehole.									
95					115				
100					120				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 900316.8; E 2494316.0

Well No.: MW 26 (08-03-18-16)
Date Started: August 30, 2007
Date Completed: August 30, 2007
Drilling Tech: A. Staggemeyer
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

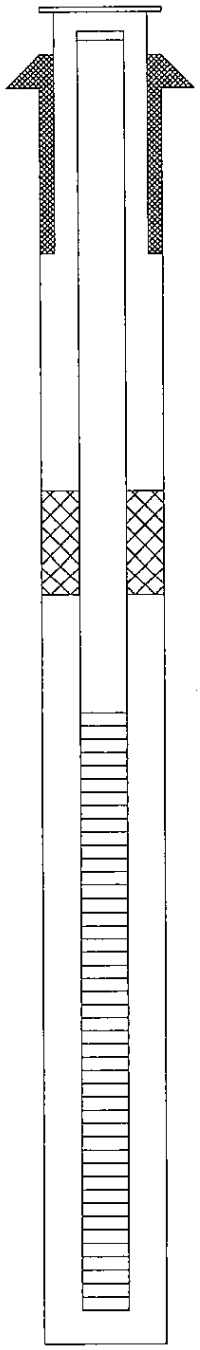
to 0.01 ft (where applicable)

Riser pipe length	12.5 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	10 gal.
Other	

Well Recovery = 0.5 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
628.69 Top of Riser Pipe
626.5 Ground Surface
625.5 Top of Annular Sealant
617.0 Top of Seal
2' Total Seal Interval
615.0 Top of Sand
614.0 Top of Screen
10' Total Screen Interval
604.0 Bottom of Screen
603.0 Bottom of Borehole

Hillsboro Energy Borings
Section 18, East Fork Township
Northwest Corner of
Wisdom Trust Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 22, 2007
BORING TECH.: A. Staggameyer
DRILLING TECH.: Terra Drill, Inc.

FOUNDATION BORING LOG

BORING NO.: 27 (08-03-18-17)
COORDINATES: N 900252.5
E 2496017.5
SURFACE ELEV.: 627.0

GROUNDWATER ELEV.
COMP.: - 16.0'
AFTER 18 HRS.: - 5.5'

Depth	Description	Core	N Value	Qu (tsf)	W (%)	REC (%)
0	SILTY LOAM (ML), Topsoil, Brown, Dry, Soft					
	SILTY CLAY (CL), Brown, Gray, Mottled, Dry to Moist, Stiff	Macro Core No. 1				80%
5	Medium Stiff to Soft, Trace of Sand	Macro Core No. 2				50%
10	Gray, Green, Brown, Mottled, Moist, Soft, Trace of Sand and Gravel	Macro Core No. 3				90%
15	SAND (SP), Gray, Saturated, Medium Dense, Fine to Medium Coarse, Trace of Gravel	Macro Core No. 4				65%
20	SILTY CLAY (CL), Gray, Dry, Medium Stiff					
20	SAND (SP), Gray, Saturated, Dense, Medium Coarse to Coarse, Some Gravel	Macro Core No. 5				60%
25	Core Refusal at 25.0 ft.					
	Fine to Medium Coarse, Trace of Gravel		12 17 23 33			100%
	CLAY TILL (CL), Dry to Moist, Hard, Trace of Sand and Gravel		36 48 46			100%
30			18 28 44			90%
35	Small Sand Seam at 34 ft., Saturated, Medium Coarse		17 32 35			70%
40	Few Sand		48 50/4"			60%

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
Northwest Corner of
Wisdom Trust Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 22, 2007
BORING TECH.: A. Staggameyer
DRILLING TECH.: Terra Drill, Inc.

FOUNDATION BORING LOG

BORING NO.: 27 (08-03-18-17)
COORDINATES: N 900252.5
E 2496017.5
SURFACE ELEV.: 627.0
GROUNDWATER ELEV.
COMP.: - 16.0'
AFTER 18 HRS.: - 5.5'

	N Value	Qu (tsf)	W (%)	REC (%)
40 SILTY CLAY TILL (CL), Gray, Dry to Moist, Very Stiff to Hard, Trace of Sand and Gravel				
	14 25 40			90%
45				
Few Sand	20 22 23			95%
50				
	17 20 25			80%
55 Methane Gas Encountered Trace of Wood				
	6 11 18			100%
60 Brown with Gray				
	5 7 13			100%
65				
	11 12 17			95%
70				
	5 8 14			100%
75				
	7 14 22			100%
80 End of Exploration at 80.0 ft.				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
Northwest Corner of
Wisdom Trust Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 22, 2007
BORING TECH.: A. Staggameyer
DRILLING TECH.: Terra Drill, Inc.

FOUNDATION BORING LOG

BORING NO.: 27 (08-03-18-17)

COORDINATES: N 900252.5
E 2496017.5

SURFACE ELEV.: 627.0

GROUNDWATER ELEV.
COMP.: - 16.0'
AFTER 18 HRS.: - 5.5'

N Value	Qu (tsf)	W (%)	REC (%)	N Value	Qu (tsf)	W (%)	REC (%)

Notes:
1) Boring completed with a Macro-Core sampler to the 25 ft. depth, then hollow stem auging and split spoon sampling to the 80 ft. depth.
2) Borehole backfilled with soil cuttings and bentonite mix following final groundwater measurments.
3) Methane gas encountered at 75 ft. depth. Dissipated quickly.
3) A Shelby tube sample was collected from 8 ft. - 10 ft. in an adjacent borehole.

80 85 90 95 100 105 110 115 120

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 900250.6; E 2496029.8

Well No.: MW 27 (08-03-18-17) (Shallow)
Date Started: August 23, 2007
Date Completed: August 23, 2007
Drilling Tech: A. Staggemeyer
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

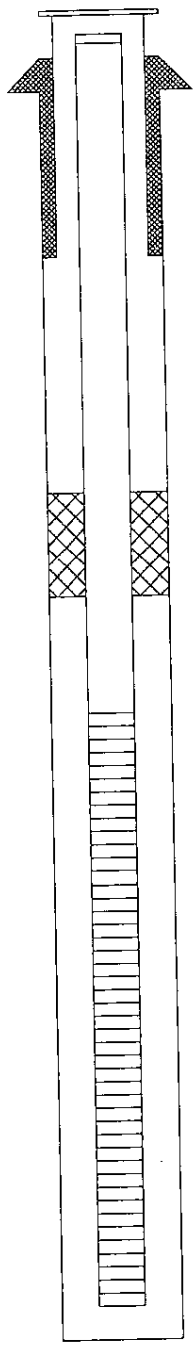
to 0.01 ft (where applicable)

Riser pipe length	7.5 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	5 gal.
Other	

Well Recovery = 0.7 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
628.69 Top of Riser Pipe
626.9 Ground Surface
625.9 Top of Annular Sealant

624.2 Top of Seal

2' Total Seal Interval
622.2 Top of Sand

621.2 Top of Screen

10' Total Screen Interval

611.2 Bottom of Screen
610.2 Bottom of Borehole

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 900256.9; E 2496029.7

Well No.: MW 27 (08-03-18-17) (Deep)
Date Started: August 24, 2007
Date Completed: August 24, 2007
Drilling Tech: A. Staggemeyer
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet):
Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

to 0.01 ft (where applicable)

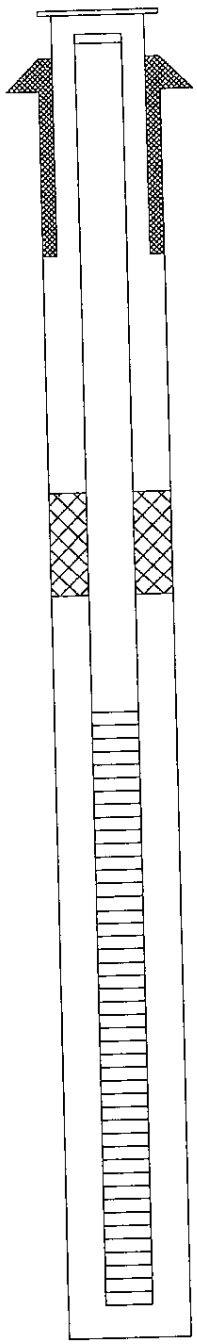
Riser pipe length	25.0 ft.
Screen length	5.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	4 gal.
Other	

Note: Well bailed dry during development.

Well Recovery = 0.1 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
629.67 Top of Riser Pipe
627.0 Ground Surface
626.0 Top of Annular Sealant

607.7 Top of Seal

2' Total Seal Interval
605.7 Top of Sand

604.7 Top of Screen

5' Total Screen Interval

599.7 Bottom of Screen
598.7 Bottom of Borehole

Hillsboro Energy Borings
Section 18, East Fork Township
Northeast Corner of
Wisdom Trust Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 22, 2007 - August 23, 2007
BORING TECH.: R. Ruhmann
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 28 (08-03-18-18)
COORDINATES: N 900320.6
E 2497977.2
SURFACE ELEV.: 632.4

GROUNDWATER ELEV.
COMP.: –
AFTER 24 HRS.: –

Depth	Description	N Value	Qu (tsf)	W (%)	REC (%)
0	SILTY CLAY (CL), Brown, Moist	CTS No. 1			85%
5	Gray	CTS No. 2			65%
10	Gray and Brown	CTS No. 3			80%
15	SAND (SP), Saturated	CTS No. 4			90%
20	SILTY CLAY TILL (CL), Gray, Moist to Dry, Trace of Sand and Gravel	CTS No. 5			100%
25	Very Stiff to Hard	CTS No. 6			80%
30		13 29 42			45%
35		17 16 21			90%
40					

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
Northeast Corner of
Wisdom Trust Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 22, 2007 - August 23, 2007
BORING TECH.: R. Ruhmann
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 28 (08-03-18-18)

COORDINATES: N 900320.6
E 2497977.2

SURFACE ELEV.: 632.4

GROUNDWATER ELEV.
COMP.: –
AFTER 24 HRS.: –

	N Value	Qu (tsf)	W (%)	REC (%)
40 SILTY CLAY TILL (CL), Gray, Dry to Moist, Very Stiff to Hard, Trace of Sand and Gravel				
	21 22 31			80%
(A 2 inch piece of chert was present in split spoon)	90 80 20			100%
	11 20 27			95%
	7 12 19			95%
60 Trace of Wood				
60	12 10 11			70%
	3 5 6			100%
	7 14 25			35%
	8 16 26			90%
80 End of Exploration at 80.0 ft.				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 18, East Fork Township
Northeast Corner of
Wisdom Trust Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 22, 2007 - August 23, 2007
BORING TECH.: R. Ruhmann
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 28 (08-03-18-18)

COORDINATES: N 900320.6
E 2497977.2

SURFACE ELEV.: 632.4

GROUNDWATER ELEV.
COMP.: –
AFTER 24 HRS.: –

	N Value	Qu (tsf)	W (%)	REC (%)		N Value	Qu (tsf)	W (%)	REC (%)
80					100				
85					105				
90					110				
95					115				
100					120				

Notes:
1) Boring completed with a continuous tube sampler to the 30 ft. depth, then wash boring and split spoon sampling to the 80 ft. depth.
2) Borehole backfilled with soil cuttings and bentonite mix upon completion.

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 900325.1; E 2497976.7

Well No.: MW 28 (08-03-18-18)
Date Started: August 23, 2007
Date Completed: August 23, 2007
Drilling Tech: A. Staggemeyer
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

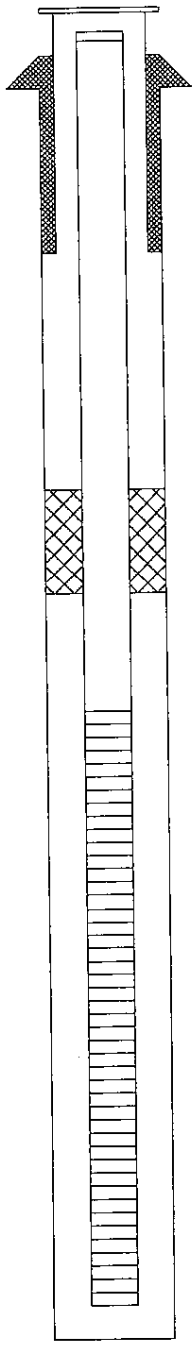
to 0.01 ft (where applicable)

Riser pipe length	12.5 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	5 gal.
Other	

Well Recovery = 1.0 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
634.30 Top of Riser Pipe
632.5 Ground Surface
631.5 Top of Annular Sealant

624.8 Top of Seal

2' Total Seal Interval
622.8 Top of Sand

621.8 Top of Screen

10' Total Screen Interval

611.8 Bottom of Screen
610.8 Bottom of Borehole

Hillsboro Energy Borings
Section 18, East Fork Township
Southeast Corner of
Justison Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 16, 2007 - August 17, 2007
BORING TECH.: A. Staggemeyer
DRILLING TECH.: Terra Drill, Inc.

FOUNDATION BORING LOG

BORING NO.: 29 (08-03-18-19)
COORDINATES: N 897658.2
E 2494293.2
SURFACE ELEV.: 625.8
GROUNDWATER ELEV.
COMP.: - 9.0'
AFTER 72 HRS.: - 6.5'

Depth	Description	Core	N Value	Qu (tsf)	W (%)	REC (%)
0	SILTY CLAY (CL), Dark Brown, Dry to Moist, Soft to Medium Stiff					
	Dark Gray	Macro Core No. 1				80%
5	Gray, Orange, Mottled					
	Trace of Sand and Gravel	Macro Core No. 2				90%
10	Dark Gray, Moist, Trace of Sand					
	SANDY CLAY, Green, Brown, Mottled, Moist, Soft	Macro Core No. 3				65%
	Green, Gray, Mottled					
15	SAND (SP), Gray, Saturated, Medium Dense, Medium Coarse	Macro Core No. 4				85%
	SILTY CLAY TILL (CL), Gray, Dry to Moist, Medium Stiff					
20	Gray, Dry, Very Stiff to Hard, Trace of Sand and Gravel		12 30 24 30			100%
			15 23 26 43			100%
25	Few Gravel		10 25 44 50/5"			100%
			19 45 50/4"			80%
			17 36 50/5"			85%
30			23 32 33			90%
35			18 26 21			85%
40	Little Sand		19 24 31			100%

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
Southeast Corner of
Justison Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 16, 2007 - August 17, 2007
BORING TECH.: A. Staggemeyer
DRILLING TECH.: Terra Drill, Inc.

FOUNDATION BORING LOG

BORING NO.: 29 (08-03-18-19)
COORDINATES: N 897658.2
E 2494293.2
SURFACE ELEV.: 625.8

GROUNDWATER ELEV.
COMP.: - 9.0'
AFTER 72 HRS.: - 6.5'

	N Value	Qu (tsf)	W (%)	REC (%)
40 SILTY CLAY TILL (CL), Gray, Dry to Moist, Very Stiff to Hard, Trace of Sand and Gravel				
	7			
	13			
45	30			100%
Some Sand	17			
	35			
50	39			95%
SAND (SP), Gray Saturated, Loose to Medium Dense, Fine to Medium Coarse	10			
SILTY CLAY TILL (CL), Gray, Dry	11			
to Moist, Very Stiff to Hard, 55	20			100%
Trace of Sand and Gravel				
SAND (SP), Gray, Saturated, Very	49			
Dense, Fine to Medium 60	50/1"			100%
Coarse				

	N Value	Qu (tsf)	W (%)	REC (%)
60				
SILTY CLAY TILL (CL), Gray, Dry	10			
to Moist, Very Stiff to Hard, Trace	15			
of Sand and Gravel 65	20			100%
	7			
	10			
70	16			100%
	9			
	15			
75	15			100%
	5			
	9			
80	13			100%
End of Exploration 80.0 ft.				

Notes:
1) Boring completed with a Macro-Core sampler to the 20 ft. dept, then hallow stem auger and split spoon sampling to the 80 ft. depth.
2) Borehole backfilled with soil cuttings and bentonite mix following final groundwater measurement.

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
Southwest Corner of
Wisdom Trust Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 17, 2007
BORING TECH.: A. Staggemeyer
DRILLING TECH.: Terra Drill, Inc.

FOUNDATION BORING LOG

BORING NO.: 30 (08-03-18-20)
COORDINATES: N 897738.5
E 2496045.3
SURFACE ELEV.: 628.4

GROUNDWATER ELEV.
COMP.: - 40 ft.
AFTER 60 HRS.: - 6.0 ft.

	N Value	Qu (tsf)	W (%)	REC (%)
0 SILTY CLAY (CL), Light Brown, Dry, Medium Stiff; Dark Brown, Dry to Moist; Gray, Orange, Mottled	Macro Core No. 1			90%
5 Trace of Sand; Trace of Gravel, Few Sand	Macro Core No. 2			95%
10 Little Sand, Soft; SAND (SP), Light Brown, Saturated, Medium Coarse to Coarse	Macro Core No. 3			85%
15 SANDY CLAY, Gray, Moist to Wet, Soft, Few Gravel	Macro Core No. 4			70%
CLAY TILL (CL), Gray, Dry to Moist, Very Stiff, Trace of Sand and Gravel; 20 Core Refusal at 18.5 ft.	11 12 16 18			100%

	N Value	Qu (tsf)	W (%)	REC (%)
20 Some Sand	2 7 14 10			100%
	9 9 12 14			100%
25	5 9 13			100%
	5 10 12 14			100%
	5 9 13 14			100%
30				
35	5 12 17			90%
SAND (SP), Gray, Saturated, Medium Coarse to Coarse, 40 Dense, Trace of Gravel	9 12 22			100%

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
Southwest Corner of
Wisdom Trust Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 17, 2007
BORING TECH.: A. Staggemeyer
DRILLING TECH.: Terra Drill, Inc.

FOUNDATION BORING LOG

BORING NO.: 30 (08-03-18-20)

COORDINATES: N 897738.5
E 2496045.3

SURFACE ELEV.: 628.4

GROUNDWATER ELEV.
COMP.: - 40 ft.
AFTER 60 HRS.: - 6.0 ft.

	N Value	Qu (tsf)	W (%)	REC (%)
40 SAND (SP), Gray, Saturated, Medium Coarse to Coarse, Dense, Trace of Gravel				
SILTY CLAY TILL (CL), Gray, Dry to Moist, Very Stiff to Hard, Trace of Sand and Gravel	17			
	26			
45	29			95%
	36			
	32			
50	28			85%
	5			
	13			
55	19			100%
	3			
	8			
60	10			100%
60 CLAY TILL (CL), Gray, Brown, Mottled, Dry to Moist, Stiff				
	7			
	10			
65	12			100%
	3			
	5			
70	8			100%
CLAY TILL (CL), Brown and Gray, Dry to Moist, Very Stiff, Trace of Sand and Gravel	7			
	13			
75	18			100%
	17			
Brown, Gray, Mottled, Hard	28			
80	40			100%
End of Exploration 80.0 ft.				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Hillsboro Energy Borings
Section 18, East Fork Township
Southwest Corner of
Wisdom Trust Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 17, 2007
BORING TECH.: A. Staggemeyer
DRILLING TECH.: Terra Drill, Inc.

FOUNDATION BORING LOG

BORING NO.: 30 (08-03-18-20)

COORDINATES: N 897738.5
E 2496045.3

SURFACE ELEV.: 628.4

GROUNDWATER ELEV.
COMP.: - 40 ft.
AFTER 60 HRS.: - 6.0 ft.

N Value	Qu (tsf)	W (%)	REC (%)	N Value	Qu (tsf)	W (%)	REC (%)

80 85 90 95 100 105 110 115 120

Notes:
1) Boring completed with a Macro-Core sample to the 18.5 ft. dept, then hollow stem auger and split spoon sampling to the 80 ft. depth.
2) Borehole backfilled with soil cuttings and bentonite mix following final groundwater measurement.
3) Shelby tubes were collected from 10 ft. - 12 ft. and 20 ft. - 22 ft. in an adjacent borehole.

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 897704.5; E 2496053.1

Well No.: MW 30 (08-03-18-20)
Date Started: September 4, 2007
Date Completed: September 4, 2007
Drilling Tech: A. Staggemeyer
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

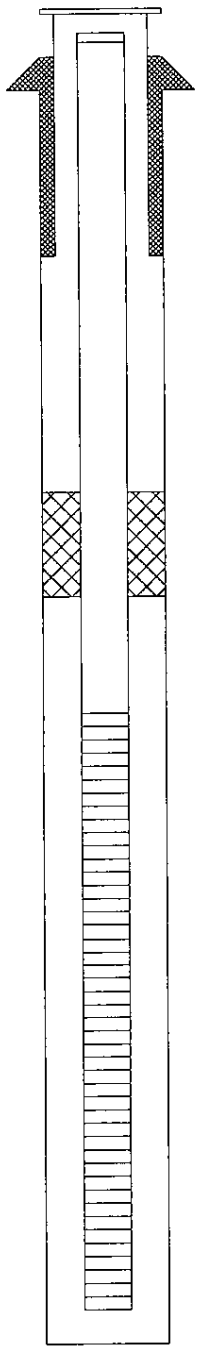
to 0.01 ft (where applicable)

Riser pipe length	7.5 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	5 gal.
Other	

Well Recovery = 0.7 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
630.48 Top of Riser Pipe
628.2 Ground Surface
627.2 Top of Annular Sealant
626.0 Top of Seal
2' Total Seal Interval
624.0 Top of Sand
623.0 Top of Screen
10' Total Screen Interval
613.0 Bottom of Screen
612.0 Bottom of Borehole

Hillsboro Energy Borings
Section 18, East Fork Township
Southeast Corner of
Wisdom Trust Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 20, 2007
BORING TECH.: A. Staggemeyer
DRILLING TECH.: Terra Drill, Inc.

FOUNDATION BORING LOG

BORING NO.: 31 (08-03-18-21)
COORDINATES: N 897945.7
E 2497968.3
SURFACE ELEV.: 636.0

GROUNDWATER ELEV.
COMP.: - 13.0 ft.
AFTER 24 HRS.: --

	N Value	Qu (tsf)	W (%)	REC (%)
0 SILTY LOAM (ML), Topsoil, Light Brown, Dry, Soft to Medium Stiff				
SILTY CLAY (CL), Brown, Orange, Black, Mottled, Dry, Stiff	Macro Core No. 1			85%
5 Brown, Gray, Black, Mottled, Moist, Soft	Macro Core No. 2			50%
10 Trace of Sand and Gravel	Macro Core No. 3			95%
SAND (SP), Brown, Black, Mottled, Saturated, Fine to Medium Coarse, Few Gravel				
15 CLAY, Gray, Orange, Mottled, Moist, Soft to Medium Stiff				
SAND (SP), Orange, Saturated, Fine to Medium Coarse	Macro Core No. 4			95%
SANDY CLAY, Brown, Moist, Soft, Few Gravel				
20				

	N Value	Qu (tsf)	W (%)	REC (%)
20 CLAY (CL), Dry to Moist, Stiff, Trace of Sand and Gravel	Macro Core No. 5			100%
SAND (SP), Gray, Saturated, Dense, Fine	15 41 39	51		100%
CLAY TILL (CL), Gray, Dry to Moist, Hard, Trace of Sand and Gravel	19 39 38	52		100%
25	21			
	12 27 40	53		100%
	30 50/5"	54		100%
	23 50/5"	55		100%
	20 40 50/5"	56		100%
30				
	30 49 50/4"			100%
35				
	26 41 38			100%
40				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 18, East Fork Township
Southeast Corner of
Wisdom Trust Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 20, 2007
BORING TECH.: A. Staggemeyer
DRILLING TECH.: Terra Drill, Inc.

