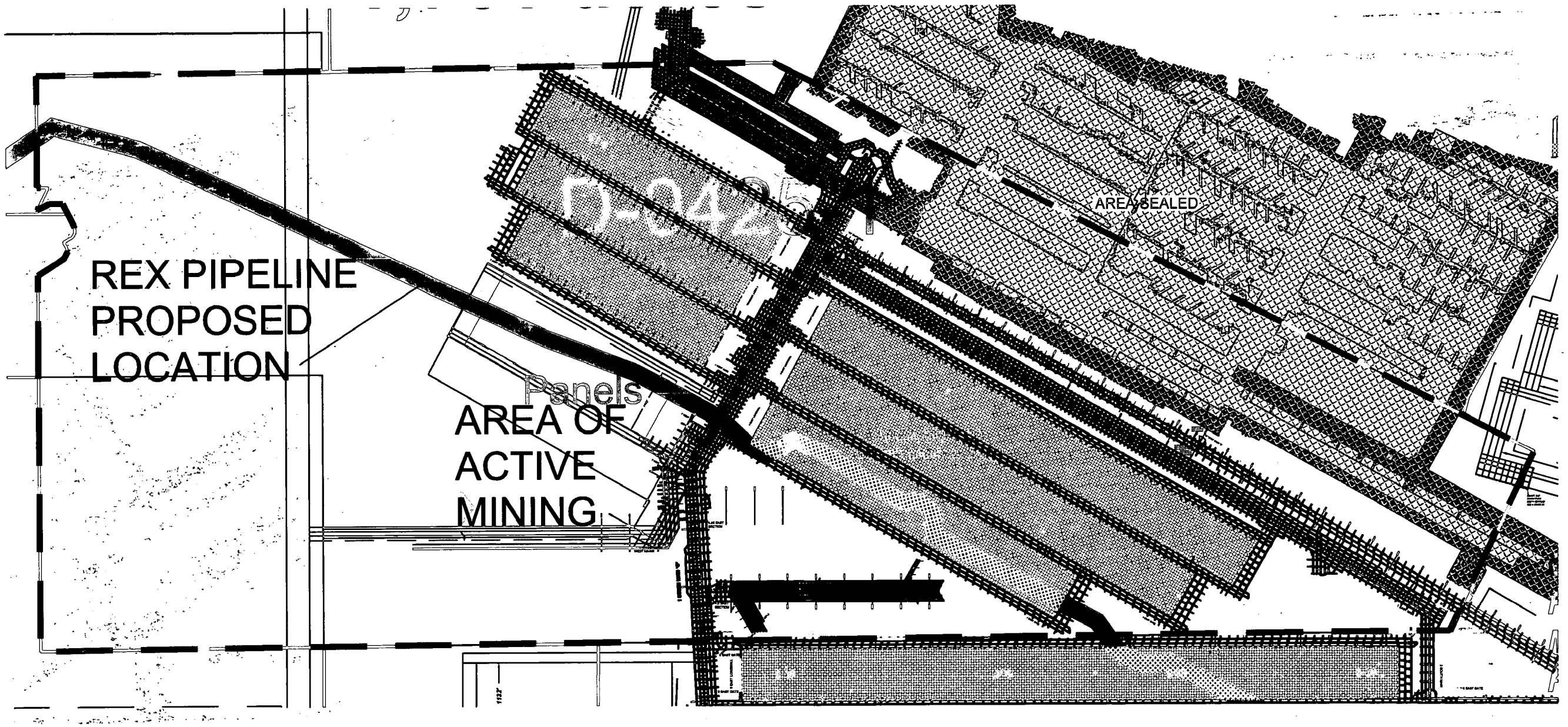

AMERICAN ENERGY CORPORATION
CENTURY MINE
APPROVED MINING AREA D-0425-1
SCALE: 1" = 2000'

BOUNDARY OF APPROVED UNDERGROUND MINING AREA

COMM. #: 625-V
NAME: Century. Mine

COAL COMPANY: Bennoc, Inc.
PHONE #: 695-9199
CONTACT PERSON: _____

DATE MAILED/DELIVERED TO ODNR 4/6/99 - UPS

DATE DEEMED COMPLETE 6-30-99
APPLICATION #: D-0425-1
APPLICATION MANAGER Scott Stitzler (Originally K. Rossmann)
HYDROLOGIST George Mychkovsky
ENGINEER _____
FIELD INSPECTOR John Poterbaugh ?

DATE 8-9-94
STORM WATER IN PLACE - OGR00014
APPLIED FOR _____

DATE OF FIRST PUBLICATION 7-5-99
DATE OF LAST PUBLICATION 7-26-99
NEWS PAPER TIMES LEADER

DATE RECEIVED 1ST REVISIONS: A.M. 1-13-00 Hydro " Eng. " Field "
DATE RETURNED 1ST REVISIONS: A.M. 10-31-00 Hydro " Eng. " Field "

BLASTING NOTICES HANDLED BY: N/A

DATE RECEIVED 2ND REVISIONS: A.M. 01-24-01 Hydro " Eng. " Field "
DATE RETURNED 2ND REVISIONS: A.M. 02-7-01 Hydro " Eng. " Field "

DATE RECEIVED 3RD REVISIONS: A.M. _____ Hydro _____ Eng. _____ Field _____
DATE RETURNED 3RD REVISION: A.M. _____ Hydro _____ Eng. _____ Field _____

DATE PERMIT APPROVED _____

PERMIT NUMBER _____

NOTES:
PER KATHY ROSSMANN ON 4-22-99 - SHE WILL START PRE-INTIAL REVIEW OF APP. 4-23-99
Deem complete revisions received 5-13/14-99 - Revised pages/maps sent in 6-11-99 by U.P.S.
6-30-99 - Mailed revised sheet 2 of map to K. Rossman (4 copies)
1st revisions hand delivered by Dave Bartsch 10-31-00.

RECEIPT 118149

OFFICE OF

COUNTY RECORDER

BELMONT CO.

ST. CLAIRSVILLE, OHIO

Instrument No. _____ Amount _____

Date 7-2 19 99

Received Of Benroc Inc.

FOR RECORDING THE FOLLOWING INSTRUMENTS:

DEED	$	
CERT. FOR TRANS.	$	
P. OF ATT'Y.	$	
RELEASE	$	
ASSIGNMENTS	$	
LIEN	$	
MORTGAGE	$	
XEROX COPY	$	
LEASE	$	
FINANCING STATEMENT	$	
	$	
	$	

#68 Permit D-0425-1 @ 9:00 am

OTHER

MARY CATHERINE NIXON, RECORDER

BY Snp. DEPUTY

McGHEE & CO., WHEELING, W. VA.

RECEIPT 118297

OFFICE OF

COUNTY RECORDER

BELMONT CO.

ST. CLAIRSVILLE, OHIO

Instrument No. _____ Amount _____

Date 10/31 19 2000

Received Of Benroc, Inc

FOR RECORDING THE FOLLOWING INSTRUMENTS:

DEED	$	
CERT. FOR TRANS.	$	
P. OF ATT'Y.	$	
RELEASE	$	
ASSIGNMENTS	$	
LIEN	$	
MORTGAGE	$	
XEROX COPY	$	
LEASE	$	
FINANCING STATEMENT	$	
	$	
	$	

#87

Permit No. D-0425

FILED OCT 31 2000 MARY CATHERINE NIXON RECORDER BELMONT CO OHIO

OTHER

MARY CATHERINE NIXON, RECORDER

BY D. L. Irwin DEPUTY

McGHEE & CO., WHEELING, W. VA.

AEC 04381

9/88

#68

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION
ADJACENT AREA COAL MINING PERMIT APPLICATION

FILED 2 1999 MARY CATHERINE UNKOW RECORDER BELMONT CO OHIO

1. Applicant BENNOC, INC.
   Address P.O. BOX 208, 38722 NATIONAL ROAD
   City MORRISTOWN State OHIO
   Telephone No. (740) 782-1330

2. Original Permit No. D-0425

3. Date Original Permit Issued OCTOBER 22, 1984

4. Number of adjacent area applications for the D-permit which were previously:

   a. Submitted 0 b. Issued 0

5. Number of acres in this permit application. 4957.3

6. Number of acres in this permit application that are to be affected during the balance of the current mining year of the original permit identified in item 2. above. N/A

7. I, the undersigned, a responsible official of the applicant do, hereby verify the information in the complete permit application as true and correct to the best of my information and belief.

   Printed Name LARRY CONWAY; Date APRIL 2, 1999

   Signature Larry Conway; Title PRESIDENT

   Sworn before me and subscribed in my presence this 2nd day of APRIL, 19 99.

   ELLEN M. LOPER Notary Public

   Ellen M. Loper
   Notary Public

8. For Revision Review Only. 2001 This item is to be completed after revisions, if any, have been made to the permit application.

   I, the undersigned official of the applicant, do hereby verify and acknowledge the revisions made during the permit review process as true and correct to the best of my information and belief.

   Printed Name _____; Date _____
   Signature _____; Title _____
   Sworn before me and subscribed in my presence this _____ day of _____, 19 _____.

   _____
   Notary Public

9/88

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION
ADJACENT AREA COAL MINING PERMIT APPLICATION

1. Applicant BENNOC, INC.
   Address P.O. BOX 208, 38722 NATIONAL ROAD
   City MORRISTOWN State OHIO Zip 43759
   Telephone No. (740) 782-1330

2. Original Permit No. D-0425

3. Date Original Permit Issued OCTOBER 22, 1984

4. Number of adjacent area applications for the D-permit which were previously:

   a. Submitted 0 b. Issued 0

5. Number of acres in this permit application. 4957.3

6. Number of acres in this permit application that are to be affected during the balance of the current mining year of the original permit identified in item 2. above. N/A *

   * This application proposes no permit area, underground works only.

7. I, the undersigned, a responsible official of the applicant do, hereby verify the information in the complete permit application as true and correct to the best of my information and belief.

   Printed Name LARRY CONWAY; Date APRIL 2, 1999

   Signature Larry Conway; Title PRESIDENT

   Sworn before me and subscribed in my presence this 2nd day of APRIL, 19 99.

   Ellen M. Roper
   Notary Public

   [illegible] 2001

8. For Revision Review Only. This item is to be completed after revisions, if any, have been made to the permit application.

   I, the undersigned official of the applicant, do hereby verify and acknowledge the revisions made during the permit review process as true and correct to the best of my information and belief.

   Printed Name Larry Conway; Date 10-24-00
   Signature Larry Conway; Title President
   Sworn before me and subscribed in my presence this 24th day of October, 20 00.

   Ellen M. Roper
   Notary Public

   2001

PROOF OF PUBLICATION

The State of Ohio
County of Belmont, ss:

The undersigned, being sworn, says that he or she is an employee of Eastern Ohio Newspapers, Inc., A Corporation, publisher of the Times Leader a newspaper published in Martins Ferry, Belmont County, Ohio, each day of the week except Saturday and of general circulation in said city and county; that it is a newspaper meeting the requirements of sections 7.12 and 5721.01 Ohio Revised Code as amended effective September 24, 1957; that affiant has custody of the records and files of said newspaper; and that the advertisement of which the annexed is a true copy, was published in said newspaper on each of the days in the month and year stated, as follows:

July 5, 12, 19,
26 19 99

Carol Scouten

Subscribed by Affiant and sworn to before me, this 26 day of July, A.D. 19 99.

Rebecca L. Anderson
Notary Public

REBECCA L. ANDERSON
Notary Public, State of Ohio
My Commission Expires Nov. 25, 2001

PUBLIC NOTICE
Bennoc, Inc., P.O. Box 208, 38722 National Road, Morristown, Ohio, 43759 has submitted an underground coal mining application designated as number D-0425-1 to the Ohio Department of Natural Resources, Division of Mines and Reclamation. The proposed additional acreage for permit D-0425 is located in Sections 1, 2, 3, 7, 8, 9, 13, 14, 15, 19, 20, and 21, T-6 R-5, Wayne Township, and Sections 31, 32, 33, 26, and 27 T-5 R-4, Washington Township, Belmont County, Ohio. The area is located on the Armstrongs Mills, Hunter, Woodsfield, and Cameron 7-1/2 minute U.S.G.S. Quadrangle maps south of State Route 148, approximately 3 miles east of Somerton, approximately 3 miles southwest of Armstrongs Mills, and approximately 1.5 miles notth of Beallsville, Ohio. The proposed underground workings encompass 4957.3 Acres. Coal in this underground area will be removed using full recovery methods.

This application is on file at the Belmont County Recorder's Office, located at the County Courthouse, Main Street, St. CLairsville, Ohio 43950 for public inspection. Written comments, objections or request for an informal conference may be sent to the Ohio Department of Natural Resources, Division of Mines and Reclamation, 1855 Fountain Square Court, Columbus, Ohio 43224, within (30) thirty days of the last date of publication of this notice.

T-ADV-July5-4 Mon.

I hereby certify that this is a true copy of the original.

Ellen M. Loper

2001

Printer's Fee $ 173.80

Notary's Fee $

The Times Leader
Martins Ferry, Ohio

F. For Revision Review Only. This item is to be completed after revisions, if any, have been made to the permit application.

I, the undersigned, a responsible official of the applicant, do hereby verify and acknowledge the revisions made during the permit review process as true and correct to the best of my information and belief.

Printed Name LARRY CONWAY Title PRESIDENT

Signature Larry Conway Date 10-24-00

Sworn before me and subscribed in my presence this 24th day of October, 20 00.

Ellen M. Roper
Notary Public

2001

PART 1 LEGAL, FINANCIAL, COMPLIANCE, AND RELATED INFORMATION

A. IDENTIFICATION OF INTERESTS

(1) Applicant's Name BENNOC, INC.

Address P.O. BOX 208, 38722 NATIONAL ROAD

City MORRISTOWN State OHIO Zip 43759

Telephone 740 - 782 - 1330

Employer Identification No. (EIN) 34-1036688 or

Social Security No. (SSN) , _____

(2) Indicate business structure of entity and additional information:

_____ Single Proprietorship,
_____ Partnership (registration no. and date obtained) _____,
X Corporation (charter no. and date incorporated) 371500 MAY 07, 1968,
_____ Association, _____ Other, specify _____

(3) If the entity is a single proprietorship, provide the following:

Owner's Name _____

Address _____

City _____ State _____ Zip _____

Telephone _____ - _____ - _____

EIN _____ , or SSN _____

Beginning date of ownership _____

F. For Revision Review Only. This item is to be completed after revisions, if any, have been made to the permit application.

I, the undersigned, a responsible official of the applicant, do hereby verify and acknowledge the revisions made during the permit review process as true and correct to the best of my information and belief.

Printed Name LARRY CONWAY Title PRESIDENT

Signature Larry Conway Date 2-7-01

Sworn before me and subscribed in my presence this

7th day of February, 20 01 .

Ellen M. Roper
Notary Public

[illegible] M. ROPER [illegible] Public
[illegible]
My Commission [illegible] 23, 2001

9. Did a person other than an employee of the applicant prepare this application? X Yes, _____ No. If "yes" provide:

Preparer's Name JACK A. HAMILTON & ASSOCIATES, INC.
Address P.O. BOX 471, 342 HIGH STREET
City FLUSHING State OHIO Zip 43977
Telephone No. (740) 968-4947

10. Provide the following information for all surface and subsurface owners of record within this proposed permit area indicating the type of ownership and permit area location information.

SEE PAGE 7 OF U/G PERMIT APPLICATION, 1 OF 12 THRU 12 OF 12

Name _____
Address _____
City _____ State _____ Zip _____
Surface _____, Coal _____, Non Coal _____
County _____ Township _____
Section _____ LOT _____, T- _____ R- _____

Name _____
Address _____
City _____ State _____ Zip _____
Surface _____, Coal _____, Non Coal _____
County _____ Township _____
Section _____ LOT _____, T- _____ R- _____

Name _____
Address _____
City _____ State _____ Zip _____
Surface _____, Coal _____, Non Coal _____
County _____ Township _____
Section _____ LOT _____, T- _____ R- _____

Name _____
Address _____
City _____ State _____ Zip _____
Surface _____, Coal _____, Non Coal _____
County _____ Township _____
Section _____ LOT _____, T- _____ R- _____

Name _____
Address _____
City _____ State _____ Zip _____
Surface _____, Coal _____, Non Coal _____
County _____ Township _____
Section _____ LOT _____, T- _____ R- _____

(If more space is required, submit an addendum identifying owners in the same format)

11. Submit any required right of entry documentation unless previously submitted and filed with the division and valid for this adjacent area application.

SEE PREVIOUSLY APPROVED PERMIT TRANSFER AND U/G PERMIT APPLICATION, PAGE 10 - AFFIDAVITS AND ADDENDA

12. In the space below, provide the name and address of the public office where a complete copy of this adjacent area permit application and the approved application for the original permit are to be filed. (Note: if previous adjacent area permits have been issued, they must also be on file.)

RECORDER'S OFFICE
BELMONT COUNTY COURTHOUSE
ST. CLAIRSVILLE, OHIO 43950

13. In the space below, list the complete name and address of the newspaper and provide the text of the advertisement that is to be published in a newspaper of general circulation in the locality of the proposed permit area once a week for four (4) consecutive weeks. The advertisement is to provide the information required by rule 1501: 13-5-01 (A)(1) of the Administrative Code.

THE TIMES LEADER
200 SOUTH FOURTH STREET
MARTINS FERRY, OHIO 43938

SEE U/G PERMIT APPLICATION, ADDENDUM TO PAGE 15, ITEM G(2)

14. Address any additional information that must be included in this adjacent area application when all items from the approved permit application have been considered. Application items must be addressed when following situations are applicable:

    a "no" response in the approved permit application becomes a "yes" when applied to the adjacent area and/or

    additional information is required to make a response complete when applied to the adjacent area.

    Provide the required information submitting either of the following:

    a) the appropriate page of the permit application identifying the application items that must be included in this adjacent area application after all items from the issued permit application have been considered or

    b) an addendum specifically identifying by application page and item number any additional information that must be included in this adjacent area application after all items from the issued permit application have been considered.

    SEE ATTACHED ADDENDUM TO ITEM 14.b) TO UPDATE OWNERSHIP AND RIGHT-OF-ENTRY DATA FOR THE EXISTING D-0425 PERMIT AREA.

    Submit the revised response and any required Attachments, documents, or addenda.

ADDENDUM TO A.A.A., ITEM 14. b), BENNOC, INC.

PART 1, LEGAL, FINANCIAL, COMPLIANCE, AND RELATED INFORMATION

Page 6, Item C(1)(a): See attached Page 6.

Page 9, Item C(8)(a): See attached affidavit and reference (in bold italic).

Page 11, Item C(9)(a): See attached Page 11.

C. RIGHT OF ENTRY INFORMATION

(1)(a) Provide the following information for every legal or equitable owner of record, surface and mineral, of the property to be mined on the permit area (i.e. areas affected by surface operations and facilities), indicating whether the ownership is of surface, coal, or noncoal mineral.

Name AMERICAN ENERGY CORP.

Address P.O. BOX 210, 1298 SOM CENTER ROAD

City MAYFIELD HEIGHTS State OHIO Zip 44124

Surface X , Coal _____ , Noncoal _____

Deed Parcel No. 2-13-63, 2-5-2, 2-5-44

NOTE: SEE Page 9, Item C(8)(a) for affidavit reference to all other surface permit D-0425 parcel numbers.

Name _____

Address _____

City _____ State _____ Zip _____

Surface _____ , Coal _____ , Noncoal _____

Deed Parcel No. _____

Name _____

Address _____

City _____ State _____ Zip _____

Surface _____ , Coal _____ , Noncoal _____

Deed Parcel No. _____

C. (8)(a) Provide either of the following to allow for coal mining operations on the permit area.

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described.

AFFIDAVIT

State of Ohio, Belmont County, ss. Larry Conway being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date FEBRUARY 5, 1994

Expiration Date FEBRUARY 4, 2004 WITH RIGHT TO RENEW

Parties: From AMERICAN ENERGY CORP. To BENNOC, INC.

Description of land: No. Acres 156.896

County BELMONT Township WAYNE/WASHINGTON

Sections 3, 4, 26 Lots N/A

Parcel # 2-13-63, 2-5-2, 2-5-44

NOTE: See Affidavit 1 of 40 for Parcel numbers 2-13-3, 2-13-41, 2-13-42, 2-13-43, & 2-13-64; Affidavit 9 of 40 for Parcel number 2-13-154; & Affidavit 14 of 40 for Parcel number 2-13-182. See attached highlighted copies.

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 9, ITEM C(8)(a)(ii)(Item 1)for parcel number 2-5-44;

See Addendum to Page 10, Item C(8)(b)(ii) (Item 1) for Parcel numbers 2-13-63, 2-13-3, 2-13-41, 2-13-42, 2-13-43, & 2-13-64, (Item 2) for Parcel number 2-5-2, (Item 9) for Parcel number 2-13-154, (Item 14) for Parcel number 2-13-182. See attached highlighted copies.

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

6-2-99
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of June, 19 99.

Ellen M. Loper
Notary Public

ELLEN M. LOPER Notary Public
State of Ohio
My Commission Expires September 23, 2001

ADDENDUM TO PART 1, PAGE 9, ITEM C(8)(a)(ii)
BENNOC, INC.
PERMIT D-0425

Item 1 - Rights to Parcel 2-5-44

TOGETHER with the right to enter, mine and carry away said coal by means of main entries, passages and tunnels, and the right to transport coal through said main entries, passages and tunnels that may be mined from the lands of other parties.

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 2413.45

County BELMONT Township (SEE BELOW)

Sections WAYNE; 9, 2, 1, 3, 8
WASHINGTON; 31, 33, 32, 27, 26 Lots N/A

Parcel # 2-13-3, 2-13-9/2-13-158, 2-13-15, 2-13-16, 2-13-17, 2-13-18, 2-13-37, 2-13-38, 2-13-39, 2-13-40, 2-13-41, 2-13-42, 2-13-43, 2-13-44, 2-13-45, 2-13-46, 2-13-47, 2-13-52, 2-13-58, 2-13-60, 2-13-61, 2-13-62, 2-13-64, 2-13-65, 2-13-66, 2-13-67, 2-13-68, 2-13-69, 2-13-70, 2-13-73, 2-13-74, 2-13-78, 2-13-79, 2-13-80, 21-3-83, 2-13-86, 2-13-87, 2-13-90, 2-13-91, 2-13-92, 2-13-93, 2-13-94, 2-13-99, 2-13-100, 2-13-105, 2-13-107, 2-13-111, 2-13-113, 2-13-114, 2-13-116, 2-13-119, 2-13-127, 2-13-129, 2-13-130, 2-13-132

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 1)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this

2nd day of April, 19 99.

Ellen M. Roper
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 119.46

County BELMONT Township WASHINGTON

Sections 26 Lots N/A

Parcel # 2-13-152, 2-13-153, 2-13-154

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 9)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Roper
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 219.0

County BELMONT Township WASHINGTON

Sections 26, 32 Lots N/A

Parcel # 2-13-182, 2-13-183, 2-13-184

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 14)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Lopez
Notary Public

ELLEN M. LOPEZ, Notary Public
State of Ohio
My Commission Expires September 23, 2001

ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii)
BENNOC, INC.
CENTURY MINE
PERMIT D-0425-1

The following items describe the lease rights claimed by Bennoc, Inc for the Pittsburgh (No. 8) Coal Seam:

Item 1 - Lease Rights to Parcels 2-13-3, 2-13-9/2-13-158, 2-13-15, 2-13-16, 2-13-17, 2-13-18, 2-13-37, 2-13-38, 2-13-39, 2-13-40, 2-13-41, 2-13-42, 2-13-43, 2-13-44, 2-13-45, 2-13-46, 2-13-47, 2-13-52, 2-13-58, 2-13-60, 2-13-61, 2-13-62, 2-13-64, 2-13-65, 2-13-66, 2-13-67, 2-13-68, 2-13-69, 2-13-70, 2-13-73, 2-13-74, 2-13-78, 2-13-79, 2-13-80, 2-13-83, 2-13-86, 2-13-87, 2-13-90, 2-13-91, 2-13-92, 2-13-93, 2-13-94, 2-13-99, 2-13-100, 2-13-105, 2-13-107, 2-13-111, 2-13-113, 2-13-114, 2-13-116, 2-13-119, 2-13-127, 2-13-129, 2-13-130, 2-13-132, and 2-13-63

"Together with the free and uninterrupted rights of way into, upon and under said described land, at such points, and in such manner as may be useful for the purpose of digging, draining, and ventilating, and mining and removing said coal, together with the privilege of mining and removing through said described premises other coal belonging to said Grantees, their heirs and assigns, or which may hereafter be acquired, together with the right and privilege to make drains on the surface, and air holes, and change the same as the convenience of mining may require, together with all mining privileges on said surface or under it necessary for the removal of all of the Pittsburgh Vein underlying the same and neighboring properties now owned, or hereafter acquired by said Grantees, their heirs and assigns; and said Grantees, their heirs and assigns, shall in no wise be liable for damages for failure to support the overlying surface, or for the sinking or falling in of said surface, or for destroying any spring or well of water, or for diverting any water flow or natural stream by reason of the removal of said coal or the exercise of any of the above mining privileges."

Item 2 - Lease rights to Parcel 2-5-24 and 2-5-2

TOGETHER with the free and uninterrupted use and enjoyment of right of way into, upon and under said land, at such points and in such manner as may be considered proper and necessary for the advantageous and economical operation thereof, and in the digging and mining of said coal, and without liability therefore and hereby waiving any and all damages that might or could arise therefrom by reason of such digging, mining and carrying away all of said coal, together with the privilege of carrying, transporting and removing through the described premises, this and other coal now owned or acquired by said Grantee, its successors or assigns, generally freed, clear and discharged of any servitude whatever to the overlying land or anything therein or thereon. The said Grantors, reserved, however to them, their heirs and assigns, the right to drill through said coal for oil and gas, and water, etc. The said Grantee, its successors and assigns, have the right to purchase at any time as much of the surface (reserving three acres around the buildings, if any buildings are on the land) of said land as may be necessary in mining, manufacturing, or marketing said coal, at the price of $150.00 per acre, which payment shall entitle them to a deed in fee simple for the same. Said grantee shall have the right to enter upon said farm to drill and test said coal without liability for damages, except as to growing crops.

Item 7 - Lease Rights to Parcel 2-11-37

Together with the free uninterrupted use enjoyment of and right of way into, upon and under said land at such points and in such manner as may be considered proper and necessary for the advantageous and economical operation thereof, and in the digging and mining of said coal and draining and ventilating of the mines and without liability therefore, and hereby waiving any or all damages that might or could arise therefrom by reason of such digging, mining, draining and ventilating and carrying away of all said coal or the manufacture of said coal or other coal into coke or other products, together with the privilege of carrying or transferring and removing; through the described premises this and other coal and mine supplies now owned or hereafter acquired by said grantee, its successors and assigns, generally free, clear and discharged of any servitude whatever to the overlying land or anything therein or thereon, excepting, however, the right to drill through said coal for oil or gas in such manner as not to endanger the working of said mines. Said grantee, its successors and assigns, shall have the right to purchase at any time so much of said land as may be necessary for railroad, and in mining, manufacturing or marketing said coal at the price of One Hundred Fifty ($150.00) Dollars per acre, upon receipt of which payment the said grantors, their heirs and assigns, agree to deliver a deed in fee for the same.

Item 8 - Lease Rights to Parcel 2-13-151

"Together with the free and uninterrupted rights of way into, upon and under said described land, at such points, and in such manner as may be useful for the purpose of digging, draining and ventilating, and mining and removing said coal, together with the privilege of mining and removing through said seam of coal under said premises other coal belonging to said grantees, their heirs and assigns, or which may be hereafter acquired, together with the right and privilege to make drains on the surface and air holes and change the same as the convenience of mining may require, together with all the mining privileges on said surface or under it necessary for the removal of all of said seam of coal underlying said premises and for the removal of coal underlying neighboring properties now owned or hereafter acquired, by said grantees, their heirs and assigns, through said seam of coal under said premises. And the said grantees, their heirs and assigns, shall in no wise be liable for damages for failure to support the overlying surface, or for the sinking or falling in of said surface, or for destroying any spring or well of water, or for diverting any water flow or natural stream by reason of the removal of said coal or the exercise of any of the above mining privileges."

Item 9 - Lease Rights to Parcels 2-13-152, 2-13-153, 2-13-154

"Together with the free and uninterrupted right-of-way into, upon and under said land at such points and in such manner as may be proper for the purpose of digging, draining, and ventilating and mining and removing said coal, together with the right of mining and removing through said premises other coal belonging to the grantees, their heirs and assigns, or which may be hereafter acquired by said grantees, their heirs and assigns, together with the right to make drains on the surface and air holes, and change the same as the convenience of mining may require, together with all mining privileges on said surface or under it, necessary for the removal of all the said coal underlying the same and neighboring properties now owned or hereafter acquired by said Grantees, their heirs and assigns, and waiving and releasing said grantees, their heirs and assigns, from all liability for damages for failure to support the overlying surface, or for sinking or falling in of such surface or for destroying any spring or well of water or for diverting any water flow or natural stream by reason of the removal of said coal or the exercise of any of the above mining privileges, together with all incidental rights that shall or may accrue to said grantees, their heirs and assigns, by virtue of said grant of coal mining privileges."

ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii); PAGE 5

Item 13 - Lease Rights to Parcel 2-13-181

"Together with the free and uninterrupted rights of way into, upon and under said land at such points and in such manner as may be proper for the purpose of digging, draining and ventilating, and mining and removing said coal, together with the right of mining and removing through said premises other coal belonging to said Grantees, their heirs and assigns, or which may be hereafter acquired, together with the right to make drains on the surface, and air holes, and change the same as the convenience of mining may require, together with all mining privileges on said surface, or under it, necessary for the removal of all said coal underlying the same and neighboring properties now owned or hereafter acquired by said Grantees, their heirs and assigns, and waiving and releasing said Grantees, their heirs and assigns, for all liability for damages for failure to support the overlying surface, or for sinking or falling in of such surface, or for destroying any spring or well of water, or for diverting any water flow or natural stream by reason of the removal of such coal or the exercise of any of the above mining privileges, together with all incidental rights that shall or may accrue to the said Grantees, their heirs and assigns, by virtue of the within grant of coal and mining privileges."

Item 14 - Lease Rights to Parcels 2-13-182, 2-13-183, 2-13-184

"Together with the free and uninterrupted rights of way into, upon and under said described land, at such points, and in such manner as may be useful for the purpose of digging, draining, and ventilating, and mining and removing said coal, together with the privilege of mining and removing through said seam of coal under said described premises, other coal belonging to said Grantees, their heirs and assigns, or which may be hereafter acquired, together with the right and privilege to make drains on the surface or air holes and change the same as the convenience of mining may require, together with all the mining privileges on said surface or under it necessary for the removal of all of said seam of coal underlying said premises and for the removal of coal underlying neighboring properties now owned or hereafter acquired by said grantees, their heirs and assigns, through said seam of coal under said premises." "And said Grantees, their heirs and assigns, shall in no wise be liable for damages for failure to support the overlying surface, or for sinking or falling in of said surface, or for destroying any spring or well of water, or for diverting any water flow or natural stream by reason of the removal of said coal or the exercise of any of the above mining privileges."

Item 15 - Lease Rights to Parcel 2-13-189

Together with all necessary or convenient rights-of-way under the surface of said lands for the purposes of approaching, mining, removing, and transporting said coal thereunder and therefrom and other coal now owned or hereafter acquired by said Grantor [*sic*], its successors and assigns, and at the pleasure to place, maintain, remove or replace under the surface all fixtures, structures, machinery, and appliances deemed necessary or convenient to the operation of mines and to do all things required to ventilate and drain the workings and also the right to mine and remove all of said coal with or without leaving support to the surface of said lands, the Grantees [*sic*] hereby waiving all damages whatsoever for any injury to the surface or to water courses or roads or ways by reason of said mining and removing, draining, and ventilating of said coal.

C. (9)(a) List below the following information for each surface owner of land within the proposed permit area.

OWNER NAME	COUNTY	TOWNSHIP	SEC./LOT	T-	,R-
AMERICAN ENERGY CORP.	BELMONT	WAYNE	3,4	6	5
		WASHINGTON	26	5	4

11/90

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION
UNDERGROUND COAL MINING AND RECLAMATION
PERMIT APPLICATION

Applicant: BENNOC, INC.

A. Type of Operation (check, appropriate space(s)):

_____ Shaft, __X__ Slope, _____ Drift,
__X__ Room and Pillar, _____ Pillar Extraction,
__X__ Longwall, _____ Combined Surface and Underground

B. Type of Application (check appropriate space (s)):

(1) _____ New
(2) _____ Initial Underground Workings to Existing Permit
(3) __X__ Additional Underground Workings

C. Address the following if applicable:

(1) Permit Number D-0425
(2) Date Issued 10-22-84

D. Did a person other than an employee of the applicant prepare this application? __X__ Yes, _____ No. If "yes," provide:

Preparer's Name JACK A. HAMILTON & ASSOCIATES, INC.

Address P.O. BOX 471, 342 HIGH STREET

City FLUSHING State OHIO Zip 43977

Telephone 740 - 968 - 4947

E. I, the undersigned a responsible official of the applicant do hereby verify the information in the complete permit application as true and correct to the best of my information and belief.

Printed Name LARRY CONWAY Date APRIL 2, 1999

Signature Larry Conway Title PRESIDENT

Sworn before me and subscribed in my presence this

2nd day of April, 19 99.

Ellen M. Hoper
Notary Public

ELLEN M. HOPER, Notary Public
State of Ohio
My Commission Expires on March 28, 2001

F. For Revision Review Only. This item is to be completed after revisions, if any, have been made to the permit application.

I, the undersigned, a responsible official of the applicant, do hereby verify and acknowledge the revisions made during the permit review process as true and correct to the best of my information and belief.

Printed Name LARRY CONWAY Title PRESIDENT

Signature _____ Date _____

Sworn before me and subscribed in my presence this

_____ day of _____ , 19 _____ .

_____
Notary Public

PART 1 LEGAL, FINANCIAL, COMPLIANCE, AND RELATED INFORMATION

A. IDENTIFICATION OF INTERESTS

(1) Applicant's Name BENNOC, INC.

Address P.O. BOX 208, 38722 NATIONAL ROAD

City MORRISTOWN State OHIO Zip 43759

Telephone 740 - 782 - 1330

Employer Identification No. (EIN) 34-1036688 or

Social Security No. (SSN) , _____

(2) Indicate business structure of entity and additional information:

_____ Single Proprietorship,
_____ Partnership (registration no. and date obtained)
_____,
X Corporation (charter no. and date incorporated)
371500 MAY 07, 1968,
_____ Association, _____ Other, specify _____

(3) If the entity is a single proprietorship, provide the following:

Owner's Name _____

Address _____

City _____ State _____ Zip _____

Telephone _____ - _____ - _____

EIN _____ , or SSN _____

Beginning date of ownership _____

A. (4) If the applicant is a business entity other than a single proprietorship, provide the following for the applicant's statutory agent and submit Attachment 1.

Agent's Name LARRY CONWAY

Address 60962 SANDY RIDGE ROAD

City BARNESVILLE State OHIO Zip 43713

Telephone (740) - 782 - 1330

(5) Is the operator of the mine to be a person different from the applicant? X Yes, _____ No. If "Yes," provide the operator's name and submit Attachment 17. (Note: if more than one operator, indicate operator's name and submit a separate attachment for each).

Operator's Name AMERICAN ENERGY CORP.

(6) Provide the following for the person who will pay the abandoned mine land reclamation fee for the applicant.

Name BENNOC, INC.

Address P.O. BOX 208, 38722 NATIONAL ROAD

City MORRISTOWN State OHIO Zip 43759

Telephone (740) 782 - 1330

EIN _____ , or SSN (optional) 295-36-8852

(7) Provide the following for all persons having the authority or ability to commit the financial, real property assets, or working resources of the applicant who are not otherwise identified as officers, directors, or owners of the applicant. If none, check box: [X]. If any person listed is a business entity and not an individual, also complete Attachment 1 for that person.

Name _____

Address _____

City _____ State _____ Zip _____

Telephone ____ - _____ - _____

EIN _____ , or SSN (optional) _____

Date O & C relationship began/ended (if applicable)

_____ / _____

Submit and identify additional pages necessary to complete response.

11/92

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION
ATTACHMENT 1
(OWNERS AND CONTROLLERS)

Applicant's Name BENNOC, INC.

This attachment is to be completed and submitted with the permit application if the applicant is other than a single proprietorship. Provide the following for all partners, officers, directors, stockholders owning ten percent or more of any class of voting stock or other instruments of ownership, and any other person performing a function similar to a director. If any person listed is a business entity and not an individual, also complete an Attachment 1 for that person.

Name of business entity BENNOC, INC.

Name RAWLEY LEE CONWAY, AKA R. LEE CONWAY
Street address 41020 BETHESDA-BELMONT ROAD
City BETHESDA State OHIO Zip 43719
EIN _____, or SSN 271-24-3111
Title of position within entity SECRETARY-TREASURER, DIRECTOR
Date position assumed/ended (if applicable) SEC/TRES 5-1-81 / DIRECTOR 4-6-94 / 7-19-96
Percent of ownership 68% Date of ownership 5-1-81
Location in organizational structure SECRETARY-TREASURER

Name LARRY CONWAY
Street address 60962 SANDY RIDGE ROAD
City BARNESVILLE State OHIO Zip 43713
EIN _____, or SSN 295-48-5264
Title of position within entity PRESIDENT, DIRECTOR
Date position assumed/ended (if applicable) PRES. 5-1-81 / DIRECTOR 4-6-94 / 7-19-96
Percent of ownership 16% Date of ownership 5-1-81
Location in organizational structure PRESIDENT

Name DAVID CONWAY
Street address 60750 SANDY RIDGE ROAD
City BARNESVILLE State OHIO Zip 43713
EIN _____, or SSN 236-92-4406
Title of position within entity VICE PRESIDENT, DIRECTOR
Date position assumed/ended (if applicable) V.P. 5-1-81 / DIRECTOR 4-6-94 / 7-19-96
Percent of ownership 16% Date of ownership 5-1-81
Location in organizational structure VICE PRESIDENT

Submit and identify additional pages necessary to complete response.

11/92

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION
ATTACHMENT 1
(OWNERS AND CONTROLLERS)

Applicant's Name BENNOC, INC.

This attachment is to be completed and submitted with the permit application if the applicant is other than a single proprietorship. Provide the following for all partners, officers, directors, stockholders owning ten percent or more of any class of voting stock or other instruments of ownership, and any other person performing a function similar to a director. If any person listed is a business entity and not an individual, also complete an Attachment 1 for that person.

Name of business entity BENNOC, INC.

Name PETE CHRISTAKIS
Street address 67153 JOELLA CIRCLE
City ST.CLAIRSVILLE State OHIO Zip 43750
EIN 34-1036688, or SSN
Title of position within entity STATUTORY AGENT
Date position assumed/ended (if applicable) 4-6-94 / 7-19-96
Percent of ownership 0% Date of ownership N/A
Location in organizational structure N/A

Name
Street address
City State Zip
EIN, or SSN
Title of position within entity
Date position assumed/ended (if applicable) PRES. /
Percent of ownership Date of ownership
Location in organizational structure

Name
Street address
City State Zip
EIN, or SSN
Title of position within entity
Date position assumed/ended (if applicable) /
Percent of ownership Date of ownership
Location in organizational structure

Submit and identify additional pages necessary to complete response.

11/92

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 17
(OPERATOR OWNERSHIP AND CONTROL INFORMATION)

This attachment is to be completed and submitted with the permit application if an entity other than the permittee will remove overburden or coal from a coal mining and reclamation operation.

1. Operator's Name American Energy Corporation
   Address RD 1 Box 119
   City Avonmore State PA Zip 15618
   Telephone (724)- 697 - 4551
   Employer Identification No. (EIN) 31-1550443, or
   Social Security No. (SSN), N/A

2. Indicate business structure of operator and additional information:

   _____ Single proprietorship,
   _____ Partnership (registration no. and date obtained)
   _____,
   __X__ Corporation (charter no. and date incorporated)
   00842695 4-12-1993,
   _____ Association, _____ Other, specify _____

3. If the operator is a single proprietorship, provide the following:

   Owner's Name N/A
   Address _____
   City _____ State _____ Zip _____
   Telephone _____-_____-_____
   EIN _____, or SSN _____
   Beginning date of ownership _____

4. If the operator is other than a single proprietorship, provide the following for the operator's statutory agent for service of process:

   Agent's Name American Energy Corporation
   Address RD 1 Box 119
   City Avonmore State PA Zip 15618
   Telephone (724)- 697 - 4551
   EIN 31-1550443, SSN (Optional) _____

5. If the operator is other than a single proprietorship, provide the following for all officers, partners, directors, stockholders owning ten percent or more of any class of voting stock or other instruments of ownership, and any other person performing a function similar to a director. If any person listed is a business entity and not an individual, also complete item 7. for that person.

Name D. Arthur Hile
Address RD 1 Box 119
City Avonmore State PA Zip 15618
Telephone (724)- 697 - 4551
EIN 31-1550443, or SSN
Title of position President and Treasurer
Date position assumed/ended (if applicable) 6/1/2000/
Percent of ownership 0 Date of ownership N/A
Location in organizational structure President/Treasurer

Name Michael O. McKown
Address RD 1 Box 119
City Avonmore State PA Zip 15618
Telephone (724)- 697 - 4551
EIN 31-1550443, or SSN
Title of position Secretary
Date position assumed/ended (if applicable) 11/1/99/
Percent of ownership 0 Date of ownership N/A
Location in organizational structure Secretary

Name Clyde Borrell
Address RD 1 Box 119
City Avonmore State PA Zip 15618
Telephone (724)- 697 - 4551
EIN 31-1550443, or SSN
Title of position Director
Date position assumed/ended (if applicable) 11-1-99 /
Percent of ownership 0 Date of ownership N/A
Location in organizational structure Director

Name Coal Resources, Inc.
Address RD 1 Box 119
City Avonmore State PA Zip 15618
Telephone (724)- 697 - 4551
EIN 31-1586390, or SSN
Title of position Owner
Date position assumed/ended (if applicable) /
Percent of ownership 100% Date of ownership 01-01-98
Location in organizational structure Parent

Submit and identify additional pages necessary to complete response.

6. Provide the following for all persons having the authority or ability to commit the financial, real property assets, or working resources of the operator who are not otherwise identified as officers, directors, or owners of the operator. If none, check box: [X]. If any person listed is a business entity and not an individual, also complete Item 7. for that person.

Name _____
Address _____
City _____ State _____ Zip _____
Telephone _____-_____-_____
EIN _____, or SSN _____
O & C relationship to operator _____
Date O & C relationship began/ended (if applicable)
_____/_____

Name _____
Address _____
City _____ State _____ Zip _____
Telephone _____-_____-_____
EIN _____, or SSN _____
O & C relationship to operator _____
Date O & C relationship began/ended (if applicable)
_____/_____

Name _____
Address _____
City _____ State _____ Zip _____
Telephone _____-_____-_____
EIN _____, or SSN _____
O & C relationship to operator _____
Date O & C relationship began/ended (if applicable)
_____/_____

Name _____
Address _____
City _____ State _____ Zip _____
Telephone _____-_____-_____
EIN _____, or SSN _____
O & C relationship to operator _____
Date O & C relationship began/ended (if applicable)
_____/_____

Name _____
Address _____
City _____ State _____ Zip _____
Telephone _____-_____-_____
EIN _____, or SSN _____
O & C relationship to operator _____
Date O & C relationship began/ended (if applicable)
_____/_____

Name _____
Address _____
City _____ State _____ Zip _____
Telephone _____-_____-_____
EIN _____, or SSN _____
O & C relationship to operator _____
Date O & C relationship began/ended (if applicable)
_____/_____

Submit and identify additional pages necessary to complete response.

7. Complete this item whenever a business entity, rather than an individual, is listed in Items 5, 6, or 7. Check the box corresponding to the item number in which the entity is found:

5. [X], 6. [ ], 7. [ ].

Name of entity Coal Resources, Inc.

Provide the following for owners and controllers of this entity. If any person listed is a business entity and not an individual, also complete Item 7. for that person.

Name Donald A. Gentry
Address RD 1 Box 119
City Avonmore State PA Zip 15618
Telephone (724)- 697 - 4551
EIN 31-1586390, or SSN
Title of position President
Date position assumed/ended (if applicable) 11-1-99/
Percent of ownership 0 Date of ownership N/A
Location in organizational structure President

Name Robert A. Murray
Address RD 1 Box 119
City Avonmore State PA Zip 15618
Telephone (724)- 697 - 4551
EIN 31-1586390, or SSN
Title of position Sole Shareholder
Date position assumed/ended (if applicable) 11-1-98/
Percent of ownership 100% Date of ownership 1-29-88
Location in organizational structure Owner, Sole Shareholder

Name
Address
City State Zip
Telephone - -
EIN , or SSN
Title of position
Date position assumed/ended (if applicable) /
Percent of ownership Date of ownership
Location in organizational structure

Name
Address
City State Zip
Telephone - -
EIN , or SSN
Title of position
Date position assumed/ended (if applicable) /
Percent of ownership Date of ownership
Location in organizational structure

Name
Address
City State Zip
Telephone - -
EIN , or SSN
Title of position
Date position assumed/ended (if applicable) /
Percent of ownership Date of ownership
Location in organizational structure

Submit and identify additional pages necessary to complete response.

8. List all U.S coal mining permits issued to the operator and/or any person or entity identified in items 5, 6, or 7 within the five years preceding submittal of the application. **N/A - NONE**

Permit holder's name _____
Address _____
City _____ State _____ Zip _____
Telephone _____
EIN _____ or SSN _____

Permit No.	State	Regulatory Authority	MSHA No. and Date Issued

Permit holder's name _____
Address _____
City _____ State _____ Zip _____
Telephone _____
EIN _____ or SSN _____

Permit No.	State	Regulatory Authority	MSHA No. and Date Issued

Permit holder's name _____
Address _____
City _____ State _____ Zip _____
Telephone _____
EIN _____ or SSN _____

Permit No.	State	Regulatory Authority	MSHA No. and Date Issued

Submit and identify additional pages necessary to complete response.

9. List all U.S. coal mining applications pending for the operator and/or person or entity identified in items 5, 6, or 7. **N/A -NONE**

Entity with pending application _____

Application No.	State	Regulatory Authority

Entity with pending application _____

Application No.	State	Regulatory Authority

Entity with pending application _____

Application No.	State	Regulatory Authority

Submit and identify additional pages necessary to complete response.

Compliance Information

10. Has the operator, any subsidiary, affiliate, or persons controlled by or under common control with the operator:

(a) Has a federal or state coal mining permit suspended or revoked in the five years preceding the date of submission of the application? _____ Yes, __X__ No. If "yes," provide the following:

Name of entity suspended/revoked _____
Permit No. _____ Date permit issued _____
State and regulatory authority _____
Reasons for action _____
Current status of permit _____

(If administrative or judicial proceedings initiated, provide the following:)

Date _____ Location _____
Type _____
Current status of proceedings _____

Submit and identify additional pages necessary to complete response.

(b) Forfeited a mining bond or similar security deposited in lieu of bond? _____ Yes, __X__ No. If yes," provide the following

Name of entity forfeited _____
Permit No. _____ Date permit issued _____
State and regulatory authority _____
Reasons for action _____
Current status of bond or security _____

(If administrative or judicial proceedings initiated, provide the following:)

Date _____ Location _____
Type _____
Current status of proceedings _____

Submit and identify additional pages necessary to complete response.

11. Have any unabated state or federal cessation orders (CO) and unabated air and water quality notices of violation (NOV) been received prior to the submission of the application by any coal mining and reclamation operation owned or controlled by the operator or any person identified in items 5, 6, or 7? _____ Yes, __X__ No. If "yes," provide the following:

Name to whom CO/NOV was issued _____
Permit no. _____ CO/NOV I.D. no. _____
State and regulatory authority _____
Date CO/NOV issued _____
Description of alleged CO/NOV _____
Abatement actions taken _____
Date of abatement actions _____
Current status of CO/NOV _____
(If administrative/judicial proceedings initiated, provide the following:)
Date _____ Location _____
Current status of proceedings _____

Name to whom CO/NOV was issued _____
Permit no. _____ CO/NOV I.D. no. _____
State and regulatory authority _____
Date CO/NOV issued _____
Description of alleged CO/NOV _____
Abatement actions taken _____
Date of abatement actions _____
Current status of CO/NOV _____
(If administrative/judicial proceedings initiated, provide the following:)
Date _____ Location _____
Current status of proceedings _____

Name to whom CO/NOV was issued _____
Permit no. _____ CO/NOV I.D. no. _____
State and regulatory authority _____
Date CO/NOV issued _____
Description of alleged CO/NOV _____
Abatement actions taken _____
Date of abatement actions _____
Current status of CO/NOV _____
(If administrative/judicial proceedings initiated, provide the following:)
Date _____ Location _____
Current status of proceedings _____

Submit and identify any additional pages necessary to complete response.

12. I, the undersigned, a responsible official of the operator, do hereby verify the information contained in this attachment is true and correct to the best of my knowledge and belief.

Printed Name Clyde Borrell, Title Director

Signature Clyde Borrell as Director, Date 1/26/01

Sworn before me and subscribed in my presence this 26th day of January, 2001.

Ellen M. Roper
Notary Public

ELLEN M. ROPER, Notary Public
State of Ohio
My Commission Expires September 23, 2001

(8) Provide the following for all persons owning or controlling the coal to be mined by another person under a lease, sublease, or other contract and (a) having the right to receive the coal after mining, or (b) having the authority to determine the manner in which another person conducts coal mining operations. If none, check box: [X]. If any person listed is a business entity and not an individual, also complete Attachment 1 for that person.

Name _____

Address _____

City _____ State _____ Zip _____

Telephone _____ - _____ - _____

EIN _____ , or SSN _____

O & C relationship to entity _____

Date O & C relationship began/ended (if applicable)

_____ / _____

Submit and identify additional pages necessary to complete response.

(9) List below the person or persons primarily responsible for ensuring that the applicant will comply with Chapter 1513. of the Revised Code and the rules adopted pursuant thereto while mining and reclaiming the area for which this permit is requested.

LARRY CONWAY

(10) Has the applicant, any person listed under items A(3), (7), and (8), or any person listed on Attachment 1 who "owned or controlled" or "owns or controls" as defined in 1501: 13-4-03(A), held a coal mining permit in the United States within the five years preceding the date of the application? __X__ Yes, _____ No. If "yes," submit Attachment 5. **SEE ATTACHMENT 5**

(11) Does the applicant, any person listed under items A(3), (7), and (8), or any person listed on Attachment 1 have a pending coal mining application in any state of the United States? _____ Yes, __X__ No. Is "yes," submit Attachment 23.

(12) Indicate name of mine __CENTURY MINE__

(13) List below the MSHA identification numbers for the mine and for all mine-associated structures requiring MSHA approval on the proposed permit area.

33-61070

(14) Submit Attachment 22, Certificate of Liability Insurance.

11-92

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 5
(PERMIT LISTING)

Applicant's Name BENNOC, INC.

Submit the following information for each coal mining operation owned or controlled by either the applicant or by any person who owns or controls the applicant.

Name of business Entity BENNOC, INC.
Address P.O. BOX 208, 38722 NATIONAL ROAD
City MORRISTOWN State OHIO Zip 43759
Telephone (740) - 782 - 1330
EIN 34-1036688 or SSN

Permit No.	State	Regulatory Authority	MSHA No. and Date Issued	
D-0425	OHIO	ODNR	33-61070	10-22-84
D-1159	OHIO	ODNR	33-02122	01-26-98

If not previously provided, indicate the ownership and control relationship of the business entity with the applicant, including percent of ownership and location in organizational structure:

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES & RECLAMATION

ATTACHMENT 22
(CERTIFICATE OF LIABILITY INSURANCE)

Name of Insured **Bennoc, Inc.**

This is to certify that the policy of insurance listed below has been issued to the above named insured and is in force at this time. The policy provides bodily injury and property damage insurance for all coal mining and reclamation operations of the insured in the State of Ohio as required by paragraph (B) of rule 1501:13-7-07 of the Administrative Code stated below.

Name of Insurer **Federal Insurance Co.**
Policy Number **3710-25-72**
Policy Period **06/01/00** to **06/01/01**
Name of Underwriting Agent **Steele Insurance Assoc., Inc.**
Address of Underwriting Agent **107 Plaza Dr., St. Clairsville OH 43950**
Telephone No. of Underwriting Agent **740-695-8200**

In the event of cancellation or non-renewal of this policy, including non-payment of policy premiums, the insurer agrees to promptly notify: The Division of Mines & Reclamation, Fountain Square, Columbus, Ohio 43224.

11-16-00 — Carolyn L. Brown
Date — Signature of Underwriting Agent

This certificate is issued as a matter of information only and confers no rights upon the Division of Mines & Reclamation. This certificate does not amend, extend, or alter the coverage afforded by the policy listed above.

1501:13-7-07(B) THE PUBLIC LIABILITY INSURANCE POLICY SHALL:

(1) BE IN EFFECT DURING THE TERM OF THE PERMIT OR ANY RENEWAL INCLUDING THE LENGTH OF ALL RECLAMATION OPERATIONS;
(2) PROVIDE FOR PERSONAL INJURY AND PROPERTY DAMAGE PROTECTION IN AMOUNTS NOT LESS THAN THE FOLLOWING:
  (a) THREE HUNDRED THOUSAND DOLLARS FOR ALL DAMAGES BECAUSE OF BODILY INJURY SUSTAINED BY ONE PERSON AS THE RESULT OF ANY OCCURRENCE, AND FIVE HUNDRED THOUSAND DOLLARS FOR ALL DAMAGES BECAUSE OF BODILY INJURY SUSTAINED BY TWO OR MORE PERSONS AS THE RESULT OF ANY ONE OCCURRENCE; AND
  (b) THREE HUNDRED THOUSAND DOLLARS FOR ALL CLAIMS ARISING OUT OF DAMAGE TO PROPERTY AS THE RESULT OF ANY ONE OCCURRENCE INCLUDING COMPLETED OPERATIONS, WITH AN AGGREGATE LIMIT OF FIVE HUNDRED THOUSAND DOLLARS FOR all PROPERTY DAMAGE TO WHICH THE POLICY APPLIES.

(3) INCLUDE A RIDER REQUIRING THAT THE INSURER NOTIFY THE CHIEF WHENEVER SUBSTANTIVE CHANGES ARE MADE IN THE POLICY, INCLUDING ANY TERMINATION OR FAILURE TO RENEW.

B. COMPLIANCE INFORMATION

(1) Has the applicant, any subsidiary, affiliate, or persons controlled by or under common control with the applicant:

(a) Had a federal or state coal mining permit suspended or revoked in the five years preceding the date of submission of this application? _____ Yes, __X__ No. If "yes," submit Attachment 6.

(b) Forfeited a mining bond or similar security deposited in lieu of bond? _____ Yes, __X__ No. If "yes," submit Attachment 6.

(2) Has the applicant been issued a notice of violation (NOV) in connection with any coal mining and reclamation operation during the three years preceding the date of submission of this application for violations of Chapter 1513. of the Revised Code or these rules, or of any federal or state law, rule, or regulation pertaining to air or water environmental protection? __X__ Yes, _____ No. If "yes," submit Attachment 7A.

(3) Have any unabated federal or state cessation orders (COs) and unabated air and water quality notices of violation (NOV's) been received prior to the submission date of this application by any coal mining and reclamation operation owned or controlled by either the applicant or by any person who owns or controls the applicant? _____ Yes, __X__ No. If "yes," submit Attachment 7B.

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 7A
(NOTICES OF VIOLATION)

Applicant's Name BENNOC, INC. (D-0425-1)

Permit No.	Violation Number	Date of Issuance	Issuing Agency	State	Brief Description of N.O.V.	Action Taken to Abate N.O.V.	Current Status of N.O.V. (*)
D-0425	22459	9/17/97	ODNR	OHIO	RAW & CLEAN COAL SILOS, CONVEYOR TO CLEAN COAL SILO, HAVE NOT BEEN REMOVED AND AREA RECLAIMED.	APPEAL TO BOARD OF REVIEW	VACATED

(*) If administrative or judicial proceedings have been initiated concerning any of the violations, identify the violation and provide an addendum indicating the date, location, type of proceeding, and current status.

C. RIGHT OF ENTRY INFORMATION

(1)(a) Provide the following information for every legal or equitable owner of record, surface and mineral, of the property to be mined on the permit area (i.e. areas affected by surface operations and facilities), indicating whether the ownership is of surface, coal, or noncoal mineral.
See Addendum to A.A.A., Item 14.b)

Name _____

Address _____

City _____ State _____ Zip _____

Surface _____ , Coal _____ , Noncoal _____

Deed Parcel No. _____

Name _____

Address _____

City _____ State _____ Zip _____

Surface _____ , Coal _____ , Noncoal _____

Deed Parcel No. _____

Name _____

Address _____

City _____ State _____ Zip _____

Surface _____ , Coal _____ , Noncoal _____

Deed Parcel No. _____

Name _____

Address _____

City _____ State _____ Zip _____

Surface _____ , Coal _____ , Noncoal _____

Deed Parcel No. _____

C.(1)(b) Provide the following information for every legal or equitable owner of the property to be mined covered by the underground workings indicating whether ownership is for the surface or coal.

Name **C. S. WARSINSKEY**
Address 54140 BELMONT RIDGE ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. 2-15-7

Name **G.L. & C. HOOVER**
Address 54541 BELMONT RIDGE ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. 2-15-7

Name **C. J. & T. A. LUCAS**
Address 54010 BELMONT RIDGE ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. 2-15-3, 2-13-18

Name **T. G. JR. & C. J. COSS**
Address 54131 BELMONT RIDGE ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. 2-15-3

Name **C. L. BONDY**
Address 53900 CRABAPPLE ROAD
City ALLEDONIA State OHIO Zip 43902
Surface X , Coal
Deed Parcel No. 2-15-3, 2-13-79, 2-13-99, 2-13-172, 2-13-78, 2-13-74, 2-15-2, 2-13-130, 2-13-129

Name
Address
City State Zip
Surface , Coal
Deed Parcel No.

Name **T. F. & E. R. CALDWELL**
Address 54128 BELMONT RIDGE ROAD
City BEALLSVILLE State OHIO Zip 43916
Surface X , Coal
Deed Parcel No. 2-15-3, 2-15-4

Name **C. & J. PERKINS**
Address BOX 3
City ALLEDONIA State OHIO Zip 43902
Surface X , Coal
Deed Parcel No. 2-13-86, 2-13-87, 2-13-80,

Name **M. D. & C. D. LALLATHIN**
Address 54633 BELMONT RIDGE ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. 2-15-8, 2-13-79, 2-13-92, 2-15-6

Name **C. & T. THORNBERRY**
Address 54128 BELMONT RIDGE ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. 2-15-3

Name **R. GREER, ETAL**
Address 1255 KOONS ROAD
City NORTH CANTON State OHIO Zip 44720
Surface X , Coal
Deed Parcel No. 2-13-192, 2-13-73, 2-13-70, 2-13-74

Name **F. C. ROTE, JR.**
Address 1091 EAST BOULEVARD
City AURORA State OHIO Zip 44202
Surface X , Coal
Deed Parcel No. 2-13-130, 2-13-132, 2-13-129

Name **W. D. & J. K. SAFFELL**
Address 54980 BELMONT RIDGE ROAD
City BEALLSVILLE State OHIO Zip 43916
Surface X , Coal
Deed Parcel No. 2-13-90, 2-13-37, 2-13-65

Name **J. S. JR. & M. M. PYLES**
Address P.O. BOX 228, ROUTE 1
City BEALLSVILLE State OHIO Zip 43916
Surface X , Coal
Deed Parcel No. 2-13-38

Name **H. J. & C. S. WARSINSKEY**
Address 54140 BELMONT RIDGE ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. 2-13-38, 2-13-37

Name **R. W. & J. EIKLEBERRY**
Address 54830 BELMONT RIDGE ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. 2-13-91

Name **J. W. & J. A. SHRIVER**
Address 54709 BELMONT RIDGE ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. 2-13-92

Name **C. & P. RILEY**
Address 54240 BELMONT RIDGE ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. 2-15-7

Name **JOSEPH HUML**
Address 4360 Lu Rae DRIVE
City ST.CLAIRSVILLE State OHIO Zip 43950
Surface X , Coal
Deed Parcel No. 2-13-132

Name **D. W. TAYLOR, ETAL**
Address 45368 HUDSON ROAD
City ALLEDONIA State OHIO Zip 43902
Surface X , Coal
Deed Parcel No. 2-13-107, 2-13-105

Name **M. & C. BECKETT**
Address 54305 ALLEDONIA-CRABAPPLE ROAD
City ALLEDONIA State OHIO Zip 43902
Surface X , Coal
Deed Parcel No. 2-13-105

Name **20 BUCKHORN CLUB, INC.**
Address 776 E. EXCHANGE STREET
City AKRON State OHIO Zip 44306
Surface X , Coal
Deed Parcel No. 2-13-100

Name **H. L. CROOKS**
Address 55079 ALLEDONIA-CRABAPPLE ROAD
City ALLEDONIA State OHIO Zip 43902
Surface X , Coal
Deed Parcel No. 2-13-80

Name **N. C. STUKEY, ETAL**
Address 55119 STUKEY ROAD
City ALLEDONIA State OHIO Zip 43902
Surface X , Coal
Deed Parcel No. 2-13-177

Name **D. A. & J. CROOKS**
Address 54980 STUKEY ROAD
City ALLEDONIA State OHIO Zip 43902
Surface X , Coal
Deed Parcel No. 2-13-181

Name **N. & B. LINDSEY**
Address 55495 ALLEDONIA-CRABAPPLE ROAD
City ALLEDONIA State OHIO Zip 43902
Surface X , Coal
Deed Parcel No. 2-13-111

Name **P. G. CROOKS**
Address RD #1
City ALLEDONIA State OHIO Zip 43902
Surface X , Coal
Deed Parcel No. 2-13-192

Name **S. & S. SCHAFER**
Address 45280 BILES HILL ROAD
City ALLEDONIA State OHIO Zip 43902
Surface X , Coal
Deed Parcel No. 2-13-189, 2-13-182, 2-13-192

Name **J. F. & J. F. THOMAS**
Address R.D.#1
City ALLEDONIA State OHIO Zip 43902
Surface X , Coal
Deed Parcel No. 2-13-152, 2-13-153

Name **V. M. KNOTTS**
Address R.D. #1
City ALLEDONIA State OHIO Zip 43902
Surface X , Coal
Deed Parcel No. 2-13-153

Name **J. E. & T. A. EDGE**
Address 183 STONE CHURCH ROAD
City WHEELING State WV Zip 26003
Surface X , Coal
Deed Parcel No. 2-13-193, 2-13-182

Name **O. R. & N. PERKINS**
Address 54060 PUGH RIDGE ROAD
City ALLEDONIA State OHIO Zip 43902
Surface X , Coal
Deed Parcel No. 2-13-154, 2-13-3

Name **AMERICAN ENERGY CORP.**
Address RD 1 BOX 119
City AVONMORE State PA Zip 15618
Surface X , Coal
Deed Parcel No. 2-13-154, 2-13-3, 2-13-182, 2-13-37, 2-13-38, 2-13-39, 2-13-40, 2-13-41, 2-13-42, 2-13-43, 2-13-52/2-13-53, 2-13-64, 2-13-65

Name **E. P. & Z. I. BOSTON**
Address BELMONT RIDGE ROAD, R.D.#1
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. 2-13-92

Name **R. D. MOBLEY**
Address 53859 BELMONT RIDGE ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. 2-13-18

Name **S. MOBLEY C/O R. D. MOBLEY**
Address 53859 BELMONT RIDGE ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. 2-13-18

Name **H. R. JENEWEIN**
Address R.R. #2
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. 2-5-34, P-33, P-90, Y-212-6, Y-212-8 Y-212-9, Y-212-10, P-93

Name **A. C. KINDALL**
Address 1351 GUMWOOD DRIVE
City COLUMBUS State OHIO Zip 43229
Surface X , Coal
Deed Parcel No. 2-5-30, 2-5-31, 2-5-32, 2-5-29

Name **H. E. & M. R. PERKINS**
Address BELMONT RIDGE ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. 2-13-60, 2-13-61, 2-13-9, 2-13-58, 2-13-62, 2-13-9/2-13-158

Name **C. H. & A. J. KINNEY**
Address 55085 KINNEY ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. 2-13-69, P-70, Y-212-5, Y-212-10, Y-217

Name **E. W. & M. S. LUCAS**
Address 5377 HUNTER ROAD
City ENON State OHIO Zip 45323
Surface X , Coal
Deed Parcel No. 2-5-24, 2-13-45, 2-13-44, 2-5-39, 2-13-46, 2-13-47, 2-13-67, P-41, P-92

Name **D. F. WHITE, ETAL**
Address 39795 OLD STATE ROUTE 147
City BETHESDA State OHIO Zip 43719
Surface X , Coal
Deed Parcel No. 2-13-16, 2-13-15, 2-13-93

Name **RAVEN ROCKS, INC.**
Address 54061 CRUM ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. 2-13-67, 2-13-93, 2-13-69, 2-13-66, 2-5-33, 2-5-38, 2-5-47, 2-13-94, 2-13-114, 2-13-119, 2-13-116, 2-13-113, 2 13-91, 2-5-45, 2-5-46, 2-15-1,2-13-92 2-13-17, 2-15-5, 2-15-7, 2-5-48, 2-13-157, 2-13-15, 2-13-68, 2-13-44

Name **N.E. JENEWEIN**
Address 37201 S.R.78
City WOODSFIELD State OHIO Zip 43793
Surface X , Coal
Deed Parcel No. 2-5-26, P-25, P-26, P-27

Name **R. D. & C. F. HICKMAN**
Address 53659 NEW CASTLE-BEALLSVILLE ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. 2-65-1, 2-64-1, 2-5-35

Name **D. J. RISER**
Address R.R. #2
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. 2-5-38, 2-5-37, 2-5-32

Name **R. E. & B. L. LUCAS**
Address 55790 C.R. 72
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. 2-13-127, 2-13-83, 2-11-37, P-44, Y-212-4, Y-219-1, Y-220

Name **R. KEMP**
Address 229 2ND. STREET, NELLIE VILLAGE
City WARSAW State OHIO Zip 43844
Surface X , Coal X 1/4 INTEREST IN PARCEL RK-1
Deed Parcel No. 2-15-3, 2-5-45, RK-1, 2-15-5

Name **CONSOLIDATED LAND COMPANY**
Address BOX 505, 34208 AURORA ROAD
City SOLON State OHIO Zip 44139
Surface , Coal X
Deed Parcel No. ALL PARCELS IN SECTIONS 26, 27, 31, 32, 33 WASHINGTON TWP., AND SECTIONS 1, 2, 3, 7, 8, 9, WAYNE TWP. (EXCEPTING PARCEL RK-1 IN SECTION 2)

Name **B. & J. ROGERS**
Address R.D. #1
City JERUSALEM State OHIO Zip 43747
Surface X , Coal
Deed Parcel No. C-203

Name **T. R. DANFORD, ETAL**
Address 3150 JEFFERSON STREET
City BELLAIRE State OHIO Zip 43906
Surface X , Coal
Deed Parcel No. 2-13-183, 2-13-151, 2-13-184

Name **G. A. & L. D. CRIBBEN**
Address 55415 COUNTY ROAD 92
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. P-103, Y-212-4, P-102

Name **E. E. & B. WINGROVE**
Address 55081 COUNTY ROAD 92, RR #1
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. P-90

Name **R. M. & D. Y. MOORE**
Address P.O. BOX 47, 150 LIBERTY STREET
City ETNA State OHIO Zip 43018
Surface X , Coal
Deed Parcel No. P-102

Name **C. J. & C. BAKER**
Address R.D. #1
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. P-102

Name **E. McARDLE**
Address 132 LAKE STREET
City KENT State OHIO Zip 43205
Surface X , Coal
Deed Parcel No. P-70

Name **A. G. & M. V. PHILLIPS**
Address 2252 SOUTH SWINEHART ROAD
City APPLE CREEK State OHIO Zip 44606
Surface X , Coal
Deed Parcel No. P-70

Name **N. L. BURKHART**
Address 54100 NEW CASTLE ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. P-63

Name **L. & L. GUINDON**
Address R.R. #6
City CALDWELL State OHIO Zip 43724
Surface X , Coal
Deed Parcel No. C-207

Name **D. THOBURN c/o VIRGINIA KINNEY**
Address 52901 RT. #26
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. Y-212-5, Y-212-10

Name **M. VUCELICH**
Address R.D. #2
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. Y-212-5, Y-212-10, Y-212-11

Name **O. K. & J. FUCHS**
Address R.D. #2
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. P-53

Name **C. D. & C. R. LEACH**
Address R.D. #1
City JERUSALEM State OHIO Zip 43747
Surface X , Coal
Deed Parcel No. P-94

Name **K.C. & L.L. PHILLIPS**
Address R.D. #2
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. P-94

Name **J. E. & N. P. HAMILTON**
Address 54235 NEW CASTLE ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. P-36, P-64

Name **S. & E. BATES**
Address 52521 BRUSHY ROAD
City JERUSALEM State OHIO Zip 43747
Surface X , Coal
Deed Parcel No. Y-212-5, Y-212-10

Name **M. & M. FUCHS**
Address R.D. #2
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. P-37

Name **M. J. JENEWEIN**
Address 54281 NEW CASTLE, BEALSVILLE ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. P-26

Name **N. P. HAMILTON**
Address 54014 NEW CASTLE-BEALLSVILLE ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. P-64, P-62

Name **W. E. DAVIS**
Address R.D. #2
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. P-28, P-59

Name **R. S. DAVIS**
Address R.D. #2
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. P-59

Name **E. L. WARD**
Address R.D. #2
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. P-68

Name **C. J. & L. J. FRANCIS**
Address 53910 NEW CASTLE-BEALLSVILLE ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. P-67

Name **L.W. & B. DATKULIAK**
Address P.O. BOX 466
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. P-29, P-68

Name **W. & V. CARPENTER**
Address R.D. #2
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. P-64

Name D. L. SEAL
Address 54405 NEW CASTLE ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. P-61

Name L. VANDYNE
Address 54961 NEWCASTLE-BEALLSVILLE ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. P-93

Name D. B. & M. A. CRUM
Address 55041 CR 92
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. P-90

Name R. & M. TUBAUGH
Address 55042 CR 92
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal
Deed Parcel No. P-90

Name M. WILSON
Address 7931 SISSONVILLE DRIVE
City SISSONVILLE State WV Zip 25320
Surface X , Coal
Deed Parcel No. P-90

Name R. D. HAGAN
Address R.F.D. #1
City JERUSALEM State OHIO Zip 43747
Surface X , Coal
Deed Parcel No. Y-216

Name T. & R. HAGAN
Address 55218 NEW CASTLE ROAD
City JERUSALEM State OHIO Zip 43747
Surface X , Coal
Deed Parcel No. P-86

Name G. T. & D. D. BALLOG
Address R.F.D. #1
City JERUSALEM State OHIO Zip 43747
Surface X , Coal
Deed Parcel No. C-201

Name **A.F.C. COAL PROPERTIES, INC.**
Address ONE EAST FOURTH STREET, SUITE 1800
City CINCINNATI State OHIO Zip 45202
Surface _____ , Coal X
Deed Parcel No. P-25, P-26, P-27, P-28, P-29, P-33, P-36, P-37, P-41, P-44, P-53, P-61, P-62, P-63, P-64, P-67, P-68, P-70, P-86, P-90, P-94, P-102, P-103, C-201, C-203, C-207, Y-212-4, Y-212-5, Y-212-6, Y-212-7, Y-212-8, Y-212-9, Y-212-10, Y-212-11, Y-216, Y-217, Y-219-1, Y-220, P-59, P-92, P-93

Name **L.J. SEAL**
Address 54405 NEW CASTLE ROAD
City BEALLSVILLE State OHIO Zip 43716
Surface X , Coal _____
Deed Parcel No. Y-212-7

Name _____
Address _____
City _____ State _____ Zip _____
Surface _____ , Coal _____
Deed Parcel No. _____

Name _____
Address _____
City _____ State _____ Zip _____
Surface _____ , Coal _____
Deed Parcel No. _____

Name _____
Address _____
City _____ State _____ Zip _____
Surface _____ , Coal _____
Deed Parcel No. _____

Name _____
Address _____
City _____ State _____ Zip _____
Surface _____ , Coal _____
Deed Parcel No. _____

ADDENDUM TO PART 1, PAGE 7, ITEM C(1)(b)
BENNOC, INC.
CENTURY MINE
PERMIT D-0425

Bennoc, Inc. is leasing the Pittsburgh (No. 8) coal seam in this application area. The surface owners generally own the other mineral rights, unless otherwise indicated.

C. (2) Provide the following information for the holders of record of any leasehold interest in the coal to be mined or property to be affected by surface operations or facilities, indicating whether the held interest is of surface, coal, or noncoal rights.

Name BENNOC, INC.

Address P.O. BOX 208, 38722 NATIONAL ROAD

City MORRISTOWN State OHIO Zip 43759

Surface _____ , Coal X , Noncoal _____

Name CONSOLIDATED LAND COMPANY

Address BOX 505, 34208 AURORA ROAD

City SOLON State OHIO Zip 44139

Surface _____ , Coal X , Noncoal _____

Submit and identify additional pages necessary to complete response. **(ALSO SEE ADDENDUM TO THIS ITEM)**

(3) Are there purchasers of record under a real estate contract of the coal to be mined or property to be affected by surface operations and facilities?
_____ Yes, X No. If "yes," submit Attachment 2.

(4) Is any owner, holder, or purchaser listed in items C(1) (a and b), (2), or (3) respectively, a business entity other than a single proprietorship?
X Yes, _____ No. If "yes," submit Attachment 3.

SEE ATTACHMENT 3'S

(5) Is any part of the proposed permit area adjacent to any lands which are not owned by those persons identified in item C(1)(a)? _____ Yes, X No. If "yes," submit Attachment 4.

(6) Does the applicant hold lands, interests in lands, options, or pending bids on interests in lands which are contiguous to the property to be mined?
X Yes, _____ No. If "yes," provide a description of the lands.

SEE ADDENDUM TO PART 1, PAGE 8, ITEM C(6)

(7) Is it anticipated that individual mining permits will be sought for any of those lands described in item C(6) above? X Yes, _____ No. If "yes," submit as an addendum and identify those lands to include the size, sequence, and timing of future mining permits, utilizing a map pursuant to 1501:13-4-13(J)(29), Ohio Administrative Code.
SEE ADDENDUM TO PART 1, PAGE 8, ITEM C(7)

ADDENDUM TO PAGE 8, ITEM C(2), BENNOC, INC.

C. (2) Provide the following information for the holders of record of any leasehold interest in the coal to be mined or property to be affected by surface operations or facilities, indicating whether the held interest is of surface, coal, or noncoal rights.

Name AMERICAN ENERGY CORP.

Address RD 1 BOX 119

City AVONMORE State PA Zip 15618

Surface _____ , Coal X , Noncoal _____

Name WYOMING POCAHONTAS LAND CO.

Address 39 ROBIN PLACE

City BECKLEY State WV Zip 25810

Surface _____ , Coal X , Noncoal _____

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION
ATTACHMENT 3
(IDENTIFICATION OF OTHER BUSINESS ENTITIES)

Applicant's Name BENNOC, INC.

This attachment is to be completed and submitted with the permit application if the response to item C. (4) in Part 1 of the permit application is "yes." A separate attachment is to be submitted for each business entity.

Name of business entity BENNOC, INC.

Statutory agent LARRY CONWAY

Street Address 60962 SANDY RIDGE ROAD 1100

City BARNESVILLE State OHIO Zip 43713

Person's Name LARRY CONWAY Position PRESIDENT

Street Address 60962 SANDY RIDGE ROAD

City BARNESVILLE State OHIO Zip 43713

Person's Name DAVID CONWAY Position VICE PRESIDENT

Street Address 60750 SANDY RIDGE ROAD

City BARNESVILLE State OHIO Zip 43713

Person's Name LEE CONWAY Position SECRETARY/TREASURER

Street Address 41020 BETHESDA-BELMONT ROAD

City BETHESDA State OHIO Zip 43713

Person's Name _____ Position _____

Street Address _____

City _____ State _____ Zip _____

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION
ATTACHMENT 3
(IDENTIFICATION OF OTHER BUSINESS ENTITIES)

Applicant's Name BENNOC, INC.

This attachment is to be completed and submitted with the permit application if the response to item C. (4) in Part 1 of the permit application is "yes." A separate attachment is to be submitted for each business entity.

Name of business entity AMERICAN ENERGY CORP.

Statutory agent American Energy Corp.

Street Address RD 1 Box 119

City Avonmore State PA Zip 15618

Person's Name D. ARTHUR HILE Position PRESIDENT/TREASURER

Street Address RD 1 Box 119

City Avonmore State PA Zip 15618

Person's Name MICHAEL O. McKOWN Position SECRETARY

Street Address RD 1 Box 119

City Avonmore State PA Zip 15618

Person's Name CLYDE I. BORRELL Position DIRECTOR

Street Address RD 1 Box 119

City Avonmore State PA Zip 15618

11/92

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION
ATTACHMENT 3
(IDENTIFICATION OF OTHER BUSINESS ENTITIES)

Applicant's Name BENNOC, INC.

This attachment is to be completed and submitted with the permit application if the response to item C. (4) in Part 1 of the permit application is "yes." A separate attachment is to be submitted for each business entity.

Name of business entity CONSOLIDATED LAND COMPANY

Statutory agent A.H. STATUTORY SERVICE CORP. #842696

Street Address 925 EUCLID AVENUE, SUITE 1100

City CLEVELAND State OHIO Zip 44115

Person's Name PETER VULJANIC Position PRESIDENT

Street Address BOX 505, 34208 AURORA ROAD

City SOLON State OHIO Zip 44139

Person's Name DOMINIC M. DAMORE Position SECRETARY

Street Address BOX 505, 34208 AURORA ROAD

City SOLON State OHIO Zip 44139

Person's Name PETER VULJANIC Position TREASURER

Street Address BOX 505, 34208 AURORA ROAD

City SOLON State OHIO Zip 44139

Person's Name _____ Position _____

Street Address _____

City _____ State _____ Zip _____

11/92

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION
ATTACHMENT 3
(IDENTIFICATION OF OTHER BUSINESS ENTITIES)

Applicant's Name BENNOC, INC.

This attachment is to be completed and submitted with the permit application if the response to item C. (4) in Part 1 of the permit application is "yes." A separate attachment is to be submitted for each business entity.

Name of business entity AFC COAL PROPERTIES, INC.

Statutory agent KMK SERVICE CORPORATION #961944

Street Address ONE EAST FOURTH STREET, SUITE 1800

City CINCINNATI State OHIO Zip 45202

Person's Name JOHN A. ANDERSON Position PRESIDENT

Street Address ONE EAST FOURTH STREET

City CINCINNATI State OHIO Zip 45202

Person's Name JAMES C. KENNEDY Position SECRETARY

Street Address ONE EAST FOURTH STREET

City CINCINNATI State OHIO Zip 45202

Person's Name FRED J. RUNK Position TREASURER

Street Address ONE EAST FOURTH STREET

City CINCINNATI State OHIO Zip 45202

Person's Name _____ Position _____

Street Address _____

City _____ State _____ Zip _____

11/92

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION
ATTACHMENT 3
(IDENTIFICATION OF OTHER BUSINESS ENTITIES)

Applicant's Name BENNOC, INC.

This attachment is to be completed and submitted with the permit application if the response to item C. (4) in Part 1 of the permit application is "yes." A separate attachment is to be submitted for each business entity.

Name of business entity 20 BUCKHORN CLUB, INC.

INCORPORATION NOT ACTIVE - CANCELLED 1965

Statutory agent _____

Street Address _____

City _____ State _____ Zip _____

Person's Name _____ Position _____

Street Address _____

City _____ State _____ Zip _____

Person's Name _____ Position _____

Street Address _____

City _____ State _____ Zip _____

Person's Name _____ Position _____

Street Address _____

City _____ State _____ Zip _____

Person's Name _____ Position _____

Street Address _____

City _____ State _____ Zip _____

11/92

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION
ATTACHMENT 3
(IDENTIFICATION OF OTHER BUSINESS ENTITIES)

Applicant's Name BENNOC, INC.

This attachment is to be completed and submitted with the permit application if the response to item C. (4) in Part 1 of the permit application is "yes." A separate attachment is to be submitted for each business entity.

Name of business entity RAVEN ROCKS, INC.

Statutory agent RICHARD A. STRATTON #403275

Street Address OLNEY FRIENDS BOARDING SCHOOL, SANDY RIDGE ROAD

City BARNESVILLE State OHIO Zip 43713

Person's Name HERBERT L. SMITH Position PRESIDENT

Street Address CRUM ROAD

City BEALLSVILLE State OHIO Zip 43716

Person's Name MARY B. SIDWELL Position SECRETARY

Street Address 54061 CRUM ROAD

City BEALLSVILLE State OHIO Zip 43716

Person's Name RICHARD F. SIDWELL Position TREASURER

Street Address 54061 CRUM ROAD

City BEALLSVILLE State OHIO Zip 43716

Person's Name _____ Position _____

Street Address _____

City _____ State _____ Zip _____

C. (8)(a) Provide either of the following to allow for coal mining operations on the permit area.

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described.

See Addendum to A.A.A., Item 14.b)

AFFIDAVIT

State of Ohio, _____ County, ss. _____ being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document _____

Execution Date _____

Expiration Date _____

Parties: From _____ To _____

Description of land: No. Acres _____

County _____ Township _____

Sections _____ Lots _____

Parcel # _____

Explanation of legal rights claimed _____

_____

_____

Pending litigation _____ Yes, _____ No.

_____ _____
Signature of Affiant Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this

_____ day of _____ , 19 _____.

_____
Notary Public

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 2413.45

County BELMONT Township (SEE BELOW)

Sections WAYNE; 9, 2, 1, 3, 8
WASHINGTON; 31, 33, 32, 27, 26 Lots N/A

Parcel # 2-13-3, 2-13-9/2-13-158, 2-13-15, 2-13-16, 2-13-17, 2-13-18, 2-13-37, 2-13-38, 2-13-39, 2-13-40, 2-13-41, 2-13-42, 2-13-43, 2-13-44, 2-13-45, 2-13-46, 2-13-47, 2-13-52, 2-13-58, 2-13-60, 2-13-61, 2-13-62, 2-13-64, 2-13-65, 2-13-66, 2-13-67, 2-13-68, 2-13-69, 2-13-70, 2-13-73, 2-13-74, 2-13-78, 2-13-79, 2-13-80, 21-3-83, 2-13-86, 2-13-87, 2-13-90, 2-13-91, 2-13-92, 2-13-93, 2-13-94, 2-13-99, 2-13-100, 2-13-105, 2-13-107, 2-13-111, 2-13-113, 2-13-114, 2-13-116, 2-13-119, 2-13-127, 2-13-129, 2-13-130, 2-13-132

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 1)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this

2nd day of April, 19 99.

Ellen M. Roper
Notary Public

ELLEN M. LOPER, Notary Public
State of Ohio
My Commission Expires September 23, 2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 30.90

County BELMONT Township WAYNE

Sections 9 Lots N/A

Parcel # 2-5-24

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 2)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this

2nd day of April, 19 99.

Ellen M. Kopen
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 429.34

County BELMONT Township WAYNE

Sections 8, 7 Lots N/A

Parcel # 2-5-26 (PARCEL NO. 52), 2-5-29 (PARCEL NO. 55), 2-5-30 (PARCEL NO. 56), 2-5-31 (PARCEL NO. 57), 2-5-32 (PARCEL NO. 58), 2-5-33 (PARCEL NO. 59), 2-5-34 (PARCEL NO. 60), 2-5-35 (PARCEL NO. 61)

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 3)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Roper
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 206.99

County BELMONT Township WAYNE

Sections 7, 8 Lots N/A

Parcel # 2-5-37, 2-5-38

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 4)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Roper
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 48.73

County BELMONT Township WAYNE

Sections 9 Lots N/A

Parcel # 2-5-39

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 5)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Hopen
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 158.07

County BELMONT Township WAYNE

Sections 1, 2, 8 Lots N/A

Parcel # 2-5-45 (PARCEL NO. 71, 2-5-46 (PARCEL NO. 72), 2-5-47 (PARCEL NO. 73), 2-5-48 (PARCEL NO. 74)

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 6)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Lopez
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 80.00

County BELMONT Township WAYNE

Sections 9 Lots N/A

Parcel # 2-11-37

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 7)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Roper
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 80.00

County BELMONT Township WAYNE

Sections 9 Lots N/A

Parcel # 2-13-151

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 8)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Roper
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 119.46

County BELMONT Township WASHINGTON

Sections 26 Lots N/A

Parcel # 2-13-152, 2-13-153, 2-13-154

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 9)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Roper
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 77.16

County BELMONT Township WAYNE

Sections 9 Lots N/A

Parcel # 2-13-157

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 10)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this

2nd day of April, 19 99.

Ellen M. Loper
Notary Public

ELLEN M. LOPER, Notary Public
State of Ohio
My Commission Expires September 23, 2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 40.00

County BELMONT Township WASHINGTON

Sections 32 Lots N/A

Parcel # 2-13-172

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 11)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Loper
Notary Public

ELLEN M. LOPER, Notary Public
State of Ohio
My Commission Expires September 23, 2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 30.00

County BELMONT Township WASHINGTON

Sections 26 Lots N/A

Parcel # 2-13-177

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 12)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Loper
Notary Public

ELLEN M. LOPER, Notary Public
State of Ohio
My Commission Expires September 23, 2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 10.00

County BELMONT Township WASHINGTON

Sections 26 Lots N/A

Parcel # 2-13-181

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 13)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Loper
Notary Public

ELLEN M. LOPER, Notary Public
State of Ohio
My Commission Expires September 23, 2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 219.0

County BELMONT Township WASHINGTON

Sections 26, 32 Lots N/A

Parcel # 2-13-182, 2-13-183, 2-13-184

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 14)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Loper
Notary Public

ELLEN M. LOPER, Notary Public
State of Ohio
My Commission Expires September 23, 2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 26.0

County BELMONT Township WASHINGTON

Sections 26 Lots N/A

Parcel # 2-13-189

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 15)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Loper
Notary Public

ELLEN M. LOPER, Notary Public
State of Ohio
My Commission Expires September 23, 2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 97.00

County BELMONT Township WASHINGTON

Sections 32, 26 Lots N/A

Parcel # 2-13-192

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 16)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Loper
Notary Public

ELLEN M. LOPER, Notary Public
State of Ohio
My Commission Expires September 23, 2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 50.665

County BELMONT Township WASHINGTON

Sections 26 Lots N/A

Parcel # 2-13-193

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 17)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Loper
Notary Public

ELLEN M. LOPER, Notary Public
State of Ohio
My Commission Expires September 23, 2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 18.59

County BELMONT Township WAYNE

Sections 2 Lots N/A

Parcel # 2-15-1

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 18)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Loper
Notary Public

ELLEN M. LOPER, Notary Public
State of Ohio
My Commission Expires September 23, 2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 98.62

County BELMONT Township (SEE BELOW)

Sections WAYNE; 2, 1
WASHINGTON; 32 Lots N/A

Parcel # 2-15-2, 2-15-3, 2-15-4

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 19)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Loper
Notary Public

ELLEN M. LOPER, Notary Public
State of Ohio
My Commission Expires September 23, 2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 149.29

County BELMONT Township (SEE BELOW)

Sections WAYNE; 2
WASHINGTON; 32 Lots N/A

Parcel # 2-15-5, 2-15-6, 2-15-7, 2-15-8

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 20)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Loper
Notary Public

9001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 33.49

County BELMONT Township WAYNE

Sections 8 Lots N/A

Parcel # 2-64-1, 2-65-1

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 21)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Loper
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date July 25, 1975

Expiration Date Until such time as all commercially mineable coal shall have been removed

Parties: From RALPH E. KEMP & ETHEL E. KEMP
TO WYOMING POCAHONTAS LAND COMPANY (fka THE YOUGHIOGHENY AND OHIO COAL COMPANY)

Description of land: No. Acres 63.30625

County BELMONT Township WAYNE

Sections 2 Lots N/A

Parcel # RK-1

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (ITEM 22)

Pending litigation _____ Yes, X No.

Type of document LEASE ASSIGNMENT

Execution Date April 30, 1993

Expiration Date Until such time as all commercially mineable coal shall have been removed

Parties: From WYOMING POCAHONTAS LAND COMPANY
TO AMERICAN ENERGY CORPORATION

Description of land: No. Acres 63.30625

County BELMONT Township WAYNE

Sections 2 Lots N/A

Parcel # RK-1

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (ITEM 22)

Pending litigation _____ Yes, X No.

Continued on next page

Continued from previous page

Type of document LEASE-ASSIGNMENT

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From AMERICAN ENERGY CORPORATION TO BENNOC, INC.

Description of land: No. Acres 63.30625

County BELMONT Township WAYNE

Sections 2 Lots N/A

Parcel # RK-1

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (ITEM 22)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Loper
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From AFC COAL PROPERTIES, INC. TO CONSOLIDATED LAND COMPANY

Description of land: No. Acres 356.65

County BELMONT Township WAYNE

Sections 13, 14, 19 Lots N/A

Parcel # 25, 26, 27, 28, 29, 33

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 23)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Loper
Notary Public

[illegible] LOPER, Notary [illegible]
State of Ohio
[illegible] 2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From AFC COAL PROPERTIES, INC. TO CONSOLIDATED LAND COMPANY

Description of land: No. Acres 41.28

County BELMONT Township WAYNE

Sections 14 Lots N/A

Parcel # 36, 37

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 24)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Hoper
Notary Public

[illegible] Notary Public
[illegible]
[illegible] 23, 2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From AFC COAL PROPERTIES, INC. TO CONSOLIDATED LAND COMPANY

Description of land: No. Acres 561.87

County BELMONT Township WAYNE

Sections 13, 14, 15, 19, 20 Lots N/A

Parcel # 41, 44, 53, 59, 61, 62, 63, 64, 67, 68

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 25)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Hoper
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From AFC COAL PROPERTIES, INC. TO CONSOLIDATED LAND COMPANY

Description of land: No. Acres 80.0

County BELMONT Township WAYNE

Sections 15 Lots N/A

Parcel # 70

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 26)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this

2nd day of April, 19 99.

Ellen M. Roper
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From AFC COAL PROPERTIES, INC. TO CONSOLIDATED LAND COMPANY

Description of land: No. Acres 50.0

County BELMONT Township WAYNE

Sections 21 Lots N/A

Parcel # 86

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 27)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this

2nd day of April, 19 99.

Ellen M. Roper
Notary Public

Ellen M. Roper, Notary Public
State of Ohio
My Commission Expires Dec. 3, 2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From AFC COAL PROPERTIES, INC. TO CONSOLIDATED LAND COMPANY

Description of land: No. Acres 83.35

County BELMONT Township WAYNE

Sections 15, 21 Lots N/A

Parcel # 90

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 28)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Roper
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From AFC COAL PROPERTIES, INC. TO CONSOLIDATED LAND COMPANY

Description of land: No. Acres 23.0

County BELMONT Township WAYNE

Sections 15 Lots N/A

Parcel # 92

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 29)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this

2nd day of April, 19 99.

Ellen M. Roper
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From AFC COAL PROPERTIES, INC. TO CONSOLIDATED LAND COMPANY

Description of land: No. Acres 7.73

County BELMONT Township WAYNE

Sections 20 Lots N/A

Parcel # 93

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 30)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Hoper
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From AFC COAL PROPERTIES, INC. TO CONSOLIDATED LAND COMPANY

Description of land: No. Acres 46.67

County BELMONT Township WAYNE

Sections 14 Lots N/A

Parcel # 94

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 31)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this

2nd day of April, 19 99.

Ellen M. Roper
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From AFC COAL PROPERTIES, INC. TO CONSOLIDATED LAND COMPANY

Description of land: No. Acres 153.3

County BELMONT Township WAYNE

Sections 15 Lots N/A

Parcel # 102, 103

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 32)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this

2nd day of April, 19 99.

Ellen M. Roper
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From AFC COAL PROPERTIES, INC. TO CONSOLIDATED LAND COMPANY

Description of land: No. Acres 41.6

County BELMONT Township WAYNE

Sections 21 Lots N/A

Parcel # C-201, C-203

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 33)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this

2nd day of April, 19 99.

Ellen M. Roper
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From AFC COAL PROPERTIES, INC. TO CONSOLIDATED LAND COMPANY

Description of land: No. Acres 70.0

County BELMONT Township WAYNE

Sections 15 Lots N/A

Parcel # C-207

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 34)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Roper
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From AFC COAL PROPERTIES, INC. TO CONSOLIDATED LAND COMPANY

Description of land: No. Acres 297.82

County BELMONT Township WAYNE

Sections 14, 15, 20 Lots N/A

Parcel # Y-212-4, Y-212-5, Y-212-6, Y-212-7, Y-212-8, Y-212-9, Y-212-10, Y-212-11

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 35)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Loper
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From AFC COAL PROPERTIES, INC. TO CONSOLIDATED LAND COMPANY

Description of land: No. Acres 57.68

County BELMONT Township WAYNE

Sections 21 Lots N/A

Parcel # Y-216

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 36)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this

2nd day of April, 19 99.

Ellen M. Roper
Notary Public

3001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From AFC COAL PROPERTIES, INC. TO CONSOLIDATED LAND COMPANY

Description of land: No. Acres 58.54

County BELMONT Township WAYNE

Sections 14 Lots N/A

Parcel # Y-217

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 37)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this

2nd day of April, 19 99.

Ellen M. Roper
Notary Public

3001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From AFC COAL PROPERTIES, INC. TO CONSOLIDATED LAND COMPANY

Description of land: No. Acres 24.4

County BELMONT Township WAYNE

Sections 15 Lots N/A

Parcel # Y-219-1

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 38)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this

2nd day of April, 19 99.

Ellen M. Roper
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From AFC COAL PROPERTIES, INC. TO CONSOLIDATED LAND COMPANY

Description of land: No. Acres 0.30

County BELMONT Township WAYNE

Sections 15 Lots N/A

Parcel # Y-220

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (Item 39)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Roper
Notary Public

2001

C.(8)(b) Provide either of the following to allow for coal mining operations within the underground workings:

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the underground workings, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, BELMONT County, ss. LARRY CONWAY being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document SUB-LEASE

Execution Date MARCH 26, 1999

Expiration Date NONE

Parties: From CONSOLIDATED LAND COMPANY TO BENNOC, INC.

Description of land: No. Acres 1945.39

County BELMONT Township WAYNE

Sections 13, 14, 15, 19, 20, 21 Lots N/A

Parcel # 25, 26, 27, 28, 29, 33, 36, 37, 41, 44, 53, 59, 61, 62, 63, 64, 67, 68, 70, 86, 90, 92, 94, 102, 103, C-201, C-203, C-207, Y-212-4, Y-212-5, Y-212-6, Y-212-7, Y-212-8, Y-212-9, Y-212-10, Y-212-11, Y-216, Y-217, Y-219-1, Y-220

Explanation of legal rights claimed SEE ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii) (ITEMS 23 THRU 39)

Pending litigation _____ Yes, X No.

Larry Conway
Signature of Affiant

APRIL 2, 1999
Date

PRESIDENT
Position

Sworn to before me and subscribed in my presence this 2nd day of April, 19 99.

Ellen M. Roper
Notary Public

2001

ADDENDUM TO PART 1, PAGE 10, ITEM C(8)(b)(ii)
BENNOC, INC.
CENTURY MINE
PERMIT D-0425-1

The following items describe the lease rights claimed by Bennoc, Inc for the Pittsburgh (No. 8) Coal Seam:

Item 1 - Lease Rights to Parcels 2-13-3, 2-13-9/2-13-158, 2-13-15, 2-13-16, 2-13-17, 2-13-18, 2-13-37, 2-13-38, 2-13-39, 2-13-40, 2-13-41, 2-13-42, 2-13-43, 2-13-44, 2-13-45, 2-13-46, 2-13-47, 2-13-52, 2-13-58, 2-13-60, 2-13-61, 2-13-62, 2-13-64, 2-13-65, 2-13-66, 2-13-67, 2-13-68, 2-13-69, 2-13-70, 2-13-73, 2-13-74, 2-13-78, 2-13-79, 2-13-80, 2-13-83, 2-13-86, 2-13-87, 2-13-90, 2-13-91, 2-13-92, 2-13-93, 2-13-94, 2-13-99, 2-13-100, 2-13-105, 2-13-107, 2-13-111, 2-13-113, 2-13-114, 2-13-116, 2-13-119, 2-13-127, 2-13-129, 2-13-130, 2-13-132, and 2-13-63

"Together with the free and uninterrupted rights of way into, upon and under said described land, at such points, and in such manner as may be useful for the purpose of digging, draining, and ventilating, and mining and removing said coal, together with the privilege of mining and removing through said described premises other coal belonging to said Grantees, their heirs and assigns, or which may hereafter be acquired, together with the right and privilege to make drains on the surface, and air holes, and change the same as the convenience of mining may require, together with all mining privileges on said surface or under it necessary for the removal of all of the Pittsburgh Vein underlying the same and neighboring properties now owned, or hereafter acquired by said Grantees, their heirs and assigns; and said Grantees, their heirs and assigns, shall in no wise be liable for damages for failure to support the overlying surface, or for the sinking or falling in of said surface, or for destroying any spring or well of water, or for diverting any water flow or natural stream by reason of the removal of said coal or the exercise of any of the above mining privileges."

Item 2 - Lease rights to Parcel 2-5-24 and 2-5-2

TOGETHER with the free and uninterrupted use and enjoyment of right of way into, upon and under said land, at such points and in such manner as may be considered proper and necessary for the advantageous and economical operation thereof, and in the digging and mining of said coal, and without liability therefore and hereby waiving any and all damages that might or could arise therefrom by reason of such digging, mining and carrying away all of said coal, together with the privilege of carrying, transporting and removing through the described premises, this and other coal now owned or acquired by said Grantee, its successors or assigns, generally freed, clear and discharged of any servitude whatever to the overlying land or anything therein or thereon. The said Grantors, reserved, however to them, their heirs and assigns, the right to drill through said coal for oil and gas, and water, etc. The said Grantee, its successors and assigns, have the right to purchase at any time as much of the surface (reserving three acres around the buildings, if any buildings are on the land) of said land as may be necessary in mining, manufacturing, or marketing said coal, at the price of $150.00 per acre, which payment shall entitle them to a deed in fee simple for the same. Said grantee shall have the right to enter upon said farm to drill and test said coal without liability for damages, except as to growing crops.

Item 3 - Lease Rights to Parcels 2-5-26(Parcel No. 52), 2-5-29 (Parcel No 55), 2-5-30 (Parcel No. 56), 2-5-31 (Parcel No. 57), 2-5-32 (Parcel No. 58), 2-5-33 (Parcel No. 59), 2-5-34 (Parcel No. 60), and 2-5-35 (Parcel No. 61)

TOGETHER with the free and uninterrupted right of way into, upon and under the above described Parcels of land numbered from 52 to 62 inclusive, at such points and in such manner as may be proper and necessary for the purpose of digging, mining, coking, draining and ventilating and carrying away said coal, hereby waiving all surface damages or damages of any sort arising therefrom or from the removal of all of said coal, together with the privilege of mining and removing through said described premises other coal belonging to the grantee, its successors and assigns, or which may be hereafter acquired by said grantee, its successors and assigns.

Item 4 - Lease Rights to Parcels 2-5-37 and 2-5-38

TOGETHER with the free and uninterrupted right of way into and under the above described Parcels at such points and in such manner as may be proper and necessary for the purpose of digging, mining, coking, draining, and ventilating and carrying away said coal, hereby waiving all surface damages or damages of any sort arising therefrom or from the removal of all of said coal, together with the privilege of mining and removing through said described premises other coal belonging to the grantee herein, its successors and assigns, or which may hereafter be acquired by said grantee, its successors and assigns.

Item 5 - Lease Rights to Parcel 2-5-39

TOGETHER with the free and uninterrupted right of way into and under said Parcel at such points and in such manner as may be proper and necessary for the purpose of digging, mining, coking, draining, and ventilating and carrying away said coal, hereby waiving all surface damages or damages of any sort arising therefrom or from the removal of all of said coal, together with the privilege of mining and removing through said described premises other coal now owned or which may be hereafter acquired by said grantee, its successors and assigns.

Item 6 - Lease Rights to Parcels 2-5-45 (Parcel No. 71), 2-5-46 (Parcel No. 72), 2-5-47 (Parcel No. 73), and 2-5-48 (Parcel No. 74)

TOGETHER with the free uninterrupted use and enjoyment of right of way into, upon and under said Parcels 71, 72, 73, and 74, at such points and in such manner as may be considered proper and necessary for the advantageous and economical operation thereof, and in the digging and mining of said coal, and without liability therefore and hereby waiving any and all damages that might or could arise therefrom by reason of such digging, mining and carrying away all of said coal, together with the privilege of carrying, transporting and removing through the described premises, this and other coal now owned by, acquired by said grantee, its successors or assigns, generally freed, clear and discharged of any servitude whatever to the overlying land or anything therein or thereon. The said grantors reserved, however to them, their heirs and assigns, the right to drill through said coal for oil and gas and water, etc. The Grantee, its successors and assigns, have the right to purchase at any time as much of the surface (reserving three acres around the buildings, if any buildings are on the land) of said land as may be necessary in mining, manufacturing or marketing said coal, at the price of $150.00 per acre, which payment shall entitle them to a deed in fee simple for the same. Said Grantee shall have the right to enter upon said farm to drill and test coal without liability for damages, except as to growing crops.

Item 7 - Lease Rights to Parcel 2-11-37

Together with the free uninterrupted use enjoyment of and right of way into, upon and under said land at such points and in such manner as may be considered proper and necessary for the advantageous and economical operation thereof, and in the digging and mining of said coal and draining and ventilating of the mines and without liability therefore, and hereby waiving any or all damages that might or could arise therefrom by reason of such digging, mining, draining and ventilating and carrying away of all said coal or the manufacture of said coal or other coal into coke or other products, together with the privilege of carrying or transferring and removing; through the described premises this and other coal and mine supplies now owned or hereafter acquired by said grantee, its successors and assigns, generally free, clear and discharged of any servitude whatever to the overlying land or anything therein or thereon, excepting, however, the right to drill through said coal for oil or gas in such manner as not to endanger the working of said mines. Said grantee, its successors and assigns, shall have the right to purchase at any time so much of said land as may be necessary for railroad, and in mining, manufacturing or marketing said coal at the price of One Hundred Fifty ($150.00) Dollars per acre, upon receipt of which payment the said grantors, their heirs and assigns, agree to deliver a deed in fee for the same.

Item 8 - Lease Rights to Parcel 2-15-151

"Together with the free and uninterrupted rights of way into, upon and under said described land, at such points, and in such manner as may be useful for the purpose of digging, draining and ventilating, and mining and removing said coal, together with the privilege of mining and removing through said seam of coal under said premises other coal belonging to said grantees, their heirs and assigns, or which may be hereafter acquired, together with the right and privilege to make drains on the surface and air holes and change the same as the convenience of mining may require, together with all the mining privileges on said surface or under it necessary for the removal of all of said seam of coal underlying said premises and for the removal of coal underlying neighboring properties now owned or hereafter acquired, by said grantees, their heirs and assigns, through said seam of coal under said premises. And the said grantees, their heirs and assigns, shall in no wise be liable for damages for failure to support the overlying surface, or for the sinking or falling in of said surface, or for destroying any spring or well of water, or for diverting any water flow or natural stream by reason of the removal of said coal or the exercise of any of the above mining privileges."

Item 9 - Lease Rights to Parcels 2-13-152, 2-13-153, 2-13-154

"Together with the free and uninterrupted right-of-way into, upon and under said land at such points and in such manner as may be proper for the purpose of digging, draining, and ventilating and mining and removing said coal, together with the right of mining and removing through said premises other coal belonging to the grantees, their heirs and assigns, or which may be hereafter acquired by said grantees, their heirs and assigns, together with the right to make drains on the surface and air holes, and change the same as the convenience of mining may require, together with all mining privileges on said surface or under it, necessary for the removal of all the said coal underlying the same and neighboring properties now owned or hereafter acquired by said Grantees, their heirs and assigns, and waiving and releasing said grantees, their heirs and assigns, from all liability for damages for failure to support the overlying surface, or for sinking or falling in of such surface or for destroying any spring or well of water or for diverting any water flow or natural stream by reason of the removal of said coal or the exercise of any of the above mining privileges, together with all incidental rights that shall or may accrue to said grantees, their heirs and assigns, by virtue of said grant of coal mining privileges."

Item 10 - Lease Rights to Parcel 2-13-157

"Together with the free and uninterrupted rights of way into, upon and under said land at such points and in such manner as may be proper for the purpose of digging, draining and ventilating, and mining and removing said coal, together with the right of mining and removing through said premises other coal belonging to said Grantees, their heirs and assigns, or which may be hereafter acquired, together with the right to make drains on the surface, and air holes, and change the same as the convenience of mining may require, together with all mining privileges on said surface, or under it, necessary for the removal of all said coal underlying the same and neighboring properties now owned or hereafter acquired by said Grantees, their heirs and assigns, and waiving and releasing said Grantees, their heirs and assigns, from all liability for damages for failure to support the overlying surface, or for sinking or falling in of such surface, or for destroying any spring or well of water, or for diverting any water flow or natural stream by reason of the removal of such coal or the exercise of any of the above mining privileges, together with all incidental rights that shall or may accrue to the said Grantees, their heirs and assigns, by virtue of the within grant of coal and mining privileges."

Item 11 - Lease Rights to Parcel 2-13-172

"Together with the free and uninterrupted rights of way into, upon and under said land at such points and in such manner as may be proper for the purpose of digging, draining and ventilating, and mining and removing said coal, together with the right of mining and removing through said premises other coal belonging to said Grantees, their heirs and assigns, or which may be hereafter acquired, together with the right to make drains on the surface, and air holes, and change the same as the convenience of mining may require, together with all mining rights and privileges on said surface, or under it necessary for the removal of all said coal underlying the same and neighboring properties now owned or hereafter acquired by said Grantees, their heirs and assigns, and waiving and releasing said Grantees, their heirs and assigns, from all liability for damages for failure to support the overlying surface, or for sinking or falling in of such surface, or for destroying any spring or well of water, or for diverting any water flow or natural stream by reason of the removal of such coal or the exercise of any of the above mining privileges, together with all incidental rights that shall or may accrue to the said Grantees, their heirs and assigns, by virtue of the within grant of coal and mining privileges."

Item 12 - Lease Rights to Parcel 2-13-177

"Together with the free and uninterrupted rights of way into, upon and under said described land at such points, and in such manner as may be useful for the purpose of digging, draining and ventilating and mining and removing said coal, together with the privilege of mining and removing through said described premises, other coal belonging to said Grantees, their heirs and assigns, or which may be hereafter acquired together with the right and privilege to make drains on the surface, and air holes, and change the same as the convenience of mining may require, together with all mining privileges on said surface or under it, necessary for the removal of all the Pittsburgh Vein underlying the same and neighboring properties now owned, or hereafter acquired by said Grantee, their heirs and assigns; and said Grantees, their heirs and assigns, shall in no wise be liable for damages for failure to support the overlying surface, or for the sinking or falling in of said surface, or for destroying any spring or well of water, or for diverting any water flow or natural stream by reason of the removal of said coal or the exercise of any of the above mining privileges."

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Item 13 - Lease Rights to Parcel 2-13-181

"Together with the free and uninterrupted rights of way into, upon and under said land at such points and in such manner as may be proper for the purpose of digging, draining and ventilating, and mining and removing said coal, together with the right of mining and removing through said premises other coal belonging to said Grantees, their heirs and assigns, or which may be hereafter acquired, together with the right to make drains on the surface, and air holes, and change the same as the convenience of mining may require, together with all mining privileges on said surface, or under it, necessary for the removal of all said coal underlying the same and neighboring properties now owned or hereafter acquired by said Grantees, their heirs and assigns, and waiving and releasing said Grantees, their heirs and assigns, for all liability for damages for failure to support the overlying surface, or for sinking or falling in of such surface, or for destroying any spring or well of water, or for diverting any water flow or natural stream by reason of the removal of such coal or the exercise of any of the above mining privileges, together with all incidental rights that shall or may accrue to the said Grantees, their heirs and assigns, by virtue of the within grant of coal and mining privileges."

Item 14 - Lease Rights to Parcels 2-13-182, 2-13-183, 2-13-184

"Together with the free and uninterrupted rights of way into, upon and under said described land, at such points, and in such manner as may be useful for the purpose of digging, draining, and ventilating, and mining and removing said coal, together with the privilege of mining and removing through said seam of coal under said described premises, other coal belonging to said Grantees, their heirs and assigns, or which may be hereafter acquired, together with the right and privilege to make drains on the surface or air holes and change the same as the convenience of mining may require, together with all the mining privileges on said surface or under it necessary for the removal of all of said seam of coal underlying said premises and for the removal of coal underlying neighboring properties now owned or hereafter acquired by said grantees, their heirs and assigns, through said seam of coal under said premises." "And said Grantees, their heirs and assigns, shall in no wise be liable for damages for failure to support the overlying surface, or for sinking or falling in of said surface, or for destroying any spring or well of water, or for diverting any water flow or natural stream by reason of the removal of said coal or the exercise of any of the above mining privileges."

Item 15 - Lease Rights to Parcel 2-13-189

Together with all necessary or convenient rights-of-way under the surface of said lands for the purposes of approaching, mining, removing, and transporting said coal thereunder and therefrom and other coal now owned or hereafter acquired by said Grantor [*sic*], its successors and assigns, and at the pleasure to place, maintain, remove or replace under the surface all fixtures, structures, machinery, and appliances deemed necessary or convenient to the operation of mines and to do all things required to ventilate and drain the workings and also the right to mine and remove all of said coal with or without leaving support to the surface of said lands, the Grantees [*sic*] hereby waiving all damages whatsoever for any injury to the surface or to water courses or roads or ways by reason of said mining and removing, draining, and ventilating of said coal.

Item 16 - Lease Rights to Parcel 2-13-192

"TOGETHER with the free, uninterrupted use and enjoyment of right of way into, upon and under said lands at such points and in such manner as may be considered proper and necessary for the advantageous and economical operation thereof, and in the digging and mining of said coal and draining and ventilating of the mines, and without liability therefore, and hereby waiving any or all damages that might or could arise therefrom by reason of such digging, mining, draining and ventilating and carrying away of all of said coal, or the manufacture of said coal or other coal into coke or other products, together with the privilege of carrying or transferring and removing through the described premises this and other coal and mine supplies now owned or hereafter acquired by said grantee, his heirs and assigns, generally freed, clear and discharged of any servitude whatever to the overlying land or anything therein or thereon, reserving, however, the right to drill through said coal for oil and gas in such manner as not to endanger the working of said mines.

Item 17 - Lease Rights to Parcel 2-13-193

"TOGETHER with the right in perpetuity of mining, taking out and removing such coal; also the further right in perpetuity to remove coal to and from other lands or lands through entries, shafts, air ways and mine openings of any and every kind whatsoever with the same rights in removing coal to or from such other lands to use the surface, entries, shafts, pits and other appliances for mining, upon, in and through or under the lands herein described, as are herein granted for the mining and removal of the coal hereby granted; provided further that the said grantee, his heirs, executors, administrators and assigns, shall have and are hereby given the right to re-enter and take from time to time so much of and such part of the surface over the aforesaid coal rights as said grantee, his heirs, executors, administrators and assigns, may desire, and as may be necessary for pits, shafts, buildings, structures, and appurtenances thereto, platforms, drifts, drains, reservoirs, roads, switches, side tracks, machinery and chutes to facilitate the taking out, mining and removing of such coal paying therefore at the rate of $100 per acre, provided, however, that no part of the surface of said premises within 100 yards of any building now erected shall be taken except upon payment of the just and reasonable value of said surface so taken and the actual damage resulting to the residue of said premises by the use to which said surface is put; and also granting the right to enter upon said land at any time for the purpose of testing for said coal. Giving and granting the rights and privileges hereinbefore mentioned without liability by reason of or in any way resulting from their enjoyment or from the removal of said coal from over and under said premises or any part thereof. Excepting and reserving the right to drill and operate through said vein of coal for oil, gas and other minerals.

Item 18 - Lease Rights to Parcel 2-15-1

Together with the free and uninterrupted right-of-way into, upon and under said described land, at such points, and in such manner as may be useful for the purpose of digging, draining and ventilating, and mining and removing said coal, together with the privilege of mining and removing through said described premises, other coal belonging to said Grantees, their heirs and assigns, or which may hereafter be acquired, together with the right and privilege to make drains on the surface, and air holes and change the same as the convenience of mining may require, together with all mining privileges on said surface or under it necessary for the removal of all of the Pittsburgh Vein underlying the same and neighboring properties now owned, or hereafter acquired by the said Grantees, their heirs and assigns; and the said Grantees, their heirs and assigns, shall in no wise be liable for damages for failure to support the overlying surface or for the sinking or falling in of said surface or for destroying any spring or well of water, or for diverting any water flow or natural stream by reason of the removal of said coal or the exercises of any of the above mining privileges.

Item 19 - Lease Rights to Parcels 2-15-2, 2-14-3, 2-15-4

Together with the free and uninterrupted right-of-way into, upon and under said lands, at such points and in such manner as may be proper for the purpose of digging, mining, draining, removing refuse, ventilating and carrying away said coal; together with the right of mining and removing under said premises, other coal belonging to said Grantees, their heirs and assigns, or that may hereafter be by them acquired, and waiving and releasing the Grantees, their heirs and assigns, from all liability for damages for failure to support the overlying surface, or for sinking or falling in of said surface, or for destroying any spring or well of water, or for diverting any water flow, or natural stream, by reason of the removal of said coal, or in the exercise of any of the above mining privileges.

Item 20 - Lease Rights to Parcels 2-15-5, 1-15-6, 2-15-7, 2-15-8

Together with the free and uninterrupted rights of ways into, upon and under said described land, at such points, and in such manner as may be useful for the purpose of digging and ventilating, and mining and removing said coal together with the privilege of mining and removing through said described premises, other coal belonging to said Grantees, their heirs and assigns, or which may be hereafter acquired, together with the right and privilege to make drains on the surface, and air holes, and change the same as the convenience of mining may require, together with all mining privileges on said surface or under it necessary for the removal of all of the Pittsburgh Vein underlying the same and neighboring properties now owned, or hereafter acquired by said Grantees, their heirs and assigns; and said Grantees, their heirs and assigns, shall in no wise be liable for damages for failure to support the overlying surface, or for the sinking or falling in of said surface, or for destroying any spring or well of water, or for diverting any water flow or natural stream by reason of the removal of said coal or the exercise of any of the above mining privileges.

Item 21 - Lease Rights to Parcels 2-64-1, 2-65-1

Together with the right to mine the same by any method, except for that method commonly known as surface mining.

Item 22 - Lease Rights to Parcel RK-1

All that certain vein of coal known as the Pittsburgh or No. 8 seam of coal, together with the sole and exclusive right and privilege of mining and removing the same, without liability for damage to the surface, or anything therein or thereon, or other geological strata above or beneath the said coal contained in and underlying the described premises, containing 63.30625 acres, or to the streams, springs, or other waters above or beneath the said surface caused by the removal of coal or the exercise of any other right or privilege given.

Item 23 - Lease Rights to Parcels 25, 26, 27, 28, 29, 33

Together with the free and uninterrupted right of way into, upon and under the above described tracts of land, Parcels No. 25 to No. 34, both inclusive, at such points and in such manner as may be proper and necessary for the purpose of digging, mining, coking, draining, and ventilating, and carrying away said coal, hereby waiving all surface damages or damages of any sort arising therefrom or from the removal of all said coal, together with the privilege of mining and removing through said described premises other coal belonging to the grantee, its successors and assigns, or which may be hereafter acquired by said grantee, its successors and assigns.

Item 24 - Lease Rights to Parcels 36, 37

Together with the free and uninterrupted right of way into and under said Parcels No. 36, No. 37, and No. 38, above described at such points and in such manner as may be proper and necessary for the purpose of digging, mining, draining, and ventilating and carrying away all of said coal, hereby waiving all surface damages or damages of any sort arising therefrom or from the removal of all of said coal. Together with the privilege of mining and removing through and under said last above described premises other coal now owned or which may hereafter be acquired by said grantee, its successors and assigns.

Item 25 - Lease Rights to Parcels 41, 44, 53, 59, 61, 62, 63, 64, 67, 68

Together with the free and uninterrupted right of way into, upon and under said Parcels No. 39 to No. 68 both inclusive of coal land at such points and in such manner as may be proper and necessary for the purpose of digging, mining, coking, draining, and ventilating and carrying away said coal, hereby waiving all surface damages or damages of any sort arising therefrom or from the removal of all of said coal, together with the privilege of mining and removing through said described premises other coal now owned or which may be hereafter acquired by said grantee, its successors and assigns.

Item 26 - Lease Rights to Parcel 70

Together with the free an uninterrupted right of way into, and under said Parcels No. 69 and No. 70, of coal land at such points and in such manner as may be proper and necessary for the purpose of digging, mining, draining, and ventilating and carrying away said coal, hereby waiving all surface damages or damages of any sort arising from the mining or removal of all of said coal, together with the privileges of mining and removing through said premises the coal underlying the neighboring premises now owned or which may be hereafter acquired by the grantee herein, its successors and assigns.

Item 27 - Lease Rights to Parcel 86

Together with the free and uninterrupted rights of way, into, upon and under said land, at such points and in such manner as may be proper for the purpose of digging, draining and ventilating and mining and removing said coal, together with the right of mining and removing through said premises other coal belonging to said Grantors [*sic*], their heirs and assigns, or which may be hereafter acquired, together with the right to make drains on the surface, and air holes and change the same as the convenience of mining may require, togther with all mining privileges on said surface, or under it, necessary for the removal of all said coal underlying the same and neighboring properties now owned or hereafter acquired by said Grantors [*sic*] their heirs and assigns, and waiving and releasing said Grantors [*sic*], their heirs and assigns, from all liability for damages for failure to support the overlying surface, or for sinking or for falling in of such surface, or for destroying any spring or well of water, or for diverting any water flow or natural stream by reason of the removal of such coal or the exercise of any of the above mining privileges, together with all incidental rights that shall or may accrue to Grantors [*sic*], their heirs and assigns, by virtue of said grant of coal mining privileges. The said Grantee [*sic*], hereby agrees to and with the said Grantors [*sic*], their heirs and assigns, to convey in fee simple such amount of said above described surface as may, in the opinion of said Grantors [*sic*], their heirs and assigns from time to time as may be useful for the purpose of mining said coal, or exercising any right incidental thereto, or may be useful for the deposit of Gob or Refuse caused by the mining of said coal.

Item 28 - Lease Rights to Parcel 90

Together with the right and privilege of way into, upon and under said lands, at such points, and in such manner as may be useful to said grantees their heirs and assigns for the purpose of operating, digging, mining, ventilating, draining, removing and carrying away all of said coal, and said grantor hereby waives all claims for damages in any way arising therefrom, or for the removal of all of said coal. And also the right and privilege of mining, operating, draining, removing and carrying away, upon and through said premises, any other coal which belongs to or is controlled by said grantees their heirs and assigns. Said grantor, his heirs and assigns, agree to convey to said Grantees, their heirs and assigns, by Warranty deed free from all encumbrances, not less than one acre of the surface of the land above described and sold, upon the payment by the grantees, their heirs and assigns, to the grantor his heirs and assigns, therefore, at the rate of One Hundred dollars, per acre; but it is understood and agreed that shafts for ventilation and drainage openings shall be in ravines and on waste places on said lands herein sold and conveyed.

Item 29 - Lease Rights to Parcel 92

Together with the free uninterrupted right of way into, upon and under said land, at such points, and in such manner as may be proper and necessary for the purpose of digging, mining, coking, draining, and ventilating, and carrying away said coal, etc., (hereby waiving all surface damages, or damages of any sort arising therefrom, or from the removal of all of said coal), together with the privilege of mining and removing through, upon and over said described premises, other coal belonging to said grantee, his heirs and assigns, or which may hereafter be acquired.

Item 30 - Lease Rights to Parcel 93

Together with the rights and privileges necessary and useful in the mining and removing of the said coal, including the right of mining the same without leaving any support for the overlying stratas and without liability for any injury which may result to the surface from the breaking of said stratas, together with the right of ventilation and drainage, and of access to the mines for men and materials; the shafts or openings for such purposes, however, to be in the ravines and waste places upon said land, and not nearer than ten rods (165.0') of the principle buildings thereon. Any surface ground required for building and operating switches and railroads, shafts, openings, machinery, ways, roads, houses for employees, and the deposit of gob from the mines may also be taken, but shall be paid for, before being occupied, at the rate of Two Hundred ($200.00) Dollars per acre and upon the payment thereof, the said Grantors for themselves their heirs and assigns, agrees to execute and deliver a General Warranty Deed to said Grantee, his heirs and assigns, thereby conveying such amount of said surface which in the opinion of the Grantee, his heirs and assigns, may be required for the purpose aforesaid. Together with the right of mining, ventilating, draining, and transporting the coal of other lands through the mines and openings in and upon the land above described.

Item 31 - Lease Rights to Parcel 94

Together with the rights and privileges necessary and useful in the mining and removing of said coal, including the right of mining the same without leaving any support for the overlying stratas and without liability for any injury which may result to the surface from the breaking of said stratas, the right of ventilation and drainage and of access to the mines for men and materials; the shafts or openings, for such purposes, however, to be in the ravines and waste places upon said land, and not nearer than ten (10) rods (165.0') to the principle buildings thereon. Any surface ground required for building and operating switches and railroads, shafts, openings or machinery, ways, roads, houses for employees, etc., may also be taken but shall be paid for before being occupied at the rate of Two Hundred Dollars ($200.00) per acre which payment shall thereupon entitle the said grantee herein, his heirs and assigns, to a deed in fee for the same. Also the right of mining, ventilating, draining and transporting the coal of other lands through the mines and openings in and upon the said land.

Item 32 - Lease Rights to Parcels 102, 103

Together with the free uninterrupted use and enjoyment of right of way into, upon and under said land, Parcels No. 102 and No. 103, at such points and in such manner as may be considered proper and necessary for the advantageous and economical operation thereof, and in the digging and mining of said coal, and without liability therefore and hereby waiving any and all damages that might or could arise therefrom by reason of such mining privilege of carrying, transporting and removing through the described premises, this and other coal now owned or acquired by said grantee, its successors or assigns, generally freed, clear and discharged of any servitude whatever to the overlying land or anything therein or thereon. The said grantors reserved however to them, their heirs and assigns, the right to drill through said coal for oil and gas and water, etc. The said grantee, its successors and assigns, have the right to purchase at any time as much of the surface (reserving three acres around the building, if any buildings are on the land) of said land as may be necessary in mining, manufacturing or marketing said coal, at the price of $150.00 an acre, which payment shall entitle them to a deed in fee simple for the same. Said grantee shall have the right to enter upon said farm to drill and test said coal without liability to damages, except to growing crops.

Item 33 - Lease Rights to Parcels C-201, C-203

All the so-called Six foot or No. 8 Pittsburgh Vein coal being and lying below the water level of the creek running through and adjoining the herein described lands, with the right to enter mine and carry away the same from under the described parcel of land. With the right of passage through and under the described lands by means of main entries, passages or tunnels, for the purpose of transporting coal that may be mined from the lands of other parties.

Item 34 - Lease Rights to Parcel C-207

Together with the right to enter, mine and carry away said coal be means of main entries, passages, and tunnels, and the right to use such main entries, passages and tunnels, for the purpose of transporting coal that may be mined from the lands of other parties.

Item 35 - Lease Rights to Parcels Y-212-4, Y-212-5, Y-212-6, Y-212-7, Y-212-8, Y-212-9, Y-212-10, Y-212-11

Together with the free and uninterrupted right of way into, upon and under said described 13 tracts of land, Parcels No. Y-212-1 to No. Y-212-13, both inclusive, at such points, and in such manner as may be proper and necessary for the purpose of digging, mining, coking, draining and ventilating, and carrying away said coal, hereby waiving all damages arising therefrom or from the removal of all of said coal, together with the privilege of mining and removing through said described premises other coal belonging to the grantee, his heirs and assigns, or which may hereafter be acquired by said grantee, his heirs and assigns.

Item 36 - Lease Rights to Parcel Y-216

Together with the free and uninterrupted use and enjoyment of right of way into, upon and under said land at such points and in such manner as may be considered proper and necessary for the advantageous and economical operation thereof, and in the digging and mining of said coal and draining the mines, and ventilating the same, and without liability therefor, and hereby waiving any and all damages that might or could arise therefrom by reason of such digging, mining, draining, and ventilating and carrying away of all said coal or the manufacture of said coal or other coal into coke or other products, together with the privilege of carrying or transferring or removing through the premises hereinafter described, this and other coal and mining supplies now or hereafter acquired by said grantee, its successors and assigns, generally freed, cleared and discharged of any servitude whatever to the underlying land or anything therein or thereon.

Item 7 - Lease Rights to Parcel 2-11-37

Together with the free uninterrupted use enjoyment of and right of way into, upon and under said land at such points and in such manner as may be considered proper and necessary for the advantageous and economical operation thereof, and in the digging and mining of said coal and draining and ventilating of the mines and without liability therefore, and hereby waiving any or all damages that might or could arise therefrom by reason of such digging, mining, draining and ventilating and carrying away of all said coal or the manufacture of said coal or other coal into coke or other products, together with the privilege of carrying or transferring and removing; through the described premises this and other coal and mine supplies now owned or hereafter acquired by said grantee, its successors and assigns, generally free, clear and discharged of any servitude whatever to the overlying land or anything therein or thereon, excepting, however, the right to drill through said coal for oil or gas in such manner as not to endanger the working of said mines. Said grantee, its successors and assigns, shall have the right to purchase at any time so much of said land as may be necessary for railroad, and in mining, manufacturing or marketing said coal at the price of One Hundred Fifty ($150.00) Dollars per acre, upon receipt of which payment the said grantors, their heirs and assigns, agree to deliver a deed in fee for the same.

Item 8 - Lease Rights to Parcel 2-13-151

"Together with the free and uninterrupted rights of way into, upon and under said described land, at such points, and in such manner as may be useful for the purpose of digging, draining and ventilating, and mining and removing said coal, together with the privilege of mining and removing through said seam of coal under said premises other coal belonging to said grantees, their heirs and assigns, or which may be hereafter acquired, together with the right and privilege to make drains on the surface and air holes and change the same as the convenience of mining may require, together with all the mining privileges on said surface or under it necessary for the removal of all of said seam of coal underlying said premises and for the removal of coal underlying neighboring properties now owned or hereafter acquired, by said grantees, their heirs and assigns, through said seam of coal under said premises. And the said grantees, their heirs and assigns, shall in no wise be liable for damages for failure to support the overlying surface, or for the sinking or falling in of said surface, or for destroying any spring or well of water, or for diverting any water flow or natural stream by reason of the removal of said coal or the exercise of any of the above mining privileges."

Item 9 - Lease Rights to Parcels 2-13-152, 2-13-153, 2-13-154

"Together with the free and uninterrupted right-of-way into, upon and under said land at such points and in such manner as may be proper for the purpose of digging, draining, and ventilating and mining and removing said coal, together with the right of mining and removing through said premises other coal belonging to the grantees, their heirs and assigns, or which may be hereafter acquired by said grantees, their heirs and assigns, together with the right to make drains on the surface and air holes, and change the same as the convenience of mining may require, together with all mining privileges on said surface or under it, necessary for the removal of all the said coal underlying the same and neighboring properties now owned or hereafter acquired by said Grantees, their heirs and assigns, and waiving and releasing said grantees, their heirs and assigns, from all liability for damages for failure to support the overlying surface, or for sinking or falling in of such surface or for destroying any spring or well of water or for diverting any water flow or natural stream by reason of the removal of said coal or the exercise of any of the above mining privileges, together with all incidental rights that shall or may accrue to said grantees, their heirs and assigns, by virtue of said grant of coal mining privileges."

C. (9)(a) List below the following information for each surface owner of land within the proposed permit area.

See Addendum to A.A.A., Item 14.b)

OWNER NAME	COUNTY	TOWNSHIP	SEC./LOT	T- ,R-

C. (9)(b) List the following information for each surface owner of land within the proposed underground workings.

OWNER NAME	COUNTY	TOWNSHIP	SEC./LOT	T-	R-
C. S. WARSINSKEY	BELMONT	WAYNE	2	6	5
G.L. & C. HOOVER	BELMONT	WAYNE	2	6	5
C. J. & T. A. LUCAS	BELMONT	WAYNE	1, 2	6	5
T. G. JR. & C. J. COSS	BELMONT	WAYNE	2	6	5
C. L. BONDY	BELMONT	WAYNE	2	6	5
	BELMONT	WASHINGTON	31, 32	5	4
T. F. & E. R. CALDWELL	BELMONT	WAYNE	1, 2	6	5
C. & J. PERKINS	BELMONT	WASHINGTON	27,33	5	4
M. D. & C. D. LALLATHIN	BELMONT	WASHINGTON	32	5	4
	BELMONT	WAYNE	2	6	5
C. & T. THORNBERRY	BELMONT	WAYNE	2	6	5
R. GREER, ETAL	BELMONT	WASHINGTON	32,26	5	4
F. C. ROTE, JR.	BELMONT	WASHINGTON	31, 32	5	4
W. D. & J. K. SAFFELL	BELMONT	WAYNE	2, 3	6	5
J. S. JR. & M. M. PYLES	BELMONT	WAYNE	3	6	5
H. J. & C. S. WARSINSKEY	BELMONT	WAYNE	2, 3	6	5
R. W. & J. EIKLEBERRY	BELMONT	WAYNE	2	6	5
J. W. & J. A. SHRIVER	BELMONT	WAYNE	2	6	5
C. & P. RILEY	BELMONT	WAYNE	2	6	5
J. HUML	BELMONT	WASHINGTON	31, 32	5	4
D. W. TAYLOR, ETAL	BELMONT	WASHINGTON	32	5	4
M. & C. BECKETT	BELMONT	WASHINGTON	32	5	4
20 BUCKHORN CLUB, INC.	BELMONT	WASHINGTON	31	5	4
H. L. CROOKS	BELMONT	WASHINGTON	26	5	4
N. C. STUKEY, ETAL	BELMONT	WASHINGTON	26	5	4
D. A. & J. CROOKS	BELMONT	WASHINGTON	26	5	4

OWNER NAME	COUNTY	TOWNSHIP	SEC./LOT	T-	R-
N. & B. LINDSEY	BELMONT	WASHINGTON	26	5	4
P. G. CROOKS	BELMONT	WASHINGTON	26	5	4
S. & S. SCHAFER	BELMONT	WASHINGTON	26	5	4
J. F. & J. F. THOMAS	BELMONT	WASHINGTON	26	5	4
V. M. KNOTTS	BELMONT	WASHINGTON	26	5	4
J. E. & T. A. EDGE	BELMONT	WASHINGTON	26	5	4
O. R. & N. PERKINS	BELMONT	WASHINGTON	26	5	4
AMERICAN ENERGY CORP.	BELMONT	WASHINGTON	26	5	4
	BELMONT	WAYNE	2, 3	6	5
E. P. & Z. I. BOSTON	BELMONT	WAYNE	2	6	5
R. D. MOBLEY	BELMONT	WAYNE	1	6	5
S. MOBLEY	BELMONT	WAYNE	1	6	5
H. R. JENEWEIN	BELMONT	WAYNE	8, 14, 20, 21	6	5
A. C. KINDALL	BELMONT	WAYNE	7	6	5
H. E. & M. R. PERKINS	BELMONT	WAYNE	3	6	5
	BELMONT	WASHINGTON	32, 33	5	4
C. H. & A. J. KINNEY	BELMONT	WAYNE	8,14,15	6	5
E. W. & M. S. LUCAS	BELMONT	WAYNE	9, 15	6	5
D. F. WHITE, ETAL	BELMONT	WAYNE	9	6	5
RAVEN ROCKS, INC.	BELMONT	WAYNE	1,2,3,8,9	6	5
N. E. JENEWEIN	BELMONT	WAYNE	8, 14	6	5
R. D. & C. F. HICKMAN	BELMONT	WAYNE	7, 8	6	5
D. J. RISER	BELMONT	WAYNE	7, 8	6	5
R. E. & B. L. LUCAS	BELMONT	WAYNE	9, 15	6	5
R. KEMP	BELMONT	WAYNE	2	6	5
B. & J. ROGERS	BELMONT	WAYNE	21	6	5
T. R. DANFORD, ETAL	BELMONT	WASHINGTON	26,32,33	5	4
G. A. & L. D. CRIBBEN	BELMONT	WAYNE	15	6	5

OWNER NAME	COUNTY	TOWNSHIP	SEC./LOT	T-	R-
E. E. & B. WINGROVE	BELMONT	WAYNE	15	6	5
R. M. & D. Y. MOORE	BELMONT	WAYNE	15	6	5
C. J. & C. BAKER	BELMONT	WAYNE	15	6	5
E. McARDLE	BELMONT	WAYNE	15	6	5
A. G. & M. V. PHILLIPS	BELMONT	WAYNE	15	6	5
N. L. BURKHART, ETAL	BELMONT	WAYNE	19	6	5
L. & L. GUINDON	BELMONT	WAYNE	15	6	5
D. THOBURN	BELMONT	WAYNE	14	6	5
M. VUCELICH	BELMONT	WAYNE	14	6	5
O. K. & J. FUCHS	BELMONT	WAYNE	14	6	5
C. D. & C. R. LEACH	BELMONT	WAYNE	14	6	5
K. C. & L. L. PHILLIPS	BELMONT	WAYNE	14	6	5
J. E. & N. P. HAMILTON	BELMONT	WAYNE	14, 20	6	5
S. & E. BATES	BELMONT	WAYNE	14	6	5
M. & M. FUCHS	BELMONT	WAYNE	14	6	5
M. J. JENEWEIN	BELMONT	WAYNE	14	6	5
N. P. HAMILTON	BELMONT	WAYNE	14, 20	6	5
W. E. DAVIS	BELMONT	WAYNE	13, 14	6	5
R. S. DAVIS	BELMONT	WAYNE	14	6	5
E. L. WARD	BELMONT	WAYNE	13	6	5
C. J. & L. J. FRANCIS	BELMONT	WAYNE	13	6	5
L.W. & B. DATKULIAK	BELMONT	WAYNE	13, 19	6	5
W. & V. CARPENTER	BELMONT	WAYNE	20	6	5
D. L. SEAL	BELMONT	WAYNE	20	6	5
L. VANDYNE	BELMONT	WAYNE	20	6	5
D. B. & M. A. CRUM	BELMONT	WAYNE	21	6	5
R. & M. TUBAUGH	BELMONT	WAYNE	21	6	5

OWNER NAME	COUNTY	TOWNSHIP	SEC./LOT	T-	R-
M. WILSON	BELMONT	WAYNE	21	6	5
R. D. HAGAN	BELMONT	WAYNE	21	6	5
T. & R. HAGAN	BELMONT	WAYNE	21	6	5
G. T. & D. D. BALLOG	BELMONT	WAYNE	21	6	5
L. J. SEAL	BELMONT	WAYNE	20	6	5

D. AREAS WHERE MINING IS PROHIBITED OR LIMITED **Permit Area**

(1) Does the permit area included in this permit application include any area dedicated as a nature preserve pursuant to Chapter 1517., Ohio Revised Code? _____ Yes, _____ No. If "yes," submit proof of valid existing right. **N/A - NO PERMIT AREA**

(2) Does the permit area included in this permit application include any area within one-thousand feet of the waterlines of any wild, scenic, or recreational river dedicated pursuant to Chapter 1501., Ohio Revised Code? _____ Yes, _____ No. If "yes," submit proof of valid existing right. **N/A - NO PERMIT AREA**

(3) Does the permit area included in this permit application include any area within the boundaries of the following systems: national park, national wildlife refuge, national trails, national wilderness preservation, national recreational areas, or wild and scenic rivers or river corridors, including those rivers under study? _____ Yes, _____ No. If "yes," submit proof of valid existing right. **N/A - NO PERMIT AREA**

(4) Does the permit area included in this permit application include any federal lands within the boundaries of any national forest? _____ Yes, _____ No. If "yes," submit approval of U.S. Secretary of Interior or proof of valid existing right. **N/A - NO PERMIT AREA**

(5) Will operations in the permit area conducted under this permit adversely affect any publicly owned park or places listed on the National Register of Historic Places? _____ Yes, _____ No. If "yes," submit joint approval from the chief and the federal, state, or local agency with jurisdiction over the park or places or proof of valid existing right. **N/A - NO PERMIT AREA**

(6) Will operations in the permit area conducted under this permit affect land within one hundred feet of the outside right-of-way of a public highway? _____ Yes, _____ No. If "yes," list the highway(s) in the space below and submit Attachment 9 or proof of valid existing right. **N/A NO PERMIT AREA**

D. (7) Will operations in the permit area conducted under this permit affect land within three hundred feet of any occupied dwelling? _____ Yes, _____ No. If "yes," list the name of the owner(s) in the space below and submit Attachment 10 or proof of valid existing right. **N/A - NO PERMIT AREA**

(8) Will operations in the permit area conducted under this permit, affect land within three hundred feet of any public building, school, church, community or institutional building, or public park? _____ Yes, _____ No. If "yes," submit proof of valid existing right. **N/A - NO PERMIT AREA**

(9) Will operations in the permit area conducted under this permit, affect land within one hundred feet of a cemetery? _____ Yes, _____ No. If "yes," submit proof of valid existing right or appropriate authorization to relocate the cemetery. **N/A - NO PERMIT AREA**

(10) Will operations conducted during this permit result in the extension of any part of the pit within fifty feet of horizontal distance to any adjacent land or water in which the applicant does not own either the surface or mineral rights? _____ Yes, _____ No. If "yes," list below the names of the adjacent owners and submit Attachment 11. **N/A - NO PERMIT AREA**

E. Areas Where Mining is Prohibited or Limited-**Permit And Shadow Area**

Are there areas within the proposed permit area, shadow area, or adjacent areas designated unsuitable for coal mining operations under rule 1501:13-3-07 of the Administrative Code or under study for designation in an administrative proceeding under this rule?
_____ Yes, __X__ No.

(1) If "yes" to the item above, did the applicant make substantial legal and financial commitments in the proposed areas prior to January 4, 1977?
_____ Yes, _____ No.

(2) If "yes" to item (1) above, submit as an addendum to the permit application information supporting the assertions that the commitments were made prior to January 4, 1977.

F. PERMIT TERM AND EXTENT-**Permit and Underground Workings**

(1) Anticipated/actual date for:

(a) Starting mining operations JANUARY 1, 2001
(b) Terminating mining operations JANUARY, 2023

(2) Does the applicant propose a permit term in excess of five (5) years? _____ Yes, X No. If "yes," submit an addendum with the information required by 1501:13-4-03 (E) (3), Ohio Administrative Code.

(3) Indicate the following acreage figures:

(a) Total Acres N/A (Permit Area)
(b) Total Acres 3350.3 (Underground Workings)

(4) Horizontal extent of underground workings over life of permit in acres:

(a) Full Coal Recovery 2964.5
(b) Room and Pillar 385.8

G. PUBLIC NOTICE-**Permit and Shadow Area**

(1) In the space below, provide the name and address of the public office where a complete copy of this permit application is to be filed.

SEE ADDENDUM TO PAGE 15, ITEM G(2)

(2) In the space below, list the name and address of the newspaper and submit an addendum providing the text of the advertisement that is to be published in a newspaper of general circulation in the locality of the proposed operation. Note: the advertisement is to provide the information required by paragraph (A) of rule 1501:13-5-01 of the Administrative Code.

THE TIMES LEADER
200 SOUTH 4TH STREET
MARTINS FERRY, OHIO 43935

ADDENDUM TO PAGE 15,ITEM G(2)

BENNOC, INC.

PUBLIC NOTICE

Bennoc, Inc., P.O. Box 208, 38722 National Road, Morristown, Ohio, 43759 has submitted an underground coal mining application designated as number D-0425-1 to the Ohio Department of Natural Resources, Division of Mines and Reclamation. The proposed additional acreage for permit D-0425 is located in Sections 1, 2, 3, 7, 8, 9, 13, 14, 15, 19, 20, and 21, T-6 R-5, Wayne Township, and Sections 31, 32, 33, 26, and 27, T-5 R-4, Washington Township, Belmont County, Ohio. The area is located on the Armstrongs Mills, Hunter, Woodsfield, and Cameron 7-1/2 minute U.S.G.S Quadrangle maps south of State Route 148, approximately 3 miles east of Somerton, approximately 3 miles southwest of Armstrongs Mills, and approximately 1.5 miles north of Beallsville, Ohio. The proposed underground workings encompass 4957.3 Acres. Coal in this underground area will be removed using full recovery methods.

This application is on file at the Belmont County Recorder's Office, located at the County Courthouse, Main Street, St. Clairsville, Ohio 43950 for public inspection. Written comments, objections or request for an informal conference may be sent to the Ohio Department of Natural Resources, Division of Mines and Reclamation, 1855 Fountain Square Court, Columbus, Ohio 43224, within (30) thirty days of the last date of publication of this notice.

PART 2 ENVIRONMENTAL RESOURCES INFORMATION

A. CULTURAL, HISTORIC, AND ARCHEOLOGICAL INFORMATION-**Permit and Planned Subsidence Area**

(1) Are there any cultural or historic resources or structures listed or eligible for listing on the National Register of Historic Places within the proposed permit or planned subsidence area?
__X__ Yes, _____ No. If "yes," submit an addendum describing the resources and structures including the location and submit Attachment 27 or 27A as appropriate.

SEE ATTACHMENT 27A & ADDENDA

(2) Are there any known archeological sites within the proposed permit or planned subsidence area?
_____ Yes, __X__ No. If "yes," submit an addendum describing the site including the location and submit Attachment 27 or 27A as appropriate.

(3) If applicable, based upon the review of the proposed planned subsidence areas and the completed Attachment 27A for the initial six months of projected mining, have any properties listed or eligible for listing on the National Register of Historic Places been identified? _____ Yes, _____ No. If "yes," submit an addendum listing each property identified.

SEE ATTACHMENT 27A & ADDENDA

(4) Submit an addendum indicating the method to be used to identify historic properties on planned subsidence areas as mining progresses.

SEE ADDENDUM TO PAGE 16, PART 2, ITEM A(4)

B. GEOLOGY DESCRIPTION-**Permit and Shadow Area**

(1) Submit an addendum describing the geology within the proposed permit area and shadow area down to and including the first stratum below the lowest coal seam to be mined or any aquifer below the lowest coal seam to be mined which may be adversely affected by mining. The description shall also include information on the areal and structural geology of the permit and shadow area and any other geologic parameters which may influence the probable hydrologic consequences and protection of the hydrologic balance from material damage outside of the permit area.

SEE ORIGINAL PERMIT D-0425 AND ADDENDUM TO PART 2, PAGE 16, ITEM B(1).

(2) Submit an addendum describing how the areal and structural qeology may affect the occurrence, availability, movement, quantity, and quality of potentially affected surface and ground waters per paragraph (C) of rule 1501:13-4-13 of the Administrative Code.

SEE ORIGINAL PERMIT D-0425 AND ADDENDUM TO PART 2, PAGE 16, ITEM B(2).

2/89

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION
Planned Subsidence Areas - Underground Mining Operations

ATTACHMENT 27A
(HISTORIC AND PREHISTORIC PROPERTIES)

1. Applicant's Name BENNOC, INC. Permit # D-0425-1

   Address P.O. BOX 208, 38722 NATIONAL ROAD

   City MORRISTOWN State OHIO Zip 43759

2. Contact Person LARRY CONWAY Phone (740) 782-1330

3. Location and Acreage Information

   County BELMONT Township WASHINGTON WAYNE

   Section(s) / Lots 1,2,3,7,8,9,13,14,15,19,20 & 21 T- 6 R- 5
   26, 27, 31, 32 & 33 T- 5 , R- 4

   USGS Quadrangle ARMSTRONGS MILLS, HUNTER, CAMERON & WOODSFIELD Acreage 4957.3

4. Full Coal Recovery Area Map Attached: (USGS Quadrangle with full coal recovery area delineated)

5. Historic and Prehistoric Structures:

   Definitions

   A historic or prehistoric structure is a work made up on interdependent and interrelated parts in a definite pattern of organization. Constructed by humans, and 50 years or older, it is usually an engineering project.

   Types

   Historic structures include, but are not limited to dwellings, buildings, barns, farmstead outbuildings, bridges, culverts, churches, schools, halls, iron furnaces, (and associated buildings), canals, forts, abandoned coal mine buildings, mine entrances, tipples, and related structures, etc.

   Prehistoric structures include, but are not limited to, earthworks and mounds.

List all known historic and prehistoric structures below and locate each one on the map to be sent to the SHPO including corresponding labeled black and white front and rear photographs of each structure. Attach addendum, if necessary.

Structure Type	Construction Date	Map Reference	Photo# Front	Photo# Rear
SEE ADDENDUM TO ATTACHMENT 27A				

6. Previous Historic and/or Archeological Surveys: (describe and surveys known to applicant on the planned subsidence areas)

7. **SHPO please send this form to:**

Dr. Jeffrey C. Reichwein
Division of Mines and Reclamation
Fountain Square, Building B-3
Columbus, OH 43224

FOR USE BY THE STATE HISTORIC PRESERVATION OFFICE ONLY

(check appropriate spaces)

A. _____ This is a recommendation for an archeological survey of the proposed full coal recovery area based on the following reasons (attached addendum, if necessary):

A SHPO review of the area shown on the map has provided a listing below of all known historic and prehistoric properties listed and eligible for listing on the "National Register of Historic Places" and known historic and prehistoric sites on the permit and adjacent areas (in a 1.5 mile radius). The listing includes, when appropriate, those historic and prehistoric structures identified by the applicant in items 5. and 6. above.

Listed and Eligible National Register Sites

Site Name	(#)	Type	Proposed Area	Adjacent Area

Known Historic and Prehistoric Sites

Site Name	(#)	Type	Proposed Area	Adjacent Area

B. _____ A SHPO review of the area shown on the application map and information contained in this attachment finds that the proposed mining does not have a reasonable probability of affecting and properties listed or eligible for listing on the "National Register of Historic Places." Therefore, no further coordination will be necessary with this office unless the scope of the proposed application area changes.

State Historic Preservation Officer _____

SHPO # _____

Date _____

ADDENDUM TO ATTACHMENT 27A

BENNOC, INC.

STRUCTURE TYPE	CONSTRUCTION DATE	MAP REFERENCE	PHOTO REFERENCE (FRONT & REAR)
Barn	pre-1948	1	1A
House	pre-1898	1	1B
Garage	pre-1948	1	1C
Barn	late 1800s	2	2A
Smokehouse	pre-1948	2	2B
Barn	late 1800s	3	3A
House	late 1800s	3	3B
Ruins	late 1800s	4	4A
Cabin	Unknown	4	4B
House	Unknown	5	5
Barn	pre-1948	6	6A
Machine Shed	pre-1948	6	6B
House	1888	6	6C
Garage	pre-1948	6	6D
Sheep Barn	pre-1898	7	7A
Pig Pen	pre-1948	7	7B
Shed (by Carport)	pre-1948	7	7C
House	late 1800s	7	7D
Garage	pre-1948	7	7E
Outbuilding	pre-1948	7	7F
Root Cellar	pre-1948	7	7G
House	1862	8	8A
Tool Shed	pre-1948	8	8B
Machine Shed	early 1900s	8	8C
Barn	1862	8	8D
Barn	pre-1948	9	9A
House	1890s	9	9B
Garage	pre-1948	10	10A
Machine Shed	pre-1948	10	10B
Barn	1918-1920	10	10C
Shed	pre-1948	10	10D
House	1917	10	10E
Tool Shed	pre-1948	10	10F
Big Barn	pre-1948	10	10G
Small Barn	late 1800s - early 1900s	11	11A
Garage	late 1800s - early 1900s	11	11B
Machine Shed	late 1800s - early 1900s	11	11C
Chicken House	late 1800s - early 1900s	11	11D
Corn Crib	late 1800s - early 1900s	11	11E
House	late 1800s - early 1900s	12	12A
Barn	late 1800s - early 1900s	12	12B
Landowner Denies Access		13	
Outbuilding	pre-1948	14	14A
Smokehouse	pre-1948	14	14B
Barn	pre-1948	14	14C
House	pre-1948	15	15
Barn	late 1800s	16	16A
House	1886	16	16B
Haybarn	late 1800s	16	16C
Shed	late 1800s	16	16D
Ruins	early 1800s	17	17
School House	late 1800s - early 1900s	18	18A
Privy	late 1800s - early 1900s	18	18B
Shed (near privy)	late 1800s - early 1900s	18	18C
Shed (behind house)	late 1800s - early 1900s	18	18D
House	late 1800s - early 1900s	18	18E

ADDENDUM TO ATTACHMENT 27A
BENNOC, INC.

STRUCTURE TYPE	CONSTRUCTION DATE	MAP REFERENCE	PHOTO REFERENCE (FRONT & REAR)
Machine Shed	late 1800s - early 1900s	18	18F
Storage Shed	late 1800s - early 1900s	18	18G
Log Barn	late 1800s - early 1900s	18	18H
Shed Ruins	late 1800s - early 1900s	18	18I
Barn (edge of cornfield)	late 1800s - early 1900s	18	18J
House	pre-1880	19	19A
Washhouse	pre-1880	19	19B
Barn	1890s	20	20A
House	1890s	20	20B
Woodshed	1890s	20	20C
White Shed	1890s	20	20D
Cabin early	1800s	21	21
Garage (Behind house)	late 1800s - early 1900s	22	22A
House	late 1800s - early 1900s	22	22B
Barn (By house)	late 1800s - early 1900s	22	22C
Barn	late 1800s - early 1900s	22	22D
Ruins - House	1920s	23	23A
Ruins - Barn	1920s	23	23B
Ruins (By Cabin)	1903-1907	23	23C
Cabin	1903-1907	23	23D
Machine Shed	1903-1907	23	23E
Privy	1903-1907	23	23F
Root Cellar	1903-1907	23	23G
Montana Barn	1900	24	24A
Garage	1900	24	24B
Hen House	1900	24	24C
House	1900	24	24D
Crum Cabin	early 1800s	25	25A
Root Cellar	early 1800s	25	25B
Chicken Coop	1898	26	26A
Privy	1898	26	26B
House	1898	26	26C
Garage (Behind house)	1898	26	26D
Old Garage	1898	26	26E
Barn	1898	26	26F
Milk House	1898	26	26G
House	1878	27	27
House	pre-1948	28	28
Barn	pre-1948	29	29A
Garage	pre-1948	29	29B
Milk House	pre-1948	29	29C
House	1850-1880	30	30A
Outbuilding	1850-1880	30	30B
Garage (By house)	1850-1880	30	30C
Summer Kitchen	1850-1880	30	30D
Barn	1850-1880	30	30E
Shed-1	1850-1880	30	30F
Chicken Coop	1850-1880	30	30G
Shed-2	1850-1880	30	30H
Garage	1945	30	30I
Machine Shed	1920-1930	31	31J
Outbuilding	1920-1930	31	31K
Cellar	1920-1930	31	31L
House	1920-1930	31	31M
Machine Shed	pre-1948	32	32A

ADDENDUM TO ATTACHMENT 27A
BENNOC, INC.

STRUCTURE TYPE	CONSTRUCTION DATE	MAP REFERENCE	PHOTO REFERENCE (FRONT & REAR)
Garage	pre-1948	32	32B
Cellar	pre-1948	32	32C
Barn	pre-1948	32	32D
Barn (Ruins)	1938	33	33A
House	1875	33	33B
Shed	1938	33	33C
Privy	1938	33	33D
Garden Shed	1938	33	33E
Barn	pre-1948	35	35
House	pre-1948	36	36A
Shed	pre-1948	36	36B
Garage	early 1900s	37	37A
Ruins	early 1900s	37	37B
Barn	early 1900s	37	37C
Root Cellar	pre-1938	38	38A
Barn	pre-1938	38	38B
Storage Barn	pre-1938	38	38C
Chicken House	pre-1938	38	38D
Barn	late 1800s - early 1900s	39	39A
Chicken Coop	late 1800s - early 1900s	39	39B
Garage	late 1800s - early 1900s	39	39C
Pig House	late 1800s - early 1900s	39	39D
Machinery Bldg.	late 1800s - early 1900s	39	39E
Milk House	late 1800s - early 1900s	39	39F
Hen House	late 1800s - early 1900s	39	39G
Privy	late 1800s - early 1900s	39	39H
Corn Crib	late 1800s - early 1900s	39	39I
Shed	late 1800s - early 1900s	39	39J
Meathouse	late 1800s - early 1900s	39	39K
House	late 1800s - early 1900s	39	39L
Well House	late 1800s - early 1900s	39	39M
House	1940s	40	40A
Bank Barn	1940s	40	40B
Corn Crib	1940s	40	40C
House	early 1900s	43	43

ADDENDUM TO ATTACHMENT 27A

BENNC INC.

BARN 1A

BARN 1A

HOUSE 1B

HOUSE 1B

AEC 04511

ADDENDUM TO ATTACHMENT 27A

BENNO INC.

GARAGE 1C

GARAGE 1C

BARN 2A

BARN 2A

ADDENDUM TO ATTACHMENT 27A

BENNO INC.

SMOKEHOUSE 2B

SMOKEHOUSE 2B

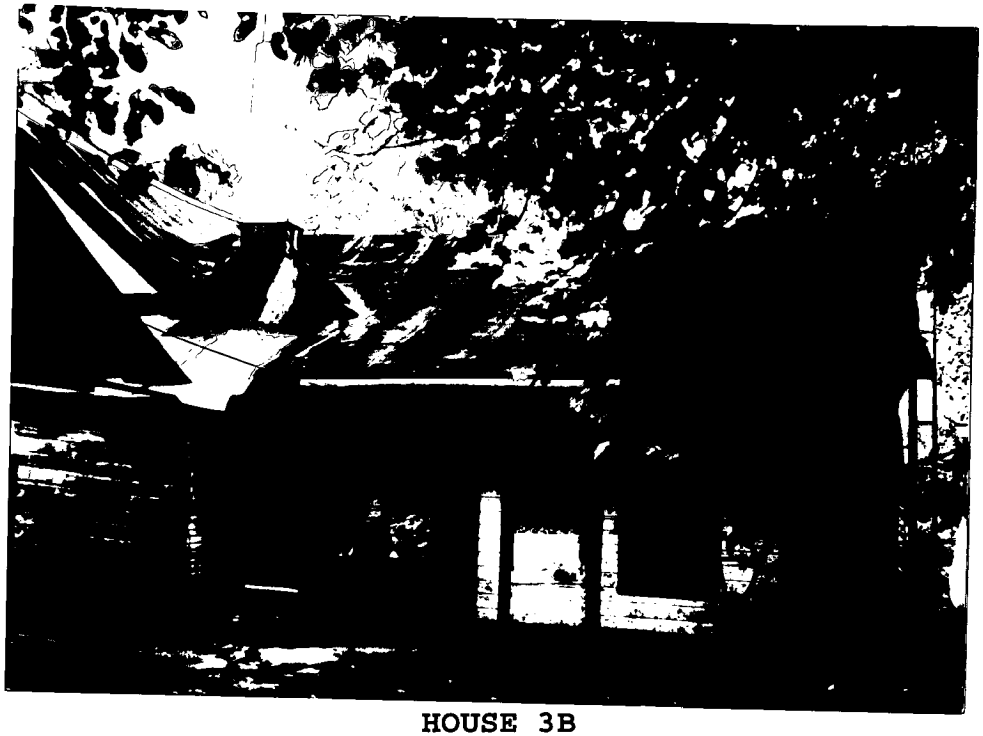
BARN 3A

BARN 3A

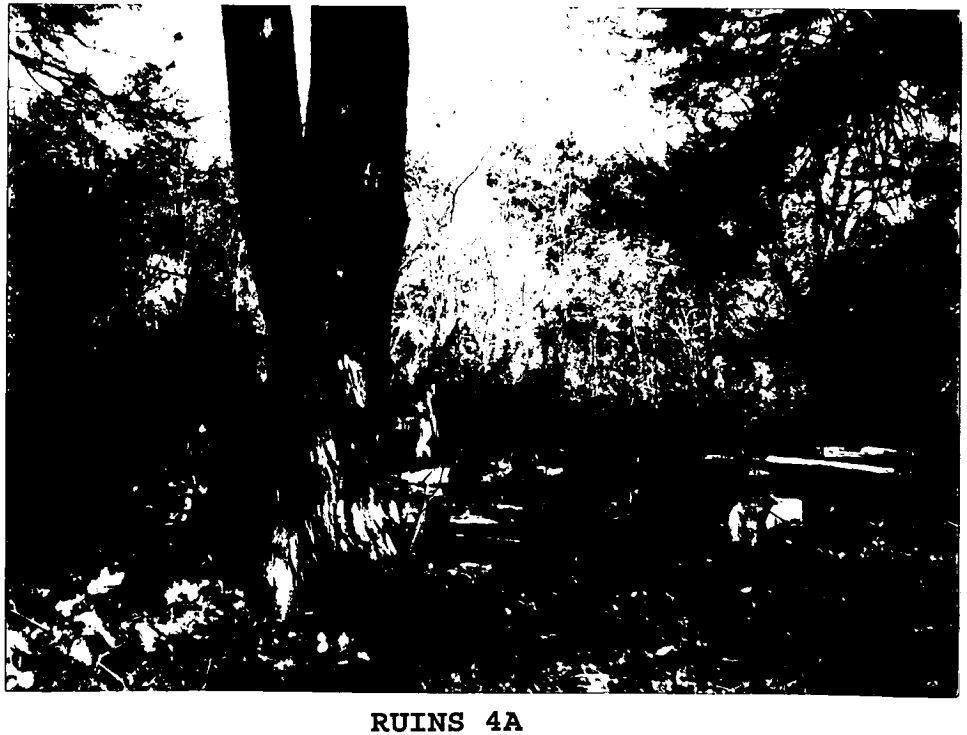
ADDENDUM TO ATTACHMENT 27A

BENNCO, INC.

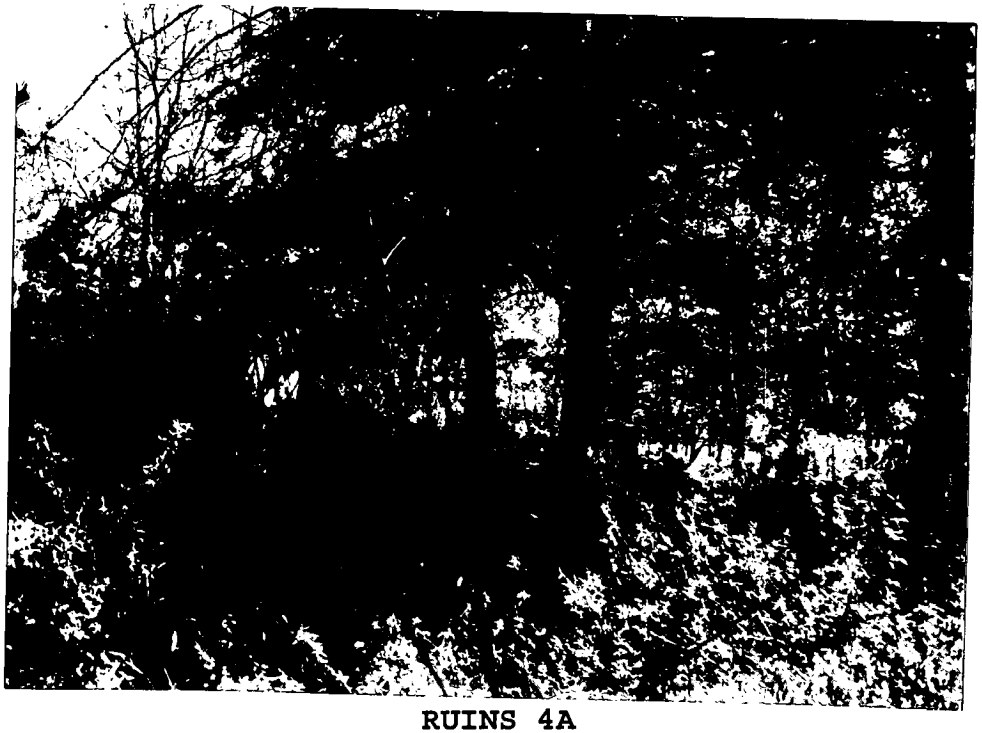
HOUSE 3B



HOUSE 3B



RUINS 4A



RUINS 4A

AEC 04514

ADDENDUM TO ATTACHMENT 27A

BENNOCH INC.

CABIN 4B

CABIN 4B

ADDENDUM TO ATTACHMENT 27A

BENNOCH, INC.

HOUSE 5

HOUSE 5

BARN 6A

BARN 6A

AEEC 0455166

ADDENDUM TO ATTACHMENT 27A
BENNOS, INC.

MACHINE SHED 6B

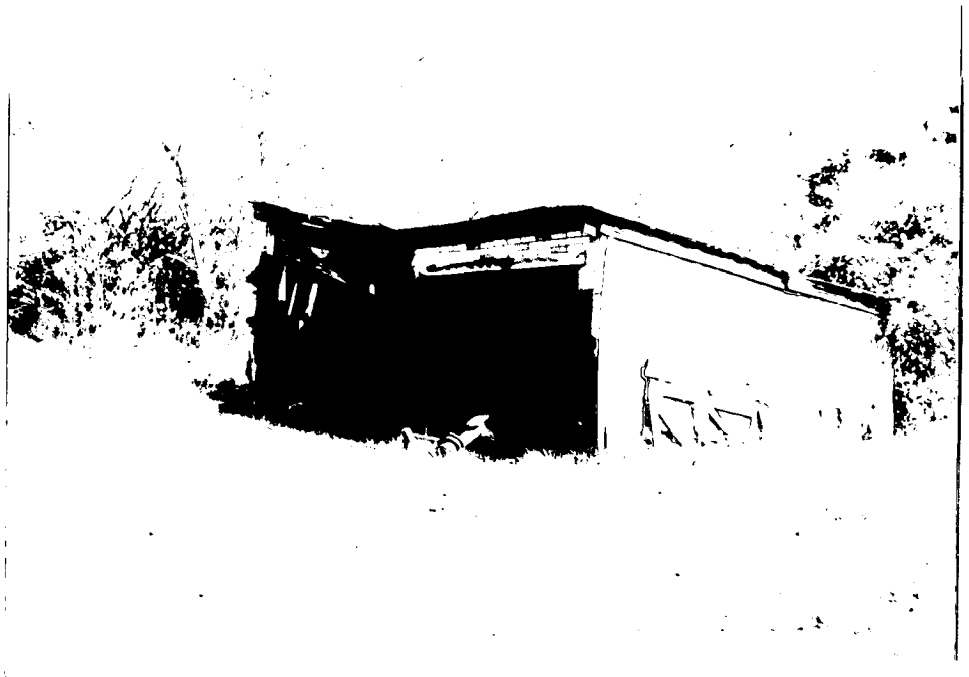
MACHINE SHED 6B

HOUSE 6C

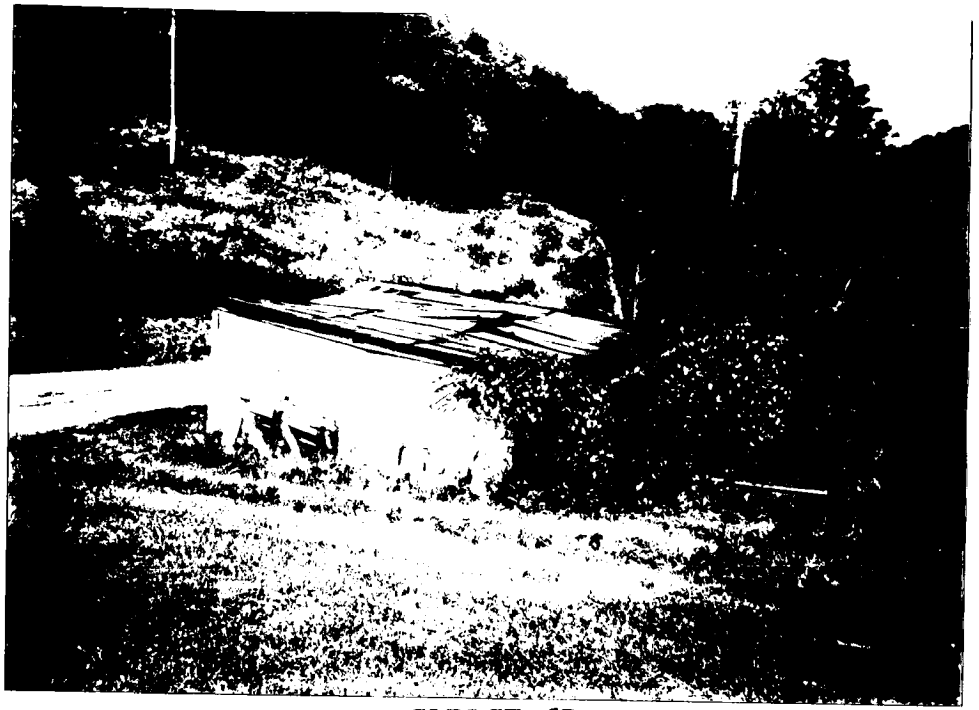
HOUSE 6C

AEC 045177

ADDENDUM TO ATTACHMENT 27A
BENNOCK, INC.

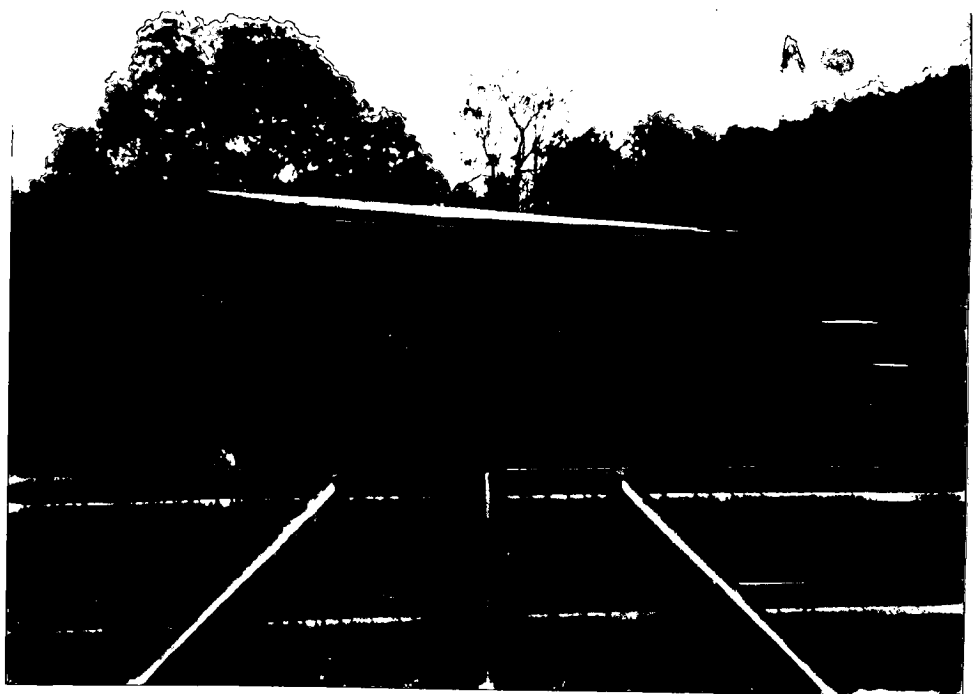


GARAGE 6D



GARAGE 6D

SHEEP BARN 7A

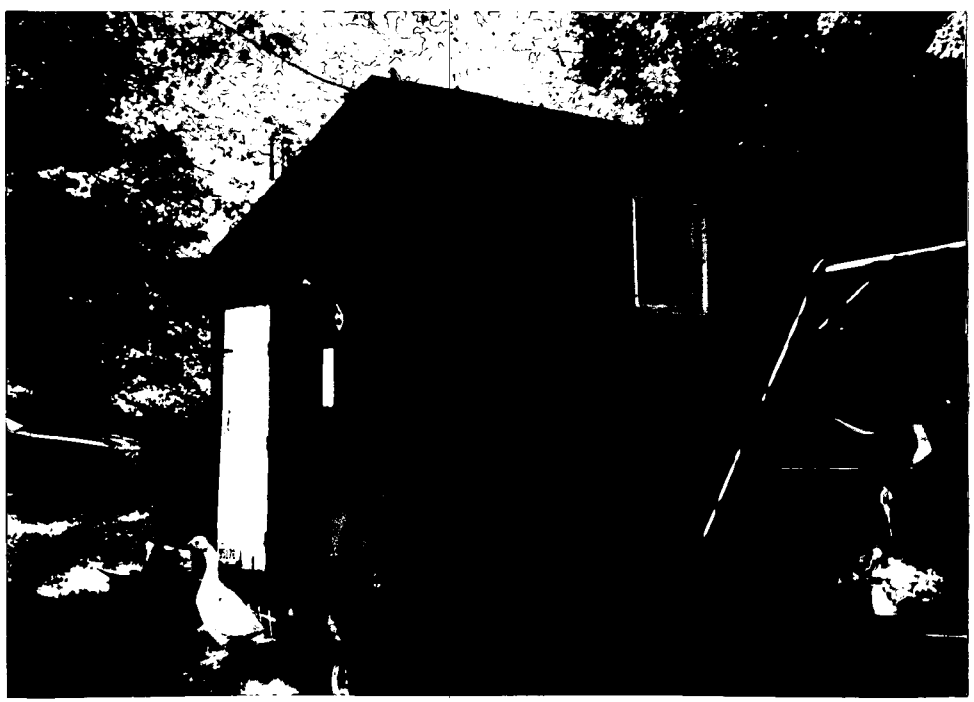


SHEEP BARN 7A

PIG PEN 7B

PIG PEN 7B

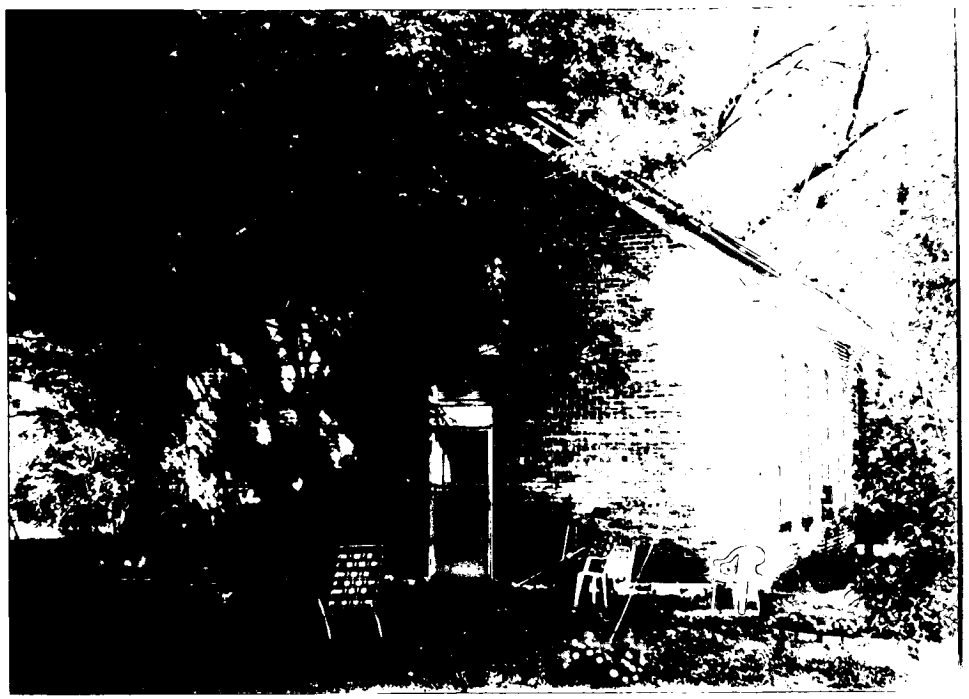
SHED 7C



SHED 7C

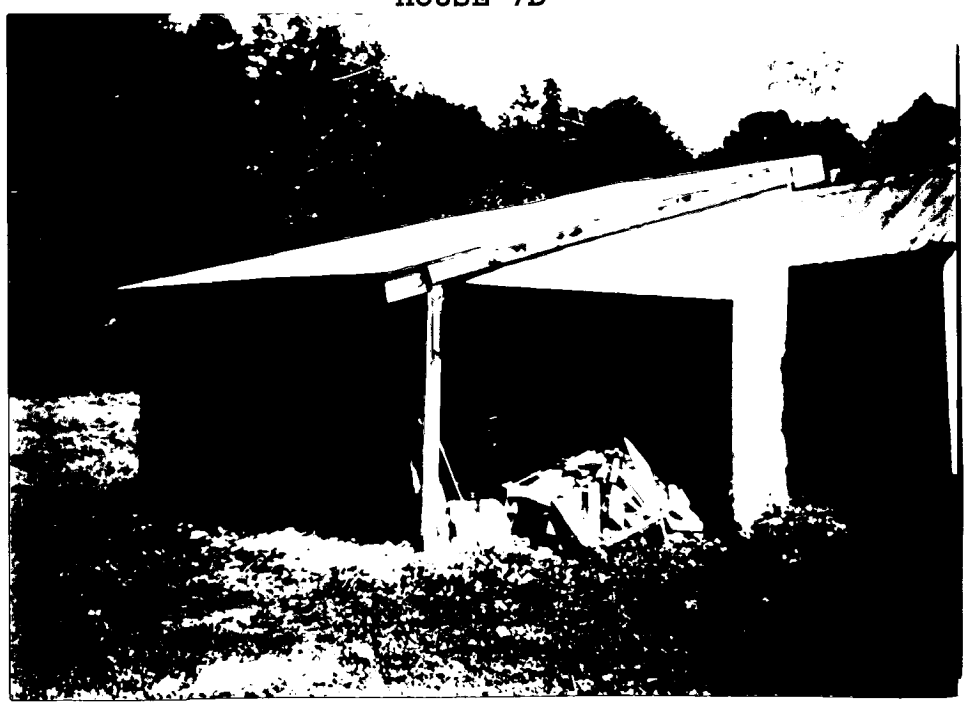
ADDENDUM TO ATTACHMENT 27A

BENNOCK, INC.



HOUSE 7D

HOUSE 7D

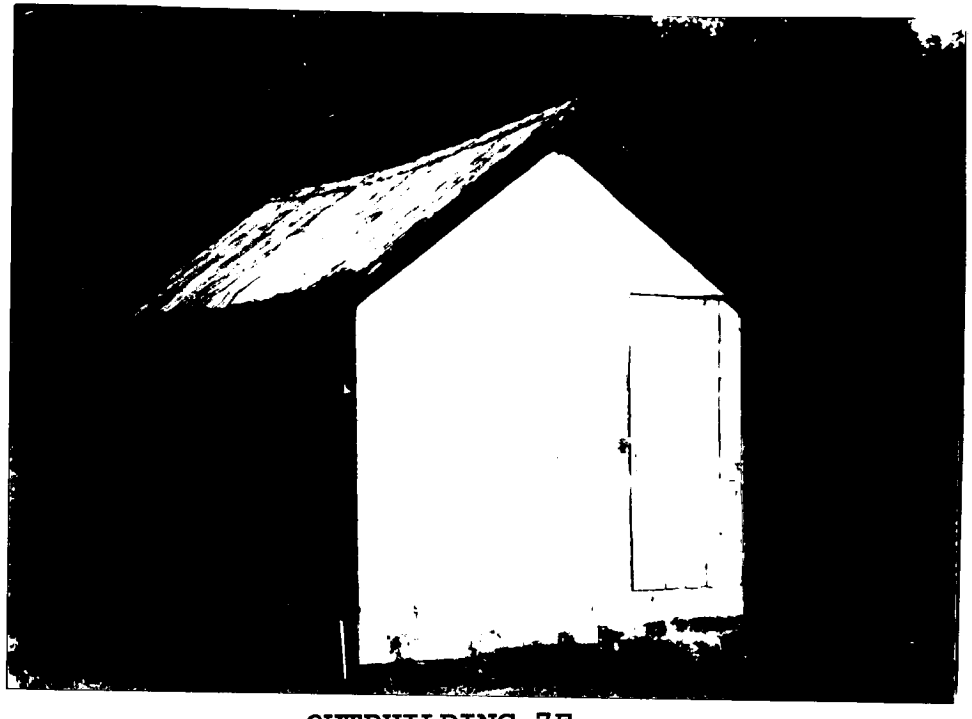


GARAGE 7E

GARAGE 7E

AEC 04520

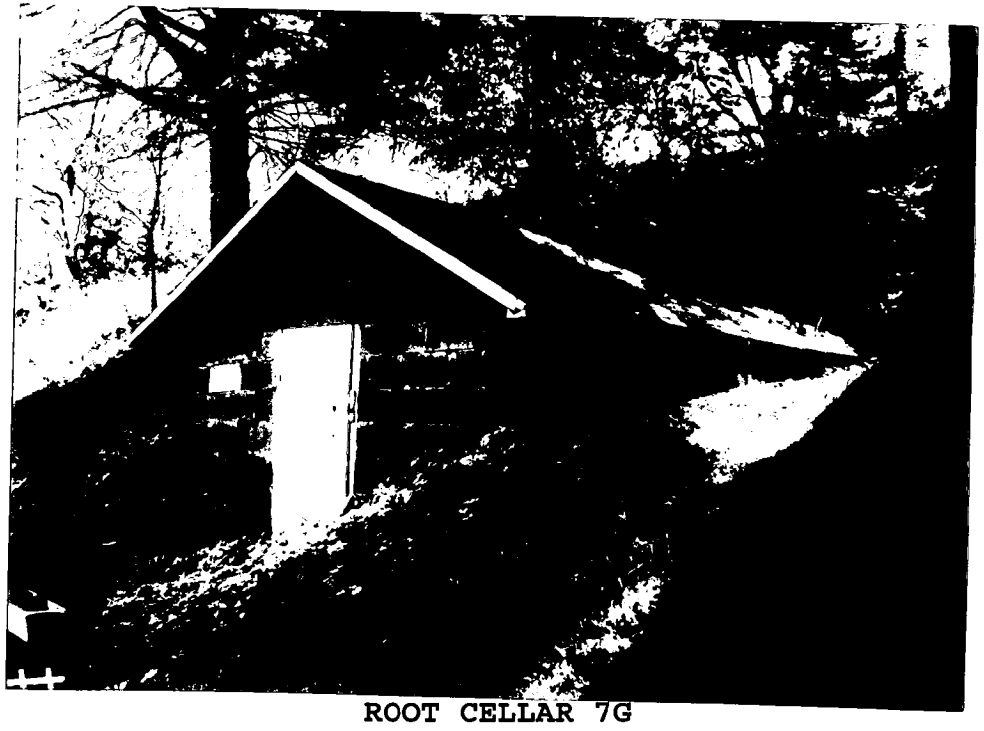
ADDENDUM TO ATTACHMENT 27A
BENNOC, INC.



OUTBUILDING 7F

OUTBUILDING 7F

ROOT CELLAR 7G



ROOT CELLAR 7G

AEC 04521

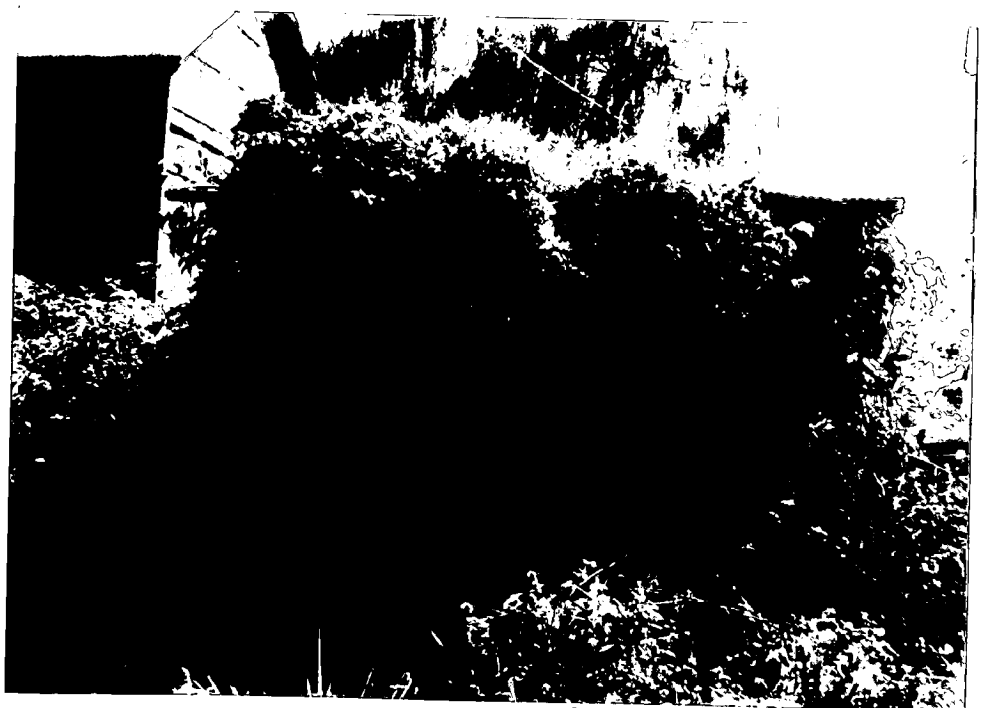
ADDENDUM TO ATTACHMENT 27A

BENNOCK, INC.

HOUSE 8A

HOUSE 8A

TOOL SHED 8B



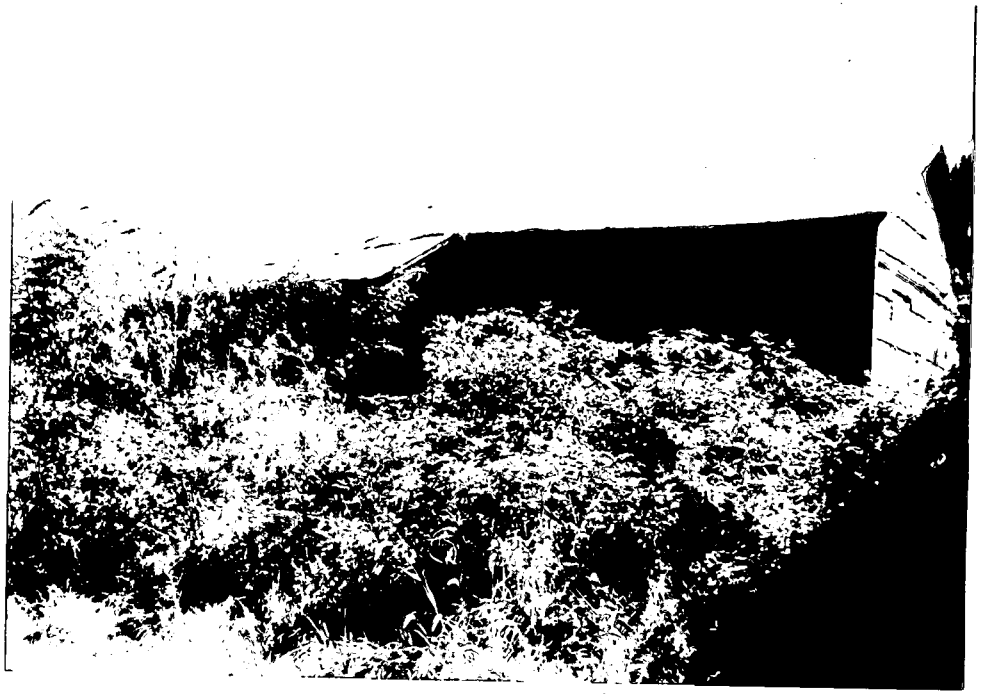
TOOL SHED 8B

AEC 04522

ADDENDUM TO ATTACHMENT 27A

BENNOCH, INC.

MACHINE SHED 8C



MACHINE SHED 8C

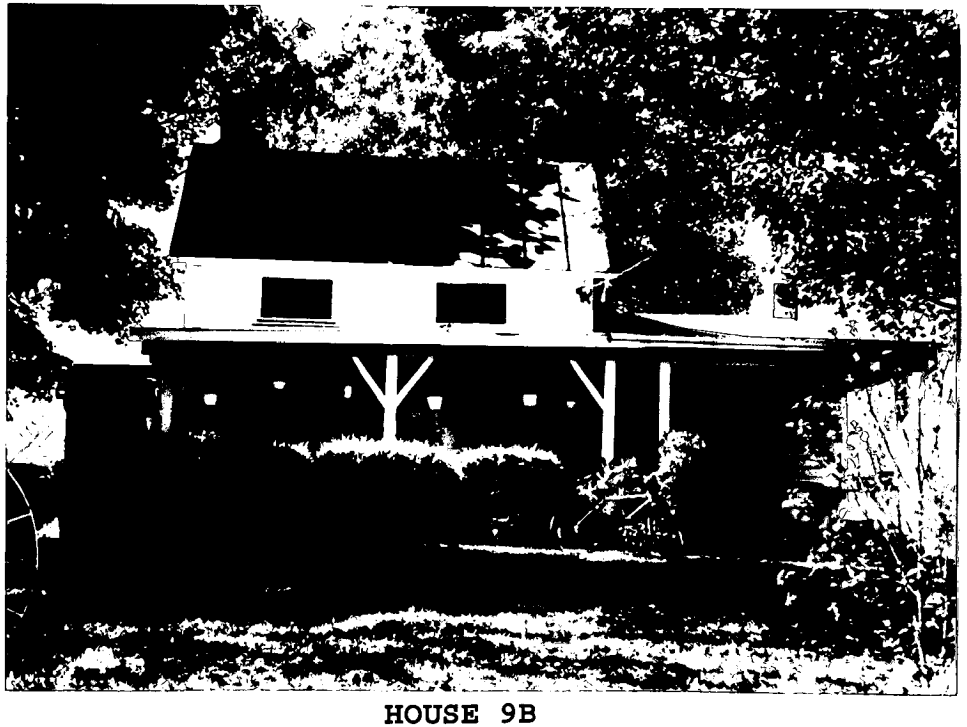
BARN 8D

BARN 8D

ADDENDUM TO ATTACHMENT 27A
BENNOCK, INC.

BARN 9A

BARN 9A



HOUSE 9B

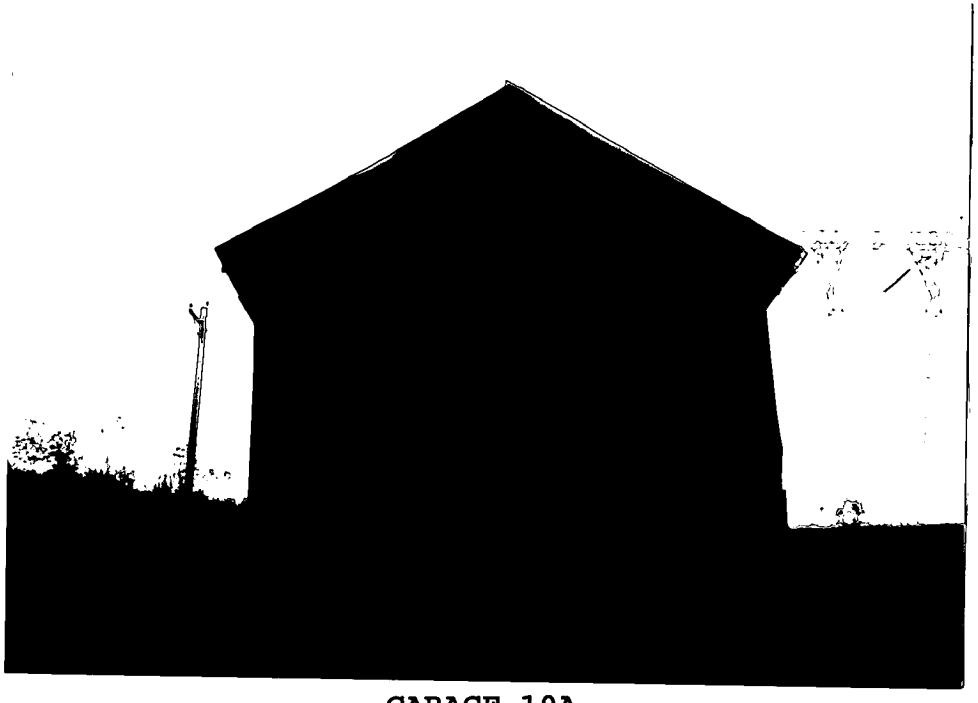
HOUSE 9B

AEC 04524

ADDENDUM TO ATTACHMENT 27A

BENNOC, INC.

GARAGE 10A



GARAGE 10A

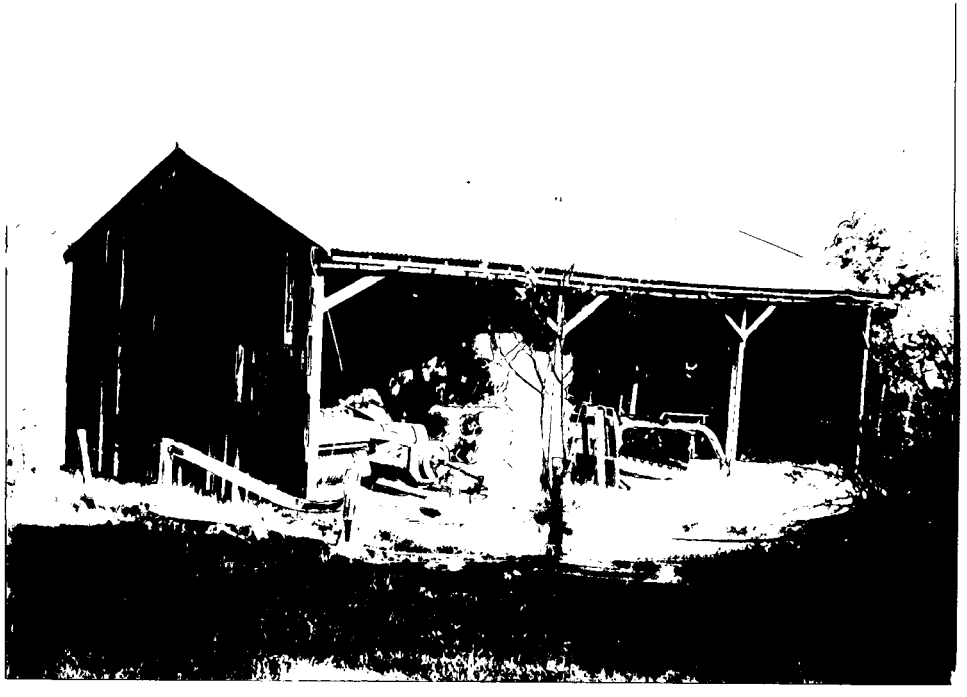
MACHINE SHED 10B

MACHINE SHED 10B

AEC 04525

ADDENDUM TO ATTACHMENT 27A

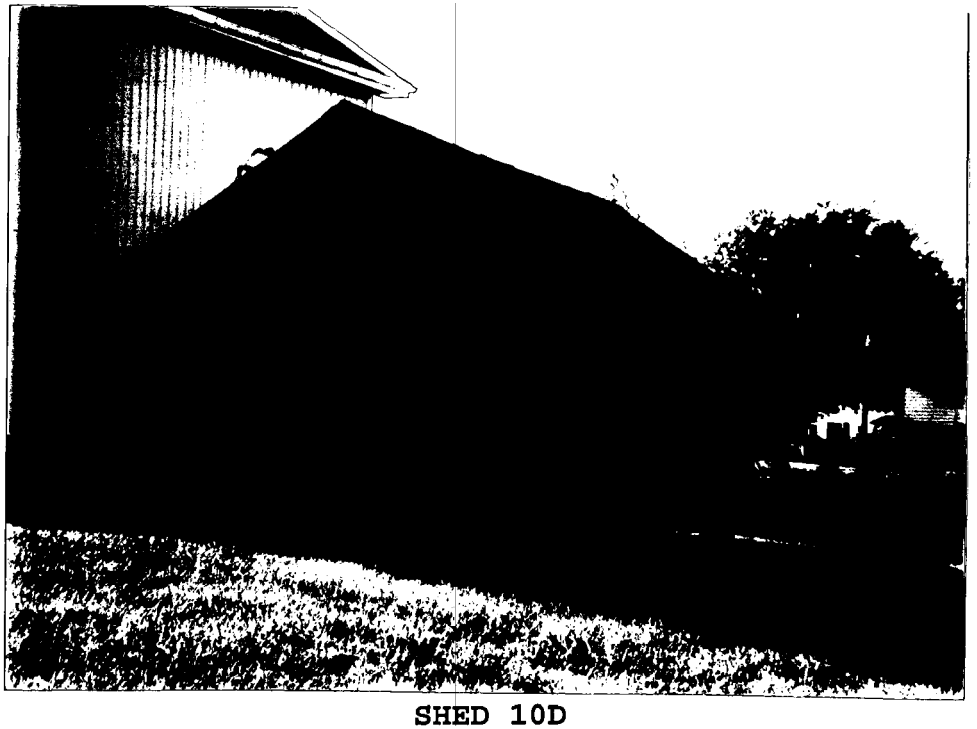
BENNOC, INC.



BARN 10C

BARN 10C

SHED 10D



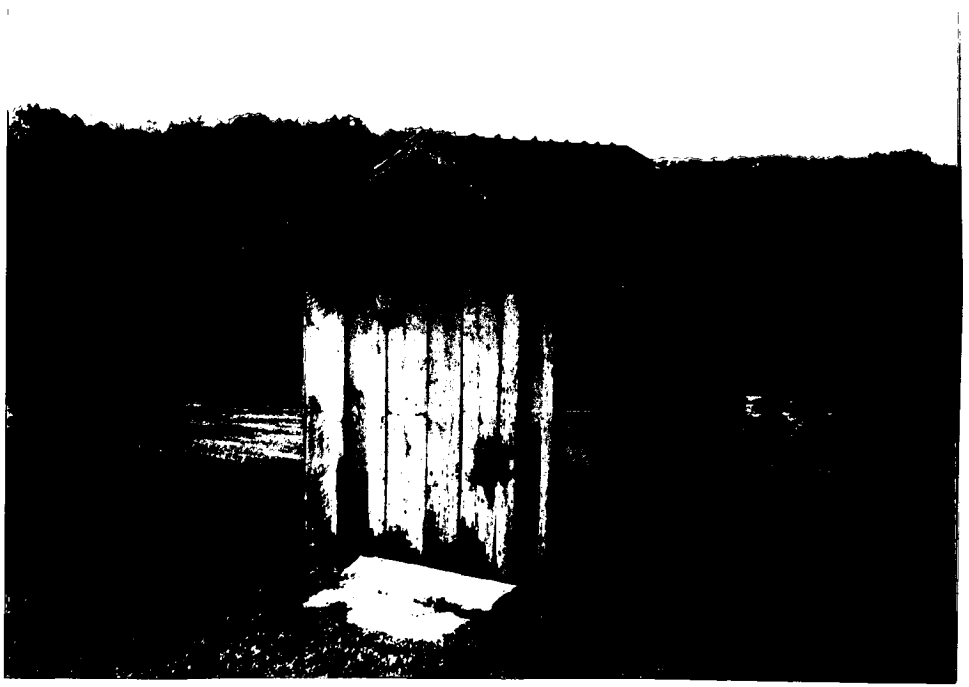
SHED 10D

AEC 045266

ADDENDUM TO ATTACHMENT 27A
BENNOC, INC.

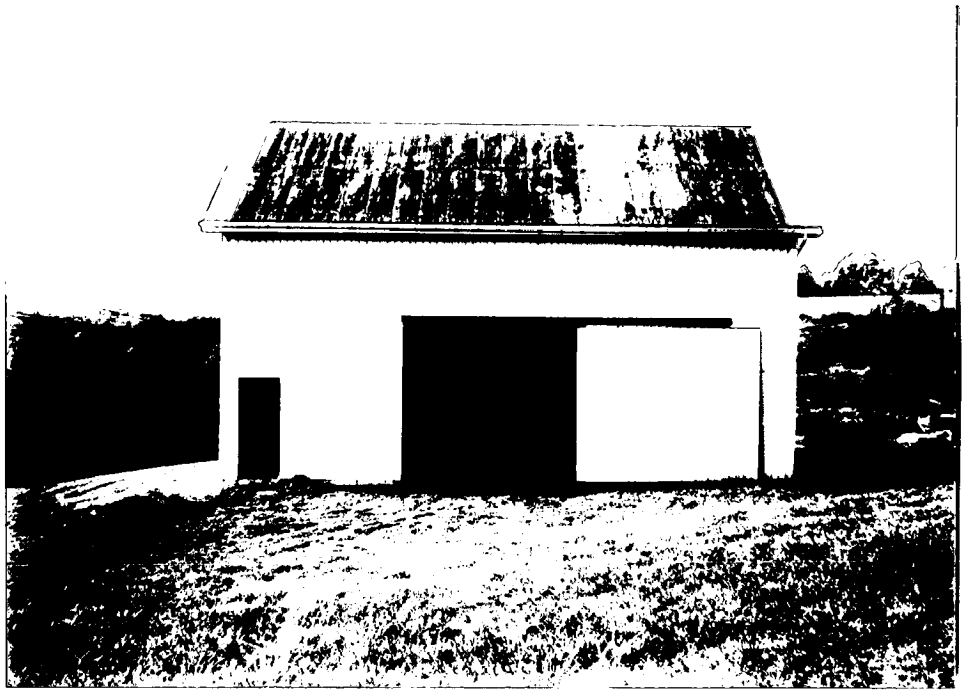
HOUSE 10E

HOUSE 10E

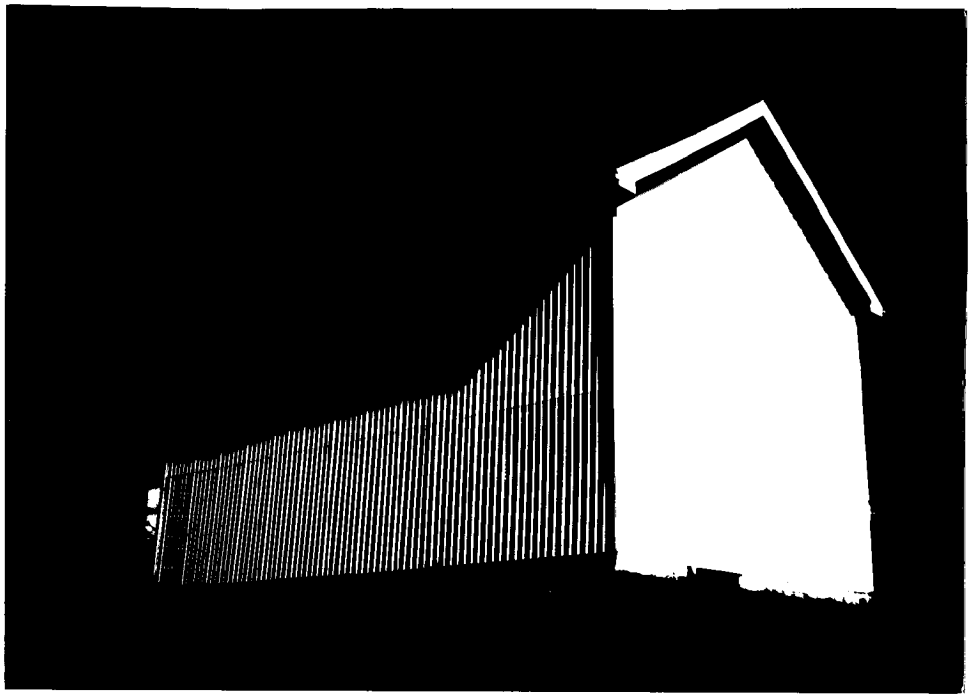


TOOL SHED 10F

TOOL SHED 10F



BIG BARN 10G



BIG BARN 10G

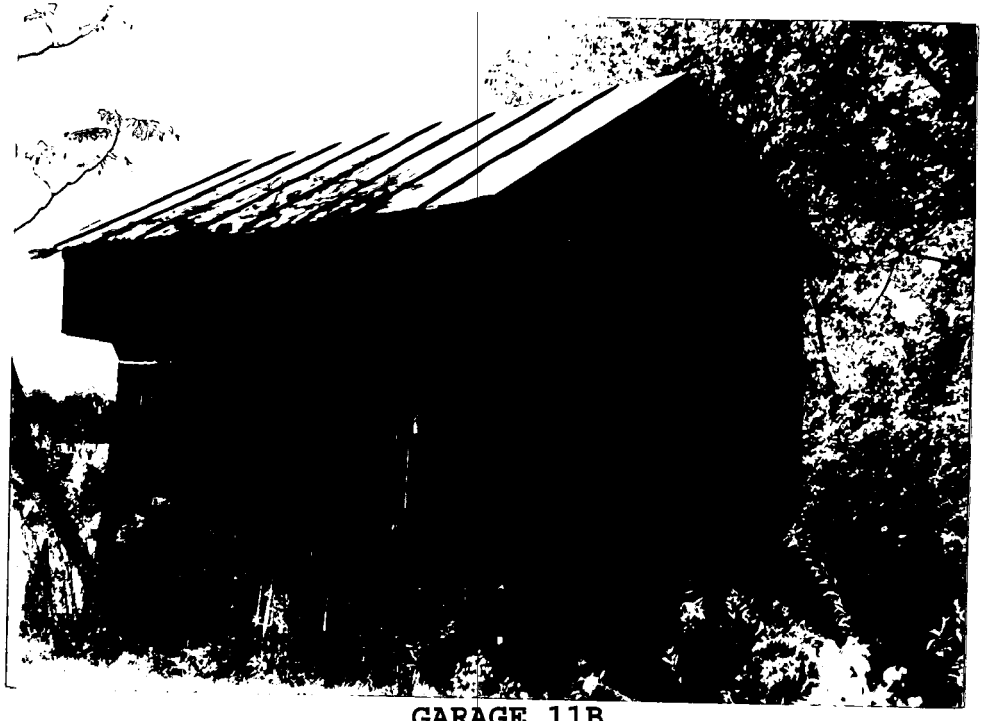
SMALL BARN 11A

SMALL BARN 11A

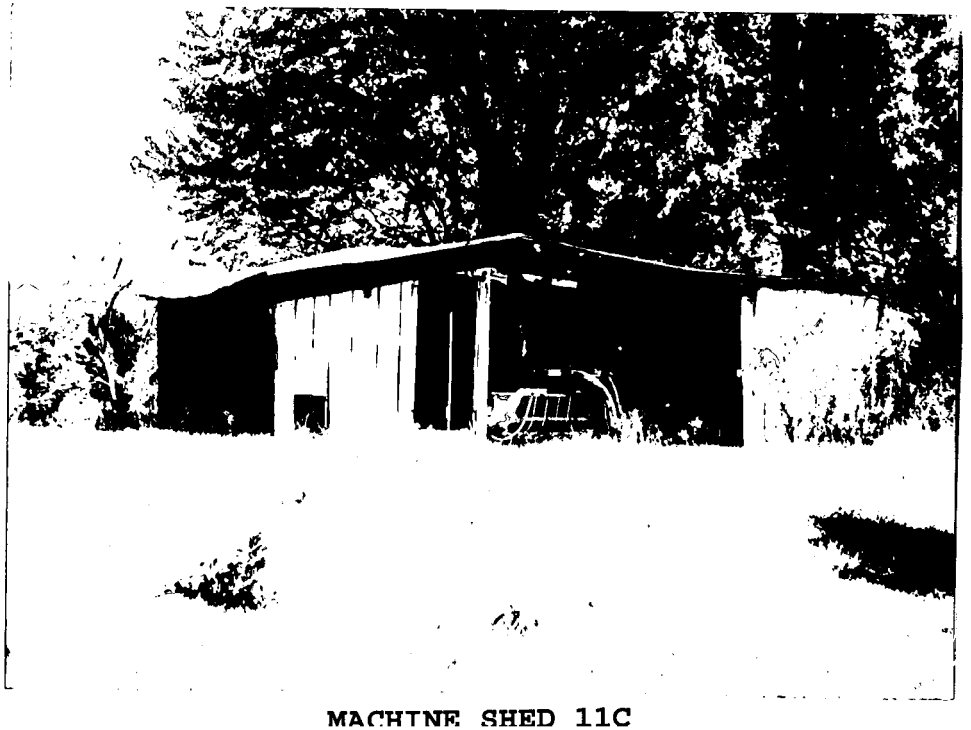
ADDENDUM TO ATTACHMENT 27A

BENNOCK, INC.

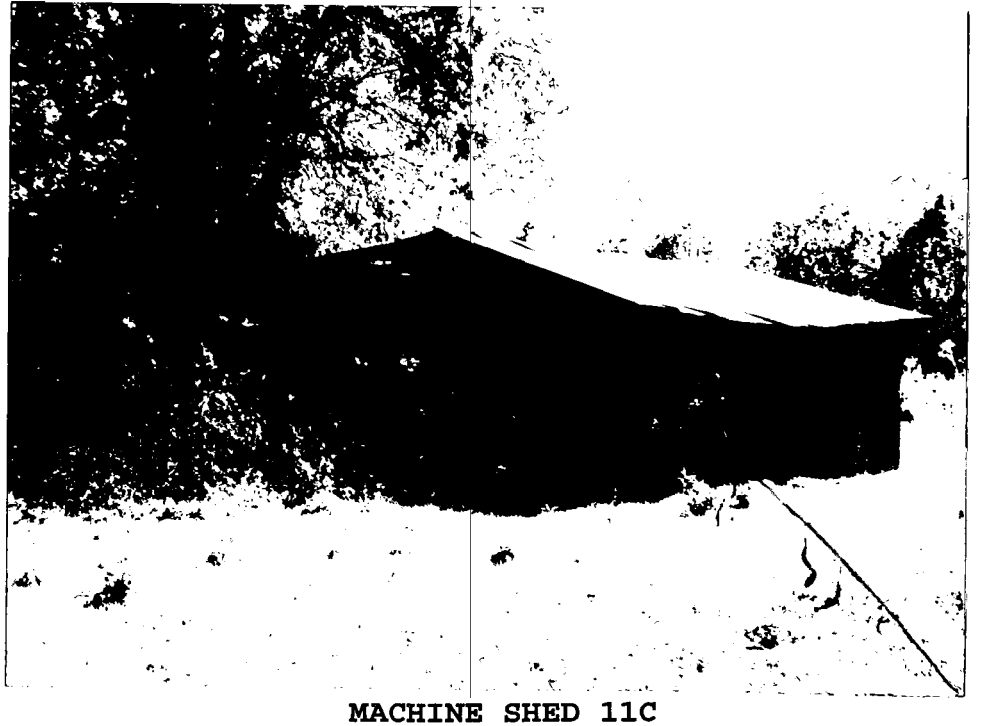
GARAGE 11B



GARAGE 11B



MACHINE SHED 11C



MACHINE SHED 11C

AEC 045299

ADDENDUM TO ATTACHMENT 27A

BENNOCK, INC.

CHICKEN HOUSE 11D

CHICKEN HOUSE 11D

CORN CRIB 11E

CORN CRIB 11E

AEC 04530

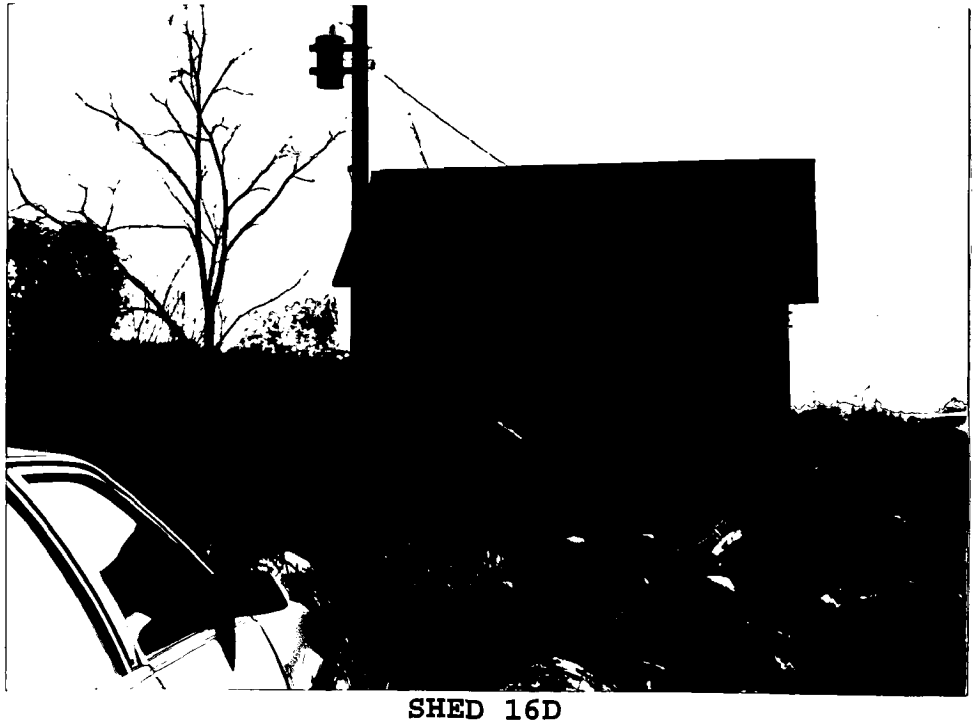
ADDENDUM TO ATTACHMENT 27A

BENNOCO INC.

HAY BARN 16C

HAY BARN 16C

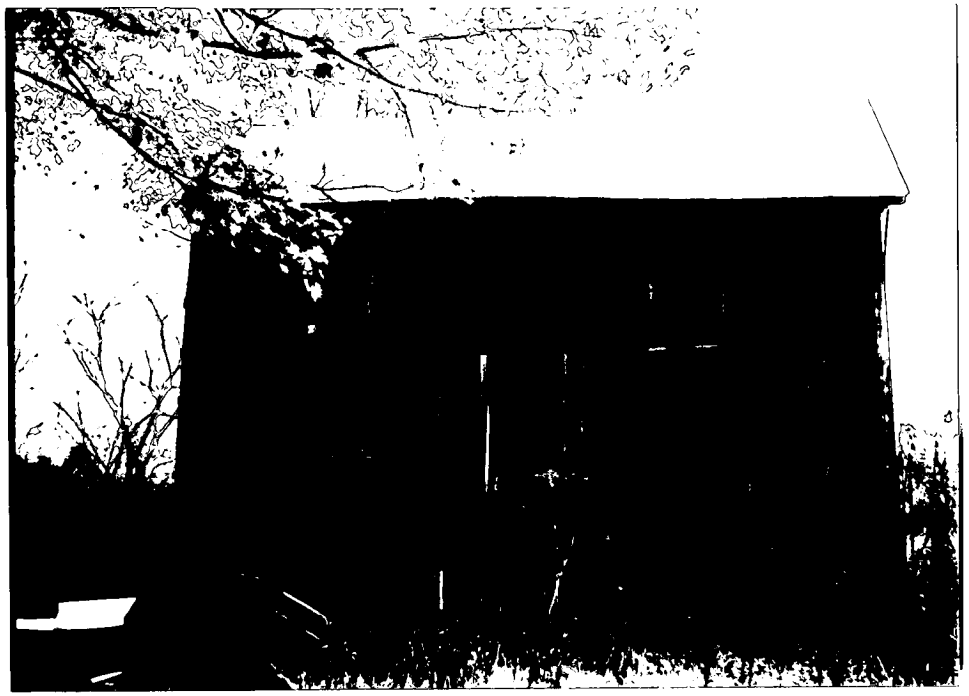
SHED 16D



SHED 16D

ADDENDUM TO ATTACHMENT 27A

BENNOCK, INC.



HOUSE 12A

HOUSE 12A

BARN 12B

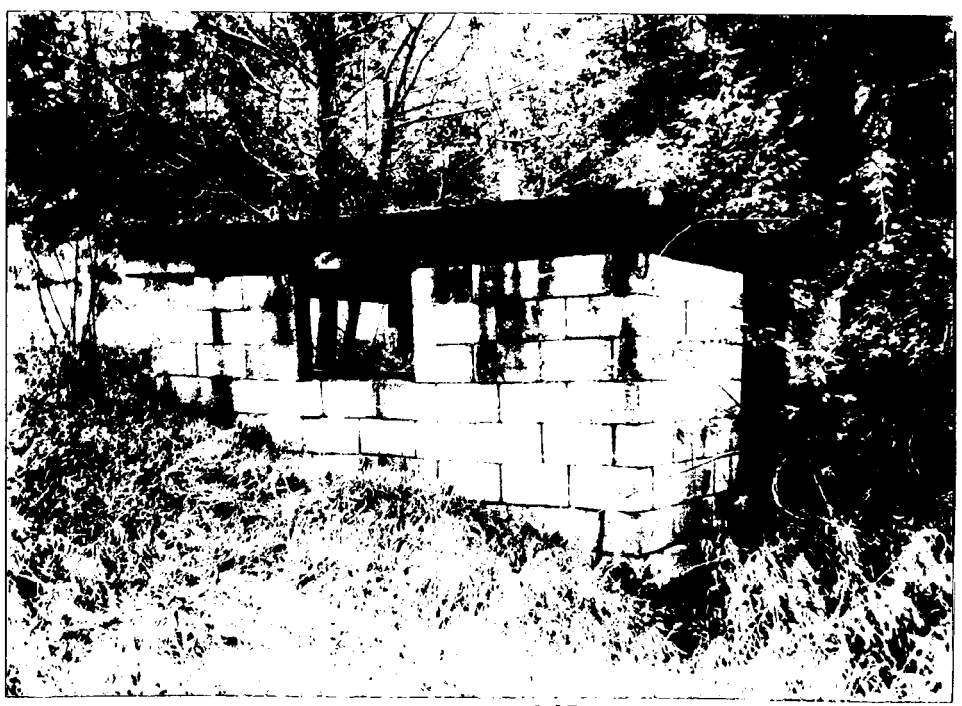
BARN 12B

ADDENDUM TO ATTACHMENT 27A

BENNETT, INC.

OUTBUILDING 14A

OUTBUILDING 14A



SMOKEHOUSE 14B

SMOKEHOUSE 14B

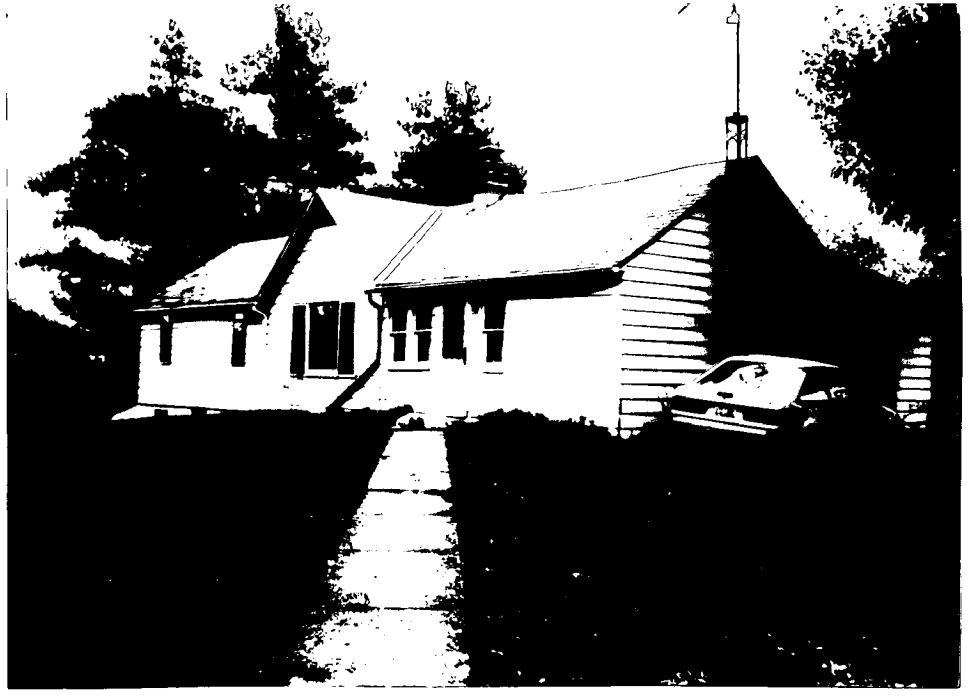
AEC 045333

ADDENDUM TO ATTACHMENT 27A

BENNETT, INC.

BARN 14C

BARN 14C



HOUSE 15

HOUSE 15

AEC 04534

ADDENDUM TO ATTACHMENT 27A

BENNETT, INC.

BARN 16A

BARN 16A

HOUSE 16B

HOUSE 16B

AEC 04535

ADDENDUM TO ATTACHMENT 27A

BENNETT, INC.

RUINS 17

RUINS 17

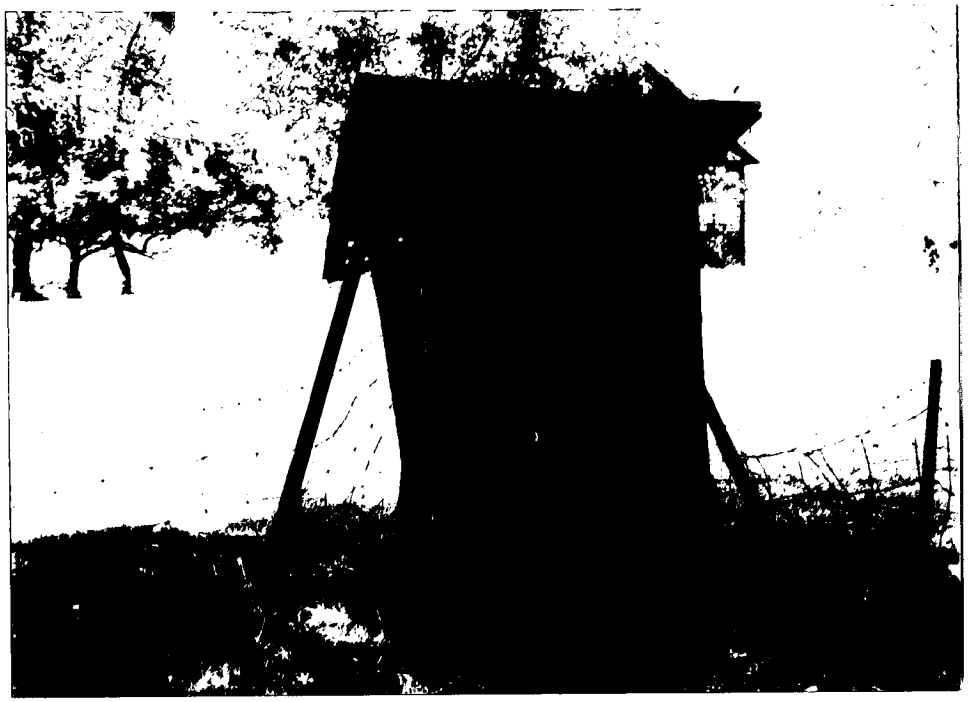
SCHOOL HOUSE 18A

SCHOOL HOUSE 18A

AEC 04536

ADDENDUM TO ATTACHMENT 27A

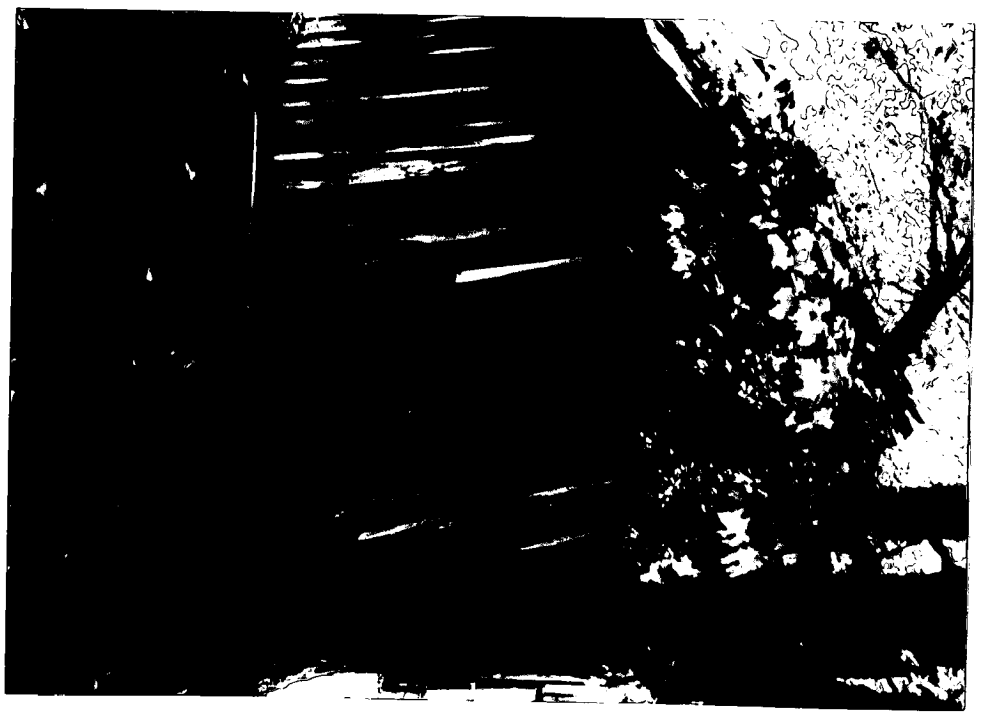
BENNETT, INC.



PRIVY 18B

PRIVY 18B

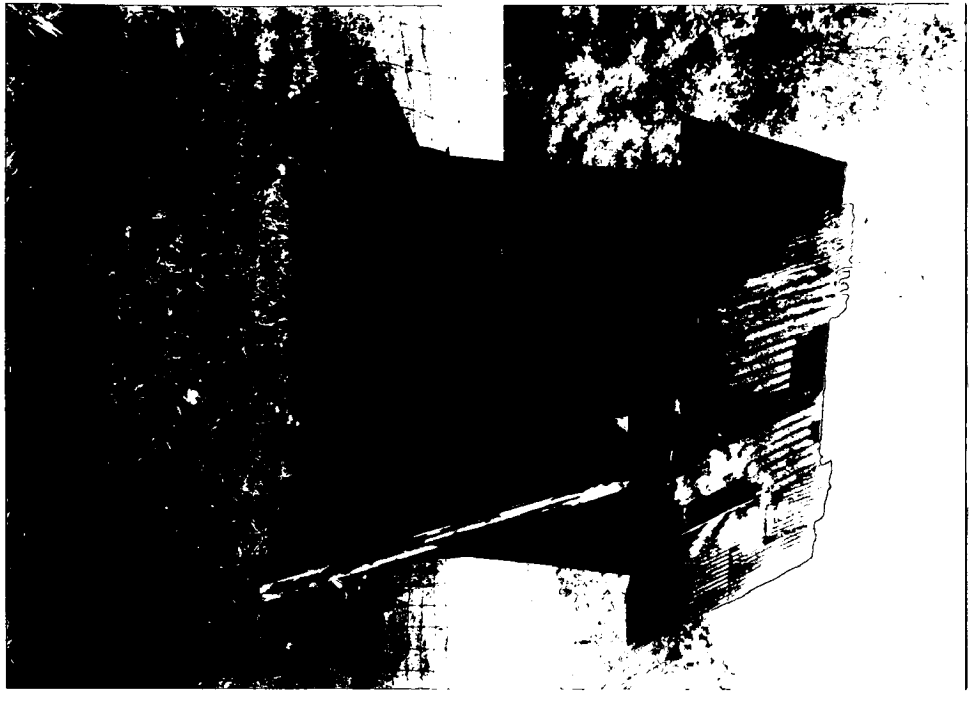
SHED 18C



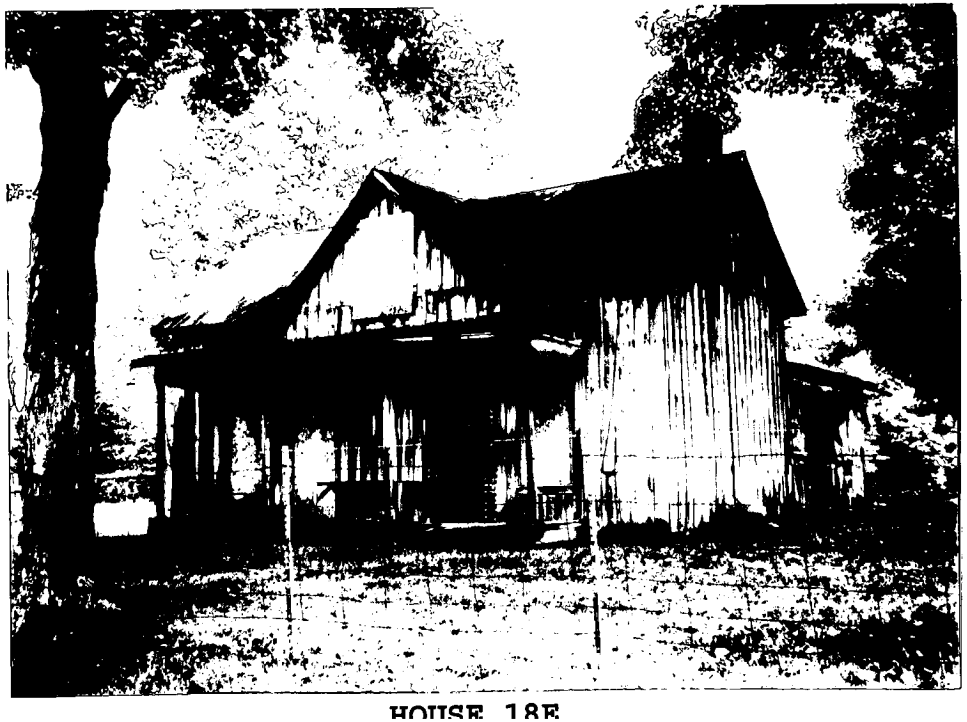
SHED 18C

ADDENDUM TO ATTACHMENT 27A
BENNOC, INC.

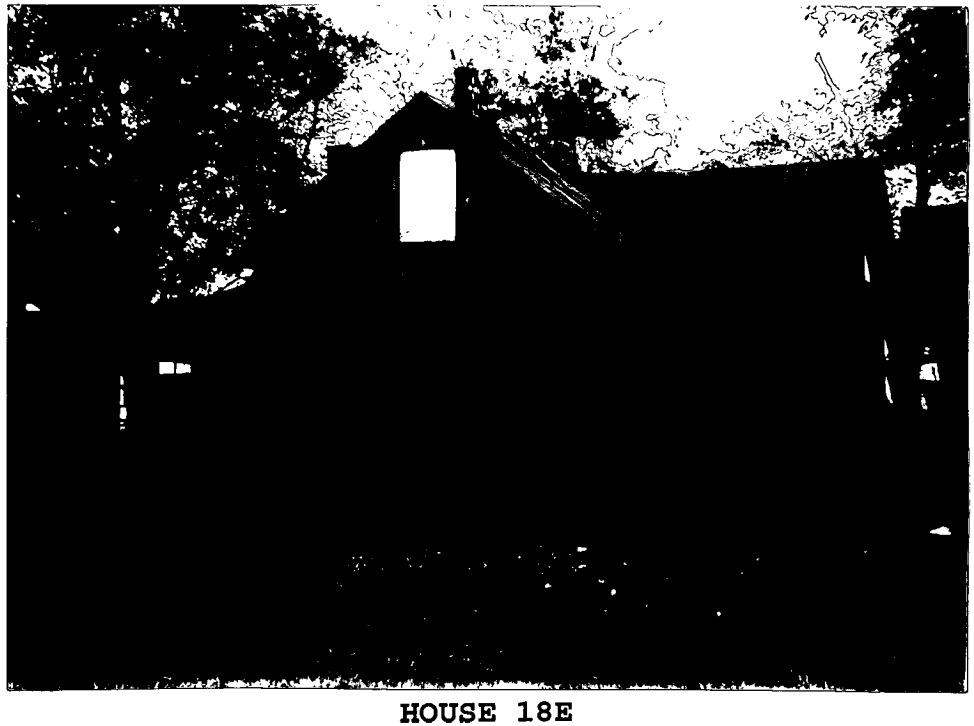
SHED 18D



SHED 18D



HOUSE 18E



HOUSE 18E

AEC 04538

ADDENDUM TO ATTACHMENT 27A

BENNETT, INC.

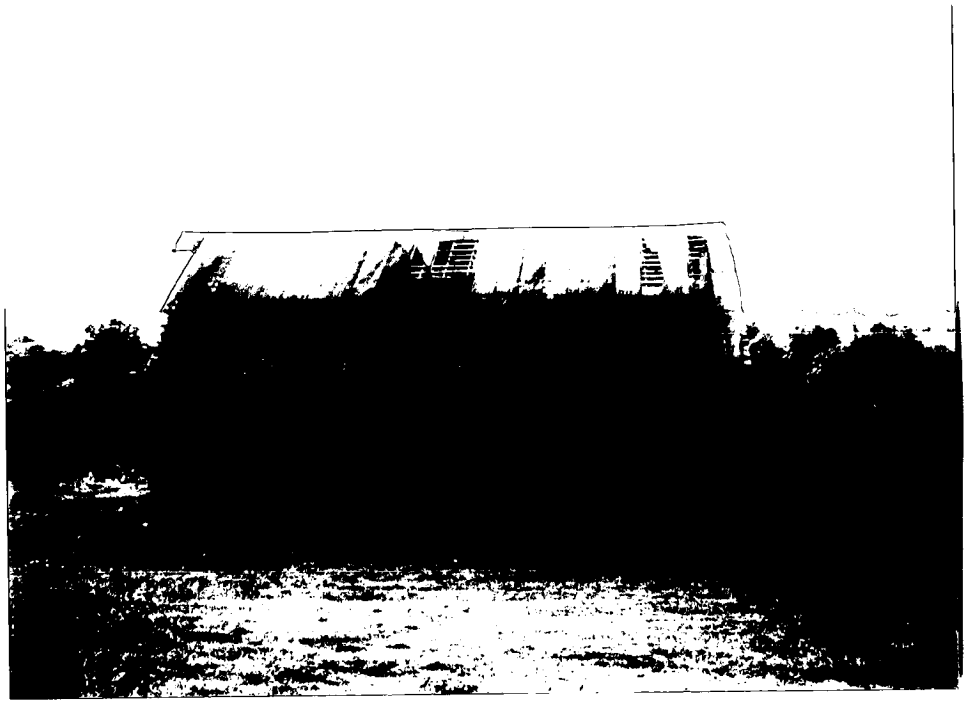
MACHINE SHED 18F

MACHINE SHED 18F

STORAGE SHED 18G

STORAGE SHED 18G

AEC 045399



LOG BARN 18H

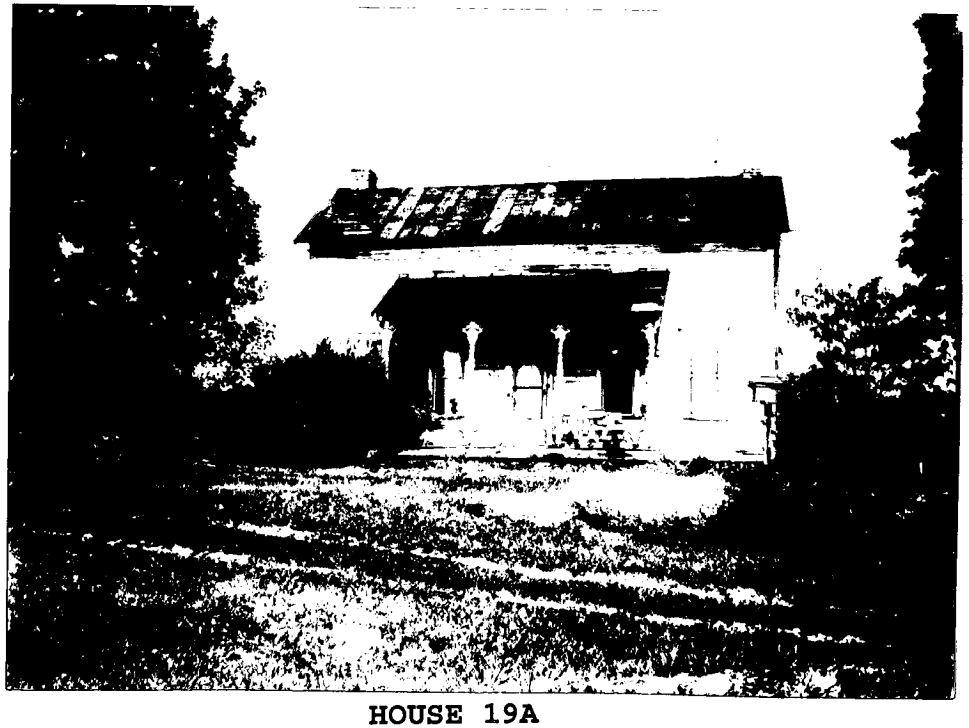
LOG BARN 18H

SHED RUINS 18I

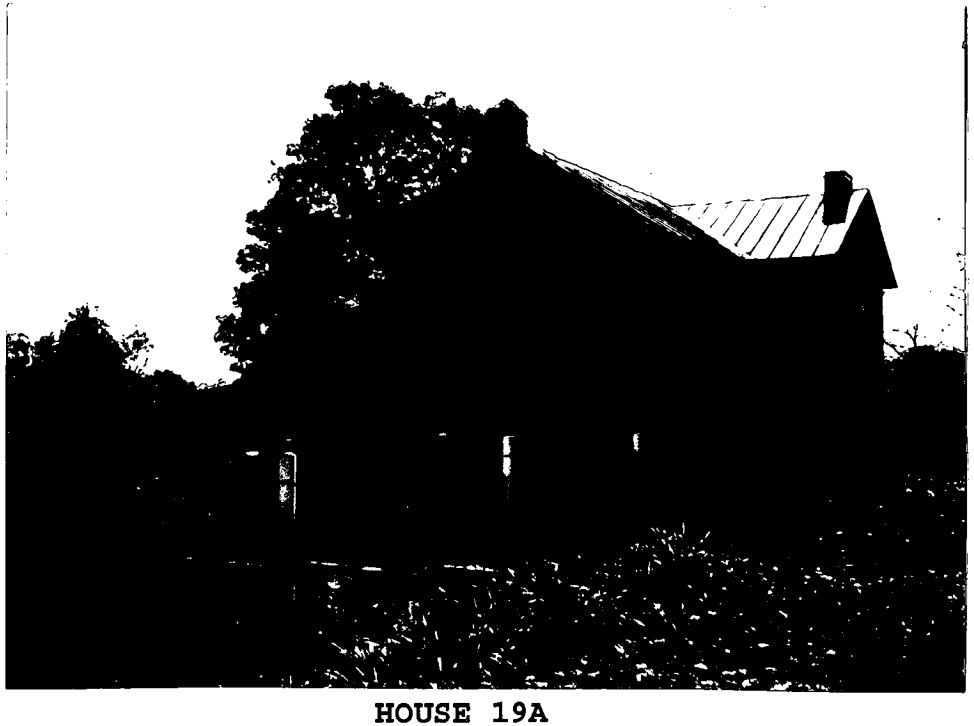
SHED RUINS 18I

BARN 18J

BARN 18J



HOUSE 19A



HOUSE 19A

ADDENDUM TO ATTACHMENT 27A
BENNETT, INC.

WASHHOUSE 19B

WASHHOUSE 19B

BARN 20A

BARN 20A

AEC 04542

ADDENDUM TO ATTACHMENT 27A

BENNOC, INC.

HOUSE 20B

HOUSE 20B

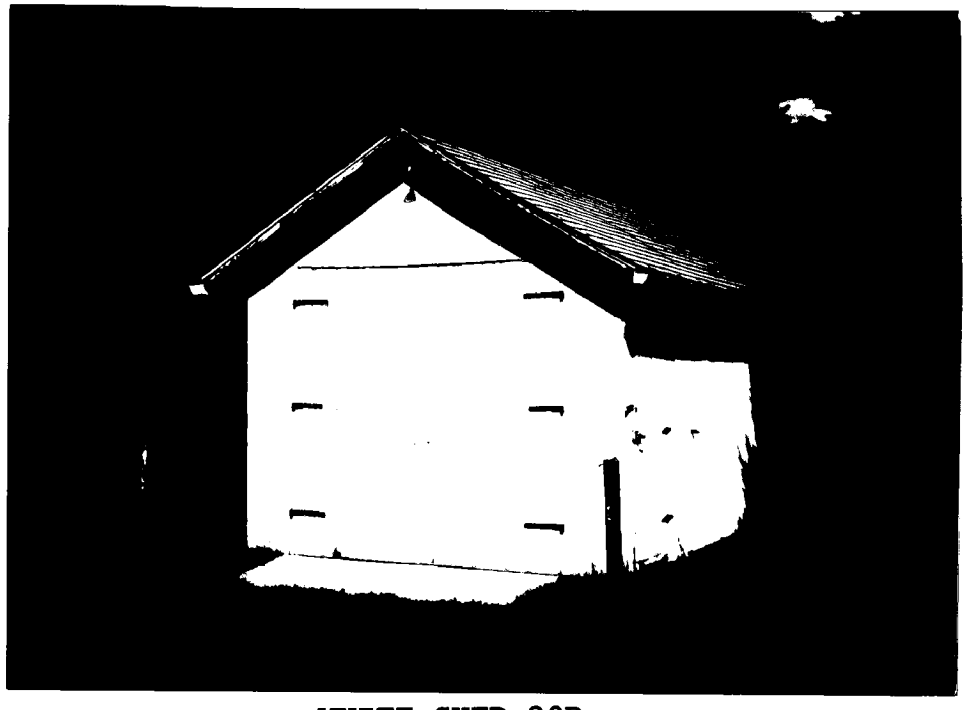
WOODSHED 20C

WOODSHED 20C

AEC 04543

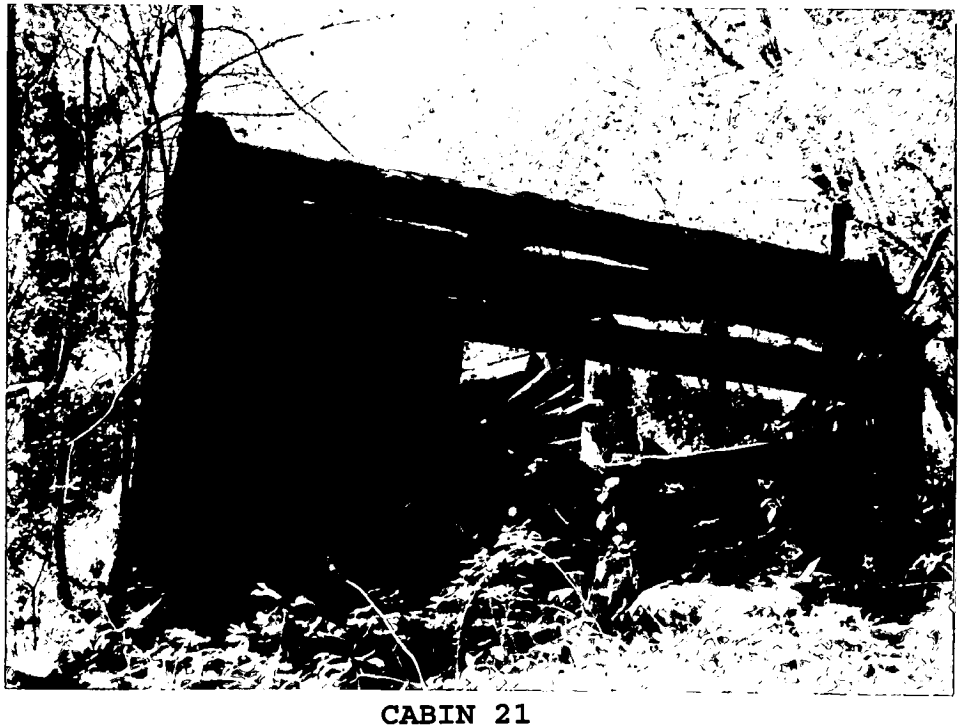
ADDENDUM TO ATTACHMENT 27A

BENNETT, INC.



WHITE SHED 20D

WHITE SHED 20D



CABIN 21

CABIN 21

ADDENDUM TO ATTACHMENT 27A

BENNOS, INC.

GARAGE 22A

GARAGE 22A

HOUSE 22B

HOUSE 22B

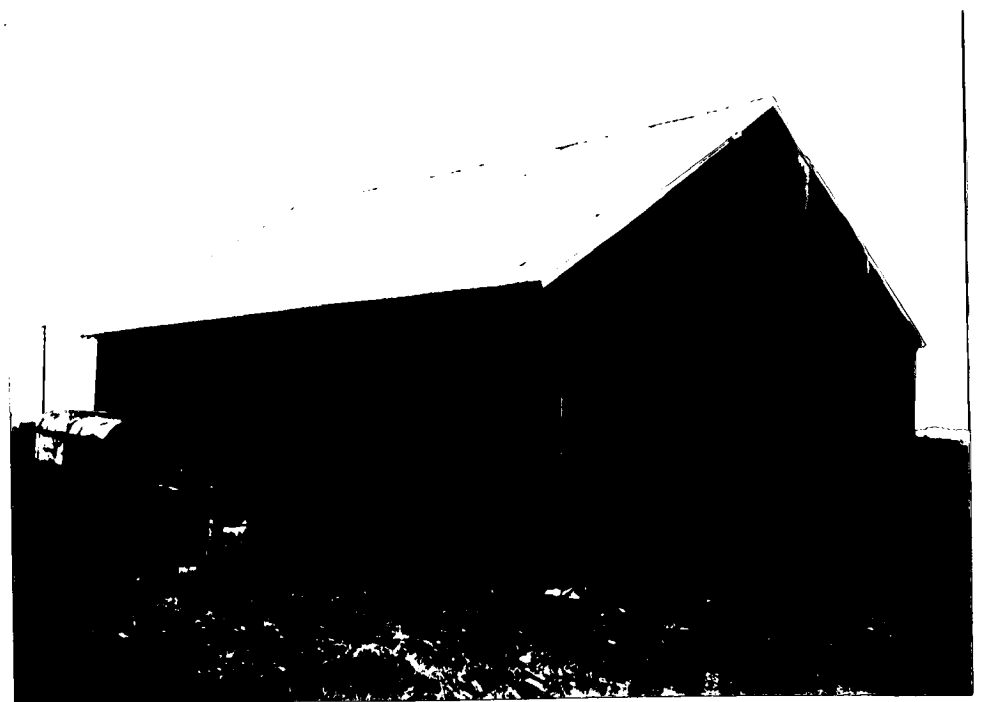
AEC 04545

ADDENDUM TO ATTACHMENT 27A
BENNOC, INC.

BARN 22C

BARN 22C

BARN 22D



BARN 22D

AEC 04546

ADDENDUM TO ATTACHMENT 27A
BENNOC, INC.

RUINS-HOUSE 23A

RUINS-HOUSE 23A

RUINS-BARN 23B

AEEC 0045447

RUINS 23C

CABIN 23D

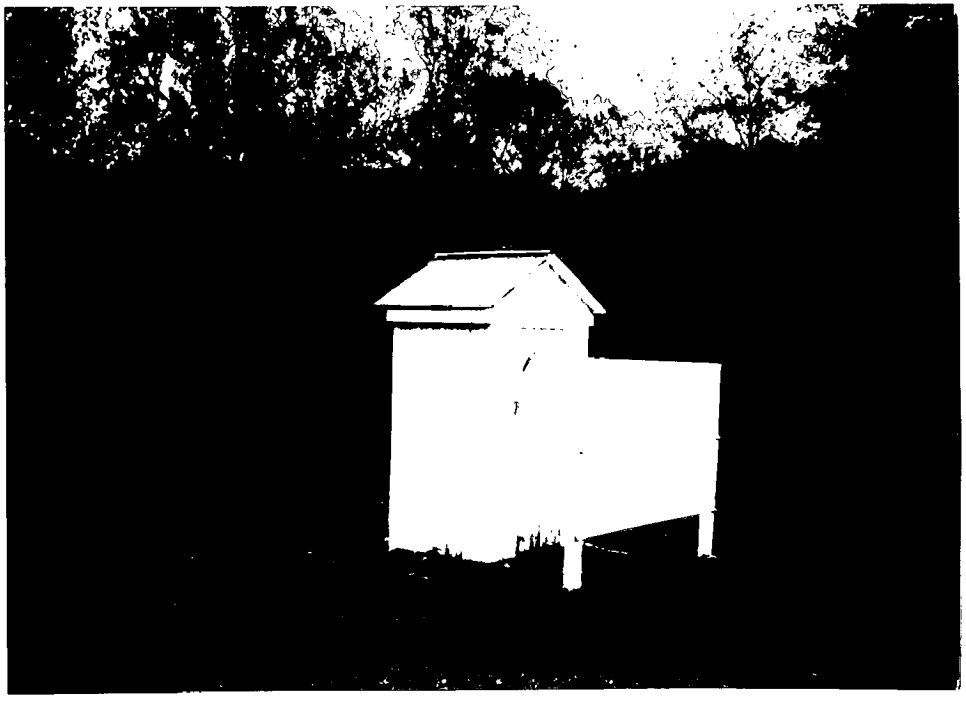
CABIN 23D

ADDENDUM TO ATTACHMENT 27A

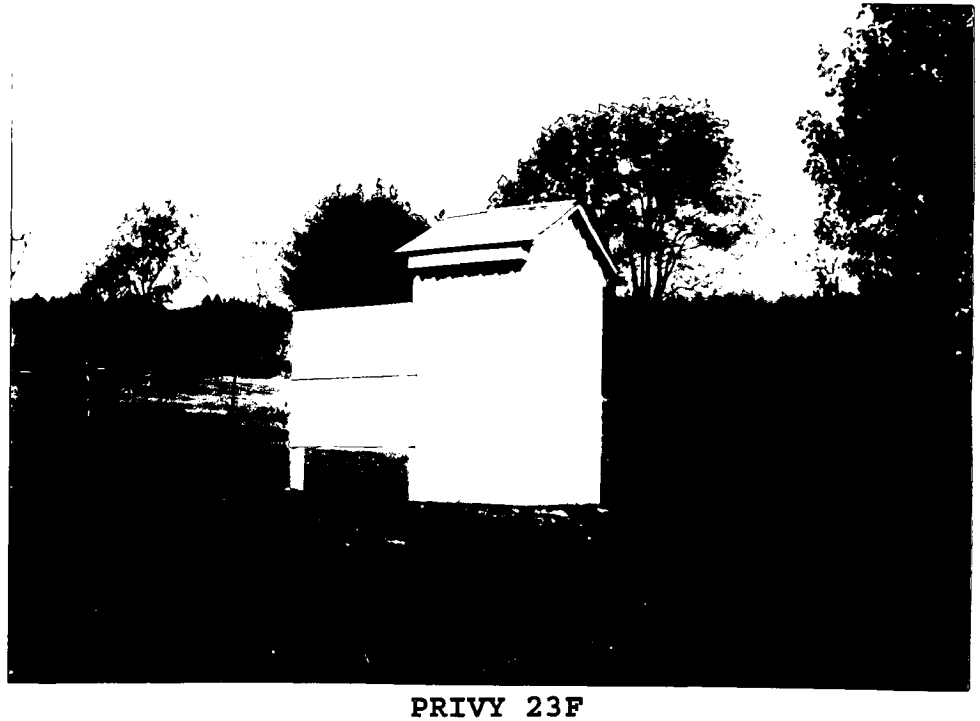
BENNETT, INC.

MACHINE SHED 23E

MACHINE SHED 23E



PRIVY 23F



PRIVY 23F

AEC 04549

ADDENDUM TO ATTACHMENT 27A

BENN[illegible], INC.

ROOT CELLAR 23G

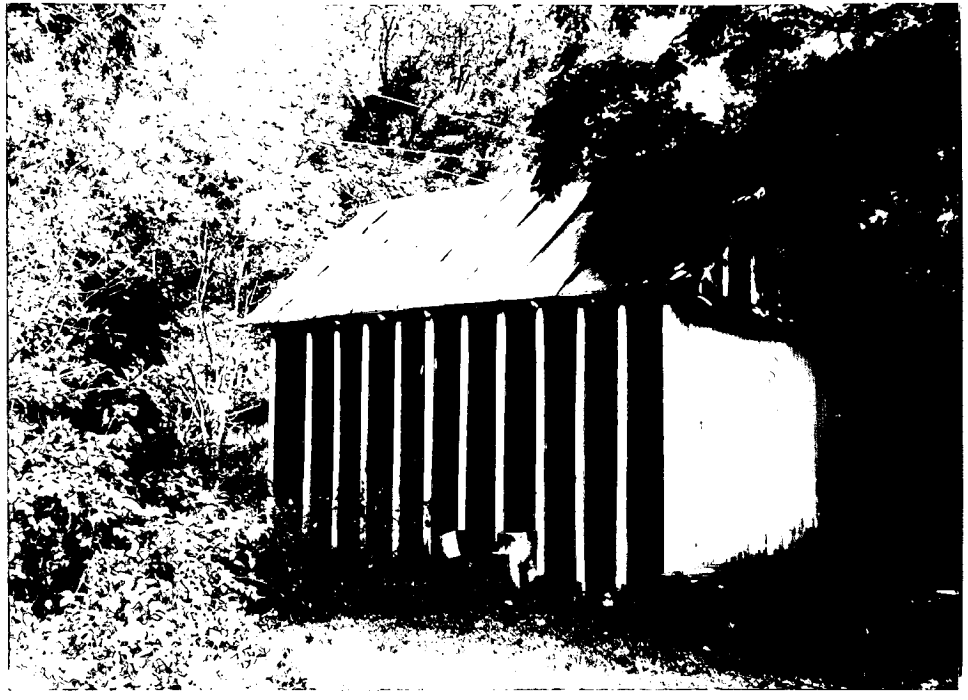
ROOT CELLAR 23G

MONTANA BARN 24A

MONTANA BARN 24A

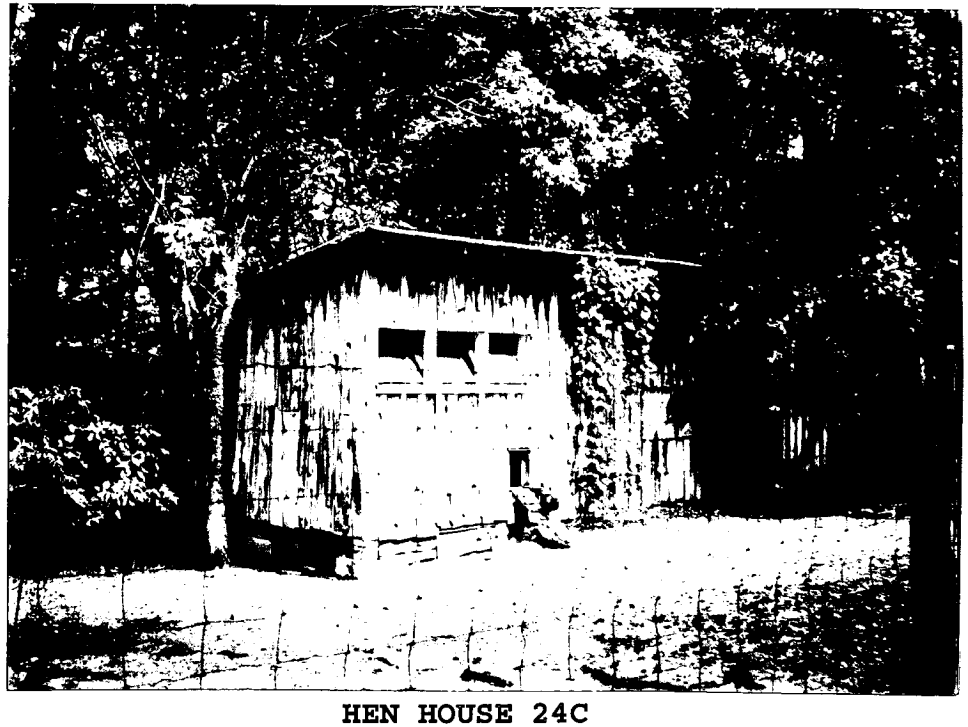
AEC 04550

ADDENDUM TO ATTACHMENT 27A
BENNOC, INC.



GARAGE 24B

GARAGE 24B



HEN HOUSE 24C

HEN HOUSE 24C

AEC 04551

ADDENDUM TO ATTACHMENT 27A

BENNOC, INC.

HOUSE 24D

HOUSE 24D

CRUM CABIN 25A

CRUM CABIN 25A

AEC 04552

ROOT CELLAR 25B

CHICKEN COOP 26A

CHICKEN COOP 26A

ADDENDUM TO ATTACHMENT 27A

BENNOC, INC.

PRIVY 26B

PRIVY 26B

HOUSE 26C

HOUSE 26C

AEC 04554

ADDENDUM TO ATTACHMENT 27A

BENNO[illegible], INC.

GARAGE 26D

GARAGE 26D

OLD GARAGE 26E

OLD GARAGE 26E

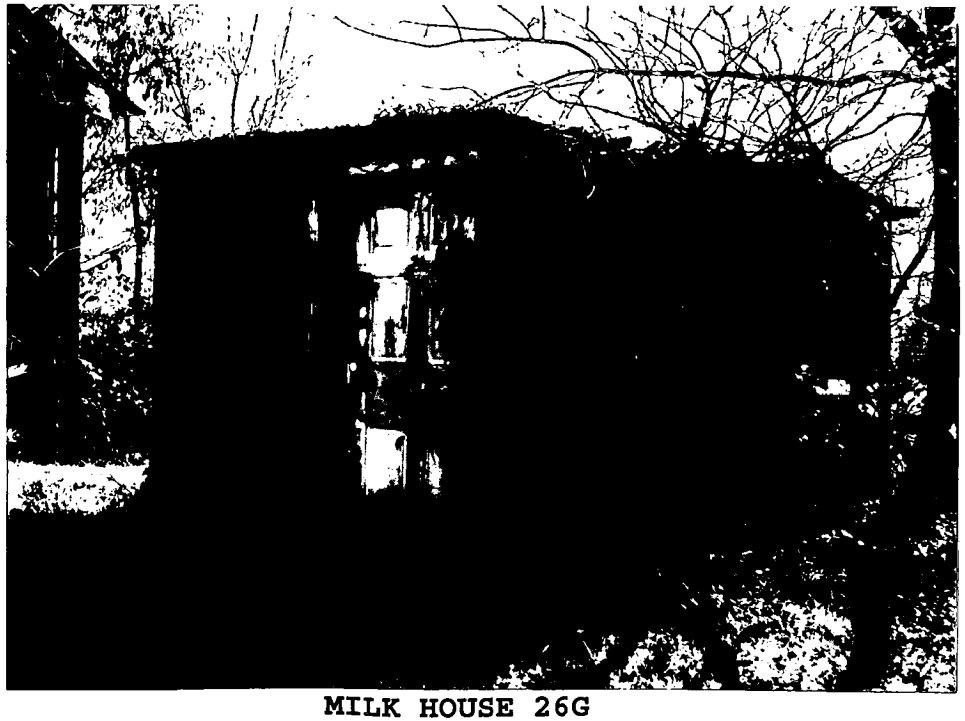
AEC 04555

ADDENDUM TO ATTACHMENT 27A

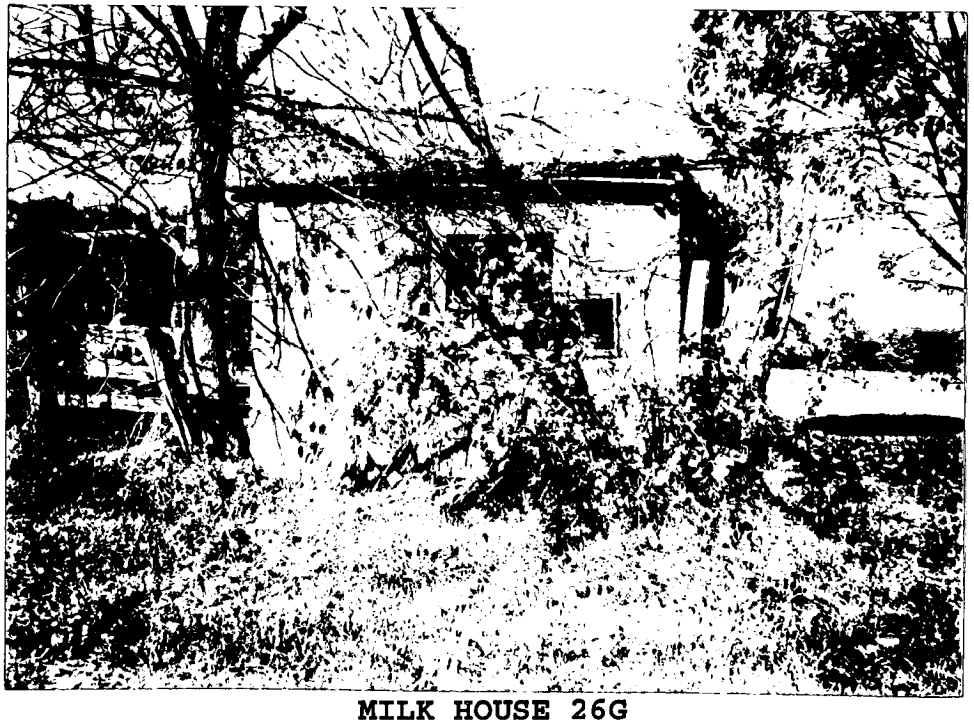
BENNETT, INC.

BARN 26F

BARN 26F



MILK HOUSE 26G



MILK HOUSE 26G

AEC 04556

ADDENDUM TO ATTACHMENT 27A

BENNOC, INC.

HOUSE 27

HOUSE 27

HOUSE 28

HOUSE 28

AEC 04557

ADDENDUM TO ATTACHMENT 27A
BENNCO, INC.

BARN 29A

BARN 29A

GARAGE 29B

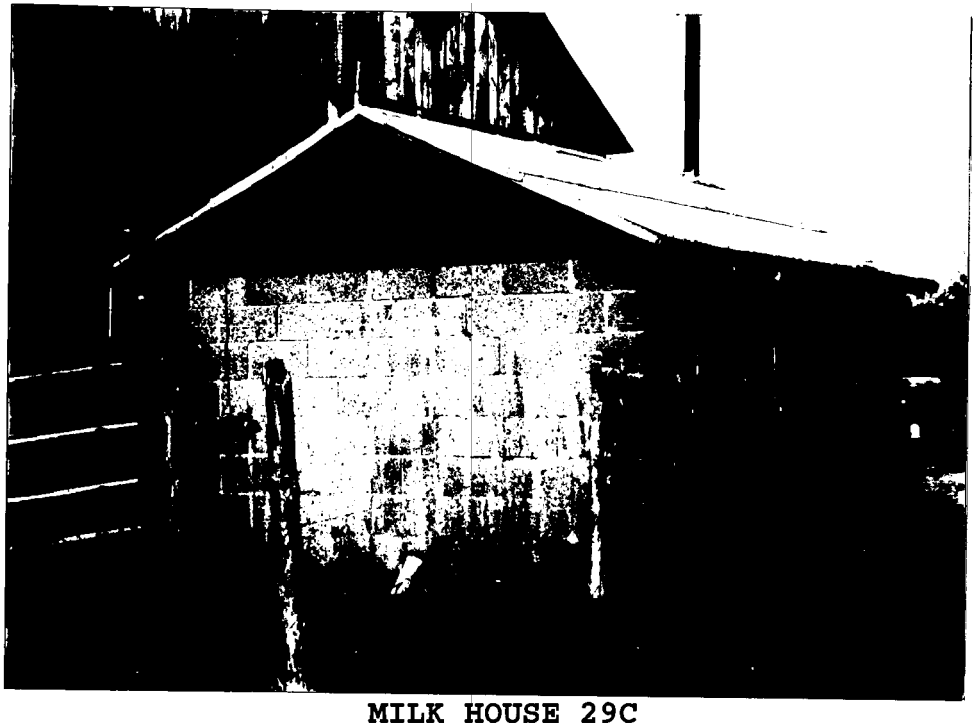
GARAGE 29B

AEC 04558

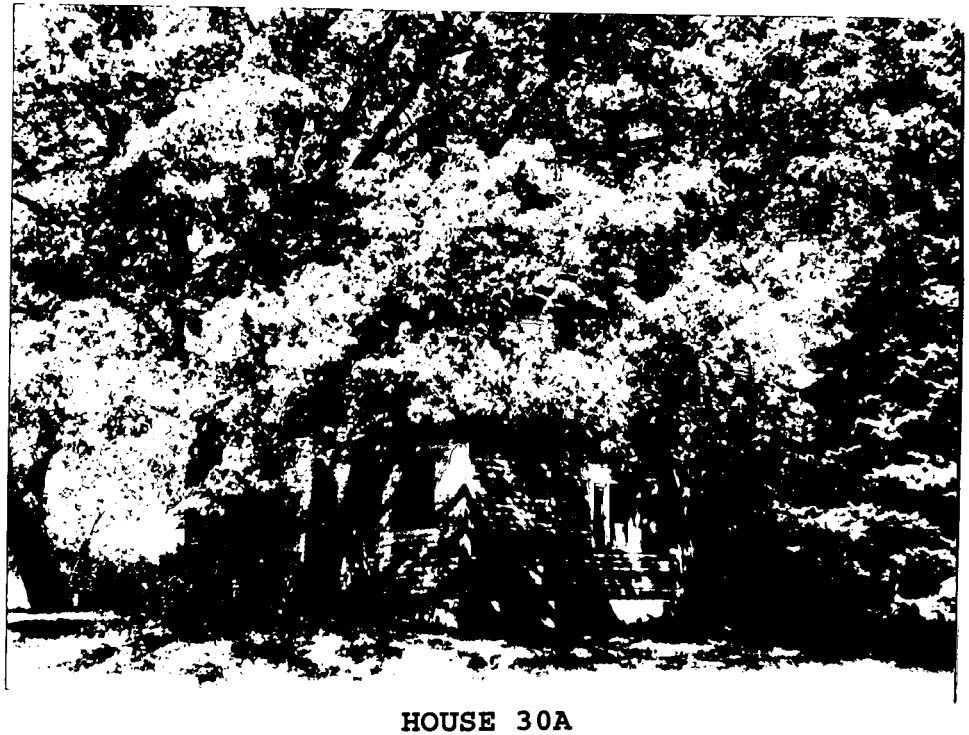
ADDENDUM TO ATTACHMENT 27A

BENNETT, INC.

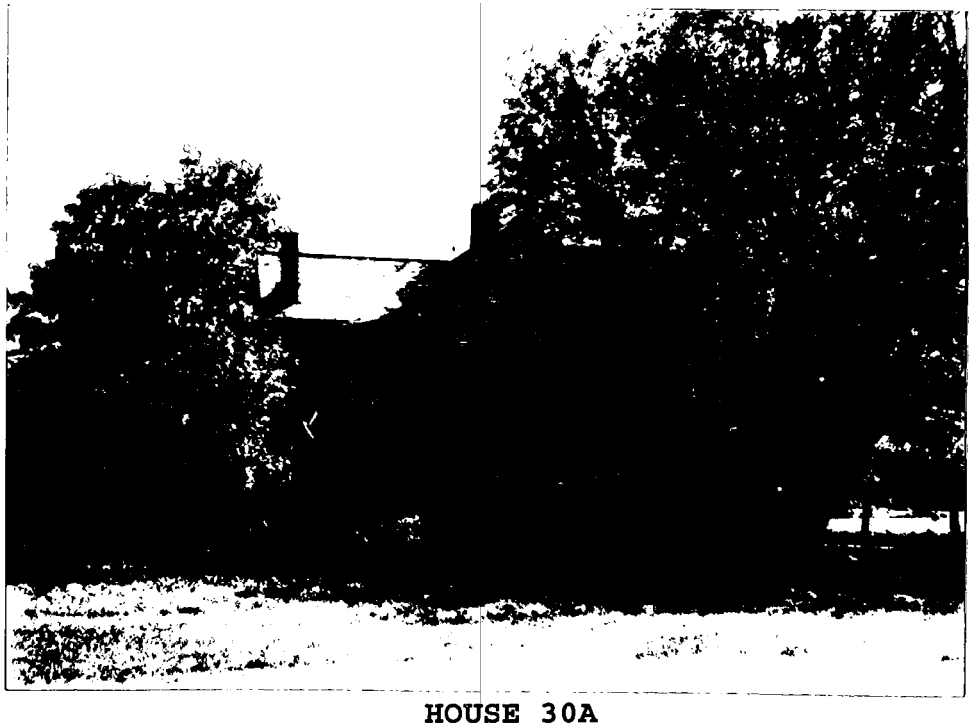
MILK HOUSE 29C



MILK HOUSE 29C



HOUSE 30A



HOUSE 30A

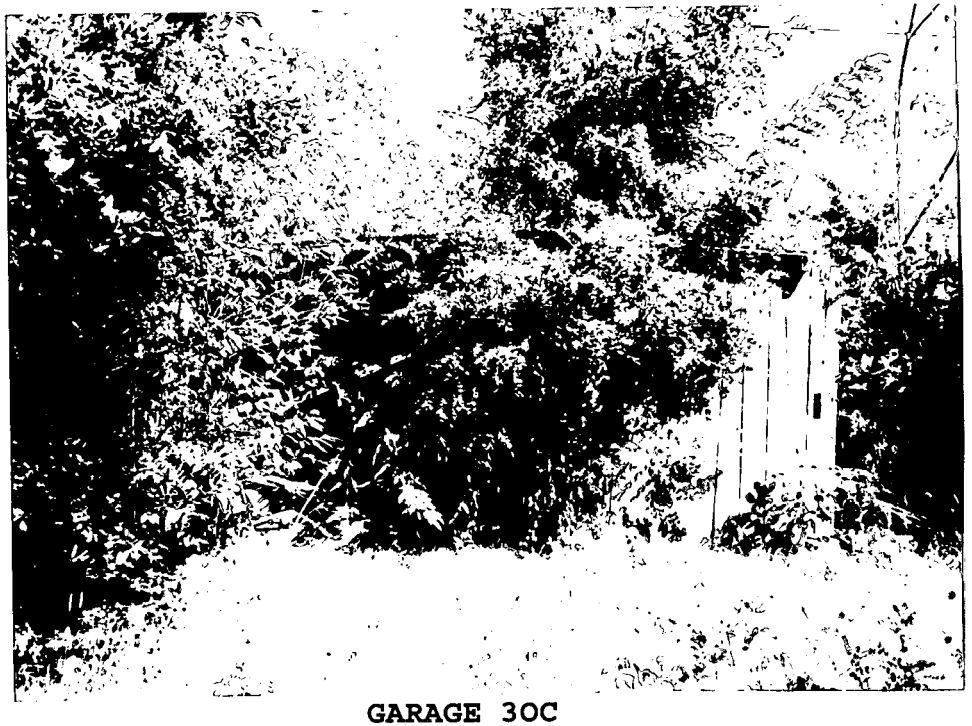
AEC 04559

ADDENDUM TO ATTACHMENT 27A

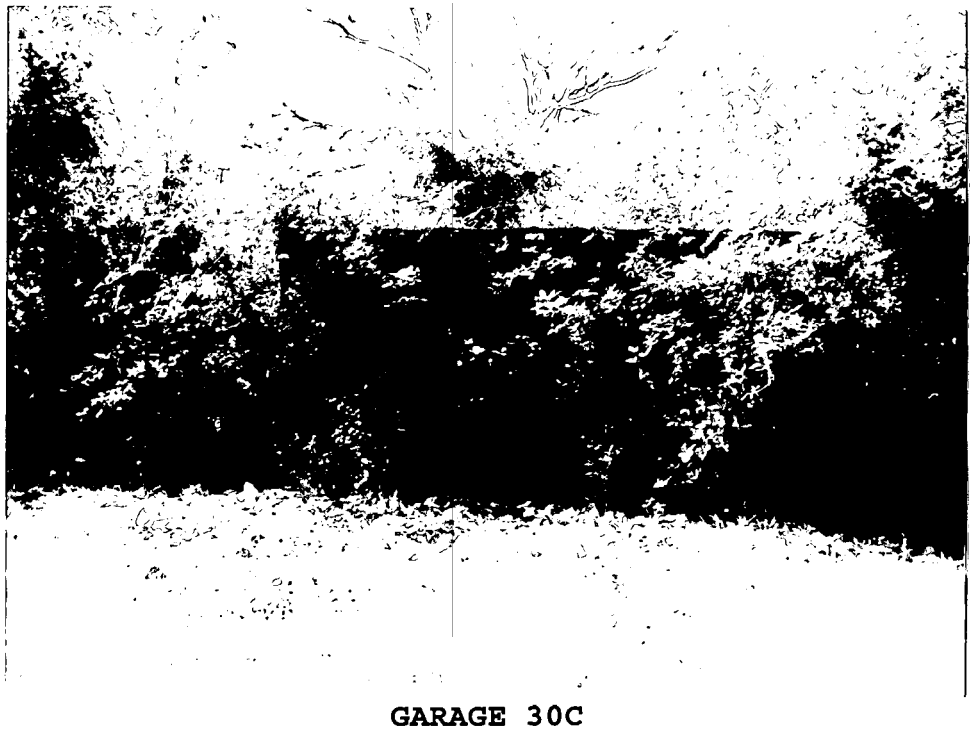
BENNO[illegible] INC.

OUTBUILDING 30B

OUTBUILDING 30B



GARAGE 30C



GARAGE 30C

AEC 04560

ADDENDUM TO ATTACHMENT 27A

BENNOS, INC.

SUMMER KITCHEN 30D

SUMMER KITCHEN 30D

BARN 30E

BARN 30E

AEC 04561

ADDENDUM TO ATTACHMENT 27A

BENNOCK, INC.

SHED-1 30F

SHED-1 30F

CHICKEN COOP 30G

CHICKEN COOP 30G

AEC 04562

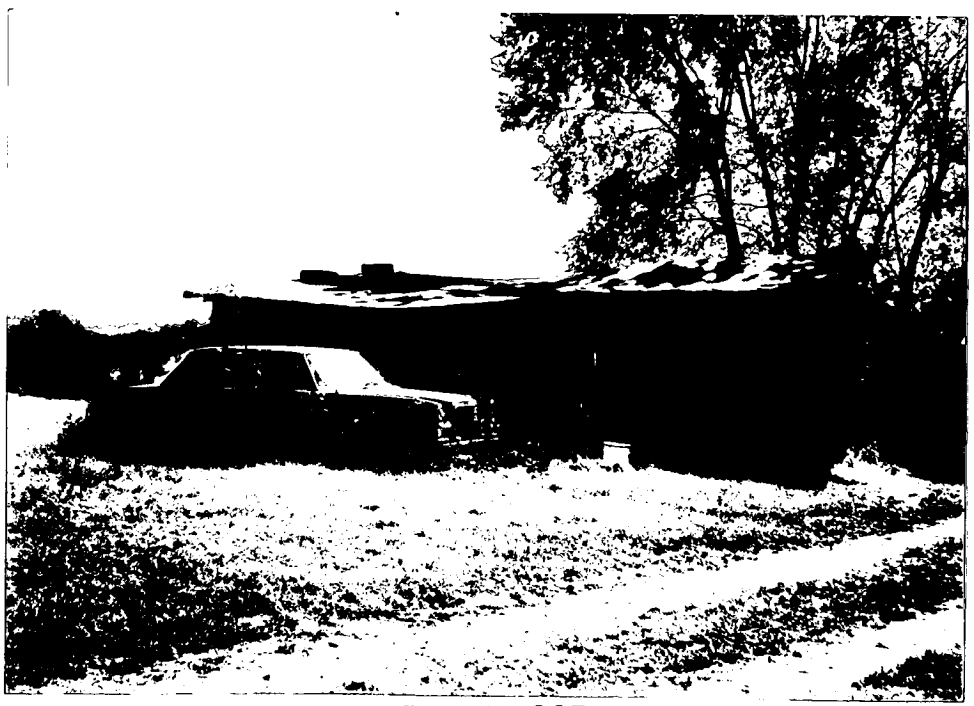
ADDENDUM TO ATTACHMENT 27A

BENNOCK, INC.

SHED-2 30H

SHED-2 30H

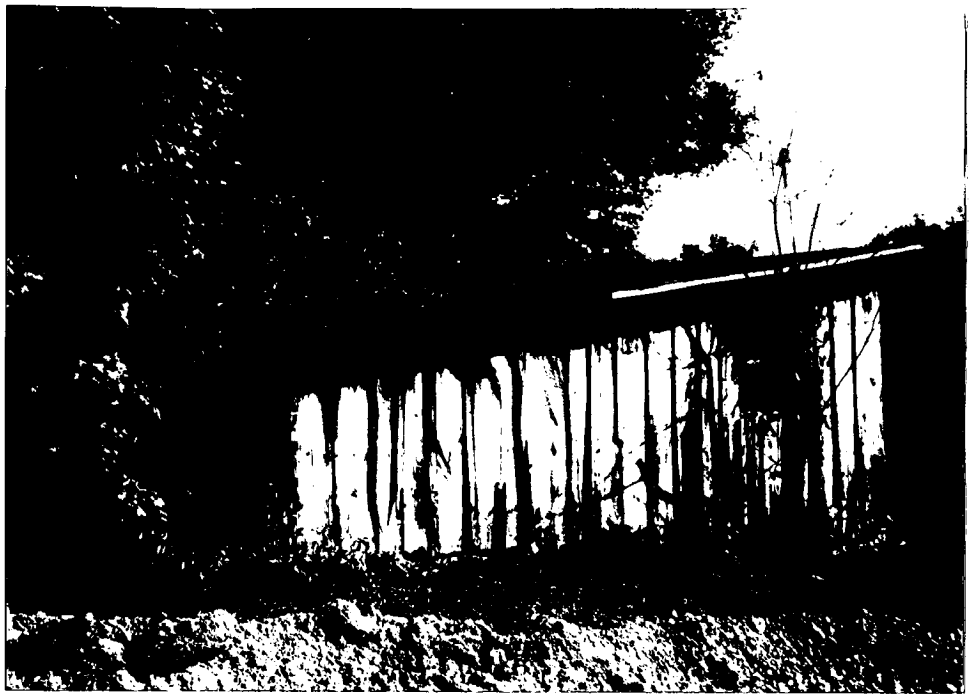
GARAGE 30I



GARAGE 30I

ADDENDUM TO ATTACHMENT 27A
BENNOCK INC.

MACHINE SHED 31A



MACHINE SHED 31A

OUTBUILDING 31B

OUTBUILDING 31B

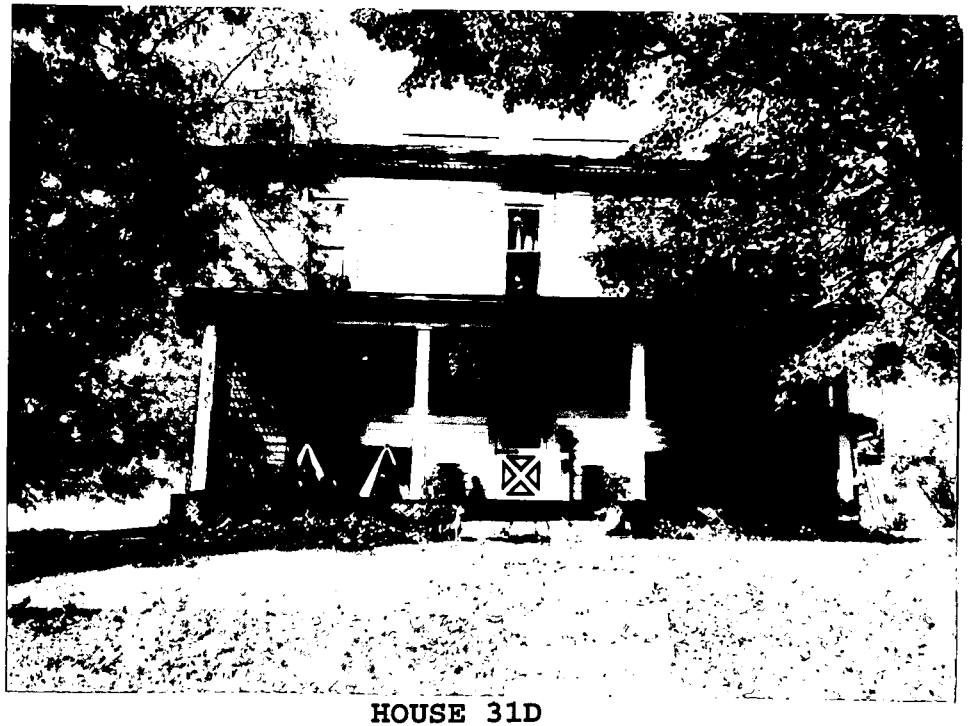
AEC 04564

ADDENDUM TO ATTACHMENT 27A

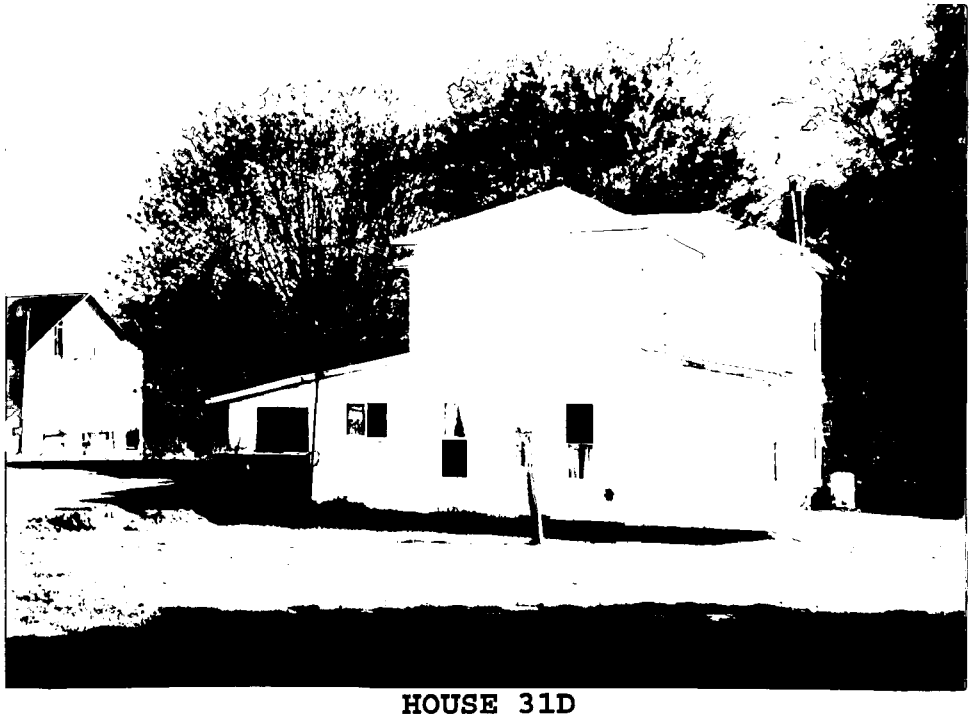
BENNOCH INC.

CELLAR 31C

CELLAR 31C



HOUSE 31D



HOUSE 31D

AEC 045665

ADDENDUM TO ATTACHMENT 27A
BENNOCK, INC.

MACHINE SHED 32A

MACHINE SHED 32A

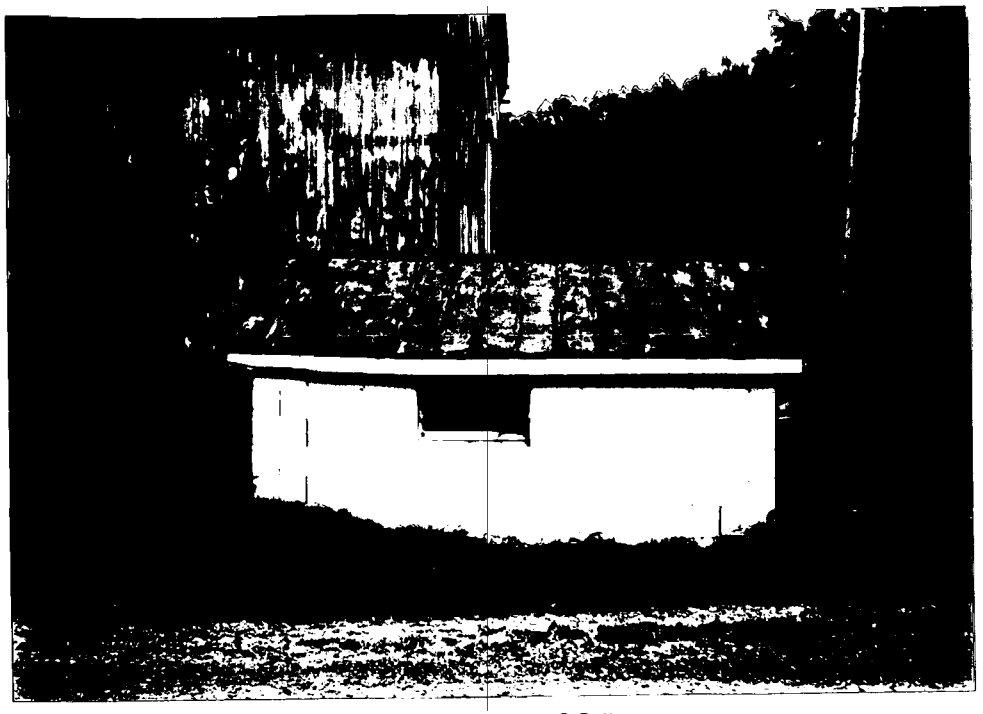
GARAGE 32B

GARAGE 32B

AEC 04566

ADDENDUM TO ATTACHMENT 27A
BENNOCK INC.

CELLAR 32C



CELLAR 32C

BARN 32D

BARN 32D

AEC 04567

ADDENDUM TO ATTACHMENT 27A
BENNOCK, INC.

RUINS-BARN 33A

RUINS-BARN 33A

HOUSE 33B

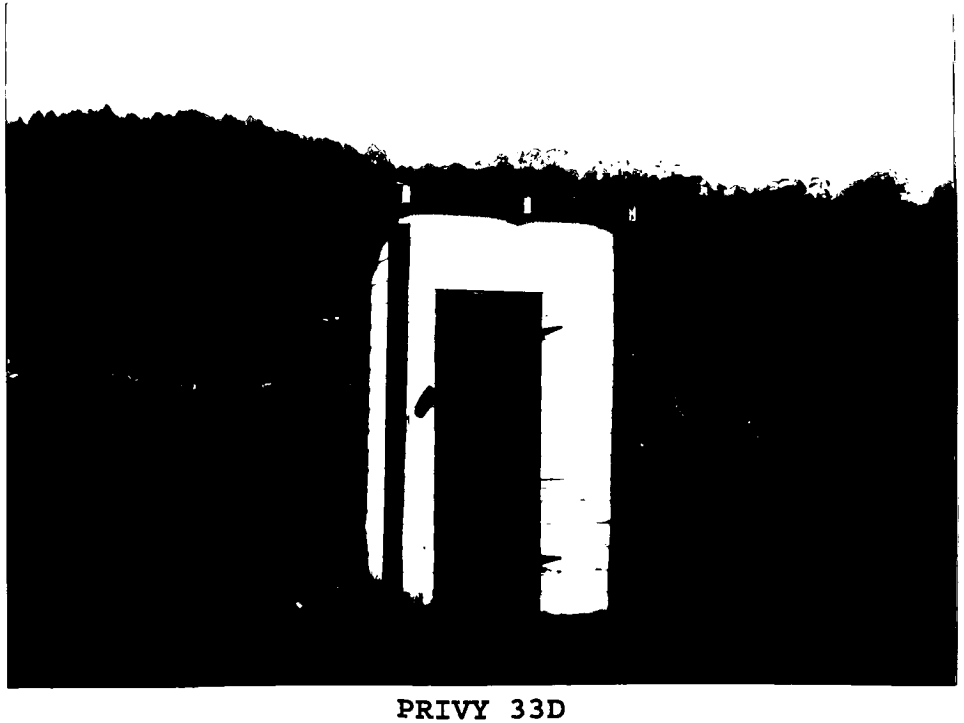
HOUSE 33B

AEC 04568

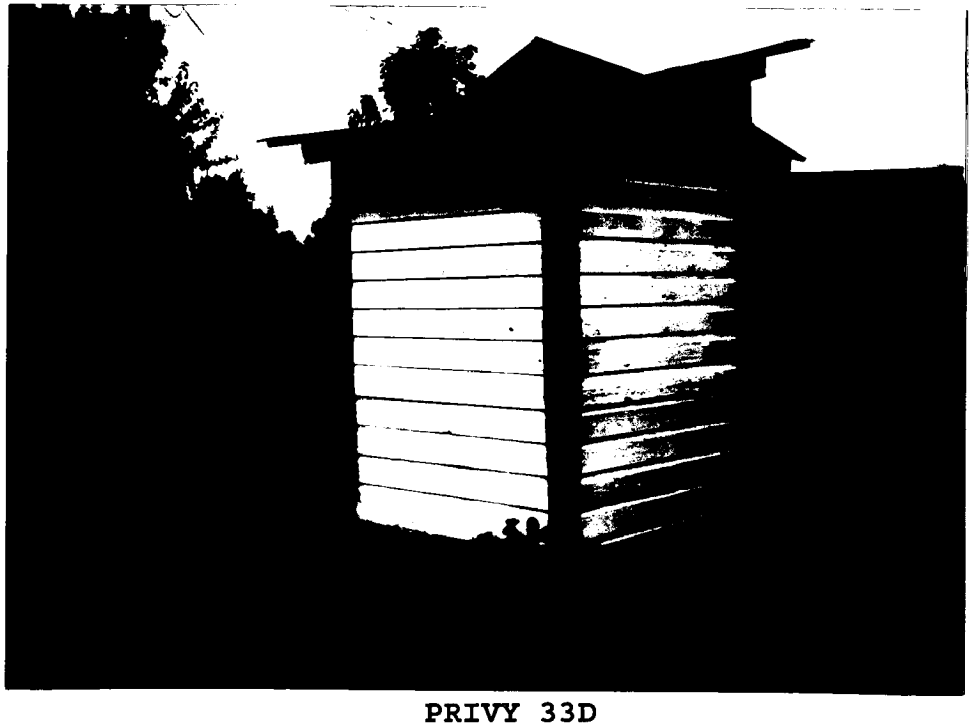
ADDENDUM TO ATTACHMENT 27A
BENNOCK INC.

SHED 33C

SHED 33C



PRIVY 33D



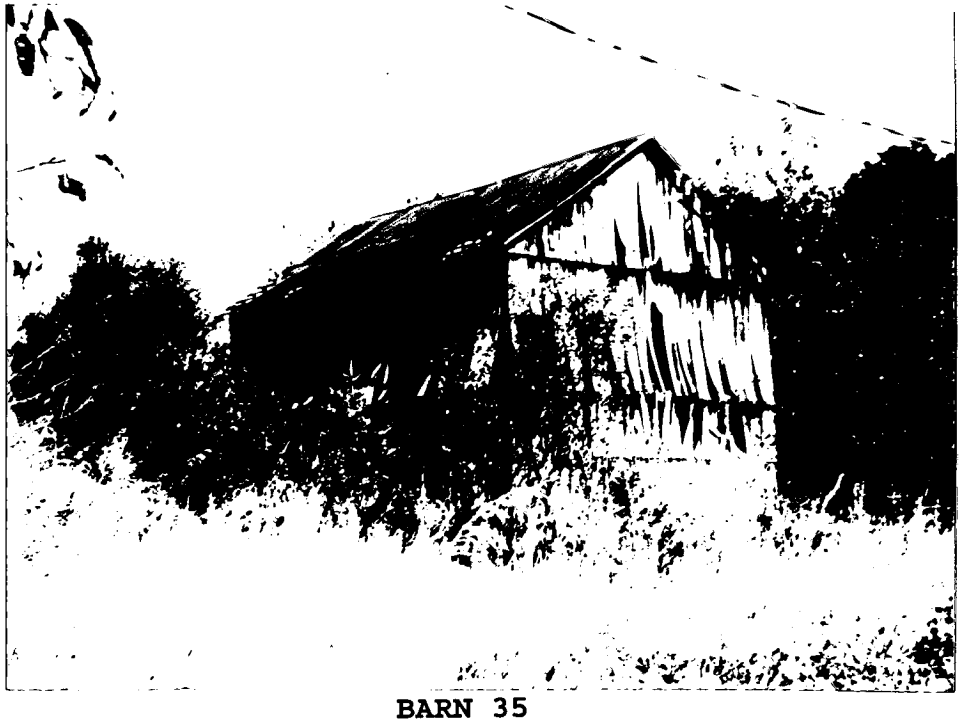
PRIVY 33D

AEC 04569

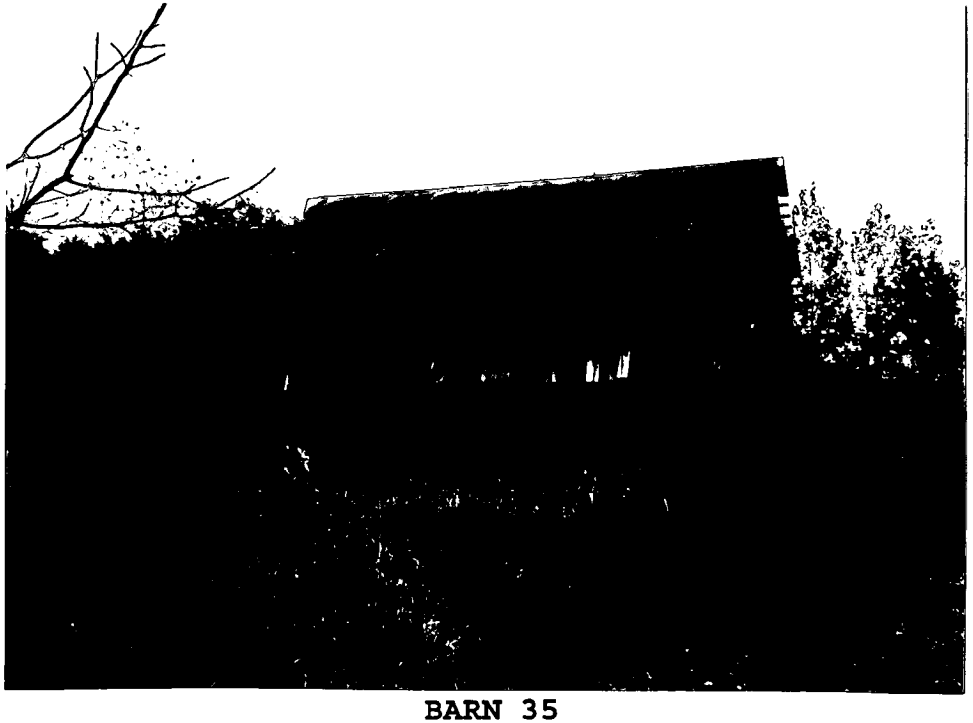
ADDENDUM TO ATTACHMENT 27A
BENNCO, INC.

GARDEN SHED 33E

GARDEN SHED 33E



BARN 35



BARN 35

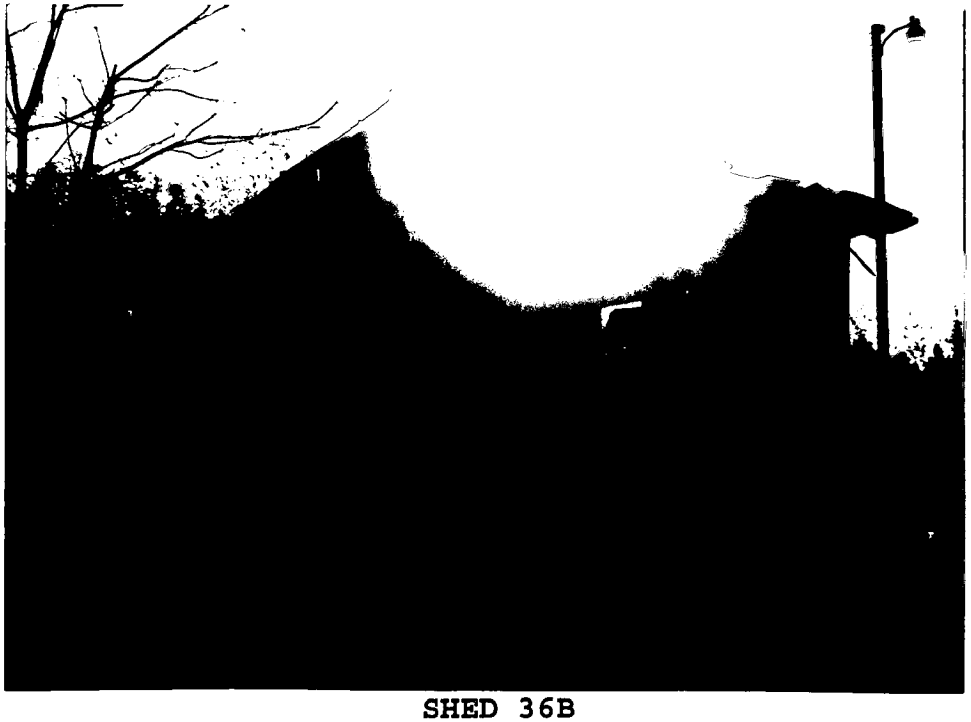
AEC 04570

ADDENDUM TO ATTACHMENT 27A
BENNOCK, INC.

HOUSE 36A

HOUSE 36A

SHED 36B



SHED 36B

AEC 04571

ADDENDUM TO ATTACHMENT 27A

BENNOCH INC.

GARAGE 37A

GARAGE 37A

RUINS 37B

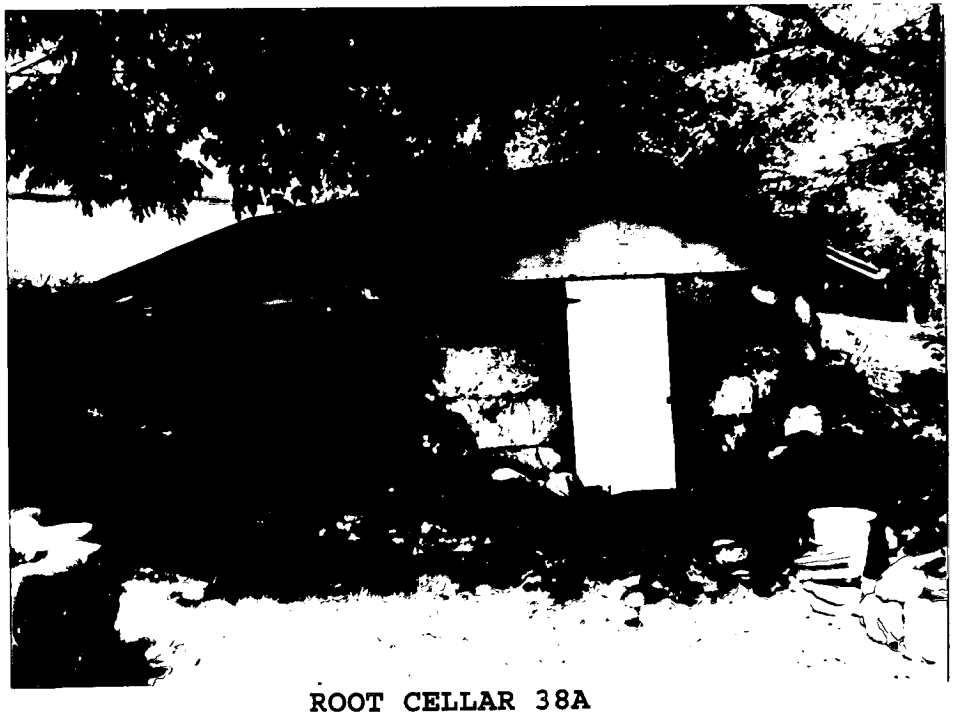
AEEC 045572

ADDENDUM TO ATTACHMENT 27A

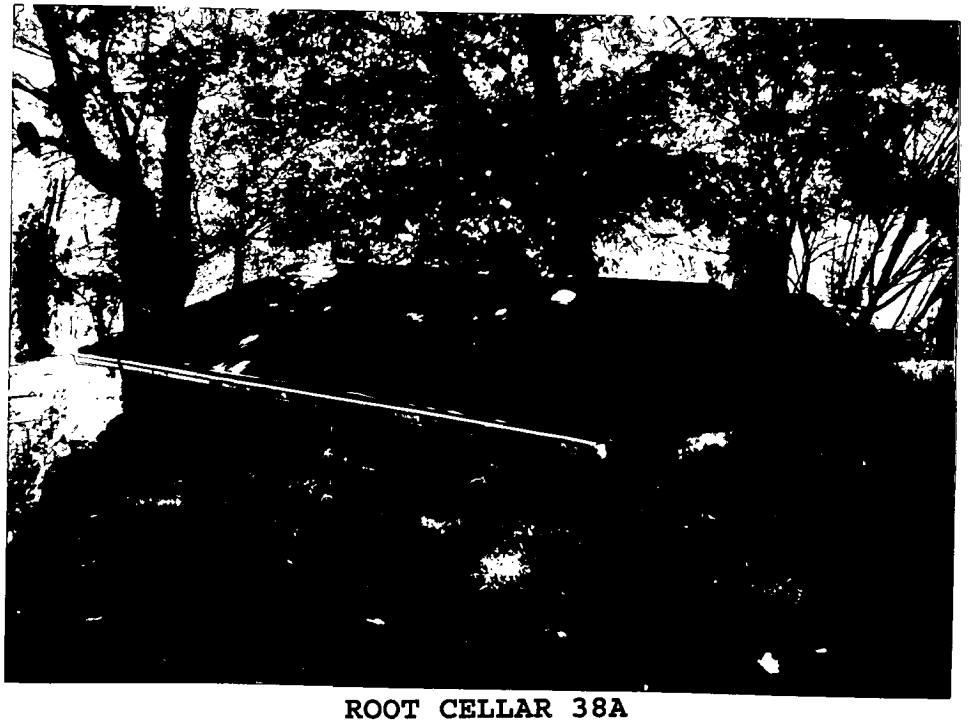
BENNOC, INC.

BARN 37C

BARN 37C



ROOT CELLAR 38A

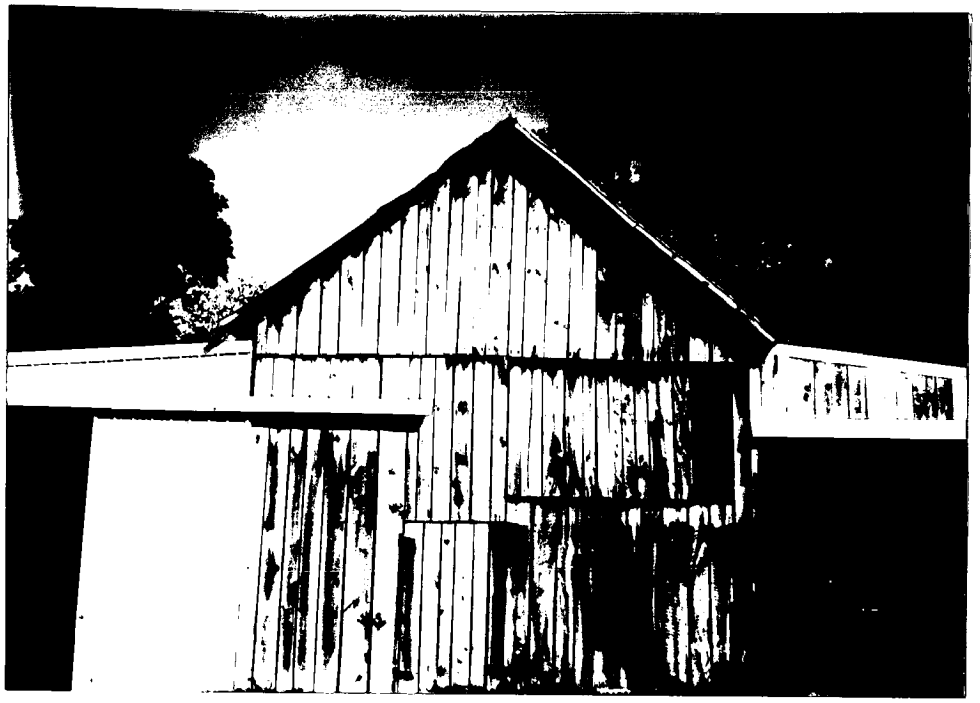


ROOT CELLAR 38A

AEC 04573

ADDENDUM TO ATTACHMENT 27A
BENNOCK, INC.

BARN 38B



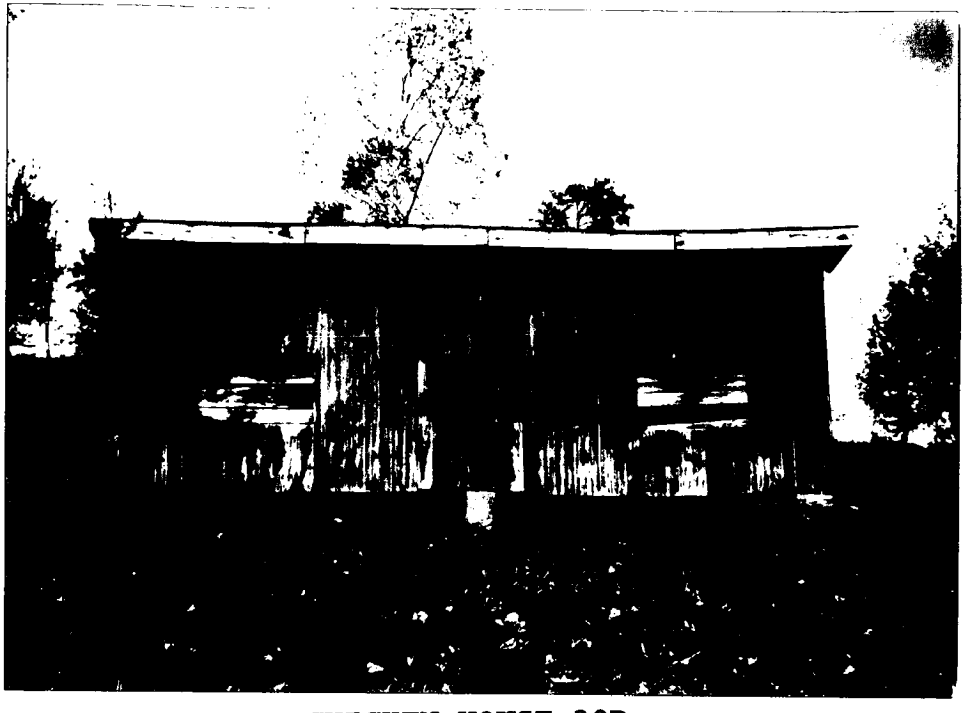
BARN 38B

STORAGE BARN 38C

STORAGE BARN 38C

ADDENDUM TO ATTACHMENT 27A

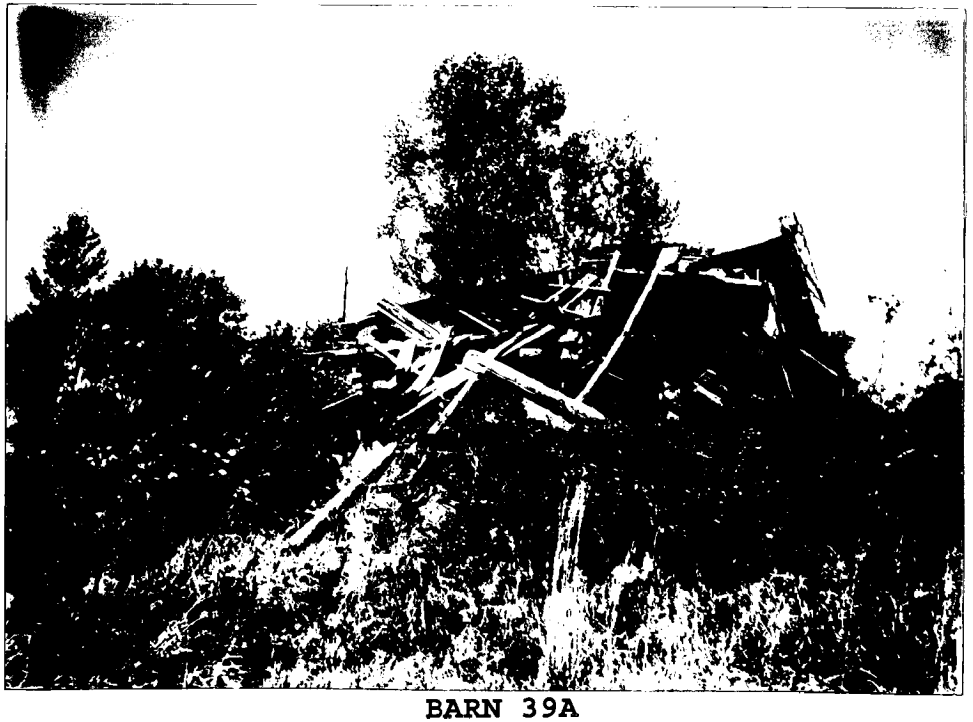
BENNOCK INC.



CHICKEN HOUSE 38D

CHICKEN HOUSE 38D

BARN 39A



BARN 39A

AEC 04575

ADDENDUM TO ATTACHMENT 27A

BENNOCH INC.

CHICKEN COOP 39B

CHICKEN COOP 39B

GARAGE 39C

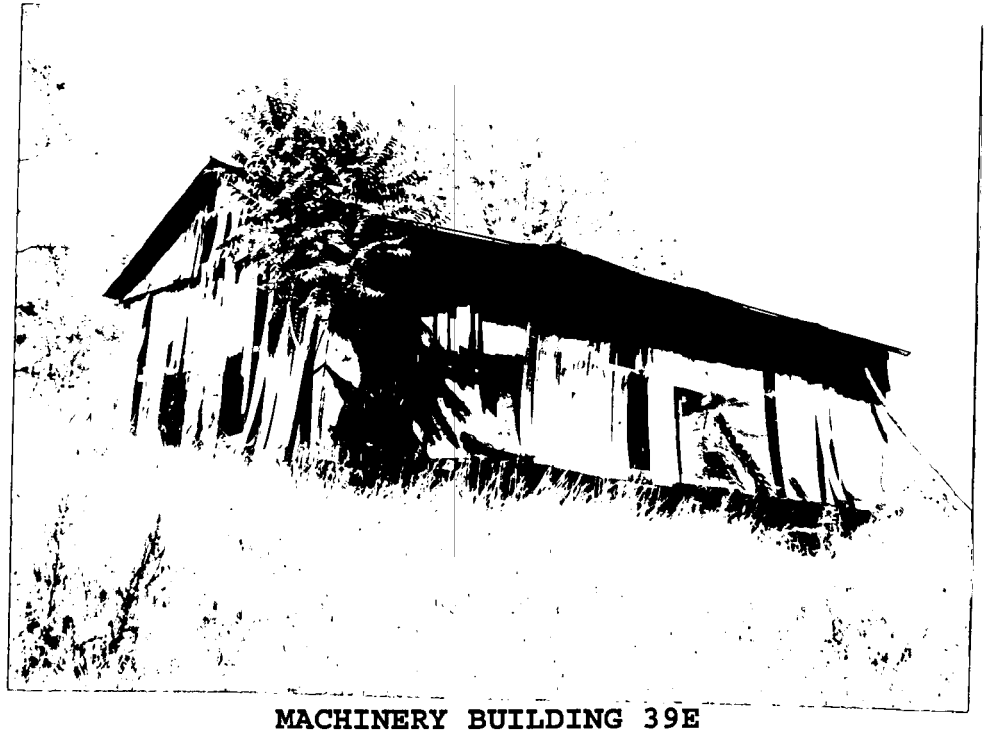
GARAGE 39C

AEC 045766

PIG HOUSE 39D

PIG HOUSE 39D

MACHINERY BUILDING 39E

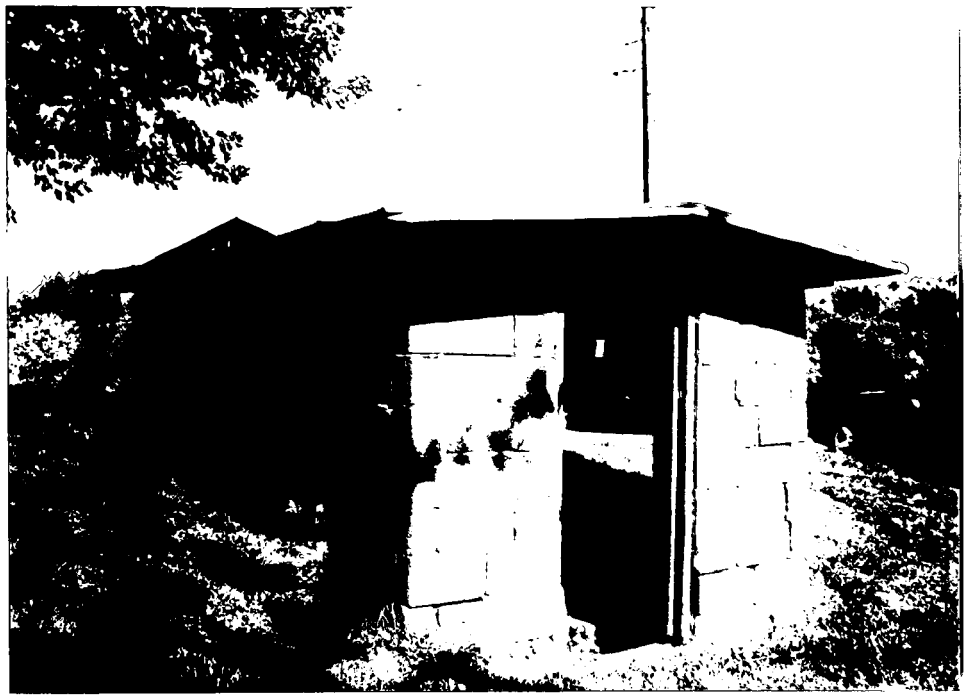


MACHINERY BUILDING 39E

AEC 045777

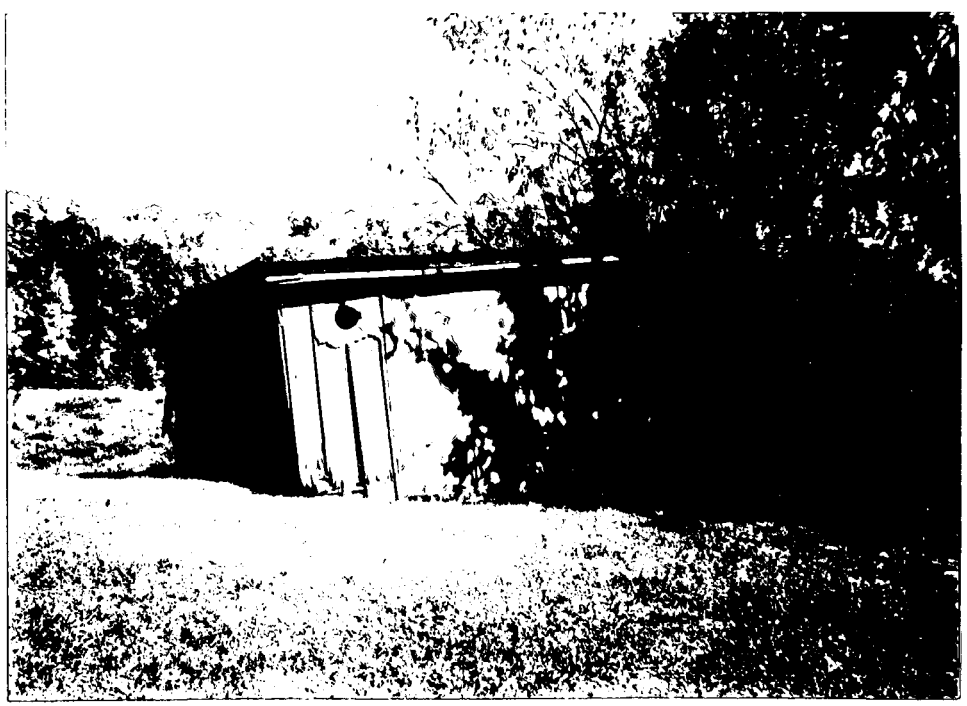
ADDENDUM TO ATTACHMENT 27A

BENNOCK, INC.

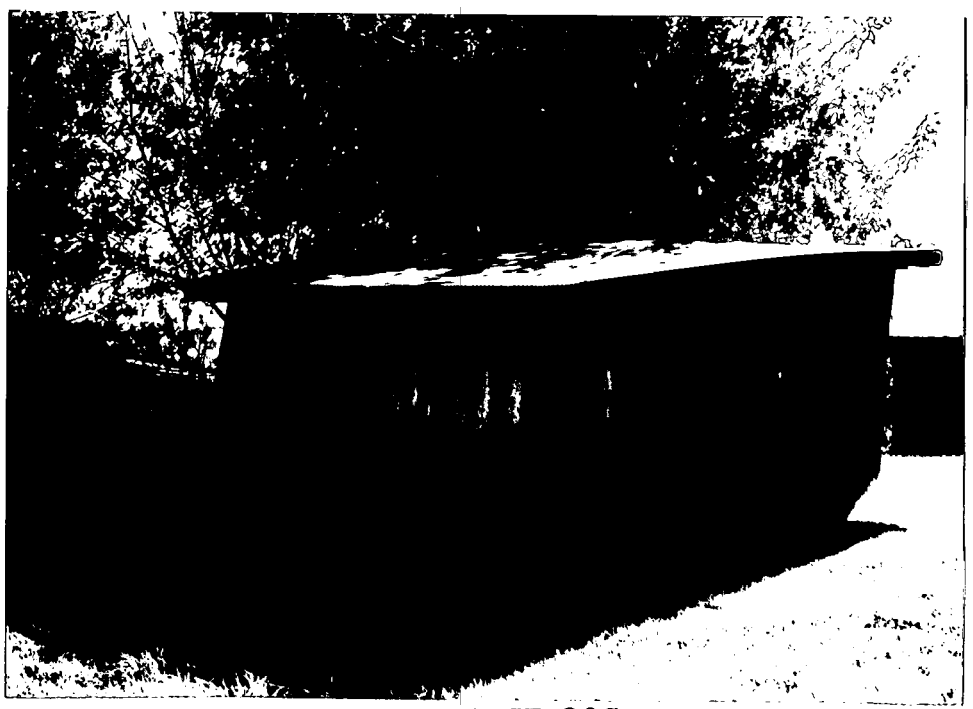


MILK HOUSE 39F

MILK HOUSE 39F

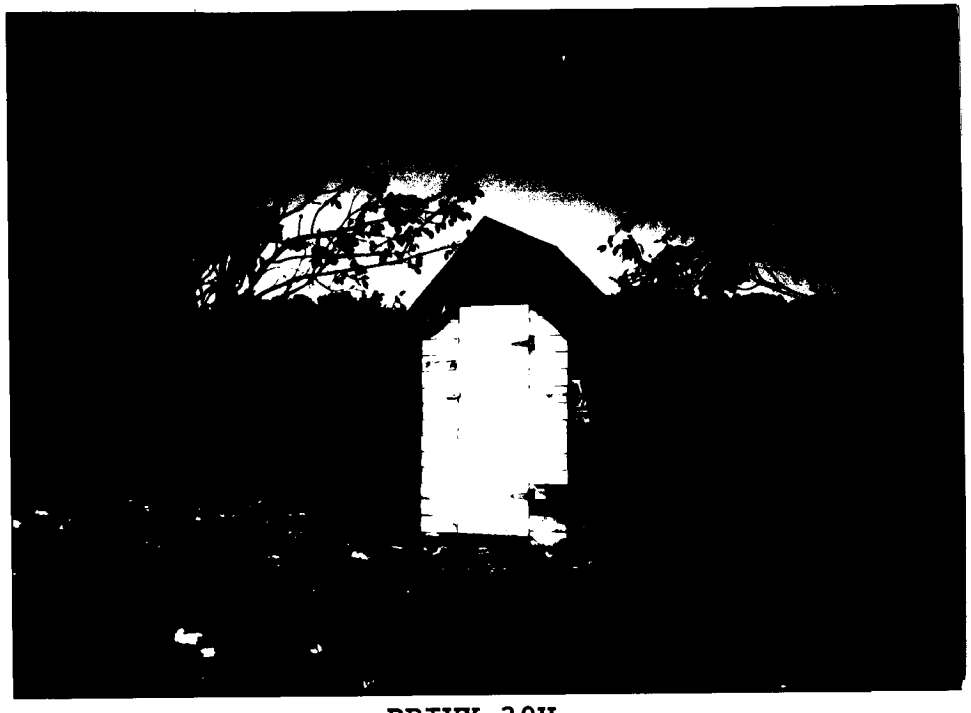


HEN HOUSE 39G



HEN HOUSE 39G

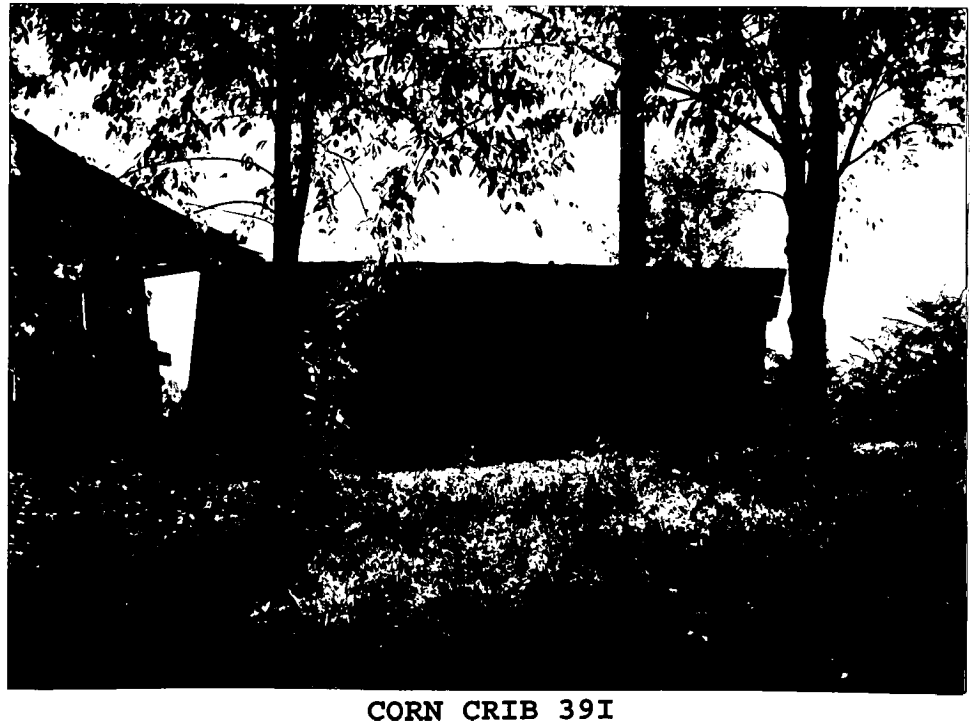
AEC 045788



PRIVY 39H

PRIVY 39H

CORN CRIB 39I



CORN CRIB 39I

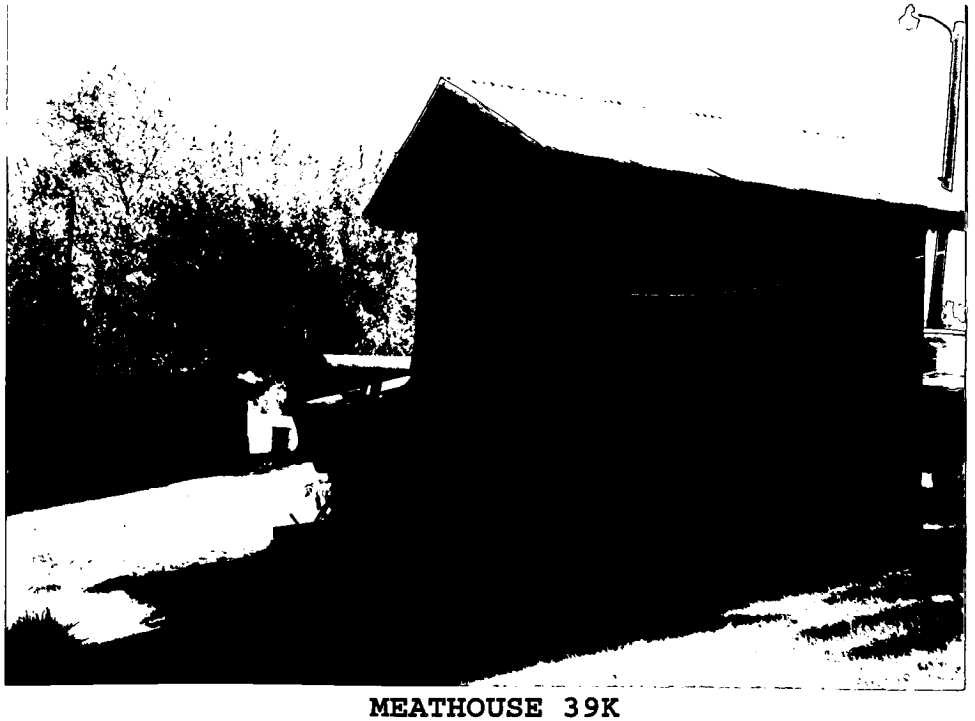
AEC 04579

ADDENDUM TO ATTACHMENT 27A
BENNOCH INC.

SHED 39J

SHED 39J

MEATHOUSE 39K

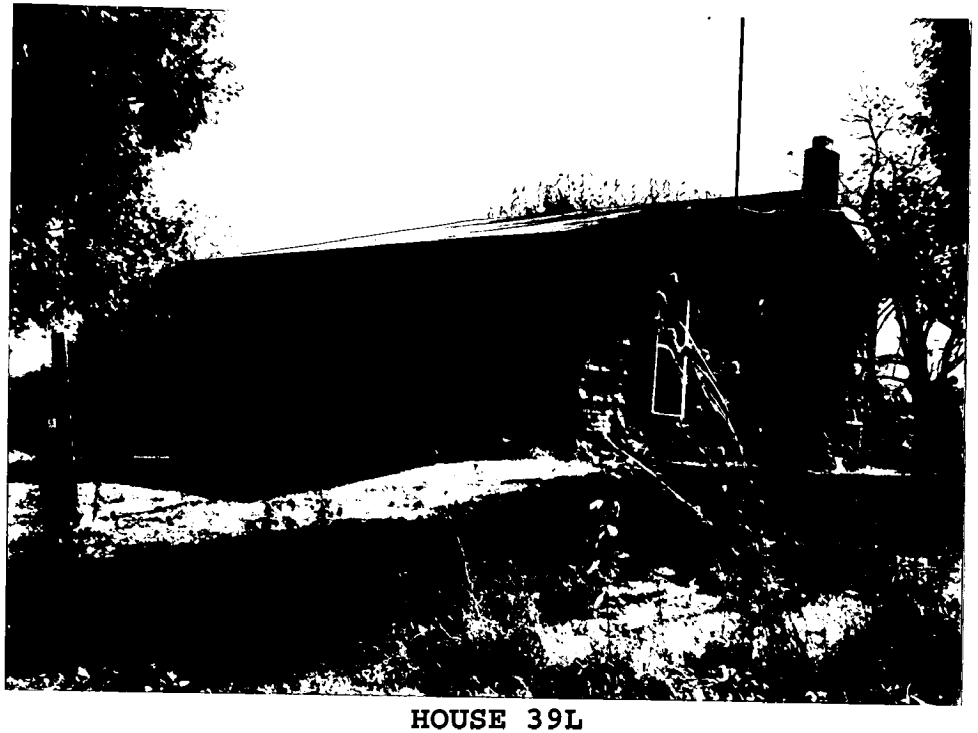


MEATHOUSE 39K

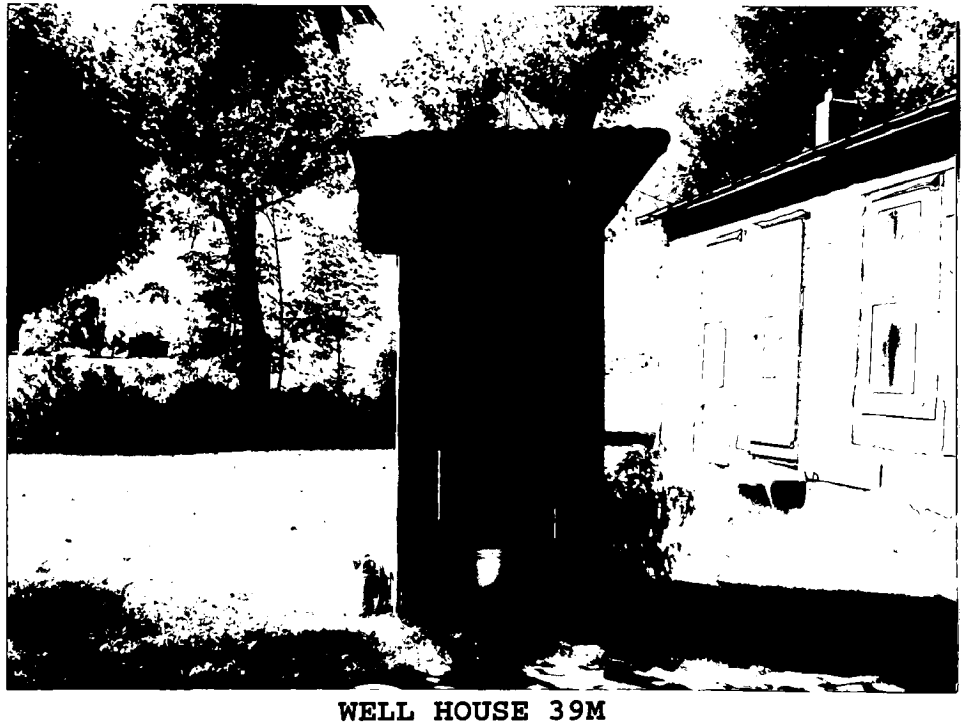
AEC 04580

ADDENDUM TO ATTACHMENT 27A
BENNO[illegible] INC.

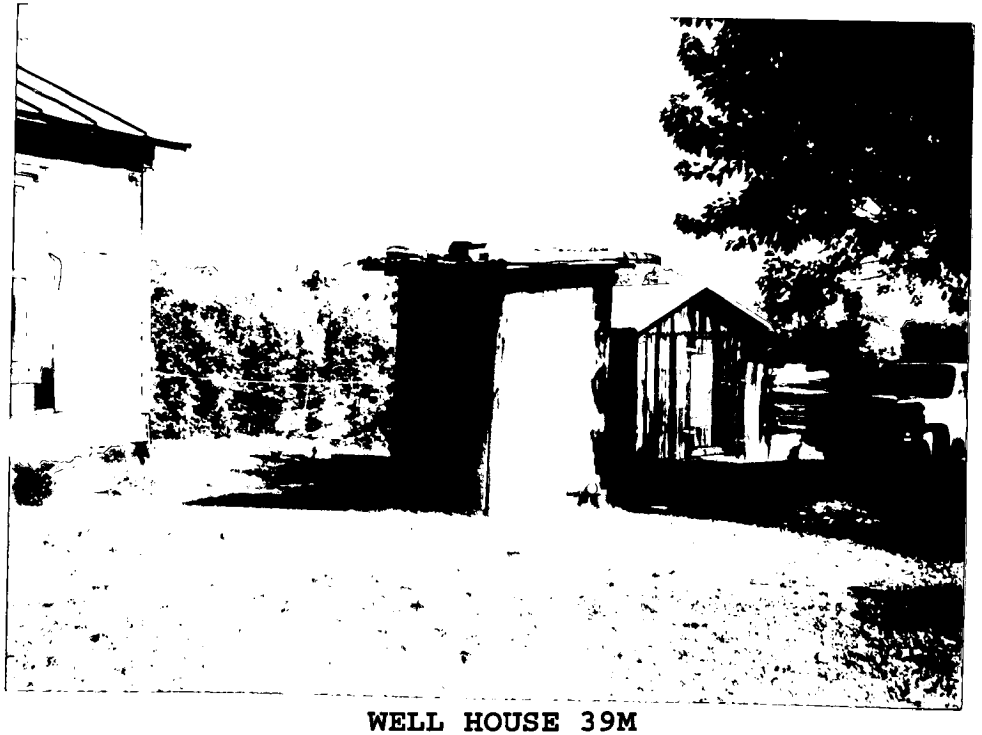
HOUSE 39L



HOUSE 39L



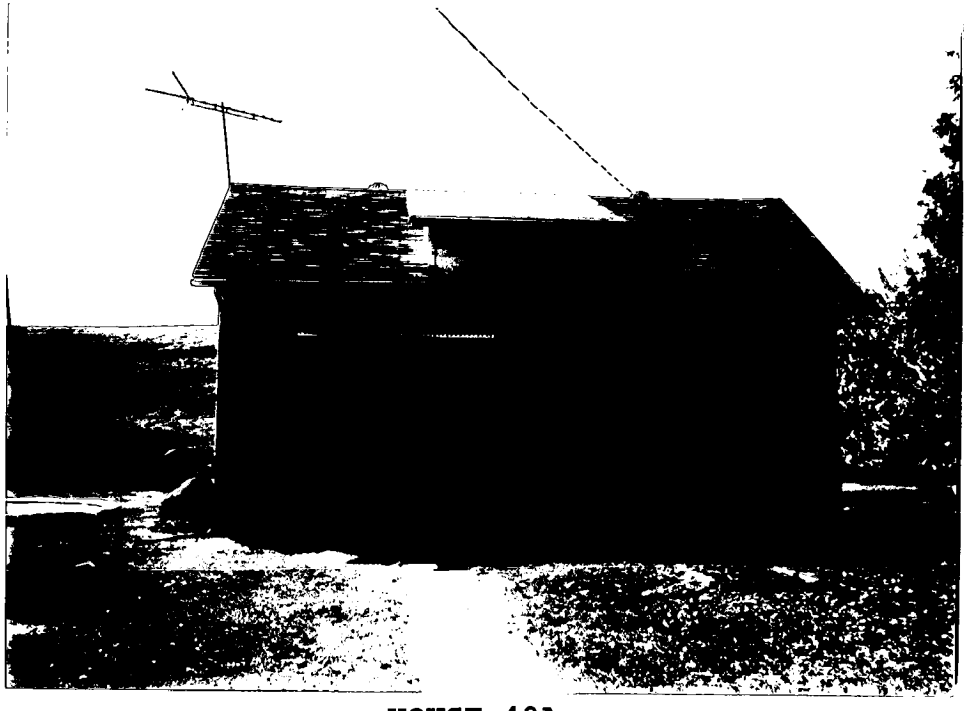
WELL HOUSE 39M



WELL HOUSE 39M

AEC 04581

ADDENDUM TO ATTACHMENT 27A
BENNOCK, INC.



HOUSE 40A

HOUSE 40A

BANK BARN 40B

BANK BARN 40B

AEC 04582

CORN CRIB 40C

CORN CRIB 40C

HOUSE 43

HOUSE 43

AEC 045883

ADDENDUM TO PART 2, PAGE 16, A(4)
BENNOC, INC.
CENTURY MINE
PERMIT D-0425

METHOD USED TO IDENTIFY HISTORIC PROPERTIES AS MINING PROGRESSES

Potential historic properties have been identified in Attachment 27A submitted with this application. Properties that are deemed eligible for listing on the National Register for Historic Places will be identified by the SHPO and will be noted as such by Bennoc, Inc. As mining progresses, Bennoc, Inc. will identify properties to be undermined and proper mitigative efforts will be implemented.

ADDENDUM TO PART 2, PAGE 16, B(1)
BENNOC, INC.
CENTURY MINE
PERMIT D-0425

GEOLOGY DESCRIPTION

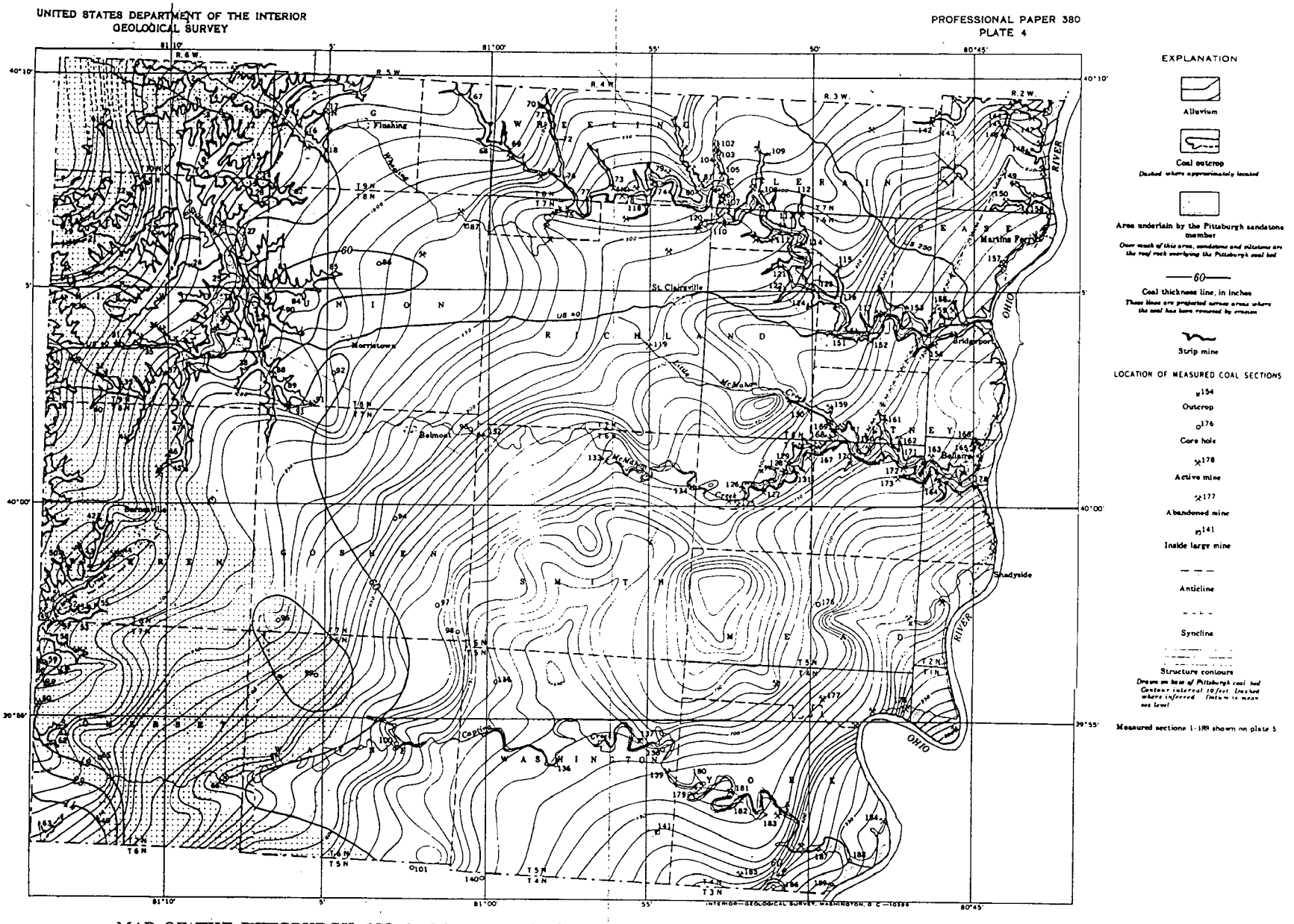
Stratigraphy of the proposed permit area is formed by the Monongahela formation of the Pennsylvania period, and the Dunkard group of Permian time. The primary strata of both sections consists of an alternating sequence of limestone, sandstone, clay, shale, claystone, soapstone, and coal.