FOUNDATION BORING LOG

BORING NO.: 31 (08-03-18-21)

COORDINATES: N 897945.7
E 2497968.3

SURFACE ELEV.: 636.0

GROUNDWATER ELEV.
COMP.: - 13.0 ft.
AFTER 24 HRS.: –

	N Value	Qu (tsf)	W (%)	REC (%)
40				
SILTY CLAY TILL (CL), Gray, Hard, Trace of Sand and Gravel				
	11			
	20			
45	17			100%
	50/5"			
Some Sand				
50				100%
	20			
	22			
55	35			100%
	14			
	22			
60	23			100%
60				
	4			
	6			
65	11			100%
	4			
	7			
70	14			100%
	4			
Gray to Brown, Trace of Sand,	6			
Medium Stiff to Stiff				
75	6			100%
	5			
	7			
Brown, Gray, and Green				
80	9			100%
End of Exploration at 80.0 ft.				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 897936.9; E 2497977.6

Well No.: MW 31 (08-03-18-21)
Date Started: September 4, 2007
Date Completed: September 4, 2007
Drilling Tech: A. Staggemeyer
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

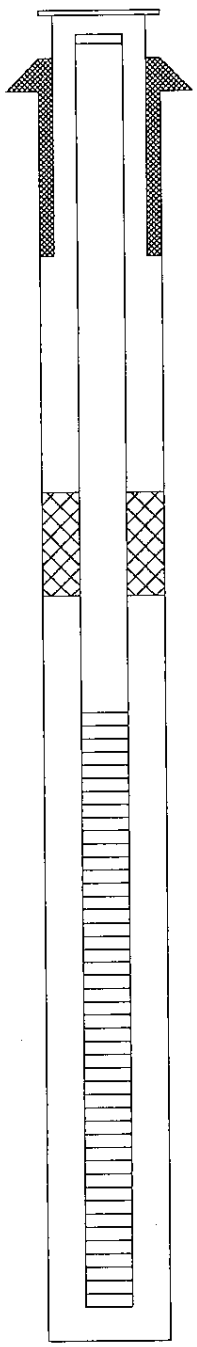
to 0.01 ft (where applicable)

Riser pipe length	12.5 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	5 gal.
Other	

Well Recovery = 0.8 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
639.05 Top of Riser Pipe
636.4 Ground Surface
635.4 Top of Annular Sealant

629.6 Top of Seal

2' Total Seal Interval
627.6 Top of Sand

626.6 Top of Screen

10' Total Screen Interval

616.6 Bottom of Screen
615.6 Bottom of Borehole

Hillsboro Energy Borings
Section 18, East Fork Township
North End of
Rademacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 31, 2007 & September 1, 2007
BORING TECH.: A. Staggemeyer/D. Kimmle
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 32 (08-03-07-04)
COORDINATES: N 903994.6
E 2494118.7
SURFACE ELEV.: 614.4

GROUNDWATER ELEV.
COMP.: - 25.3 ft.
AFTER 24 HRS.: - 14.2 ft.

	N Value	Qu (tsf)	W (%)	REC (%)
0 SILTY CLAY LOAM (CL), Light Brown, Dry	CTS NO. 1			80%
Orange, Brown, Mottled				
5 Gray, Brown, Mottled, Moist, Medium Stiff	CTS No. 2			100%
10 Orange, Brown, Gray, Mottled, Moist	CTS No. 3			100%
Trace of Sand				
Brown, Mottled, Moist to Wet				
15 SAND (SP), Gray, Saturated, Fine to Medium Coarse, Few Gravel	CTS No. 4			60%
20 Medium Coarse to Coarse, Some Gravel	CTS No. 5			35%
25 SANDY LOAM (SP), Gray, Saturated, Medium Dense	CTS No. 6			55%
30 Medium Dense to Loose	CTS No. 7			30%
35 SANDY LOAM to SAND (SP), Intermittent Seams, Gray, Saturated, Very Dense				
SILTY LOAM TILL (ML), Gray, Moist, Hard, With Sand, Trace of Gravel	CTS No. 8			60%
40				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler
12" with 140 lb. Hammer falling 30"
(Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Hillsboro Energy Borings
Section 18, East Fork Township
North End of
Rademacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: August 31, 2007 & September 1, 2007
BORING TECH.: A. Staggemeyer/D. Kimmle
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 32 (08-03-07-04) COORDINATES: N 903994.6 E 2494118.7 SURFACE ELEV.: 614.4	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: - 25.3 ft. AFTER 24 HRS.: - 14.2 ft.	N Value	Qu (tsf)	W (%)	REC (%)
40					60				
SILTY LOAM TILL (ML), Gray, Moist to Dry, Hard, With Sand and Gravel	26 20 39			100%	65				
End of Exploration at 41.5 ft.					70				
45					75				
Notes: 1) Boring completed with a continuous tube sampler to the 40 ft. depth, then split spoon sampling to the 41.5 ft. depth. 2) Borehole backfilled with soil cuttings and bentonite mix following final groundwater measurement.					80				
50									
55									
60									

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 903994.3; E 2494125.3

Well No.: MW 32 (08-03-07-04)
Date Started: September 1, 2007
Date Completed: September 1, 2007
Drilling Tech: D. Kimmle
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

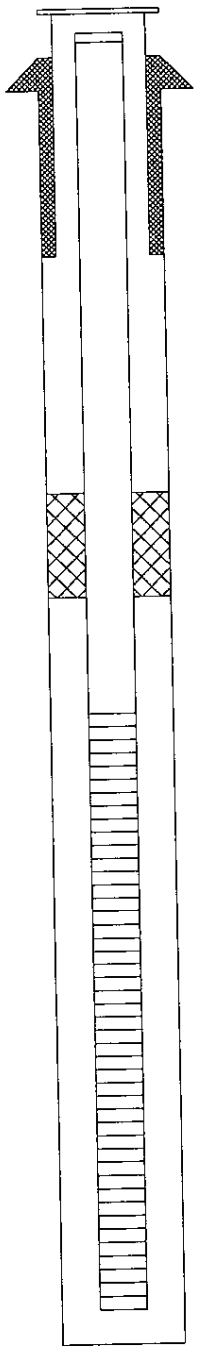
to 0.01 ft (where applicable)

Riser pipe length	12.5 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	5 gal.
Other	

Well Recovery = 0.8 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
616.98 Top of Riser Pipe
614.5 Ground Surface
613.5 Top of Annular Sealant

607.5 Top of Seal

2' Total Seal Interval
605.5 Top of Sand

604.5 Top of Screen

10' Total Screen Interval

594.5 Bottom of Screen
593.5 Bottom of Borehole

Hillsboro Energy Borings
Section 18, East Fork Township
Western Edge of
Rademacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: September 5, 2007
BORING TECH.: A. Staggemeyer
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 33 (08-03-18-22)

COORDINATES: N 902191.0
E 2493596.7

SURFACE ELEV.: 611.7

GROUNDWATER ELEV.
COMP.: Dry
AFTER 24 HRS.: --

	N Value	Qu (tsf)	W (%)	REC (%)
0 SILTY LOAM (ML), Topsoil, Brown, Brown, Orange, Black, Mottled, Dry; Trace of Gravel and Sand 5	CTS No. 1			100%
SILTY CLAY (CL), Light Brown, Orange, Black, Mottled, Dry to Moist, Soft 10	CTS No. 2			100%
Gray,With Brown, Mottling; Gray, Moist, Trace of Sand and Gravel 15	CTS No. 3			90%
SAND (SP), Gray, Moist to Wet, Medium Coarse, Few Gravel; SILTY CLAY TILL (SC), Gray, Moist, Very Stiff to Hard 20	CTS No. 4			50%
End of Exploration at 20.0 ft.				

Notes:
1) Boring completed with a continuous tube sampler to the 20 ft. depth.
2) Peizometer/monitor well installed in borehole upon completion.

N Value	Qu (tsf)	W (%)	REC (%)
20			
25			
30			
35			
40			

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

RQD: Rock Quality Determination

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 902191.0; E 2493596.7

Well No.: MW 33 (08-03-18-22)
Date Started: September 5, 2007
Date Completed: September 5, 2007
Drilling Tech: D. Kimmle
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet):
Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

to 0.01 ft (where applicable)

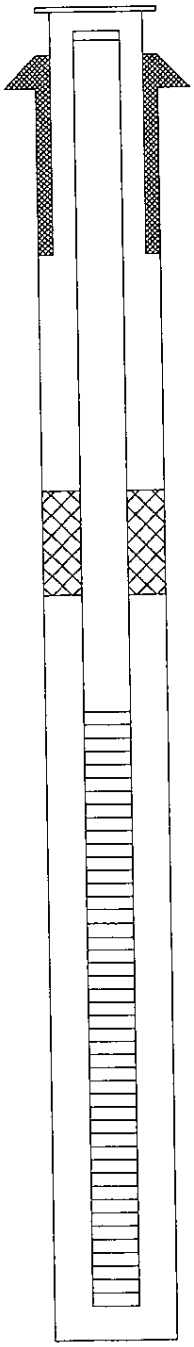
Riser pipe length	12.5 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	2.5 gal.
Other	

Note: Well bailed dry during development.

Well Recovery = 0.8 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- Top of Protective Casing
614.31 Top of Riser Pipe
611.7 Ground Surface
610.7 Top of Annular Sealant

604.8 Top of Seal

2' Total Seal Interval
602.8 Top of Sand

601.8 Top of Screen

10' Total Screen Interval

591.8 Bottom of Screen
591.8 Bottom of Borehole

Hillsboro Energy Borings
Section 18, East Fork Township
Center of
Rademacher Property
Project # 180-3366

ATLAS SOILS, INC.
HILLSBORO, ILLINOIS
PHONE 217/532-3959

DATE: September 6, 2007
BORING TECH.: A. Staggemeyer
DRILLING TECH.: M. Hough

FOUNDATION BORING LOG

BORING NO.: 34 (08-03-07-05) COORDINATES: N 903337.0 E 2494041.6 SURFACE ELEV.: 612.5	N Value	Qu (tsf)	W (%)	REC (%)	GROUNDWATER ELEV. COMP.: – AFTER 24 HRS.: –	N Value	Qu (tsf)	W (%)	REC (%)
0					20				
SILTY LOAM (ML), Brown, Dry Gray 5	CTS No. 1			80%	SILTY LOAM (ML), Gray, Wet, Stiff, Trace of Gravel SAND (SP), Gray, Medium Coarse, Wet to Saturated, Trace of Gravel	CTS No. 5			70%
SILTY CLAY (CL), Gray to Dark Gray, Trace of Gravel Orange, Gray, Black, Mottled, Moist 10	CTS No. 2			80%	SILTY CLAY TILL (CL), Gray, Dry to Moist, Hard, Trace of Sand and Gravel 25	20 31 51			100%
SILTY LOAM (ML), Brown, Gray, Moist 15	CTS No. 3			35%	End of Exploration at 25.0 ft. Notes: 1) Boring completed with a continuous tube sampler to the 23.5 ft. depth, then split spoon sampling to the 25.0 ft. depth. 2) Piezemeter/monitor well installed in borehole upon completion. 30 35				
SILTY CLAY (CL), Gray, Moist (with small Sand Seam at 16.0 ft.) SAND (SP), Gray, Saturated, Medium Coarse, Trace of Gravel 20	CTS No. 4			55%	40				

N:Blows per ft. to Drive 2" O.D. Split Spoon Sampler 12" with 140 lb. Hammer falling 30" (Standard Penetration Test)

Qu: Unconfined Compression Strength
NP: Non-Plastic
ST: Shelby Tube
W: Water Content

Type Failure:
B: Bulge Failure
S: Shear Failure
NS: No Sample
P: Penetrometer

RQD: Rock Quality Determination

Well Completion Report

Site Name: Hillsboro Energy
Drilling Contractor: Atlas Soils
Driller: M. Hough
Drilling Method: Hollow Stem Augers
Location: N 903337.0; E 2494041.6

Well No.: MW 34 (08-03-07-05)
Date Started: September 6, 2007
Date Completed: September 6, 2007
Drilling Tech: D. Kimmle
Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Cement/Bentonite Mix
Type of Bentonite Seal (Granular, Pellet): Volclay 3/8 inch Pellets
Type of Sand Pack: Unimin Corp. Quartz

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		-	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		-	
Protective casing		None	

Measurements

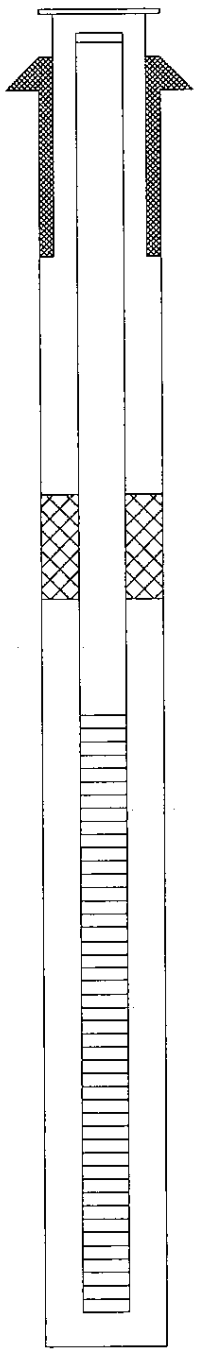
to 0.01 ft (where applicable)

Riser pipe length	12.5 ft.
Screen length	10.0 ft.
Screen slot size (in)	0.01
Protective casing length	N/A
Depth to water	-
Elevation of water from riser	-
Gallons removed (develop)	5 gal.
Other	

Well Recovery = 0.6 gpm.

Completed by: A. Staggemeyer

Elevations (ft.)



- - Top of Protective Casing
- 615.90 Top of Riser Pipe
- 612.5 Ground Surface
- 611.5 Top of Annular Sealant
- 606.4 Top of Seal
- 2' Total Seal Interval
- 604.4 Top of Sand
- 603.4 Top of Screen
- 10' Total Screen Interval
- 593.4 Bottom of Screen
- 589.5 Bottom of Borehole

Attachment X.X.X - Residential water use and well survey data in and within 1/2 miles of the proposed shadow area

ay ID	Map	Name	City_State	Well on Property	Inhabited House	Mobile Home	Primary Supply	Secondary Supply	Water Use	Well Dia. (in)	Well Depth (ft)	Notes
1	17-07-252-001	BLANKENSHIP GEORGE LEE	HILLSBORO IL									
2	17-07-151-002	JUSTISON THOMAS A	BUTLER IL									
3	17-07-151-001	IP COMPANY C/O AMEREN SERVICES	ST LOUIS MO									
#4&5	17-07-300-002	RADEMACHER TRUST	ELLISON BAY WI	No								
5	17-07-276-001	WALTER, DIANNE, ROBERT & PHYLLIS KUNZ	TRENTON IL									
6	17-07-400-002	CITY OF HILLSBORO	HILLSBORO IL	Yes					Other	?	?	40 years old
7	17-07-400-005	ULLMAN EMERALD J	HILLSBORO IL	No								
8	17-08-300-009	SHURE RICHARD & DOROTHY	ALHAMBRA IL	No								
9	17-08-400-002	GOLDSBOROUGH R C & K M	COWDEN IL									
10	17-08-400-004	SNODDY RONALD H	WESTLAKE TX									
11	17-15-100-002	ERNST LESTER A	COFFEEN IL	No								
12	17-15-200-004	HUBER EDWARD	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Garden	72	35	100 years old
13	17-15-300-002	L & L HUBER FARMS LLC	SANTA MONICA CA									
14	17-15-400-001	MANSHOLT FARMS INC	LITCHFIELD IL									
15	17-15-400-009	MERANO SCOTT & STACIE	WITT IL									
#16&1	17-16-100-002	MOHR DONNA	DALLAS CITY IL	Yes	No		Yes		Stock Watering	36	25	
17	17-16-100-003	CRAWFORD DANIEL & MARION TRUST	AVON IN	Yes	No		Yes		Stock Watering	?	? - Deep	70 years old; Used to water 140 head dairy herd in previous years. Not used for last 20 years
18	17-16-200-003	FRAVALA FARM	HILLSBORO IL									
19	17-17-100-001	WHITE DAVID B	HILLSBORO IL									
20	17-17-200-001	LANE RICHARD R	VIRDEN IL									
21	17-17-300-001	WISDOM MARY JANE TRUST	HILLSBORO IL	Yes			No		None			Not Used
22	17-17-300-004	AUSTIN ROBERT M TRUST	DECATUR IL									
23	17-17-300-005	HARMS HENRY	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Garden	36	25	85 years old; It is the only source of water and have never ran dry even when they had 150 head of hogs
24	17-17-400-004	SPINNER GEORGE & MARTHA	HILLSBORO IL	No								
25	17-18-300-008	SPINNER EDMUND & JAN	HILLSBORO IL	Yes	Yes				Bathing	?	?	50-60 years old;
26	17-18-300-009	MURPHY & FUDOU	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing	?	?	
27	17-19-100-006	WHITE DORIS M	NOKOMIS IL									
28	17-19-100-007	GRAHAM CORRECTIONAL CENTER	HILLSBORO IL	No								
29	17-19-100-010	MONTGOMERY COUNTY FARM	HILLSBORO IL	No								
30	17-19-200-003	DUNKIRK DOROTHY L	HILLSBORO IL									
31	17-19-200-004	SPINNER DARIN M	HILLSBORO IL	No								
32	17-19-300-002	BOAS JOSEPH L	IRVING IL	Yes	No		No		None	?		
33	17-19-400-002	REDMAN BRIAN	HILLSBORO IL	Yes	Yes		No		Garden, Animals	60	17	70+ years old
34	17-19-400-004	SPINNER KENT	HILLSBORO IL									
35	17-20-100-003	FATH BILL E	HILLSBORO IL	No								
36	17-20-200-003	SPINNER DAVID L	HILLSBORO IL	No								
37	17-20-300-001	KASTEN ARLEN R	HILLSBORO IL									
38	17-20-300-005	SCHRAUT LARRY G	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Stock Watering, Garden, Laundry	?	?	
#39&	17-20-400-002	FULLER BARBARA K	HILLSBORO IL	Yes	Yes		No		Bathing, Garden	?	?	There are 2 wells. One not in use.
40	17-20-400-004	SELTZER EARL C TRUSTEE	HILLSBORO IL									
41	17-20-400-005	ARMENTROUT MARY F	HILLSBORO IL	No								
42	17-20-400-007	CABELLO JOSE III &	WITT IL	No								
43	17-21-100-002	SPINNER STEPHEN J	JACKSONVILLE IL									
44	17-21-200-001	TIMMONS WAYNE	LAMAR MO									
3	17-21-200-002	GRABBE PHILIP R	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Garden	36	25	
4	17-21-300-001	BONETTO DEANNE	HILLSBORO IL									
47	17-22-200-001	SPINNER DIANE	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Garden	30	40	17 years old; A 2nd well is on the property - no longer used 30' deep (30" Dia) - City water available never hooked up
48	17-22-200-002	GARRETT CONNIE	HILLSBORO IL									
49	17-22-300-002	IL DEPT OF NATURAL RESOURCES	SPRINGFIELD IL									
50	17-22-400-002	MICENHEIMER ESTELLA & MERRILL	COFFEEN IL									
51	17-27-200-003	HUBER FERDINAND J	COFFEEN IL									
52	17-27-300-014	BLANKENSHIP KENNETH E &	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing	36	18	40+ years old
53	17-28-100-001	JURGENA HAROLD W & DOLORES I	IRVING IL	No								
54	17-28-100-002	ELAM GEORGE F	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Stock Watering, Garden	30	30	35 years old
55	17-28-100-005	HAMILTON JOHNNY & RITA	HILLSBORO IL	Yes	Yes				Drinking, Stock Watering	48	20	30 years old
56	17-29-200-001	BOWEN CLAUDE H & LOIS D TRUST	BETHALTO IL									
57	17-29-200-003	FIRST NATL BANK VANDALIA	VANDALIA IL									
58	17-29-300-001	SCHRAUT FLORENCE	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Stock Watering, Garden	?	?	
59	17-29-400-002	SCHRAUT R LEE	HILLSBORO IL	Yes	Yes		Yes		Drinking, Stock Watering, Garden	60	30	100 years old; 2nd well - 12", depth 100', 35 years old
60	17-30-300-001	ELAM RICHARD A SR	TAYLOR SPRINGS IL									
#61&	17-30-400-002	YOUNG GERALD E	HILLSBORO IL	Yes	No		Yes		Stock Watering	36	50	15 years old
62	17-14-100-001	TUETKEN MYRON & LESTER	IRVING IL	Yes	Yes		Yes		Drinking	36	50	15 years old
63	17-14-100-002	MC LEAN JAMES & HELEN	STAUNTON IL									
64	17-14-300-003	KABURICK GEORGE W	TEXARKANA TX									
65	17-15-100-001	RAPP AGLAND INC	HIGHLAND IL									
66	17-15-400-007	HUBER JAMES & KRISTA	HILLSBORO IL	No	Yes							
67	17-16-200-004	JACOBS ROBERT & MARSHA	DES MOINES IA	Yes	Yes		Yes		Drinking, Bathing, Stock Watering, Garden, Laundry	?	?	20 years old
68	17-22-400-003, 17-26-100-001	CLARK JOHN A	HILLSBORO IL	Yes	Yes		Yes		Drinking, Garden, Cooking, Laundry	?	22	170 years old; Abe Lincoln drank from this well when traveling from SPFLD to the state house in Vandalia.
69	17-23-300-001	PARISH HOLDINGS L P	MINNEAPOLIS MN									
70	17-26-100-005	EARNEST LEONARD SCOTT & MEGAN	HILLSBORO IL									
71	17-26-100-006	BOCKSTRUCK CHARLES	ALBUQUERQUE NM									
72	17-26-300-001	WHITTEN CLARA MAE	COFFEEN IL									
73	17-27-200-005	HUBER DEAN	COFFEEN IL									
74	17-27-200-006	HUBER FERDINAND J	COFFEEN IL									
75	17-27-300-005	GARRETT ELZIE L	COFFEEN IL									
#76&	17-27-300-010	HUBER BERNARD J & GERALDINE A	HILLSBORO IL	Yes	Yes							
77	17-27-300-011	BRANCH CARL	HILLSBORO IL									
78	17-27-300-012	BICKFORD CELENE M	COFFEEN IL									
79	17-27-400-003	ARNEY MARY & MARTHA LYNCH	HILLSBORO IL									
80	17-28-400-002	HUGHES HELEN L	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Stock Watering, Garden	48	80	50+ years old
#81	17-31-100-002	YOUNG GERALD E	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Stock Watering	?	18	57 years old
82	17-32-100-002	KASTEN ROY B	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Garden	3 @ 48	18, 20, 65	3 wells on the property, 15 years, 18 years, ?
83	17-32-100-004	CLARK JOHN E & SHARON	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Stock Watering, Garden	10	60	28 years old;
1	17-32-100-005	YOUNG BRAD & DAWN	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Garden	36	50	25 years old
5	17-33-100-001	EARL SELTZER ENTERPRISES	HILLSBORO IL									
86	17-34-100-004	MC DAVID POINT CEMETERY	HILLSBORO IL									

Attachment X.X.X - Residential water use and well survey data in and within 1/2 miles of the proposed shadow area

Key ID	Map	Name	City_State	Well on Property	Inhabited House	Mobile Home	Primary Supply	Secondary Supply	Water Use	Well Dia. (in)	Well Depth (ft)	Notes
87	17-34-100-005	NULL KENNETH & LINDA	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Stock Watering, Garden	7	25	9 years old; We have two springs that feed the well. Do not want City Water
88	17-34-100-006	RAY ROBERT & RALPH	ST LOUIS MO									
89	17-34-200-001	TITSWORTH SHAWN L SR	COFFEEN IL									
90	18-13-200-002	SCHNEIDER RANDOLPH L & SUSAN C	HILLSBORO IL									Not that I know of
91	18-24-400-006	OELZE MARION E TRUSTEE	NASHVILLE IL	No								
92	18-13-177-002	SLEPICKA RICHARD & NANCY	HILLSBORO IL	Yes	Yes		No		Garden	36	40	50 years old
93	18-13-177-005	B/R WRIGHT INVESTMENTS INC	HILLSBORO IL	No								
94	18-13-327-004	MONTGOMERY COUNTY HEALTH DEPT	HILLSBORO IL	No								
95	18-13-328-003	SMITH PATSY J	HILLSBORO IL	No								
96	18-13-328-008	HOME FUNDING ASSOCIATION	HILLSBORO IL									
97	18-13-328-009	ERNST PAUL L & CHRISTINE J	HILLSBORO IL									
98	18-13-379-001	MONTGOMERY NURSING & REHAB	HILLSBORO IL									
99	18-13-379-004	HUBER RANDALL B	HILLSBORO IL	No								
100	18-13-379-009	VOILS BROS INT INC	HILLSBORO IL									
101	18-13-379-010	HILLSBORO TOWNSHIP	HILLSBORO IL	No								
102	18-24-127-005	LESSMAN JAMES E	HILLSBORO IL									
103	18-24-127-007	MIKESKA MARY C	HILLSBORO IL									
104	18-24-127-008	V F W OF THE U S	TAYLOR SPRINGS IL	No								
105	18-24-176-002	BRAUER BARBARA A	HILLSBORO IL									
106	18-24-300-002	FENTON DOUG	HILLSBORO IL									
107	18-24-300-005	MURPHY JOANN	PEORIA IL	No								
108	18-24-300-013	HUBER RICHARD & JEANNE	HILLSBORO IL									
109	18-24-400-011	MC FARLIN ROGER C TRUST	HILLSBORO IL									
110	18-25-100-005	MC FARLIN BETTY LANGSTON	HILLSBORO IL									
111	18-25-100-012	COBETTO WILLIAM D	TAYLOR SPRINGS IL	No								
112	18-25-100-013	COBETTO WILLIAM & KELLY	HILLSBORO IL	No								
113	18-25-300-005	FINLEY BRUCE R	HILLSBORO IL	Yes	Yes		Yes		Drinking, Bathing, Stock Watering, Garden	36	65	10 years old
114	18-25-300-010	PRICE CECIL W	HILLSBORO IL									
115	18-25-300-017	CHAPPELEAR DANIEL	HILLSBORO IL	No								
116	18-25-300-512	SANDERS SETH	HILLSBORO IL									
117	18-25-400-006	SCHLUCKEBIER DAVID & CAROL	DONNELLSON IL									

Added Information

Appendix C
Summary of Water Level Measurements

Summary of Water Level Measurements
Hillsboro Energy

Numeric Well No.[1]	Township/Range/ Section Well No.[1]	Riser Elev.	Water Elev. (ft msl) 9/5/07 & 9/7/07	9/10/07
22	08-03-17-06	623.36	611.2	610.4
23	08-03-17-07	633.52	619.2	618.9
24 (S)	08-03-17-08(S)	635.69	622.2	622.1
24 (D)	08-03-17-08(D)	634.54	(2)	622.9
25 (S)	08-03-17-09(S)	633.61	623.2	622.9
25 (D)	08-03-17-09(D)	631.81	(2)	618.9
26	08-03-18-16	628.69	613.5	613.5
27 (S)	08-03-18-17(S)	628.69	620.8	620.0
27 (D)	08-03-18-17(D)	629.67	(2)	620.2
28	08-03-18-18	634.30	623.8	624.2
30	08-03-18-20	630.48	621.3	621.8
31	08-03-18-21	639.05	625.7	625.9
32	08-03-07-04	616.98	607.7	607.9
33	08-03-18-22	614.31	597	595.0
34	08-03-07-05	615.90	602.4	601.3

Notes:

1. S and D desginations stand for shallow and deep wells, respectively. Shallow wells have been incorporated into the groundwater monitoring program. Deep wells are ultimately to be abandoned.
2. Water levels were not measured and recorded at these locations on the noted date(s).

Prepared by:
Hurst-Rosche Engineers, Inc.
September 14, 2007
Revised November 15, 2007
Revised November 30, 2007

Appendix D
In-Situ Permeability Test Results

HILLSBORO ENERGY
HYDROGEOLOGIC INVESTIGATION
HILLSBORO, ILLINOIS

GROUNDWATER WELL NO.: 24 (08-03-17-08) (Deep) DATE: 9/7/2007

H_i = Initial depth to water before water was removed (ft.)* = 12.40

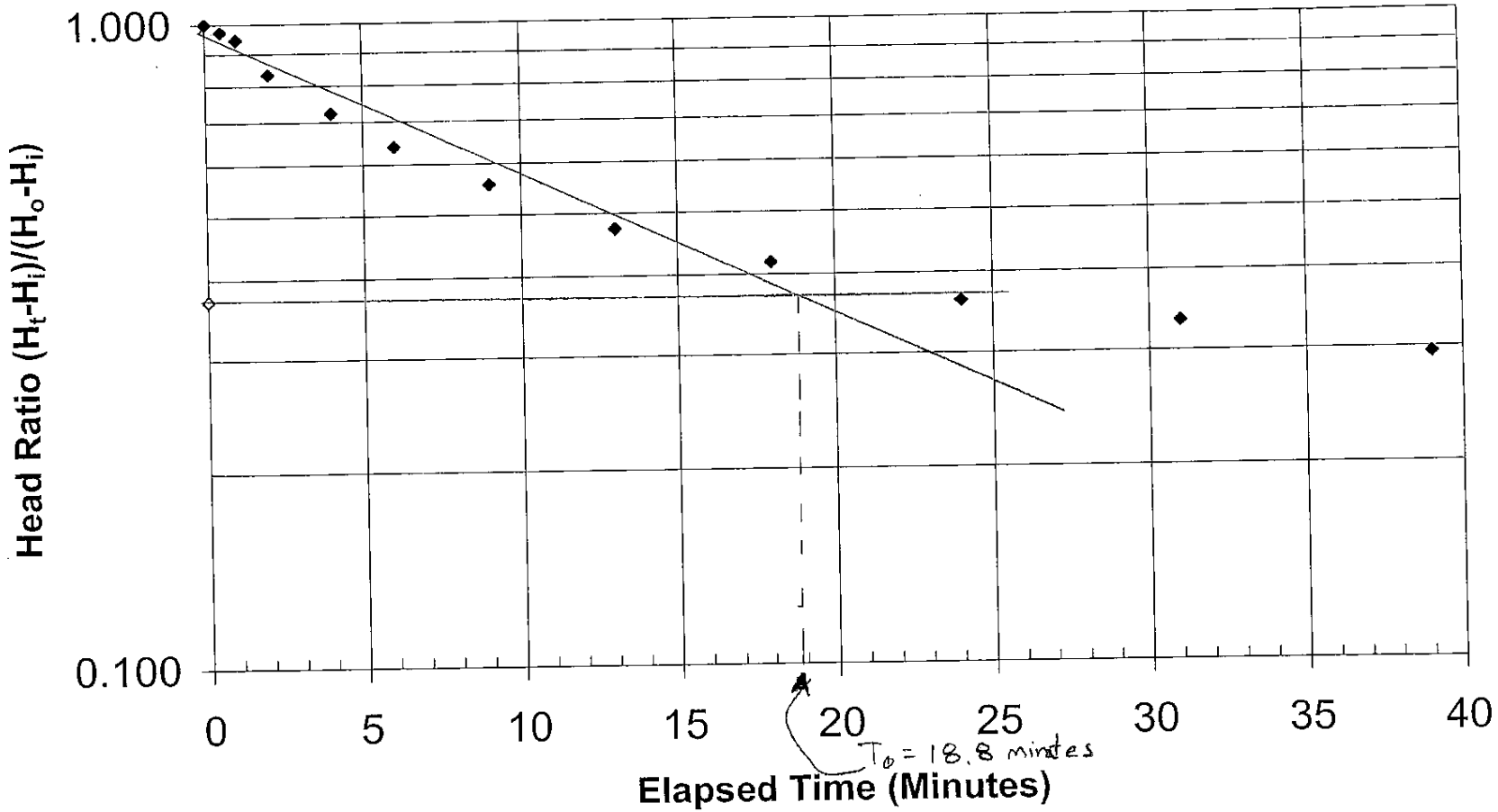
$H_o - H_i$ = Depth to water at time zero (ft.) - Initial depth to water (ft.) = 14.20 - 12.40 = 1.80

$H_t - H_i$ = Depth to water at time t - Initial depth to water

Elapsed Time (Minutes)	Depth to Water (Feet)*	$H_t - H_i$ (Feet)	Head Ratio $(H_t - H_i)/(H_o - H_i)$
0.00	14.20	1.80	1.000
0.50	14.15	1.75	0.972
1.00	14.10	1.70	0.944
2.00	13.90	1.50	0.833
4.00	13.70	1.30	0.722
6.00	13.55	1.15	0.639
9.00	13.40	1.00	0.556
13.00	13.25	0.85	0.472
18.00	13.15	0.75	0.417
24.00	13.05	0.65	0.361
31.00	13.00	0.60	0.333
39.00	12.93	0.53	0.294

* Water level measured from top of riser.

Hillsboro Energy
Monitoring Well No. 24 (08-03-17-08) (Deep)



Hillsboro Energy
Hydrogeologic Investigation
Hillsboro, Illinois

To determine the in-situ hydraulic conductivity of the soil at the project site, a slug test was completed and the test data used in the following calculations.

Reference to Groundwater, Freeze, R.A. and John A. Cherry, Prentice-Hall, Inc., Englewood Cliffs, N.J., 1979, pp. 339-342 provides the following equations and procedures.

Monitoring Well No. 24 (08-03-17-08) (Deep)

r = radius of well screen: $r := 1.0$ inches

$r := r \cdot 2.54$

$r = 2.54$ cm

L = length of well intake: $L := 5.0$ ft.

$L := L \cdot 12 \cdot 2.54$

$L = 152.4$ cm

R = radius of well intake: $R := 2.75$ inches

$R := R \cdot 2.54$

$R = 6.985$ cm

T_o = basic time lag (from accompanying data curve): $T_o := 18.8$ minutes

$T_o := T_o \cdot 60$

$T_o = 1128$ seconds

k = hydraulic conductivity

$$k := \frac{r^2 \cdot \ln\left(\frac{L}{R}\right)}{2 \cdot L \cdot T_o}$$

$k = 5.785 \times 10^{-5}$ cm/sec

$k := k \cdot 60 \cdot 60 \cdot 24 \cdot 365$

$k = 1824.3$ cm/year

HILLSBORO ENERGY
HYDROGEOLOGIC INVESTIGATION
HILLSBORO, ILLINOIS

GROUNDWATER WELL NO.: 25 (08-03-17-09) (Deep) DATE: 9/7/2007

H_i = Initial depth to water before water was removed (ft.)* = 15.05

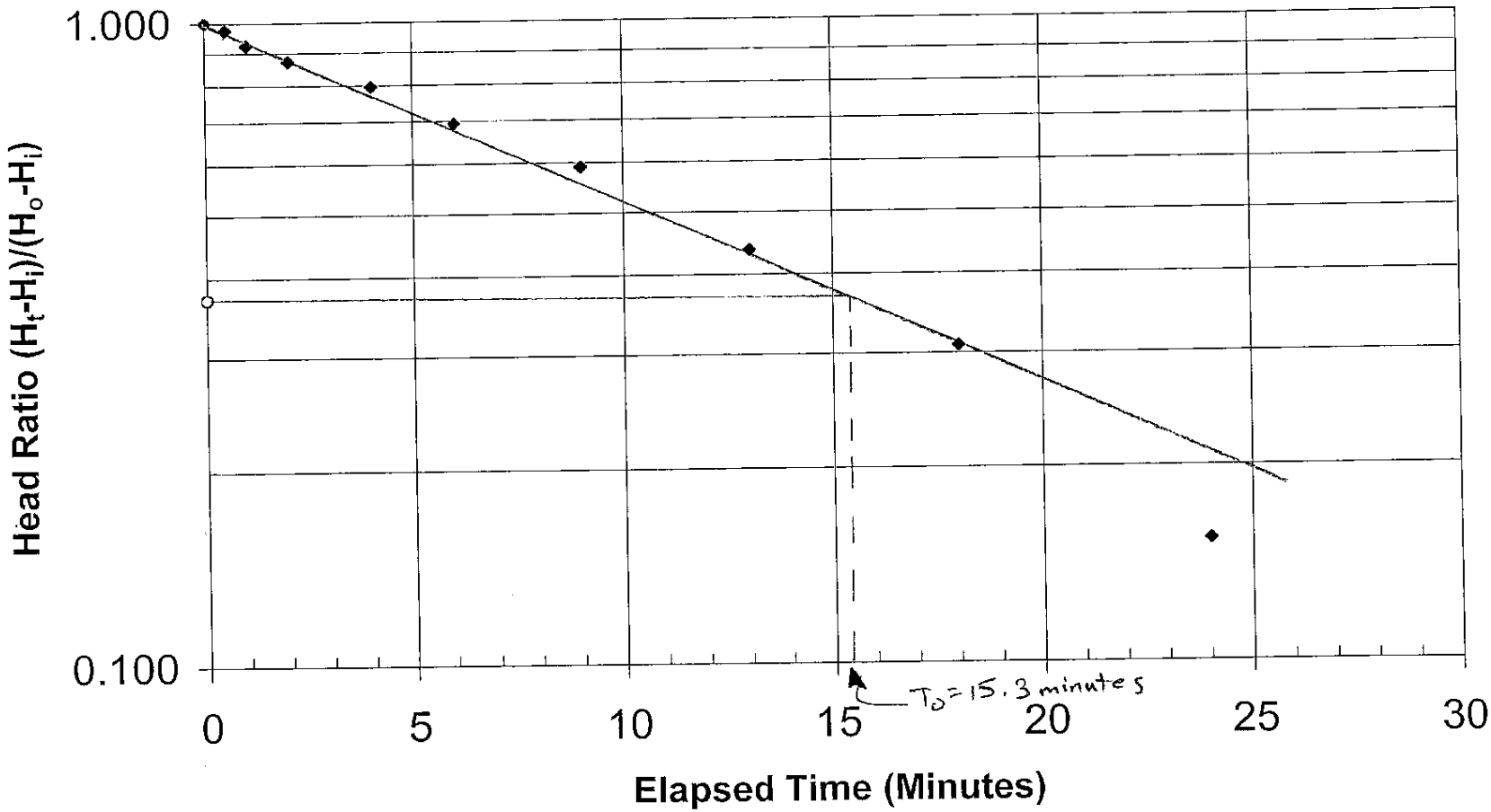
$H_o - H_i$ = Depth to water at time zero (ft.) - Initial depth to water (ft.) = 17.00 - 15.05 = 1.95

$H_t - H_i$ = Depth to water at time t - Initial depth to water

Elapsed Time (Minutes)	Depth to Water (Feet)*	$H_t - H_i$ (Feet)	Head Ratio $(H_t - H_i)/(H_o - H_i)$
0.00	17.00	1.95	1.000
0.50	16.95	1.90	0.974
1.00	16.85	1.80	0.923
2.00	16.75	1.70	0.872
4.00	16.60	1.55	0.795
6.00	16.40	1.35	0.692
9.00	16.20	1.15	0.590
13.00	15.90	0.85	0.436
18.00	15.65	0.60	0.308
24.00	15.35	0.30	0.154

* Water level measured from top of riser.

Hillsboro Energy
Monitoring Well No. 25 (08-03-17-09) (Deep)



Monitoring Well No. 25 (08-03-17-09) (Deep)

r = radius of well screen: $r := 1.0$ inches

$r := r \cdot 2.54$

$r = 2.54$ cm

L = length of well intake: $L := 5.0$ ft.

$L := L \cdot 12 \cdot 2.54$

$L = 152.4$ cm

R = radius of well intake: $R := 2.75$ inches

$R := R \cdot 2.54$

$R = 6.985$ cm

T_o = basic time lag (from accompanying data curve): $T_o := 15.3$ minutes

$T_o := T_o \cdot 60$

$T_o = 918$ seconds

k = hydraulic conductivity

$$k := \frac{r^2 \cdot \ln\left(\frac{L}{R}\right)}{2 \cdot L \cdot T_o}$$

$k = 7.108 \times 10^{-5}$ cm/sec

$k := k \cdot 60 \cdot 60 \cdot 24 \cdot 365$

$k = 2241.6$ cm/year

HILLSBORO ENERGY
HYDROGEOLOGIC INVESTIGATION
HILLSBORO, ILLINOIS

GROUNDWATER WELL NO.: 28 (08-03-18-18) DATE: 9/7/2007

H_i = Initial depth to water before water was removed (ft.)* = 10.20

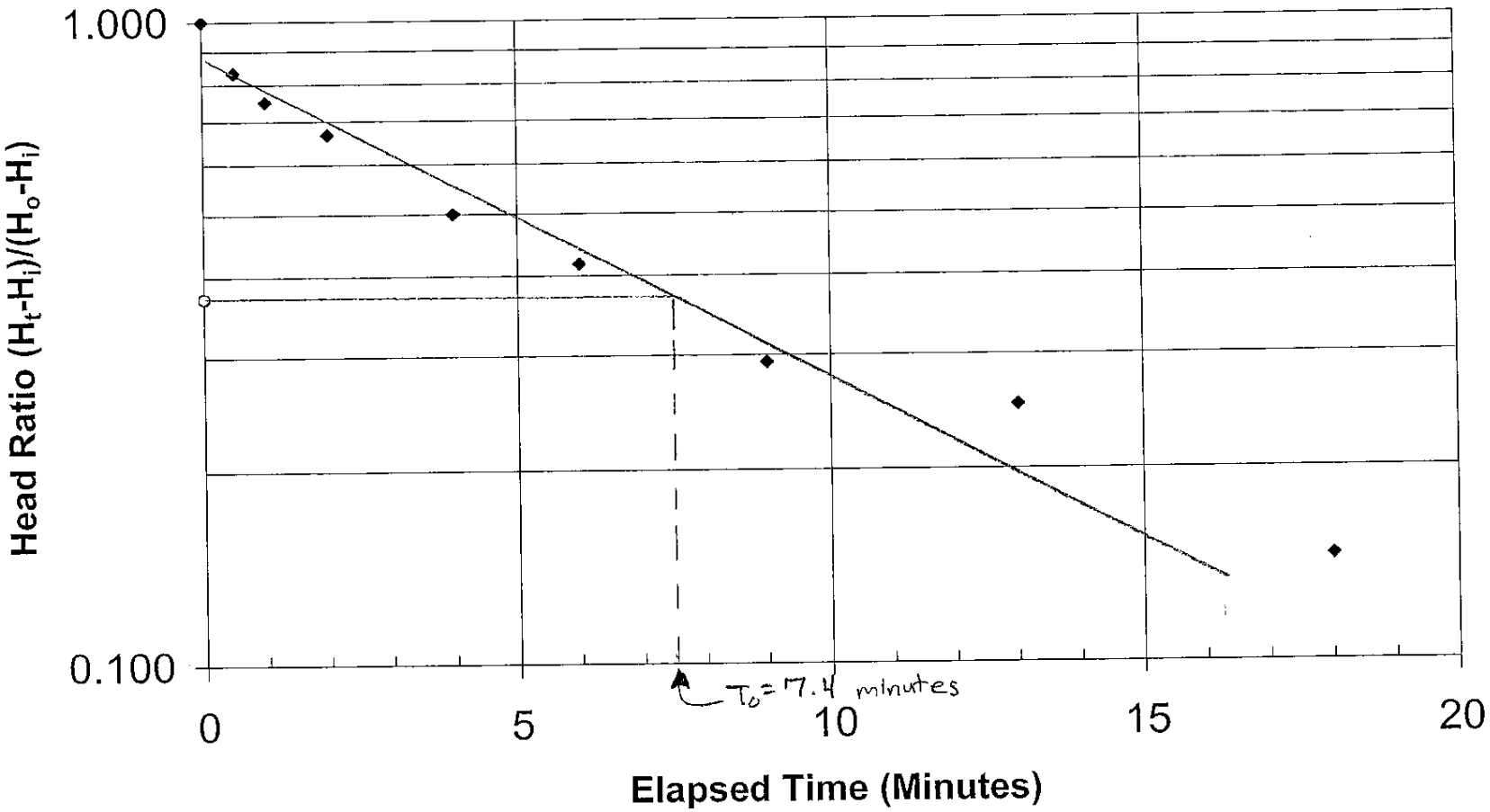
$H_o - H_i$ = Depth to water at time zero (ft.) - Initial depth to water (ft.) = 11.40 - 10.20 = 1.20

$H_t - H_i$ = Depth to water at time t - Initial depth to water

Elapsed Time (Minutes)	Depth to Water (Feet)*	$H_t - H_i$ (Feet)	Head Ratio $(H_t - H_i)/(H_o - H_i)$
0.00	11.40	1.20	1.000
0.50	11.20	1.00	0.833
1.00	11.10	0.90	0.750
2.00	11.00	0.80	0.667
4.00	10.80	0.60	0.500
6.00	10.70	0.50	0.417
9.00	10.55	0.35	0.292
13.00	10.50	0.30	0.250
18.00	10.38	0.18	0.146
24.00	10.30	0.10	0.083
31.00	10.30	0.10	0.083

* Water level measured from top of riser.

Hillsboro Energy
Monitoring Well No. 28 (08-03-18-18)



Monitoring Well No. 28 (08-03-18-18)

r = radius of well screen: $r := 1.0$ inches

$r := r \cdot 2.54$

$r = 2.54$ cm

L = length of well intake: $L := 10.0$ ft.