The Monongahela formation is approximately 245 feet thick. In ascending order, it occupies the interval from the Pittsburgh No. 8 to the Waynesburg No. 11 coal bed. The primary rock units are limestone, shale, and claystone. Limestone forms 44 to 68 percent of this stratigraphic interval. As a result of longwall mining, the immediate strata overlying the Pittsburgh No. 8 coal bed will cave to a height of 3 to 6 times the mining height, depending on the bulking factor of roof strata. The beds above this caved zone are provided some support by the caved rock but may sag and give rise to bed separation and may be subject to fracturing, to heights 24 to 54 times the mining height (120 to 270 feet above the mine).

The Dunkard group is 250 to 300 feet thick, occupying the interval from the Waynesburg No. 11 coal bed to the ground surface. The primary rock units here are shale and claystone. These soft units form about 85 percent of this stratigraphic interval. This strata is primarily located within the constrained zone of disturbance resulting from longwall mining. The constrained zone is defined as that interval above 24 to 54 times the mining height and below 50 feet from the ground surface. This strata is expected to be sufficiently confined to prevent development of any fractures. Rock beds here will tend to absorb most of the strain energy without fracturing.

Strata close to the surface, however, are not sufficiently confined and may move in any direction. Surface cracks may be produced from tensile strains resulting from longwall mining. The depth of these cracks is generally estimated to be less than 50 feet.

The main safety against inflow of groundwater into the CENTURY MINE is afforded by the constrained zone. The nature and thickness of the individual beds found here are of particular importance. Through extensive core drilling, multiple beds of claystone, with total thicknesses of 79 to 108 feet, have been identified. These claystone beds are relatively impermeable and generally capable of absorbing large amounts of strain energy before fracture. In the application area, it is our opinion that sufficient claystones are in-place to provide an adequate barrier against inflow from surface water and shallow groundwater disruptions caused by longwall mining. Where stream valleys are encountered, longwall operations are generally not planned under less than about 200 feet of cover to further protect the mine and overlying groundwater resources. **Consequently, no longwall operations will occur in areas with less than 200 feet of cover.** The rock strata of Belmont County typically form a gentle monocline that dips southeasterly at grades less than one percent (Figure 2)



MAP OF THE PITTSBURGH (NO. 8) COAL BED SHOWING DISTRIBUTION AND THE STRUCTURE AND THICKNESS OF THE LOWER BENCH OF THE BED IN BELMONT COUNTY, OHIO

SCALE 1:125 000

2 1 0 2 4 6 MILES

FIGURE 2

AEC 04586

and in the application area is southward to southeasterly. **As illustrated by structure contours on the Timing/Structure Contour Map, a prominent east-plunging anticline occurs in the central portion of the application area near Test Hole Y & O #1, with a syncline in the coal formation to the south of this test hole. A prominent south-plunging syncline occurs at the eastern edge of the application area near Test Holes C98-4 and Y 7 O #2.** The base elevation of the No. 8 seam ranges from approximately 680 ft. in the **southeast corner** of the application area to approximately 800 ft. in the **northwest** corner.

The orientation of the major joints in rock and face cleat in coal is approximately N 75° W. The minor joints and butt cleats are generally perpendicular to these (N 15° E).

Geology and Coal Resources of Belmont County, Ohio, Geological Survey Professional Paper 380, reports that a small dome-shaped anticline lies in eastern Belmont County, primarily in Mead Township. This structure is located over five miles northeast of the CENTURY MINE application area and, therefore, is not expected to have an impact on ground water flow in the application area.

In addition, there is a graben structure that passes through portions of Belmont County. This graben has been tracked through the adjacent Powhatan No. 3 Mine and enters the No. 6 reserve on the eastern boundary. It proceeds in a southwesterly direction, turns approximately 90 degrees, proceeds in a northwesterly direction, then turns again and proceeds in a general westerly direction off the Powhatan mine property.

The structural contours of the No. 8 Seam indicate that the graben is made up of a series of slumps in the deposit, indicated by a thickening of the seam at the bottom of the structure. This structure apparently affected the structural contours to the north of the graben, but these effects do not extend into the application area.

ADDENDUM TO PAGE 16, B(2)
BENNOC, INC.
CENTURY MINE
PERMIT D-0425

Geological Impact of Coal Removal Upon Ground Water

The geological impact of coal removal, according to the PHC, is expected to vary from short term to long term. The Pittsburgh (No. 8) coal seam will be mined, and in this area has dip of approximately 40 ft per mile to the southeast, with the strike to the northeast. Ground water occurs in this area in several disconnected saturated zones associated with the occurrence of the coal seams and underlying clay stone units that prevent downward migration of the ground water. Ground water is generally limited to within the first 100 ft of the surface. Since primary porosity in the rock units is poor, nearly all of the ground water in this area of Ohio occurs as secondary porosity in the joints, cleats, fractures, and bedding planes of the rocks.

As longwall mining progresses, a caved area occurs immediately over the coal seam mined. Above this area, fractures occur in hard rocks and extend upward to about 200 ft above the coal seam. In the area above these fractures, a zone known as the continuous deformation zone develops where the rocks bend down and form the classic subsidence basin. In the center of the basin, rocks are put into compression, while there are areas of tension from the gate entries inward for a short distance and outside the basin for a short distance. As the mining occurs, the rocks may be fractured and bedding planes may open as a result of this deformation. This process provides new openings to contain additional ground water, with a lowering of the phreatic surface of the water in the area. After mining, the aquifers are more connected and provide a larger source of water for well recharge. Ground water in wells usually drops, and may be found lower in the well or even beneath the bottom of the well. Wells that are drilled deeper can be restored to their full potential usefulness.

The CENTURY MINE is virtually a dry mine, with no pumping of water to the outside except for water from behind shaft linings. The deformation and non-cracking of the soft rocks accounts for the dry conditions in the mine. Generally speaking, ground or surface water does not enter the Century Mine.

In summary, the coal removal is expected to have some impact on ground water in the application area. The impacts are described in the PHC and in the Addendum to Page 18 F(1).

B. (3) For those areas to be affected by underground mining surface operations where removal of the overburden down to the level of the coal seam will occur, submit Attachment 12(s) as required by paragraphs (C)(2)(a) and (c) of rule 1501:13-4-13 of the Administrative Code. N/A

(4) For those areas within the shadow area where the stratum above the coal seam to be mined will not be removed, submit Attachment 13(s) as required by paragraphs (C)(2)(d) and (e) of rule 1501:13-4-13 of the Administrative Code.

SEE APPROVED TEST HOLE VARIANCE REQUEST & ATTACHMENTS

C. GROUND WATER INFORMATION-**Permit, Shadow Area, and Adjacent Area**

(1) Submit an Attachment 14B which describes the ground water hydrology of the proposed permit area, shadow area, and adjacent area. The Attachment 14B is to include information on each waterbearing stratum or zone as required by paragraph (D) of rule 1501:13-4-13 of the Administrative Code, including the first waterbearing stratum below the coal to be mined.

SEE ATTACHMENT 14B & ADDENDA

(2) Are there any wells on the proposed permit area, shadow area, and adjacent areas? __X__ Yes, _____ No. If "yes," submit Attachment 14C.

(3) Are there any springs on the proposed permit area, or developed springs on the shadow area and adjacent area? __X__ Yes, _____ No. If "yes," submit Attachment 14C.

(4) Are there any public water supply sources on the proposed permit area, shadow area, and adjacent area? _____ Yes, __X__ No. If "yes," submit Attachment 14A, Attachment 14D, and show location on the hydrology map.

(5) Submit Attachment 14A for representative wells and developed springs as required by paragraph (D)(4) of rule 1501:13-4-13. Based on this data identify the seasonal variations of ground water quality and quantity.

D. SURFACE WATER INFORMATION-**Permit, Shadow Area, and Adjacent Area**

(1) List the name of the watershed that will receive water discharges from the proposed permit, shadow, and adjacent areas as listed in the "Gazetteer of Ohio Streams" published by the Ohio Department of Natural Resources.

CAPTINA CREEK

(2) Are there any perennial or intermittent streams or other surface water bodies on the proposed permit, shadow area, and adjacent area? __X__ Yes, _____ No. If "yes," submit Attachment 14A and Attachment 14D and show location on application and hydrology map.

JACK A. HAMILTON & ASSOCIATES, INC.

CONSULTING ENGINEERS & SURVEYORS

Box 471, 342 High Street, Flushing, Ohio 43977 • Phone (740) 968-4947 • Fax (740) 968-4225

November 17, 1998

Chief
Division of Mines & Reclamation
1855 Fountain Square Court
Columbus, OH 43224

RECEIVED 1 8 1998

Re: Drill Hole Variance Request, Bennoc, Inc., D-0425-1 Proposed Shadow Area

Dear Chief:

Pursuant to OAC 1501: 13-4-13 (c)(3), please accept this letter as a request for a variance for the items required under 1501: 13-4-13 (C)(2)(d)(ii), (iii), and (C)(2)(e)(ii) on Bennoc, Inc.'s proposed additional underground workings in the Pittsburgh #8 seam located in and adjacent to the south boundary of existing underground workings at permit D-0425. The proposed workings are located in Sections 1, 2, 3, 7, 8, 9, 13, 14, 15, 19, 20, and 21, T-6 R-5, Wayne Township, and Sections 26, 27, 31, 32, and 33, T-5 R-4, Washington Township, Belmont County, Ohio. *The longwall method of mining will be utilized for the proposed adjacent underground workings.*

The proposed Shadow Area, as shown on the attached map, contains approximately 4900 acres of which 600 acres are existing underground workings.. The #8 coal ranges in elevation from approximately 680 to 800, with overburden in the area ranging from approximately 240 to 600 feet.

Pursuant to OCA 1501:13-4-13(C)(2)(e)(ii), twenty seven (27) test holes are required. Attachment 13's and drill logs for holes DDH-1 (Y & O #1), DDH-3 (Y & O #3), DDH-5 (Y & O #5), and DDH-6 (Y & O #6) from original permit D-0425 and information from drill logs compiled by others prior to current regulations, *some of which* have been transferred to Attachment 13's, are being submitted with this request. *An additional five (5) drill holes have been drilled and analyzed as required by current regulations, and are being submitted on Attachment 13's. A total of twenty-two (22) drill holes are being submitted with this request, five (5) of which have the complete required chemical analysis, ten (10) of which have total sulfur coal analysis, seven (7) of which represent geological data only. A total of fourteen (14) drill holes are located within the proposed shadow area, with the remaining eight (8) drill holes located outside the shadow area, however all are within approximately ½ mile. In summary, five (5) drill holes are lacking pursuant to the above referenced rule.*

The following is a list of attachments to this drill hole variance request:

1. *1" = 2000' scale Drill Hole Variance Request Map (shows Structure Contours, locations of Geologic Cross Sections A - A' and B - B', and all drill holes)*
2. *Geologic Cross Section A - A'*
3. *Geologic Cross Section B - B'*

Continued on next page;

4. *Attachment 13's and/or drill logs for drill holes:*

Y&O 1 (DDH-1)	
Y&O 2	
Y&O 3 (DDH-3)	
Y&O 5 (DDH-5)	*Geologic Data Only*
Y&O 6 (DDH-6)	
Y&O 7 (DDH-7)	
O-5	
M-14	
M-16	
M-17	
M-19	
M-20	
N-94-14	*Total Sulfur Coal Analysis Only*
N-94-18	
N-94-19	
O-1	
B&O 1	
C98-1	
C98-2	
C98-3	*Complete Required Chemical Analysis*
C98-4	
C98-5	

We believe that all the data submitted in the original permit combined with the information submitted herein *demonstrates that the structure and stratigraphy of this application area is well known, and adequately represents the conditions of the shadow area as well as portions of the adjacent area.* Your prompt review and approval of this variance request is appreciated.

APPROVED X
UNAPPROVED ☐
DATE 12/2/98
SIGNED Lisa J. Morris for Chief

Yours truly,

Jack A Hamilton & Associates, Inc.
Consultants for Bennoc, Inc.

Ellen M. Loper

Ellen M. Loper

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 13
(GEOLOGY REPORT - Underground Mines)

Applicant The Youghiogheny & Ohio Coal Company - Allison Mine

SECTION 1 - AREAS TO BE AFFECTED BY SURFACE DISTURBANCE

Sampling Site No. DDH-1

Lithologic(1) Unit	Thickness	Acid (2)* Producing	Toxic (2)* Forming	Alkaline(2)* Producing	Comp-actible(3)	Erodible(3)
Topsoil						
Subsoil						
See attached	Boring Log					
Black Slate	4-1/4"	X			X	
Roof Coal	11-1/4"	X				
Draw Slate	9-3/4"	X			X	
Pittsburgh #8	4'7-3/4"	X				
Fire Clay	4-1/4"	X			X	

(1) Identify the stratum with an asterisk (*) if subsurface water will be exposed at the face up area.

(2) Identify with a (✓) mark whether the stratum is acid producing, toxic forming, or alkaline producing.

(3) Using texture and visual characteristics of the overburden, categorize the stratum as very, moderately, or slightly compactible or erodible.

*The Allison Mine has been temporarily sealed. It is not possible to extract samples for testing, therefore, an analysis of the stratum above the coal, the coal seam, and the stratum below the coal seam could not be performed. Based on the results of the one sample tested and the historical evidence of the acidity of the Pittsburgh No. 8 coal seam, the roof, floor, and coal seam in the vicinity of the Allison Mine are considered acid producing.

AEC 04592

Drill Hole #1 - Lower Belmont - Hitchcock & Robbins Field

Hole located near center of Section 2
~~Washington~~ Wayne Township, along Piney Creek

Surface Elevation: 980

Material	To	Thickness
Surface	11' 6"	11' 6"
Dark shale	19' 0"	7' 6"
Boney Coal	19' 3"	0' 3"
Limestone & Shale	74' 0"	54' 9"
Red & Green Shale	75' 0"	1' 0"
Sand rock	83' 0"	8' 0"
Limestone	93' 0"	10' 0"
Limestone & Shale	173' 0"	80' 0"
Soft dark shale	176' 0"	3' 0"
Coal - No. 9	179' 0"	3' 0"
Shaley clay	179' 9"	0' 9"
Green Shale	184' 0"	4' 3"
Sandy Shale	188' 0"	4' 0"
Soft Green shale	189' 6"	1' 6"
Sandy shale	193' 0"	3' 6"
Green shale & soapstone	195' 0"	2' 0"
Boney coal & slate	197' 3"	2' 3"
Limestone	217' 0"	19' 9"
Lime & Shale	228' 0"	11' 0"
Slate & coal spars	228' 8½"	0' 8½"
Dark shale & lime	230' 0"	1' 3½"
Limestone	244' 0"	14' 0"
Limestone & Shale	250' 8"	6' 8"
Dark shale & soapstone	254' 0"	3' 4"
Black slate	254' 4¼"	0' 4¼"
Roof coal	255' 3½"	0' 11¼"
Draw slate	256' 1¼"	0' 9-3/4"
Coal	256' 3¼"	0' 2"
Sulphur parting	256' 3-7/8"	0' 0-5/8"
Coal	258' 0-5/8"	1' 8-3/4"
Slate parting	258' 1½"	0' 0-7/8"
Coal	259' 8-5/8"	1' 7-1/8"
Slate parting	259' 8-7/8"	0' 0¼"
Coal	260' 9-1/8"	1' 0¼"
Slate parting	260' 9-7/8"	0' 0-3/4"
Coal	260' 11½"	0' 1-5/8"
Fire clay	261' 3-3/4"	0' 4½"
Limestone	262' 8"	1' 4¼"
Dark shale	263' 7"	0' 11"
Limestone	265' 0"	1' 5"

AEC 04593

11/89

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 13
(GEOLOGY REPORT - UNDERGROUND WORKINGS)

Applicant BENNOC, INC. Drill Hole # Y & O #2
*Coordinates X. 2,422,398 Y. 688,300 Surface Elevation 935.9

Lithology	H20**	Thickness	Physical Properties *** Compactibility	Erodibility
Topsoil				
Subsoil		7.5'		
LIMESTONE & SHALE		30.0'	M	S
SANDY SHALE		2.5'	M	S
SOFT GREEN SHALE		3.0'	M	S
RED & GREEN SHALE		2.0'	M	S
LIMESTONE & SHALE		32.0'	M	S
SAND ROCK		8.0'	S	S
GREEN SHALE & LIME		4.0'	M	S
LIMESTONE & SHALE		62.0'	M	S
SOFT DARK SHALE		3.5'	M	S
BONEY COAL (MEIGS CREEK #9)		1.25'	S	V
SHALEY CLAY		4.25'	V	S
SAND ROCK		20.5'	S	S
DARK SHALE		5.0'	M	S
BONEY COAL (FISHPOT)		1.12'	S	V
CLAY PARTING		0.54'	V	S
COAL (FISHPOT)		1.91'	S	V
DARK SHALE		0.58'	M	S
LIMESTONE		19.33'	M	S
GREEN SHALE		2.5'	M	S
SAND ROCK		3.0'	S	S
DARK & GREEN SHALE		3.0'	M	S
DARK SHALE & LIME		2.0'	M	S
LIMESTONE		4.0'	M	S
DARK SHALE		0.5'	M	S
LIMESTONE & GREEN SHALE		2.0'	M	S
DARK SHALE		1.75'	M	S
BONEY COAL (POMEROY #8A)		0.2'	S	V
DARK SHALE		0.5'	M	S
FIRECLAY & SHALE		2.04'	V	S
LIMESTONE		13.0'	M	S

Lithology	H2O**	Thickness	Physical Properties *** Compactibility	Erodibility
LIMESTONE & SHALE		8.5'	M	S
SHALEY CLAY & SOAPSTONE		3.5'	V	S
BLACK SLATE		0.06'	M	S
SOAPSTONE		0.33'	M	S
ROOF COAL (PITTSBURGH #8 ROOF)		1.41'	S	V
DRAW SLATE		1.16'	M	S
BONEY COAL (PITTSBURGH #8)		0.06'	S	V
COAL (PITTSBURGH #8)		1.79'	S	V
SLATE PARTING		0.04'	M	S
COAL (PITTSBURGH #8)		0.45'	S	V
SLATE PARTING		0.04'	M	S
COAL (PITTSBURGH #8)		1.06'	S	V
BONEY COAL (PITTSBURGH #8)		0.08'	S	V
COAL (PITTSBURGH #8)		1.25'	S	V
DARK SHALE		1.33'	M	S
LIMESTONE		1.37'	M	S
SHALEY CLAY		2.0'	V	S
LIMESTONE		0.91'	M	S

Submit the following information for the stratum above the coal seam, the coal seam, and the stratum below the coal seam.

DATA UNAVAILABLE

Stratum	Total Sulfur	Pyrite Marcasite Sulfur	Potential Acidity	Neutral-ization Potential	CaCo3 Deficiency

* If other than State Plane, indicate coordinate system.
** Indicate water bearing stratum with an asterick (*) under the column labeled H20.
*** S-Slightly M-Moderately V-Very

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 13
(GEOLOGY REPORT - Underground Mines)

Applicant The Youghiogheny & Ohio Coal Company - Allison Mine

SECTION 1 - AREAS TO BE AFFECTED BY SURFACE DISTURBANCE

Sampling Site No. DDH-3

Lithologic(1) Unit	Thickness	Acid (2)* Producing	Toxic (2)* Forming	Alkaline(2) Producing	*Compactible(3)	Erodible(3)
Topsoil						
Subsoil						
↑ See attached	Boring Log					
↓						
Soft Dark Shale	2'0"	X			X	
Roof Coal	2'7"	X				
Draw Slate	0"	X			X	
Pittsburgh #8	5'0"	X				
Dark Shale	1'9"	X			X	

(1) Identify the stratum with an asterisk (*) if subsurface water will be exposed at the face up area.

(2) Identify with a (✓) mark whether the stratum is acid producing, toxic forming, or alkaline producing.

(3) Using texture and visual characteristics of the overburden, categorize the stratum as very, moderately, or slightly compactible or erodible.

*The Allison Mine has been temporarily sealed. It is not possible to extract samples for testing, therefore, an analysis of the stratum above the coal, the coal seam, and the stratum below the coal seam could not be performed. Based on the results of the one sample tested and the historical evidence of the acidity of the Pittsburgh No. 8 coal seam, the roof, floor, and coal seam in the vicinity of the Allison Mine are considered acid producing.

Sec 9
T 6
R 5

DH 3

Drill Hole #3 - Lower Belmont - Hitchcock & Robbins Field

Hole located on Long Run about 300 feet from westerly extremity of the above property (1921)

Sec 9 Wayne Twp

Surface Elevation: 1019.83

Material	To	Thickness
Surface	10' 6"	10' 6"
Dark shale	15' 6"	5' 0"
Sandy shale	18' 0"	2' 6"
Dark shale	21' 0"	3' 0"
Boney coal	22' 8"	1' 8"
Dark shale	25' 0"	2' 4"
Dark sandy shale	30' 0"	5' 0"
Soft dark shale	34' 6"	4' 6"
Boney coal	25' 0"	0' 6"
Limestone & shale	70' 0"	35' 0"
Green shale	75' 0"	5' 0"
Red & Green shale	77' 0"	2' 0"
Shale & Lime	85' 0"	8' 0"
Sandy shale	91' 0"	6' 0"
Limestone	91' 9"	0' 9"
Dark shale	94' 9"	3' 0"
Limestone	97' 0"	2' 3"
Dark shale	99' 0"	2' 0"
Limestone	102' 0"	3' 0"
Dark shale	105' 0"	3' 0"
Lime & shale	111' 0"	6' 0"
Red & Green shale	116' 0"	5' 0"
Limestone & shale	180' 0"	64' 0"
Soft dark shale	183' 6"	3' 6"
Coal	185' 8"	2' 2"
Dark shale	186' 8"	1' 0"
Green shale & lime	191' 0"	4' 4"
Dark shale	203' 0"	12' 0"
Dark shale & coal spar	203' 7"	0' 7"
Coal	204' 5"	0' 10"
Slate & bone coal	204' 6½"	0' 1½"
Coal	205' 7½"	1' 1"
Clay parting	205' 11½"	0' 4"
Coal	206' 7"	0' 7½"
Dark shale	206' 9"	0' 2"
Limestone	220' 0"	13' 3"
Green shale & Lime	227' 0"	7' 0"
Limestone	230' 0"	3' 0"
Green shale & clay	234' 0"	4' 0"
Limestone	249' 0"	15' 0"
Green shale & Lime	255' 0"	6' 0"
Dark shale & Lime	265' 0"	10' 0"
Soft dark shale	267' 0"	2' 0"
Roof coal	268' 9"	1' 9"
Coal	269' 5"	0' 8"
Slate parting	269' 5"	0' 0"

AEC 04597

Drill Hole #3 - Continued -- Page #2.

Material	To	Thickness
Boney coal	269' 6"	0' 0-3/4"
Slate parting & coal spars	269' 7-1/4"	0' 0"
Coal	270' 2"	0' 6-3/4"
Slate parting	270' 2¼"	0' 0¼"
Coal	270' 4¼"	0' 2"
Boney coal	270' 5½"	0' 1¼"
Slate parting	270' 5-3/4"	0' 0¼"
Coal	272' 8"	2' 3"
Slate parting	272' 9"	0' 0¼"
Coal	273' 9¼"	1' 0"
Sulphur parting	273' 9"	0' 0"
Coal	273' 10"	0' 1½" 5'-0"
Dark shale	275' 7"	1' 9"
Limestone	276' 0"	0' 4"
Shaley clay	279' 0"	3' 0"
Limestone	280' 0"	1' 0"

AEC 04598

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 13
(GEOLOGY REPORT - Underground Mines)

Applicant The Youghiogheny & Ohio Coal Company - Allison Mine

SECTION 1 - AREAS TO BE AFFECTED BY SURFACE DISTURBANCE

Sampling Site No. DDH-5

Lithologic(1) Unit	Thickness	Acid (2)* Producing	Toxic (2)* Forming	Alkaline(2) Producing	*Compactible(3)	Erodible(3)
Topsoil						
Subsoil						
See attached boring Log and Lithologic and Hydrogeologic section shown on Drawing 82-1862-E4 in Appendix A.						
Dark Gray Shale	1.8	X			X	
Roof Coal	0.1	X				
Draw Rock	1.1	X			X	
Pittsburgh #8	5.0	X				
Gray Clay Shale	11.5	X			X	

(1) Identify the stratum with an asterisk (*) if subsurface water will be exposed at the face up area.

(2) Identify with a (✓) mark whether the stratum is acid producing, toxic forming, or alkaline producing.

(3) Using texture and visual characteristics of the overburden, categorize the stratum as very, moderately, or slightly compactible or erodible.

*The Allison Mine has been temporarily sealed. It is not possible to extract samples for testing, therefore, an analysis of the stratum above the coal, the coal seam, and the stratum below the coal seam could not be performed. Based on the results of the one sample tested and the historical evidence of the acidity of the Pittsburgh No. 8 coal seam, the roof, floor, and coal seam in the vicinity of the Allison Mine are considered acid producing.

AEC 04599

LEROY G. HETAGER, INC.
DIAMOND CORE DRILLING

P. O. BOX 363, PUNXSUTAWNEY, PENNSYLVANIA 15767

DIAMOND CORE DRILL HOLE RECORD

FOR Y. & O. COAL COMPANY ADDRESS Martin's Ferry, Ohio DATE 1-9-67 19

ON _____ TWP. Wayne COUNTY Belmont STATE Ohio

HOLE NO. DDH5 SIZE HOLE 4" EL. 952.7 DRILLER HARRY MERRITT DRILL NO. 1

Page 1

CLASSIFICATION	THICKNESS OF STRATA FEET	INS. THS.	DEPTH FROM SURFACE FEET	INS. THS.
Surface, brown	7	0	7	0
Gray shale, clayey	3	0	10	0
Limestone, gray	3	2	13	2
Shale, gray, clayey	8	10	22	0
Limestone	1	8	23	8
Dark gray soft clay	0	4	24	0
Greenich gray shale	14	10	38	10
Soft clay	1	9	40	7
Gray clay shale	27	11	68	6
Green soft clay	0	6	69	0
Gray clay shale	11	2	80	2
Red shale with green	2	5	82	7
Gray clay shale	2	9	85	4
Limestone	5	3	90	7
Red soft clay shale	3	0	93	7
Green clay shale	0	11	94	6
Gray limestone with some shale	23	8	118	2
White limestone	4	9	122	11
Gray limestone with shale	16	7	139	6
White limestone	0	11	140	5
Gray limestone	4	4	144	9
Dark gray shale	2	7	147	4
	continued to page 2			

STARTED 1-9-67 COMPLETED 1-9-67 19 TOTAL

FORM 2

LEROY G. HETAGER, INC.
DIAMOND CORE DRILLING

P. O. BOX 363, PUNXSUTAWNEY, PENNSYLVANIA 15767

DIAMOND CORE DRILL HOLE RECORD

FOR [illegible] ADDRESS [illegible] DATE [illegible] 19

ON [illegible] TWP. [illegible] COUNTY [illegible] STATE [illegible]

HOLE NO. DDH5 SIZE HOLE 4" EL. DRILLER [illegible] DRILL NO. 1

Page II CLASSIFICATION	THICKNESS OF STRATA FEET	INS. THS.	DEPTH FROM SURFACE FEET	INS. THS.
COAL No. 9	1.	0	148.	4
Dark Gray shale	2.	10	151.	2
COAL	0.	3	151.	5
Soft clay with shale	0.	6	151.	11
Gray sandstone	20.	1	172.	0
Dark gray shale	4.	0	176.	0
COAL	0.	1	176.	1
Shale binder Fishpot No. 8B	0.	5	176.	6
COAL	1.	10	178.	4
Binder	0.	3	178.	7
COAL	0.	7	179.	2
Dark gray shale	0.	10	180.	0
Limestone, gray	19.	10	199.	10
Greenish gray shale	10.	8	210.	6
Dark gray shale	1.	6	212.	0
Limestone	1.	0	213.	0
Gray shale	5.	0	218.	0
Black shale	0.	6	218.	6
Gray shale with limestone	21.	6	24.	0
Dark gray shale	1.	8	241.	8
COAL Roof Coal No. 8 R	0.	10	242.	6
Binder Draw Rock	1.	1	243.	7

STARTED 1-9-67 COMPLETED 1-9-67 19 TOTAL

continued to page 3

FORM 2

LEROY G. HETAGER, INC.

DIAMOND CORE DRILLING

P. O. BOX 363, PUNXSUTAWNEY, PENNSYLVANIA 15767

HETAGER DIAMOND CORE DRILLING

DIAMOND CORE DRILL HOLE RECORD

FOR [illegible] ADDRESS Martin's Ferry, Ohio DATE [illegible] 19

ON Bottom slope, Section [illegible] TWP. [illegible] COUNTY Belmont STATE Ohio

HOLE NO. DDH5 SIZE HOLE 4" EL. DRILLER [illegible] DRILL NO. 1

Page III CLASSIFICATION	THICKNESS OF STRATA FEET	INS. THS.	DEPTH FROM SURFACE FEET	INS. THS.
COAL Pgh #8	5.	0	248.	7
Gray clay shale	11.	5	260.	0

STARTED [illegible] COMPLETED [illegible] 19 TOTAL [illegible]

FORM 2

AEC 04602

7-82

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 13
(GEOLOGY REPORT - Underground Mines)

Applicant The Youghiogheny & Ohio Coal Company - Allison Mine

SECTION 1 - AREAS TO BE AFFECTED BY SURFACE DISTURBANCE

Sampling Site No. DDH-6

Lithologic(1) Unit	Thickness	Acid (2)* Producing	Toxic (2)* Forming	Alkaline(2)* Producing	Compactible(3)	Erodible(3)
Topsoil						
Subsoil						
See attached Boring Log						
Gray Clay Shale, Soft	9.6	X			X	
Roof Coal	1.1	X				
Draw Rock	1.2	X			X	
Pittsburgh #8	5.0	X				
Fire Clay	0.3	X			X	

(1) Identify the stratum with an asterisk (*) if subsurface water will be exposed at the face up area.

(2) Identify with a (✓) mark whether the stratum is acid producing, toxic forming, or alkaline producing.

(3) Using texture and visual characteristics of the overburden, categorize the stratum as very, moderately, or slightly compactible or erodible.

*The Allison Mine has been temporarily sealed. It is not possible to extract samples for testing, therefore, an analysis of the stratum above the coal, the coal seam, and the stratum below the coal seam could not be performed. Based on the results of the one sample tested and the historical evidence of the acidity of the Pittsburgh No. 8 coal seam, the roof, floor, and coal seam in the vicinity of the Allison Mine are considered acid producing.

LEROY G. HETAGER, INC.

DIAMOND CORE DRILLING

P. O. BOX 363, PUNXSUTAWNEY, PENNSYLVANIA 15767

TEST BORING RECORD

SIZE CASING 4" SIZE CORE ____" SUR. EL. 943.9
SAMPLER SIZE O. D. ____" STATION ____
CASING HAMMER WT. 300 DROP 30"
SAMPLER HAMMER WT. 140 DROP 30"
COUNTY Belmont STATE Ohio
RIG NO ____

FOR Y. & O. Coal Company
Martin's Ferry, Ohio
HOLE NO. 1 (DDH6) PROJECT NO. ____
JOB NAME · LOCATION ~~Buchanan Point, Ohio~~
Section 3, Wayne Township

CLASSIFICATION	THICKNESS OF STRATA	DEPTH OF STRATA	CASING LENGTH	CASING HAMMER BLOWS
	Feet and	Inches	0 - 1	
urface	8.0	8.0	1 - 2	
			2 - 3	
imestone, gray	8.0	16.0	3 - 4	
			4 - 5	
ray clay shale broken with soft seams	4.0	20.0	5 - 6	
			6 - 7	
andy shale, gray with soft seams	16.6	36.6	7 - 8	
			8 - 9	
od clay shale	1.0	37.6	9 - 10	
			10 - 11	
ray clay shale	12.6	50.0	11 - 12	
			12 - 13	
y limestone with some sandy shale	24.0	74.0	13 - 14	
			14 - 15	
andstone, gray	3.6	77.6	15 - 16	
			16 - 17	
reenish gray clay shale	6.0	83.6	17 - 18	
			18 - 19	
ray limestone	8.6	92.0	19 - 20	
			20 - 21	
reen clay shale	1.6	93.6	21 - 22	
			22 - 23	
ray limestone and shale	49.6	143.0	23 - 24	
			24 - 25	
oft clay with shale	2.0	145.0	25 - 26	
			26 - 27	
oal, slate and boney	2.0	147.0	27 - 28	
			28 - 29	
ark gray shale	3.6	150.6	29 - 30	
			30 - 31	
andstone, gray	15.6	166.0	31 - 32	
			32 - 33	
imestone, gray	6.0	172.0	33 - 34	
			34 - 35	
OAL	2.1	174.1	35 - 36	

SAMPLER NO.	DEPTH	BLOWS ON SAMPLER 6" INTERVALS 0-6	6-12	12-18
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

RUN NO.	DEPTH OF RUN	CORE REC. FT.
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

GROUND WATER DATA

DEPTH	HOUR	DATE

REMARKS

Forwarded to page II

STARTED 12/12/66 COMPLETED 12/27/66 TOTAL DEPTH 462 feet, actual.

LEROY G. HETAGER, INC.

DIAMOND CORE DRILLING

P. O. BOX 363, PUNXSUTAWNEY, PENNSYLVANIA 15767

TEST BORING RECORD

SIZE CASING 4" SIZE CORE ____" SUR. EL. ____
SAMPLER SIZE O. D. ____" STATION ____
CASING HAMMER WT. 300 DROP 30 "
SAMPLER HAMMER WT. 140 DROP 30 "
COUNTY ____ STATE Ohio
RIG No ____

FOR Y. & O. Coal Company
Martin's Ferry, Ohio
HOLE NO. 1 (DDH6) PROJECT No ____
JOB NAME - LOCATION Powhaten Point, Ohio

CLASSIFICATION	THICKNESS OF STRATA	DEPTH OF STRATA	CASING LENGTH	CASING HAMMER BLOWS
			0 - 1	
Binder	0.3	174.4	1 - 2	
			2 - 3	
COAL	0.3	174.7	3 - 4	
			4 - 5	
Binder	0.1	174.8	5 - 6	
			6 - 7	
COAL	0.4	175.2	7 - 8	
			8 - 9	
Gray limestone	21.0	196.0	9 - 10	
			10 - 11	
Clay shale, gray	6.0	202.0	11 - 12	
			12 - 13	
Dark gray shale	2.0	204.0	13 - 14	
			14 - 15	
limestone, gray	6.0	210.0	15 - 16	
			16 - 17	
Dark gray carbon shale	2.0	212.0	17 - 18	
			18 - 19	
Gray limestone	15.0	227.0	19 - 20	
			20 - 21	
Gray clay shale, soft	9.6	236.6	21 - 22	
			22 - 23	
COAL Roof Coal No. 8 R	1.1	237.7	23 - 24	
			24 - 25	
Shale, gray Draw Rock	1.2	238.9	25 - 26	
			26 - 27	
COAL Pgh #8 No. 8	5.0	243.9	27 - 28	
			28 - 29	
Fire clay	0.3	244.0	29 - 30	
			30 - 31	
Dark gray shale	2.6	246.6	31 - 32	
			32 - 33	
Gray clay shale	13.6	260.0	33 - 34	
			34 - 35	
			35 - 36	

SAMPLER NO.	DEPTH	BLOWS ON SAMPLER 6" INTERVALS 0-6	6-12	12-18
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

RUN NO.	DEPTH OF RUN	CORE REC. FT
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

GROUND WATER DATA

DEPTH	HOUR	DATE

REMARKS

STARTED ____ COMPLETED ____ 260.0

LEROY G. HETAGER, INC.

T6N R5

DIAMOND CORE DRILLING

P. O. BOX 363, PUNXSUTAWNEY, PENNSYLVANIA 15767

DIAMOND CORE DRILL HOLE RECORD

FOR Y. & O. COAL COMPANY ADDRESS Martin's Ferry, Ohio DATE 2-16-67 19

ON Latta Boan Property located between twp. road 103 and Crabapple Creek, w. of Twp. line TWP. Wayne, Sec. 1 COUNTY Belmont STATE Ohio

HOLE NO. DDH-7 SIZE HOLE 4" EL. 1060 DRILLER HARRY MERRITT DRILL NO. 1

Page I CLASSIFICATION	THICKNESS OF STRATA FEET	INS.	DEPTH FROM SURFACE FEET	INS.
Surface sand and silt, soft	5.	0	5.	0
Brown sandstone coarse grained	21.	0	26.	0
Gray sandstone, coarse grained	26.	10	52.	10
COAL, dirty with shale WAYNESBURG "A" No 11 A	0.	9	53.	7
Gray ~~xx~~ clay shale	16.	5	70.	0
Gray sandstone	11.	0	81.	0
Green shale	2.	8	83.	8
Gray limestone	2.	4	86.	0
Green shale	8.	0	94.	0
Limestone	3.	2	97.	2
Shale, gray	2.	10	100.	0
Black shale	0.	10	100.	10
Gray limey shale	9.	2	110.	0
Gray sandstone	7.	5	117.	5
Gray clayey shale	2.	7	120.	0
Black shale	2.	0	122.	0
Gray shale & Limestone	30.	2	152.	2
Black shale	0.	4	152.	6
Green shale	3.	6	156.	0
Red shale	0.	9	156.	9
Gray limey shale	10.	0	166.	9
Red shale	0.	3	167.	0
TOTAL	continued to page 2			

STARTED 2-8-67 COMPLETED 2-14-67 19

FORM 2

AEC 04606

LEROY G. HETAGER, INC.
DIAMOND CORE DRILLING

P. O. BOX 363, PUNXSUTAWNEY, PENNSYLVANIA 15767

DIAMOND CORE DRILL HOLE RECORD

FOR Y. & O. COAL COMPANY ADDRESS Martin's Ferry, Ohio DATE 2-16-67 19

ON Latta Boan Property located between twp. road 103 and Crab-apple Creek, w. of twp. line TWP. Sec.1 Wayne Twp. COUNTY Belmont STATE Ohio

HOLE NO. DDH-7 SIZE HOLE 4" EL. DRILLER HARRY MERRITT DRILL NO. 1

Page II CLASSIFICATION	THICKNESS OF STRATA FEET	INS. THS.	DEPTH FROM SURFACE FEET	INS. THS.
Green shale	2.	0	169.	0
Gray sandstone	3.	0	172.	0
Green shale	2.	8	174.	8
Gray limestone	12.	7	187.	3
Green weathered shale	1.	3	188.	6
Red shale	1.	6	190.	0
Green shale with some red	15.	00	205.	0
Gray limestone	6.	0	211.	0
Green shale	4.	9	215.	0
Gray limestone	9.	6	224.	6
Green shale	3.	0	227.	6
Gray limestone with some shale	38.	6	266.	0
Black shale	3.	3	269.	3
COAL No 9	2.	6	271.	9
Gray shale	10.	3	282.	0
Gray limestone	8.	0	290.	0
COAL	1.	8	291.	8
Binder FISHPOT	0.	3	291.	11
COAL No 8 B.	0.	7	292.	6
Gray clayey shale	2.	0	294.	6
Gray limestone	5.	0	299.	6
Black Limestone	0.	6	300.	0
			continued on page 3	

STARTED 2-8-67 COMPLETED 2-14-67 19 TOTAL

FORM 2

LEROY G. HETAGER, INC.
DIAMOND CORE DRILLING

P. O. BOX 363, PUNXSUTAWNEY, PENNSYLVANIA 15767

DIAMOND CORE DRILL HOLE RECORD

FOR Y. & O. COAL CO. ADDRESS Martin's Ferry DATE 2-16-67 19

ON Latta Boan Property located between twp. road 103 and Crabapple Creek, W. of twp. line TWP. Sec. 1 Wayne Twp. COUNTY Belmont STATE Ohio

HOLE NO. DDH-7 SIZE HOLE 4" EL. DRILLER HARRY MERRITT DRILL NO. 1

Page III CLASSIFICATION		THICKNESS OF STRATA FEET	INS. THS.	DEPTH FROM SURFACE FEET	INS. THS.
Gray limestone		15.	6	315.	6
Gray limey shale		7.	6	323.	0
Gray limestone		2.	7	325.	7
Gray clay shale		2.	6	328.	1
Black shale		0.	6	328.	7
COAL	REDSTONE No 8A	1.	0	329.	7
Gray limestone		16.	5	346.	0
Gray clah shale		5.	9	351.	9
COAL	No 8R	1.	2	352.	11
Binder (shale)		1.	0	353.	11
COAL	Pgh - 2 No 8	5.	1	359.	0
Gray shale		3.	0	362.	0
	TOTAL	362.	0	362.	0

STARTED 2-8-67 COMPLETED 2-14-67 19

FORM 2

AEC 04608

LEROY G. HETAGER, INC.
DIAMOND CORE DRILLING

P. O. BOX 363, PUNXSUTAWNEY, PENNSYLVANIA 15767

DIAMOND CORE DRILL HOLE RECORD

FOR [illegible] ADDRESS St. Clairsville, Ohio DATE [illegible] 19

ON Ralph Carpenter property Rt.26 Captina Creek, S.Fork TWP. COUNTY Belmont STATE [illegible]

HOLE NO. 0 - 5 - SIZE HOLE NX EL. 929.10 DRILLER ROBERT MITCHELL DRILL NO.

CLASSIFICATION	THICKNESS OF STRATA FEET	INS. THS.	DEPTH FROM SURFACE FEET	INS. THS.
Surface	12	9	12	9
Sandstone, gray	20	2	32	11
Boney COAL	1	1	34	0
Hard dark claystone	1	0	35	0
Limestone, gray, pink	16	0	51	0
Soft lime claystone, gray	1	2	52	2
Sandstone, gray	1	10	54	0
Limestone, gray with lime clay streaks	4	0	58	0
Soft lime clay stone gray, green	3	6	61	6
Dark clayey limestone	5	6	67	0
Red shale	1	0	68	0
Dark limestone	1	5	69	5
Soft lime claystone, gray, green	3	7	73	0
Hard lime claystone, gray	11	6	84	6
Sandstone, gray	6	0	90	6
Shaley claystone, dark	1	1	91	7
Sandstone, gray	2	7	94	2
Hard gray claystone	0	8	94	10
Sandstone, gray	24	6	119	4
SULPHUR COAL	0	4	119	8
COAL 980 123.7 856.2 #8	4	2	123	10
Hard dark fire clay	2	2	126	0
STARTED 3-5-63 COMPLETED 3-6-63 19 TOTAL	126	0	126	00

FORM 2

AEC 04609

PENNSYLVANIA DRILLING COMPANY

MAIN ADDRESS
1201-1215 CHARTIERS AVENUE
PITTSBURGH 20, PA.
PHONE WALNUT 1-5816

For MANOR REAL ESTATE CO.

Record of Hole No. 14 " M-14

Location WOODSFIELD, OHIO

NW ¼ SECT. 15, WAYNE TWP.

Surface Elevation 895 BAR.

Date Started 6-9-56

Driller BYRON DOYLE

Date Completed 6-13-56

STRATA	FEET	INCHES	TOTAL
CLAY & SAND	6	0	6' 0"
GRAY SHALE	7	0	13' 0"
COAL, SLATE & BLACK SHALE	2	0	15' 0"
BROWN LIMESTONE	14	6	29' 6"
GREEN SHALE	5	6	35' 0"
BROWN LIMESTONE	4	0	39' 0"
BROKEN GREEN & GRAY SHALE	25	0	64' 0"
GRAY SANDY SHALE	9	0	73' 0"
GRAY SANDSTONE	17	0	90' 0"
DARK SHALE	5	0	95' 0"
COAL No. 8	4	3½	99' 3½"
HARD GRAY SHALE	2	1	101' 4½"

A Duplicate of this Record may be obtained by writing to the Above Address

AEC 04610

Form 407-

PITTSBURGH TESTING LABORATORY

ESTABLISHED 1881

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ORDER No. PG-6307

LABORATORY No. 481700

CLIENT'S No.

FILE No.

REPORT

July 10, 1956

Analysis of COAL

Marked:- M-14

Submitted by Manor Real Estate Co.

Reported to Manor Real Estate Co.
Buck Hill Bottom
Industrial Site Development
C/O Richard D. Snouffer
1520 Farmers Bank Bldg.
Pittsburgh 22, Penna.

	As Received	Dry Basis
MOISTURE	1.76%	-----%
VOLATILE MATTER	41.50	42.24
FIXED CARBON	44.59	45.39
ASH	12.15	12.37
SULPHUR	5.89	6.00
BTU PER POUND	12,696	12,923
FUSION TEMPERATURE OF ASH	1970°F	
ASTM FREE SWELLING INDEX	-----	

PITTSBURGH TESTING LABORATORY

Lawrence K. Jones

Lawrence K. Jones,
Manager, Chemical Division

3 Copies: Manor Real Estate Co.

cn

11/89

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 13
(GEOLOGY REPORT - UNDERGROUND WORKINGS)

Applicant BENNOC, INC. Drill Hole # M-16
*Coordinates X. 2,405,404 Y. 690,644 Surface Elevation 1080.4

Lithology	H20**	Thickness	Physical Properties *** Compactibility	Erodibility
Topsoil				
Subsoil				
CLAY AND WEATHERED SANDSTONE		5.0'	M	S
GRAY SANDSTONE		35.0'	S	S
GRAY SANDY SHALE		15.0'	M	S
GRAY SANDSTONE		7.5'	S	S
GRAY SHALE		42.5'	M	S
VARIGATED SHALE		35.0'	M	S
GRAY SHALE WITH LIME STREAKS		58.0'	M	S
BROWN LIMESTONE		7.0'	M	S
GRAY SHALE		25.0'	M	S
VERY DARK SHALE		7.0'	M	S
GRAY SHALE, VERY SANDY		10.0'	M	S
DARK SHALE		4.0'	M	S
COAL, SLATE, BLACK SHALE		4.0'	M	S
BROWN LIMESTONE		12.0'	M	S
GRAY & GREEN SHALE		27.0'	M	S
HARD GREEN SHALE		10.0'	M	S
DARK SANDY SHALE		12.0'	M	S
SANDSTONE		3.5'	S	S
DARK SHALE		5.5'	M	S
GRAY SANDSTONE		5.25'	S	S
SHALEY COAL (PITTSBURGH #8)		0.16'	S	V
COAL (PITTSBURGH #8)		4.0'	S	V
HARD GRAY SHALE		4.58'	M	S

Submit the following information for the stratum above the coal seam, the coal seam, and the stratum below the coal seam.

Stratum	Total Sulfur	Pyrite Marcasite Sulfur	Potential Acidity	Neutral-ization Potential	CaCo3 Deficiency
#8 COAL	5.57				

* If other than State Plane, indicate coordinate system.
** Indicate water bearing stratum with an asterick (*) under the column labeled H20.
*** S-Slightly M-Moderately V-Very

"WE LOOK INTO THE EARTH"

FORM 0-104 AM 4-54

PENNSYLVANIA DRILLING COMPANY

MAIN ADDRESS
1201-1215 CHARTIERS AVENUE
PITTSBURGH 20, PA.
PHONE WALNUT 1-5816

For MANOR REAL ESTATE CO.

Record of Hole No. M-17

Location WOODSFIELD, OHIO

SE¼ SECT. 20, WAYNE TWP.

Surface Elevation 1215 BAR.

Date Started 5-2-56

Driller W. WILSON / B. DOYLE

Date Completed 5-23-56

STRATA	FEET	INCHES	TOTAL
OVERBURDEN	10	0	10' 0"
YELLOW SANDY SHALE	8	0	18' 0"
GRAY SANDSTONE	40	0	58' 0"
DARK SHALE	3	0	61' 0"
COAL		8	61' 8"
DARK SHALE	1	4	63' 0"
GRAY SHALE	14	0	77' 0"
DO.	22	0	99' 0"
GRAY SANDY SHALE	14	0	113' 0"
COAL	1	0	#11 114' 0"
DARK SHALE	21	0	135' 0"
LIMESTONE	10	0	145' 0"
GREEN SHALE	1	0	146' 0"
GRAY SHALE	17	0	163' 0"
COAL - SHALE PARTINGS	1	6	#10 164' 6"
GRAY SHALE	21	6	186' 0"
LIME SHALE	20	0	206' 0"
G[illegible] & GREEN SHALE	7	6	213' 6"
GRAY SANDSTONE	2	6	216' 0"
GRAY SHALE	12	0	[illegible]

AEC 04613

"WE LOOK INTO THE EARTH"

PENNSYLVANIA DRILLING COMPANY

MAIN ADDRESS
1201-1215 CHARTIERS AVENUE
PITTSBURGH 20, PA.
PHONE WALNUT 1-5816

For MANOR REAL ESTATE CO.

Record of Hole No. 17 (CONTINUED)

Location WOODSFIELD, OHIO

Surface Elevation

Date Started

Driller

Date Completed

STRATA	FEET	INCHES	TOTAL
BROWN LIMESTONE	6	0	241' 0"
GRAY SHALE WITH LIME	21	0	262' 0"
BROWN LIMESTONE	4	0	266' 0"
GRAY & BLACK SHALE	6	0	272' 0"
SLATE & COAL	1	0	GR 273' 0"
GRAY SHALE	17	0	290' 0"
GRAY SANDSTONE & SHALE	6	0	296' 0"
VERY DARK SHALE	9	0	305' 0"
SLATE & COAL	2	6	#9 307' 6"
BROWN LIMY SHALE	15	0	322' 6"
GRAY SANDSTONE	3	6	326' 0"
GRAY & GREEN SHALE WITH LIMESTREAKS	38	0	364' 0"
GRAY SANDSTONE	6	0	370' 0"
DARK SHALE	2	0	372' 0"
GRAY SANDSTONE	5	6	377' 6"
DARK SHALE	5		382' 6"

A Duplicate of this Record may be obtained by writing to the Above Address

AEC 04614

"WE LOOK INTO THE EARTH"

PENNSYLVANIA DRILLING COMPANY

MAIN ADDRESS
1201-1215 CHARTIERS AVENUE
PITTSBURGH 20, PA.
PHONE WALNUT 1-5816

For MANOR REAL ESTATE CO.

Record of Hole No. 17 (CONTINUED)

Location WOODSFIELD, OHIO

Surface Elevation

Date Started

Driller B. DOYLE

Date Completed 5-23-56

STRATA	FEET	INCHES	TOTAL 382' 6"
COAL No. 8	4	5	386' 11"
HARD GRAY SHALE	3	0	389' 11"

AEC 04615

Form 407-

PITTSBURGH TESTING LABORATORY

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ORDER No. PG-6307

LABORATORY No. 480759

CLIENT'S No.

FILE No.

REPORT

June 8, 1956

Analysis of C O A L

Marked:- M-17

Submitted by Manor Real Estate Company

Reported to Manor Real Estate Company
Buck Hill Bottom
Industrial Site Development

	As Received	Dry Basis
MOISTURE	1.76%	-----%
VOLATILE MATTER	43.30	44.08
FIXED CARBON	46.54	47.37
ASH	8.40	8.55
SULPHUR	4.78	4.87
BTU PER POUND	13,312	13,550
FUSION TEMPERATURE OF ASH	1980°F.	
ASTM FREE SWELLING INDEX	-----	

PITTSBURGH TESTING LABORATORY

Lawrence K. Jones

Lawrence K. Jones,
Manager, Chemical Division

3 Copies: Manor Real Estate Co.

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"WE LOOK INTO THE EARTH"

FORM D-104 6M 6-54

PENNSYLVANIA DRILLING COMPANY

MAIN ADDRESS
1201-1215 CHARTIERS AVENUE
PITTSBURGH 20, PA.
PHONE WALNUT 1-5816

For MANOR REAL ESTATE CO.

Record of Hole No. 19-M M-19

Location WOODSFIELD, OHIO

SECT. 13, WAYNE TWP.

Surface Elevation 1120 BAR.

Date Started 5-25-56

Driller B. DOYLE

Date Completed 5-31-56

STRATA	FEET	INCHES	TOTAL
CLAY & WEATHERED SANDSTONE	13	6	13' 6"
GRAY SANDSTONE	14	2	27' 8"
COAL	0	4	#11A 28' 0"
GRAY CLAY & SOFT SHALE	2	0	30' 0"
GRAY SHALE	32	0	62' 0"
GRAY SANDSTONE	5	0	67' 0"
GRAY SHALE	23	0	90' 0"
GRAY SANDSTONE	4	0	94' 0"
DARK SHALE	9	6	103' 6"
COAL		2	#11 103' 8"
GRAY & GREEN SHALE WITH LIME STREAKS	108	4	212'
BROWN LIME	6	0	218'
GRAY SHALE WITH LIME STREAKS	12	0	230'
GRAY & BLACK SHALE	8	0	238'
GRAY SHALE WITH LIME STREAKS	12	0	250'
GRAY SANDY SHALE	10	0	260'
VERY DARK SHALE	12	0	272'
* COAL, SLATE & BLACK SHALE	4	6	#9 275' 6"
BROWN LIMESTONE	13	6	290' 0"
GRAY & GREEN SHALE	30	0	320' 0"

DE ALL IN *
CO

A Duplicate of this Record may be obtained by writing to the Above Address

AEC 04617

"S" LOOK INTO THE EARTH"

FORM 0-104 6M 6-54

PENNSYLVANIA DRILLING COMPANY

MAIN ADDRESS
1201-1215 CHARTIERS AVENUE
PITTSBURGH 20, PA.
PHONE WALNUT 1-5816

For MANOR REAL ESTATE CO.

Record of Hole No. 19 M (CONTINUED)

Location WOODSFIELD, OHIO

Surface Elevation

Date Started

Driller

Date Completed

STRATA	FEET	INCHES	TOTAL
VERY DARK SHALE	4	0	324' 0"
GRAY SANDSTONE	3	0	327' 0"
SANDSTONE, BLACK SHALE	4	0	331' 0"
GRAY SANDSTONE	2	6	333' 6"
SANDSTONE, BLACK SHALE	3	6	337' 0"
GRAY SANDSTONE	21	0	358' 0"
DARK SHALE		10	358' 10"
COAL No. 8	4	5½	363' 3½"
HARD GRAY SHALE	2	8½	366' 0"

A Duplicate of this Record may be obtained by writing to the Above Address

AEC 04618

Form 407-C

PITTSBURGH TESTING LABORATORY

ESTABLISHED 1881

PITTSBURGH, PA.

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ORDER No. PG-6307

LABORATORY No. 481702

CLIENT'S No.

FILE No.

REPORT

July 10, 1956

Analysis of C O A L

Marked:- M-19

Submitted by Manor Real Estate Co.

Reported to Manor Real Estate Co.
Buck Hill Bottom
Industrial Site Development
c/o Richard D. Snouffer
1520 Farmers Bank Bldg.
~~Pittsburgh 22, Penna.~~

	As Received	Dry Basis
MOISTURE	1.69%	-----%
VOLATILE MATTER	42.57	43.30
FIXED CARBON	44.10	44.86
ASH	11.64	11.84
SULPHUR	6.81	6.93
BTU PER POUND	12,728	12,947
FUSION TEMPERATURE OF ASH	1960°F	
ASTM FREE SWELLING INDEX	-----	

PITTSBURGH TESTING LABORATORY

Lawrence K. Jones

Lawrence K. Jones,
Manager, Chemical Division

3 Copies: Manor Real Estate Co.

cn

11/89

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 13
(GEOLOGY REPORT - UNDERGROUND WORKINGS)

Applicant BENNOC, INC. Drill Hole # M-20

*Coordinates X. 2,406,834 Y. 687,635 Surface Elevation 1140.16

Lithology	H20**	Thickness	Physical Properties *** Compactibility	Erodibility
Topsoil				
Subsoil				
YELLOW CLAY		8.0'	V	S
SOFT GRAY SHALE		6.0'	M	S
SOFT SHALE WITH BOULDERS		34.0'	M	S
GRAY SANDY SHALE		4.0'	M	S
GRAY SANDSTONE		56.0'	S	S
GREEN SHALE		4.0'	M	S
DARK SHALE		58.0'	M	S
GRAY SHALE		90.0'	M	S
GRAY SHALE WITH LIME STREAKS		18.0'	M	S
GREEN SHALE		5.0'	M	S
YELLOW LIMESTONE		6.0'	M	S
GRAY & GREEN SHALE		16.0'	M	S
DARK SHALE		4.0'	M	S
COAL (MEIGS CREEK #9)		2.5'	S	V
GRAY SHALE		8.0'	M	S
GRAY SANDSTONE		7.0'	M	S
DARK SHALE		5.5'	M	S
BLACK SHALE & COAL (FISHPOT)		4.0'	S	V
BROWN LIMESTONE		15.0'	M	S
GREEN SHALE		4.0'	M	S
GRAY SHALE & LIME		15.0'	M	S
GREEN & GRAY SHALE		25.0'	M	S
GRAY SANDSTONE		14.0'	S	S
DARK SHALE		6.16'	M	S
COAL (PITTSBURGH #8)		4.0'	S	V
HARD GRAY SHALE		3.0'	M	S

Submit the following information for the stratum above the coal seam, the coal seam, and the stratum below the coal seam.

Stratum	Total Sulfur	Pyrite Marcasite Sulfur	Potential Acidity	Neutral-ization Potential	CaCo3 Deficiency
#8 COAL	4.51				

* If other than State Plane, indicate coordinate system.
** Indicate water bearing stratum with an asterick (*) under the column labeled H20.

LJ HUGHES & SONS, INC.

DIAMOND CORE DRILLING
Pressure Grouting, Foundation & Soil Borings
320 Turnpike Road, Summersville, West Virginia 26651 (304) 872-1111

DRILL HOLE NO. N-94-14 DRILLER. JOSEPH MILLER

DRILLING FOR: THE OHIO VALLEY COAL COMPANY
ALLEDONIA OHIO

SURFACE ELEVATION: 1094.91 STARTED: SEPTEMBER 29 1994
COMPLETED: SEPTEMBER 30 1994

LOCATION OHIO BELMONT COUNTY

FORMATION	STRATA THICKNESS	DEPTH FROM SURFACE
CASING	20.00	20.00
BROWN SHALY CLAYSTONE	18.30	38.30
GRAY SANDSTONE	7.20	45.50
COAL	0.60	46.10
GRAY SHALY CLAYSTONE	22.10	68.20
GRAY SHALE	12.50	80.70
GRAY LIMY SHALY CLAYSTONE	14.40	95.10
GRAY SANDSTONE	2.00	97.10
DARK SHALE	0.50	97.60
GRAY SHALY CLAYSTONE	1.90	99.50
GRAY SANDY SHALE	4.40	103.90
GRAY SANDSTONE WITH SHALE STREAKS	2.50	106.40
GRAY SANDSTONE WITH COAL SPARS	2.60	109.00
DARK GRAY SHALY CLAYSTONE	3.70	112.70
COAL	0.40	113.10
DARK GRAY LIMY SHALY CLAYSTONE	7.00	120.10
GRAY SHALY LIMESTONE	9.80	129.90
DARK GRAY LIMY SHALY CLAYSTONE	10.20	140.10
RED AND GRAY SHALY CLAYSTONE	1.90	142.00
GRAY LIMY SHALE	1.60	143.60
GRAY AND GREEN SANDSTONE	3.10	146.70
RED AND GRAY SHALY CLAYSTONE	2.70	149.40

AEC 04621

LJ HUGHES & SONS, INC.

THE OHIO VALLEY COAL COMPANY
CONTINUATION OF DRILL HOLE NO. N-94-14

FORMATION	STRATA THICKNESS	149.40 DEPTH FROM SURFACE
GRAY LIMY SANDY SHALE	3.10	152.50
GRAY LIMESTONE	1.20	153.70
GRAY LIMY SHALY CLAYSTONE	4.10	157.80
GRAY SANDSTONE	3.80	161.60
GRAY SHALE	3.80	165.40
GRAY SHALY LIMESTONE	3.60	169.00
GRAY LIMY SHALY CLAYSTONE	2.00	171.00
RED AND GRAY LIMY SHALY CLAYSTONE	6.00	177.00
GRAY LIMY SHALY CLAYSTONE	7.00	184.00
GRAY SANDSTONE	3.30	187.30
GRAY SHALY CLAYSTONE	1.60	188.90
GRAY SANDY SHALE	0.80	189.70
GRAY SHALE	2.70	192.40
GRAY LIMY SHALY CLAYSTONE	2.80	195.20
GRAY LIMESTONE	2.90	198.10
GRAY LIMY SHALY CLAYSTONE	6.00	204.10
GRAY SHALY LIMESTONE	18.20	222.30
GRAY GREEN LIMY CLAYSTONE	1.90	224.20
WHITE LIMESTONE	6.00	230.20
GRAY LIMY SHALY CLAYSTONE	1.90	232.10
WHITE LIMESTONE	2.50	234.60
GRAY LIMY SHALE	11.20	245.80
GRAY LIMESTONE	1.70	247.50
GRAY LIMY SHALY CLAYSTONE	1.80	249.30
DARK GRAY SHALY CLAYSTONE	3.48	252.78
BONY COAL	0.17	252.95
COAL	0.42	253.37
PYRITE	0.02	253.39
COAL	0.27	253.66
DARK SHALE	0.05	253.71
COAL	0.52	254.23
DARK SHALE	0.05	254.28
COAL	1.28	255.56
DARK NODULES	0.07	255.63
COAL	0.08	255.71
DARK SHALE	0.25	255.96
GRAY SANDSTONE	1.45	257.41
GRAY GREEN SHALY CLAYSTONE	3.20	260.61
GRAY SHALY CLAYSTONE	6.30	266.91
GRAY SANDSTONE WITH SHALE STREAKS	5.53	272.44
GRAY SHALY CLAYSTONE	1.80	274.24
DARK SHALY CLAYSTONE	0.35	274.59
COAL AND PYRITE . . .	0.07	274.66
COAL	0.60	275.26
DARK SHALY CLAYSTONE	0.07	275.33
COAL	0.16	275.49

AEC 04622

LJ HUGHES & SONS, INC.

THE OHIO VALLEY COAL COMPANY
CONTINUATION OF DRILL HOLE NO. N-94-14

FORMATION	STRATA THICKNESS	275.49 DEPTH FROM SURFACE
DARK SHALY CLAYSTONE	0.12	275.61
COAL	0.17	275.78
BONY COAL	0.12	275.90
COAL	0.94	276.84
GRAY SHALY CLAYSTONE	0.10	276.94
PYRITE	0.03	276.97
COAL	0.25	277.22
DARK SHALE WITH PYRITE	0.04	277.26
COAL	0.29	277.55
DARK SHALY CLAYSTONE	0.80	278.35
GRAY LIMESTONE	14.75	293.10
GREEN LIMY SHALY CLAYSTONE	2.09	295.19
GRAY SANDSTONE	1.01	296.20
GRAY SHALY CLAYSTONE	3.20	299.40
GRAY LIMESTONE	1.00	300.40
GRAY LIMY SHALY CLAYSTONE	20.00	320.40
GRAY LIMY SANDSTONE	1.20	321.60
GRAY SANDY SHALE	7.10	328.70
GRAY SANDSTONE WITH SHALE STREAKS	2.30	331.00
GRAY SHALE	4.80	335.80
GRAY SANDSTONE	4.50	340.30
GRAY SANDY SHALE	1.60	341.90
GRAY SANDSTONE	12.10	354.00
DARK SHALE WITH COAL SPARS	0.23	354.23
DARK SHALY CLAYSTONE	5.20	359.43
PYRITE	0.15	359.58
BLACK SHALE	0.13	359.71
COAL #8	4.20	363.91
DARK SHALY CLAYSTONE	0.12	364.03
DARK GRAY SHALY CLAYSTONE	2.26	366.29
GRAY LIMESTONE	0.23	366.52
DARK GRAY SHALY CLAYSTONE	0.95	367.47
GRAY LIMESTONE	1.26	368.73
DARK GRAY LIMY SHALY CLAYSTONE	11.50	380.23
GRAY SHALE WITH LIME NODULES	5.70	385.93
RED AND GRAY SHALY CLAYSTONE	11.27	397.20
GRAY SANDY LIMY SHALE	2.10	399.30
GRAY SANDSTONE	3.50	402.80
RED AND GRAY SHALY CLAYSTONE	0.60	403.40
GRAY SANDSTONE	1.60	405.00
RED AND GREEN SANDY SHALY CLAYSTONE	0.40	405.40
GRAY SANDSTONE	1.60	407.00

AEC 04623

LJ HUGHES & SONS, INC.

THE OHIO VALLEY COAL COMPANY
CONTINUATION OF DRILL HOLE NO. N-94-14

FORMATION	STRATA THICKNESS	407.00 DEPTH FROM SURFACE
GRAY SANDY SHALE	0.90	407.90
RED SHALY CLAYSTONE	8.40	416.30
GRAY LIMY SHALE	3.70	420.00

TOTAL DEPTH OF HOLE = 420.00 FEET

20 BAGS CEMENT PLACED IN HOLE

AEC 04624

CCITT G3:# 2
3045479097→
;10-20-94 12:29PM ;
SENT BY:TraDet,Inc.

DIAMOND DRILL HOLE NO. 94-14
Drilled: 0/00/00
Surface Elevation: 0000.00
North 00000.00, East 00000.00
THE OHIO VALLEY COAL COMPANY

PITTSBURGH NO. 8 - MAIN SEAM
Lab Processed Depth: 000.00 to 000.00 ft.
Lab Processed Elevation: 000.00 to 000.00 ft.

SPECIFIC GRAVITY		DRY BASIS				CUMULATIVE PRODUCT (FLOAT)				CUMULATIVE REJECT (SINK)			
Sink	Float	% Wt.	% Ash	% Sulf.	BTU	% Wt.	% Ash	% Sulf.	BTU	% Wt.	% Ash	% Sulf.	BTU
3/4" x 8-Mesh SQ Fraction = 88.69% of Total Seam													
	1.40	89.18	6.92	4.33	13,769	89.18	6.92	4.33	13,769	100.00	9.19	5.10	13,381
1.40	1.60	6.95	20.84	8.40	11,454	96.13	7.93	4.62	13,602	10.82	27.92	11.48	10,179
1.60	1.80	2.00	34.31	12.32	9,087	98.13	8.46	4.78	13,510	3.87	40.63	17.00	7,890
1.80		1.87	47.39	22.00	6,609	100.00	9.19	5.10	13,381	1.87	47.39	22.00	6,609
8 Mesh x 200-Mesh SQ Fraction = 12.19% of Total Seam													
	1.40	81.85	5.55	3.82	14,008	81.85	5.55	3.82	14,008	100.00	11.09	4.77	12,828
1.40	1.60	8.58	18.12	7.25	11,938	90.43	6.74	4.15	13,812	18.15	36.07	9.06	7,507
1.60	1.80	2.02	31.65	9.19	9,693	92.45	7.28	4.26	13,722	9.57	52.17	10.69	3,535
1.80		7.55	57.66	11.09	1,887	100.00	11.09	4.77	12,828	7.55	57.66	11.09	1,887

Minus 200-mesh Fraction = 1.12% of Total Sample

% Ash (D/B)	21.13
% Sulfur (D/B)	5.04
BTU/lb. (D/B)	11,504
MAFBTU/lb.	14,586

AEC 04625

11/89

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 13
(GEOLOGY REPORT - UNDERGROUND WORKINGS)

Applicant BENNOC, INC. Drill Hole # N-94-18

*Coordinates X. 2,399,293 Y. 691,789 Surface Elevation 1242.53

Lithology	H20**	Thickness	Physical Properties *** Compactibility	Erodibility
Topsoil				
Subsoil				
RED & GRAY SHALY CLAYSTONE		2.90'	V	S
GRAY LIMESTONE		7.70'	M	S
RED SHALY CLAYSTONE		1.40'	V	S
GRAY SHALY CLAYSTONE		1.00'	V	S
GRAY SANDY SHALE		10.30'	M	S
GRAY SHALY CLAYSTONE		1.50'	V	S
BROWN SANDSTONE (BROKEN)		2.30'	S	S
GRAY SANDSTONE		3.00'	S	S
GRAY SHALE		2.80'	M	S
GRAY SHALY CLAYSTONE		3.90'	V	S
GRAY LIMESTONE		1.20'	M	S
GRAY SHALY CLAYSTONE		8.60'	V	S
DARK SHALE		1.30'	M	S
COAL (WASHINGTON #12)		0.90'	S	V
GRAY SHALY CLAYSTONE		10.50'	V	S
GRAY SANDY SHALE		4.00'	M	S
GRAY SANDSTONE		56.50	S	S
COAL (WAYNESBURG "A")		0.20'	S	V
GRAY SHALY CLAYSTONE		5.80'	V	S
GRAY SANDY SHALY CLAYSTONE		38.10'	V	S
GRAY SHALY CLAYSTONE		3.42	V	S
COAL (WAYNESBURG #11)		1.03	S	V
DARK SHALE		0.04'	M	S
COAL (#11)		0.62'	S	V
DARK GRAY SHALE		0.25'	M	S
COAL (#11)		0.76'	S	V
DARK GRAY SHALY CLAYSTONE		0.25'	V	S
GRAY SANDY SHALE		0.65'	M	S
GRAY SHALY CLAYSTONE		1.80'	V	S
GRAY SANDY SHALE		1.60'	M	S
GRAY SANDSTONE		4.60'	S	S

N-94-18. CONTINUED:

Lithology	H2O**	Thickness	Physical Properties *** Compactibility	Erodibility
Topsoil				
Subsoil				
GRAY SANDY SHALE		5.50'	M	S
DARK GRAY SHALY CLAYSTONE		1.50'	V	S
COAL (UNIONTOWN #10)		0.10'	S	V
BLACK SHALY CLAYSTONE		0.60'	V	S
COAL (UNIONTOWN #10)		0.25'	S	V
GRAY LIMY SHALY CLAYSTONE		7.83'	V	S
GRAY SHALY LIMESTONE		10.60'	M	S
DARK GRAY LIMY SHALY CLAYSTONE		18.60'	V	S
RED & GRAY SHALY CLAYSTONE		1.40'	V	S
GRAY LIMY SHALY CLAYSTONE		8.80'	V	S
GRAY SANDSTONE		1.40'	S	S
GRAY SANDY SHALE		4.20'	M	S
GRAY SHALY LIMESTONE		10.40'	M	S
RED & GRAY LIMY SHALY CLAYSTONE		3.70'	V	S
GRAY SANDY SHALY CLAYSTONE		7.90'	V	S
RED & GRAY LIMY SHALY CLAYSTONE		1.90'	V	S
GRAY LIMESTONE (BROKEN)		1.40'	M	S
GRAY LIMY SANDY SHALY CLAYSTONE		2.00'	V	S
GRAY SHALY LIMESTONE		4.80'	M	S
GREEN SHALY CLAYSTONE		4.10'	V	S
GRAY SHALY LIMESTONE		4.50'	M	S
GRAY LIMESTONE		3.00'	M	S
GRAY LIMY SHALY CLAYSTONE		12.20'	V	S
WHITE LIMESTONE		5.00'	M	S
GRAY LIMY SHALY CLAYSTONE		10.30	V	S
WHITE LIMESTONE		5.40'	M	S
GRAY LIMY SHALY CLAYSTONE		20.70'	V	S
GRAY SANDY SHALY CLAYSTONE		15.70'	V	S
DARK GRAY SHALY CLAYSTONE		0.28'	V	S
COAL W/PYRITE & SHALE STREAKS		0.14'	S	V
GRAY SHALE W/COAL & SHALE STREAKS		0.25'	M	S
COAL & SHALE (MEIGS CREEK #9)		0.12'	M	S
DARK GRAY SHALY CLAYSTONE		0.61'	V	S
DARK SANDY SHALE		0.38'	M	S
COAL (#9)		0.01	S	V
DARK SANDY SHALE		0.02'	M	S

11/89

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 13
(GEOLOGY REPORT - UNDERGROUND WORKINGS)

Applicant BENNOC, INC. Drill Hole # N-94-18

*Coordinates X. 2,399,430 Y. 691,425 Surface Elevation 1242.53

Lithology	H20**	Thickness	Physical Properties *** Compactibility	Erodibility
Topsoil				
Subsoil				
RED & GRAY SHALY CLAYSTONE		2.90'	V	S
GRAY LIMESTONE		7.70'	M	S
RED SHALY CLAYSTONE		1.40'	V	S
GRAY SHALY CLAYSTONE		1.00'	V	S
GRAY SANDY SHALE		10.30'	M	S
GRAY SHALY CLAYSTONE		1.50'	V	S
BROWN SANDSTONE (BROKEN)		2.30'	S	S
GRAY SANDSTONE		3.00'	S	S
GRAY SHALE		2.80'	M	S
GRAY SHALY CLAYSTONE		3.90'	V	S
GRAY LIMESTONE		1.20'	M	S
GRAY SHALY CLAYSTONE		8.60'	V	S
DARK SHALE		1.30'	M	S
COAL (WASHINGTON #12)		0.90'	S	V
GRAY SHALY CLAYSTONE		10.50'	V	S
GRAY SANDY SHALE		4.00'	M	S
GRAY SANDSTONE		56.50	S	S
COAL (WAYNESBURG "A")		0.20'	S	V
GRAY SHALY CLAYSTONE		5.80'	V	S
GRAY SANDY SHALY CLAYSTONE		38.10'	V	S
GRAY SHALY CLAYSTONE		3.42	V	S
COAL (WAYNESBURG #11)		1.03	S	V
DARK SHALE		0.04'	M	S
COAL (#11)		0.62'	S	V
DARK GRAY SHALE		0.25'	M	S
COAL (#11)		0.76'	S	V
DARK GRAY SHALY CLAYSTONE		0.25'	V	S
GRAY SANDY SHALE		0.65'	M	S
GRAY SHALY CLAYSTONE		1.80'	V	S
GRAY SANDY SHALE		1.60'	M	S
GRAY SANDSTONE		4.60'	S	S

N-94-18, CONTINUED;

Lithology	H20**	Thickness	Physical Properties *** Compactibility	Erodibility
Topsoil				
Subsoil				
COAL (#9)		0.05'	S	V
DARK SANDY SHALE		0.43'	M	S
COAL (#9)		1.06'	S	V
GRAY SHALY CLAYSTONE		0.26'	V	S
COAL (#9)		0.75'	S	V
DARK SHALY CLAYSTONE		0.80'	V	S
GRAY SHALY LIMESTONE		9.44'	M	S
GRAY LIMY SHALY CLAYSTONE		6.60'	V	S
GRAY LIMESTONE		2.00'	M	S
GRAY LIMY SHALY CLAYSTONE		2.90'	V	S
DARK SHALE		0.10'	M	S
GRAY LIMY SHALY CLAYSTONE		17.80'	V	S
GRAY SANDSTONE		34.00'	S	S
GRAY SANDSTONE W/SHALE NODULES		1.20'	S	S
GRAY SANDSTONE		4.50'	S	S
DARK GRAY SANDY SHALY CLAYSTONE		0.30'	V	S
GRAY SANDSTONE		0.30'	S	S
DARK GRAY SHALY CLAYSTONE		3.60'	V	S
DARK SHALE		0.20'	M	S
DARK SHALY CLAYSTONE W/PYRITE NODULES		0.62'	V	S
BLACK SHALE		0.07'	M	S
PYRITE W/COAL SPARS		0.05'	S	V
COAL (PITTSBURGH #8)		0.70'	S	V
DARK SANDSTONE		0.03'	S	S
COAL (#8)		0.84'	S	V
DARK SHALE		0.03'	M	S
COAL (#8)		1.95'	S	V
PYRITE		0.10'	S	V
COAL (#8)		0.65'	S	V
DARK SHALY CLAYSTONE		2.50'	V	S
GRAY LIMESTONE		3.46'	M	S
GRAY LIMY SHALY CLAYSTONE		3.50'	V	S
GRAY SANDY SHALE		4.70'	M	S

Submit the following information for the stratum above the coal seam, the coal seam, and the stratum below the coal seam.

Stratum	Total Sulfur	Pyrite Marcasite Sulfur	Potential Acidity	Neutral-ization Potential	CaCo3 Deficiency
#8 COAL	6.89				

* If other than State Plane, indicate coordinate system.
** Indicate water bearing stratum with an asterick (*) under the column labeled H20.
*** S-Slightly M-Moderately V-Very

11/89

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 13
(GEOLOGY REPORT - UNDERGROUND WORKINGS)

Applicant BENNOC, INC. Drill Hole # N-94-19
*Coordinates X. 2,402,775 Y. 689,158 Surface Elevation 1122.03

Lithology	H20**	Thickness	Physical Properties *** Compactibility	Erodibility
Topsoil				
Subsoil				
GRAY SANDSTONE		9.0'	S	S
COAL (WAYNESBURG "A")		0.2'	S	V
GRAY SHALY CLAYSTONE		3.1'	V	S
GRAY SANDSTONE		8.7'	S	S
GRAY SHALY CLAYSTONE		9.2'	V	S
GRAY SANDY SHALE		1.1'	M	S
GRAY SANDSTONE		2.4'	S	S
GRAY SANDY SHALY CLAYSTONE		4.2'	V	S
GRAY SHALY CLAYSTONE		17.10	V	S
GRAY SANDY SHALE		1.8'	M	S
GRAY SHALY CLAYSTONE		2.6'	V	S
SHALY COAL (#11)		0.3'	S	V
COAL (WAYNESBURG #11)		1.4'	S	V
GRAY SHALY CLAYSTONE		0.7'	V	S
GRAY SANDSTONE W/SHALE STREAKS		2.9'	S	S
GRAY SHALY CLAYSTONE W/SHALE BANDS		5.4'	V	S
DARK GRAY SHALE		9.9'	M	S
DARK SHALE W/COAL SPARS (#11)		0.3'	M	S
COAL (WAYNESBURG #11)		0.1'	S	V
GRAY LIME SHALY CLAYSTONE		36.6'	V	S
GRAY LIMESTONE		1.2'	M	S
GRAY LIME SHALY CLAYSTONE		9.8'	V	S
GRAY SANDSTONE		1.3'	S	S
GRAY SANDY SHALE		5.0'	M	S
DARK GRAY SHALY LIMESTONE		9.9'	M	S
DARK GRAY LIME SHALY CLAYSTONE		7.3'	V	S
GRAY SANDSTONE W.RIPPLED SHALE		5.9'	S	S
GRAY GREEN LINE SHALY CLAYSTONE		18.0'	V	S
GRAY SHALY LIMESTONE		10.6'	M	S

Lithology	H20**	Thickness	Physical Properties *** Compactibility	Erodibility
GREEN LIME SHALY CLAYSTONE		6.2'	V	S
WHITE LIMESTONE		8.4'	M	S
GRAY LIME SHALY CLAYSTONE		2.5'	V	S
FINE GRAIN NODULAR LIMESTONE		1.3'	M	S
GRAY LIME SHALY CLAYSTONE		4.2'	V	S
DARK GRAY LIME SHALY CLAYSTONE		10.8'	V	S
GRAY SHALE		3.1'	M	S
GRAY SHALY CLAYSTONE		9.65'	V	S
DARK SHALY CLAYSTONE W/COAL SPAR		0.36'	V	S
COAL (MEIGS CREEK #9)		0.07'	S	V
DARK SHALY CLAYSTONE W/COAL SPAR		0.22'	V	S
DARK GRAY SHALY CLAYSTONE		0.16'	V	S
PYRITE		0.07'	S	V
DARK GRAY SHALY CLAYSTONE		0.15'	V	S
BLACK SANDY SHALE W/COAL SPARS		1.43'	M	S
COAL (#9)		0.05'	S	V
PYRITE		0.05'	V	S
COAL (#9)		0.86'	S	V
DARK GRAY SHALY CLAYSTONE		0.21'	V	S
COAL (#9)		0.42'	S	V
GRAY SHALY CLAYSTONE		0.02'	V	S
COAL (#9)		0.30'	S	V
DARK GRAY SHALY CLAYSTONE		0.48'	V	S
GRAY LIMESTONE		3.52'	M	S
GREEN SANDY SHALE		0.48'	M	S
GRAY SANDSTONE		1.40'	S	S
GRAY GREEN LIME SHALY CLAYSTONE		1.80'	V	S
GRAY LINESTONE		1.50'	M	S
GRAY LIME SHALY CLAYSTONE		4.10'	V	S
DARK GRAY SHALY CLAYSTONE w/SPAR		0.20'	V	S
GRAY LIME SHALY CLAYSTONE		8.00'	V	S
FINE GRAIN NODULAR LIMESTONE		3.20'	M	S
GRAY SANDY SHALY CLAYSTONE		6.70'	V	S
GRAY SANDSTONE		35.60'	S	S
GRAY SANDSTONE W/SHALE STREAKS		0.36'	S	S
GRAY SANDSTONE		2.23'	S	S
GRAY SANDSTONE W/GR CLAY NODULES		1.70'	S	S
COAL WITH PYRITE STEAKS (#8)		1.16'	S	V
DARK SHALY CLAYSTONE		0.05'	V	S

Lithology	H20**	Thickness	Physical Properties ***	
			Compactibility	Erodibility
Topsoil				
Subsoil				
COAL W/PYRITE STREAKS (#8)		0.44'	S	V
PYRITE		0.05'	S	V
COAL (PITTSBURG #8)		2.65'	S	V
DARK GRAY SHALY CLAYSTONE		2.66'	V	S
GRAY LIME SHALY CLAYSTONE		11.00'	V	S
GRAY SANDY SHALE		6.70'	M	S
GRAY LIME SHALY CLAYSTONE		5.50'	V	S

Submit the following information for the stratum above the coal seam, the coal seam, and the stratum below the coal seam.

Stratum	Total Sulfur	Pyrite Marcasite Sulfur	Potential Acidity	Neutral-ization Potential	CaCo3 Deficiency
#8 COAL	4.85				

* If other than State Plane, indicate coordinate system.
** Indicate water bearing stratum with an asterick (*) under the column labeled H20.
*** S-Slightly M-Moderately V-Very

11/89

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 13
(GEOLOGY REPORT - UNDERGROUND WORKINGS)

Applicant BENNOC, INC. Drill Hole # 0-1

*Coordinates X. 2,404,851 Y. 694,797 Surface Elevation 1220.5

Lithology	H20**	Thickness	Physical Properties *** Compactibility	Erodibility
Topsoil				
Subsoil				
GRAY LIMESTONE		8.25'	M	S
SOFT GRAY SHALE		32.0'	M	S
COAL (WASHINGTON #12)		2.25'	S	V
GRAY TO BROWN SHALE W/CLAY STREAK		72.5'	M	S
GRAY SANDY SHALE		23.0'	M	S
GRAY SANDSTONE		29.0'	M	S
COAL (WASHINGTON #11)		3.0'	S	V
GRAY SHALE		0.33'	M	S
GRAY SHALEY SANDSTONE		12.66'	S	S
GRAY SHALE		3.33'	M	S
COAL (UNIONTOWN #10)		0.33'	S	V
DARK LIME CLAYSTONE		2.5'	V	S
GRAY LIME CLAYSTONE		5.4'	V	S
GRAY LIMESTONE W/LIMECLAY STREAKS		126.4'	M	S
DARK SHALE		4.0'	M	S
COAL (MEIGS CREEK #9)		1.5'	S	V
DARK SHALE		2.33'	M	S
GRAY SILTSTONE		20.0'	M	S
COAL W/BINDERS (FISHPOT)		3.16'	S	V
DARK SHALE		1.16'	M	S
GRAY-WHITE LIMESTONE		17.25'	M	S
GRAY SANDSTONE		5.58'	S	S
GRAY LIMESTONE		24.25'	M	S
GRAY/GREEN LIME CLAYSTONE		9.5'	M	S
GRAY SANDSTONE		18.66'	S	S
COAL (PITTSBURG #8)		4.0'	S	V
DARK CLAY		1.58'	V	S

Submit the following information for the stratum above the coal seam, the coal seam, and the stratum below the coal seam.

Stratum	Total Sulfur	Pyrite Marcasite Sulfur	Potential Acidity	Neutral-ization Potential	CaCo3 Deficiency
#8 COAL	3.94				

* If other than State Plane, indicate coordinate system.
** Indicate water bearing stratum with an asterick (*) under the column labeled H20.
*** S-Slightly M-Moderately V-Very

Drill No. C

Hole No. 1 B&O

Driller [illegible]

L. J. HUGHES & SONS

Contractors, Diamond Core Drilling

INDIANA, PA.

RICHWOOD, W. VA.

Date Started Oct. 18, 1950

Date Finished Oct. 20, 1950

FOR WHOM DRILLING: Baltimore & Ohio Railroad Company

ADDRESS: [illegible]

Property Description: Ohio, Belmont County, Wayne Township. Located on Captina Creek one quarter mile east of Mike's Run near mouth of a small drain on North side Captina Creek. On farm of Judson Moore.

Surface elevation: 855.93

No. of Strata	FORMATION	Thickness of Strata Feet	Thickness of Strata Inches	Depth from Surface Feet	Depth from Surface Inches
	Surface Slag, [illegible]	15	0	15	0
	Shaley Fire Clay	15	7	30	7
	Limestone	3	9	33	4
	Gray Shale	1	6	34	10
	Dark Shale	0	4	35	2
	Coal Boney	1	11	37	1
	Fire Clay	0	4	37	5
	Limestone	11	5	48	10
	Light Gray Shale	0	8	4	6
	Limestone	6	7	56	1
	Gray Shale	0	9	56	10
	Shaley Fire Clay	10	1	66	11
	Limestone	1	9	68	8
	Gray Shale	2	0	71	5
	Dark Shale	1	10	73	3
	Fire Clay	1	9	75	0
	Limestone	0	9	75	9
	Dark Shale	2	5	78	2
	Limestone	3	0	81	2
	Dark Shale	0	3	81	5
	Limestone	9	4	90	9
	Shaley Fire Clay	8	1	98	10
	Dark Shale	0	2	99	0
	Boney Coal with [illegible] Shale Lominations	0	9	99	9
	Gray Shale	0	11	100	8
	Bone Coal	0	2	100	10
	Coal	1	4	102	3
	Fire Clay Binder	0	0	102	5
	Coal	0	4	102	7
	Slate binder	0	0	102	9
	Boney Coal	0	1	102	10
	Slate binder	0	0	102	10
	Coal	1	11	104	10
	Boney Coal	0	0	104	10½
	Coal	1	0	105	11½
	Gray Shale	1	0	107	0
	Total Depth			107	0

AEC 04635

MORGANTOWN COAL TESTING LABORATORY

401 University Ave.
Morgantown, W. Va.

Laboratory No. 50-3618 Date Nov. 6, 1950

Report No. 50-3795

Company Bernard G. Sampson Co. Address Fairmont, W.Va.

Date Received 10/28/50 Sent By

THIS SAMPLE IS (REPRESENTED TO US TO BE)

Taken at Mine B & O Coal Location Diamond Drill Hole # 1

Seam # 8 Type Sample # 1 - Wild coal

ANALYSIS

	Moisture	Volatile Matter	Fixed Carbon	Ash	Sulfur	Ash Softng. Temp.	B.T.U.
As Received	1.8	30.8	36.3	30.9	9.71	2520	9,450
Dry Basis	---	31.4	37.1	31.5	9.89	2520	9,620

WE DO NOT CERTIFY SAMPLING

REMARKS:

(signed) Paul N. Brown
Chief Chemist

AEC 04636

MORGANTOWN COAL TESTING LABORATORY

401 University Ave.
Morgantown, W. Va.

Laboratory No. 50-3619 Date Nov. 6, 1950

Report No. 50-3796

Company Bernard G. Sampson Co. Address Fairmont, W.Va.

Date Received 10/28/50 Sent By

THIS SAMPLE IS (REPRESENTED TO US TO BE)

Taken at Mine B & O Coal Location Diamond Drill Hole # 1

Seam #8 Type Sample # 2 - Top 6"

ANALYSIS

	Moisture	Volatile Matter	Fixed Carbon	Ash	Sulfur	Ash Softng. Temp.	B.T.U.
As Received	1.7	40.8	41.0	16.5	7.34	2420	11,620
Dry Basis	---	41.5	41.7	16.8	7.47	2420	11,820

WE DO NOT CERTIFY SAMPLING

REMARKS:

(signed) Paul N. Brown
Chief Chemist

AEC 04637

MORGANTOWN COAL TESTING LABORATORY

401 University Ave.
Morgantown, W. Va.

Laboratory No.	50-3620	Date	Nov. 6, 1950
Report No.	50-3828		

Company	Bernard G. Sampson Co.	Address	Fairmont, W.Va.
Date Received	10/28/50	Sent By	

THIS SAMPLE IS (REPRESENTED TO US TO BE)

Taken at Mine	B & O Coal	Location	D.D.Hole # 1
Seam	#8	Type	Sample #3 main seam with top 6" & bottom 6" & biniers removed.

ANALYSIS

	Moisture	Volatile Matter	Fixed Carbon	Ash	Sulfur	Ash Softng. Temp.	B.T.U.
As Received	1.7	41.8	46.3	10.2	5.29	2210	12,850
Dry Basis	---	42.5	47.1	10.4	5.38	2210	13,070

WE DO NOT CERTIFY SAMPLING

REMARKS:

(signed) Paul N. Brown
Chief Chemist

AEC 04638

MORGANTOWN COAL TESTING LABORATORY

401 University Ave.
Morgantown, W. Va.

Laboratory No.	50-3621	Date	Nov. 6, 1950
Report No.	50-3829		

Company	Bernard G. Sampson Co.	Address	Fairmont, W.Va.
Date Received	10/28/50	Sent By	

THIS SAMPLE IS (REPRESENTED TO US TO BE)

Taken at Mine	B & O Coal	Location	D.D.Hole #1
Seam	#8	Type	Sample #4 - bottom 6"

ANALYSIS

	Moisture	Volatile Matter	Fixed Carbon	Ash	Sulfur	Ash Softng. Temp.	B.T.U.
As Received	2.0	40.5	42.8	14.7	6.63	2180	12,010
Dry Basis	---	41.3	43.7	15.0	6.77	2180	12,250

WE DO NOT CERTIFY SAMPLING

REMARKS:

(signed) Paul N. Brown
Chief Chemist

AEC 04639

11/89

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION
ATTACHMENT 13
(GEOLOGY REPORT - UNDERGROUND WORKINGS)

Applicant BENNOC, INC.
*Coordinates X. 2,414,034 Y. 685,831

Drill Hole# C98-1
Surface Elevation 1229.09

Lithology	H2O **	Thickness	Physical Properties **** Compatibility	Erodibility
Topsoil				
Subsoil				
NON-CORING		11.00'		
BRN. SHALE/INTERBEDDED SANDSTONE	*	4.90'	M	M
BROWN SHALE		2.30'	M	M
CLAYSTONE, REDDISH-BROWN		3.90'	V	V
CLAYSTONE, M. GRAY, CALCAREOUS		1.20'	V	V
CLAYSTONE, RED		5.70'	V	V
CLAYSTONE, RED W/GRAY BANDS		8.60'	V	V
SHALE, M. GRAY, SANDY		4.20'	M	M
CLAYSTONE, M. GRAY		6.50'	V	V
CLAYSTONE, DRK.GRAY-BLACK		0.30'	V	V
CLAYSTONE, M. GRAY, CALCAREOUS		5.40'	V	V
SHALE, M. GRAY		1.60'	M	M
CLAYSTONE, RED W/OLIVE BANDS		17.20'	V	V
CLAYSTONE, GRAY-GREEN W/RED BANDS		1.60'	V	V
SHALE, M.GRAY, SILTY, MICAEOUS		19.30'	M	M
CLAYSTONE, M. GRAY		8.70'	V	V
LIMESTONE, LIGHT GRAY, HARD		1.20'	S	S
CLAYSTONE, GRAY-GREEN		1.20'	V	V
LIMESTONE, LIGHT GRAY, SILTY		1.50'	S	S
CLAYSTONE, M. GRAY		1.20'	V	V
CLAYSTONE, RED		5.40'	V	V
CLAYSTONE, M. GRAY		3.80'	V	V
SANDSTONE, LIGHT GRAY, SILTY		0.70'	S	S
SHALE, M. GRAY, SANDY		5.20'	M	M
SANDSTONE, LIGHT GRAY, SILTY		0.90'	S	S
SHALE, M. GRAY		4.10'	M	M
LIMESTONE, LIGHT GRAY, HARD		0.50'	S	S
CLAYSTONE, M. GRAY		4.50'	V	V
CLAYSTONE, DRK. GRAY-BLACK		1.00'	V	V
LIMESTONE, LIGHT GRAY, HARD		0.50'	S	S
SHALE, M. GRAY		1.00'	M	M
CLAYSTONE, GREEN/RED, W/LS NODULES		4.20'	V	V
SHALE, M. GRAY		4.80'	M	M
SHALE, DRK. GRAY-BLACK		0.60'	M	M
CLAYSTONE, DRK., GRAY		5.50'	V	V
SHALE, BLK. W/COAL PARTINGS		0.30'	M	M
COAL		0.30'	M	M
SHALE, BLK., CARBONACEOUS		1.50'	M	M
COAL, WASHINGTON (NO 12)		0.85'	M	M
CLAYSTONE, M. GRAY W/LS NODULES		9.95'	V	V
SANDSTONE, LT. GRAY W/THIN SHALE PARTINGS		1.00'	S	S
SHALE, M. GRAY, SILTY		0.30'	M	M
SANDSTONE, MANNINGTON, LT. GRAY		52.50'	S	S
SHALE, M. GRAY		1.40'	M	M
SANDSTONE, LT. GRAY, MICAEOUS		6.60'	S	S
SHALE, BLK.W/COAL PARTINGS		0.40'	M	M
COAL, WAYNESBURG "A"		0.20'	M	M

DRILL HOLE C98-1; CONTINUED

SHALE, DRK.GRAY-BLACK	0.60'	M	M
CLAYSTONE, M. GRAY	0.80'	V	V
LIMESTONE, LIGHT GRAY, SILTY	0.70'	S	S
SHALE, M. GRAY	14.00'	M	M
SANDSTONE, LT. GRAY W/THIN SHALE PARTINGS	1.80'	S	S
SHALE, M. GRAY	3.80'	M	M
SHALE, M. GRAY, SANDY	3.00'	M	M
SHALE, M. GRAY	10.00'	M	M
SHALE, DRK. GRAY	0.70'	M	M
LIMESTONE, LT. GRAY, HARD	0.50'	S	S
SHALE, M. GRAY	7.80'	M	M
LIMESTONE, M. GRAY W/SHALE PARTINGS	1.70'	S	S
SHALE, DRK. GRAY-BLACK	2.70'	M	M
CLAYSTONE, DK. GRAY W/LS NODULES	3.00'	V	V
SHALE, BLACK, CARBONACEOUS	0.30'	M	M
SHALE, M. GRAY, GRADES SANDY	4.70'	M	M
SANDSTONE, LT. GRAY	4.00'	S	S
SHALE, M. GRAY, SANDY	4.20'	M	M
SHALE, M. GRAY	3.70'	M	M
COAL UNIONTOWN (NO. 10)	0.45'	M	M
CLAYSTONE, DK. GRAY	1.05'	V	V
LIMESTONE, M. GRAY W/SHALE PARTINGS	3.20'	S	S
SHALE DK. GRAY	7.20'	M	M
LIMESTONE, LT. GRAY, HARD	1.40	S	S
SHALE, DK. GRAY	0.80'	M	M
LIMESTONE, LT. GRAY, HARD	0.40'	S	S
SHALE, DK. GRAY	0.90'	M	M
SHALE, M. GRAY, CALCAREOUS	3.70'	M	M
LIMESTONE, LT. GRAY, HARD	1.50'	S	S
CLAYSTONE, M. GRAY	2.70'	V	V
LIMESTONE, LT. GRAY, HARD	0.80'	S	S
CLAYSTONE, M. GRAY	1.70'	V	V
LIMESTONE, LT. GRAY, HARD	0.50'	S	S
CLAYSTONE, M. GRAY	1.30'	V	V
LIMESTONE, LT. GRAY, NODULAR	2.10'	S	S
CLAYSTONE, M. GRAY	1.80'	V	V
CLAYSTONE, DK. GRAY	0.70'	V	V
SHALE, M. GRAY-GREEN	3.60'	M	M
SHALE, RED	1.10'	M	M
SHALE, M. GRAY-GREEN	16.00	M	M
LIMESTONE, LT. GRAY, HARD	2.90'	S	S
SHALE, M. GRAY-GREEN	2.10'	M	M
LIMESTONE, LT. GRAY, HARD	0.80'	S	S
SHALE, M. GRAY-GREEN	1.60'	M	M
LIMESTONE, LT. GRAY, HARD, NODULAR	0.70'	S	S
CLAYSTONE, M. GRAY	0.90'	V	V
CLAYSTONE, DK. GRAY	1.10'	V	V
CLAYSTONE, M. GRAY-GREEN, CALCAREOUS	11.90'	V	V
SANDSTONE, LT. GRAY, THIN SHALE PARTINGS	0.50'	S	S
SHALE, M.GRAY, SILTY	1.60'	M	M
SANDSTONE, LT. GRAY, THIN SHALE PARTINGS	0.30'	S	S
SHALE, M. GRAY, SILTY	1.30'	M	M
CLAYSTONE, M. GRAY-GREEN, FLINTY	2.70'	V	V
SHALE, M. GRAY, CALCAREOUS	5.80'	M	M
LIMESTONE, LT. GRAY, HARD	0.70'	S	S
CLAYSTONE, M. GRAY-GREEN	4.50'	V	V
SHALE, M. GRAY, CALCEREOUS	5.90'	M	M
LIMESTONE, LT. GRAY, HARD	1.60'	S	S
SHALE, M. GRAY, CALCEREOUS	11.50'	M	M
LIMESTONE, LT. GRAY, HARD	1.30'	S	S
SHALE, M. GRAY, CALCAREOUS	1.20'	M	M

DRILL HOLE C98-1; CONTINUED

LIMESTONE, M. GRAY, SILTY		5.80'	S	S
SHALE M. GRAY, CALCAREOUS		1.90'	M	M
LIMESTONE, M. GRAY, SILTY		0.90'	S	S
SHALE, M. GRAY, CALCAREOUS		18.70'	M	M
SHALE, DK. GRAY		2.60'	M	M
LIMESTONE, M. GRAY, SILTY		0.30'	S	S
CLAYSTONE, DK. GRAY, CALCITE PARTINGS		1.50'	V	V
LIMESTONE, DK. GRAY, NODULAR		0.40'	S	S
CLAYSTONE, DK. GRAY, CALCITE PARTINGS		0.50'	V	V
LIMESTONE, DK. GRAY, NODULAR		1.20'	S	S
COAL, SEWICKLEY (NO. 9)		0.50'	M	M
SHALE, BK. W/COAL PARTINGS		1.00'	M	M
CLAYSTONE, DK. GRAY		1.40'	V	V
CLAYSTONE, M. GRAY-GREEN		9.00'	V	V
LIMESTONE, MED. GRAY, HARD		0.20'	S	S
CLAYSTONE, M. GRAY		2.00'	V	V
SHALE, M. GRAY, SILTY		5.40'	M	M
CLAYSTONE, M. GRAY		2.40'	V	V
COAL, FISHPOT, BROKEN,		0.40'	M	M
SHALE, BK. W/COAL PARTINGS.		0.30'	M	M
COAL, FISHPOT, BONY		0.25'	M	M
SHALE, M. GRAY		1.05'	M	M
LIMESTONE, M. GRAY, SILTY		1.70'	S	S
SHALE, M. GRAY, CALCAREOUS		4.40'	M	M
LIMESTONE, LT. GRAY, SILTY		2.40'	S	S
SHALE, DK. GRAY		0.50'	M	M
LIMESTONE, LT. GRAY, SITLY		8.00'	S	S
SHALE, M. GRAY W/SS PARTINS		2.90'	M	M
SANDSTONE, LT. GRAY		2.30'	S	S
SHALE, M. GRAY		2.00'	M	M
CLAYSTONE, M. GRAY		4.90'	V	V
SHALE, M. GRAY		0.80'	M	M
LIMESTONE, M. GRAY, SILTY		2.40'	S	S
CLAYSTONE, M. GRAY		2.30'	V	V
COAL, REDSTONE (NO. 8A) BONY		1.24'	M	M
SHALE, DK. GRAY		0.26'	M	M
SANDSTONE, LT. GRAY, SILTY		1.10'	S	S
SHALE, DK. GRAY		1.80'	M	M
LIMESTONE, LT. GRAY, SILTY		3.70'	S	S
CLAYSTONE, M. GRAY		1.00'	V	V
LIMESTONE, LT. GRAY, HARD		9.70'	S	S
CLAYSTONE, M. GRAY		3.90'	V	V
LIMESTONE, M. GRAY, NODULAR, HARD		0.80'	S	S
CLAYSTONE, M. GRAY		1.85'	V	V
SHALE, BLACK		0.40'	M	M
COAL, ROOF COAL, W/BONE PARTINGS		1.47'	M	M
CLAYSTONE, M. GRAY		0.92'	V	V
COAL, PITTSBURGH (NO.8)		4.90'	M	M
CLAYSTONE, M. GRAY, FIRM		0.76'	V	V
LIMESTONE, M. GRAY, HARD		0.80'	S	S
SHALE, M. GRAY, SLITY		2.30'	M	M
LIMESTONE, M. GRAY, HARD		0.50'	S	S
CLAYSTONE, M. GRAY W/LS NODULES		5.10'	V	V

DRILL HOLE C98-1; CONTINUED

Submit the following information for the stratum above the coal Seam, the coal seam, and the stratum below the coal seam.

Stratum	Total Sulfur	Pyrite Marcasite Sulfur	Potential Acidity	Neutral-ization Potential	CaCo3 Deficiency
Claystone					
#8 Coal					
Claystone					

* If other than State Plane, indicate coordinate system.
** Indicate water bearings stratum with an asterisk (*) under the column labeled H20.
*** S-Slightly M-Moderately V-Very

11/89

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION
ATTACHMENT 13
(GEOLOGY REPORT - UNDERGROUND WORKINGS)

Applicant BENNOC, INC.
*Coordinates X. 2,399,500.291 Y. 684,636.627

Drill Hole# C98-2
Surface Elevation 1260.07

Lithology	H2O **	Thickness	Physical Properties **** Compatibility	Erodibility
Topsoil				
Subsoil				
NON-CORING		20.00		
CLAYSTONE,M.GRAY,FE-STAIN JOINTS 20-22.2	*	14.30	V	V
CLAYSTONE, RED 2/GRAY BANDS		0.70	V	V
CLAYSTONE, M. GRAY		1.85	V	V
CLAYSTONE, RED W/GRAY BANDS		0.90	V	V
CLAYSTONE, M.GRAY CARBONACEOUS BOTT.0.2'		1.45	V	V
LIMESTONE, L. GRAY, NODULAR W/CS PARTING		0.60	S	S
CLAYSTONE M. GRAY		1.80	V	V
LIMESTONE, M. GRAY, SILTY		1.40	S	S
SHALE, M. GRAY		1.00	M	M
LIMESTONE, L. GRAY, NODULAR, HARD		1.95	S	S
CLAYSTONE, M. GRAY		0.70	V	V
LIMESTONE, L. GRAY, NODULAR, HARD		1.10	S	S
CLAYSTONE, M. GRAY-GREEN		1.20	V	V
CLAYSTONE, RED		3.55	V	V
CLAYSTONE, M. GRAY-GREEN		1.60	V	V
SANDSTONE, M. GRAY, SILTY		3.05	S	S
SHALE, M. GRAY, SILTY W/SS PTGS.		7.95	M	M
CLAYSTONE, RED W/GRAY STREAKS		1.05	V	V
SHALE, M. GRAY		2.20	M	M
SHALE, RED		1.20	M	M
CLAYSTONE, M. GRAY W/LS NODULES		2.00	V	V
LIMESTONE, M. GRAY, NODULAR, HARD		0.85	S	S
CLAYSTONE, DARK GRAY		0.60	V	V
SHALE, BLACK, CARBONACEOUS		0.10	M	M
CLAYSTONE, M. GRAY W/OCC. LS NODULES		2.30	V	V
LIMESTONE, L. GRAY, NODULAR, HARD		0.95	S	S
SHALE, BLACK, CARBONACEOUS		0.45	M	M
CLAYSTONE, M. GRAY		8.05	V	V
SHALE, BLACK, CARBONACEOUS		1.35	M	M
COAL W/BONE PTGS. WASHINGTON (NO.12)		0.87	M	M
CLAYSTONE, M.GRAY W/OCC. RED STREAKS		19.93	V	V
SHALE, M.GRAY W/OCC.SS PTG, GRADES SANDY		12.60	M	M
SANDSTONE, MANNINGTON,L..GRAY, MICACEOUS,		22.15	S	S
MED.GRAINED TO 130 COARSE GRAIN 130-141'			M	M
SHALE, M. GRAY		5.45	M	M
COAL, WAYNESBURG "A"		0.72	M	M
CLAYSTONE, M. GRAY		6.38	V	V
SHALE, M. GRAY, SILTY		6.50	M	M
SANDSTONE, M. GRAY, SILTY		1.55	S	S
SHALE, M. GRAY, SILTY		12.35	M	M
LIMESTONE, M. GRAY, SILTY		0.55	S	S
CLAYSTONE, M. GRAY W/OCC. LS NODULES		3.55	V	V
SHALE, M. GRAY W/OCC. LS NODULES		8.60	M	M
SANDSTONE, M. GRAY, SILTY		2.15	S	S
SHALE, M. GRAY, SILTY		2.20	M	M
SHALE, BLACK W/COAL PARTINGS		0.25	M	M
COAL, WAYNESBURG (NO. 11)		1.45	M	M

DRILL HOLE C98-2; CONTINUED

SHALE, BLACK, CARBONACEOUS		1.00	M	M
SANDSTONE, M. GRAY, SILTY		1.05	S	S
SHALE, M. GRAY, SILTY		3.50	M	M
SANDSTONE, M. GRAY, SILTY		1.20	S	S
SHALE, M.GRAY W/OCC.SS PTGS.GRADES SANDY		12.20	M	M
COAL, LITTLE WAYNESBURG		0.15	M	M
SHALE, BLACK W/COAL PARTINGS		0.20	M	M
CLAYSTONE, DARK GRAY		1.50	V	V
LIMESTONE, M. GRAY, NODULAR, HARD		0.40	S	S
CLAYSTONE, DARK GRAY		0.70	V	V
LIMESTONE, M. GRAY, NODULAR, HARD		0.70	S	S
CLAYSTONE, M. GRAY-GREEN W/LS NODULES		2.20	V	V
LIMESTONE, L.GRAY, NODULAR W/CS PARTINGS		3.85	S	S
CLAYSTONE, M. GRAY-GREEN		8.30	V	V
SHALE, M. GRAY-GREEN		6.35	M	M
SHALE, BLACK, CARBONACEOUS		0.15	M	M
COAL		0.47	M	M
SHALE, M. GRAY		0.53	M	M
COAL		0.10	M	M
CLAYSTONE, M. GRAY		1.65	V	V
SHALE, M. GRAY		0.15	M	M
COAL, UNIONTOWN (NO.10) W/SHALE PARTINGS		1.31	M	M
CLAYSTONE, M. GRAY, GRADES SANDY		2.59	V	V
SHALE, M. GRAY, SANDY		1.40	M	M
SHALE, M. GRAY		3.00	M	M
SANDSTONE, L..GRAY, W/THIN SHALE PARTINGS		0.25	S	S
SHALE, M. GRAY W/SS PARTINGS		0.35	M	M
SHALE, M. GRAY		1.95	M	M
SHALE, DARK GRAY-BLACK		0.20	V	V
CLAYSTONE, M. GRAY W/LS NODULES		3.25	V	V
CLAYSTONE, M.GRAY W/LS NODULES & RED STREAKS		0.90	V	V
CLAYSTONE, M. GRAY W/LS NODULES		2.60	V	V
CLAYSTONE, RED		0.76	V	V
CLAYSTONE, M.GRAY W/LS NODULES & RED STREAKS		3.35	V	V
SHALE, M. GRAY W/OCC. THIN SS PARTINGS		5.60	M	M
SANDSTONE, L. GRAY CALCAREOUS		0.50	S	S
LIMESTONE, L. GRAY, HARD		0.30	S	S
SHALE, M. GRAY		1.20	M	M
LIMESTONE, L. GRAY, HARD, NODULAR		1.00	S	S
SHALE, M. GRAY		0.40	M	M
LIMESTONE, L. GRAY, HARD, NODULAR		1.40	S	S
SHALE, M. GRAY		1.00	M	M
LIMESTONE, L. GRAY, HARD, NODULAR		3.30	S	S
CLAYSTONE, M. GRAY W/LS NODULES		4.00	V	V
LIMESTONE, L. GRAY, HARD, NODULAR		2.60	S	S
SHALE, M. GRAY-GREEN		4.40	M	M
LIMESTONE, L. GRAY, HARD, NODULAR		1.50	S	S
CLAYSTONE, M. GRAY-GREEN W/LS NODULES		14.45	V	V
SHALE, M-DARK GRAY		0.40	M	M
LIMESTONE, L. GRAY, HARD		2.40	S	S
CLAYSTONE, M. GRAY-GREEN W/LS NODULES		4.95	V	V
LIMESTONE, L. GRAY, HARD		1.70	S	S
SHALE, M. GRAY		3.90	M	M
LIMESTONE, L. GRAY, HARD		5.20	S	S
SHALE, M. GRAY		0.45	M	M
LIMESTONE, L. GRAY, HARD		2.80	S	S
SHALE, M. GRAY-GREEN, CALCAREOUS		6.15	M	M
LIMESTONE, M. GRAY W/SHALE PARTINGS		4.80	S	S
CLAYSTONE, M. GRAY		1.30	V	V
CLAYSTONE, DARK GRAY		1.00	V	V
CLAYSTONE, M. GRAY		1.80	V	V

DRILL HOLE C98-2; CONTINUED

SHALE, BLACK, CARBONACEOUS	0.30	M	M
CLAYSTONE, DARK GRAY	2.50	V	V
CLAYSTONE, M. GRAY	14.60	V	V
SANDSTONE, L. GRAY	0.40	S	S
SHALE, M. GRAY, SANDY	4.40	M	M
SANDSTONE, L. GRAY	0.60	S	S
SHALE, M. GRAY, SANDY	0.95	M	M
SANDSTONE, **SEWICKLEY**, L.GRAY, MICACEOUS,	23.35	S	S
M.GRAINED TO 371',COARSE GRAINED TO 388'			
SHALE, BLACK, CARBONACEOUS	0.25	M	M
COAL, SEWICKLEY (NO. 9) BONY W/PYRITE	0.45	M	M
CLAYSTONE, DARK GRAY	0.60	V	V
LIMESTONE, M. GRAY-BROWN, FLINTY	14.40	S	S
CLAYSTONE, M. GRAY-GREEN W/LS NODULES	14.30	V	V
CLAYSTONE, BLACK, CARBONACEOUS	0.70	V	V
SHALE, M. GRAY-GREEN, GRADES SANDY	4.40	M	M
SHALE, M. GRAY-GREEN W/SS PARTINGS	2.50	M	M
SHALE, M. GRAY, SILTY	6.50	M	M
SANDSTONE, **PITTSBURGH**, L.GRAY,MICACEOUS,	22.70	S	S
M-COARSE GRAINED W/MASSIVE TEXTURE TO 443			
COARSE GRAIN W/OOC. SH & COAL PTGS. TO 454'			
SHALE, M. GRAY	0.40	M	M
SANDSTONE,L.GRAY, COARSE GRAINED W/COAL STKS	5.55	S	S
SHALE, M. GRAY	0.40	M	M
SANDSTONE,L.GRAY,COARSE GRAINED W/COAL STKS.	3.40	S	S
SHALE, BLACK, CARBONACEOUS	0.10	M	M
SANDSTONE,L.GRAY COARSE GRAINED W/COAL STKS.	1.65	S	S
SANDSTONE,L.GRAY,M-CRA GRAIN, MASSIVE TEXTURE	6.60	S	S
SHALE, M. GRAY, SILTY W/SS PTGS.	2.55	M	M
COAL, PITTSBURGH (NO. 8)	4.00	M	M
SHALE, DARK GRAY, CALCAREOUS, HARD	4.20	M	M
LIMESTONE, M. GRAY, HARD	1.05	S	S
CLAYSTONE, M. GRAY W/LS NODULES	5.70	V	V
SANDSTONE, L. GRAY, MED. GRAINED	4.40	S	S
SHALE, M. GRAY W/OCC. CLAY PTGS.	10.00	M	M
CLAYSTONE, M. GRAY	0.80	V	V
SHALE, M. GRAY	0.65	M	M
CLAYSTONE, RED	3.35	V	V
CLAYSTONE, M. GRAY	1.25	V	V
CLAYSTONE, RED	0.40	V	V
CLAYSTONE, DARK GRAY	0.40	V	V
LIMESTONE, L. GRAY, HARD	3.00	S	S
SHALE, M. GRAY, CALCAREOUS	1.25	M	M
CLAYSTONE, M. GRAY-OLIVE W/OCC.RED STKS.	3.70	V	V
CLAYSTONE, RED	6.70	V	V
CLAYSTONE, M. GRAY-GREEN	2.50	V	V
CLAYSTONE, RED	8.30	V	V
CLAYSTONE, M. GRAY-GREEN W/LS NODULES	1.40	V	V

DRILL HOLE C98-2; CONTINUED

Submit the following information for the stratum above the coal Seam, the coal seam, and the stratum below the coal seam.

Stratum	Total Sulfur	Pyrite Marcasite Sulfur	Potential Acidity	Neutral-ization Potential	CaCo3 Deficiency

* If other than State Plane, indicate coordinate system.
** Indicate water bearings stratum with an asterisk (*) under the column labeled H20.
*** S-Slightly M-Moderately V-Very

11/89

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION
ATTACHMENT 13
(GEOLOGY REPORT - UNDERGROUND WORKINGS)

Applicant BENNOC, INC. Drill Hole# C98-3
*Coordinates X. 2,408,886.602 Y. 689,901.337 Surface Elevation 1246.29

Lithology	H2O **	Thickness	Physical Properties **** Compatibility	Erodibility
Topsoil				
Subsoil				
NON-CORING		20.00		
SANDSTONE,TAN & I. GRAY, MICACEOUS, MED.	*	22.50	S	S
GRAINED, AQUIFER FRACTURES @ 26.5'& 42-42.5'				
SHALE, MEDIUM GRAY		4.85	M	M
SANDSTONE, L. GRAY, MEDIUM GRAINED		4.35	S	S
CLAYSTONE, M. GRAY		0.50	V	V
LIMESTONE, L. GRAY, HARD, NODULAR		0.30	S	S
CLAYSTONE, MED. GRAY W/RED BANDS		3.80	V	V
LIMESTONE, L.GRAY, HARD, NODULAR W/RED CS PT		2.10	S	S
CLAYSTONE, RED		13.00	V	V
CLAYSTONE, GRAY & GREEN W/LS NODULES		1.60	V	V
LIMESTONE, L.GRAY, HARD, NODULAR W/GRAY CS P		2.50	S	S
CLAYSTONE, GRAY & GREEN W/LS NODULES		3.75	V	V
SANDSTONE, L. GRAY, SILTY		4.50	S	S
SHALE, M. GRAY W/OCC., SLICKENSIDES		5.65	M	M
CLAYSTONE, MED. GRAY W/RED BANDS		2.50	V	V
SHALE, M. GRAY		6.25	M	M
CLAYSTONE, MED. GRAY W/RED BANDS		2.70	V	V
CLAYSTONE, MED. GRAY W/LS NODULES		3.85	V	V
LIMESTONE, L. GRAY, NODULAR, HARD		0.65	S	S
CLAYSTONE, MED. GRAY W/LS NODULES		2.15	V	V
LIMESTONE, L. GRAY, NODULAR, HARD		1.20	S	S
CLAYSTONE, MED. GRAY W/LS NODULES		3.00	V	V
CLAYSTONE, RED		1.60	V	V
CLAYSTONE, MED. GRAY W/LS NODULES		4.50	V	V
SHALE, M. GRAY W/OCC, SS STKS & LS NODULES		9.50	M	M
SHALE, DARK GRAY		5.20	M	M
SHALE, BLACK W/COAL PARTINGS		0.10	M	M
COAL, **WASHINGTON (NO. 12)** UPPER SPLIT		0.70	M	M
SHALE, BLACK, CARBONACEOUS		0.13	M	M
COAL, **WASHINGTON (NO. 12)** UPPER SPLIT		0.72	M	M
SHALE, M. GRAY, GRADES SANDY		2.05	M	M
LIMESTONE, L. GRAY, NODULAR, HARD		0.75	S	S
SHALE, DARK GRAY-BLACK		1.25	M	M
LIMESTONE, L. GRAY, NODULAR, HARD		0.50	S	S
CLAYSTONE, MED. GRAY W/LS NODULES		9.65	V	V
SHALE, BLACK, CARBONACEOUS		0.80	M	M
COAL, **WASHINGTON (NO. 12)**, LOWER SPLIT		0.60	M	M
SHALE, BLACK W/COAL PARTINGS		0.57	M	M
COAL, **WASHINGTON (NO. 12)**, LOWER SPLIT		0.47	M	M
CLAYSTONE, M. GRAY W/LS NODULES		15.76	V	V
SHALE, M. GRAY-GREEN, SANDY		0.40	M	M
SHALE, M. GRAY-GREEN		3.95	M	M
SANDSTONE, M. GRAY, SILTY		0.40	S	S
SHALE, M. GRAY-GREEN, SANDY		6.20	M	M
SANDSTONE,L.GRAY-WHITE,MICAEOUS,M/OR GRAINED		8.60	S	S
SHALE, M. GRAY-GREEN, SANDY		0.80	M	M
SANDSTONE, L.GRAY, MICAEOUS, MED.GRAINED		1.40	S	S

DRILL HOLE C98-3; CONTINUED

SHALE, M. GRAY-GREEN, SANDY		0.90	M	M
SANDSTONE, MANNINGTON, L. GRAY-WHITE, MICAEOUS, MED.-COARSE GRAINED		50.70	S	S
COAL, **WAYNESBURG** "A"		0.20	M	M
SANDSTONE, L. GRAY, MED. GRAINED		0.40	S	S
COAL, BONY **WAYNESBURG "A"**		0.15	M	M
SANDSTONE, L. GRAY, MED.GRAINED CONGLOMERATE		2.35	S	S
SHALE, M. GRAY, SANDY W/SS PTGS.		4.90	M	M
SHALE, M. GRAY		7.60	M	M
SHALE, DARK GRAY W/LS NODULES		0.95	M	M
LIMESTONE, L. GRAY, HARD, NODULAR		2.00	S	S
SHALE, M. GRAY		4.30	M	M
CLAYSTONE, M. GRAY W/LS NODULES		4.65	V	V
SHALE, M. GRAY		3.40	M	M
SHALE, BLACK, CARBONACEOUS W/PYRITE		0.55	M	M
COAL, **WAYNESBURG (NO. 11)**		1.15	M	M
CLAYSTONE, M. GRAY		0.90	V	V
SHALE, M. GRAY		9.70	M	M
SANDSTONE, L. GRAY, MED. GRAINED		0.25	S	S
SHALE, M. GRAY		3.85	M	M
SHALE, DARK GRAY-BLACK		1.45	M	M
LIMESTONE, M. GARY W/SHALE PARTINGS		5.45	S	S
CLAYSTONE, M. GRAY		4.05	V	V
LIMESTONE, M. GRAY W/SHALE PARTINGS		3.10	S	S
SHALE, M. GRAY, CALCAREOUS		3.85	M	M
CLAYSTONE, M. GRAY		5.20	V	V
LIMESTONE, L. GRAY, HARD, NODULAR		2.45	S	S
CLAYSTONE, M. GRAY W/LS NODULES		3.20	V	V
SHALE, M. GRAY, CALCAREOUS		9.05	M	M
LIMESTONE, L. GRAY, HARD, NODULAR		0.60	S	S
SHALE, M. GRAY, CALCAREOUS		3.20	M	M
LIMESTONE, L. GRAY, HARD, NODULAR		0.40	S	S
SHALE, M. GRAY, CALCAREOUS, GRADES SANDY		4.60	M	M
SANDSTONE, L. GRAY W/THIN SHALE PTGS.		4.25	S	S
SHALE, M. GRAY		2.75	M	M
LIMESTONE, L. GRAY, NODULAR		0.95	S	S
SHALE, M. GRAY		0.70	M	M
LIMESTONE, L. GRAY, NODULAR		0.55	S	S
SHALE, M. GRAY		1.65	M	M
LIMESTONE, L. GRAY, NODULAR		0.90	S	S
SHALE, M. GRAY, CALCAREOUS		2.55	M	M
LIMESTONE, L. GRAY, HARD		1.50	S	S
SHALE, M. GRAY, CALCAREOUS		0.50	M	M
LIMESTONE, L. GRAY, HARD		1.65	S	S
SHALE, M. GRAY, CALCAREOUS		4.25	M	M
LIMESTONE, L. GRAY, HARD, NODULAR		1.20	S	S
SHALE, M. GRAY, GRADES SANDY		2.80	M	M
SANDSTONE, L. GRAY W/THIN SHALE PTGS.		0.45	S	S
CLAYSTONE, M. GRAY-OLIVE		3.15	V	V
CLAYSTONE, RED		0.90	V	V
CLAYSTONE, M. GRAY-GREEN		1.60	V	V
LIMESTONE, L. GRAY, HARD, NODULAR		0.50	S	S
SHALE, M. GRAY		6.60	M	M
LIMESTONE, L. GRAY, HARD, NODULAR		0.60	S	S
CLAYSTONE, M. GRAY-GREEN		10.30	V	V
LIMESTONE, L. GRAY, HARD		3.80	S	S
SHALE, M. GRAY		1.00	M	M
LIMESTONE, M. GRAY, HARD, NODULAR		1.00	S	S
SHALE, M. GRAY-GREEN		12.10	M	M
LIMESTONE, L. GRAY, HARD		5.90	S	S
SHALE, M. GRAY		0.65	M	M

DRILL HOLE C98-3; CONTINUED

LIMESTONE, M. GRAY W/SHALE PARTINGS		1.45	S	S
SHALE, M. GRAY		0.40	M	M
LIMESTONE, L. GRAY, HARD		1.05	S	S
SHALE, M. GRAY		6.60	M	M
LIMESTONE, L. GRAY, HARD		3.40	S	S
SHALE, M. GRAY, CALCAREOUS		7.15	M	M
CLAYSTONE, DARK GRAY-BLACK		3.10	V	V
SHALE, BLACK, CARBONACEOUS		0.25	M	M
COAL, **SEWICKLEY (NO.9)** W/BONE & SHALE PT		2.75	M	M
SHALE, BLACK W/COAL PARTINGS		2.00	M	M
CLAYSTONE, M. GRAY		1.40	V	V
SHALE, M. GRAY W/THIN SS PTGS UPPER 2'		12.80	M	M
SHALE, BLACK		0.15	M	M
CLAYSTONE, DARK GRAY		0.40	V	V
SHALE BLACK		0.15	M	M
SHALE, DARK GRAY		0.40	V	V
COAL, **FISHPOT**, BROKEN		2.90	M	M
SHALE, DARK GRAY		1.00	M	M
LIMESTONE, M. GRAY, SILTY		2.00	S	S
CLAYSTONE, M. GRAY		0.50	V	V
LIMESTONE, M. GRAY, SILTY		5.50	S	S
SHALE, DARK GRAY		0.50	V	V
SHALE, M. GRAY, CALCAREOUS, FLINTY		3.90	M	M
LIMESTONE, L. GRAY, HARD		4.65	S	S
SHALE, M. GRAY		9.85	M	M
LIMESTONE, L. GRAY, HARD		3.45	S	S
SHALE, M. GRAY		0.40	M	M
CLAYSTONE, M. GRAY W/LS NODULES		2.45	V	V
SHALE, BLACK		0.30	M	M
SHALE, M. GRAY-GREEN, CALCAREOUS		1.40	M	M
LIMESTONE, M. GRAY W/SHALE PARTINGS		6.90	S	S
SHALE, M. GRAY W/LS NODULES		2.15	M	M
LIMESTONE, M. GRAY W/SHALE PARTINGS		7.85	S	S
CLAYSTONE, M. GRAY		2.05	V	V
LIMESTONE, M. GRAY, NODULAR, HARD		0.50	S	S
CLAYSTONE, M. GRAY		1.10	V	V
LIMESTONE, M. GRAY, NODULAR, HARD		0.55	S	S
CLAYSTONE, M. GRAY		0.70	V	V
LIMESTONE, M. GRAY, NODULAR, HARD		0.25	S	S
CLAYSTONE, M. GRAY W/THIN BL SHALE PTGS		3.30	V	V
SHALE, BLACK		0.17	M	M
COAL, **ROOF COAL** W/BONE PARTINGS		0.93	M	M
CLAYSTONE, M. GRAY-BROWN		0.90	V	V
SHALE, BLACK		0.56	M	M
COAL, **PITTSBURGH (NO. 8)**		5.35	M	M
SHALE, M. GRAY, FIRM		0.46	M	M
LIMESTONE, M. GRAY, HARD		0.50	S	S
SHALE, M. GRAY, SILTY		1.35	M	M
LIMESTONE, M. GRAY, HARD		1.50	S	S
SHALE, M. GRAY, SILTY		2.90	M	M
LIMESTONE, M. GRAY, HARD		0.60	S	S
CLAYSTONE, M. GRAY		2.20	V	V

DRILL HOLE C98-3; CONTINUED

Submit the following information for the stratum above the coal Seam, the coal seam, and the stratum below the coal seam.

Stratum	Total Sulfur	Pyrite Marcasite Sulfur	Potential Acidity	Neutral-ization Potential	CaCo3 Deficiency

* If other than State Plane, indicate coordinate system.
** Indicate water bearings stratum with an asterisk (*) under the column labeled H20.
*** S-Slightly M-Moderately V-Very

11/89

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION
ATTACHMENT 13
(GEOLOGY REPORT - UNDERGROUND WORKINGS)

Applicant BENNOC, INC. Drill Hole# C98-4

*Coordinates X. 2,420,869.926 Y. 685,679.331 Surface Elevation 964.66

Lithology	H2O **	Thickness	Physical Properties **** Compatibility	Erodibility
Topsoil				
Subsoil				
NON-CORING		9.00		
SANDSTONE, I.GRAY,MED. GRAINED, MICAEOUS				
JOINED, MANNINGTON		0.60	S	S
CLAYSTONE, M. GRAY, SILTY		0.25	V	V
SHALE, M. GRAY, SANDY S		4.15	M	M
SANDSTONE, L.GRAY, MED. GRAINED MICAEOUS		0.55	S	S
SHALE, M. GRAY, SANDY W/LS NODULES		2.60	M	M
CLAYSTONE, GRAY-GREEN		3.60	V	V
LIMESTONE, MED. GRAY, NODULAR, HARD		0.45	S	S
CLAYSTONE, GRAY-GREEN		1.90	V	V
LIMESTONE, MED. GRAY, NODULAR, HARD		0.70	S	S
CLAYSTONE, GRAY-GREEN		2.95	V	V
CLAYSTONE, DARK GRAY- BLACK		1.10	V	V
CLAYSTONE, MED.-DARK GRAY		1.75	V	V
SHALE, DARK GRAY-BLACK		0.15	M	M
SHALE, M. GRAY, GRADES SANDY		5.95	M	M
SANDSTONE, L. GRAY, SILTY, MICAEOUS		3.20	S	S
SHALE, M. GRAY		3.80	M	M
SHALE, M. GRAY, GRADES SANDY		1.30	M	M
SANDSTONE, L. GRAY W/THIN SHALE PTGS.		1.60	S	S
SHALE, BLACK, CARBONACEOUS		0.60	M	M
UNIONTOWN NO. 10 HORIZON				
CLAYSTONE, M. GRAY		2.30	V	V
LIMESTONE, L. GRAY, NODULAR W/CS PTGS.		2.00	S	S
CLAYSTONE, M. GRAY - OLIVE		4.40	V	V
LIMESTONE, L. GRAY, NODULAR		0.70	S	S
CLAYSTONE, M. GRAY		1.90	V	V
LIMESTONE, L. GRAY, NODULAR, HARD		1.85	S	S
CLAYSTONE, MED. GRAY W/LS NODULES		5.40	V	V
LIMESTONE, L. GRAY, NODULAR, HARD		1.00	S	S
CLAYSTONE, M. GRAY		1.00	V	V
LIMESTONE, L. GRAY, NODULAR, HARD		0.40	S	S
CLAYSTONE, MED. GRAY W/LS NODULES		6.45	V	V
LIMESTONE, L. GRAY, NODULAR W/CS PTGS.		2.70	S	S
CLAYSTONE, MED. GRAY W/LS NODULES		4.40	V	v
SANDSTONE, L. GRAY, SILTY, MICAEOUS		1.80	S	S
SHALE, M. GRAY-GREEN		1.70	M	M
SHALE, RED		0.45	M	M
SHALE, M. GRAY - GREEN		0.45	M	M
SHALE, RED		0.90	M	M
SHALE, M. GRAY		1.90	M	M
LIMESTONE, L. GRAY, NODULAR, HARD		0.65	S	S
CLAYSTONE, MED. GRAY W/LS NODULES		6.65	V	V
LIMESTONE, L. GRAY, NODULAR, HARD		1.15	S	S
CLAYSTONE, GRAY - GREEN		0.45	V	V
SHALE, M. GRAY		0.70	M	M
SANDSTONE, L. GRAY, MICAEOUS, SILTY		1.00	S	S
SHALE, M. GRAY, SANDY		0.50	M	M

DRILL HOLE C98-4; CONTINUED

SHALE, M. GRAY		1.80	M	M
LIMESTONE, L. GRAY, NODULAR, HARD		1.25	S	S
SHALE, M. GRAY, CALCAREOUS		2.35	M	M
LIMESTONE, L. GRAY, NODULAR, HARD		0.80	S	S
SHALE, M. GRAY		2.50	M	M
LIMESTONE, L. GRAY, NODULAR, HARD		3.10	S	S
CLAYSTONE, GRAY & RED		0.50	V	V
LIMESTONE, MED. GRAY, NODULAR, HARD		0.40	S	S
SHALE, M. GRAY		3.50	M	M
CLAYSTONE, GRAY-GREEN		5.20	V	V
SANDSTONE, L. GRAY, MICAEOUS, SILTY		7.30	S	S
CLAYSTONE, M. GRAY		5.60	V	V
LIMESTONE, L. GRAY, NODULAR, HARD		0.70	S	S
CLAYSTONE, M. GRAY		0.50	V	v
LIMESTONE, L. GRAY, NODULAR, HARD		0.45	S	S
CLAYSTONE, GRAY-GREEN		4.70	V	V
SHALE, M. GRAY-GREEN		3.90	M	M
LIMESTONE, L. GRAY, NODULAR, HARD		0.70	S	S
SHALE, M. GRAY-GREEN		6.95	M	M
LIMESTONE, L. GRAY, NODULAR, HARD		2.10	S	S
SHALE, M. GRAY W/LS NODULES		2.70	M	M
LIMESTONE, L. GRAY, NODULAR, HARD		0.60	S	S
SHALE, M. GRAY-GREEN W/LS NODULES		6.70	M	M
LIMESTONE, L. GRAY, HARD		5.70	S	S
SHALE, M. GRAY		11.60	M	M
LIMESTONE,L.GRAY, NODULAR, HARD W/OCC.CS PTS		5.50	S	S
SHALE, M. GRAY W/LS NODULES		6.10	M	M
CLAYSTONE, DARK GRAY		1.35	V	V
SHALE, BLACK W/COAL PARTINGS		0.30	M	M
COAL SEWICKLEY (NO.9) W/BONE PTGS.		1.30	M	M
CLAYSTONE, DARK GRAY		2.00	V	V
SHALE, M. GRAY, SANDY		1.70	M	M
SANDSTONE, L. GRAY, MICAEOUS, SILTY		1.70	S	S
SHALE, M. GRAY		4.40	M	M
SHALE, M. GRAY, SANDY		0.80	M	M
SHALE, M. GRAY		0.55	M	M
LIMESTONE, MED. GRAY, NODULAR, HARD		0.50	S	S
SHALE, M. GRAY		2.85	M	M
SANDSTONE, L.GRAY, MICAEOUS, SILTY W/SH PTGS		4.10	S	S
SHALE, M. GRAY		7.75	M	M
COAL FISHPOT.		3.25	M	M
SHALE, BLACK W/COAL PARTING		0.10	M	M
SHALE, DARK GRAY		0.55	M	M
LIMESTONE, L. GRAY, HARD		2.70	S	S
SHALE, DARK GRAY		0.25	M	M
LIMESTONE, L. GRAY, HARD W/OCC. SHALE PTGS		12.95	S	S
CLAYSTONE, M. GRAY-GREEN W/LS NODULES		2.10	V	V
LIMESTONE, L. GRAY, HARD		0.60	S	S
CLAYSTONE, M. GRAY-GREEN W/LS NODULES		4.60	V	V
SANDSTONE, L.GRAY, MICAEOUS, SILTY W/SH PTGS		0.50	S	S
SHALE, M. GRAY		1.85	M	M
LIMESTONE, M. GRAY, NODULAR, HARD		0.25	S	S
SHALE, M. GRAY		3.50	M	M
LIMESTONE, L. GRAY, NODULAR, HARD		2.80	S	S
CLAYSTONE, M. GRAY-GREEN		2.50	V	V
SHALE, BLACK W/COAL PARTINGS & PYRITE		0.42	M	M
COAL, REDSTONE (8A)		1.20	V	V
SHALE, BLACK W/COAL PARTING & PYRITES		1.18	M	M
LIMESTONE, L. GRAY, NODULAR, HARD		5.05	S	S
SHALE, DARK GRAY		0.75	V	V
LIMESTONE, M. GRAY, NODULAR, HARD		1.85	S	S

DRILL HOLE C98-4; CONTINUED

SHALE, DARK GRAY		0.55	V	V
LIMESTONE, M. GRAY, NODULAR, HARD		1.00	S	S
SHALE, DARK GRAY		0.40	V	V
LIMESTONE, M. GRAY, NODULAR, HARD		2.70	S	S
CLAYSTONE, M. GRAY-GREEN W/ABUND. LS NODS.		2.55	V	V
LIMESTONE, MED. GRAY, HARD		0.65	S	S
CLAYSTONE, M. GRAY-GREEN		0.65	V	V
LIMESTONE, MED. GRAY, HARD		1.00	S	S
CLAYSTONE, M. GRAY-GREEN		4.75	V	V
COAL, ROOF COAL, BONY		0.80	M	M
SHALE, BLACK		0.25	M	M
CLAYSTONE, M. GRAY-BROWN		0.55	V	V
COAL PITTSBURGH(NO.8), BONY BOTT. 0.1"		5.30	M	M
CLAYSTONE, M. GRAY, FIRM		0.60	V	V
SHALE, DARK GRAY		0.10	V	V
LIMESTONE, M. GRAY, HARD		1.70	S	S
CLAYSTONE, M. GRAY W/LS NODULES		4.50	V	V
SANDSTONE, L. GRAY WITHIN SHALE PTGS.		2.20	S	S
SHALE, M. GRAY W/THIN SS PTGS.		2.30	M	M

Submit the following information for the stratum above the coal Seam, the coal seam, and the stratum below the coal seam.

Stratum	Total Sulfur	Pyrite Marcasite Sulfur	Potential Acidity	Neutral-ization Potential	CaCo3 Deficiency

* If other than State Plane, indicate coordinate system.
** Indicate water bearings stratum with an asterisk (*) under the column labeled H20.
*** S-Slightly M-Moderately V-Very

11/89

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION
ATTACHMENT 13
(GEOLOGY REPORT - UNDERGROUND WORKINGS)

Applicant BENNOC, INC. Drill Hole# C98-5
*Coordinates X. 2,417,198.406 Y. 692,676.852 Surface Elevation 1258.06

Lithology	H2O **	Thickness	Physical Properties **** Compatibility	Erodibility
Topsoil				
Subsoil				
NON-CORING		11.50		
CLAYSTONE, RED		1.50	V	V
SANDSTONE, TAN, JOINTED W/FE-STAINS @ 13-14'	*	11.30	S	S
CLAYSTONE, M. GRAY W/FE-STAINED JOINTS	*	1.50	V	V
CLAYSTONE, RED W/GRAY BANDS		1.60	V	V
CLAYSTONE, M. GRAY, GRADES SANDY		7.60	V	V
SANDSTONE, L. GRAY-WHITE, W/FE-STAINED PTGS.	*	1.80	S	S
CLAYSTONE, M. GRAY		0.50	V	V
CLAYSTONE, RED		2.00	V	V
CLAYSTONE, M. GRAY		2.40	V	V
CLAYSTONE, RED		1.90	V	V
CLAYSTONE, M. GRAY W/RED STREAKS		7.30	V	V
SHALE, RED		1.60	M	M
CLAYSTONE, M.GRAY W/LS NODULES BOTTOM 1'		2.60	V	V
LIMESTONE, L. GRAY, NODULAR		0.50	S	S
CLAYSTONE, M. GRAY W/LS NODULES		1.95	V	V
SHALE, M. GRAY		1.80	M	M
SANDSTONE, L. GRAY, SILTY		0.45	S	S
SHALE, M. GRAY		8.00	M	M
SHALE, RED		1.35	M	M
SHALE, M. GRAY		1.90	M	M
LIMESTONE, M. GRAY, NODULAR		0.95	S	S
CLAYSTONE, M. GRAY-OLIVE		4.85	V	V
SHALE, M. GRAY, SANDY		17.75	M	M
CLAYSTONE, DARK GRAY-OLIVE		0.60	V	V
CLAYSTONE, M. GRAY W/OCC. LS NODULES		6.40	V	V
CLAYSTONE, RED W/GRAY STREAKS		5.70	V	V
CLAYSTONE, M. GRAY		2.20	V	V
LIMESTONE, L. GRAY, NODULAR W/SHALE PTG.		1.75	S	S
CLAYSTONE, M. GRAY		2.90	V	V
CLAYSTONE, RED		7.85	V	V
CLAYSTONE, M. GRAY W/LS NODULES & RED STKS.		2.65	V	V
CLAYSTONE, M. GRAY W/RED STREAKS		4.00	V	V
SHALE, M. GRAY		13.55	M	M
SHALE, RED		0.60	M	M
CLAYSTONE, M. GRAY-OLIVE		5.50	V	V
LIMESTONE, L. GRAY, NODULAR W/CS PTGS.		3.80	S	S
CLAYSTONE, M. GRAY-GREEN		5.90	V	V
SHALE, M. GRAY, GRADES SANDY		4.35	M	M
SANDSTONE,L.GRAY,MICACEOUS,MED.GRAINED,SHALY		1.65	S	S
SHALE, M. GRAY, SILTY WITHIN SS PARTINGS		1.00	M	M
SANDSTONE,L.GRAY, MICAEOUS W/OCC. SHALE PTGS		11.85	S	S
SHALE, M. GRAY, SILTY WITHIN SS PARTINGS		2.50	M	M
SANDSTONE,L.GRAY, MICACEOUS W/OCC.SHALE PTGS		0.50	S	S
SHALE, M. GRAY, SANDY		1.10	M	M
SHALE, M. GRAY		5.20	M	M
SHALE, BLACK, CARBONACEOUS		0.65	M	M
LIMESTONE, M. GRAY, NODULAR		0.35	S	S

DRILL HOLE C98-5; CONTINUED

SHALE, M. GRAY, CALCAREOUS		1.65	M	M
CLAYSTONE, M. GRAY		1.65	V	V
SHALE, M. GRAY, W/LS NODULES		6.00	M	M
CLAYSTONE, M. GRAY		0.80	V	V
SHALE, BLACK, CARBONACEOUS		0.30	M	M
CLAYSTONE, M. GRAY		7.65	V	V
SHALE, BLACK, CARBONACEOUS		0.70	M	M
COAL, WASHINGTON (NO. 12) W/BONE PTG.		3.95	M	M
CLAYSTONE, M. GRAY		2.35	V	V
LIMESTONE, L. GRAY, NODULAR		1.00	S	S
CLAYSTONE, M. GRAY-GREEN		7.50	V	V
SHALE, M. GRAY-GREEN		3.80	M	M
SANDSTONE,1.GRAY,MICACEOUS,MED GRAINED,SHALY		0.75	S	S
SHALE, M. GRAY-GREEN		3.10	M	M
CLAYSTONE, M. GRAY W/RED STREAKS		2.20	V	V
CLAYSTONE, RED		1.70	V	V
CLAYSTONE, M. GRAY W/RED STREAKS		1.25	V	V
SHALE, M. GRAY-GREEN, SILTY		11.20	M	M
CLAYSTONE, DARK GRAY-GREEN		4.00	V	V
SHALE, M. GRAY-GREEN, SILTY		1.75	M	M
CLAYSTONE, DARK GRAY		2.70	V	V
SHALE, BLACK, CARBONACEOUS		0.85	M	M
COAL		0.10	M	M
SHALE, BLACK, CARBONACEOUS W/COAL PTGS.		1.15	M	M
COAL		0.10	M	M
SHALE, M. GRAY		2.10	M	M
COAL WAYNESBURG "A" BONY W/SHALE PTGS.		0.80	M	M
SHALE, BLACK CARBONACEOUS		0.15	M	M
LIMESTONE, M. GRAY, NODULAR		0.65	S	S
SHALE, DARK GRAY		1.05	M	M
LIMESTONE, L. GRAY, NODULAR		1.40	S	S
CLAYSTONE, M. GRAY-GREEN W/LS NODULES		6.66	V	V
SHALE, M. GRAY-GREEN W/LS NODULES		8.76	M	M
SANDSTONE, L. GRAY, MED. GRAINED		1.50	S	S
SHALE, M. GRAY-GREEN, SANDY		5.95	M	M
LIMESTONE, L. GRAY, NODULAR		0.65	S	S
CLAYSTONE, M. GRAY-GREEN W/LS NODULES		8.85	V	V
SANDSTONE, L.GRAY, MED. GRAINED W/SHALE PTGS		15.95	S	S
SHALE, BLACK WAYNESBURG (NO.11) COAL HORIZ.		0.40	M	M
CLAYSTONE, M. GRAY		3.15	V	V
SHALE, M. GRAY, SILTY W/SS PARTINGS		0.75	M	M
SHALE, M. GRAY		10.80	M	M
SHALE, BLACK, CARBONACEOUS W/COAL PTGS.		0.25	M	M
CLAYSTONE, M. GRAY		2.95	V	V
LIMESTONE, L. GRAY, NODULAR		2.50	S	S
CLAYSTONE, M. GRAY		4.10	V	V
LIMESTONE, L. GRAY, NODULAR		0.80	S	S
CLAYSTONE, M. GRAY		1.70	V	V
LIMESTONE, L. GRAY, NODULAR		1.75	S	S
CLAYSTONE, M. GRAY		0.70	V	V
LIMESTONE, L. GRAY-TAN, FLINTY		1.60	S	S
SHALE, M. GRAY, CALCAREOUS		8.90	M	M
CLAYSTONE, M. GRAY-GREEN		1.00	V	V
LIMESTONE, L. GRAY, NODULAR W/CS PTGS.		2.90	S	S
CLAYSTONE, M. GRAY		1.00	V	V
CLAYSTONE, BLACK UNIONTOWN NO.10 HORIZ.		0.40	V	V
SHALE, M. GRAY, SANDY		2.40	M	M
SANDSTONE, L. GRAY, MED. GRAINED		0.45	S	S
SHALE, M. GRAY, SANDY		0.25	M	M
SANDSTONE, L. GRAY, MED. GRAINED		0.80	S	S
SHALE, M. GRAY, SANDY		0.65	M	M

DRILL HOLE C98-5; CONTINUED

SANDSTONE, L.GRAY, MED.GRAINED W/SHALE PTGS.		1.40	S	S
CLAYSTONE, M. GRAY		1.30	V	V
CLAYSTONE, RED		1.40	V	V
CLAYSTONE, M. GRAY		0.50	V	V
CLAYSTONE, GRAY-GREEN, LS NODS, GRADES SANDY		8.20	V	V
LIMESTONE, L. GRAY, NODULAR		1.45	S	S
SHALE, M. GRAY-GREEN		4.45	M	M
LIMESTONE, M. GRAY, NODULAR		0.80	S	S
SHALE, DARK GRAY		0.75	V	V
SHALE, M. GRAY W/LS NODULES		6.45	M	M
LIMESTONE, L. GRAY, NODULAR		3.30	S	S
CLAYSTONE, GRAY-GREEN-OLIVE W/LS NODULES		6.10	V	V
LIMESTONE, L. GRAY, NODULAR		0.90	S	S
SHALE, M. GRAY-GREEN W/OCC. LS NODULES		13.90	M	M
LIMESTONE, L. GRAY, NODULAR		2.50	S	S
SHALE, M. GRAY		0.90	M	M
SHALE, M. GRAY, W/LS NODULES		2.70	M	M
SHALE, M. GRAY-GREEN, CALCAREOUS		8.60	M	M
LIMESTONE, M. GRAY, SILTY		3.00	S	S
SHALE, M. GRAY, CALCAREOUS		9.40	M	M
LIMESTONE, L. GRAY, NODULAR		1.10	S	S
SHALE, M. GRAY, CALCAREOUS		0.80	M	M
LIMESTONE, L. GRAY, NODULAR		1.00	S	S
CLAYSTONE, M. GRAY-GREEN		1.70	V	V
LIMESTONE, L. GRAY-WHITE, VERY HARD		6.40	S	S
SHALE, M. GRAY		0.60	M	M
LIMESTONE, L. GRAY, NODULAR		1.50	S	S
SHALE, M. GRAY-GREEN, CALCAREOUS		5.00	M	M
LIMESTONE, BENWOOD, L. GRAY-TAN, FLINTY		3.10	S	S
SHALE, M. GRAY-GREEN		2.90	M	M
LIMESTONE, L.GRAY ,NODULAR W/SHALE PTGS.		5.65	S	S
CLAYSTONE, DARK GRAY W/LS NODULES		4.20	V	V
LIMESTONE, M. GRAY, NODULAR W/CS PTGS.		0.55	S	S
CLAYSTONE, M. GRAY		1.40	V	V
SHALE, BLACK		0.25	M	M
COAL **SEWICKLEY (NO.8)** W/BONE PARTINGS		1.83	M	M
CLAYSTONE, DARK GRAY		0.62	V	V
CLAYSTONE, M. GRAY		3.80	V	V
SHALE, M. GRAY		4.65	M	M
SANDSTONE, **FISHPOT**, L. GRAY, MED.GRAINED		9.75	S	S
SHALE, M. GRAY		5.45	M	M
SHALE, BLACK		0.30	M	M
COAL, **FISHPOT**		2.72	M	M
SHALE, DARK GRAY-BLACK		0.53	M	M
LIMESTONE, L. GRAY, NODULAR		6.00	S	S
SHALE, DARK GRAY		0.20	V	V
LIMESTONE, L. GAY, NODULAR		1.90	S	S
SHALE, DARK GRAY		0.50	V	V
LIMESTONE, L. GRAY, NODULAR		1.10	S	S
SHALE, M. GRAY, CALCAREOUS		2.50	M	M
LIMESTONE, L. GRAY-WHITE, VERY HARD		4.40	S	S
SHALE, M. GRAY-GREEN		1.20	M	M
LIMESTONE, L. GRAY, NODULAR		2.75	S	S
CLAYSTONE, M. GRAY-GREEN		2.05	V	V
SHALE, M. GRAY, SILTY W/SS PARTINGS		0.95	M	M
SANDSTONE, L. GRAY, MED. GRAINED		0.35	S	S
SHALE, M. GRAY		6.50	M	M
LIMESTONE, M. GRAY, NODULAR		0.90	S	S
CLAYSTONE, M. GRAY W/LS NODULES		4.30	V	V

DRILL HOLE C98-5; CONTINUED

SHALE, BLACK, CARBONACEOUS W/COAL PTGS.		0.75	M	M
COAL, **REDSTONE, (NO.8A)**, BONY		0.50	M	M
CLAYSTONE, DARK GRAY		1.00	V	V
LIMESTONE, M. GRAY, NODULAR		0.50	S	S
SHALE, DARK GRAY-BLACK		0.90	M	M
LIMESTONE, M. GRAY, NODULAR		1.06	S	S
CLAYSTONE, DARK GRAY		0.35	V	V
LIMESTONE, M. GRAY, NODULAR		1.90	S	S
CLAYSTONE, DARK GRAY		0.35	V	V
LIMESTONE, L. GARY, NODULAR		6.00	S	S
SHALE, DARK GRAY		0.65	V	V
LIMESTONE, L. GRAY, NODULAR		1.45	S	S
CLAYSTONE, M. GRAY-GREEN		3.00	V	V
LIMESTONE, L. GRAY, NODULAR		0.50	S	S
CLAYSTONE, M. GRAY-GREEN		0.85	V	V
LIMESTONE, L. GRAY, NODULAR		0.55	S	S
CLAYSTONE, M. GRAY-GREEN		2.55	V	V
COAL		0.05	M	M
CLAYSTONE, DARK GRAY		1.50	V	V
COAL, ROOF COAL		1.25	M	M
CLAYSTONE, M. GRAY		0.75	V	V
COAL **PITTSBURGH NO.8**, LOST 2' MINE VOID		5.10	M	M
SHALE, M. GRAY, SILTY		1.90	M	M

Submit the following information for the stratum above the coal Seam, the coal seam, and the stratum below the coal seam.

Stratum	Total Sulfur	Pyrite Marcasite Sulfur	Potential Acidity	Neutral-ization Potential	CaCo3 Deficiency

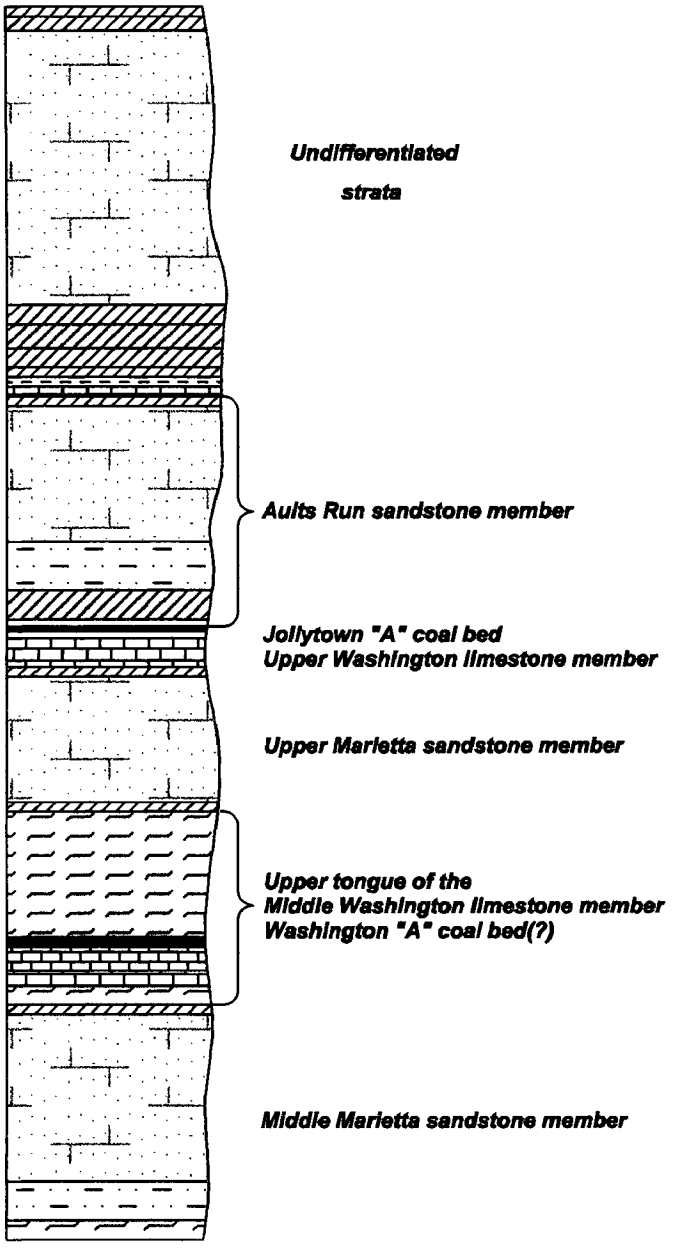
* If other than State Plane, indicate coordinate system.
** Indicate water bearings stratum with an asterisk (*) under the column labeled H20.
*** S-Slightly M-Moderately V-Very

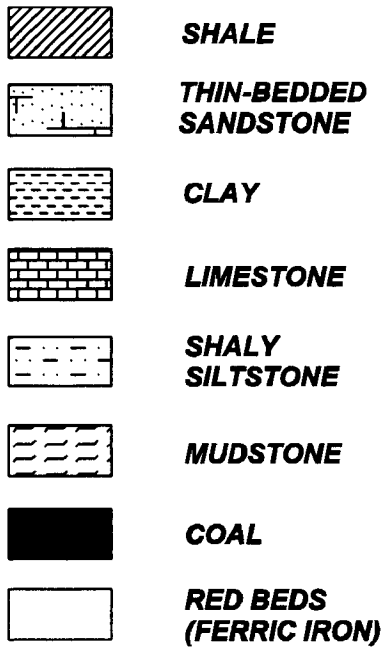
ADDENDUM TO DRILL LOGS
BENNOC, INC.
CENTURY MINE
D-0425

DRILL HOLE	STATE PLANE COORDINATES X	Y
Y&O-1	2,413,269	689,013
Y&O-2	2,422,398	688,300
Y&O-3	2,407,750	692,259
Y&O-5	2,413,763	693,318
Y&O-6	2,414,323	692,084
Y&O-7	2,416,070	683,167
O-5	2,398,033	696,861
M-14	2,400,924	696,485
M-16	2,405,404	690,644
M-17	2,397,805	689,008
M-19	2,404,430	682,115
M-20	2,406,834	687,635
N-94-14	2,407,971	682,961
N-94-18	2,399,293	691,789
N-94-19	2,402,775	689,158
O-1	2,404,851	694,797
B&O-1	2,411,647	698,040

STATE PLANE COORDINATES FOR TEST HOLES C98-1 THROUGH C98-5 ARE LOCATED ON THE ATTACHMENT 13'S FOR SAME.

ILLUSTRATION OF STRATIGRAPHIC INTERVAL, FROM TOP OF HIGHEST SURFACE ELEVATION HOLE (C98-2) TO MAXIMUM SURFACE ELEVATION WITHIN THE APPLICATION AREA. (TAKEN FROM UNITED STATES DEPT. OF THE INTERIOR, GEOLOGICAL SURVEY, PROFESSIONAL PAPER 380, PLATE 2)



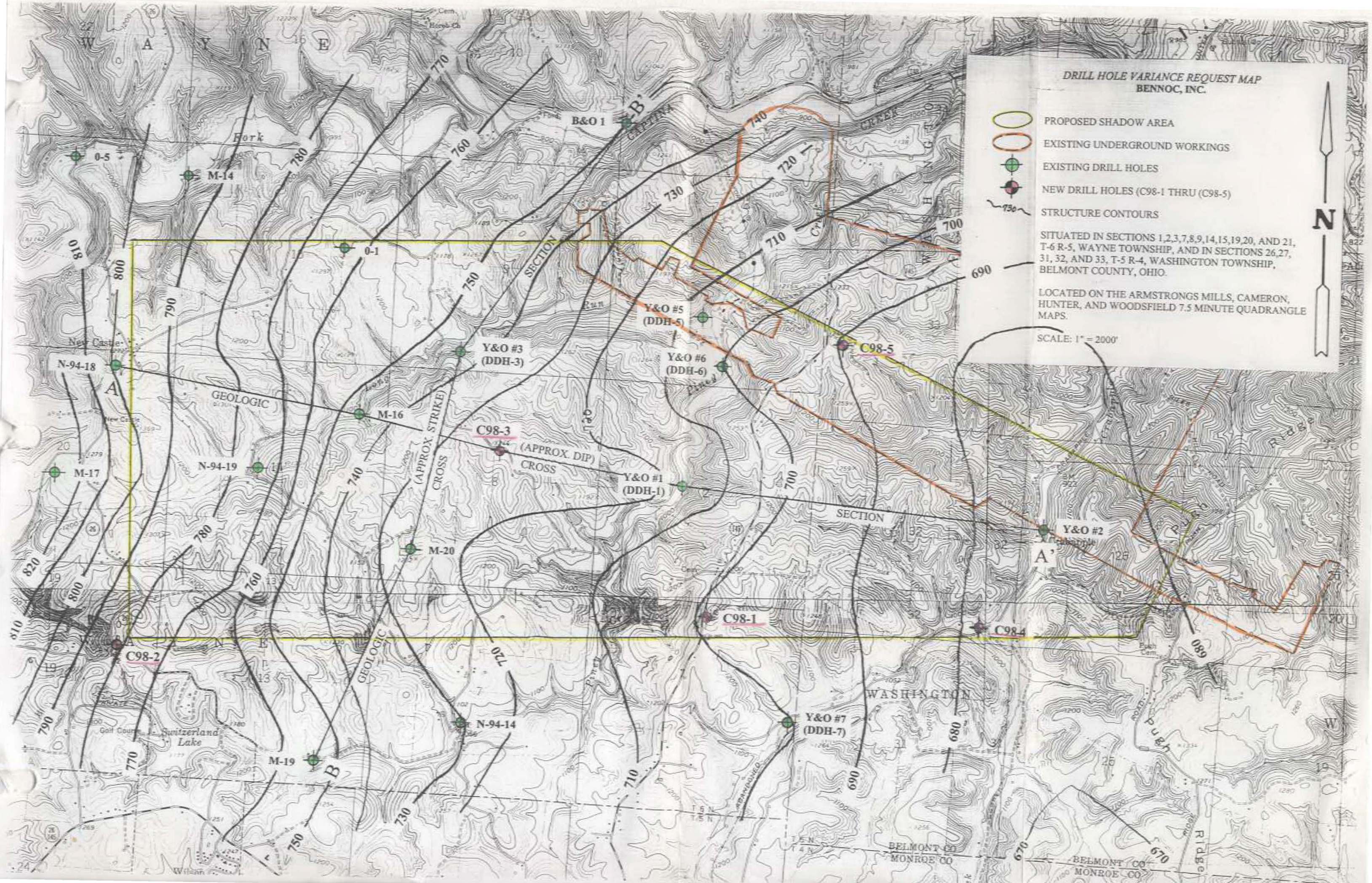


ADDENDUM TO PART 2, PAGE 17, ITEM B(4)

BENNOC, INC.

SUPPLEMENTAL GEOLOGIC DATA

SCALE: 1" = 20' ATT13.DWG


DRILL HOLE VARIANCE REQUEST MAP
BENNOC, INC.
PROPOSED SHADOW AREA
EXISTING UNDERGROUND WORKINGS
EXISTING DRILL HOLES
NEW DRILL HOLES (C98-1 THRU (C98-5)
STRUCTURE CONTOURS
SITUATED IN SECTIONS 1,2,3,7,8,9,14,15,19,20, AND 21, T-6 R-5, WAYNE TOWNSHIP, AND IN SECTIONS 26,27, 31, 32, AND 33, T-5 R-4, WASHINGTON TOWNSHIP, BELMONT COUNTY, OHIO.
LOCATED ON THE ARMSTRONGS MILLS, CAMERON, HUNTER, AND WOODSFIELD 7.5 MINUTE QUADRANGLE MAPS.
SCALE: 1" = 2000'
N
WAYNE
WASHINGTON
B&O 1
0-5
M-14
0-1
Y&O #5 (DDH-5)
Y&O #3 (DDH-3)
Y&O #6 (DDH-6)
C98-5
N-94-18
M-16
C98-3
(APPROX. DIP)
CROSS
Y&O #1 (DDH-1)
SECTION
GEOLOGIC
(APPROX. STRIKE)
M-17
N-94-19
M-20
Y&O #2
C98-1
C98-4
C98-2
N-94-14
Y&O #7 (DDH-7)
M-19
New Castle
Switzerland Lake
BELMONT CO
MONROE CO

AEC 04661

9-88

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14B
(GROUND WATER HYDROLOGY DESCRIPTION)

Applicant's Name BENNOC, INC. Century Mine Permit Number D-0425-1

Aquifer/Zone Identification	Aquifer/Zone Lithology	Aquifer/Zone Thickness	Aquifer/Zone Elev. (msl)	Aquifer/Zone Horizontal Extent	Aquifer/Zone Known Uses	Approx. Rate of Discharge/Usage of Aquifer/Zone (gpm or cfs)
(A) Unconsolidated Material	Silt, Sand & Gravel, Weathered Bedrock, Shale	Up to 30 feet	910 to 1360 msl	Local-Primarily along stream valleys	Domestic Recreational Commercial	Variable-Generally <2 to >20 gpm
(B) Washington No. 12 Cyclotherm	Silt, Sandstone, Limestone, Shale, Coal	Approximately 70 feet	1025 to 1305 msl	Local-Primarily where less than 100 feet deep	Domestic Livestock	Variable-Generally less than 2 gpm
(C) Waynesburg No. 11 Cyclotherm	Silt, Sandstone, Limestone, Shale, Coal	Approximately 100 feet	925 to 1155 msl	Local-Primarily where less than 100 feet deep	Domestic Livestock	Variable-Generally less than 2 gpm
(D) Sewickley No. 9 Cyclotherm	Silt, Sandstone, Limestone, Shale, Coal	Approximately 120 feet	765 to 1055 msl	Local-Primarily where less than 100 feet deep	Domestic	Variable-Generally less than 2 gpm
(E) Redstone No. 8A Cyclotherm	Silt, Sandstone, Limestone, Shale, Coal	Approximately 60 feet	705 to 895 msl	Local-Primarily where less than 100 feet deep	Not In Use	

AEC 04662

OHIO Department of Natural Resources

George V. Voinovich • *Governor*
Donald C. Anderson • *Director*

DATE September 29, 1998

ANALYSIS OF EXISTING GROUND WATER FILE DATA

PREPARED BY: Bill Haiker BH, HYDROGEOLOGIST

OPERATOR: Bennoc, Inc.

COUNTY: Belmont

TOWNSHIP: Wayne ; Washington

SECTION (S): 1, 2, 3, 7, 8, 9, 13, 14, 15, 19, 20 and 21 ; 26, 27, 31, 32, and 33

NUMBER OF WATER WELL LOGS WITHIN 1,000 FOOT RADIUS OF SITE (COPIES ATTACHED) 36 : FIELD LOCATED: 36

GENERAL DESCRIPTION OF LOCAL HYDROLOGY:
(USE ADDITIONAL SHEET IF NECESSARY)

Ground water is obtained from interbedded shale, sandstone and limestone bedrock. Well depths range from 25 to 150 feet with sustained yields that seldom exceed 3 gallons per minute.

AREAS OF PARTICULAR CONCERN:
(USE ADDITIONAL SHEET IF NECESSARY)

Longwall mining at elevations of 800 to 680 feet M.S.L. will affect ground water within the permit boundary. All wells should be monitored for any quantity changes.

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio 43212

PLEASE USE PENCIL OR TYPEWRITER
DO NOT USE INK.

Nº 356333
WL-2

County Belmont Township Washington Section of Township 26

Owner Oscar Perkins Address

Location of property on 86 between Aladonia & 145 SR

CONSTRUCTION DETAILS

Casing diameter 8 Length of casing 21

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion 11/25/68

BAILING OR PUMPING TEST

Pumping Rate 25 G.P.M. Duration of test hrs.

Drawdown ft. Date

Static level-depth to water 23 ft.

Quality (clear, cloudy, taste, odor) Clear

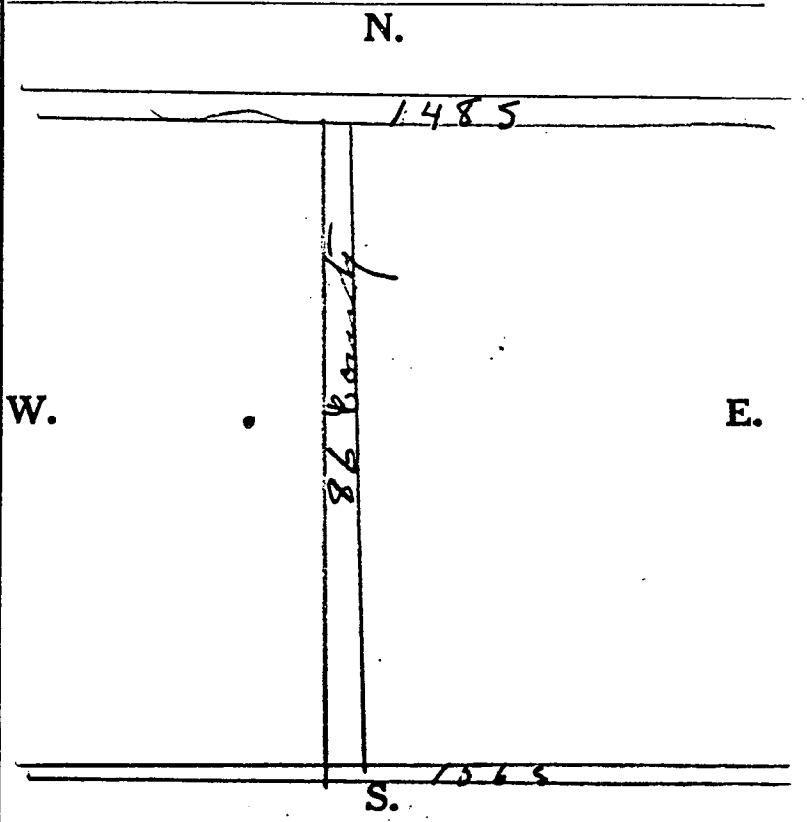
Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Loam	0 Feet	4 Ft.
Sand S & Clay	4	64

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Chas McGuire Date 11-25-68

Address Rochelle P.O. Signed Chas McGuire

*If additional space is needed to complete well log, use next consecutive numbered form.