$L := L \cdot 12 \cdot 2.54$

$L = 304.8$ cm

R = radius of well intake: $R := 2.75$ inches

$R := R \cdot 2.54$

$R = 6.985$ cm

T_o = basic time lag (from accompanying data curve): $T_o := 7.4$ minutes

$T_o := T_o \cdot 60$

$T_o = 444$ seconds

k = hydraulic conductivity

$$k := \frac{r^2 \cdot \ln\left(\frac{L}{R}\right)}{2 \cdot L \cdot T_o}$$

$k = 9.00 \times 10^{-5}$ cm/sec

$k := k \cdot 60 \cdot 60 \cdot 24 \cdot 365$

$k = 2838.3$ cm/year

Appendix E
Laboratory Test Results (Soil)

ATLAS SOILS, INC.
SOIL TEST DATA

Project: Hillsboro Energy
Hydrogeologic Investigation
Project No.: 180-3366

Lab. Number	1	2	3	4	5	6
Boring No.	24 08-03-17-08	25 08-03-17-09	26 08-03-18-16	27 08-03-18-17	30 08-03-18-20	30 08-03-18-20
Depth (ft.)	15'2"-15'5"	11'0"-11'4"	6'3"-6'6"	8'0"-8'3"/ 8'6"-8'8"	10'5"-10'10"	20'5"-20'9"
Textural Classification (USDA)	Sandy Loam	Loam	Loam	Loam	Loam	Sandy Loam
Textural Classification (ASTM)	Sandy Silt	Sandy Lean Clay	Sandy Lean Clay	Sandy Lean Clay	Sandy Lean Clay	Sandy Silt
Unified Classification	ML	CL	CL	CL	CL	ML
Total Sample Passing 2 1/2" (%)	100.0	100.0	100.0	100.0	100.0	100.0
Total Sample Passing 1" (%)	100.0	100.0	100.0	100.0	100.0	100.0
Total Sample Passing 3/4" (%)	100.0	100.0	100.0	100.0	100.0	100.0
Total Sample Passing 1/2" (%)	98.5	99.8	100.0	100.0	100.0	100.0
Total Sample Passing 3/8" (%)	98.0	99.8	100.0	100.0	100.0	99.1
Total Sample Passing No. 4 (%)	97.7	99.6	100.0	100.0	100.0	98.7
Total Sample Passing No. 8 (%)	93.2	98.2	99.3	98.9	99.3	95.3
Total Sample Passing No. 10 (%)	92.2	97.9	99.0	98.7	99.1	94.3
Total Sample Passing No. 16 (%)	87.7	96.7	98.3	97.6	98.5	91.9
Total Sample Passing No. 40 (%)	77.1	92.0	92.7	91.7	94.4	83.8
Total Sample Passing No. 100 (%)	51.6	76.1	61.8	73.0	78.5	62.1
Total Sample Passing No. 200 (%)	41.5	69.3	54.3	66.4	68.3	52.0
Gravel (> No. 4) (%)	2	1	0	0	0	1
Sand (< No. 4 > No. 200) (%)	56	30	46	34	32	47
Silt (< No. 200 > 0.005 mm) (%)	33	47	32	40	48	48
Clay (< 0.005 mm) (%)	9	22	22	26	20	4
Liquid Limit (%)	13	28	27	28	24	14
Plasticity Index (%)	1	9	11	12	8	2
Remarks:						

Hydraulic Conductivity Calculations

Project: Hillsboro Energy - Hydrogeologic Investigation
Project No.: 180-3366
Sample No.: 1
Location: Boring No. 26 (08-03-18-16); 6'0"-6'3"
Permeameter No.: 4

Diameter (cm): 7.19
End Area (cm^2): 40.60
Length (cm): 7.77
Back Pressure (psi): 3
Lateral Pressure (psi): 5

Date & Time	Time Increment (min)	Reading (in)	Reading (out)	Inflow (ml)	Outflow (ml)	Outflow/ Inflow Ratio	Avg. Flow (ml)	H1(in) (cm)	H2(out) (cm)	Driving Pressure	K (cm/sec)	Temp. (deg C)	Temp Factor	Cum. Time (min)	Cum. Volume (ml)	K 20 deg C (cm/sec)
								94.4	47.4			23	0.931			
9/4/07 8:19:00 AM		9.9	24.4													
9/4/07 8:44:00 AM	25	18.0	17.7	8.1	6.7	0.83	7.4	85.7	57.7	248.4	3.80E-06	23	0.931	25	7.40	3.54E-06
9/4/07 8:52:00 AM	8	20.2	15.5	2.2	2.2	1.00	2.2	83.3	61.1	236.0	3.72E-06	23	0.931	33	9.60	3.46E-06
9/4/07 9:55:00 AM	63	30.6	5.5	10.4	10.0	0.96	10.2	72.1	76.5	219.8	2.35E-06	23	0.931	96	19.80	2.19E-06
9/4/07 10:36:00 AM	41	35.2	1.0	4.6	4.5	0.98	4.6	67.1	83.5	200.5	1.77E-06	23	0.931	137	24.35	1.64E-06
								92.6	47.4			23	0.931			
9/4/07 10:38:00 AM		11.6	24.4													
9/4/07 11:35:00 AM	57	25.3	11.4	13.7	13.0	0.95	13.4	77.8	67.4	238.7	3.13E-06	23	0.931	194	37.70	2.91E-06
9/4/07 12:04:00 PM	29	29.9	6.9	4.6	4.5	0.98	4.6	72.8	74.4	215.3	2.32E-06	23	0.931	223	42.25	2.16E-06
9/4/07 12:35:00 PM	31	34.1	2.9	4.2	4.0	0.95	4.1	68.3	80.5	204.0	2.07E-06	23	0.931	254	46.35	1.92E-06
9/4/07 12:55:00 PM	20	36.4	0.6	2.3	2.3	1.00	2.3	65.8	84.1	195.7	1.87E-06	23	0.931	274	48.65	1.75E-06
9/4/07 1:01:00 PM	6	37.0	0.0	0.6	0.6	1.00	0.6	65.1	85.0	191.9	1.66E-06	23	0.931	280	49.25	1.55E-06

Time weighted average (last four readings): 1.94E-06

Hydraulic Conductivity Calculations

Project:	Hillsboro Energy - Hydrogeologic Investigation
Project No.:	180-3366
Sample No.:	1
Location:	Boring No. 27 (08-03-18-17); 8'3"-8'6"
Permeameter No.:	1

Diameter (cm):	7.19
End Area (cm^2):	40.60
Length (cm):	7.77
Back Pressure (psi):	3
Lateral Pressure (psi):	5

Date & Time	Time Increment (min)	Reading (in)	Reading (out)	Inflow (ml)	Outflow (ml)	Outflow/ Inflow Ratio	Avg. Flow (ml)	H1(in) (cm)	H2(out) (cm)	Driving Pressure	K (cm/sec)	Temp. (deg C)	Temp Factor	Cum. Time (min)	Cum. Volume (ml)	K 20 deg C (cm/sec)
8/27/07 10:31:00 AM		11.8	24.4					92.8	48.9			23	0.931			
8/27/07 2:35:00 PM	244	19.3	18.2	7.5	6.2	0.83	6.9	84.6	57.9	246.2	3.64E-07	23	0.931	244	6.85	3.39E-07
8/29/07 7:43:00 AM		12.4	24.6					92.2	48.6			23	0.931			
8/29/07 11:07:00 AM	204	17.7	19.4	5.3	5.2	0.98	5.3	86.3	56.2	247.8	3.31E-07	24	0.910	448	12.10	3.05E-07
8/29/07 4:39:00 PM	332	25.4	11.7	7.7	7.7	1.00	7.7	77.9	67.4	231.2	3.20E-07	24	0.910	780	19.80	2.91E-07
8/29/07 4:40:00 PM		11.5	24.8					93.2	48.3			24	0.910			
8/30/07 8:18:00 AM	938	33.2	3.5	21.7	21.3	0.98	21.5	69.3	79.4	228.3	3.20E-07	24	0.910	1718	41.30	2.91E-07
8/30/07 9:11:00 AM	53	34.2	2.5	1.0	1.0	1.00	1.0	68.2	80.9	199.6	3.02E-07	24	0.910	1771	42.30	2.74E-07
8/30/07 11:41:00 AM		11.0	24.7					93.7	48.4			24	0.910			
8/30/07 12:36:00 PM	55	12.8	23.2	1.8	1.5	0.83	1.7	91.7	50.6	254.1	3.77E-07	24	0.910	1826	43.95	3.43E-07
8/30/07 2:32:00 PM	116	15.6	20.2	2.8	3.0	1.07	2.9	88.6	55.0	248.3	3.21E-07	24	0.910	1942	46.85	2.92E-07
8/30/07 3:35:00 PM	63	17.1	18.7	1.5	1.5	1.00	1.5	87.0	57.2	242.7	3.13E-07	24	0.910	2005	48.35	2.85E-07
8/30/07 4:29:00 PM	54	18.6	17.4	1.5	1.3	0.87	1.4	85.3	59.1	239.0	3.46E-07	24	0.910	2059	49.75	3.15E-07

Time weighted average (last four readings): 3.04E-07

Hydraulic Conductivity Calculations

Project:	Hillsboro Energy - Hydrogeologic Investigation
Project No.:	180-3366
Sample No.:	1
Location:	Boring No. 30 (08-03-18-20); 10'10"-11'0"
Permeameter No.:	5

Diameter (cm):	7.21
End Area (cm^2):	40.83
Length (cm):	7.92
Back Pressure (psi):	3
Lateral Pressure (psi):	5

Date & Time	Time Increment (min)	Reading (in)	Reading (out)	Inflow (ml)	Outflow (ml)	Outflow/ Inflow Ratio	Avg. Flow (ml)	H1(in) (cm)	H2(out) (cm)	Driving Pressure	K (cm/sec)	Temp. (deg C)	Temp Factor	Cum. Time (min)	Cum. Volume (ml)	K 20 deg C (cm/sec)
9/6/07 12:46:00 PM		11.5	24.9					92.9	48.1			23	0.931			
9/6/07 2:46:00 PM	120	19.3	17.1	7.8	7.8	1.00	7.8	84.5	59.7	245.7	8.55E-07	23	0.931	120	7.80	7.96E-07
9/6/07 4:03:00 PM	77	23.6	12.5	4.3	4.6	1.07	4.5	79.8	66.5	230.0	8.12E-07	23	0.931	197	12.25	7.56E-07
9/7/07 7:08:00 AM		11.6	24.4					92.8	48.9			24	0.910			
9/7/07 9:26:00 AM	138	19.2	16.3	7.6	8.1	1.07	7.9	84.6	60.9	244.7	7.51E-07	24	0.910	335	20.10	6.84E-07
9/7/07 10:01:00 AM	35	20.9	14.6	1.7	1.7	1.00	1.7	82.7	63.4	232.5	6.75E-07	24	0.910	370	21.80	6.15E-07
9/7/07 11:15:00 AM	74	24.1	11.1	3.2	3.5	1.09	3.4	79.3	68.6	226.0	6.48E-07	24	0.910	444	25.15	5.89E-07
9/7/07 1:47:00 PM	152	30.1	4.6	6.0	6.5	1.08	6.3	72.8	78.2	213.6	6.22E-07	24	0.910	596	31.40	5.66E-07

Time weighted average (last four readings): 6.15E-07

Hydraulic Conductivity Calculations

Project: Hillsboro Energy - Hydrogeologic Investigation
Project No.: 180-3366
Sample No.: 1
Location: Boring No. 30 (08-03-18-20); 20'9"-21'0"
Permeameter No.: 4

Diameter (cm): 7.21
End Area (cm^2): 40.83
Length (cm): 7.75
Back Pressure (psi): 3
Lateral Pressure (psi): 5

Date & Time	Time Increment (min)	Reading (in)	Reading (out)	Inflow (ml)	Outflow (ml)	Outflow/ Inflow Ratio	Avg. Flow (ml)	H1(in) (cm)	H2(out) (cm)	Driving Pressure	K (cm/sec)	Temp. (deg C)	Temp Factor	Cum. Time (min)	Cum. Volume (ml)	K 20 deg C (cm/sec)
9/6/07 12:45:00 PM		9.2	24.4					95.2	47.4			23	0.931			
9/6/07 2:46:00 PM	121	10.4	24.0	1.2	0.4	0.33	0.8	93.9	48.0	257.7	8.12E-08	23	0.931	121	0.80	7.56E-08
9/6/07 4:02:00 PM	76	11.2	23.3	0.8	0.7	0.88	0.7	93.0	49.1	255.8	1.22E-07	23	0.931	197	1.55	1.14E-07
9/7/07 7:06:00 AM	904	20.6	14.8	9.4	8.5	0.90	9.0	82.9	62.2	243.2	1.29E-07	24	0.910	1101	10.50	1.19E-07
9/7/07 9:27:00 AM	141	21.7	13.8	1.1	1.0	0.91	1.1	81.7	63.7	230.2	1.02E-07	24	0.910	1242	11.55	9.31E-08
9/7/07 10:02:00 AM	35	22.0	13.5	0.3	0.3	1.00	0.3	81.3	64.2	228.5	1.19E-07	24	0.910	1277	11.85	1.08E-07
9/7/07 11:15:00 AM	73	22.6	13.0	0.6	0.5	0.83	0.6	80.7	65.0	227.4	1.05E-07	24	0.910	1350	12.40	9.54E-08

Time weighted average (last four readings): 1.14E-07

Appendix F
Analytical Test Results (Water)

TEKLAB, INC.

ENVIRONMENTAL TESTING LABORATORY

5445 HORSESHOE LAKE ROAD
COLLINSVILLE, ILLINOIS 62234

TEL: 618-344-1004
FAX: 618-344-1005

September 12, 2007

ACCREDITED IN ACCORDANCE WITH nelac

NELAP Accredited #100226

David Kimmle
Hurst-Rosche Engineers, Inc.
1400 East Tremont
P.O. Box 130
Hillsboro, IL 62049
TEL: (217) 532-3959
FAX: (217) 532-3212

RE: 180-3366/Hillsboro Energy

Work Order: 07090093

Dear David Kimmle:

TEKLAB, INC received 8 samples on 9/5/2007 2:00:00 PM for the analysis presented in the following report. A list of report contents can be found on the following page.

Samples are analyzed on an as received basis unless otherwise requested and documented. The sample results contained in this report relate only to the requested analytes of interest as directed on the chain of custody. IL ELAP and NELAP accredited fields of testing are indicated by the letters NELAP under the Certification column.

All quality control criteria applicable to the test methods employed for this project have been satisfactorily met and are in accordance with NELAP except where noted. The following report shall not be reproduced, except in full, without the written approval of Teklab, Inc.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Kelly A. Klostermann

Kelly A. Klostermann
Project Manager
(618)344-1004 ex.11

TEKLAB, INC.

ENVIRONMENTAL TESTING LABORATORY

5445 HORSESHOE LAKE ROAD
COLLINSVILLE, ILLINOIS 62234

TEL: 618-344-1004
FAX: 618-344-1005

REPORT CONTENTS

Client: Hurst-Rosche Engineers, Inc.
Project: 180-3366/Hillsboro Energy
LabOrder: 07090093
Report Date: 12-Sep-07

This reporting package includes the following:

TEKLAB, INC.

5445 HORSESHOE LAKE ROAD
COLLINSVILLE, ILLINOIS 62234

ENVIRONMENTAL TESTING LABORATORY

TEL: 618-344-1004
FAX: 618-344-1005

CASE NARRATIVE

Client: Hurst-Rosche Engineers, Inc.
Project: 180-3366/Hillsboro Energy
LabOrder: 07090093
Report Date: 12-Sep-07

Cooler Receipt Temp: 9.0 °C

State accreditations:
IL: DPH #17584 NELAP #IL00045 | KS: NELAP #E-10347 | KY: UST #0073 | MO: DNR #00930 | AR: ADEQ #70-028-0

See the sample receipt checklist for any noted deviations from NELAP sample acceptance policies.

Qualifiers

DF - Dilution Factor
RL - Reporting Limit
ND - Not Detected at the Reporting Limit
Surr - Surrogate Standard added by lab
TNTC - Too numerous to count (> 200 CFU)
Q - QC criteria failed or noncompliant CCV
NELAP - IL ELAP and NELAP Accredited Field of Testing

B - Analyte detected in the associated Method Blank
J - Analyte detected below reporting limits
R - RPD outside accepted recovery limits
S - Spike Recovery outside accepted recovery limits
X - Value exceeds Maximum Contaminant Level
- Unknown hydrocarbon
IDPH - IL Dept. of Public Health

C - Client requested RL below
D - Diluted out of sample
E - Value above quantitation range
H - Holding time exceeded
MI - Matrix interference
DNI - Did not ignite

TEKLAB, INC.

5445 HORSESHOE LAKE ROAD
COLLINSVILLE, ILLINOIS 62234

ENVIRONMENTAL TESTING LABORATORY

TEL: 618-344-1004
FAX: 618-344-1005

LABORATORY RESULTS

Client: Hurst-Rosche Engineers, Inc.
WorkOrder: 07090093
Lab ID: 07090093-001
Report Date: 12-Sep-07

Client Project: 180-3366/Hillsboro Energy
Client Sample ID: MW24A (08-03-17-08)
Collection Date: 9/5/2007 8:50:00 AM
Matrix: GROUNDWATER

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Analyst
STANDARD METHODS 18TH ED. 2310 B								
Acidity, Total (as CaCO3)	NELAP	0		-368	mg/L	1	9/6/2007	MK
STANDARD METHODS 18TH ED. 2320 B								
Alkalinity, Total (as CaCO3)	NELAP	0		354	mg/L	1	9/6/2007	MK
STANDARD METHODS 18TH ED. 2340 C								
Hardness, as (CaCO3)	NELAP	5		240	mg/L	1	9/7/2007	MK
STANDARD METHODS 18TH ED. 2540 C (TOTAL)								
Total Dissolved Solids	NELAP	20		534	mg/L	1	9/7/2007	JMT
SW-846 3005A, 6010B, METALS BY ICP (TOTAL)								
Calcium	NELAP	0.500		4560	mg/L	10	9/7/2007 6:09:35 AM	LAL
Iron	NELAP	10.0		2550	mg/L	500	9/10/2007 1:30:07 PM	CRK
Magnesium	NELAP	0.100		3630	mg/L	10	9/7/2007 6:09:35 AM	LAL
Manganese	NELAP	2.50		59.3	mg/L	500	9/10/2007 1:30:07 PM	CRK
Sodium	NELAP	0.500		74.0	mg/L	10	9/7/2007 6:09:35 AM	LAL
Zinc	NELAP	0.100		9.48	mg/L	10	9/10/2007 5:21:52 PM	CRK
SW-846 9036 (TOTAL)								
Sulfate	NELAP	50		105	mg/L	1	9/6/2007 11:53:05 AM	KLE
SW-846 9040B								
pH	NELAP	1.00		7.05		1	9/5/2007 6:31:00 PM	KNL
SW-846 9210 (TOTAL)								
Nitrogen, Nitrate (as N)	NELAP	0.20		0.51	mg/L	1	9/6/2007 9:50:00 AM	BSJ
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		0.70	mg/L	1	9/11/2007	BSJ
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		52	mg/L	1	9/6/2007 10:30:07 AM	KLE

Sample Narrative

TEKLAB, INC.

5445 HORSESHOE LAKE ROAD
COLLINSVILLE, ILLINOIS 62234

ENVIRONMENTAL TESTING LABORATORY

TEL: 618-344-1004
FAX: 618-344-1005

LABORATORY RESULTS

Client: Hurst-Rosche Engineers, Inc.
WorkOrder: 07090093
Lab ID: 07090093-002
Report Date: 12-Sep-07

Client Project: 180-3366/Hillsboro Energy
Client Sample ID: MW23 (08-03-17-07)
Collection Date: 9/5/2007 9:15:00 AM
Matrix: GROUNDWATER

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Analyst
STANDARD METHODS 18TH ED. 2310 B								
Acidity, Total (as CaCO3)	NELAP	0		-338	mg/L	1	9/6/2007	MK
STANDARD METHODS 18TH ED. 2320 B								
Alkalinity, Total (as CaCO3)	NELAP	0		334	mg/L	1	9/6/2007	MK
STANDARD METHODS 18TH ED. 2340 C								
Hardness, as (CaCO3)	NELAP	5		300	mg/L	1	9/7/2007	MK
STANDARD METHODS 18TH ED. 2540 C (TOTAL)								
Total Dissolved Solids	NELAP	20		464	mg/L	1	9/7/2007	JMT
SW-846 3005A, 6010B, METALS BY ICP (TOTAL)								
Calcium	NELAP	0.500		2040	mg/L	10	9/7/2007 6:16:18 AM	LAL
Iron	NELAP	4.00		1090	mg/L	200	9/10/2007 1:32:27 PM	CRK
Magnesium	NELAP	0.100		1120	mg/L	10	9/7/2007 6:16:18 AM	LAL
Manganese	NELAP	0.0500		22.1	mg/L	10	9/7/2007 4:47:07 PM	CRK
Sodium	NELAP	0.500		99.2	mg/L	10	9/7/2007 6:16:18 AM	LAL
Zinc	NELAP	0.100		4.82	mg/L	10	9/10/2007 5:24:58 PM	CRK
SW-846 9036 (TOTAL)								
Sulfate	NELAP	50		103	mg/L	1	9/6/2007 10:38:33 AM	KLE
SW-846 9040B								
pH	NELAP	1.00		7.02		1	9/5/2007 6:32:00 PM	KNL
SW-846 9210 (TOTAL)								
Nitrogen, Nitrate (as N)	NELAP	0.20		0.37	mg/L	1	9/6/2007 9:50:00 AM	BSJ
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		0.26	mg/L	1	9/11/2007	BSJ
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		45	mg/L	1	9/6/2007 10:35:27 AM	KLE

Sample Narrative

9/5/11

TEKLAB, INC.

5445 HORSESHOE LAKE ROAD
COLLINSVILLE, ILLINOIS 62234

ENVIRONMENTAL TESTING LABORATORY

TEL: 618-344-1004
FAX: 618-344-1005

LABORATORY RESULTS

Client: Hurst-Rosche Engineers, Inc.
WorkOrder: 07090093
Lab ID: 07090093-003
Report Date: 12-Sep-07

Client Project: 180-3366/Hillsboro Energy
Client Sample ID: MW22 (08-03-17-06)
Collection Date: 9/5/2007 9:35:00 AM
Matrix: GROUNDWATER

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Analyst
STANDARD METHODS 18TH ED. 2310 B								
Acidity, Total (as CaCO3)	NELAP	0		-272	mg/L	1	9/6/2007	MK
STANDARD METHODS 18TH ED. 2320 B								
Alkalinity, Total (as CaCO3)	NELAP	0		268	mg/L	1	9/6/2007	MK
STANDARD METHODS 18TH ED. 2340 C								
Hardness, as (CaCO3)	NELAP	5		280	mg/L	1	9/7/2007	MK
STANDARD METHODS 18TH ED. 2540 C (TOTAL)								
Total Dissolved Solids	NELAP	20		482	mg/L	1	9/7/2007	JMT
SW-846 3005A, 6010B, METALS BY ICP (TOTAL)								
Calcium	NELAP	0.500		343	mg/L	10	9/7/2007 6:23:05 AM	LAL
Iron	NELAP	0.400		101	mg/L	20	9/10/2007 1:34:48 PM	CRK
Magnesium	NELAP	0.100		163	mg/L	10	9/7/2007 6:23:05 AM	LAL
Manganese	NELAP	0.0500		2.10	mg/L	10	9/7/2007 4:50:03 PM	CRK
Sodium	NELAP	0.500		60.0	mg/L	10	9/7/2007 6:23:05 AM	LAL
Zinc	NELAP	0.100		0.299	mg/L	10	9/10/2007 5:28:05 PM	CRK
SW-846 9036 (TOTAL)								
Sulfate	NELAP	50		115	mg/L	10	9/7/2007 10:51:11 AM	KLE
SW-846 9040B								
pH	NELAP	1.00		7.13		1	9/5/2007 6:33:00 PM	KNL
SW-846 9210 (TOTAL)								
Nitrogen, Nitrate (as N)	NELAP	0.20		2.62	mg/L	1	9/6/2007 9:50:00 AM	BSJ
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		0.42	mg/L	1	9/11/2007	BSJ
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		54	mg/L	1	9/6/2007 10:40:47 AM	KLE

Sample Narrative

TEKLAB, INC.