AEC 04664

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

426073
WL-4

County BELMONT Township WASHINGTON Section of Township 26

Owner K. DEPKINS Address ALLEDONIA, OHIO

Location of property Co ROAD 26

CONSTRUCTION DETAILS

Casing diameter 5 Length of casing 22

Type of screen _____ Length of screen _____

Type of pump _____

Capacity of pump _____

Depth of pump setting _____

Date of completion 11-20-71

BAILING OR PUMPING TEST
(Specify one by circling)

Test Rate 2 G.P.M. Duration of test _____ hrs

Drawdown _____ ft. Date _____

Static level-depth to water 40 ft.

Quality (clear, cloudy, taste, odor) _____

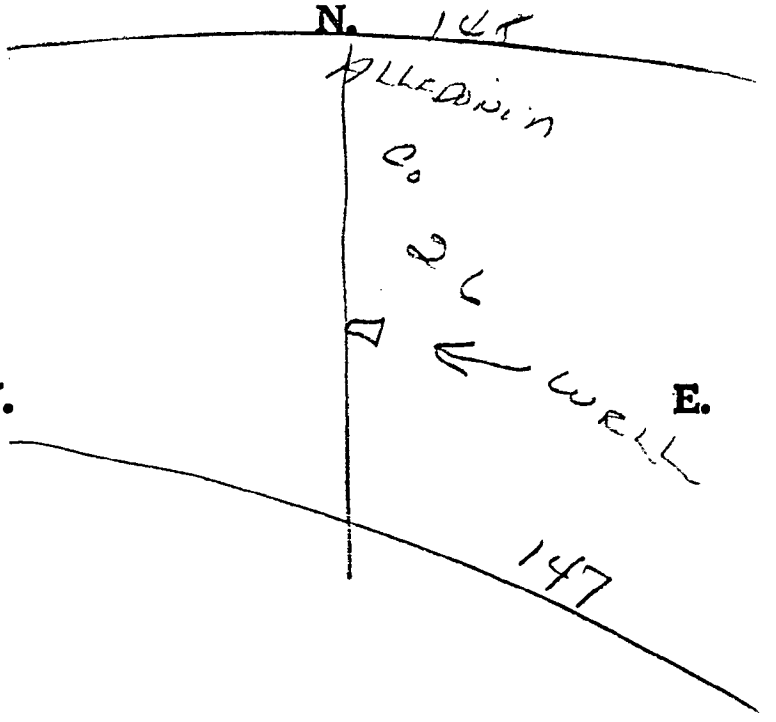
Pump installed by _____

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Soil	0 Feet	4 Ft.
SANDSTONE	4	37
GRAY SHALE	37	61
WHITE SAND	61	90
WATER 40 + 59		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



Drilling Firm BILLMAN DRILLING

Address WOODSFIELD, OHIO

Date 11-20-71

Signed [illegible]

*If additional space is needed to complete well log, use next consecutive numbered form.

31

AEC 04665

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

No. 402983
WL-5

County BELMONT Township WASHINGTON Section of Township

Owner WILLIAM FIELDING Address ALLENDONIA OHIO

Location of property 5 MILES S.W. OF ALLEDONIA CO. RD. 86

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing 60'

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion 4-9-75

BAILING OR PUMPING TEST
(Specify one by circling)

Test Rate 5 G.P.M. Duration of test hrs.

Drawdown ft. Date

Static level-depth to water ft.

Quality (clear, cloudy, taste, odor)

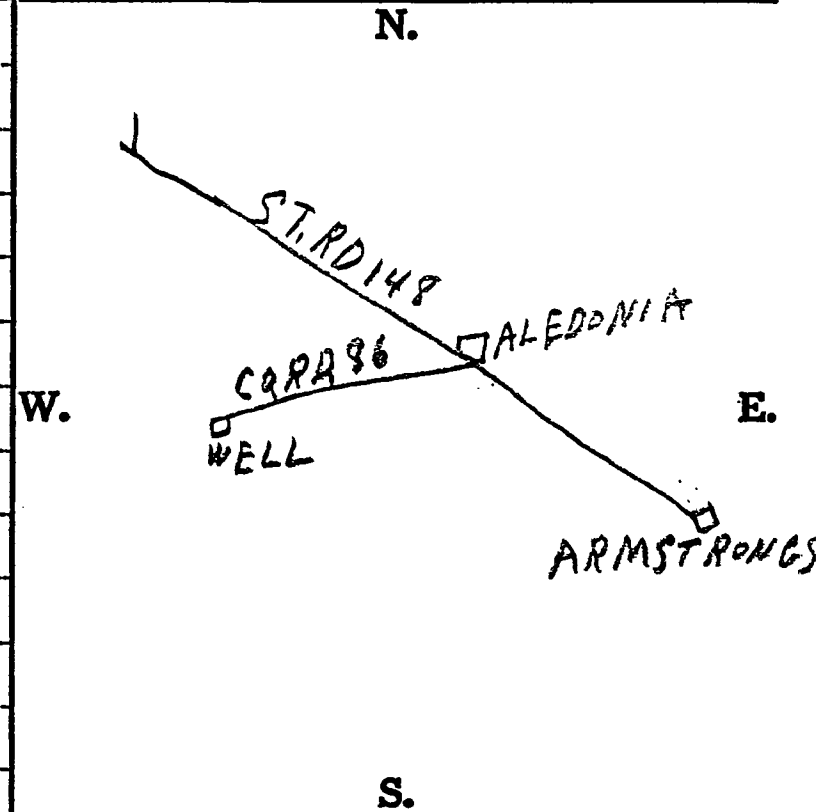
Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
CLAY	0 Feet	10 Ft.
RED SHALE	10	21
GREY SHALE	21	28
RED SHALE	28	35
SAND STONE	35	37
GREY SHALE	37	58
WATER AT 22'		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



Drilling Firm KRIECHBAUM DRILLING Date 4-12-75

Address JACOBSBURG OHIO Signed LaVerne Kriechbaum

*If additional space is needed to complete well log, use next consecutive numbered form.

AEC 04666

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio 43212

PLEASE USE PENCIL OR TYPEWRITER
DO NOT USE INK.

Nº 356320
WL-9

County Belmont Township Washington Section of Township 32

Owner Harry Taylor Address Alledonia Ohio

Location of property 3 Miles above Alledonia on crabapple
TOWNSHIP 9 & 2 Down at old crabapple School Property

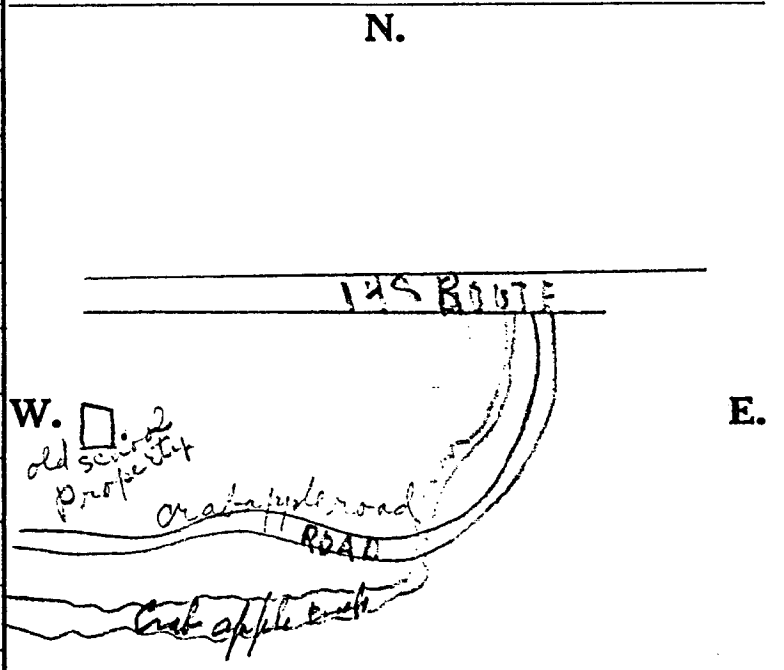
CONSTRUCTION DETAILS	BAILING OR PUMPING TEST
Casing diameter 10 Length of casing 12 ft	Pumping Rate ..... G.P.M. Duration of test ..... hrs.
Type of screen ..... Length of screen	Drawdown ..... ft. Date .....
Type of pump	Static level-depth to water ..... ft.
Capacity of pump	Quality (clear, cloudy, taste, odor) .....
Depth of pump setting	3 gal min
Date of completion Oct 5/67	Pump installed by .....

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Loam	0 Feet	12 Ft.
Lime	12	28
Water at 18 ft		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Chas H. Gee Date Oct 5/67

Address Powhatan Pt O Signed Chas H. Gee

*If additional space is needed to complete well log, use next consecutive numbered form.

TO 103 2.1

AEC 04667

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

No. 402985
WL-21

County BELMONT Township WASHINGTON Section of Township

Owner KENNETH PERKINS Address ALLEDONIA OHIO

Location of property 5 MILES S.W. OF ALLEDONIA

CONSTRUCTION DETAILS

Casing diameter 9" Length of casing 251

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion 5-8-75

BAILING OR PUMPING TEST
(Specify one by circling)

Test Rate 2 G.P.M. Duration of test hrs.

Drawdown ft. Date

Static level-depth to water ft.

Quality (clear, cloudy, taste, odor)

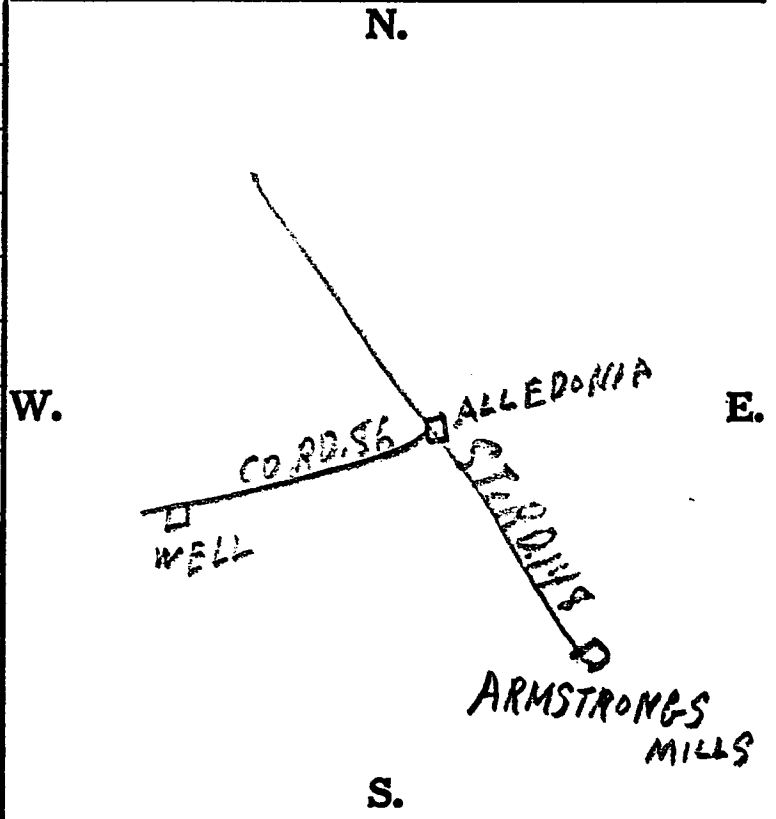
Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
CLAY	0 Feet	2 Ft.
SANDSTONE	2	4
RED CLAY	4	20
SANDSTONE	20	23
GREY SHALE	23	40
SANDSTONE	40	43
SHALE	43	60
SANDSTONE	60	72
DARK SHALE	72	84
SANDSTONE	84	86
DARK SHALE	86	90
SANDSTONE	90	92

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



Drilling Firm KRIECHBAUM Date 5-5-75

Address JACOBSBURG OHIO Signed [illegible]

*If additional space is needed to complete well log, use next consecutive numbered form.

AEC 04668

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio 43212

PLEASE USE PENCIL OR TYPEWRITER
DO NOT USE INK.

№ 327018

WL-39

County Belmont Township Wayne Section of Township 2

Owner Jim Warsinskey Address Beallsville, O.

Location of property South of Beallsville, O. approx (2) Mile on state Rail (145) on the west side of road

CONSTRUCTION DETAILS	BAILING OR PUMPING TEST
Casing diameter 8 Length of casing 20	Pumping Rate ..... G.P.M. Duration of test ..... hrs.
Type of screen ..... Length of screen	Drawdown ..... ft. Date .....
Type of pump	Static level-depth to water .65 ft.
Capacity of pump	Quality (clear, cloudy, taste, odor) .....
Depth of pump setting	
Date of completion	Pump installed by .....

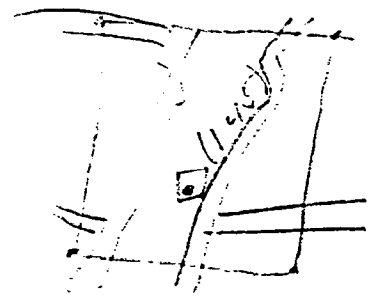
WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Clay	0 Feet	5 Ft.
Shale	5	25
Rock	25	32
Shale	32	55
Shale	55	85
Sandstone	85	93
Shale	93	110
Water 40		
" 85		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.

N.

W.  E.

S.

See reverse side for instructions

Drilling Firm L. A. Mas Date 5/20/66

Address Woodsfield O. Signed L. A. Mas

*If additional space is needed to complete well log, use next consecutive numbered form.

AEC 04669

WE . LOG AND DRILLING RF ORT

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Fountain Square
Columbus, Ohio 43224

NO CARBON PAPER NECESSARY - SELF-TRANSCRIBING

624680
WL-43

COUNTY Belmont TOWNSHIP Wayne SECTION OF TOWNSHIP

OWNER Roy W. Eikl Derry ADDRESS Beallsville OH 43716

LOCATION OF PROPERTY St. Rt. 145 3 mile from St. Rt. 148

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing 100 Ft

Type of screen Pea Gravel Length of screen 80 Ft

Type of pump To Be Installed

Capacity of pump

Depth of pump setting By Owner

Date of completion

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 1.5 gpm Duration of test 1 hrs

Drawdown 48 Ft ft Date 11-25-86

Static level (depth to water) 50 Ft ft

Quality (clear, cloudy, taste, odor) Clear

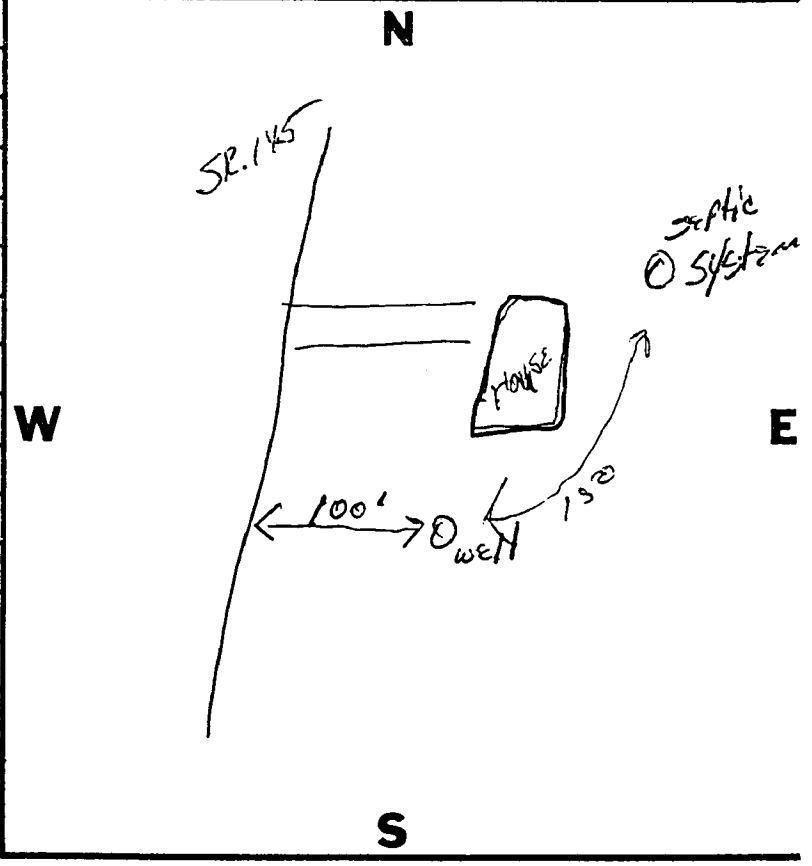
Pump installed by Owner

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
Top	0 ft	3 ft
Sand Shale	3	12
Sandy Clay	12	18
Soap Stone	18	34
Shale	34	44
Sand Stone	44	55
Red Clay	55	59
Soap Stone	59	65
water Sand Stone	65	72
Shale	72	91
Red Clay	91	98

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM C+D Drilling DATE 11-29-86

ADDRESS Rt 3 Beallsville SIGNED Donald Dorman

*If additional space is needed to complete well log, use next consecutive numbered form.

ORIGINAL COPY - OPND DIVISION OF WATER, FOUNTAIN SQ., COLS. OHIO 43224

(25)

AEC 04670

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1500 Dublin Road
Columbus, Ohio

No. 196521
WL-64

County Belmont Township Wayne Section of ~~Township~~ 15

Owner William Thomas Address New Castle, Ohio

Location of property Two mile east of New Castle on Co. Rd. 91

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing 20'

Type of screen None Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion 1-24-58

BAILING OR PUMPING TEST

Pumping rate 5 G.P.M. Duration of test 5 hrs.

Drawdown ft. Date 1-24-58

Developed capacity

Static level—depth to water 30 ft.

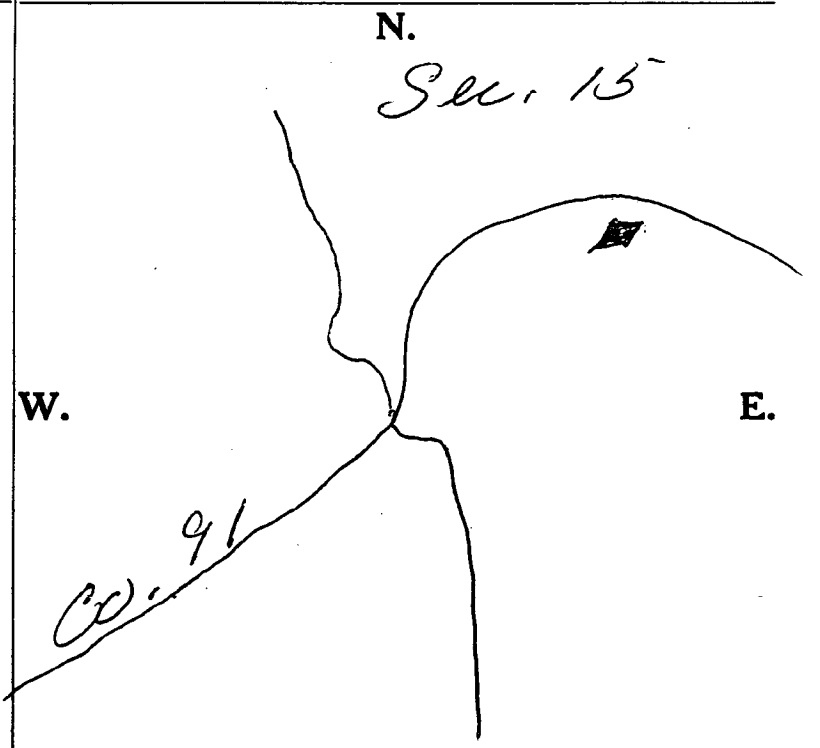
Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Top soil	0 Feet	3 Ft.
Sand Rock	3	30
Gray Shale	30	45
Hit water 30 ft		
Sand Rock	45	50
Gray Shale	50	75

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Warrick Bros.

Address 190 Bethesda St, Barnesville, Ohio

Date 2-10-58

Signed Donald Warrick

(19)

AEC 04671

County Permit No. _____

NO CARBON PAPER NECESSARY– SELF-TRANSCRIBING

WELL LOG AND DRILLING REPORT

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Fountain Square
Columbus, Ohio 43224

ORIGINAL

540725

WL-78

COUNTY Belmont TOWNSHIP Wayne SECTION OF TOWNSHIP _____

OWNER Roger Williamson ADDRESS Bealeville, Ohio

LOCATION OF PROPERTY 500 FT. E. OF ST. RT 26. AT NEW CASTLE

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing 70'

Type of screen _____ Length of screen _____

Type of pump _____

Capacity of pump _____

Depth of pump setting _____

Date of completion _____

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 1 gpm Duration of test _____ hrs

Drawdown _____ ft Date _____

Static level (depth to water) _____ ft

Quality (clear, cloudy, taste, odor) Clear

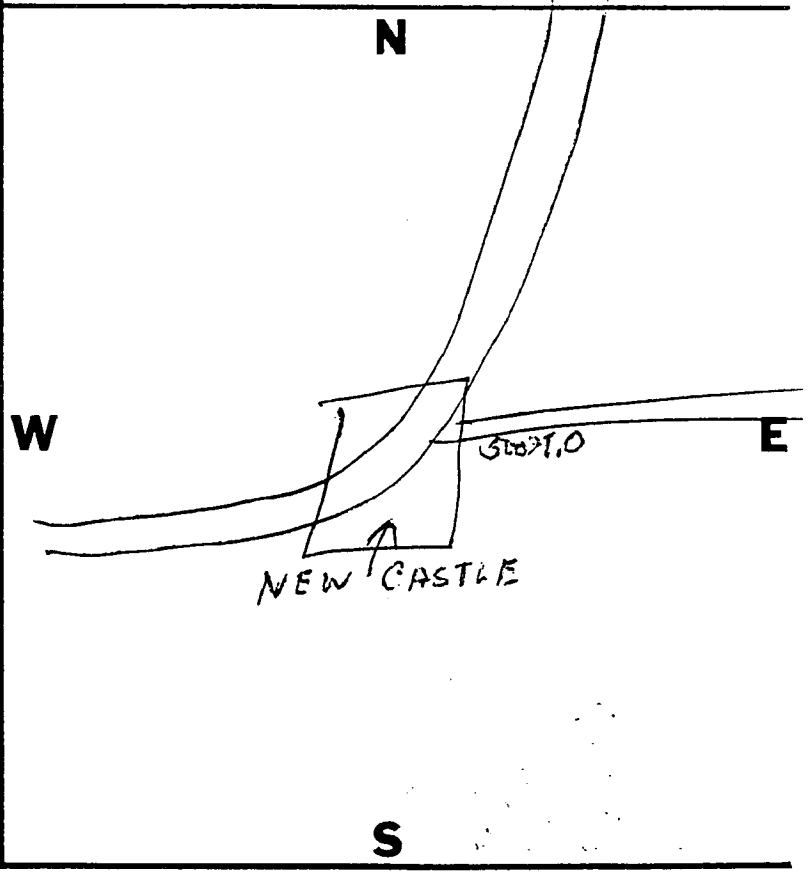
Pump installed by _____

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
Top Soil	0 ft	3 ft
Shale, Sandy	3	20
Limestone	20	24
Red Clay	24	36
Lime Clay	36	45
Limestone	45	50
Lime Clay	50	62
Limestone	62	68

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM Mann Drilling DATE 10-7-78

ADDRESS RT. 3, Woodsfield, O. SIGNED Floyd E. Mann

*If additional space is needed to complete well log, use next consecutive numbered form. CR 92, RA

AEC 04672

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY– SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Geological Survey
Fountain Square
Columbus, Ohio 43224 Phone (614) 466-5344

480158
WL-93

COUNTY BELMONT TOWNSHIP WAYNE SECTION OF TOWNSHIP OR LOT NUMBER 13

OWNER David Rubel ADDRESS STATE RT 78 Woodsfield, O.

LOCATION OF PROPERTY Wilson, O.

CONSTRUCTION DETAILS

Casing diameter 7" Length of casing 29'

Type of screen _____ Length of screen _____

Type of pump _____

Capacity of pump _____

Depth of pump setting _____

Date of completion _____

BAILING OR PUMPING TEST
(specify one by circling)

Test rate _____ gpm Duration of test 12 gal 1. hrs

Drawdown 134 ft Date 10-24-74

Static level (depth to water) _____ ft

Quality (clear) cloudy, taste, odor) _____

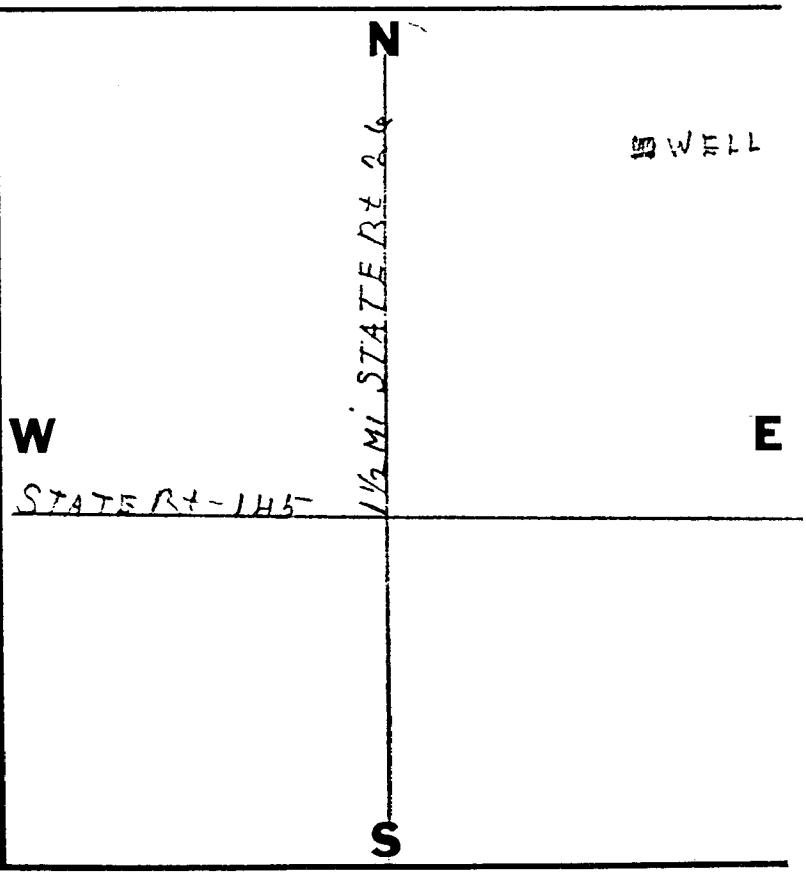
Pump installed by _____

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
Clay	0 ft	4 ft
Rock	4	28
gray shale & Rock	28	60
gray shale	60	100
Rock	100	134

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM Ellis Hague DATE 10-24-74

ADDRESS Rt 3 Woodsfield, O. SIGNED Ellis Hague

TR 60

*If additional space is needed to complete well log, use next consecutive numbered form.

AEC 04673

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY– SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Fountain Square
Columbus, Ohio 43224

504176

WL-98

COUNTY BELMONT TOWNSHIP WAYNE SECTION OF TOWNSHIP 13

OWNER RONALD Seidler ADDRESS 337 Guilford Woodsfield OH

LOCATION OF PROPERTY WILSON, OH.

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing 103'

Type of screen _____ Length of screen _____

Type of pump _____

Capacity of pump _____

Depth of pump setting _____

Date of completion _____

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 1 gpm Duration of test 24 hrs

Drawdown 102 ft Date 1-3-78

Static level (depth to water) 40' ft

Quality (clear, cloudy, taste, odor) _____

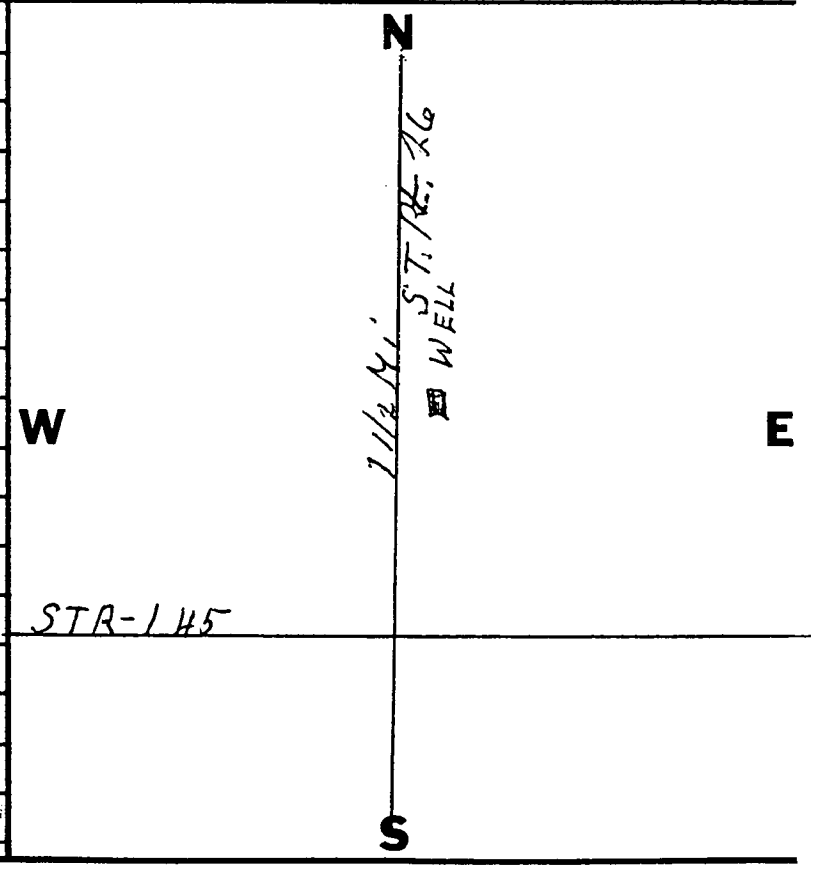
Pump installed by _____

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
SANDSTONE	0 ft	30 ft
gray SHALE & rock	30	102
WATER AT 45'		

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM ELLIS HOGUE DATE 1-3-78

ADDRESS Rt#3 Woodsfield, OH. SIGNED Ellis Hogue

B

*If additional space is needed to complete well log, use next consecutive numbered form.

AEC 04674

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

No. 413068
WL-103

County BELMONT Township ~~Brown~~ Wayne Section of Township 19

Owner RAY KEMP Address RT #2 BEALLSVILLE OHIO

Location of property IN NEW CASTLE

CONSTRUCTION DETAILS

Casing diameter 6 1/4 Length of casing 28

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion 12-3-70

BAILING OR PUMPING TEST
(Specify one by circling)

Test Rate 7 G.P.M. Duration of test hrs.

Drawdown ft. Date

Static level-depth to water 44 ft.

Quality (clear, cloudy, taste, odor)

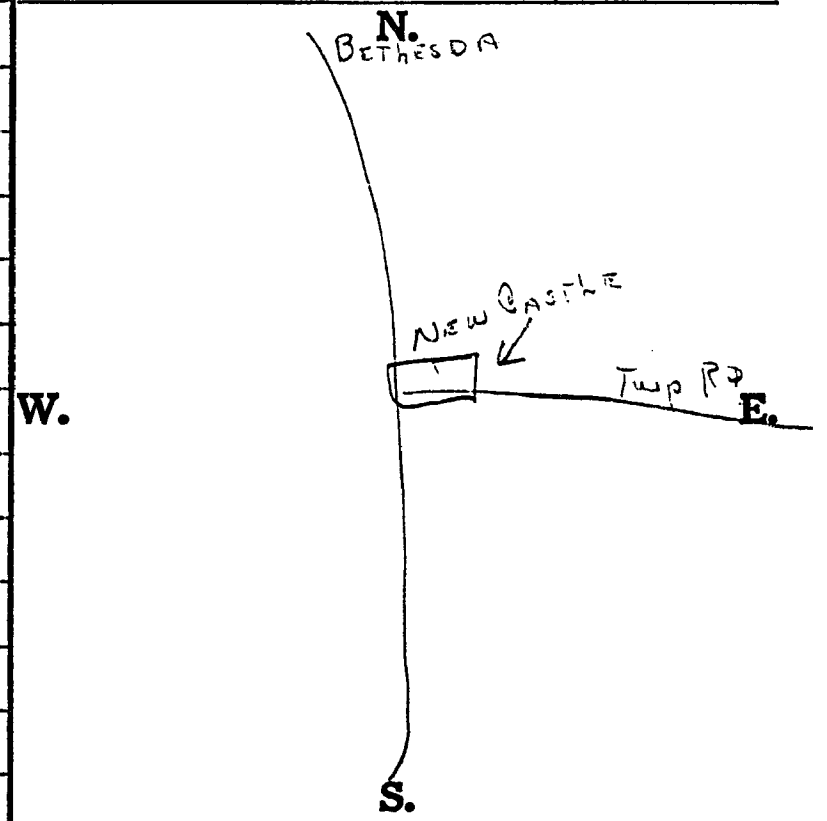
Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
SOIL	0 Feet	2 Ft.
SANDSTONE	2	41
GRAY SHALE	42	68
LIMESTONE	68	85
WATER- 52		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



Drilling Firm BILLMAN DRILLING Date 12-10-70

Address WOODSFIELD OHIO Signed H. H. Billman

TR 41

*If additional space is needed to complete well log, use next consecutive numbered form.

AEC 04675

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY – SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Fountain Square
Columbus, Ohio 43224

504872
WL-106

COUNTY Belmont TOWNSHIP Wayne SECTION OF TOWNSHIP

OWNER Floyd Lucas ADDRESS Rt. 1 Bellsville, O.

LOCATION OF PROPERTY New Castle at int. of ST RT 26 & CTY Rd 92

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing 26'

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 1 gpm Duration of test 24 hrs

Drawdown ft Date

Static level (depth to water) ft

Quality (clear, cloudy, taste, odor) Cloudy

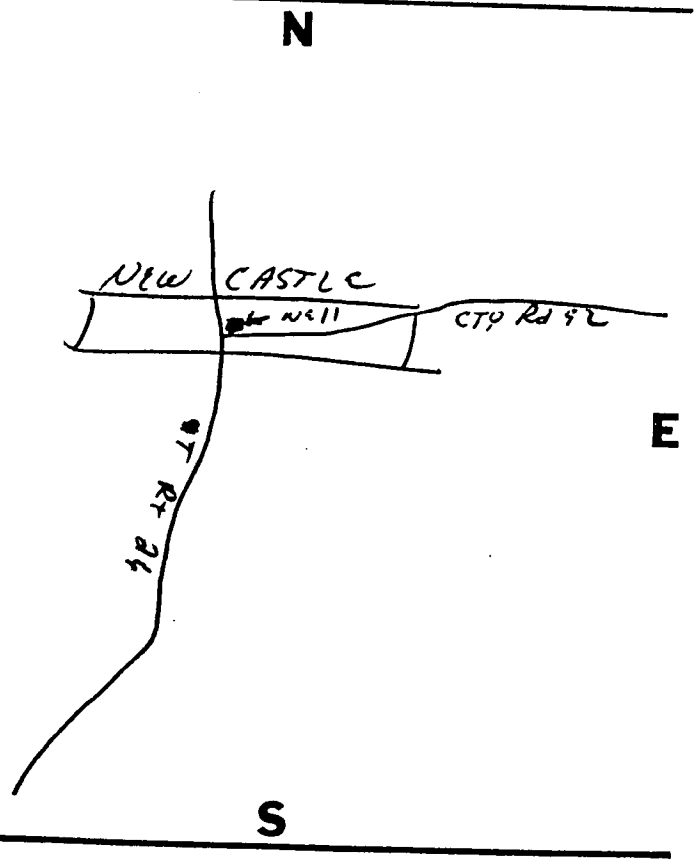
Pump installed by

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
Top	0 ft	1 ft
Red Clay	1	6
Sandstone	6	28
Limestone	28	35
Red Clay	35	46
Limestone	46	52
Sandstone	52	63
Limeston Clay	63	67
Sandstone V. Hard	67	
Veins @ 28 & 46		

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM Mann Drilling DATE 9-16-76

ADDRESS Rt. 3 Woodsfield, O. SIGNED R. C. Mann

*If additional space is needed to complete well log, use next consecutive numbered form.

1 of 1

AEC 04676

WE . LOG AND DRILLING RPORT

ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

No. 395339
WL-116

County BELMONT Township WAYNE Section of Township 14

Owner HAROLD MOWERY Address AMANA, OHIO

Location of property ST RT 26 NEW CASTLE

CONSTRUCTION DETAILS

Casing diameter 8 Length of casing 28

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion 6-22-70

BAILING OR PUMPING TEST
(Specify one by circling)

Test Rate 5 G.P.M. Duration of test hrs.

Drawdown ft. Date

Static level-depth to water 22 ft.

Quality (clear, cloudy, taste, odor)

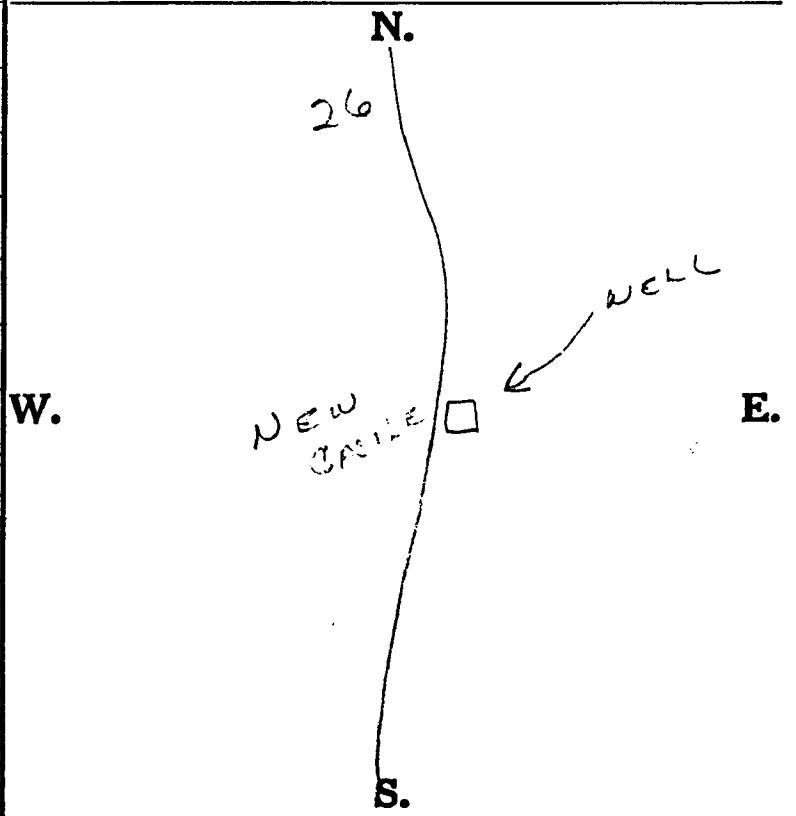
Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
RED CLAY	0 Feet	6 Ft.
SANDSTONE	6	31
GRAY CLAY	31	61
WATER 34		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



Drilling Firm BILLMAN DRILLING Date 6-22-70

Address 211 GREEN ST WOODSFIELD, OHIO Signed H. H. Billman

*If additional space is needed to complete well log, use next consecutive numbered form.

(A)

AEC 04677

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1500 Dublin Road
Columbus, Ohio

OUTSIDE 1000' LIMIT

No. 196545

County Belmont Township Wayne Section of Township 1

Owner Ward McCabe Address Bealsville RR

Location of property 2½ Miles North of Bealsville on Rt 145

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing 20

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion Oct. 3, 1958

BAILING OR PUMPING TEST

Pumping rate 1 G.P.M. Duration of test 4 hrs.

Drawdown ft. Date Oct 3

Developed capacity 1 G.P.M.

Static level—depth to water 30 ft.

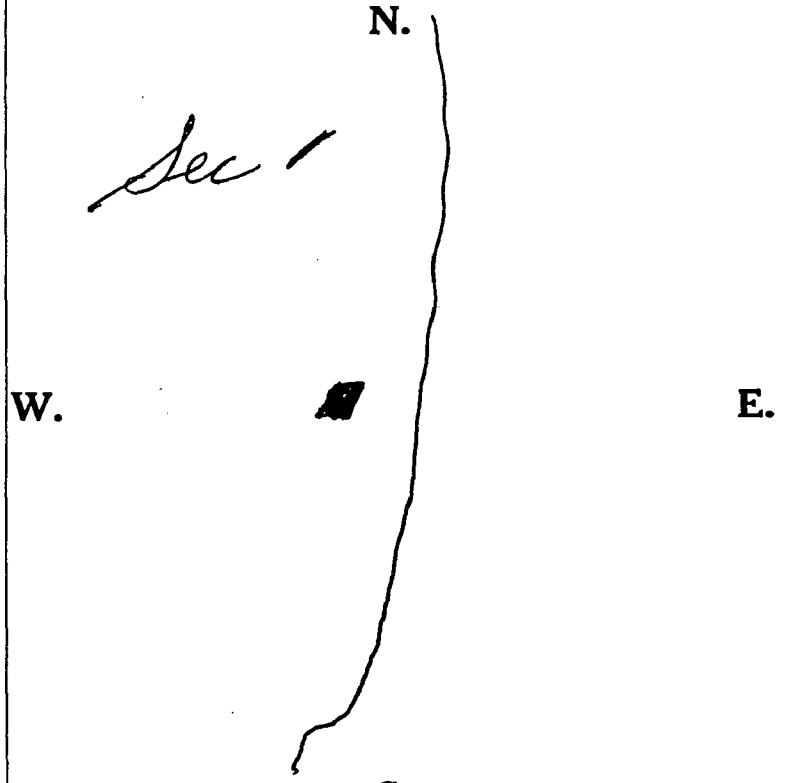
Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
top soil	0 Feet	4 Ft.
Shale	4	15
Sand Rock	15	30
Gray shale	30	45
Red Rock	45	50
blue Coal	50	55
Gray Shale	55	68
Red Rock	68	70
Fresh Water	30	4

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Warrick Bros. Date Oct 3, 1958

Address 120 Bethesda St. Barnesville Ohio Signed Gerald S. Warrick

35

AEC 04678

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

442599
OUTSIDE 1000' LIMITS

County BELMONT Township ~~Brown~~ Wayne Section of Township 24

Owner GENE ROBERTS Address GUILFORD, WOODSFIELD

Location of property WILSON LAKE

CONSTRUCTION DETAILS

Casing diameter 8 Length of casing 28

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion 6-19-74

BAILING OR PUMPING TEST
(Specify one by circling)

Test Rate 15 G.P.M. Duration of test hrs

Drawdown ft. Date

Static level-depth to water 38 ft.

Quality (clear, cloudy, taste, odor) CLEAR

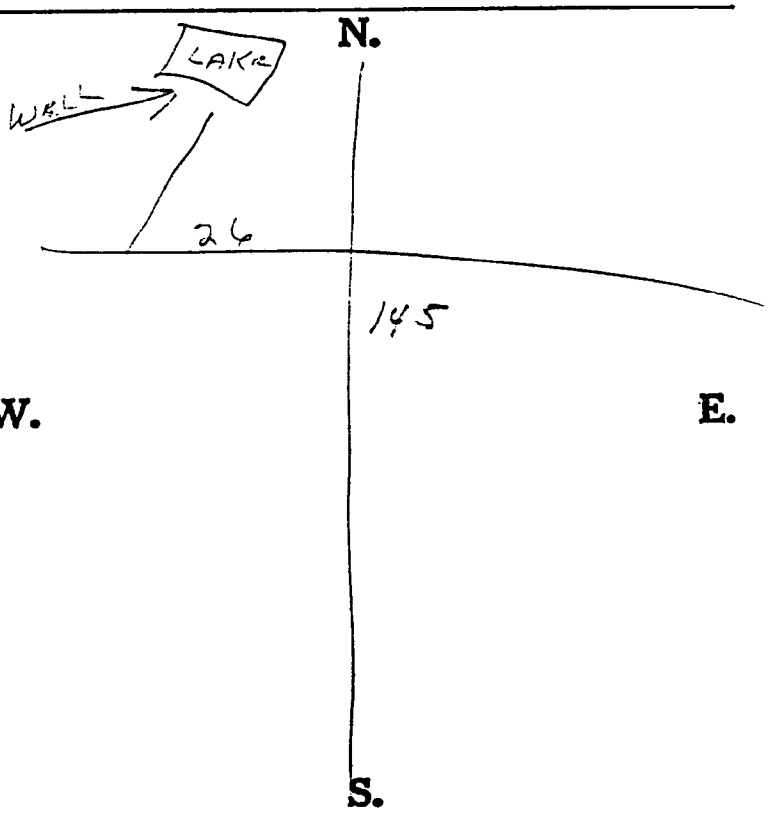
Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
SANDSTONE	0 Feet	52 Ft.
GRAY SHALE	52	64
COAL	64	66
WHITE SAND	66	100
WATER 50		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



Drilling Firm HARLAN BILLMAN
317 Guilford Avenue
Woodsfield, Ohio 43793

Address

Date 6-19-74

Signed H. R. Billman

(B)

*If additional space is needed to complete well log, use next consecutive numbered form.

AEC 04679

WE LOG AND DRILLING RE ORT

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Fountain Square
Columbus, Ohio 43224

NO CARBON PAPER NECESSARY– SELF-TRANSCRIBING

633976

OUTSIDE 1000' LIMITS

COUNTY Belmont TOWNSHIP WAYNE SECTION OF TOWNSHIP

OWNER Eugene Milhoan ADDRESS Rt 1 Beallsville Ohio 43716

LOCATION OF PROPERTY Twp. Rd 60 (Wilson Lake)

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing 101

Type of screen Half Casing Length of screen 60'

Type of pump

Capacity of pump Pump Not

Depth of pump setting Installed Yet

Date of completion

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 25+ gpm Duration of test 2 hrs

Drawdown ft Date 9/17/87

Static level (depth to water) 55' ft

Quality (clear, cloudy, taste, odor) Clear No Odor

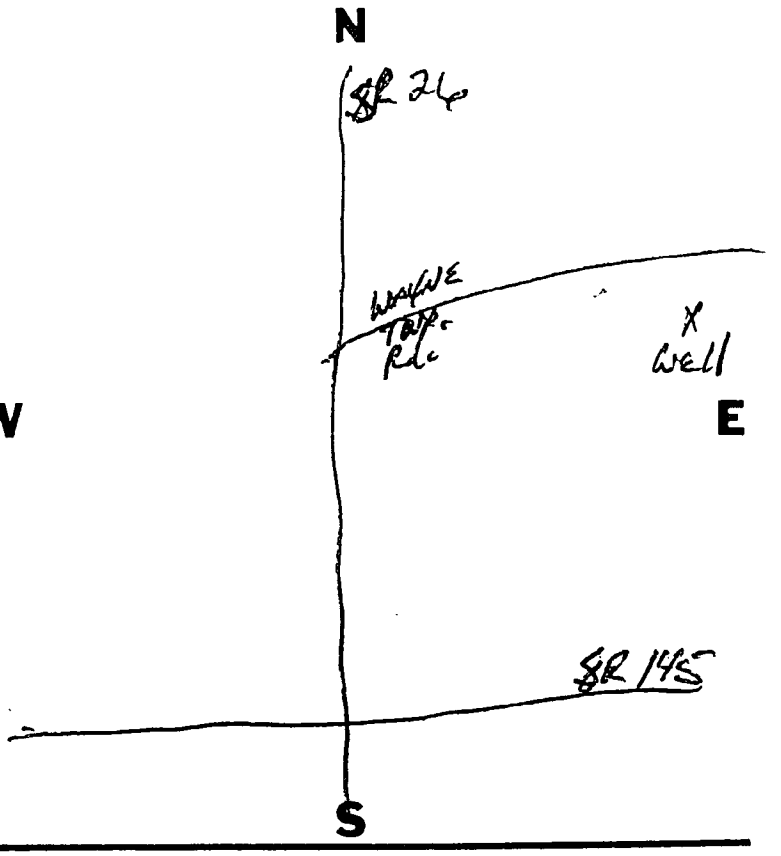
Pump installed by

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
Sandy Shale	0 ft	24 ft
Gray Clay	24	34
" Shale	34	37
Red Clay	37	40
Shale	40	46
50' water Gray Shale	46	60
4' Lots water Gray Shale	60	71
Slate	71	74
Gray Shale	74	100

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM C&D Drilling DATE 9/19/87

ADDRESS Rt 3 Beallsville Ohio SIGNED Donald Warren

*If additional space is needed to complete well log, use next consecutive numbered form.

ORIGINAL COPY – OPND DIVISION OF WATER FOUNTAIN SQ. COLS. OHIO 43224 (B)

AEC 04680

ORIGINAL

WELL LOG AND DRILLING REPORT

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio

PLEASE USE PENCIL OR TYPEWRITER. DO NOT USE INK.

OUTSIDE 1000' LIMITS

No. 238125

County ~~Mahoning~~ BELMONT Township WAYNE Section of Township 13

Owner O. J. CLINE Address EASTERN AVE, WOODSFIELD,

Location of property 1 MILE NORTH ROUTE 26 ON LAKE WILSON

CONSTRUCTION DETAILS

Casing diameter 6 1/4 Length of casing 18.3

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion 5-22-60

BAILING OR PUMPING TEST

Pumping rate 100 G.P.M. Duration of test hrs.

Drawdown ft. Date

Developed capacity

Static level—depth to water 27 ft.

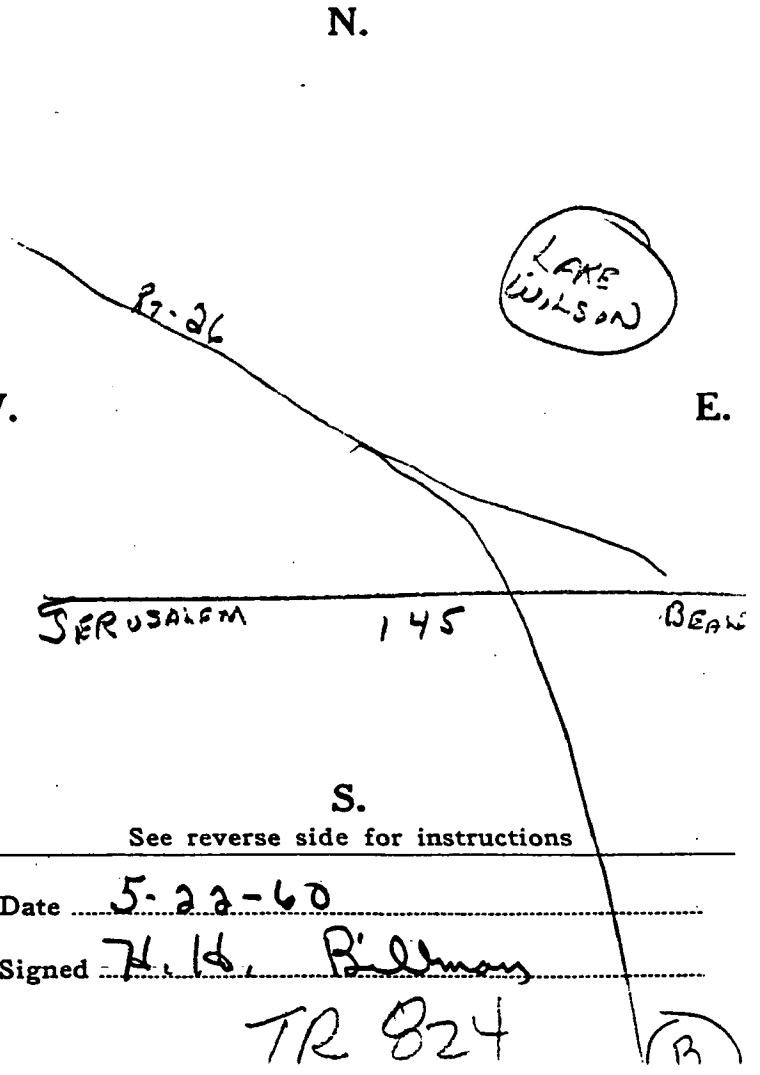
Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
CLAY - SOIL	0 Feet	2 Ft.
RED ROCK	2	9 FT
SANDSTONE	9	21
RED ROCK	21	33
WATER 36 GRAY SHALE	33	41
RED ROCK	41	53
GRAY SHALE	53	67
WHITE SAND	67	70

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm H. H. BILLIMAN Date 5-22-60

Address 416 E. MARIETTA ST. Signed H. H. Billiman

WOODSFIELD, OHIO

TR 824

AEC 04681

County Permit No. _____

NO CARBON PAPER NECESSARY– SELF-TRANSCRIBING

WELL LOG AND DRILLING REPORT

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Fountain Square
Columbus, Ohio 43224

ORIGINAL

540722

OUTSIDE 1000' LIMITS

COUNTY Belmont TOWNSHIP Wayne SECTION OF TOWNSHIP _____

OWNER George Cramer ADDRESS Rt. #1 Jerusalem, Ohio

LOCATION OF PROPERTY Wilson Lake 3/4 mi. E. of RT. #26

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing 98'

Type of screen _____ Length of screen _____

Type of pump _____

Capacity of pump _____

Depth of pump setting _____

Date of completion _____

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 5 gpm Duration of test _____ hrs

Drawdown _____ ft Date _____

Static level (depth to water) _____ ft

Quality (clear, cloudy, taste, odor) Clear

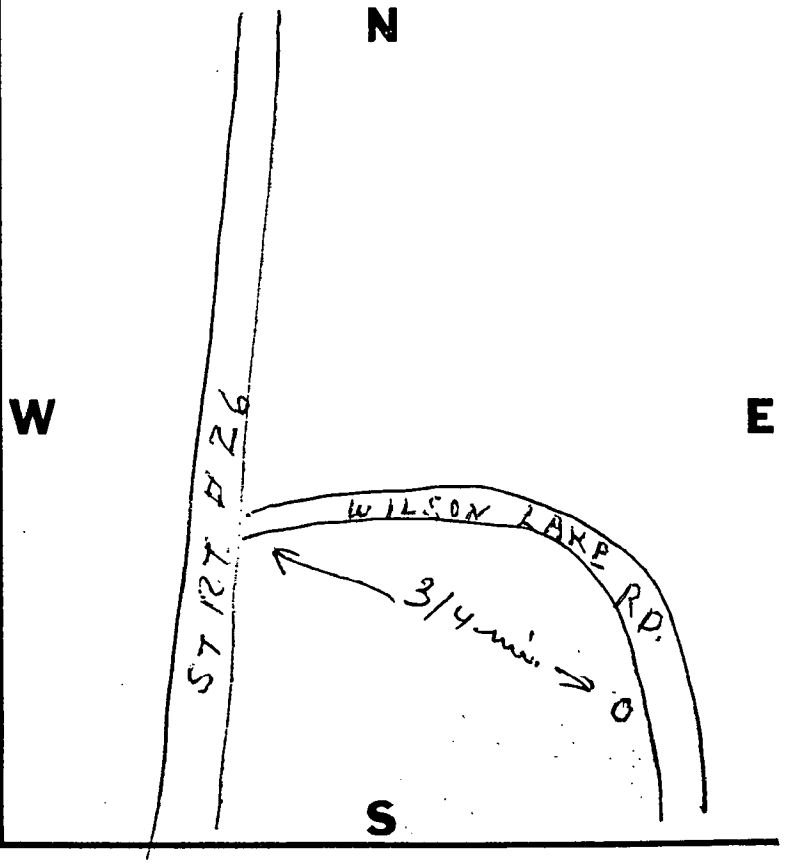
Pump installed by —

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
Top Soil	0 ft	4 ft
Sandy Shale	4	16
Red Clay	16	22
Sandy Clay	22	30
Sandstone	30	36
Clay	36	46
Sandstone	46	50
Lime Clay	50	58
Limestone	58	64
Lime Clay	64	83
Limestone	83	93

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM Mann Drilling DATE 9-2-78

ADDRESS RT. 3, Woodsfield, O SIGNED Floyd E. Mann

*If additional space is needed to complete well log, use next consecutive numbered form.

TB

AEC 04682

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio

PLEASE USE PENCIL OR TYPEWRITER. DO NOT USE INK.

OUTSIDE 1000' LIMITS

No. 259264

County BELMONT Township WAYNE Section of Township 13

Owner GEO. KEHOE Address 512 EASTERN AVE WOODSFIELD

Location of property ON LAKE WILSON 1 MILE FROM ST RT 145

CONSTRUCTION DETAILS

Casing diameter 6 1/4 Length of casing 22

Type of screen ..... Length of screen .....

Type of pump .....

Capacity of pump .....

Depth of pump setting .....

Date of completion 5-14-62

BAILING OR PUMPING TEST

Pumping rate 1/5 G.P.M. Duration of test ..... hrs.

Drawdown ..... ft. Date .....

Developed capacity .....

Static level—depth to water 53 ft.

Pump installed by .....

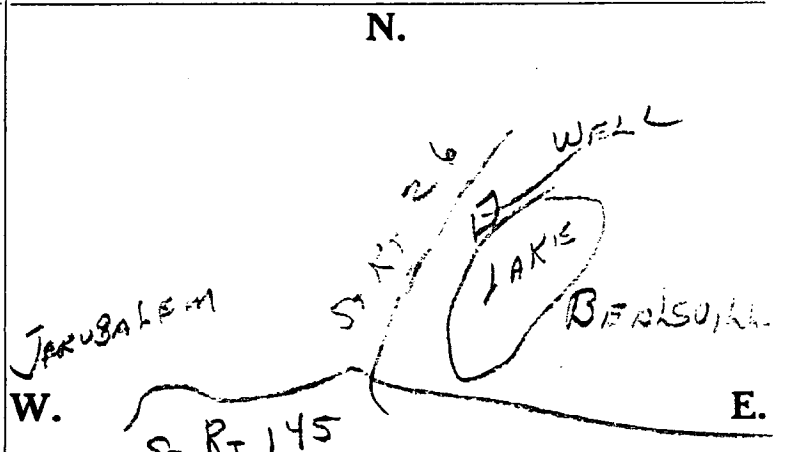
WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
SOIL	0 Feet	1 Ft.
SANDSTONE	1	32
BLUE SHALE	32	34
RED ROCK	34	37
GRAY SHALE	37	54
WHITE SAND	54	61
GRAY SHALE	61	64
BLACK SHALE	64	66
COAL	66	71
RED ROCK	71	75

WATER 51
WATER 26

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm H.H. BILLMAN Date 5-14-62

Address 416 EAST MARIETTA ST WOODSFIELD, OHIO

Signed H. H. Billman

TR 824 (B)

AEC 04683

County Permit No. _____

NO CARBON PAPER NECESSARY– SELF-TRANSCRIBING

WELL LOG AND DRILLING REPORT

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Fountain Square
Columbus, Ohio 43224

ORIGINAL

540712

OUTSIDE 1000' LIMITS

COUNTY Belmont TOWNSHIP Wayne SECTION OF TOWNSHIP _____

OWNER Charles Billman ADDRESS Rt #1 Jerusalem, Ohio

LOCATION OF PROPERTY Wilson Lake 3/4 mi. E. ST RT. 26

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing 100

Type of screen _____ Length of screen _____

Type of pump ✓

Capacity of pump _____

Depth of pump setting _____

Date of completion _____

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 10 gpm Duration of test _____ hrs

Drawdown _____ ft Date _____

Static level (depth to water) _____ ft

Quality (clear, cloudy, taste, odor) Clear

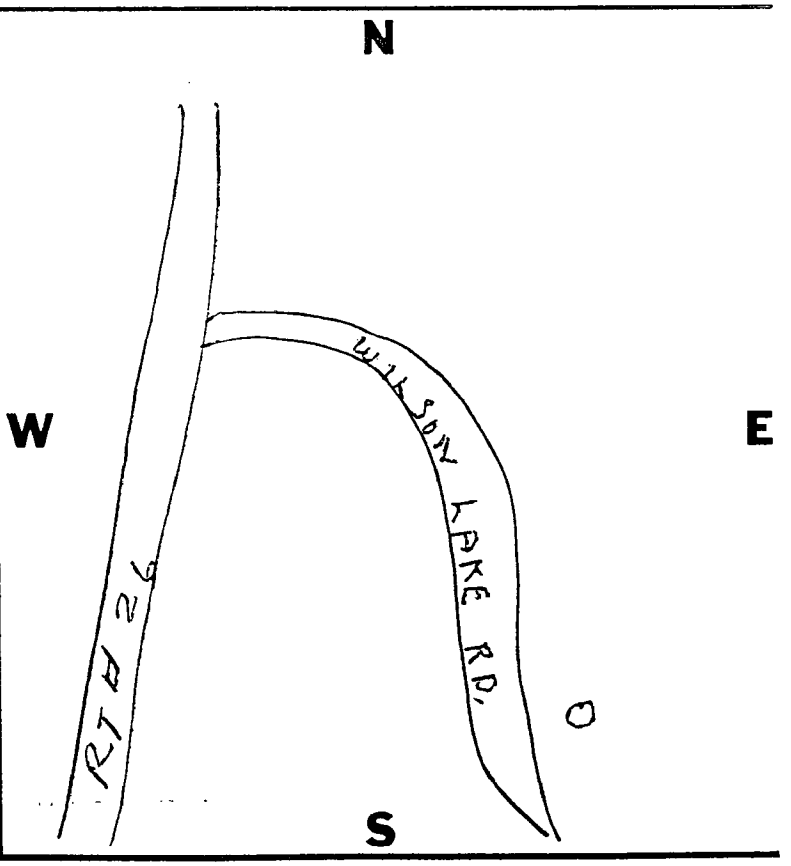
Pump installed by ✓

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
Top Soil	0 ft	3 ft
Sandstone	3	8
Sandy Clay	8	18
Hard Sandstone	18	20
Clay	20	32
Sandstone	32	36
Sandy Clay	36	45
Sandstone	45	52
Lime Clay	52	54
Limestone	54	58
Lime Clay	58	83
Limestone	83	84
Lime Clay	84	89
Limestone	89	94
Clay	94	100

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM Mann Drilling DATE 5-1-78

ADDRESS RT. 3, Woodsfield, O. SIGNED Floyd E. Mann

*If additional space is needed to complete well log, use next consecutive numbered form.

AEC 04684

WELL LOG AND DRILLING REPORT

ORIGINAL

OUTSIDE 1000' LIMITS

480177

NO CARBON PAPER NECESSARY– SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Geological Survey
Fountain Square
Columbus, Ohio 43224 Phone (614) 466-5344

COUNTY BELMONT TOWNSHIP WAYNE SECTION OF TOWNSHIP OR LOT NUMBER 13

OWNER HALLEY NEWLAND ADDRESS Box #413 Martin's Ferry, Ohio

LOCATION OF PROPERTY WILSON, OHIO

CONSTRUCTION DETAILS

Casing diameter 6" Length of casing 100'

Type of screen NONE Length of screen

Type of pump Deep Well

Capacity of pump 5 GPM

Depth of pump setting 90'

Date of completion 10-20-75

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 5 gpm Duration of test 24 hrs

Drawdown 75 ft Date 10-20-75

Static level (depth to water) 52' ft

Quality (clear, cloudy, taste, odor)

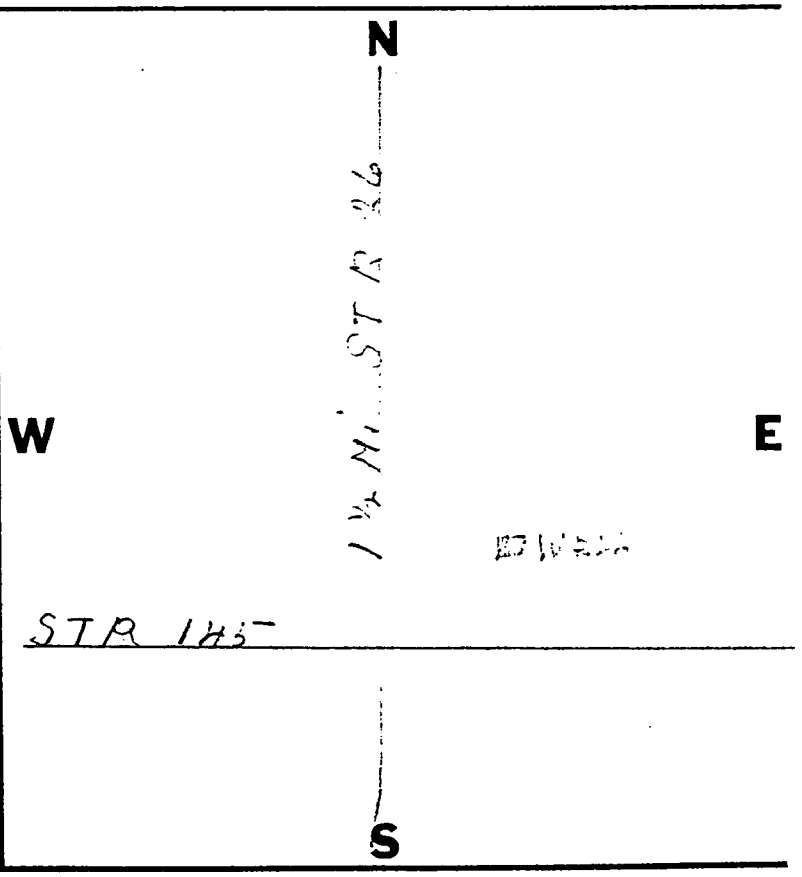
Pump installed by Ellis Hogue

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
Clay	0 ft	12 ft
Rock	12	16
Shale gray	16	47
Sandstone	47	60
Shale gray	60	99

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM Ellis Hogue DATE 10-20-75

ADDRESS Rt 3 Woodsfield, O. SIGNED Ellis E Hogue

*If additional space is needed to complete well log, use next consecutive numbered form.

TR 60 (B)

AEC 04685

County Permit No. _____

NO CARBON PAPER NECESSARY– SELF-TRANSCRIBING

WELL LOG AND DRILLING REPORT

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Fountain Square
Columbus, Ohio 43224

ORIGINAL

540731

OUTSIDE 1000' LIMITS

COUNTY Belmont TOWNSHIP Wayne SECTION OF TOWNSHIP _____

OWNER John Price ADDRESS Rt. #1 Jerusalem, Ohio

LOCATION OF PROPERTY Wilson Lake 3/4 mi. E. of ST RT. 26.

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing 100

Type of screen _____ Length of screen _____

Type of pump _____

Capacity of pump _____

Depth of pump setting _____

Date of completion _____

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 5 gpm Duration of test _____ hrs

Drawdown _____ ft Date _____

Static level (depth to water) _____ ft

Quality (clear, cloudy, taste, odor) Clear

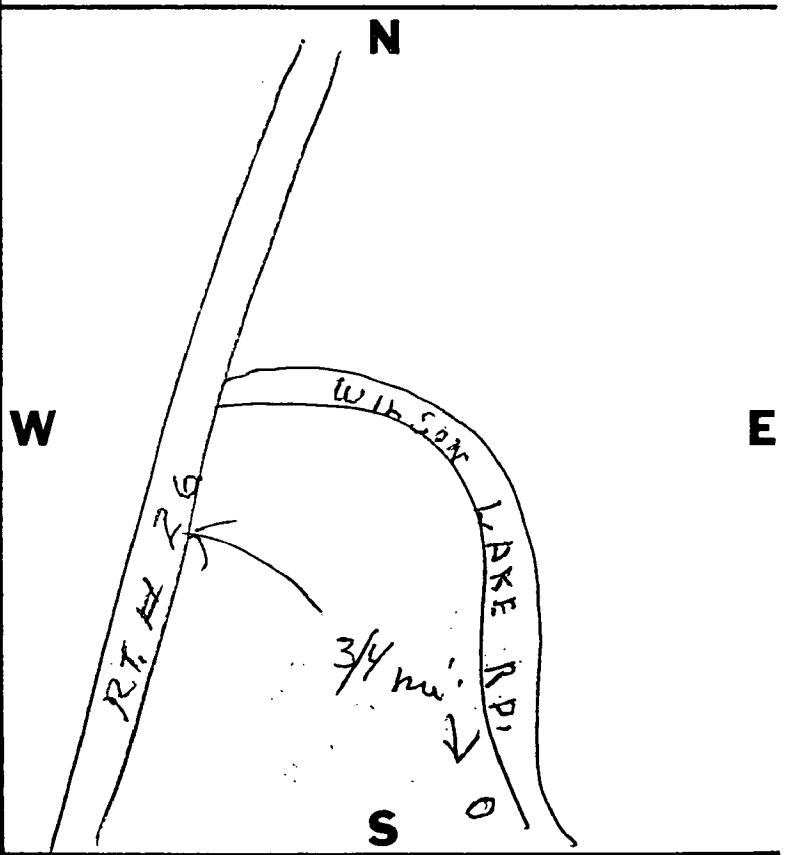
Pump installed by —

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
Top Soil	0 ft	4 ft
Sandy Shale	4	16
Red Clay	16	22
Sandy Clay	22	30
Sandstone	30	36
Clay	36	46
Sandstone	46	50
Clay, Lime	50	58
LIME ~~Sandstone~~	58	64
Lime Clay	64	82
Limestone	82	100

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM Mann Drilling DATE 12-5-78

ADDRESS RT. 3, Woodsfield, Ohio SIGNED Joseph E. Mann

*If additional space is needed to complete well log, use next consecutive numbered form.

AEC 04686

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio

PLEASE USE PENCIL OR TYPEWRITER. DO NOT USE INK.

OUTSIDE 1000' LIMITS

No. 259265

County BELMONT Township WAYNE Section of Township 19

Owner SWITZERLAND COUNTRY CLUB Address JERUSALEM, OHIO

Location of property ½ MILE OF ST RT 145 ON LAKE WILSON

CONSTRUCTION DETAILS

Casing diameter 6¼ Length of casing 12

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion 5-17-62

BAILING OR PUMPING TEST

Pumping rate 1½ G.P.M. Duration of test hrs.

Drawdown ft. Date

Developed capacity

Static level—depth to water 14 ft.

Pump installed by

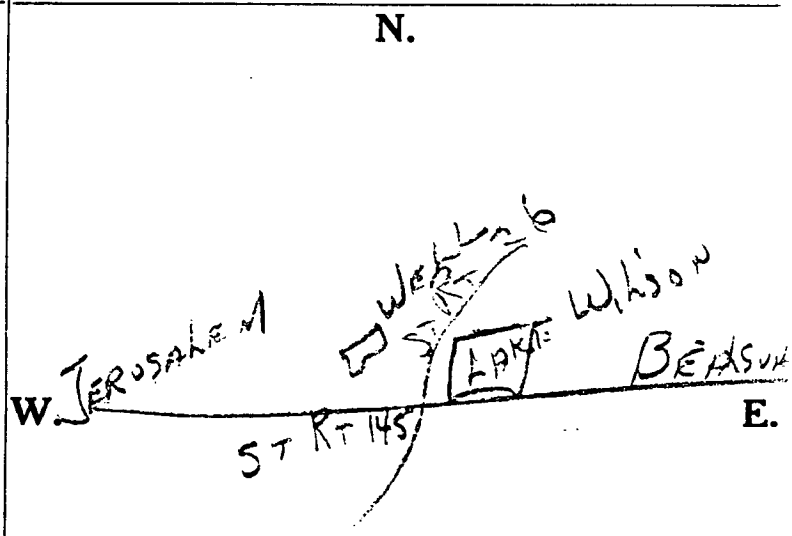
WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
SOIL	0 Feet	1 Ft.
SANDSTONE	1	12
GRAY SHALE	12	19
RED ROCK	19	23
GRAY SHALE	23	34
BLUE ROCK	34	40
GRAY SHALE	40	42

WATER-16

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm H. H. BILLMAN

Address 416 E. MARIETTA ST
WOODSFIELD, OHIO

Date 5-17-62

Signed H. H. Billman
TR 824

34B

AEC 04687

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

No. 402984

Outside 1000' limits
S/E corner sheet 1 of 3
on Twp. Rd. 106

County BELMONT Township WASHINGTON Section of Township

Owner ARNOLD WILES Address ALEDONIA

Location of property 5 MILES S.W. OF ALEDONIA

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing 27'

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion 4-23-75

BAILING OR PUMPING TEST
(Specify one by circling)

Test Rate 2 G.P.M. Duration of test hrs.

Drawdown ft. Date

Static level-depth to water ft.

Quality (clear, cloudy, taste, odor)

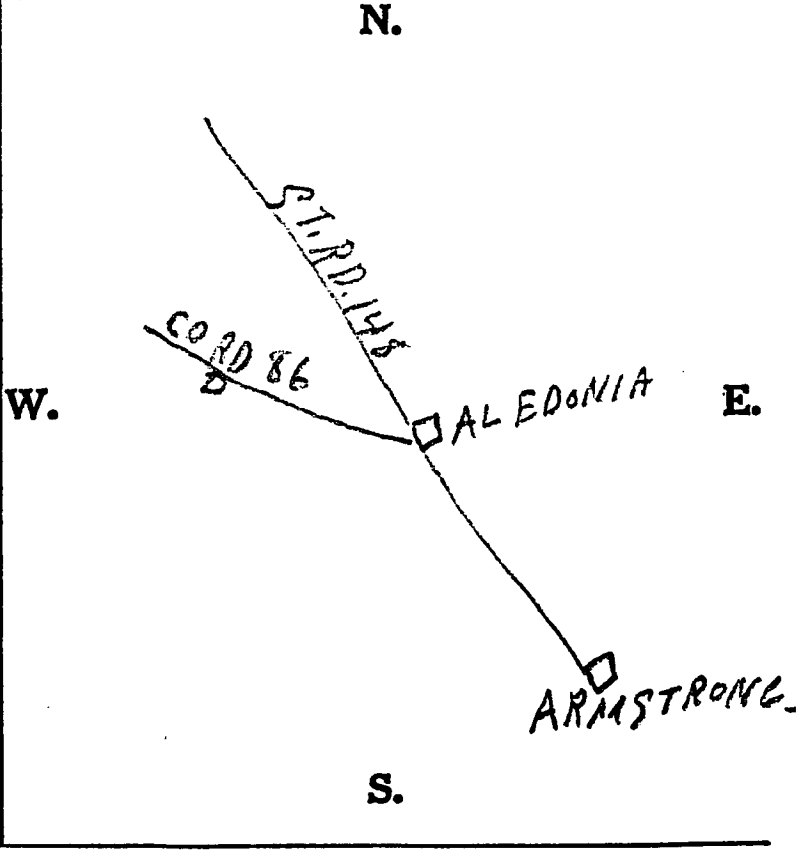
Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
CLAY	0 Feet	8 Ft.
RED CLAY	8	14
DARK CLAY	14	20
SANDSTONE	20	22
GREY SHALE	22	33
LIMESTONE	33	35
GREYSHALE	35	75
WATER AT 45'		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



Drilling Firm KRIECHBAUM DRILLING Date 4-2-75

Address JACOBSBURG OHIO Signed Lawrence Kriechbaum

*If additional space is needed to complete well log, use next consecutive numbered form.

AEC 04688

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio

PLEASE USE PENCIL OR TYPEWRITER. DO NOT USE INK.

OUTSIDE 1000' LIMITS

No. 265757

County Belmont Township Washington Section of Township 33

Owner Russel Gobard Address Bealsville O RD #7

Location of property 1¼ Mile off 148 on 145 Top of hill

CONSTRUCTION DETAILS

Casing diameter 6¼ Length of casing 30 ft

Type of screen ..... Length of screen .....

Type of pump .....

Capacity of pump .....

Depth of pump setting .....

Date of completion .....

BAILING OR PUMPING TEST

Pumping rate ..... G.P.M. Duration of test ..... hrs.

Drawdown ..... ft. Date .....

Developed capacity 6 gal min

Static level—depth to water ..... ft.

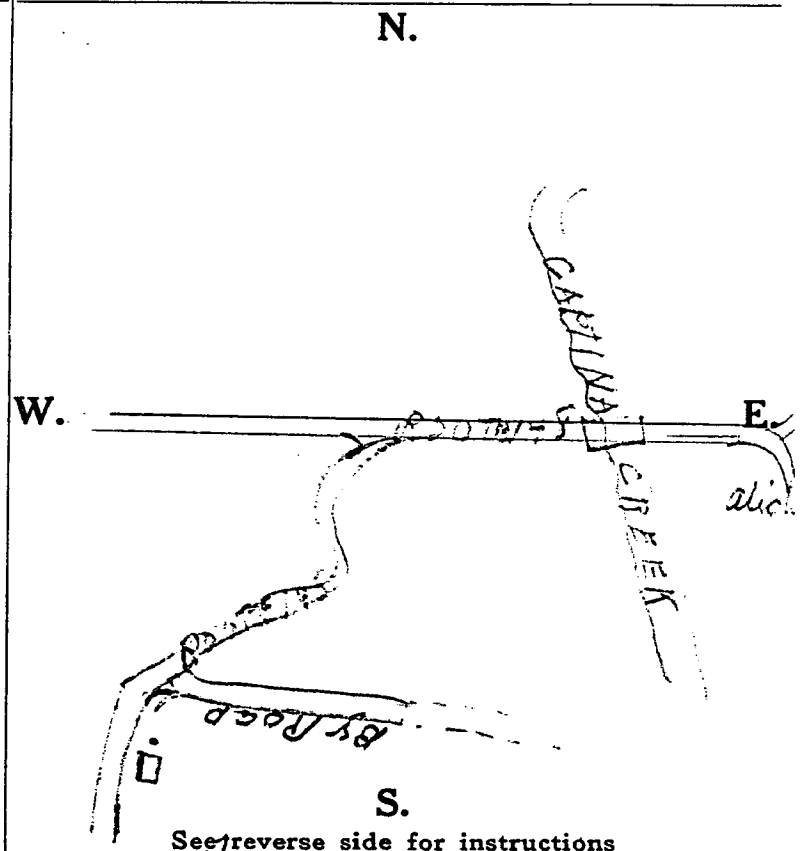
Pump installed by .....

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Lime & shale	0 Feet	30 Ft.
6 [illegible]	30	90
[illegible] 72 & 85		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm [illegible]

Address [illegible]

Date June 2/61

Signed [illegible]

SR 145 (24)

AEC 04689

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio

PLEASE USE PENCIL OR TYPEWRITER. DO NOT USE INK.

OUTSIDE 1000' LIMITS

No. 272557

County Belmont Township Washington Section of Township

Owner L.W. Kirby Address Bealsville R.D. 1

Location of property 1 1/4 Mile on 145 of 148 Back Belmont Church

CONSTRUCTION DETAILS

Casing diameter 6" Length of casing 29

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion Nov 6/62

BAILING OR PUMPING TEST

Pumping rate G.P.M. Duration of test hrs.

Drawdown ft. Date

Developed capacity 2 gal

Static level—depth to water ft.

Pump installed by

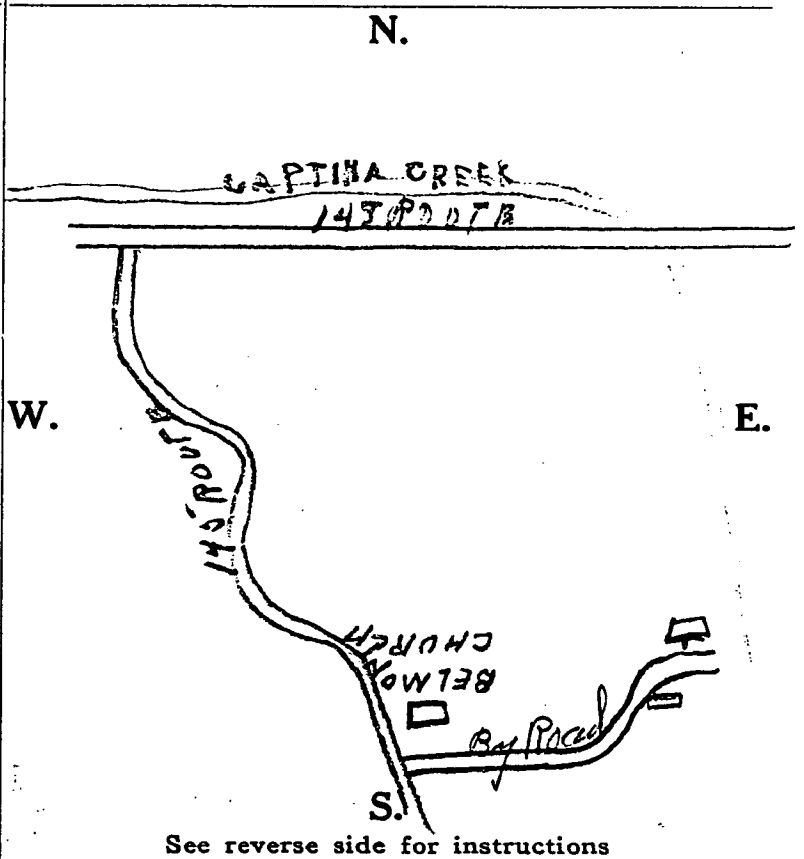
WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Loome & Shale	0 Feet	28 Ft.
Shale Clay	28	60
Clay & Lime	60	115

Water at 92

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Chas M. Gunn Date Nov 6/62

Address Powhatan Pl Signed Chas M. Gunn

TR 104

(27)

AEC 04690

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio 43212

PLEASE USE PENCIL OR TYPEWRITER
DO NOT USE INK.

Nº 356334
OUTSIDE 1000' LIMITS

County Belmont Township Washington Section of Township 21

Owner George Dietrich Address Bealsville R.D. #1

Location of property 2 miles on Crab apple Road above Modern Stone Rd.

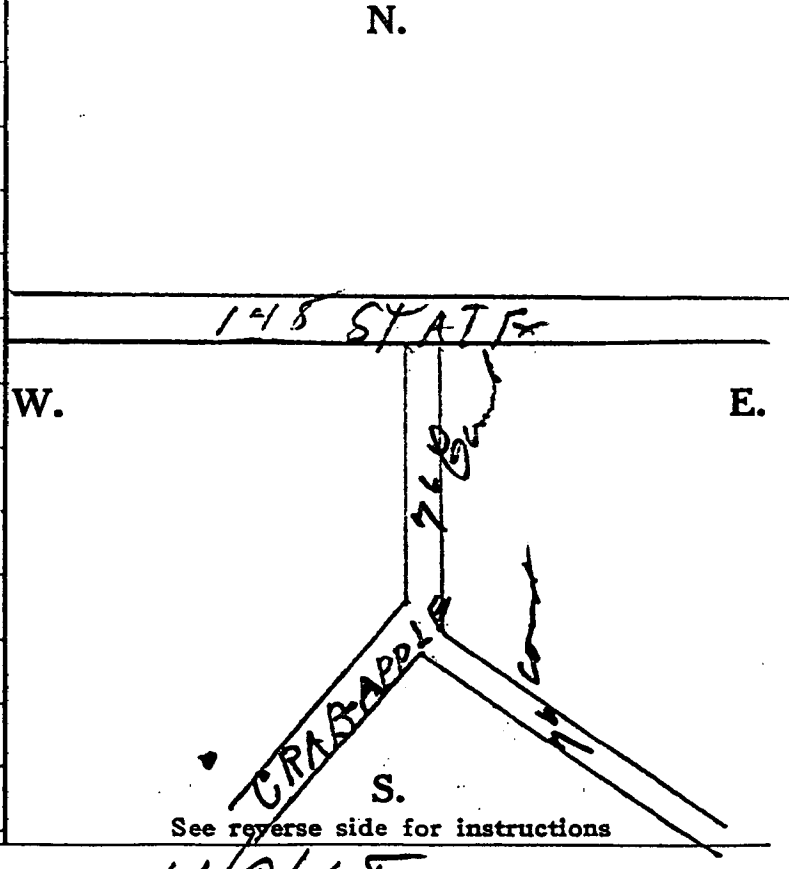
CONSTRUCTION DETAILS	BAILING OR PUMPING TEST
Casing diameter 8 Length of casing 19	Pumping Rate 3 G.P.M. Duration of test ..... hrs.
Type of screen ..... Length of screen	Drawdown ..... ft. Date .....
Type of pump	Static level-depth to water 6 ft.
Capacity of pump	Quality (clear, cloudy, taste, odor) Clear
Depth of pump setting	
Date of completion Dec 9/68	Pump installed by .....

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Loam & shale	0 Feet	16 Ft.
Sand & Lime	16	35

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Chas. McGuire Date 11/9/68

Address Powhatan P.O. Signed Chas. McGuire

*If additional space is needed to complete well log, use next consecutive numbered form.

AEC 04691

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio

PLEASE USE PENCIL OR TYPEWRITER. DO NOT USE INK.

OUTSIDE 1000' LIMITS

No. 272559

County Belmont Township Washington Section of Township 21

Owner William Ruschak Address Beallsville R.D.1.

Location of property 2 Wells on Crabapple above Howden Store on Left of [illegible]

CONSTRUCTION DETAILS

Casing diameter 6 Length of casing 12

Type of screen ..... Length of screen .....

Type of pump .....

Capacity of pump .....

Depth of pump setting .....

Date of completion Nov 21/62

BAILING OR PUMPING TEST

Pumping rate ..... G.P.M. Duration of test ..... hrs.

Drawdown ..... ft. Date .....

Developed capacity 5 Gal P Min

Static level—depth to water ..... ft.

Pump installed by .....

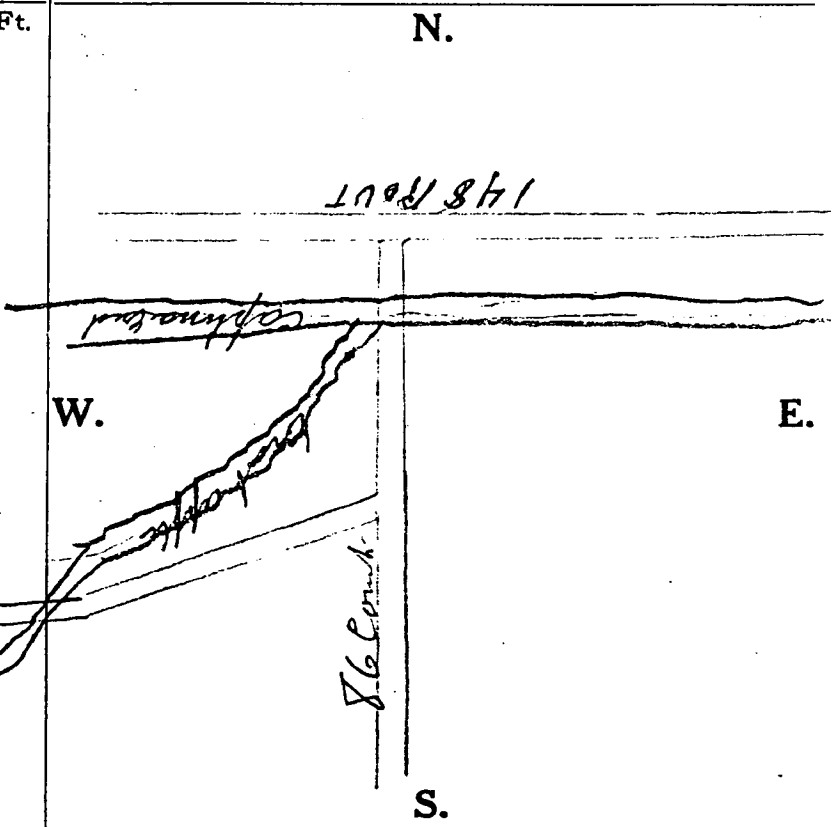
WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Loam	0 Feet	12 Ft.
Sand & Lime	12	50

Water at 45 ft.

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm [signature]

Address [illegible]

Date Nov 21/62

Signed [signature]

TR103

(79)

AEC 04692

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio

PLEASE USE PENCIL OR TYPEWRITER. DO NOT USE INK.

OUTSIDE 1000' LIMITS

No. 272576

County Belmont Township Wayne Section of Township 1

Owner Cyril Louden Address Bealsville R D 1 O.

Location of property on 145 north of Bealsville O 1¼ mile

CONSTRUCTION DETAILS

Casing diameter 8 Length of casing 22

Type of screen Length of screen

Type of pump Jet

Capacity of pump

Depth of pump setting

Date of completion 4/14/64

BAILING OR PUMPING TEST

Pumping rate G.P.M. Duration of test hrs.

Drawdown ft. Date

Developed capacity 5 gal min ut

Static level—depth to water 12 ft ft.

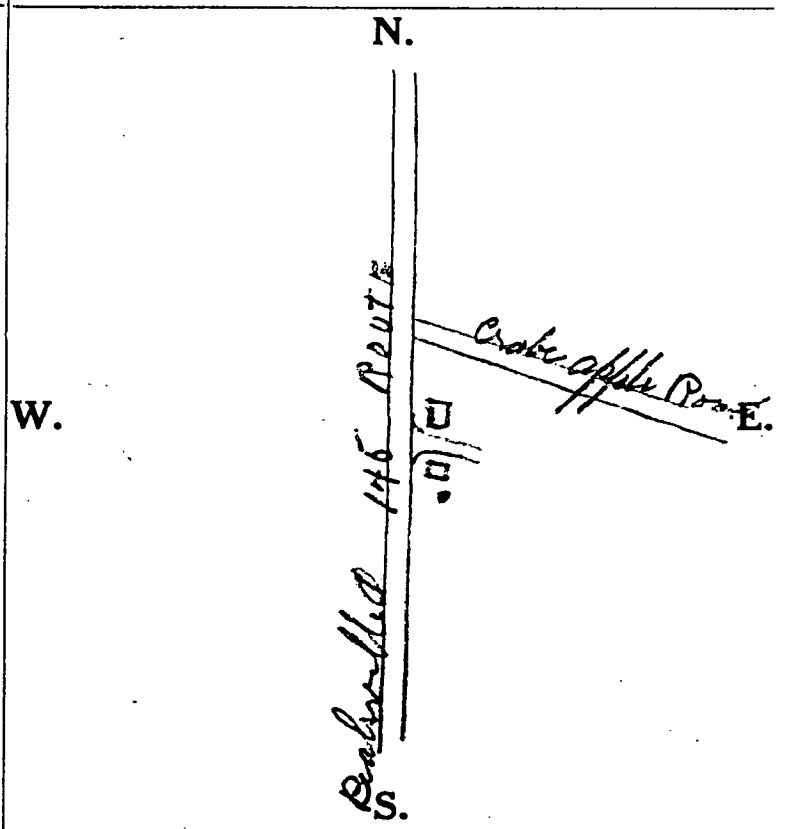
Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Loam	0 Feet	20 Ft.
Shale & Clay	24	75
Water 26-40-70		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm [signature]

Address [illegible] P O

Date 4/14/64

Signed [signature]

F-36

AEC 04693

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

No. 413094

OUTSIDE 1000' LIMITS

County Belmont Township Wayne Section of Township 17

Owner Cyril Lauden Address St Rt 145 Bellaire

Location of property On St Rt 145 North of Bellaire

CONSTRUCTION DETAILS

Casing diameter 8 Length of casing 18

Type of screen _____ Length of screen _____

Type of pump _____

Capacity of pump _____

Depth of pump setting _____

Date of completion 7-1-71

BAILING OR PUMPING TEST
(Specify one by circling)

Test Rate 2½ G.P.M. Duration of test _____ hrs.

Drawdown _____ ft. Date _____

Static level-depth to water 18 ft.

Quality (clear, cloudy, taste, odor) _____

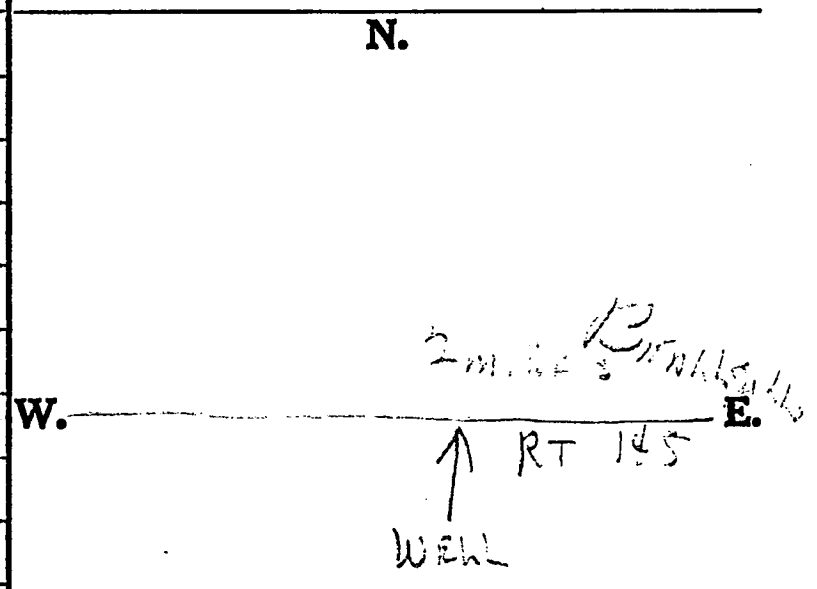
Pump installed by _____

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Soil	0 Feet	1 Ft.
Sand Stone	1	19
Gray Shale	19	70
WATER 20		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



Drilling Firm Billman Drilling Date 7-1-71

Address Uhrichsville Ohio Signed H. H. Billman

*If additional space is needed to complete well log, use next consecutive numbered form.

AEC 04694

WELL LOG AND DRILLING REPORT

ORIGINAL

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Fountain Square
Columbus, Ohio 43224

NO CARBON PAPER NECESSARY– SELF-TRANSCRIBING

504177

Outside 1000' Limits

COUNTY BELMONT TOWNSHIP WAYNE SECTION OF TOWNSHIP 13

OWNER MARVELINE McCONNELL ADDRESS 1939 Willow Run Rd Grove Ci

LOCATION OF PROPERTY WILSON. OH.

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing 32'

Type of screen _____ Length of screen _____

Type of pump _____

Capacity of pump _____

Depth of pump setting _____

Date of completion _____

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 5 gpm Duration of test 24 hrs

Drawdown 35 ft Date 3-28-78

Static level (depth to water) 40 ft

Quality (clear, cloudy, taste, odor) _____

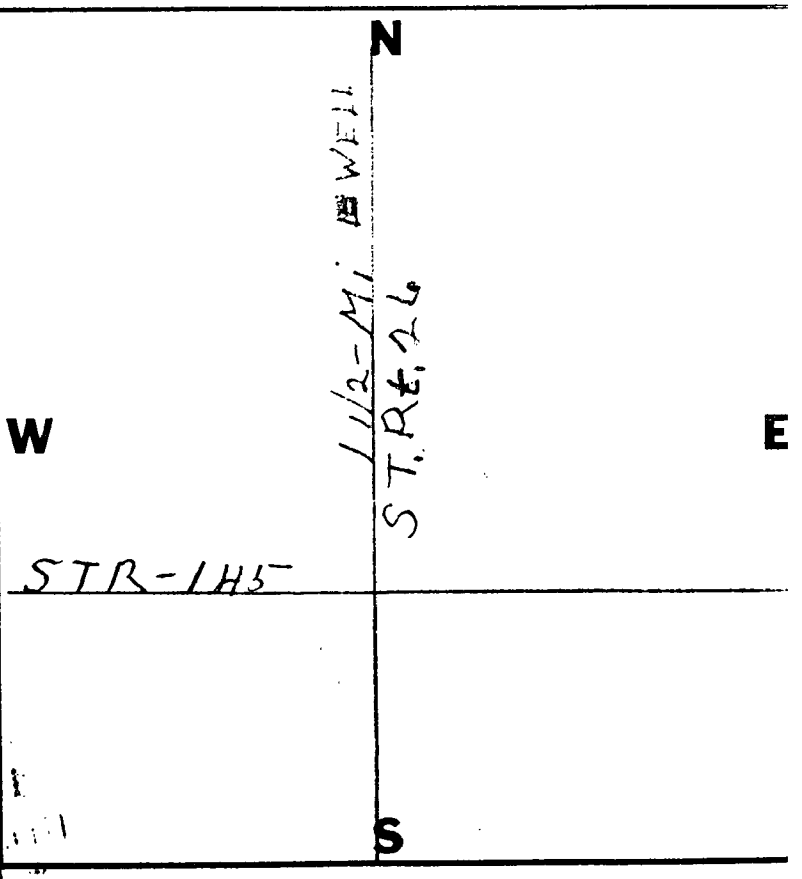
Pump installed by _____

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
SANDSTONE	0 ft	22 ft
Shale gray	22	45
Rock	45	52
Shale & Rock	52	82
WATER AT 46'		

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM ELLIS HOGUE DATE 3-28-78

ADDRESS Rt 3 Woodsfield Oh. SIGNED Ellis Hogue

B

*If additional space is needed to complete well log, use next consecutive numbered form.

AEC 04695

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY – SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Geological Survey
Fountain Square
Columbus, Ohio 43224 Phone (614) 466-5344

480157
OUTSIDE 1000' LIMITS

COUNTY BELMONT TOWNSHIP WAYNE SECTION OF TOWNSHIP OR LOT NUMBER 13

OWNER DALE Schwall ADDRESS 222 W Marietta Woodsfield

LOCATION OF PROPERTY WILSON, O.

CONSTRUCTION DETAILS

Casing diameter 7" Length of casing 102'

Type of screen _____ Length of screen _____

Type of pump _____

Capacity of pump _____

Depth of pump setting _____

Date of completion _____

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 1½ gpm Duration of test 90 min. hrs

Drawdown 102 ft Date 10-14-74

Static level (depth to water) 70 ft

Quality (clear, cloudy, taste, odor) _____

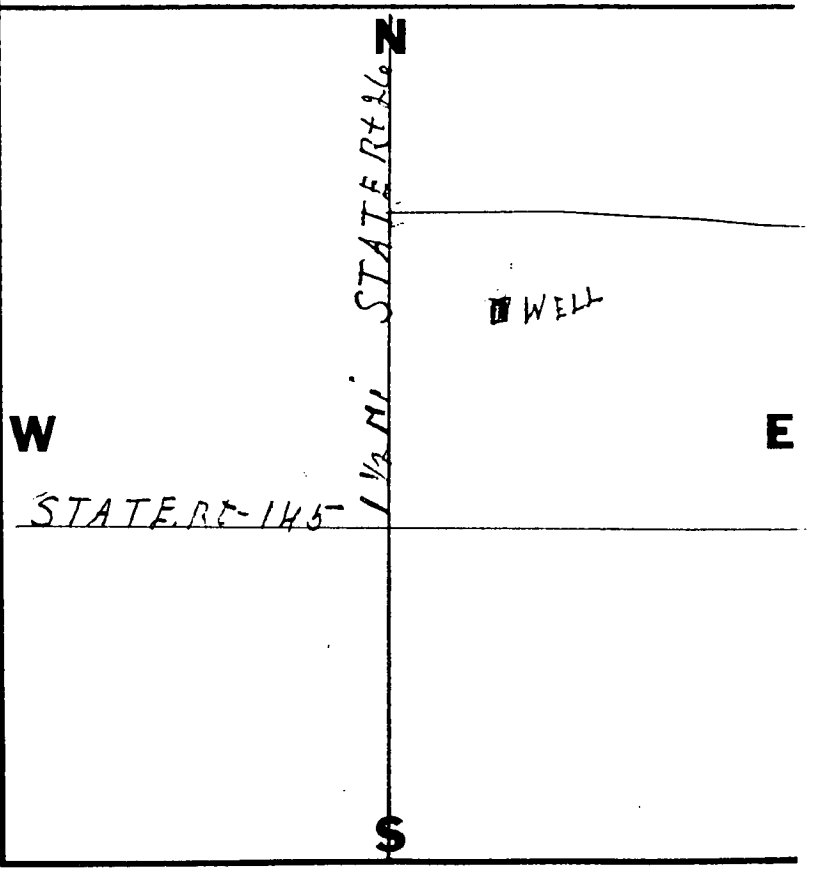
Pump installed by _____

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
Clay	0 ft	3 ft
Rock	3	28
Shale gray	28	50
Rock	50	58
Shale gray	58	102

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM ELLIS HOGUE DATE 10-14-74

ADDRESS Rt 3 Woodsfield, O. SIGNED Ellis E Hogue

*If additional space is needed to complete well log, use next consecutive numbered form.

7R60 (B)

AEC 04696

WELL LOG AND DRILLING REPORT

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Fountain Square
Columbus, Ohio 43224

NO CARBON PAPER NECESSARY– SELF-TRANSCRIBING

618517

OUTSIDE 1000' LIMITS.

COUNTY Belmont TOWNSHIP Wayne SECTION OF TOWNSHIP 19

OWNER Thomas Williams ADDRESS 514 Grant Ave Martins Ferry

LOCATION OF PROPERTY Wilson Lake Wilson, Ohio

CONSTRUCTION DETAILS

Casing diameter 6" Length of casing 20'

Type of screen _____ Length of screen _____

Type of pump N/A

Capacity of pump _____

Depth of pump setting _____

Date of completion MAY, 1986

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 15 gal per hr. gpm Duration of test 4 hrs

Drawdown 2 ft Date MAY-1986

Static level (depth to water) 40' ft

Quality (clear, cloudy, taste, odor) clear

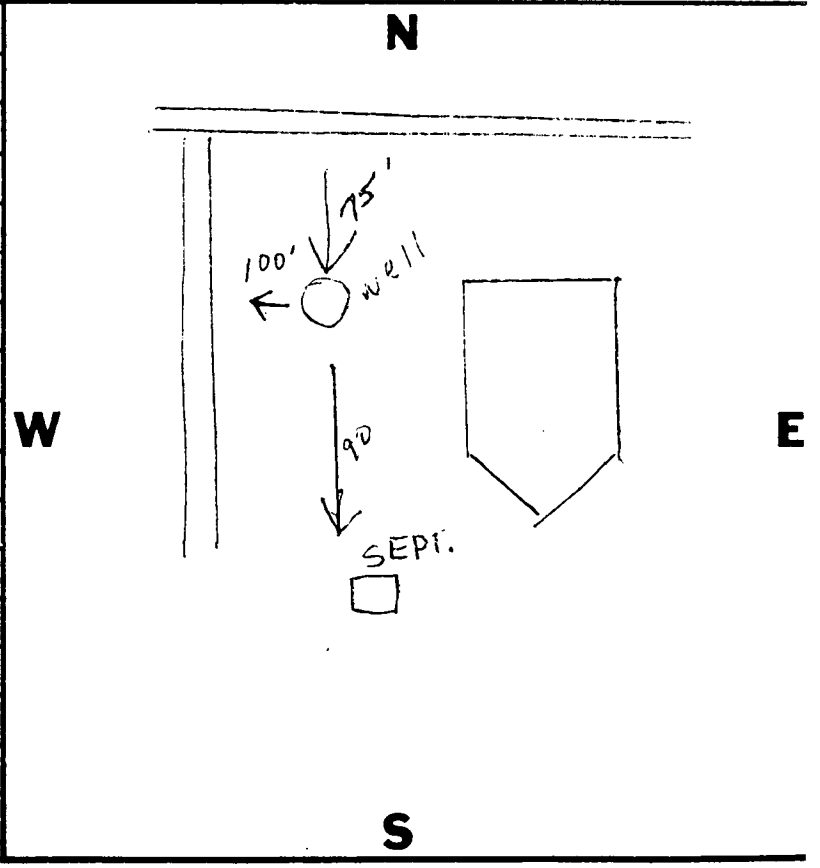
Pump installed by _____

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
Top soil	0 ft	5 ft
Shale	5'	10'
SANDSTONE	10'	40'
Limestone	40'	50'
CLAY-RED	50	65'
CLAY gray	65'	75'
COAL	75'	77'
LIMESTONE	77'	120'
WATER	40'	

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM Crozier Drilling DATE June 1986

ADDRESS Jacobsburg, Ohio SIGNED Charles Crozier

*If additional space is needed to complete well log, use next consecutive numbered form.

ORIGINAL COPY - ODNR, DIVISION OF WATER, FOUNTAIN SQ., COLS., OHIO 43224

B

AEC 04697

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY– SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Geological Survey
Fountain Square
Columbus, Ohio 43224 Phone (614) 466-5344

480152
OUTSIDE 1000' LIMITS

COUNTY BELMONT TOWNSHIP WAYNE SECTION OF TOWNSHIP OR LOT NUMBER 13

OWNER HEBER GRANT ADDRESS Rt 1 BEALLSVILLE, O.

LOCATION OF PROPERTY Wilson N. O

CONSTRUCTION DETAILS

Casing diameter 7" Length of casing 31'-7"

Type of screen _____ Length of screen _____

Type of pump _____

Capacity of pump _____

Depth of pump setting _____

Date of completion _____

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 1 gpm Duration of test 40 hrs

Drawdown 100 ft Date 9-9-74

Static level (depth to water) 60' ft

Quality (clear) cloudy, taste, odor) _____

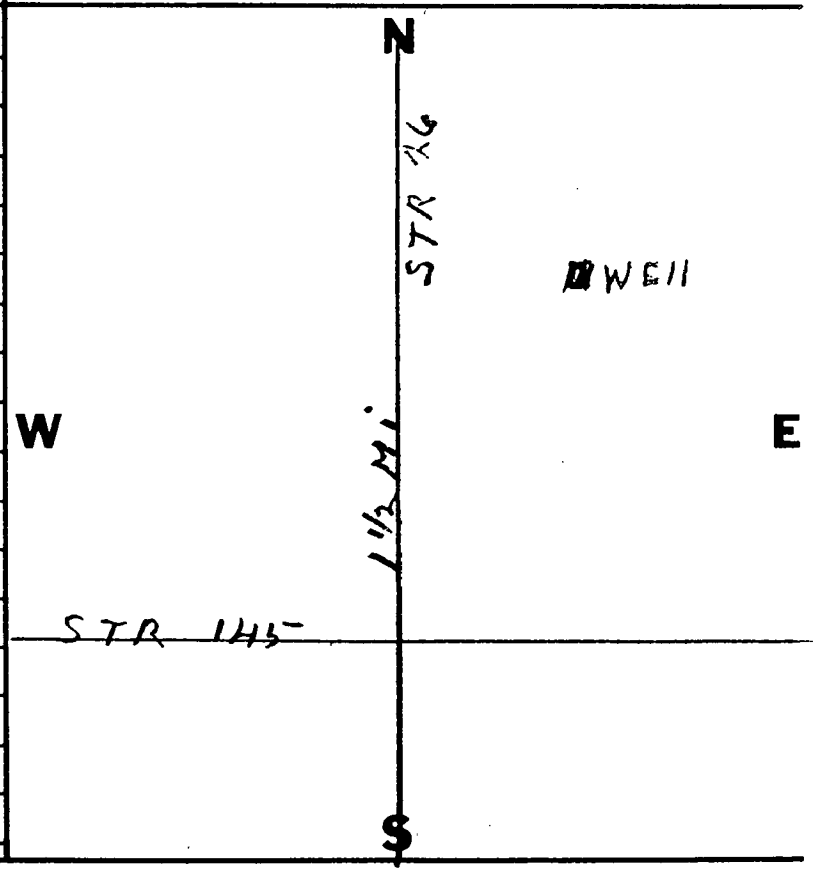
Pump installed by _____

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
Clay	0 ft	16 ft
Sand	16	30
Shale Rock gray	30	100

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM Ellis Hague DATE 9-9-74

ADDRESS Rt 3 Woodsfield, O. SIGNED Ellis E Hague

*If additional space is needed to complete well log, use next consecutive numbered form.

TR 40 (B)

AEC 04698

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY– SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Geological Survey
Fountain Square
Columbus, Ohio 43224 Phone (614) 466-5344

480151
OUTSIDE 1000' LIMITS

COUNTY BELMONT TOWNSHIP WAYNE SECTION OF TOWNSHIP OR LOT NUMBER 13

OWNER Ronald Seidler ADDRESS 3376 Vilford Woodsfield, Oh

LOCATION OF PROPERTY WILSON. O.

CONSTRUCTION DETAILS

Casing diameter 7" Length of casing 73'

Type of screen _____ Length of screen _____

Type of pump _____

Capacity of pump _____

Depth of pump setting _____

Date of completion _____

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 1½ gpm Duration of test 90 1hr hrs

Drawdown 100 ft Date 9-3-74

Static level (depth to water) 60' ft

Quality (clear, cloudy, taste, odor) _____

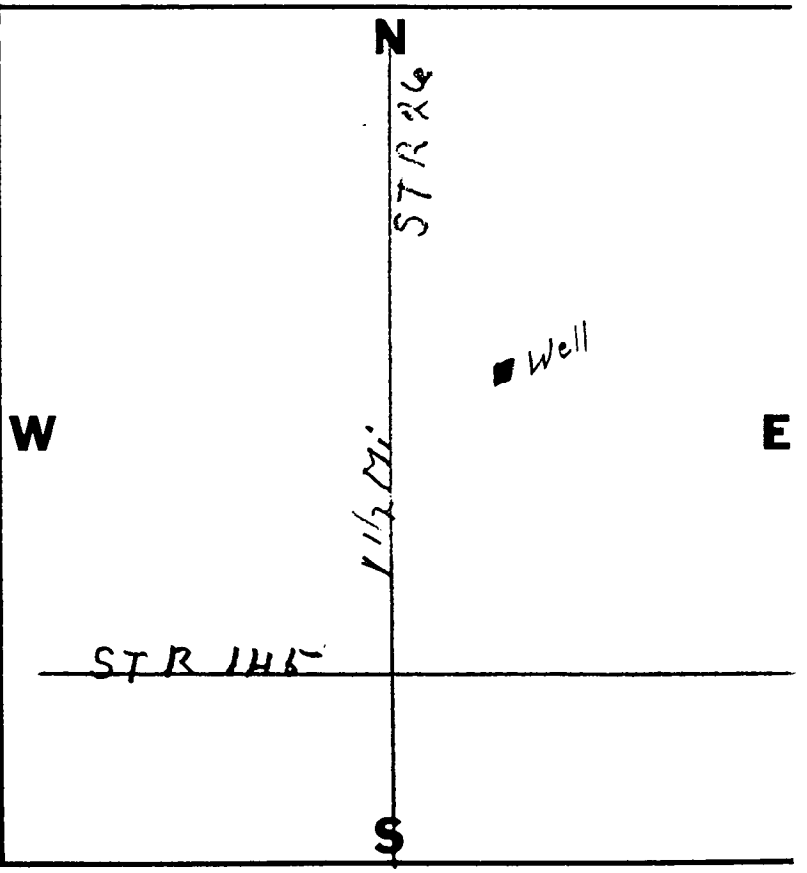
Pump installed by _____

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
Clay	0 ft	15 ft
SAND	15	30
Shale & Rock grey	30	100

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM Ellis Hague DATE 9-3-74

ADDRESS Rt 3 Woodsfield, O. SIGNED Ellis E Hague

TR 40 (D)

*If additional space is needed to complete well log, use next consecutive numbered form.

AEC 04699

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY– SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Geological Survey
Fountain Square
Columbus, Ohio 43224 Phone (614) 466-5344

480154
OUTSIDE 1000' LIMITS

COUNTY BELMONT O. TOWNSHIP WAYNE SECTION OF TOWNSHIP OR LOT NUMBER 13

OWNER Charley Hoff ADDRESS Rt 1 BEALLSVILLE, O.

LOCATION OF PROPERTY WILSON, O.

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing 31'-6"

Type of screen _____ Length of screen _____

Type of pump _____

Capacity of pump _____

Depth of pump setting _____

Date of completion _____

BAILING OR PUMPING TEST
(specify one by circling)

Test rate 3 gal gpm Duration of test 180 -1 hrs

Drawdown 120 ft Date 9-18-74

Static level (depth to water) 72 ft

Quality (clear, cloudy, taste, odor) _____

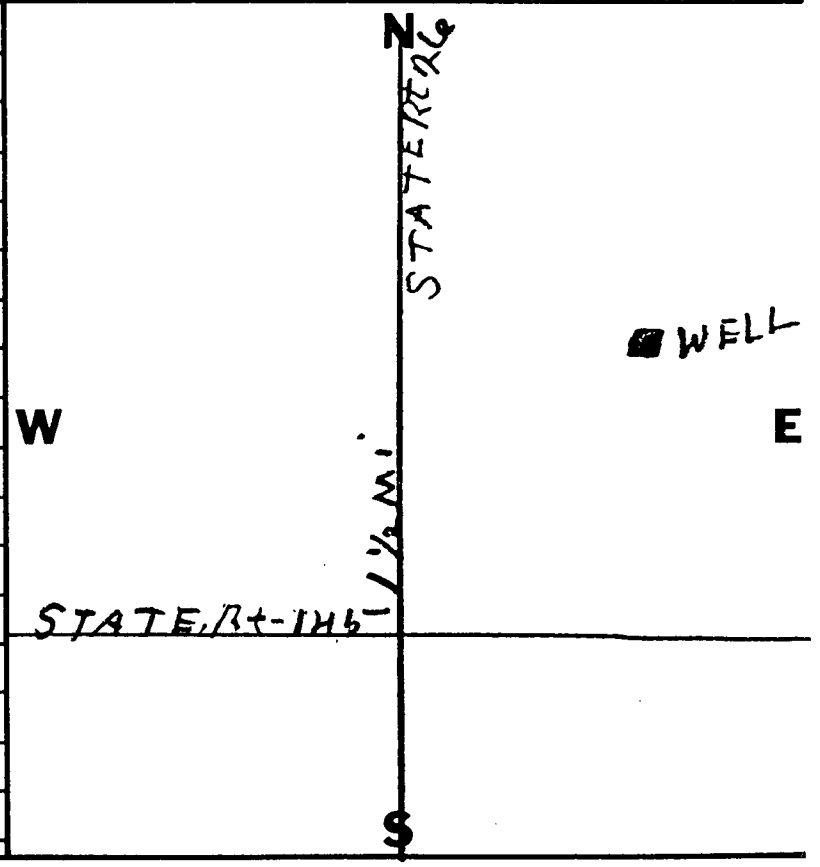
Pump installed by _____

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
Clay	0 ft	2 ft
Rock	2	28
Shale gray	28	50
Rock	50	58
Shale gray	58	104
Rock	104	120

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM ELLIS HOGUE DATE 9-18-74

ADDRESS Rt 3 Woodsfield, O. SIGNED Ellis E Hogue

*If additional space is needed to complete well log, use next consecutive numbered form.

TR 60 (B)

AEC 04700

ADDENDUM TO PAGE 17, C
BENNOC, INC.
CENTURY MINE
PERMIT D-0425

GROUNDWATER INFORMATION

Naturally occurring groundwater in this area resides primarily in consolidated (rock) aquifers that are partially or wholly confined and lie within the geologic interval above the Pittsburgh No. 8 Coal.

The rock aquifers are primarily sandstones, limestones and coals, but may also include shales, claystones, and siltstones. All units transmit water primarily by secondary porosity or hydraulic conductivity (joints and other fractures, bedding partings). In general, primary permeabilities are low to very low for these materials. In fact, there are no "aquifers" in the application area. Rather, the ground water is generally limited to the first 50 to 100 ft. of the strata, designated herein as the "Near Surface Saturated Zone." Larger openings in the rock strata saturated zones may be identified by limonitic (iron) stained or alkaline stained rocks in the test holes. The saturated zone is recharged through infiltration and percolation at outcrop zones and in some cases, by vertical flows through discontinuities and locally permeable overlying strata. The stratigraphy identified in the Geology Description section shows numerous lithologic units that are probably capable of transmitting water. Wells penetrating near surface rock aquifers typically exhibit yields of less than **2 gpm. Well yields are typically greater along valleys than along hilltops, as the density of stress-relief fractures are higher beneath valleys than beneath hills. This is the result of less confining pressure along valleys due to overburden removal.**

Numerous aquicludes comprised of claystones, mudstones, underclays, limestones with clay lenses, and some shales and siltstones are interbedded with the more permeable water bearing units. These less permeable strata strongly influence horizontal and vertical water movements. A portion of the springs flowing from valley walls below the ridgelines probably originate in the saturated zone and many can probably be identified as adjacent to (usually above) the less permeable strata.

Groundwater quality data obtained from these rock aquifer springs and the wells generally indicate pH ranges from 6.1 to 9.0, alkalinities in excess of acidities, high hardness, and low metals concentrations.

Wells and springs located within the application area are identified on the Attachment 14 forms included with this application. Their locations are shown on the Application Map.

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14C
(WELL/SPRING INVENTORY)

Applicant's Name BENNOC, INC. (D-0425-1)

Well/Spring Identification Number	Name of Owner of Well/Spring	Surface Elevation of Well/Spring	Depth of Well in Feet Below Land Surface	Static Water Level of Well in Feet Below Land Surface	Lithology of Supplying Aquifer/ Waterbearing Zone (SEE ATTACHMENT 14B)	Known Uses of Well/Spring (if spring give discharge rate)
WL-1	O. PERKINS	1239	REPORTED - 63'	BURIED	B	NOT IN USE
WL-2	O. PERKINS	1236	62'	SEE ATTACH. 14A	B	NOT IN USE
W-3	O. PERKINS	1246	73'	SEE ATTACH. 14A	B	NOT IN USE
WL-4 (Buried)	W. PERKINS	1300	WELL LOG 90'	WELL LOG 60'	B	NOT IN USE
WL-5	P. MOORE	1221	57'	SEE ATTACH. 14A	B	NOT IN USE
W-6	J. THOMAS	1263	82'	SEE ATTACH. 14A	B	NOT IN USE
DW-7	J. THOMAS	1264	25'	SEE ATTACH. 14A	A	NOT IN USE
DW-8	P. CROOKS	939	13'	SEE ATTACH. 14A	A	DOMESTIC
WL-9	M. BECKETT	983	28'	SEE ATTACH. 14A	C	DOMESTIC
DW-10	M. BECKETT	983	30'	SEE ATTACH. 14A	A	NOT IN USE
W-11	D. TAYLOR	976	25'	SEE ATTACH. 14A	C	DOMESTIC
W-12	D. TAYLOR	976	36'	SEE ATTACH. 14A	C	NOT IN USE
DW-13	D. TAYLOR	972	15'	SEE ATTACH. 14A	A	NOT IN USE
DW-14	J. EDGE	957	13'	SEE ATTACH. 14A	A	NOT IN USE

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14C
(WELL/SPRING INVENTORY)

Applicant's Name BENNOC, INC. (D-0425-1)

Well/Spring Identification Number	Name of Owner of Well/Spring	Surface Elevation of Well/Spring	Depth of Well in Feet Below Land Surface	Static Water Level of Well in Feet Below Land Surface	Lithology of Supplying Aquifer/ Waterbearing Zone (SEE ATTACHMENT 14B)	Known Uses of Well/Spring (if spring give discharge rate)
DW-15	S. SCHAFER	937	SEALED	SEALED	UNKNOWN	NOT IN USE
W-16	R. THOMAS	1242	OBSTRUCTION	DRY	UNKNOWN	NOT IN USE
W-17	R. MOBLEY	1240	76'	SEE ATTACH. 14A	B	DOMESTIC
W-18	S. MOBLEY	1262	104'	SEE ATTACH. 14A	B	NOT IN USE
DW-19	S. MOBLEY	1260	28'	SEE ATTACH. 14A	A	NOT IN USE
DW-20	J. WELLS	1288	51'	SEE ATTACH. 14A	A	NOT IN USE
WL-21	J. WELLS	1287	92'	SEE ATTACH. 14A	B	DOMESTIC
W-22	C. BROWN	1060	51'	SEE ATTACH. 14A	C	DOMESTIC
W-23	C. BONDY	1039	REPORTED - 60'	BURIED	C	DOMESTIC
DW-24	C. BONDY	1206	20'	SEE ATTACH. 14A	A	NOT IN USE
W-25	RAVEN ROCKS, INC	1240	90'	SEE ATTACH. 14A	B	DOMESTIC
W-26	RAVEN ROCKS, INC	1240	84'	SEE ATTACH. 14A	B	NOT IN USE
W-27	RAVEN ROCKS, INC	1220	80'	SEE ATTACH. 14A	B	NOT IN USE
DW-28	RAVEN ROCKS, INC	1220	13'	SEE ATTACH. 14A	A	NOT IN USE

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14C
(WELL/SPRING INVENTORY)

Applicant's Name BENNOC, INC. (D-0425-1)

Well/Spring Identification Number	Name of Owner of Well/Spring	Surface Elevation of Well/Spring	Depth of Well in Feet Below Land Surface	Static Water Level of Well in Feet Below Land Surface	Lithology of Supplying Aquifer/ Waterbearing Zone	Known Uses of Well/Spring (if spring give discharge rate)
W-29	RAVEN ROCKS, INC.	1240	61'	SEE ATTACH. 14A	B	DOMESTIC
W-30	RAVEN ROCKS, INC.	1238	35'	SEE ATTACH. 14A	B	NOT IN USE
DW-31	RAVEN ROCKS, INC.	1130	23'	SEE ATTACH. 14A	A	DOMESTIC
W-32	RAVEN ROCKS, INC.	1181	100'	SEE ATTACH. 14A	B	DOMESTIC
W-33	RAVEN ROCKS, INC.	1181	75.5'	SEE ATTACH. 14A	B	NOT IN USE
DW-34	RAVEN ROCKS, INC.	1145	22'	SEE ATTACH. 14A	A	NOT IN USE
DW-35	RAVEN ROCKS, INC.	1240	31'	SEE ATTACH. 14A	A	NOT IN USE
W-36	RAVEN ROCKS, INC.	1233	BURIED	BURIED	UNKNOWN	NOT IN USE
DW-37	RAVEN ROCKS, INC.	1178	15'	SEE ATTACH. 14A	A	NOT IN USE
DW-38	RAVEN ROCKS, INC.	1204	30'	SEE ATTACH. 14A	A	NOT IN USE
WL-39	C. WARSINSKEY	1220	WELL LOG 110' BURIED	WELL LOG 65' BURIED	B	NOT IN USE
DW-40	C. RILEY	1209	19'	SEE ATTACH. 14A	A	RECREATIONAL
W-41	J. SHRIVER	1242	90'	SEE ATTACH. 14A	B	DOMESTIC
W-42	R. EIKLEBERRY	1223	OBSTRUCTION - 52'	SEE ATTACH. 14A	B	DOMESTIC

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ATTACHMENT 14C
(WELL/SPRING INVENTORY)

Applicant's Name BENNOC, INC. (D-0425-1)

Well/Spring Identification Number	Name of Owner of Well/Spring	Surface Elevation of Well/Spring	Depth of Well in Feet Below Land Surface	Static Water Level of Well in Feet Below Land Surface	Lithology of Supplying Aquifer/ Waterbearing Zone	Known Uses of Well/Spring (if spring give discharge rate)
WL-43	R. EIKLEBERRY	1241	98'	SEE ATTACH. 14A	B	NOT IN USE
DW-44	E. BOSTON	1211	25'	SEE ATTACH. 14A	A	DOMESTIC
W-45	H. PERKINS	1205	47'	SEE ATTACH. 14A	B	NOT IN USE
DW-46	H. PERKINS	1265	32'	SEE ATTACH. 14A	A	NOT IN USE
DW-47	R. KEMP	1220	29'	SEE ATTACH. 14A	A	DOMESTIC
W-48	M. LALLATHIN	1222	78'	SEE ATTACH. 14A	B	DOMESTIC
W-49	M. PYLES	1260	99'	SEE ATTACH. 14A	B	DOMESTIC
DW-50	F. LUCAS	1141	16'	SEE ATTACH. 14A	A	DOMESTIC
W-51	R. HICKMAN	1122	REPORTED 85' OBSTRUCTION	SEE ATTACH. 14A	C	DOMESTIC, LIVESTOCK
DW-52	D. RISER	1160	22'	SEE ATTACH. 14A	A	DOMESTIC
DW-53	R. LUCAS	1175	26'	SEE ATTACH. 14A	A	DOMESTIC
W-54	R. LUCAS	1175	REPORTED 125' OBSTRUCTION	SEE ATTACH. 14A	C & D	DOMESTIC
W-55	R. LUCAS	1186	REPORTED 123' OBSTRUCTION	SEE ATTACH. 14A	C	DOMESTIC
W-56	R. LUCAS	1190	78'	SEE ATTACH. 14A	B	OCCASIONAL DOMESTIC

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ATTACHMENT 14C
(WELL/SPRING INVENTORY)

Applicant's Name BENNOC, INC. (D-0425-1)

Well/Spring Identification Number	Name of Owner of Well/Spring	Surface Elevation of Well/Spring	Depth of Well in Feet Below Land Surface	Static Water Level of Well in Feet Below Land Surface	Lithology of Supplying Aquifer/ Waterbearing Zone	Known Uses of Well/Spring (if spring give discharge rate)
W-~~55~~ 57	R. LUCAS	1234	55'	SEE ATTACH. 14A	B	NOT IN USE
W-58	E. LUCAS	1072	85'	SEE ATTACH. 14A	D	DOMESTIC
DW-59	E. LUCAS	1120	BURIED	BURIED	UNKNOWN	AGRICULTURAL
DW-60	E. LUCAS	1161	20'	SEE ATTACH. 14A	A	NOT IN USE
W-61	C. BAKER	1230	48'	SEE ATTACH. 14A	B	DOMESTIC
DW-62	M. VUCELICH	1215	29'	SEE ATTACH. 14A	A	NOT IN USE
W-63	S. BATES	1152	92'	SEE ATTACH. 14A	C	DOMESTIC
WL-64	G. CRIBBEN	1228	WELL LOG 75' OBSTRUCTION	SEE ATTACH. 14A	B	DOMESTIC
W-65	R. DAVIS	1222	REPORTED 60'	SEALED	B	DOMESTIC
DW-66	R. DAVIS	1222	26'	SEE ATTACH. 14A	A	NOT IN USE
W-67	H. PERKINS	1262	89'	SEE ATTACH. 14A	B	DOMESTIC
W-68	J. JENEWEIN	1228	BURIED	BURIED	UNKNOWN	DOMESTIC
W-69	C. FRANCIS	1152	REPORTED 89' OBSTRUCTION	SEE ATTACH. 14A	C	DOMESTIC
W-70	C. FRANCIS	1155	REPORTED 58'	SEALED	B	NOT IN USE

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ATTACHMENT 14C
(WELL/SPRING INVENTORY)

Applicant's Name BENNOC, INC. (D-0425-1)

Well/Spring Identification Number	Name of Owner of Well/Spring	Surface Elevation of Well/Spring	Depth of Well in Feet Below Land Surface	Static Water Level of Well in Feet Below Land Surface	Lithology of Supplying Aquifer/ Waterbearing Zone	Known Uses of Well/Spring (if spring give discharge rate)
DW-71	C. FRANCIS	1192	24'	SEE ATTACH. 14A	B	NOT IN USE
W-72	D. DERHAMMER	1165	103'	SEE ATTACH. 14A	C	DOMESTIC
W-73	H. JENEWEIN	1200	37'	SEE ATTACH. 14A	B	NOT IN USE
W-74	W. DAVIS	1141	BURIED	BURIED	UNKNOWN	DOMESTIC
W-75	M. FUCHS	1149	81'	SEE ATTACH. 14A	C	DOMESTIC
W-76	O. FUCHS	1193	76'	SEE ATTACH. 14A	C	DOMESTIC
W-77	E. WINGROVE	1260	31'	SEE ATTACH. 14A	B	DOMESTIC
WL-78	H. JENEWEIN	1260	56'	SEE ATTACH. 14A	B	DOMESTIC
W-79	H. JENEWEIN	1248	91'	SEE ATTACH. 14A	B	NOT IN USE
DW-80	H. JENEWEIN	1241	29'	SEE ATTACH. 14A	A	DOMESTIC
DW-81	H. JENEWEIN	1201	20'	SEE ATTACH. 14A	A	DOMESTIC
DW-82	A. KINDALL	1200	SEALED	SEALED	UNKNOWN	DOMESTIC
DW-83	A. KINDALL	1139	5'	SEE ATTACH. 14A	A	NOT IN USE
DW-84	A. KINDALL	1182	15.5'	SEE ATTACH. 14A	A	NOT IN USE

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ATTACHMENT 14C
(WELL/SPRING INVENTORY)

Applicant's Name BENNOC, INC. (D-0425-1)

Well/Spring Identification Number	Name of Owner of Well/Spring	Surface Elevation of Well/Spring	Depth of Well in Feet Below Land Surface	Static Water Level of Well in Feet Below Land Surface	Lithology of Supplying Aquifer/ Waterbearing Zone	Known Uses of Well/Spring (if spring give discharge rate)
W-85	D. TAYLOR	1090	41'	SEE ATTACH. 14A	B	DOMESTIC
W-86	N. JENEWEIN	1222	51'	SEE ATTACH. 14A	B	LIVESTOCK
DW-87	N. JENEWEIN	1222	22'	SEE ATTACH. 14A	A	NOT IN USE
W-88	D. CRUM	1240	57'	SEE ATTACH. 14A	B	DOMESTIC
W-89	W. DAVIS	1224	SEALED	SEALED	UNKNOWN	NOT IN USE
W-90	M. WARD	1240	51'	SEE ATTACH. 14A	B	DOMESTIC, LIVESTOCK
W-91	M. WARD	1241	67'	SEE ATTACH. 14A	B	DOMESTIC, LIVESTOCK
DW-92	E. WARD	1215	24'	SEE ATTACH. 14A	A	NOT IN USE
WL-93	E. WARD	1233	WELL LOG 134'	SEALED	C	DOMESTIC
W-94	N. BURKHART	1241	REPORTED 110' OBSTRUCTION	SEE ATTACH. 14A	C	DOMESTIC
W-95	N. BURKHART	1240	46'	SEE ATTACH. 14A	B	NOT IN USE
W-96	E. McARDLE	1202	39'	SEE ATTACH. 14A	B	NOT IN USE
W-97	C. CHRISTMAN	1175	REPORTED 100' OBSTRUCTION	SEE ATTACH. 14A	C	DOMESTIC, LIVESTOCK
WL-98	L. DATKULIAK	1262	65'	SEE ATTACH. 14A	B	DOMESTIC

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(WELL/SPRING INVENTORY)

Applicant's Name BENNOC, INC. (D-0425-1)

Well/Spring Identification Number	Name of Owner of Well/Spring	Surface Elevation of Well/Spring	Depth of Well in Feet Below Land Surface	Static Water Level of Well in Feet Below Land Surface	Lithology of Supplying Aquifer/ Waterbearing Zone	Known Uses of Well/Spring (if spring give discharge rate)
W-99	L. DATKULIAK	1244	56'	SEE ATTACH. 14A	B	DOMESTIC
W-100	L. DATKULIAK	1244	148'	SEE ATTACH. 14A	C	DOMESTIC
W-101	T. JACKSON	1253	98'	SEE ATTACH. 14A	B	DOMESTIC
DW-102	M. WILSON	1263	BURIED	BURIED	UNKNOWN	NOT IN USE
WL-103	R. TUBAUGH	1244	82'	SEE ATTACH. 14A	B	DOMESTIC
DW-104	J. WARD	1263	19'	SEE ATTACH. 14A	A	DOMESTIC
DW-105	J. WARD	1263	SEALED	SEALED	UNKNOWN	NOT IN USE
WL-106	LEACH & KERNEN	1263	62'	SEE ATTACH. 14A	B	DOMESTIC
W-107	J. MURRAY	1282	REPORTED 80' OBSTRUCTION	SEE ATTACH. 14A	B	DOMESTIC
W-108	R. HAGAN	1221	REPORTED 90' OBSTRUCTION	SEE ATTACH. 14A	C	DOMESTIC, LIVESTOCK
W-109	T. HAGAN	1203	REPORTED 112'SEALED	SEALED	C	DOMESTIC
DW-110	T. HAGAN	1203	20'	SEE ATTACH. 14A	A	NOT IN USE
W-111	L. VAN DYNE	1288	OBSTRUCTION	SEE ATTACH. 14A	UNKNOWN	DOMESTIC
DW-112	WAYNE TWP. TRUSTEES	1265	23'	SEE ATTACH. 14A	A	COMMERCIAL
DW-113	R. MILLER	1270	19'	SEE ATTACH 14A	A	DOMESTIC

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(WELL/SPRING INVENTORY)

Applicant's Name BENNOC, INC. (D-0425-1)

Well/Spring Identification Number	Name of Owner of Well/Spring	Surface Elevation of Well/Spring	Depth of Well in Feet Below Land Surface	Static Water Level of Well in Feet Below Land Surface	Lithology of Supplying Aquifer/ Waterbearing Zone	Known Uses of Well/Spring (if spring give discharge rate)
W-114	R. MILLER	1270	SEALED	SEALED	UNKNOWN	NOT IN USE
DW-115	M. LUCAS	1255	18'	SEE ATTACH. 14A	A	DOMESTIC
WL-116	H. MOWERY	1265	WELL LOG 61' LOCKED	WELL LOG 22' LOCKED	B	DOMESTIC
W-117	V. EBERT	1250	REPORTED 80' SEALED	SEALED	B	DOMESTIC
W-118	A. SEAL	1260	REPORTED 35' SEALED	REPORTED 26' SEALED	B	DOMESTIC
W-119	A. SEAL	1260	37'	SEE ATTACH. 14A	B	NOT IN USE
W-120	G. BALLOG	1095	118'	SEE ATTACH. 14A	D	DOMESTIC
W-121	D. HAGAN	1239	REPORTED 100' OBSTRUCTION	SEE ATTACH. 14A	C	DOMESTIC
W-122	W. CARPENTER	1260	REPORTED 64' BURIED	REPORTED 27' BURIED	B	DOMESTIC
W-123	S. BONDY	1240	89'	SEE ATTACH. 14A	B	DOMESTIC
W-124	W. CARPENTER	1260	REPORTED 30' BURIED	REPORTED 18' BURIED	B	DOMESTIC
W-125	D. WHITE	1192	21'	SEE ATTACH. 14A	B	NOT IN USE
DW-126	M. PYLES	1261	37'	SEE ATTACH. 14A	A	OCCASIONAL DOMESTIC
W-127	W. SAFFELL	1258	REPORTED 81' OBSTRUCTION	53' TO 55'	B	DOMESTIC
W-128	C. PERKINS	1230	103'	51'	B	DOMESTIC

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(WELL/SPRING INVENTORY)

Applicant's Name BENNOC, INC. (D-0425-1)

Well/Spring Identification Number	Name of Owner of Well/Spring	Surface Elevation of Well/Spring	Depth of Well in Feet Below Land Surface	Static Water Level of Well in Feet Below Land Surface	Lithology of Supplying Aquifer/ Waterbearing Zone	Known Uses of Well/Spring (if spring give discharge rate)
W-129	AMERICAN ENERGY CORP	930	150'	81'	E	NOT IN USE
DW-130	R. MOORE	1225	18'	SEE ATTACH. 14A	A	NOT IN USE
W-131	R. MOORE	1241	48'	SEE ATTACH. 14A	B	NOT IN USE
DW-132	F. ROTE	1044	9'	SEE ATTACH. 14A	A	NOT IN USE
DW-133	R. HICKMAN	1142	11'	SEE ATTACH. 14A	A	NOT IN USE
W-134	N. MOORE	1224	BURIED	BURIED	UNKNOWN	NOT IN USE
DW-135	D. DAVIS	1220	24'	SEE ATTACH. 14A	A	NOT IN USE
W-140	C. KINNEY	1155	90'	18'	C	LIVESTOCK
W-141	W. DAVIS	1225	100'	29'	B	DOMESTIC
W-142	W. SAFFELL	1258	122'	101'	B	DOMESTIC
W-143	RAVEN ROCKS, INC.	1135	BACKFILLED	BACKFILLED	UNKNOWN	NOT IN USE
DW-144	RAVEN ROCKS, INC.	995	BACKFILLED	BACKFILLED	UNKNOWN	NOT IN USE
W-145	C. CRIBBEN	1262	30'	10'	A	NOT IN USE
DW-146	G. HOOVER	1230	SEALED	SEALED	UNKNOWN	LIVESTOCK
DW-147	C. BONDY	1030	8'	5'	A	NOT IN USE

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ATTACHMENT 14C
(WELL/SPRING INVENTORY)

Applicant's Name BENNOC, INC. (D-0425-1)

Well/Spring Identification Number	Name of Owner of Well/Spring	Surface Elevation of Well/Spring	Depth of Well in Feet Below Land Surface	Static Water Level of Well in Feet Below Land Surface	Lithology of Supplying Aquifer/ Waterbearing Zone (SEE ATTACHMENT 14B)	Known Uses of Well/Spring (if spring give discharge rate)
DS-1	P. MOORE	1170	N/A	N/A	B	NONE, SEE 14A FOR FLOW RATES
DS-2	P. MOORE	1192	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-3	N. STUKEY	1180	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-4	J. EDGE	1012	N/A	N/A	C	D, L, SEE 14A FOR FLOW RATES
DS-5	C. PERKINS	1074	N/A	N/A	B	D, SEE 14A FOR FLOW RATES
DS-6	H. CROOKS	1032	N/A	N/A	B	D, L, SEE 14A FOR FLOW RATES
DS-7	R. KEMP	1192	N/A	N/A	B	NONE, SEE 14A FOR FLOW RATES
DS-8	A. BURKHART	1200	N/A	N/A	B	NONE, SEE 14A FOR FLOW RATES
DS-9	RAVEN ROCKS, INC	1199	N/A	N/A	B	A, SEE 14A FOR FLOW RATES
DS-10	RAVEN ROCKS, INC	1216	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-11	RAVEN ROCKS, INC	1206	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-12	RAVEN ROCKS, INC	1198	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-13	RAVEN ROCKS, INC	1186	N/A	N/A	B	NONE, SEE 14A FOR FLOW RATES
DS-14	C. RILEY	1195	N/A	N/A	B	A, SEE 14A FOR FLOW RATES
DS-15	R. EIKLEBERRY	1114	N/A	N/A	B	L, SEE 14A FOR FLOW RATES

D - DOMESTIC, L - LIVESTOCK, A - AGRICULTURAL

AEC 04712

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(WELL/SPRING INVENTORY)

Applicant's Name BENNOC, INC. (D-0425-1)

Well/Spring Identification Number	Name of Owner of Well/Spring	Surface Elevation of Well/Spring	Depth of Well in Feet Below Land Surface	Static Water Level of Well in Feet Below Land Surface	Lithology of Supplying Aquifer/ Waterbearing Zone	Known Uses of Well/Spring (if spring give discharge rate)
DS-16	H. PERKINS	1146	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-17	R. KEMP	1090	N/A	N/A	B	NONE, SEE 14A FOR FLOW RATES
DS-18	R. HICKMAN	1127	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-19	D. RISER	1139	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-20	D. RISER	1141	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-20A	D. RISER	1141	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-21	R. LUCAS	1159	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-22	R. LUCAS	1121	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-23	R. LUCAS	1129	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-24	R. LUCAS	1120	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-25	R. LUCAS	1144	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-26	M. LALLATHIN	1199	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-27	M. LALLATHIN	1165	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-28	J. THOMAS	1205	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-29	E. LUCAS	1030	N/A	N/A	C	L, SEE 14A FOR FLOW RATES

D - DOMESTIC, L - LIVESTOCK, A - AGRICULTURAL

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ATTACHMENT 14C
(WELL/SPRING INVENTORY)

Applicant's Name BENNOC, INC. (D-0425-1)

Well/Spring Identification Number	Name of Owner of Well/Spring	Surface Elevation of Well/Spring	Depth of Well in Feet Below Land Surface	Static Water Level of Well in Feet Below Land Surface	Lithology of Supplying Aquifer/ Waterbearing Zone	Known Uses of Well/Spring (if spring give discharge rate)
DS-30	M. VUCELICH	1180	N/A	N/A	B	D, SEE 14A FOR FLOW RATES
DS-31	M. VUCELICH	1150	N/A	N/A	B	D, SEE 14A FOR FLOW RATES
DS-32	A. KINDALL	1158	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-33	K. PHILLIPS	1178	N/A	N/A	B	D, SEE 14A FOR FLOW RATES
DS-34	W. DAVIS	1210	N/A	N/A	B	D, SEE 14A FOR FLOW RATES
DS-35	W. DAVIS	1222	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-36	W. DAVIS	1210	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-37	W. DAVIS	1185	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-38	W. DAVIS	1180	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-39	W. DAVIS	1160	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-40	O. FUCHS	1213	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-41	E. WINGROVE	1195	N/A	N/A	B	NONE, SEE 14A FOR FLOW RATES
DS-42	H. JENEWEIN	1245	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-43	H. JENEWEIN	1236	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-44	H. JENEWEIN	1215	N/A	N/A	B	D, SEE 14A FOR FLOW RATES

D - DOMESTIC, L - LIVESTOCK, A - AGRICULTURAL

AEC 04714

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ATTACHMENT 14C
(WELL/SPRING INVENTORY)

Applicant's Name BENNOC, INC. (D-0425-1)

Well/Spring Identification Number	Name of Owner of Well/Spring	Surface Elevation of Well/Spring	Depth of Well in Feet Below Land Surface	Static Water Level of Well in Feet Below Land Surface	Lithology of Supplying Aquifer/ Waterbearing Zone	Known Uses of Well/Spring (if spring give discharge rate)
DS-45	H. JENEWEIN	1157	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-46	N. JENEWEIN	1175	N/A	N/A	B	NONE, SEE 14A FOR FLOW RATES
DS-47	N. JENEWEIN	1181	N/A	N/A	B	NONE, SEE 14A FOR FLOW RATES
DS-48	N. JENEWEIN	1200	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-49	N. BURKHART	1215	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-50	M. WARD	1222	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-51	M. WARD	1235	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-52	E. WARD	1185	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-53	D. HAGAN	1232	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-54	D. HAGAN	1240	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-55	M. WILSON	1198	N/A	N/A	B	D, SEE 14A FOR FLOW RATES
DS-56	L. DATKULIAK	1207	N/A	N/A	B	D & L, SEE 14A FOR FLOW RATES
DS-57	L. DATKULIAK	1230	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-58	L. DATKULIAK	1218	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-59	L. DATKULIAK	1219	N/A	N/A	B	L, SEE 14A FOR FLOW RATES

D - DOMESTIC, L - LIVESTOCK, A - AGRICULTURAL

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ATTACHMENT 14C
(WELL/SPRING INVENTORY)

Applicant's Name BENNOC, INC. (D-0425-1)

Well/Spring Identification Number	Name of Owner of Well/Spring	Surface Elevation of Well/Spring	Depth of Well in Feet Below Land Surface	Static Water Level of Well in Feet Below Land Surface	Lithology of Supplying Aquifer/ Waterbearing Zone	Known Uses of Well/Spring (if spring give discharge rate)
DS-60	C. KINNEY	1161	N/A	N/A	B	D, L, SEE 14A FOR FLOW RATES
DS-61	R. HAGAN	1170	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-62	R. HAGAN	1180	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-63	N. HAMILTON	1202	N/A	N/A	B	D, L, SEE 14A FOR FLOW RATES
DS-64	N. HAMILTON	1220	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-65	J. HAMILTON	1142	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-66	A. SEAL	1220	N/A	N/A	B	NONE, SEE 14A FOR FLOW RATES
DS-67	G. BALLOG	1042	N/A	N/A	C	D, SEE 14A FOR FLOW RATES
DS-68	R. MOORE	1230	N/A	N/A	B	D, SEE 14A FOR FLOW RATES
DS-69	O. FUCHS	1220	N/A	N/A	B	NONE, SEE 14A FOR FLOW RATES
DS-70	H. PERKINS	1220	N/A	N/A	B	NONE, SEE 14A FOR FLOW RATES
DS-71	AMERICAN ENERGY CORP.	1080	N/A	N/A	B	NONE, SEE 14A FOR FLOW RATES
DS-72	N. LINDSEY	1265	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-75	H. JENEWEIN	1215	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-76	H. JENEWEIN	1215	N/A	N/A	B	L, SEE 14A FOR FLOW RATES

D - DOMESTIC, L - LIVESTOCK, A - AGRICULTURAL

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 14C
(WELL/SPRING INVENTORY)

Applicant's Name BENNOC, INC. (D-0425-1)

Well/Spring Identification Number	Name of Owner of Well/Spring	Surface Elevation of Well/Spring	Depth of Well in Feet Below Land Surface	Static Water Level of Well in Feet Below Land Surface	Lithology of Supplying Aquifer/ Waterbearing Zone	Known Uses of Well/Spring (if spring give discharge rate)
DS-77	H. JENEWEIN	1215	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-78	W. DAVIS	1178	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-79	D. RISER	1165	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-80	J. EDGE	1075	N/A	N/A	B	D, SEE 14A FOR FLOW RATES
DS-81	G. HOOVER	1198	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
DS-82	G. HOOVER	1198	N/A	N/A	B	L, SEE 14A FOR FLOW RATES
W-1	AMER. ENERGY CORP.	940	OBSTRUCTION	90'	E	NOT IN USE
* W-5Y	AMER. ENERGY CORP.	940	UNKNOWN	UNKNOWN	PROBABLY E	NOT IN USE
* W-8Y	AMER. ENERGY CORP.	942	UNKNOWN	UNKNOWN	PROBABLY E	NOT IN USE
* W-12Y	AMER. ENERGY CORP.	931	UNKNOWN	UNKNOWN	PROBABLY E	NOT IN USE
* W-13Y	AMER. ENERGY CORP.	932	UNKNOWN	UNKNOWN	PROBABLY E	NOT IN USE

D - DOMESTIC, L - LIVESTOCK, A - AGRICULTURAL

* These wells were either proposed or drilled for use at the Allison Mine office & bath house. These buildings no longer exist.

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	WL-2	WL-2	WL-2	WL-2	WL-2	WL-2
2	Identification Number 98-	07174	08311	09199	10110	11242	12188
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1236	1236	1236	1236	1236	1236
5	Depth of Well Below Land Surface (feet)	62'	62'	62'	62'	62'	62'
6	Static Water Level of Well Below Land Surface (feet)	26'	28'	29'	29'	29'	29'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	7-13-98	8-29-98	9-17-98	10-6-98	11-12-98	12-9-98
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.50	7.30	7.30	7.60	7.70	7.80
	Total Acidity (mg/l CaCO3)	26.00	10.00	39.0	13.00	44.00	10.0
12	Total Alkalinity (mg/l CaCO3)	290.00	300.00	310.0	270.0	310.0	260.0
13	Specific Conductivity (umhos/cm at 25° C)	660.0	540.0	580.0	560.0	540.0	620.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.08	0.11	0.05	0.05	0.08	0.04
16	Total Sulfates (mg/l)	46.00	44.00	43.0	38.0	42.0	40.0
17	Total Iron (mg/l)	1.40	5.50	0.99	0.45	1.20	0.65
18	Total Suspended Solids (mg/l)	2.7	2.7	<1.0	<1.0	6.7	7.0
19	Total Hardness (mg/l as CaCO3)	280.0	260.0	300.0	320.0	320.0	320.0
20	Nitrates	0.27	0.19	0.42	0.38	0.36	0.44
21	Date Sampled for Analysis	7-13-98	8-29-98	9-17-98	10-6-98	11-12-98	12-9-98
22	Date Last Precipitation Event Occurred	7-08-98	8-26-98	9-9-98	10-04-98	11-9-98	12-9-98

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-3	W-3	W-3	W-3	W-3	W-3
2	Identification Number 98-	07175	08312	09200	10111	11243	12189
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1246	1246	1246	1246	1246	1246
5	Depth of Well Below Land Surface (feet)	73'	73'	73'	73'	73'	73'
6	Static Water Level of Well Below Land Surface (feet)	28'	31'	32'	32'	23'	23'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	7-13-98	8-29-98	9-17-98	10-6-98	11-12-98	12-9-98
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.80	7.50	7.50	7.60	7.50	7.70
11	Total Acidity (mg/l CaCO3)	17.00	6.00	29.0	9.80	27.0	9.80
12	Total Alkalinity (mg/l CaCO3)	230.00	210.00	230.00	220.00	240.0	220.0
13	Specific Conductivity (umhos/cm at 25° C)	660.0	550.0	580.0	580.0	610.0	660.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.24	0.04	0.15	0.22	0.22	0.66
16	Total Sulfates (mg/l)	100.00	95.00	95.00	100.00	130.0	130.0
17	Total Iron (mg/l)	8.90	0.83	7.40	5.00	7.90	7.20
18	Total Suspended Solids (mg/l)	53.0	11.0	25.0	10.0	4.70	19.0
19	Total Hardness (mg/l as CaCO3)	250.0	300.0	290.0	280.0	300.0	310.0
20	Nitrates	0.25	<0.10	<0.10	0.11	<0.09	0.37
21	Date Sampled for Analysis	7-13-98	8-29-98	9-17-98	10-6-98	11-12-98	12-9-98
22	Date Last Precipitation Event Occurred	7-8-98	8-26-98	9-9-98	10-4-98	11-9-98	12-9-98

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	WL-5	WL-5	WL-5	WL-5	WL-5	WL-5
2	Identification Number 98-	07176	08313	09201	10107	11239	12185
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1221	1221	1221	1221	1221	1221
5	Depth of Well Below Land Surface (feet)	57'	57'	57'	57'	57'	57'
6	Static Water Level of Well Below Land Surface (feet)	27'	32'	33'	32'	34'	34'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	7-14-98	8-29-98	9-17-98	10-6-98	11-12-98	12-9-98
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.50	7.10	7.00	7.00	7.30	6.90
	Total Acidity (mg/l CaCO3)	43.00	21.00	53.0	18.00	46.00	23.0
12	Total Alkalinity (mg/l CaCO3)	320.00	330.0	320.0	320.0	340.0	260.0
13	Specific Conductivity (umhos/cm at 25° C)	910.0	760.0	950.0	740.0	830.0	910.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.04	<0.02	<0.02	0.08	0.05	0.14
16	Total Sulfates (mg/l)	140.00	140.00	130.00	150.00	170.00	160.0
17	Total Iron (mg/l)	0.30	0.06	0.19	0.42	0.32	0.34
18	Total Suspended Solids (mg/l)	8.0	13.0	2.7	3.0	1.30	25.0
19	Total Hardness (mg/l as CaCO3)	370.0	410.0	420.0	400.0	410.0	450.0
20	Nitrates	<0.10	0.22	0.37	0.36	<0.09	0.19
21	Date Sampled for Analysis	7-14-98	8-29-98	9-17-98	10-6-98	11-12-98	12-9-98
22	Date Last Precipitation Event Occurred	7-8-98	8-26-98	9-9-98	10-4-98	11-9-98	12-9-98

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-6	W-6	W-6	W-6	W-6	W-6
2	Identification Number 98-	07177	08316	09196	10105	11237	12182
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1263	1263	1263	1263	1263	1263
5	Depth of Well Below Land Surface (feet)	82'	82'	82'	82'	82'	82'
6	Static Water Level of Well Below Land Surface (feet)	75'	78'	80'	80'	81'	81'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	7-14-98	8-29-98	9-17-98	10-6-98	11-12-98	12-9-98
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.60	7.50	7.30	7.60	7.40	7.40
	Total Acidity (mg/l CaCO3)	11.00	10.00	37.0	9.70	26.0	8.60
12	Total Alkalinity (mg/l CaCO3)	240.00	250.00	250.00	220.00	250.00	250.0
13	Specific Conductivity (umhos/cm at 25° C)	580.0	470.0	560.0	460.0	480.0	540.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.64	0.51	0.62	0.16	0.50	27.0
16	Total Sulfates (mg/l)	35.00	32.00	33.0	32.0	33.0	34.0
17	Total Iron (mg/l)	2.00	1.10	1.60	0.31	1.20	36.0
18	Total Suspended Solids (mg/l)	13.0	2.7	29.0	51.0	46.0	300.0
19	Total Hardness (mg/l as CaCO3)	190.0	170.0	210.0	170.0	180.0	310.0
20	Nitrates	1.20	1.50	1.30	2.60	0.96	0.65
21	Date Sampled for Analysis	7-14-98	8-29-98	9-17-98	10-6-98	11-12-98	12-9-98
22	Date Last Precipitation Event Occurred	7-08-98	8-26-98	9-9-98	10-4-98	11-9-98	12-9-98

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-7	DW-7	DW-7	DW-7	DW-7	DW-7
2	Identification Number 98-	07178	08316	09197	10104	11236	12183
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1264	1264	1264	1264	1264	1264
5	Depth of Well Below Land Surface (feet)	25'	25'	25'	25'	25'	25'
6	Static Water Level of Well Below Land Surface (feet)	17'	19'	20'	20'	21'	21'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	7-14-98	8-29-98	9-17-98	10-6-98	11-12-98	12-9-98
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	7.40	6.90	6.90	7.00	6.80	7.10
	Total Acidity (mg/l CaCO3)	17.00	12.00	25.0	8.70	22.0	8.60
12	Total Alkalinity (mg/l CaCO3)	100.00	82.00	120.0	120.0	110.0	88.0
13	Specific Conductivity (umhos/cm at 25° C)	350.0	280.00	360.0	310.0	280.0	270.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	0.02	0.09	0.16	0.20	1.20
16	Total Sulfates (mg/l)	41.00	39.00	36.0	36.0	40.0	40.0
17	Total Iron (mg/l)	0.71	0.10	1.20	1.30	1.40	1.90
18	Total Suspended Solids (mg/l)	2.7	<1.0	4.0	6.0	12.0	65.0
19	Total Hardness (mg/l as CaCO3)	120.0	80.0	140.0	140.0	100.0	120.0
20	Nitrates	2.30	2.40	0.67	0.64	0.81	0.65
21	Date Sampled for Analysis	7-14-98	8-29-98	9-17-98	10-6-98	11-12-98	12-9-98
22	Date Last Precipitation Event Occurred	7-8-98	8-26-98	9-9-98	10-4-98	11-9-98	12-9-98

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-8	DW-8	DW-8	DW-8	DW-8	DW-8
2	Identification Number 98-	07301	08318	09275		11245	12193
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	939	939	939	939	939	939
5	Depth of Well Below Land Surface (feet)	13'	13'	13'	13'	13'	13'
6	Static Water Level of Well Below Land Surface (feet)	9'	10'	10'	10'	10'	10'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	7-21-98	8-29-98	9-24-98		11-12-98	12-9-98
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	6.50	6.80	6.70		7.10	7.00
11	Total Acidity (mg/l CaCO3)	13.00	23.00	46.0		29.0	7.70
12	Total Alkalinity (mg/l CaCO3)	150.00	180.00	170.0		200.0	200.0
13	Specific Conductivity (umhos/cm at 25° C)	680.0	530.00	440.0		540.00	550.0
14	Total Dissolved Solids (mg/l)	---	---	---		---	---
15	Total Manganese (mg/l)	<0.02	<0.02	0.03		<0.02	0.07
16	Total Sulfates (mg/l)	210.00	85.00	57.0		82.0	86.0
17	Total Iron (mg/l)	<0.02	0.05	0.57		<0.05	0.23
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0		<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	320.0	220.0	210.00		250.00	260.0
20	Nitrates	3.20	3.60	3.60		3.40	3.10
21	Date Sampled for Analysis	7-21-98	8-29-98	9-24-98		11-12-98	12-9-98
22	Date Last Precipitation Event Occurred	7-21-98	8-26-98	9-22-98		11-9-98	12-9-98

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	WL-9	WL-9	WL-9	WL-9	WL-9	WL-9
2	Identification Number 98-	07302	08319	09277	10114	11250	12195
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	983	983	983	983	983	983
5	Depth of Well Below Land Surface (feet)	28'	28'	28'	28'	28'	28'
6	Static Water Level of Well Below Land Surface (feet)	21'	22'	23'	22'	22'	22'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	7-21-98	8-29-98	9-24-98	10-6-98	11-12-98	12-9-98
9	Aquifer/Zone Identification For Well/Spring	C	C	C	C	C	C
10	pH (Standard Units)	7.80	7.30	7.50	8.00	7.60	7.50
11	Total Acidity (mg/l CaCO3)	14.00	11.00	34.00	12.00	27.0	11.0
12	Total Alkalinity (mg/l CaCO3)	300.00	290.00	300.00	280.00	300.00	300.0
13	Specific Conductivity (umhos/cm at 25° C)	630.0	620.0	640.0	600.0	640.0	680.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.13	0.10	0.12	0.12	0.10	0.12
16	Total Sulfates (mg/l)	75.00	58.00	56.0	50.0	57.0	57.0
17	Total Iron (mg/l)	1.40	0.32	0.37	0.45	0.22	1.00
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	2.0
19	Total Hardness (mg/l as CaCO3)	210.0	140.0	150.0	150.0	160.0	180.0
20	Nitrates	0.09	<0.10	<0.10	0.10	<0.09	<0.09
21	Date Sampled for Analysis	7-21-98	8-29-98	9-24-98	10-6-98	11-12-98	12-9-98
22	Date Last Precipitation Event Occurred	7-21-98	8-26-98	9-22-98	10-4-98	11-9-98	12-9-98

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-10	DW-10	DW-10	DW-10	DW-10	DW-10
2	Identification Number 98-	07303	08320	09276	10115	11249	12194
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	983	983	983	983	983	983
5	Depth of Well Below Land Surface (feet)	30'	30'	30'	30'	30'	30'
6	Static Water Level of Well Below Land Surface (feet)	10'	13'	14'	14'	15'	15'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	7-14-98	8-29-98	9-24-98	10-6-98	11-12-98	12-9-98
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	6.50	7.00	6.80	7.00	7.10	7.40
11	Total Acidity (mg/l CaCO3)	6.80	8.10	18.00	5.40	10.0	4.60
12	Total Alkalinity (mg/l CaCO3)	76.00	80.00	83.00	72.00	83.0	76.0
13	Specific Conductivity (umhos/cm at 25° C)	330.0	350.00	370.0	360.0	390.0	410.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	0.02	0.02	0.02	0.19
16	Total Sulfates (mg/l)	23.00	26.00	24.0	23.0	27.0	29.0
17	Total Iron (mg/l)	0.13	0.10	0.86	0.11	0.52	0.59
18	Total Suspended Solids (mg/l)	<1.0	<1.0	17.0	25.0	13.0	10.0
19	Total Hardness (mg/l as CaCO3)	110.0	110.0	100.00	100.00	100.0	120.0
20	Nitrates	2.80	2.10	4.90	5.70	6.90	5.90
21	Date Sampled for Analysis	7-14-98	8-29-98	9-24-98	10-6-98	11-12-98	12-9-98
22	Date Last Precipitation Event Occurred	7-8-98	8-26-98	9-22-98	10-4-98	11-9-98	12-9-98

Laboratory Name TRA-DET, INC.
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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-11	W-11	W-11	W-11	W-11	W-11
2	Identification Number 98-	07304	08324	09208	10118	11253	12199
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	976	976	976	976	976	976
5	Depth of Well Below Land Surface (feet)	25'	25'	25'	25'	25'	25'
6	Static Water Level of Well Below Land Surface (feet)	5'	6'	7'	6'	6'	6'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	7-14-98	8-29-98	9-24-98	10-6-98	11-12-98	12-9-98
9	Aquifer/Zone Identification For Well/Spring	C	C	C	C	C	C
10	pH (Standard Units)	7.40	7.50	7.70	8.00	7.50	7.70
11	Total Acidity (mg/l CaCO3)	10.00	6.80	22.00	4.80	19.0	3.50
12	Total Alkalinity (mg/l CaCO3)	190.00	200.00	190.00	190.00	200.00	190.0
13	Specific Conductivity (umhos/cm at 25° C)	370.0	380.0	410.0	390.0	400.0	450.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.10	0.09	0.09	0.10	0.09	0.09
16	Total Sulfates (mg/l)	43.00	38.00	42.0	40.0	45.0	49.0
17	Total Iron (mg/l)	0.40	0.09	0.68	0.34	0.31	0.59
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	190.0	180.0	170.0	170.0	170.0	200.0
20	Nitrates	<0.10	<0.10	0.10	<0.09	<0.09	<0.09
21	Date Sampled for Analysis	7-14-98	8-29-98	9-24-98	10-6-98	11-12-98	12-9-98
22	Date Last Precipitation Event Occurred	7-8-98	8-26-98	9-22-98	10-4-98	11-9-98	12-9-98

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC.