5445 HORSESHOE LAKE ROAD
COLLINSVILLE, ILLINOIS 62234

ENVIRONMENTAL TESTING LABORATORY

TEL: 618-344-1004
FAX: 618-344-1005

LABORATORY RESULTS

Client: Hurst-Rosche Engineers, Inc.
WorkOrder: 07090093
Lab ID: 07090093-004
Report Date: 12-Sep-07

Client Project: 180-3366/Hillsboro Energy
Client Sample ID: MW 25A (08-03-17-09)
Collection Date: 9/5/2007 9:50:00 AM
Matrix: GROUNDWATER

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Analyst
STANDARD METHODS 18TH ED. 2310 B								
Acidity, Total (as CaCO3)	NELAP	0		-302	mg/L	1	9/6/2007	MK
STANDARD METHODS 18TH ED. 2320 B								
Alkalinity, Total (as CaCO3)	NELAP	0		308	mg/L	1	9/6/2007	MK
STANDARD METHODS 18TH ED. 2340 C								
Hardness, as (CaCO3)	NELAP	5		220	mg/L	1	9/7/2007	MK
STANDARD METHODS 18TH ED. 2540 C (TOTAL)								
Total Dissolved Solids	NELAP	20		398	mg/L	1	9/7/2007	JMT
SW-846 3005A, 6010B, METALS BY ICP (TOTAL)								
Calcium	NELAP	0.500		2120	mg/L	10	9/7/2007 6:29:41 AM	LAL
Iron	NELAP	10.0		1790	mg/L	500	9/10/2007 1:37:23 PM	CRK
Magnesium	NELAP	0.100		1280	mg/L	10	9/7/2007 6:29:41 AM	LAL
Manganese	NELAP	2.50		62.2	mg/L	500	9/10/2007 1:37:23 PM	CRK
Sodium	NELAP	0.500		75.2	mg/L	10	9/7/2007 6:29:41 AM	LAL
Zinc	NELAP	0.100		5.02	mg/L	10	9/10/2007 5:31:09 PM	CRK
SW-846 9036 (TOTAL)								
Sulfate	NELAP	5		39	mg/L	1	9/7/2007 10:21:49 AM	KLE
SW-846 9040B								
pH	NELAP	1.00		7.15		1	9/5/2007 6:34:00 PM	KNL
SW-846 9210 (TOTAL)								
Nitrogen, Nitrate (as N)	NELAP	0.20		0.24	mg/L	1	9/6/2007 9:50:00 AM	BSJ
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		0.45	mg/L	1	9/11/2007	BSJ
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		40	mg/L	1	9/6/2007 10:51:27 AM	KLE

Sample Narrative

TEKLAB, INC.

5445 HORSESHOE LAKE ROAD
COLLINSVILLE, ILLINOIS 62234

ENVIRONMENTAL TESTING LABORATORY

TEL: 618-344-1004
FAX: 618-344-1005

LABORATORY RESULTS

Client: Hurst-Rosche Engineers, Inc.
WorkOrder: 07090093
Lab ID: 07090093-005
Report Date: 12-Sep-07

Client Project: 180-3366/Hillsboro Energy
Client Sample ID: MW 28 (08-03-18-18)
Collection Date: 9/5/2007 10:15:00 AM
Matrix: GROUNDWATER

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Analyst
STANDARD METHODS 18TH ED. 2310 B								
Acidity, Total (as CaCO3)	NELAP	0		-262	mg/L	1	9/6/2007	MK
STANDARD METHODS 18TH ED. 2320 B								
Alkalinity, Total (as CaCO3)	NELAP	0		264	mg/L	1	9/6/2007	MK
STANDARD METHODS 18TH ED. 2340 C								
Hardness, as (CaCO3)	NELAP	5		260	mg/L	1	9/7/2007	MK
STANDARD METHODS 18TH ED. 2540 C (TOTAL)								
Total Dissolved Solids	NELAP	20		392	mg/L	1	9/7/2007	JMT
SW-846 3005A, 6010B, METALS BY ICP (TOTAL)								
Calcium	NELAP	0.500		311	mg/L	10	9/7/2007 6:36:27 AM	LAL
Iron	NELAP	0.200		54.8	mg/L	10	9/7/2007 4:55:55 PM	CRK
Magnesium	NELAP	0.100		146	mg/L	10	9/7/2007 6:36:27 AM	LAL
Manganese	NELAP	0.0500		1.44	mg/L	10	9/7/2007 4:55:55 PM	CRK
Sodium	NELAP	0.500		35.2	mg/L	10	9/7/2007 6:36:27 AM	LAL
Zinc	NELAP	0.100		0.120	mg/L	10	9/10/2007 5:40:21 PM	CRK
SW-846 9036 (TOTAL)								
Sulfate	NELAP	50		52	mg/L	1	9/6/2007 10:59:57 AM	KLE
SW-846 9040B								
pH	NELAP	1.00		7.27		1	9/5/2007 6:36:00 PM	KNL
SW-846 9210 (TOTAL)								
Nitrogen, Nitrate (as N)	NELAP	0.20		0.21	mg/L	1	9/6/2007 9:50:00 AM	BSJ
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		0.34	mg/L	1	9/11/2007	BSJ
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		47	mg/L	1	9/6/2007 10:56:47 AM	KLE

Sample Narrative

TEKLAB, INC.

5445 HORSESHOE LAKE ROAD
COLLINSVILLE, ILLINOIS 62234

ENVIRONMENTAL TESTING LABORATORY

TEL: 618-344-1004
FAX: 618-344-1005

LABORATORY RESULTS

Client: Hurst-Rosche Engineers, Inc.
WorkOrder: 07090093
Lab ID: 07090093-006
Report Date: 12-Sep-07

Client Project: 180-3366/Hillsboro Energy
Client Sample ID: MW 27A (08-03-18-17)
Collection Date: 9/5/2007 10:25:00 AM
Matrix: GROUNDWATER

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Analyst
STANDARD METHODS 18TH ED. 2310 B								
Acidity, Total (as CaCO3)	NELAP	0		-300	mg/L	1	9/6/2007	MK
STANDARD METHODS 18TH ED. 2320 B								
Alkalinity, Total (as CaCO3)	NELAP	0		294	mg/L	1	9/6/2007	MK
STANDARD METHODS 18TH ED. 2340 C								
Hardness, as (CaCO3)	NELAP	5		300	mg/L	1	9/7/2007	MK
STANDARD METHODS 18TH ED. 2540 C (TOTAL)								
Total Dissolved Solids	NELAP	20		392	mg/L	1	9/7/2007	JMT
SW-846 3005A, 6010B, METALS BY ICP (TOTAL)								
Calcium	NELAP	0.500		351	mg/L	10	9/7/2007 6:43:03 AM	LAL
Iron	NELAP	1.00		73.7	mg/L	50	9/10/2007 1:39:48 PM	CRK
Magnesium	NELAP	0.100		173	mg/L	10	9/7/2007 6:43:03 AM	LAL
Manganese	NELAP	0.0500		21.6	mg/L	10	9/7/2007 4:58:52 PM	CRK
Sodium	NELAP	0.500		32.2	mg/L	10	9/7/2007 6:43:03 AM	LAL
Zinc	NELAP	0.100		0.404	mg/L	10	9/10/2007 5:43:26 PM	CRK
SW-846 9036 (TOTAL)								
Sulfate	NELAP	50		60	mg/L	1	9/6/2007 11:05:09 AM	KLE
SW-846 9040B								
pH	NELAP	1.00		7.21		1	9/5/2007 6:37:00 PM	KNL
SW-846 9210 (TOTAL)								
Nitrogen, Nitrate (as N)	NELAP	0.20		< 0.20	mg/L	1	9/6/2007 9:50:00 AM	BSJ
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		0.24	mg/L	1	9/11/2007	BSJ
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		41	mg/L	1	9/6/2007 11:02:07 AM	KLE

Sample Narrative

TEKLAB, INC.

5445 HORSESHOE LAKE ROAD
COLLINSVILLE, ILLINOIS 62234

ENVIRONMENTAL TESTING LABORATORY

TEL: 618-344-1004
FAX: 618-344-1005

LABORATORY RESULTS

Client: Hurst-Rosche Engineers, Inc.
WorkOrder: 07090093
Lab ID: 07090093-007
Report Date: 12-Sep-07

Client Project: 180-3366/Hillsboro Energy
Client Sample ID: MW 32 (08-03-07-04)
Collection Date: 9/5/2007 11:00:00 AM
Matrix: GROUNDWATER

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Analyst
STANDARD METHODS 18TH ED. 2310 B								
Acidity, Total (as CaCO3)	NELAP	0		-372	mg/L	1	9/6/2007	MK
STANDARD METHODS 18TH ED. 2320 B								
Alkalinity, Total (as CaCO3)	NELAP	0		380	mg/L	1	9/6/2007	MK
STANDARD METHODS 18TH ED. 2340 C								
Hardness, as (CaCO3)	NELAP	5		400	mg/L	1	9/7/2007	MK
STANDARD METHODS 18TH ED. 2540 C (TOTAL)								
Total Dissolved Solids	NELAP	20		740	mg/L	1	9/7/2007	JMT
SW-846 3005A, 6010B, METALS BY ICP (TOTAL)								
Calcium	NELAP	0.500	S	1250	mg/L	10	9/7/2007 7:02:14 AM	LAL
Iron	NELAP	10.0	S	217	mg/L	500	9/10/2007 1:46:34 PM	CRK
Magnesium	NELAP	0.100	S	587	mg/L	10	9/7/2007 7:02:14 AM	LAL
Manganese	NELAP	0.0500	S	6.22	mg/L	10	9/7/2007 5:01:47 PM	CRK
Sodium	NELAP	0.500	S	112	mg/L	10	9/7/2007 7:02:14 AM	LAL
Zinc	NELAP	0.100		0.411	mg/L	10	9/10/2007 5:46:31 PM	CRK
SW-846 9036 (TOTAL)								
Sulfate	NELAP	50		258	mg/L	1	9/6/2007 11:10:31 AM	KLE
SW-846 9040B								
pH	NELAP	1.00		7.23		1	9/5/2007 6:38:00 PM	KNL
SW-846 9210 (TOTAL)								
Nitrogen, Nitrate (as N)	NELAP	0.20		0.20	mg/L	1	9/6/2007 9:50:00 AM	BSJ
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		0.37	mg/L	1	9/11/2007	BSJ
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		33	mg/L	1	9/6/2007 11:07:27 AM	KLE

Sample Narrative
SW-846 3005A, 6010B, Metals by ICP (Total)
Fe - Sample concentration was greater than 5 times the spike concentration.
Mn - Sample concentration was greater than 5 times the spike concentration.
Ca, Mg and Na - Sample concentration was greater than 5 times the spike concentration.

TEKLAB, INC.

5445 HORSESHOE LAKE ROAD
COLLINSVILLE, ILLINOIS 62234

ENVIRONMENTAL TESTING LABORATORY

TEL: 618-344-1004
FAX: 618-344-1005

LABORATORY RESULTS

Client: Hurst-Rosche Engineers, Inc.
WorkOrder: 07090093
Lab ID: 07090093-008
Report Date: 12-Sep-07

Client Project: 180-3366/Hillsboro Energy
Client Sample ID: MW 26A (08-03-18-16)
Collection Date: 9/5/2007 11:15:00 AM
Matrix: GROUNDWATER

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Analyst
STANDARD METHODS 18TH ED. 2310 B								
Acidity, Total (as CaCO3)	NELAP	0		-398	mg/L	1	9/6/2007	MK
STANDARD METHODS 18TH ED. 2320 B								
Alkalinity, Total (as CaCO3)	NELAP	0		396	mg/L	1	9/6/2007	MK
STANDARD METHODS 18TH ED. 2340 C								
Hardness, as (CaCO3)	NELAP	5		340	mg/L	1	9/7/2007	MK
STANDARD METHODS 18TH ED. 2540 C (TOTAL)								
Total Dissolved Solids	NELAP	20		528	mg/L	1	9/7/2007	JMT
SW-846 3005A, 6010B, METALS BY ICP (TOTAL)								
Calcium	NELAP	0.500		1170	mg/L	10	9/7/2007 7:22:42 AM	LAL
Iron	NELAP	1.00		160	mg/L	50	9/10/2007 1:52:35 PM	CRK
Magnesium	NELAP	0.100		479	mg/L	10	9/7/2007 7:22:42 AM	LAL
Manganese	NELAP	0.0500		5.05	mg/L	10	9/7/2007 5:16:25 PM	CRK
Sodium	NELAP	0.500		55.4	mg/L	10	9/7/2007 7:22:42 AM	LAL
Zinc	NELAP	0.100		0.420	mg/L	10	9/11/2007 12:30:39 PM	CRK
SW-846 9036 (TOTAL)								
Sulfate	NELAP	50		67	mg/L	1	9/6/2007 11:55:45 AM	KLE
SW-846 9040B								
pH	NELAP	1.00		7.24		1	9/5/2007 6:39:00 PM	KNL
SW-846 9210 (TOTAL)								
Nitrogen, Nitrate (as N)	NELAP	0.20		0.20	mg/L	1	9/6/2007 9:50:00 AM	BSJ
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		0.45	mg/L	1	9/11/2007	BSJ
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		40	mg/L	1	9/6/2007 11:52:47 AM	KLE

Sample Narrative

TEKLAB, INC.

5445 HORSESHOE LAKE ROAD
COLLINSVILLE, ILLINOIS 62234

ENVIRONMENTAL TESTING LABORATORY

TEL: 618-344-1004
FAX: 618-344-1005

September 12, 2007

NELAP Accredited #100226

David Kimmle
Hurst-Rosche Engineers, Inc.
1400 East Tremont
P.O. Box 130
Hillsboro, IL 62049
TEL: (217) 532-3959
FAX: (217) 532-3212

Work Order: 07090210

RE: 180-3366/Hillsboro Energy

Dear David Kimmle:

TEKLAB, INC received 4 samples on 9/7/2007 3:30:00 PM for the analysis presented in the following report. A list of report contents can be found on the following page.

Samples are analyzed on an as received basis unless otherwise requested and documented. The sample results contained in this report relate only to the requested analytes of interest as directed on the chain of custody. IL ELAP and NELAP accredited fields of testing are indicated by the letters NELAP under the Certification column.

All quality control criteria applicable to the test methods employed for this project have been satisfactorily met and are in accordance with NELAP except where noted. The following report shall not be reproduced, except in full, without the written approval of Teklab, Inc.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Kelly A. Klostermann

Kelly A. Klostermann
Project Manager
(618)344-1004 ex.11

TEKLAB, INC.

5445 HORSESHOE LAKE ROAD
COLLINSVILLE, ILLINOIS 62234

ENVIRONMENTAL TESTING LABORATORY

TEL: 618-344-1004
FAX: 618-344-1005

REPORT CONTENTS

Client: Hurst-Rosche Engineers, Inc.
Project: 180-3366/Hillsboro Energy
LabOrder: 07090210
Report Date: 12-Sep-07

This reporting package includes the following:

TEKLAB, INC.

5445 HORSESHOE LAKE ROAD
COLLINSVILLE, ILLINOIS 62234

ENVIRONMENTAL TESTING LABORATORY

TEL: 618-344-1004
FAX: 618-344-1005

CASE NARRATIVE

Client: Hurst-Rosche Engineers, Inc.
Project: 180-3366/Hillsboro Energy
LabOrder: 07090210
Report Date: 12-Sep-07

Cooler Receipt Temp: 7.6 °C

State accreditations:
IL: DPH #17584 NELAP #IL00045 | KS: NELAP #E-10347 | KY: UST #0073 | MO: DNR #00930 | AR: ADEQ #70-028-0

Qualifiers

DF - Dilution Factor
RL - Reporting Limit
ND - Not Detected at the Reporting Limit
Surr - Surrogate Standard added by lab
TNTC - Too numerous to count (> 200 CFU)
Q - QC criteria failed or noncompliant CCV
NELAP - IL ELAP and NELAP Accredited Field of Testing

B - Analyte detected in the associated Method Blank
J - Analyte detected below reporting limits
R - RPD outside accepted recovery limits
S - Spike Recovery outside accepted recovery limits
X - Value exceeds Maximum Contaminant Level
- Unknown hydrocarbon
IDPH - IL Dept. of Public Health

C - Client requested RL below
D - Diluted out of sample
E - Value above quantitation range
H - Holding time exceeded
MI - Matrix interference
DNI - Did not ignite

TEKLAB, INC.

5445 HORSESHOE LAKE ROAD
COLLINSVILLE, ILLINOIS 62234

ENVIRONMENTAL TESTING LABORATORY

TEL: 618-344-1004
FAX: 618-344-1005

LABORATORY RESULTS

Client: Hurst-Rosche Engineers, Inc.
WorkOrder: 07090210
Lab ID: 07090210-001
Report Date: 12-Sep-07

Client Project: 180-3366/Hillsboro Energy
Client Sample ID: MW-33 (08-03-18-22)
Collection Date: 9/7/2007 6:50:00 AM
Matrix: AQUEOUS

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Analyst
STANDARD METHODS 18TH ED. 2310 B								
Acidity, Total (as CaCO3)	NELAP	0		466	mg/L	1	9/10/2007	MK
STANDARD METHODS 18TH ED. 2320 B								
Alkalinity, Total (as CaCO3)	NELAP	0		488	mg/L	1	9/10/2007	MK
STANDARD METHODS 18TH ED. 2340 C								
Hardness, as (CaCO3)	NELAP	5		380	mg/L	1	9/10/2007	MK
STANDARD METHODS 18TH ED. 2510 B								
Conductivity	NELAP	1		1150	µmhos/cm	1	9/11/2007	KNL
STANDARD METHODS 18TH ED. 2540 C (TOTAL)								
Total Dissolved Solids	NELAP	20		730	mg/L	1	9/10/2007	JMT
SW-846 3005A, 6010B, METALS BY ICP (TOTAL)								
Calcium	NELAP	0.0500	S	533	mg/L	1	9/10/2007 6:50:47 PM	JMW
Iron	NELAP	0.0200	S	139	mg/L	1	9/10/2007 6:50:47 PM	JMW
Magnesium	NELAP	1.00	S	217	mg/L	100	9/11/2007 12:43:39 PM	CRK
Manganese	NELAP	0.0050	S	3.05	mg/L	1	9/10/2007 6:50:47 PM	JMW
Sodium	NELAP	5.00		108	mg/L	100	9/11/2007 12:43:39 PM	CRK
Zinc	NELAP	0.0100	S	0.290	mg/L	1	9/10/2007 6:50:47 PM	JMW
SW-846 9036 (TOTAL)								
Sulfate	NELAP	50		164	mg/L	1	9/10/2007 12:43:07 PM	KLE
SW-846 9040B								
pH	NELAP	1.00		7.23		1	9/7/2007 4:48:00 PM	NJK
SW-846 9210 (TOTAL)								
Nitrogen, Nitrate (as N)	NELAP	0.20	H	0.22	mg/L	1	9/9/2007 1:10:00 PM	BSJ
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		0.48	mg/L	1	9/11/2007	BSJ
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		66	mg/L	1	9/10/2007 12:40:12 PM	KLE

Sample Narrative

SW-846 9210 (Total)
Sample analysis did not meet hold time requirements.

SW-846 3005A, 6010B, Metals by ICP (Total)
Na - Sample result was more than 10 times the blank contamination. Data is reportable.
Mg, Na - Sample concentration was greater than 5 times the spike concentration.
Ca,Fe,Mn - Sample concentration was greater than 5 times the spike concentration.

TEKLAB, INC.

5445 HORSESHOE LAKE ROAD
COLLINSVILLE, ILLINOIS 62234

ENVIRONMENTAL TESTING LABORATORY

TEL: 618-344-1004
FAX: 618-344-1005

LABORATORY RESULTS

Client: Hurst-Rosche Engineers, Inc.
WorkOrder: 07090210
Lab ID: 07090210-002
Report Date: 12-Sep-07

Client Project: 180-3366/Hillsboro Energy
Client Sample ID: MW-34 (08-03-07-05)
Collection Date: 9/7/2007 7:15:00 AM
Matrix: AQUEOUS

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Analyst
STANDARD METHODS 18TH ED. 2310 B								
Acidity, Total (as CaCO3)	NELAP	0		-342	mg/L	1	9/10/2007	MK
STANDARD METHODS 18TH ED. 2320 B								
Alkalinity, Total (as CaCO3)	NELAP	0		342	mg/L	1	9/10/2007	MK
STANDARD METHODS 18TH ED. 2340 C								
Hardness, as (CaCO3)	NELAP	5		380	mg/L	1	9/10/2007	MK
STANDARD METHODS 18TH ED. 2510 B								
Conductivity	NELAP	1		978	µmhos/cm	1	9/11/2007	KNL
STANDARD METHODS 18TH ED. 2540 C (TOTAL)								
Total Dissolved Solids	NELAP	20		594	mg/L	1	9/10/2007	JMT
SW-846 3005A, 6010B, METALS BY ICP (TOTAL)								
Calcium	NELAP	0.500		3280	mg/L	10	9/10/2007 7:23:16 PM	JMW
Iron	NELAP	0.200		1030	mg/L	10	9/10/2007 7:23:16 PM	JMW
Magnesium	NELAP	5.00		1180	mg/L	500	9/11/2007 12:51:10 PM	CRK
Manganese	NELAP	0.0500		21.3	mg/L	10	9/10/2007 7:23:16 PM	JMW
Sodium	NELAP	0.500		75.8	mg/L	10	9/10/2007 7:23:16 PM	JMW
Zinc	NELAP	0.100		2.10	mg/L	10	9/10/2007 7:23:16 PM	JMW
SW-846 9036 (TOTAL)								
Sulfate	NELAP	50		119	mg/L	1	9/10/2007 12:48:25 PM	KLE
SW-846 9040B								
pH	NELAP	1.00		7.32		1	9/7/2007 4:50:00 PM	NJK
SW-846 9210 (TOTAL)								
Nitrogen, Nitrate (as N)	NELAP	0.20	H	< 0.20	mg/L	1	9/9/2007 1:10:00 PM	BSJ
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		0.49	mg/L	1	9/11/2007	BSJ
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		62	mg/L	1	9/10/2007 12:45:34 PM	KLE

Sample Narrative
SW-846 9210 (Total)
Sample analysis did not meet hold time requirements.

CHAIN OF CUSTODY

pg. 1 of 1 Work Order # ______

TEKLAB, INC. 5445 Horseshoe Lake Road ~ Collinsville, IL 62234 ~ Phone: (618) 344-1004 ~ Fax: (618) 344-1005

Client: Hurst-Rosche Engineers
Address: 1400 E [illegible]
City / State / Zip: Hillsboro, IL 62049
Contact: Dave Kimmle Phone: 217-[illegible]-3959
E-Mail: dkimmle@hurst-rosche.com Fax: 217-532-3[illegible]

Samples on: ☒ Ice ☐ Blue Ice ☐ No Ice 9.0 °C
Preserved in: ☐ Lab ☒ Field
Lab Notes:
Comments:

- Are these samples known to be involved in litigation? If yes, a surcharge will apply. ☐ Yes ☒ No
- Are these samples known to be hazardous? ☐ Yes ☒ No
- Are there any required reporting limits to be met on the requested analysis? If yes, please provide limits in comment section. ☐ Yes ☐ No

Project Name / Number: 180-3366 / Hillsboro Energy
Sample Collector's Name: A. Staggemeyer

Results Requested: ☒ Standard ☐ 1-2 Day (100% Surcharge) ☐ Other ____ ☐ 3 Day (50% Surcharge)
Billing Instructions:

Lab Use Only	Sample Identification	Date/Time Sampled	UNPRES	HNO_3	NaOH	H_2SO_4	HCL	MeOH	$NaHSO_4$	Other	Water	Drinking Water	Soil	Sludge	Sp. Waste	INDICATE ANALYSIS REQUESTED
	MW 24A	9/5/07 8:50	3	1							X					
	MW 23	9/5/07 9:15	3	1							X					
	MW 22	9/5/07 9:35	3	1							X					
	MW 25A	9/5/07 9:50	3	1							X					
	MW 28	9/5/07 10:15	3	1							X					
	MW 27A	9/5/07 10:25	3	1							X					
	MW 32	9/5/07 11:00	3	1							X					
	MW 26A	9/5/07 11:15	3	1							X					

Relinquished By	Date / Time	Received By	Date / Time
Adam Staggemeyer	9-5-07 11:45 Am	Holly Meyer	9-5-07 11:45 AM
Holly Meyer	9-5-07	[illegible]	9/5/07 1400

The individual signing this agreement on behalf of client acknowledges that he/she has read and understands the terms and conditions of this agreement, on the reverse side, and that he/she has the authority to sign on behalf of client.