(D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-12	W-12	W-12	W-12	W-12	W-12
2	Identification Number 98-	07305	08322	09281	10119	11254	12200
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	976	976	976	976	976	976
5	Depth of Well Below Land Surface (feet)	36'	36'	36'	36'	36'	36'
6	Static Water Level of Well Below Land Surface (feet)	13'	14'	14'	14'	14'	14'
7	'Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	7-14-98	8-29-98	9-24-98	10-6-98	11-12-98	12-9-98
9	Aquifer/Zone Identification For Well/Spring	C	C	C	C	C	C
10	pH (Standard Units)	6.70	6.90	7.30	7.10	7.70	7.50
	Total Acidity (mg/l CaCO3)	14.00	13.00	30.00	5.80	16.0	6.40
12	Total Alkalinity (mg/l CaCO3)	160.00	150.00	210.00	200.00	210.00	170.0
13	Specific Conductivity (umhos/cm at 25° C)	370.0	380.0	460.0	410.0	450.0	440.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.20	0.20	0.18	0.22	0.08	0.02
16	Total Sulfates (mg/l)	58.00	54.00	64.0	58.0	66.0	61.0
17	Total Iron (mg/l)	0.12	<0.02	0.27	0.17	0.19	<0.05
18	Total Suspended Solids (mg/l)	2.5	<1.0	4.0	6.7	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	190.0	170.0	220.0	200.0	240.0	190.0
20	Nitrates	0.12	0.14	0.22	0.20	0.10	0.12
21	Date Sampled for Analysis	7-14-98	8-29-98	9-24-98	10-6-98	11-12-98	12-9-98
22	Date Last Precipitation Event Occurred	7-8-98	8-26-98	9-22-98	10-4-98	11-9-98	12-9-98

Laboratory Name TRA-DET, INC.
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Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-13	DW-13	DW-13	DW-13	DW-13	DW-13
2	Identification Number 98-	07306	80323	09282	10122	11255	12201
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	972	972	972	972	972	972
5	Depth of Well Below Land Surface (feet)	15'	15'	15'	15'	15'	15'
6	Static Water Level of Well Below Land Surface (feet)	12'	12'	13'	12'	12'	12'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	7-14-98	8-29-98	9-24-98	10-6-98	11-12-98	12-9-98
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	6.40	6.80	6.90	6.90	7.20	7.40
	Total Acidity (mg/l CaCO3)	15.00	15.00	34.00	7.20	8.40	3.70
12	Total Alkalinity (mg/l CaCO3)	130.00	130.00	150.00	140.00	83.0	85.0
13	Specific Conductivity (umhos/cm at 25° C)	340.0	350.0	390.0	390.0	220.0	270.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.05	0.24	0.35	0.25	0.02	<0.02
16	Total Sulfates (mg/l)	30.00	28.00	20.00	33.00	30.0	31.0
17	Total Iron (mg/l)	0.21	3.90	1.40	2.80	0.98	0.32
18	Total Suspended Solids (mg/l)	<1.0	250.0	37.0	63.0	16.0	2.70
19	Total Hardness (mg/l as CaCO3)	110.0	160.0	150.0	180.0	90.0	120.0
20	Nitrates	0.40	1.60	6.20	6.30	2.70	2.10
21	Date Sampled for Analysis	7-14-98	8-29-98	9-24-98	10-6-98	11-12-98	12-9-98
22	Date Last Precipitation Event Occurred	7-8-98	8-26-98	9-22-98	10-4-98	11-9-98	12-9-98

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-14	DW-14	DW-14	DW-14	DW-14	DW-14
2	Identification Number 98-	07307	08321	09278	10116	11251	12196
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	957	957	957	957	957	957
5	Depth of Well Below Land Surface (feet)	13'	13'	13'	13'	13'	13'
6	Static Water Level of Well Below Land Surface (feet)	10'	10'	10'	10'	9'	9'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	7-14-98	8-29-98	9-24-98	10-6-98	11-12-98	12-9-98
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	6.60	6.70	6.90	7.00	6.80	6.90
	Total Acidity (mg/l CaCO3)	14.00	89.00	130.00	44.00	52.0	4.40
12	Total Alkalinity (mg/l CaCO3)	150.00	340.00	390.00	320.00	150.00	120.0
13	Specific Conductivity (umhos/cm at 25° C)	340.0	590.0	720.0	640.0	370.0	390.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.11	2.10	3.80	3.50	1.00	0.15
16	Total Sulfates (mg/l)	33.0	7.30	<1.5	3.80	38.0	89.0
17	Total Iron (mg/l)	0.08	4.80	11.00	9.90	4.50	0.26
18	Total Suspended Solids (mg/l)	6.7	11.0	120.0	51.0	32.0	4.0
19	Total Hardness (mg/l as CaCO3)	160.0	200.0	260.0	220.0	190.0	200.0
20	Nitrates	0.16	0.21	0.12	0.37	0.10	0.88
21	Date Sampled for Analysis	7-14-98	8-29-98	9-24-98	10-6-98	11-12-98	12-9-98
22	Date Last Precipitation Event Occurred	7-8-98	8-26-98	9-22-98	10-4-98	11-9-98	12-9-98

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-17	W-17	W-17	W-17	W-17	W-17
2	Identification Number 98-	08076	09296	10473	11416	12238	99-01173
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1240	1240	1240	1240	1240	1240
5	Depth of Well Below Land Surface (feet)	76'	76'	76'	76'	76'	76'
6	Static Water Level of Well Below Land Surface (feet)	47.5'	46'	45'	46'	46'	36'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-8-98	9-25-98	10-26-98	11-25-98	12-14-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.10	7.10	7.20	7.50	7.20	7.40
11	Total Acidity (mg/l CaCO3)	33.00	28.0	18.0	12.0	8.10	15.0
12	Total Alkalinity (mg/l CaCO3)	230.00	230.0	230.0	230.0	230.0	220.0
13	Specific Conductivity (umhos/cm at 25° C)	800.0	820.0	900.0	770.0	890.0	900.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	0.02	<0.02	0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	45.00	40.00	38.0	37.0	42.0	40.0
17	Total Iron (mg/l)	<0.02	<0.02	<0.05	0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	390.0	380.0	400.0	380.0	400.0	430.0
20	Nitrates	1.70	0.95	1.30	0.90	0.92	1.50
21	Date Sampled for Analysis	8-8-98	9-25-98	10-26-98	11-25-98	12-14-98	1-22-99
22	Date Last Precipitation Event Occurred	8-8-98	9-22-98	10-18-98	11-25-98	12-9-98	1-22-99

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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-18	W-18	W-18	W-18	W-18	W-18
2	Identification Number 98-	08077	09297	10471	11471	12239	99-01174
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1262	1262	1262	1262	1262	1262
5	Depth of Well Below Land Surface (feet)	104'	104'	104'	104'	104'	104'
6	Static Water Level of Well Below Land Surface (feet)	41.5'	43'	43'	43'	43'	38'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-8-98	9-25-98	10-26-98	11-25-98	12-14-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.20	7.20	7.20	7.30	7.10	7.30
11	Total Acidity (mg/l CaCO3)	27.00	21.00	14.00	13.0	11.0	22.0
12	Total Alkalinity (mg/l CaCO3)	220.00	170.0	190.0	200.0	200.0	250.0
13	Specific Conductivity (umhos/cm at 25° C)	880.0	820.0	780.0	810.0	850.0	820.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.11	0.11	0.12	0.11	0.30	0.39
16	Total Sulfates (mg/l)	220.00	180.0	160.0	170.0	170.0	140.0
17	Total Iron (mg/l)	6.70	3.60	3.10	3.80	10.0	7.40
18	Total Suspended Solids (mg/l)	39.0	18.0	14.0	11.0	69.0	7.30
19	Total Hardness (mg/l as CaCO3)	450.0	390.0	400.0	350.0	380.0	430.0
20	Nitrates	2.90	0.38	0.33	0.68	0.43	0.90
21	Date Sampled for Analysis	8-8-98	9-25-98	10-26-98	11-25-98	12-14-98	1-22-99
22	Date Last Precipitation Event Occurred	8-8-98	9-22-98	10-18-98	11-25-98	12-9-98	1-22-99

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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-19	DW-19	DW-19	DW-19	DW-19	DW-19
2	Identification Number 98-	08078	09298	10472	11418	12240	99-01175
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1260	1260	1260	1260	1260	1260
5	Depth of Well Below Land Surface (feet)	28'	28'	28'	28'	28'	28'
6	Static Water Level of Well Below Land Surface (feet)	21'	22'	23'	24'	24'	24'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-8-98	9-25-98	10-26-98	11-25-98	12-14-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	6.40	6.80	6.90	7.00	7.20	7.60
11	Total Acidity (mg/l CaCO3)	26.00	15.00	13.0	6.80	4.40	2.60
12	Total Alkalinity (mg/l CaCO3)	48.00	86.00	100.0	98.0	100.0	22.0
13	Specific Conductivity (umhos/cm at 25° C)	550.0	700.0	680.0	660.0	680.0	300.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.04	0.04	0.02	0.03	0.04	0.04
16	Total Sulfates (mg/l)	72.00	84.0	96.0	100.0	110.0	52.0
17	Total Iron (mg/l)	0.94	0.78	0.47	0.58	1.20	3.20
18	Total Suspended Solids (mg/l)	41.0	22.0	230.0	1.30	43.0	33.0
19	Total Hardness (mg/l as CaCO3)	150.0	200.0	240.0	230.0	270.0	90.0
20	Nitrates	6.30	4.40	4.40	5.00	3.90	2.40
21	Date Sampled for Analysis	8-8-98	9-25-98	10-26-98	11-25-98	12-14-98	1-22-99
22	Date Last Precipitation Event Occurred	8-8-98	9-22-98	10-18-98	11-25-98	12-9-98	1-22-99

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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-20	DW-20	DW-20	DW-20	DW-20	DW-20
2	Identification Number 98-	08191	09193	11075	11234	12180	99-02178
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1288	1288	1288	1288	1288	1288
5	Depth of Well Below Land Surface (feet)	51'	51'	51'	51'	51'	51'
6	Static Water Level of Well Below Land Surface (feet)	50'	51'	51'	51'	51'	43'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-15-98	9-17-98	10-31-98	11-12-98	12-9-98	1-29-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	7.60	6.90	7.00	7.30	7.10	7.90
11	Total Acidity (mg/l CaCO3)	50.00	32.00	12.0	35.0	50.0	3.0
12	Total Alkalinity (mg/l CaCO3)	160.00	150.00	180.0	190.0	300.0	88.0
13	Specific Conductivity (umhos/cm at 25° C)	400.0	540.0	450.0	500.0	540.0	330.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	0.05	0.36	0.52	0.72	<0.02
16	Total Sulfates (mg/l)	65.00	69.00	57.0	72.0	88.0	67.0
17	Total Iron (mg/l)	0.09	0.38	5.50	21.0	34.0	0.07
18	Total Suspended Solids (mg/l)	81.0	14.0	150.0	670.0	7200.0	<1.00
19	Total Hardness (mg/l as CaCO3)	180.0	200.0	220.0	320.0	550.0	130.0
20	Nitrates	5.30	5.20	3.00	2.40	0.19	8.40
21	Date Sampled for Analysis	8-15-98	9-17-98	10-31-98	11-12-98	12-9-98	1-29-99
22	Date Last Precipitation Event Occurred	8-12-98	9-9-98	10-29-98	11-9-98	12-9-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	WL-21	WL-21	WL-21	WL-21	WL-21	WL-21
2	Identification Number 98-	08192	09194	10103	11235	12181	99-02179
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1287	1287	1287	1287	1287	1287
5	Depth of Well Below Land Surface (feet)	92'	92'	92'	92'	92'	92'
6	Static Water Level of Well Below Land Surface (feet)	56'	86'	46'	48'	48'	32'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-15-98	9-17-98	10-6-98	11-12-98	12-9-98	1-29-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.50	7.20	7.20	7.20	7.00	7.60
11	Total Acidity (mg/l CaCO3)	31.00	29.00	7.10	23.0	6.80	10.0
12	Total Alkalinity (mg/l CaCO3)	150.00	220.00	150.00	150.0	150.0	170.0
13	Specific Conductivity (umhos/cm at 25° C)	360.0	580.0	360.0	390.0	400.0	370.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	0.04	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	53.00	47.00	50.00	52.0	52.0	45.0
17	Total Iron (mg/l)	0.09	0.49	0.07	0.14	0.08	0.13
18	Total Suspended Solids (mg/l)	<1.0	5.30	<1.0	<1.0	4.70	<1.0
19	Total Hardness (mg/l as CaCO3)	180.0	110.0	200.0	170.0	190.0	160.0
20	Nitrates	3.60	0.27	3.60	3.20	2.80	0.84
21	Date Sampled for Analysis	8-15-98	9-17-98	10-6-98	11-12-98	12-9-98	1-29-99
22	Date Last Precipitation Event Occurred	8-12-98	9-9-98	10-4-98	11-9-98	12-9-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-22	W-22	W-22	W-22	W-22	W-22
2	Identification Number 98-	08193	09283	10120	11256	12202	99-02170
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1060	1060	1060	1060	1060	1060
5	Depth of Well Below Land Surface (feet)	51'	51'	51'	51'	51'	51'
6	Static Water Level of Well Below Land Surface (feet)	28'	33'	33'	32'	31'	32'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-15-98	9-24-98	10-6-98	11-12-98	12-9-98	1-30-99
9	Aquifer/Zone Identification For Well/Spring	C	C	C	C	C	C
10	pH (Standard Units)	6.70	7.00	7.10	7.10	7.20	7.20
11	Total Acidity (mg/l CaCO3)	48.00	44.00	13.00	36.0	14.0	18.0
12	Total Alkalinity (mg/l CaCO3)	260.00	260.00	250.00	260.0	230.0	210.0
13	Specific Conductivity (umhos/cm at 25° C)	470.0	560.0	520.0	530.0	570.0	510.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	1.80	0.06	0.15	2.00	0.95
16	Total Sulfates (mg/l)	64.00	57.0	54.0	57.0	56.0	58.0
17	Total Iron (mg/l)	<0.02	2.50	<0.05	0.22	4.80	0.72
18	Total Suspended Solids (mg/l)	<1.0	3.30	<1.0	<1.0	3.3	<1.0
19	Total Hardness (mg/l as CaCO3)	280.0	300.0	280.0	270.0	280.0	250.0
20	Nitrates	0.20	0.23	0.16	0.18	0.14	0.26
21	Date Sampled for Analysis	8-15-98	9-24-98	10-6-98	11-12-98	12-9-98	1-30-99
22	Date Last Precipitation Event Occurred	8-12-98	9-22-98	10-4-98	11-9-98	12-9-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-23	W-23	W-23	W-23	W-23	W-23
2	Identification Number 98-	08194	09285	10188	11413	12266	99-01170
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1039	1039	1039	1039	1039	1039
5	Depth of Well Below Land Surface (feet)	REPORTED 60'	REPORTED 60'	REPORTED 60'	REPORTED 60'	REPORTED 60'	REPORTED 60'
6	Static Water Level of Well Below Land Surface (feet)	BURIED	BURIED	BURIED	BURIED	BURIED	BURIED
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-15-98	9-25-98	10-9-98	11-25-98	12-14-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	C	C	C	C	C	C
10	pH (Standard Units)	6.90	7.10	7.20	7.60	7.10	7.60
11	Total Acidity (mg/l CaCO3)	30.00	34.00	18.00	13.0	6.10	8.60
12	Total Alkalinity (mg/l CaCO3)	270.00	280.00	270.00	260.00	270.0	89.0
13	Specific Conductivity (umhos/cm at 25° C)	500.0	620.0	580.0	620.0	620.0	240.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	0.26	0.16	0.07	0.14	0.10
16	Total Sulfates (mg/l)	73.00	110.00	110.0	110.0	110.0	110.0
17	Total Iron (mg/l)	0.22	0.75	0.37	0.23	0.84	0.34
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	8.0	<1.0
19	Total Hardness (mg/l as CaCO3)	320.0	330.0	280.0	320.0	330.0	10.0
20	Nitrates	0.56	0.15	0.13	<0.09	<0.09	0.98
21	Date Sampled for Analysis	8-12-98	9-22-98	10-7-98	11-25-98	12-14-98	1-22-99
22	Date Last Precipitation Event Occurred	8-12-98	9-22-98	10-7-98	11-25-98	12-9-98	1-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-24	DW-24	DW-24	DW-24	DW-24	DW-24
2	Identification Number 98-	08195			11248		99-02291
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1206	1206	1206	1206	1206	1206
5	Depth of Well Below Land Surface (feet)	20'	20'	20'	20'	20'	20'
6	Static Water Level of Well Below Land Surface (feet)	8"	9'	10'	10'	11'	4'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-15-98			11-12-98		1-29-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	6.60			7.40		7.50
11	Total Acidity (mg/l CaCO3)	28.0			23.0		22.0
12	Total Alkalinity (mg/l CaCO3)	270.0			240.0		260.0
13	Specific Conductivity (umhos/cm at 25° C)	550.0			540.0		540.0
14	Total Dissolved Solids (mg/l)	---			---		---
15	Total Manganese (mg/l)	0.08			<0.02		<0.02
16	Total Sulfates (mg/l)	120.0			69.0		75.0
17	Total Iron (mg/l)	0.16			0.49		0.93
18	Total Suspended Solids (mg/l)	<1.0			<1.0		<1.0
19	Total Hardness (mg/l as CaCO3)	340.0			280.0		300.0
20	Nitrates	0.14			0.55		0.18
21	Date Sampled for Analysis	8-15-98			11-12-98		1-29-99
22	Date Last Precipitation Event Occurred	8-12-98			11-9-8		1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of sampling Station from Hydrology Map	W-25	W-25	W-25	W-25	W-25	W-25
2	Identification Number 98-	08204	10011	10475	11450	12273	99-01371
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1240	1240	1240	1240	1240	1240
5	Depth of Well Below Land Surface (feet)	90'	90'	90'	90'	90'	90'
6	Static Water Level of Well Below Land Surface (feet)	45'	50'	47'	49'	46'	42'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-21-98	9-28-98	10-26-98	11-27-98	12-15-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.20	7.70	7.50	8.10	7.90	7.50
11	Total Acidity (mg/l CaCO3)	10.00	9.30	8.40	6.20	26.0	8.40
12	Total Alkalinity (mg/l CaCO3)	130.00	130.00	130.0	140.0	130.0	110.0
13	Specific Conductivity (umhos/cm at 25° C)	320.0	310.0	280.0	290.0	290.0	250.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	0.03	<0.02	<0.02	0.02	<0.02
16	Total Sulfates (mg/l)	33.00	31.00	32.0	28.0	35.0	35.0
17	Total Iron (mg/l)	<0.02	0.75	<0.05	<0.05	0.33	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	120.0	100.0	130.0	110.0	130.0	130.0
20	Nitrates	0.21	0.26	0.15	<0.09	0.15	0.24
21	Date Sampled for Analysis	8-21-98	9-28-98	10-26-98	11-27-98	12-15-98	1-27-99
22	Date Last Precipitation Event Occurred	8-17-98	9-27-98	10-18-98	11-25-98	12-9-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of sampling Station from Hydrology Map	W-26	W-26	W-26	W-26	W-26	W-26
2	Identification Number 98-	08206	10017	10476	11451	12274	99-01372
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1240	1240	1240	1240	1240	1240
5	Depth of Well Below Land Surface (feet)	84'	84'	84'	84'	84'	84'
6	Static Water Level of Well Below Land Surface (feet)	47'	57'	47'	48'	47'	46'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	7-14-98	9-28-98	10-26-98	11-27-98	12-15-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.00	7.50	7.50	7.90	7.60	7.80
11	Total Acidity (mg/l CaCO3)	12.00	6.00	13.0	4.60	19.0	9.40
12	Total Alkalinity (mg/l CaCO3)	140.0	140.0	140.0	130.0	130.0	130.0
13	Specific Conductivity (umhos/cm at 25° C)	330.0	360.0	320.0	330.0	320.0	300.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.04	<0.02	0.02	<0.02	0.02	0.18
16	Total Sulfates (mg/l)	42.00	38.00	40.00	41.0	43.0	44.0
17	Total Iron (mg/l)	0.59	<0.02	0.36	1.70	0.26	2.70
18	Total Suspended Solids (mg/l)	1.3	<1.0	<1.0	21.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	150.0	130.00	160.0	160.0	150.0	160.0
20	Nitrates	0.19	<0.10	<0.09	0.11	<0.09	<0.09
21	Date Sampled for Analysis	7-14-98	9-28-98	10-26-98	11-27-98	12-15-98	1-27-99
22	Date Last Precipitation Event Occurred	7-07-98	9-27-98	10-18-98	11-25-98	12-9-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of sampling Station from Hydrology Map	W-27	W-27	W-27	W-27	W-27	W-27
2	Identification Number 98-	08249	10018	10459	12008	12277	99-02160
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1220	1220	1220	1220	1220	1220
5	Depth of Well Below Land Surface (feet)	80'	80'	80'	80'	80'	80'
6	Static Water Level of Well Below Land Surface (feet)	45'	42'	42'	43'	43'	38'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-24-98	9-28-98	10-24-98	11-28-98	12-15-98	1-30-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.20	7.40	7.60	7.60	7.50	7.70
11	Total Acidity (mg/l CaCO3)	12.00	15.00	26.00	13.0	18.0	9.40
12	Total Alkalinity (mg/l CaCO3)	230.0	250.0	340.0	310.0	260.0	270.0
13	Specific Conductivity (umhos/cm at 25° C)	360.0	430.0	470.0	470.0	480.0	430.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.21	0.40	0.26	0.06	0.29	1.10
16	Total Sulfates (mg/l)	38.00	41.00	35.00	38.0	38.0	34.0
17	Total Iron (mg/l)	2.10	12.00	4.00	0.94	3.50	18.0
18	Total Suspended Solids (mg/l)	110.0	250.0	560.0	500.0	200.0	230.0
19	Total Hardness (mg/l as CaCO3)	230.0	400.0	310.0	230.0	300.0	490.0
20	Nitrates	0.48	0.10	0.20	0.18	0.29	0.17
21	Date Sampled for Analysis	8-24-98	9-28-98	10-24-98	11-28-98	12-15-98	1-30-99
22	Date Last Precipitation Event Occurred	8-17-98	9-27-98	10-18-98	11-25-98	12-9-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of sampling Station from Hydrology Map	DW-28	DW-28	DW-28	DW-28	DW-28	DW-28
2	Identification Number 98-	08238	10019	10460	12009	12278	99-02159
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1220	1220	1220	1220	1220	1220
5	Depth of Well Below Land Surface (feet)	13'	13'	13'	13'	13'	13'
6	Static Water Level of Well Below Land Surface (feet)	11'	12'	12'	12'	12'	11'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-22-98	9-28-98	10-24-98	11-28-98	12-15-98	1-30-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	6.5	6.80	6.90	7.20	7.20	6.30
11	Total Acidity (mg/l CaCO3)	38.00	16.00	37.00	17.0	12.0	5.80
12	Total Alkalinity (mg/l CaCO3)	100.00	100.00	100.00	85.0	88.0	11.0
13	Specific Conductivity (umhos/cm at 25° C)	200.0	240.0	280.0	210.0	210.0	100.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.61	0.63	0.68	0.56	0.90	0.07
16	Total Sulfates (mg/l)	5.20	3.90	<1.50	7.60	1.30	36.0
17	Total Iron (mg/l)	3.00	4.30	5.10	6.50	6.10	1.00
18	Total Suspended Solids (mg/l)	60.0	130.0	47.0	310.0	51.0	21.0
19	Total Hardness (mg/l as CaCO3)	80.0	100.0	120.0	70.0	100.0	50.0
20	Nitrates	0.28	0.11	0.21	2.50	0.20	0.66
21	Date Sampled for Analysis	8-22-98	9-28-98	10-24-98	11-28-98	12-15-98	1-30-99
22	Date Last Precipitation Event Occurred	8-17-98	9-27-98	10-18-98	11-25-98	12-9-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of sampling Station from Hydrology Map	W-29	W-29	W-29	W-29	W-29	W-29
2	Identification Number 98-	08203	10032	10479	11458	12283	99-01376
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1240	1240	1240	1240	1240	1240
5	Depth of Well Below Land Surface (feet)	61'	61'	61'	61'	61'	61'
6	Static Water Level of Well Below Land Surface (feet)	40'	42'	42'	56'	42'	36'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-21-98	9-29-98	10-26-98	11-27-98	12-15-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	6.90	7.60	7.40	7.80	7.60	7.60
11	Total Acidity (mg/l CaCO3)	18.00	8.50	10.0	8.80	16.0	8.30
12	Total Alkalinity (mg/l CaCO3)	170.0	190.0	200.0	190.0	200.0	110.0
13	Specific Conductivity (umhos/cm at 25° C)	400.0	380.0	420.0	390.0	400.0	240.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	32.00	30.00	28.0	29.0	32.0	32.0
17	Total Iron (mg/l)	<0.02	<0.02	<0.05	<0.05	0.05	0.07
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	180.0	170.0	200.0	200.0	190.0	120.0
20	Nitrates	1.4	1.1	0.68	0.83	0.79	1.90
21	Date Sampled for Analysis	8-21-98	9-29-98	10-26-98	11-27-98	12-15-98	1-27-99
22	Date Last Precipitation Event Occurred	8-17-98	9-29-98	10-18-98	11-25-98	12-9-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of sampling Station from Hydrology Map	W-30	W-30	W-30	W-30	W-30	W-30
2	Identification Number 98-	08205	10007	10480	11455	12282	99-01377
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1238	1238	1238	1238	1238	1238
5	Depth of Well Below Land Surface (feet)	35'	35'	35'	35'	35'	35'
6	Static Water Level of Well Below Land Surface (feet)	30'	27'	26'	27'	28'	21'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-21-98	9-28-98	10-26-98	11-27-98	12-15-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	6.50	7.40	7.30	7.80	7.40	7.20
11	Total Acidity (mg/l CaCO3)	26.00	7.70	5.70	9.90	14.0	21.0
12	Total Alkalinity (mg/l CaCO3)	160.00	150.00	79.0	140.0	160.0	160.0
13	Specific Conductivity (umhos/cm at 25° C)	390.0	370.0	320.0	350.0	350.0	330.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.19	0.10	0.34	0.06	0.43	0.05
16	Total Sulfates (mg/l)	39.00	44.00	48.0	44.0	41.0	42.0
17	Total Iron (mg/l)	4.90	1.10	6.20	0.32	2.50	0.42
18	Total Suspended Solids (mg/l)	280.0	39.0	130.0	<1.0	9.3	5.3
19	Total Hardness (mg/l as CaCO3)	190.0	150.0	150.0	150.0	190.0	160.0
20	Nitrates	2.1	3.1	4.6	1.30	0.65	2.30
21	Date Sampled for Analysis	8-21-98	9-28-98	10-26-98	11-27-98	12-15-98	1-27-99
22	Date Last Precipitation Event Occurred	8-17-98	9-27-98	10-18-98	11-25-98	12-9-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of sampling Station from Hydrology Map	DW-31	DW-31	DW-31	DW-31	DW-31	DW-31
2	Identification Number 98-	08201	10004	10485	11461	12286	99-01382
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1130	1130	1130	1130	1130	1130
5	Depth of Well Below Land Surface (feet)	23'	23'	23'	23'	23'	23'
6	Static Water Level of Well Below Land Surface (feet)	19'	20'	20'	21"	21'	16'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-21-98	9-28-98	10-26-98	11-27-98	12-15-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	6.80	7.50	7.50	8.40	7.70	7.40
11	Total Acidity (mg/l CaCO3)	33.00	13.00	16.0	0.00	18.0	24.0
12	Total Alkalinity (mg/l CaCO3)	240.00	180.00	240.0	180.0	190.0	230.0
13	Specific Conductivity (umhos/cm at 25° C)	570.0	560.0	560.0	520.0	510.0	540.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	0.03	<0.02	<0.02	0.02	0.03
16	Total Sulfates (mg/l)	84.00	84.00	80.0	76.0	90.0	82.0
17	Total Iron (mg/l)	<0.02	<0.02	<0.05	<0.05	<0.05	1.60
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	300.0	280.0	280.0	240.0	280.0	290.0
20	Nitrates	0.45	0.35	0.15	0.10	<0.09	0.22
21	Date Sampled for Analysis	8-21-98	9-28-98	10-26-98	11-27-98	12-15-98	1-27-99
22	Date Last Precipitation Event Occurred	8-17-98	9-27-98	10-18-98	11-25-98	12-9-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-32	W-32	W-32	W-32	W-32	W-32
2	Identification Number 98-	08239	10005	10483	11459	12284	99-01380
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1181	1181	1181	1181	1181	1181
5	Depth of Well Below Land Surface (feet)	100'	100'	100'	100'	100'	100'
6	Static Water Level of Well Below Land Surface (feet)	61'	62'	62'	63'	63'	60'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-22-98	9-28-98	10-26-98	11-27-98	12-15-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.30	7.50	7.30	7.90	7.60	7.70
11	Total Acidity (mg/l CaCO3)	22.00	8.10	8.90	11.0	16.0	15.0
12	Total Alkalinity (mg/l CaCO3)	220.00	190.00	220.0	220.0	220.0	210.0
13	Specific Conductivity (umhos/cm at 25° C)	450.0	440.0	420.0	430.0	410.0	400.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	0.06	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	26.00	26.00	23.0	22.0	22.0	24.0
17	Total Iron (mg/l)	<0.02	0.20	<0.05	<0.05	<0.05	1.30
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	180.0	180.0	190.0	180.0	200.0	190.0
20	Nitrates	0.49	0.52	0.32	0.24	0.29	1.00
21	Date Sampled for Analysis	8-22-98	9-28-98	10-26-98	11-27-98	12-15-98	1-27-99
22	Date Last Precipitation Event Occurred	8-17-98	9-27-98	10-18-98	11-25-98	12-9-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of sampling Station from Hydrology Map	W-33	W-33	W-33	W-33	W-33	W-33
2	Identification Number 98-	08240	10006	10484	11460	12285	99-01381
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1181	1181	1181	1181	1181	1181
5	Depth of Well Below Land Surface (feet)	74'	74'	74'	74'	74'	74'
6	Static Water Level of Well Below Land Surface (feet)	54'	55'	55'	55'	56'	50'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-22-98	9-28-98	10-26-98	11-27-98	12-15-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.50	7.70	7.50	8.00	7.50	7.80
11	Total Acidity (mg/l CaCO3)	17.00	6.20	9.30	7.80	16.0	10.0
12	Total Alkalinity (mg/l CaCO3)	190.0	190.0	200.0	200.0	200.0	180.0
13	Specific Conductivity (umhos/cm at 25° C)	430.0	440.0	440.0	430.0	410.0	360.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.22	0.03	0.04	0.03	0.94	0.04
16	Total Sulfates (mg/l)	20.00	22.00	21.0	22.0	21.0	19.0
17	Total Iron (mg/l)	0.13	0.06	0.09	<0.05	2.60	0.12
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	4.7	<1.0
19	Total Hardness (mg/l as CaCO3)	220.0	210.0	230.0	200.0	240.0	190.0
20	Nitrates	7.5	8.8	4.8	4.20	5.00	5.40
21	Date Sampled for Analysis	8-22-98	9-28-98	10-26-98	11-27-98	12-15-98	1-27-99
22	Date Last Precipitation Event Occurred	8-17-98	9-27-98	10-18-98	11-25-98	12-9-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of sampling Station from Hydrology Map	DW-34	DW-34	DW-34	DW-34	DW-34	DW-34
2	Identification Number 98-	08241	10002	10487	11464	12289	99-01386
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1145	1145	1145	1145	1145	1145
5	Depth of Well Below Land Surface (feet)	22'	22'	22'	22'	22'	22'
6	Static Water Level of Well Below Land Surface (feet)	16'	17'	17'	18'	18'	14'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-22-98	9-28-98	10-26-98	11-27-98	12-15-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	6.90	6.90	6.60	7.00	6.70	6.30
11	Total Acidity (mg/l CaCO3)	90.00	46.00	62.0	69.0	91.0	29.0
12	Total Alkalinity (mg/l CaCO3)	320.00	180.00	340.0	230.0	390.0	19.0
13	Specific Conductivity (umhos/cm at 25° C)	480.0	560.0	640.0	830.0	790.0	130.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	2.30	2.20	2.20	2.50	2.60	0.39
16	Total Sulfates (mg/l)	<1.50	3.90	1.70	3.10	2.90	31.0
17	Total Iron (mg/l)	4.80	4.50	4.90	5.30	6.40	1.50
18	Total Suspended Solids (mg/l)	8.7	13.0	11.0	<1.0	21.0	37.0
19	Total Hardness (mg/l as CaCO3)	190.0	210.0	250.0	260.0	280.0	60.0
20	Nitrates	0.49	0.12	<0.09	<0.09	0.09	2.30
21	Date Sampled for Analysis	8-22-98	9-28-98	10-26-98	11-27-98	12-15-98	1-27-99
22	Date Last Precipitation Event Occurred	8-17-98	9-27-98	10-18-98	11-25-98	12-9-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of sampling Station from Hydrology Map	DW-35	DW-35	DW-35	DW-35	DW-35	DW-35
2	Identification Number 98-	08242	10025	10467	11420	12242	99-01177
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1240	1240	1240	1240	1240	1240
5	Depth of Well Below Land Surface (feet)	31'	31'	31'	31'	31'	31'
6	Static Water Level of Well Below Land Surface (feet)	23'	24'	24'	25'	25'	25'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-22-98	9-28-98	10-26-98	11-25-98	12-14-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	6.80	6.70	6.60	6.60	6.70	6.60
11	Total Acidity (mg/l CaCO3)	15.00	23.00	16.0	18.0	14.0	17.0
12	Total Alkalinity (mg/l CaCO3)	100.00	120.00	130.0	130.0	110.0	36.0
13	Specific Conductivity (umhos/cm at 25° C)	560.0	560.0	580.0	600.0	550.0	280.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	0.03	0.02	<0.02
16	Total Sulfates (mg/l)	58.00	55.00	54.0	51.0	55.0	53.0
17	Total Iron (mg/l)	<0.02	0.11	0.34	0.14	0.26	0.14
18	Total Suspended Solids (mg/l)	<1.0	<1.0	2.0	<1.0	4.0	3.0
19	Total Hardness (mg/l as CaCO3)	160.0	190.0	200.0	200.0	210.0	110.0
20	Nitrates	3.20	0.98	2.20	1.60	1.40	0.70
21	Date Sampled for Analysis	8-22-98	9-28-98	10-18-98	11-25-98	12-14-98	1-22-99
22	Date Last Precipitation Event Occurred	8-17-98	9-27-98	10-18-98	11-25-98	12-9-98	1-22-99

Laboratory Name TRA-DET, INC.
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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-37	DW-37	DW-37	DW-37	DW-37	DW-37
2	Identification Number 98-						99-01383
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1178	1178	1178	1178	1178	1178
5	Depth of Well Below Land Surface (feet)	15'	15'	15'	15'	15'	15'
6	Static Water Level of Well Below Land Surface (feet)	DRY	DRY	DRY	DRY	DRY	14.75'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-22-98	9-30-98-	10-26-98	11-27-98	12-15-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)						7.80
11	Total Acidity (mg/l CaCO3)						10.0
12	Total Alkalinity (mg/l CaCO3)						120.0
13	Specific Conductivity (umhos/cm at 25° C)						270.0
14	Total Dissolved Solids (mg/l)						---
15	Total Manganese (mg/l)						0.03
16	Total Sulfates (mg/l)						33.0
17	Total Iron (mg/l)						0.62
18	Total Suspended Solids (mg/l)						17.0
19	Total Hardness (mg/l as CaCO3)						140.0
20	Nitrates						1.00
21	Date Sampled for Analysis						1-27-99
22	Date Last Precipitation Event Occurred						1-23-99

Laboratory Name TRA-DET, INC.
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of sampling Station from Hydrology Map	DW-38	DW-38	DW-38	DW-38	DW-38	DW-38
2	Identification Number 98-	08243	10053	10477	11453	12276	99-01374
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1204	1204	1204	1204	1204	1204
5	Depth of Well Below Land Surface (feet)	30'	30'	30'	30'	30'	30'
6	Static Water Level of Well Below Land Surface (feet)	25'	25'	25'	22'	26'	15'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-22-98	9-30-98	10-26-98	11-27-98	12-15-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	6.80	6.70	6.70	7.00	7.00	6.80
11	Total Acidity (mg/l CaCO3)	6.40	32.0	28.0	62.0	48.0	12.0
12	Total Alkalinity (mg/l CaCO3)	120.00	150.00	190.0	220.0	230.0	20.0
13	Specific Conductivity (umhos/cm at 25° C)	260.0	300.0	390.0	440.0	450.0	120.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	1.80	2.30	3.20	<0.02	4.30	0.03
16	Total Sulfates (mg/l)	19.00	17.00	2.0	2.50	2.30	20.0
17	Total Iron (mg/l)	5.50	2.60	5.60	0.06	7.40	0.76
18	Total Suspended Solids (mg/l)	700.0	17.0	170.0	5.30	21.0	40.0
19	Total Hardness (mg/l as CaCO3)	150.0	170.0	200.0	150.0	230.0	50.0
20	Nitrates	0.54	0.11	<0.09	<0.09	<0.09	6.20
21	Date Sampled for Analysis	8-22-98	9-30-98	10-26-98	11-27-98	12-15-98	1-27-99
22	Date Last Precipitation Event Occurred	8-17-98	9-29-98	10-18-98	11-25-98	12-9-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of sampling Station from Hydrology Map	DW-40	DW-40	DW-40	DW-40	DW-40	DW-40
2	Identification Number 98-	08259	09302	10185	11409	12262	99-01167
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1209	1209	1209	1209	1209	1209
5	Depth of Well Below Land Surface (feet)	19'	19'	19'	19'	19'	19'
6	Static Water Level of Well Below Land Surface (feet)	16'	16'	16'	17'	17'	11'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-25-98	9-25-98	10-9-98	11-25-98	12-14-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	6.90	7.00	7.30	7.70	7.30	7.20
11	Total Acidity (mg/l CaCO3)	18.00	28.00	16.00	9.60	8.30	8.60
12	Total Alkalinity (mg/l CaCO3)	190.00	190.00	190.00	190.0	190.0	67.0
13	Specific Conductivity (umhos/cm at 25° C)	780.0	820.0	780.0	780.0	770.0	330.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	0.04	0.04	0.26	0.10	0.06
16	Total Sulfates (mg/l)	47.00	42.00	53.00	43.0	49.0	26.0
17	Total Iron (mg/l)	0.73	3.40	0.15	3.0	1.20	0.20
18	Total Suspended Solids (mg/l)	1.30	<1.0	11.0	220.0	140.0	<1.0
19	Total Hardness (mg/l as CaCO3)	370.0	390.0	330.0	360.0	380.0	120.0
20	Nitrates	0.80	0.55	0.58	0.66	0.76	0.19
21	Date Sampled for Analysis	8-25-98	9-25-98	10-9-98	11-25-98	12-14-98	1-22-99
22	Date Last Precipitation Event Occurred	8-25-98	9-22-98	10-7-98	11-25-98	12-9-98	1-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-41	W-41	W-41	W-41	W-41	W-41
2	Identification Number 98-	08260	10068	10465	12002	12378	99-01119
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1242	1242	1242	1242	1242	1242
5	Depth of Well Below Land Surface (feet)	90'	90'	90'	90'	90'	90'
6	Static Water Level of Well Below Land Surface (feet)	57'	58'	58'	59'	58'	53'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-25-98	9-30-98	10-26-98	11-28-98	12-17-98	1-30-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.50	7.50	7.50	7.60	7.50	7.70
11	Total Acidity (mg/l CaCO3)	10.00	9.70	20.0	11.0	19.0	9.90
12	Total Alkalinity (mg/l CaCO3)	210.0	170.0	190.0	190.0	220.0	150.0
13	Specific Conductivity (umhos/cm at 25° C)	480.0	560.0	620.0	680.0	480.0	480.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	42.00	42.00	48.0	48.0	35.0	34.0
17	Total Iron (mg/l)	0.05	<0.05	0.14	0.12	0.06	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	230.0	240.0	290.0	270.0	220.0	230.0
20	Nitrates	0.56	0.41	0.34	0.25	0.25	3.80
21	Date Sampled for Analysis	8-25-98	9-30-98	10-26-98	11-28-98	12-17-98	1-30-99
22	Date Last Precipitation Event Occurred	8-25-98	9-29-98	10-18-98	11-25-98	12-17-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019
State WEST VIRGINIA
City WHEELING
Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-42	W-42	W-42	W-42	W-42	W-42
2	Identification Number 98-	08261	10028	10282	11404	12258	99-01162
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1223	1223	1223	1223	1223	1223
5	Depth of Well Below Land Surface (feet)	REPORTED 52'	REPORTED 52'	REPORTED 52'	REPORTED 52'	REPORTED 52'	REPORTED 52'
6	Static Water Level of Well Below Land Surface (feet)	20.5	24'	37'	22'	26'	13'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-25-98	9-28-98	10-14-98	11-25-98	12-14-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.10	7.10	7.10	7.30	7.10	7.20
11	Total Acidity (mg/l CaCO3)	17.00	15.00	15.00	12.00	9.90	18.0
12	Total Alkalinity (mg/l CaCO3)	210.00	210.00	220.00	220.0	220.0	220.0
13	Specific Conductivity (umhos/cm at 25° C)	1000.0	1100.0	1100.0	1200.0	1200.0	1400.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	56.00	60.00	56.00	57.0	58.0	59.0
17	Total Iron (mg/l)	<0.02	<0.02	<0.02	<0.05	<0.05	0.06
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	9.0
19	Total Hardness (mg/l as CaCO3)	320.0	300.0	320.0	340.0	310.0	350.0
20	Nitrates	2.60	0.58	1.20	0.79	0.86	1.00
21	Date Sampled for Analysis	8-25-98	9-28-98	10-14-98	11-25-98	12-14-98	1-22-99
22	Date Last Precipitation Event Occurred	8-25-98	9-27-98	10-7-98	11-25-98	12-9-98	1-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	WL-43	WL-43	WL-43	WL-43	WL-43	WL-43
2	Identification Number 98-	08262	10029	10281	11405	12259	99-01163
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1241	1241	1241	1241	1241	1241
5	Depth of Well Below Land Surface (feet)	98'	98'	98'	98'	98'	98'
6	Static Water Level of Well Below Land Surface (feet)	58'	60'	59'	60'	59'	49'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-25-98	9-28-98	10-14-98	11-25-98	12-14-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.60	7.70	7.40	7.90	7.10	7.40
11	Total Acidity (mg/l CaCO3)	7.40	12.00	9.70	7.40	3.10	11.0
12	Total Alkalinity (mg/l CaCO3)	170.00	180.00	190.00	200.0	210.0	170.0
13	Specific Conductivity (umhos/cm at 25° C)	410.0	510.0	440.0	480.0	480.0	470.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	0.02	0.05
16	Total Sulfates (mg/l)	35.00	47.00	45.0	41.0	42.0	45.0
17	Total Iron (mg/l)	<0.02	0.19	0.16	<0.05	0.16	0.16
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	200.0	190.0	200.0	220.0	220.0	210.0
20	Nitrates	3.1	0.17	0.32	0.10	0.22	1.00
21	Date Sampled for Analysis	8-25-98	9-28-98	10-14-98	11-25-98	12-14-98	1-22-99
22	Date Last Precipitation Event Occurred	8-25-98	9-27-98	10-7-98	11-25-98	12-9-98	1-22-98

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-44	DW-44	DW-44	DW-44	DW-44	DW-44
2	Identification Number 98-	08263	09294	10464	11406	12260	99-01165
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1211	1211	1211	1211	1211	1211
5	Depth of Well Below Land Surface (feet)	25'	25'	25'	25'	25'	25'
6	Static Water Level of Well Below Land Surface (feet)	17'	18'	19'	20'	20'	15'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-25-98	9-25-98	10-26-98	11-25-98	12-14-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	7.00	7.30	7.40	7.80	7.30	7.70
11	Total Acidity (mg/l CaCO3)	14.00	30.00	22.0	10.0	6.80	60.6
12	Total Alkalinity (mg/l CaCO3)	250.00	250.00	250.0	240.0	250.0	44.0
13	Specific Conductivity (umhos/cm at 25° C)	700.0	660.0	620.0	610.0	640.0	350.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	0.03	<0.02	0.03	0.09	0.57
16	Total Sulfates (mg/l)	62.00	55.00	50.0	57.0	55.0	29.0
17	Total Iron (mg/l)	0.22	0.20	0.31	0.46	1.60	0.71
18	Total Suspended Solids (mg/l)	<1.0	<1.0	6.70	<1.0	2.7	4.0
19	Total Hardness (mg/l as CaCO3)	370.0	320.0	300.0	290.0	280.0	110.0
20	Nitrates	4.80	2.20	2.60	1.30	2.20	15.0
21	Date Sampled for Analysis	8-25-98	9-25-98	11-26-98	11-25-98	12-14-98	1-22-99
22	Date Last Precipitation Event Occurred	8-25-98	9-22-98	10-18-98	11-25-98	12-9-98	1-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-45	W-45	W-45	W-45	W-45	W-45
2	Identification Number 98-	08264	09289	10181	11402	12256	99-01160
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1205	1205	1205	1205	1205	1205
5	Depth of Well Below Land Surface (feet)	47'	47'	47'	47'	47'	47'
6	Static Water Level of Well Below Land Surface (feet)	27'	27'	27'	27'	27'	20'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-25-98	9-25-98	10-9-98	11-25-98	12-14-98	1-22-98
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.10	7.50	7.50	7.80	7.40	7.40
11	Total Acidity (mg/l CaCO3)	7.70	23.00	13.00	6.20	4.0	17.0
12	Total Alkalinity (mg/l CaCO3)	200.00	200.00	200.00	200.00	210.0	95.0
13	Specific Conductivity (umhos/cm at 25° C)	410.0	450.0	460.0	440.0	400.0	310.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	0.08	0.08	0.02	<0.02	0.36
16	Total Sulfates (mg/l)	35.00	35.00	36.00	35.0	37.0	35.0
17	Total Iron (mg/l)	0.29	1.80	3.90	0.36	0.10	2.60
18	Total Suspended Solids (mg/l)	<1.0	3.3	10.0	<1.0	<1.0	39.0
19	Total Hardness (mg/l as CaCO3)	220.0	210.0	200.0	200.0	180.0	140.0
20	Nitrates	0.-95	0.40	0.46	0.17	0.25	0.93
21	Date Sampled for Analysis	8-25-98	9-25-98	10-9-98	11-25-98	12-14-98	1-22-99
22	Date Last Precipitation Event Occurred	8-25-98	9-22-98	10-7-98	11-25-98	12-9-98	1-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-46	DW-46	DW-46	DW-46	DW-46	DW-46
2	Identification Number 98-	08265	09288	11059	11401	12255	99-01158
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1265	1265	1265	1265	1265	1265
5	Depth of Well Below Land Surface (feet)	32'	32'	32'	32'	32'	32'
6	Static Water Level of Well Below Land Surface (feet)	26'	28'	28'	28'	28'	22'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-25-98	9-25-98	10-31-98	11-25-98	12-14-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	7.20	7.40	7.20	7.50	7.30	7.90
11	Total Acidity (mg/l CaCO3)	12.00	33.00	29.0	11.0	7.50	5.90
12	Total Alkalinity (mg/l CaCO3)	230.00	270.00	240.0	250.0	260.0	130.0
13	Specific Conductivity (umhos/cm at 25° C)	560.0	720.0	680.0	720.0	710.0	440.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	0.11	0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	85.00	120.00	110.0	120.0	120.0	67.0
17	Total Iron (mg/l)	01.0	0.42	0.86	0.06	<0.05	0.06
18	Total Suspended Solids (mg/l)	<1.0	<1.0	3.3	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	320.0	330.0	300.0	340.0	310.0	200.0
20	Nitrates	8.50	4.80	3.50	3.40	4.80	5.50
21	Date Sampled for Analysis	8-25-98	9-25-98	10-31-98	11-25-98	12-14-98	1-22-99
22	Date Last Precipitation Event Occurred	8-25-98	9-22-98	10-29-98	11-25-98	12-9-98	1-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-47	DW-47	DW-47	DW-47	DW-47	DW-47
2	Identification Number 98-	08266	09300		11411	12267	99-02155
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1220	1220	1220	1220	1220	1220
5	Depth of Well Below Land Surface (feet)	29'	29'	29'	29'	29'	29'
6	Static Water Level of Well Below Land Surface (feet)	26.5'	27'	28'	28'	28'	25'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-25-98	9-25-98		11-25-98	12-14-98	1-30-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	7.10	7.30		7.80	7.60	8.10
11	Total Acidity (mg/l CaCO3)	8.90	24.00		<1.2	<1.0	6.70
12	Total Alkalinity (mg/l CaCO3)	200.00	190.00		24.0	89.0	130.0
13	Specific Conductivity (umhos/cm at 25° C)	460.0	440.0		120.0	270.0	380.0
14	Total Dissolved Solids (mg/l)	---	---		---	---	---
15	Total Manganese (mg/l)	<0.02	0.02		0.02	0.19	<0.02
16	Total Sulfates (mg/l)	40.00	29.00		29.0	32.0	42.0
17	Total Iron (mg/l)	0.05	<0.02		<0.05	5.20	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0		<1.0	130.0	<1.0
19	Total Hardness (mg/l as CaCO3)	200.0	200.0		60.0	120.0	180.0
20	Nitrates	7.9	6.4		<0.09	0.62	6.20
21	Date Sampled for Analysis	8-25-98	9-25-98		11-25-98	12-14-98	1-30-99
22	Date Last Precipitation Event Occurred	8-25-98	9-22-98		11-25-98	12-9-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-48	W-48	W-48	W-48	W-48	W-48
2	Identification Number 98-	08295	10069	10461	12021	99-01120	99-02177
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1222	1222	1222	1222	1222	1222
5	Depth of Well Below Land Surface (feet)	78'	78'	78'	78'	78'	78'
6	Static Water Level of Well Below Land Surface (feet)	29'	31'	31'	32'	32'	23'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-27-98	9-30-98	10-26-98	11-28-98	12-31-98	1-29-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.40	7.60	7.80	7.50	7.90	7.80
11	Total Acidity (mg/l CaCO3)	7.60	9.50	18.0	5.30	8.50	10.0
12	Total Alkalinity (mg/l CaCO3)	200.00	190.00	210.0	190.0	210.0	180.0
13	Specific Conductivity (umhos/cm at 25° C)	360.0	440.0	420.0	460.0	410.0	360.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	26.00	26.00	28.0	30.0	32.0	23.0
17	Total Iron (mg/l)	<0.02	<0.05	0.06	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	200.0	200.0	200.0	200.0	200.0	210.0
20	Nitrates	0.42	0.47	0.44	0.35	0.32	0.97
21	Date Sampled for Analysis	8-27-98	9-30-98	10-26-98	11-28-98	12-31-98	1-29-99
22	Date Last Precipitation Event Occurred	8-26-98	9-27-98	10-18-98	11-25-98	12-31-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-49	W-49	W-49	W-49	W-49	W-49
2	Identification Number 98-	08282	09291	10183	12001	12466	99-01161
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1260	1260	1260	1260	1260	1260
5	Depth of Well Below Land Surface (feet)	99'	99'	99'	99'	99'	99'
6	Static Water Level of Well Below Land Surface (feet)	97'	93'	94'	88'	88'	88'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-26-98	9-25-98	10-9-98	11-28-98	12-29-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.20	7.50	7.70	7.80	7.40	7.00
11	Total Acidity (mg/l CaCO3)	10.00	20.00	10.00	7.40	5.60	9.60
12	Total Alkalinity (mg/l CaCO3)	200.00	200.00	200.00	190.0	190.0	190.0
13	Specific Conductivity (umhos/cm at 25° C)	860.0	820.0	780.0	870.0	1200.0	790.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	0.04	<0.02	<0.02	0.02
16	Total Sulfates (mg/l)	35.00	34.00	27.00	29.0	28.0	29.0
17	Total Iron (mg/l)	0.18	0.12	0.14	0.21	<0.05	0.07
18	Total Suspended Solids (mg/l)	5.3	<1.0	<1.0	<1.0	<1.0	5.0
19	Total Hardness (mg/l as CaCO3)	290.0	240.0	220.0	210.0	220.0	280.0
20	Nitrates	0.38	0.51	0.40	0.52	0.58	0.40
21	Date Sampled for Analysis	8-26-98	9-25-98	10-9-98	11-28-98	12-29-98	1-22-99
22	Date Last Precipitation Event Occurred	8-26-98	9-22-98	10-7-98	11-25-98	12-29-98	1-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-50	DW-50	DW-50	DW-50	DW-50	DW-50
2	Identification Number 98-	08283	10054	11016	12024	12358	99-01387
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1141	1141	1141	1141	1141	1141
5	Depth of Well Below Land Surface (feet)	16'	16'	16'	16'	16'	16'
6	Static Water Level of Well Below Land Surface (feet)	11.5'	13'	13'	12'	13'	4'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-26-98	9-30-98	10-29-98	11-28-98	12-17-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	6.30	6.40	6.60	6.90	6.90	7.60
11	Total Acidity (mg/l CaCO3)	9.80	6.10	9.10	14.0	26.0	17.0
12	Total Alkalinity (mg/l CaCO3)	71.00	78.00	82.0	86.0	91.0	33.0
13	Specific Conductivity (umhos/cm at 25° C)	180.0	240.0	220.0	260.0	260.0	100.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	------
15	Total Manganese (mg/l)	<0.02	0.13	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	32.00	34.00	35.0	37.0	37.0	19.0
17	Total Iron (mg/l)	0.06	0.40	<0.05	0.10	0.06	0.20
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	80.0	120.0	110.0	110.0	120.0	40.0
20	Nitrates	0.27	0.11	<0.09	0.35	0.18	0.59
21	Date Sampled for Analysis	8-26-98	9-30-98	10-29-98	11-28-98	12-17-98	1-27-99
22	Date Last Precipitation Event Occurred	8-26-98	9-29-98	10-29-98	11-25-98	12-17-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-51	W-51	W-51	W-51	W-51	W-51
2	Identification Number 98-	08284	10033	10448	11398	99-01132	99-02158
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1122	1122	1122	1122	1122	1122
5	Depth of Well Below Land Surface (feet)	REPORTED 85'	REPORTED 85'	REPORTED 85'	REPORTED 85'	REPORTED 85'	REPORTED 85'
6	Static Water Level of Well Below Land Surface (feet)	36'	37'	38'	39'	38'	38'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-26-98	9-29-98	10-21-98	11-24-98	12-31-98	1-30-99
9	Aquifer/Zone Identification For Well/Spring	C	C	C	C	C	C
10	pH (Standard Units)	7.10	7.00	7.40	7.40	7.50	7.50
11	Total Acidity (mg/l CaCO3)	9.00	14.00	16.00	7.90	57.0	12.0
12	Total Alkalinity (mg/l CaCO3)	190.00	180.00	170.00	160.0	170.0	170.0
13	Specific Conductivity (umhos/cm at 25° C)	360.0	370.0	370.0	350.0	360.0	330.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	0.03	0.02	<0.02	0.02	0.02
16	Total Sulfates (mg/l)	37.00	34.00	32.00	28.0	33.0	32.0
17	Total Iron (mg/l)	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	190.0	150.0	180.0	160.0	190.0	170.0
20	Nitrates	0.17	0.20	0.20	0.29	0.19	0.61
21	Date Sampled for Analysis	8-26-98	9-29-98	10-21-98	11-24-98	12-31-98	1-30-99
22	Date Last Precipitation Event Occurred	8-26-98	9-29-98	10-18-98	11-23-98	12-31-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-52	DW-52	DW-52	DW-52	DW-52	DW-52
2	Identification Number 98-	08307	10055	11013	12003	12353	99-01392
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1160	1160	1160	1160	1160	1160
5	Depth of Well Below Land Surface (feet)	22'	22'	22'	22'	22'	22'
6	Static Water Level of Well Below Land Surface (feet)	17'	18'	19'	19'	20'	17'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-27-98	9-30-98	10-29-98	11-28-98	12-17-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	7.50	7.40	7.40	7.40	7.40	7.50
	Total Acidity (mg/l CaCO3)	12.00	98.00	3.0	7.70	37.0	10.0
12	Total Alkalinity (mg/l CaCO3)	190.00	190.00	190.0	190.0	190.0	100.0
13	Specific Conductivity (umhos/cm at 25° C)	400.0	370.0	440.0	410.0	420.0	280.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	------
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	33.00	32.00	30.0	34.0	35.0	31.0
17	Total Iron (mg/l)	<0.02	<0.05	<0.05	0.08	<0.05	0.16
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	200.0	200.0	190.0	200.0	200.0	130.0
20	Nitrates	1.60	1.80	1.40	1.50	0.79	4.40
21	Date Sampled for Analysis	8-27-98	9-30-98	10-29-98	11-28-98	12-17-98	1-27-99
22	Date Last Precipitation Event Occurred	8-26-98	9-29-98	10-29-98	11-25-98	12-17-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-53	DW-53	DW-53	DW-53	DW-53	DW-53
2	Identification Number 98-	08303	10020	11018	12027	99-01126	99-02099
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1175	1175	1175	1175	1175	1172
5	Depth of Well Below Land Surface (feet)	26'	26'	26'	26'	26'	26'
6	Static Water Level of Well Below Land Surface (feet)	16'	18'	17'	18.5'	17'	13'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-27-98	9-28-98	10-29-98	11-28-98	12-31-98	1-28-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	7.40	7.30	7.10	8.00	7.50	7.30
	Total Acidity (mg/l CaCO3)	20.00	20.00	18.0	8.60	18.0	22.0
12	Total Alkalinity (mg/l CaCO3)	300.00	240.00	300.0	280.0	290.0	300.0
13	Specific Conductivity (umhos/cm at 25° C)	540.0	540.0	540.0	660.0	560.0	550.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	38.00	37.00	37.0	57.0	42.0	44.0
17	Total Iron (mg/l)	0.12	<0.02	<0.05	0.06	<0.05	0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	340.0	290.0	310.0	100.0	300.0	330.0
20	Nitrates	0.47	0.16	0.32	<0.09	0.30	0.44
21	Date Sampled for Analysis	8-27-98	9-28-98	10-29-98	11-28-98	12-31-98	1-28-99
22	Date Last Precipitation Event Occurred	8-26-98	9-27-98	10-29-98	11-25-98	12-31-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-54	W-54	W-54	W-54	W-54	W-54
2	Identification Number 98-	08304	10021	11017	12028	99-01127	99-02098
3	High (H)/Low (L) Designation (if applicable)	SIX MONTH SAMPLING					
4	Surface Elevation for Sampling Station (msl)	1175	1175	1175	1175	1175	1175
5	Depth of Well Below Land Surface (feet)	REPORTED 125'	REPORTED 125'	REPORTED 125'	REPORTED 125'	REPORTED 125'	REPORTED 125'
6	Static Water Level of Well Below Land Surface (feet)	83'	84'	84'	84'	85'	84'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-27-98	9-28-98	10-29-98	11-28-98	12-31-98	1-28-99
9	Aquifer/Zone Identification For Well/Spring	C & D	C & D	C & D	C & D	C & D	C & D
10	pH (Standard Units)	7.80	7.60	7.90	7.30	8.20	7.30
11	Total Acidity (mg/l CaCO3)	8.70	19.00	4.80	20.0	4.70	19.0
12	Total Alkalinity (mg/l CaCO3)	240.00	260.00	290.0	270.0	290.0	290.0
13	Specific Conductivity (umhos/cm at 25° C)	490.0	540.0	560.0	680.0	530.0	540.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	54.00	58.00	58.0	43.0	58.0	44.0
17	Total Iron (mg/l)	<0.02	<0.02	<0.05	0.06	0.06	0.10
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	180.0	420.0	90.0	290.0	110.0	330.0
20	Nitrates	<0.10	<0.10	<0.09	<0.09	<0.09	0.42
21	Date Sampled for Analysis	8-27-98	9-28-98	10-29-98	11-28-98	12-31-98	1-28-99
22	Date Last Precipitation Event Occurred	8-26-98	9-27-98	10-29-98	11-25-98	12-31-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-55	W-55	W-55	W-55	W-55	W-55
2	Identification Number 98-	08308	10023	11061	12030	12248	99-01186
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1186	1186	1186	1186	1186	1186
5	Depth of Well Below Land Surface (feet)	REPORTED 123'	REPORTED 123'	REPORTED 123'	REPORTED 123'	REPORTED 123'	REPORTED 123'
6	Static Water Level of Well Below Land Surface (feet)	72'	53'	73'	68'	68'	45'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-27-98	9-28-98	10-31-98	11-28-98	12-14-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	C	C	C	C	C	C
10	pH (Standard Units)	7.20	7.50	7.40	7.60	7.30	7.40
11	Total Acidity (mg/l CaCO3)	16.00	21.00	12.0	11.0	3.90	20.0
12	Total Alkalinity (mg/l CaCO3)	320.00	260.00	240.0	170.0	250.0	240.0
13	Specific Conductivity (umhos/cm at 25° C)	640.0	640.0	560.0	570.0	630.0	760.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	0.08	0.07	<0.02	0.07	<0.02
16	Total Sulfates (mg/l)	69.00	52.00	49.0	52.0	43.0	80.0
17	Total Iron (mg/l)	0.46	5.00	0.93	0.23	0.06	0.48
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	4.0
19	Total Hardness (mg/l as CaCO3)	260.0	290.0	300.0	270.0	200.0	340.0
20	Nitrates	2.00	0.19	0.10	0.17	<0.09	2.60
21	Date Sampled for Analysis	8-27-98	9-28-98	10-31-98	11-28-98	12-14-98	1-22-99
22	Date Last Precipitation Event Occurred	8-26-98	9-27-98	10-29-98	11-25-98	12-9-98	1-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-56	W-56	W-56	W-56	W-56	W-56
2	Identification Number 98-	09023	10024	10287	12031	12247	99-01185
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1190	1190	1190	1190	1190	1190
5	Depth of Well Below Land Surface (feet)	78'	78'	78'	78'	78'	78'
6	Static Water Level of Well Below Land Surface (feet)	29'	29'	28'	28'	28'	27'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-30-98	9-28-98	10-14-98	11-28-98	12-14-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.20	7.10	7.00	7.40	7.20	7.20
11	Total Acidity (mg/l CaCO3)	38.00	26.00	20.00	19.0	16.0	28.0
12	Total Alkalinity (mg/l CaCO3)	320.00	320.00	320.00	240.0	300.0	270.0
13	Specific Conductivity (umhos/cm at 25° C)	640.0	640.0	620.0	720.0	670.0	730.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.06	0.04	<0.02	0.03	<0.02	0.17
16	Total Sulfates (mg/l)	72.00	60.00	63.00	61.0	58.0	140.0
17	Total Iron (mg/l)	0.35	0.79	0.28	1.30	0.13	1.30
18	Total Suspended Solids (mg/l)	6.7	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	350.0	330.0	350.0	350.0	340.0	390.0
20	Nitrates	1.50	1.20	1.60	1.80	2.30	4.40
21	Date Sampled for Analysis	8-30-98	9-28-98	10-14-98	11-28-98	12-14-98	1-22-99
22	Date Last Precipitation Event Occurred	8-26-98	9-27-98	10-7-98	11-25-98	12-9-98	1-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-57	W-57	W-57	W-57	W-57	W-57
2	Identification Number 98-	09024	10022	10284	12032	12249	99-01187
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1234	1234	1234	1234	1234	1234
5	Depth of Well Below Land Surface (feet)	55'	55'	55'	55'	55'	55'
6	Static Water Level of Well Below Land Surface (feet)	39'	42'	43'	43'	44'	39'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	8-30-98	9-28-98	10-14-98	11-28-98	12-14-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.80	7.80	7.70	7.40	7.10	7.30
11	Total Acidity (mg/l CaCO3)	14.00	12.00	11.00	16.0	15.0	20.0
12	Total Alkalinity (mg/l CaCO3)	200.00	180.00	240.00	190.0	260.0	250.0
13	Specific Conductivity (umhos/cm at 25° C)	750.0	820.0	780.0	980.0	870.0	700.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	------
15	Total Manganese (mg/l)	0.02	0.02	<0.02	0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	210.00	180.00	180.00	200.0	180.0	100.0
17	Total Iron (mg/l)	0.43	0.20	0.22	0.51	0.27	0.42
18	Total Suspended Solids (mg/l)	9.3	<1.0	<1.0	<1.0	3.3	34.0
19	Total Hardness (mg/l as CaCO3)	380.0	340.0	410.0	440.0	420.0	330.0
20	Nitrates	5.30	4.40	7.40	5.20	6.60	5.40
21	Date Sampled for Analysis	8-30-98	9-28-98	10-14-98	11-28-98	12-14-98	1-22-99
22	Date Last Precipitation Event Occurred	8-26-98	9-27-98	10-7-98	11-25-98	12-9-8	1-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-58	W-58	W-58	W-58	W-58	W-58
2	Identification Number 98-	09159	10490	11445	12271	99-01315	99-02260
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1072	1072	1072	1072	1072	1072
5	Depth of Well Below Land Surface (feet)	85'	85'	85'	85'	85'	85'
6	Static Water Level of Well Below Land Surface (feet)	53'	51'	51'	51'	37'	49'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-12-98	10-16-98	11-27-98	12-14-98	1-23-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	D	D	D	D	D	D
10	pH (Standard Units)	7.70	6.90	8.40	8.00	9.90	7.40
	Total Acidity (mg/l CaCO3)	57.00	5.10	0.00	65.0	0.00	7.1
12	Total Alkalinity (mg/l CaCO3)	170.00	160.0	120.0	170.0	120.0	77.0
13	Specific Conductivity (umhos/cm at 25° C)	500.0	460.0	260.0	420.0	270.0	260.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	3.50	0.03	<0.02	0.02
16	Total Sulfates (mg/l)	84.00	77.0	58.0	75.0	36.0	43.0
17	Total Iron (mg/l)	0.15	0.32	6.20	0.16	0.13	0.17
18	Total Suspended Solids (mg/l)	39.0	<1.0	<1.0	<1.0	2.70	1.30
19	Total Hardness (mg/l as CaCO3)	200.0	200.0	240.0	200.0	80.0	90.0
20	Nitrates	0.67	0.91	3.10	0.94	5.20	3.10
21	Date Sampled for Analysis	9-12-98	10-16-98	11-27-98	12-14-98	1-23-99	2-10-99
22	Date Last Precipitation Event Occurred	9-09-98	10-7-98	11-25-98	12-9-98	1-23-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-59					
2	Identification Number 98-	009160					
3	High (H)/Low (L) Designation (if applicable)	SUPPLE-MENTAL					
4	Surface Elevation for Sampling Station (msl)	1120					
5	Depth of Well Below Land Surface (feet)	BURIED					
6	Static Water Level of Well Below Land Surface (feet)	BURIED					
7	Flow for Spring and Stream (gpm or cfs)	---					
8	Date Above Measurements Made	9-12-98					
9	Aquifer/Zone Identification For Well/Spring	UNKNOWN					
10	pH (Standard Units)	6.70					
11	Total Acidity (mg/l CaCO3)	54.00					
12	Total Alkalinity (mg/l CaCO3)	170.00					
13	Specific Conductivity (umhos/cm at 25° C)	390.0					
14	Total Dissolved Solids (mg/l)	---					
15	Total Manganese (mg/l)	<0.02					
16	Total Sulfates (mg/l)	8.60					
17	Total Iron (mg/l)	0.07					
18	Total Suspended Solids (mg/l)	<1.0					
19	Total Hardness (mg/l as CaCO3)	170.0					
20	Nitrates	2.10					
21	Date Sampled for Analysis	9-12-98					
22	Date Last Precipitation Event Occurred	9-09-98					

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-60	DW-60	DW-60	DW-60	DW-60	DW-60
2	Identification Number 98-	09161	10286	11448	12253	99-01318	99-02259
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1161	1161	1161	1161	1161	1161
5	Depth of Well Below Land Surface (feet)	20'	20'	20'	20'	20'	20'
6	Static Water Level of Well Below Land Surface (feet)	17'	17'	18'	18'	14'	14'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-12-98	10-14-98	11-27-98	12-14-98	1-23-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	6.70	6.90	7.30	7.40	7.10	7.00
	Total Acidity (mg/l CaCO3)	56.00	18.00	18.0	7.50	25.0	24.0
12	Total Alkalinity (mg/l CaCO3)	220.00	240.00	240.0	220.0	150.0	180.0
13	Specific Conductivity (umhos/cm at 25° C)	620.0	540.0	620.0	560.0	580.0	670.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	0.05	0.07	0.07	<0.02
16	Total Sulfates (mg/l)	48.00	46.00	46.0	47.0	51.0	49.0
17	Total Iron (mg/l)	0.08	0.11	1.50	0.73	0.45	0.08
18	Total Suspended Solids (mg/l)	<1.0	<1.0	13.0	11.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	260.0	270.0	260.0	260.0	240.0	250.0
20	Nitrates	3.30	3.20	4.40	6.00	5.30	4.00
21	Date Sampled for Analysis	9-12-98	10-14-98	11-27-98	12-14-98	1-23-99	2-10-99
22	Date Last Precipitation Event Occurred	9-09-98	10-7-98	11-25-98	12-9-98	1-23-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-61	W-61	W-61	W-61	W-61	W-61
2	Identification Number 98-	09249	11028	11442	12364	99-01190	99-02260
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1230	1230	1230	1230	1230	1230
5	Depth of Well Below Land Surface (feet)	48'	48'	48'	48'	48'	48'
6	48'Static Water Level of Well Below Land Surface (feet)	40'	42'	42'	43'	33'	31'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-21-98	10-30-98	11-27-98	12-17-98	1-22-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.30	7.20	7.50	7.20	7.40	7.50
11	Total Acidity (mg/l CaCO3)	34.0	11.0	9.90	30.0	13.0	14.0
12	Total Alkalinity (mg/l CaCO3)	240	260.0	230.0	250.0	190.0	200.0
13	Specific Conductivity (umhos/cm at 25° C)	520	540	560	560	460.0	470.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	40.0	51.0	51.0	53.0	55.0	50.0
17	Total Iron (mg/l)	<0.02	<0.05	<0.05	0.13	0.10	0.06
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	290.0	270.0	370.0	260.0	230.0	240.0
20	Nitrates	2.60	1.30	1.20	1.40	6.40	3.70
21	Date Sampled for Analysis	9-21-98	10-30-98	11-27-98	12-17-98	1-22-99	2-10-99
22	Date Last Precipitation Event Occurred	9-21-98	10-29-98	11-25-98	12-17-98	1-22-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-62	DW-62	DW-62	DW-62	DW-62	DW-62
2	Identification Number 98-	09267	11031	11438	12296	99-01325	99-02268
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1215	1215	1215	1215	1215	1215
5	Depth of Well Below Land Surface (feet)	29'	29'	29'	29'	29'	29'
6	Static Water Level of Well Below Land Surface (feet)	27'	27'	27'	27'	17'	17'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-23-98	10-30-98	11-25-98	12-18-98	1-23-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	7.10	7.20	7.30	7.30	7.40	7.60
11	Total Acidity (mg/l CaCO3)	29.0	13.0	7.40	7.90	15.0	10.0
12	Total Alkalinity (mg/l CaCO3)	220	230	220	230.0	150.0	160.0
13	Specific Conductivity (umhos/cm at 25° C)	540	460	470	450.0	600.0	570.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	0.17	0.05	0.02
16	Total Sulfates (mg/l)	44.0	34.0	35.0	37.0	45.0	47.0
17	Total Iron (mg/l)	<0.02	0.23	0.06	1.80	0.47	0.29
18	Total Suspended Solids (mg/l)	2.70	2.00	<1.0	31.0	47.0	<1.0
19	Total Hardness (mg/l as CaCO3)	220.0	230.0	220.0	250.0	250.0	230.0
20	Nitrates	3.10	3.20	1.90	0.21	1.10	1.80
21	Date Sampled for Analysis	9-23-98	10-30-98	11-25-98	12-18-98	1-23-99	2-10-99
22	Date Last Precipitation Event Occurred	9-22-98	10-29-98	11-25-98	12-17-98	1-23-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-63	W-63	W-63	W-63	W-63	W-63
2	Identification Number 98-	09349	11033	11437	12294	99-01327	99-02271
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1152	1152	1152	1152	1152	1152
5	Depth of Well Below Land Surface (feet)	92'	92'	92'	92'	92'	92'
6	Static Water Level of Well Below Land Surface (feet)	73'	61'	42'	54'	44'	86'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-26-98	10-30-98	11-25-98	12-18-98	1-23-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	C	C	C	C	C	C
10	pH (Standard Units)	7.20	7.00	7.10	7.10	7.10	7.30
11	Total Acidity (mg/l CaCO3)	15.0	12.0	14.0	6.70	20.0	14.0
12	Total Alkalinity (mg/l CaCO3)	220.0	220.0	210.0	220.0	190.0	190.0
13	Specific Conductivity (umhos/cm at 25° C)	450	460	480	460.0	380.0	450.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.04	0.02	0.02	0.04	0.42	0.04
16	Total Sulfates (mg/l)	27.0	65.0	72.0	31.0	46.0	54.0
17	Total Iron (mg/l)	0.28	0.68	0.05	0.08	2.0	0.11
18	Total Suspended Solids (mg/l)	6.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	200.0	250.0	230.0	250.0	210.0	220.0
20	Nitrates	0.48	<0.09	<0.09	<0.09	<0.09	<0.09
21	Date Sampled for Analysis	9-26-98	10-30-98	11-25-98	12-18-98	1-23-99	2-10-99
22	Date Last Precipitation Event Occurred	9-22-98	10-29-98	11-25-98	12-17-98	1-23-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	WL-64	WL-64	WL-64	WL-64	WL-64	WL-64
2	Identification Number 98-	09266	11027	11443		99-01188	99-02263
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1228	1228	1228	1228	1228	1228
5	Depth of Well Below Land Surface (feet)	75'	75'	75'	75'	75'	75'
6	Static Water Level of Well Below Land Surface (feet)	18'	21'	23'	23'	14'	9'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-23-98	10-.30-98	11-27-98		1-22-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.30	7.20	7.60		7.30	7.30
11	Total Acidity (mg/l CaCO3)	38.0	17.0	13.0		20.0	22.0
12	Total Alkalinity (mg/l CaCO3)	270.0	280.0	240.0		260.0	260.0
13	Specific Conductivity (umhos/cm at 25° C)	560.0	540.0	550.0		560.0	520.0
14	Total Dissolved Solids (mg/l)	---	---	---		---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02		<0.02	<0.02
16	Total Sulfates (mg/l)	19.0	39.0	42.0		45.0	41.0
17	Total Iron (mg/l)	<0.02	<0.05	0.14		<0.05	<0.05
18	Total Suspended Solids (mg/l)	8.7	<1.0	<1.0		<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	300.0	280.0	310.0		270.0	280.0
20	Nitrates	2.30	1.50	1.50		2.80	1.60
21	Date Sampled for Analysis	9-23-98	10-30-98	11-27-98		1-22-99	2-10-99
22	Date Last Precipitation Event Occurred	9-22-98	10-29-98	11-25-98		1-22-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-65	W-65	W-65	W-65	W-65	W-65
2	Identification Number 98-	09268	11069	11388	99-01046	99-02085	99-02292
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1222	1222	1222	1222	1222	1222
5	Depth of Well Below Land Surface (feet)	REPORTED 60'	REPORTED 60'	REPORTED 60'	REPORTED 60'	REPORTED 60'	REPORTED 60'
6	Static Water Level of Well Below Land Surface (feet)	SEALED	SEALED	SEALED	SEALED	SEALED	SEALED
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-23-98	10-31-98	11-24-98	12-30-98	1-28-99	2-11-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.20	7.20	7.50	7.60	6.70	7.30
11	Total Acidity (mg/l CaCO3)	53.0	13.0	25.0	7.60	18.0	16.0
12	Total Alkalinity (mg/l CaCO3)	230.0	230.0	240.0	230.0	220.0	230.0
13	Specific Conductivity (umhos/cm at 25° C)	580.0	580.0	600.0	600.0	580.0	620.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.07	0.04	0.94	0.02	0.03	0.03
16	Total Sulfates (mg/l)	57.0	50.0	54.0	59.0	50.0	52.0
17	Total Iron (mg/l)	<0.02	<0.05	0.07	<0.05	0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	300.0	300.0	300.0	300.0	340.0	310.0
20	Nitrates	4.70	3.00	1.70	1.80	5.80	6.40
21	Date Sampled for Analysis	9-23-98	10-31-98	11-24-98	12-30-98	1-28-99	2-11-99
22	Date Last Precipitation Event Occurred	9-22-98	10-29-98	11-23-98	12-29-98	1-23-99	2-11-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-66	DW-66	DW-66	DW-66	DW-66	DW-66
2	Identification Number 98-	09269	11068	11382	99-01047	99-02086	99-02299
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1222	1222	1222	1222	1222	1222
5	Depth of Well Below Land Surface (feet)	26'	26'	26'	26'	26'	26'
6	Static Water Level of Well Below Land Surface (feet)	16'	18'	18'	19'	3'	3'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-23-98	10-31-98	11-24-98	12-30-98	1-28-99	2-11-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	6.60	6.70	6.60	7.00	6.30	6.30
11	Total Acidity (mg/l CaCO3)	40.0	6.50	11.0	7.60	1.70	21.0
12	Total Alkalinity (mg/l CaCO3)	41.0	43.0	30.0	45.0	12.0	15.0
13	Specific Conductivity (umhos/cm at 25° C)	190.0	190.0	120.0	150.0	130.0	220.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	1.60	0.91	0.48	0.47	<0.02	<0.02
16	Total Sulfates (mg/l)	26.0	23.0	29.0	25.0	18.0	23.0
17	Total Iron (mg/l)	1.90	2.00	1.30	0.88	0.15	0.26
18	Total Suspended Solids (mg/l)	21.0	3.3	6.0	<1.0	<1.0	7.3
19	Total Hardness (mg/l as CaCO3)	70.0	50.0	60.0	70.0	60.0	40.0
20	Nitrates	0.18	0.11	0.49	0.48	7.00	6.90
21	Date Sampled for Analysis	9-23-98	10-31-98	11-24-98	12-30-98	1-28-99	2-11-99
22	Date Last Precipitation Event Occurred	9-22-98	10-29-98	11-23-98	12-29-98	1-23-99	2-11-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-67	W-67	W-67	W-67	W-67	W-67
2	Identification Number 98-	09287	10180	11440	12254	99-01157	99-03062
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1262	1262	1262	1262	1262	1262
5	Depth of Well Below Land Surface (feet)	89'	89'	89'	89'	89'	89'
6	Static Water Level of Well Below Land Surface (feet)	54'	54'	54'	54'	44'	44'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-25-98	10-9-98	11-24-98	12-14-98	1-22-99	2-27-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.20	7.20	7.60	7.10	7.30	7.40
11	Total Acidity (mg/l CaCO3)	38.00	21.00	8.10	17.0	21.0	19.0
12	Total Alkalinity (mg/l CaCO3)	260.0	260.0	240.0	270.0	250.0	240.0
13	Specific Conductivity (umhos/cm at 25° C)	990.0	940.0	500.0	1100.0	670.0	720.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.05	<0.05	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	62.0	73.0	29.0	72.0	110.0	39.0
17	Total Iron (mg/l)	<0.02	<0.05	<0.05	<0.05	<0.05	0.06
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	480.0	440.0	270.0	440.0	340.0	310.0
20	Nitrates	0.62	0.93	0.33	0.31	3.80	5.70
21	Date Sampled for Analysis	9-25-98	10-9-98	11-24-98	12-14-98	1-22-99	2-27-99
22	Date Last Precipitation Event Occurred	9-22-98	10-7-98	11-23-98	12-9-98	1-22-99	2-27-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-68	W-68	W-68	W-68	W-68	W-68
2	Identification Number 98-	09345	11074	11329	12476	99-01330	99-02274
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1228	1228	1228	1228	1228	1228
5	Depth of Well Below Land Surface (feet)	BURIED	BURIED	BURIED	BURIED	BURIED	BURIED
6	Static Water Level of Well Below Land Surface (feet)	BURIED	BURIED	BURIED	BURIED	BURIED	BURIED
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-25-98	10-31-98	11-23-98	12-29-98	1-23-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
10	pH (Standard Units)	7.30	7.20	7.50	7.30	7.00	7.40
11	Total Acidity (mg/l CaCO3)	26.0	10.0	47.0	4.3	15.0	15.0
12	Total Alkalinity (mg/l CaCO3)	250.0	260.0	250.0	250.0	130.0	180.0
13	Specific Conductivity (umhos/cm at 25° C)	450.0	450.0	460.0	530.0	260.0	400.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.03	0.04	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	23.00	16.00	20.00	21.0	20.0	23.0
17	Total Iron (mg/l)	0.18	0.06	0.14	<0.05	0.14	0.07
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	230.0	220.0	230.0	240.0	140.0	190.0
20	Nitrates	1.20	0.37	0.26	0.31	300.0	3.1
21	Date Sampled for Analysis	9-25-98	10-31-98	11-23-98	12-29-98	1-23-99	2-10-99
22	Date Last Precipitation Event Occurred	9-22-98	10-29-98	11-23-98	12-29-98	1-23-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-69	W-69	W-69	W-69	W-69	W-69
2	Identification Number 98-	09346	11065	11327	12483	99-01336	99-02284
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1152	1152	1152	1152	1152	1152
5	Depth of Well Below Land Surface (feet)	REPORTED 89'	REPORTED 89'	REPORTED 89'	REPORTED 89'	REPORTED 89'	REPORTED 89'
6	Static Water Level of Well Below Land Surface (feet)	52'	51'	52'	53'	55'	46'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-25-98	10-31-98	11-23-98	12-29-98	1-23-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	C	C	C	C	C	C
10	pH (Standard Units)	7.10	7.40	7.30	7.30	7.20	7.30
11	Total Acidity (mg/l CaCO3)	22.00	10.00	46.00	6.10	17.0	12.0
12	Total Alkalinity (mg/l CaCO3)	200.00	210.00	200.00	210.0	200.0	200.0
13	Specific Conductivity (umhos/cm at 25° C)	540.0	490.0	550.0	560.0	480.0	550.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.03	0.03	0.03	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	120.00	96.00	120.00	120.0	97.0	100.0
17	Total Iron (mg/l)	<0.02	0.05	<0.05	<0.05	0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	270.0	280.0	280.0	300.0	250.0	280.0
20	Nitrates	0.53	0.50	0.44	0.36	0.61	0.54
21	Date Sampled for Analysis	9-25-98	10-31-98	11-23-98	12-29-98	1-23-99	2-10-99
22	Date Last Precipitation Event Occurred	9-22-98	10-29-98	11-23-98	12-29-98	1-23-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-70	W-70	W-70	W-70	W-70	W-70
2	Identification Number 98-	09347	11066	11328	12484	99-01337	99-02285
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1155	1155	1155	1155	1155	1155
5	Depth of Well Below Land Surface (feet)	REPORTED 58'	REPORTED 58'	REPORTED 58'	REPORTED 58'	REPORTE D 58'	REPORTED 58'
6	Static Water Level of Well Below Land Surface (feet)	SEALED	SEALED	SEALED	SEALED	SEALED	SEALED
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-25-98	10-31-98	11-23-98	12-29-98	1-23-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.10	7.10	7.20	7.20	6.80	7.00
	Total Acidity (mg/l CaCO3)	16.00	5.90	37.00	38.0	34.0	12.0
12	Total Alkalinity (mg/l CaCO3)	180.00	190.00	190.00	190.0	160.0	160.0
13	Specific Conductivity (umhos/cm at 25° C)	470.0	490.0	460.0	430.0	380.0	400.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	0.12	0.18	0.18	0.38	0.18
16	Total Sulfates (mg/l)	84.00	73.00	91.00	78.0	66.0	76.0
17	Total Iron (mg/l)	0.60	0.53	0.48	0.68	2.00	0.43
18	Total Suspended Solids (mg/l)	140.0	72.0	80.0	430.0	480.0	73.0
19	Total Hardness (mg/l as CaCO3)	290.0	250.0	240.0	270.0	270.0	240.0
20	Nitrates	0.20	0.24	0.25	0.58	0.81	0.26
21	Date Sampled for Analysis	9-25-98	10-31-98	11-23-98	12-29-98	1-23-99	2-10-99
22	Date Last Precipitation Event Occurred	9-22-98	10-29-98	11-23-98	12-29-98	1-23-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-71	DW-71	DW-71	DW-71	DW-71	DW-71
2	Identification Number 98-					99-01338	99-02286
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1192	1192	1192	1192	1192	1192
5	Depth of Well Below Land Surface (feet)	24'	24'	24'	24'	24'	24'
6	Static Water Level of Well Below Land Surface (feet)	DRY	DRY	DRY	19'	18'	18'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	
8	Date Above Measurements Made	9-26-98	10-31-98	11-24-98	12-29-98	1-23-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)					7.40	7.70
11	Total Acidity (mg/l CaCO3)					13.0	6.2
12	Total Alkalinity (mg/l CaCO3)					95.0	180.0
13	Specific Conductivity (umhos/cm at 25° C)					230.0	380.0
14	Total Dissolved Solids (mg/l)					---	---
15	Total Manganese (mg/l)					0.09	0.02
16	Total Sulfates (mg/l)					32.0	52.0
17	Total Iron (mg/l)					3.10	0.67
18	Total Suspended Solids (mg/l)					69.0	<1.0
19	Total Hardness (mg/l as CaCO3)					100.0	200.0
20	Nitrates					0.99	0.63
21	Date Sampled for Analysis					1-23-99	2-10-99
22	Date Last Precipitation Event Occurred					1-23-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-72	W-72	W-72	W-72	W-72	W-72
2	Identification Number 98-	09348	11060	11361	12485	99-01183	99-02288
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1165	1165	1165	1165	1165	1165
5	Depth of Well Below Land Surface (feet)	103'	103'	103'	103'	103'	103'
6	Static Water Level of Well Below Land Surface (feet)	62'	62'	62'	62'	56'	59'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-26-98	10-31-98	11-24-98	12-29-98	1-22-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	C	C	C	C	C	C
10	pH (Standard Units)	7.20	7.20	7.10	7.30	7.30	7.30
11	Total Acidity (mg/l CaCO3)	26.0	12.0	33.0	14.0	29.0	18.0
12	Total Alkalinity (mg/l CaCO3)	260.0	250.0	260.0	270.0	260.0	280.0
13	Specific Conductivity (umhos/cm at 25° C)	500.0	540.0	480.0	480.0	500.0	520.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.05	0.02	0.03	<0.02	0.04	<0.02
16	Total Sulfates (mg/l)	58.0	28.0	43.0	42.0	43.0	39.0
17	Total Iron (mg/l)	0.46	0.38	0.06	0.73	1.30	0.08
18	Total Suspended Solids (mg/l)	<1.0	<1.0	2.7	3.3	7.0	<1.0
19	Total Hardness (mg/l as CaCO3)	230.0	250.0	230.0	240.0	290.0	280.0
20	Nitrates	<0.10	0.11	<0.09	<0.09	0.36	0.26
21	Date Sampled for Analysis	9-26-98	10-31-98	11-24-98	12-29-98	1-22-99	2-10-99
22	Date Last Precipitation Event Occurred	9-22-98	10-29-98	11-23-98	12-29-98	1-22-99	2-7-99

Laboratory Name TRA-DET, INC.
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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-73	W-73	W-73	W-73	W-73	W-73
2	Identification Number 98-	09356	10520	11351	99-01052	99-02186	99-02280
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1200	1200	1200	1200	1200	1200
5	Depth of Well Below Land Surface (feet)	37'	37'	37'	37'	37'	37'
6	Static Water Level of Well Below Land Surface (feet)	13'	18'	18'	19'	11'	8'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-27-98	10-29-98	11-23-98	12-30-98	1-30-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.00	7.70	7.70	7.60	7.60	7.30
12	Total Acidity (mg/l CaCO3)	13.0	7.40	22.0	10.0	6.90	7.0
13	Total Alkalinity (mg/l CaCO3)	220.0	210.0	210.0	170.0	110.0	110.0
14	Specific Conductivity (umhos/cm at 25° C)	500.0	410.0	410.0	380.0	310.0	300.0
15	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
16	Total Manganese (mg/l)	0.04	0.05	0.26	0.09	0.03	<0.02
17	Total Sulfates (mg/l)	72.0	25.0	32.0	52.0	52.0	52.0
18	Total Iron (mg/l)	5.40	1.40	3.30	0.50	2.30	0.31
19	Total Suspended Solids (mg/l)	<1.0	4.70	36.0	<1.0	22.0	<1.0
20	Total Hardness (mg/l as CaCO3)	250.0	210.0	220.0	170.0	150.0	130.0
21	Nitrates	0.10	0.56	0.28	1.10	1.30	0.46
22	Date Sampled for Analysis	9-27-98	10-29-98	11-23-98	12-30-98	1-30-99	2-10-99
	Date Last Precipitation Event Occurred	9-27-98	10-29-98	11-23-98	12-29-98	1-23-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-74	W-74	W-74	W-74	W-74	W-74
2	Identification Number 98-	09350	10521	11426	12482	99-02161	99-02283
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1141	1141	1141	1141	1141	1141
5	Depth of Well Below Land Surface (feet)	BURIED	BURIED	BURIED	BURIED	BURIED	BURIED
6	Static Water Level of Well Below Land Surface (feet)	BURIED	BURIED	BURIED	BURIED	BURIED	BURIED
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-26-98	10-29-98	11-25-98	12-29-98	1-30-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
10	pH (Standard Units)	7.10	7.30	7.20	7.30	7.30	7.30
12	Total Acidity (mg/l CaCO3)	15.0	7.60	13.0	9.70	15.0	11.0
13	Total Alkalinity (mg/l CaCO3)	230.0	230.0	230.0	240.0	190.0	200.0
14	Specific Conductivity (umhos/cm at 25° C)	720.0	720.0	750.0	680.0	610.0	650.0
15	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
16	Total Manganese (mg/l)	0.03	0.02	<0.02	<0.02	<0.02	<0.05
17	Total Sulfates (mg/l)	230.0	220.0	200.0	210.0	58.0	180.0
18	Total Iron (mg/l)	<0.02	0.06	0.05	0.10	0.05	0.05
19	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
20	Total Hardness (mg/l as CaCO3)	400.0	430.0	380.0	410.0	350.0	340.0
21	Nitrates	<0.10	<0.09	<0.09	<0.09	0.44	0.45
22	Date Sampled for Analysis	9-26-98	10-29-98	11-25-98	12-29-98	1-30-99	210-99
	Date Last Precipitation Event Occurred	9-22-98	10-29-98	11-25-98	12-29-98	1-23-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019
State WEST VIRGINIA
City WHEELING
Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-75	W-75	W-75	W-75	W-75	W-75
2	Identification Number 98-	09355	11035	11427	12368	99-02088	99-02424
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1149	1149	1149	1149	1149	1149
5	Depth of Well Below Land Surface (feet)	81'	81'	81'	81'	81'	81'
6	Static Water Level of Well Below Land Surface (feet)	22'	25'	26'	25'	24'	24'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-27-98	10-30-98	11-25-98	12-17-98	1-28-99	2-26-99
9	Aquifer/Zone Identification For Well/Spring	C	C	C	C	C	C
10	pH (Standard Units)	7.00	7.00	7.10	6.90	7.10	7.10
	Total Acidity (mg/l CaCO3)	12.0	8.60	9.90	27.0	13.0	15.0
12	Total Alkalinity (mg/l CaCO3)	160.0	160.0	180.0	170.0	100.0	120.0
13	Specific Conductivity (umhos/cm at 25° C)	410.0	160.0	180.0	170.0	280.0	330.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.07	0.32	0.15	0.11	0.14	0.10
16	Total Sulfates (mg/l)	64.0	62.0	59.0	72.0	51.0	52.0
17	Total Iron (mg/l)	0.34	2.1	0.23	0.35	0.29	0.25
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	170.0	190.0	150.0	200.0	140.0	140.0
20	Nitrates	0.14	<0.09	<0.09	<0.09	<0.09	<0.09
21	Date Sampled for Analysis	9-27-98	10-30-98	11-25-98	12-29-98	1-28-99	2-26-99
22	Date Last Precipitation Event Occurred	9-27-98	10-29-98	11-25-98	11-29-98	1-23-99	2-26-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC.

(D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-76	W-76	W-76	W-76	W-76	W-76
2	Identification Number 98-	09351	11036	11428	12370	99-02090	99-02426
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1193	1193	1193	1193	1193	1193
5	Depth of Well Below Land Surface (feet)	76'	76'	76'	76'	76'	76'
6	Static Water Level of Well Below Land Surface (feet)	45'	42'	42'	46'	43'	44'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-26-98	10-30-98	11-25-98	12-17-98	1-28-99	2-26-99
9	Aquifer/Zone Identification For Well/Spring	C	C	C	C	C	C
10	pH (Standard Units)	7.20	7.10	7.20	7.20	7.40	7.40
12	Total Acidity (mg/l CaCO3)	22.0	12.0	11.0	26.0	15.0	18.0
13	Total Alkalinity (mg/l CaCO3)	260.0	220.0	240.0	220.0	150.0	180.0
14	Specific Conductivity (umhos/cm at 25° C)	510.0	400.0	460.0	440.0	320.0	400.0
15	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
16	Total Manganese (mg/l)	0.10	<0.02	0.08	0.04	0.03	0.02
17	Total Sulfates (mg/l)	37.0	33.0	34.0	36.0	34.0	43.0
18	Total Iron (mg/l)	0.22	0.27	0.12	0.10	0.18	0.11
19	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
20	Total Hardness (mg/l as CaCO3)	170.0	170.0	160.0	190.0	180.0	160.0
21	Nitrates	0.13	0.14	<0.09	<0.09	<0.09	<0.09
22	Date Sampled for Analysis	9-26-98	10-30-98	11-25-98	12-17-98	1-28-99	2-26-99
	Date Last Precipitation Event Occurred	9-22-98	10-29-98	11-25-98	12-17-98	1-23-99	2-26-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019
State WEST VIRGINIA
City WHEELING
Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-77	W-77	W-77	W-77	W-77	W-77
2	Identification Number 98-	09353	11062	11368	12389	99-02133	99-03042
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1260	1260	1260	1260	1260	1260
5	Depth of Well Below Land Surface (feet)	31'	31'	31'	31'	31'	31'
6	Static Water Level of Well Below Land Surface (feet)	17'	19'	20'	25'	8'	9'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-26-98	10-31-98	11-24-98	12-17-98	1-29-99	2-27-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.20	7.40	7.50	7.40	7.60	7.50
11	Total Acidity (mg/l CaCO3)	14.0	8.90	22.0	16.0	15.0	18.0
12	Total Alkalinity (mg/l CaCO3)	210.0	210.0	210.0	210.0	210.0	190.0
13	Specific Conductivity (umhos/cm at 25° C)	560.0	560.0	560.0	540.0	540.0	610.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	88.0	72.0	80.0	79.0	93.0	98.0
17	Total Iron (mg/l)	<0.02	<0.05	<0.05	0.10	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	290.0	280.0	270.0	260.0	310.0	300.0
20	Nitrates	4.90	4.00	4.50	4.80	4.10	4.60
21	Date Sampled for Analysis	9-26-98	10-31-98	11-24-98	12-17-98	1-29-99	2-27-99
22	Date Last Precipitation Event Occurred	9-22-98	10-29-98	11-23-98	12-17-98	1-23-99	2-27-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	WL-78	WL-78	WL-78	WL-78	WL-78	WL-78
2	Identification Number 98-		10140			99-01196	99-03046
3	High (H)/Low (L) Designation (if applicable)	SIX MONTH SAMPLING					
4	Surface Elevation for Sampling Station (msl)	1260	1260	1260	1260	1260	1260
5	Depth of Well Below Land Surface (feet)	56'	56'	56'	56'	56'	56'
6	Static Water Level of Well Below Land Surface (feet)	40'	40'	42'	44'	22'	27'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-17-98	10-6-98	11-24-98	12-17-98	1-22-99	2-27-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)		7.40			7.50	7.80
11	Total Acidity (mg/l CaCO3)		6.50			5.30	12.00
12	Total Alkalinity (mg/l CaCO3)		240.00			63.00	210.00
13	Specific Conductivity (umhos/cm at 25° C)		540.0			290.0	580.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)		0.04			<0.02	<0.02
16	Total Sulfates (mg/l)		74.0			56.0	80.0
17	Total Iron (mg/l)		0.34			0.15	0.22
18	Total Suspended Solids (mg/l)		<1.0			<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)		280.0			120.0	230.0
20	Nitrates	---	---	---	---	---	---
21	Date Sampled for Analysis	9-17-98	10-6-98	11-24-98	12-17-98	1-22-99	2-27-99
22	Date Last Precipitation Event Occurred	9-9-98	10-4-98	11-23-98	12-17-98	1-22-99	2-27-99

Laboratory Name TraDet, Inc.
Address PO Box 2019 City Wheeling
State West Virginia Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-79	W-79	W-79	W-79	W-79	W-79
2	Identification Number 98-	09357	10139	11394	12387	99-01197	99-03047
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1248	1248	1248	1248	1248	1248
5	Depth of Well Below Land Surface (feet)	91'	91'	91'	91'	91'	91'
6	Static Water Level of Well Below Land Surface (feet)	20'	20'	20'	21'	14'	16'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-27-98	10-6-98	11-24-98	12-17-98	1-22-99	2-27-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.00	7.30	7.50	7.20	6.80	7.30
	Total Acidity (mg/l CaCO3)	13.0	11.0	11.0	25.0	17.0	18.0
12	Total Alkalinity (mg/l CaCO3)	240.0	260.0	230.0	250.0	81.0	170.0
13	Specific Conductivity (umhos/cm at 25° C)	580.0	580.0	580.0	600.0	320.0	500.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.37	0.02	<0.02	0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	91.0	88.0	92.0	94.0	76.0	87.0
17	Total Iron (mg/l)	1.1	0.05	0.12	0.05	0.08	<0.05
18	Total Suspended Solids (mg/l)	9.3	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	270.0	260.0	300.0	270.0	140.0	230.0
20	Nitrates	0.99	0.50	0.26	0.11	0.96	0.87
21	Date Sampled for Analysis	9-27-98	10-6-98	11-24-98	12-17-98	1-22-99	2-27-99
22	Date Last Precipitation Event Occurred	9-27-98	10-4-98	11-23-98	12-17-98	1-22-99	2-27-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-80	DW-80	DW-80	DW-80	DW-80	DW-80
2	Identification Number 98-	09358	00.38	11432	12374	99-02084	99-03058
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1241	1241	1241	1241	1241	1241
5	Depth of Well Below Land Surface (feet)	29'	29'	29'	29'	29'	29'
6	Static Water Level of Well Below Land Surface (feet)	20'	22'	25'	25'	5'	10'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-27-98	10-30-98	11-25-98	12-17-98	1-28-99	2-27-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	6.90	6.90	7.00	7.10	7.20	7.20
11	Total Acidity (mg/l CaCO3)	18.0	5.70	14.0	30.0	12.0	19.0
12	Total Alkalinity (mg/l CaCO3)	230.0	200.0	220.0	220.0	110.0	140.0
13	Specific Conductivity (umhos/cm at 25° C)	520.0	470.0	550.0	560.0	350.0	480.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.03	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	35.0	46.0	58.0	66.0	53.0	66.0
17	Total Iron (mg/l)	<0.02	0.15	<0.05	<0.05	0.06	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	220.0	220.0	260.0	250.0	190.0	200.0
20	Nitrates	3.00	5.90	3.50	4.70	9.20	10.0
21	Date Sampled for Analysis	9-27-98	10-30-98	11-25-98	12-17-98	1-28-99	2-27-99
22	Date Last Precipitation Event Occurred	9-27-98	10-29-98	11-25-98	12-17-98	1-23-99	2-27-99

Laboratory Name TRA-DET, INC.
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-81	DW-81	DW-81	DW-81	DW-81	DW-81
2	Identification Number 98-	09359	10518	11352	99-01053	99-02181	99-02281
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1201	1201	1201	1201	1201	1201
5	Depth of Well Below Land Surface (feet)	20'	20'	20'	20'	20'	20'
6	Static Water Level of Well Below Land Surface (feet)	16'	17'	16'	20'	11'	9'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-27-98	10-29-98	11-23-98	12-30-98	1-29-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	7.10	7.60	7.70	7.70	7.50	7.40
11	Total Acidity (mg/l CaCO3)	12.0	3.80	21.0	7.60	7.10	8.5
12	Total Alkalinity (mg/l CaCO3)	210.0	220.0	210.0	220.0	130.0	140.0
13	Specific Conductivity (umhos/cm at 25° C)	380.0	420.0	400.0	390.0	310.0	320.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	30.0	27.0	28.0	30.0	34.0	38.0
17	Total Iron (mg/l)	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	190.0	270.0	230.0	210.0	150.0	150.0
20	Nitrates	0.70	0.59	0.25	0.52	3.20	1.90
21	Date Sampled for Analysis	9-27-98	10-29-98	11-23-98	12-30-98	1-29-99	2-10-99
22	Date Last Precipitation Event Occurred	9-27-98	10-29-98	11-23-98	12-29-98	1-23-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-82	DW-82	DW-82	DW-82	DW-82	DW-82
2	Identification Number 98-	10036	10488	11466	12290	99-01341	99-02254
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1200	1200	1200	1200	1200	1200
5	Depth of Well Below Land Surface (feet)	SEALED	SEALED	SEALED	SEALED	SEALED	SEALED
6	Static Water Level of Well Below Land Surface (feet)	SEALED	SEALED	SEALED	SEALED	SEALED	SEALED
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-29-98	10-16-98	11-27-98	12-15-98	1-23-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
10	pH (Standard Units)	7.10	7.20	7.30	7.50	7.40	7.30
	Total Acidity (mg/l CaCO3)	15.0	8.50	10.0	12.0	11.0	15.0
12	Total Alkalinity (mg/l CaCO3)	220.0	210.0	190.0	190.0	170.0	180.0
13	Specific Conductivity (umhos/cm at 25° C)	430.0	430.0	370.0	330.0	310.0	350.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.37	0.11	0.88	1.20	1.1	0.55
16	Total Sulfates (mg/l)	35.0	18.0	26.0	26.0	20.0	14.0
17	Total Iron (mg/l)	0.41	0.33	0.28	1.60	0.27	0.34
18	Total Suspended Solids (mg/l)	55.0	220.0	47.0	89.0	110.0	92.0
19	Total Hardness (mg/l as CaCO3)	230.0	200.0	200.0	190.0	190.0	200.0
20	Nitrates	<0.10	<0.09	<0.09	0.19	0.22	<0.09
21	Date Sampled for Analysis	9-29-98	10-16-98	11-27-98	12-15-98	1-23-99	2-10-99
22	Date Last Precipitation Event Occurred	9-29-98	10-7-98	11-25-98	12-9-98	1-23-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-83	DW-83	DW-83	DW-83	DW-83	DW-83
2	Identification Number 98-	10037	11048	11467	12291	99-01342	99-02255
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1139	1139	1139	1139	1139	1139
5	Depth of Well Below Land Surface (feet)	5'	5'	5'	5'	5'	5'
6	Static Water Level of Well Below Land Surface (feet)	1'	1'	1'	1'	1'	1'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-29-98	10-30-98	11-27-98	12-15-98	1-23-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	6.50	6.60	6.90	6.80	6.70	6.20
11	Total Acidity (mg/l CaCO3)	12.0	6.30	16.0	<1.0	6.40	2.1
12	Total Alkalinity (mg/l CaCO3)	680.0	120.0	100.0	110.0	5.0	9.0
13	Specific Conductivity (umhos/cm at 25° C)	200.0	240.0	180.0	150.0	21.0	48.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.18	2.2	1.5	1.5	0.04	0.02
16	Total Sulfates (mg/l)	27.0	7.80	7.40	5.00	9.80	10.0
17	Total Iron (mg/l)	1.60	3.70	3.60	2.10	0.66	<0.05
18	Total Suspended Solids (mg/l)	5.30	8.00	2.70	7.30	8.0	1.3
19	Total Hardness (mg/l as CaCO3)	70.0	110.0	90.0	100.0	<1.0	10.0
20	Nitrates	0.25	<0.09	0.30	<0.09	0.25	<0.0
21	Date Sampled for Analysis	9-29-98	10-30-98	11-27-98	12-15-98	1-23-99	2-10-99
22	Date Last Precipitation Event Occurred	9-29-98	10-29-98	11-25-98	12-9-98	1-23-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-84	DW-84	DW-84	DW-84	DW-84	DW-84
2	Identification Number 98-	10038				99-01339	99-02253
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1182	1182	1182	1182	1182	1182
5	Depth of Well Below Land Surface (feet)	15.5'	15.5'	15.5'	15.5'	15.5'	15.5'
6	Static Water Level of Well Below Land Surface (feet)	15'	DRY	DRY	DRY	4'	5'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	9-29-98				1-23-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	7.20				7.40	7.30
11	Total Acidity (mg/l CaCO3)	16.0				9.60	<1.0
12	Total Alkalinity (mg/l CaCO3)	130.0				74.0	59.0
13	Specific Conductivity (umhos/cm at 25° C)	280.0				200.0	260.0
14	Total Dissolved Solids (mg/l)	---				---	---
15	Total Manganese (mg/l)	0.56				<0.02	0.02
16	Total Sulfates (mg/l)	30.0				28.0	34.0
17	Total Iron (mg/l)	1.60				0.23	<0.05
18	Total Suspended Solids (mg/l)	100.0				4.0	<1.0
19	Total Hardness (mg/l as CaCO3)	140.0				70.0	100.0
20	Nitrates	0.10				3.8	0.66
21	Date Sampled for Analysis	9-29-98				1-23-99	2-10-99
22	Date Last Precipitation Event Occurred	9-29-98				1-23-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-85	W-85	W-85	W-85	W-85	W-85
2	Identification Number 98-	11077	11324	12197	99-02152		99-03287
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1090	1090	1090	1090	1090	1090
5	Depth of Well Below Land Surface (feet)	41'	41'	41'	41'	41'	41'
6	Static Water Level of Well Below Land Surface (feet)	24'	24'	22'	13'	13'	16'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-31-98	11-23-98	12-9-98	1-30-99		3-19-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	6.90	6.80	6.90	7.00		7.10
11	Total Acidity (mg/l CaCO3)	30.0	130.0	20.0	43.0		36.0
12	Total Alkalinity (mg/l CaCO3)	380.0	360.0	320.0	350.0		330.0
13	Specific Conductivity (umhos/cm at 25° C)	1100.0	1300.0	1400.0	1300.0		1200.0
14	Total Dissolved Solids (mg/l)	---	---	---	---		---
15	Total Manganese (mg/l)	0.50	0.49	0.43	0.35		0.30
16	Total Sulfates (mg/l)	290.0	510.0	530.0	360.0		330.0
17	Total Iron (mg/l)	0.12	0.16	0.11	1.50		0.96
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	17.0		15.0
19	Total Hardness (mg/l as CaCO3)	600.0	690.0	610.0	600.0		540.0
20	Nitrates	<0.09	<0.09	2.90	2.20		1.40
21	Date Sampled for Analysis	10-31-98	11-23-98	12-9-98	1-30-99		3-19-99
22	Date Last Precipitation Event Occurred	10-29-98	11-23-98	12-9-98	1-23-99		3-14-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-86	W-86	W-86	W-86	W-86	W-86
2	Identification Number 98-	10123	11354	12479	99-01333	99-0227	99-03273
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1222	1222	1222	1222	1222	1222
5	Depth of Well Below Land Surface (feet)	51'	51'	51'	51'	51'	51'
6	Static Water Level of Well Below Land Surface (feet)	14'	15'	15'	11'	10'	9'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-2-98	11-23-98	12-29-98	1-23-99	2-10-99	3-19-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.50	7.60	7.50	7.20	7.60	7.60
	Total Acidity (mg/l CaCO3)	7.40	23.0	11.0	18.0	16.0	15.0
12	Total Alkalinity (mg/l CaCO3)	180.0	230.0	230.0	270.0	210.0	250.0
13	Specific Conductivity (umhos/cm at 25° C)	520.0	590.0	620.0	620.0	620.0	600.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.65	0.72	0.29	0.25	0.02	<0.02
16	Total Sulfates (mg/l)	33.0	32.0	34.0	35.0	35.0	30.0
17	Total Iron (mg/l)	3.50	0.71	1.70	1.80	1.20	0.84
18	Total Suspended Solids (mg/l)	19.0	17.0	<1.0	10.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	260.0	300.0	300.0	320.0	300.0	290.0
20	Nitrates	7.10	6.20	9.40	6.00	4.70	3.50
21	Date Sampled for Analysis	10-2-98	11-23-98	12-29-98	1-23-99	2-10-99	3-19-99
22	Date Last Precipitation Event Occurred	9-29-98	11-23-98	12-29-98	1-23-99	2-7-99	3-14-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC.

(D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-87	DW-87	DW-87	DW-87	DW-87	DW-87
2	Identification Number 98-	10124	11355	12477	99-01331	99-02275	99-03271
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1222	1222	1222	1222	1222	1222
5	Depth of Well Below Land Surface (feet)	22'	22'	22'	22'	22'	22'
6	Static Water Level of Well Below Land Surface (feet)	12'	13'	13'	1'	4'	4'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-2-98	11-23-98	12-29-98	1-23-99	2-10-99	3-19-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	6.40	6.80	6.70	7.50	6.70	7.10
11	Total Acidity (mg/l CaCO3)	3.90	6.70	2.90	5.90	4.50	<1.0
12	Total Alkalinity (mg/l CaCO3)	32.0	38.0	45.0	26.0	27.0	24.0
13	Specific Conductivity (umhos/cm at 25° C)	160.0	130.0	280.0	110.0	130.0	120.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02	<0.02	0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	31.0	35.0	38.0	28.0	27.0	22.0
17	Total Iron (mg/l)	0.06	0.16	0.19	0.56	0.57	0.18
18	Total Suspended Solids (mg/l)	<1.0	2.7	1.3	8.7	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	30.0	50.0	80.0	50.0	50.0	30.0
20	Nitrates	2.40	0.20	1.00	0.80	0.54	0.39
21	Date Sampled for Analysis	10-2-98	11-23-98	12-29-98	1-23-99	2-10-99	3-19-99
22	Date Last Precipitation Event Occurred	9-29-98	11-23-98	12-29-98	1-23-99	2-10-99	3-14-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019
State WEST VIRGINIA
City WHEELING
Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-88	W-88	W-88	W-88	W-88	W-88
2	Identification Number 98-	10138	11395	12388	99-01195	99-03044	99-03386
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1240	1240	1240	1240	1240	1240
5	Depth of Well Below Land Surface (feet)	57'	57'	57'	57'	57'	57'
6	Static Water Level of Well Below Land Surface (feet)	25'	51'	20'	14'	10'	10'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-6-98	11-24-98	12-17-98	1-22-99	2-27-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.50	7.70	7.20	7.80	7.40	7.50
11	Total Acidity (mg/l CaCO3)	4.10	7.20	20.0	12.0	13.0	12.0
12	Total Alkalinity (mg/l CaCO3)	250.0	260.0	240.0	180.0	180.0	180.0
13	Specific Conductivity (umhos/cm at 25° C)	460.0	500.0	470.0	370.0	390.0	380.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	30.0	31.0	33.0	26.0	26.0	23.0
17	Total Iron (mg/l)	<0.05	<0.05	<0.05	0.07	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	200.0	170.0	190.0	180.0	170.0	170.0
20	Nitrates	0.20	<0.09	<0.09	0.36	0.23	0.19
21	Date Sampled for Analysis	10-6-98	11-24-98	12-17-98	1-22-99	2-27-99	3-23-99
22	Date Last Precipitation Event Occurred	10-4-98	11-23-98	12-17-98	1-22-99	2-27-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-90	W-90	W-90	W-90	W-90	W-90
2	Identification Number 98-	10245	11331	12395	99-02134	99-02388	99-03341
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1240	1240	1240	1240	1240	1240
5	Depth of Well Below Land Surface (feet)	51'	51'	51'	51'	51'	51'
6	Static Water Level of Well Below Land Surface (feet)	35'	38'	37'	31'	35'	33'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-13-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.30	7.40	7.20	7.20	7.40	6.90
11	Total Acidity (mg/l CaCO3)	12.0	34.0	27.0	12.0	18.0	16.0
12	Total Alkalinity (mg/l CaCO3)	210.0	220.0	220.0	120.0	200.0	120.0
13	Specific Conductivity (umhos/cm at 25° C)	620.0	860.0	850.0	460.0	700.0	490.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.03	0.02	<0.02	0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	52.0	61.0	62.0	53.0	56.0	43.0
17	Total Iron (mg/l)	0.94	4.50	2.20	1.10	0.18	0.74
18	Total Suspended Solids (mg/l)	1.0	4.7	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	280.0	370.0	370.0	210.0	310.0	190.0
20	Nitrates	4.80	1.20	1.30	9.80	4.10	9.90
21	Date Sampled for Analysis	10-13-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC.

(D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-91	W-91	W-91	W-91	W-91	W-91
2	Identification Number 98-	10246	11330	12394	99-02135	99-02387	99-03340
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1241	1241	1241	1241	1241	1241
5	Depth of Well Below Land Surface (feet)	67'	67'	67'	67'	67'	67'
6	Static Water Level of Well Below Land Surface (feet)	52'	53'	53'	46'	51'	47'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-13-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.40	7.40	7.30	7.60	7.50	7.50
11	Total Acidity (mg/l CaCO3)	14.0	43.0	24.0	10.0	14.0	14.0
12	Total Alkalinity (mg/l CaCO3)	240.0	230.0	220.0	180.0	200.0	190.0
13	Specific Conductivity (umhos/cm at 25° C)	620.0	810.0	740.0	430.0	480.0	480.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	39.0	50.0	47.0	37.0	38.0	26.0
17	Total Iron (mg/l)	0.02	0.06	<0.05	<0.05	<0.05	0.05
18	Total Suspended Solids (mg/l)	1.0	4.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	270.0	330.0	340.0	220.0	270.0	220.0
20	Nitrates	0.80	0.72	0.61	3.00	2.60	2.40
	Date Sampled for Analysis	10-13-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-92	DW-92	DW-92	DW-92	DW-92	DW-92
2	Identification Number 98-	10247	11337	12409	99-02104	99-02397	99-03353
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1215	1215	1215	1215	1215	1215
5	Depth of Well Below Land Surface (feet)	24'	24'	24'	24'	24'	24'
6	Static Water Level of Well Below Land Surface (feet)	24'	24'	24'	17'	20'	16'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-13-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	7.20	7.50	7.40	7.20	7.50	7.40
11	Total Acidity (mg/l CaCO3)	24.0	33.0	20.0	17.0	24.0	23.0
12	Total Alkalinity (mg/l CaCO3)	220.0	220.0	220.0	220.0	230.0	210.0
13	Specific Conductivity (umhos/cm at 25° C)	520.0	520.0	490.0	500.0	560.0	520.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.08	0.20	0.21	0.24	2.40	0.03
16	Total Sulfates (mg/l)	60.0	69.0	56.0	70.0	68.0	50.0
17	Total Iron (mg/l)	0.09	1.10	0.28	0.26	6.10	0.12
18	Total Suspended Solids (mg/l)	2.0	68.0	<1.0	<1.0	17.0	<1.0
19	Total Hardness (mg/l as CaCO3)	230.0	260.0	260.0	300.0	310.0	250.0
20	Nitrates	0.17	0.14	3.40	1.80	2.80	1.90
21	Date Sampled for Analysis	10-13-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	WL-93	WL-93	WL-93	WL-93	WL-93	WL-93
2	Identification Number 98-	10248	11339	12411	99-02106	99-02399	99-03355
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1233	1233	1233	1233	1233	1233
5	Depth of Well Below Land Surface (feet)	WELL LOG 134'	WELL LOG 134'	WELL LOG 134'	WELL LOG 134'	WELL LOG 134'	WELL LOG 134'
6	Static Water Level of Well Below Land Surface (feet)	SEALED	SEALED	SEALED	SEALED	SEALED	SEALED
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-13-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	C	C	C	C	C	C
10	pH (Standard Units)	7.20	7.30	7.30	7.20	7.30	7.30
	Total Acidity (mg/l CaCO3)	12.0	26.0	23.0	14.0	22.0	20.0
12	Total Alkalinity (mg/l CaCO3)	200.0	200.0	200.0	200.00	220.0	200.0
13	Specific Conductivity (umhos/cm at 25° C)	430.0	440.0	420.0	430.0	450.0	470.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.03	0.02	<0.02	0.02	0.07	<0.02
16	Total Sulfates (mg/l)	48.0	52.0	53.0	49.0	48.0	38.0
17	Total Iron (mg/l)	2.50	2.10	2.40	2.30	6.60	1.60
18	Total Suspended Solids (mg/l)	1.0	<1.0	<1.0	<1.0	4.50	<1.0
19	Total Hardness (mg/l as CaCO3)	210.0	240.0	250.0	220.0	240.0	200.0
20	Nitrates	0.29	0.27	0.37	1.10	1.50	1.60
21	Date Sampled for Analysis	10-13-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-94	W-94	W-94	W-94	W-94	W-94
2	Identification Number 98-	10249	11335	12396	99-02136	99-02392	99-03345
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1241	1241	1241	1241	1241	1241
5	Depth of Well Below Land Surface (feet)	REPORTED 110'	REPORTED 110'	REPORTED 110'	REPORTED 110'	REPORTED 110'	REPORTED 110'
6	Static Water Level of Well Below Land Surface (feet)	76'	85'	66'	52'	55'	55'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-13-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	C	C	C	C	C	C
	pH (Standard Units)	7.50	7.90	7.50	7.60	7.60	7.40
11	Total Acidity (mg/l CaCO3)	13.0	28.0	13.0	11.0	14.0	14.0
12	Total Alkalinity (mg/l CaCO3)	220.0	230.0	240.0	200.0	200.0	200.0
13	Specific Conductivity (umhos/cm at 25° C)	580.0	620.0	600.0	560.0	560.0	620.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	42.0	46.0	44.0	44.0	42.0	35.0
17	Total Iron (mg/l)	0.02	<0.02	<0.05	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	160.0	150.0	130.0	280.0	240.0	310.0
20	Nitrates	0.80	0.38	0.17	2.90	3.00	2.90
21	Date Sampled for Analysis	10-13-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-95	W-95	W-95	W-95	W-95	W-95
2	Identification Number 98-	10250	11336	12397	99-02137	99-02393	99-03346
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1240	1240	1240	1240	1240	1240
5	Depth of Well Below Land Surface (feet)	46'	46'	46'	46'	46'	46'
6	Static Water Level of Well Below Land Surface (feet)	33'	34'	34'	30'	31'	30'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-13-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.20	7.50	7.20	7.30	7.50	7.40
	Total Acidity (mg/l CaCO3)	13.0	29.0	22.0	7.70	17.0	16.0
12	Total Alkalinity (mg/l CaCO3)	190.0	200.0	200.0	140.0	200.0	190.0
13	Specific Conductivity (umhos/cm at 25° C)	640.0	700.0	660.0	590.0	590.0	640.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	3.50	0.23	3.70	0.66	0.11	2.0
16	Total Sulfates (mg/l)	57.0	49.0	48.0	97.0	53.0	42.0
17	Total Iron (mg/l)	4.70	0.38	6.50	0.75	0.15	1.3
18	Total Suspended Solids (mg/l)	29.0	2.0	86.0	35.0	<1.0	3.3
19	Total Hardness (mg/l as CaCO3)	310.0	340.0	340.0	260.0	330.0	280.0
20	Nitrates	3.40	2.40	2.00	6.50	5.80	5.90
21	Date Sampled for Analysis	10-13-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-96	W-96	W-96	W-96	W-96	W-96
2	Identification Number 98-	10258	12033	12366	99-01322	99-02266	99-03284
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1202	1202	1202	1202	1202	1202
5	Depth of Well Below Land Surface (feet)	39'	39'	39'	39'	39'	39'
6	Static Water Level of Well Below Land Surface (feet)	11'	12'	13'	7'	6'	5'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-14-98	11-28-98	12-17-98	1-23-99	2-10-99	3-19-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.30	7.60	7.40	7.30	7.50	7.60
11	Total Acidity (mg/l CaCO3)	8.40	16.0	26.0	21.0	15.0	18.0
12	Total Alkalinity (mg/l CaCO3)	200.0	200.0	210.0	210.0	210.0	240.0
13	Specific Conductivity (umhos/cm at 25° C)	560.0	630.0	660.0	580.0	560.0	610.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	0.11	<0.02	0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	56.0	55.0	51.0	50.0	48.0	40.0
17	Total Iron (mg/l)	0.43	3.20	<0.05	0.09	<0.05	0.18
18	Total Suspended Solids (mg/l)	1.0	32.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	270.0	270.0	290.0	270.0	260.0	270.0
20	Nitrates	8.80	7.50	8.40	7.90	6.70	6.10
21	Date Sampled for Analysis	10-14-98	11-28-98	12-17-98	1-23-99	2-10-99	3-19-99
22	Date Last Precipitation Event Occurred	10-07-98	11-25-98	12-17-98	1-23-99	2-7-99	3-14-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-97	W-97	W-97	W-97	W-97	W-97
2	Identification Number 98-	10259	11362	12246	99-01184	99-02287	99-03269
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1175	1175	1175	1175	1175	1175
5	Depth of Well Below Land Surface (feet)	REPORTED 100'	REPORTED 100'	REPORTED 100'	REPORTED 100'	REPORTED 100'	REPORTED 100'
6	tatic Water Level of Well Below Land Surface (feet)	90'	88'	90'	54'	56'	53'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-15-98	11-24-98	12-14-98	1-22-99	2-10-99	3-19-99
9	Aquifer/Zone Identification For Well/Spring	C	C	C	C	C	C
	pH (Standard Units)	7.50	7.60	7.10	7.60	7.40	7.50
11	Total Acidity (mg/l CaCO3)	17.0	28.0	14.0	20.0	13.0	25.0
12	Total Alkalinity (mg/l CaCO3)	290.0	300.0	310.0	270.0	200.0	240.0
13	Specific Conductivity (umhos/cm at 25° C)	520.0	560.0	610.0	550.0	490.0	520.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	0.02	<0.02	0.17	<0.02	<0.02
16	Total Sulfates (mg/l)	42.0	38.0	41.0	39.0	38.0	32.0
17	Total Iron (mg/l)	0.16	0.31	0.30	3.90	0.11	0.09
18	Total Suspended Solids (mg/l)	2.70	2.70	7.30	<1.0	31.0	4.70
19	Total Hardness (mg/l as CaCO3)	190.0	190.0	180.0	230.0	270.0	240.0
20	Nitrates	1.00	0.63	0.60	0.85	2.20	1.50
21	Date Sampled for Analysis	10-15-98	11-24-98	12-14-98	1-22-99	2-10-99	3-19-99
22	Date Last Precipitation Event Occurred	10-07-98	11-23-98	12-9-98	1-22-99	2-7-99	3-14-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	WL-98	WL-98	WL-98	WL-98	WL-98	WL-98
2	Identification Number 98-	10260	11342	12407	99-02168	99-02396	99-03349
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1262	1262	1262	1262	1262	1262
5	Depth of Well Below Land Surface (feet)	65'	65'	65'	65'	65'	65'
6	Static Water Level of Well Below Land Surface (feet)	31'	23'	32'	18'	17'	14'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-15-98	11-23-98	12-21-98	1-30-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.60	7.60	7.40	7.40	7.50	7.40
11	Total Acidity (mg/l CaCO3)	12.0	33.0	14.0	16.0	18.0	18.0
12	Total Alkalinity (mg/l CaCO3)	230.0	220.0	220.0	220.0	220.0	220.0
13	Specific Conductivity (umhos/cm at 25° C)	520.0	440.0	410.0	520.0	540.0	530.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	35.0	20.0	20.0	42.0	40.0	30.0
17	Total Iron (mg/l)	0.02	<0.05	<0.05	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	250.0	220.0	170.0	270.0	270.0	240.0
20	Nitrates	1.00	0.30	0.26	2.60	1.40	0.84
21	Date Sampled for Analysis	10-15-98	11-23-98	12-21-98	1-30-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-07-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-99	W-99	W-99	W-99	W-99	W-99
2	Identification Number 98-	10261	11340	12405	99-02138	99-02402	99-03350
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1244	1244	1244	1244	1244	1244
5	Depth of Well Below Land Surface (feet)	56'	56'	56'	56'	56'	56'
6	Static Water Level of Well Below Land Surface (feet)	26'	19'	19'	12'	15'	12'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-15-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.60	8.00	7.70	8.00	8.00	7.90
11	Total Acidity (mg/l CaCO3)	10.0	21.0	10.0	7.60	5.80	3.80
12	Total Alkalinity (mg/l CaCO3)	250.0	240.0	240.0	240.0	240.0	240.0
13	Specific Conductivity (umhos/cm at 25° C)	460.0	440.0	430.0	440.0	440.0	480.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.03	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	26.0	20.0	20.0	32.0	19.0	14.0
17	Total Iron (mg/l)	0.02	0.05	0.06	<0.05	<0.05	0.14
18	Total Suspended Solids (mg/l)	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	210.0	70.0	70.0	60.0	60.0	50.0
20	Nitrates	<0.10	0.09	0.20	0.13	0.20	0.19
21	Date Sampled for Analysis	10-15-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-07-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-100	W-100	W-100	W-100	W-100	W-100
2	Identification Number 98-	10262	11341	12406	99-02139	99-02403	99-03351
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1244	1244	1244	1244	1244	1244
5	Depth of Well Below Land Surface (feet)	148'	148'	148'	148'	148'	148'
6	Static Water Level of Well Below Land Surface (feet)	103'	139'	133'	131'	122'	128'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-15-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	C	C	C	C	C	C
10	pH (Standard Units)	7.50	8.00	7.60	8.00	7.90	7.90
11	Total Acidity (mg/l CaCO3)	8.20	24.0	13.0	4.90	7.90	13.0
12	Total Alkalinity (mg/l CaCO3)	250.0	240.0	240.0	250.0	240.0	240.0
13	Specific Conductivity (umhos/cm at 25° C)	460.0	450.0	440.0	440.0	420.0	470.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	28.0	16.0	19.0	19.0	19.0	15.0
17	Total Iron (mg/l)	0.05	0.05	<0.05	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	230.0	100.0	70.0	70.0	60.0	60.0
20	Nitrates	<0.10	0.09	0.12	0.11	0.18	0.20
21	Date Sampled for Analysis	10-15-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-101	W-101	W-101	W-101	W-101	W-101
2	Identification Number 98-	10452	11348	12404	99-02110	99-02406	99-03359
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1253	1253	1253	1253	1253	1253
5	Depth of Well Below Land Surface (feet)	98'	98'	98'	98'	98'	98'
6	Static Water Level of Well Below Land Surface (feet)	47'	43'	47'	40'	37'	35'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-21-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.70	7.60	7.30	7.30	7.50	7.40
11	Total Acidity (mg/l CaCO3)	18.0	27.0	14.0	14.0	17.0	18.0
12	Total Alkalinity (mg/l CaCO3)	220.0	230.0	190.0	220.0	210.0	210.0
13	Specific Conductivity (umhos/cm at 25° C)	420.0	430.0	410.0	390.0	450.0	440.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	28.0	24.0	24.0	28.0	34.0	25.0
17	Total Iron (mg/l)	<0.05	0.07	<0.05	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	220.0	210.0	200.0	210.0	210.0	230.0
20	Nitrates	0.31	0.36	0.16	0.31	0.33	0.32
21	Date Sampled for Analysis	10-21-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-18-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	WL-103	WL-103	WL-103	WL-103	WL-103	WL-103
2	Identification Number 98-	10263	12016	99-01125	99-02187	99-03045	99-03387
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1244	1244	1244	1244	1244	1244
5	Depth of Well Below Land Surface (feet)	82'	82'	82'	82'	82'	82'
6	Static Water Level of Well Below Land Surface (feet)	48'	67'	55'	40'	42'	43'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-15-98	11-28-98	12-31-98	1-30-99	2-27-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	11pH (Standard Units)	7.40	7.60	7.7	7.60	7.60	7.60
11	Total Acidity (mg/l CaCO3)	12.0	13.0	14.0	10.0	14.0	12.0
12	Total Alkalinity (mg/l CaCO3)	250.0	250.0	250.0	200.0	220.0	200.0
13	Specific Conductivity (umhos/cm at 25° C)	580.0	670.0	550.0	510.0	580.0	510.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	45.0	58.0	53.0	66.0	67.0	58.0
17	Total Iron (mg/l)	0.05	0.15	<0.05	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	220.0	220.0	240.0	230.0	300.0	250.0
20	Nitrates	0.85	0.45	0.54	5.50	4.10	5.20
21	Date Sampled for Analysis	10-15-98	11-28-98	12-31-98	1-30-99	2-27-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-25-98	12-31-98	1-23-99	2-27-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-104	DW-104	DW-104	DW-104	DW-104	DW-104
2	Identification Number 98-	10264	113936	12382	99-02173	99-03048	99-03381
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1263	1263	1263	1263	1263	1263
5	Depth of Well Below Land Surface (feet)	19'	19'	19'	19'	19'	19'
6	Static Water Level of Well Below Land Surface (feet)	17'	18'	18'	8'	12'	10'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-15-98	11-24-98	12-17-98	1-30-99	2-27-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	7.40	7.60	7.40	7.70	7.50	7.70
11	Total Acidity (mg/l CaCO3)	12.0	9.0	23.0	7.50	16.0	6.90
12	Total Alkalinity (mg/l CaCO3)	200.0	220.0	220.0	95.0	200.0	110.0
13	Specific Conductivity (umhos/cm at 25° C)	580.0	650.0	680.0	380.0	600.0	460.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	51.0	54.0	55.0	39.0	41.0	30.0
17	Total Iron (mg/l)	0.06	0.10	<0.05	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	1.0	1.3	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	260.0	280.0	290.0	190.0	160.0	220.0
20	Nitrates	16.0	12.0	15.0	18.0	11.0	23.0
21	Date Sampled for Analysis	10-15-98	11-24-98	12-17-98	1-30-99	2-27-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-17-98	1-23-99	2-27-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	WL-106	WL-106	WL-106	WL-106	WL-106	WL-106
2	Identification Number 98-	10265	12034	12383	99-01178	99-03050	99-03379
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1263	1263	1263	1263	1263	1263
5	Depth of Well Below Land Surface (feet)	62'	62'	62'	62'	62'	62'
6	Static Water Level of Well Below Land Surface (feet)	50'	51'	51'	47'	47'	46'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-15-98	11-28-98	12-17-98	1-22-99	2-27-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.30	7.70	7.50	7.50	7.60	7.40
11	Total Acidity (mg/l CaCO3)	16.0	15.0	27.0	16.0	19.0	24.0
12	Total Alkalinity (mg/l CaCO3)	280.0	210.0	270.0	260.0	230.0	270.0
13	Specific Conductivity (umhos/cm at 25° C)	760.0	820.0	750.0	720.0	860.0	800.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	72.0	87.0	91.0	96.0	62.0	80.0
17	Total Iron (mg/l)	0.02	<0.05	<0.05	<0.05	<0.05	0.19
18	Total Suspended Solids (mg/l)	1.0	<1.0	<1.0	1.5	<1.0	7.3
19	Total Hardness (mg/l as CaCO3)	350.0	330.0	320.0	320.0	340.0	340.0
20	Nitrates	2.50	1.60	1.80	1.60	2.70	2.80
21	Date Sampled for Analysis	10-15-98	11-28-98	12-17-98	1-22-99	2-27-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-25-98	12-17-98	1-22-99	2-27-99	3-33-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-107	W-107	W-107	W-107	W-107	W-107
2	Identification Number 98-	10272	12040	99-01131	99-02167	99-03063	99-03385
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1282	1282	1282	1282	1282	1282
5	Depth of Well Below Land Surface (feet)	REPORTED 80'	REPORTED 80'	REPORTED 80'	REPORTED 80'	REPORTED 80'	REPORTED 80'
6	Static Water Level of Well Below Land Surface (feet)	46'	47'	48'	48'	43'	41'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-16-98	11-28-98	12-31-98	1-30-99	2-28-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	8.10	8.20	8.20	8.10	8.00	8.00
11	Total Acidity (mg/l CaCO3)	4.90	9.40	6.50	12.0	7.30	12.0
12	Total Alkalinity (mg/l CaCO3)	270.0	270.0	280	270.0	270.0	270.0
13	Specific Conductivity (umhos/cm at 25° C)	580.0	680.0	600	600.0	660.0	610.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.04	0.02	0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	38.0	37.0	38.0	40.0	39.0	33.0
17	Total Iron (mg/l)	0.33	<0.05	<0.05	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	70.0	70.0	70.0	60.0	160.0	80.0
20	Nitrates	<0.10	0.14	<0.09	0.29	0.10	0.09
21	Date Sampled for Analysis	10-16-98	11-28-98	12-31-98	1-30-99	2-28-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-25-98	12-31-98	1-23-99	2-28-99	3-24-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-108	W-108	W-108	W-108	W-108	W-108
2	Identification Number 98-	10273	12037	12471	99-02166	99-02420	99-03375
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1221	1221	1221	1221	1221	1221
5	Depth of Well Below Land Surface (feet)	REPORTED 90'	REPORTED 90'	REPORTED 90'	REPORTED 90'	REPORTED 90'	REPORTED 90'
6	Static Water Level of Well Below Land Surface (feet)	27.5'	30'	27'	22'	24'	23'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-16-98	11-28-98	12-29-98	1-30-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	C	C	C	C	C	C
10	pH (Standard Units)	7.30	7.40	7.10	7.40	7.30	7.20
11	Total Acidity (mg/l CaCO3)	17.0	16.0	<1.0	9.0	14.0	20.0
12	Total Alkalinity (mg/l CaCO3)	210.0	180.0	210.0	200.0	200.0	200.0
13	Specific Conductivity (umhos/cm at 25° C)	820.0	930.0	900.0	950.0	990.0	960.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.06	0.04	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	63.0	65.0	63.0	62.0	60.0	44.0
17	Total Iron (mg/l)	1.3	0.76	<0.05	<0.05	<0.05	0.12
18	Total Suspended Solids (mg/l)	1.0	<1.0	4.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	390.0	400.0	110.0	40.0	140.0	420.0
20	Nitrates	<0.10	0.13	<0.09	0.31	0.27	0.28
21	Date Sampled for Analysis	10-16-98	11-28-98	12-29-98	1-30-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-25-98	12-29-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-109	W-109	W-109	W-109	W-109	W-109
2	Identification Number 98-	10274	12044	99-01043	99-01199	99-03056	99-03372
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1203	1203	1203	1203	1203	1203
5	Depth of Well Below Land Surface (feet)	REPORTED 112'	REPORTED 112'	REPORTED 112'	REPORTED 112'	REPORTED 112'	REPORTED 112'
6	Static Water Level of Well Below Land Surface (feet)	SEALED	SEALED	SEALED	SEALED	SEALED	SEALED
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-16-98	11-30-98	12-30-98	1-22-99	2-27-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	C	C	C	C	C	C
10	pH (Standard Units)	6.90	7.00	7.40	6.80	6.90	6.80
11	Total Acidity (mg/l CaCO3)	16.0	15.0	16.0	27.0	31.0	33.0
12	Total Alkalinity (mg/l CaCO3)	230.0	200.0	200.0	160.0	180.0	170.0
13	Specific Conductivity (umhos/cm at 25° C)	880.0	1300.0	880.0	580.0	700.0	590.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	96.0	110.0	89.0	71.0	69.0	55.0
17	Total Iron (mg/l)	0.02	<0.05	0.07	0.06	<0.05	<0.05
18	Total Suspended Solids (mg/l)	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	400.0	500.0	330.0	240.0	320.0	300.0
20	Nitrates	0.43	0.53	0.35	1.2	0.89	0.72
21	Date Sampled for Analysis	10-16-98	11-30-98	12-30-98	1-22-99	2-27-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-30-98	12-29-98	1-22-99	2-27-99	3-22-99

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-110	DW-110	DW-110	DW-110	DW-110	DW-110
2	Identification Number 98-	10275	12017	12469	99-01198	99-02418	99-03373
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1203	1203	1203	1203	1203	1203
5	Depth of Well Below Land Surface (feet)	20'	20'	20'	20'	20'	20'
6	Static Water Level of Well Below Land Surface (feet)	17'	17'	17'	12'	17'	16'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-16-98	11-28-98	12-29-98	1-22-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	6.80	7.10	6.40	7.20	7.30	7.50
11	Total Acidity (mg/l CaCO3)	9.70	6.40	4.70	5.20	8.50	4.60
12	Total Alkalinity (mg/l CaCO3)	100.0	84.0	86.0	38.0	54.0	43.0
13	Specific Conductivity (umhos/cm at 25° C)	430.0	400.0	450.0	250.0	330.0	320.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.06	0.05	0.07	0.41	<0.02	<0.02
16	Total Sulfates (mg/l)	72.0	70.0	76.0	42.0	52.0	42.0
17	Total Iron (mg/l)	1.0	0.17	1.50	2.6	0.11	0.06
18	Total Suspended Solids (mg/l)	10.0	<1.0	32.0	7.30	4.0	<1.0
19	Total Hardness (mg/l as CaCO3)	150.0	140.0	170.0	110.0	120.0	120.0
20	Nitrates	2.10	2.80	2.00	8.30	6.10	7.30
21	Date Sampled for Analysis	10-16-98	11-28-98	12-29-98	1-22-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-25-98	12-29-98	1-22-99	2-26-99	3-22-99

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-111	W-111	W-111	W-111	W-111	W-111
2	Identification Number 98-	10276	11389		99-02163	99-03054	99-03279
3	High (H)/Low (L) Designation (if applicable)	SIX MONTH SAMPLING					
4	Surface Elevation for Sampling Station (msl)	1288	1288	1288	1288	1288	1288
5	Depth of Well Below Land Surface (feet)	OBSTRUCTION	OBSTRUCTION	OBSTRUCTION	OBSTRUCTION	OBSTRUCTION	OBSTRUCTION
6	Static Water Level of Well Below Land Surface (feet)	33'	33'	33'	29'	29'	25'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-16-98	11-24-98	12-17-98	1-30-99	2-27-99	3-19-99
9	Aquifer/Zone Identification For Well/Spring	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
10	pH (Standard Units)	7.50	7.60		7.60	7.70	7.60
	Total Acidity (mg/l CaCO3)	12.0	24.0		9.40	15.0	14.0
12	Total Alkalinity (mg/l CaCO3)	230.0	220.0		210.0	200.0	210.0
13	Specific Conductivity (umhos/cm at 25° C)	460.0	470.0		410.0	430.0	470.0
14	Total Dissolved Solids (mg/l)	---	---		---	---	---
15	Total Manganese (mg/l)	0.02	<0.02		<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	35.0	34.0		38.0	33.0	30.0
17	Total Iron (mg/l)	0.05	0.10		0.27	0.78	0.05
18	Total Suspended Solids (mg/l)	1.0	4.0		<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	220.0	230.0		230.0	180.0	220.0
20	Nitrates	0.67	0.59		0.92	0.82	0.52
21	Date Sampled for Analysis	10-16-98	11-24-98		1-30-99	2-27-99	3-19-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98		1-23-99	2-27-99	3-14-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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NOTE: For each sample provide data for either item 13 or 14.

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-112	DW-112	DW-112	DW-112	DW-112	DW-112
2	Identification Number 98-	10277	10236	12380	99-01201	99-03051	99-03383
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1265	1265	1265	1265	1265	1265
5	Depth of Well Below Land Surface (feet)	23'	23'	23'	23'	23'	23'
6	Static Water Level of Well Below Land Surface (feet)	18'	17'	19'	11'	14'	11'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-16-98	11-28-98	12-17-98	1-22-99	2-27-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	7.40	7.80	7.50	7.80	7.80	7.80
11	Total Acidity (mg/l CaCO3)	12.0	9.40	26.0	6.20	9.60	9.00
12	Total Alkalinity (mg/l CaCO3)	240.0	180.0	240.0	100.0	180.0	160.0
13	Specific Conductivity (umhos/cm at 25° C)	680.0	540.0	730.0	480.0	580.0	530.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	0.02	0.08	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	61.0	45.0	62.0	43.0	71.0	43.0
17	Total Iron (mg/l)	0.09	0.24	0.17	0.19	<0.05	<0.05
18	Total Suspended Solids (mg/l)	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	290.0	220.0	280.0	170.0	160.0	220.0
20	Nitrates	3.00	2.90	0.92	3.70	3.30	3.20
21	Date Sampled for Analysis	10-16-98	11-28-98	12-17-98	1-22-99	2-27-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-25-98	12-17-98	1-22-99	2-27-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC.

(D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-113	DW-113	DW-113	DW-113	DW-113	DW-113
2	Identification Number 98-	10297	11391	12379		99-03052	99-03382
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1270	1270	1270	1270	1270	1270
5	Depth of Well Below Land Surface (feet)	19'	19'	19'	19'	19'	19'
6	Static Water Level of Well Below Land Surface (feet)	15'	17'	17'	7'	9'	7'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-17-98	11-24-98	12-17-98	1-22-99	2-27-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	7.50	7.70	7.60		7.40	7.40
11	Total Acidity (mg/l CaCO3)	39.0	7.20	15.0		16.0	22.0
12	Total Alkalinity (mg/l CaCO3)	190.0	190.0	200.0		190.0	180.0
13	Specific Conductivity (umhos/cm at 25° C)	460.0	500.0	500.0		570.0	550.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02	<0.02		<0.02	<0.02
16	Total Sulfates (mg/l)	18.0	46.0	47.0		57.0	55.0
17	Total Iron (mg/l)	0.16	0.05	<0.05		0.12	<0.05
18	Total Suspended Solids (mg/l)	1.0	<1.0	<1.0		<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	220.0	230.0	250.0		160.0	250.0
20	Nitrates	3.40	1.20	2.80		5.60	6.60
21	Date Sampled for Analysis	10-17-98	11-24-98	12-17-98		2-27-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-17-98		2-27-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019
State WEST VIRGINIA
City WHEELING
Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-115	DW-115	DW-115	DW-115	DW-115	DW-115
2	Identification Number 98-	10296	11390	12475	99-02184	99-03053	99-03384
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1255	1255	1255	1255	1255	1255
5	Depth of Well Below Land Surface (feet)	18'	18'	18'	18'	18'	18'
6	Static Water Level of Well Below Land Surface (feet)	8'	8'	7'	6'	7'	7'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-17-98	11-24-98	12-29-98	1-30-99	2-27-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	7.40	7.50	7.20	7.60	7.60	7.70
	Total Acidity (mg/l CaCO3)	8.40	19.0	5.40	5.20	5.30	5.60
12	Total Alkalinity (mg/l CaCO3)	120.0	160.0	170.0	54.0	72.0	64.0
13	Specific Conductivity (umhos/cm at 25° C)	340.0	460.0	480.0	170.0	260.0	230.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	56.0	61.0	68.0	33.0	42.0	34.0
17	Total Iron (mg/l)	0.07	0.34	<0.05	0.06	<0.05	0.05
18	Total Suspended Solids (mg/l)	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	140.0	210.0	200.0	80.0	60.0	90.0
20	Nitrates	3.30	0.97	1.50	3.10	1.90	1.90
21	Date Sampled for Analysis	10-17-98	11-24-98	12-29-98	1-30-99	2-27-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-29-98	1-23-99	2-27-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	WL-116	WL-116	WL-116	WL-116	WL-116	WL-116
2	Identification Number 98-	10292	12035				
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1265	1265	1265	1265	1265	1265
5	Depth of Well Below Land Surface (feet)	WELL LOG 61'	WELL LOG 61'	WELL LOG 61'	WELL LOG 61'	WELL LOG 61'	WELL LOG 61'
6	Static Water Level of Well Below Land Surface (feet)	WELL LOG 22'	WELL LOG 22'	WELL LOG 22'	WELL LOG 22'	WELL LOG 22'	WELL LOG 22'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-17-98	11-28-98				
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.40	7.50				
11	Total Acidity (mg/l CaCO3)	13.0	13.0				
12	Total Alkalinity (mg/l CaCO3)	270.0	290.0				
13	Specific Conductivity (umhos/cm at 25° C)	800.0	900.0				
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02				
16	Total Sulfates (mg/l)	89.0	94.0				
17	Total Iron (mg/l)	0.05	<0.05				
18	Total Suspended Solids (mg/l)	1.0	<1.0				
19	Total Hardness (mg/l as CaCO3)	370.0	390.0				
20	Nitrates	1.90	1.30				
21	Date Sampled for Analysis	10-17-98	11-28-98				
22	Date Last Precipitation Event Occurred	10-7-98	11-25-98				

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-117	W-117	W-117	W-117	W-117	W-117
2	Identification Number 98-	10298	11372	12401	99-02140	99-02394	99-03347
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1250	1250	1250	1250	1250	1250
5	Depth of Well Below Land Surface (feet)	REPORTED 80'	REPORTED 80'	REPORTED 80'	REPORTED 80'	REPORTED 80'	REPORTED 80'
6	Static Water Level of Well Below Land Surface (feet)	SEALED	SEALED	SEALED	SEALED	SEALED	SEALED
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-17-98	11-24-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.50	7.60	7.20	7.60	7.50	7.40
	Total Acidity (mg/l CaCO3)	23.0	26.0	12.0	14.0	17.0	16.0
12	Total Alkalinity (mg/l CaCO3)	230.0	200.0	250.0	220.0	220.0	210.0
13	Specific Conductivity (umhos/cm at 25° C)	460.0	780.0	510.0	510.0	480.0	530.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	50.0	55.0	30.0	36.0	38.0	30.0
17	Total Iron (mg/l)	0.08	0.06	<0.05	<0.05	0.05	<0.05
18	Total Suspended Solids (mg/l)	1.0	21.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	260.0	260.0	250.0	260.0	260.0	250.0
20	Nitrates	0.74	0.35	0.28	3.40	3.90	3.80
21	Date Sampled for Analysis	10-17-98	11-24-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-07-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-118	W-118	W-118	W-118	W-118	W-118
2	Identification Number 98-	10289	11376	12419	99-02114	99-02410	99-03364
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1260	1260	1260	1260	1260	1260
5	Depth of Well Below Land Surface (feet)	REPORTED 35'	REPORTED 35'	REPORTED 35'	REPORTED 35'	REPORTED 35'	REPORTED 35'
6	Static Water Level of Well Below Land Surface (feet)	REPORTED 26'	REPORTED 26'	REPORTED 26'	REPORTED 26'	REPORTED 26'	REPORTED 26'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-17-98	11-24-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.10	7.10	6.90	7.00	7.10	7.10
	Total Acidity (mg/l CaCO3)	17.0	26.0	26.0	26.0	30.0	36.0
12	Total Alkalinity (mg/l CaCO3)	220.0	200.0	200.0	260.0	220.0	240.0
13	Specific Conductivity (umhos/cm at 25° C)	780.0	830.0	870.0	1800.0	1200.0	1800.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	36.0	43.0	44.0	75.0	64.0	63.0
17	Total Iron (mg/l)	0.02	<0.05	<0.05	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	340.0	320.0	360.0	480.0	390.0	550.0
20	Nitrates	0.36	<0.09	0.36	1.10	0.80	1.40
21	Date Sampled for Analysis	10-17-98	11-24-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-07-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

(D-0425-1)

APPLICANT BENNOC, INC.

1	Identification No. of Sampling Station from Hydrology Map	W-119	W-119	W-119	W-119	W-119	W-119
2	Identification Number 98-	10290	11377	12420	99-02115	99-02411	99-03365
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1260	1260	1260	1260	1260	1260
5	Depth of Well Below Land Surface (feet)	37'	37'	37'	37'	37'	37'
6	Static Water Level of Well Below Land Surface (feet)	36'	36'	36'	30'	32'	29'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-17-98	11-24-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.30	7.30	7.10	7.60	7.60	7.50
11	Total Acidity (mg/l CaCO3)	13.0	*	20.0	10.0	15.0	13.0
12	Total Alkalinity (mg/l CaCO3)	210.0	*	190.0	180.0	170.0	180.0
13	Specific Conductivity (umhos/cm at 25° C)	820.0	*	750.0	580.0	600.0	570.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.12	0.38	0.18	0.32	1.70	0.03
16	Total Sulfates (mg/l)	44.0	*	56.0	61.0	57.0	46.0
17	Total Iron (mg/l)	1.6	5.2	3.2	1.50	4.30	0.32
18	Total Suspended Solids (mg/l)	18.0	*	140.0	2.0	4.00	<1.0
19	Total Hardness (mg/l as CaCO3)	290.0	350.0	300.0	290.0	290.0	270.0
20	Nitrates	0.98	0	1.00	6.20	5.90	6.50
21	Date Sampled for Analysis	10-17-98	11-24-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-07-98	11-25-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC. City WHEELING
Address P.O. BOX 2019 Zip 26003-0219
State WEST VIRGINIA

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* Non-preserved sample lost

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

(D-0425-1)

APPLICANT BENNOC, INC.

1	Identification No. of Sampling Station from Hydrology Map	W-120	W-120	W-120	W-120	W-120	W-120
2	Identification Number 98-	10300	11396	12467	99-02120	99-02416	99-03370
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1095	1095	1095	1095	1095	1095
5	Depth of Well Below Land Surface (feet)	118'	118'	118'	118'	118'	118'
6	Static Water Level of Well Below Land Surface (feet)	113'	35'	37'	24'	26'	24'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-18-98	11-24-98	12-29-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	D	D	D	D	D	D
10	pH (Standard Units)	7.30	7.40	6.40	7.40	7.60	7.40
11	Total Acidity (mg/l CaCO3)	30.0	18.0	12.0	11.0	15.0	17.0
12	Total Alkalinity (mg/l CaCO3)	260.0	310.0	270.0	200.0	210.0	240.0
13	Specific Conductivity (umhos/cm at 25° C)	1200.0	770.0	1300.0	480.0	520.0	520.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.18	0.21	0.17	0.02	0.33	0.12
16	Total Sulfates (mg/l)	120.0	110.0	120.0	57.0	52.0	42.0
17	Total Iron (mg/l)	9.0	0.81	2.9	0.18	1.60	0.85
18	Total Suspended Solids (mg/l)	16.0	<1.0	2.7	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	620.0	420.0	500.0	240.0	250.0	250.0
20	Nitrates	0.21	<0.09	0.23	0.52	0.36	0.25
21	Date Sampled for Analysis	10-18-98	11-24-98	12-29-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-18-98	11-24-98	12-29-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019
State WEST VIRGINIA
City WHEELING
Zip 26003-0219

NOTE: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A a statement giving the reasons why the information is unobtainable.

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-121	W-121	W-121	W-121	W-121	W-121
2	Identification Number 98-	10302	12043	12474	99-02183	99-02423	99-03378
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1239	1239	1239	1239	1239	1239
5	Depth of Well Below Land Surface (feet)	REPORTED 100'	REPORTED 100'	REPORTED 100'	REPORTED 100'	REPORTED 100'	REPORTED 100'
6	Static Water Level of Well Below Land Surface (feet)	SEALED	SEALED	SEALED	43'	42'	42'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-18-98	11-30-98	12-29-98	1-30-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	C	C	C	C	C	C
10	pH (Standard Units)	7.80	7.40	7.20	7.60	7.40	7.50
11	Total Acidity (mg/l CaCO3)	14.0	15.0	9.40	11.0	18.0	25.0
12	Total Alkalinity (mg/l CaCO3)	220.0	220.0	190.0	200.0	210.0	200.0
13	Specific Conductivity (umhos/cm at 25° C)	470.0	520.0	520.0	420.0	480.0	470.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	47	51	58	41.0	46.0	32.0
17	Total Iron (mg/l)	0.07	<0.05	<0.05	<0.05	<0.05	0.24
18	Total Suspended Solids (mg/l)	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	230.0	240.0	210.0	230.0	230.0	220.0
20	Nitrates	0.67	0.58	0.99	1.70	0.92	1.90
21	Date Sampled for Analysis	10-18-98	11-30-98	12-29-98	1-30-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-18-98	11-30-98	12-29-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-122	W-122	W-122	W-122	W-122	W-122
2	Identification Number 98-	10450	11370	12403	99-02141	99-02395	99-03348
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1260	1260	1260	1260	1260	1260
5	Depth of Well Below Land Surface (feet)	REPORTED 64'	REPORTED 64'	REPORTED 64'	REPORTED 64'	REPORTED 64'	REPORTED 64'
6	Static Water Level of Well Below Land Surface (feet)	REPORTED 27'	REPORTED 27'	REPORTED 27'	REPORTED 27'	REPORTED 27'	REPORTED 27'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-21-98	11-24-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.60	7.50	7.20	7.60	7.50	7.70
11	Total Acidity (mg/l CaCO3)	21.00	21.00	18.0	9.0	21.0	11.0
12	Total Alkalinity (mg/l CaCO3)	230.00	230.00	230.0	140.0	220.0	160.0
13	Specific Conductivity (umhos/cm at 25° C)	440.0	450.0	450.0	330.0	440.0	380.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	38.0	38.0	40.0	32.0	36.0	28.0
17	Total Iron (mg/l)	<0.05	<0.05	<0.05	0.08	0.15	0.08
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	250.0	220	240.0	160.0	230.0	160.0
20	Nitrates	0.72	0.74	0.70	4.20	1.70	1.80
21	Date Sampled for Analysis	10-21-98	11-24-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-18-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-123	W-123	W-123	W-123	W-123	W-123
2	Identification Number 98-	10453	11349	99-01124	99-02169	99-03055	99-03360
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1240	1240	1240	1240	1240	1240
5	Depth of Well Below Land Surface (feet)	89'	89'	89'	89'	89'	89'
6	Static Water Level of Well Below Land Surface (feet)	76'	78'	79'	65'	66'	64'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-21-98	11-23-98	12-31-98	1-30-99	2-27-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.90	8.00	8.20	7.80	7.60	7.60
11	Total Acidity (mg/l CaCO3)	15.00	24.0	7.90	9.20	13.0	13.0
12	Total Alkalinity (mg/l CaCO3)	280.00	290.0	280.0	230.0	240.0	240.0
13	Specific Conductivity (umhos/cm at 25° C)	480.0	530.0	480.0	470.0	480.0	480.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	25.0	25.0	26.0	26.0	23.0	18.0
17	Total Iron (mg/l)	0.06	0.38	0.10	0.06	0.06	0.30
18	Total Suspended Solids (mg/l)	<1.0	6.7	<1.0	2.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	120.0	110.0	100.0	140.0	190.0	170.0
20	Nitrates	<0.09	0.12	<0.09	0.13	0.12	0.13
21	Date Sampled for Analysis	10-21-98	11-23-98	12-31-98	1-30-99	2-27-99	3-23-99
22	Date Last Precipitation Event Occurred	10-18-98	11-23-98	12-31-98	1-23-99	2-27-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-124	W-124	W-124	W-124	W-124	W-124
2	Identification Number 98-	10451	11371	12402			
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1260	1260	1260	1260	1260	1260
5	Depth of Well Below Land Surface (feet)	REPORTED 30'	REPORTED 30'	REPORTED 30'	REPORTED 30'	REPORTED 30'	REPORTED 30'
6	Static Water Level of Well Below Land Surface (feet)	REPORTED 18'	REPORTED 18'	REPORTED 18'	REPORTED 18'	REPORTED 18'	REPORTED 18'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-21-98	11-24-98	12-21-98			
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.60	7.60	7.30			
11	Total Acidity (mg/l CaCO3)	17.00	19.0	18.0			
12	Total Alkalinity (mg/l CaCO3)	200.00	230.0	230.0			
13	Specific Conductivity (umhos/cm at 25° C)	440.0	450.0	440.0			
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02			
16	Total Sulfates (mg/l)	38.0	110.0	40.0			
17	Total Iron (mg/l)	0.05	<0.05	0.11			
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0			
19	Total Hardness (mg/l as CaCO3)	240.0	230.0	230.0			
20	Nitrates	0.71	0.76	0.62			
21	Date Sampled for Analysis	10-21-98	11-24-98	12-21-98			
22	Date Last Precipitation Event Occurred	10-18-98	11-23-98	12-21-98			

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-125	W-125	W-125	W-125	W-125	W-125
2	Identification Number 98-				99-01182	99-02289	99-03268
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1192	1192	1192	1192	1192	1192
5	Depth of Well Below Land Surface (feet)	21'	21'	21'	21'	21'	21'
6	Static Water Level of Well Below Land Surface (feet)	DRY	DRY	DRY	12'	14'	12'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-29-98	11-25-98	12-14-98	1-22-99	2-10-99	3-19-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)				6.60	6.90	6.70
11	Total Acidity (mg/l CaCO3)				5.50	3.20	7.10
12	Total Alkalinity (mg/l CaCO3)				15.0	24.0	22.0
13	Specific Conductivity (umhos/cm at 25° C)				110.0	150.0	160.0
14	Total Dissolved Solids (mg/l)				---	---	---
15	Total Manganese (mg/l)				<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)				39.0	42.0	35.0
17	Total Iron (mg/l)				0.33	0.23	0.38
18	Total Suspended Solids (mg/l)				<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)				50.0	60.0	60.0
20	Nitrates				0.22	0.13	0.09
21	Date Sampled for Analysis				1-22-99	2-10-99	3-19-99
22	Date Last Precipitation Event Occurred				1-22-99	2-10-99	3-14-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-126	DW-126				
2	Identification Number	93-12-1168	94-03-581				
3	High (H)/Low (L) Designation (if applicable)	L	H				
4	Surface Elevation for Sampling Station (msl)	1261	1261				
5	Depth of Well Below Land Surface (feet)	37'	37'				
6	Static Water Level of Well Below Land Surface (feet)	21'	18'				
7	Flow for Spring and Stream (gpm or cfs)	---	---				
8	Date Above Measurements Made	12-29-93	3-10-94				
9	Aquifer/Zone Identification For Well/Spring	A	A				
10	pH (Standard Units)	7.35	7.88				
	Total Acidity (mg/l CaCO3)	13.80	9.40				
12	Total Alkalinity (mg/l CaCO3)	227.00	121.20				
13	Specific Conductivity (umhos/cm at 25° C)	741.0	260.0				
14	Total Dissolved Solids (mg/l)	---	---				
15	Total Manganese (mg/l)	0.04	<0.02				
16	Total Sulfates (mg/l)	50.0	20.0				
17	Total Iron (mg/l)	0.09	0.29				
18	Total Suspended Solids (mg/l)	4.0	6.0				
19	Total Hardness (mg/l as CaCO3)	382.0	98.0				
20	Nitrates	---	---				
21	Date Sampled for Analysis	12-29-93	3-10-94				
22	Date Last Precipitation Event Occurred	12-25-93	3-9-94				

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-127	W-127	W-128	W-128		
2	Identification Number	93-121171	94-03577	93-121172	94-03578		
3	High (H)/Low (L) Designation (if applicable)	L	H	L	H		
4	Surface Elevation for Sampling Station (msl)	1258	1258	1230	1230		
5	Depth of Well Below Land Surface (feet)	REPORTED 81'	REPORTED 81'	103'	103'		
6	Static Water Level of Well Below Land Surface (feet)	55'	53'	51'	51'		
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---		
8	Date Above Measurements Made	12-29-93	3-10-94	12-29-93	3-10-94		
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B		
10	pH (Standard Units)	7.24	7.95	7.57	8.14		
11	Total Acidity (mg/l CaCO3)	14.00	12.80	11.00	6.00		
12	Total Alkalinity (mg/l CaCO3)	255.60	255.20	258.60	259.00		
13	Specific Conductivity (umhos/cm at 25° C)	981	1061	654	728		
14	Total Dissolved Solids (mg/l)	---	---	---	---		
15	Total Manganese (mg/l)	0.04	<0.02	0.02	<0.02		
16	Total Sulfates (mg/l)	73.0	108.0	67.0	84.0		
17	Total Iron (mg/l)	0.06	0.06	<0.04	<0.04		
18	Total Suspended Solids (mg/l)	3.0	<2.0	4.0	<2.0		
19	Total Hardness (mg/l as CaCO3)	474.0	420.0	370.0	340.0		
20	Nitrates	---	---	---	---		
21	Date Sampled for Analysis	12-29-93	3-10-94	12-29-93	3-10-94		
22	Date Last Precipitation Event Occurred	12-25-93	3-9-94	12-25-93	3-9-94		

Laboratory Name INDUSTRIAL LAB ANALYSIS
Address 2240 WILLIAMSBURG DRIVE City GLEN DALE
State WEST VIRGINIA Zip 26083

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9/88

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-129	W-129				
2	Identification Number	97-10-479	99-05-351				
3	High (H)/Low (L) Designation (if applicable)	L	H				
4	Surface Elevation for Sampling Station (msl)	930	930				
5	Depth of Well Below Land Surface (feet)	150'	150'				
6	Static Water Level of Well Below Land Surface (feet)	81'	79.5'				
7	Flow for Spring and Stream (gpm or cfs)	---	---				
8	Date Above Measurements Made	10-13-97	5-17-99				
9	Aquifer/Zone Identification For Well/Spring	E	E				
10	pH (Standard Units)	7.45	7.17				
11	Total Acidity (mg/l CaCO3)	10.20	15.40				
12	Total Alkalinity (mg/l CaCO3)	188.60	63.40				
13	Specific Conductivity (umhos/cm at 25° C)	546.0	243.0				
14	Total Dissolved Solids (mg/l)	---	---				
15	Total Manganese (mg/l)	0.24	0.34				
16	Total Sulfates (mg/l)	36.0	21.0				
17	Total Iron (mg/l)	0.06	0.13				
18	Total Suspended Solids (mg/l)	24.0	<2.0				
19	Total Hardness (mg/l as CaCO3)	80.0	87.0				
20	Nitrates	---	---				
21	Date Sampled for Analysis	10-13-97	5-17-99				
22	Date Last Precipitation Event Occurred	10-11-97	5-14-99				

Laboratory Name Industrial Lab Analysis, Inc.
Address 2240 Williamsburg Drive City Glen Dale
State West Virginia Zip 26083

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-130	DW-130	DW-130	DW-130	DW-130	DW-130
2	Identification Number 98-	10454	11364	01040	99-01192	99-03038	99-03281
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1225	1225	1225	1225	1225	1225
5	Depth of Well Below Land Surface (feet)	18'	18'	18'	18'	18'	18'
6	Static Water Level of Well Below Land Surface (feet)	12'	13'	13'	1'	3'	3'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-24-98	11-24-98	12-30-98	1-22-99	2-27-99	3-19-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	ApH (Standard Units)	7.30	7.20	7.50	6.70	6.80	6.80
	Total Acidity (mg/l CaCO3)	16.00	17.00	12.0	9.60	27.0	12.0
12	Total Alkalinity (mg/l CaCO3)	130.00	130.00	140.0	29.0	56.0	45.0
13	Specific Conductivity (umhos/cm at 25° C)	380.00	350.00	380.0	120.0	240.0	170.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	0.06	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	46.0	50.0	66.0	28.0	34.0	25.0
17	Total Iron (mg/l)	<0.05	0.05	0.49	0.86	0.46	1.2
18	Total Suspended Solids (mg/l)	<1.0	<1.0	17.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	170.0	150.0	180.0	70.0	80.0	60.0
20	Nitrates	0.85	0.97	0.99	0.98	<0.09	0.59
21	Date Sampled for Analysis	10-24-98	11-24-98	12-30-98	1-22-99	2-27-99	3-19-99
22	Date Last Precipitation Event Occurred	10-18-98	11-23-98	12-29-98	1-22-99	2-27-99	3-14-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-131	W-131	W-131	W-131	W-131	W-131
2	Identification Number 98-	10455	11365	01041	99-01193	99-03039	99-03282
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1241	1241	1241	1241	1241	1241
5	Depth of Well Below Land Surface (feet)	48'	48'	48'	48'	48'	48'
6	Static Water Level of Well Below Land Surface (feet)	15'	17'	12'	2'	6'	4'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-24-98	11-24-98	12-30-98	1-22-99	2-27-99	3-19-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.90	7.80	8.00	6.90	7.50	7.60
	Total Acidity (mg/l CaCO3)	16.00	23.0	9.70	12.0	11.0	23.0
12	Total Alkalinity (mg/l CaCO3)	170.00	170.0	160.0	31.0	73.0	65.0
13	Specific Conductivity (umhos/cm at 25° C)	420.00	440.0	530.0	160.0	260.0	240.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.37	0.41	0.20	0.07	0.02	0.02
16	Total Sulfates (mg/l)	66.0	66.0	160.0	41.0	43.0	26.0
17	Total Iron (mg/l)	1.70	3.80	1.30	3.10	1.40	2.80
18	Total Suspended Solids (mg/l)	10.0	27.0	2.0	150.0	11.0	4.70
19	Total Hardness (mg/l as CaCO3)	210.0	200.0	250.0	110.0	110.0	90.0
20	Nitrates	0.90	0.71	1.0	0.89	1.20	1.60
21	Date Sampled for Analysis	10-24-98	11-24-98	12-30-98	1-22-99	2-27-99	3-19-99
22	Date Last Precipitation Event Occurred	10-18-98	11-23-98	12-29-98	1-22-99	2-27-99	3-14-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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NOTE: For each sample provide data for either item 13 or 14.

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-132	DW-132	DW-132	DW-132	DW-132	DW-132
2	Identification Number 98-	10456	11325	12203	99-02153	99-02251	
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1044	1044	1044	1044	1044	1044
5	Depth of Well Below Land Surface (feet)	9'	9'	9'	9'	9'	9'
6	Static Water Level of Well Below Land Surface (feet)	7'	6'	6'	3'	3'	2'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-24-98	11-23-98	12-9-98	1-30-99	2-10-99	
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)	7.40	7.30	7.30	6.70	6.10	
11	Total Acidity (mg/l CaCO3)	25.00	51.0	<1.0	5.80	4.30	
12	Total Alkalinity (mg/l CaCO3)	140.00	160.0	160.0	26.0	28.0	
13	Specific Conductivity (umhos/cm at 25° C)	280.00	370.0	400.0	100.0	120.0	
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.91	1.00	0.97	0.02	0.02	
16	Total Sulfates (mg/l)	24.0	46.0	56.0	24.0	24.0	
17	Total Iron (mg/l)	0.65	0.85	0.47	0.43	0.65	
18	Total Suspended Solids (mg/l)	<1.0	6.7	<1.0	3.3	<1.0	
19	Total Hardness (mg/l as CaCO3)	150.0	170.0	190.0	40.0	40.0	
20	Nitrates	0.28	0.91	0.72	0.60	0.42	
21	Date Sampled for Analysis	10-24-98	11-23-98	12-9-98	1-30-99	2-10-99	
22	Date Last Precipitation Event Occurred	10-18-98	11-23-98	12-9-98	1-23-99	2-7-99	

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC.