WHITE & YELLOW – LAB PINK – SAMPLER'S COPY

TEKLAB, INC.

5445 HORSESHOE LAKE ROAD
COLLINSVILLE, ILLINOIS 62234

ENVIRONMENTAL TESTING LABORATORY

TEL: 618-344-1004
FAX: 618-344-1005

LABORATORY RESULTS

Client: Hurst-Rosche Engineers, Inc.
WorkOrder: 07090210
Lab ID: 07090210-003
Report Date: 12-Sep-07

Client Project: 180-3366/Hillsboro Energy
Client Sample ID: MW-30 (08-03-18-20)
Collection Date: 9/7/2007 7:50:00 AM
Matrix: AQUEOUS

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Analyst
STANDARD METHODS 18TH ED. 2310 B								
Acidity, Total (as CaCO3)	NELAP	0		-264	mg/L	1	9/10/2007	MK
STANDARD METHODS 18TH ED. 2320 B								
Alkalinity, Total (as CaCO3)	NELAP	0		270	mg/L	1	9/10/2007	MK
STANDARD METHODS 18TH ED. 2340 C								
Hardness, as (CaCO3)	NELAP	5		260	mg/L	1	9/10/2007	MK
STANDARD METHODS 18TH ED. 2510 B								
Conductivity	NELAP	1		775	µmhos/cm	1	9/11/2007	KNL
STANDARD METHODS 18TH ED. 2540 C (TOTAL)								
Total Dissolved Solids	NELAP	20		456	mg/L	1	9/10/2007	JMT
SW-846 3005A, 6010B, METALS BY ICP (TOTAL)								
Calcium	NELAP	0.500		2620	mg/L	10	9/10/2007 7:29:59 PM	JMW
Iron	NELAP	0.200		666	mg/L	10	9/10/2007 7:29:59 PM	JMW
Magnesium	NELAP	5.00		1170	mg/L	500	9/11/2007 12:52:54 PM	CRK
Manganese	NELAP	0.0500		11.0	mg/L	10	9/10/2007 7:29:59 PM	JMW
Sodium	NELAP	0.500		85.1	mg/L	10	9/10/2007 7:29:59 PM	JMW
Zinc	NELAP	0.100		2.15	mg/L	10	9/10/2007 7:29:59 PM	JMW
SW-846 9036 (TOTAL)								
Sulfate	NELAP	50		105	mg/L	1	9/10/2007 12:56:25 PM	KLE
SW-846 9040B								
pH	NELAP	1.00		7.19		1	9/7/2007 4:51:00 PM	NJK
SW-846 9210 (TOTAL)								
Nitrogen, Nitrate (as N)	NELAP	0.20	H	0.24	mg/L	1	9/9/2007 1:10:00 PM	BSJ
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		0.35	mg/L	1	9/11/2007	BSJ
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		28	mg/L	1	9/10/2007 12:53:31 PM	KLE

Sample Narrative
SW-846 9210 (Total)
Sample analysis did not meet hold time requirements.

TEKLAB, INC.

5445 HORSESHOE LAKE ROAD
COLLINSVILLE, ILLINOIS 62234

ENVIRONMENTAL TESTING LABORATORY

TEL: 618-344-1004
FAX: 618-344-1005

LABORATORY RESULTS

Client: Hurst-Rosche Engineers, Inc.
WorkOrder: 07090210
Lab ID: 07090210-004
Report Date: 12-Sep-07

Client Project: 180-3366/Hillsboro Energy
Client Sample ID: MW-31 (08-03-18-21)
Collection Date: 9/7/2007 7:40:00 AM
Matrix: AQUEOUS

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Analyst
STANDARD METHODS 18TH ED. 2310 B								
Acidity, Total (as CaCO3)	NELAP	0		-282	mg/L	1	9/10/2007	MK
STANDARD METHODS 18TH ED. 2320 B								
Alkalinity, Total (as CaCO3)	NELAP	0		280	mg/L	1	9/10/2007	MK
STANDARD METHODS 18TH ED. 2340 C								
Hardness, as (CaCO3)	NELAP	5		280	mg/L	1	9/10/2007	MK
STANDARD METHODS 18TH ED. 2510 B								
Conductivity	NELAP	1		919	µmhos/cm	1	9/11/2007	KNL
STANDARD METHODS 18TH ED. 2540 C (TOTAL)								
Total Dissolved Solids	NELAP	20		588	mg/L	1	9/10/2007	JMT
SW-846 3005A, 6010B, METALS BY ICP (TOTAL)								
Calcium	NELAP	0.0500		277	mg/L	1	9/10/2007 7:36:43 PM	JMW
Iron	NELAP	0.0200		92.7	mg/L	1	9/10/2007 7:36:43 PM	JMW
Magnesium	NELAP	0.500		110	mg/L	50	9/11/2007 12:54:38 PM	CRK
Manganese	NELAP	0.0050		1.62	mg/L	1	9/10/2007 7:36:43 PM	JMW
Sodium	NELAP	0.0500		80.0	mg/L	1	9/10/2007 7:36:43 PM	JMW
Zinc	NELAP	0.0100		0.242	mg/L	1	9/10/2007 7:36:43 PM	JMW
SW-846 9036 (TOTAL)								
Sulfate	NELAP	50		187	mg/L	1	9/10/2007 1:01:47 PM	KLE
SW-846 9040B								
pH	NELAP	1.00		7.34		1	9/7/2007 4:53:00 PM	NJK
SW-846 9210 (TOTAL)								
Nitrogen, Nitrate (as N)	NELAP	0.20	H	5.48	mg/L	1	9/9/2007 1:10:00 PM	BSJ
SW-846 9214 (TOTAL)								
Fluoride	NELAP	0.10		0.24	mg/L	1	9/11/2007	BSJ
SW-846 9251 (TOTAL)								
Chloride	NELAP	1		29	mg/L	1	9/10/2007 12:58:52 PM	KLE

Sample Narrative
SW-846 9210 (Total)
Sample analysis did not meet hold time requirements.

CHAIN OF CUSTODY

pg. 1 of 1 Work Order # _____

TEKLAB, INC. 5445 Horseshoe Lake Road ~ Collinsville, IL 62234 ~ Phone: (618) 344-1004 ~ Fax: (618) 344-1005

Client: Hurst Rosche Engineers
Address: 1400 E. Tremont Street
City / State / Zip: Hillsboro, IL 62049
Contact: Dave Reimmle Phone: 217-532-3959
E-Mail: dreimmle@Hurst-Rosche.com Fax: 217-532-3917

Samples on: ☑ Ice ☐ Blue Ice ☐ No Ice 7.6 °C
Preserved in: ☐ Lab ☑ Field
Lab Notes:

Comments: Request that these samples & results be ready at same time that results for samples delivered on 9/5/07 for same project are.

- Are these samples known to be involved in litigation? If yes, a surcharge will apply. ☐ Yes ☑ No
- Are these samples known to be hazardous? ☐ Yes ☑ No
- Are there any required reporting limits to be met on the requested analysis? If yes, please provide limits in comment section. ☐ Yes ☑ No

Project Name / Number: Hillsboro Energy (180-3366)
Sample Collector's Name: Adam Staggemeyer
Results Requested: ☑ Standard ☐ 1-2 Day (100% Surcharge) ☐ Other _____ ☒ 3 Day (50% Surcharge)
Billing Instructions:

Lab Use Only	Sample Identification	Date/Time Sampled	# and Type of Containers: UNPRES	HNO3	NaOH	H2SO4	HCL	MeOH	NaHSO4	Other	MATRIX: Water	Drinking Water	Soil	Sludge	Sp. Waste	INDICATE ANALYSIS REQUESTED: Refer to attached list for parameters
	MW 33	9-7-07 6:50	3	2							X					X
	MW 34	9-7-07 7:15	3	2							X					X
	MW 30	9-7-07 7:50	3	2							X					X
	MW 31	9-7-07 7:40	3	2							X					X

Relinquished By	Date / Time	Received By	Date / Time
Adam Staggemeyer	9-7-07 8:15	Mike Zumbahlen	9/7/07 8:15
Mike Zumbahlen	9/7/07 14:20	Brooke Burkett	9/7/07 14:20
Brooke Burkett	9/7/07 15:30	Maureen A. Darlington	9/7/07 1520

The individual signing this agreement on behalf of client acknowledges that he/she has read and understands the terms and conditions of this agreement, on the reverse side, and that he/she has the authority to sign on behalf of client.

WHITE & YELLOW – LAB PINK – SAMPLER'S COPY

Appendix G
ISGS and ISWS Well Records

1/95

WATER WELL SEALING FORM

ILLINOIS DEPARTMENT OF PUBLIC HEALTH
DIVISION OF ENVIRONMENTAL HEALTH
525 WEST JEFFERSON STREET
SPRINGFIELD, ILLINOIS 62761

17-07-252-001
(A)
RETURN ALL COPIES TO IDPH O
LOCAL HEALTH DEPARTMENT

TYPE OR PRESS FIRMLY
This form shall be submitted to this Department or the local health department not more than 30 days after a water well, borir or monitoring well is sealed. Such wells are to be sealed not more than 30 days after they are abandoned in accordance with th sealing requirements in the Water Well Construction Code.

1. Ownership (Name of Controlling Party) Cleveland Plunkett

2. Well Location: 1909 Klar Ave (Address - Lot Number) Schram City (City) Montgomery (County)

General Description: Township 8N (N)(S) Range 3W (E)(W) Section 7.4 f

NW Quarter of the SW Quarter of the NE Quarter

3. Year Drilled Early 1900's

4. Drilling Permit Number (and date, if known)

5. Type of Well: Bored _____ Drilled _____ Other Brick lined

6. Total Depth 15 Diameter(inches) 36"

7. Formation clear of obstruction ✓ Yes _____ No

8. DETAILS OF PLUGGING

Filled with Casing (Brick (cement or other materials) from 0 to 3 ft.

Kind of plug Soil (High Clay) from 3 to 15 ft.

Filled with _____ from _____ to _____ ft.

Kind of plug _____ from _____ to _____ ft.

Filled with _____ from _____ to _____ ft.

Kind of plug _____ from _____ to _____ ft.

9. CASING RECORD: Upper 3 feet of casing removed ✓ Yes _____ No

10. Date well was sealed: Month August Day 6 Year 2009.

11. Licensed water well driller or other person approved by the Department performing well sealing.

[signature] (Name)

P 363128 (Complete License Number)

1111 Tremont (Address)

Hillsboro (City)

62049 (State/Zip)

This State Agency is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under Public Act 85-0863. Disclosure of this information is mandatory. This form has been approved by the Forms Management Center.

IL 482-0631

Ye... ...any – Well Contractor
Blue ... ...ell Owner

PARTMENT OF PUBLIC HEALTH, ROO... ILLINOIS, 62706. DO NOT DETACH GEOL... L/WATER SURVEYS SECTION. BE SURE TO PROVIDE PROPER WELL LOCATION.

(B) 17-08-400-002

ILLINOIS DEPARTMENT OF PUBLIC HEALTH
WELL CONSTRUCTION REPORT

1. Type of Well
   a. Dug ____. Bored ✓. Hole Diam. 30 in. Depth 72 ft.
      Curb material ____. Buried Slab: Yes ____ No ____
   b. Driven ____. Drive Pipe Diam. ____ in. Depth ____ ft.
   c. Drilled ____. Finished in Drift ✓. In Rock ____.
      Tubular ____. Gravel Packed ____.
   d. Grout:

(KIND)	FROM (Ft.)	TO (Ft.)

2. Distance to Nearest:
   Building 18 Ft. Seepage Tile Field 85
   Cess Pool 70 Sewer (non Cast iron) ____
   Privy 70 Sewer (Cast iron) ____
   Septic Tank 70 Barnyard ____
   Leaching Pit 70 Manure Pile ____
3. Is water from this well to be used for human consumption?
   Yes ✓ No ____
4. Date well completed ____ ✓
5. Permanent Pump Installed? Yes ____ No ____
   Manufacturer ____ Type ____
   Capacity ____ gpm. Depth of setting ____ ft.
6. Well Top Sealed? Yes ✓ No ____
7. Pitless Adaptor Installed? Yes ____ No ✓
8. Well Disinfected? Yes ✓ No ____
9. Water Sample Submitted? Yes ✓ No ____

REMARKS:

IDPH 4.065
10/68

P115397

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Wayne Ballard Well No. ____
    Address [illegible]
    Driller [illegible] License No. 72472
11. Permit No. NF 13416 Date ____
12. Water from Clay (Formation) 13. County Montgomery
    at depth ____ to ____ ft. Sec. 8 2ad
14. Screen: Diam. ____ in. Twp. 8N
    Length: ____ ft. Slot ____ Rge. 3W
    Elev. ____

SHOW LOCATION IN SECTION PLAT

NW NE SE

15. Casing and Liner Pipe

Diam. (In.)	Kind and Weight	From (Ft.)	To (Ft.)
30	Concrete	33	

16. Size Hole below casing: ____ in.
17. Static level ____ ft. below casing top which is ____ ft. above ground level. Pumping level ____ ft. when pumping at ____ gpm for ____ hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
Clay	32	

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED [signature] DATE 9-17-72

[illegible] Well Drilling

1/95

WATER WELL SEALING FORM

17-08-300-009

(C)

ILLINOIS DEPARTMENT OF PUBLIC HEALTH
DIVISION OF ENVIRONMENTAL HEALTH
525 WEST JEFFERSON STREET
SPRINGFIELD, ILLINOIS 62761

RETURN ALL COPIES TO IDPH OR LOCAL HEALTH DEPARTMENT

TYPE OR PRESS FIRMLY

This form shall be submitted to this Department or the local health department not more than 30 days after a water well, boring or monitoring well is sealed. Such wells are to be sealed not more than 30 days after they are abandoned in accordance with the sealing requirements in the Water Well Construction Code.

1. Ownership (Name of Controlling Party) Cleveland Plunket

2. Well Location: 613 Park St. (Address - Lot Number) Hillsboro (City) Montgomery (County)

General Description: Township 8N (N)(S) Range 3W (E)(W) Section 8. 8d

NW Quarter of the NW Quarter of the SW Quarter

3. Year Drilled early 1900's

4. Drilling Permit Number (and date, if known) ______

5. Type of Well: Bored ______ Drilled ______ Other Brick

6. Total Depth 25 Diameter(inches) 36"

7. Formation clear of obstruction ✓ Yes ______ No

8. DETAILS OF PLUGGING

Filled with Brick Casing (cement or other materials) from 0 to 4 ft.

Kind of plug Clay from 4 to 25 ft.

Filled with ______ from ______ to ______ ft.

Kind of plug ______ from ______ to ______ ft.

Filled with ______ from ______ to ______ ft.

Kind of plug ______ from ______ to ______ ft.

9. CASING RECORD: Upper 3 feet of casing removed ✓ Yes ______ No

10. Date well was sealed: Month Sept Day 10 Year 2004.

11. Licensed water well driller or other person approved by the Department performing well sealing.

[signature] Name

Complete License Number ______

111 E Tremont Address

Hillsboro City

62049 State/Zip

PILKS BDVD

P 303238

This State Agency is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under Public Act 85-0863. Disclosure of this information is mandatory. This form has been approved by the Forms Management Center.

IL 482-0631

White Copy — Ill. Dept. of Pu[illegible] [illegible]alth
Yellow Copy — We[illegible] [illegible]ontractor
Blue Copy — Well Owner

INSTRUCTIONS TO [illegible]ERS

FILL IN ALL PERTINENT INFORMATION REQUEST[illegible] [illegible]ND MAIL ORIGINAL TO STATE DEPARTMENT OF PUBLIC HEALTH, ROOM 616, STATE OFFICE BUILDING, SPRINGFIELD, ILLINOIS, 62706. DO NOT DETACH GEOLOGICAL / WATER SURVEYS SECTION. BE SURE TO PROVIDE PROPER WELL LOCATION.

17-16-100-002

(D)

ILLINOIS DEPARTMENT OF PUBLIC HEALTH WELL CONSTRUCTION REPORT

1. Type of Well
   a. Dug ____. Bored ✓. Hole Diam. 30 in. Depth 18 ft.
      Curb material ____. Buried Slab: Yes ____ No ____
   b. Driven ____. Drive Pipe Diam. ____ in. Depth ____ ft.
   c. Drilled ____. Finished in Drift ____. In Rock ____.
      Tubular ____. Gravel Packed ✓.
   d. Grout:

(KIND)	FROM (Ft.)	TO (Ft.)

2. Distance to Nearest:
   Building ____ Ft. Seepage Tile Field ____
   Cess Pool ____ Sewer (non Cast iron) ____
   Privy ____ Sewer (Cast iron) ____
   Septic Tank ____ Barnyard ____
   Leaching Pit ____ Manure Pile ____
3. Is water from this well to be used for human consumption?
   Yes ✓ No ____
4. Date well completed ____
5. Permanent Pump Installed? Yes ____ No ✓
   Manufacturer ____ Type ____
   Capacity ____ gpm. Depth of setting ____ ft.
6. Well Top Sealed? Yes ✓ No ____
7. Pitless Adaptor Installed? Yes ____ No ✓
8. Well Disinfected? Yes ✓ No ____
9. Water Sample Submitted? Yes ____ No ✓

REMARKS:

No Buildings

P115400

IDPH 4.065
10/68

→ Hamel Well Co.

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner [illegible] Well No. ____
    Address [illegible]
    Driller Gerit Behrmeyer License No. 92-472
11. Permit No. N-0 8343 Date ____
12. Water from Sand (Formation) 13. County Montgomery
    at depth ____ to ____ ft. Sec. 9 & 31
14. Screen: Diam. ____ in. Twp. 5N
    Length: ____ ft. Slot ____ Rge. 3W
    Elev. ____

SHOW LOCATION IN SECTION PLAT

NW NW SW

15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
30	Concrete	18	1

16. Size Hole below casing: ____ in.
17. Static level 8 ft. below casing top which is ____ ft. above ground level. Pumping level ____ ft. when pumping at ____ gpm for ____ hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
Clay	8	
Sand	10	

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Gerit Behrmeyer DATE 6-5-70

...te & P... Copies:
Ill. Dept. of Public Health
Yellow Copy: Well Contractor
Golden Copy: Well Owner

Well Construction Report

17-16-200-002
(E)

THIS FORM MUST BE COMPLETED WITHIN 30 DAYS
OF WELL COMPLETION AND SENT TO
THE ILLINOIS DEPARTMENT OF PUBLIC HEALTH
DIVISION OF ENVIRONMENTAL HEALTH
525 WEST JEFFERSON STREET
SPRINGFIELD, ILLINOIS 62761

GEOLOGICAL AND WATER SURVEYS WELL RECORD

1. Type of Well
   a. Bored ✓ Hole Diam. 30 in. Depth 34 ft
   Buried Slab: Yes ✓ No___
   b. Driven___ Drive Pipe Diam.___in. Depth___ft
   c. Drilled___ Finished in Drift___ In Rock___
   d. Grout:

(KIND)	FROM (Ft.)	TO (Ft.)

2. Well furnishes water for human consumption? Yes ✓ No___
3. Date well drilled 4/11/90
4. Permanent pump installed? Yes___ Date___ No ✓
   Manufacturer___ Type___
   Location___
   Capacity ___ gpm. Depth of setting___ ft.
5. Well top sealed? Yes ✓ No___ Type___
6. Pitless adapter installed? Yes___ No ✓
   Manufacturer___ Model No.___
   How attached to casing?___
7. Well disinfected? Yes ✓ No___
8. Pump and equipment disinfected Yes___ No___

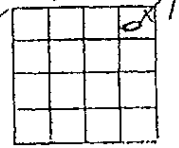
IMPORTANT NOTICE

This State Agency is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under Public Act 85-0863. Disclosiure of this information is mandatory. This form has been approved by the Forms Management Center.

R 2088616

PRESS FIRMLY WITH BLACK PEN OR TYPE
Do Not Use Felt Pen

9. Driller Gary E. Noll License No. 092006238
10. Well Site Address Hillsboro Ill
11. Property Owner Lie (Louis) Rademacher Well No.___
12. Permit No. 1350790 Date Issued 4/6/90
13. Location: County Montgomery
    Sec. 16 (1/4)
    Twp. 8N
    Rge. 3W



Show location in section plat

NE NE NE

14. Water from___ at depth___ ft
    to___ ft

15. Casing and Liner Pipe

Diam.(in)	Kind and Weight	From (ft)	To (ft)
30	concrete	3½	

16. Screen: Diam. 30 in, Length 36 in, Slot Size___
17. Size hole below casing___in. 18. Ground Elev.___ ft msl.
19. Static level___ft below casing top which is ___ft. above ground level. Pumping level ___ft, pumping gpm for ___ hours.

20. Earth Materials Passed Through	Depth of Top	Depth of Bottom
clay	34	

Continue on separate sheet if necessary.

Signed Gary E. Noll Date 4/11/90

White Co... Ill. De... Public Health
Yellow C... y — Well Contractor
Blue Copy — Well Owner

INSTRUCTION... DRILLERS

FILL IN ALL PERTINENT INFORMATION R... STED AND MAIL ORIGINAL TO STATE DEPARTMENT OF PUBLIC HEALTH, ROOM 616, STATE OFFICE BUILDING, SPRINGFIELD, ILLINOIS, 62706. DO NOT DETACH GEOLOGICAL / WATER SURVEYS SECTION. BE SURE TO PROVIDE PROPER WELL LOCATION.

17-20-100-002

ILLINOIS DEPARTMENT OF PUBLIC HEALTH WELL CONSTRUCTION REPORT

1. Type of Well
   a. Dug ____. Bored ✓. Hole Diam. 30 in. Depth 29 ft.
      Curb material ____. Buried Slab: Yes ____ No ____
   b. Driven ____. Drive Pipe Diam. ____ in. Depth ____ ft.
   c. Drilled ____. Finished in Drift ✓. In Rock ____.
      Tubular ____. Gravel Packed ✓.
   d. Grout:

(KIND)	FROM (Ft.)	TO (Ft.)

2. Distance to Nearest:
   Building ____ Ft. Seepage Tile Field ____
   Cess Pool ____ Sewer (non Cast iron) ____
   Privy ____ Sewer (Cast iron) ____
   Septic Tank ____ Barnyard ____
   Leaching Pit ____ Manure Pile ____
3. Is water from this well to be used for human consumption?
   Yes ✓ No ____
4. Date well completed ____
5. Permanent Pump Installed? Yes ____ No ✓
   Manufacturer ____ Type ____
   Capacity ____ gpm. Depth of setting ____ ft.
6. Well Top Sealed? Yes ✓ No ____
7. Pitless Adaptor Installed? Yes ✓ No ____
8. Well Disinfected? Yes ✓ No ____
9. Water Sample Submitted? Yes ____ No ✓

REMARKS:

P115407 No Building

IDPH 4.065
10/68

GEOLOGICAL AND WATER SURVEYS WELL RECORD (F)

10. Property owner James May Well No. ____
    Address Hillsboro, Ill.
    Driller [illegible] License No. [illegible]
11. Permit No. NE/80 87 Date ____
12. Water from Clay (Formation) 13. County Montgomery
    at depth ____ to ____ ft. Sec. 20
14. Screen: Diam. ____ in. Twp. 8N
    Length: ____ ft. Slot ____ Rge. 3W
    Elev. ____

SHOW LOCATION IN SECTION PLAT

SE SW NW

15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
30	Concrete	30	

16. Size Hole below casing: ____ in.
17. Static level ____ ft. below casing top which is ____ ft. above ground level. Pumping level ____ ft. when pumping at ____ gpm for ____ hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
Clay	29	

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED [illegible signature] DATE 4-[illegible]-73

Whi : Pink Copies:
Ill. D of Public Health
Yellow y: Well Contractor
Golden Copy: Well Owner

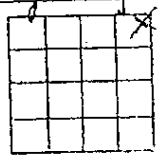
Well Construction Report

17-22-200-001
(47)

THIS FORM MUST BE COMPLETED WITHIN 30 DAYS
OF WELL COMPLETION AND SENT TO
THE ILLINOIS DEPARTMENT OF PUBLIC HEALTH
DIVISION OF ENVIRONMENTAL HEALTH
525 WEST JEFFERSON STREET
SPRINGFIELD, ILLINOIS 62761

GEOLOGICAL AND WATER SURVEYS WELL RECORD

9. Driller Harold Link License No. 092-006071
10. Well Site Address Coffeyville
11. Property Owner Mike Spinner Well No.
12. Permit No. 014696 Date Issued 9-19-89
13. Location: County Montgomery
Sec. 32-11 Twp. 8N Rge. 3W


Show location in section plat

NE NE NE

1. Type of Well
a. Bored ✓ Hole Diam. 44 in. Depth 35 ft
Buried Slab: Yes ✓ No
b. Driven Drive Pipe Diam. in. Depth ft
c. Drilled Finished in Drift In Rock

d. Grout:

(KIND)	FROM (Ft.)	TO (Ft.)

2. Well furnishes water for human consumption? Yes ✓ No
3. Date well drilled 10-31-89
4. Permanent pump installed? Yes Date No ✓
Manufacturer Type
Location
Capacity gpm. Depth of setting ft.
5. Well top sealed? Yes ✓ No Type
6. Pitless adapter installed? Yes No ✓
Manufacturer Model No.
How attached to casing?
7. Well disinfected? Yes No ✓
8. Pump and equipment disinfected Yes No ✓

14. Water from gravel at depth 14 ft
to 31 ft

15. Casing and Liner Pipe

Diam.(in)	Kind and Weight	From (ft)	To (ft)
6	plastic		11
36	Concrete		35

16. Screen: Diam. in, Length in, Slot Size
17. Size hole below casing in. 18. Ground Elev. ft msl.
19. Static level ft below casing top which is ft. above ground level. Pumping level ft, pumping gpm for hours.

20. Earth Materials Passed Through	Depth of Top	Depth of Bottom
Clay		14
yellow gravel & clay		18
gray clay & gravel		31
gray clay		35

Continue on separate sheet if necessary.

Signed Harold Link Date 10-31-89

IMPORTANT NOTICE

This State Agency is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under Public Act 85-0863. Disclosiure of this information is mandatory. This form has been approved by the Forms Management Center.

PRESS FIRMLY WITH BLACK PEN OR TYPE
Do Not Use Felt Pen

IL482-0126 P201583

WELL CONST CTION REPORT Date 4/20/99

17-27-200-003 (G)

TYPE OR PRESS FIRMLY WITH BLACK INK PEN, THIS FORM MUST BE COMPLETED WITHIN 30 DAYS OF COMPLETION AND SENT TO THE APPROPRIATE HEALTH DEPARTMENT

1. Date Well Completed 4/30/99
2. Use: [✓] Domestic [ ] Irrigation [ ] Commercial [ ] Livestock [ ] Monitoring [ ] Other
3. Type of Well:
   a. Bored Well: Hole Diameter 44 in. Depth 32 ft. Casing Diameter 6/36 in. Buried Slab: [✓] Yes [ ] No
   b. Driven Well: Drive Pipe Diameter ____ in. Depth ____ ft.
   c. Drilled Well: Well Diameter ____ in. Depth ____ ft. Casing Diameter ____ in. Type ____ Joint ____

Casing Grout:

Kind	Oversized Drill Hole(In)	From(ft)	To(ft)
Bentonite Hole Plug		9	10

Finished In: Unconsolidated [✓] Gravel Pack: [✓] Yes [ ] No
Rock [ ] Grain Size ½ pea gravel

4. Well Disinfected? [✓] Yes. [ ] No
5. Date Permanent Pump Installed
6. Licensed Pump Contractor
   License Number
7. Pitless Adapter Installed? [ ] Yes [✓] No
   Manufacturer Martinson Model EP10X
   Attached to Casing - How? [ ] Screwed On [ ] Welded [✓] Compression
8. Type of Well Cap Monitor Co. NETP
9. Tank Working Cycle ____ gallons Captive Air: [ ] Yes [ ] No
10. Pump and Equipment Disinfected? [ ] Yes [ ] No

CO# 23906

General Comments: (If dry hole, fill out log & indicate how hole was sealed.)

agent for State

MONTGOMERY COUNTY HEALTH D.
ROUTE 185
P.O. BOX 128
HILLSBORO, ILLINOIS 62049

Illinois Department of Public Health
Division of Environmental Health - 525 W. Jefferson
Springfield, IL 62761 P-309521

IMPORTANT NOTICE. This State Agency is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under Public Act 85-0863. Disclosure of this information is mandatory. This form has been approved by the Forms Management Center.

IL 482-0126 Printed by Authority of the State of Illinois P.O. PRT3030244 6.5M 6/98

GEOLOGICAL AND WATER SURVEY WELL RECORD

11. Permit Number 135/005/99 Date Issued 4/11/99
12. Property Owner Fred Hubert Well # 2
13. Drilling Company Name Smith Water Well Drilling
14. Name of Person who drilled the well Steve Walters
15. Well Site Address 7225 Coffeen Rd, Coffeen, IL
16. Twnshp Name E. Fork Land ID#
17. Subdivision Name ____ Lot ____ Elevation ____ ft.
18. Location: Cnty Montgomery Sect 27 Twnshp 8N Range 2W
    SW Quarter of the SE Quarter of the NE Quarter
19. Casing and Liner Pipe:

Dia (In)	Type	From(ft)	To (ft)
6	ASTM F480 SDR21	0	10
	Hole Plug	9	10
36	Concrete	10	32

20. Screen: Diameter ____ in. Length ____ ft. Slot Size ____ Material ____

21. Water from Gravelly clay at depth 10 ft. to 13 ft.
22. Static Level 12 ft. below casing top which is 24 in. above ground level.
    Pumping Level ____ ft. Pumping ____ gpm for ____ hours.
23. Earth Materials Passed Through

Earth Materials Passed Through	Depth Top(ft)	Depth Bottom(ft)
Clay	0	9
Yellow clay	9	13
Brown clay	13	16
Gray sandy clay	16	22
Gray gravelly sand +		
brown gravel gravelly clay	22	26
Gray gravelly clay	26	32

Continue on back of sheet if necessary

Steven M. Walters
Licensed Contractor Signature

102 023800
License Number

11/95

(SEE REVERSE SIDE FOR ADDITIONAL INFORMATION)

White Copy – Ill. Dept. of P[illegible]c Health
Yellow Copy – Well Contractor
Blue Copy – Well Owner

INSTRUCTIONS TO [illegible]LERS

FILL IN ALL PERTINENT INFORMATION REQU[illegible]ED AND MAIL ORIGINAL TO STATE DEPARTMENT OF PUBLIC HEALTH, CONSUMER HEALTH PROTECTION, 535 WEST JEFFERSON, SPRINGFIELD, ILLINOIS, 62761. DO NOT DETACH GEOLOGICAL/WATER SURVEYS SECTION. BE SURE TO PROVIDE PROPER WELL LOCATION.

17-28-100-004
(H)

ILLINOIS DEPARTMENT OF PUBLIC HEALTH WELL CONSTRUCTION REPORT

1. Type of Well
   a. Dug ____. Bored ✓. Hole Diam. 44 in. Depth 40 ft.
   Curb material [illegible]. Buried Slab: Yes ✓ No ____
   b. Driven ____. Drive Pipe Diam. ____ in. Depth ____ ft.
   c. Drilled ____. Finished in Drift ____. In Rock ____.
   Tubular ____. Gravel Packed ____.
   d. Grout:

(KIND)	FROM (Ft.)	TO (Ft.)

2. Distance to Nearest:
   Building 20 Ft. Seepage Tile Field 100
   Cess Pool – Sewer (non Cast iron) –
   Privy – Sewer (Cast iron) –
   Septic Tank 175 Barnyard –
   Leaching Pit – Manure Pile ____
3. Well furnishes water for human consumption? Yes ✓ No ____
4. Date well completed 4-11-77
5. Permanent Pump Installed? Yes ____ Date ____ No ✓
   Manufacturer ____ Type ____ Location ____
   Capacity ____ gpm. Depth of Setting ____ Ft.
6. Well Top Sealed? Yes ✓ No ____ Type ____
7. Pitless Adapter Installed? Yes ____ No ✓
   Manufacturer ____ Model Number ____
   How attached to casing? ____
8. Well Disinfected? Yes ____ No ✓
9. Pump and Equipment Disinfected? Yes ____ No ✓
10. Pressure Tank Size ____ gal. Type ____
   Location ____
11. Water Sample Submitted? Yes ____ No ✓

REMARKS:

P115411

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner [illegible] Well No. ____
    Address [illegible]
    Driller [illegible] License No. 92-471
11. Permit No. 58605 Date 4-5-77
12. Water from [illegible] (Formation) 13. County [illegible]
    at depth 15 to 18 ft. Sec. 28 [illegible]
14. Screen: Diam. ____ in. Twp. 8N
    Length: ____ ft. Slot ____ Rge. 3W
    Elev. ____

SHOW LOCATION IN SECTION PLAT
SW SE NW

15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
6	[illegible]		10
36	concrete		40

16. Size Hole below casing: ____ in.
17. Static level ____ ft. below casing top which is ____ ft. above ground level. Pumping level ____ ft. when pumping at ____ gpm for ____ hours.

18.

FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
Clay		15
[illegible] clay		18
[illegible]		40

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED [signature] DATE 4-11-77

IDPH 4.065
[illegible]1/74 [illegible] KNB-1

White/Pink Copies: Ill. of Public Health
Yellow Copy: Well Contractor
Golden Copy: Well Owner

Well Construction Report

17-30-400-002 (61)

THIS FORM MUST BE COMPLETED WITHIN 30 DAYS OF WELL COMPLETION AND SENT TO THE ILLINOIS DEPARTMENT OF PUBLIC HEALTH DIVISION OF ENVIRONMENTAL HEALTH 525 WEST JEFFERSON STREET SPRINGFIELD, ILLINOIS 62761

Agent for State:
MONTGOMERY COUNTY HEALTH DEPT.
ROUTE 185
P.O. BOX 128
HILLSBORO, ILLINOIS 62049

GEOLOGICAL AND WATER SURVEYS WELL RECORD

1. Type of Well
   a. Bored ✓ Hole Diam. 30 in. Depth 15 ft
      Buried Slab: Yes ✓ No
   b. Driven ___ Drive Pipe Diam. ___ in. Depth ___ ft
   c. Drilled ___ Finished in Drift ___ In Rock ___
   d. Grout:

(KIND)	FROM (Ft.)	TO (Ft.)
clay	0	10

2. Well furnishes water for human consumption? Yes ✓ No ___
3. Date well drilled 7/15/94
4. Permanent pump installed? Yes ___ Date ___ No ✓
   Manufacturer ___ Type ___
   Location ___
   Capacity 3 gpm. Depth of setting ___ ft.
5. Well top sealed? Yes ✓ No ___ Type ___
6. Pitless adapter installed? Yes ✓ No ___
   Manufacturer ___ Model No. ___
   How attached to casing? ✓
7. Well disinfected? Yes ✓ No ___
8. Pump and equipment disinfected Yes ___ No ___

9. Driller Gary E Noll License No. 052006238
10. Well Site Address Hillsboro IL
11. Property Owner Gerald Young Well No. ___
12. Permit No. 1350944 Date Issued ___
13. Location: Live Stock Well
    County Montgomery
    Sec. 30 4a
    Twp. 8N
    Rge. 3W
    Show location in section plat: SWSWSE
14. Water from Gravel at depth 10 to 20 ft to ___ ft

15. Casing and Liner Pipe			
Diam. (in)	Kind and Weight	From (ft)	To (ft)
30	concrete	15	
~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	

16. Screen: Diam. 30 in, Length 36 in, Slot Size ___
17. Size hole below casing ___ in. 18. Ground Elev. ___ ft msl.
19. Static level ___ ft below casing top which is ___ ft. above ground level. Pumping level ___ ft, pumping gpm for ___ hours.

20. Earth Materials Passed Through	Depth of Top	Depth of Bottom
Gravel	10 15	
No clay		

Continue on separate sheet if necessary.

Signed Gary E Noll Date 7/19/94

IMPORTANT NOTICE

This State Agency is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under Public Act 85-0863. Disclosure of this information is mandatory. This form has been approved by the Forms Management Center.

PRESS FIRMLY WITH BLACK PEN OR TYPE
Do Not Use Felt Pen

IL482-0126

Pink Copies:
Ill. pt. of Public Health
Yellow Copy: Well Contractor
Golden Copy: Well Owner

Well Construction Report

17-30-400-003

THIS FORM MUST BE COMPLETED WITHIN 30 DAYS
OF WELL COMPLETION AND SENT TO
THE ILLINOIS DEPARTMENT OF PUBLIC HEALTH
DIVISION OF ENVIRONMENTAL HEALTH
525 WEST JEFFERSON STREET
SPRINGFIELD, ILLINOIS 62761

GEOLOGICAL AND WATER SURVEYS WELL RECORD (S)

9. Driller Gary E. Noll License No. 092-0062
10. Well Site Address Hillsboro Ill
11. Property Owner Brad Young Well No.
12. Permit No. 015857 Date Issued 11/13/8
13. Location: County Montgomery
Sec. 30-a
Twp. 8N
Rge. 3W

Show location in section plat

SE SE SE

1. Type of Well
a. Bored ✓ Hole Diam. 30 in. Depth 35 ft
Buried Slab: Yes___ No ✓
b. Driven___ Drive Pipe Diam.___in. Depth___ft
c. Drilled___ Finished in Drift___ In Rock___

d. Grout:

(KIND)	FROM (Ft.)	TO (Ft.)

2. Well furnishes water for human consumption? Yes ✓ No___
3. Date well drilled 11/30/89
4. Permanent pump installed? Yes___ Date___ No ✓
Manufacturer___ Type___
Location___
Capacity 5 gpm. Depth of setting___ft.
5. Well top sealed? Yes ✓ No___ Type___
6. Pitless adapter installed? Yes___ No ✓
Manufacturer___ Model No.___
How attached to casing?___
7. Well disinfected? Yes ✓ No___
8. Pump and equipment disinfected Yes___ No___

14. Water from ___ at depth___ft to___ft

15. Casing and Liner Pipe

Diam.(in)	Kind and Weight	From (ft)	To (ft)
30	concrete	36	

16. Screen: Diam. 30 in, Length 36 in, Slot Size___
17. Size hole below casing___in. 18. Ground Elev.___ ft msl.
19. Static level___ft below casing top which is ___ft. above ground level. Pumping level ___ft, pumping gpm for ___ hours.

20. Earth Materials Passed Through	Depth of Top	Depth of Bottom
Clay	35	

Continue on separate sheet if necessary.

Signed Gary E. Noll Date 11/30/89

IMPORTANT NOTICE
This State Agency is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under Public Act 85-0863. Disclosure of this information is mandatory. This form has been approved by the Forms Management Center.

P206323

PRESS FIRMLY WITH BLACK PEN OR TYPE
Do Not Use Felt Pen

IL482-0126

White Copy – Ill. Dept. of Public Health
Yellow Copy – Well Contractor
Blue Copy – Well Owner

INSTRUCTIONS TO DRILLERS

FILL IN ALL PERTINENT INFORMATION REQUESTED AND MAIL ORIGINAL TO STATE DEPARTMENT OF PUBLIC HEALTH, CONSUMER HEALTH PROTECTION, 535 WEST JEFFERSON, SPRINGFIELD, ILLINOIS, 62761. DO NOT DETACH GEOLOGICAL/WATER SURVEYS SECTION. BE SURE TO PROVIDE PROPER WELL LOCATION.

17-31-100-002

ILLINOIS DEPARTMENT OF PUBLIC HEALTH
WELL CONSTRUCTION REPORT

1. Type of Well
   a. Dug____. Bored ✓. Hole Diam. 30 in. Depth 24 ft.
   Curb material _____. Buried Slab: Yes____ No____
   b. Driven _____. Drive Pipe Diam. _____ in. Depth _____ ft.
   c. Drilled _____. Finished in Drift _____. In Rock _____.
   Tubular _____. Gravel Packed ✓.
   d. Grout:

(KIND)	FROM (Ft.)	TO (Ft.)

2. Distance to Nearest:
   Building Na Ft. — Seepage Tile Field _____
   Cess Pool _____ — Sewer (non Cast iron) _____
   Privy _____ — Sewer (Cast iron) _____
   Septic Tank Na — Barnyard _____
   Leaching Pit _____ — Manure Pile _____
3. Well furnishes water for human consumption? Yes____ No ✓
4. Date well completed _____
5. Permanent Pump Installed? Yes____ Date _____ No ✓
   Manufacturer _____ Type _____ Location _____
   Capacity _____ gpm. Depth of Setting _____ Ft.
6. Well Top Sealed? Yes ✓ No____ Type _____
7. Pitless Adapter Installed? Yes____ No ✓
   Manufacturer _____ Model Number _____
   How attached to casing? _____
8. Well Disinfected? Yes ✓ No _____
9. Pump and Equipment Disinfected? Yes____ No _____
10. Pressure Tank Size____ gal. Type _____
    Location _____
11. Water Sample Submitted? Yes____ No ✓

REMARKS:

P115412

IDPH 4.065
1/74 – KNB-1

GEOLOGICAL AND WATER SURVEYS WELL RECORD (K)

10. Property owner Gerald Young Well No. _____
    Address Hillsboro Ill
    Driller Gary E. Null License No. 92-623
11. Permit No. 92178 Date _____
12. Water from clay (Formation) 13. County Montgomery
    at depth ____ to ____ ft.
14. Screen: Diam. _____ in.
    Length: _____ ft. Slot _____
    Sec. 36 NW
    Twp. 8N
    Rge. 3W
    Elev. _____

SHOW LOCATION IN SECTION PLAT
NE NE NE

15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
30	Concrete	25	

16. Size Hole below casing: _____ in.
17. Static level _____ ft. below casing top which is _____ ft. above ground level. Pumping level _____ ft. when pumping at _____ gpm for _____ hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
clay	24	

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Gary E. Null DATE 4-14-80

White Co
Ill. Dept. of Public Health
Yellow Copy – Well Contractor
Blue Copy – Well Owner

INSTRUCTIONS TO DRILLERS

FILL IN ALL PERTINENT INFORMATION REQUESTED AND MAIL ORIGINAL TO STATE DEPARTMENT OF PUBLIC HEALTH, CONSUMER HEALTH PROTECTION, 535 WEST JEFFERSON, SPRINGFIELD, ILLINOIS, 62761. DO NOT DETACH GEOLOGICAL/WATER SURVEYS SECTION. BE SURE TO PROVIDE PROPER WELL LOCATION.

17-31-100-002

ILLINOIS DEPARTMENT OF PUBLIC HEALTH
WELL CONSTRUCTION REPORT

1. Type of Well
   a. Dug ____. Bored ✓. Hole Diam. 30 in. Depth 50 ft.
   Curb material ____. Buried Slab: Yes ____ No ____
   b. Driven ____. Drive Pipe Diam. ____ in. Depth ____ ft.
   c. Drilled ____. Finished in Drift ____. In Rock ____.
   Tubular ____. Gravel Packed ✓.
   d. Grout:

(KIND)	FROM (Ft.)	TO (Ft.)

2. Distance to Nearest:
   Building No Ft. — Seepage Tile Field ____
   Cess Pool ____ — Sewer (non Cast iron) ____
   Privy ____ — Sewer (Cast iron) ____
   Septic Tank No — Barnyard ____
   Leaching Pit ____ — Manure Pile ____
3. Well furnishes water for human consumption? Yes ✓ No ____
4. Date well completed ____
5. Permanent Pump Installed? Yes ____ Date ____ No ✓
   Manufacturer ____ Type ____ Location ____
   Capacity ____ gpm. Depth of Setting ____ Ft.
6. Well Top Sealed? Yes ✓ No ____ Type ____
7. Pitless Adapter Installed? Yes ____ No ✓
   Manufacturer ____ Model Number ____
   How attached to casing? ____
8. Well Disinfected? Yes ✓ No ____
9. Pump and Equipment Disinfected? Yes ____ No ____
10. Pressure Tank Size ____ gal. Type ____
    Location ____
11. Water Sample Submitted? Yes ____ No ✓

REMARKS:

P115413

IDPH 4.065
1/74 – KNB-1

GEOLOGICAL AND WATER SURVEYS WELL RECORD

(L)

10. Property owner Gerald Young Well No. ____
    Address Hillsboro Ill.
    Driller Gary E. Noll License No. 92-623
11. Permit No. 92179 Date ____
12. Water from ____ (Formation) 13. County Montgomery
    at depth ____ to ____ ft.
14. Screen: Diam. ____ in.
    Length: ____ ft. Slot ____
    Sec. 31 N
    Twp. 8N
    Rge. 3W
    Elev. ____

SHOW LOCATION IN SECTION PLAT
NE NE NE

15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
30	Concrete	51	

16. Size Hole below casing: ____ in.
17. Static level ____ ft. below casing top which is ____ ft. above ground level. Pumping level ____ ft. when pumping at ____ gpm for ____ hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
Clay	50	

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Gary E Noll DATE 4-14-80

White – Ill. Dept. of Public Health
Yellow Copy – Well Contractor
Blue Copy – Well Owner

INSTRUCTIONS TO DRILLERS

FILL IN ALL PERTINENT INFORMATION REQUESTED AND MAIL ORIGINAL TO STATE DEPARTMENT OF PUBLIC HEALTH, CONSUMER HEALTH PROTECTION, 535 WEST JEFFERSON, SPRINGFIELD, ILLINOIS, 62761. DO NOT DETACH GEOLOGICAL/WATER SURVEYS SECTION. BE SURE TO PROVIDE PROPER WELL LOCATION.