(D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-133	DW-133	DW-133	DW-133	DW-133	DW-133
2	Identification Number 98-				99-02172	99-02257	99-03388
3	High (H)/Low (L) Designation (if applicable)		SIX MONTH SAMPLING				
4	Surface Elevation for Sampling Station (msl)	1142	1142	1142	1142	1142	1142
5	Depth of Well Below Land Surface (feet)	11'	11'	11'	11'	11'	11'
6	Static Water Level of Well Below Land Surface (feet)	DRY	DRY	DRY	8'	8'	8'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-24-98	11-23-98	12-9-98	1-30-99	2-10-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)				5.20	5.30	5.90
	Total Acidity (mg/l CaCO3)				9.20	6.80	28.0
12	Total Alkalinity (mg/l CaCO3)				3.00	<1.2	7.90
13	Specific Conductivity (umhos/cm at 25° C)				190.0	320.0	320.0
14	Total Dissolved Solids (mg/l)				---	---	
15	Total Manganese (mg/l)				0.63	0.79	1.0
16	Total Sulfates (mg/l)				62.0	100.0	94.0
17	Total Iron (mg/l)				0.52	0.12	0.31
8	Total Suspended Solids (mg/l)				4.7	26.0	2.70
9	Total Hardness (mg/l as CaCO3)				170.0	80.0	120.0
0	Nitrates				6.80	10.0	7.30
1	Date Sampled for Analysis				1-30-99	2-10-99	3-23-99
2	Date Last Precipitation Event Occurred	10-18-98	11-23-98	12-9-98	1-23-99	2-10-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019
State WEST VIRGINIA
City WHEELING
Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DW-135	DW-135	DW-135	DW-135	DW-135	DW-135
2	Identification Number				99-02082	99-02296	99-03270
3	High (H)/Low (L) Designation (if applicable)			SIX MONTH SAMPLING			
4	Surface Elevation for Sampling Station (msl)	1220	1220	1220	1220	1220	1220
5	Depth of Well Below Land Surface (feet)				24'	24'	24'
6	Static Water Level of Well Below Land Surface (feet)	DRY	DRY	DRY	23'	23'	23'
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	---
8	Date Above Measurements Made	10-24-98	11-23-98	12-9-98	1-28-99	2-11-99	3-19-99
9	Aquifer/Zone Identification For Well/Spring	A	A	A	A	A	A
10	pH (Standard Units)				7.90	7.80	7.80
	Total Acidity (mg/l CaCO3)				14.0	9.2	14.0
12	Total Alkalinity (mg/l CaCO3)				150.0	130.0	200.0
13	Specific Conductivity (umhos/cm at 25° C)				430.0	430.0	460.0
14	Total Dissolved Solids (mg/l)				---	---	---
15	Total Manganese (mg/l)				0.02	0.03	<0.02
16	Total Sulfates (mg/l)				36.0	40.0	29.0
17	Total Iron (mg/l)				0.62	0.49	0.16
18	Total Suspended Solids (mg/l)				11.0	88.0	<1.0
19	Total Hardness (mg/l as CaCO3)				230.0	220.0	190.0
20	Nitrates				3.00	1.40	0.36
21	Date Sampled for Analysis				1-28-99	2-11-99	3-19-99
22	Date Last Precipitation Event Occurred	10-18-98	11-23-98	12-9-98	1-23-99	2-11-99	3-14-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	W-140	W-141	W-142	W-145	W-147	DS-75
2	Identification Number	00-05-586	00-05-587	00-05-588	00-05-695	00-06-209	00-05-580
3	High (H)/Low (L) Designation (if applicable)	SUPPLEMENTAL					
4	Surface Elevation for Sampling Station (msl)	1155	1225	1258	1262	1030	1215
5	Depth of Well Below Land Surface (feet)	90'	100'	122'	30'	8'	--
6	Static Water Level of Well Below Land Surface (feet)	18'	29'	101'	10'	3'	--
7	Flow for Spring and Stream (gpm or cfs)	---	---	---	---	---	0.44 GPM
8	Date Above Measurements Made	5-16-00	5-16-00	5-16-00	5-20-00	5-30-00	5-16-00
9	Aquifer/Zone Identification For Well/Spring	C	B	B	A	A	B
10	pH (Standard Units)	7.47	7.64	7.60	6.97	7.02	7.14
	Total Acidity (mg/l CaCO3)	13.80	9.20	10.40	12.40	5.40	16.00
12	Total Alkalinity (mg/l CaCO3)	244.60	213.80	200.80	99.80	65.00	210.20
13	Specific Conductivity (umhos/cm at 25° C)	563.0	478.0	740.0	521.0	180.0	885.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	0.03	<0.02	0.04	<0.02	<0.02
16	Total Sulfates (mg/l)	43.0	32.0	42.0	145.0	20.0	58.0
17	Total Iron (mg/l)	0.10	0.08	0.06	0.07	0.18	0.08
18	Total Suspended Solids (mg/l)	<2.0	<2.0	<2.0	<2.0	3.0	4.0
19	Total Hardness (mg/l as CaCO3)	300.0	236.0	300.0	198.0	68.0	264.0
20	Nitrates	---	---	---	---	---	---
21	Date Sampled for Analysis	5-16-00	5-16-00	5-16-00	5-20-00	5-30-00	5-16-00
22	Date Last Precipitation Event Occurred	5-13-00	5-13-00	5-13-00	5-19-00	5-28-00	5-13-00

Laboratory Name Industrial Lab Analysis, Inc.
Address 2240 Williamsburg Drive City Glen Dale
State West Virginia Zip 26083

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-1	DS-1	DS-1	DS-1	DS-1	DS-1
2	Identification Number 98-	07179	08314	09202	10108	11241	12187
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1170	1170	1170	1170	1170	1170
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.20 GPM	0.20 GPM	0.20 GPM	0.21 GPM	0.13 GPM	0.06 GPM
8	Date Above Measurements Made	7-13-98	8-29-98	9-17-98	10-6-98	11-12-98	12-9-98
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.40	7.20	7.10	7.10	7.30	7.20
	Total Acidity (mg/l CaCO3)	34.0	13.0	36.0	13.0	66.0	14.0
12	Total Alkalinity (mg/l CaCO3)	300.0	280.0	270.0	280.0	280.0	250.0
13	Specific Conductivity (umhos/cm at 25° C)	740.0	580.0	680.0	620.0	580.0	650.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	0.02	0.04	<0.02
16	Total Sulfates (mg/l)	89.0	68.0	41.0	71.0	69.0	72.0
17	Total Iron (mg/l)	0.90	<0.02	<0.02	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	8.0	17.0
19	Total Hardness (mg/l as CaCO3)	350.0	330.0	320.0	300.0	300.0	330.0
20	Nitrates	0.74	0.70	0.95	0.62	0.71	0.75
21	Date Sampled for Analysis	7-13-98	8-29-98	9-17-98	10-6-98	11-12-98	12-9-98
22	Date Last Precipitation Event Occurred	7-8-98	8-26-98	9-9-98	10-4-98	11-10-98	12-9-98

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-2	DS-2	DS-2	DS-2	DS-2	DS-2
2	Identification Number 98-	07180	09026	09203	10109	11240	12186
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1192	1192	1192	1192	1192	1192
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.075 GPM	0.25 GPM	0.01 GPM	0.04 GPM	0.10 GPM	0.04 GPM
8	Date Above Measurements Made	7-14-98	8-30-98	9-17-98	10-6-98	11-12-98	12-9-98
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	8.10	7.60	7.40	7.60	7.30	7.30
11	Total Acidity (mg/l CaCO3)	8.80	18.00	36.00	5.80	98.0	11.0
12	Total Alkalinity (mg/l CaCO3)	220.00	260.00	280.00	240.00	230.00	200.0
13	Specific Conductivity (umhos/cm at 25° C)	490.0	450.0	540.0	440.0	440.0	450.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.57	1.30	1.80	1.00	0.38	0.23
16	Total Sulfates (mg/l)	36.00	17.00	8.70	18.00	30.0	34.0
17	Total Iron (mg/l)	17.00	4.50	5.00	18.00	9.90	1.10
18	Total Suspended Solids (mg/l)	220.0	240.0	130.0	89.0	160.0	68.0
19	Total Hardness (mg/l as CaCO3)	300.0	270.0	290.0	290.0	250.0	220.0
20	Nitrates	0.37	0.10	0.23	<0.09	0.10	<0.09
21	Date Sampled for Analysis	7-14-98	8-30-98	9-17-98	10-6-98	11-12-98	12-9-98
22	Date Last Precipitation Event Occurred	7-08-98	8-26-98	9-9-98	10-4-98	11-10-98	12-9-98

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-3	DS-3	DS-3	DS-3	DS-3	DS-3
2	Identification Number 98-	07181		09195	10102	11233	12179
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1180	1180	1180	1180	1180	1180
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.06 GPM	0	0.06 GPM	0	0	0
8	Date Above Measurements Made	7-14-98	8-21-98	9-17-98	10-6-98	11-12-98	12-9-98
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.33	DRY	7.60	7.60	6.80	6.80
11	Total Acidity (mg/l CaCO3)	7.60		20.00	6.40	62.0	74.0
12	Total Alkalinity (mg/l CaCO3)	78.0		100.0	78.0	100.0	110.0
13	Specific Conductivity (umhos/cm at 25° C)	240.0		270.0	180.0	220.0	230.0
14	Total Dissolved Solids (mg/l)	---		---	---	---	---
15	Total Manganese (mg/l)	0.25		0.52	0.20	1.70	4.10
16	Total Sulfates (mg/l)	19.0		7.10	10.0	7.30	4.10
17	Total Iron (mg/l)	2.30		3.00	2.10	4.10	8.30
18	Total Suspended Solids (mg/l)	9.30		5.00	2.70	21.0	38.0
19	Total Hardness (mg/l as CaCO3)	70.0		90.0	60.0	80.0	110.0
20	Nitrates	<0.10		0.10	0.18	<0.09	<0.09
21	Date Sampled for Analysis	7-14-98		9-17-98	10-6-98	11-12-98	12-9-98
22	Date Last Precipitation Event Occurred	7-8-98		9-9-98	10-4-98	11-10-98	12-9-98

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-4	DS-4	DS-4	DS-4	DS-4	DS-4
2	Identification Number 98-	07308	08317	09209	10112	11244	12190
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1012	1012	1012	1012	1012	1012
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.11 GPM	0.08 GPM	0.06 GPM	0.06 GPM	0.05 GPM	0.05 GPM
8	Date Above Measurements Made	7-14-98	8-29-98	9-17-98	10-6-98	11-12-98	12-9-98
9	Aquifer/Zone Identification For Well/Spring	C	C	C	C	C	C
10	pH (Standard Units)	7.20	7.50	7.70	8.10	8.00	8.30
	Total Acidity (mg/l CaCO3)	14.0	12.0	31.0	13.0	28.0	0.00
12	Total Alkalinity (mg/l CaCO3)	270.0	290.0	290.0	220.0	210.0	200.0
13	Specific Conductivity (umhos/cm at 25° C)	720.0	700.0	660.0	680.0	640.0	750.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	150.0	150.0	160.0	160.0	160.0	150.0
17	Total Iron (mg/l)	<0.02	<0.02	0.08	0.02	0.06	0.13
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	15.0
19	Total Hardness (mg/l as CaCO3)	320.0	320.0	350.0	350.0	340.0	340.0
20	Nitrates	0.17	0.13	0.10	0.10	<0.09	<0.09
21	Date Sampled for Analysis	7-14-98	8-29-98	9-17-98	10-6-98	11-12-98	12-9-98
22	Date Last Precipitation Event Occurred	7-8-98	8-26-98	9-9-98	10-4-98	11-10-98	12-9-98

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-5	DS-5	DS-5	DS-5	DS-5	DS-5
2	Identification Number 98-	07287					
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1074	1074	1074	1074	1074	1074
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.18 GPM	0	0	0	0	0
8	Date Above Measurements Made	7-22-98	8-29-98	9-17-98	10-6-98	11-12-98	12-9-98
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.70	DRY	DRY	DRY	DRY	DRY
	Total Acidity (mg/l CaCO3)	17.0					
12	Total Alkalinity (mg/l CaCO3)	230.0					
13	Specific Conductivity (umhos/cm at 25° C)	560.0					
14	Total Dissolved Solids (mg/l)	---					
15	Total Manganese (mg/l)	<0.02					
16	Total Sulfates (mg/l)	44.0					
17	Total Iron (mg/l)	1.10					
18	Total Suspended Solids (mg/l)	14.0					
19	Total Hardness (mg/l as CaCO3)	250.0					
20	Nitrates						
21	Date Sampled for Analysis	7-22-98					
22	Date Last Precipitation Event Occurred	7-22-98					

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-6	DS-6	DS-6	DS-6	DS-6	DS-6
2	Identification Number 98-	07309	09027	09205	11009	11246	12191
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1032	1032	1032	1032	1032	1032
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.07 GPM	0.06 GPM	0.03 GPM	0.05 GPM	0.05 GPM	0.05 GPM
8	Date Above Measurements Made	7-14-98	8-30-98	9-17-98	10-29-98	11-12-98	12-9-98
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.00	7.80	7.70	8.30	7.90	8.20
11	Total Acidity (mg/l CaCO3)	9.40	9.70	27.0	0.00	24.0	9.90
12	Total Alkalinity (mg/l CaCO3)	220.0	220.0	240.0	210.0	180.0	180.0
13	Specific Conductivity (umhos/cm at 25° C)	510.0	490.0	540.0	490.0	580.0	650.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	3.20	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	78.0	75.0	120.0	90.0	100.0	100.0
17	Total Iron (mg/l)	2.70	<0.02	0.06	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	1.3	5.3
19	Total Hardness (mg/l as CaCO3)	270.0	250.0	300.0	250.0	260.0	300.0
20	Nitrates	0.13	<0.10	<0.10	<0.09	<0.09	<0.09
21	Date Sampled for Analysis	7-14-98	8-30-98	9-17-98	10-29-98	11-12-98	12-9-98
22	Date Last Precipitation Event Occurred	7-8-98	8-26-98	9-9-98	10-29-98	11-10-98	12-9-98

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-7	DS-7	DS-7	DS-7	DS-7	DS-7
2	Identification Number 98-	08075	09295	11012	11415	12269	99-01172
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1192	1192	1192	1192	1192	1192
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.26 GPM	0.22 GPM	0.41 GPM	0.26 GPM	0.11 GPM	5.0 GPM
8	Date Above Measurements Made	8-8-98	9-25-98	10-29-98	11-25-98	12-14-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.70	6.70	7.00	6.80	6.90	6.90
11	Total Acidity (mg/l CaCO3)	13.0	27.0	7.20	13.0	6.40	12.0
12	Total Alkalinity (mg/l CaCO3)	120.0	130.0	130.0	130.0	130.0	76.0
13	Specific Conductivity (umhos/cm at 25° C)	530.0	660.0	600.0	620.0	610.0	340.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	0.05	0.13	0.12	0.24	0.02
16	Total Sulfates (mg/l)	29.0	35.0	22.0	22.0	24.0	30.0
17	Total Iron (mg/l)	<0.02	0.06	0.14	0.27	0.68	0.42
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	230.0	260.0	270.0	270.0	280.0	130.0
20	Nitrates	0.46	0.56	0.48	0.61	0.54	1.00
21	Date Sampled for Analysis	8-8-98	9-25-98	10-29-98	11-25-98	12-14-98	1-22-99
22	Date Last Precipitation Event Occurred	8-8-98	9-22-98	10-29-98	11-25-98	12-9-98	1-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-8	DS-8	DS-8	DS-8	DS-8	DS-8
2	Identification Number 98-	08196	09286	10113	11414	12265	99-01171
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1200	1200	1200	1200	1200	1200
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.47 GPM	0.02 GPM	0.02 GPM	0.01 GPM	0.01 GPM	0.03 GPM
8	Date Above Measurements Made	8-15-98	9-25-98	10-6-98	11-25-98	12-14-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.30	7.60	7.10	7.70	7.40	7.40
11	Total Acidity (mg/l CaCO3)	14.0	24.0	4.60	5.70	<1.0	11.0
12	Total Alkalinity (mg/l CaCO3)	200.0	210.0	190.0	210.0	210.0	94.0
13	Specific Conductivity (umhos/cm at 25° C)	400.0	410.0	480.0	410.0	430.0	240.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.08	0.32	0.02	0.11	0.09	0.13
16	Total Sulfates (mg/l)	32.0	24.0	58.0	25.0	26.0	14.0
17	Total Iron (mg/l)	0.09	0.54	0.20	0.27	0.11	0.58
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	1.3	9.0
19	Total Hardness (mg/l as CaCO3)	200.0	210.0	210.0	210.0	220.0	110.0
20	Nitrates	2.40	0.78	5.40	0.28	0.45	0.48
21	Date Sampled for Analysis	8-15-98	9-25-98	10-6-98	11-25-98	12-14-98	1-22-99
22	Date Last Precipitation Event Occurred	8-12-98	9-22-98	10-4-98	11-25-98	12-9-98	1-22-99

Laboratory Name TRA-DET, INC.
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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-9	DS-9	DS-9	DS-9	DS-9	DS-9
2	Identification Number 98-	08207		10012	10466	11452	12275
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1199	1199	1199	1199	1199	1199
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.13 GPM	0	0.16 GPM	0.94 GPM	0.22 GPM	0.12 GPM
8	Date Above Measurements Made	7-14-98	8-30-98	9-28-98	10-26-98	11-27-98	12-15-98
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	6.70	DRY	7.60	8.50	8.70	8.00
	Total Acidity (mg/l CaCO3)	16.0		8.90	0.00	0.00	1.80
12	Total Alkalinity (mg/l CaCO3)	95.0		85.0	82.0	82.0	90.0
13	Specific Conductivity (umhos/cm at 25° C)	300.0		280.0	310.0	270.0	300.0
14	Total Dissolved Solids (mg/l)	---		---	---	---	---
15	Total Manganese (mg/l)	<0.02		<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	36.0		40.0	39.0	38.0	43.0
17	Total Iron (mg/l)	<0.02		<0.02	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0		<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	120.0		90.0	130.0	110.0	110.0
20	Nitrates	4.10		4.70	5.30	4.60	5.50
21	Date Sampled for Analysis	7-14-98		9-28-98	10-26-98	11-27-98	12-15-98
22	Date Last Precipitation Event Occurred	7-7-98		9-27-98	10-18-98	11-25-98	12-9-98

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-10	DS-10	DS-10	DS-10	DS-10	DS-10
2	Identification Number 98-	10294	10010	10478	11454	12279	99-01375
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1216	1216	1216	1216	1216	1216
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.03 GPM	0.02 GPM	0.05 GPM	0.01 GPM	0	1.6 GPM
8	Date Above Measurements Made	8-21-98	9-28-98	10-26-98	11-27-98	12-15-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	6.5	7.20	7.50	8.50	7.80	7.20
	Total Acidity (mg/l CaCO3)	30.00	4.70	8.20	0.00	15.0	13.0
12	Total Alkalinity (mg/l CaCO3)	160.0	160.0	180.0	150.0	160.0	91.0
13	Specific Conductivity (umhos/cm at 25° C)	360.0	330.0	390.0	350.0	350.0	240.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	0.02	<0.02
16	Total Sulfates (mg/l)	29.00	30.00	44.0	41.0	44.0	33.0
17	Total Iron (mg/l)	<0.06	<0.02	<0.05	0.27	0.05	0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	160.0	150.0	190.0	180.0	170.0	120.0
20	Nitrates	1.10	1.80	0.69	0.62	1.30	3.00
21	Date Sampled for Analysis	8-21-98	9-28-98	10-26-98	11-27-98	12-15-98	1-27-99
22	Date Last Precipitation Event Occurred	8-17-98	9-27-98	10-18-98	11-25-98	12-9-98	1-23-99

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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-11	DS-11	DS-11	DS-11	DS-11	DS-11
2	Identification Number 98-	08200	10008	10482	11457	12281	99-01379
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1206	1206	1206	1206	1206	1206
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.05 GPM	0.06 GPM	0.04 GPM	0.06 GPM	0.02 GPM	1.5 GPM
8	Date Above Measurements Made	8-21-98	9-28-98	10-26-98	11-27-98	12-15-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.00	7.30	7.40	7.60	7.90	6.70
11	Total Acidity (mg/l CaCO3)	20.0	10.0	10.0	9.0	9.50	24.0
12	Total Alkalinity (mg/l CaCO3)	160.0	160.0	160.0	120.0	150.0	74.0
13	Specific Conductivity (umhos/cm at 25° C)	410.0	370.0	370.0	370.0	350.0	210.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	0.03	<0.02
16	Total Sulfates (mg/l)	39.0	39.0	39.0	37.0	41.0	35.0
17	Total Iron (mg/l)	<0.02	<0.02	0.05	<0.05	0.84	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	1.3	12.0	<1.0
19	Total Hardness (mg/l as CaCO3)	180.0	160.0	180.0	150.0	160.0	90.0
20	Nitrates	0.42	0.93	0.32	0.51	0.11	0.86
21	Date Sampled for Analysis	8-21-98	9-28-98	10-26-98	11-27-98	12-15-98	1-27-99
22	Date Last Precipitation Event Occurred	8-17-98	9-9-98	10-18-98	11-25-98	12-9-98	1-23-99

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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-12	DS-12	DS-12	DS-12	DS-12	DS-12
2	Identification Number 98-	08208		10009	10481	11456	12280
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1198	1198	1198	1198	1198	1198
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.08 GPM	DRY	0.03 GPM	0.02 GPM	0.01 GPM	0.02 GPM
8	Date Above Measurements Made	7-14-98	8-30-98	9-28-98	10-26-98	11-27-98	12-15-98
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	6.80		7.60	7.30	7.80	7.60
11	Total Acidity (mg/l CaCO3)	16.0		8.30	8.40	4.60	10.0
12	Total Alkalinity (mg/l CaCO3)	150.0		150.0	160.0	150.0	160.0
13	Specific Conductivity (umhos/cm at 25° C)	330.0		330.0	340.0	330.0	350.0
14	Total Dissolved Solids (mg/l)	---		---	---	---	---
15	Total Manganese (mg/l)	<0.02		0.07	0.06	<0.02	0.12
16	Total Sulfates (mg/l)	27.0		25.0	23.0	26.0	33.0
17	Total Iron (mg/l)	<0.02		0.08	0.06	<0.05	0.14
18	Total Suspended Solids (mg/l)	<1.0		<1.0	1.3	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	150.0		140.0	190.0	150.0	160.0
20	Nitrates	0.63		0.31	0.10	0.40	<0.09
21	Date Sampled for Analysis	7-14-98		9-28-98	10-26-98	11-27-98	12-15-98
22	Date Last Precipitation Event Occurred	7-7-98		9-27-98	10-18-98	11-25-98	12-9-98

Laboratory Name TRA-DET, INC.
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-13	DS-13	DS-13	DS-13	DS-13	DS-13
2	Identification Number 98-	08244	09293	10187	11410	12264	99-01169
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1186	1186	1186	1186	1186	1186
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.58 GPM	0.63 GPM	0.60 GPM	0.36 GPM	0.26 GPM	6.5 GPM
8	Date Above Measurements Made	8-22-98	9-25-98	10-9-98	11-25-98	12-14-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.30	7.00	7.40	8.00	7.40	7.60
	Total Acidity (mg/l CaCO3)	14.0	26.0	13.0	6.10	2.60	4.00
12	Total Alkalinity (mg/l CaCO3)	210.0	230.0	220.0	210.0	220.0	45.0
13	Specific Conductivity (umhos/cm at 25° C)	620.0	580.0	580.0	620.0	620.0	220.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	0.06	0.03	0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	61.0	36.0	57.0	60.0	59.0	22.0
17	Total Iron (mg/l)	0.05	0.20	0.06	0.14	<0.05	0.29
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	4.7	<1.0	5.0
19	Total Hardness (mg/l as CaCO3)	280.0	270.0	250.0	280.0	290.0	70.0
20	Nitrates	4.60	1.50	2.60	2.10	2.40	<0.09
21	Date Sampled for Analysis	8-22-98	9-25-98	10-9-98	11-25-98	12-14-98	1-22-99
22	Date Last Precipitation Event Occurred	8-17-98	9-22-98	10-7-98	11-25-98	12-9-98	1-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-14	DS-14	DS-14	DS-14	DS-14	DS-14
2	Identification Number 98-	08267	10031	10184	11408	12263	99-01168
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1195	1195	1195	1195	1195	1195
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.13 GPM	0.86 GPM	0.45 GPM	0.04 GPM	0.05 GPM	6 GPM
8	Date Above Measurements Made	8-25-98	9-28-98	10-9-98	11-25-98	12-14-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.20	7.50	7.60	8.00	7.60	7.30
11	Total Acidity (mg/l CaCO3)	12.0	13.0	11.0	10.0	2.80	7.70
12	Total Alkalinity (mg/l CaCO3)	190.0	210.0	190.0	200.0	200.0	75.0
13	Specific Conductivity (umhos/cm at 25° C)	510.0	660.0	520.0	540.0	530.0	460.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	0.04	0.02	0.02	<0.02
16	Total Sulfates (mg/l)	46.0	59.0	45.0	46.0	47.0	31.0
17	Total Iron (mg/l)	0.05	<0.02	0.22	0.32	0.05	0.24
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	6.0	<1.0	9.0
19	Total Hardness (mg/l as CaCO3)	240.0	260.0	200.0	240.0	240.0	140.0
20	Nitrates	4.30	2.10	1.40	1.40	2.00	0.71
21	Date Sampled for Analysis	8-25-98	9-28-98	10-9-98	11-25-98	12-14-98	1-22-99
22	Date Last Precipitation Event Occurred	8-25-98	9-27-98	10-7-98	11-25-98	12-9-98	1-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-15	DS-15	DS-15	DS-15	DS-15	DS-15
2	Identification Number 98-	08268	10030				99-01164
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1114	1114	1114	1114	1114	1114
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0	0	0	0	0	6.8 GPM
8	Date Above Measurements Made	8-25-98	9-28-98	10-9-98	11-25-98	12-14-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.60	8.10	DRY	DRY	DRY	7.50
11	Total Acidity (mg/l CaCO3)	5.10	5.80				5.90
12	Total Alkalinity (mg/l CaCO3)	97.0	89.0				25.0
13	Specific Conductivity (umhos/cm at 25° C)	380.0	380.0				260.0
14	Total Dissolved Solids (mg/l)	---	---				---
15	Total Manganese (mg/l)	0.06	0.02				<0.02
16	Total Sulfates (mg/l)	36.0	37.0				32.0
17	Total Iron (mg/l)	9.80	1.60				0.19
18	Total Suspended Solids (mg/l)	21.0	27.0				8.0
19	Total Hardness (mg/l as CaCO3)	160.0	110.0				70.0
20	Nitrates	0.44	0.16				<0.09
21	Date Sampled for Analysis	8-25-98	9-28-98				1-22-99
22	Date Last Precipitation Event Occurred	8-25-98	9-27-98				1-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-16	DS-16	DS-16	DS-16	DS-16	DS-16
2	Identification Number 98-	08269	09290	10182	11403	12257	99-01159
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1146	1146	1146	1146	1146	1146
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.80 GPM	0.75 GPM	0.67 GPM	0.33 GPM	0.31 GPM	10 GPM
8	Date Above Measurements Made	8-25-98	9-25-98	10-9-98	11-25-98	12-14-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.10	7.50	7.70	8.10	7.60	7.20
11	Total Acidity (mg/l CaCO3)	9.60	25.0	12.0	6.80	5.20	7.70
12	Total Alkalinity (mg/l CaCO3)	220.0	230.0	230.0	240.0	240.0	51.0
13	Specific Conductivity (umhos/cm at 25° C)	500.0	520.0	490.0	530.0	520.0	160.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	--	---
15	Total Manganese (mg/l)	<0.02	<0.02	0.07	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	47.0	44.0	48.0	49.0	51.0	27.0
17	Total Iron (mg/l)	<0.02	<0.02	0.07	<0.05	<0.05	0.45
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	9.0
19	Total Hardness (mg/l as CaCO3)	290.0	190.0	180.0	200.0	160.0	60.0
20	Nitrates	2.5	0.49	0.43	0.24	0.36	1.00
21	Date Sampled for Analysis	8-25-98	9-25-98	10-9-98	11-25-98	12-14-98	1-22-99
22	Date Last Precipitation Event Occurred	8-25-98	9-22-98	10-7-98	11-25-98	12-9-98	1-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-17	DS-17	DS-17	DS-17	DS-17	DS-17
2	Identification Number 98-	08285	09301	11011	11412	12268	99-02156
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1090	1090	1090	1090	1090	1090
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.035 GPM	0.01 GPM	0.01 GPM	0.01 GPM	0.01 GPM	0.17 GPM
8	Date Above Measurements Made	8-26-98	9-25-98	10-29-98	11-25-98	12-14-98	1-30-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.80	7.70	7.70	8.20	7.50	7.90
11	Total Acidity (mg/l CaCO3)	10.0	20.0	7.80	7.70	4.80	6.40
12	Total Alkalinity (mg/l CaCO3)	200.0	210.0	210.0	200.0	200.0	150.0
13	Specific Conductivity (umhos/cm at 25° C)	330.0	410.0	420.0	360.0	380.0	320.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.82	0.31	0.36	0.52	0.38	0.05
16	Total Sulfates (mg/l)	2.00	21.0	19.0	22.0	24.0	22.0
17	Total Iron (mg/l)	8.00	0.47	0.44	0.70	0.65	0.17
18	Total Suspended Solids (mg/l)	29.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	200.0	190.0	180.0	200.0	190.0	160.0
20	Nitrates	0.17	0.18	<0.09	0.23	<0.09	<0.09
21	Date Sampled for Analysis	8-26-98	9-25-98	10-29-98	11-25-98	12-14-98	1-30-99
22	Date Last Precipitation Event Occurred	8-26-98	9-22-98	10-29-98	11-25-98	12-9-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-18	DS-18	DS-18	DS-18	DS-18	DS-18
2	Identification Number 98-	08286	10035	11399	99-01134	99-02157	
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1127	1127	1127	1127	1127	1127
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.54 GPM	0.64 GPM	0.08 GPM	0.23 GPM	3.3 GPM	3.3 GPM
8	Date Above Measurements Made	9-29-98	10-21-98	11-24-98	12-31-98	1-30-99	
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	6.6	7.90	7.80	7.20	6.90	
11	Total Acidity (mg/l CaCO3)	25	14.00	4.80	22.0	9.2	
12	Total Alkalinity (mg/l CaCO3)	130	190.0	170.0	130.0	58.0	
13	Specific Conductivity (umhos/cm at 25° C)	350	430	390	330.0	160.0	
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	
15	Total Manganese (mg/l)	0.07	<0.02	<0.02	0.02	<0.02	
16	Total Sulfates (mg/l)	49	60	48	48	32	
17	Total Iron (mg/l)	0.20	<0.05	<0.05	<0.05	<0.05	
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	
19	Total Hardness (mg/l as CaCO3)	140	220	190	180	70	
20	Nitrates	0.98	0.20	<0.09	<0.09	0.55	
21	Date Sampled for Analysis	9-29-98	10-21-98	11-24-98	12-31-98	1-30-99	
22	Date Last Precipitation Event Occurred	9-29-98	10-18-98	11-23-98	12-31-98	1-23-99	

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-19	DS-19	DS-19	DS-19	DS-19	DS-19
2	Identification Number 98-		10056	11083	12004	12354	99-01393
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1139	1139	1139	1139	1139	1139
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0	0.01 GPM	0	0.01 GPM	0.01 GPM	0.30 GPM
8	Date Above Measurements Made	8-26-98	9-30-98	10-29-98	11-28-98	12-17-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	DRY	9.20	7.60	8.00	7.90	7.20
	Total Acidity (mg/l CaCO3)		0.00	0.28	<1.0	16.0	2.80
12	Total Alkalinity (mg/l CaCO3)		63.00	120.00	76.0	63.0	22.0
13	Specific Conductivity (umhos/cm at 25° C)		170.0	320.0	150.0	210.0	38.0
14	Total Dissolved Solids (mg/l)		---	---	---	---	---
15	Total Manganese (mg/l)		0.92	0.06	0.07	0.06	0.11
16	Total Sulfates (mg/l)		10.0	17.0	8.50	31.0	4.60
17	Total Iron (mg/l)		1.10	0.08	0.08	<0.05	0.07
18	Total Suspended Solids (mg/l)		8.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)		60.0	120.0	50.0	60.0	20.0
20	Nitrates		0.12	<0.09	0.87	0.54	0.27
21	Date Sampled for Analysis	8-26-98	9-30-98	10-29-98	11-28-98	12-17-98	1-27-99
22	Date Last Precipitation Event Occurred	8-26-98	9-29-98	10-29-98	11-25-98	12-17-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-19	DS-19	DS-19	DS-19	DS-19	DS-19
2	Identification Number 98-		10056	11083	12004	12354	99-01393
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1139	1139	1139	1139	1139	1139
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0	0.01 GPM	0	0.01 GPM	0.01 GPM	0.30 GPM
8	Date Above Measurements Made	8-26-98	9-30-98	10-29-98	11-28-98	12-17-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	DRY	9.20	7.60	8.00	7.90	7.20
11	Total Acidity (mg/l CaCO3)		10.00	0.28	<1.0	16.0	2.80
12	Total Alkalinity (mg/l CaCO3)		63.00	120.00	76.0	63.0	22.0
13	Specific Conductivity (umhos/cm at 25° C)		170.0	320.0	150.0	210.0	38.0
14	Total Dissolved Solids (mg/l)		---	---	---	---	---
15	Total Manganese (mg/l)		0.92	0.06	0.07	0.06	0.11
16	Total Sulfates (mg/l)		10.0	17.0	8.50	31.0	4.60
17	Total Iron (mg/l)		1.10	0.08	0.08	<0.05	0.07
18	Total Suspended Solids (mg/l)		8.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)		60.0	120.0	50.0	60.0	20.0
20	Nitrates		0.12	<0.09	0.87	0.54	0.27
21	Date Sampled for Analysis	8-26-98	9-30-98	10-29-98	11-28-98	12-17-98	1-27-99
22	Date Last Precipitation Event Occurred	8-26-98	9-29-98	10-29-98	11-25-98	12-17-98	1-23-99

Laboratory Name TRA-DET, INC.
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-20	DS-20	DS-20	DS-20	DS-20	DS-20
2	Identification Number 98-	08306	10057	11014	12005	12355	99-01394
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1141	1141	1141	1141	1141	1141
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.47 GPM	0.03 GPM	0.03 GPM	0.11 GPM	0.01 GPM	7.7 GPM
8	Date Above Measurements Made	8-27-98	9-30-98	10-29-98	11-28-98	12-17-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.50	7.30	7.40	7.20	7.30	6.70
11	Total Acidity (mg/l CaCO3)	10.0	6.90	4.40	12.0	22.0	21.0
12	Total Alkalinity (mg/l CaCO3)	110.0	140.0	150.0	130.0	140.0	53.0
13	Specific Conductivity (umhos/cm at 25° C)	300.0	380.0	330.0	330.0	350.0	160.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	0.03	<0.02	0.03	1.20	<0.02
16	Total Sulfates (mg/l)	34.0	25.0	22.0	28.0	26.0	21.0
17	Total Iron (mg/l)	0.07	0.08	0.14	<0.05	0.25	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	2.7	<1.0
19	Total Hardness (mg/l as CaCO3)	150.0	160.0	150.0	140.0	150.0	70.0
20	Nitrates	1.30	0.54	0.49	0.96	0.28	2.00
21	Date Sampled for Analysis	8-27-98	9-30-98	10-29-98	11-28-98	12-17-98	1-27-99
22	Date Last Precipitation Event Occurred	8-26-98	9-29-98	10-29-98	11-27-98	12-17-98	1-23-99

Laboratory Name TRA-DET, INC.
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-20A	DS-20A	DS-20A	DS-20A	DS-20A	DS-20A
2	Identification Number 98-	10067	11015	12006	12356	99-01395	99-02252
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1141	1141	1141	1141	1141	1141
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.08 GPM	0.09 GPM	0.13 GPM	0.13 GPM	0.42 GPM	.5 GPM
8	Date Above Measurements Made	9-30-98	10-29-98	11-28-98	12-17-98	1-27-98	2-10-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.80	7.30	7.20	7.20	7.10	7.00
11	Total Acidity (mg/l CaCO3)	7.20	5.30	14.0	31.0	19.0	14.0
12	Total Alkalinity (mg/l CaCO3)	160.00	180.00	170.0	190.0	97.0	100.0
13	Specific Conductivity (umhos/cm at 25° C)	410.0	390.0	410.0	410.0	230.0	250.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.03	<0.02	0.02	0.02	0.02	0.02
16	Total Sulfates (mg/l)	28.0	22.0	28.0	28.0	24.0	23.0
17	Total Iron (mg/l)	<0.05	<0.05	0.06	0.05	0.06	0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	180.0	190.00	190.0	190.0	100.0	110.0
20	Nitrates	0.17	0.22	0.55	0.54	0.85	0.90
21	Date Sampled for Analysis	9-30-98	10-29-98	11-28-98	12-17-98	1-27-99	2-10-99
22	Date Last Precipitation Event Occurred	9-29-98	10-29-98	11-25-98	12-17-98	1-23-97	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-21	DS-21	DS-21	DS-21	DS-21	DS-21
2	Identification Number 98-	08301	10014	11020	12010	99-01057	99-01314
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1159	1159	1159	1159	1159	1159
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.47 GPM	0.47 GPM	0.18 GPM	0.12 GPM	0.16 GPM	1.0 GPM
8	Date Above Measurements Made	8-27-98	9-28-98	10-29-98	11-28-98	12-30-98	1-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	6.90	7.40	7.90	7.70	8.40	7.8
	Total Acidity (mg/l CaCO3)	18.0	15.0	13.0	18.0	0.00	2.8
12	Total Alkalinity (mg/l CaCO3)	250.0	200.0	210.0	200.0	190.0	130.0
13	Specific Conductivity (umhos/cm at 25° C)	480.0	470.0	470.0	540.0	390.0	130.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	34.0	31.0	33.0	40.0	40.0	1.20
17	Total Iron (mg/l)	<0.02	<0.02	<0.05	<0.05	<0.05	0.10
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	2.7	1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	270.0	230.0	260.0	240.0	260.0	90.0
20	Nitrates	2.20	0.95	1.30	1.20	0.77	0.10
21	Date Sampled for Analysis	8-27-98	9-28-98	10-29-98	11-28-98	13-30-98	1-23-99
22	Date Last Precipitation Event Occurred	8-26-98	9-27-98	10-29-98	11-25-98	12-29-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-22	DS-22	DS-22	DS-22	DS-22	DS-22
2	Identification Number 98-	08296	10015	11021	12011	99-01128	99-02101
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1121	1121	1121	1121	1121	1121
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.12 GPM	0.06 GPM	0.21 GPM	0.19 GPM	0.31 GPM	1.3 GPM
8	Date Above Measurements Made	8-27-98	9-28-98	10-29-98	11-28-98	12-31-98	1-28-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.30	7.50	7.60	7.60	7.70	7.20
11	Total Acidity (mg/l CaCO3)	13.0	13.0	12.0	5.90	12.0	15.0
12	Total Alkalinity (mg/l CaCO3)	200.0	160.0	240.0	160.0	220.0	190.0
13	Specific Conductivity (umhos/cm at 25° C)	460.0	330.0	560.0	600.0	540.0	420.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.06	0.22	0.03	<0.02	<0.02	0.02
16	Total Sulfates (mg/l)	47.0	8.70	53.0	61.0	59.0	40.0
17	Total Iron (mg/l)	0.23	0.41	0.27	0.32	0.05	<0.05
18	Total Suspended Solids (mg/l)	4.7	4.7	<1.0	<1.0	<1.0	1.3
19	Total Hardness (mg/l as CaCO3)	260.0	150.0	130.0	260.0	300.0	250.0
20	Nitrates	0.30	<0.10	0.18	0.43	0.27	0.50
21	Date Sampled for Analysis	8-27-98	9-28-98	10-29-98	11-28-98	12-31-98	1-28-99
22	Date Last Precipitation Event Occurred	8-26-98	9-27-98	10-29-98	11-25-98	12-31-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-23	DS-23	DS-23	DS-23	DS-23	DS-23
2	Identification Number 98-	08299	10016	11022	12012	99-01129	99-02102
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1129	1129	1129	1129	1129	1129
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.58 GPM	0.06 GPM	0.27 GPM	0.31 GPM	0.54 GPM	5.1 GPM
8	Date Above Measurements Made	8-27-98	9-28-98	10-29-98	11-28-98	12-31-98	1-28-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.10	7.30	7.40	7.40	7.40	7.10
11	Total Acidity (mg/l CaCO3)	15.0	17.0	32.0	12.0	14.0	16.0
12	Total Alkalinity (mg/l CaCO3)	220.0	220.0	220.0	210.0	150.0	160.0
13	Specific Conductivity (umhos/cm at 25° C)	440.0	450.0	410.0	590.0	320.0	340.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	42.0	41.0	39.0	42.0	41.0	34.0
17	Total Iron (mg/l)	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	250.0	200.0	230.0	220.0	220.0	200.0
20	Nitrates	<0.10	<0.10	<0.09	0.13	0.11	0.51
21	Date Sampled for Analysis	8-27-98	9-28-98	10-29-98	11-28-98	12-31-98	1-28-99
22	Date Last Precipitation Event Occurred	8-26-98	9-27-98	10-29-98	11-25-98	12-31-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-24	DS-24	DS-24	DS-24	DS-24	DS-24
2	Identification Number 98-	08297	10058	11023	12013	99-01056	99-01320
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1120	1120	1120	1120	1120	1120
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.16 GPM	0.12 GPM	0.12 GPM	0.12 GPM	0.12 GPM	4.8 GPM
8	Date Above Measurements Made	8-27-98	9-30-98	10-29-98	11-28-98	12-30-98	1-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.50	7.20	8.20	8.40	8.50	7.60
	Total Acidity (mg/l CaCO3)	9.10	9.80	12.0	0.00	0.00	24.0
12	Total Alkalinity (mg/l CaCO3)	210.0	210.0	220.0	180.0	180.0	82.0
13	Specific Conductivity (umhos/cm at 25° C)	440.0	460.0	450.0	470.0	380.0	180.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	51.0	51.0	50.0	52.0	48.0	20.0
17	Total Iron (mg/l)	<0.02	<0.05	<0.05	<0.05	<0.05	0.32
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	11.0
19	Total Hardness (mg/l as CaCO3)	250.0	260.0	240.0	230.0	240.0	80.0
20	Nitrates	<0.10	<0.09	<0.09	<0.09	0.17	0.58
21	Date Sampled for Analysis	8-27-98	9-30-98	10-29-98	11-28-98	12-30-98	1-23-99
22	Date Last Precipitation Event Occurred	8-26-98	9-29-98	10-29-98	11-25-98	12-29-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-25	DS-25	DS-25	DS-25	DS-25	DS-25
2	Identification Number 98-	08300	10059	11024	12014	99-01055	99-01321
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1144	1144	1144	1144	1144	1144
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.17 GPM	0.17 GPM	0.11 GPM	0.07 GPM	0.09 GPM	2.7 GPM
8	Date Above Measurements Made	8-27-98	9-30-98	10-29-98	11-28-98	12-30-98	1-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.30	7.20	7.90	8.20	8.60	6.9
	Total Acidity (mg/l CaCO3)	12.0	10.0	13.0	14.0	0.00	24.0
12	Total Alkalinity (mg/l CaCO3)	220.0	240.0	260.0	200.0	200.0	140.0
13	Specific Conductivity (umhos/cm at 25° C)	490.0	520.0	500.0	570.0	450.0	310.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	58.0	58.0	54.0	62.0	60.0	35.0
17	Total Iron (mg/l)	0.08	<0.05	<0.05	<0.05	0.06	0.06
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	7.3
19	Total Hardness (mg/l as CaCO3)	260.0	270.0	280.0	280.0	290.0	150.0
20	Nitrates	1.6	1.7	0.65	0.85	0.28	2.00
21	Date Sampled for Analysis	8-27-98	9-30-98	10-29-98	11-28-98	12-30-98	1-23-99
22	Date Last Precipitation Event Occurred	8-26-98	9-29-98	10-29-98	11-25-98	12-2-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-26	DS-26	DS-26	DS-26	DS-26	DS-26
2	Identification Number 98-	08305		10463	12022	99-01122	99-02174
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1199	1199	1199	1199	1199	1199
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.50 GPM	0.23 GPM	0.15 GPM	0.12 GPM	0.12 GPM	1.9 GPM
8	Date Above Measurements Made	8-27-88		10-26-98	11-28-98	12-31-98	1-29-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.40		8.30	7.90	7.90	7.10
11	Total Acidity (mg/l CaCO3)	3.80		0.00	6.80	7.70	2.20
12	Total Alkalinity (mg/l CaCO3)	58.0		96.0	120.0	120.0	28.0
13	Specific Conductivity (umhos/cm at 25° C)	170.0		300.0	410.0	340.0	120.0
14	Total Dissolved Solids (mg/l)	---		---	---	---	---
15	Total Manganese (mg/l)	<0.02		<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	16.0		22.0	29.0	33.0	21.0
17	Total Iron (mg/l)	0.06		0.13	0.22	0.61	0.08
18	Total Suspended Solids (mg/l)	<1.0		<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	60.0		110.0	130.0	160.0	50.0
20	Nitrates	0.38		0.84	1.20	0.50	0.16
21	Date Sampled for Analysis	8-27-98		10-26-98	11-28-98	12-31-98	1-29-99
22	Date Last Precipitation Event Occurred	8-26-98		10-18-98	11-25-98	12-31-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-27	DS-27	DS-27	DS-27	DS-27	DS-27
2	Identification Number					99-01123	99-02176
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1165	1165	1165	1165	1165	1165
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0	0	0	0	0.01 GPM	0.12 GPM
8	Date Above Measurements Made	8-29-98	9-17-98	10-6-98	11-12-98	12-31-98	1-29-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)					8.1	7.8
11	Total Acidity (mg/l CaCO3)					3.1	<1.0
12	Total Alkalinity (mg/l CaCO3)					65.0	86.0
13	Specific Conductivity (umhos/cm at 25° C)					180.0	180.0
14	Total Dissolved Solids (mg/l)					---	---
15	Total Manganese (mg/l)					<0.02	<0.02
16	Total Sulfates (mg/l)					35.0	25.0
17	Total Iron (mg/l)					0.08	<0.05
18	Total Suspended Solids (mg/l)					<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)					90.0	100.0
20	Nitrates					0.43	<0.09
21	Date Sampled for Analysis					12-31-98	1-29-99
22	Date Last Precipitation Event Occurred					12-31-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC.

(D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-28	DS-28	DS-28	DS-28	DS-28	DS-28
2	Identification Number 98-	08309	09198	10106	11238	12138	99-02171
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1205	1205	1205	1205	1205	1205
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.20 GPM	1.10 GPM	0.14 GPM	0.13 GPM	0.13 GPM	1.30 GPM
8	Date Above Measurements Made	8-29-98	9-17-98	10-6-98	11-12-98	12-9-98	1-30-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.50	7.30	7.70	7.80	7.80	7.80
12	Total Acidity (mg/l CaCO3)	9.40	33.0	7.60	17.0	12.0	4.7
13	Total Alkalinity (mg/l CaCO3)	220.0	240.0	230.0	220.0	210.0	110.0
14	Specific Conductivity (umhos/cm at 25° C)	450.0	560.0	440.0	430.0	440.0	340.0
15	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
16	Total Manganese (mg/l)	<0.02	<0.02	0.02	<0.02	0.02	<0.02
17	Total Sulfates (mg/l)	38.0	43.0	50.0	43.0	42.0	36.0
18	Total Iron (mg/l)	0.06	0.06	0.25	0.16	0.26	0.14
9	Total Suspended Solids (mg/l)	8.70	31.0	3.30	<1.0	8.0	1.30
0	Total Hardness (mg/l as CaCO3)	230.0	240.0	230.0	210.0	220.0	170.0
1	Nitrates	0.10	0.11	0.10	0.10	0.18	0.51
2	Date Sampled for Analysis	8-29-98	9-17-98	10-6-98	11-12-98	12-9-98	1-30-99
	Date Last Precipitation Event Occurred	8-26-98	9-9-98	10-4-98	11-10-98	12-9-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019
State WEST VIRGINIA
City WHEELING
Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC.

(D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-29	DS-29	DS-29	DS-29	DS-29	DS-29
2	Identification Number 98-	09164	10491	11446	12270	99-01317	99-02261
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1030	1030	1030	1030	1030	1030
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.34 GPM	0.23 GPM	0.18 GPM	0.08 GPM	2.2 GPM	3.8 GPM
8	Date Above Measurements Made	9-12-98	10-16-98	11-27-98	12-14-98	1-23-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	C	C	C	C	C	C
10	pH (Standard Units)	7.70	7.20	8.00	7.30	7.60	8.00
12	Total Acidity (mg/l CaCO3)	41.0	10.0	5.90	<1.0	11.5	8.5
13	Total Alkalinity (mg/l CaCO3)	230.0	160.0	170.0	140.0	81.0	80.0
14	Specific Conductivity (umhos/cm at 25° C)	760.0	340.0	330.0	390.0	210.0	230.0
15	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
16	Total Manganese (mg/l)	0.02	<0.02	<0.02	0.02	<0.02	<0.02
17	Total Sulfates (mg/l)	160.0	12.0	18.0	22.0	34.0	34.0
8	Total Iron (mg/l)	0.82	0.06	<0.05	<0.05	<0.05	<0.05
9	Total Suspended Solids (mg/l)	55.0	<1.0	1.3	<1.0	<1.0	<1.0
0	Total Hardness (mg/l as CaCO3)	330.0	160.0	160.0	140.0	90.0	100.0
1	Nitrates	2.0	1.3	0.28	<0.09	<0.09	0.11
2	Date Sampled for Analysis	9-12-98	10-16-98	11-29-98	12-14-98	1-23-99	2-10-99
	Date Last Precipitation Event Occurred	9-9-98	10-7-98	11-25-98	12-9-98	1-23-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019
State WEST VIRGINIA
City WHEELING
Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-30	DS-30	DS-30	DS-30	DS-30	DS-30
2	Identification Number 98-	09246	11030			99-01326	99-02270
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1180	1180	1180	1180	1180	1180
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0	0	0	0	1.3 GPM	.38 GPM
8	Date Above Measurements Made	9-21-98	10-30-98	11-27-98	12-14-98	1-23-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.00	7.50	DRY	DRY	7.50	7.30
11	Total Acidity (mg/l CaCO3)	38.0	25.0			6.20	5.10
12	Total Alkalinity (mg/l CaCO3)	70.0	190.0			49.0	91.0
13	Specific Conductivity (umhos/cm at 25° C)	220.0	350.0			130.0	200.0
14	Total Dissolved Solids (mg/l)	---	---			---	---
15	Total Manganese (mg/l)	0.20	0.07			0.03	<0.02
16	Total Sulfates (mg/l)	26.0	22.0			21.0	24.0
17	Total Iron (mg/l)	0.68	0.17			0.44	<0.05
18	Total Suspended Solids (mg/l)	48.0	22.0			2.70	<1.0
19	Total Hardness (mg/l as CaCO3)	60.0	180.0			70.0	80.0
20	Nitrates	0.10	0.30			0.11	<0.09
21	Date Sampled for Analysis	9-21-98	10-30-98			1-23-99	2-10-99
22	Date Last Precipitation Event Occurred	9-21-98	10-29-98			1-23-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-31	DS-31	DS-31	DS-31	DS-31	DS-31
2	Identification Number 98-	09247	11032	11439	12295	99-01324	99-02269
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1150	1150	1150	1150	1150	1150
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.23 GPM	0.25 GPM	0.28 GPM	0.26 GPM	1.8 GPM	.63 GPM
8	Date Above Measurements Made	9-21-98	10-30-98	11-25-98	12-18-98	1-23-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.30	7.20	7.30	7.40	7.10	7.30
12	Total Acidity (mg/l CaCO3)	44.0	12.0	9.20	7.70	18.0	12.0
13	Total Alkalinity (mg/l CaCO3)	220.0	220.0	220.0	200.0	180.0	190.0
14	Specific Conductivity (umhos/cm at 25° C)	460.0	460.0	470.0	440.0	410.0	450.0
15	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
16	Total Manganese (mg/l)	<0.02	<0.02	<0.02	0.02	0.02	<0.02
17	Total Sulfates (mg/l)	27.0	28.0	29.0	33.0	28.0	29.0
18	Total Iron (mg/l)	<0.02	<0.05	0.05	0.10	0.18	0.08
19	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	4.70	<1.0	<1.0
20	Total Hardness (mg/l as CaCO3)	210.0	220.0	300.0	240.0	210.0	230.0
21	Nitrates	6.40	4.40	4.00	4.00	5.70	6.40
22	Date Sampled for Analysis	9-21-98	10-30-98	11-25-98	12-18-98	1-23-99	2-10-99
	Date Last Precipitation Event Occurred	9-21-98	10-30-98	11-25-98	12-17-98	1-23-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-32	DS-32	DS-32	DS-32	DS-32	DS-32
2	Identification Number 98-	10034	10489	11465	12292	99-01340	99-02256
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1158	1158	1158	1158	1158	1158
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.06 GPM	0.03 GPM	0.16 GPM	0.14 GPM	1.9 GPM	.54 GPM
8	Date Above Measurements Made	9-29-98	10-16-98	11-27-98	12-15-98	1-23-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.30	7.70	7.60	7.90	7.30	7.70
11	Total Acidity (mg/l CaCO3)	13.0	7.00	5.30	3.20	9.60	13.0
12	Total Alkalinity (mg/l CaCO3)	210.0	220.0	200.0	220.0	110.0	140.0
13	Specific Conductivity (umhos/cm at 25° C)	410.0	440.0	440.0	400.0	220.0	330.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.05	0.03	0.08	0.04	0.02	<0.02
16	Total Sulfates (mg/l)	30.0	28.0	28.0	29.0	27.0	31.0
17	Total Iron (mg/l)	<0.02	0.07	0.18	0.07	0.22	0.46
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	7.3	<1.0
19	Total Hardness (mg/l as CaCO3)	170.0	200.0	180.0	200.0	110.0	140.0
20	Nitrates	<0.10	<0.09	0.09	<0.09	0.38	0.10
21	Date Sampled for Analysis	9-29-98	10-16-98	11-27-98	12-15-98	1-23-99	2-10-99
22	Date Last Precipitation Event Occurred	9-29-98	10-7-98	11-25-98	12-9-98	1-23-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-33	DS-33	DS-33	DS-33	DS-33	DS-33
2	Identification Number 98-	09248	11034	11436	12293	99-01328	99-02272
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1178	1178	1178	1178	1178	1178
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.14 GPM	0.75 GPM	0.27 GPM	0.40 GPM	3.1 GPM	3.8 GPM
8	Date Above Measurements Made	9-21-98	10-30-98	11-25-98	12-18-98	1-23-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.90	7.40	7.60	7.50	7.30	7.20
	Total Acidity (mg/l CaCO3)	30.0	11.0	9.20	7.90	13.0	9.0
12	Total Alkalinity (mg/l CaCO3)	220.0	230.0	220.0	220.0	120.0	190.0
13	Specific Conductivity (umhos/cm at 25° C)	460.0	430.0	430.0	400.0	240.0	400.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	0.02	<0.02
16	Total Sulfates (mg/l)	52.0	25.0	27.0	28.0	24.0	26.0
17	Total Iron (mg/l)	0.12	<0.05	<0.05	<0.05	1.20	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	11.0	<1.0
19	Total Hardness (mg/l as CaCO3)	210.0	230.0	240.0	240.0	140.0	190.0
20	Nitrates	0.17	0.17	<0.09	<0.09	0.19	0.14
21	Date Sampled for Analysis	9-21-98	10-30-98	11-25-98	12-18-98	1-23-99	2-10-99
22	Date Last Precipitation Event Occurred	9-21-98	10-29-98	11-25-98	12-17-98	1-23-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-34	DS-34	DS-34	DS-34	DS-34	DS-34
2	Identification Number 98-	09270	11064	12041	99-01044	99-02162	99-02300
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1210	1210	1210	1210	1210	1210
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0	0	0	0	0	0
8	Date Above Measurements Made	9-23-98	10-31-98	11-28-98	12-30-98	1-30-99	2-11-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.50	7.50	8.20	8.50	7.80	7.40
	Total Acidity (mg/l CaCO3)	30.0	5.10	9.00	0.00	4.5	17.0
12	Total Alkalinity (mg/l CaCO3)	210.0	220.0	210.0	150.0	120.0	130.0
13	Specific Conductivity (umhos/cm at 25° C)	430.0	470.0	450.0	350.0	270.0	310.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	38.0	34.0	40.0	36.0	24.0	26.0
17	Total Iron (mg/l)	<0.02	<0.05	0.09	<0.05	0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	220.0	220.0	220.0	180.0	160.0	140.0
20	Nitrates	0.34	0.20	<0.09	0.17	0.29	0.10
21	Date Sampled for Analysis	9-23-98	10-31-98	11-28-98	12-30-98	1-30-99	2-11-99
22	Date Last Precipitation Event Occurred	9-22-98	10-29-98	11-25-98	12-29-98	1-23-99	2-11-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-35	DS-35	DS-35	DS-35	DS-35	DS-35
2	Identification Number 98-	09271	11070	11383	99-01048	99-02080	99-02294
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1222	1222	1222	1222	1222	1222
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.05 GPM	0.07 GPM	0.08 GPM	0.06 GPM	0.68 GPM	0.74 GPM
8	Date Above Measurements Made	9-23-98	10-31-98	11-24-98	12-30-98	1-28-99	2-11-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	6.90	7.00	7.20	7.40	6.60	6.60
12	Total Acidity (mg/l CaCO3)	20.0	8.40	15.0	9.40	37.0	12.0
13	Total Alkalinity (mg/l CaCO3)	160.0	150.0	150.0	150.0	58.0	64.0
14	Specific Conductivity (umhos/cm at 25° C)	430.0	380.0	330.0	330.0	260.0	290.0
15	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
16	Total Manganese (mg/l)	<0.02	0.04	<0.02	<0.02	<0.02	<0.02
17	Total Sulfates (mg/l)	38.0	33.0	34.0	37.0	33.0	33.0
18	Total Iron (mg/l)	<0.02	<0.05	<0.05	0.05	<0.05	<0.05
19	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
20	Total Hardness (mg/l as CaCO3)	170.0	180.0	190.0	170.0	110.0	110.0
21	Nitrates	2.40	1.40	0.20	0.88	0.92	8.70
22	Date Sampled for Analysis	9-23-98	10-31-98	11-24-98	12-30-98	1-28-99	2-11-99
	Date Last Precipitation Event Occurred	9-22-98	10-29-98	11-23-98	12-29-98	1-23-99	2-11-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-36	DS-36	DS-36	DS-36	DS-36	DS-36
2	Identification Number 98-	09272	11071	11384	99-01049	99-02081	99-02295
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1210	1210	1210	1210	1210	1210
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.09 GPM	0.06 GPM	0.04 GPM	0.05 GPM	0.85 GPM	0.82 GPM
8	Date Above Measurements Made	9-23-98	10-31-98	11-24-98	12-30-98	1-28-99	2-11-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.60	7.80	8.40	8.60	7.00	7.00
	Total Acidity (mg/l CaCO3)	25.0	5.50	0.00	0.00	13.0	12.0
12	Total Alkalinity (mg/l CaCO3)	220.0	210.0	230.0	190.0	100.0	100.0
13	Specific Conductivity (umhos/cm at 25° C)	580.0	490.0	510.0	440.0	320.0	350.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	0.04	0.03	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	50.0	27.0	29.0	29.0	22.0	24.0
17	Total Iron (mg/l)	0.09	<0.05	0.43	0.09	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	8.70	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	300.0	290.0	300.0	260.0	220.0	150.0
20	Nitrates	7.40	7.10	5.40	5.0	9.0	8.8
21	Date Sampled for Analysis	9-23-98	10-31-98	11-24-98	12-30-98	1-28-99	2-11-99
22	Date Last Precipitation Event Occurred	9-22-98	10-29-98	11-23-98	12-29-98	1-23-99	2-11-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-37	DS-37	DS-37	DS-37	DS-37	DS-37
2	Identification Number 98-	09273	11072	11385	99-01050	99-02084	99-02298
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1185	1185	1185	1185	1185	1185
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.05 GPM	0.12 GPM	0.11 GPM	0.23 GPM	1.3 GPM	1.6 GPM
8	Date Above Measurements Made	9-23-98	10-31-98	11-24-98	12-30-98	1-28-99	2-11-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.60	7.90	8.10	8.40	7.30	7.30
	Total Acidity (mg/l CaCO3)	15.0	<1.0	11.0	0.00	10.0	8.0
12	Total Alkalinity (mg/l CaCO3)	130.0	140.0	140.0	140.0	84.0	81.0
13	Specific Conductivity (umhos/cm at 25° C)	350.0	320.0	280.0	300.0	250.0	250.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.71	0.20	<0.02	0.78	0.06	0.04
16	Total Sulfates (mg/l)	35.0	29.0	32.0	40.0	39.0	38.0
17	Total Iron (mg/l)	0.09	<0.05	<0.05	0.08	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	150.0	150.0	170.0	150.0	130.0	100.0
20	Nitrates	1.60	0.80	0.45	0.47	0.88	0.66
21	Date Sampled for Analysis	9-23-98	10-31-98	11-24-98	12-30-98	1-28-99	2-11-99
22	Date Last Precipitation Event Occurred	9-22-98	10-29-98	11-23-98	12-29-98	1-23-99	2-11-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC.

(D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-38	DS-38	DS-38	DS-38	DS-38	DS-38
2	Identification Number 98-	09274	11073	11386	99-01051	99-02083	99-02297
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1180	1180	1180	1180	1180	1180
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.16 GPM	0.13 GPM	0.18 GPM	0.12 GPM	3.8 GPM	4.2 GPM
8	Date Above Measurements Made	9-23-98	10-31-98	11-24-98	12-30-98	1-28-99	2-11-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.80	7.90	8.20	8.20	7.50	7.50
12	Total Acidity (mg/l CaCO3)	20.0	8.20	19.0	5.20	11.0	9.0
13	Total Alkalinity (mg/l CaCO3)	190.0	170.0	200.0	200.0	150.0	130.0
14	Specific Conductivity (umhos/cm at 25° C)	350.0	390.0	350.0	370.0	330.0	330.0
15	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
16	Total Manganese (mg/l)	0.03	0.38	0.03	0.02	<0.02	<0.02
17	Total Sulfates (mg/l)	31.0	29.0	34.0	37.0	28.0	32.0
18	Total Iron (mg/l)	<0.02	0.55	<0.05	0.06	<0.05	<0.05
19	Total Suspended Solids (mg/l)	1.30	<1.0	<1.0	<1.0	<1.0	<1.0
20	Total Hardness (mg/l as CaCO3)	200.0	210.0	190.0	200.0	160.0	170.0
21	Nitrates	0.29	0.80	<0.09	0.21	0.68	0.70
22	Date Sampled for Analysis	9-23-98	10-31-98	11-24-98	12-30-98	1-28-99	2-11-99
	Date Last Precipitation Event Occurred	9-22-98	11-29-98	11-23-98	12-29-98	1-23-99	2-11-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019
State WEST VIRGINIA
City WHEELING
Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-39	DS-39	DS-39	DS-39	DS-39	DS-39
2	Identification Number 98-	09344	11067	11387	99-01045	99-02087	99-02293
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1160	1160	1160	1160	1160	1160
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.10 GPM	0.10 GPM	0.09 GPM	0.26 GPM	1.4 GPM	1.1 GPM
8	Date Above Measurements Made	9-25-98	10-31-98	11-24-98	12-30-98	1-28-99	2-11-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.50	7.90	8.40	8.20	7.20	7.0
	Total Acidity (mg/l CaCO3)	46.0	8.20	0.00	2.70	9.90	10.0
12	Total Alkalinity (mg/l CaCO3)	190.0	170.0	170.0	180.0	130.0	120.0
13	Specific Conductivity (umhos/cm at 25° C)	540.0	490.0	440.0	470.0	340.0	380.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.08	0.04	0.02	0.06	0.04	0.04
16	Total Sulfates (mg/l)	39.0	32.0	37.0	44.0	30.0	33.0
17	Total Iron (mg/l)	0.46	0.12	0.25	0.20	0.14	0.17
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	2.7	<1.0
19	Total Hardness (mg/l as CaCO3)	220.0	220.0	220.0	220.0	170.0	170.0
20	Nitrates	2.10	1.60	0.44	<0.09	1.40	1.00
21	Date Sampled for Analysis	9-25-98	10-31-98	11-24-98	12-30-98	1-28-99	2-11-99
22	Date Last Precipitation Event Occurred	9-22-98	10-29-98	11-23-98	12-29-98	1-23-99	2-11-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC.

(D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-40	DS-40	DS-40	DS-40	DS-40	DS-40
2	Identification Number 98-	09352	11037	11429	12371	99-02091	99-02447
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1213	1213	1213	1213	1213	1213
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.06 GPM	0.75 GPM	0.11 GPM	0.13 GPM	1.2 GPM	.94 GPM
8	Date Above Measurements Made	9-26-98	10-30-98	11-25-98	12-17-98	1-28-99	2-26-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.10	7.20	7.50	7.60	7.50	7.50
11	Total Acidity (mg/l CaCO3)	11.0	11.0	3.30	17.0	11.0	17.0
12	Total Alkalinity (mg/l CaCO3)	200.0	200.0	200.0	200.0	190.0	210.0
13	Specific Conductivity (umhos/cm at 25° C)	440.0	400.0	400.0	410.0	370.0	430.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.14	0.22	0.05	0.03	<0.02	<0.02
16	Total Sulfates (mg/l)	33.0	28.0	29.0	31.0	25.0	33.0
17	Total Iron (mg/l)	0.51	0.33	0.23	0.13	<0.05	<0.05
18	Total Suspended Solids (mg/l)	6.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	200.0	230.0	180.0	210.0	210.0	210.0
20	Nitrates	0.22	0.09	0.10	<0.09	0.76	0.47
21	Date Sampled for Analysis	9-26-98	10-30-98	11-25-98	12-17-98	1-28-99	2-26-99
22	Date Last Precipitation Event Occurred	9-22-98	10-29-98	11-25-98	12-17-98	1-23-99	2-26-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019
State WEST VIRGINIA
City WHEELING
Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-41	DS-41	DS-41	DS-41	DS-41	DS-41
2	Identification Number 98-	09354	11063	11367	12391	99-02143	99-03041
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1195	1195	1195	1195	1195	1195
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.04 GPM	0.05 GPM	0.03 GPM	0.02 GPM	0.60 GPM	0.59 GPM
8	Date Above Measurements Made	9-26-98	10-31-98	11-24-98	12-17-98	1-29-99	2-27-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.90	7.80	8.10	7.80	7.70	7.70
11	Total Acidity (mg/l CaCO3)	10.0	6.00	21.0	10.0	5.0	14.0
12	Total Alkalinity (mg/l CaCO3)	220.0	220.0	220.0	210.0	160.0	190.0
13	Specific Conductivity (umhos/cm at 25° C)	500.0	490.0	440.0	450.0	330.0	440.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.05	0.03	0.03	0.05	<0.02	<0.02
16	Total Sulfates (mg/l)	51.0	49.0	52.0	55.0	38.0	44.0
17	Total Iron (mg/l)	1.0	0.15	0.36	1.20	0.19	<0.05
18	Total Suspended Solids (mg/l)	23.0	<1.0	2.0	600.0	5.3	<1.0
19	Total Hardness (mg/l as CaCO3)	240.0	260.0	230.0	240.0	180.0	200.0
20	Nitrates	<0.10	<0.09	<0.09	<0.09	<0.09	<0.09
21	Date Sampled for Analysis	9-26-98	10-31-98	11-24-98	12-17-98	1-29-99	2-27-99
22	Date Last Precipitation Event Occurred	9-22-98	10-29-98	11-23-98	12-17-98	1-23-99	2-27-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-42	DS-42	DS-42	DS-42	DS-42	DS-42
2	Identification Number 98-	09360	11041	11434	12376	99-02096	99-03060
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1245	1245	1245	1245	1245	1245
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.18 GPM	0.20 GPM	0.12 GPM	0.09 GPM	1.3 GPM	1.4 GPM
8	Date Above Measurements Made	9-27-98	10-30-98	11-25-98	12-17-98	1-28-99	2-27-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
	pH (Standard Units)	7.40	7.60	7.80	7.90	7.50	7.60
11	Total Acidity (mg/l CaCO3)	14.0	12.0	12.0	17.0	10.0	11.0
12	Total Alkalinity (mg/l CaCO3)	240.0	250.0	240.0	220.0	210.0	220.0
13	Specific Conductivity (umhos/cm at 25° C)	450.0	460.0	460.0	470.0	450.0	480.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	32.0	30.0	30.0	31.0	32.0	33.0
17	Total Iron (mg/l)	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	230.0	220.0	180.0	250.0	250.0	220.0
20	Nitrates	2.00	1.40	0.59	1.00	4.40	2.90
21	Date Sampled for Analysis	9-27-98	10-30-98	11-25-98	12-17-98	1-28-99	2-27-99
22	Date Last Precipitation Event Occurred	9-27-98	10-29-98	11-25-98	12-17-98	1-23-99	2-27-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-43	DS-43	DS-43	DS-43	DS-43	DS-43
2	Identification Number 98-	09361	11042	11435	12377	99-02097	99-03061
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1236	1236	1236	1236	1236	1236
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.68 GPM	0.55 GPM	0.38 GPM	0.32 GPM	2.6 GPM	3.3 GPM
8	Date Above Measurements Made	9-27-98	10-30-98	11-25-98	12-17-98	1-28-99	2-27-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.70	7.40	7.70	7.60	7.50	7.60
11	Total Acidity (mg/l CaCO3)	13.0	12.0	8.10	17.0	11.0	12.0
12	Total Alkalinity (mg/l CaCO3)	190.0	230.0	220.0	230.0	190.0	210.0
13	Specific Conductivity (umhos/cm at 25° C)	520.0	540.0	560.0	540.0	410.0	530.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.03	0.04	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	34.0	32.0	32.0	34.0	28.0	100.0
17	Total Iron (mg/l)	<0.02	0.35	<0.05	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	16.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	280.0	250.0	190.0	230.0	200.0	230.0
20	Nitrates	2.00	1.50	0.59	1.00	2.60	2.40
21	Date Sampled for Analysis	9-27-98	10-30-98	11-25-98	12-17-98	1-28-99	2-27-99
22	Date Last Precipitation Event Occurred	9-27-98	10-29-98	11-25-98	12-17-98	1-23-99	2-27-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-44	DS-44	DS-44	DS-44	DS-44	DS-44
2	Identification Number 98-	09362	11039	11431	12373	99-02093	99-03057
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1215	1215	1215	1215	1215	1215
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.02 GPM	0.03 GPM	0.03 GPM	0.03 GPM	0.34 GPM	0.40 GPM
8	Date Above Measurements Made	9-27-98	10-30-98	11-25-98	12-17-98	1-28-99	2-27-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.30	7.90	7.90	8.00	7.40	7.80
11	Total Acidity (mg/l CaCO3)	16.0	10.0	12.0	12.0	7.3	8.8
12	Total Alkalinity (mg/l CaCO3)	240.0	240.0	240.0	210.0	140.0	170.0
13	Specific Conductivity (umhos/cm at 25° C)	520.0	470.0	480.0	490.0	320.0	430.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.04	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	30.0	32.0	34.0	38.0	30.0	35.0
17	Total Iron (mg/l)	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	240.0	260.0	200.0	250.0	190.0	210.0
20	Nitrates	2.60	2.20	1.40	2.70	2.70	2.60
21	Date Sampled for Analysis	9-27-98	10-30-98	11-25-98	12-17-98	1-28-99	2-27-99
22	Date Last Precipitation Event Occurred	9-27-98	10-29-98	11-25-98	12-17-98	1-23-99	2-27-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-45	DS-45	DS-45	DS-45	DS-45	DS-45
2	Identification Number 98-	09363	10519	11353	99-01054	99-02180	99-02282
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1157	1157	1157	1157	1157	1157
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.08 GPM	0.08 GPM	0.09 GPM	0.10 GPM	0.28 GPM	0.46 GPM
8	Date Above Measurements Made	9-27-98	10-29-98	11-23-98	12-30-98	1-29-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	8.00	7.90	8.10	8.40	8.10	7.40
	Total Acidity (mg/l CaCO3)	9.90	8.20	14.0	0.00	<1.0	<1.0
12	Total Alkalinity (mg/l CaCO3)	190.0	180.0	180.0	150.0	77.0	68.0
13	Specific Conductivity (umhos/cm at 25° C)	410.0	410.0	370.0	320.0	300.0	270.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	35.0	37.0	39.0	41.0	33.0	31.0
17	Total Iron (mg/l)	<0.02	<0.05	<0.05	<0.05	<0.05	0.10
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	13.0	21.0	11.0
19	Total Hardness (mg/l as CaCO3)	190.0	240.0	200.0	220.0	130.0	140.0
20	Nitrates	0.16	0.24	<0.09	0.09	0.96	0.96
21	Date Sampled for Analysis	9-27-98	10-29-98	11-23-98	12-30-98	1-29-99	2-10-99
22	Date Last Precipitation Event Occurred	9-27-98	10-29-98	11-23-98	12-29-98	1-23-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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NOTE: For each sample provide data for either item 13 or 14.

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-46	DS-46	DS-46	DS-46	DS-46	DS-46
2	Identification Number 98-	10125	11356	12478	99-01332	99-02276	99-03272
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1175	1175	1175	1175	1175	1175
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.03 GPM	0.01 GPM	0.01 GPM	1.6 GPM	.52 GPM	.59 GPM
8	Date Above Measurements Made	10-2-98	11-23-98	12-29-98	1-23-99	2-10-99	3-19-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.10	7.50	7.40	7.50	7.60	7.50
	Total Acidity (mg/l CaCO3)	3.50	27.0	37.0	11.0	10.0	18.0
12	Total Alkalinity (mg/l CaCO3)	210.0	220.0	200.0	82.0	130.0	120.0
13	Specific Conductivity (umhos/cm at 25° C)	370.0	390.0	450.0	170.0	280.0	250.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	0.02	0.36	0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	25.0	19.0	28.0	18.0	24.0	19.0
17	Total Iron (mg/l)	<0.05	0.25	3.00	0.54	<0.05	0.06
18	Total Suspended Solids (mg/l)	<1.0	<1.0	160.0	2.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	190.0	190.0	220.0	90.0	150.0	130.0
20	Nitrates	0.49	<0.09	0.67	0.16	0.09	<0.09
21	Date Sampled for Analysis	10-2-98	11-23-98	12-29-98	1-23-99	2-10-99	3-19-99
22	Date Last Precipitation Event Occurred	9-29-98	11-23-98	12-29-98	1-23-99	2-7-99	3-14-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC.

(D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-47	DS-47	DS-47	DS-47	DS-47	DS-47
2	Identification Number 98-	10126	11010	11359	12425	99-01329	99-02273
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1181	1181	1181	1181	1181	1181
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.06 GPM	0.05 GPM	0.05 GPM	0.05 GPM	3.1 GPM	.75 GPM
8	Date Above Measurements Made	10-2-98	10-29-98	11-23-98	12-21-98	1-23-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.30	7.70	7.80	7.60	7.80	6.90
11	Total Acidity (mg/l CaCO3)	<1.0	6.50	18.0	9.80	5.20	6.20
12	Total Alkalinity (mg/l CaCO3)	190.0	190.0	190.0	180.0	27.0	110.0
13	Specific Conductivity (umhos/cm at 25° C)	370.0	460.0	350.0	380.0	83.0	270.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.28	<0.02	<0.05	0.07	3.10	0.14
16	Total Sulfates (mg/l)	27.0	23.0	26.0	29.0	20.0	28.0
17	Total Iron (mg/l)	5.0	<0.05	0.15	0.62	18.0	1.80
18	Total Suspended Solids (mg/l)	110.0	<1.0	<1.0	22.0	410.0	48.0
19	Total Hardness (mg/l as CaCO3)	220.0	190.0	170.0	200.0	140.0	120.0
20	Nitrates	0.30	3.70	<0.09	0.61	0.44	<0.09
21	Date Sampled for Analysis	10-2-98	10-29-98	11-23-98	12-21-98	1-23-99	2-10-99
22	Date Last Precipitation Event Occurred	9-29-98	10-29-98	11-23-98	12-21-98	1-23-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019
State WEST VIRGINIA
City WHEELING
Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-48	DS-48	DS-48	DS-48	DS-48	DS-48
2	Identification Number 98-	10127	11357	12480	99-01334	99-02278	99-03274
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1200	1200	1200	1200	1200	1200
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0	0	0	2.3 GPM	.78 GPM	.69 GPM
8	Date Above Measurements Made	10-2-98	11-23-98	12-29-98	1-23-99	2-10-99	3-19-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.80	7.60	7.40	7.40	7.20	7.30
	Total Acidity (mg/l CaCO3)	4.50	20.0	3.10	14.0	2.10	31.0
12	Total Alkalinity (mg/l CaCO3)	170.0	210.0	210.0	110.0	110.0	120.0
13	Specific Conductivity (umhos/cm at 25° C)	370.0	420.0	430.0	250.0	320.0	310.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.17	0.13	0.12	0.04	0.03	0.02
16	Total Sulfates (mg/l)	25.0	36.0	36.0	27.0	33.0	26.0
17	Total Iron (mg/l)	0.07	0.35	0.09	0.53	0.06	0.05
18	Total Suspended Solids (mg/l)	<1.0	9.30	1.30	28.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	180.0	210.0	200.0	120.0	150.0	130.0
20	Nitrates	0.30	0.18	0.26	0.62	0.57	0.45
21	Date Sampled for Analysis	10-2-98	11-23-98	12-29-98	1-23-99	2-10-99	3-19-99
22	Date Last Precipitation Event Occurred	9-29-98	11-23-98	12-29-98	1-23-99	2-7-99	3-14-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-49	DS-49	DS-49	DS-49	DS-49	DS-49
2	Identification Number 98-	10251	11332	12399	99-02144	99-02391	99-03344
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1215	1215	1215	1215	1215	1215
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.12 GPM	0.03 GPM	0.06 GPM	2.9 GPM	1.1 GPM	2.3 GPM
8	Date Above Measurements Made	10-13-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.00	7.30	7.50	7.40	7.30	7.30
	Total Acidity (mg/l CaCO3)	20.0	36.0	18.0	10.0	17.0	15.0
12	Total Alkalinity (mg/l CaCO3)	210.0	240.0	230.0	52.0	150.0	130.0
13	Specific Conductivity (umhos/cm at 25° C)	760.0	820.0	730.0	600.0	680.0	680.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.21	0.38	0.13	0.02	0.08	0.03
16	Total Sulfates (mg/l)	43.0	44.0	44.0	43.0	45.0	30.0
17	Total Iron (mg/l)	0.19	0.46	0.17	0.07	0.85	<0.05
18	Total Suspended Solids (mg/l)	1.0	7.3	<1.0	13.0	4.7	<1.0
19	Total Hardness (mg/l as CaCO3)	280.0	340.0	300.0	190.0	220.0	200.0
20	Nitrates	0.41	0.29	0.58	0.72	0.55	3.10
21	Date Sampled for Analysis	10-13-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-50	DS-50	DS-50	DS-50	DS-50	DS-50
2	Identification Number 98-	10252	11333	12398	99-02145	99-02390	99-03343
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1222	1222	1222	1222	1222	1222
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.57 GPM	0.33 GPM	0.33 GPM	3.8 GPM	1.7 GPM	3 GPM
8	Date Above Measurements Made	10-13-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.60	7.70	7.50	7.50	7.60	7.30
	Total Acidity (mg/l CaCO3)	12.0	31.0	16.0	<1.0	13.0	12.0
12	Total Alkalinity (mg/l CaCO3)	210.0	210.0	200.0	120.0	180.0	180.0
13	Specific Conductivity (umhos/cm at 25° C)	640.0	180.0	740.0	560.0	560.0	590.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	52.0	55.0	56.0	54.0	41.0	40.0
17	Total Iron (mg/l)	0.02	<0.05	<0.05	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	300.0	200.0	330.0	250.0	250.0	240.0
20	Nitrates	2.60	2.60	2.30	5.10	3.60	4.10
21	Date Sampled for Analysis	10-13-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-51	DS-51	DS-51	DS-51	DS-51	DS-51
2	Identification Number 98-	10253	11334	12400	99-02146	99-02389	99-03342
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1235	1235	1235	1235	1235	1235
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.15 GPM	0.12 GPM	0.09 GPM	1.4 GPM	0.75 GPM	1.3 GPM
8	Date Above Measurements Made	10-13-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.70	8.10	7.80	7.30	7.90	7.40
	Total Acidity (mg/l CaCO3)	9.90	27.0	10.0	8.0	9.4	13.0
12	Total Alkalinity (mg/l CaCO3)	190.0	190.0	190.0	120.0	170.0	140.0
13	Specific Conductivity (umhos/cm at 25° C)	560.0	600.0	600.0	340.0	440.0	390.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	38.0	45.0	44.0	35.0	37.0	26.0
17	Total Iron (mg/l)	0.02	<0.05	<0.05	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	1.0	3.3	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	270.0	260.0	260.0	160.0	210.0	180.0
20	Nitrates	0.29	0.30	0.22	0.38	0.37	0.21
21	Date Sampled for Analysis	10-13-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-52	DS-52	DS-52	DS-52	DS-52	DS-52
2	Identification Number 98-	10254	11338	12410	99-02105	99-02398	99-03354
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1185	1185	1185	1185	1185	1185
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0	0.27 GPM	0.23 GPM	2.3 GPM	0.63 GPM	2.2 GPM
8	Date Above Measurements Made	10-13-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.20	7.90	7.40	7.20	7.20	7.40
11	Total Acidity (mg/l CaCO3)	14.0	27.0	14.0	11.0	24.0	18.0
12	Total Alkalinity (mg/l CaCO3)	220.0	210.0	210.0	170.0	180.0	180.0
13	Specific Conductivity (umhos/cm at 25° C)	470.0	460.0	450.0	410.0	430.0	460.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	38.0	46.0	45.0	54.0	53.0	42.0
17	Total Iron (mg/l)	0.20	0.02	<0.05	0.07	0.06	<0.05
18	Total Suspended Solids (mg/l)	1.0	<1.0	<1.0	<1.0	2.0	<1.0
19	Total Hardness (mg/l as CaCO3)	270.0	250.0	210.0	210.0	210.0	220.0
20	Nitrates	0.92	0.92	0.93	0.89	1.20	1.20
21	Date Sampled for Analysis	10-13-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-53	DS-53	DS-53	DS-53	DS-53	DS-53
2	Identification Number 98-	10255	11381	12423	99-02118	99-02414	99-03368
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1232	1232	1232	1232	1232	1232
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.15 GPM	1.10 GPM	0.11 GPM	1.6 GPM	1.04 GPM	1.5 GPM
8	Date Above Measurements Made	10-14-98	11-24-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.60	7.70	7.40	7.30	7.20	7.30
11	Total Acidity (mg/l CaCO3)	11.0	20.0	6.80	11.0	27.0	20.0
12	Total Alkalinity (mg/l CaCO3)	200.0	200.0	190.0	140.0	170.0	140.0
13	Specific Conductivity (umhos/cm at 25° C)	680.0	800.0	790.0	680.0	920.0	780.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	0.08	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	38.0	38.0	40.0	32.0	38.0	27.0
17	Total Iron (mg/l)	0.02	0.16	<0.05	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	260.0	300.0	310.0	220.0	290.0	250.0
20	Nitrates	0.13	<0.09	<0.09	0.27	<0.06	0.10
21	Date Sampled for Analysis	10-14-98	11-24-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

NOTE: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A a statement giving the reasons why the information is unobtainable.
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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-54	DS-54	DS-54	DS-54	DS-54	DS-54
2	Identification Number 98-	10256	11380	12424	99-02119	99-02415	99-03369
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1240	1240	1240	1240	1240	1240
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.76 GPM	0.50 GPM	1.44 GPM	4.7 GPM	4.7 GPM	5.8 GPM
8	Date Above Measurements Made	10-14-98	11-24-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	8.10	8.10	7.30	7.30	7.70	7.50
11	Total Acidity (mg/l CaCO3)	17.0	22.0	12.0	11.0	19.0	19.0
12	Total Alkalinity (mg/l CaCO3)	230.0	230.0	120.0	210.0	220.0	210.0
13	Specific Conductivity (umhos/cm at 25° C)	620.0	650.0	940.0	620.0	700.0	660.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	38.0	42.0	38.0	40.0	43.0	33.0
17	Total Iron (mg/l)	0.02	<0.05	0.19	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	290.0	290.0	260.0	310.0	290.0	270.0
20	Nitrates	0.37	0.30	0.30	0.73	0.52	0.60
21	Date Sampled for Analysis	10-14-98	11-24-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-55	DS-55	DS-55	DS-55	DS-55	DS-55
2	Identification Number 98-	10257	11392	12381	99-02188	99-03049	99-03380
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1198	1198	1198	1198	1198	1198
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.07 GPM	0.08 GPM	0.08 GPM	0.75 GPM	0.65 GPM	0.54 GPM
8	Date Above Measurements Made	10-14-98	11-24-98	12-17-98	1-30-99	2-27-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.50	7.40	7.30	7.10	7.10	7.10
11	Total Acidity (mg/l CaCO3)	10.0	7.90	20.0	15.0	16.0	26.0
12	Total Alkalinity (mg/l CaCO3)	190.0	180.0	190.0	140.0	140.0	130.0
13	Specific Conductivity (umhos/cm at 25° C)	580.0	580.0	540.0	420.0	470.0	420.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02	<0.02	0.05	0.06	0.10
16	Total Sulfates (mg/l)	65.0	66.0	72.0	66.0	65.0	53.0
17	Total Iron (mg/l)	0.02	<0.05	0.19	0.07	0.26	0.64
18	Total Suspended Solids (mg/l)	1.0	<1.0	<1.0	<1.0	45.0	61.0
19	Total Hardness (mg/l as CaCO3)	250.0	250.0	240.0	180.0	190.0	180.0
20	Nitrates	0.34	0.20	0.25	1.80	0.83	1.1
21	Date Sampled for Analysis	10-14-98	11-24-98	12-17-98	1-30-99	2-27-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-17-98	1-28-99	2-27-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-56	DS-56	DS-56	DS-56	DS-56	DS-56
2	Identification Number 98-	10266	11343	12408	99-02147	99-02400	99-03352
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1207	1207	1207	1207	1207	1207
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.05 GPM	0.03 GPM	0.02 GPM	1.2 GPM	0.65 GPM	1.3 GPM
8	Date Above Measurements Made	10-15-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.90	8.00	7.90	7.10	7.20	7.20
11	Total Acidity (mg/l CaCO3)	3.60	17.0	5.50	13.0	11.0	18.0
12	Total Alkalinity (mg/l CaCO3)	130.0	130.0	130.0	82.0	100.0	87.0
13	Specific Conductivity (umhos/cm at 25° C)	300.0	280.0	290.0	190.0	220.0	230.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	19.0	21.0	21.0	20.0	19.0	15.0
17	Total Iron (mg/l)	0.08	0.07	0.08	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	120.0	150.0	90.0	90.0	100.0	90.0
20	Nitrates	<0.10	<0.09	<0.09	0.24	0.17	0.22
21	Date Sampled for Analysis	10-15-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Addresss P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-57	DS-57	DS-57	DS-57	DS-57	DS-57
2	Identification Number 98-	10267	11345	12412	99-02148	99-02401	99-03356
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1230	1230	1230	1230	1230	1230
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.06 GPM	0.45 GPM	0.34 GPM	1.9 GPM	1.3 GPM	1.5 GPM
8	Date Above Measurements Made	10-15-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.50	7.50	7.20	7.40	7.30	7.30
11	Total Acidity (mg/l CaCO3)	11.0	30.0	20.0	9.20	16.0	23.0
12	Total Alkalinity (mg/l CaCO3)	230.0	240.0	240.0	130.0	190.0	230.0
13	Specific Conductivity (umhos/cm at 25° C)	520.0	530.0	490.0	610.0	520.0	610.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.05	0.06	0.13	0.04	0.05	0.03
16	Total Sulfates (mg/l)	46.0	42.0	41.0	55.0	44.0	37.0
17	Total Iron (mg/l)	0.09	0.11	0.11	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	12.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	260.0	260.0	270.0	290.0	270.0	280.0
20	Nitrates	1.80	1.80	2.00	5.10	2.70	3.1
21	Date Sampled for Analysis	10-15-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-58	DS-58	DS-58	DS-58	DS-58	DS-58
2	Identification Number 98-	10268	11344	12414	99-02108	99-02405	99-03358
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1218	1218	1218	1218	1218	1218
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.11 GPM	0.08 GPM	0.04 GPM	0.71 GPM	0.42 GPM	0.57 GPM
8	Date Above Measurements Made	10-15-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.80	8.00	7.80	7.30	7.40	7.40
11	Total Acidity (mg/l CaCO3)	4.0	20.0	<1.0	10.0	11.0	5.40
12	Total Alkalinity (mg/l CaCO3)	180.0	180.0	150.0	98.0	130.0	110.0
13	Specific Conductivity (umhos/cm at 25° C)	350.0	340.0	420.0	240.0	270.0	270.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	0.68	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	26.0	26.0	25.0	24.0	24.0	18.0
17	Total Iron (mg/l)	<0.02	0.30	<0.05	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	160.0	250.0	170.0	140.0	130.0	130.0
20	Nitrates	0-90	0.63	0.77	1.00	0.80	0.92
21	Date Sampled for Analysis	10-15-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-59	DS-59	DS-59	DS-59	DS-59	DS-59
2	Identification Number 98-	10269	11347	12413	99-02107	99-02404	99-03357
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1219	1219	1219	1219	1219	1219
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.06 GPM	0.02 GPM	0.05 GPM	0.52 GPM	0.54 GPM	0.67 GPM
8	Date Above Measurements Made	10-15-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.30	8.20	7.00	7.20	7.30	7.30
11	Total Acidity (mg/l CaCO3)	14.0	35.0	23.0	11.0	30.0	4.8
12	Total Alkalinity (mg/l CaCO3)	220.0	180.0	180.0	130.0	150.0	140.0
13	Specific Conductivity (umhos/cm at 25° C)	720.0	640.0	1800.0	580.0	900.0	560.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	0.03	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	38.0	38.0	47.0	33.0	33.0	23.0
17	Total Iron (mg/l)	<0.02	<0.05	0.13	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	260.0	320.0	450.0	210.0	280.0	170.0
20	Nitrates	0.93	0.78	0.83	0.88	2.20	1.4
21	Date Sampled for Analysis	10-15-98	11-23-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-60	DS-60	DS-60	DS-60	DS-60	DS-60
2	Identification Number 98-	10270	11363	12367	99-01323	99-02267	99-03285
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1161	1161	1161	1161	1161	1161
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.15 GPM	0.12 GPM	0.11 GPM	1.6 GPM	1.4 GPM	1.6 GPM
8	Date Above Measurements Made	10-15-98	11-24-98	12-17-98	1-23-99	2-10-99	3-19-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.20	7.40	7.10	7.00	7.30	7.40
11	Total Acidity (mg/l CaCO3)	5.30	29.0	30.0	20.0	16.0	51.0
12	Total Alkalinity (mg/l CaCO3)	210.0	210.0	210.0	180.0	200.0	200.0
13	Specific Conductivity (umhos/cm at 25° C)	460.0	440.0	450.0	380.0	420.0	440.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	43.0	42.0	45.0	31.0	34.0	30.0
17	Total Iron (mg/l)	<0.02	<0.05	<0.05	0.09	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	2.70	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	220.0	230.0	230.0	180.0	230.0	200.0
20	Nitrates	<0.10	<0.09	<0.09	0.60	0.61	0.74
21	Date Sampled for Analysis	10-15-98	11-24-98	12-17-98	1-23-99	2-10-99	3-19-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-17-98	1-23-99	2-7-99	3-14-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-61	DS-61	DS-61	DS-61	DS-61	DS-61
2	Identification Number 98-	10278	12038	12473	99-02164	99-02422	99-03376
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1170	1170	1170	1170	1170	1170
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.017GPM	0.04 GPM	0.06 GPM	0.83 GPM	0.43 GPM	1.3 GPM
8	Date Above Measurements Made	10-16-98	11-28-98	12-29-98	1-30-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	8.00	7.60	6.90	6.90	7.10	7.20
11	Total Acidity (mg/l CaCO3)	5.30	7.00	4.50	13.0	24.0	15.0
12	Total Alkalinity (mg/l CaCO3)	150.0	140.0	140.0	110.0	120.0	100.0
13	Specific Conductivity (umhos/cm at 25° C)	490.0	550.0	580.0	510.0	600.0	530.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.04	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	46.0	45.0	46.0	49.0	45.0	38.0
17	Total Iron (mg/l)	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	4.7	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	200.0	220.0	210.0	210.0	210.0	200.0
20	Nitrates	<0.10	0.52	0.72	2.50	2.30	2.50
21	Date Sampled for Analysis	10-16-98	11-28-98	12-29-98	1-30-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-25-98	12-29-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-62	DS-62	DS-62	DS-62	DS-62	DS-62
2	Identification Number 98-	10279	12018	12470	99-01200	99-02419	99-03374
3	High (H)/Low (L) Designation (if applicable)	SIX MONTH SAMPLING					
4	Surface Elevation for Sampling Station (msl)	1180	1180	1180	1180	1180	1180
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.028GPM	0.02 GPM	0.03 GPM	0.72 GPM	0.21 GPM	0.32 GPM
8	Date Above Measurements Made	10-16-98	11-28-98	12-29-98	1-22-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.80	8.30	7.70	7.40	7.50	7.70
	Total Acidity (mg/l CaCO3)	9.30	0.00	5.20	4.60	16.0	20.0
12	Total Alkalinity (mg/l CaCO3)	190.0	150.0	180.0	100.0	210.0	180.0
13	Specific Conductivity (umhos/cm at 25° C)	580.0	660.0	620.0	320.0	620.0	530.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	0.03	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	68.0	69.0	71.0	35.0	57.0	43.0
17	Total Iron (mg/l)	<0.02	<0.05	<0.05	0.66	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	6.7	1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	290.0	250.0	270.0	150.0	280.0	240.0
20	Nitrates	<0.10	0.19	<0.09	0.28	0.12	<0.09
21	Date Sampled for Analysis	10-16-98	11-28-98	12-29-98	1-22-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-25-98	12-29-98	1-22-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-63	DS-63	DS-63	DS-63	DS-63	DS-63
2	Identification Number 98-	10293	11373	12416	99-02111	99-02407	99-03361
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1202	1202	1202	1202	1202	1202
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.38 GPM	0.30 GPM	0.25 GPM	0.99 GPM	0.75 GPM	0.89 GPM
8	Date Above Measurements Made	10-17-98	11-24-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.10	7.20	7.10	7.30	7.10	7.30
11	Total Acidity (mg/l CaCO3)	7.40	13.0	12.0	11.0	20.0	13.0
12	Total Alkalinity (mg/l CaCO3)	150.0	150.0	150.0	120.0	130.0	120.0
13	Specific Conductivity (umhos/cm at 25° C)	320.0	290.0	320.0	280.0	320.0	300.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	27.0	29.0	31.0	30.0	29.0	28.0
17	Total Iron (mg/l)	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	160.0	150.0	160.0	160.0	150.0	140.0
20	Nitrates	0.12	<0.09	<0.09	0.94	0.84	0.90
21	Date Sampled for Analysis	10-17-98	11-24-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-64	DS-64	DS-64	DS-64	DS-64	DS-64
2	Identification Number 98-	10294	11374	12418	99-02113	99-02409	99-03363
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1220	1220	1220	1220	1220	1220
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.016GPM	0.02 GPM	0.02 GPM	0.82 GPM	0.14 GPM	0.28 GPM
8	Date Above Measurements Made	10-17-98	11-24-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.50	7.40	7.50	7.10	6.90	7.10
11	Total Acidity (mg/l CaCO3)	11.0	24.0	12.0	16.0	38.0	34.0
12	Total Alkalinity (mg/l CaCO3)	270.0	260.0	220.0	160.0	170.0	160.0
13	Specific Conductivity (umhos/cm at 25° C)	1400.0	1700.0	1700.0	1300.0	1200.0	1100.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.44	<0.02	0.33	0.03	0.05	0.04
16	Total Sulfates (mg/l)	59.0	68.0	62.0	46.0	52.0	40.0
17	Total Iron (mg/l)	0.16	<0.05	0.11	<0.05	<0.05	0.41
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	320.0	330.0	360.0	240.0	290.0	280.0
20	Nitrates	0.21	<0.09	0.26	0.13	0.11	<0.09
21	Date Sampled for Analysis	10-17-98	11-24-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-65	DS-65	DS-65	DS-65	DS-65	DS-65
2	Identification Number 98-	10299	11360	12369	99-02089	99-02425	99-03277
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1142	1142	1142	1142	1142	1142
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.60 GPM	1.56 GPM	1.34 GPM	6.2 GPM	7.9 GPM	6.1 GPM
8	Date Above Measurements Made	10-17-98	11-23-98	12-17-98	1-28-99	2-26-99	3-19-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	6.90	6.90	6.50	7.50	7.00	7.10
11	Total Acidity (mg/l CaCO3)	19.0	18.0	32.0	6.0	9.0	6.90
12	Total Alkalinity (mg/l CaCO3)	120.0	110.0	120.0	32.0	45.0	34.0
13	Specific Conductivity (umhos/cm at 25° C)	290.0	290.0	310.0	150.0	190.0	160.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	30.0	35.0	35.0	24.0	29.0	20.0
17	Total Iron (mg/l)	0.47	0.18	0.08	0.07	0.06	0.06
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	140.0	120.0	140.0	70.0	60.0	40.0
20	Nitrates	0.28	0.13	0.10	0.41	0.20	0.36
21	Date Sampled for Analysis	10-17-98	11-23-98	12-17-98	1-28-99	2-26-99	3-19-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-17-98	1-23-99	2-26-99	3-14-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-66	DS-66	DS-66	DS-66	DS-66	DS-66
2	Identification Number 98-	10291	11378	12421	99-02116	99-02412	99-03366
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1220	1220	1220	1220	1220	1220
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.14 GPM	0.08 GPM	0.10 GPM	5 GPM	2.6 GPM	4.7 GPM
8	Date Above Measurements Made	10-17-98	11-24-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.30	7.70	7.30	7.50	7.20	7.30
11	Total Acidity (mg/l CaCO3)	11.0	15.30	11.0	3.40	16.0	14.0
12	Total Alkalinity (mg/l CaCO3)	190.0	190.0	180.0	74.0	120.0	91.0
13	Specific Conductivity (umhos/cm at 25° C)	580.0	600.0	600.0	340.0	460.0	410.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	38.0	39.0	40.0	32.0	37.0	26.0
17	Total Iron (mg/l)	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	21.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	230.0	250.0	250.0	100.0	150.0	140.0
20	Nitrates	<0.10	<0.09	<0.09	0.12	<0.09	<0.09
21	Date Sampled for Analysis	10-17-98	11-24-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-67	DS-67	DS-67	DS-67	DS-67	DS-67
2	Identification Number 98-	10301	11397	12468	99-02121	99-02417	99-03371
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1042	1042	1042	1042	1042	1042
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.03 GPM	0.03 GPM	0.04 GPM	2.2 GPM	0.47 GPM	0.63 GPM
8	Date Above Measurements Made	10-18-98	11-24-98	12-29-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	C	C	C	C	C	C
10	pH (Standard Units)	7.60	8.20	7.00	7.30	8.00	7.70
11	Total Acidity (mg/l CaCO3)	9.80	4.0	6.10	9.20	9.20	8.60
12	Total Alkalinity (mg/l CaCO3)	140.0	140.0	190.0	110.0	120.0	110.0
13	Specific Conductivity (umhos/cm at 25° C)	290.0	330.0	980.0	310.0	270.0	240.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	16.0	26.0	72.0	16.0	15.0	12.0
17	Total Iron (mg/l)	0.09	<0.05	0.05	<0.05	0.08	0.06
18	Total Suspended Solids (mg/l)	<1.0	<1.0	6.7	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	100.0	130.0	110.0	110.0	110.0	110.0
20	Nitrates	<0.10	<0.09	0.23	0.12	<0.09	<0.09
21	Date Sampled for Analysis	10-18-98	11-24-98	12-29-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-18-98	11-23-98	12-29-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-68	DS-68	DS-68	DS-68	DS-68	DS-68
2	Identification Number 98-	10457	11366	99-01042	99-01194	99-03040	99-03283
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1230	1230	1230	1230	1230	1230
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.05 GPM	0.01 GPM	0.01 GPM	0.63 GPM	0.30 GPM	0.45 GPM
8	Date Above Measurements Made	10-24-98	11-24-98	12-30-98	1-22-99	2-27-99	3-19-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	8.10	8.00	8.00	7.40	7.50	7.40
11	Total Acidity (mg/l CaCO3)	26.0	22.0	7.20	15.0	30.0	18.0
12	Total Alkalinity (mg/l CaCO3)	270.0	260.0	170.0	200.0	270.0	260.0
13	Specific Conductivity (umhos/cm at 25° C)	480.0	500.0	560.0	450.0	560.0	560.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	<0.02	0.08	<0.02	<0.02
16	Total Sulfates (mg/l)	40.0	39.0	78.0	33.0	45.0	32.0
17	Total Iron (mg/l)	0.15	0.06	0.49	2.0	0.07	0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	12.0	17.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	280.0	270.0	250.0	240.0	270.0	270.0
20	Nitrates	0.50	0.46	7.60	2.70	1.30	1.4
21	Date Sampled for Analysis	10-24-98	11-24-98	12-30-98	1-22-99	2-27-99	3-19-99
22	Date Last Precipitation Event Occurred	10-18-98	11-23-98	12-29-98	1-22-99	2-27-99	3-14-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-69	DS-69	DS-69	DS-69	DS-69	DS-69
2	Identification Number 98-	11076	11430	12352	99-02092	99-02428	99-03278
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1220	1220	1220	1220	1220	1220
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.02 GPM	0.01 GPM	0.01 GPM	0.19 GPM	0.19 GPM	0.20 GPM
8	Date Above Measurements Made	10-30-98	11-25-98	12-17-98	1-28-99	2-26-99	3-19-99
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	7.30	8.10	8.00	7.30	7.90	7.80
11	Total Acidity (mg/l CaCO3)	73.0	<1.00	17.0	8.6	10.0	20.0
12	Total Alkalinity (mg/l CaCO3)	300.0	150.0	210.0	180.0	180.0	180.0
13	Specific Conductivity (umhos/cm at 25° C)	680.0	480.0	480.0	390.0	420.0	390.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	2.50	0.05	<0.02	0.02	<0.02	0.02
16	Total Sulfates (mg/l)	40.0	94.0	53.0	42.0	45.0	34.0
17	Total Iron (mg/l)	5.80	0.43	0.34	1.20	0.09	0.05
18	Total Suspended Solids (mg/l)	240.0	<1.0	<1.0	120.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	360.0	230.0	260.0	220.0	210.0	200.0
20	Nitrates	<0.09	0.74	<0.09	0.31	0.27	<0.09
21	Date Sampled for Analysis	10-30-98	11-25-98	12-17-98	1-28-99	2-26-99	3-19-99
22	Date Last Precipitation Event Occurred	10-29-98	11-25-98	12-17-98	1-23-99	2-26-99	3-14-99

Laboratory Name TRA-DET, INC.
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-70	DS-70		DS-71		
2	Identification Number	93-12-1177	94-03-582		99-03-584		
3	High (H)/Low (L) Designation (if applicable)	L	H		SUPPLE-MENTAL		
4	Surface Elevation for Sampling Station (msl)	1220	1220		1220		
5	Depth of Well Below Land Surface (feet)	---	---		---		
6	Static Water Level of Well Below Land Surface (feet)	---	---		---		
7	Flow for Spring and Stream (gpm or cfs)	3.4 GPM	11.5 GPM		2.3 GPM		
8	Date Above Measurements Made	12-29-98	3-10-98		3-10-98		
9	Aquifer/Zone Identification For Well/Spring	B	B		B		
10	pH (Standard Units)	7.92	7.74		7.75		
11	Total Acidity (mg/l CaCO3)	6.80	10.40		10.00		
12	Total Alkalinity (mg/l CaCO3)	215.80	160.40		211.60		
13	Specific Conductivity (umhos/cm at 25° C)	981.0	920.0		428.0		
14	Total Dissolved Solids (mg/l)	---	---		---		
15	Total Manganese (mg/l)	<0.02	<0.02		<0.02		
16	Total Sulfates (mg/l)	40.0	57.0		25.0		
17	Total Iron (mg/l)	0.07	0.09		0.04		
18	Total Suspended Solids (mg/l)	2.0	3.0		2.0		
19	Total Hardness (mg/l as CaCO3)	452.0	307.0		207.0		
20	Nitrates						
21	Date Sampled for Analysis	12-29-98	3-10-98		3-10-98		
22	Date Last Precipitation Event Occurred	12-25-98	3-9-98		3-9-98		

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

NOTE: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A a statement giving the reasons why the information is unobtainable.
NOTE: For each sample provide data for either item 13 or 14.

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-72	DS-72	DS-72	DS-72	DS-72	DS-72
2	Identification Number 98-	11326	12352	99-02182	99-02249	99-03288	
3	High (H)/Low (L) Designation (if applicable)	SIX MONTH SAMPLING					
4	Surface Elevation for Sampling Station (msl)	1265	1265	1265	1265	1265	
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	
7	Flow for Spring and Stream (gpm or cfs)	0.02 GPM	0.02 GPM	1.1 GPM	3 GPM	3.4 GPM	
8	Date Above Measurements Made	11-23-98	12-17-98	1-30-99	2-10-99	3-19-99	
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	
10	pH (Standard Units)	8.30	8.20	7.90	7.50	7.80	
11	Total Acidity (mg/l CaCO3)	0.00	51.0	5.80	47.0	5.40	
12	Total Alkalinity (mg/l CaCO3)	210.0	200.0	140.0	120.0	120.0	
13	Specific Conductivity (umhos/cm at 25° C)	420.0	420.0	290.0	340.0	310.0	
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	
15	Total Manganese (mg/l)	0.04	0.02	<0.02	<0.02	<0.02	
16	Total Sulfates (mg/l)	46.0	41.0	41.0	37.0	30.0	
17	Total Iron (mg/l)	<0.05	<0.05	<0.05	<0.05	0.08	
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	
19	Total Hardness (mg/l as CaCO3)	220.0	210.0	150.0	130.0	130.0	
20	Nitrates	0.10	0.18	<0.09	<0.09	<0.09	
21	Date Sampled for Analysis	11-23-98	12-17-98	1-30-99	2-10-99	3-19-99	
22	Date Last Precipitation Event Occurred	11-23-98	12-17-98	1-23-99	2-7-99	3-14-99	

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-76	DS-77	DS-78	DS-79	DS-80	DS-81
2	Identification Number	00-05-581	00-05-582	00-05-583	00-05-584	00-06-585	00-06-207
3	High (H)/Low (L) Designation (if applicable)	SUPPLEMENTAL					
4	Surface Elevation for Sampling Station (msl)	1215	1215	1178	1165	1075	1198
5	Depth of Well Below Land Surface (feet)	--	--	--	--	--	--
6	Static Water Level of Well Below Land Surface (feet)	--	—	--	--	--	--
7	Flow for Spring and Stream (gpm or cfs)	0.42 GPM	0.29 GPM	0.13 GPM	0.22 GPM	0.24 GPM	1 GPM
8	Date Above Measurements Made	5-16-00	5-16-00	5-16-00	5-16-00	5-30-00	5-30-00
9	Aquifer/Zone Identification For Well/Spring	B	B	B	B	B	B
10	pH (Standard Units)	6.73	7.26	7.31	7.26	7.43	7.49
11	Total Acidity (mg/l CaCO3)	36.80	14.40	12.40	12.40	9.00	26.40
12	Total Alkalinity (mg/l CaCO3)	227.20	209.60	155.80	147.80	162.20	148.80
13	Specific Conductivity (umhos/cm at 25° C)	535.0	471.0	564.0	360.0	364.0	402.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.56	<0.02	<0.02	<0.02	<0.02	0.03
16	Total Sulfates (mg/l)	37.0	27.0	28.0	25.0	26.0	37.0
17	Total Iron (mg/l)	0.17	0.08	0.07	0.06	0.10	0.11
18	Total Suspended Solids (mg/l)	3.0	<2.0	<2.0	<2.0	<2.0	2.0
19	Total Hardness (mg/l as CaCO3)	284.0	260.0	272.0	184.0	180.0	173.0
20	Nitrates	---	---	---	---	---	---
21	Date Sampled for Analysis	5-16-00	5-16-00	5-16-00	5-16-00	5-16-00	5-30-00
22	Date Last Precipitation Event Occurred	5-13-00	5-13-00	5-13-00	5-13-00	5-13-00	5-28-00

Laboratory Name Industrial Lab Analysis, Inc.
Address 2240 Williamsburg Drive City Glen Dale
State West Virginia Zip 26083

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	DS-82	U-13A	P-25			
2	Identification Number	00-06-208	00-05-579	00-06-210			
3	High (H)/Low (L) Designation (if applicable)	SUPPLEMENTAL					
4	Surface Elevation for Sampling Station (msl)	1198	1080	1195			
5	Depth of Well Below Land Surface (feet)	--	--	--			
6	Static Water Level of Well Below Land Surface (feet)	--	—	--			
7	Flow for Spring and Stream (gpm or cfs)	0.75 GPM	.003 CFS	--			
8	Date Above Measurements Made	5-30-00	5-16-00	5-30-00			
9	Aquifer/Zone Identification For Well/Spring	B	--	--			
10	pH (Standard Units)	7.08	8.26	7.73			
11	Total Acidity (mg/l CaCO3)	8.00	10.40	3.20			
12	Total Alkalinity (mg/l CaCO3)	126.40	210.20	66.80			
13	Specific Conductivity (umhos/cm at 25° C)	324.0	885.0	427.0			
14	Total Dissolved Solids (mg/l)	---	---	---			
15	Total Manganese (mg/l)	<0.02	0.02	<0.02			
16	Total Sulfates (mg/l)	29.0	58.0	21.0			
17	Total Iron (mg/l)	0.09	0.04	0.08			
18	Total Suspended Solids (mg/l)	<2.0	12.0	5.0			
19	Total Hardness (mg/l as CaCO3)	137.0	360.0	94.0			
20	Nitrates	---	---	---			
21	Date Sampled for Analysis	5-30-00	5-16-00	5-30-00			
22	Date Last Precipitation Event Occurred	5-28-00	5-13-00	5-28-00			

Laboratory Name Industrial Lab Analysis, Inc.
Address 2240 Williamsburg Drive City Glen Dale
State West Virginia Zip 26083

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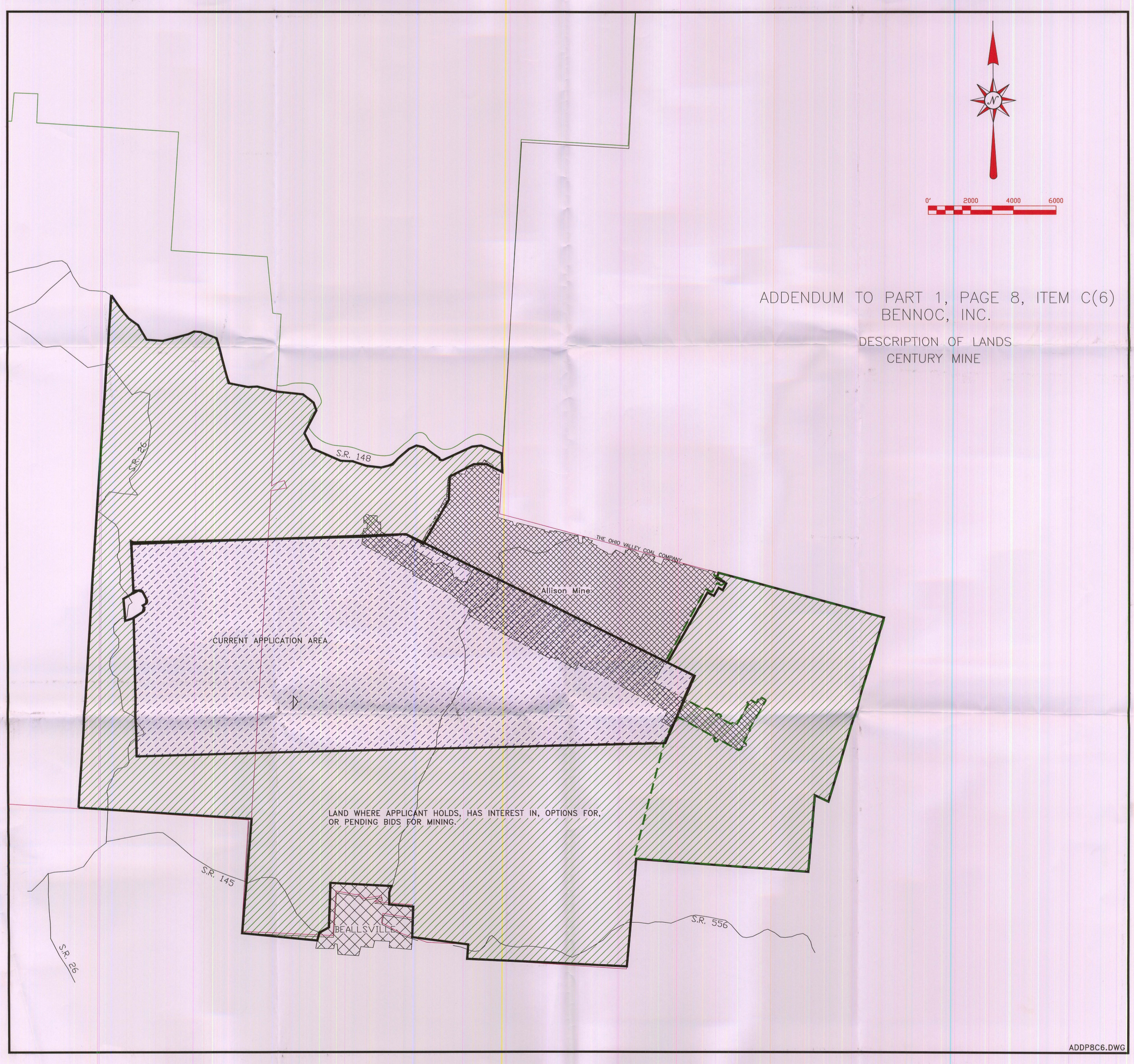
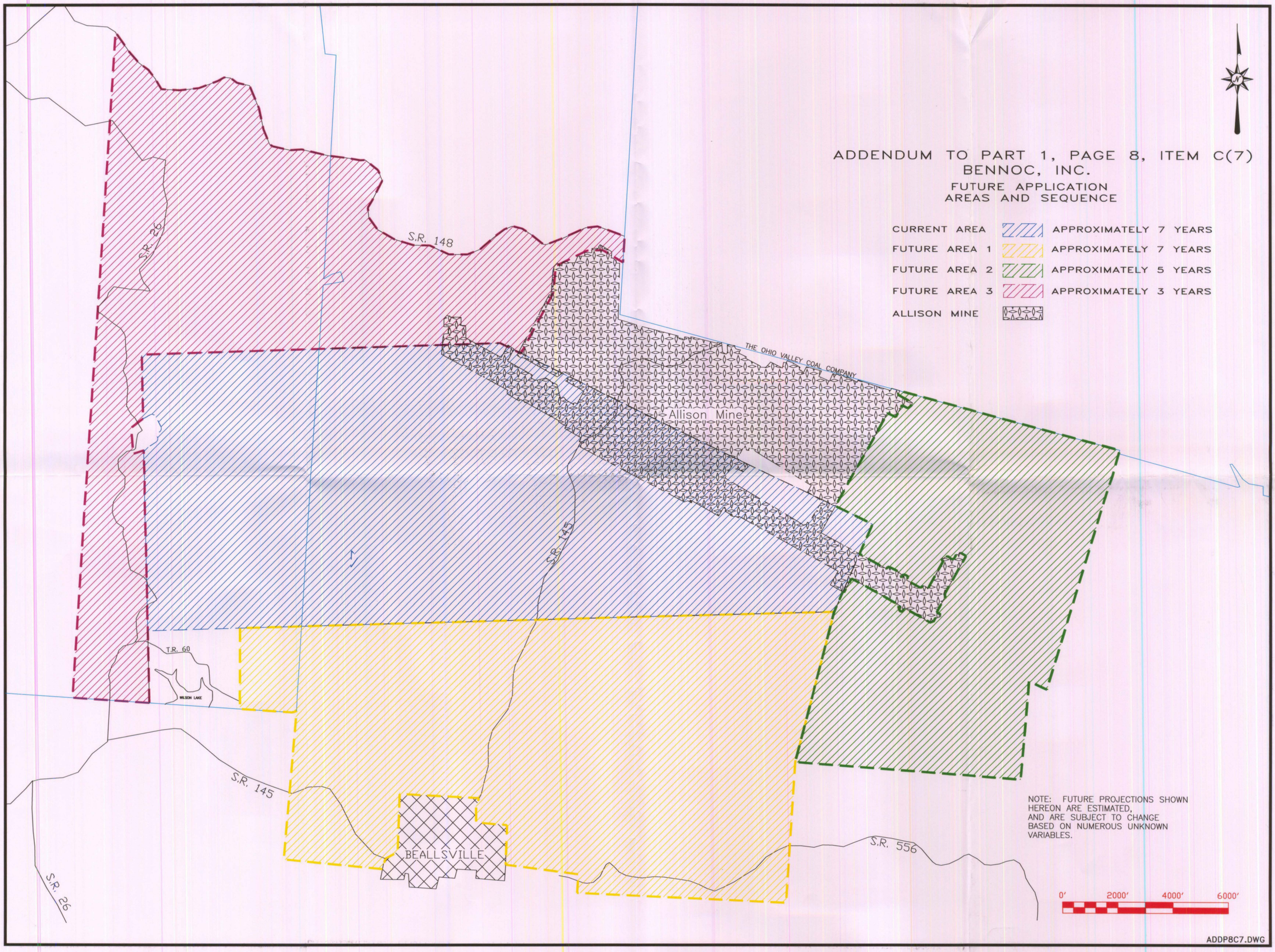
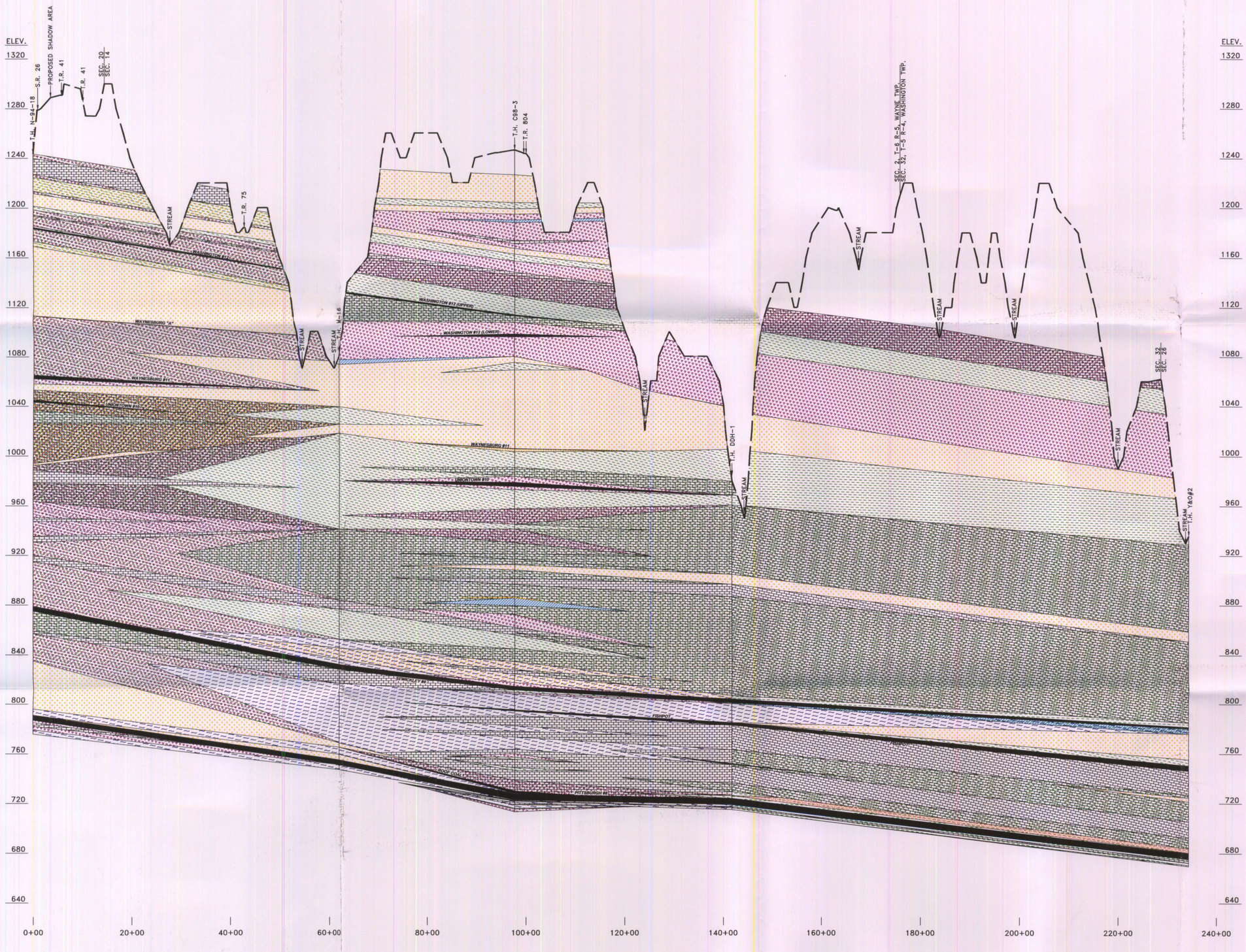


ADDENDUM TO PART 1, PAGE 8, ITEM C(6)
BENNOC, INC.

DESCRIPTION OF LANDS
CENTURY MINE


ADDENDUM TO PART 1, PAGE 8, ITEM C(7)
BENNOC, INC.
FUTURE APPLICATION
AREAS AND SEQUENCE
CURRENT AREA
APPROXIMATELY 7 YEARS
FUTURE AREA 1
APPROXIMATELY 7 YEARS
FUTURE AREA 2
APPROXIMATELY 5 YEARS
FUTURE AREA 3
APPROXIMATELY 3 YEARS
ALLISON MINE
S.R. 148
S.R. 26
THE OHIO VALLEY COAL COMPANY
Allison Mine
S.R. 145
T.R. 60
WILSON LAKE
S.R. 145
BEALLSVILLE
S.R. 556
S.R. 26
NOTE: FUTURE PROJECTIONS SHOWN HEREON ARE ESTIMATED, AND ARE SUBJECT TO CHANGE BASED ON NUMEROUS UNKNOWN VARIABLES.
0'
2000'
4000'
6000'
ADDP8C7.DWG



GEOLOGIC CROSS SECTION A-A'

(APPROXIMATE DIP OF NO. 8 COAL SEAM)

HORIZ. SCALE: 1" = 1000'

VERT. SCALE: 1" = 40'

LEGEND

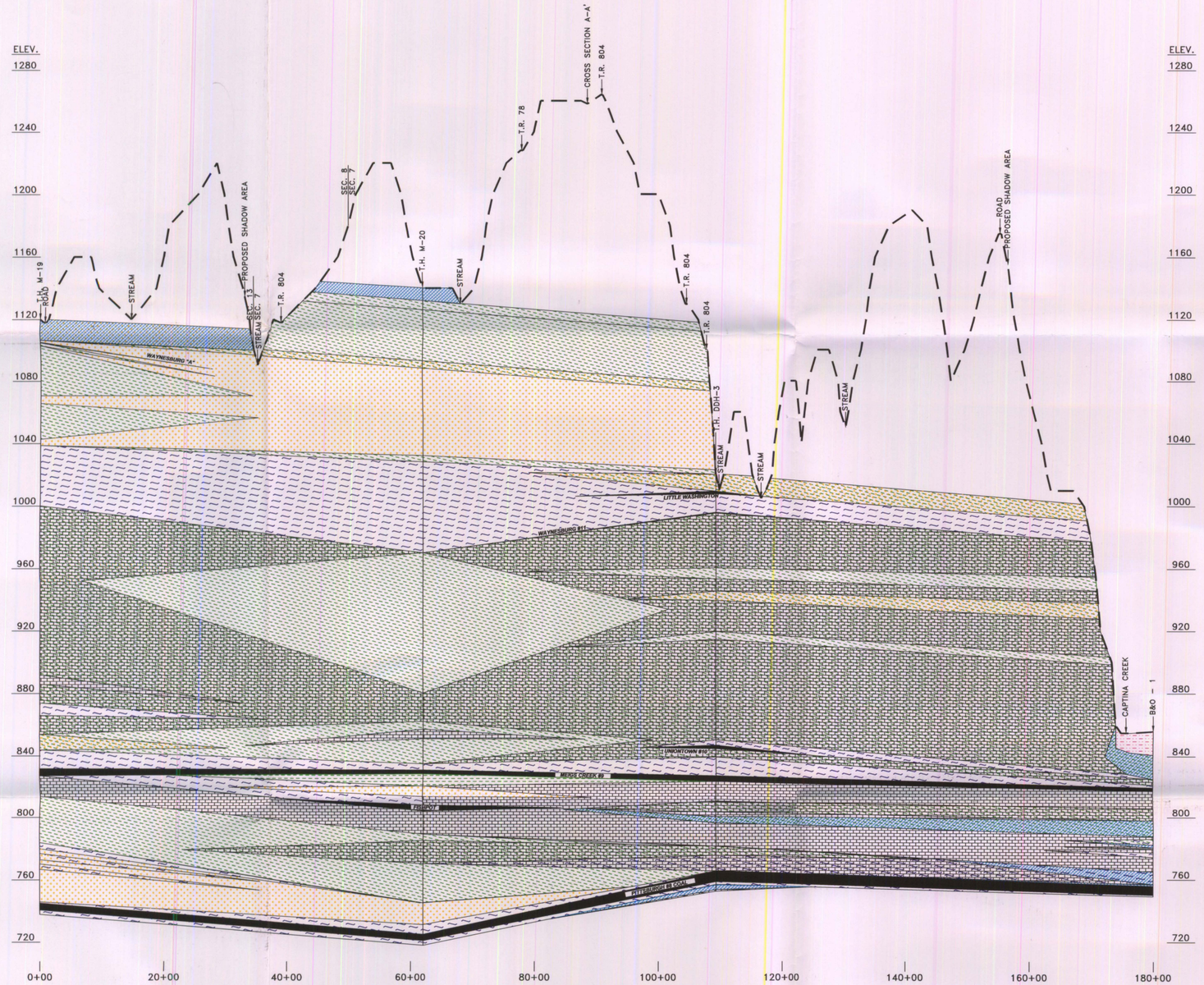
- CLAY
- CLAYSTONE
- ALLUVIUM
- SHALE (RED, GREEN OR GRAY)
- SANDSTONE
- DARK SHALE
- LIMESTONE
- SOAPSTONE
- COAL SEAM

BENNOC, INC.

LOCATED IN SECTIONS 2, 8, 14 & 20, T-6 R-5, WAYNE TWP. AND SECTIONS 26 & 32, T-5 R-4, WASHINGTON TWP.

SCALE: AS SHOWN	COUNTY: BELMONT
DRAWN BY: SSU	COMM. #625-U
DATE: 11-13-98	REV. DATE: 4-18-00

Jack A. Hamilton & Associates, Inc.
Consulting Engineers & Surveyors
Box 471 342 High Street
Flushing, Ohio 43977



LEGEND

- CLAY
- ALLUVIUM
- SHALE (RED, GREEN OR GRAY)
- SANDSTONE
- DARK SHALE
- LIMESTONE
- COAL SEAM

GEOLOGIC CROSS SECTION B-B'

(APPROXIMATE STRIKE OF NO. 8 COAL SEAM)

HORIZ. SCALE: 1" = 1000'
VERT. SCALE: 1" = 40'

BENNOC, INC.

LOCATED IN SECTIONS 2, 8, 14 & 20, T-6 R-5, WAYNE TWP. AND SECTIONS 26 & 32, T-5 R-4, WASHINGTON TWP.

SCALE: AS SHOWN	COUNTY: BELMONT
DRAWN BY: SSU	COMM. #625-U
DATE: 11-16-98	REV. DATE: 4-18-00

Jack A. Hamilton & Associates, Inc.
Consulting Engineers & Surveyors
Box 471 342 High Street
Flushing, Ohio 43977

CENTURY MINE

D-0425-1

SUBMITTED 4-6-99

VOLUME TWO

AEC 04921

ADDENDUM TO PART 3, PAGE 28, K(4)
AMERICAN ENERGY CORPORATION – CENTURY MINE
PERMIT D-0425

ENGINEERING PROPERTIES FOR MAIN DEVELOPMENT ENTRIES AND PARTIAL RECOVERY ROOM SECTIONS

The Century mine proposes to use the Murray Mining System to mine coal where longwall mining is not possible. This is a partial coal recovery system that entails leaving pillars to support the overburden and prevent or minimize subsidence in order to prevent material damage. One of the areas considered for this mining system is beneath Raven Rocks. Previously, this area was projected for mining using the room-and-pillar method with a stability factor of 2.0, based on the experience at the adjacent Powhatan No. 6 mine.

The Murray Mining System includes driving main entries and rooms. The main entries are to be driven on 45 x 100 foot centers with cross-cuts driven at 60 degree angles. The estimated mining height is 6.5 feet. Main entry pillar dimensions will be 80.4 feet x 28 feet. The rooms are to be driven on 45 x 200 foot centers with cross-cuts driven at 60 degree angles. The resultant pillar will be 180.4 feet x 28 feet. The estimated mining height is 5.0 feet. Entry and cross-cut widths are to be 17 feet, maximum, in both the main entries and rooms.

The maximum cover is 530 feet where the Murray Mining System will be utilized.

Pillar stability was analyzed using NIOSH, ARMPS 5.0 program. The unit compressive strength for the Pittsburgh No. 8 coalbed used in this calculation was 900 psi, per recommendation by MSHA, District 3, Morgantown, West Virginia. The resultant factors of safety are 2.04 for the main enrty pillars and 2.97 for the room pillars. Mining extraction rates are 49.95 percent (rounded-up to 50 percent on the computer printout) for the main entries, and 44 percent for room section. Attached are computer printouts for both analyses.

Pillar stability is expected beneath Raven Rocks using the Murray Mining System based on factors of safety exceeding 2.0 and mining extractions less than 50 percent in both the main entries and rooms.

STATE OF OHIO
WILLIAM J. SIPLIVY
E-51015
REGISTERED PROFESSIONAL ENGINEER

William J. Siplivy
14 March 2007

ADDENDUM TO PART 3, PAGE 28, K(4)
AMERICAN ENERGY CORPORATION – CENTURY MINE
PERMIT D-0425

ENGINEERING PROPERTIES FOR MAIN DEVELOPMENT ENTRIES AND PARTIAL RECOVERY ROOM SECTIONS

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The Murray Mining System includes driving main entries and rooms. The main entries are to be driven on 45 x 100 foot centers with cross-cuts driven at 60 degree angles. The estimated mining height is 6.5 feet. Main entry pillar dimensions will be 80.4 feet x 28 feet. The rooms are to be driven on 45 x 200 foot centers with cross-cuts driven at 60 degree angles. The resultant pillar will be 180.4 feet x 28 feet. The estimated mining height is 5.0 feet. Entry and cross-cut widths are to be 17 feet, maximum, in both the main entries and rooms.

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Pillar stability is expected beneath Raven Rocks using the Murray Mining System based on factors of safety exceeding 2.0 and mining extractions less than 50 percent in both the main entries and rooms.

STATE OF OHIO
WILLIAM
J.
SIPLIVY
E-51015
REGISTERED
PROFESSIONAL ENGINEER

William J. Siplivy
14 March 2005

9. In the space below, give the name and address of the public office where this application is to be filed for public viewing.

NA

I, the undersigned, a responsible official of the applicant, do hereby verify the information contained in this revision request is true and correct to the best of my information and belief.

Print Name JAMES R TURNER Jr Title TREASURER

Signature Date 3/12/07

Sworn before me and subscribed in my presence this 12th day of March, 2007

STATE OF OHIO
NOTARY PUBLIC
DENISE R. JACKSON
My Commission Expires Sept. 28, 2010

Denise R. Jackson
Notary Public

(For Division Use Only)

This application for renewal is hereby ☐ issued, ☐ disapproved.

Chief, Division of Mineral Resources Management Date

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	D-2	D-2	D-2	D-2	D-2	D-2
2	Identification Number 98-	09030	10062	11026	12020	12362	99-01396
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	920	920	920	920	920	920
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	2.9 CFS	1.13 CFS	0.47 CFS	2.3 CFS	1.32 CFS	16.3 CFS
8	Date Above Measurements Made	8-30-98	9-30-98	10-29-98	11-28-98	12-17-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	7.80	8.00	7.80	8.10	7.80	7.70
[illegible]	Total Acidity (mg/l CaCO3)	4.90	4.00	4.20	5.90	12.0	4.40
12	Total Alkalinity (mg/l CaCO3)	120.0	140.0	140.0	120.0	120.0	51.0
13	Specific Conductivity (umhos/cm at 25° C)	350.0	140.0	140.0	400.0	410.0	160.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.31	0.04	0.02	0.04	0.04	0.06
16	Total Sulfates (mg/l)	62.0	74.0	100.0	71.0	85.0	32.0
17	Total Iron (mg/l)	0.60	0.23	0.11	0.22	0.17	0.36
18	Total Suspended Solids (mg/l)	4.0	<1.0	<1.0	<1.0	<1.0	4.0
19	Total Hardness (mg/l as CaCO3)	140.0	170.0	200.0	100.0	170.0	60.0
20	Nitrates	0.12	<0.09	<0.09	<0.09	<0.09	0.46
21	Date Sampled for Analysis	8-30-98	9-30-98	10-29-98	11-28-98	12-17-98	1-27-99
22	Date Last Precipitation Event Occurred	8-26-98	9-29-98	10-29-98	11-25-98	12-17-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	D-4	D-4	D-4	D-4	D-4	D-4
2	Identification Number 98-	09034	10064	11043	11423	12384	99-02122
3	High (H)/Low (L) Designation (if applicable)	SIX MONTH SAMPLING					
4	Surface Elevation for Sampling Station (msl)	900	900	900	900	900	900
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	6.00 CFS	2.59 CFS	1.85 CFS	2.76 CFS	2.13 CFS	43 CFS
8	Date Above Measurements Made	8-30-98	9-30-98	10-30-98	11-25-98	12-17-98	1-29-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	7.90	7.90	7.90	8.30	8.10	7.70
	Total Acidity (mg/l CaCO3)	3.40	2.00	4.40	0.00	7.20	<1.0
12	Total Alkalinity (mg/l CaCO3)	120.0	150.0	160.0	150.0	150.0	68.0
13	Specific Conductivity (umhos/cm at 25° C)	290.0	330.0	380.0	360.0	370.0	200.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	29.0	27.0	30.0	31.0	32.30	27.0
17	Total Iron (mg/l)	0.05	<0.05	<0.05	<0.05	<0.05	0.14
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	140.0	160.0	150.0	160.0	150.0	90.0
20	Nitrates	<0.10	<0.09	<0.09	<0.09	<0.09	0.89
21	Date Sampled for Analysis	8-30-98	9-30-98	10-30-98	11-25-98	12-17-98	1-29-99
22	Date Last Precipitation Event Occurred	8-26-98	9-29-98	10-29-98	11-25-98	12-17-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	D-6	D-6	D-6	D-6	D-6	D-6
2	Identification Number 98-	08302	10066	11025	12015	99-01130	99-02100
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1015	1015	1015	1015	1015	1015
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.009 CFS	0.003 CFS	0.003 CFS	0.009 CFS	0.01 CFS	0.15 CFS
8	Date Above Measurements Made	8-27-98	9-30-98	10-29-98	11-28-98	12-31-98	1-28-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	7.50	8.10	8.00	7.90	8.10	8.00
11	Total Acidity (mg/l CaCO3)	6.80	<1.0	5.10	4.00	3.40	<1.0
12	Total Alkalinity (mg/l CaCO3)	180.0	180.00	190.00	150.00	120.0	100.0
13	Specific Conductivity (umhos/cm at 25° C)	430.0	410.0	470.0	460.0	400.0	270.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	0.03	<0.02	0.02	<0.02
16	Total Sulfates (mg/l)	60.00	65.00	75.00	85.00	110.0	41.0
17	Total Iron (mg/l)	0.15	0.29	0.42	<0.05	0.28	0.36
18	Total Suspended Solids (mg/l)	7.3	2.7	27.0	<1.0	<1.0	11.0
19	Total Hardness (mg/l as CaCO3)	210.0	210.0	220.0	190.0	190.0	140.0
20	Nitrates	1.2	0.76	0.36	0.72	0.45	0.57
21	Date Sampled for Analysis	8-27-98	9-30-98	10-29-98	11-28-98	12-31-98	1-28-99
22	Date Last Precipitation Event Occurred	8-26-98	9-29-98	10-29-98	11-25-98	12-31-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	D-21	D-21	D-21	D-21	D-21	D-21
2	Identification Number 98-	08288			12026	12360	99-01389
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1088	1088	1088	1088	1088	1088
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.0006 CFS	0	0	0.003 CFS	0.01 CFS	0.18 CFS
8	Date Above Measurements Made	8-26-98	9-30-98	10-29-98	11-28-98	12-17-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	7.10	DRY	DRY	7.60	7.30	7.30
	Total Acidity (mg/l CaCO3)	5.30			1.30	12.0	3.70
12	Total Alkalinity (mg/l CaCO3)	59.00			43.00	49.0	28.0
13	Specific Conductivity (umhos/cm at 25° C)	210.0			170.0	180.0	93.0
14	Total Dissolved Solids (mg/l)	---			---	---	---
15	Total Manganese (mg/l)	0.10			0.03	<0.02	<0.02
16	Total Sulfates (mg/l)	43.00			27.0	34.0	21.0
17	Total Iron (mg/l)	0.27			0.29	0.15	0.17
18	Total Suspended Solids (mg/l)	4.7			<1.0	<1.0	2.70
19	Total Hardness (mg/l as CaCO3)	90.0			70.0	80.0	40.0
20	Nitrates	0.21			<0.09	<0.09	<0.09
21	Date Sampled for Analysis	8-26-98			11-28-98	12-17-98	1-27-99
22	Date Last Precipitation Event Occurred	8-26-98			11-25-98	12-17-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	D-22	D-22	D-22	D-22	D-22	D-22
2	Identification Number 98-	08287			12025	12359	99-01390
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1090	1090	1090	1090	1090	1090
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.007 CFS	0	0	0	0.002 CFS	0.13 CFS
8	Date Above Measurements Made	8-26-98	9-30-98	10-29-98	11-28-98	12-17-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	7.40	DRY	DRY	7.20	7.70	7.30
	Total Acidity (mg/l CaCO3)	5.50			5.20	14.0	5.90
12	Total Alkalinity (mg/l CaCO3)	57.00			56.00	61.0	25.0
13	Specific Conductivity (umhos/cm at 25° C)	250.0			240.0	260.0	110.0
14	Total Dissolved Solids (mg/l)	---			---	---	---
15	Total Manganese (mg/l)	0.17			0.07	0.03	<0.02
16	Total Sulfates (mg/l)	53.00			74.00	53.0	25.0
17	Total Iron (mg/l)	0.23			0.60	0.35	0.34
18	Total Suspended Solids (mg/l)	3.3			<1.0	1.0	7.30
19	Total Hardness (mg/l as CaCO3)	100.0			90.0	100.0	40.0
20	Nitrates	0.27			0.13	0.27	0.57
21	Date Sampled for Analysis	8-26-98			11-28-98	12-17-98	1-27-99
22	Date Last Precipitation Event Occurred	8-26-98			11-25-98	12-17-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	D-31	D-31	D-31	D-31	D-31	D-31
2	Identification Number 98-	09031	10063	11047	11350	12426	99-02150
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1080	1080	1080	1080	1080	1080
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.07 CFS	0.02 CFS	0.004CFS	0.02 CFS	0.10 CFS	0.77 CFS
8	Date Above Measurements Made	8-30-98	9-30-98	10-30-98	11-23-98	12-21-98	1-29-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	7.90	7.30	7.30	8.00	7.70	7.90
11	Total Acidity (mg/l CaCO3)	7.90	42.0	6.80	14.0	5.30	<1.0
12	Total Alkalinity (mg/l CaCO3)	110.0	110.0	120.0	98.0	95.0	55.0
13	Specific Conductivity (umhos/cm at 25° C)	310.0	280.0	300.0	280.0	280.0	160.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.06	0.02	0.06	0.03	0.03	<0.02
16	Total Sulfates (mg/l)	39.0	27.0	31.0	41.0	40.0	28.0
17	Total Iron (mg/l)	0.10	<0.05	0.10	0.14	0.16	0.07
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	4.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	130.0	100.0	130.0	110.0	110.0	70.0
20	Nitrates	0.32	0.12	0.25	<0.09	<0.09	0.32
21	Date Sampled for Analysis	8-30-98	9-30-98	10-30-98	11-23-98	12-21-98	1-29-99
22	Date Last Precipitation Event Occurred	8-26-98	9-29-98	10-30-98	11-23-98	12-21-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC.

(D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	D-32	D-32	D-32	D-32	D-32	D-32
2	Identification Number 98-	09036	10065	10283	11441	12365	99-01191
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	940	940	940	940	940	940
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.50 CFS	0.001 CFS	0.001 CFS	0.02 CFS	0.01 CFS	3.01 CFS
8	Date Above Measurements Made	8-30-98	9-30-98	10-14-98	11-27-98	12-17-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	7.60	7.70	7.80	8.10	8.00	7.80
12	Total Acidity (mg/l CaCO3)	8.10	9.80	5.30	3.40	14.0	3.10
13	Total Alkalinity (mg/l CaCO3)	210.0	180.0	210.0	180.0	190.0	44.0
14	Specific Conductivity (umhos/cm at 25° C)	450.0	180.0	210.0	410.0	440.0	140.0
15	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
16	Total Manganese (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
17	Total Sulfates (mg/l)	52.0	54.0	42.0	55.0	57.0	22.0
18	Total Iron (mg/l)	0.37	<0.05	0.08	<0.05	<0.05	0.48
19	Total Suspended Solids (mg/l)	9.3	<1.0	<1.0	<1.0	<1.0	5.3
20	Total Hardness (mg/l as CaCO3)	240.0	180.0	230.0	210.0	210.0	70.0
21	Nitrates	0.20	0.13	<0.10	<0.09	<0.09	0.52
2	Date Sampled for Analysis	8-30-98	9-30-98	10-14-98	11-27-98	12-17-98	1-22-99
	Date Last Precipitation Event Occurred	8-26-98	9-29-98	10-7-98	11-25-98	12-17-98	1-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019
State WEST VIRGINIA
City WHEELING
Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	D-33	D-33	D-33	D-33	D-33	D-33
2	Identification Number 98-	09035		11044	11424	12385	99-02123
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	900	900	900	900	900	900
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.003 CFS	0	0.007 CFS	0.01 CFS	0.02 CFS	0.35 CFS
8	Date Above Measurements Made	8-30-98	9-30-98	10-30-98	11-25-98	12-17-98	1-29-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	7.80	DRY	7.60	8.00	7.90	7.70
11	Total Acidity (mg/l CaCO3)	5.50		3.80	3.90	9.60	<1.0
12	Total Alkalinity (mg/l CaCO3)	180.0		160.00	170.00	160.0	78.0
13	Specific Conductivity (umhos/cm at 25° C)	420.0		420.0	430.0	440.0	240.0
14	Total Dissolved Solids (mg/l)	---		---	---	---	---
15	Total Manganese (mg/l)	<0.02		<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	49.00		53.00	55.00	62.0	36.0
17	Total Iron (mg/l)	<0.02		<0.05	<0.05	<0.05	<0.05
18	Total Suspended Solids (mg/l)	<1.0		<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	200.0		190.0	190.0	200.0	110.0
20	Nitrates	0.36		0.13	<0.09	<0.09	0.37
21	Date Sampled for Analysis	8-30-98		10-30-98	11-25-98	12-17-98	1-29-99
22	Date Last Precipitation Event Occurred	8-26-98		10-29-98	11-25-98	12-17-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	U-1	U-1	U-1	U-1	U-1	U-1
2	Identification Number 98-	09029	09279	10117	11252	12198	99-02151
3	High (H)/Low (L) Designation (if applicable)	SIX MONTH SAMPLING					
4	Surface Elevation for Sampling Station (msl)	955	955	955	955	955	955
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.11 CFS	0.06 CFS	0.06 CFS	0.25 CFS	0.27 CFS	2.95 CFS
8	Date Above Measurements Made	8-30-98	9-24-98	10-6-98	11-12-98	12-9-98	1-30-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	8.30	7.80	8.00	7.80	8.30	8.20
	Total Acidity (mg/l CaCO3)	0.00	17.00	<1.0	15.00	0.00	<1.0
12	Total Alkalinity (mg/l CaCO3)	140.00	142.00	150.00	140.00	140.0	57.0
13	Specific Conductivity (umhos/cm at 25° C)	360.0	430.0	390.0	380.0	410.0	220.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	53.00	76.00	68.00	74.00	73.0	44.0
17	Total Iron (mg/l)	0.12	1.00	<0.05	<0.05	<0.05	0.05
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	4.0	<1.0
19	Total Hardness (mg/l as CaCO3)	170.0	180.0	210.0	180.0	170.0	120.0
20	Nitrates	<0.10	0.12	<0.09	<0.09	<0.09	0.24
21	Date Sampled for Analysis	8-30-98	9-24-98	10-6-98	11-12-98	12-9-98	1-30-99
22	Date Last Precipitation Event Occurred	8-26-98	9-22-98	10-4-98	11-10-98	12-9-98	1-23-99

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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	U-1A	U-1A	U-1A	U-1A	U-1A	U-1A
2	Identification Number 98-						99-02154
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1030	1030	1030	1030	1030	1030
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0	0	0	0	0	0.93 CFS
8	Date Above Measurements Made	8-30-98	9-24-98	10-6-98	11-12-98	12-9-98	1-30-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	DRY	DRY	DRY	DRY	DRY	7.80
11	Total Acidity (mg/l CaCO3)						11.0
12	Total Alkalinity (mg/l CaCO3)						63.0
13	Specific Conductivity (umhos/cm at 25° C)						170.0
14	Total Dissolved Solids (mg/l)						---
15	Total Manganese (mg/l)						<0.02
16	Total Sulfates (mg/l)						29.0
17	Total Iron (mg/l)						<0.05
18	Total Suspended Solids (mg/l)						<1.0
19	Total Hardness (mg/l as CaCO3)						60.0
20	Nitrates						0.35
21	Date Sampled for Analysis						1-30-99
22	Date Last Precipitation Event Occurred						1-23-99

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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	U-2	U-2	U-2	U-2	U-2	U-2
2	Identification Number 98-	08310	10060		12042	12361	99-01388
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1010	1010	1010	1010	1010	1010
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	1.20 CFS	0.34 CFS	0.43 CFS	1.0 CFS	0.76 CFS	10.3 CFS
8	Date Above Measurements Made	8-28-98	9-30-98		11-28-98	12-17-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	7.60	7.30		8.10	7.50	7.80
	Total Acidity (mg/l CaCO3)	4.00	3.30		2.80	12.0	5.70
12	Total Alkalinity (mg/l CaCO3)	99.00	110.00		90.00	110.0	45.0
13	Specific Conductivity (umhos/cm at 25° C)	250.0	270.0		270.0	280.0	130.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.03	0.06		<0.02	<0.02	0.03
16	Total Sulfates (mg/l)	22.00	18.00		35.00	29.0	20.0
17	Total Iron (mg/l)	0.52	0.16		0.05	0.83	0.51
18	Total Suspended Solids (mg/l)	6.0	<1.0		<1.0	<1.0	15.0
19	Total Hardness (mg/l as CaCO3)	100.0	100.0		110.0	100.0	60.0
20	Nitrates	0.25	0.19		<0.09	<0.09	0.48
21	Date Sampled for Analysis	8-28-98	9-30-98		11-28-98	12-17-98	1-27-99
22	Date Last Precipitation Event Occurred	8-26-98	9-29-98		11-25-98	12-17-98	1-23-99

Laboratory Name TRA-DET, INC.
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	U-2C	U-2C	U-2C	U-2C	U-2C	U-2C
2	Identification Number 98-				12019	12363	99-01397
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1057	1057	1057	1057	1057	1057
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0	0	0	0.002 CFS	0.0008 CFS	0.02 CFS
8	Date Above Measurements Made	8-26-98	9-30-98	10-29-98	11-28-98	12-17-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	DRY	DRY	DRY	7.30	6.90	7.50
11	Total Acidity (mg/l CaCO3)				7.90	33.0	9.20
12	Total Alkalinity (mg/l CaCO3)				170.0	170.0	84.0
13	Specific Conductivity (umhos/cm at 25° C)				590.0	580.0	260.0
14	Total Dissolved Solids (mg/l)				---	---	---
15	Total Manganese (mg/l)				0.02	<0.02	0.03
16	Total Sulfates (mg/l)				140.0	150.0	59.0
17	Total Iron (mg/l)				<0.05	<0.05	0.96
18	Total Suspended Solids (mg/l)				<1.0	<1.0	18.0
19	Total Hardness (mg/l as CaCO3)				240.0	270.0	130.0
20	Nitrates				<0.09	<0.09	<0.09
21	Date Sampled for Analysis				11-28-98	12-17-98	1-27-99
22	Date Last Precipitation Event Occurred				11-25-98	12-17-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	U-4	U-4	U-4	U-4	U-4	U-4
2	Identification Number 98-	09033	10061	11045	11425	12386	99-02124
3	High (H)/Low (L) Designation (if applicable)	SIX MONTH SAMPLING					
4	Surface Elevation for Sampling Station (msl)	900	900	900	900	900	900
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	4.75 CFS	2.54 CFS	1.80 CFS	2.31 CFS	1.98 CFS	40 CFS
8	Date Above Measurements Made	8-30-98	9-30-98	10-30-98	11-25-98	12-17-98	1-29-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	8.20	8.30	8.20	8.30	8.10	7.90
	Total Acidity (mg/l CaCO3)	7.90	0.00	3.80	0.00	6.10	<1.0
12	Total Alkalinity (mg/l CaCO3)	110.00	140.00	160.00	150.00	140.0	72.0
13	Specific Conductivity (umhos/cm at 25° C)	250.0	340.0	380.0	360.0	360.0	200.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	29.00	26.00	29.00	30.00	33.0	27.0
17	Total Iron (mg/l)	0.10	<0.05	<0.05	<0.05	0.10	0.15
18	Total Suspended Solids (mg/l)	3.3	<1.0	<1.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	110.0	160.0	170.0	160.0	160.0	90.0
20	Nitrates	<0.10	<0.09	<0.09	<0.09	<0.09	0.68
21	Date Sampled for Analysis	8-30-98	9-30-98	10-30-98	11-25-98	12-17-98	1-29-99
22	Date Last Precipitation Event Occurred	8-26-98	9-29-98	10-29-98	11-25-98	12-17-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC.

(D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	U-31E	U-31E	U-31E	U-31E	U-31E	U-31E
2	Identification Number 98-	09032		11046	11346	12415	99-02109
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1195	1195	1195	1195	1195	1195
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.002 CFS	0	0.0004 CFS	0.0004 CFS	0.005 CFS	0.06 CFS
8	Date Above Measurements Made	8-30-98	9-30-98	10-30-98	11-23-98	12-21-98	1-29-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	7.80	DRY	7.40	7.70	7.60	7.80
	Total Acidity (mg/l CaCO3)	7.60		4.90	16.0	6.20	<1.0
12	Total Alkalinity (mg/l CaCO3)	150.00		130.00	120.00	110.0	61.0
13	Specific Conductivity (umhos/cm at 25° C)	280.0		300.0	270.0	290.0	160.0
14	Total Dissolved Solids (mg/l)	---		---	---	---	---
15	Total Manganese (mg/l)	0.21		0.25	0.20	0.14	0.04
16	Total Sulfates (mg/l)	23.00		20.00	26.00	24.0	25.0
17	Total Iron (mg/l)	0.18		0.96	0.44	0.24	0.13
18	Total Suspended Solids (mg/l)	67.0		4.7	<1.0	<1.0	2.0
9	Total Hardness (mg/l as CaCO3)	130.0		120.0	130.0	110.0	100.0
0	Nitrates	0.23		0.10	0.15	0.14	0.51
1	Date Sampled for Analysis	8-30-98		10-30-98	11-23-98	12-21-98	1-29-99
2	Date Last Precipitation Event Occurred	8-26-98		10-29-98	11-23-98	12-21-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019
State WEST VIRGINIA
City WHEELING
Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	P-1	P-1	P-1	P-1	P-1	P-1
2	Identification Number 98-		09299	10470	11419	12241	99-01176
3	High (H)/Low (L) Designation (if applicable)	SIX MONTH SAMPLING					
4	Surface Elevation for Sampling Station (msl)	1220	1220	1220	1220	1220	1220
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0	0	0	0	0	0.04 CFS
8	Date Above Measurements Made	8-25-98	9-25-98	10-26-98	11-25-98	12-14-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	DRY	8.60	8.00	8.20	7.00	6.70
	Total Acidity (mg/l CaCO3)		0.00	14.00	6.20	3.90	5.30
12	Total Alkalinity (mg/l CaCO3)		73.00	74.00	67.00	62.0	15.0
13	Specific Conductivity (umhos/cm at 25° C)		200.0	160.0	160.0	190.0	97.0
14	Total Dissolved Solids (mg/l)		---	---	---	---	---
15	Total Manganese (mg/l)		0.73	0.46	0.19	0.26	0.07
16	Total Sulfates (mg/l)		3.10	6.80	8.20	10.0	5.20
17	Total Iron (mg/l)		2.10	2.80	1.60	1.30	1.10
18	Total Suspended Solids (mg/l)		17.0	19.0	10.0	16.0	15.0
19	Total Hardness (mg/l as CaCO3)		90.0	70.0	40.0	50.0	40.0
20	Nitrates		0.15	<0.09	<0.09	0.00	0.54
21	Date Sampled for Analysis		9-25-98	10-26-98	11-25-98	12-14-98	1-22-99
22	Date Last Precipitation Event Occurred		9-22-98	10-18-98	11-25-98	12-9-98	1-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	P-2	P-2	P-2	P-2	P-2	P-2
2	Identification Number 98-	08245	10003	10458	11462	12287	99-01384
3	High (H)/Low (L) Designation (if applicable)	SIX MONTH SAMPLING					
4	Surface Elevation for Sampling Station (msl)	1096	1096	1096	1096	1096	1096
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0	0	0	0	0	0.13 CFS
8	Date Above Measurements Made	8-25-98	9-28-98	10-24-98	11-27-98	12-15-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	8.40	7.80	7.90	8.60	7.90	7.20
	Total Acidity (mg/l CaCO3)	0.00	7.80	6.30	0.00	4.00	6.10
12	Total Alkalinity (mg/l CaCO3)	47.00	48.00	49.00	42.00	42.0	30.0
13	Specific Conductivity (umhos/cm at 25° C)	130.0	120.0	120.0	100.0	130.0	100.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.03	0.04	<0.02	0.02	0.04	0.06
16	Total Sulfates (mg/l)	12.00	13.00	15.00	19.00	12.0	18.0
17	Total Iron (mg/l)	0.03	0.14	0.15	0.33	0.33	0.48
18	Total Suspended Solids (mg/l)	<1.0	1.3	<1.0	<1.0	1.0	6.7
19	Total Hardness (mg/l as CaCO3)	50.0	40.0	50.0	40.0	70.0	40.0
20	Nitrates	0.30	0.101	0.10	<0.09	<0.09	0.40
21	Date Sampled for Analysis	8-22-98	9-28-98	10-24-98	11-27-98	12-15-98	1-27-99
22	Date Last Precipitation Event Occurred	8-17-98	9-27-98	10-18-98	11-25-98	12-9-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	P-3	P-3	P-3	P-3	P-3	P-3
2	Identification Number 98-	08246	10001	10486	11463	12288	99-01385
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1110	1110	1110	1110	1110	1110
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0	0	0	0	0	0.07 CFS
8	Date Above Measurements Made	8-22-98	9-28-98	10-26-98	11-27-98	12-15-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	8.50	8.20	8.60	8.70	7.60	7.40
	Total Acidity (mg/l CaCO3)	0.00	4.50	0.00	0.00	<1.0	4.60
12	Total Alkalinity (mg/l CaCO3)	45.00	43.00	42.00	40.0	45.0	25.0
13	Specific Conductivity (umhos/cm at 25° C)	110.0	120.0	110.0	78.0	120.0	83.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.06	0.04	<0.02	<0.02	0.06	0.15
16	Total Sulfates (mg/l)	10.00	11.00	11.00	12.00	14.0	16.0
17	Total Iron (mg/l)	0.21	0.09	0.06	<0.05	0.07	0.62
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	<1.0	3.30	6.0
19	Total Hardness (mg/l as CaCO3)	40.0	40.0	50.0	40.0	60.0	40.0
20	Nitrates	0.30	<0.10	<0.09	<0.09	<0.09	0.15
21	Date Sampled for Analysis	8-22-98	9-28-98	10-26-98	11-27-98	12-15-98	1-27-99
22	Date Last Precipitation Event Occurred	8-17-98	9-27-98	10-18-98	11-25-98	12-9-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC.