17-31-100-002

ILLINOIS DEPARTMENT OF PUBLIC HEALTH
WELL CONSTRUCTION REPORT

1. Type of Well
   a. Dug ____. Bored ✓. Hole Diam. 30 in. Depth 49 ft.
   Curb material ____. Buried Slab: Yes ____ No ____
   b. Driven ____. Drive Pipe Diam. ____ in. Depth ____ ft.
   c. Drilled ____. Finished in Drift ____. In Rock ____.
   Tubular ____. Gravel Packed ✓.
   d. Grout:

(KIND)	FROM (Ft.)	TO (Ft.)

2. Distance to Nearest:
   Building No Ft. — Seepage Tile Field ____
   Cess Pool ____ — Sewer (non Cast iron) ____
   Privy ____ — Sewer (Cast iron) ____
   Septic Tank No — Barnyard ____
   Leaching Pit ____ — Manure Pile ____
3. Well furnishes water for human consumption? Yes ✓ No ____
4. Date well completed ____
5. Permanent Pump Installed? Yes ____ Date ____ No ✓
   Manufacturer ____ Type ____ Location ____
   Capacity ____ gpm. Depth of Setting ____ Ft.
6. Well Top Sealed? Yes ✓ No ____ Type ____
7. Pitless Adapter Installed? Yes ____ No ✓
   Manufacturer ____ Model Number ____
   How attached to casing? ____
8. Well Disinfected? Yes ✓ No ____
9. Pump and Equipment Disinfected? Yes ____ No ____
10. Pressure Tank Size ____ gal. Type ____
    Location ____
11. Water Sample Submitted? Yes ____ No ✓

REMARKS:

P 115414

IDPH 4.065
1/74 – KNB-1

GEOLOGICAL AND WATER SURVEYS WELL RECORD

(M)

10. Property owner Gerald Young Well No. ____
    Address Hillsboro, Ill.
    Driller Gary E. Wall License No. 92-623
11. Permit No. 40135 Date ____
12. Water from ____ (Formation) 13. County Montgomery
    at depth ____ to ____ ft.
    Sec. 31
    Twp. 8N
    Rge. 3W
    Elev. ____
14. Screen: Diam. ____ in.
    Length: ____ ft. Slot ____

SHOW LOCATION IN SECTION PLAT
NW NE NE

15. Casing and Liner Pipe

Diam. (In.)	Kind and Weight	From (Ft.)	To (Ft.)
30	concrete	+0	

16. Size Hole below casing: ____ in.
17. Static level ____ ft. below casing top which is ____ ft. above ground level. Pumping level ____ ft. when pumping at ____ gpm for ____ hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
clay	49	

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Gary E. Wall DATE 1-14-80.

White Copy – Ill. Dept. of Pu[illegible] alth
Yellow Copy – We[illegible] ntractor
Blue Copy – Well Owner

FILL IN ALL PERTINENT INFORMATION REQUE[illegible]D AND MAIL ORIGINAL TO STATE DEPARTMENT OF PUBLIC HEALTH, CONSUM[illegible]EALTH PROTECTION, 535 WEST JEFFERSON, SPRINGFIELD, ILLINOIS, 62761. DO NOT DETACH GEOLOGICAL/WATER SURVEYS SECTION. BE SURE TO PROVIDE PROPER WELL LOCATION.

17-32-100-002 (N)

ILLINOIS DEPARTMENT OF PUBLIC HEALTH
WELL CONSTRUCTION REPORT

1. Type of Well
   a. Dug ____. Bored ✓. Hole Diam. 44 in. Depth 64 ft.
   Curb material ____. Buried Slab: Yes ✓ No ____
   b. Driven ____. Drive Pipe Diam. ____ In. Depth ____ ft.
   c. Drilled ____. Finished in Drift ____. In Rock ____.
   Tubular ____. Gravel Packed ____.
   d. Grout:

(KIND)	FROM (Ft.)	TO (Ft.)

2. Distance to Nearest:
   Building 100 Ft. — Seepage Tile Field ____
   Cess Pool ____ — Sewer (non Cast Iron) ____
   Privy ____ — Sewer (Cast Iron) ____
   Septic Tank ____ — Barnyard ____
   Leaching Pit ____ — Manure Pile ____
3. Well furnishes water for human consumption? Yes ✓ No ____
4. Date well completed June 26-77
5. Permanent Pump Installed? Yes ____ Date ____ No ✓
   Manufacturer ____ Type ____ Location ____
   Capacity ____ gpm. Depth of Setting ____ Ft.
6. Well Top Sealed? Yes ✓ No ____ Type ____
7. Pitless Adapter Installed? Yes ____ No ✓
   Manufacturer ____ Model Number ____
   How attached to casing? ____
8. Well Disinfected? Yes ____ No ✓
9. Pump and Equipment Disinfected? Yes ____ No ✓
10. Pressure Tank Size ____ gal. Type ____
    Location ____
11. Water Sample Submitted? Yes ____ No ✓

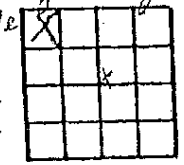
REMARKS:

P 115416

IDPH 4.065
1/74 – KNB:1

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Roy Kasber Well No. ____
    Address Coffeen
    Driller Beasley License No. 92-477
11. Permit No. 61679 Date June 6 – 1977
12. Water from gravel & sand (Formation) 13. County Montgomery
    at depth 24 to 37 ft.
14. Screen: Diam. ____ in.
    Length: ____ ft. Slot ____
    Sec. 3 ne/4
    Twp. 8N
    Rge. 3W
    Elev. ____



SHOW LOCATION IN SECTION PLAT

SW SW NE

15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
6	Plastic		10
36	Concrete		64

16. Size Hole below casing: ____ in.
17. Static level ____ ft. below casing top which is ____ ft. above ground level. Pumping level ____ ft. when pumping at ____ gpm for ____ hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
clay	24	24
Sand & gravel	13	37
Slate	9	46
Blue clay	18	64

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Eugene Beasley DATE June 26-77

White Copy – Ill. Dept. of Public Health
Yellow Copy – Well Contractor
Blue Copy – Well Owner

INSTRUCTIONS TO [ ]ERS

FILL IN ALL PERTINENT INFORMATION REQUES[ ]D AND MAIL ORIGINAL TO STATE DEPARTMENT OF PUBLIC HEALTH, CONSUMER HEALTH PROTECTION, 535 WEST JEFFERSON, SPRINGFIELD, ILLINOIS, 62761. DO NOT DETACH GEOLOGICAL/WATER SURVEYS SECTION. BE SURE TO PROVIDE PROPER WELL LOCATION.

P

17-32-100-004

[redacted] I

ILLINOIS DEPARTMENT OF PUBLIC HEALTH
WELL CONSTRUCTION REPORT

1. Type of Well
   a. Dug ____. Bored ✓. Hole Diam. 44 in. Depth 50 ft.
      Curb material Conc. Buried Slab: Yes ✓ No ____
   b. Driven ____. Drive Pipe Diam. ____ in. Depth ____ ft.
   c. Drilled ____. Finished in Drift ____. In Rock ____
      Tubular ____. Gravel Packed ____.
   d. Grout:

(KIND)	FROM (Ft.)	TO (Ft.)

2. Distance to Nearest:
   Building 100 Ft. Seepage Tile Field 175
   Cess Pool — Sewer (non Cast iron) —
   Privy — Sewer (Cast iron) —
   Septic Tank 175 Barnyard —
   Leaching Pit — Manure Pile —
3. Well furnishes water for human consumption? Yes ✓ No ____
4. Date well completed 4-13-88
5. Permanent Pump Installed? Yes ____ Date ____ No ✓
   Manufacturer ____ Type ____ Location ____
   Capacity ____ gpm. Depth of Setting ____ Ft.
6. Well Top Sealed? Yes ✓ No ____ Type ____
7. Pitless Adapter Installed? Yes ____ No ✓
   Manufacturer ____ Model Number ____
   How attached to casing? ____
8. Well Disinfected? Yes ____ No ✓
9. Pump and Equipment Disinfected? Yes ____ No ✓
10. Pressure Tank Size ____ gal. Type ____
    Location ____
11. Water Sample Submitted? Yes ____ No ✓

REMARKS:

Co# 23147

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Tom Foster Well No. ____
    Address Hillsboro
    Driller Link License No. 092-00071
11. Permit No. 00649 Date 3-18-88
12. Water from gravel (Formation) 12-14
    at depth 37 to 39 ft.
13. County Montgomery
    Sec. 32 Twp. 8N Rge. 3W Elev. ____
14. Screen: Diam. ____ in.
    Length: ____ ft. Slot ____

SHOW LOCATION IN SECTION PLAT: NW NW NW

15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
6	plastic		14
36	Concrete		50

16. Size Hole below casing: ____ in.
17. Static level ____ ft. below casing top which is ____ ft. above ground level. Pumping level ____ ft. when pumping at ____ gpm for ____ hours.

18.

FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
Clay		12
gravely clay		14
gray clay		37
gray gravel		39
gravely clay		50

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Harold Link DATE 4-15-88

IDPH 4.065
1/74 — KNB-1

3A

White Copy — Ill. Dept. of Public Health
Yellow Copy — Well Contractor
Blue Copy — Well Owner

INSTRUCTIONS TO DRILLERS

FILL IN ALL PERTINENT INFORMATION REQUESTED AND MAIL ORIGINAL TO STATE DEPARTMENT OF PUBLIC HEALTH, CONSUMER HEALTH PROTECTION, 535 WEST JEFFERSON, SPRINGFIELD, ILLINOIS, 62761. DO NOT DETACH GEOLOGICAL/WATER SURVEYS SECTION. BE SURE TO PROVIDE PROPER WELL LOCATION.

17-32-100-004

ILLINOIS DEPARTMENT OF PUBLIC HEALTH
WELL CONSTRUCTION REPORT

1. Type of Well
   a. Dug ____. Bored ✓. Hole Diam. 42 in. Depth 50 ft.
      Curb material Conc. Buried Slab: Yes ✓ No ____
   b. Driven ____. Drive Pipe Diam. ____ in. Depth ____ ft.
   c. Drilled ____. Finished in Drift ____. In Rock ____.
      Tubular ____. Gravel Packed ____.
   d. Grout:

(KIND)	FROM (Ft.)	TO (Ft.)

2. Distance to Nearest:
   Building — Ft. Seepage Tile Field —
   Cess Pool — Sewer (non Cast iron) —
   Privy — Sewer (Cast iron) —
   Septic Tank — Barnyard —
   Leaching Pit — Manure Pile ____
3. Well furnishes water for human consumption? Yes ✓ No ____
4. Date well completed July 8-76
5. Permanent Pump Installed? Yes ____ Date ____ No ✓
   Manufacturer ____ Type ____ Location ____
   Capacity ____ gpm. Depth of Setting ____ Ft.
6. Well Top Sealed? Yes ✓ No ____ Type ____
7. Pitless Adapter Installed? Yes ____ No ✓
   Manufacturer ____ Model Number ____
   How attached to casing? ____
8. Well Disinfected? Yes ____ No ✓
9. Pump and Equipment Disinfected? Yes ____ No ✓
10. Pressure Tank Size ____ gal. Type ____
    Location ____
11. Water Sample Submitted? Yes ____ No ✓

REMARKS:
New construction – no building yet

P115417

IDPH 4.065
1/74 — KNB-1

GEOLOGICAL AND WATER SURVEYS WELL RECORD

(83)

10. Property owner Robert Edmonds Well No. ____
    Address Hillsboro, Ill.
    Driller Beasley License No. 92-471
11. Permit No. 47817 Date May 27-76
12. Water from gravel (Formation) 13. County Montgomery
    at depth 27 to 36 ft.
    Sec. 32 Twp. 8N Rge. 3W Elev. ____
14. Screen: Diam. ____ in.
    Length: ____ ft. Slot ____

SHOW LOCATION IN SECTION PLAT: NW NW NW

15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
6	Plastic		10
36	Concrete		50

16. Size Hole below casing: ____ in.
17. Static level ____ ft. below casing top which is ____ ft. above ground level. Pumping level ____ ft. when pumping at ____ gpm for ____ hours.

18.

FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
Clay		9
Gravelly clay		11
Hardpan yellow		21
Gray hardpan		27
Gravel hardpan mixed with sand		36
Gray hardpan		50

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Eugene Beasley DATE 7-8-76

16-13-200-002

(0)

LOG OF WATER WELL

Property owner O B EDWARDS Well No. 1

Drilled by J H Smith Farina Year 1949

Formations passed through	Thickness	Depth of Bottom
Well 17 ft to Begins With		
17 - 20 fine gravel & sand		
20 - 25 Gravel		
25/45 Blue Clay & gravel mixed		
45 - 60 Blue shale & gravel mixed		
60 - 65 Blue shale		
65 - 70 Shale + gravel		
TD 70		

[Continue on back if necessary]

Finished in Shale + gravel at 65 to 70 ft.

Cased with 7 inch Black pipe from 0-12 dia. 0 to 21 ft.

and 6 1/4 inch Open Hole from 21 to 70 ft.

Size hole below casing ______ inch. Static level from surf. 16 ft.

Tested capacity 30 gal. per ~~min.~~ Hr Temperature ______ °F.

Water lowered to ______ ft. ______ in. in ______ hrs. ______ min.

Length of test ______ hrs. ______ min. Screen ______

Slot ______ Diam. ______ Length ______ Bottom set at ______ ft.

[Show location in Section Plat]

Township name ______ Elev. ______ Sec. 13

Description of location ______ Twp. 9N

Rge. 4W

Signed J H Smith County Montgomery

Copy for Illinois State Water Survey Index:

P113929

UCTIONS TO DRILLERS

White Copy – Ill. Dept. of Public Health
Yellow Copy – Well Contractor
Blue Copy – Well Owner

FILL IN ALL PERTINENT INFORMATION REQUESTED AND MAIL ORIGINAL TO STATE DEPARTMENT OF PUBLIC HEALTH, CONSUMER HEALTH PROTECTION, 535 WEST JEFFERSON, SPRINGFIELD, ILLINOIS, 62761. DO NOT DETACH GEOLOGICAL/WATER SURVEYS SECTION. BE SURE TO PROVIDE PROPER WELL LOCATION.

16-25-400-004
(38)

ILLINOIS DEPARTMENT OF PUBLIC HEALTH
WELL CONSTRUCTION REPORT

1. Type of Well
   a. Dug ___. Bored ✓. Hole Diam. 42 in. Depth 34 ft.
   Curb material Cone. Buried Slab: Yes ✓ No ___
   b. Driven ___. Drive Pipe Diam. ___ in. Depth ___ ft.
   c. Drilled ___. Finished in Drift ___. In Rock ___.
   Tubular ___. Gravel Packed ___.
   d. Grout:

(KIND)	FROM (Ft.)	TO (Ft.)

2. Distance to Nearest:
   Building 15 Ft. — Seepage Tile Field 200
   Cess Pool — — Sewer (non Cast iron) —
   Privy — — Sewer (Cast iron) —
   Septic Tank 200 — Barnyard —
   Leaching Pit — — Manure Pile —
3. Well furnishes water for human consumption? Yes ✓ No ___
4. Date well completed Nov 10-75
5. Permanent Pump Installed? Yes ___ Date ___ No ✓
   Manufacturer ___ Type ___ Location ___
   Capacity ___ gpm. Depth of Setting ___ Ft.
6. Well Top Sealed? Yes ___ No ✓ Type ___
7. Pitless Adapter Installed? Yes ___ No ___
   Manufacturer ___ Model Number ___
   How attached to casing? ___
8. Well Disinfected? Yes ___ No ✓
9. Pump and Equipment Disinfected? Yes ___ No ✓
10. Pressure Tank Size ___ gal. Type ___
    Location ___
11. Water Sample Submitted? Yes ___ No ✓

REMARKS:

P113946

IDPH 4.065
1/74 – KNB-1

GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Lenny Schwartz Well No. ___
    Address Pittsburg
    Driller Bunch License No. 92-471
11. Permit No. 42668 Date Nov 4-75
12. Water from Sand (Formation)
    at depth 18 to 20 ft.
13. County Montgomery
    Sec. 25 N
    Twp. 8N
    Rge. 4W
    Elev. ___

SHOW LOCATION IN SECTION PLAT

NENE S

14. Screen: Diam. ___ in.
    Length: ___ ft. Slot ___

15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
6	plastic		10
36	concrete		34

16. Size Hole below casing: ___ in.
17. Static level ___ ft. below casing top which is ___ ft above ground level. Pumping level ___ ft. when pumping at ___ gpm for ___ hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
Clay		18
sand		20
gravy hard pan		34

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Eugene Bunch DATE Nov 10-7

Pink Copies: [illegible] of Public Health
Yellow Copy: Well Contractor
Golden Copy: Well Owner

Well Construction Report

wrong for Sta[illegible]

MONTGOMERY COUNTY [illegible]
ROUTE 185
P.O. BOX 128
HILLSBORO, ILLINOIS 62049

16-25-300-005
(113)

THIS FORM MUST BE COMPLETED WITHIN 30 DAYS
OF WELL COMPLETION AND SENT TO
THE ILLINOIS DEPARTMENT OF PUBLIC HEALTH
DIVISION OF ENVIRONMENTAL HEALTH
525 WEST JEFFERSON STREET
SPRINGFIELD, ILLINOIS 62761

Bruce Finley

GEOLOGICAL AND WATER SURVEYS WELL RECORD

9. Driller Steven Walton License No. 102003866
10. Well Site Address RR Hillsboro Ill
11. Property Owner Bruce Finley Well No. ___
12. Permit No. 135-64-96 Date Issued 9/12/96
13. Location: County Montgomery
Sec. 25
Twp. 8N
Rge. 4W

Gravely clay 10-11'
Sandy-gravel layer 11-18'
Gray sandy gravel layer 22'
14. Water from sandy gravel layer at depth 30 40 ft to 46 ft

Show location in section plat
NW NE SW
[illegible]

1. Type of Well
a. Bored ✓ Hole Diam. 44 in. Depth 60 ft
Buried Slab: Yes ✓ No ___
b. Driven ___ Drive Pipe Diam. ___ in. Depth ___ ft
c. Drilled ___ Finished in Drift ___ In Rock ___

d. Grout:

(KIND)	FROM (Ft.)	TO (Ft.)

15. Casing and Liner Pipe

Diam.(in)	Kind and Weight	From (ft)	To (ft)
6	plastic		
36	concrete		60

2. Well furnishes water for human consumption? Yes ✓ No ___
3. Date well drilled 10/4/96
4. Permanent pump installed? Yes ___ Date ___ No ✓
Manufacturer ___ Type ___
Location ___
Capacity ___ gpm. Depth of setting ___ ft.
5. Well top sealed? Yes ✓ No ___ Type clay
6. Pitless adapter installed? Yes ___ No ✓
Manufacturer Maass[illegible] Model No. BP6X
How attached to casing? ___
7. Well disinfected? Yes ✓ No ___
8. Pump and equipment disinfected Yes ___ No ✓

16. Screen: Diam. ___ in, Length ___ in, Slot Size ___
17. Size hole below casing ___ in. 18. Ground Elev. ___ ft msl.
19. Static level ___ ft below casing top which is ___ ft. above ground level. Pumping level ___ ft, pumping gpm for ___ hours.

20. Earth Materials Passed Through	Depth of Top	Depth of Bottom
Clay		7
Gravely clay		11
Hardpacked gravely clay layered gravel		18
Hardpacked gravely clay		20
Gray gravely clay layered sand gravel		30

Continue on separate sheet if necessary.
Gray gravely clay 40
Gray gravely clay layered sandy gravel 46
Layered sand gravel
Gray gravely clay 55
Gray gravely clay 60

IMPORTANT NOTICE

This State Agency is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under Public Act 85-0863. Disclosiure of this information is mandatory. This form has been approved by the Forms Management Center.

PRESS FIRMLY WITH BLACK PEN OR TYPE
Do Not Use Felt Pen

Signed Steven M. Walton Date 10/4/96

IL482-0126

White Copy – Ill. Dept. of Public Health
Yellow Copy – Well Contractor
Blue Copy – Well Owner

IN[illegible]CTIONS TO DRILLERS

FILL IN ALL PERTINENT INFORMATION REQUESTED AND MAIL ORIGINAL TO STATE DEPARTMENT OF PUBLIC HEALTH, CONSUMER HEALTH PROTECTION, 535 WEST JEFFERSON, SPRINGFIELD, ILLINOIS, 62761. DO NOT DETACH GEOLOGICAL/WATER SURVEYS SECTION. BE SURE TO PROVIDE PROPER WELL LOCATION.

16-25-400-006

ILLINOIS DEPARTMENT OF PUBLIC HEALTH
WELL CONSTRUCTION REPORT

1. Type of Well
   a. Dug ____. Bored ✓. Hole Diam. 42 in. Depth 31 ft.
      Curb material Conc. Buried Slab: Yes ✓ No ____
   b. Driven ____. Drive Pipe Diam. ____ in. Depth ____ ft.
   c. Drilled ____. Finished in Drift ____. In Rock ____.
      Tubular ____. Gravel Packed ____.
   d. Grout:

(KIND)	FROM (Ft.)	TO (Ft.)

2. Distance to Nearest:
   Building 100 Ft.
   Cess Pool –
   Privy –
   Septic Tank 110
   Leaching Pit –
   Seepage Tile Field 120
   Sewer (non Cast iron) –
   Sewer (Cast iron) –
   Barnyard –
   Manure Pile –
3. Well furnishes water for human consumption? Yes ✓ No ____
4. Date well completed May 5-75
5. Permanent Pump Installed? ~~Yes~~ ____ Date ____ No ✓
   Manufacturer ____ Type ____ Location ____
   Capacity ____ gpm. Depth of Setting ____ Ft.
6. Well Top Sealed? Yes ✓ No ____ Type ____
7. Pitless Adapter Installed? Yes ____ No ✓
   Manufacturer ____ Model Number ____
   How attached to casing? ____
8. Well Disinfected? Yes ____ No ✓
9. Pump and Equipment Disinfected? Yes ____ No ✓
10. Pressure Tank Size ____ gal. Type ____
    Location ____
11. Water Sample Submitted? Yes ____ No ✓

REMARKS:

P113951

IDPH 4.065
1/74 – KNB-1

GEOLOGICAL AND WATER SURVEYS WELL RECORD

(P)

10. Property owner Mrs. H.C. [illegible] Well No. ____
    Address Hillsboro, Ill
    Driller [illegible] License No. 92-471
11. Permit No. 37337 Date Apr 29-75
12. Water from gravelly clay (Formation) 13. County Montgomery
    at depth 12 to 15 ft.
    Sec. 25, 400
    Twp. 8N
    Rge. 4W
    Elev. ____
14. Screen: Diam. ____ in.
    Length: ____ ft. Slot ____

SHOW LOCATION IN SECTION PLAT

SWSWSE

15. Casing and Liner Pipe

Diam. (In.)	Kind and Weight	From (Ft.)	To (Ft.)
6	plastic		10
36	Concrete		31

16. Size Hole below casing: ____ in.
17. Static level ____ ft. below casing top which is ____ ft. above ground level. Pumping level ____ ft. when pumping at ____ gpm for ____ hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
Clay	12	12
gravelly clay	3	15
Clay	2	17
hard pan	14	31

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Eugene [illegible] DATE May 5-75

Hillsboro Energy LLC
Deer Run Mine

Map Index