(D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	P-4	P-4	P-4	P-4	P-4	P-4
2	Identification Number 98-	08248	10026	10468	11421	12244	99-0118(
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1160	1160	1160	1160	1160	1160
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.001	0	0	0	0	0
8	Date Above Measurements Made	8-22-98	9-28-98	10-26-98	11-25-98	12-14-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	6.40	7.60	6.90	6.90	7.50	6.20
12	Total Acidity (mg/l CaCO3)	18.00	4.50	9.10	2.20	3.30	9.00
13	Total Alkalinity (mg/l CaCO3)	66.00	40.00	52.00	48.00	47.0	12.0
14	Specific Conductivity (umhos/cm at 25° C)	180.0	140.0	240.0	230.0	260.0	160.0
15	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
16	Total Manganese (mg/l)	1.00	0.07	0.05	0.02	0.06	0.34
17	Total Sulfates (mg/l)	12.00	10.00	6.20	7.10	9.50	18.0
18	Total Iron (mg/l)	5.10	0.28	0.36	0.15	0.22	0.48
19	Total Suspended Solids (mg/l)	140.0	<1.0	6.7	1.3	<1.0	5.0
20	Total Hardness (mg/l as CaCO3)	90.0	20.0	80.0	50.0	80.0	60.0
21	Nitrates	0.39	<0.10	0.10	<0.09	<0.09	<0.09
22	Date Sampled for Analysis	8-22-98	9-28-98	10-26-98	11-25-98	12-14-98	1-22-99
23	Date Last Precipitation Event Occurred	8-17-98	9-27-98	10-18-98	11-25-98	12-9-98	1-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019
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City WHEELING
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	P-5	P-5	P-5	P-5	P-5	P-5
2	Identification Number 98-	08247	10027	10469	11422	12243	99-01179
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1160	1160	1160	1160	1160	1160
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.002	0	0	0	0	0
8	Date Above Measurements Made	8-22-98	9-28-98	10-26-98	11-25-98	12-14-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	7.50	7.10	6.80	7.20	7.90	6.20
11	Total Acidity (mg/l CaCO3)	8.10	5.50	3.00	2.80	2.60	<1.0
12	Total Alkalinity (mg/l CaCO3)	180.00	51.00	39.00	33.00	35.0	8.40
13	Specific Conductivity (umhos/cm at 25° C)	460.0	240.0	120.0	99.0	120.0	66.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.14	0.14	<0.02	<0.02	0.02	0.19
16	Total Sulfates (mg/l)	21.00	7.90	8.30	8.20	11.0	15.0
17	Total Iron (mg/l)	0.49	0.72	0.26	0.10	0.18	0.29
18	Total Suspended Solids (mg/l)	40.0	<1.0	1.3	<1.0	6.0	2.0
19	Total Hardness (mg/l as CaCO3)	210.0	70.0	40.0	30.0	50.0	10.0
20	Nitrates	0.43	<0.10	<0.09	<0.09	0.11	<0.09
21	Date Sampled for Analysis	8-22-98	9-28-98	10-26-98	11-25-98	12-14-98	1-22-99
22	Date Last Precipitation Event Occurred	8-17-98	9-27-98	10-18-98	11-25-98	12-9-98	1-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	P-6	P-6	P-6	P-6	P-6	P-6
2	Identification Number 98-	08270	09292	10186	11407	12261	99-01166
3	High (H)/Low (L) Designation (if applicable)	SIX MONTH SAMPLING					
4	Surface Elevation for Sampling Station (msl)	1178	1178	1178	1178	1178	1178
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.004	0	0	0	0	0.03 CFS
8	Date Above Measurements Made	8-25-98	9-28-98	10-9-98	11-25-98	12-14-98	1-22-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	8.35	8.80	8.40	8.90	8.00	7.60
	Total Acidity (mg/l CaCO3)	0.00	0.00	0.00	0.00	<1.0	3.1
12	Total Alkalinity (mg/l CaCO3)	96.00	100.0	93.00	110.0	100.0	48.0
13	Specific Conductivity (umhos/cm at 25° C)	270.0	270.0	260.0	280.0	310.0	390.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.82	0.34	0.35	0.05	0.15	0.02
16	Total Sulfates (mg/l)	19.00	14.00	12.00	18.00	25.0	26.0
17	Total Iron (mg/l)	0.29	0.26	0.41	0.12	0.24	0.18
18	Total Suspended Solids (mg/l)	1.3	<1.0	2.0	<1.0	<1.0	4.0
19	Total Hardness (mg/l as CaCO3)	160.0	100.0	90.0	100.0	100.0	110.0
20	Nitrates	0.26	0.10	0.20	<0.09	0.10	0.72
21	Date Sampled for Analysis	8-25-98	9-25-98	10-9-98	11-25-98	12-14-98	1-22-99
22	Date Last Precipitation Event Occurred	8-25-98	9-22-98	10-7-98	11-25-98	12-14-98	1-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	P-7	P-7	P-7	P-7	P-7	P-7
2	Identification Number 98-				12007	12357	99-01391
3	High (H)/Low (L) Designation (if applicable)			SIX	MONTH	SAMPLING	
4	Surface Elevation for Sampling Station (msl)	1142	1142	1142	1142	1142	1142
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0	0	0	0	0	0.02 CFS
8	Date Above Measurements Made	8-25-98	9-12-98	10-15-98	11-28-98	12-17-98	1-27-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	
10	pH (Standard Units)	DRY	DRY	DRY	7.20	7.20	7.20
	Total Acidity (mg/l CaCO3)				14.0	70.0	17.0
12	Total Alkalinity (mg/l CaCO3)				140.0	150.0	98.0
13	Specific Conductivity (umhos/cm at 25° C)				340.0	350.0	270.0
14	Total Dissolved Solids (mg/l)				---	---	---
15	Total Manganese (mg/l)				0.67	1.60	0.17
16	Total Sulfates (mg/l)				24.0	10.0	40.0
17	Total Iron (mg/l)				1.30	3.30	0.42
18	Total Suspended Solids (mg/l)				12.0	<1.0	2.70
19	Total Hardness (mg/l as CaCO3)				120.0	170.0	120.0
20	Nitrates				0.09	<0.09	1.20
21	Date Sampled for Analysis				11-28-98	12-17-98	1-27-99
22	Date Last Precipitation Event Occurred				11-25-98	12-17-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	P-8	P-8	P-8	P-8	P-8	P-8
2	Identification Number 98-	08298	10070	10462	12023		99-02175
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1190	1190	1190	1190	1190	1190
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.02 CFS	0.002 CFS	0.0009 CFS	0.001 CFS	0.002 CFS	0.01 CFS
8	Date Above Measurements Made	8-27-98	9-30-98	10-26-98	11-28-98		1-29-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	7.40	7.40	7.90	7.90		7.70
11	Total Acidity (mg/l CaCO3)	6.60	6.10	11.0	5.30		6.50
12	Total Alkalinity (mg/l CaCO3)	100.0	100.0	110.0	120.0		75.0
13	Specific Conductivity (umhos/cm at 25° C)	270.0	280.0	310.0	350.0		260.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.20	0.68	0.12	0.09		0.23
16	Total Sulfates (mg/l)	10.00	7.80	17.0	24.0		23.0
17	Total Iron (mg/l)	0.61	1.3	0.50	0.34		0.66
18	Total Suspended Solids (mg/l)	<1.0	4.0	1.3	<1.0		3.3
19	Total Hardness (mg/l as CaCO3)	140.0	90.0	130.0	130.0		120.0
20	Nitrates	<0.10	0.14	0.18	0.32		0.56
21	Date Sampled for Analysis	8-27-98	9-30-98	10-26-98	11-28-98		1-29-99
22	Date Last Precipitation Event Occurred	8-26-98	9-29-98	10-18-98	11-25-98		1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	P-9	P-9	P-9	P-9	P-9	P-9
2	Identification Number 98-	09025	10013	11019	12029	99-01133	99-02103
3	High (H)/Low (L) Designation (if applicable)	SIX MONTH SAMPLING					
4	Surface Elevation for Sampling Station (msl)	1160	1160	1160	1160	1160	1160
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0	0	0	0	0	0.004 CFS
8	Date Above Measurements Made	8-30-98	9-28-98	10-29-98	11-28-98	12-31-98	1-28-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	8.20	8.50	7.70	7.90	7.80	8.10
11	Total Acidity (mg/l CaCO3)	12.00	0.00	7.80	5.20	16.0	<1.0
12	Total Alkalinity (mg/l CaCO3)	96.00	90.00	110.0	110.0	110.0	81.0
13	Specific Conductivity (umhos/cm at 25° C)	220.0	210.0	240.0	290.0	240.0	220.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.44	0.38	0.45	0.20	0.67	0.61
16	Total Sulfates (mg/l)	8.40	8.70	10.0	15.0	27.0	27.0
17	Total Iron (mg/l)	0.80	1.80	0.87	0.26	0.98	0.55
18	Total Suspended Solids (mg/l)	10.0	27.0	2.0	<1.0	4.0	1.3
19	Total Hardness (mg/l as CaCO3)	100.0	70.0	100.0	100	130.0	140.0
20	Nitrates	<0.10	0.17	<0.09	0.43	0.67	0.41
21	Date Sampled for Analysis	8-30-98	9-28-98	10-29-98	11-28-98	12-31-98	1-28-99
22	Date Last Precipitation Event Occurred	8-26-98	9-27-98	10-29-98	11-25-98	12-31-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	P-10	P-10	P-10	P-10	P-10	P-10
2	Identification Number 98-	09162	10285	11449	12252	99-01319	99-02258
3	High (H)/Low (L) Designation (if applicable)	SIX MONTH SAMPLING					
4	Surface Elevation for Sampling Station (msl)	1170	1170	1170	1170	1170	1170
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0	0	0	0	0.03 CFS	0.02 CFS
8	Date Above Measurements Made	9-12-98	10-14-98	11-27-98	12-14-98	1-23-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	7.80	7.80	8.40	8.60	7.40	8.40
	Total Acidity (mg/l CaCO3)	30.00	6.30	0.00	0.00	4.20	0.00
12	Total Alkalinity (mg/l CaCO3)	130.00	130.00	130.0	130.0	57.0	110.0
13	Specific Conductivity (umhos/cm at 25° C)	330.0	260.0	260.0	290.0	110.0	230.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.25	0.10	<0.02	0.02	0.04	0.02
16	Total Sulfates (mg/l)	51.00	11.00	13.0	16.0	12.0	18.0
17	Total Iron (mg/l)	0.44	0.39	<0.05	0.07	0.64	0.10
18	Total Suspended Solids (mg/l)	4.0	<1.0	2.0	<1.0	17.0	<1.0
19	Total Hardness (mg/l as CaCO3)	120.0	130.0	130.0	100.0	40.0	100.0
20	Nitrates	0.12	<0.10	<0.09	<0.09	0.18	<0.09
21	Date Sampled for Analysis	9-12-98	10-14-98	11-27-98	12-14-98	1-23-99	2-10-99
22	Date Last Precipitation Event Occurred	9-9-98	10-7-98	11-25-98	12-9-98	1-23-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	P-11	P-11	P-11	P-11	P-11	P-11
2	Identification Number 98-	09163	10492	11447	12272	99-01316	99-02262
3	High (H)/Low (L) Designation (if applicable)	SIX MONTH SAMPLING					
4	Surface Elevation for Sampling Station (msl)	1120	1120	1120	1120	1120	1120
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0	0	0	0	0	.001 CFS
8	Date Above Measurements Made	9-12-98	10-16-98	11-27-98	12-14-98	1-23-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	7.60	8.00	9.20	8.70	7.50	8.20
	Total Acidity (mg/l CaCO3)	42.00	19.0	0.00	0.00	4.80	6.6
12	Total Alkalinity (mg/l CaCO3)	160.00	160.0	150.0	100.0	57.0	110.0
13	Specific Conductivity (umhos/cm at 25° C)	370.0	330.0	300.0	420.0	120.0	240.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.34	0.47	0.02	0.04	0.14	<0.02
16	Total Sulfates (mg/l)	12.00	19.0	22.0	20.0	17.0	24.0
17	Total Iron (mg/l)	0.53	3.90	0.20	0.14	0.48	0.06
18	Total Suspended Solids (mg/l)	15.0	100.0	6.0	<1.0	4.0	<1.0
19	Total Hardness (mg/l as CaCO3)	160.0	180.0	140.0	100.0	60.0	110.0
20	Nitrates	0.15	<0.09	<0.09	<0.09	0.14	<0.09
21	Date Sampled for Analysis	9-12-98	10-15-98	11-27-98	12-14-98	1-23-99	2-10-99
22	Date Last Precipitation Event Occurred	9-9-98	10-7-98	11-25-98	12-9-98	1-23-99	2-7-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	P-12	P-12	P-12	P-12	P-12	P-12
2	Identification Number 98-	09250	10474	11257	12245	99-01181	99-02290
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1145	1145	1145	1145	1145	1145
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0	0	0	0	0.01 CFS	0
8	Date Above Measurements Made	9-21-98	10-26-98	11-12-98	12-14-98	1-22-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	7.70	7.00	6.90	7.10	6.90	6.80
11	Total Acidity (mg/l CaCO3)	14.0	8.90	14.0	6.80	5.50	6.20
12	Total Alkalinity (mg/l CaCO3)	58.0	64.0	66.0	68.0	23.0	30.0
13	Specific Conductivity (umhos/cm at 25° C)	160.0	170.0	140.0	180.0	82.0	98.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.20	0.16	0.28	0.13	0.09	0.04
16	Total Sulfates (mg/l)	8.70	18.0	19.0	20.0	14.0	15.0
17	Total Iron (mg/l)	1.90	1.10	1.20	1.10	0.39	0.73
18	Total Suspended Solids (mg/l)	14.0	2.70	6.70	7.30	9.00	8.00
19	Total Hardness (mg/l as CaCO3)	70.0	90.0	70.0	80.0	30.0	30.0
20	Nitrates	0.19	0.11	0.09	<0.09	<0.09	<0.09
21	Date Sampled for Analysis	9-21-98	10-26-98	11-12-98	12-14-98	1-22-99	2-10-99
22	Date Last Precipitation Event Occurred	9-21-98	10-18-98	11-10-98	12-9-98	1-22-99	2-10-99

Laboratory Name TRA-DET, INC.
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	P-13	P-13	P-13	P-13	P-13	P-13
2	Identification Number 98-	09265	11029	11444	12251	99-01189	99-02264
3	High (H)/Low (L) Designation (if applicable)	SIX MONTH SAMPLING					
4	Surface Elevation for Sampling Station (msl)	1160	1160	1160	1160	1160	1160
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	-Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0	0	0	0	0.03 CFS	.004 CFS
8	Date Above Measurements Made	9-23-98	10-30-98	11-27-98	12-14-98	1-22-99	2-10-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	8.50	8.59	10.90	9.60	7.50	8.40
	Total Acidity (mg/l CaCO3)	0.00	0.00	0.00	0.00	6.60	0.00
12	Total Alkalinity (mg/l CaCO3)	110.0	72.0	66.0	67.0	59.0	100.0
13	Specific Conductivity (umhos/cm at 25° C)	300.0	160.0	140.0	180.0	190.0	250.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.07	<0.02	<0.02	0.02	<0.02	0.02
16	Total Sulfates (mg/l)	27.0	18.0	19.0	19.0	26.0	35.0
17	Total Iron (mg/l)	1.10	<0.05	<0.05	<0.05	0.24	0.07
18	Total Suspended Solids (mg/l)	6.0	17.0	<1.0	2.7	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	120.0	70.0	90.0	70.0	80.0	130.0
20	Nitrates	0.13	<0.09	<0.09	<0.09	0.46	<0.09
21	Date Sampled for Analysis	9-23-98	10-30-98	11-27-98	12-14-98	1-22-99	2-10-99
22	Date Last Precipitation Event Occurred	9-22-98	10-29-98	11-25-98	12-9-98	1-22-99	2-7-99

Laboratory Name TRA-DET, INC.
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	P-14	P-14	P-14	P-14	P-14	P-14
2	Identification Number 98-	09364	11040	11433	12375	99-02095	99-03059
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1220	1220	1220	1220	1220	1220
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0	0	0	0	0.01 CFS	.003 CFS
8	Date Above Measurements Made	9-27-98	10-30-98	11-25-98	12-17-98	1-28-99	2-27-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	7.00	7.40	7.40	7.40	7.50	7.80
11	Total Acidity (mg/l CaCO3)	26.0	9.50	9.00	47.0	<1.0	10.0
12	Total Alkalinity (mg/l CaCO3)	200.0	180.0	180.0	180.0	110.0	150.0
13	Specific Conductivity (umhos/cm at 25° C)	430.0	430.0	440.0	450.0	300.0	430.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	1.20	0.82	1.0	1.0	0.17	0.20
16	Total Sulfates (mg/l)	22.0	36.0	46.0	48.0	41.0	46.0
17	Total Iron (mg/l)	35.0	1.40	1.30	0.50	0.40	0.25
18	Total Suspended Solids (mg/l)	91.0	20.0	13.0	7.30	22.0	2.0
19	Total Hardness (mg/l as CaCO3)	210.0	220.0	160.0	200.0	170.0	190.0
20	Nitrates	0.14	<0.09	<0.09	<0.09	0.37	0.42
21	Date Sampled for Analysis	9-27-98	10-30-98	11-25-98	12-17-98	1-28-99	2-27-99
22	Date Last Precipitation Event Occurred	9-27-98	10-29-98	11-25-98	12-17-98	1-23-99	2-27-99

Laboratory Name TRA-DET, INC.
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	P-15	P-15	P-15	P-15	P-15	P-15
2	Identification Number 98-	10128	11358	12481	99-01335	99-02279	99-03275
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1195	1195	1195	1195	1195	1195
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.0002 CFS	0.0006 CFS	.002 CFS	.008 CFS	0.01 CFS	0.01 CFS
8	Date Above Measurements Made	10-2-98	11-23-98	12-29-98	1-23-99	2-10-99	3-19-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	6.70	7.20	7.20	7.40	7.30	7.60
11	Total Acidity (mg/l CaCO3)	5.0	27.0	14.0	12.0	<1.0	7.50
12	Total Alkalinity (mg/l CaCO3)	220.0	180.0	120.0	62.0	98.0	82.0
13	Specific Conductivity (umhos/cm at 25° C)	380.0	360.0	300.0	150.0	250.0	200.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	2.40	0.23	1.10	0.31	0.20	0.04
16	Total Sulfates (mg/l)	9.40	24.0	39.0	27.0	33.0	18.0
17	Total Iron (mg/l)	9.20	1.40	6.20	3.40	1.20	0.47
18	Total Suspended Solids (mg/l)	23.0	11.0	20.0	240.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	190.0	170.0	140.0	80.0	110.0	60.0
20	Nitrates	0.29	<0.09	0.25	0.22	<0.09	<0.09
21	Date Sampled for Analysis	10-2-98	11-23-98	12-29-98	1-23-99	2-10-99	3-19-99
22	Date Last Precipitation Event Occurred	9-29-98	11-23-98	12-29-98	1-23-99	2-10-99	3-14-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	P-16	P-16	P-16	P-16	P-16	P-16
2	Identification Number 98-	10271	11369	12390	99-02142	99-03043	99-03280
3	High (H)/Low (L) Designation (if applicable)	SIX MONTH SAMPLING					
4	Surface Elevation for Sampling Station (msl)	1180	1180	1180	1180	1180	1180
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.17 CFS	.00009 CFS	.0002CFS	.007 CFS	.006 CFS	.01 CFS
8	Date Above Measurements Made	10-15-98	11-24-98	12-17-98	1-29-99	2-27-99	3-19-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	7.60	7.90	7.60	7.50	8.00	8.30
	Total Acidity (mg/l CaCO3)	8.60	19.00	14.0	9.70	7.90	0.00
12	Total Alkalinity (mg/l CaCO3)	190.0	190.0	180.0	130.0	140.0	120.0
13	Specific Conductivity (umhos/cm at 25° C)	420.0	450.0	450.0	340.0	440.0	340.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.03	0.05	0.06	0.30	0.03	0.02
16	Total Sulfates (mg/l)	43.0	50.0	53.0	46.0	53.0	39.0
17	Total Iron (mg/l)	0.16	0.07	0.38	1.40	0.23	0.19
18	Total Suspended Solids (mg/l)	<1.0	<1.0	<1.0	21.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	210.0	230.0	210.0	170.0	200.0	140.0
20	Nitrates	<0.10	<0.09	<0.09	<0.09	0.44	0.35
21	Date Sampled for Analysis	10-15-98	11-24-98	12-17-98	1-29-99	2-27-99	3-19-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-17-98	1-23-99	2-27-99	3-14-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	P-17	P-17	P-17	P-17	P-17	P-17
2	Identification Number 98-	10280	12039	12472	99-02165	99-02421	99-03377
3	High (H)/Low (L) Designation (if applicable)	SIX MONTH SAMPLING					
4	Surface Elevation for Sampling Station (msl)	1140	1140	1140	1140	1140	1140
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0	0	0	.002 CFS	.003 CFS	.004 CFS
8	Date Above Measurements Made	10-16-98	11-28-98	12-29-98	1-30-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	8.70	8.10	7.50	7.60	9.50	10.20
	Total Acidity (mg/l CaCO3)	0.00	2.20	<1.0	3.6	0.00	0.00
12	Total Alkalinity (mg/l CaCO3)	64.0	59.0	43.0	50.0	51.0	56.0
13	Specific Conductivity (umhos/cm at 25° C)	290.0	320.0	230.0	420.0	460.0	470.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	0.03	0.15	0.04	<0.02	<0.02
16	Total Sulfates (mg/l)	24.0	30.0	31.0	29.0	32.0	23.0
17	Total Iron (mg/l)	0.30	0.09	0.59	0.09	<0.05	0.09
18	Total Suspended Solids (mg/l)	1.0	<1.0	30.0	<1.0	13.0	12.0
19	Total Hardness (mg/l as CaCO3)	25.0	80.0	70.0	120.0	110.0	110.0
20	Nitrates	<0.10	<0.09	<0.09	0.66	<0.09	0.29
21	Date Sampled for Analysis	10-16-98	140.0	12-29-98	1-30-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	410.0	12-29-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	P-18	P-18	P-18	P-18	P-18	P-18
2	Identification Number 98-	10295	11375	12417	99-02112	99-02408	99-03362
3	High (H)/Low (L) Designation (if applicable)		SIX	MONTH	SAMPLING		
4	Surface Elevation for Sampling Station (msl)	1215	1215	1215	1215	1215	1215
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0	.00007 CFS	.0008 CFS	.02 CFS	.14 CFS	.01 CFS
8	Date Above Measurements Made	10-17-98	11-24-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	7.60	8.20	7.70	7.50	8.10	7.70
11	Total Acidity (mg/l CaCO3)	5.30	7.60	5.00	<1.0	5.30	5.60
12	Total Alkalinity (mg/l CaCO3)	91.0	91.0	91.0	53.0	56.0	52.0
13	Specific Conductivity (umhos/cm at 25° C)	390.0	420.0	420.0	500.0	400.0	440.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.06	0.02	0.04	0.13	0.07	0.13
16	Total Sulfates (mg/l)	22.0	28.0	30.0	26.0	31.0	22.0
17	Total Iron (mg/l)	0.76	0.15	0.12	0.13	0.07	0.29
18	Total Suspended Solids (mg/l)	13.0	<1.0	<1.0	4.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	120.0	110.0	120.0	80.0	100.0	120.0
20	Nitrates	<0.10	<0.09	0.11	0.61	0.36	0.59
21	Date Sampled for Analysis	10-17-98	11-24-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	P-19	P-19	P-19	P-19	P-19	P-19
2	Identification Number 98-	10288	11379	12422	99-02117	99-02413	99-03367
3	High (H)/Low (L) Designation (if applicable)	SIX MONTH SAMPLING					
4	Surface Elevation for Sampling Station (msl)	1215	1215	1215	1215	1215	1215
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0	0	0	.02 CFS	.006 CFS	.02 CFS
8	Date Above Measurements Made	10-17-98	11-24-98	12-21-98	1-29-99	2-26-99	3-23-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	8.50	8.10	7.60	7.50	7.70	7.80
	Total Acidity (mg/l CaCO3)	0.00	7.20	3.90	<1.0	4.5	6.30
12	Total Alkalinity (mg/l CaCO3)	56.0	54.0	47.0	38.0	24.0	32.0
13	Specific Conductivity (umhos/cm at 25° C)	140.0	110.0	160.0	100.0	130.0	110.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.21	0.03	0.16	0.07	0.03	0.03
16	Total Sulfates (mg/l)	11.0	14.0	19.0	20.0	22.0	17.0
17	Total Iron (mg/l)	0.41	0.18	0.74	0.24	0.16	0.24
18	Total Suspended Solids (mg/l)	<1.0	<1.0	7.3	1.5	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	60.0	40.0	60.0	50.0	40.0	70.0
20	Nitrates	<0.10	<0.09	0.22	0.16	<0.09	<0.09
21	Date Sampled for Analysis	10-17-98	11-24-98	12-21-98	1-29-99	2-26-99	3-23-99
22	Date Last Precipitation Event Occurred	10-7-98	11-23-98	12-21-98	1-23-99	2-26-99	3-22-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	P-20	P-20				
2	Identification Number	90-08-564	90-12-213				
3	High (H)/Low (L) Designation (if applicable)	SUPPLE	MENTAL				
4	Surface Elevation for Sampling Station (msl)	1000	1000				
5	Depth of Well Below Land Surface (feet)	---	---				
6	Static Water Level of Well Below Land Surface (feet)	---	---				
7	Flow for Spring and Stream (gpm or cfs)	---	---				
8	Date Above Measurements Made	8-8-90	12-26-90				
9	Aquifer/Zone Identification For Well/Spring	---	---				
10	pH (Standard Units)	7-88	8.07				
11	Total Acidity (mg/l CaCO3)						
12	Total Alkalinity (mg/l CaCO3)						
13	Specific Conductivity (umhos/cm at 25° C)	420.0	546.0				
14	Total Dissolved Solids (mg/l)						
15	Total Manganese (mg/l)	0.02	0.02				
16	Total Sulfates (mg/l)						
17	Total Iron (mg/l)	0.12	0.08				
18	Total Suspended Solids (mg/l)	11.0	2.0				
19	Total Hardness (mg/l as CaCO3)						
20	Nitrates						
21	Date Sampled for Analysis	8-8-90	12-26-90				
22	Date Last Precipitation Event Occurred	8-6-90	12-25-90				

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	P-21	P-21				
2	Identification Number 98-	93-12-1117	94-03-464				
3	High (H)/Low (L) Designation (if applicable)	L	H				
4	Surface Elevation for Sampling Station (msl)	960	960				
5	Depth of Well Below Land Surface (feet)	---	---				
6	Static Water Level of Well Below Land Surface (feet)	---	---				
7	Flow for Spring and Stream (gpm or cfs)	---	---				
8	Date Above Measurements Made	12-29-93	3-9-94				
9	Aquifer/Zone Identification For Well/Spring	---	---				
10	93 (Standard Units)	7.93	7.90				
11	Total Acidity (mg/l CaCO3)	6.60	8.40				
12	Total Alkalinity (mg/l CaCO3)	113.60	97.60				
13	Specific Conductivity (umhos/cm at 25° C)	273	200				
14	Total Dissolved Solids (mg/l)	---	---				
15	Total Manganese (mg/l)	0.02	0.04				
16	Total Sulfates (mg/l)	33.0	30.0				
17	Total Iron (mg/l)	0.05	0.18				
18	Total Suspended Solids (mg/l)	4.0	6.0				
19	Total Hardness (mg/l as CaCO3)	143.0	124.0				
20	Nitrates						
21	Date Sampled for Analysis	12-29-93	3-9-94				
22	Date Last Precipitation Event Occurred	12-25-93	3-7-94				

Laboratory Name Industrial Lab Analysis
Address 2240 Williamsburg Drive City Glen Dale
State West Virginia Zip 26038

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	P-22	P-22				
2	Identification Number 98-	90-08-565	94-03-489				
3	High (H)/Low (L) Designation (if applicable)	SUPPLE	MENTAL				
4	Surface Elevation for Sampling Station (msl)	930	930				
5	Depth of Well Below Land Surface (feet)	---	---				
6	Static Water Level of Well Below Land Surface (feet)	---	---				
7	Flow for Spring and Stream (gpm or cfs)	---	---				
8	Date Above Measurements Made	8-8-90	2-9-94				
9	Aquifer/Zone Identification For Well/Spring	---	---				
10	pH (Standard Units)	7.52	7.43				
11	Total Acidity (mg/l CaCO3)						
12	Total Alkalinity (mg/l CaCO3)						
13	Specific Conductivity (umhos/cm at 25° C)	798	955				
14	Total Dissolved Solids (mg/l)	---	---				
15	Total Manganese (mg/l)	0.25	0.75				
16	Total Sulfates (mg/l)						
17	Total Iron (mg/l)	0.12	0.24				
18	Total Suspended Solids (mg/l)	11.0	4.0				
19	Total Hardness (mg/l as CaCO3)						
20	Nitrates						
21	Date Sampled for Analysis	8-8-90	2-9-94				
22	Date Last Precipitation Event Occurred	8-6-90	2-9-94				

Laboratory Name Industrial Lab Analysis
Address 2240 Williamsburg Drive City Glen Dale
State West Virginia Zip 26038

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	D-P2	D-P2	D-7	D-7	D-8	D-8
2	Identification Number 99-	05-781	08-665	05-782	08-524	05-783	08-525
3	High (H)/Low (L) Designation (if applicable)	H	L	H	L	H	L
4	Surface Elevation for Sampling Station (msl)	978	978	912	912	935	935
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	.04 CFS	<1GPM	.46 CFS	.029 CFS	.58 CFS	.017 CFS
8	Date Above Measurements Made	5-25-99	8-19-99	5-24-99	8-17-99	5-24-99	8-17-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	7.61	7.50	7.99	7.88	7.95	7.73
11	Total Acidity (mg/l CaCO3)	3.60	4.40	4.40	9.80	4.20	13.60
12	Total Alkalinity (mg/l CaCO3)	58.80	85.20	137.80	144.60	146.20	179.20
13	Specific Conductivity (umhos/cm at 25° C)	200.0	250.0	427.0	516.0	445.0	542.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	<0.02	<0.02	0.02	0.02	0.03	<0.02
16	Total Sulfates (mg/l)	23.0	36.0	54.00	77.0	50.0	60.0
17	Total Iron (mg/l)	0.14	0.12	0.38	0.06	0.46	0.08
18	Total Suspended Solids (mg/l)	4.0	20.0	7.0	8.0	6.0	12.0
19	Total Hardness (mg/l as CaCO3)	80.0	104.0	180.0	192.0	192.0	238.0
20	Nitrates	0.49	0.66	0.41	0.66	0.36	0.90
21	Date Sampled for Analysis	5-25-99	8-19-99	5-24-99	8-17-99	5-24-99	8-17-99
22	Date Last Precipitation Event Occurred	5-25-99	8-15-99	5-24-99	8-15-99	5-24-99	8-15-99

Laboratory Name Industrial Lab Analysis, Inc.
Address 2240 Williamsburg Drive City Glen Dale
State West Virginia Zip 26038

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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	D-9	D-9	D-10	D-10	D-11	D-11
2	Identification Number 99-	05-784	---	05-785	08-526	05-786	08-527
3	High (H)/Low (L) Designation (if applicable)	H	L	H	L	H	L
4	Surface Elevation for Sampling Station (msl)	930	930	918	918	955	955
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	.35 CFS	DRY	.96 CFS	.05 CFS	3.0 CFS	.08 CFS
8	Date Above Measurements Made	5-24-99	8-17-99	5-24-99	8-17-99	5-24-99	8-17-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	7.97		8.03	7.95	7.89	7.73
11	Total Acidity (mg/l CaCO3)	3.60		4.00	10.40	4.40	10.00
12	Total Alkalinity (mg/l CaCO3)	151.60		138.20	165.60	105.00	130.00
13	Specific Conductivity (umhos/cm at 25° C)	410.0		431.0	496	322.0	400
14	Total Dissolved Solids (mg/l)	---		---	---	---	---
15	Total Manganese (mg/l)	<0.02		0.03	<0.02	0.10	<0.02
16	Total Sulfates (mg/l)	34.0		43.0	55.0	25.0	41.0
17	Total Iron (mg/l)	0.34		0.30	0.04	0.26	0.14
18	Total Suspended Solids (mg/l)	14.0		11.0	2.0	10.0	14.0
19	Total Hardness (mg/l as CaCO3)	180.0		166.0	187.0	134.0	151.0
20	Nitrates	0.35		0.40	0.57	0.36	0.64
21	Date Sampled for Analysis	5-24-99		5-24-99	8-17-99	5-24-99	8-17-99
22	Date Last Precipitation Event Occurred	5-24-99	8-15-99	5-24-99	8-15-99	5-24-99	8-15-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	D-P12	D-P12	D-12	D-12	D-13	D-13
2	Identification Number 99-	05-787	---	05-1005	08-528	05-1032	08-666
3	High (H)/Low (L) Designation (if applicable)	H	L	H	L	H	L
4	Surface Elevation for Sampling Station (msl)	950	950	1058	1058	938	938
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	.05 CFS	Dry	.09 CFS	.0004 CFS	.26 CFS	.0051CFS
8	Date Above Measurements Made	5-25-99	8-17-99	5-26-99	8-17-99	5-24-99	8-19-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	8.06		8.02	8.29	8.09	7.90
11	Total Acidity (mg/l CaCO3)	4.40		4.00	7.40	3.60	15.60
12	Total Alkalinity (mg/l CaCO3)	159.20		179.00	210.80	172.00	261.20
13	Specific Conductivity (umhos/cm at 25° C)	513.0		523.0	538	519.0	830.0
14	Total Dissolved Solids (mg/l)	---		---	---	---	---
15	Total Manganese (mg/l)	<0.02		0.02	<0.02	0.10	0.02
16	Total Sulfates (mg/l)	69.0		44.0	43.0	103.0	146.0
17	Total Iron (mg/l)	0.20		0.13	0.11	0.21	0.06
18	Total Suspended Solids (mg/l)	5.0		2.0	5.0	3.0	2.0
19	Total Hardness (mg/l as CaCO3)	229.0		161.0	201.0	249.0	365.0
20	Nitrates	0.31		0.44	0.63	--	0.60
21	Date Sampled for Analysis	5-25-99		5-26-99	8-17-99	5-25-99	8-19-99
22	Date Last Precipitation Event Occurred	5-25-99	8-15-99	5-26-99	8-15-99	5-25-99	8-15-99

Laboratory Name Industrial Lab Analysis, Inc.
Address 2240 Williamsburg Drive City Glen Dale
State West Virginia Zip 26038

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	D-14	D-14	D-15	D-15	D-16	D-16
2	Identification Number 99-	05-1006	---	05-1007	08-667	05-788	08-668
3	High (H)/Low (L) Designation (if applicable)	H	L	H	L	H	L
4	Surface Elevation for Sampling Station (msl)	935	935	937	937	957	957
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	.002 CFS	Dry	.009 CFS	.002 CFS	.06 CFS	.0012CFS
8	Date Above Measurements Made	5-25-99	8-19-99	5-25-99	8-19-99	5-25-99	8-19-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	8.24		7.81	7.64	7.69	7.52
11	Total Acidity (mg/l CaCO3)	2.60		4.80	4.60	3.40	6.40
12	Total Alkalinity (mg/l CaCO3)	197.60		83.20	102.00	67.40	86.20
13	Specific Conductivity (umhos/cm at 25° C)	692.0		303.0	281.0	246.0	251.0
14	Total Dissolved Solids (mg/l)	---		---	---	---	---
15	Total Manganese (mg/l)	0.02		0.03	<0.02	0.02	<0.02
16	Total Sulfates (mg/l)	129.0		40.0	27.0	33.0	28.0
17	Total Iron (mg/l)	0.08		0.15	0.10	0.05	0.05
18	Total Suspended Solids (mg/l)	3.0		8.0	7.0	2.0	3.0
19	Total Hardness (mg/l as CaCO3)	260.0		122.0	142.0	102.0	111.0
20	Nitrates	0.38		0.25	0.49	0.39	0.58
21	Date Sampled for Analysis	5-25-99		5-25-99	8-19-99	5-25-99	8-19-99
22	Date Last Precipitation Event Occurred	5-25-99	8-15-99	5-25-99	8-15-99	5-25-99	8-15-99

Laboratory Name Industrial Lab Analysis, Inc.
Address 2240 Williamsburg Drive City Glen Dale
State West Virginia Zip 26038

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DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	D-17	D-17	D-18	D-18	D-19	D-19
2	Identification Number 99-	05-789	---	05-790	---	05-791	08-669
3	High (H)/Low (L) Designation (if applicable)	H	L	H	L	H	L
4	Surface Elevation for Sampling Station (msl)	960	960	978	978	978	978
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	.03 CFS	Dry	.06 CFS	Dry	.08 CFS	.06 CFS
8	Date Above Measurements Made	5-25-99	8-19-99	5-25-99	8-19-99	5-25-99	8-19-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	8.02		7.85		7.84	7.45
11	Total Acidity (mg/l CaCO3)	4.20		3.60		4.80	5.80
12	Total Alkalinity (mg/l CaCO3)	141.40		66.60		109.40	87.40
13	Specific Conductivity (umhos/cm at 25° C)	481.0		228.0		356.0	251.0
14	Total Dissolved Solids (mg/l)	---		---		---	---
15	Total Manganese (mg/l)	<0.02		<0.02		<0.02	<0.02
16	Total Sulfates (mg/l)	36.0		24.0		26.0	25.0
17	Total Iron (mg/l)	0.08		0.05		<0.04	0.06
18	Total Suspended Solids (mg/l)	3.0		<2.0		3.0	17.0
19	Total Hardness (mg/l as CaCO3)	188.0		92.0		140.0	125.0
20	Nitrates	0.42		0.28		0.65	0.66
21	Date Sampled for Analysis	5-25-99		5-25-99		5-25-99	8-19-99
22	Date Last Precipitation Event Occurred	5-25-99	8-15-99	5-25-99	8-15-99	5-25-99	8-15-99

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DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	D-20	D-20	D-23	D-23	D-24	D-24
2	Identification Number	99-05-792	99-08-670	99-05-1008	99-08-671	99-05-1009	99-08-672
3	High (H)/Low (L) Designation (if applicable)	H	L	H	L	H	L
4	Surface Elevation for Sampling Station (msl)	997	997	935	935	935	935
5	Depth of Well Below Land Surface (feet)	--	--	--	--	--	--
6	Static Water Level of Well Below Land Surface (feet)	--	--	--	--	--	--
7	Flow for Spring and Stream (gpm or cfs)	.14 cfs	.076 cfs	0.45 cfs	.14 cfs	.04 cfs	.006 cfs
8	Date Above Measurements Made	5/25/99	8-19-99	5/25/99	8-18-99	5/25/99	8-18-99
9	Aquifer/Zone Identification For Well/Spring	--	--	--	--	--	--
10	pH (Standard Units)	7.94	7.69	7.89	7.94	7.93	7.66
11	Total Acidity (mg/l CaCO3)	3.60	6.00	4.80	6.40	4.60	12.40
12	Total Alkalinity (mg/l CaCO3)	79.40	98.00	105.00	143.0	146.80	175.40
13	Specific Conductivity (umhos/cm at 25° C)	243	266	319	350	468	436
14	Total Dissolved Solids (mg/l)	--	--	--	--	--	--
15	Total Manganese (mg/l)	<0.02	<0.02	0.04	<0.02	0.02	<0.02
16	Total Sulfates (mg/l)	21.0	26.0	27.0	34.0	38.0	40.0
17	Total Iron (mg/l)	0.17	0.12	0.11	0.07	<0.04	0.23
18	Total Suspended Solids (mg/l)	4.0	5.0	6.0	7.0	3.0	59.0
19	Total Hardness (mg/l as CaCO3)	100.0	129.0	132.0	183.0	196.0	212.0
20	Nitrates	0.37	0.83	0.20	0.63	0.22	0.61
21	Date Sampled for Analysis	5/25/99	8-19-99	5/25/99	8-18-99	5/25/99	8-18-99
22	Date Last Precipitation Event Occurred	5/25/99	8-15-99	5/25/99	8-15-99	5/25/99	8-15-99

Laboratory Name INDUSTRIAL LAB ANALYSIS, INC.
Address 2240 WILLIAMSBURG DRIVE City WHEELING
State WEST VIRGINIA Zip 26038

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	D-25	D-25	D-26	D-26	D-27	D-27
2	Identification Number	99-05-793	---	99-05-794	99-08-673	99-05-795	99-08-674
3	High (H)/Low (L) Designation (if applicable)	H	L	H	L	H	L
4	Surface Elevation for Sampling Station (msl)	967	967	980	980	995	995
5	Depth of Well Below Land Surface (feet)	--	--	--	--	--	--
6	Static Water Level of Well Below Land Surface (feet)	--	--	--	--	--	--
7	Flow for Spring and Stream (gpm or cfs)	.03 cfs	Dry	0.04 cfs	.002 cfs	.05 cfs	<1 gpm
8	Date Above Measurements Made	5/25/99	8-18-99	5/25/99	8-19-99	5/25/99	8-18-99
9	Aquifer/Zone Identification For Well/Spring	--	--	--	--	--	--
10	pH (Standard Units)	8.00		7.98	7.67	8.07	8.10
11	Total Acidity (mg/l CaCO3)	4.00		4.60	8.40	4.00	7.40
12	Total Alkalinity (mg/l CaCO3)	112.60		149.00	140.80	134.80	136.00
13	Specific Conductivity (umhos/cm at 25° C)	371		421	375	442	502
14	Total Dissolved Solids (mg/l)	--	--	--	--	--	--
15	Total Manganese (mg/l)	<0.02		<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	43.0		37.0	436.0	51.0	113.0
17	Total Iron (mg/l)	0.18		0.07	0.09	0.14	0.10
18	Total Suspended Solids (mg/l)	6.0		5.0	31.0	2.0	<2.0
19	Total Hardness (mg/l as CaCO3)	163.0		190.0	186.0	194.0	240.0
20	Nitrates	0.25		0.58	0.98	0.79	1.52
21	Date Sampled for Analysis	5/25/99		5/25/99	8-18-99	5/25/99	8-18-99
22	Date Last Precipitation Event Occurred	5/25/99	8-15-99	5/25/99	8-15-99	5/25/99	8-15-99

Laboratory Name INDUSTRIAL LAB ANALYSIS, INC.
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State WEST VIRGINIA Zip 26038

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	D-28	D-28	D-29	D-29	D-30	D-30
2	Identification Number	99-05-796	99-08-675	99-05-797	99-08-676	99-05-798	99-08-677
3	High (H)/Low (L) Designation (if applicable)	H	L	H	L	H	L
4	Surface Elevation for Sampling Station (msl)	1075	1075	1115	1115	1135	1135
5	Depth of Well Below Land Surface (feet)	--	--	--	--	--	--
6	Static Water Level of Well Below Land Surface (feet)	--	--	--	--	--	--
7	Flow for Spring and Stream (gpm or cfs)	.13 cfs	.06 cfs	.09 cfs	<1 gpm	.24 cfs	.05 cfs
8	Date Above Measurements Made	5/24/99	8-18-99	5/24/99	8-18-99	5/24/99	8-18-99
9	Aquifer/Zone Identification For Well/Spring	--	--	--	--	--	--
10	pH (Standard Units)	7.81	7.89	7.87	7.89	7.65	8.19
11	Total Acidity (mg/l CaCO3)	2.40	4.80	4.20	4.80	5.40	4.20
12	Total Alkalinity (mg/l CaCO3)	114.8	131.20	95.8	98.60	124.2	121.20
13	Specific Conductivity (umhos/cm at 25° C)	366	363	289	257	329	345
14	Total Dissolved Solids (mg/l)	--	--	--	--	--	--
15	Total Manganese (mg/l)	<0.02	0.02	<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	27.0	36.0	23.0	28.0	17.0	34.0
17	Total Iron (mg/l)	0.33	0.10	0.18	0.08	0.43	0.04
18	Total Suspended Solids (mg/l)	8.0	4.0	11.0	5.0	12.0	3.0
19	Total Hardness (mg/l as CaCO3)	149.0	178.0	121.0	136.0	140.0	143.0
20	Nitrates	1.20	0.52	0.52	0.82	0.31	0.42
21	Date Sampled for Analysis	5/24/99	8-18-99	5/24/99	8-18-99	5/24/99	8-18-99
22	Date Last Precipitation Event Occurred	5/24/99	8-15-99	5/24/99	8-15-99	5/24/99	8-15-99

Laboratory Name INDUSTRIAL LAB ANALYSIS, INC.
Address 2240 WILLIAMSBURG DRIVE City WHEELING
State WEST VIRGINIA Zip 26038

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DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	U-7	U-7	U-8	U-8	U-9	U-9
2	Identification Number	99-05-800	---	99-05-801	99-08-529	---	---
3	High (H)/Low (L) Designation (if applicable)	H	L	H	L	H	L
4	Surface Elevation for Sampling Station (msl)	1177	1177	1060	1060	1050	1050
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	.09 cfs	Dry	.12 cfs	.009 cfs	Dry	Dry
8	Date Above Measurements Made	5-24-99	8-17-99	5-24-99	8-17-99	5-24-99	8-17-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	7.95		7.99	7.91		
11	Total Acidity (mg/l CaCO3)	4.00		4.40	13.40		
12	Total Alkalinity (mg/l CaCO3)	145.8		161.2	186.0		
13	Specific Conductivity (umhos/cm at 25° C)	415		442	530		
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.05		<0.02	<0.02		
16	Total Sulfates (mg/l)	45.0		41.0	55.0		
17	Total Iron (mg/l)	2.28		0.38	0.09		
18	Total Suspended Solids (mg/l)	15.0		19.0	1.0		
19	Total Hardness (mg/l as CaCO3)	176.0		189.0	226.0		
20	Nitrates	0.37		0.50	---		
21	Date Sampled for Analysis	5-24-99		5-24-99	8-17-99		
22	Date Last Precipitation Event Occurred	5-24-99	8-15-99	5-24-99	8-15-99	5-24-99	8-15-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	U-10	U-10	U-10A	U-10A	U-10B	U-10B
2	Identification Number	99-05-1010	99-08-530	99-05-1011	---	99-05-1012	---
3	High (H)/Low (L) Designation (if applicable)	H	L	H	L	H	L
4	Surface Elevation for Sampling Station (msl)	1128	1128	1179	1179	1169	1169
5	Depth of Well Below Land Surface (feet)	--	--	--	--	--	--
6	Static Water Level of Well Below Land Surface (feet)	--	--	--	--	--	--
7	Flow for Spring and Stream (gpm or cfs)	.004cfs	.001 cfs	.0003cfs	Dry	.005 cfs	Dry
8	Date Above Measurements Made	5/26/99	8/17/99	5/26/99	8/17/99	5/26/99	8/17/99
9	Aquifer/Zone Identification For Well/Spring	--	--	--	--	--	--
10	pH (Standard Units)	8.06	7.51	7.12		7.00	
11	Total Acidity (mg/l CaCO3)	4.80	14.00	4.40		4.00	
12	Total Alkalinity (mg/l CaCO3)	195.0	171.20	52.0		37.8	
13	Specific Conductivity (umhos/cm at 25° C)	578	559	237		165	
14	Total Dissolved Solids (mg/l)	--	--	--	--	--	--
15	Total Manganese (mg/l)	<0.02	0.50	0.09		0.03	
16	Total Sulfates (mg/l)	38.0	46.0	35.0		25.0	
17	Total Iron (mg/l)	0.10	0.95	0.15		0.04	
18	Total Suspended Solids (mg/l)	4.0	10.0	74.0		3.0	
19	Total Hardness (mg/l as CaCO3)	188.0	154.0	80.0		60.0	
20	Nitrates	0.80	0.73	0.24		0.21	
21	Date Sampled for Analysis	5/26/99	8/17/99	5/26/99		5/26/99	
22	Date Last Precipitation Event Occurred	5/26/99	8/15/99	5/26/99	8/15/99	5/26/99	8/15/99

Laboratory Name INDUSTRIAL LAB ANALYSIS, INC.
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	U-11	U-11	U-11A	U-11A	U-11B	U-11B
2	Identification Number	99-05-1018	99-05-531	99-05-1014	99-25-532	99-05-802	99-05-533
3	High (H)/Low (L) Designation (if applicable)	H	L	H	L	H	L
4	Surface Elevation for Sampling Station (msl)	1132	1132	1167	1167	1140	1140
5	Depth of Well Below Land Surface (feet)	--	--	--	--	--	--
6	Static Water Level of Well Below Land Surface (feet)	--	--	--	--	--	--
7	Flow for Spring and Stream (gpm or cfs)	.003cfs	.0011cfs	.0005cfs	.0001cfs	.01 cfs	.01 cfs
8	Date Above Measurements Made	5/26/99	8/17/99	5/26/99	8/17/99	5/26/99	8/17/99
9	Aquifer/Zone Identification For Well/Spring	--	--	--	--	--	--
10	pH (Standard Units)	7.61	7.77	6.44	7.04	7.71	6.87
11	Total Acidity (mg/l CaCO3)	6.20	12.20	14.60	8.0	4.60	15.40
12	Total Alkalinity (mg/l CaCO3)	142.0	159.80	52.20	68.80	128.60	38.60
13	Specific Conductivity (umhos/cm at 25° C)	389	414	200	220	348	760
14	Total Dissolved Solids (mg/l)	--	--	--	--	--	--
15	Total Manganese (mg/l)	0.05	0.15	0.10	0.63	0.12	1.51
16	Total Sulfates (mg/l)	24.0	23.0	27.0	27.0	26.0	28.4
17	Total Iron (mg/l)	0.09	0.17	0.12	0.74	0.63	0.45
18	Total Suspended Solids (mg/l)	5.0	6.0	9.00	64.0	3.0	35.0
19	Total Hardness (mg/l as CaCO3)	170.0	355.0	74.0	78.0	148.0	314.0
20	Nitrates	0.18	0.54	0.15	0.65	0.20	0.77
21	Date Sampled for Analysis	5/26/99	8/17/99	5/26/99	8/17/99	5/24/99	8/17/99
22	Date Last Precipitation Event Occurred	5/26/99	8/15/99	5/26/99	8/15/99	5/24/99	8/15/99

Laboratory Name INDUSTRIAL LAB ANALYSIS, INC.
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	U-11C	U-11C	U-12	U-12	U-13	U-13
2	Identification Number	99-05-1014	99-08-534	99-05-1015	99-08-535	99-05-1016	---
3	High (H)/Low (L) Designation (if applicable)	H	L	H	L	H	L
4	Surface Elevation for Sampling Station (msl)	1155	1155	1122	1122	1159	1159
5	Depth of Well Below Land Surface (feet)	--	--	--	--	--	--
6	Static Water Level of Well Below Land Surface (feet)	--	--	--	--	--	--
7	Flow for Spring and Stream (gpm or cfs)	.03cfs	.01 cfs	.005cfs	.003 cfs	.002 cfs	Dry
8	Date Above Measurements Made	5/24/99	8/17/99	5/26/99	8/17/99	5/25/99	8/17/99
9	Aquifer/Zone Identification For Well/Spring	--	--	--	--	--	--
10	pH (Standard Units)	7.58	7.62	7.93	8.12	7.79	
11	Total Acidity (mg/l CaCO3)	5.20	18.40	6.80	8.40	6.00	
12	Total Alkalinity (mg/l CaCO3)	140.40	231.20	212.80	177.20	182.60	
13	Specific Conductivity (umhos/cm at 25° C)	378	527	679	566	840	
14	Total Dissolved Solids (mg/l)	--	--	--	--	--	
15	Total Manganese (mg/l)	0.12	1.49	0.09	0.04	0.02	
16	Total Sulfates (mg/l)	34.0	24.0	29.0	38.0	92.0	
17	Total Iron (mg/l)	0.49	0.66	0.08	0.38	0.15	
18	Total Suspended Solids (mg/l)	28.0	4.0	2.0	39.0	10.0	
19	Total Hardness (mg/l as CaCO3)	164.0	242.0	257.0	208.0	327.0	
20	Nitrates	0.36	0.60	0.43	0.96	0.51	
21	Date Sampled for Analysis	5/24/99	8/17/99	5/26/99	8/17/99	5/25/99	
22	Date Last Precipitation Event Occurred	5/24/99	8/15/99	5/26/99	8/15/99	5/25/99	8/15/99

Laboratory Name INDUSTRIAL LAB ANALYSIS, INC.
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State WEST VIRGINIA Zip 26038

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	U-14	U-14	U-15	U-15	U-16	U-16
2	Identification Number	99-05-1017	--	99-05-804	99-08-678	99-05-805	99-08-679
3	High (H)/Low (L) Designation (if applicable)	H	L	H	L	H	L
4	Surface Elevation for Sampling Station (msl)	1100	1100	1060	1060	1137	1137
5	Depth of Well Below Land Surface (feet)	--	--	--	--	--	--
6	Static Water Level of Well Below Land Surface (feet)	--	--	--	--	--	--
7	Flow for Spring and Stream (gpm or cfs)	.002cfs	Dry	.0065cfs	.0005cfs	.0062 cfs	.0001cfs
8	Date Above Measurements Made	5/25/99	8/18/99	5/25/99	8/18/99	5/25/99	8/18/99
9	Aquifer/Zone Identification For Well/Spring	--	--	--	--	--	--
10	pH (Standard Units)	7.69		7.41	8.00	7.80	8.37
11	Total Acidity (mg/l CaCO3)	5.20		4.60	4.40	4.00	0.00
12	Total Alkalinity (mg/l CaCO3)	128.40		87.80	92.40	89.20	85.00
13	Specific Conductivity (umhos/cm at 25° C)	360		275	263	259	259
14	Total Dissolved Solids (mg/l)	--	--	--	--	--	--
15	Total Manganese (mg/l)	0.04		<0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	29.0		27.0	29.0	21.0	29.0
17	Total Iron (mg/l)	0.08		0.10	<0.04	0.26	<0.04
18	Total Suspended Solids (mg/l)	6.0		3.0	4.0	9.0	7.0
19	Total Hardness (mg/l as CaCO3)	142.0		108.0	162.0	106.0	129.0
20	Nitrates	0.27		0.18	0.39	0.71	0.34
21	Date Sampled for Analysis	5/25/99		5/25/99	8/18/99	5/25/99	8/18/99
22	Date Last Precipitation Event Occurred	5/25/99	8/15/99	5/25/99	8/15/99	5/25/99	8/15/99

Laboratory Name INDUSTRIAL LAB ANALYSIS, INC.
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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	U-17	U-17	U-18	U-18	U-19	U-19
2	Identification Number	99-05-1018	--	99-05-805	--	99-05-1019	99-08-680
3	High (H)/Low (L) Designation (if applicable)	H	L	H	L	H	L
4	Surface Elevation for Sampling Station (msl)	1105	1105	1145	1145	1135	1135
5	Depth of Well Below Land Surface (feet)	--	--	--	--	--	--
6	Static Water Level of Well Below Land Surface (feet)	--	--	--	--	--	--
7	Flow for Spring and Stream (gpm or cfs)	.0004cfs	Dry	.009cfs	Dry	.007 cfs	.001 cfs
8	Date Above Measurements Made	5/26/99	8/19/99	5/25/99	8/19/99	5/26/99	8/19/99
9	Aquifer/Zone Identification For Well/Spring	--	--	--	--	--	--
10	pH (Standard Units)	8.14		7.39		7.93	7.86
11	Total Acidity (mg/l CaCO3)	6.60		4.40		3.80	16.00
12	Total Alkalinity (mg/l CaCO3)	234.0		42.40		183.60	212.80
13	Specific Conductivity (umhos/cm at 25° C)	1276		150		685	676
14	Total Dissolved Solids (mg/l)	--	--	--	--	--	--
15	Total Manganese (mg/l)	<0.02		<0.02		0.13	0.20
16	Total Sulfates (mg/l)	47.0		19.0		46.0	54.0
17	Total Iron (mg/l)	<0.04		0.51		0.17	2.32
18	Total Suspended Solids (mg/l)	3.0		15.0		48.0	171.0
19	Total Hardness (mg/l as CaCO3)	344.0		56.00		259.0	116.0
20	Nitrates	0.70		0.33		0.68	1.02
21	Date Sampled for Analysis	5/26/99		5/25/99		5/26/99	8/19/99
22	Date Last Precipitation Event Occurred	5/26/99	8/15/99	5/25/99	8/15/99	5/26/99	8/15/99

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DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	U-20	U-20	U-20A	U-20A	U-21	U-21
2	Identification Number	99-05-1020	--	99-05-1021	--	99-05-1022	99-08-681
3	High (H)/Low (L) Designation (if applicable)	H	L	H	L	H	L
4	Surface Elevation for Sampling Station (msl)	1160	1160	1175	1175	1125	1125
5	Depth of Well Below Land Surface (feet)	--	--	--	--	--	--
6	Static Water Level of Well Below Land Surface (feet)	--	--	--	--	--	--
7	Flow for Spring and Stream (gpm or cfs)	.007cfs	Dry	.001cfs	Dry	.01 cfs	.001 cfs
8	Date Above Measurements Made	5/26/99	8/18/99	5/26/99	8/18/99	5/25/99	8/18/99
9	Aquifer/Zone Identification For Well/Spring	--	--	--	--	--	--
10	pH (Standard Units)	7.11		7.78		7.90	7.74
11	Total Acidity (mg/l CaCO3)	3.00		2.80		3.20	8.40
12	Total Alkalinity (mg/l CaCO3)	41.80		82.00		145.00	177.80
13	Specific Conductivity (umhos/cm at 25° C)	144		235		356	390
14	Total Dissolved Solids (mg/l)	--	--	--	--	--	--
15	Total Manganese (mg/l)	0.07		0.08		0.32	0.42
16	Total Sulfates (mg/l)	<10.0		16.0		15.0	14.0
17	Total Iron (mg/l)	0.38		0.20		0.27	1.77
18	Total Suspended Solids (mg/l)	29.0		45.0		25.0	18.0
19	Total Hardness (mg/l as CaCO3)	92.0		95.0		152.0	305.0
20	Nitrates	0.19		0.29		0.19	0.93
21	Date Sampled for Analysis	5/26/99		5/26/99		5/25/99	8/18/99
22	Date Last Precipitation Event Occurred	5/26/99	8/15/99	5/26/99	8/15/99	5/25/99	8/15/99

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(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	U-22	U-22	U-23	U-23	U-24	U-24
2	Identification Number	99-05-1023	--	99-05-807	--	99-05-1033	--
3	High (H)/Low (L) Designation (if applicable)	H	L	H	L	H	L
4	Surface Elevation for Sampling Station (msl)	1122	1122	1172	1172	1058	1058
5	Depth of Well Below Land Surface (feet)	--	--	--	--	--	--
6	Static Water Level of Well Below Land Surface (feet)	--	--	--	--	--	--
7	Flow for Spring and Stream (gpm or cfs)	.002cfs	Dry	.04cfs	Dry	.003cfs	Dry
8	Date Above Measurements Made	5/25/99	8/18/99	5/24/99	8/19/99	5/26/99	8/19/99
9	Aquifer/Zone Identification For Well/Spring	--	--	--	--	--	--
10	pH (Standard Units)	7.03		7.77		7.86	
11	Total Acidity (mg/l CaCO3)	3.00		5.40		6.60	
12	Total Alkalinity (mg/l CaCO3)	59.40		165.00		100.80	
13	Specific Conductivity (umhos/cm at 25° C)	191		449		407	
14	Total Dissolved Solids (mg/l)	--	--	--	--	--	--
15	Total Manganese (mg/l)	0.03		0.02		<0.02	
16	Total Sulfates (mg/l)	17.0		32.0		36.0	
17	Total Iron (mg/l)	0.25		0.39		0.05	
18	Total Suspended Solids (mg/l)	4.0		22.0		5.0	
19	Total Hardness (mg/l as CaCO3)	76.0		197.0		118.0	
20	Nitrates	0.15		0.82		--	
21	Date Sampled for Analysis	5/25/99		5/24/99		5/26/99	
22	Date Last Precipitation Event Occurred	5/25/99	8/15/99	5/24/99	8/15/99	5/26/99	8/15/99

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(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	U-25	U-25	U-26	U-26	U-27	U-27
2	Identification Number	99-05-1024	99-08-682	99-05-1025	99-08-683	99-05-808	99-08-684
3	High (H)/Low (L) Designation (if applicable)	H	L	H	L	H	L
4	Surface Elevation for Sampling Station (msl)	1053	1053	1135	1135	1155	1155
5	Depth of Well Below Land Surface (feet)	--	--	--	--	--	--
6	Static Water Level of Well Below Land Surface (feet)	--	--	--	--	--	--
7	Flow for Spring and Stream (gpm or cfs)	.006cfs	<1 gpm	.01cfs	.002 cfs	.01cfs	.0004cfs
8	Date Above Measurements Made	5/25/99	8/18/99	5/25/99	8/18/99	5/24/99	8/18/99
9	Aquifer/Zone Identification For Well/Spring	--	--	--	--	--	--
10	pH (Standard Units)	7.73	7.72	7.79	7.65	7.87	8.25
11	Total Acidity (mg/l CaCO3)	4.60	9.40	5.00	12.60	4.20	7.00
12	Total Alkalinity (mg/l CaCO3)	117.60	141.80	202.60	176.60	115.60	249.20
13	Specific Conductivity (umhos/cm at 25° C)	379	391	518	434	315	507
14	Total Dissolved Solids (mg/l)	--	--	--	--	--	--
15	Total Manganese (mg/l)	<0.02	0.24	0.22	0.24	0.07	0.09
16	Total Sulfates (mg/l)	49.0	56.0	31.0	30.0	22.0	31.0
17	Total Iron (mg/l)	0.17	0.27	2.66	0.36	0.44	0.46
18	Total Suspended Solids (mg/l)	8.0	3.0	9.0	9.0	45.0	19.0
19	Total Hardness (mg/l as CaCO3)	160.0	191.0	241.0	204.0	138.0	210.0
20	Nitrates	0.23	0.83	1.70	2.76	0.41	0.68
21	Date Sampled for Analysis	5/25/99	8/18/99	5/25/99	8/18/99	5/24/99	8/18/99
22	Date Last Precipitation Event Occurred	5/25/99	8/15/99	5/25/99	8/15/99	5/24/99	8/15/99

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ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	U-28	U-28	U-28A	U-28A	U-29	U-29
2	Identification Number	99-05-809	--	99-05-799	99-08-685	99-05-810	99-08-686
3	High (H)/Low (L) Designation (if applicable)	H	L	H	L	H	L
4	Surface Elevation for Sampling Station (msl)	1179	1179	1210	1210	1193	1193
5	Depth of Well Below Land Surface (feet)	--	--	--	--	--	--
6	Static Water Level of Well Below Land Surface (feet)	--	--	--	--	--	--
7	Flow for Spring and Stream (gpm or cfs)	.02cfs	Dry	.12cfs	.0001cfs	.01cfs	.0004cfs
8	Date Above Measurements Made	5/24/99	8/18/99	5/24/99	8/18/99	5/24/99	8/18/99
9	Aquifer/Zone Identification For Well/Spring	--	--	--	--	--	--
10	pH (Standard Units)	7.55		7.69	8.21	7.76	7.62
11	Total Acidity (mg/l CaCO3)	5.00		4.80	3.60	5.20	11.60
12	Total Alkalinity (mg/l CaCO3)	99.00		138.40	136.20	170.20	175.40
13	Specific Conductivity (umhos/cm at 25° C)	304		448	389	472	440
14	Total Dissolved Solids (mg/l)	--	--	--	--	--	--
15	Total Manganese (mg/l)	0.14		<0.02	0.03	0.35	0.53
16	Total Sulfates (mg/l)	39.0		42.0	60.0	29.0	36.0
17	Total Iron (mg/l)	1.76		0.43	0.39	1.71	0.27
18	Total Suspended Solids (mg/l)	8.0		10.0	88.0	174.0	8.0
19	Total Hardness (mg/l as CaCO3)	132.0		170.0	253.0	190.0	178.0
20	Nitrates	0.25		0.73	0.74	1.30	1.85
21	Date Sampled for Analysis	5/24/99		5/24/99	8/18/99	5/24/99	8/18/99
22	Date Last Precipitation Event Occurred	5/24/99	8/15/99	5/24/99	8/15/99	5/24/99	8/15/99

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(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	U-30	U-30	U-31	U-31	U-31A	U-31A
2	Identification Number	99-05-811	99-08-687	99-05-1026	--	99-05-1027	--
3	High (H)/Low (L) Designation (if applicable)	H	L	H	L	H	L
4	Surface Elevation for Sampling Station (msl)	1218	1218	1150	1150	1098	1098
5	Depth of Well Below Land Surface (feet)	--	--	--	--	--	--
6	Static Water Level of Well Below Land Surface (feet)	--	--	--	--	--	--
7	Flow for Spring and Stream (gpm or cfs)	.01cfs	.0001cfs	.01cfs	Dry	.09cfs	Dry
8	Date Above Measurements Made	5/24/99	8/18/99	5/25/99	8/18/99	5/25/99	8/18/99
9	Aquifer/Zone Identification For Well/Spring	--	--	--	--	--	--
10	pH (Standard Units)	7.83	7.17	7.41		7.42	
11	Total Acidity (mg/l CaCO3)	4.80	20.00	6.20		2.40	
12	Total Alkalinity (mg/l CaCO3)	180.40	202.40	108.00		101.80	
13	Specific Conductivity (umhos/cm at 25° C)	427	420	287		295	
14	Total Dissolved Solids (mg/l)	--	--	--	--	--	--
15	Total Manganese (mg/l)	0.19	2.72	<0.02		0.02	
16	Total Sulfates (mg/l)	<10.0	15.0	13.0		26.0	
17	Total Iron (mg/l)	0.42	1.47	0.22		0.18	
18	Total Suspended Solids (mg/l)	15.0	912.0	12.0		10.0	
19	Total Hardness (mg/l as CaCO3)	184.0	169.0	121.0		128.0	
20	Nitrates	0.34	3.45	0.33		0.30	
21	Date Sampled for Analysis	5/24/99	8/18/99	5/25/99		5/25/99	
22	Date Last Precipitation Event Occurred	5/24/99	8/15/99	5/25/99	8/15/99	5/25/99	8/15/99

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(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	U-31B	U-31B	U-31C	U-31C	U-31D	U-31D
2	Identification Number	99-05-1028	--	99-05-1029	--	99-05-1030	--
3	High (H)/Low (L) Designation (if applicable)	H	L	H	L	H	L
4	Surface Elevation for Sampling Station (msl)	1158	1158	1170	1170	12140	1210
5	Depth of Well Below Land Surface (feet)	--	--	--	--	--	--
6	Static Water Level of Well Below Land Surface (feet)	--	--	--	--	--	--
7	Flow for Spring and Stream (gpm or cfs)	.002cfs	Dry	.02cfs	Dry	.05cfs	Dry
8	Date Above Measurements Made	5/25/99	8/18/99	5/25/99	8/18/99	5/25/99	8/18/99
9	Aquifer/Zone Identification For Well/Spring	--	--	--	--	--	--
10	pH (Standard Units)	7.85		7.44		7.59	
11	Total Acidity (mg/l CaCO3)	4.20		3.00		4.20	
12	Total Alkalinity (mg/l CaCO3)	112.40		88.00		114.60	
13	Specific Conductivity (umhos/cm at 25° C)	368		260		314	
14	Total Dissolved Solids (mg/l)	--	--	--	--	--	--
15	Total Manganese (mg/l)	<0.02		0.10		<0.02	
16	Total Sulfates (mg/l)	28.00		24.0		19.0	
17	Total Iron (mg/l)	0.11		0.33		0.17	
18	Total Suspended Solids (mg/l)	3.0		47.0		8.0	
19	Total Hardness (mg/l as CaCO3)	148.0		106.0		132.0	
20	Nitrates	0.27		0.16		0.35	
21	Date Sampled for Analysis	5/25/99		5/25/99		5/25/99	
22	Date Last Precipitation Event Occurred	5/25/99	8/15/99	5/25/99	8/15/99	5/25/99	8/15/99

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APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	U-31F	U-31F	U-32	U-32	U-33	U-33
2	Identification Number	99-05-1031	--	99-05-812	--	99-05-813	99-08-688
3	High (H)/Low (L) Designation (if applicable)	H	L	H	L	H	L
4	Surface Elevation for Sampling Station (msl)	1155	1155	1080	1080	1108	1108
5	Depth of Well Below Land Surface (feet)	--	--	--	--	--	--
6	Static Water Level of Well Below Land Surface (feet)	--	--	--	--	--	--
7	Flow for Spring and Stream (gpm or cfs)	.002cfs	Dry	.16cfs	Dry	.04cfs	.0029cfs
8	Date Above Measurements Made	5/25/99	8/18/99	5/24/99	8/18/99	5/24/99	8/18/99
9	Aquifer/Zone Identification For Well/Spring	--	--	--	--	--	--
10	pH (Standard Units)	6.92		8.03		7.82	8.14
11	Total Acidity (mg/l CaCO3)	6.40		4.00		4.40	7.00
12	Total Alkalinity (mg/l CaCO3)	66.80		119.80		100.60	190.20
13	Specific Conductivity (umhos/cm at 25° C)	219		375		318	436
14	Total Dissolved Solids (mg/l)	--	--	--	--	--	--
15	Total Manganese (mg/l)	0.89		0.02		<0.02	0.02
16	Total Sulfates (mg/l)	13.0		43.0		32.0	43.0
17	Total Iron (mg/l)	0.23		0.29		0.37	0.52
18	Total Suspended Solids (mg/l)	6.0		8.00		17.0	270.0
19	Total Hardness (mg/l as CaCO3)	88.0		158.0		158.0	201.0
20	Nitrates	0.29		0.46		0.21	0.52
21	Date Sampled for Analysis	5/25/99		5/24/99		5/24/99	8/18/99
22	Date Last Precipitation Event Occurred	5/25/99	8/15/99	5/24/99	8/15/99	5/24/99	8/15/99

Laboratory Name INDUSTRIAL LAB ANALYSIS, INC.
Address 2240 WILLIAMSBURG DRIVE City WHEELING
State WEST VIRGINIA Zip 26038

NOTE: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A a statement giving the reasons why the information is unobtainable.
NOTE: For each sample provide data for either item 13 or 14.

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT BENNOC, INC. (D-0425-1)

1	Identification No. of Sampling Station from Hydrology Map	U-33A	U-33A				
2	Identification Number	99-05-814	99-08-689				
3	High (H)/Low (L) Designation (if applicable)	H	L				
4	Surface Elevation for Sampling Station (msl)	1100	1100				
5	Depth of Well Below Land Surface (feet)	--	--				
6	Static Water Level of Well Below Land Surface (feet)	--	--				
7	Flow for Spring and Stream (gpm or cfs)	.04 cfs	.0009 cfs				
8	Date Above Measurements Made	5/24/99	8/18/99				
9	Aquifer/Zone Identification For Well/Spring	--	--				
10	pH (Standard Units)	7.95	8.20				
11	Total Acidity (mg/l CaCO3)	4.00	9.00				
12	Total Alkalinity (mg/l CaCO3)	106.80	228.60				
13	Specific Conductivity (umhos/cm at 25° C)	390	628				
14	Total Dissolved Solids (mg/l)	--	--				
15	Total Manganese (mg/l)	<0.02	<0.02				
16	Total Sulfates (mg/l)	51.0	72.0				
17	Total Iron (mg/l)	0.17	0.07				
18	Total Suspended Solids (mg/l)	10.0	35.0				
19	Total Hardness (mg/l as CaCO3)	158.0	188.0				
20	Nitrates	0.43	0.90				
21	Date Sampled for Analysis	5/24/99	8/18/99				
22	Date Last Precipitation Event Occurred	5/24/99	8/15/99				

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

NOTE: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A a statement giving the reasons why the information is unobtainable.
NOTE: For each sample provide data for either item 13 or 14.

ADDENDUM TO ATTACHMENT 14A
BENNOC, INC.
CENTURY MINE
PERMIT D-0425

NOTES: If depths and static water levels are listed as "REPORTED", this indicates that the information was obtained from the resident due to the fact that the well was buried underground, sealed, or covered in some manner, making measurement impossible. Please note that in some cases, the resident did not have knowledge of depth or static water level.

Depths and static water levels labeled "Well Log" indicates the information was obtained from Division of Water file data, and the well was inaccessible for measurement. If no static water level is given for wells labeled "Well Log", this information was not recorded on the well log.

Diane Burnham, former landowner and resident within the shadow area, (southeast quarter of Section 2, along St. Rt. 145) refused access to her property. G.L. & C. Hoover have since purchased this property, and information on developed water sources has now been documented. This dwelling is supplied by the public water line.

For all Attachment 14A's where water analysis is not provided, however, depths and/or static water levels, as well as flow rates for springs are recorded;

The well was accessible for measurement, but the resident was not at home, making sample collection impossible.

The December sample of P-8 was lost during shipment to the laboratory.

Occupied dwellings (3) shown on the D.L. Butzer and L.R. & J.A. Wyers property are utilized as hunting cabins. None have developed water supplies. Also, the Church of Christ in New Castle has no developed water supply.

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14D
(SURFACE WATER BODIES/PUBLIC WATER SUPPLIES)

Applicant's Name BENNOC, INC. (CENTURY MINE)

Surface Water/ Public Supply Identification #	Type of Surface Water/Public Supply	Name of Owner of Surface Water/ Public Supply	Known Uses of Surface Water/ Public Supply
U-1	PERENNIAL	SEE APPLICATION MAP	NONE
U-1A TO D-1	CRABAPPLE CREEK-PER.	SEE APPLICATION MAP	LIVESTOCK
U-2 TO D-2	PINEY CREEK-PERENNIAL	SEE APPLICATION MAP	NONE
U-22 TO D-22	INTERMITTENT	SEE APPLICATION MAP	U-22 - NONE D-22 - LIVESTOCK
U-21 TO D-21	INTERMITTENT	SEE APPLICATION MAP	LIVESTOCK
U-2C	INTERMITTENT	SEE APPLICATION MAP	NONE
U-31, 31A,31B,31C, 31D,31E,31F TO D-31	INTERMITTENT	SEE APPLICATION MAP	U-31,31A,31D-NONE REMAINING-LIVESTOCK
U-4 TO D-4	CAPTINA CREEK-PEREN.	SEE APPLICATION MAP	RECREATIONAL
U-33/U-33A TO D-33	INTERMITTENT	SEE APPLICATION MAP	NONE
U-32 TO D-32	INTERMITTENT	SEE APPLICATION MAP	NONE
D-6	INTERMITTENT	SEE APPLICATION MAP	NONE
P-1	POND	R. THOMAS	RECREATIONAL
P-2 TO D-P2	POND	RAVEN ROCKS, INC.	RECREATIONAL
P-3	POND	RAVEN ROCKS, INC.	RECREATIONAL
P-4	POND	RAVEN ROCKS, INC.	RECREATIONAL
P-5	POND	RAVEN ROCKS, INC.	RECREATIONAL
P-6	POND	C. RILEY	RECREATIONAL
P-7	POND	D. RISER	NONE
P-8	POND	M. LALLATHIN	LIVESTOCK/RECREA.
P-9	POND	R. LUCAS	LIVESTOCK
P-10	POND	E. LUCAS	LIVESTOCK/RECREA.
P-11	POND	E. LUCAS	AGRICUL./LIVEST.

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14D
(SURFACE WATER BODIES/PUBLIC WATER SUPPLIES)

Applicant's Name BENNOC, INC. (CENTURY MINE)

Surface Water/ Public Supply Identification #	Type of Surface Water/Public Supply	Name of Owner of Surface Water/ Public Supply	Known Uses of Surface Water/ Public Supply
P-12 TO D-P12	POND / INTERMITTENT	D. WHITE	NONE
P-13	POND	G. CRIBBEN	RECREATIONAL
P-14	POND	H. JENEWEIN	LIVESTOCK
P-15	POND	N. JENEWEIN	LIVESTOCK
P-16	POND	M. WILSON	RECREATIONAL
P-17	POND	R. HAGAN	LIVESTOCK/RECREA.
P-18	POND	J. HAMILTON	LIVESTOCK/RECREA.
P-19	POND	A. SEAL	RECREATIONAL
P-20	POND	AMERICAN ENERGY CORP.	NONE
P-21 TO D-23	POND,LONG RUN/PEREN.	AMERICAN ENERGY CORP.	NONE
P-22	POND	AMERICAN ENERGY CORP.	NONE
U-7 TO D-7	INTERMITTENT	SEE APPLICATION MAP	U-7 - LIVESTOCK D-7 - NONE
U-8 TO D-8	INTERMITTENT	SEE APPLICATION MAP	NONE
U-9 TO D-9	INTERMITTENT	SEE APPLICATION MAP	NONE
U-10, 10A, 10B TO D-10	INTERMITTENT	SEE APPLICATION MAP	U-10 - LIVESTOCK REMAINING - NONE
U-11, 11A,11B,11C TO D-11	INTERMITTENT	SEE APPLICATION MAP	U-11A, 11B - LIVESTOCK REMAINING - NONE
U-12 TO D-12	INTERMITTENT	SEE APPLICATION MAP	U-12 - LIVESTOCK D-12 - NONE
U-13, U13A TO D-13	INTERMITTENT	SEE APPLICATION MAP	NONE
U-14 TO D-14	INTERMITTENT	SEE APPLICATION MAP	U-14 - NONE D-14 - LIVESTOCK
U-15 TO D-15	INTERMITTENT	SEE APPLICATION MAP	U-15 - NONE D-15 - LIVESTOCK

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14D
(SURFACE WATER BODIES/PUBLIC WATER SUPPLIES)

Applicant's Name BENNOC, INC. (CENTURY MINE)

Surface Water/ Public Supply Identification #	Type of Surface Water/Public Supply	Name of Owner of Surface Water/ Public Supply	Known Uses of Surface Water/ Public Supply
U-16 TO D-16	INTERMITTENT	SEE APPLICATION MAP	U-16 - NONE D-16 - LIVESTOCK
U-17 TO D-17	INTERMITTENT	SEE APPLICATION MAP	NONE
U-18 TO D-18	INTERMITTENT	SEE APPLICATION MAP	NONE
U-19 TO D-19	INTERMITTENT	SEE APPLICATION MAP	NONE
U-20/U-20A TO D-20	INTERMITTENT	SEE APPLICATION MAP	NONE
U-23 TO D-23	INTERMITTENT	SEE APPLICATION MAP	NONE
U-24 TO D-24	INTERMITTENT	SEE APPLICATION MAP	NONE
U-25 TO D-25	INTERMITTENT	SEE APPLICATION MAP	NONE
U-26 TO D-26	INTERMITTENT	SEE APPLICATION MAP	U-26 - NONE D-26 - LIVESTOCK
U-27 TO D-27	INTERMITTENT	SEE APPLICATION MAP	LIVESTOCK
U-28/U-28A TO D-28	INTERMITTENT	SEE APPLICATION MAP	U-28 - NONE, U-28A & D-28 - LIVESTOCK
U-29 TO D-29	INTERMITTENT	SEE APPLICATION MAP	U-29 - LIVESTOCK D-29 - NONE
U-30 TO D-30	INTERMITTENT	SEE APPLICATION MAP	NONE
P-25	POND	G. HOOVER	LIVESTOCK/ RECREATION

ADDENDUM TO ATTACHMENTS 14A, 14C AND 14D, BENNOC, INC.

HYDROLOGY SITE		STATE PLANE COORDINATES X	Y
WL-1		2425560	685211
WL-2		2425563	685465
W-3		2425516	685300
WL-4		2426037	687695
WL-5		2425953	686628
W-6		2425200	688010
DW-7		2425146	687961
DW-8		2422253	688145
WL-9		2421146	685617
DW-10		2421239	685690
W-11		2420388	685769
W-12		2420608	685690
DW-13		2420856	685497
DW-14		2421834	685338
DW-15		2422303	686999
W-16		2413959	684905
W-17		2413874	685544
W-18		2414163	685324
DW-19		2414148	685239
DW-20		2426914	688740
WL-21		2427022	688771
W-22		2418780	684360
W-23		2418334	684557
DW-24		2417513	687515
W-25		2407871	690373
W-26		2407868	690422
W-27		2407973	688577
DW-28		2407742	689213
W-29		2409364	689306

HYDROLOGY SITE		STATE PLANE COORDINATES X	Y
W-30		2409106	689248
DW-31		2410801	687443
W-32		2409844	687810
W-33		2409877	687754
DW-34		2409201	687798
DW-35		2413519	684384
W-36		2413601	684222
DW-37		2412164	689936
DW-38		2410730	692468
WL-39		2414291	687051
DW-40		2414625	687345
W-41		2415554	689714
W-42		2415241	690448
WL-43		2414971	690702
DW-44		2415460	689308
W-45		2417885	691943
DW-46		2417042	692760
DW-47		2413134	686697
W-48		2416048	689115
W-49		2416612	692363
DW-50		2408752	684058
W-51		2406679	684597
DW-52		2408017	684246
DW-53		2406929	694586
W-54		2406840	694519
W-55		2408047	695654
W-56		2408629	695398
W-57		2404062	695507
W-58		2408479	693220

HYDROLOGY SITE		STATE PLANE COORDINATES X	Y
DW-59		2408130	693418
DW-60		2407083	693000
W-61		2403403	694096
DW-62		2403652	691198
W-63		2403351	690370
WL-64		2403564	694838
W-65		2404625	687444
DW-66		2404699	687323
W-67		2417032	692658
W-68		2404123	688373
W-69		2405591	686197
W-70		2405649	686200
DW-71		2405838	686339
W-72		2409894	695863
W-73		2406532	687700
W-74		2405521	686715
W-75		2402149	689141
W-76		2401196	690130
W-77		2400925	692725
WL-78		2399832	692142
W-79		2399870	692054
DW-80		2401236	691036
DW-81		2406729	687890
DW-82		2409851	686161
DW-83		2409755	685741
DW-84		2409073	685962
W-85		2422819	684877
W-86		2404457	688611
DW-87		2404279	688637

HYDROLOGY SITE		STATE PLANE COORDINATES X	Y
W-88		2400118	692071
W-89		2404545	687411
W-90		2399095	686744
W-91		2398901	686980
DW-92		2401626	685977
WL-93		2401432	686150
W-94		2399109	686916
W-95		2399161	686839
W-96		2403483	693851
W-97		2409496	695654
WL-98		2399794	686579
W-99		2400241	685800
W-100		2400246	685750
W-101		2400561	684383
DW-102		2399624	692420
WL-103		2400044	692391
DW-104		2399799	692273
DW-105		2399711	692278
WL-106		2399659	692131
W-107		2399642	691650
W-108		2399088	693494
W-109		2398954	694306
DW-110		2399012	694236
W-111		2399909	691727
DW-112		2399468	692054
DW-113		2399517	691962
W-114		2399560	691901
DW-115		2399772	691950
WL-116		2399656	692256

HYDROLOGY SITE		STATE PLANE COORDINATES X	Y
W-117		2399322	687088
W-118		2398814	688717
W-119		2398835	688683
W-120		2399009	695507
W-121		2398954	692923
W-122		2399569	686857
W-123		2401377	683856
W-124		2399507	686931
W-125		2410901	696120
DW-126		2416519	692268
W-127		2415334	691542
W-128		2416729	694163
W-129		2414105	692676
DW-130		2403205	693468
W-131		2403083	693371
DW-132		2418905	684993
DW-133		2406697	688770
W-134		2425311	684709
DW-135		2403625	686710
W-140		2403593	691964
W-141		2404450	687671
W-142		2415466	691625
W-143		2409242	687737
DW-144		*2411595*	686506
W-145		2399774	692110
DW-146		2415095	687946
DW-147		2419173	687074
DS-1		2425921	686872
DS-2		2426551	687079

HYDROLOGY SITE		STATE PLANE COORDINATES X	Y
DS-3		2425690	690010
DS-4		2422551	686732
DS-5		2421786	690722
DS-6		2423563	689804
DS-7		2413912	686444
DS-8		2414949	686787
DS-9		2407677	690912
DS-10		2408907	690140
DS-11		2408924	689253
DS-12		2408864	689350
DS-13		2414759	687966
DS-14		2414616	687501
DS-15		2414535	690261
DS-16		2418303	693151
DS-17		2412970	687450
DS-18		2406095	685787
DS-19		2407323	686040
DS-20		2407810	685639
DS-21		2407188	695573
DS-22		2406819	695118
DS-23		2406418	695073
DS-24		2405252	695840
DS-25		2404309	695882
DS-26		2415795	689439
DS-27		2417092	689304
DS-28		2425543	687785
DS-29		2408398	693044
DS-30		2403379	690989
DS-31		2403860	691416

HYDROLOGY SITE		STATE PLANE COORDINATES X	Y
DS-32		2409430	685855
DS-33		2402413	689716
DS-34		2404535	687775
DS-35		2403968	687308
DS-36		2403879	686754
DS-37		2404071	685068
DS-38		2403518	685194
DS-39		2404979	687542
DS-40		2401262	689736
DS-41		2401313	693278
DS-42		2399693	690993
DS-43		2400550	691934
DS-44		2401366	691416
DS-45		2406890	687978
DS-46		2404259	689052
DS-47		2403471	688914
DS-48		2404352	688190
DS-49		2399387	686684
DS-50		2398856	686682
DS-51		2398774	687100
DS-52		2401690	685782
DS-53		2398697	690356
DS-54		2399061	691548
DS-55		2399825	692699
DS-56		2400872	686525
DS-57		2400444	685728
DS-58		2400219	684703
DS-59		2399473	685698
DS-60		2403530	692053

HYDROLOGY SITE		STATE PLANE COORDINATES X	Y
DS-61		2399449	693047
DS-62		2399096	693991
DS-63		2399455	687920
DS-64		2399262	687298
DS-65		2401757	688681
DS-66		2398900	688956
DS-67		2399234	695651
DS-68		2402776	693319
DS-69		2400745	690840
DS-70		2416671	692793
DS-71		2411906	694957
DS-72		2426905	688918
DS-75		2401500	691329
DS-76		2401141	690899
DS-77		2401481	690470
DS-78		2404329	687161
DS-79		2408115	685837
DS-80		2422774	686528
DS-81		2415397	687924
DS-82		2415654	687713
U-1		2421918	684338
U-1A		2417744	684094
U-2		2411918	684035
D-22		2409219	684099
D-21		2410266	684229
U-2C		2413484	696351
U-31E		2400488	684710
U-4		2399510	697007
D-33		2400685	695733

HYDROLOGY SITE		STATE PLANE COORDINATES X	Y
D-1		2423678	690974
D-2		2415136	695163
D-31		2407230	684026
D-4		2400802	696003
D-32		2402650	696018
D-6		2406412	696016
P-1		2413803	684602
P-2		2410863	688039
P-3		2409478	687710
P-4		2413282	684961
P-5		2413152	684745
P-6		2414367	687299
P-7		2408178	684065
P-8		2415772	689090
P-9		2407202	694604
P-10		2406730	692873
P-11		2408191	693438
P-12		2411185	695978
P-13		2403034	694797
P-14		2401157	690889
P-15		2404468	688196
P-16		2400335	692824
P-17		2399447	693162
P-18		2399255	687568
P-19		2399229	689147
P-20		2414578	692970
P-21		2412710	693221
P-22		2415130	694801
P-25		*2415349*	*688131*

HYDROLOGY SITE		STATE PLANE COORDINATES X	Y
D-P2		2411834	687424
D-7		2423666	690855
D-8		2422335	687193
D-9		2422384	687956
D-10		2422239	689405
D-11		2421683	685076
D-P12		2411564	693640
D-12		2419321	693038
D-13		2414472	693923
D-14		2414245	693900
D-15		2414403	692250
D-16		2413528	690468
D-17		2413632	689276
D-18		2412773	688555
D-19		2412717	688346
D-20		2411440	686504
D-23		2413915	693038
D-24		2414006	693353
D-25		2410476	693407
D-26		2409120	693185
D-27		2408192	692855
D-28		2404895	690596
D-29		2403180	689990
D-30		2402124	688959
U-7		2426089	689124
U-8		2425214	686712
U-9		2420392	688740
U-10		2418062	692226
U-10A		2416989	691833

HYDROLOGY SITE		STATE PLANE COORDINATES X	Y
U-10B		2415817	690795
U-11		2418996	689021
U-11A		2416918	689403
U-11B		2417816	686940
U-11C		2416157	686874
U-12		2418012	693672
U-13		2416246	693746
U-13A		*2416281*	*693009*
U-14		2412815	694613
U-15		2412805	692170
U-16		2411222	692089
U-17		2414909	689100
U-18		2408422	690918
U-19		2414435	687889
U-20		2408038	689509
U-20A		2406624	689581
U-21		2409901	685533
U-22		2408849	684948
U-23		2404395	694869
U-24		2415565	692394
U-25		2410069	695298
U-26		2408217	695357
U-27		2406395	694154
U-28		2403629	693441
U-28A		2400615	692188
U-29		2401604	691399
U-30		2399893	690856
U-31		2407958	685766
U-31A		2405454	685638

HYDROLOGY SITE		STATE PLANE COORDINATES X	Y
U-31B		2404262	686986
U-31C		2403037	687202
U-31D		2400423	686768
U-31F		2404658	684416
U-32		2402832	694347
U-33		2401879	693819
U-33A		2400101	693101
GEOTHERMAL WELL A		2409909	687784
GEOTHERMAL WELL B		2409908	687774
GEOTHERMAL WELL C		2409908	687765
GEOTHERMAL WELL D		2409907	68775
GEOTHERMAL WELL E		2409922	687783
GEOTHERMAL WELL F		2409921	687773
GEOTHERMAL WELL G		2409921	687763
GEOTHERMAL WELL H		2409920	687754
W-1		2414420	693691

ADDENDUM TO ATTACHMENT 14C AND 14D, BENNOC, INC.

GROUND WATER / SURFACE WATER SITE INDEX
SHEETS 1 THRU 3

SITE I.D.	LOCATION / SECTION	SHEET NO.	SITE I.D.	LOCATION / SECTION	SHEET NO.
WL-1	S/E QTR. / 26	1 OF 3	DW-28	N/W QTR. / 8	2 OF 3
WL-2	S/E QTR. / 26	1 OF 3	W-29	N/E QTR. / 8	2 OF 3
W-3	S/E QTR. / 26	1 OF 3	W-30	N/E QTR. / 8	2 OF 3
WL-4	S/E QTR. / 26	1 OF 3	DW-31	S/E QTR. / 8	2 OF 3
WL-5	S/E QTR. / 26	1 OF 3	W-32	S/E QTR. / 8	2 OF 3
W-6	N/E QTR. / 26	1 OF 3	W-33	S/E QTR. / 8	2 OF 3
DW-7	N/E QTR. / 26	1 OF 3	DW-34	S/E QTR. / 8	2 OF 3
DW-8	N/W QTR. / 26	1 OF 3	DW-35	N/W QTR. / 1	2 OF 3
WL-9	S/E QTR. / 32	1 OF 3	W-36	N/W QTR. / 1	2 OF 3
DW-10	S/E QTR. / 32	1 OF 3	DW-37	N/W QTR. / 2	2 OF 3
W-11	S/E QTR. / 32	1 OF 3	DW-38	S/E QTR. / 9	2 OF 3
W-12	S/E QTR. / 32	1 OF 3	WL-39	S/E QTR. / 2	2 OF 3
DW-13	S/E QTR. / 32	1 OF 3	DW-40	S/E QTR. / 2	2 OF 3
DW-14	S/W QTR. / 26	1 OF 3	W-41	N/E QTR. / 2	2 OF 3
DW-15	S/W QTR. / 26	1 OF 3	W-42	N/E QTR. / 2	2 OF 3
W-16	N/E QTR. / 1	2 OF 3	WL-43	N/E QTR. / 2	2 OF 3
W-17	N/E QTR. / 1	2 OF 3	DW-44	N/E QTR. / 2	2 OF 3
W-18	N/E QTR. / 1	2 OF 3	W-45	S/W QTR. / 33	2 OF 3
DW-19	N/E QTR. / 1	2 OF 3	DW-46	S/W QTR. / 33	2 OF 3
DW-20	N/E QTR. / 26	1 OF 3	DW-47	S/W QTR. / 2	2 OF 3
WL-21	N/E QTR. / 26	1 OF 3	W-48	N/E QTR. / 2	2 OF 3
W-22	N/W QTR. / 31	2 OF 3	W-49	S/E QTR. / 3	2 OF 3
W-23	N/W QTR. / 31	2 OF 3	DW-50	N/E QTR. / 7	2 OF 3
DW-24	S/W QTR. / 32	2 OF 3	W-51	N/W QTR. / 7	2 OF 3
W-25	N/W QTR. / 8	2 OF 3	DW-52	N/W QTR. / 7	2 OF 3
W-26	N/W QTR. / 8	2 OF 3	DW-53	N/W QTR. / 9	2 OF 3
W-27	N/W QTR. / 8	2 OF 3	W-54	N/W QTR. / 9	2 OF 3

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ADDENDUM TO ATTACHMENT 14C AND 14D, BENNOC, INC.

GROUND WATER / SURFACE WATER SITE INDEX
SHEETS 1 THRU 3

SITE I.D.	LOCATION / SECTION	SHEET NO.	SITE I.D.	LOCATION / SECTION	SHEET NO.
W-55	N/W QTR. / 9	2 OF 3	DW-82	N/E QTR. / 7	2 OF 3
W-56	N/W QTR. / 9	2 OF 3	DW-83	N/E QTR. / 7	2 OF 3
W-57	N/E QTR. / 15	3 OF 3	DW-84	N/E QTR. / 7	2 OF 3
W-58	S/W QTR. / 9	2 OF 3	W-85	N/W QTR. / 25	1 OF 3
DW-59	S/W QTR. / 9	2 OF 3	W-86	S/E QTR. / 14	3 OF 3
DW-60	S/W QTR. / 9	2 OF 3	DW-87	S/E QTR. / 14	3 OF 3
W-61	S/W QTR. / 15	3 OF 3	W-88	S/E QTR. / 21	3 OF 3
DW-62	N/E QTR. / 14	3 OF 3	W-89	S/E QTR. / 14	3 OF 3
W-63	N/E QTR. / 14	3 OF 3	W-90	S/E QTR. / 20	3 OF 3
W-64	N/E QTR. / 15	3 OF 3	W-91	S/E QTR. / 20	3 OF 3
W-65	S/E QTR. / 14	3 OF 3	DW-92	N/W QTR. / 13	3 OF 3
DW-66	S/E QTR. / 14	3 OF 3	WL-93	N/W QTR. / 13	3 OF 3
W-67	S/W QTR. / 33	2 OF 3	W-94	S/E QTR. / 20	3 OF 3
W-68	S/E QTR. / 14	3 OF 3	W-95	S/E QTR. / 20	3 OF 3
W-69	N/E QTR. / 13	3 OF 3	W-96	S/E QTR. / 15	3 OF 3
W-70	N/E QTR. / 13	3 OF 3	W-97	N/E QTR. / 9	2 OF 3
DW-71	N/E QTR. / 13	3 OF 3	WL-98	N/E QTR. / 19	3 OF 3
W-72	N/E QTR. / 9	2 OF 3	W-99	N/E QTR. / 19	3 OF 3
W-73	S/W QTR. / 8	2 OF 3	W-100	N/E QTR. / 19	3 OF 3
W-74	S/E QTR. / 14	3 OF 3	W-101	N/W QTR. / 13	3 OF 3
W-75	S/W QTR. / 14	3 OF 3	DW-102	S/E QTR. / 21	3 OF 3
W-76	N/W QTR. / 14	3 OF 3	WL-103	S/E QTR. / 21	3 OF 3
W-77	S/W QTR. / 15	3 OF 3	DW-104	S/E QTR. / 21	3 OF 3
WL-78	S/E QTR. / 21	3 OF 3	DW-105	S/E QTR. / 21	3 OF 3
W-79	S/E QTR. / 21	3 OF 3	WL-106	S/E QTR. / 21	3 OF 3
DW-80	N/W QTR. / 14	3 OF 3	W-107	N/E QTR. / 20	3 OF 3
DW-81	S/W QTR. / 8	2 OF 3	W-108	S/E QTR. / 21	3 OF 3

ADDENDUM TO ATTACHMENT 14C AND 14D, BENNOC, INC.

GROUND WATER / SURFACE WATER SITE INDEX
SHEETS 1 THRU 3

SITE I.D.	LOCATION / SECTION	SHEET NO.	SITE I.D.	LOCATION / SECTION	SHEET NO.
W-109	S/E QTR. / 21	3 OF 3	*W-141*	*S/E QTR. / 14*	*3 OF 3*
DW-110	S/E QTR. / 21	3 OF 3	*W-142*	*S/E QTR. / 3*	*2 OF 3*
W-111	N/E QTR. / 20	3 OF 3	*W-143*	*S/E QTR. / 8*	*2 OF 3*
DW-112	S/E QTR. / 21	3 OF 3	*DW-144*	*S/W QTR. / 2*	*2 OF 3*
DW-113	N/E QTR. / 20	3 OF 3	*W-145*	*S/E QTR. / 21*	*3 OF 3*
W-114	N/E QTR. / 20	3 OF 3	*DW-146*	*S/E QTR. / 2*	*2 OF 3*
DW-115	N/E QTR. / 20	3 OF 3	*DW-147*	*S/W QTR. / 32*	*2 OF 3*
W-116	S/E QTR. / 21	3 OF 3	DS-1	S/E QTR. / 26	1 OF 3
W-117	S/E QTR. / 20	3 OF 3	DS-2	S/E QTR. / 26	1 OF 3
W-118	S/E QTR. / 20	3 OF 3	DS-3	N/E QTR. / 26	1 OF 3
W-119	S/E QTR. / 20	3 OF 3	DS-4	S/W QTR. / 26	1 OF 3
W-120	N/E QTR. / 21	3 OF 3	DS-5	S/E QTR. / 33	1 OF 3
W-121	S/E QTR. / 21	3 OF 3	DS-6	N/W QTR. / 26	1 OF 3
W-122	S/E QTR. / 20	3 OF 3	DS-7	S/E QTR. / 2	2 OF 3
W-123	S/W QTR. / 13	3 OF 3	DS-8	S/E QTR. / 2	2 OF 3
W-124	S/E QTR. / 20	3 OF 3	DS-9	N/W QTR. / 8	2 OF 3
W-125	N/E QTR. / 9	2 OF 3	DS-10	N/E QTR. / 8	2 OF 3
DW-126	S/E QTR. / 3	2 OF 3	DS-11	N/E QTR. / 8	2 OF 3
W-127	S/E QTR. / 3	2 OF 3	DS-12	N/E QTR. / 8	2 OF 3
W-128	S/E QTR. / 3	2 OF 3	DS-13	S/E QTR. / 2	2 OF 3
W-129	S/E QTR. / 3	2 OF 3	DS-14	S/E QTR. / 2	2 OF 3
DW-130	S/W QTR. / 15	3 OF 3	DS-15	N/E QTR. / 2	2 OF 3
W-131	S/W QTR. / 15	3 OF 3	DS-16	S/W QTR. / 33	2 OF 3
DW-132	N/W QTR. / 31	2 OF 3	DS-17	S/W QTR. / 2	2 OF 3
DW-133	S/W QTR. / 8	2 OF 3	DS-18	N/W QTR. / 7	3 OF 3
W-134	N/E QTR. / 25	1 OF 3	DS-19	N/W QTR. / 7	2 OF 3
DW-135	S/E QTR. / 14	3 OF 3	DS-20	N/W QTR. / 7	2 OF 3
W-140	*S/E QTR. /15*	*3 OF 3*	DS-21	N/W QTR. / 9	2 OF 3

ADDENDUM TO ATTACHMENT 14C AND 14D, BENNOC, INC.

GROUND WATER / SURFACE WATER SITE INDEX
SHEETS 1 THRU 3

SITE I.D.	LOCATION / SECTION	SHEET NO.	SITE I.D.	LOCATION / SECTION	SHEET NO.
DS-22	N/W QTR. / 7	2 OF 3	DS-47	S/E QTR. / 14	3 OF 3
DS-23	N/W QTR. / 9	3 OF 3	DS-48	S/E QTR. / 14	3 OF 3
DS-24	N/E QTR. / 15	3 OF 3	DS-49	N/E QTR. / 19	3 OF 3
DS-25	N/E QTR. / 15	3 OF 3	DS-50	N/E QTR. / 19	3 OF 3
DS-26	N/E QTR. / 2	2 OF 3	DS-51	S/E QTR. / 20	3 OF 3
DS-27	N/W QTR. / 32	2 OF 3	DS-52	N/W QTR. / 13	3 OF 3
DS-28	N/E QTR. / 26	1 OF 3	DS-53	N/E QTR. / 20	3 OF 3
DS-29	S/W QTR. / 9	2 OF 3	DS-54	N/E QTR. / 20	3 OF 3
DS-30	N/E QTR. / 14	3 OF 3	DS-55	S/E QTR. / 21	3 OF 3
DS-31	N/E QTR. / 14	3 OF 3	DS-56	N/W QTR. / 13	3 OF 3
DS-32	N/E QTR. / 7	2 OF 3	DS-57	N/E QTR. / 19	3 OF 3
DS-33	N/W QTR. / 14	3 OF 3	DS-58	N/E QTR. / 19	3 OF 3
DS-34	S/E QTR. / 14	3 OF 3	DS-59	N/E QTR. / 19	3 OF 3
DS-35	S/E QTR. / 14	3 OF 3	DS-60	S/E QTR. / 15	3 OF 3
DS-36	S/E QTR. / 14	3 OF 3	DS-61	S/E QTR. / 21	3 OF 3
DS-37	N/E QTR. / 13	3 OF 3	DS-62	S/E QTR. / 21	3 OF 3
DS-38	N/E QTR. / 13	3 OF 3	DS-63	S/E QTR. / 20	3 OF 3
DS-39	S/E QTR. / 14	3 OF 3	DS-64	S/E QTR. / 20	3 OF 3
DS-40	N/W QTR. / 14	3 OF 3	DS-65	S/W QTR. / 14	3 OF 3
DS-41	S/W QTR. / 15	3 OF 3	DS-66	S/E QTR. / 20	3 OF 3
DS-42	N/E QTR. / 20	3 OF 3	DS-67	N/E QTR. / 21	3 OF 3
DS-43	N/E QTR. / 20	3 OF 3	DS-68	S/W QTR. / 15	3 OF 3
DS-44	N/W QTR. / 14	3 OF 3	DS-69	N/W QTR. / 14	3 OF 3
DS-45	S/W QTR. / 8	2 OF 3	DS-70	S/E QTR. / 3	2 OF 3
DS-46	S/E QTR. / 14	3 OF 3	DS-71	N/W QTR. / 3	2 OF 3
			DS-72	N/E QTR. / 26	1 OF 3

ADDENDUM TO ATTACHMENT 14C AND 14D, BENNOC, INC.

GROUND WATER / SURFACE WATER SITE INDEX
SHEETS 1 THRU 3

SITE I.D.	LOCATION / SECTION	SHEET NO.	SITE I.D.	LOCATION / SECTION	SHEET NO.
DS-75	*N/W QTR. / 14*	*3 OF 3*	U-13	S/E QTR. / 3	2 OF 3
DS-76	*N/W QTR. / 14*	*3 OF 3*	*U-13A*	*S/E QTR. / 3*	*2 OR 3*
DS-77	*N/W QTR. / 14*	*3 OF 3*	U-14	N/W QTR. / 3	2 OF 3
DS-78	*S/E QTR. / 14*	*3 OF 3*	U-15	S/W QTR. / 3	2 OF 3
DS-79	*N/W QTR. / 7*	*2 OF 3*	U-16	S/E QTR. / 9	2 OF 3
DS-80	*S/W QTR. / 26*	*1 OF 3*	U-17	N/E QTR. / 2	2 OF 3
DS-81	*S/E QTR. / 2*	*2 OF 3*	U-18	N/W QTR. / 8	2 OF 3
DS-82	*S/E QTR. / 2*	*2 OF 3*	U-19	S/E QTR. / 2	2 OF 3
U-1	N/W QTR. / 25	1 OF 3	U-20	N/W QTR. / 8	2 OF 3
U-1A	N/W QTR. / 31	2 OF 3	U-20A	N/W QTR. / 8	2 OF 3
U-2	N/W QTR. / 1	2 OF 3	U-21	N/E QTR. / 7	2 OF 3
D-22	N/E QTR. / 7	2 OF 3	U-22	N/E QTR. / 7	2 OF 3
D-21	N/E QTR. / 7	2 OF 3	U-23	N/E QTR. / 15	3 OF 3
U-2C	N/W QTR. / 3	2 OF 3	U-24	S/E QTR. / 3	2 OF 3
U-31E	N/W QTR. / 13	3 OF 3	U-25	N/E QTR. / 9	2 OF 3
U-4	N/E QTR. / 21	3 OF 3	U-26	N/W QTR. / 9	2 OF 3
U-7	N/E QTR. / 26	1 OF 3	U-27	S/E QTR. / 9	2 OF 3
U-8	S/E QTR. / 26	1 OF 3	U-28	S/E QTR. / 15	3 OF 3
U-9	N/E QTR. / 32	2 OF 3	U-28A	S/E QTR. / 21	3 OF 3
U-10	S/W QTR. / 33	2 OF 3	U-29	N/W QTR. / 14	3 OF 3
U-10A	S/W QTR. / 33	2 OF 3	U-30	N/E QTR. / 20	3 OF 3
U-10B	N/E QTR. / 2	2 OF 3	U-31	N/W QTR. / 7	2 OF 3
U-11	N/W QTR. / 32	2 OF 3	U-31A	N/E QTR. / 13	3 OF 3
U-11A	N/W QTR. / 32	2 OF 3	U-31B	S/E QTR. / 13	3 OF 3
U-11B	S/W QTR. / 32	2 OF 3	U-31C	S/W QTR. / 13	3 OF 3
U-11C	S/E QTR. / 2	2 OF 3	U-31D	S/E QTR. / 20	3 OF 3
U-12	N/W QTR. / 33	2 OF 3	U-31F	N/E QTR. / 13	3 OF 3

ADDENDUM TO ATTACHMENT 14C AND 14D, BENNOC, INC.

GROUND WATER / SURFACE WATER SITE INDEX
SHEETS 1 THRU 3

SITE I.D.	LOCATION / SECTION	SHEET NO.	SITE I.D.	LOCATION / SECTION	SHEET NO.
U-32	S/W QTR. / 15	3 OF 3	D-23	S/W QTR. / 3	2 OF 3
D-33	N/E QTR. / 21	3 OF 3	D-24	S/E QTR. / 3	2 OF 3
U-33	S/W QTR. / 15	3 OF 3	D-25	S/E QTR. / 9	2 OF 3
U-33A	S/E QTR. / 21	3 OF 3	D-26	S/E QTR. / 9	2 OF 3
D-33	N/E QTR. / 21	3 OF 3	D-27	S/W QTR. / 9	2 OF 3
D-1	S/W QTR. / 27	1 OF 3	D-28	N/E QTR. / 14	3 OF 3
D-2	N/E QTR. / 3	2 OF 3	D-29	N/W QTR. / 14	3 OF 3
D-31	N/W QTR. / 7	2 OF 3	D-30	S/W QTR. / 14	3 OF 3
D-4	N/E QTR. / 21	3 OF 3	P-1	N/E QTR. / 1	2 OF 3
D-32	N/W QTR. / 15	3 OF 3	P-2	S/E QTR. / 8	2 OF 3
D-6	N/W QTR. / 9	3 OF 3	P-3	S/E QTR. / 8	2 OF 3
D-P2	S/W QTR. / 2	2 OF 3	P-4	N/W QTR. / 1	2 OF 3
D-7	S/W QTR. / 2	2 OF 3	P-5	N/W QTR. / 1	2 OF 3
D-8	S/E QTR. / 26	1 OF 3	P-6	S/E QTR. / 2	2 OF 3
D-9	N/W QTR. / 25	1 OF 3	P-7	N.W QTR. / 7	2 OF 3
D-10	N/W QTR. / 26	1 OF 3	P-8	N/E QTR. / 2	2 OF 3
D-11	N/E QTR. / 31	1 OF 3	P-9	N/W QTR. / 9	2 OF 3
D-P12	S/W QTR. / 3	2 OF 3	P-10	S/W QTR. / 9	2 OF 3
D-12	S/W QTR. / 3	2 OF 3	P-11	S/W QTR. / 9	2 OF 3
D-13	S/E QTR. / 3	2 OF 3	P-12	N/E QTR. / 9	2 OF 3
D-14	S/E QTR. / 3	2 OF 3	P-13	N/W QTR. / 15	3 OF 3
D-15	S/W QTR. / 3	2 OF 3	P-14	N/W QTR. / 14	3 OF 3
D-16	N/W QTR. / 2	2 OF 3	P-15	S/E QTR. / 14	3 OF 3
D-17	N/W QTR. / 2	2 OF 3	P-16	S/E QTR. / 21	3 OF 3
D-18	S/W QTR. / 2	2 OF 3	P-17	S/E QTR. / 21	3 OF 3
D-19	S/W QTR. / 2	2 OF 3	P-18	S/E QTR. / 20	3 OF 3
D-20	S/W QTR. / 3	2 OF 3	P-19	S/E QTR. / 20	3 OF 3

ADDENDUM TO ATTACHMENT 14C AND 14D, BENNOC, INC.

GROUND WATER / SURFACE WATER SITE INDEX
SHEETS 1 THRU 3

SITE I.D.	LOCATION / SECTION	SHEET NO.	SITE I.D.	LOCATION / SECTION	SHEET NO.
P-20	S/E QTR. / 3	2 OF 3			
P-21	S/W QTR. / 3	2 OF 3			
P-22	N/E QTR. / 3	2 OF 3			
P-25	*S/E QTR. / 2*	*2 OF 3*			
GEOTHERMAL WELL A	*S/E QTR./ 8*	*2 OF 3*			
GEOTHERMAL WELL B	*S/E QTR. / 8*	*2 OF 3*			
GEOTHERMAL WELL C	*S/E QTR. / 8*	*2 OF 3*			
GEOTHERMAL WELL D	*S/E QTR. / 8*	*2 OF 3*			
GEOTHERMAL WELL E	*S/E QTR. / 8*	*2 OF 3*			
GEOTHERMAL WELL F	*S/E QTR. / 8*	*2 OF 3*			
GEOTHERMAL WELL G	*S/E QTR. / 8*	*2 OF 3*			
GEOTHERMAL WELL H	*S/E QTR. / 8*	*2 OF 3*			
W-1	*S/E QTR. / 3*	*2 OF 3*			
W-5Y	*S/W QTR. / 3*	*2 OF 3*			
W-8Y	*S/W QTR. / 3*	*2 OF 3*			
W-12Y	*S/E QTR. / 3*	*2 OF 3*			
W-13Y	*S/E QTR. / 3*	*2 OF 3*			

D. (3) Based on the data listed on Attachment 14A, and other information submitted with this application, identify the seasonal variations in water quality and quantity for the streams identified in Part 2, D(2).

SEE ATTACHMENT 14A, ADDENDA, PHC

E. HYDROLOGIC DETERMINATION-**Permit, Shadow Area, and Adjacent Area**

Based on the information submitted in response to items B, C, and D in this part of the permit application, submit an addendum describing the probable hydrologic consequences of this proposed underground mining operation on the hydrologic regime of the proposed permit area, shadow area, and adjacent area. The description shall include findings on each of the following items:

(1) The consequences of the proposed operation on the contents of total suspended and dissolved solids, total iron, total manganese, acidity, and pH.

(2) Whether adverse impacts may occur to the hydrologic balance;

(3) The impact the proposed operation will have on:

(a) sediment yield from the disturbed area,

(b) flooding and stream flow alteration or diminution,

(c) ground water and surface water availability.

SEE ADDENDUM TO PART 2, PAGE 18, ITEM E

F. ALTERNATIVE WATER SUPPLY INFORMATION-**Permit, Shadow Area and Adjacent Area**

(1) Based on the response in Part 2, item E, submit an addendum identifying the extent to which the proposed coal mining activities may proximately result in contamination, diminution, or interruption of an underground or surface source of water within the proposed permit area, shadow area, and adjacent area that is used for domestic, agricultural, industrial, or other legitimate use.

SEE ADDENDUM TO PART 2, PAGE 18, F

(2) If contamination, diminution, or interruption may result, submit an addendum identifying the alternative sources of water supply that could be developed to replace the existing sources including information on water availability and suitability of alternative sources for existing pre-mining uses and postmining land uses.

SEE ADDENDUM TO PART 2, PAGE 18, F

ADDENDUM TO PART 2, PAGE 18, D
BENNOC, INC.
CENTURY MINE
PERMIT D-0425

SEASONAL VARIATIONS OF WATER QUALITY AND QUANTITY

Surface and groundwater data contained in the Attachment 14 forms included with this application indicate the seasonal variances of quality and quantity of the water in this area.

The water wells existing in the area give a fairly representative indication of the near surface water bearing zones that can be found in this region. The Probable Hydrologic Consequences of mining gives a detailed description of these characteristics.

Precipitation is one of the principal factors influencing water systems. Infiltration of precipitation increases soil moisture and influences groundwater chemical composition. The time required for infiltrating precipitation to reach lower water bearing zones increases with increasing depth. Depending on the morphological structure, character of surface vegetation, and intensity of precipitation the amounts of infiltration also vary greatly. Amounts of infiltration subsequently influences the dissolved solids contents of groundwater which, in most cases, become more dilute during periods of prolonged precipitation. Rainfall data collected near the CENTURY MINE has been included in this application.

All the data will show that an increased water quantity and a decrease in chemical constituent levels is realized during times of increased precipitation and snow melt of winter and spring seasons; while a decrease in water quantity and increase in chemical constituent levels is realized in dry summer and early autumn seasons.

DATA COLLECTED BY: THE OHIO VALLEY COAL COMPANY

RAIN GAUGE IS LOCATED APPROXIMATELY 2 MILES NORTHEAST OF THE PROPOSED MINE SITE

RAINFALL 1997

DATE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
1	0.00	0.00	1.10	0.00	0.00	0.32	0.29	0.00	0.00	0.00	0.25	0.00	
2	0.01	T	1.20	0.00	0.00	0.90	T	T	0.04	0.00	0.07	0.00	
3	0.03	0.14	0.30	0.00	0.64	0.03	0.00	0.40	0.00	0.00	T	0.21	
4	0.60	0.35	0.00	T	0.00	0.00	0.00	T	0.00	0.00	0.00	T	
5	0.00	0.01	0.35	0.00	0.12	0.00	T	0.00	T	0.00	0.00	0.06	
6	0.00	0.00	T	0.00	0.01	0.00	T	0.00	0.00	0.00	0.09	0.04	
7	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.04	
8	0.00	T	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	
9	0.29	0.00	0.71	0.00	0.90	0.00	0.20	0.00	0.45	0.05	0.00	0.23	
10	T	T	0.00	0.00	T	0.00	0.00	0.00	T	0.00	0.01	0.31	
11	0.00	T	0.00	0.21	T	0.00	0.00	0.00	0.00	0.00	0.05	0.01	
12	T	0.00	0.00	0.48	0.00	0.18	0.00	0.59	0.00	0.00	0.00	T	
13	0.00	0.52	0.29	0.00	T	0.01	0.00	0.10	0.00	0.02	1.30	0.00	
14	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
15	T	0.00	0.00	0.00	0.00	0.00	0.00	0.70	0.00	0.00	0.00	0.00	
16	0.28	0.05	0.00	T	0.10	0.49	0.00	0.07	0.00	0.00	0.30	0.00	
17	T	0.00	0.00	0.00	T	0.00	0.00	2.53	0.09	0.00	0.00	0.00	
18	0.00	0.00	0.20	0.00	0.05	0.46	0.00	0.00	0.00	0.00	0.00	0.00	
19	0.00	0.10	0.00	0.00	0.65	0.00	0.00	0.49	1.26	0.00	0.00	0.00	
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	
21	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.39	0.15	
22	0.27	0.00	0.00	0.01	0.00	T	0.50	0.00	0.00	0.00	0.01	0.18	
23	0.00	0.00	0.02	0.04	0.00	0.00	0.06	0.00	T	0.00	0.00	T	
24	0.23	0.00	T	0.79	0.90	0.00	0.00	0.08	0.00	0.00	0.00	0.00	
25	0.01	0.00	1.04	0.60	1.10	0.00	0.00	0.00	0.00	0.20	0.00	0.00	
26	0.00	0.17	T	0.00	0.00	0.05	0.00	0.00	0.00	1.72	0.20	0.00	
27	0.79	0.00	0.00	0.39	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	
28	0.08	0.00	0.05	0.00	0.00	0.00	0.11	0.00	1.20	0.00	0.20	0.10	
29	0.00		0.00	0.00	0.20	T	0.00	0.00	0.00	0.00	0.10	0.30	
30	0.00		0.18	0.03	T	0.33	0.00	0.00	0.18	0.00	0.12	0.00	
31	0.00		T		0.25		0.00	0.00		0.00		0.00	
TOTAL	2.59	1.46	5.46	2.56	4.92	2.77	1.16	5.35	3.22	1.99	3.67	1.63	36.78
H/L	L	L	H	L	H	L	L	H	L	L	H	L	

AEC 05008

ADDENDUM TO PART 2, PAGE 18, ITEM D(3)

DATA COLLECTED BY: THE OHIO VALLEY COAL COMPANY

RAIN GAUGE IS LOCATED APPROXIMATELY 2 MILES NORTHEAST OF THE PROPOSED MINE SITE

RAINFALL 1998

DATE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
1	T	0.00	0.01	0.20	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	0.00	0.00	0.00	0.00	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3	0.00	T	0.01	0.00	0.24	0.01	0.00	0.00	0.00	0.78	0.00	TRACE	
4	0.00	0.45	0.00	0.00	0.00	0.00	0.15	0.00	0.00	T	0.00	TRACE	
5	T	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	
6	T	T	0.00	0.00	T	0.00	0.00	0.00	0.00	0.00	0.00	0.04	
7	1.29	0.00	0.00	T	1.20	0.00	0.27	0.00	0.40	1.00	0.00	0.01	
8	0.89	0.00	0.45	0.70	T	0.00	T	T	0.05	0.00	0.00	TRACE	
9	0.15	0.00	0.10	0.45	0.00	0.68	0.00	0.05	T	0.00	0.18	TRACE	
10	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.11	0.00	0.00	0.50	0.00	
11	0.00	0.08	0.00	0.00	T	0.43	0.00	0.00	0.00	0.00	0.00	0.00	
12	0.25	T	0.00	0.00	0.00	0.69	0.00	T	0.00	0.00	0.00	0.00	
13	0.04	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	
14	0.01	0.00	0.00	T	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
15	0.03	0.00	0.00	0.23	0.00	0.75	0.15	0.00	0.00	0.00	0.00	0.00	
16	T	0.08	0.00	0.30	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.06	
17	0.05	0.33	T	0.00	0.00	0.00	0.00	0.38	0.00	0.00	0.00	TRACE	
18	0.05	0.24	T	0.00	0.00	1.00	0.00	0.00	0.00	0.16	0.00	0.00	
19	0.00	0.05	0.00	0.85	0.10	0.00	0.00	0.00	0.00	0.00	0.18	0.00	
20	0.00	0.25	0.49	0.00	0.00	0.00	0.00	0.00	0.72	0.00	TRACE	TRACE	
21	0.00	0.00	0.05	0.00	0.00	0.00	0.07	0.00	T	0.00	0.00	1.49	
22	0.25	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.20	0.00	0.00	0.00	
23	T	0.10	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00	TRACE	0.00	
24	T	T	0.02	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
25	0.00	0.00	0.00	0.00	T	0.00	0.00	1.40	0.00	0.00	0.50	0.00	
26	0.00	0.00	0.00	0.70	0.00	1.25	0.00	0.10	0.00	0.00	0.00	0.00	
27	0.01	0.00	0.00	0.00	0.00	0.79	0.00	0.00	0.60	0.00	0.00	0.00	
28	0.00	0.40	0.00	0.00	0.00	1.90	0.00	0.00	0.00	T	0.00	0.00	
29	0.00		0.00	0.28	0.33	0.16	0.00	0.00	T	T	0.00	0.00	
30	T		0.00	0.00	0.00	T	1.71	0.00	0.00	0.00	TRACE	0.00	
31	0.00		0.00		0.35		0.00	0.00		0.00		TRACE	
TOTAL	3.02	2.06	1.13	3.71	3.89	8.35	2.85	2.04	1.97	1.94	1.36	1.64	33.96
H/L	H	L	L	L	H	H	H	L	L	L	L	L	

Rain gauge is read at 7:00 am for the prior day.

AEC 05009

ADDENDUM TO PART 2, PAGE 18, ITEM D(3)

DATA COLLECTED BY: THE OHIO VALLEY COAL COMPANY

RAIN GAUGE IS LOCATED APPROXIMATELY 2 MILES NORTHEAST OF THE PROPOSED MINE SITE

RAINFALL - 1999

DATE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
1	1.40	0.41	0.00	0.09	0.00	0.08							
2	0.05	0.13	0.13	0.00	0.00	0.25							
3	T	0.04	0.45	0.00	0.00								
4	0.00	0.10	0.00	0.33	0.00								
5	T	0.07	0.36	0.05	0.00								
6	1.10	0.09	0.00	0.13	0.00								
7	0.50	0.51	0.00	0.00	0.43								
8	0.10	0.00	0.34	0.00	0.04								
9	0.10	0.00	0.00	T	0.00								
10	0.10	0.00	0.00	1.35	0.00								
11	0.20	0.07	0.00	0.49	0.00								
12	0.19	0.38	0.00	0.00	0.00								
13	0.21	0.00	0.00	0.00	0.09								
14	T	0.00	0.20	0.00	0.02								
15	0.22	0.00	0.00	0.45	0.00								
16	0.11	0.08	0.00	0.05	0.00								
17	0.55	T	0.00	0.03	0.00								
18	0.00	0.00	0.00	0.30	0.57								
19	0.00	0.00	0.00	0.55	0.00								
20	0.20	0.00	0.00	0.00	0.00								
21	0.61	0.00	0.02	0.35	0.00								
22	T	0.00	T	0.44	0.50								
23	0.32	0.04	0.00	0.00	0.49								
24	0.00	0.18	0.00	0.00	0.22								
25	0.00	0.01	0.00	0.00	0.02								
26	0.00	0.10	0.00	0.00	0.00								
27	0.00	0.25	0.00	0.00	0.00								
28	0.00	0.39	0.00	0.00	0.00								
29	0.00		0.00	0.00	0.00								
30	0.00		0.00	0.00	0.00								
31	0.00		0.00		0.00								
TOTAL	5.96	2.85	1.50	4.61	2.38	0.33	0.00	0.00	0.00	0.00	0.00	0.00	17.63
H/L	H	H	L	H	H								

Rain gauge is read at 7:00 am for the prior day.

AEC 05010

Probable Hydrologic Consequences

Bennoc, Inc.
Century Mine
Application Area D-0425-1

Prepared For:

Jack A. Hamilton & Associates, Inc.
342 High Street
Flushing, Ohio 43977

December 2, 1998
Revised October 25, 2000

Prepared By:

David M. Anderson, P.G.
Geologist

Moody
and Associates Inc.

11548 COTTON ROAD
MEADVILLE, PENNSYLVANIA 16335
PHONE: 814/724-4970 FAX: 814/724-4973

ENVIRONMENTAL CONSULTANTS AND
GROUND WATER RESOURCE SPECIALISTS
SINCE 1891

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TABLE 1 Powhatan No.6 Mine Ground Water Quality Summary. Attached

TABLE A Well data and predicted hydraulic impacts summary Attached

TABLE B Spring and pond data and predicted hydraulic impacts summary Attached

APPENDIX A Powhatan No. 6 Mine – Well, spring and stream hydrographs Attached

INTRODUCTION

Moody and Associates. Inc. (Moody's) has prepared this Potential Hydrologic Consequences (PHC) statement for the Bennoc, Inc. - Century Mine. The Century Mine is located in Belmont County, Ohio. The PHC was prepared using the information provided by Jack A. Hamilton & Associates, Inc., published geologic reports and Moody's knowledge of other longwall coal mines in this area. In particular, Moody's has prepared seven PHC's for the Powhatan No. 6 Mine, which is north of the Century Mine and has utilized the historical hydrologic data from the Powhatan No.6 Mine in this evaluation.

TOPOGRAPHIC SETTING

The Century Mine is located Belmont County in southeastern Ohio. The topography of the entire application area is typical of the Appalachian Plateau Province and is characterized by narrow rounded ridges and deep V shaped valleys dissecting the terrain, which is underlain by essentially horizontal sedimentary rocks. Topographic relief within the D-0425-1 Application Area is approximately ***450*** feet. The lowest surface elevation with in the application area is approximately 920 feet located where Crabapple Creek crosses the application area boundary. The highest surface elevation is 1360 feet located along the western boundary of the application area.

The surface drainage within the application area is divided into three drainage areas. County Road 92 and State Route 145 roughly follow the drainage divides. The area northwest of County Road 92 is drained by unnamed tributaries of Captina Creek. Long Run and Piney Creek drain the area between County Road 92 and State Route 145 to Captina Creek. Long Run is a tributary of Piney Creek. Crabapple Creek drains the area southeast of State Route 145. Crabapple Creek is a tributary of Captina Creek.

Most of the developed water supplies in the application area are located along or near roads. The undeveloped areas away from the roads contain few developed water supplies. A total of 224 developed water supplies (143 wells and 81 springs) were identified and inventoried within the D-0425-1 hydrologic boundary. These supplies are listed on ATTACHMENT 14C. Of the inventoried supplies 69 springs and 80 wells are currently used as water supplies. Of the used supplies, 42 wells and 19 springs are outside the Application area boundary but within the hydrologic boundary. The descriptive information on the

AEC 05013

used supplies is listed on TABLE A – Wells and TABLE B – Springs. Only the potential impacts on the used water supplies are addressed in this PHC.

GEOLOGIC SETTING

A detailed discussion of the stratigraphic and structural setting of the application area is provided in the Geologic Section of this application. However, those properties of the geologic setting pertinent to ground water occurrence and movement are described here.

The bedrock units that outcrop in the application area belong to the Dunkard Group, which is Upper Pennsylvanian to Permian in age. The rocks consist of interbedded sandstone, siltstone, shale, mudstone, clay, fresh to brackish water limestone and coal. The Monongahela Formation (Pennsylvanian) underlies the Dunkard Group and consists of similar rock types. The Pittsburgh (No. 8) Coal Seam, which is the seam to be mined, marks the bottom of the Monongahela Formation. According to Mr. James M. Raab, a hydrogeologist with the Ohio Department of Natural Resources, in correspondence to Dave Bartsch of the Ohio Valley Coal Company dated January 30, 1989, water below 250 feet beneath the stream bottoms is brackish (personal communication).

Based on corehole data presented in other parts of this application, "soft" rocks constitute an average of 52 percent of the rock column in the D-0425-1 Application Area. Soft rocks are defined here as shale, mudstone, claystone, sandy shale and clay. The relatively high percentage of soft rocks is significant as these units have limited primary permeability, tend to deform in a more plastic manner and are more prone to self-healing after fracturing. Aquifers in these units normally have low yields and are less susceptible to subsidence fracturing due to mining. Fractures tend to close in response to lithostatic pressures or plug with fine-grained sediment and may contain clays that swell when wetted.

In addition, there is considerable horizontal and vertical variability of the rock units. Rapid facies and hydrologic property changes tend to limit the horizontal continuity of the individual rock units. With the exception of major coal seams, very few lithologic units are continuous across the proposed application area. Horizontal facies changes and corresponding changes in hydrologic properties of the rocks tend to enhance the importance of localized flow systems. In addition, most available ground water in this region

is limited to the first 100 feet of the surface where enhanced secondary permeability associated with rock fracturing is present. The records from the developed wells within the application area support this. The average depth of the developed wells in the application area is 65 feet. Ground water recharge in the upland or ridge top areas results in downward migration primarily within this shallow saturated zone. Because the topographic relief between ridge tops often exceeds 100 feet, there are localized flow systems under the hilltops that are not in hydrologic communication with adjacent hilltops. While the ground water under any given ridge top can be viewed as being continuous, the continuity generally does not extend to adjacent hilltops.

The geologic structures in the application area consist of gently folded rocks that dip to the southeast at approximately 30 feet per mile. Overburden thickness above the Pittsburgh Coal seam ranges from a low of approximately 235 feet along the bottom of the Long Run valley to 570 feet under the hilltop in the headwater of the Crabapple Creek drainage area. While geologic structure can influence regional ground water flow patterns, local variations in hydraulic properties of the rocks tend to accentuate localized flow systems.

GENERAL HYDROLOGIC SETTING

The source of all ground and surface water in the mine plan area is precipitation. Upon reaching the land surface, water that is not part of direct surface runoff or evapotranspiration infiltrates into the subsurface and contributes to soil moisture and ground water.

Within the bedrock aquifer system, ground water occurs in primary and secondary openings. Primary openings are pore spaces between sand, silt and clay grains formed at the time of sediment depositions. Primary permeability is the ability of water to move between pore spaces. In this area, primary permeability is very low and limited ground water movement occurs in hard or soft rocks as a result of primary openings (Stoner 1983, Siplivy 1992).

Fractures or partings in the rock mass form secondary porosity and permeability. Most available ground water in the application area occurs within the first 100 feet below the surface within these secondary openings. The success of a water well in terms of yield potential is dependent upon the well encountering

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water filled fracture zone(s) that transmit enough water to the well bore to meet the well's intended use (Schmitt et al, 1983; Waite, 1987).

Fractures are not ubiquitous in the area, however, and are not interconnected over large areas. For these reasons, it is very difficult to identify aquifers over large areas and the ground water flow system tends to be made up of small localized fracture controlled systems. While fractures in hard rocks tend to stay open better than fractures in soft rock, the horizontal and vertical variability of even the hard rock units tend to produce hydraulically isolated areas. In addition, fractures tend to close at increasing depths due to overlying lithostatic pressures, thereby limiting the effective depth of the ground water flow system (Stoner, 1983).

During full recovery mining, where the roof is allowed to collapse, existing natural fractures are often reopened and new fractures are created. Typically, a rubble zone develops above the extracted coal seam with a gradually reduced fracture density pattern above the rubble zone. However, the fractures developed by subsidence are normally a poorly interconnected network of cracks and are rarely continuous from the land surface to the mine void (Rauch, 1987).

Conditions at the Powhatan No. 6 Mine, located north of the Century mine, support the conclusion that both naturally occurring and mine induced fractures do not connect the near surface aquifers with the mine void. Longwall mining at the Powhatan No. 6 mine has not resulted in large volumes of water in-flow in the longwall or adjacent areas (Bartsch, 1994). The Powhatan No. 6 mine is generally very dry with very minor amounts of water inflow limited to the low cover areas (generally less than 200 feet). The Century Mine is located in the same geologic and hydrologic setting as the Powhatan No. 6 mine and the similar impacts as occurred at the Powhatan No. 6 are expected at the Century mine.

The soft rocks (which account for an average of 52 percent of the rock column in the Application area) tend to deform in a more plastic manner with limited fracturing. Many of the fractures that do form in soft rocks tend to "heal" by fracture compression or clogging. This process limits the amount of water that would tend to migrate downward. A readjustment of the subsurface flow system does occur in areas of high cover (>200 feet) resulting in some changes in ground water levels and a repositioning of some hillside springs. Changes to the net hydrologic balance in these areas, however, are minimized. The water

AEC 05016

that infiltrates from the land surface remains in the flow system and is not expected to enter the mine. The repositioning of the static water levels often results in inconvenience (usually temporary) to the ground water users in the area. There are no areas within the D-0425-1 Application Area with less than 200 feet of overburden.

Based on an evaluation of the geologic units presently supplying water to wells or springs in the Application Area, a total of five aquifers have been identified within the D-0425-1 hydrologic boundary. These units, which are also outlined on Form 14B of this application, are summarized below:

Aquifer A: Unconsolidated Material

Includes the layer of soil and weathered bedrock above solid bedrock.

Aquifer B: Washington No. 12 Cyclothem

Includes the rock sequence from the Washington Coal Seam to the surface of the consolidated bedrock. Occurs from approximately 350 feet to 500 feet above the No. 8 Pittsburgh Coal Seam.

Aquifer C: Waynesburg No. 11 Cyclothem

Includes the rock sequence from the Waynesburg No. 11 Coal Seam to the Washington No. 12 Coal Seam. Occurs from approximately 250 feet to 350 feet above the No. 8 Pittsburgh Coal Seam.

Aquifer D: Sewickley No. 9 Cyclothem

Includes the rock sequence from the Sewickley No. 9 Coal Seam to the Waynesburg No. 11 Coal Seam. Occurs from approximately 90 feet to 250 feet above the No. 8 Pittsburgh Coal Seam.

Aquifer E: Redstone No. 8A Cyclothem

Includes the rock sequence from the Redstone No. 8A Coal Seam to the Sewickley No. 9 Coal Seam. Occurs from approximately 30 feet to 90 feet above the No. 8 Pittsburgh Coal Seam.

These units are only recognized as aquifers where they occur within 100 feet of the surface where secondary porosity and permeability is greatest.

WATER SUPPLIES

A total of 149 water supplies (80 wells and 69 developed springs) that serve domestic and agricultural needs have been inventoried with in the hydrologic boundary of the application area. The Application Map illustrates the location of these supplies. Forty-two of the inventoried wells and 19 of the inventoried springs are outside the planned mining area but are within the hydrologic boundary. Fifty-three of the water supplies, in the hydrologic boundary, are over 500 feet from the closest planned longwall panel. The water supply inventory also identified all of the unused wells and developed springs with in the hydrologic boundary of the application area. These unused supplies are included on ATTACHMENT 14C. Only the used supplies are discussed in the PHC.

TABLE A presents a summary of the pertinent data for used wells in the Application Area D-0425-1. In general, the average well depth in the application area is 68 feet. The average overburden thickness, form the well bottoms to the coal, is 387 feet and the rock column contains about 63 percent of soft rocks (shale, clay, mudstone, and sandy shale). There are 5 wells located in the valley bottoms, 49 wells located on hillsides and 26 wells located on hilltops. ***Twenty-six*** of the wells are located over planned longwall panels and ***two*** wells are located over gate areas. ***Fifty-two*** wells are outside the panel or gate areas.

TABLE B presents a summary of the pertinent data for the used developed springs. Similar overburden, lithologic, and topographic settings are associated with the springs. Most of the inventoried springs occur as hillside seeps. This is a common phenomenon in this hydrogeologic setting and it reflects the presence of low permeability units that act as aquitards that promotes horizontal flow to the side of the hills. ***Seven*** of the developed springs are located in valley bottoms. The average overburden thickness is 428 feet and the rock column contains about 63 percent of soft rocks (shale, clay, mudstone, and sandy shale). ***Twenty-nine*** springs are outside the panel or gate areas, ***six*** springs are over the gates and ***34*** springs are located over longwall panels.

In addition, ***eighteen*** ponds have been recognized as agricultural water supplies.

EVALUATION OF HYDROLOGIC IMPACTS FROM LONGWALL MINING

Published reports on the impacts of longwall mining were reviewed as a guide to selecting those variables pertinent to predicting the hydrologic consequences of mining in the application area. An annotated bibliography of this literature is provided as the end of this report. Also water supply monitoring data collected by the Ohio Valley Coal Company has been reviewed in order to assess the hydrologic impacts of mining in Belmont County.

Literature Review

Stoner (1983); Rauch (1984); Cifelli (1986); and Dixon et al (1988 & 1990) explored the relation between overburden thickness and effects on ground water levels. In general, a conclusion was drawn that there is an inverse relation between overburden thickness and detrimental impacts to water levels. Aquifers less than 200 feet above longwall mines are more likely to be partially dewatered than aquifers greater than 200 feet above the mine.

The importance of rock fracturing was investigated by Dixon et al (1990), Parizek (1971), Schubert (1980), and Stoner (1983). The studies conclude that secondary rock fractures have a major influence on ground water occurrence and movement. In addition, Rauch (1984), determined that rock lithology of the overburden material was important in evaluating hydrologic impacts of mining. In general, the presence of a high percentage of soft rocks such as shale, clay, and mudstones minimizes negative impacts.

Walker (1988) and Leavitt et al (1992) indicated the position of the water supply over the longwall panel affected the degree of hydrologic impact. In general, the greatest water level declines occurred directly over the panels and decreased away from the panels. Water wells outside the angle of draw were generally unaffected.

Leavitt et al (1992) found a strong correlation between topographic position and water level declines over longwall mines. In general, where overburden thickness exceeded 300 feet, the greatest impacts occurred

AEC 05019

in hilltop wells and springs, a lesser impact was noted in hillside wells and springs and the least impacts were noted in valley bottom wells and springs.

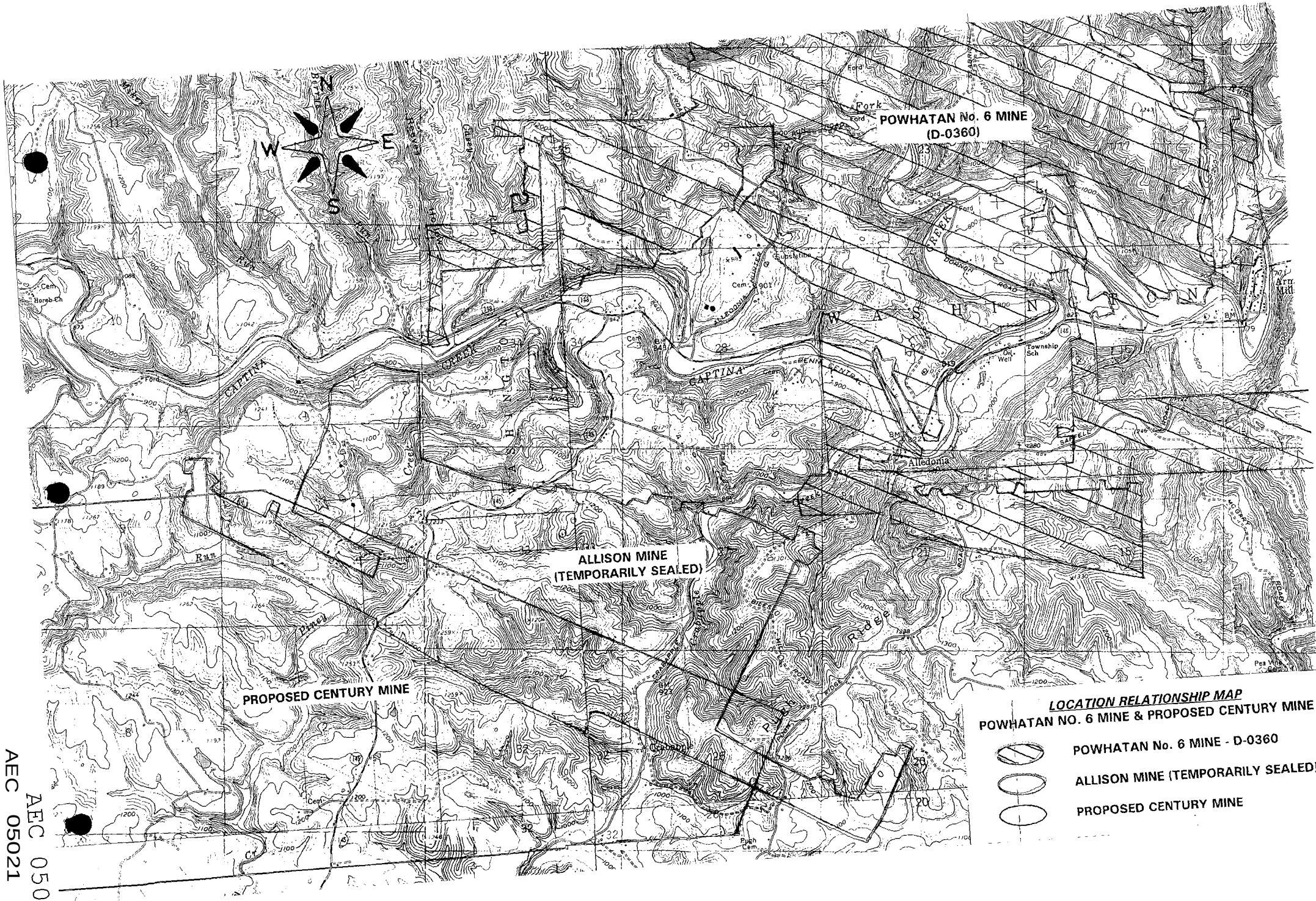
Leavitt et al (1992) and Tieman et al (1986) made a correlation between hydrologic base level and water level declines. In general, the closer the bottom of the well (or spring) is to the local hydrologic base level, the less severe and less permanent are the impacts. However, Leavitt noted that base level and topographic position are similar variables and topographic position proved to be a more reliable variable in predicting hydrologic impacts.

These variables, which include overburden thickness, local rock lithology, position over the longwall mining panel, topographic position and local hydrologic base level, are used here to evaluate the potential hydrologic impacts in the application area.

Review of analog data from the Powhatan No. 6 mine

The Powhatan No. 6 mine is located approximately four miles north of the proposed Century mine. The Century and Powhatan No. 6 mines are in the same geologic and hydrologic setting and both are No. 8 (Pittsburgh) seam mines. The Ohio Valley Coal Company (OVCC) has been monitoring groundwater levels in wells and springs flows for water supplies located over the Powhatan No. 6 mine. The water levels in wells and spring flow rates are measured on a monthly basis for one year prior to undermining until the longwall face is within 3 weeks of undermining the supply, at which point monitoring frequency is increased to a weekly basis. Monitoring is reduced to a monthly basis 3 weeks after undermining and discontinued after one year. This monitoring data also includes the distance from the active mine face to the supply at the time the measurement was taken. Hydrographs of well water levels and spring flows were prepared using the OVCC data. The hydrographs show the changes in well water levels or spring flows as the longwall panel approaches and passes under a supply. A total of 46 well hydrographs and 32 spring hydrographs were evaluated for water supplies over the Powhatan No. 6 Mine. Copies of the hydrographs are attached as APPENDIX A.

Each of the hydrographs includes both static water levels measured in feet from the top of casing or spring flow rates and the position of the panel through time. At any point in time as the panel approaches,



LOCATION RELATIONSHIP MAP

POWHATAN NO. 6 MINE & PROPOSED CENTURY MINE

POWHATAN No. 6 MINE - D-0360

ALLISON MINE (TEMPORARILY SEALED)

PROPOSED CENTURY MINE

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passes by and moves away from the supply, the flow rate or static water level can be determined. In addition, the variables that may affect the impacts of mining on the water supply are listed on the graph. These include elevation, depth of wells, topographic position (as hilltop, hillside or valley bottom), hydrologic base level elevation, position in relation to mining (as outside mine area, over the gates or chain pillars of the panel, over the quarter panel or over the midpanel), the overburden thickness and the percent of soft rock in the overburden.

Based on the observed changes in water levels or flows, the water supplies were placed in one of three categories. These categories describe the impact that mining had on the water supplies. The following are the categories and the criteria that define each category.

Minimal Impacts - Water levels for wells or flow rates for springs either did not decline during mining or returned to pre-mining conditions within two months of undermining

Moderate Impacts - Water levels for wells or flow rates for springs declined during mining but returned to premining ranges within two to six months after mining.

Severe Impacts - Water levels for wells or flow rates for springs declined during mining and did not return to premining ranges within six months (or the duration of the monitoring period) after undermining.

A total of 46 wells met the criteria for detailed analysis, which included static water level measurements prior to, during and after mining operations. Of these 46 wells, 19 (41%) had minimal impacts as a result of mining; five (11%) were moderately impacted by mining and 22 (48%) were severely impacted as a result of mining.

There is not a discernible correlation between the minimally impacted wells, the moderately impacted wells or the severely impacted wells and the variables of overburden thickness, overburden lithology, position over the panel or well depth. This may be attributed to the relatively narrow range of difference in these variables for the wells evaluated. There is, however, an apparent relation between topographic position and the impacts of longwall mining on water well supplies. In general, at the Powhatan No. 6 Mine, fewer wells in a valley setting experienced significant water level declines than wells located on hillsides or hilltops. This is consistent with the investigations of Mr. Bruce Leavitt, et al., who reported a

similar finding in their 1992 report, "Effects of Longwall Coal Mining on Rural Water Supplies and Stress Relief Fracture Flow Systems".

The conclusion derived from this data analysis is that of the wells with geologic settings similar to those within the Powhatan Mine area; 41% may be minimally impacted by mining with no changes in water levels or water levels that recover within two months of undermining, 11% may be moderately impacted with water level declines that recover within six months and 48% may be severely affected with water level declines that do not recover within six months.

A similar analysis was performed for the developed springs. A total of 32 springs met the criteria for detailed analysis, which included flow measurements prior to, during and after mining operations. Of these 32 springs, 2 (6%) had minimal decreases in flow rates (no decrease or recovery within two months); 1 (3%) had moderate decreases in flow rates (decreased flow rates with recovery within six months), and 29 (91%) had severe decreases in flow rates (decreased flow rates that do not recover to pre-mining levels within six months).

Like the water wells, there is not a discernible correlation between the minimally impacted springs, the marginally impacted springs and the severely impacted springs and the variables of overburden thickness, overburden lithology, position over the panel, discharge rates and also topographic position.

The conclusion derived from this data analysis is that of the springs with geologic settings similar to those within the Powhatan Mine area; 6% of the springs may be minimally impacted by mining, 3% may be moderately impacted by mining with temporary decreases in flow rates that persist for less than six months and 91% may be severely impacted by mining with decreased flow rates that do not recover within six months.

Four stream segments that were monitored in the pre- and post-mining phases at the Powhatan No. 6 Mine were selected at random for detailed evaluation. Hydrographs of these four data sets are presented in APPENDIX A at the end of this report. The stream data is described in the following paragraphs.

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Monitoring Point U34-067

This unnamed tributary to Williams Creek was monitored for flow rates on twelve separate occasions prior to undermining and 14 times post undermining. This first order stream is shown on the USGS Topographic map as an intermittent stream and there was approximately 265 feet of overburden in the area. There was no apparent impact on stream flow as a result of undermining.

Monitoring Point U34-144

This unnamed tributary to Williams Creek was monitored for flow rates on nine separate occasions prior to undermining and 15 times post undermining. This is a first order stream and is shown as intermittent on the USGS Topographic map. There is approximately 288 feet of overburden in the area. There was no apparent impact on stream flow as a result of undermining.

Monitoring Point U34-038

This point on Williams Creek was monitored for flow rates on 12 occasions prior to mining and nine times post mining. Williams Creek is a third order stream and has perennial flow. There is approximately 250 feet of cover at this location. There was no apparent impact on stream flow as a result of undermining.

Monitoring Point U29-C

Flow in this first order intermittent stream was monitored on twelve occasions prior to undermining and 13 times after undermining. The overburden thickness is approximately 260 feet. No apparent impacts were noted as a result of undermining.

Water Quality Impacts

The water quality effects of longwall mining on the ground water flow system were also reviewed using the Powhatan No. 6 mine data. A total of 28 wells and 22 springs were evaluated. Each of these 50 water supplies is located over previously mined sections of the Powhatan No. 6 Mine. In each case, an affect on water quantity in terms of reduced water levels or reduced flow rates was documented and water quality

AEC 05024

data was available both before and after the impacts occurred. A summary of the water quality data for those supplies is presented in TABLE 1, which presents the range of water quality in both the pre-mining phase and post- mining phase for pH, acidity, alkalinity, iron, manganese, hardness and sulfate. Nitrate concentrations did not appear to vary in response to mining.

This data indicates the water quality changes from the premining to the post mining phase are relatively minor. However, the following trends were noted:

For Wells:

15 of the 28 wells exhibited increasing levels of iron in the post-mining phase
Seven of the 16 wells tested for manganese exhibited increasing levels of manganese in the post-mining phase

For springs:

10 of the 22 springs exhibited increased iron levels in the post-mining phase
Seven of the 22 springs exhibited increased manganese levels in the post-mining phase
Seven of the 22 springs exhibited increased hardness levels in the post-mining phase

Typically the iron and manganese increases were temporary and did not persist for more than a year.

PROBABLE HYDROLOGIC CONSEQUENCES SUMMARY

Surface Water Impacts

Based on a review of the existing literature, it is expected water flow in selected sections of first order streams where overburden thickness exceeds 200 feet may be temporarily reduced over relatively short stream segments. Due to the high percentage of soft rocks in the mine overburden, the overburden thickness and the minimal amount of water that is expected to enter the mine, any stream water loss that may occur is not expected to drain into the mine.

Ground Water

The data available from the published literature and from the Powhatan No. 6 mine indicate that ground water levels may decline as mining passes under an area. Most developed water supplies will most likely

AEC 05025

experience a decline in static water level or flow. The amount of this decline appears to be dependent on the topographic position of the water supply. Hilltop water supplies may be impacted more often than water supplies located in valley bottoms. Springs are generally more significantly impacted than wells. Approximately 90% of the springs undermined may experience significant impacts, while approximately 50% of the wells may be significantly impacted. Some recovery of ground water levels occurs after mining has passed under a water supply.

Post Mining Water Breakouts

The area with the lowest cover is located along Piney Creek in the north central section of the application area. The lowest surface elevation in the application area is approximately 910 feet msl, located where Crabapple Creek crosses the application area boundary. The lowest proposed surface opening elevation for the Century mine is 920 feet msl. The maximum coal elevation in Application Area D-0145-1 is approximately 805 feet msl or 115 feet below the lowest surface ***opening*** elevation. No post mining water breakouts are predicted to occur due to mining in the D–0145–1 Application Area.

Allison Mine

The abandoned Allison Mine is located along the northeast border of the application area. Part of the Allison Mine is in the Century Mine Application Area. The Century Mine will include part of the old Allison Mine works. The old slope entry for the Allison Mine will be used as the entry to the Century Mine. Unused sections of the Allison Mine will be sealed off when the Century Mine is developed. The lowest coal elevation with in the Allison Mine is 685 feet and the highest coal elevation is 730 feet. The lowest surface elevation over the Allison Mine is 860 feet. The highest coal elevation within in the combined Century Mine Application Area and Allison Mine is 805 feet. The Century Mine is not expected to have any post mining breakouts through the old Allison Mine works.

Water Supplies

A total of 149 water supplies (80 wells and 69 springs) have been inventoried in Century Mine Application Area, including the hydrologic boundary area. The potential impacts on these water supplies by mining have been evaluated based on a review of published reports and data collected by OVCC for the Powhatan No. 6 mine.

The potential impacts on wells located over or near longwall areas are 41% may be minimally impacted by mining with no changes in water levels or water levels that recover within two months of undermining, 11% may be moderately impacted with water level declines that recover within six months and 48% may be severely affected with water level declines that do not recover within six months.

The potential impacts on springs located over or near longwall areas are 6% of the springs may be minimally impacted by mining; 3% may be moderately impacted by mining with temporary decreases in flow rates that persist for less than six months and 91% may be severely impacted by mining with decreased flow rates that do not recover within six months.

Water wells or springs located 700 feet or more from longwall areas are not expected to be impacted by mining operations.

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TABLE 1 Powhatan No.6 Mine Ground Water Quality Summary. Attached

TABLE A Well data and predicted hydraulic impacts summary Attached

TABLE B Spring and pond data and predicted hydraulic impacts summary Attached

APPENDIX A Powhatan No. 6 Mine – Well, spring and stream hydrographs Attached

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TABLE 1

Bennoc, Inc. – Century Mine
Application Area D – 0425-1

Ground Water Quality Summary
Pre and Post Mining Water Quality
Powhatan Mine No. 6

	pH		Acid		Alk.		Iron		Manganese		Hardness		Sulfate	
Supply No.	Pre SU	Post SU	Pre mg/l	Post mg/l	Pre mg/l	Post mg/l	Pre mg/l	Post mg/l	Pre mg/l	Post mg/l	Pre mg/l	Post mg/l	Pre mg/l	Post mg/l
SP-21	7.3-8.26	7.2-8	3.5-47.4	7.2-30.4	39.1-90.9	74-186.77	0.03-0.08	<0.04-.28			100-106	101-218	37-41	24-47
SP-22	7.7-7.83	7.1-7.7	5.3-8.1	2-7.03	47-88.7	58.9-94.5	0.04-0.06	0.08-0.76			105-119	95-136	55.2-66	10-78
SP-23	6.3-7.1	6.86-7.9	15.3-40.47	22.6-68.4	98.42-112	150-304.6	0.11-0.97	2.04-6.2			127-357	294-778	70-81	105-220
SP-24	6.4-7.4	6.9-7.3	11.4-27.5	2.2-15.4	82.46-118	44.6-91.8	<0.04-0.18	<0.04-1.15			198-276	144-267	50-84	42-83
SP-30	6.74-7.3	6.9-7.5	3.1-61.4	0-29.83	26.5-100.5	129.6-226.67	0.01-0.18	<0.04-0.34			193-217	166-320	89-97	26-61
SP-31	6.61-7	6.2-7.1	0-81.6	11.4-34.39	70-166	38.4-224.39	<0.02-0.24	<0.04-3.95			114-263	100-319	44-89	41-50
SP-35	7.3-7.7	7.3-7.6	8.4-11.6	10.8-15	139.4-216.2	110-251.4	<0.04-0.52	0.07-0.94			176-276	180-276	24-56	36-41
SP-36	6.9-7.5	7.4	0-24.32	14.6	46.6-176	174.6	0.06-2.12	1.67			22-262	200	33-54	46
SP-38	7.3-7.9	7.5-7.8	0-24.8	2.8-13.4	136-212	142.4-178.6	0.05-0.64	0.09-0.22			100-215	151-229	12-61	20-44
SP-39	7.27-7.6	7.7-8.4	7-15.6	<1.5-8	155.8-169.6	47-190	<0.04-34.7	0.07-0.33			0.06-184	136-230	<10.0-36	17-50
SP-41	6.6-7.3	7.6	9-14	17	60-178	167	.02-.23	0.53	<0.02-.06	.03	80-216	172	20-42	32
SP-44	7.0-7.4	7.3	24-46	0	188-206	173	<0.04-.08	0.18	<0.02-.02	<0.02	235-251	301	36-43	45
SP-45	6.7-7.1	6.7-6.8	15.77-56.24	4.4-11.2	115.8-168.91	53.4-127	<0.04-4	0.09-0.24			160-236	76-120	34-49	16-43
SP-93	7.2-7.8	7.2-7.6	0-52	5.8-9.6	63.65-32.48	122.6-160	0.01-4.5	0.16-0.95			80.4-240	142-190	17-37	33-34
SP-172	7.3-7.7	7.1-7.9	7.6-19.4	7.2-16.8	165-212.4	170-200	0.09-1.27	0.04-0.24			261-280	239-310	23-42	29-42
SP-173	6.8-8.2	7.4-7.8	6-21	6-8	79-132	96-133	<0.04-.25	.04-.13	<0.02-.02	<0.02	124-168	146-182	21-44	31-49
SP-174	7.2-7.9	6.1	16-40	9	20-204	30	<0.04-.15	.26	<0.02	<0.02	186-200	182	10-38	18
SP-175	7.4-7.7	7	17-47	5-8	166-238	31	.1-7	.41	.05-2.0	.03	272-401	66	24-51	12

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TABLE 1

Bennoc, Inc. – Century Mine
Application Area D – 0425-1

Ground Water Quality Summary
Pre and Post Mining Water Quality
Powhatan Mine No. 6

	pH		Acid		Alk.		Iron		Manganese		Hardness		Sulfate	
Supply No.	Pre SU	Post SU	Pre mg/l	Post mg/l	Pre mg/l	Post mg/l	Pre mg/l	Post mg/l	Pre mg/l	Post mg/l	Pre mg/l	Post mg/l	Pre mg/l	Post mg/l
SP-176	7.1-7.6	6.9	11-31	4-9	150-201	131-166	<0.04-.18	.07-.15	<0.02-.04	<0.02	216-304	210-252	33-49	25-49
SP-198	7.8-7.7	6.9-7.4	5.8-31.8	7.2-20	159.6-198.6	123.6-280	<0.04-0.15	0.04-0.6			173-252	216-378	24-43	53-70
SP-216	6.8-7.7	6.7-6.8	4-74	5-10	70-119	51-53	.05-.52	.14-.17	<.02-.06	<0.02	90-147	75-81	15-38	23-27
SP-220	6.8-7.7	7.6	5.6-25.4	4.4	20.4-196.8	150	0.08-1.66	5.2			58-264	188	10-54	44
W-24	7.1-7.93	6.9-8.2	9.4-18.3	6.27-27.6	96-148	116.47-169.86	<0.02-0.09	0.08-10.5	0.02-0.04	0.02-0.69	121-163	154-200	37.6-61	39-77
W-25	6.88-7.7	7.4-7.7	4.2-67.3	10.26-38.8	83-112	114.21-166	0.04-.14	<0.04-2.78	<0.02-0.04	<0.02-0.56	139-157	188-215	76-80	30-40
W-26	7.28-7.57	7.3-7.5	16.2-37.5	22.23-51.2	186-214	204.2-229.6	0.04-0.1	0.06-0.74	0.03	<0.02-0.07	217-308	258-280	61-75.2	23-49
W-28	7.2-7.41	7-7.5	18-23.4	7.6-62.8	163-189	25.3-266.8	1.03-1.34	<0.04-7.9	0.18-0.27	<0.02-0.41	238-261	266-304	56-69	14-35
W-30	7.49-7.65	7.3-7.6	8.3-11.6	10-20.71	14-206	108-248.4	0.04-0.09	0.04-1.24	0.01-0.03	<0.02-0.07	259-289-	296-312	56-59	43-59
W-33	6.9-7.61	7.1-7.8	14.52-53.2	20.2-34.8	150.1-196	22.23-186.6	<0.04-0.17	<0.04-0.11	<0.02-0.03	<0.02-0.08	214-242	155-240	34-58	32-115
W-34	6-8.09	6.5-7.1	12.2-24.13	0-33	29.64-160.17	48.6-113	0.11-3.01	<0.02-1.41	<0.02-0.85	<0.02-10.05	136-282	155-190	49-67	52-56
W-38	7.3-7.57	6.9-7.6	9.05-17.3	11.4-43.2	19.4-231	171-223.4	0.09-8.54	0.07-5.62	<0.02-0.26	0.02-0.2	198-233	198-272	37.6-46.4	29-46
W-44	7.1-7.5	7.3-8.9	1.2-71.4	0-40.8	76-343.9	29.8-268	0.04-1.98	<0.04-2.09	<0.02-0.45	<0.02-0.07	219-371	111-264	<10-140	33-100
W-51	7.3-7.8	7.8	0-40	14	158-243	286	0.04-.65	0.77	<0.02-.23	0.05	84-277	97	26-68	44
W-52	7.4-7.8	7.4-8.2	0-28.4	4.2-20.0	141-255.6	192-213	<0.04- 0.22	0.06-0.25			91-280	256-303	31-62	47-63
W-53	7.4-7.8	7.4-7.8	0-16	8-16	96-214	171-213	<0.04-1.3	.16-.75	<0.02-.05	.06-.08	84-256	228-242	11-56	35-49
W-54	7.3-7.7	7.4	0-19.2	8.8-12	94-268	192-240	<0.04-3.06	0.91-2.7			76-232	56-120	11-71	86-109
W-55	7.3-7.6	7.7-8.3	0-54	4-11	184-214	177-221	<0.04-.24	.07-1.4	<.02-.09	<0.02-4.2	71-272	120-232	35-63	24-67

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TABLE 1

Bennoc, Inc. – Century Mine
Application Area D – 0425-1

Ground Water Quality Summary
Pre and Post Mining Water Quality
Powhatan Mine No. 6

	pH		Acid		Alk.		Iron		Manganese		Hardness		Sulfate	
Supply No.	Pre SU	Post SU	Pre mg/l	Post mg/l	Pre mg/l	Post mg/l	Pre mg/l	Post mg/l	Pre mg/l	Post mg/l	Pre mg/l	Post mg/l	Pre mg/l	Post mg/l
W-56	7-7.6	7.5-7.8	0-86.4	10.6-13	156-300	207-250	0.02-1.73	0.10-5.8			24-403	244-313	31-84	35-72
W-57	6.8-7.8	7.3-7.8	0-22	11-17	87-261	179-208	0.04-0.45	.15-.46	<0.02-.02	.02-.06	63-184	200-252	31-46	12-77
W-58	7.2-7.8	7.7	0-15	9	150-335	215	<0.04-.08	0.08	<0.02-0.3	<0.02	72-196	112	41-61	43
W-92	6.9-7.0	7.2-7.4	16-72	32-131	66-127	.83-100	.65-2.2	<0.02-2.9	<0.02-.02	.02-11	162-239	72-250	93-100	70-819
W-214	6.4-6.8	6.6-7.6	0–37.24	7.36	116-172	33-50	0-.30	<0.02-.71			100-276	72-260	44-716	17-110
W-215	7.5-8.3	6.8-7.36	0-20.3	4.2-19	189-380	68-150	1.21-0.12	0.6-3.8			20-200	72-160	14-186	89-41
W-216	7.2-7.6	7.39-8.4	11.4-28.5	8.8-34	236-27	300-380	0.0-0.3	.48-.95			248-360	160-620	130-183	77-520
W-260	6.9-7.3	7.2-7.3	0-39.71	33-46	3315-380	310-360	0.02-.87	.07-.41			168-446	380-470	40-165	50-95
W-282	7.4-7.9	7.4-8.1	2.4-17	3.2-25	182-250	169-335	0.17-2.3	.11-5.5	<0.02-0.1	.02-.16	199-227	60-253	38-43	40-84
W-282A	7.3-7.7	7.4-8.4	12.54-30.4	9.6-17.1	154.6-225.71	176-279	0.21-0.6	0.02-1.91			189-204	115-262	37-44	30-116
W-283	7.5-7.9	7.4-7.9	2.4-32	3.2-15.4	182-191	218-334	0.17-2.27	0.11-2.38			199-216	60-253	38-43	44-80
W-285	6.8-7.7	7.3-7.8	8.8-16.6	15.8-27	185-196	170-234	0.86-10.90	0.69-21			262-320	12-160	52-120	290-430
W-288	7.2-8.3	7.2-7.57	3.3-32.6	16-17	150-240	150-180	0.15-2.55	0.07-.13			180-423	210-380	36-91	44-55
W72	7.2	7.4-7.5	21-29	11-21	120-138	120	0.17-2.82	0.06-0.22			330-400	290-300	11-92	59-100

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TABLE A

Bennoc, Inc. - Century Mine
Application Area D - 0425 - 1

Well Data
and
Predicted Hydrologic Impacts Summary

Well		Surface Elevation (feet)	Total Depth (feet)	Bottom Elevation (feet)	Coal Elevation (feet)	Overburden Depth well bottom to coal (feet)	Aquifer *See Attachment 14C*	Percent Soft Rocks	Topographic Position	Panel Position	Distance to Nearest Panel (feet)
DW	8	939	13	926	680	246	A	22	Valley	Outside	1401
WL	9	983	28	955	675	280	C	68	Hillside	Outside	450
W	11	976	25	951	680	271	C	68	Valley	Outside	370
W	17	1240	76	1164	700	464	B	74	Hilltop	R oom&Pillar	2090
WL	21	1287	92	1195	680	515	B	70	Hillside	Outside	5240
W	22	1060	51	1009	686	323	C	68	Hillside	Outside	1500
W	23	1039	60	979	688	291	C	68	Valley	Outside	1125
W	25	1240	90	1150	728	422	B	69	Hilltop	Quarter	130
W	29	1240	61	1179	723	456	B	65	Hilltop	Gate	30
DW	31	1130	23	1107	713	394	A	60	Hillside	Gate	490
W	32	1181	100	1081	718	363	B	73	Hilltop	Gate	80
DW	40	1209	19	1190	700	490	A	73	Hillside	Gate	20
W	41	1242	90	1152	700	452	B	60	Hilltop	Middle	290
W	42	1223	52	1171	700	471	B	60	Hillside	Quarter	80
DW	44	1211	25	1186	700	486	A	60	Hillside	Gate	50
DW	47	1220	29	1191	703	488	A	74	Hilltop	R oom&Pillar	1500
W	48	1222	78	1144	700	444	B	60	Hillside	Quarter	30
W	49	1260	99	1161	692	469	B	73	Hillside	Outside	2240
DW	50	1141	16	1125	723	402	A	68	Hillside	Outside	1000

AEC 05032

TABLE A

Bennoc, Inc. - Century Mine
Application Area D - 0425 - 1

Well Data
and
Predicted Hydrologic Impacts Summary

Well	Surface Elevation (feet)	Total Depth (feet)	Bottom Elevation (feet)	Coal Elevation (feet)	Overburden Depth well bottom to coal (feet)	Aquifer *See Attachment 14C*	Percent Soft Rocks	Topographic Position	Panel Position	Distance to Nearest Panel (feet)
W 51	1122	85	1037	730	307	C	71	Valley	Outside	1160
DW 52	1160	22	1138	725	413	A	68	Hillside	Outside	950
DW 53	1175	26	1149	753	396	A	42	Hillside	Outside	360
W 54	1175	125	1050	753	297	C/D	42	Hillside	Outside	250
W 55	1186	123	1063	753	310	C	49	Hillside	Outside	860
W 56	1190	78				B	52	Hillside	Outside	870
W 58	1072	85	987	745	242	D	45	Hillside	Quarter	40
DW 59	1120	Unk	Unk	743	Unk	Unk	45	Hillside	Middle	250
W 61	1230	48	1182	770	412	B	45	Hillside	Outside	250
W 63	1152	92	1060	770	290	C	70	Hillside	Gate	50
W 64	1228	75	1153	772	381	B	47	Hillside	Outside	520
W 65	1222	60	1162	740	422	B	69	Hilltop	Quarter	120
W 67	1262	89	1173	690	483	B	74	Hilltop	Outside	2710
W 68	1228	Unk	Unk	750	Unk	Unk	65	Hilltop	Quarter	210
W 69	1152	89	1063	733	330	C	73	Hillside	Middle	350
W 72	1165	103	1062	743	319	C	57	Hillside	Outside	1020
W 74	1141	Unk	Unk	733	Unk	Unk	73	Valley	Gate	60
W 75	1149	81	1068	780	288	C	63	Hillside	Middle	500
W 76	1193	76	1117	785	332	C	64	Hillside	Quarter	150

AEC 05033

TABLE A

Bennoc, Inc. - Century Mine
Application Area D - 0425 - 1

Well Data
and
Predicted Hydrologic Impacts Summary

Well	Surface Elevation (feet)	Total Depth (feet)	Bottom Elevation (feet)	Coal Elevation (feet)	Overburden Depth well bottom to coal (feet)	Aquifer *See Attachment 14C*	Percent Soft Rocks	Topographic Position	Panel Position	Distance to Nearest Panel (feet)
W 77	1260	31	1229	787	442	B	59	Hilltop	Gate	100
WL 78	1241	56	1185	793	392	B	59	Hillside	Outside	760
DW 80	1241	29	1212	785	427	A	61	Hillside	Middle	500
DW 81	1201	20	1181	723	458	A	76	Hilltop	Middle	360
DW 82	1200	Unk	Unk	715	Unk	Unk	72	Hillside	Outside	310
W 85	1090	41	1049	675	374	B	68	Hillside	Outside	1250
W 86	1222	51	1171	742	429	B	65	Hillside	Quarter	20
W 88	1240	57	1183	793	390	B	59	Hillside	Outside	500
W 90	1240	51	1189	796	393	B	68	Hillside	Outside	1060
W 91	1241	67	1174	800	374	B	68	Hilltop	Outside	1340
WL 93	1233	134	1099	774	325	C	66	Hillside	Middle	370
W 94	1241	110	1131	797	334	C	68	Hilltop	Outside	1140
W 97	1175	100	1075	747	328	C	56	Hillside	Outside	910
WL 98	1262	65	1197	788	409	B	68	Hilltop	Outside	370
W 99	1244	56	1188	779	409	B	67	Hillside	Outside	390
W 100	1244	148	1096	779	317	C	67	Hillside	Outside	420
W 101	1253	98	1155	770	385	B	68	Hilltop	Outside	1460
WL 103	1244	82	1162	794	368	B	59	Hillside	Outside	750
DW 104	1263	19	1244	796	448	A	59	Hilltop	Outside	800

AEC 05034

TABLE A

Bennoc, Inc. - Century Mine
Application Area D - 0425 - 1

Well Data
and
Predicted Hydrologic Impacts Summary

Well	Surface Elevation (feet)	Total Depth (feet)	Bottom Elevation (feet)	Coal Elevation (feet)	Overburden Depth well bottom to coal (feet)	Aquifer *See Attachment 14C*	Percent Soft Rocks	Topographic Position	Panel Position	Distance to Nearest Panel (feet)
WL 106	1263	62	1201	797	404	B	59	Hilltop	Outside	920
W 107	1282	80	1202	797	405	B	59	Hillside	Outside	740
W 108	1221	90	1131	802	329	C	52	Hillside	Outside	1000
W 109	1203	112	1091	803	288	C	41	Hillside	Outside	1380
W 111	1288	Unk	Unk	795	Unk	Unk	59	Hillside	Outside	500
DW 112	1265	23	1242	797	445	A	59	Hilltop	Outside	1040
DW 113	1270	19	1251	797	454	A	59	Hilltop	Outside	930
DW 115	1255	18	1237	797	440	A	59	Hillside	Outside	720
WL 116	1265	61	1204	797	407	B	59	Hillside	Outside	900
W 117	1250	80	1170	796	374	B	68	Hillside	Outside	1030
W 118	1260	35	1225	812	413	B	69	Hillside	Outside	1750
W 120	1095	118	977	802	175	D	60	Hillside	Outside	1950
W 121	1239	100	1139	802	337	C	59	Hillside	Outside	1180
W 122	1260	64	1196	792	404	B	68	Hilltop	Outside	790
W 123	1240	89	1151	762	389	B	68	Hillside	Outside	1500
W 124	1260	30	1230	793	437	B	68	Hilltop	Outside	700
DW 126	1261	37	1224	693	531	A	74	Hillside	Outside	2120
W 127	1258	81	1177	700	477	B	72	Hilltop	Outside	910
W 128	1242	103	1139	700	439	B	74	Hilltop	Outside	3870

AEC 05035

TABLE A

Bennoc, Inc. - Century Mine
Application Area D - 0425 - 1

Well Data
and
Predicted Hydrologic Impacts Summary

Well	Surface Elevation (feet)	Total Depth (feet)	Bottom Elevation (feet)	Coal Elevation (feet)	Overburden Depth well bottom to coal (feet)	Aquifer *See Attachment 14C*	Percent Soft Rocks	Topographic Position	Panel Position	Distance to Nearest Panel (feet)
W 140	1155	90	1065	763	392	C	54	Hillside	Middle	410
W 141	1225	100	1125	754	471	B	69	Hilltop	Middle	230
W 142	1258	122	1136	704	554	B	72	Hilltop	Outside	1030
DW 146	1230	Unk	Unk	711	Unk	Unk	50	Hilltop	Middle	270

Total Well	80							
Average	1202	68	1136	749	387	63	Hillside-49	Outside-52
Median	1229	71	1153	753	396	65.5	Hilltop-26	Gate-8
Minimum	939	13	926	675	175	22	Valley-5	Quarter-8
Maximum	1288	148	1251	812	531	76		Middle-10
								R oom&Pillar-2

AEC 05036

TABLE B

Bennoc, Inc. - Century Mine
Application Area D - 0425 - 1

Spring, Pond and Stream Data
and
Predicted Hydrologic Impacts Summary

Supply ID	Surface Elevation (feet)	Coal Elevation (feet)	Overburden (feet)	Aquifer See Attachment 14B	Percent Soft Rocks	Topographic Position	Panel Position	Distance to Nearest Panel (feet)
DS 2	1192	680	512	B	68	Hillside	Outside	4260
DS 3	1180	680	500	B	68	Hillside	Outside	4900
DS 4	1012	680	332	C	50	Hillside	Outside	340
DS 5	1074	680	394	B	67	Hillside	Outside	3430
DS 6	1032	680	352	B	67	Hillside	Outside	3500
DS 9	1199	732	467	B	70	Hillside	Middle	370
DS 10	1216	723	493	B	64	Hillside	Middle	420
DS 11	1206	723	483	B	65	Hillside	Quarter	90
DS 12	1198	723	475	B	65	Hillside	Quarter	150
DS 14	1195	700	495	B	50	Hillside	Gate	20
DS 15	1114	708	406	B	60	Hillside	Middle	260
DS 16	1146	680	466	B	55	Hillside	Outside	3770
DS 18	1127	730	397	B	72	Hillside	Middle	420
DS 19	1139	724	415	B	72	Valley	Middle	250
DS 20	1141	723	418	B	71	Valley	Quarter	150
DS 21	1159	756	403	B	48	Hillside	Outside	1190
DS 22	1121	756	365	B	44	Hillside	Outside	600
DS 23	1129	757	372	B	43	Hillside	Outside	370
DS 24	1120	764	356	B	43	Hillside	Outside	1640

AEC 05037

TABLE B

Bennoc, Inc. - Century Mine
Application Area D - 0425 - 1

Spring, Pond and Stream Data
and
Predicted Hydrologic Impacts Summary

Supply ID	Surface Elevation (feet)	Coal Elevation (feet)	Overburden (feet)	Aquifer See Attachment 14B	Percent Soft Rocks	Topographic Position	Panel Position	Distance to Nearest Panel (feet)
DS 25	1144	770	374	B	48	Hillside	Outside	1260
DS 26	1199	700	499	B	60	Hillside	Quarter	180
DS 27	1165	695	470	B	30	Valley	Quarter	160
DS 28	1205	680	525	B	68	Hillside	Outside	3520
DS 29	1030	745	285	C	44	Hillside	Middle	240
DS 30	1180	770	410	B	70	Hillside	Middle	380
DS 31	1150	763	387	B	67	Hillside	Quarter	60
DS 32	1158	718	440	B	72	Hillside	Gate	100
DS 33	1178	777	401	B	63	Hillside	Gate	60
DS 34	1210	742	468	B	69	Hillside	Middle	360
DS 35	1222	748	474	B	69	Hillside	Quarter	170
DS 36	1210	747	463	B	74	Hillside	Quarter	190
DS 37	1185	743	442	B	71	Hillside	Gate	925
DS 38	1180	747	433	B	71	Hillside	Quarter	***300***
DS 39	1160	738	422	B	70	Valley	Middle	380
DS 40	1213	785	428	B	64	Hillside	Middle	430
DS 42	1245	797	448	B	61	Valley	Outside	440
DS 43	1236	790	446	B	60	Hillside	Gate	70
DS 44	1215	784	431	B	61	Hillside	Gate	20

AEC 05038

TABLE B

Bennoc, Inc. - Century Mine
Application Area D - 0425 - 1

Spring, Pond and Stream Data
and
Predicted Hydrologic Impacts Summary

Supply ID	Surface Elevation (feet)	Coal Elevation (feet)	Overburden (feet)	Aquifer See Attachment 14B	Percent Soft Rocks	Topographic Position	Panel Position	Distance to Nearest Panel (feet)
DS 45	1157	723	434	B	76	Hillside	Quarter	200
DS 48	1200	746	454	B	69	Hillside	Middle	250
DS 49	1215	793	422	B	68	Hillside	Outside	770
DS 50	1222	798	424	B	68	Hillside	Outside	1270
DS 51	1235	802	433	B	68	Hillside	Outside	1510
DS 52	1185	767	418	B	66	Hillside	Middle	320
DS 53	1232	815	417	B	64	Hillside	Outside	1380
DS 54	1240	815	425	B	60	Hillside	Outside	1140
DS 55	1198	795	403	B	60	Hillside	Outside	1040
DS 56	1207	778	429	B	65	Hillside	Middle	330
DS 57	1230	777	453	B	67	Hillside	Outside	350
DS 58	1218	775	443	B	68	Hillside	Outside	1350
DS 59	1219	786	433	B	68	Hillside	Outside	870
DS 60	1161	766	395	B	54	Hillside	Middle	420
DS 61	1170	797	373	B	59	Hillside	Outside	800
DS 62	1180	800	380	B	70	Hillside	Outside	***1100***
DS 63	1202	796	406	B	68	Hillside	Outside	800
DS 64	1220	792	428	B	68	Hillside	Outside	900
DS 65	1142	782	360	B	63	Valley	Quarter	80

AEC 05039

TABLE B

Bennoc, Inc. - Century Mine
Application Area D - 0425 - 1

Spring, Pond and Stream Data
and
Predicted Hydrologic Impacts Summary

Supply ID	Surface Elevation (feet)	Coal Elevation (feet)	Overburden (feet)	Aquifer See Attachment 14B	Percent Soft Rocks	Topographic Position	Panel Position	Distance to Nearest Panel (feet)
DS 67	1042	800	242	C	60	Hillside	Outside	1890
DS 68	1230	773	457	B	57	Hillside	Quarter	140
DS 72	1265	683	581	B	70	Hillside	Outside	5200
DS 75	1216	790	426	B	64	Hillside	Quarter	20
DS 76	1219	788	431	B	61	Hillside	Middle	340
DS 77	1217	785	432	B	61	Hillside	Quarter	150
DS 78	1178	752	426	B	65	Hillside	Quarter	90
DS 79	1169	735	434	B	71	Hillside	Middle	390
DS 80	1108	678	430	B	50	Hillside	Outside	440
DS 81	1201	709	492	B	50	Hillside	Quarter	150
DS 82	1201	707	494	B	50	Hillside	Quarter	200
DS 20A	1141	723	418	B	71	Valley	Quarter	170
Total Springs		69						
Average	1177	750	428		63	Hillside-62	Outside-29	
Median	1192	754	429		65	Hilltop-0	Gate-6	
Minimum	1012	678	242		30	Valley-7	Quarter-18	
Maximum	1265	815	581		76		Middle-16	

AEC 05040

TABLE B

Bennoc, Inc. - Century Mine
Application Area D - 0425 - 1

Spring, Pond and Stream Data
and
Predicted Hydrologic Impacts Summary

Supply ID		Surface Elevation (feet)	Coal Elevation (feet)	Overburden (feet)	Aquifer See Attachment 14B	Percent Soft Rocks	Topographic Position	Panel Position	Distance to Nearest Panel (feet)
U	7	1100	680	420	B	NA	Hillside	Outside	4600
U	10	1140	700	440	B	NA	Hillside	Outside	2840
U	11A	1180	700	480	B	NA	Hillside	Quarter	160
U	11B	1140	700	440	B	NA	Hillside	Quarter	50
U	12	1120	705	415	B	NA	Hillside	Outside	4160
U	14	1100	715	385	B	NA	Hillside	Outside	1260
D	15	940	700	NA	NA	NA	NA	Outside	1040
D	16	950	710	NA	NA	NA	NA	Gate	90
D	26	980	740	NA	NA	NA	NA	Quarter	80
U	28A	1210	790	420	B	NA	Hillside	Gate	100
D	28	1070	760	NA	NA	NA	NA	Gate	30
U	29	1200	775	425	B	NA	Hillside	Gate	40

AEC 05041

TABLE B

Bennoc, Inc. - Century Mine
Application Area D - 0425 - 1

Spring, Pond and Stream Data
and
Predicted Hydrologic Impacts Summary

Supply ID	Surface Elevation (feet)	Coal Elevation (feet)	Overburden (feet)	Aquifer See Attachment 14B	Percent Soft Rocks	Topographic Position	Panel Position	Distance to Nearest Panel (feet)
P 1	1220	700	520	NA	74	Hilltop	Outside	2850
P 2	1090	715	375	NA	60	Hillside	Quarter	0
P 3	1100	710	390	NA	73	Valley	Quarter	50
P 4	1160	715	445	NA	60	Hillside	Outside	2900
P 5	1160	715	445	NA	60	Hillside	Outside	3100
P 6	1170	700	470	NA	73	Hillside	Room & Pillar	350
P 8	1190	700	490	NA	60	Hillside	Quarter	0
P 9	1160	755	405	NA	42	Hillside	Outside	380
P 10	1170	750	420	NA	42	Hillside	Quarter	150
P 11	1120	743	377	NA	45	Hillside	Gate	0
P 13	1160	715	445	NA	47	Hillside	Outside	***650***
P 14	1220	785	435	NA	61	Hillside	Middle	350
P 15	1195	745	450	NA	69	Hillside	Quarter	200
P 16	1180	785	395	NA	59	Hillside	Outside	470
P 17	1140	797	343	NA	59	Hillside	Outside	70
P 18	1215	797	418	NA	68	Valley	Outside	***870***
P 19	1210	815	395	NA	69	Hillside	Outside	950
P 25	1190	710	480	NA	50	Hillside	Quarter	0

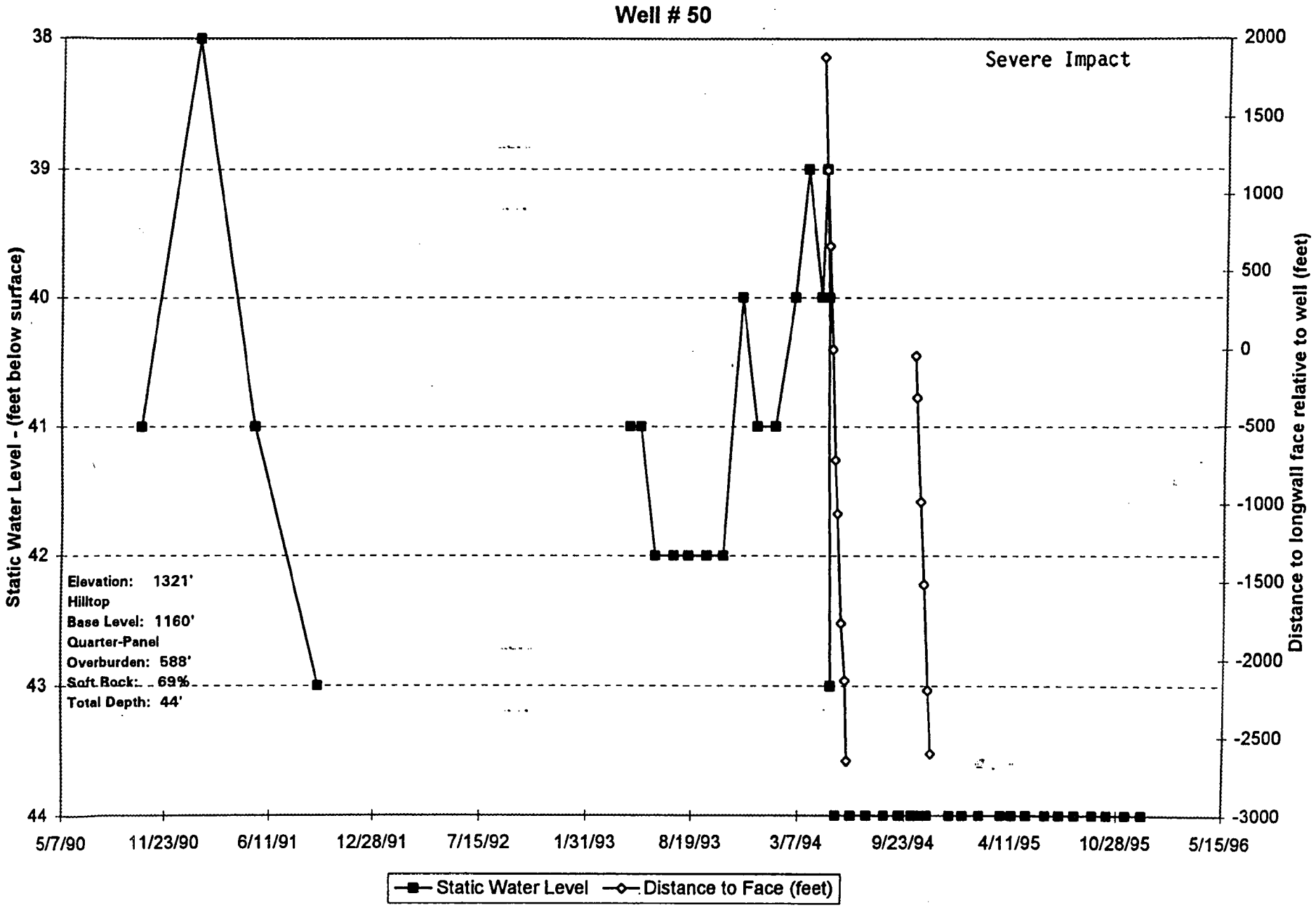
AEC 05042

Attachment to:

Bennoc, Inc. – Century Mine
Application D-0425-1

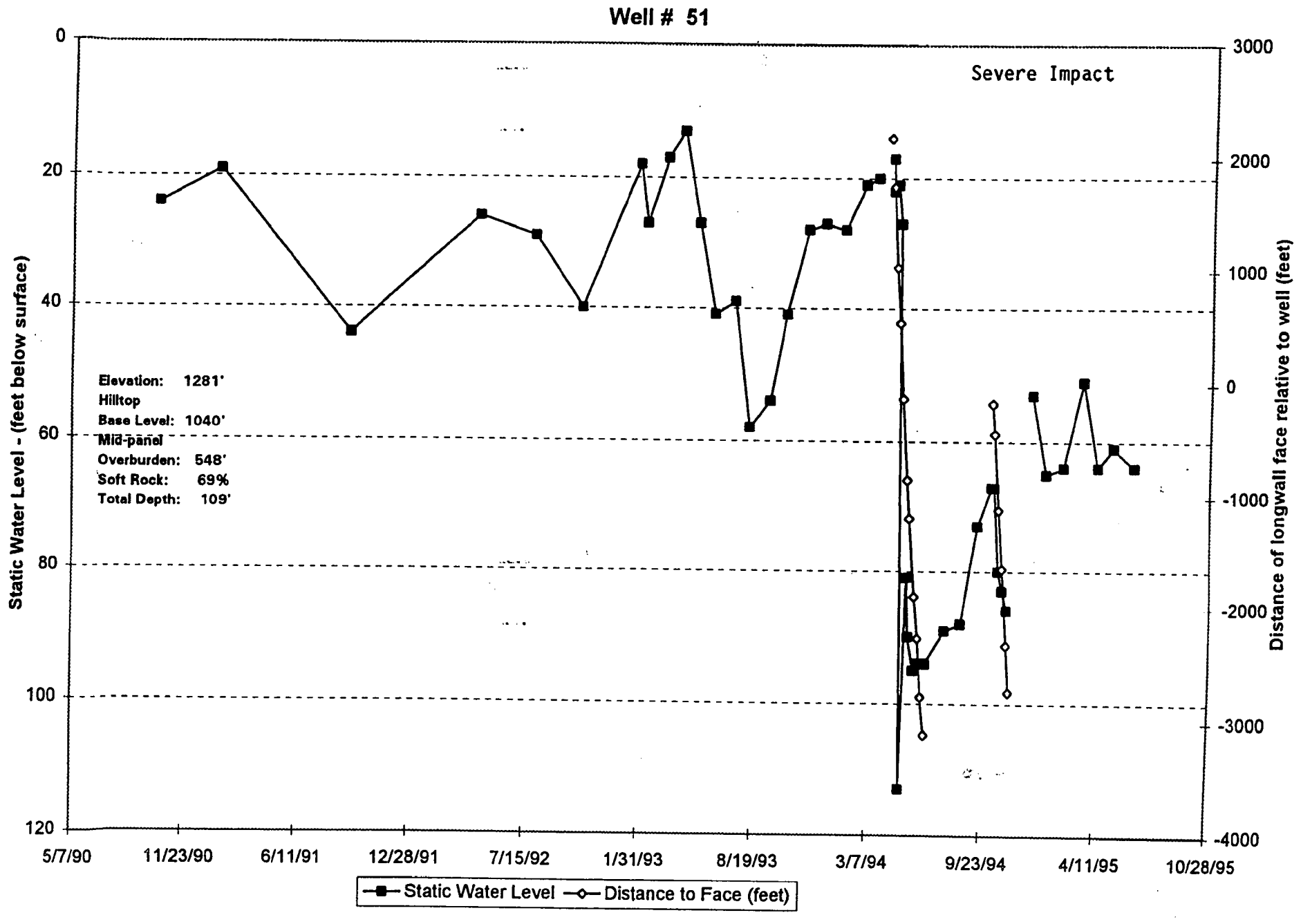
APPENDIX A

Powhatan No. 6 Mine
Well, Spring and Stream Hydrographs



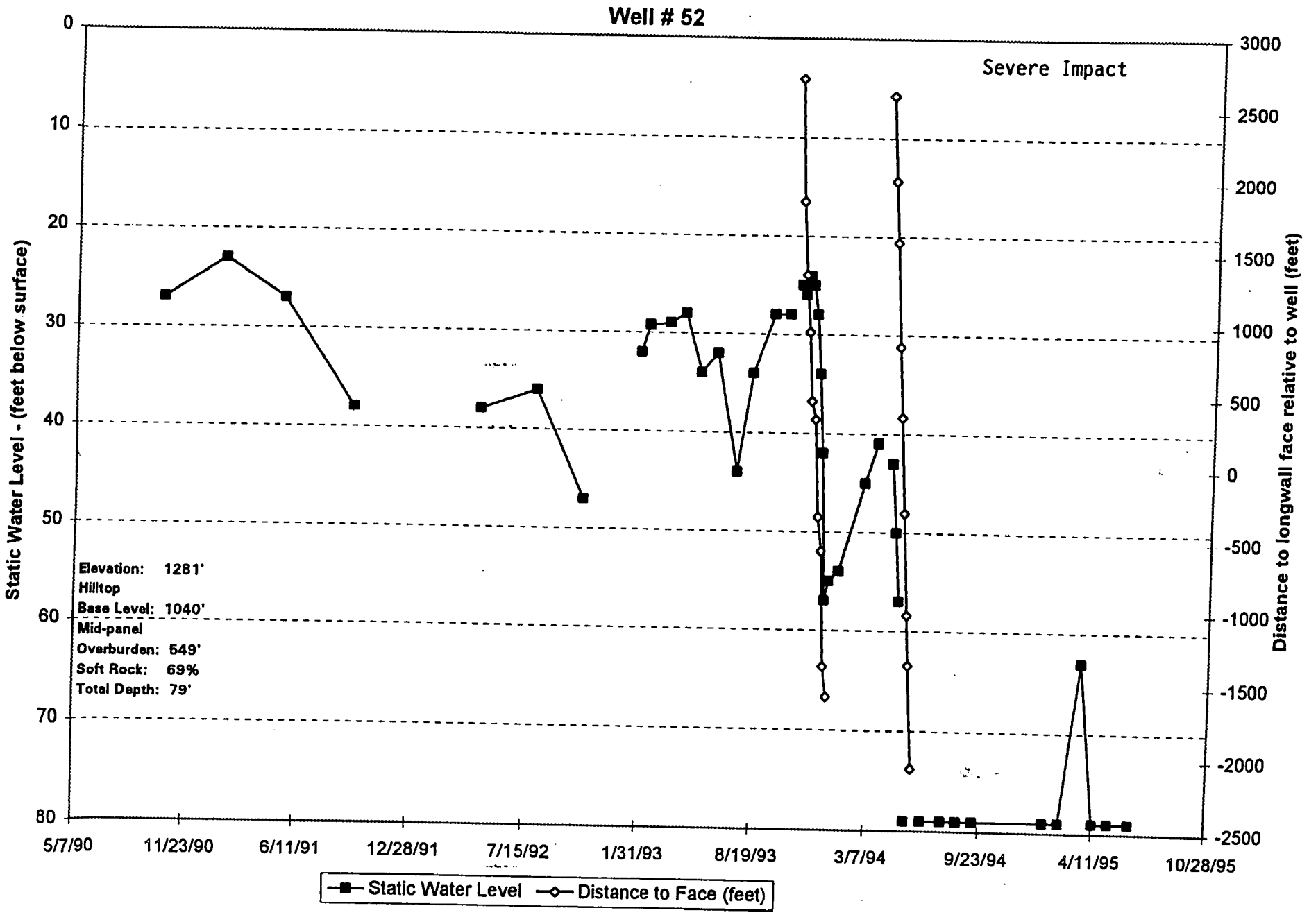
Prepared by: Moody and Assoc., Inc.4/13/97

AEC 05044



Prepared by: Moody and Assoc. Inc. 4/13/97

AEC 05045



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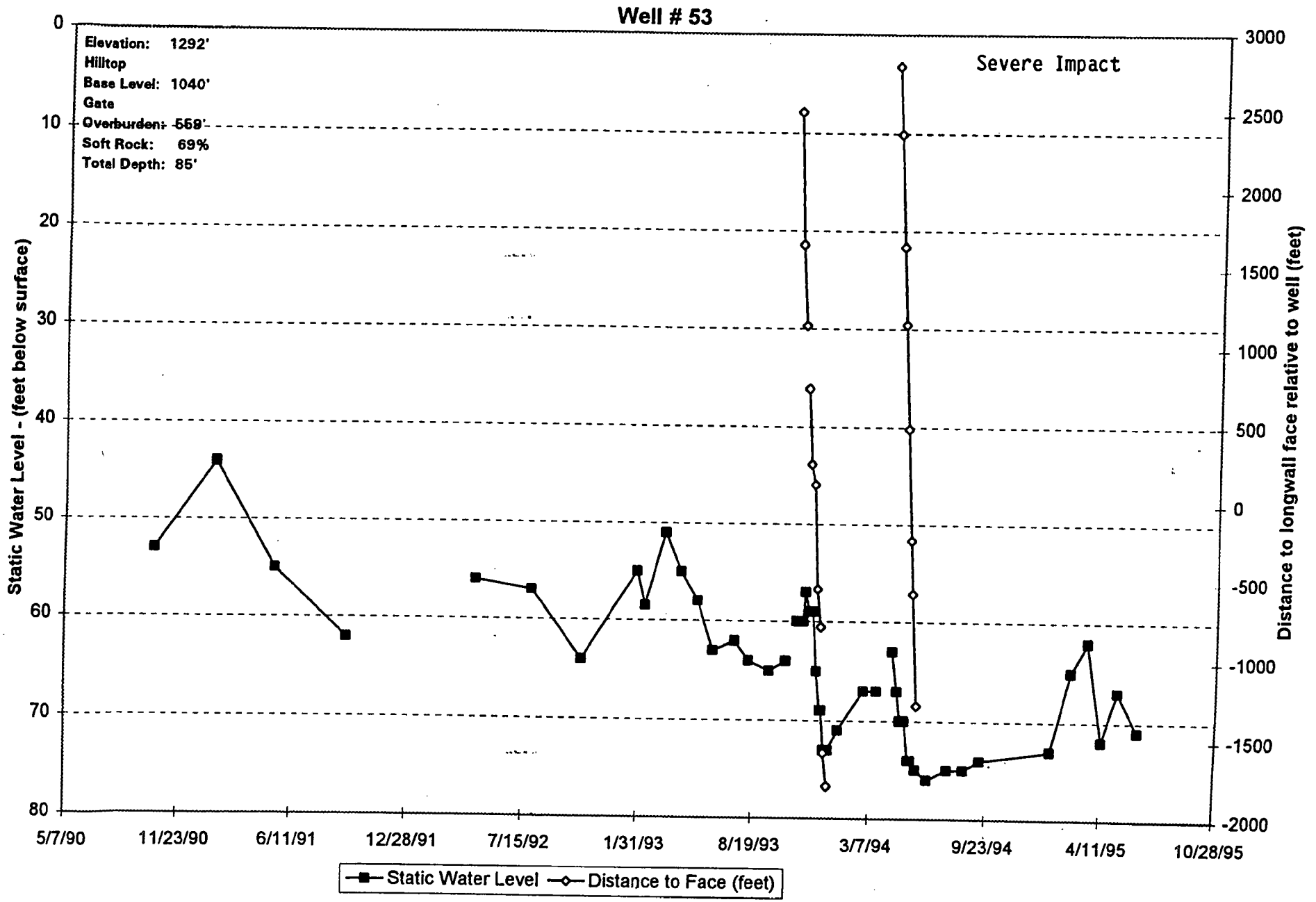
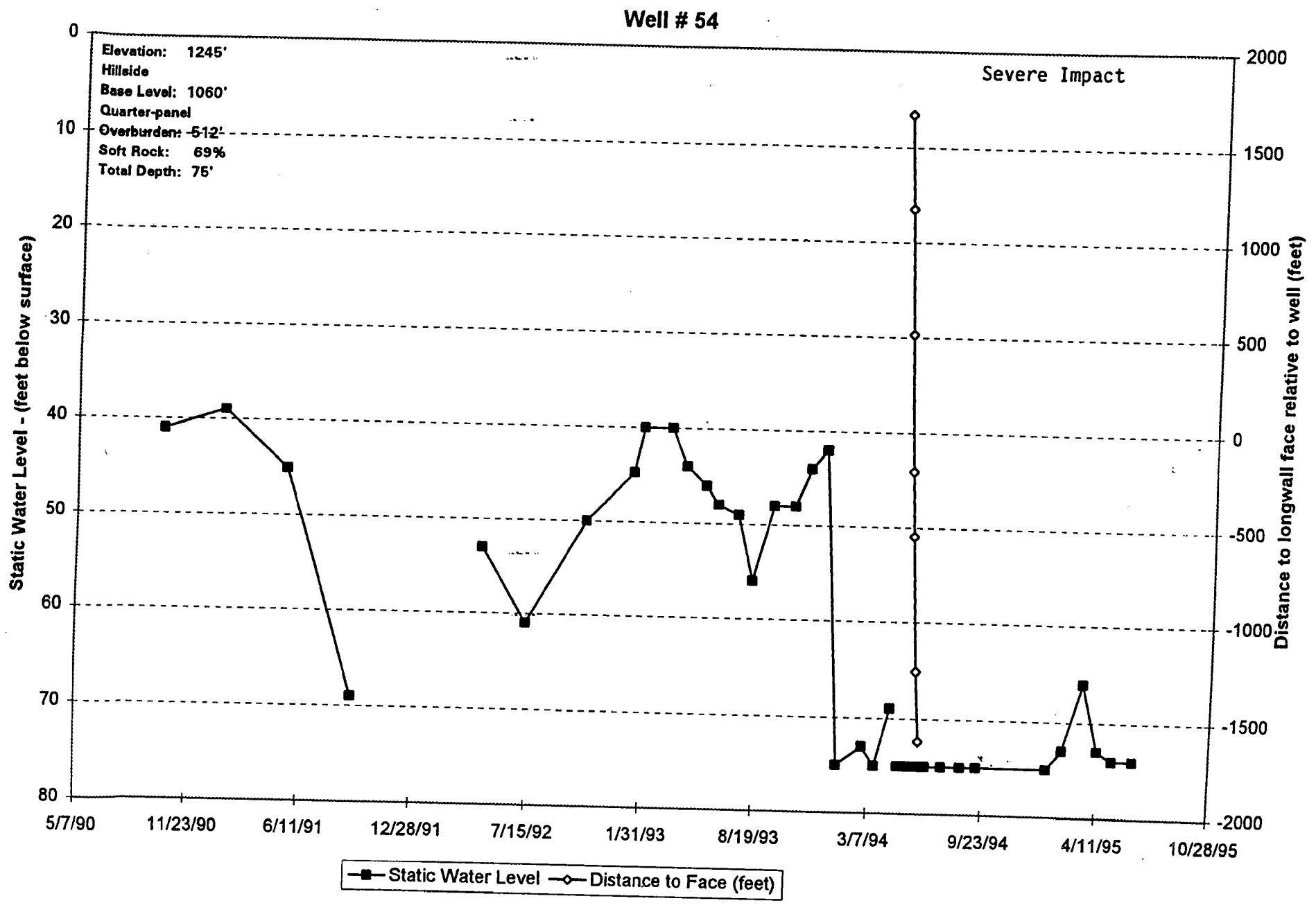


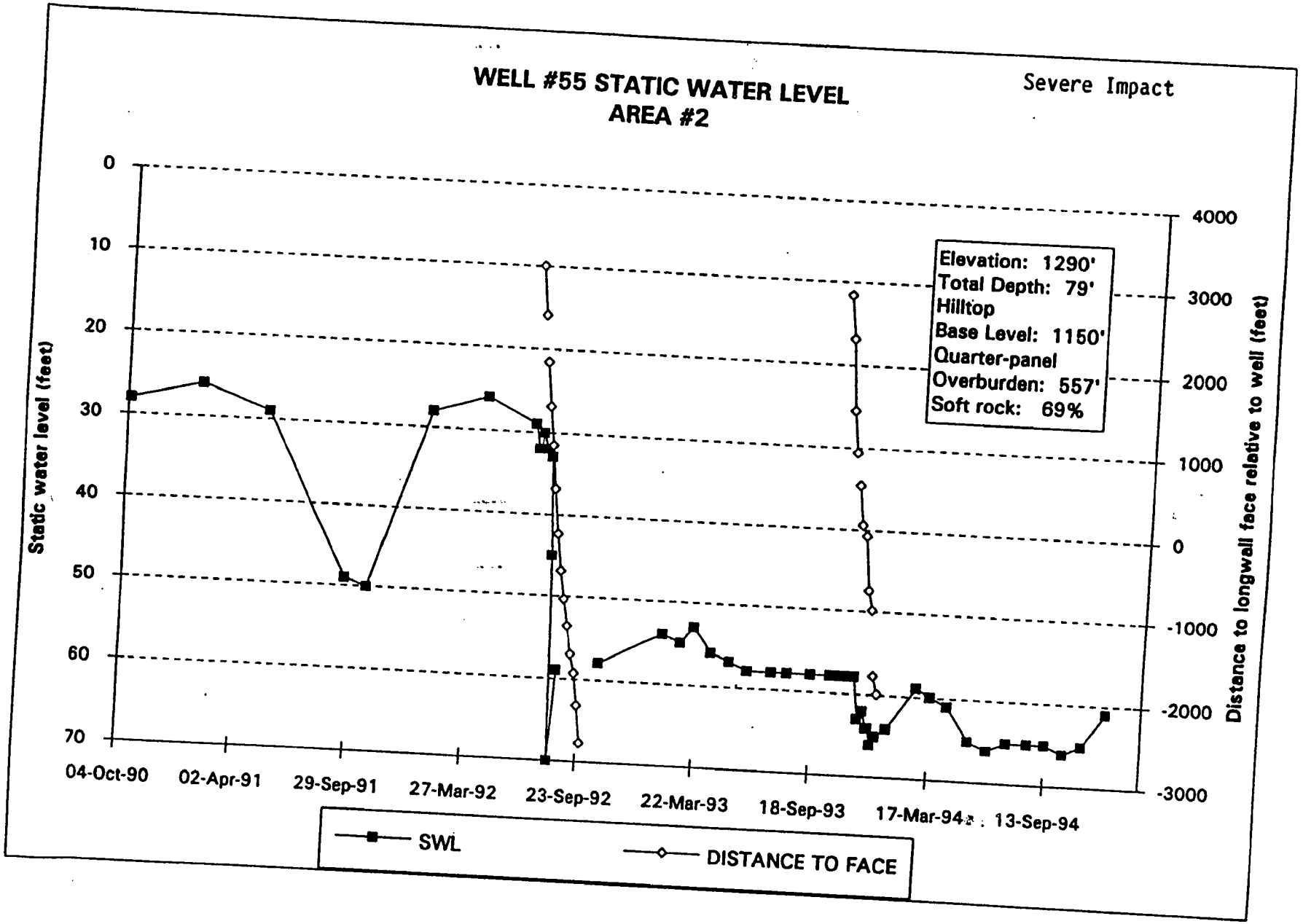
Prepared by: Moody and Assoc., Inc. 4/13/97

AEC 05047



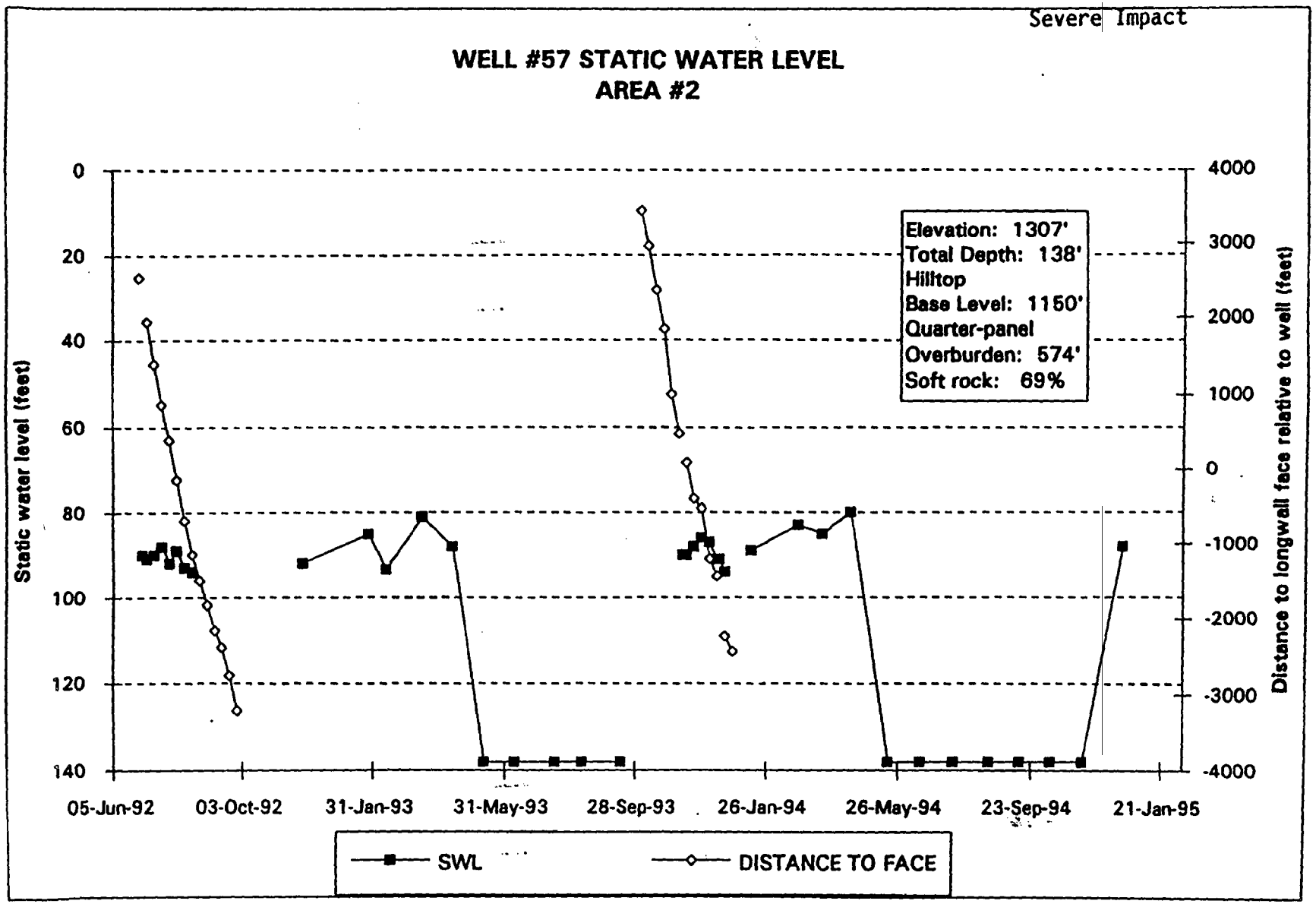
Prepared by: Moody and Assoc. Inc. 4/13/97

AEC 05048


WELL #55 STATIC WATER LEVEL
AREA #2
Severe Impact
Static water level (feet)
0
10
20
30
40
50
60
70
Distance to longwall face relative to well (feet)
4000
3000
2000
1000
0
-1000
-2000
-3000
04-Oct-90
02-Apr-91
29-Sep-91
27-Mar-92
23-Sep-92
22-Mar-93
18-Sep-93
17-Mar-94
13-Sep-94
Elevation: 1290'
Total Depth: 79'
Hilltop
Base Level: 1150'
Quarter-panel
Overburden: 557'
Soft rock: 69%
SWL
DISTANCE TO FACE

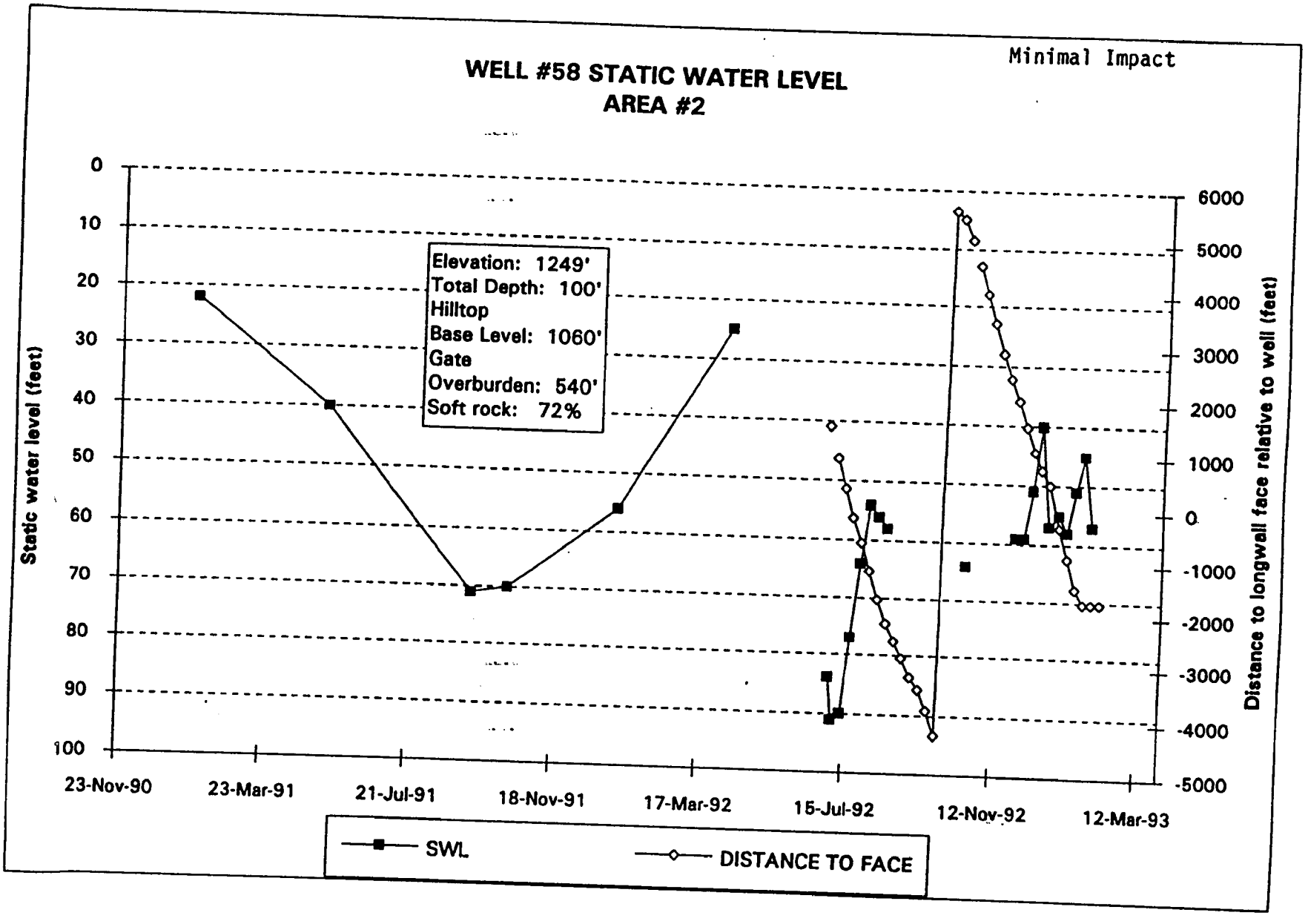
AEC 05049

Severe Impact



AEC 05050

Minimal Impact



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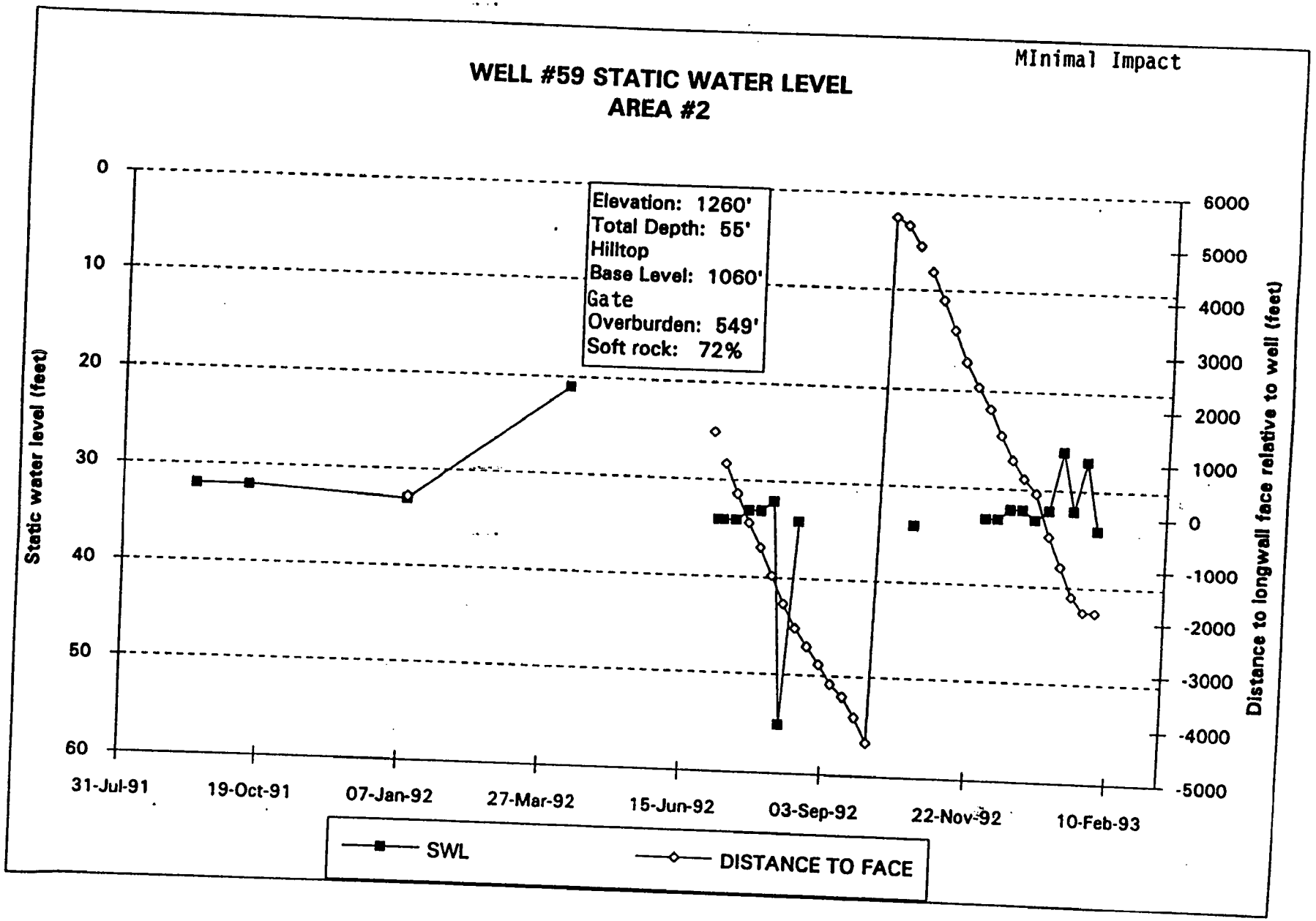
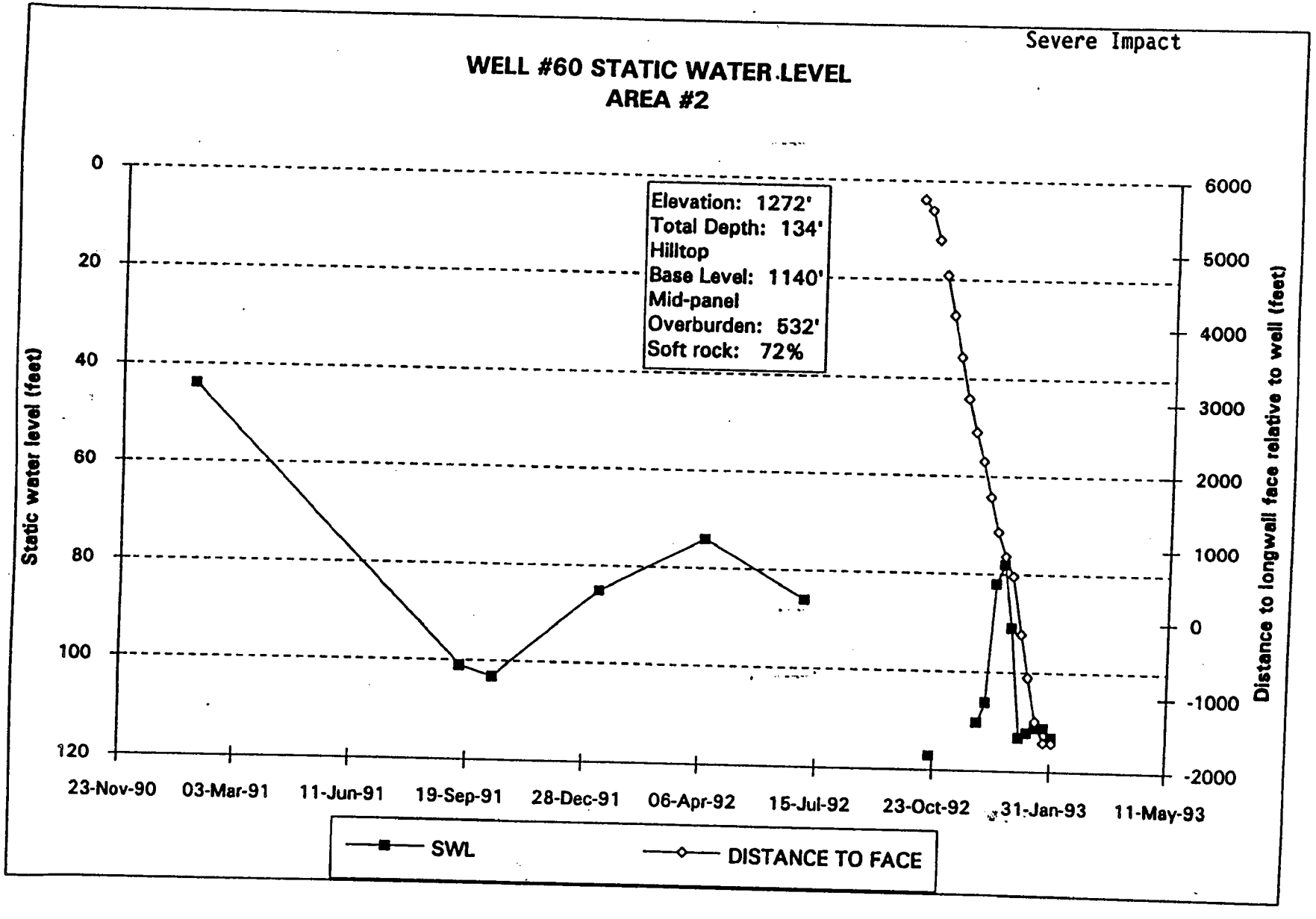

MInimal Impact
WELL #59 STATIC WATER LEVEL
AREA #2
Elevation: 1260'
Total Depth: 55'
Hilltop
Base Level: 1060'
Gate
Overburden: 549'
Soft rock: 72%
Static water level (feet)
0
10
20
30
40
50
60
Distance to longwall face relative to well (feet)
6000
5000
4000
3000
2000
1000
0
-1000
-2000
-3000
-4000
-5000
31-Jul-91
19-Oct-91
07-Jan-92
27-Mar-92
15-Jun-92
03-Sep-92
22-Nov-92
10-Feb-93
SWL
DISTANCE TO FACE

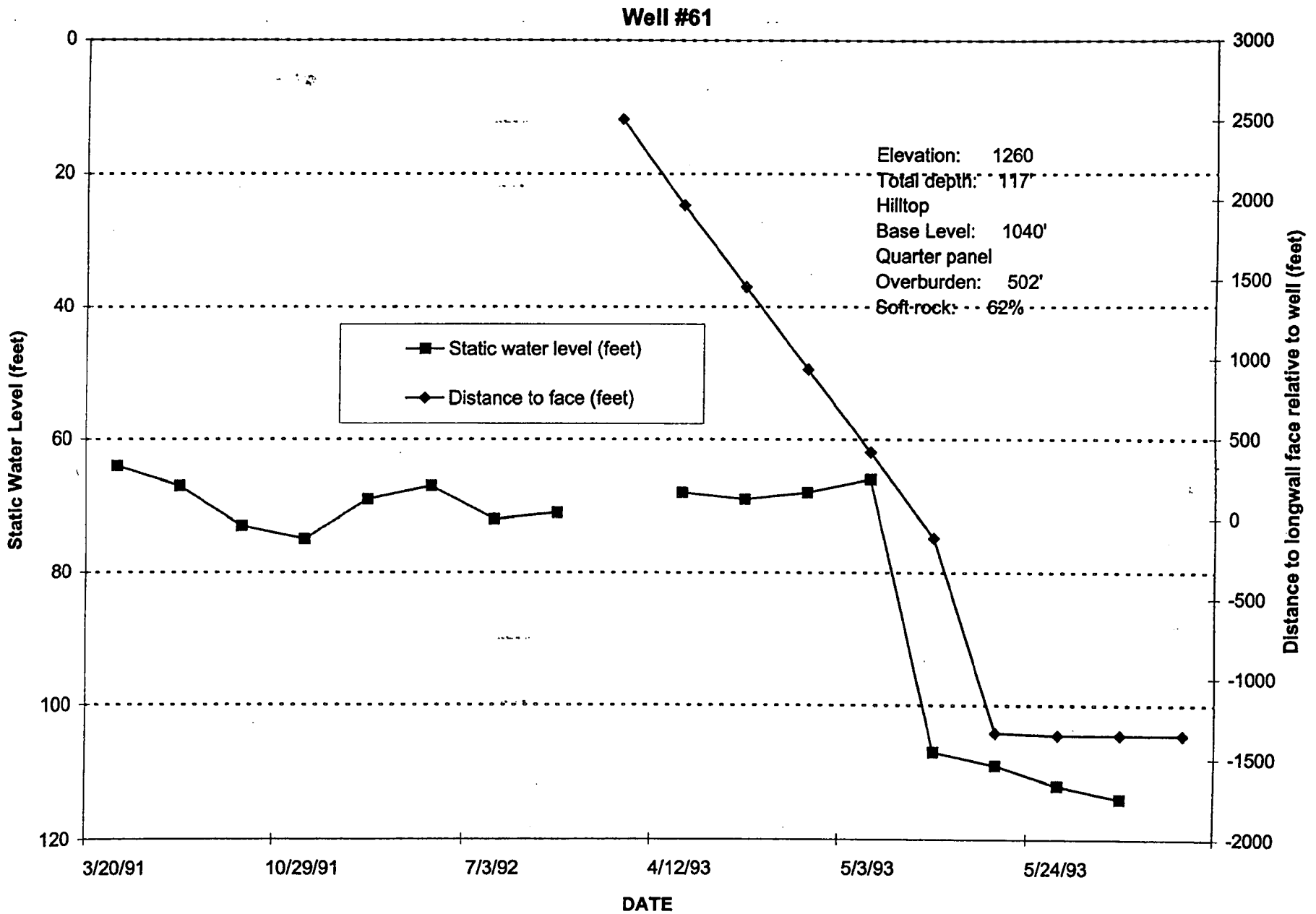
AEC 05052

Severe Impact



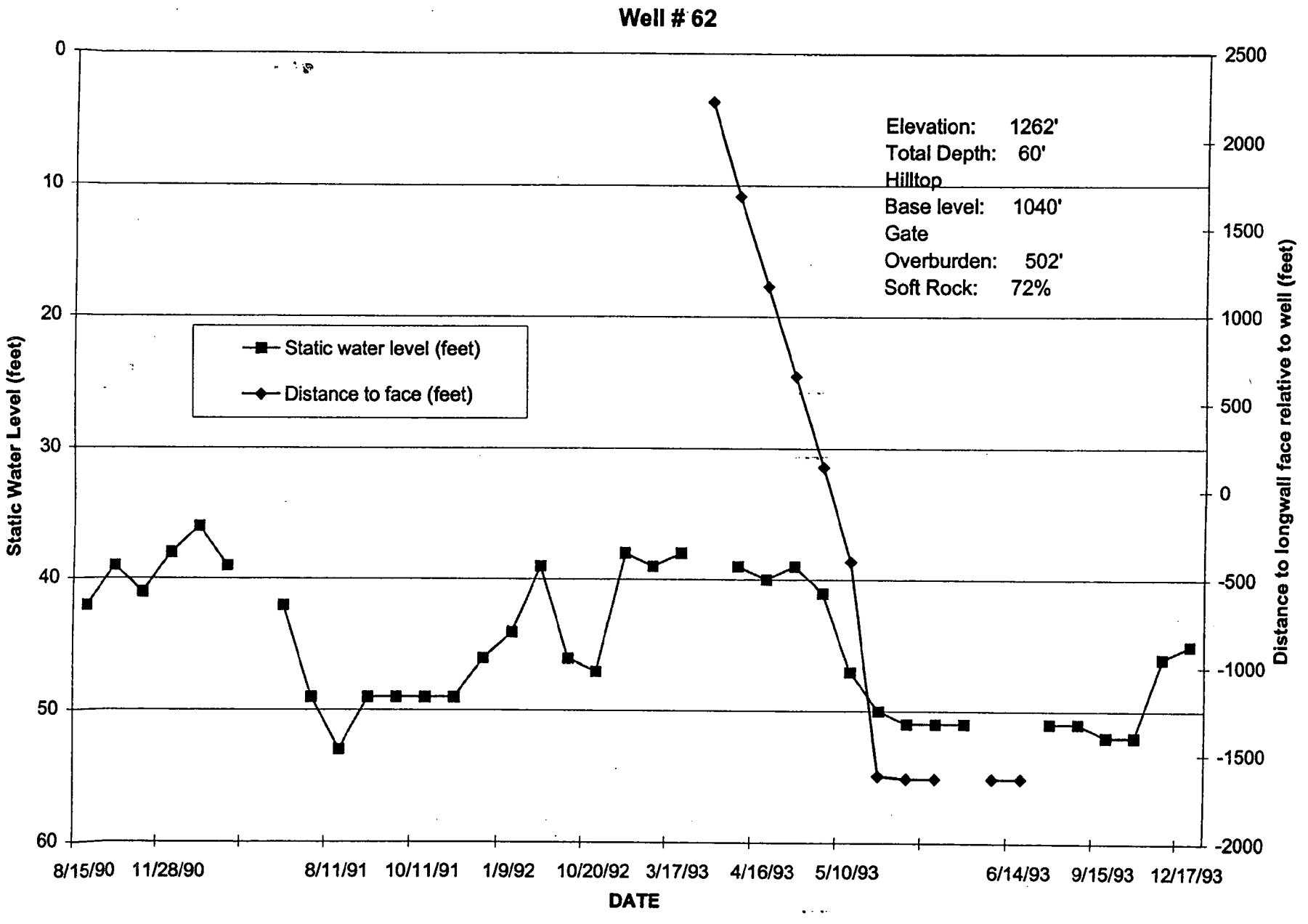
AEC 05053

Severe Impact

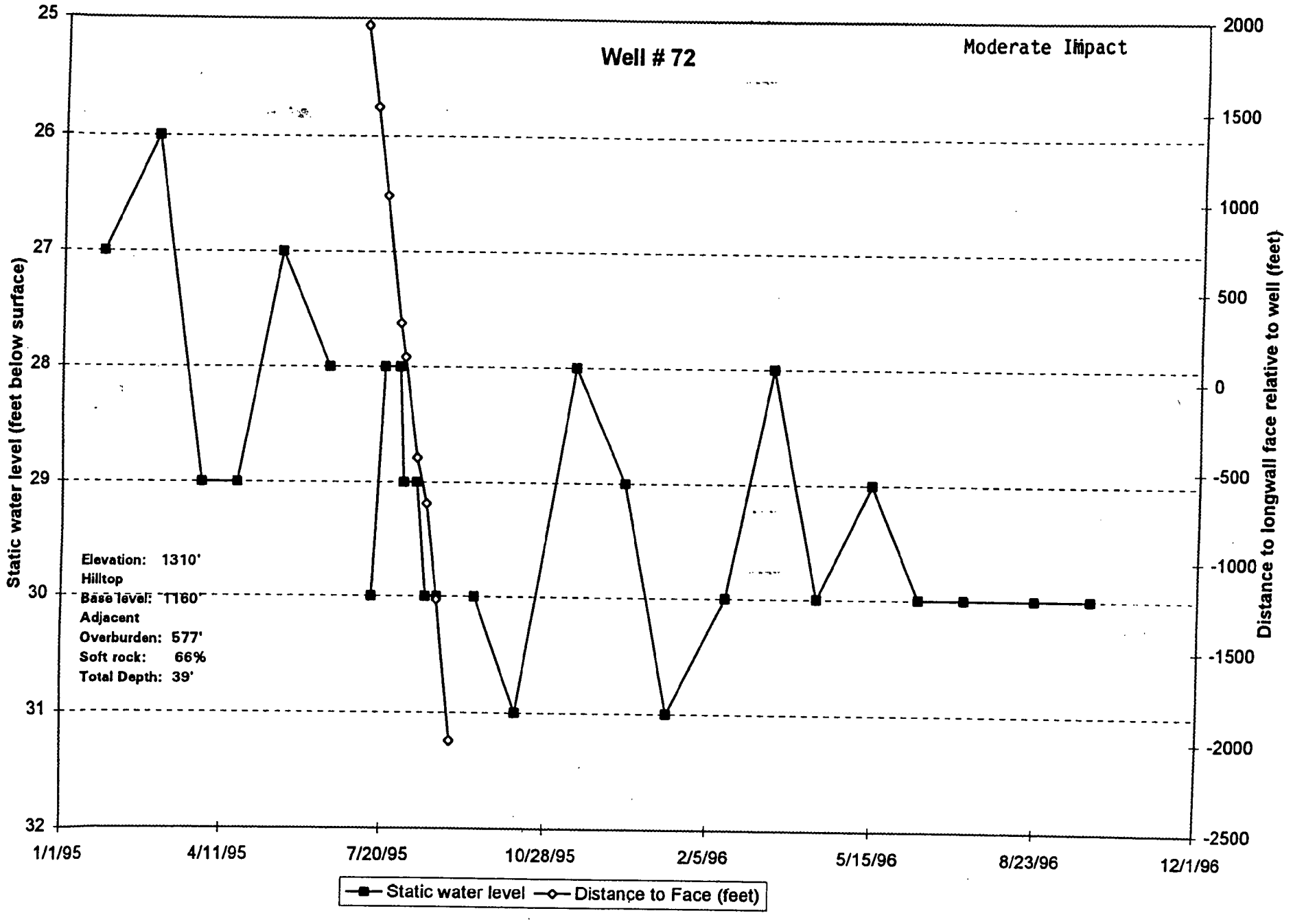


AEC 05054

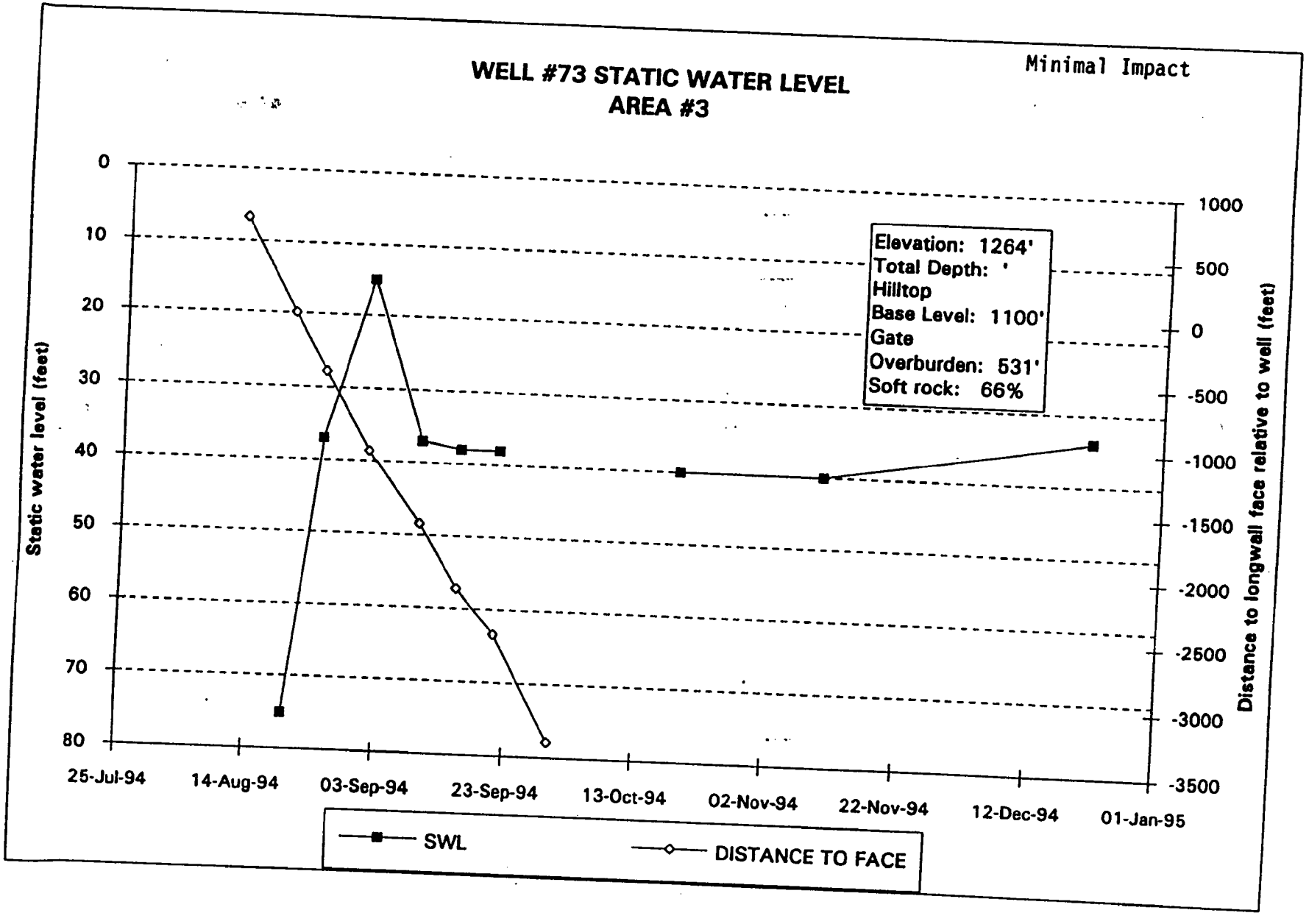
Severe Impact



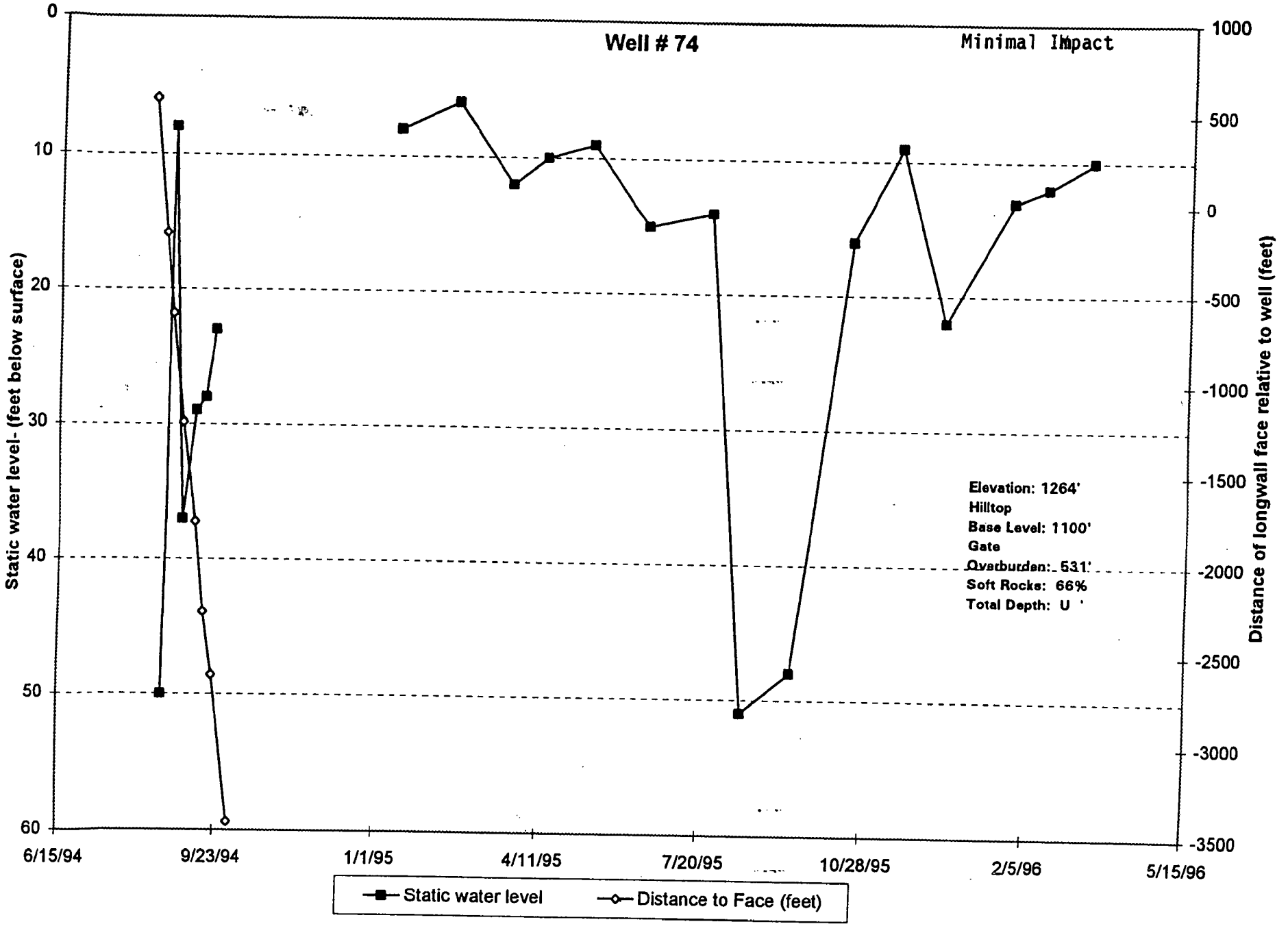
AEC 05055


Well # 72
Moderate Impact
Static water level (feet below surface)
Distance to longwall face relative to well (feet)
25
26
27
28
29
30
31
32
2000
1500
1000
500
0
-500
-1000
-1500
-2000
-2500
1/1/95
4/11/95
7/20/95
10/28/95
2/5/96
5/15/96
8/23/96
12/1/96
Elevation: 1310'
Hilltop
Base level: 1160'
Adjacent
Overburden: 577'
Soft rock: 66%
Total Depth: 39'
Static water level
Distance to Face (feet)

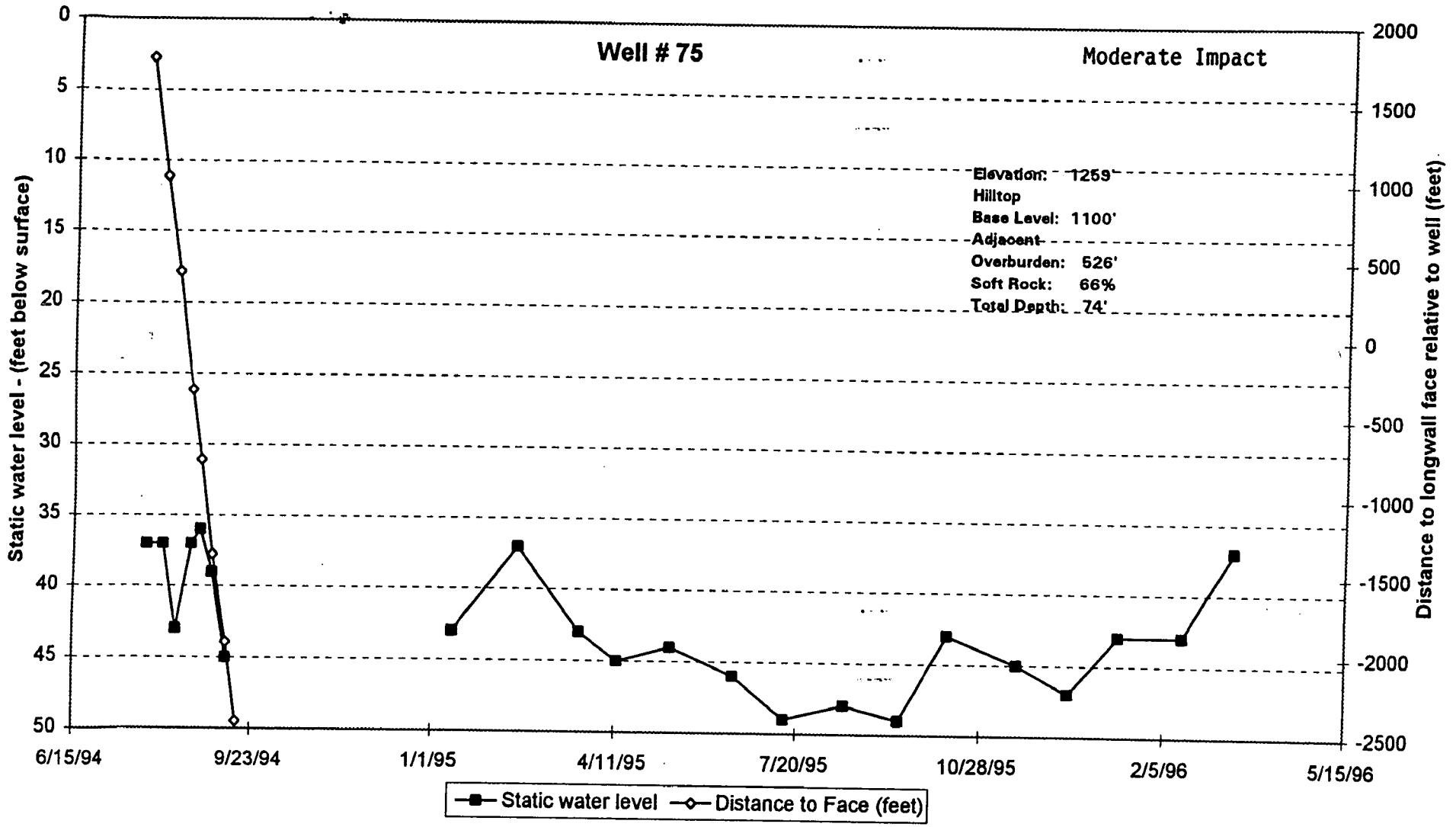
AEC 05056


WELL #73 STATIC WATER LEVEL
AREA #3
Minimal Impact
Static water level (feet)
0
10
20
30
40
50
60
70
80
Distance to longwall face relative to well (feet)
1000
500
0
-500
-1000
-1500
-2000
-2500
-3000
-3500
25-Jul-94
14-Aug-94
03-Sep-94
23-Sep-94
13-Oct-94
02-Nov-94
22-Nov-94
12-Dec-94
01-Jan-95
Elevation: 1264'
Total Depth: '
Hilltop
Base Level: 1100'
Gate
Overburden: 531'
Soft rock: 66%
SWL
DISTANCE TO FACE

AEC 05057

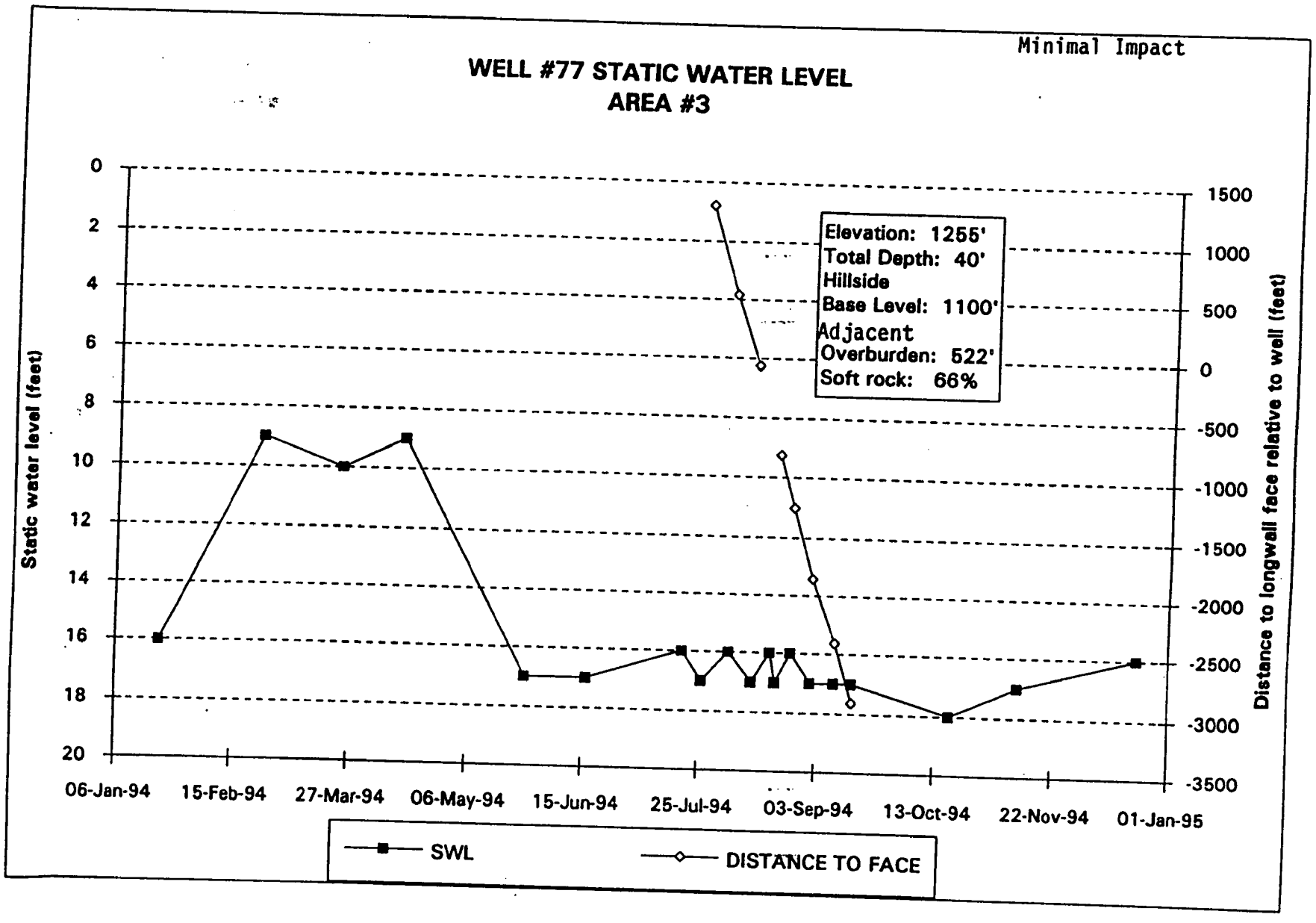

Well # 74
Minimal Impact
Static water level- (feet below surface)
Distance of longwall face relative to well (feet)
0
10
20
30
40
50
60
1000
500
0
-500
-1000
-1500
-2000
-2500
-3000
-3500
6/15/94
9/23/94
1/1/95
4/11/95
7/20/95
10/28/95
2/5/96
5/15/96
Elevation: 1264'
Hilltop
Base Level: 1100'
Gate
Overburden: 531'
Soft Rocks: 66%
Total Depth: U '
Static water level
Distance to Face (feet)

AEC 05058


Well # 75
Moderate Impact
Elevation: 1259'
Hilltop
Base Level: 1100'
Adjacent
Overburden: 526'
Soft Rock: 66%
Total Depth: 74'
Static water level - (feet below surface)
Distance to longwall face relative to well (feet)
0
5
10
15
20
25
30
35
40
45
50
2000
1500
1000
500
0
-500
-1000
-1500
-2000
-2500
6/15/94
9/23/94
1/1/95
4/11/95
7/20/95
10/28/95
2/5/96
5/15/96
Static water level
Distance to Face (feet)

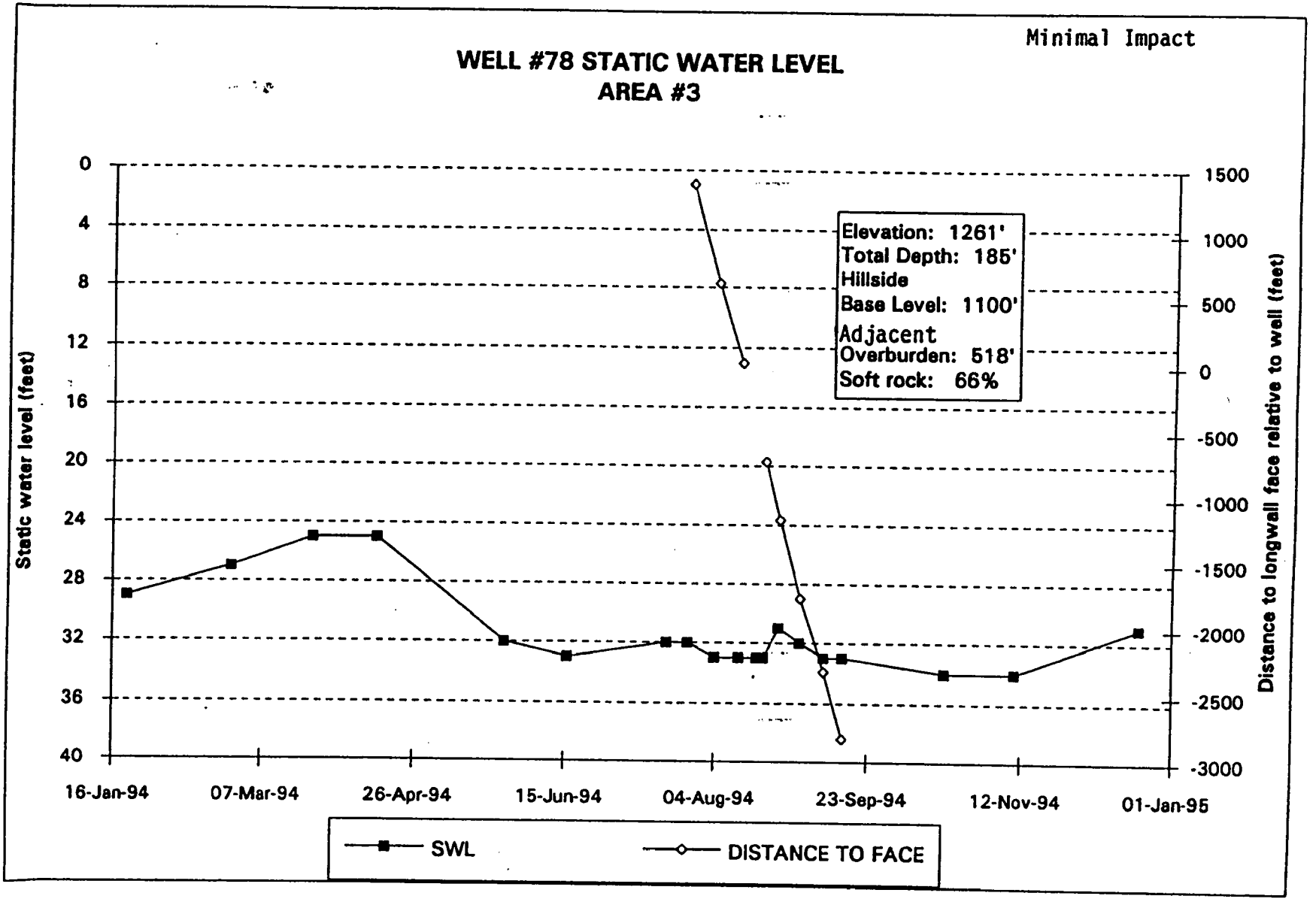
AEC 05059

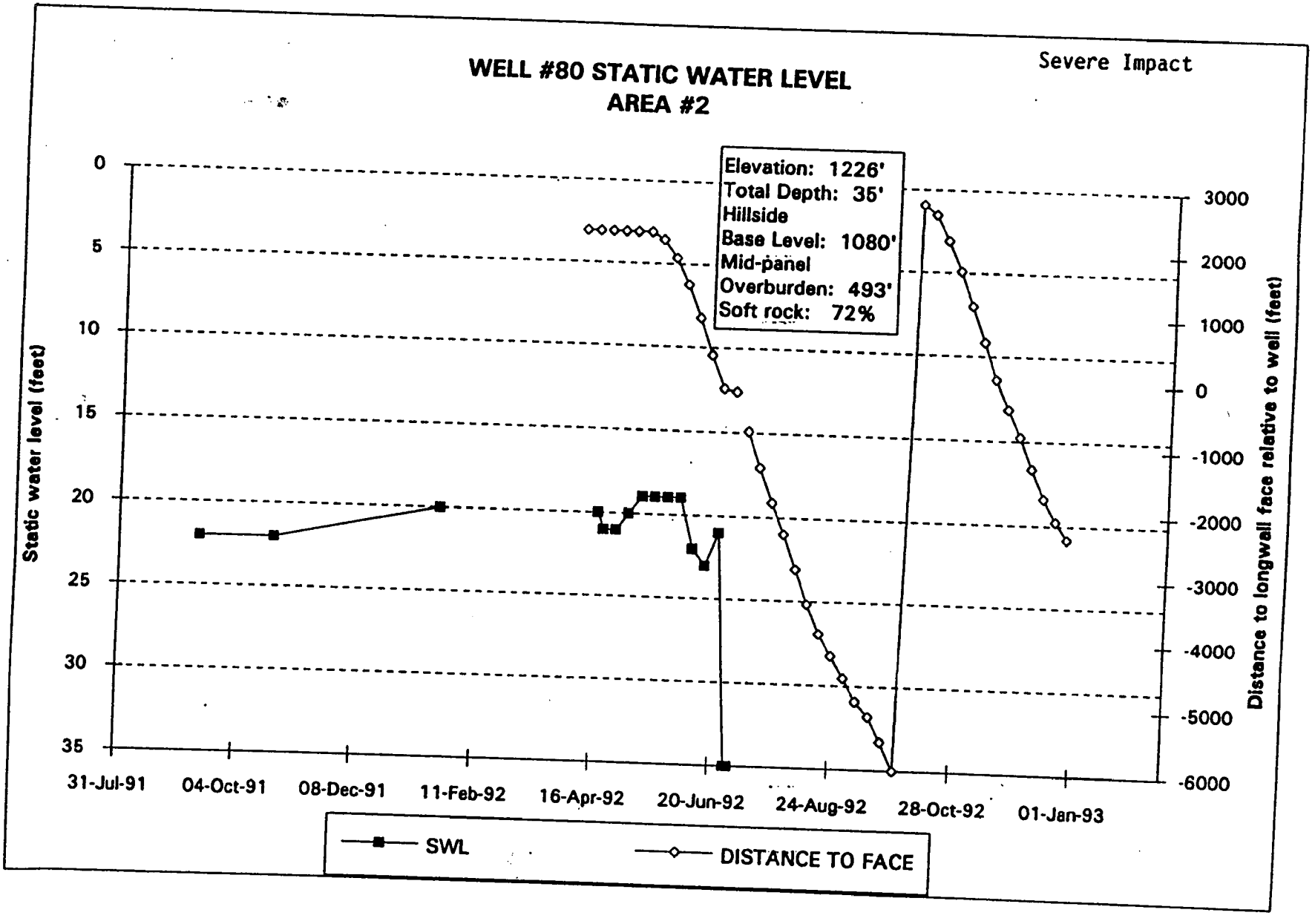
Minimal Impact



AEC 05060

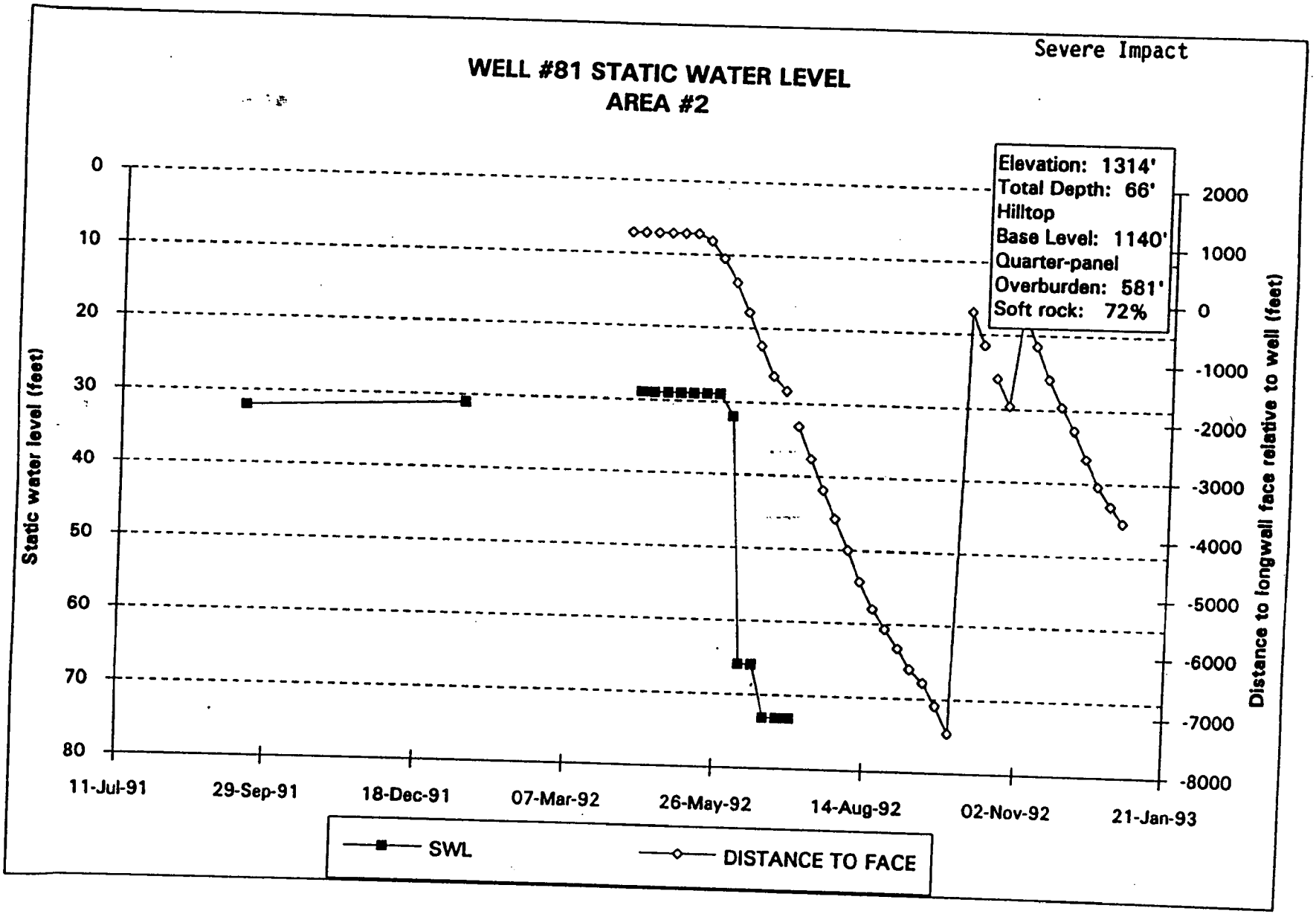
Minimal Impact



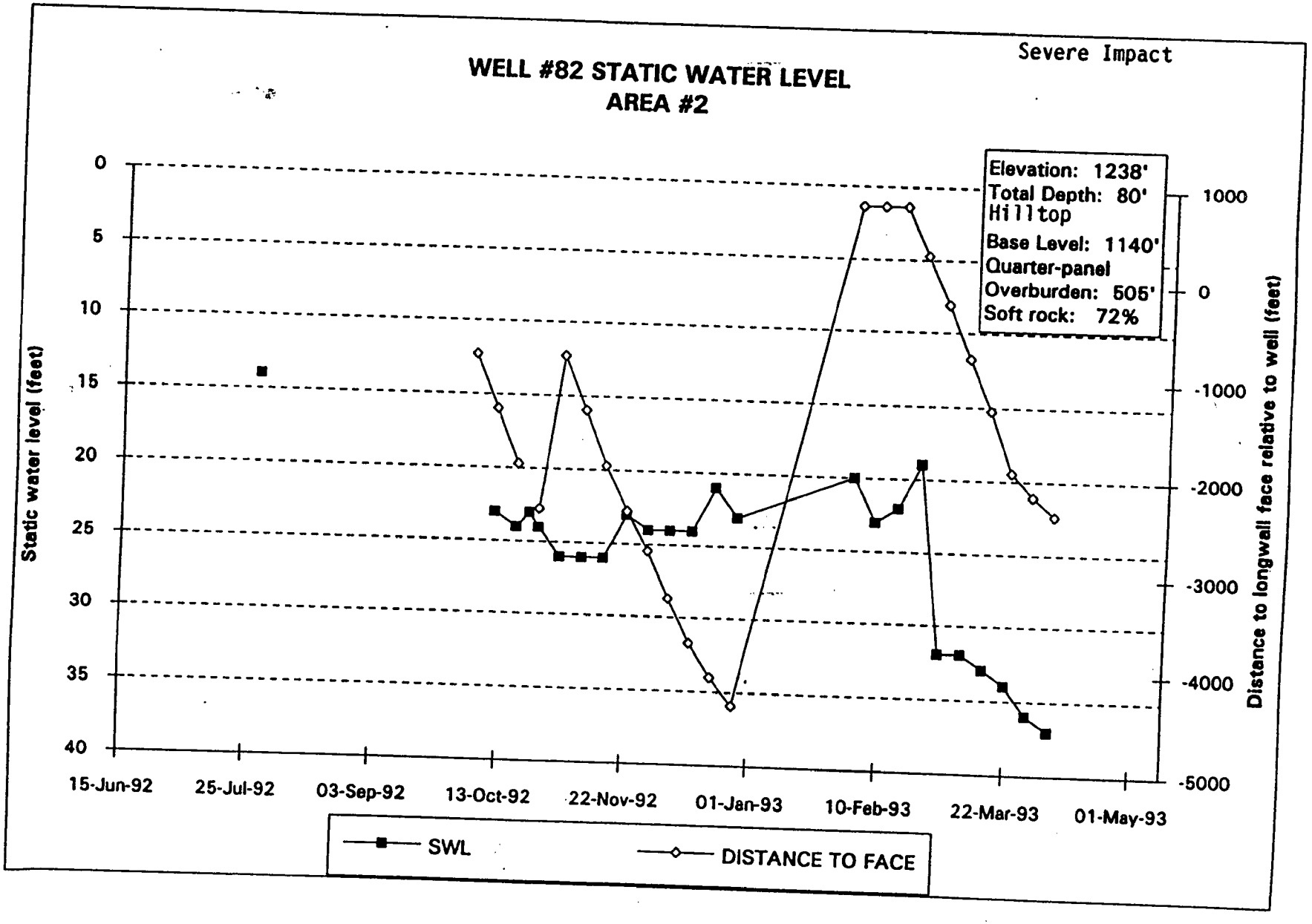

WELL #80 STATIC WATER LEVEL
AREA #2
Severe Impact
Elevation: 1226'
Total Depth: 35'
Hillside
Base Level: 1080'
Mid-panel
Overburden: 493'
Soft rock: 72%
Static water level (feet)
0
5
10
15
20
25
30
35
Distance to longwall face relative to well (feet)
3000
2000
1000
0
-1000
-2000
-3000
-4000
-5000
-6000
31-Jul-91
04-Oct-91
08-Dec-91
11-Feb-92
16-Apr-92
20-Jun-92
24-Aug-92
28-Oct-92
01-Jan-93
SWL
DISTANCE TO FACE

AEC 05062

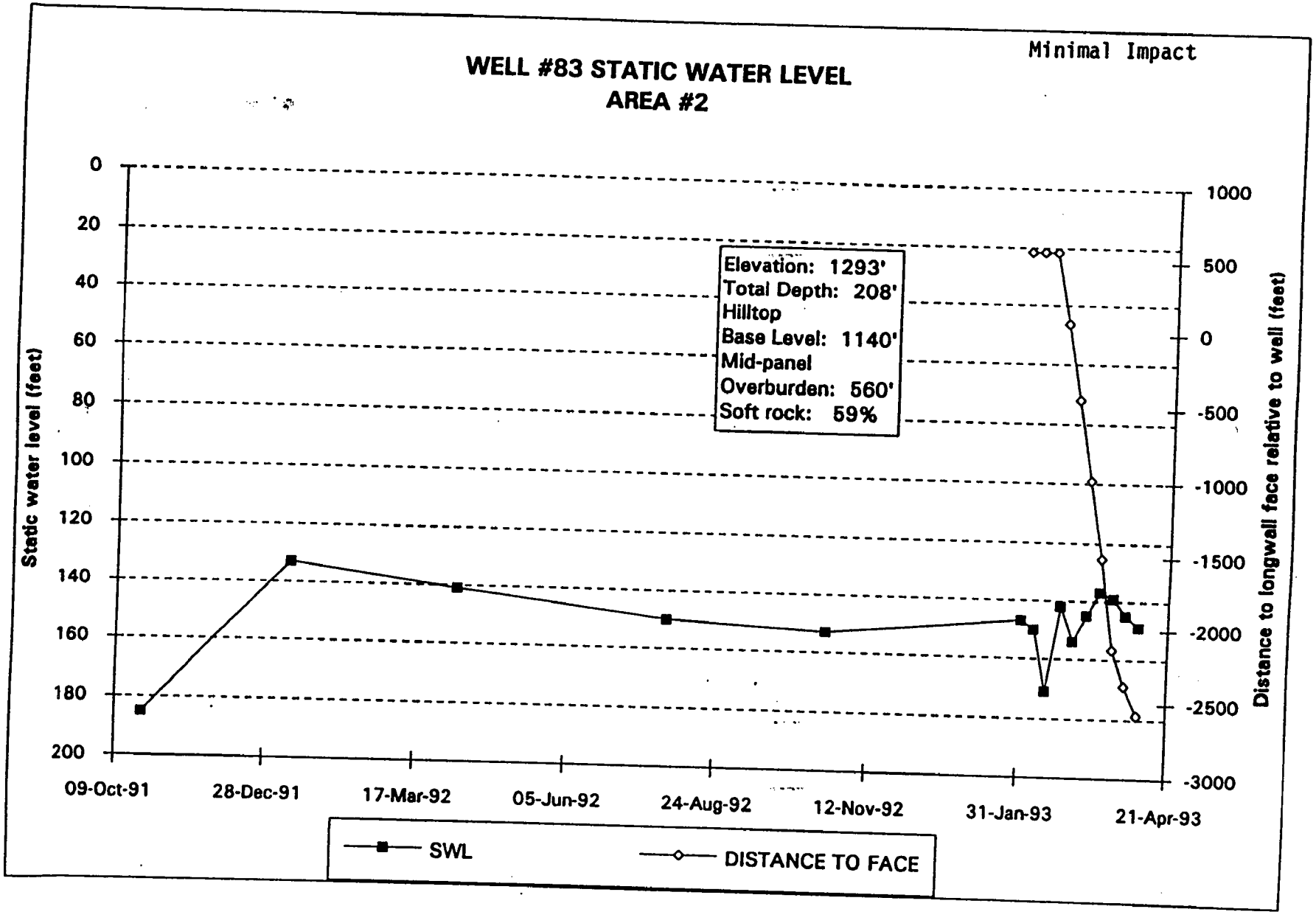
Severe Impact



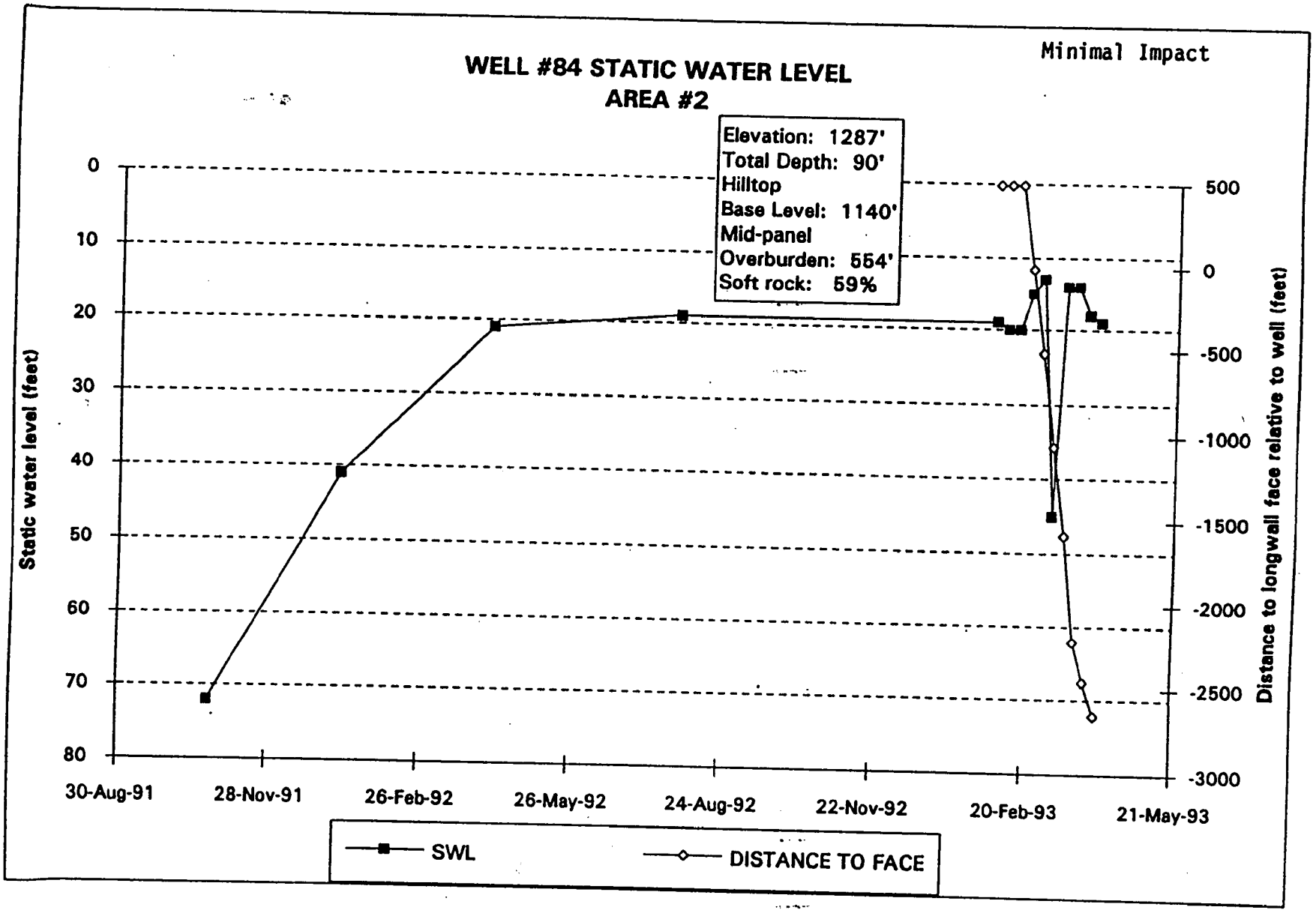
AEC 05063


Severe Impact
WELL #82 STATIC WATER LEVEL
AREA #2
Elevation: 1238'
Total Depth: 80'
Hilltop
Base Level: 1140'
Quarter-panel
Overburden: 505'
Soft rock: 72%
Static water level (feet)
0
5
10
15
20
25
30
35
40
Distance to longwall face relative to well (feet)
1000
0
-1000
-2000
-3000
-4000
-5000
15-Jun-92
25-Jul-92
03-Sep-92
13-Oct-92
22-Nov-92
01-Jan-93
10-Feb-93
22-Mar-93
01-May-93
SWL
DISTANCE TO FACE

AEC 05064

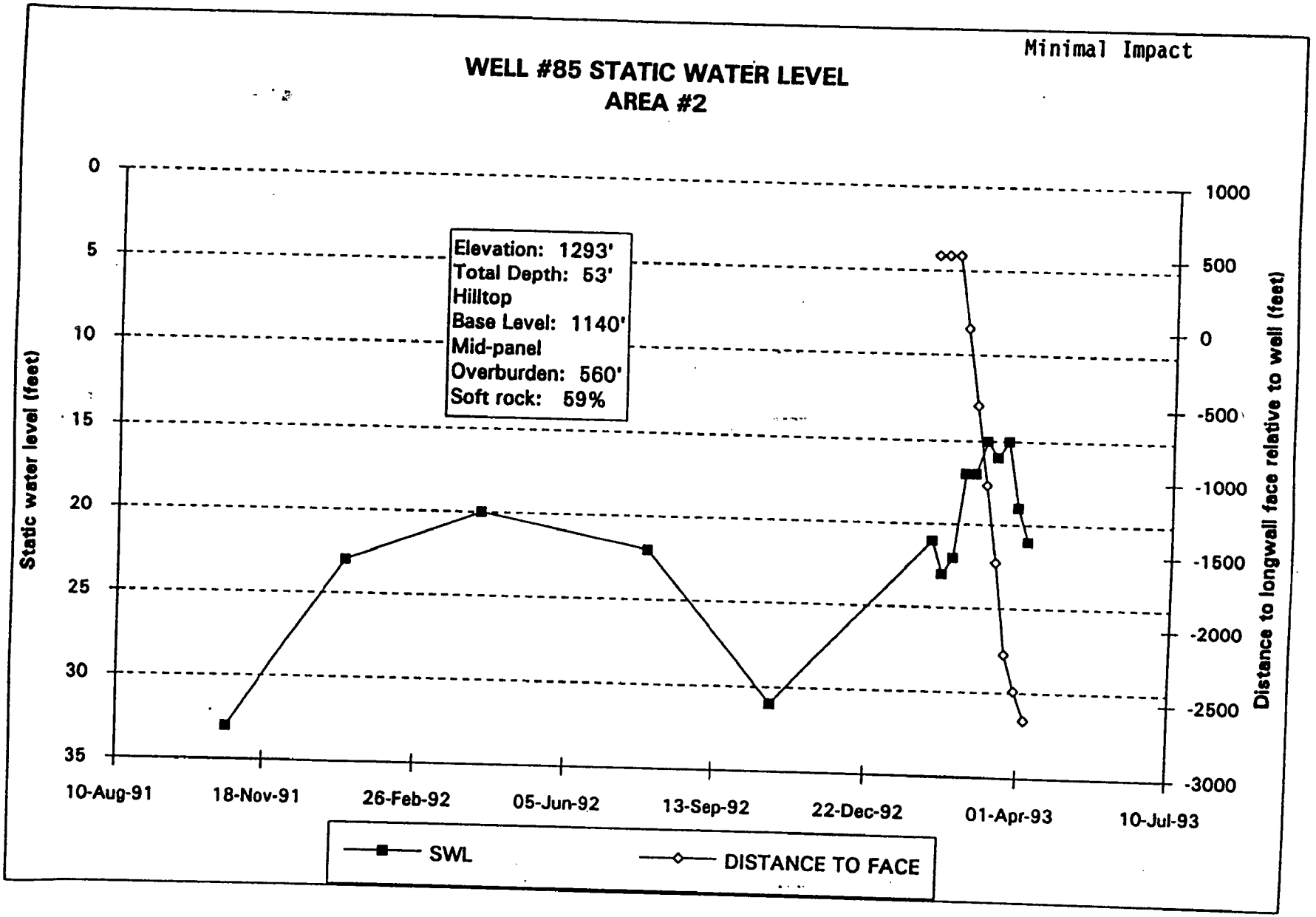

Minimal Impact
WELL #83 STATIC WATER LEVEL
AREA #2
Static water level (feet)
0
20
40
60
80
100
120
140
160
180
200
Distance to longwall face relative to well (feet)
1000
500
0
-500
-1000
-1500
-2000
-2500
-3000
09-Oct-91
28-Dec-91
17-Mar-92
05-Jun-92
24-Aug-92
12-Nov-92
31-Jan-93
21-Apr-93
Elevation: 1293'
Total Depth: 208'
Hilltop
Base Level: 1140'
Mid-panel
Overburden: 560'
Soft rock: 59%
SWL
DISTANCE TO FACE

AEC 05065

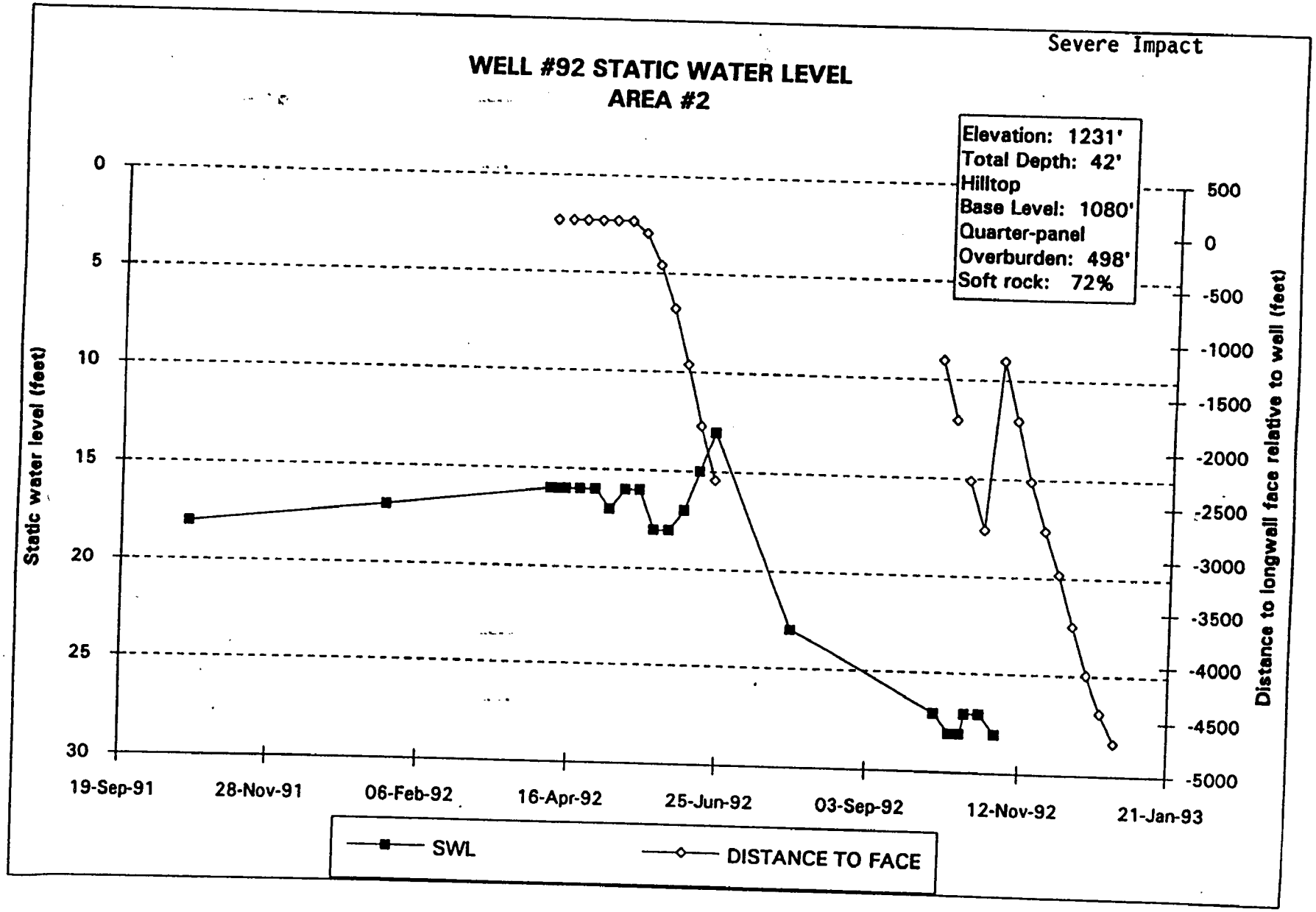

Minimal Impact
WELL #84 STATIC WATER LEVEL
AREA #2
Elevation: 1287'
Total Depth: 90'
Hilltop
Base Level: 1140'
Mid-panel
Overburden: 554'
Soft rock: 59%
Static water level (feet)
0
10
20
30
40
50
60
70
80
Distance to longwall face relative to well (feet)
500
0
-500
-1000
-1500
-2000
-2500
-3000
30-Aug-91
28-Nov-91
26-Feb-92
26-May-92
24-Aug-92
22-Nov-92
20-Feb-93
21-May-93
SWL
DISTANCE TO FACE

AEC 05066

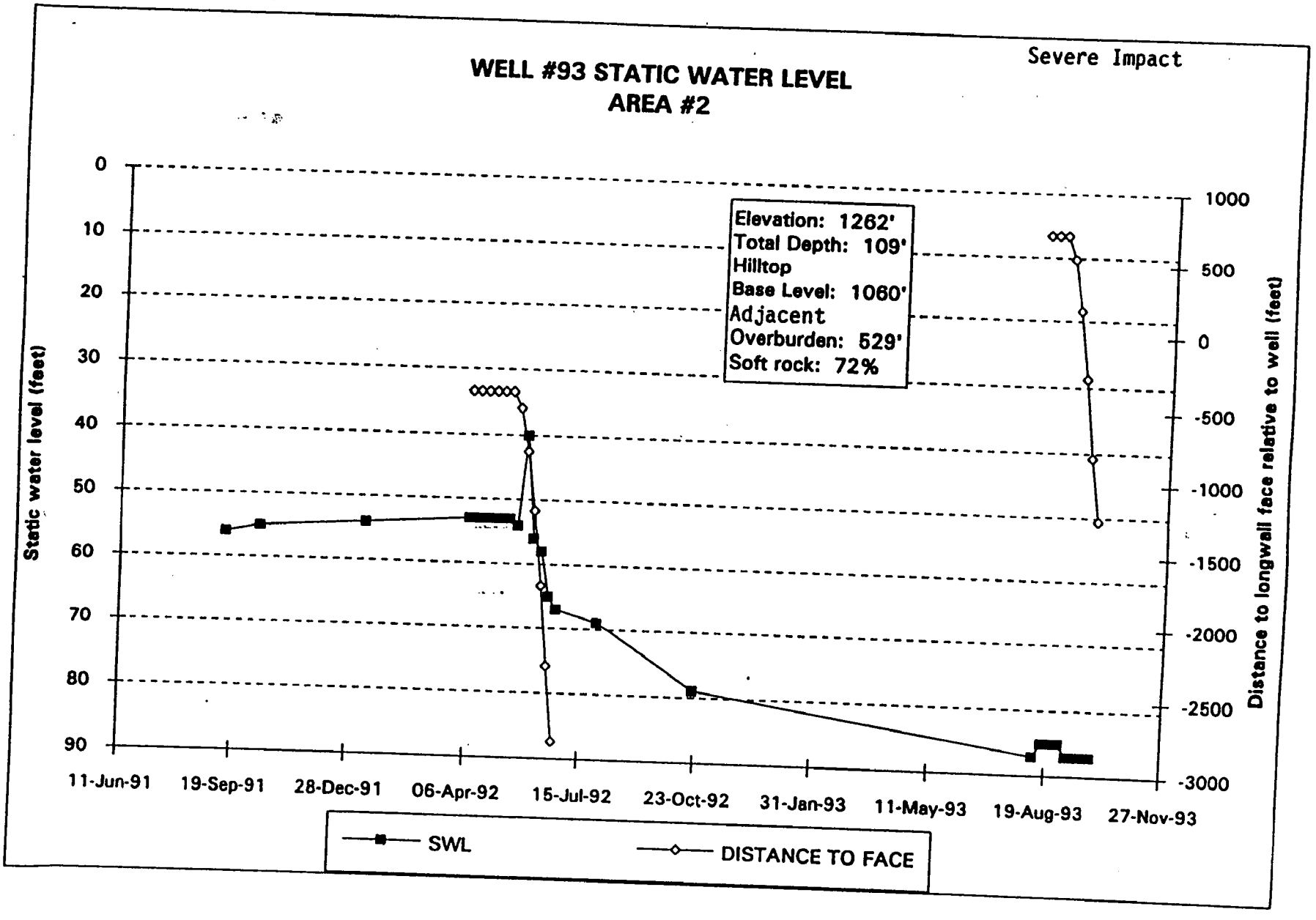
Minimal Impact



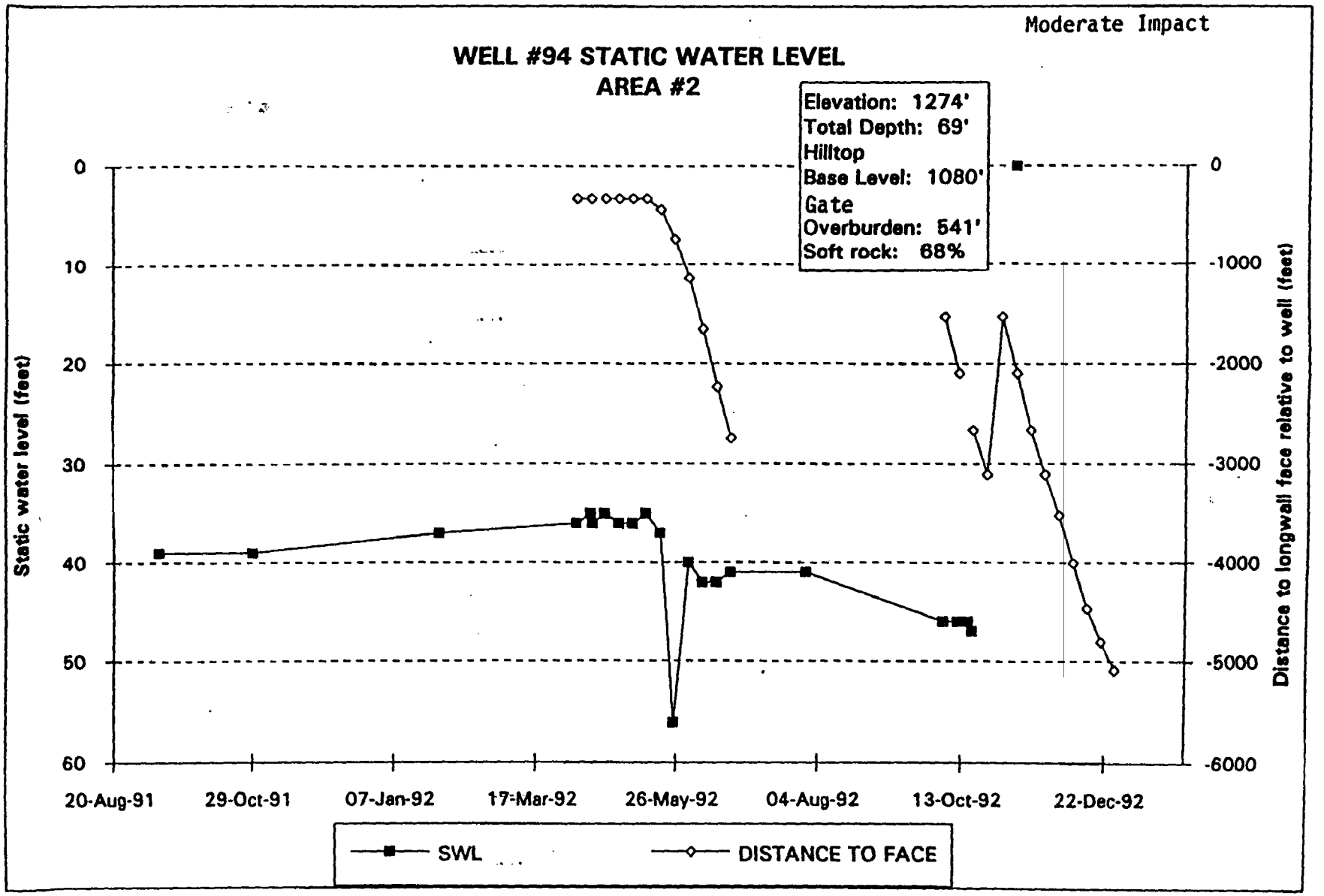
AEC 05067


Severe Impact
WELL #92 STATIC WATER LEVEL
AREA #2
Elevation: 1231'
Total Depth: 42'
Hilltop
Base Level: 1080'
Quarter-panel
Overburden: 498'
Soft rock: 72%
Static water level (feet)
0
5
10
15
20
25
30
Distance to longwall face relative to well (feet)
500
0
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
-4500
-5000
19-Sep-91
28-Nov-91
06-Feb-92
16-Apr-92
25-Jun-92
03-Sep-92
12-Nov-92
21-Jan-93
SWL
DISTANCE TO FACE

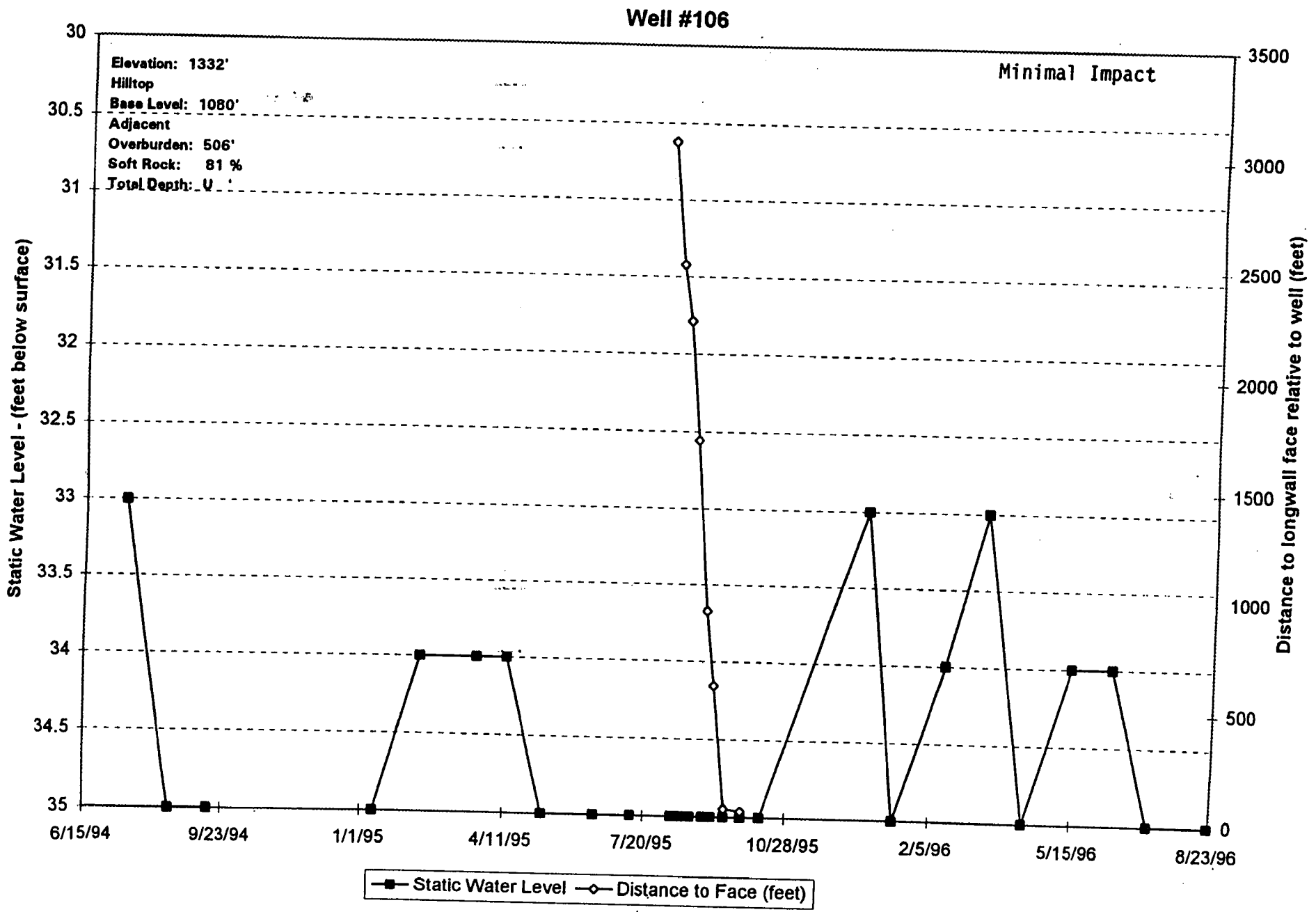
AEC 05068


Severe Impact
WELL #93 STATIC WATER LEVEL
AREA #2
Elevation: 1262'
Total Depth: 109'
Hilltop
Base Level: 1060'
Adjacent
Overburden: 529'
Soft rock: 72%
Static water level (feet)
0
10
20
30
40
50
60
70
80
90
Distance to longwall face relative to well (feet)
1000
500
0
-500
-1000
-1500
-2000
-2500
-3000
11-Jun-91
19-Sep-91
28-Dec-91
06-Apr-92
15-Jul-92
23-Oct-92
31-Jan-93
11-May-93
19-Aug-93
27-Nov-93
SWL
DISTANCE TO FACE

AEC 05069

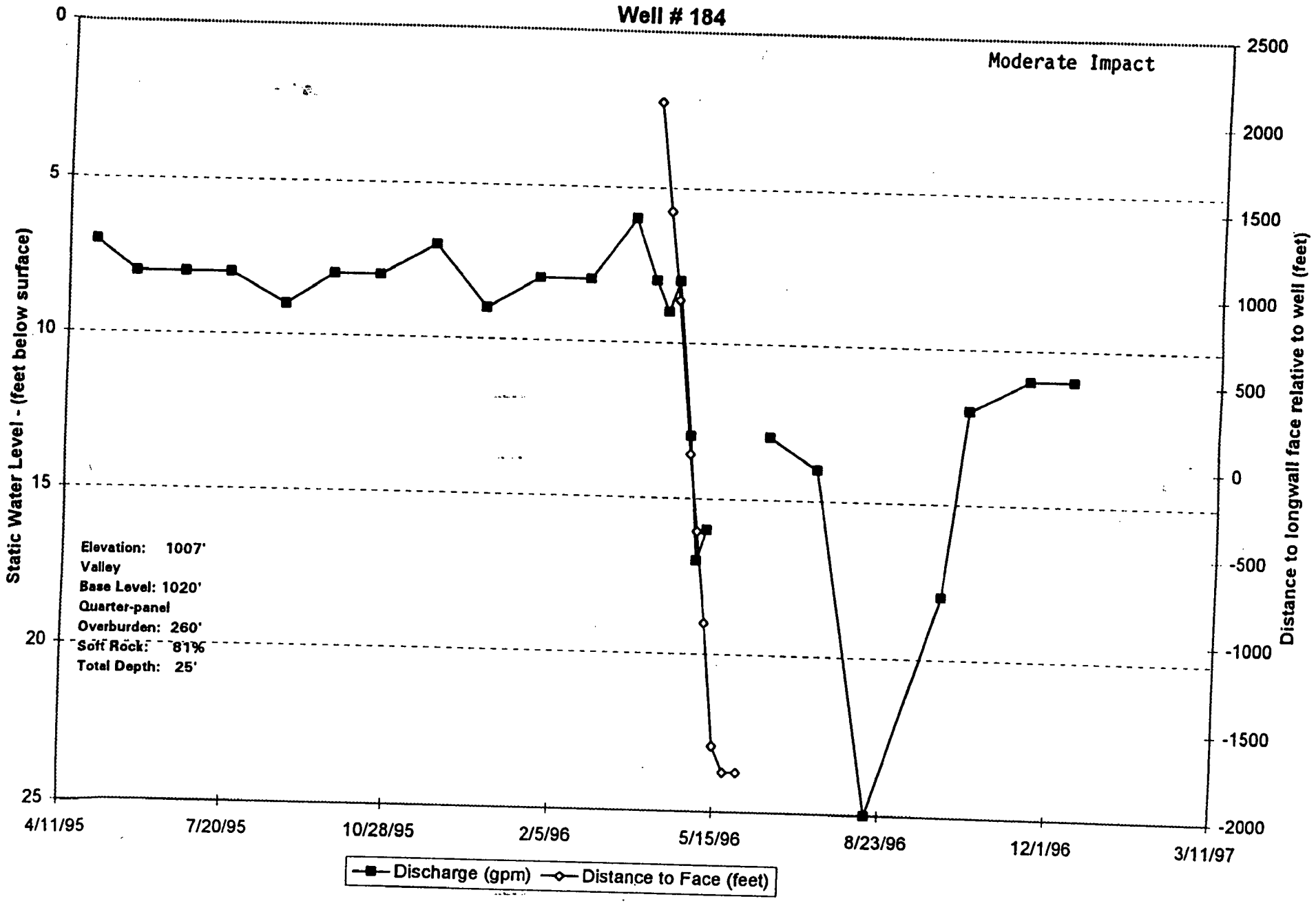

Moderate Impact
WELL #94 STATIC WATER LEVEL
AREA #2
Elevation: 1274'
Total Depth: 69'
Hilltop
Base Level: 1080'
Gate
Overburden: 541'
Soft rock: 68%
Static water level (feet)
0
10
20
30
40
50
60
Distance to longwall face relative to well (feet)
0
-1000
-2000
-3000
-4000
-5000
-6000
20-Aug-91
29-Oct-91
07-Jan-92
17-Mar-92
26-May-92
04-Aug-92
13-Oct-92
22-Dec-92
SWL
DISTANCE TO FACE

AEC 05070



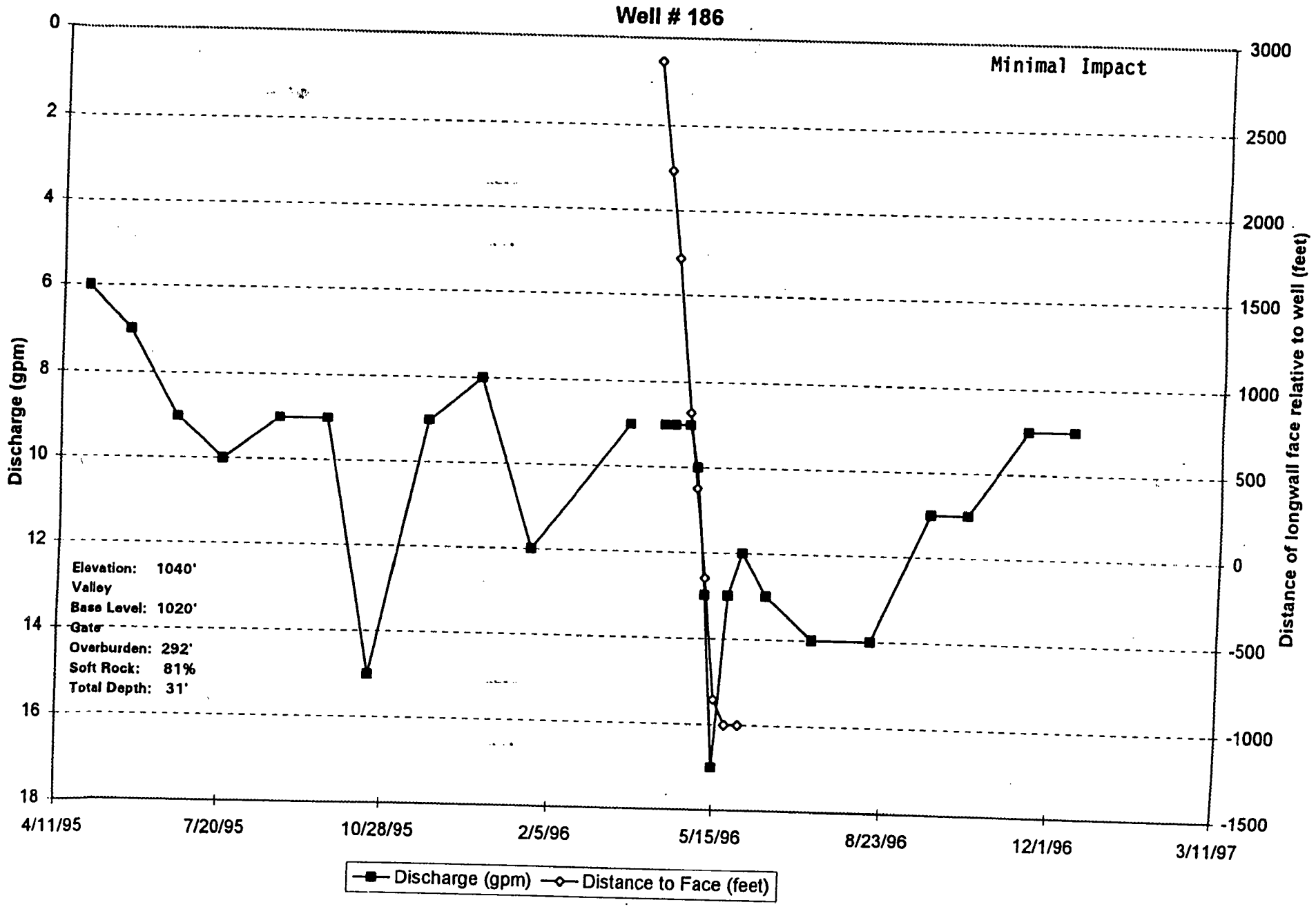
Prepared by: Moody and Assoc. Inc. 4/13/97

AEC 05071



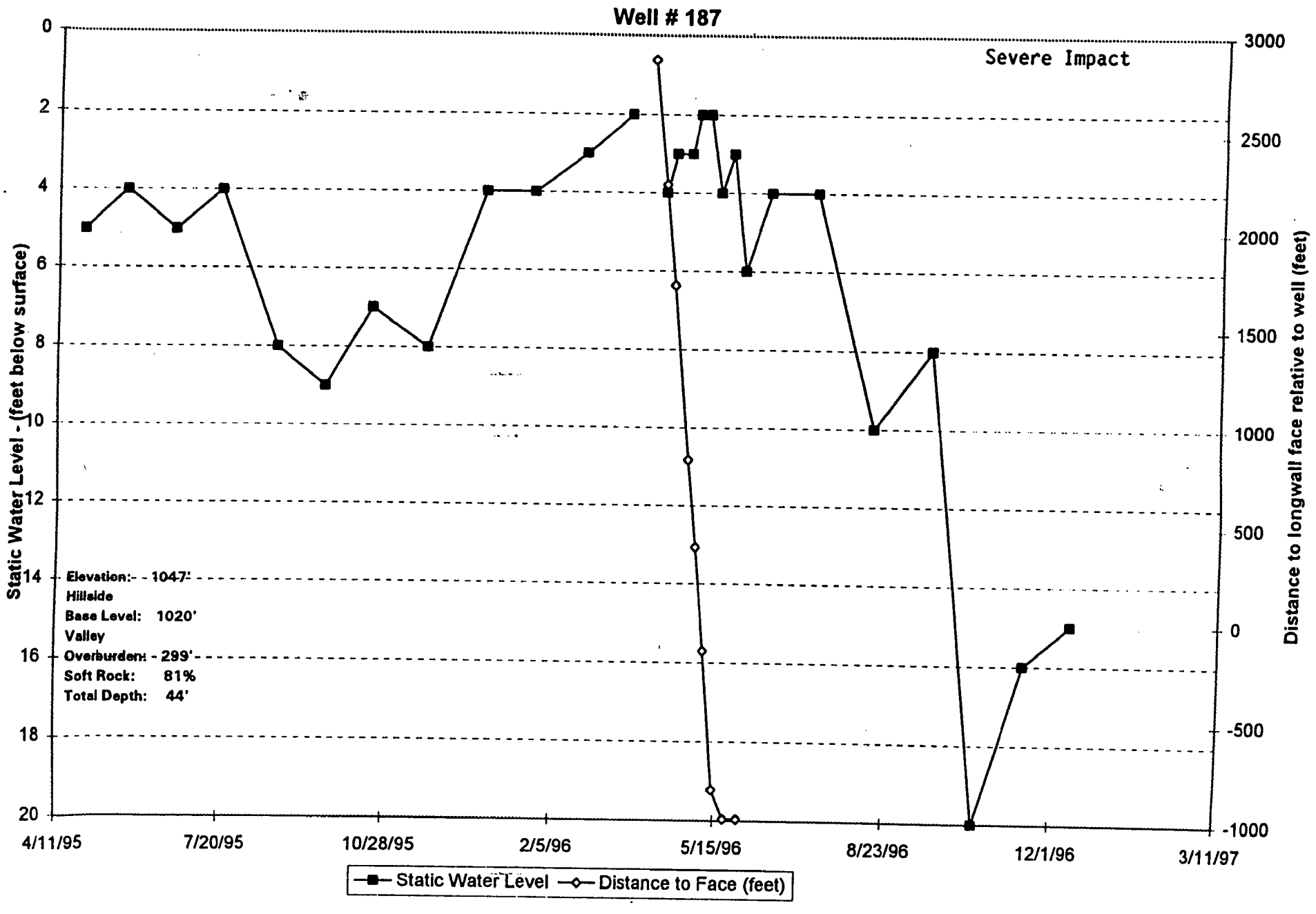
Prepared by: Moody and Assoc., Inc. 4/13/97

AEC 05072



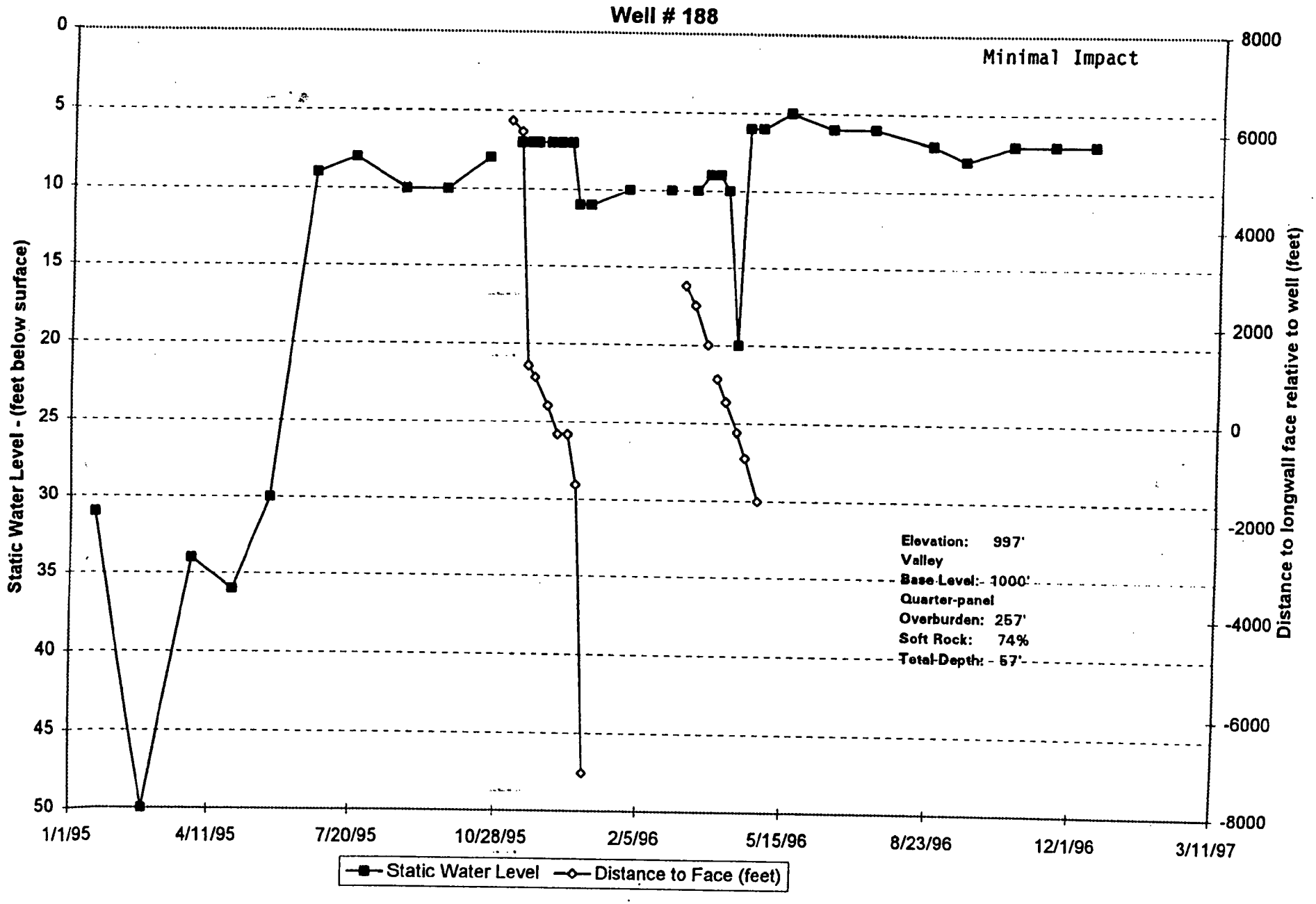
Prepared by: Moody and Assoc. Inc. 4/13/97

AEC 05073



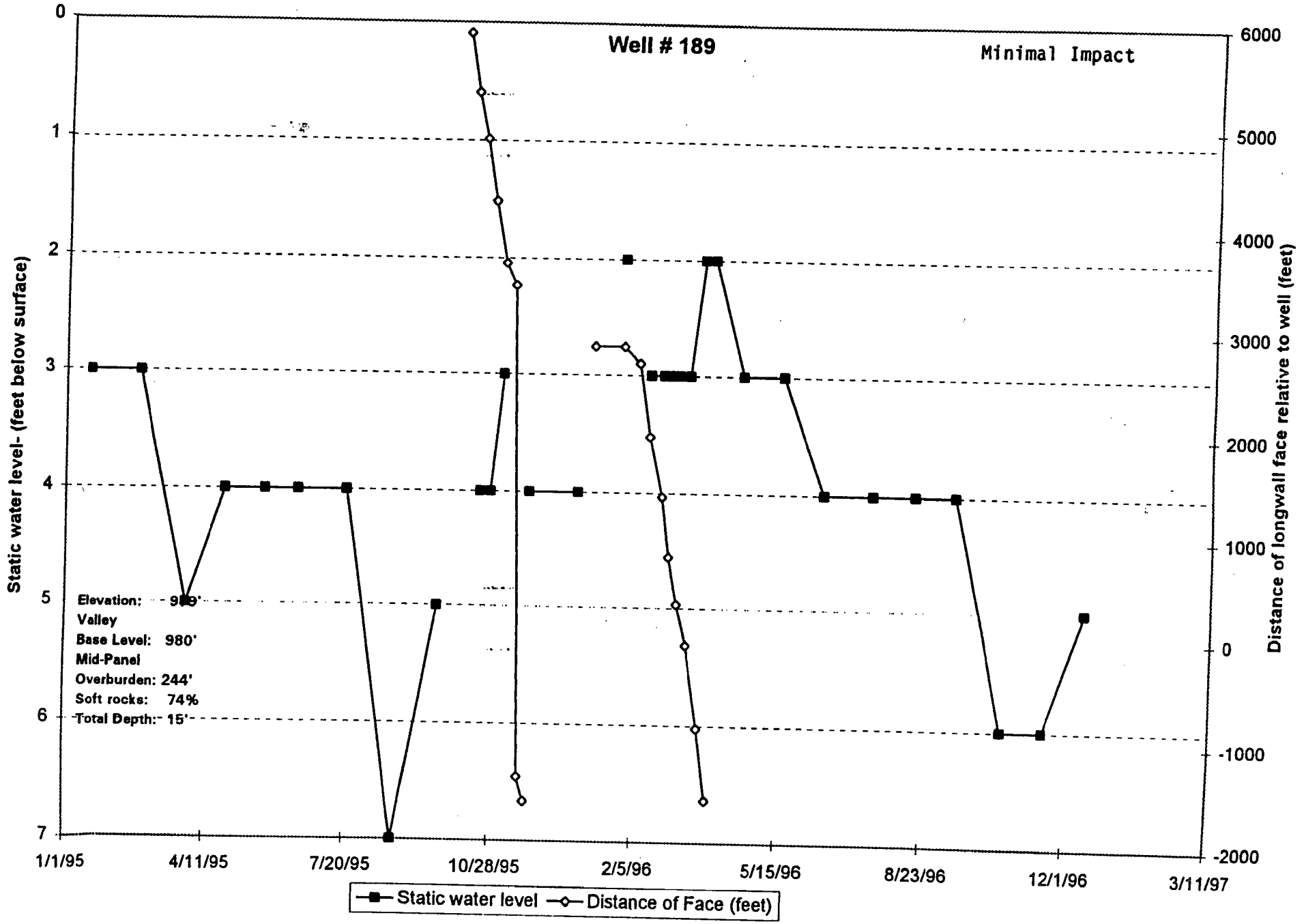
Prepared by: Moody and Assoc. Inc. 4/13/97

AEC 05074



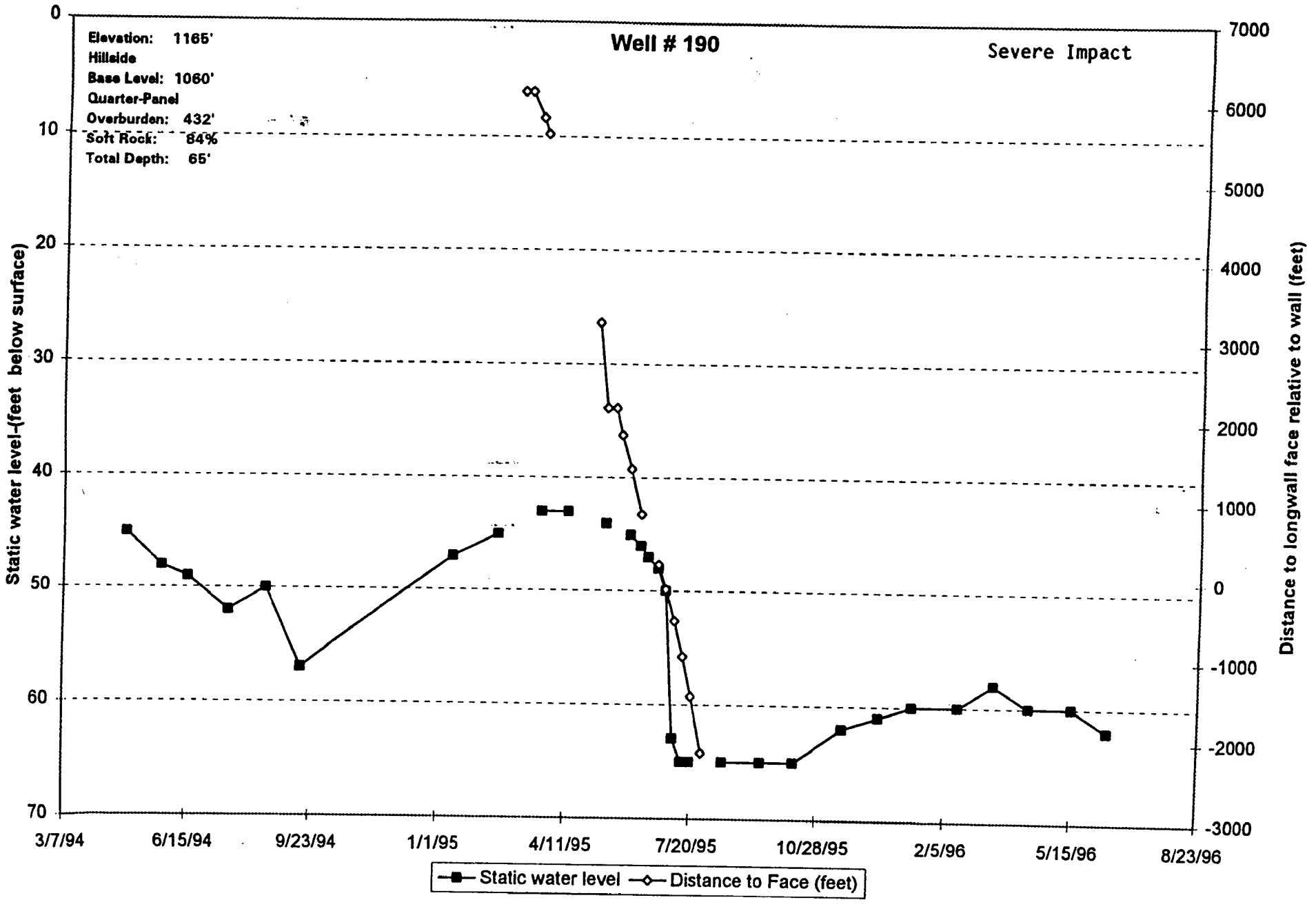
Prepared by: Moody and Assoc., Inc. 4/13/97

AEC 05075



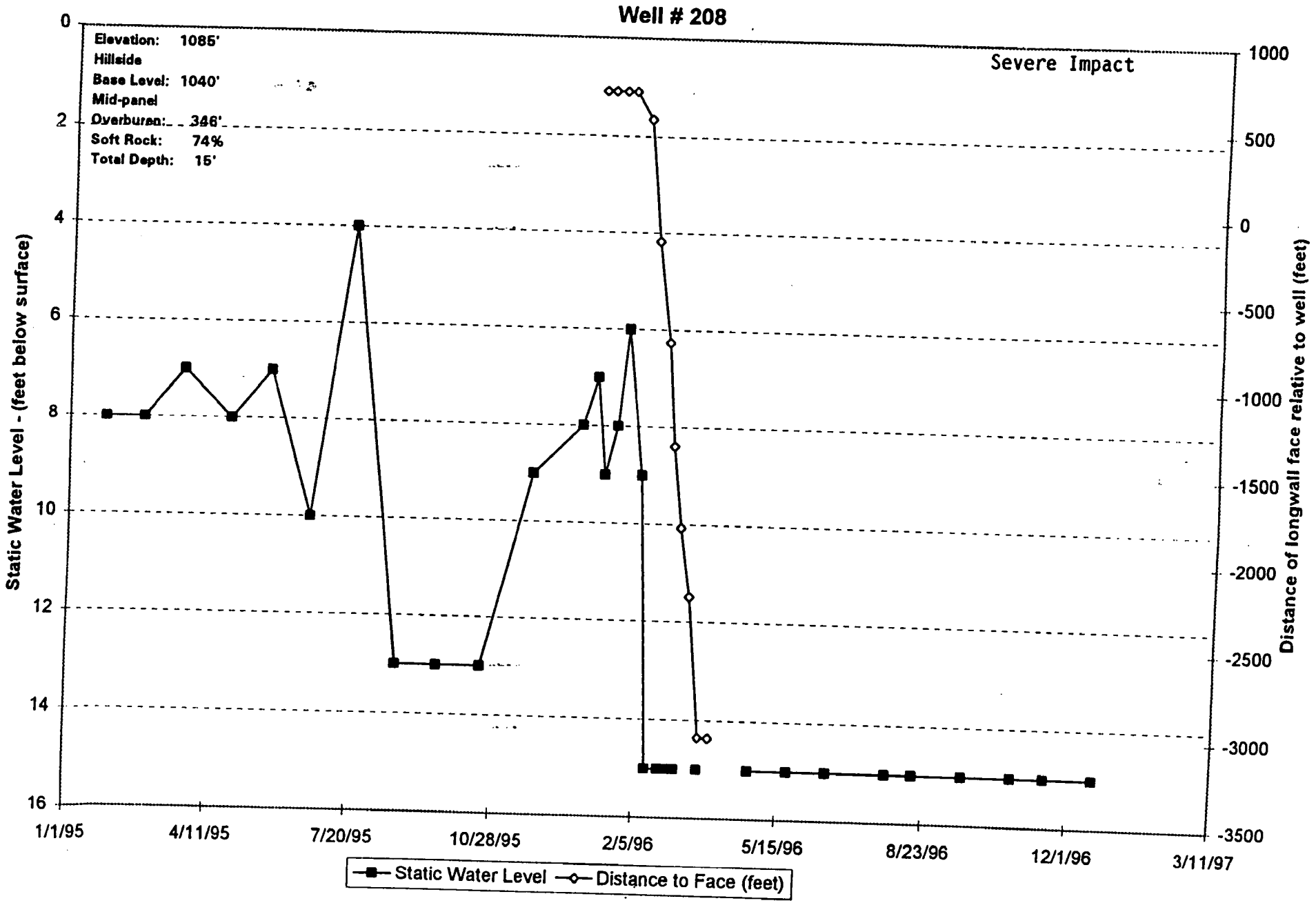
Prepared by: Moody and Assoc., Inc.4/13/97

AEC 05076



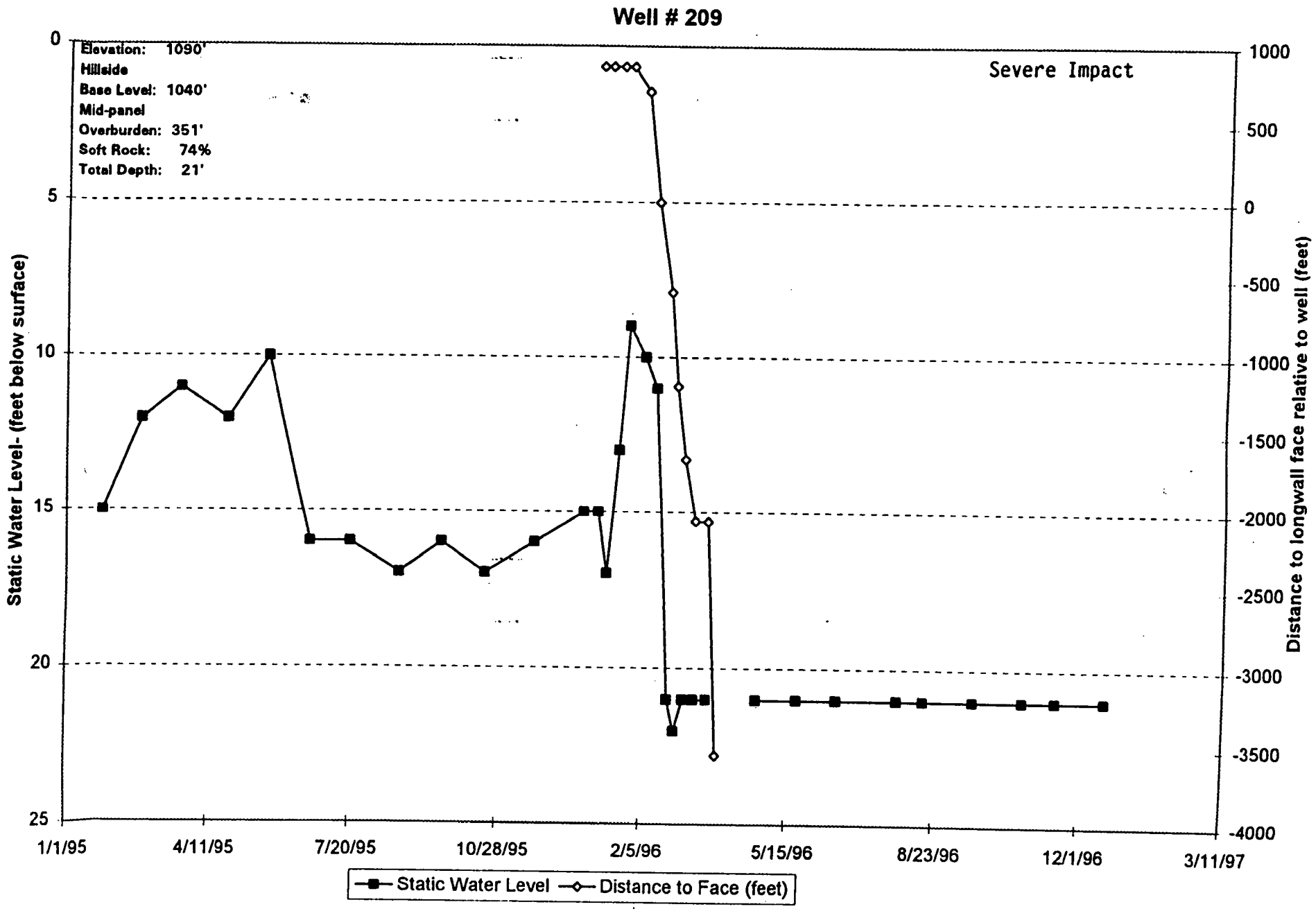
Prepared by: Moody and Assoc. Inc. 4/13/97

AEC 05077



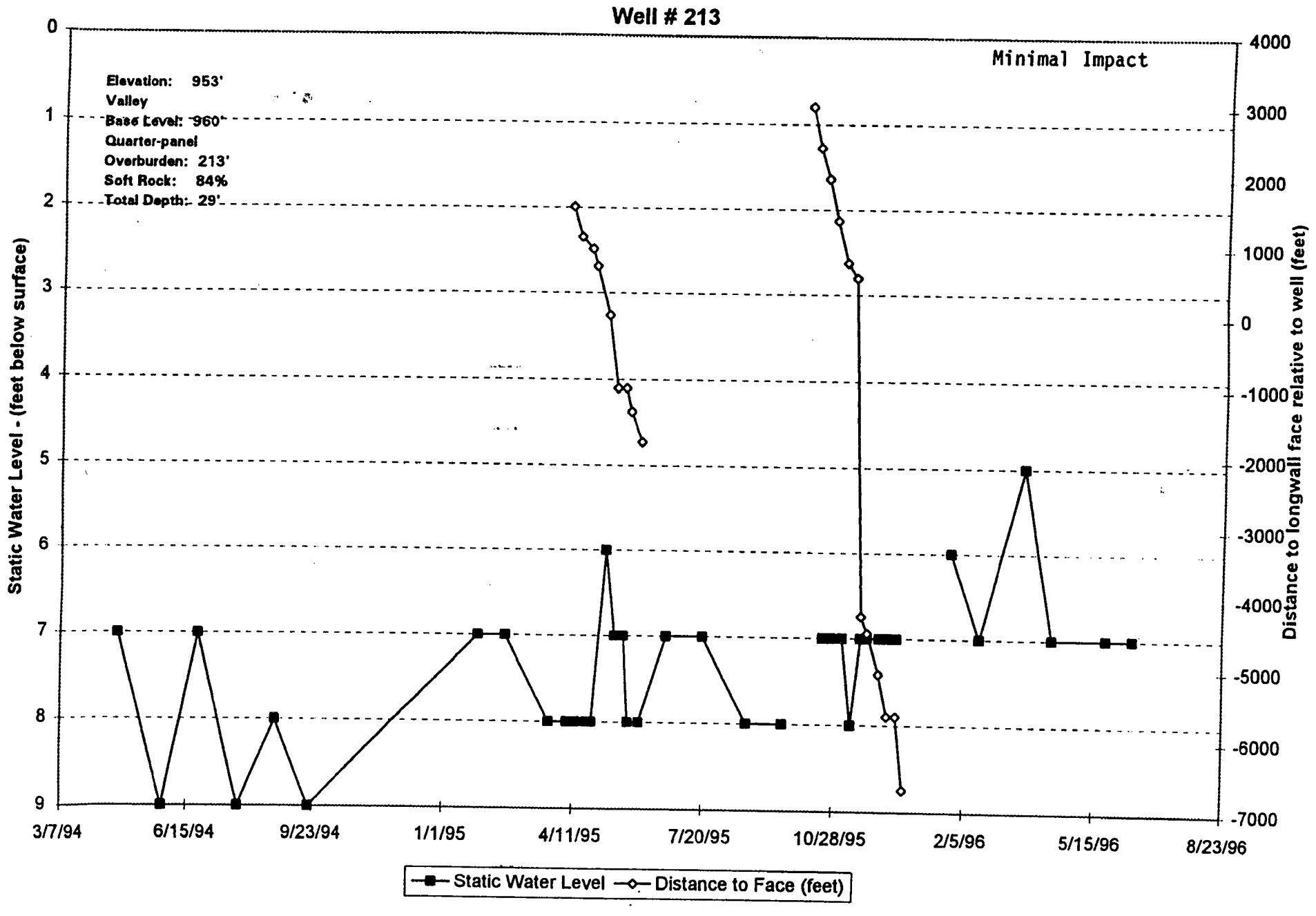
Prepared by: Moody and Assoc. Inc. 4/13/97

AEC 05078



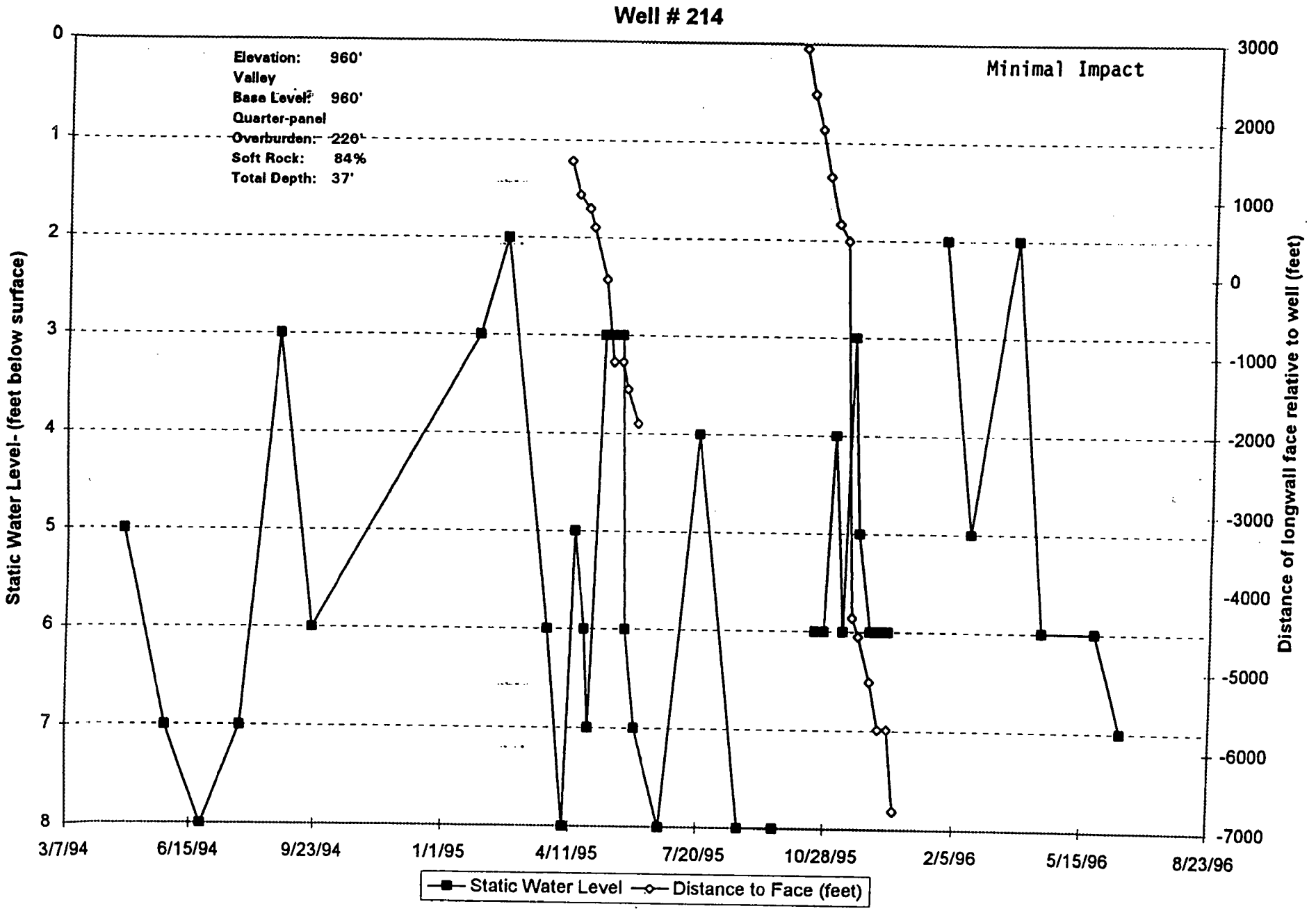
Prepared by: Moody and Assoc. Inc. 4/13/97

AEC 05079



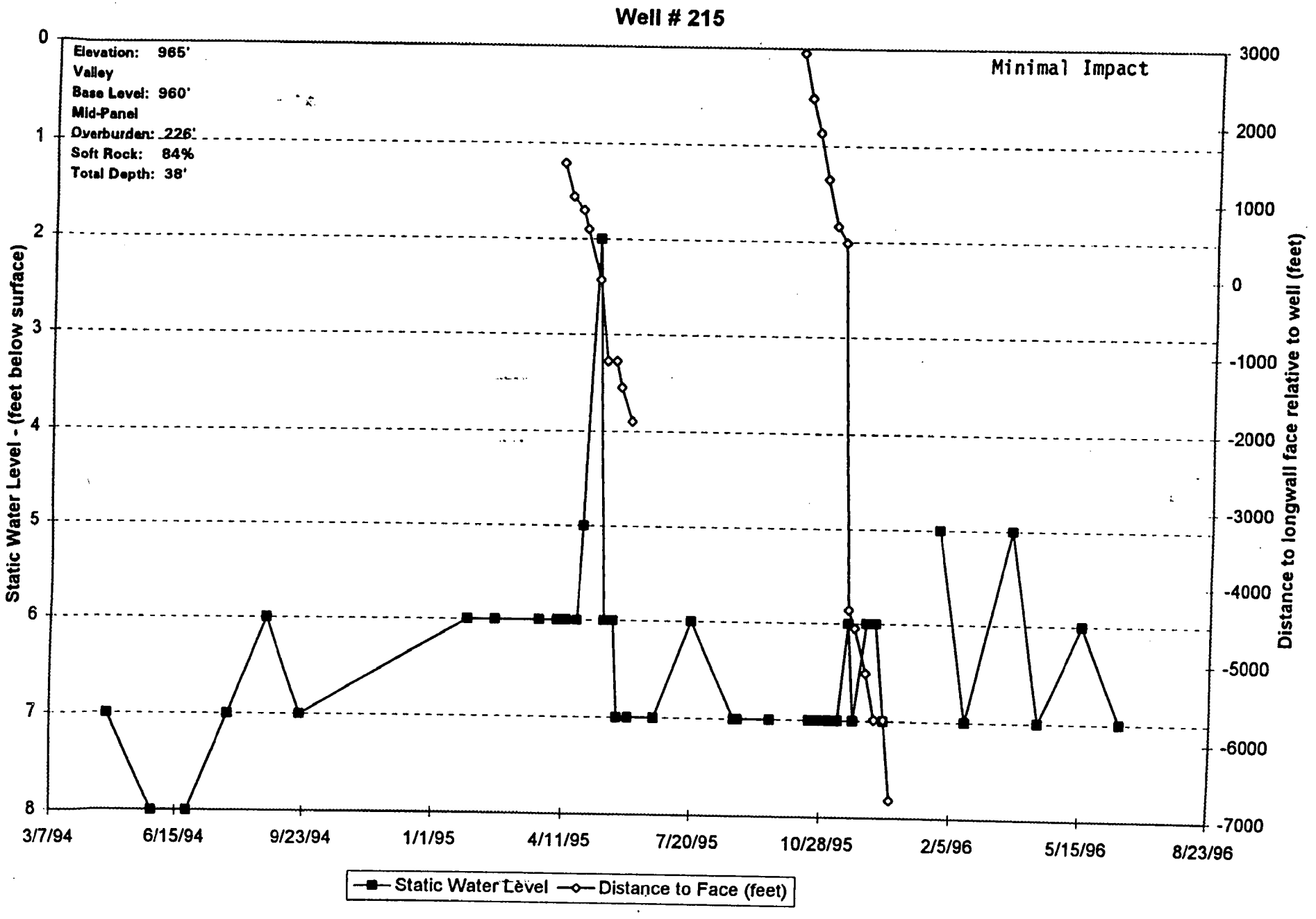
Prepared by: Moody and Assoc., Inc. 4/13/97

AEC 05080



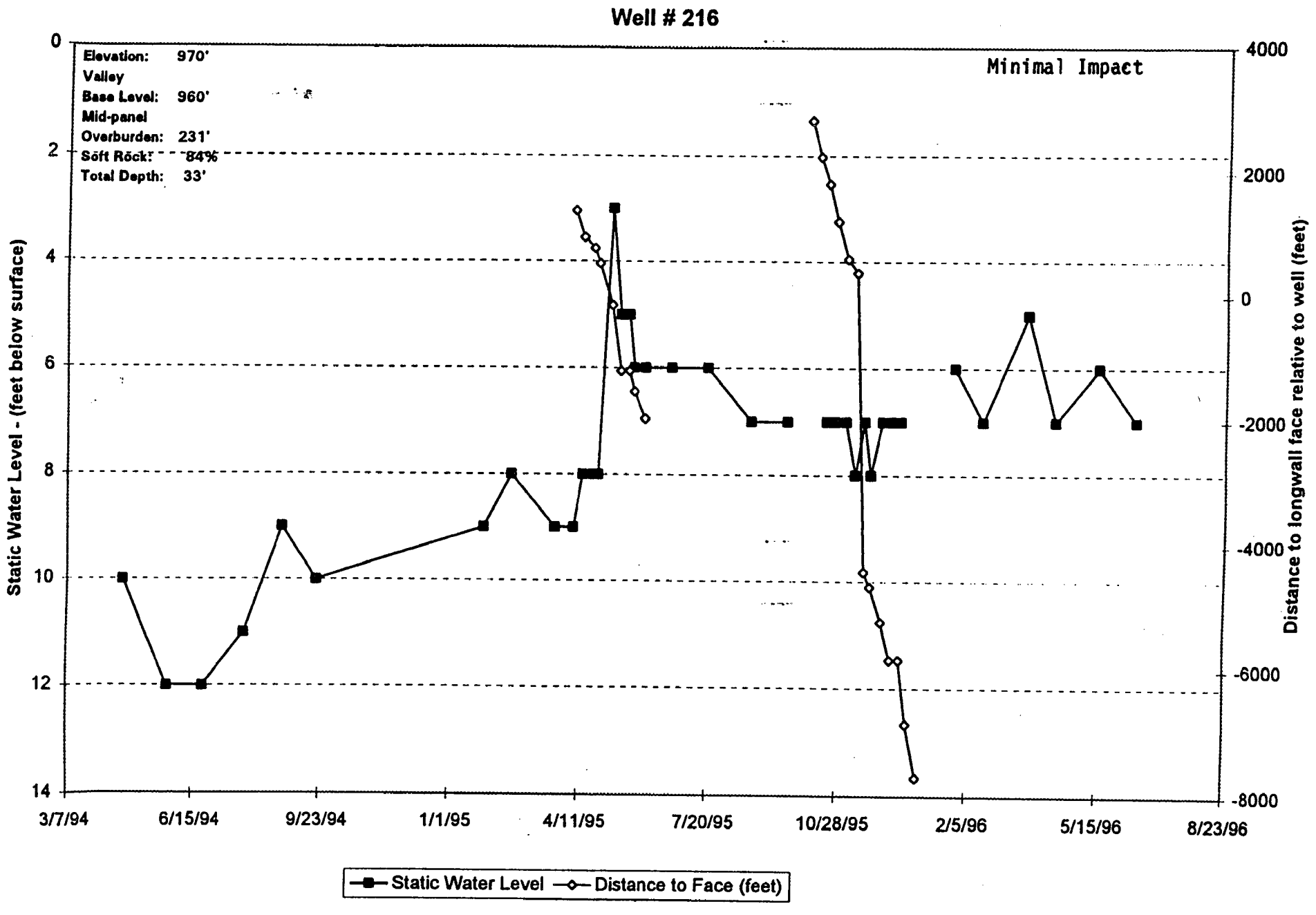
Prepared by: Moody and Assoc. Inc. 4/13/97

AEC 05081



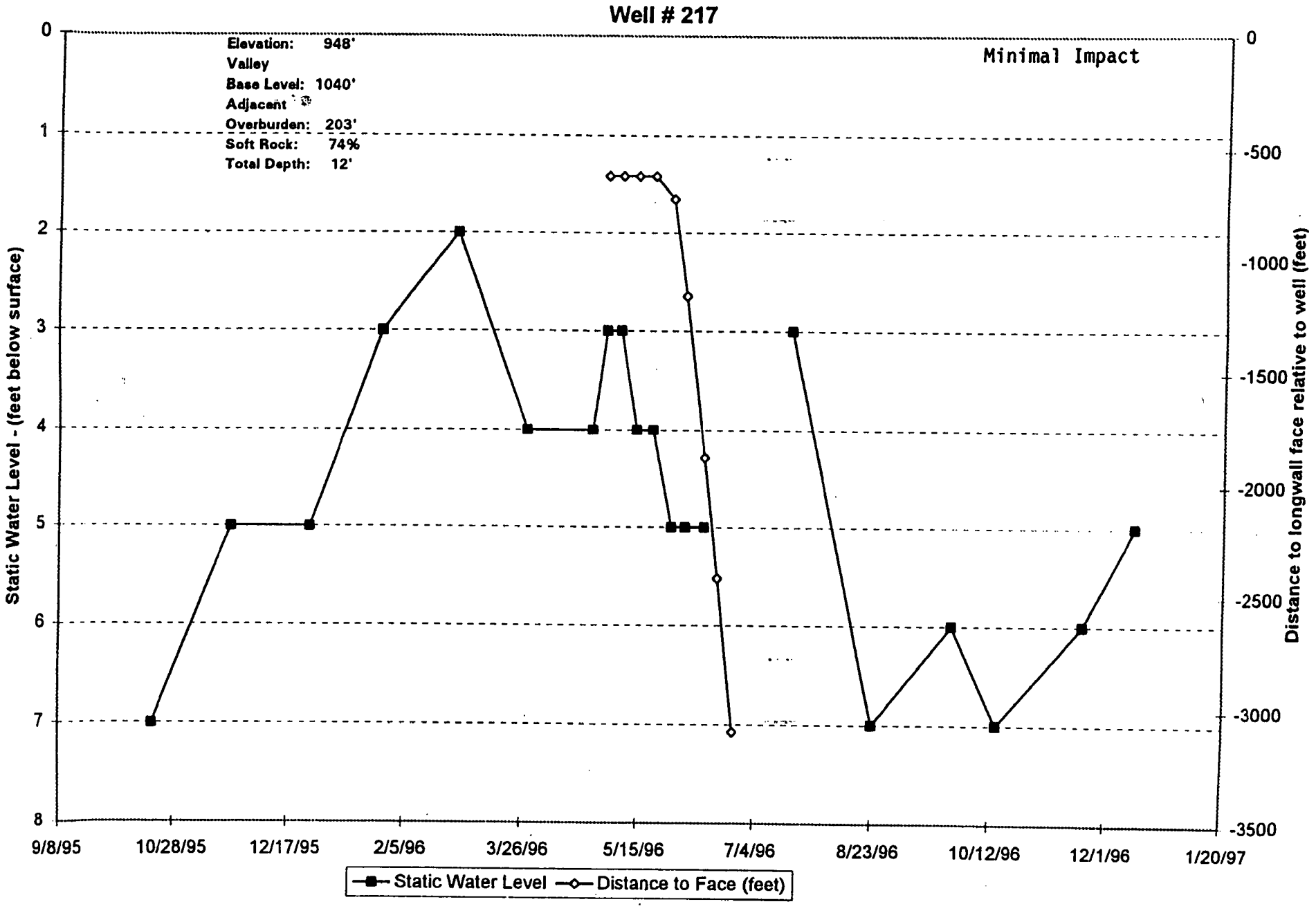
Prepared by: Moody and Assoc., Inc. 4/13/97

AEC 05082



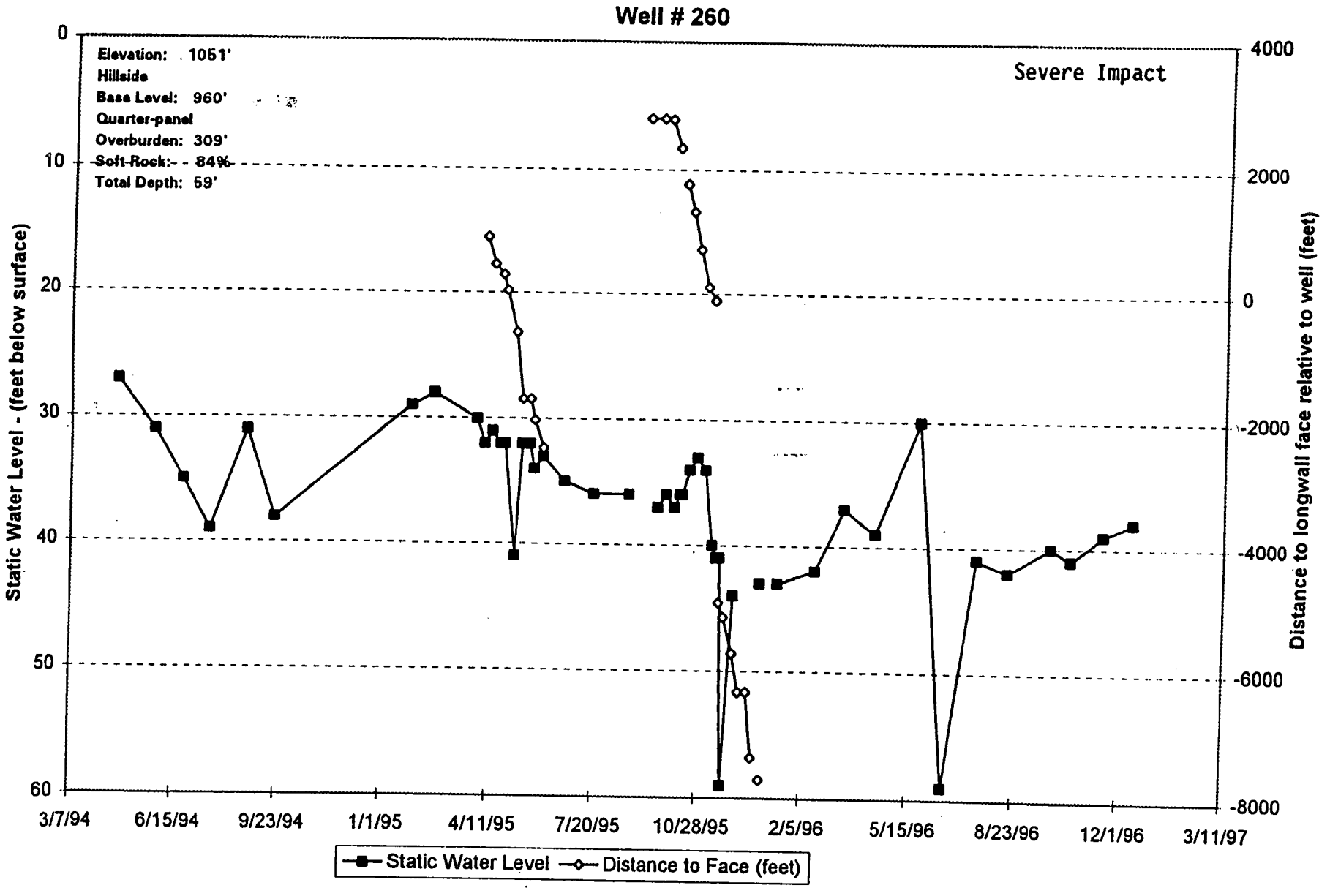
Prepared by: Moody and Assoc. Inc. 4/13/97

AEC 05083



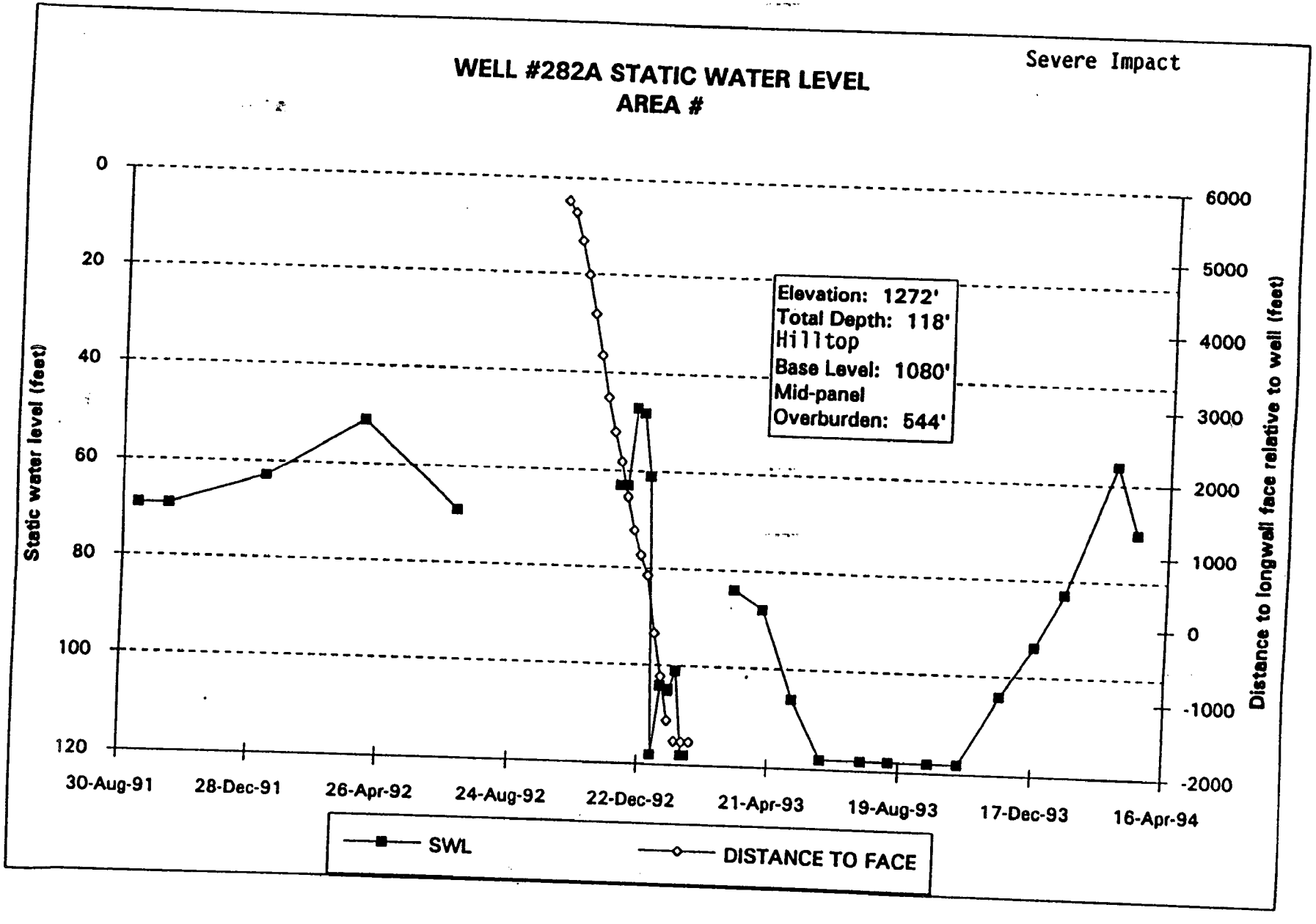
Prepared by: Moody and Assoc. Inc. 4/13/97

AEC 05084



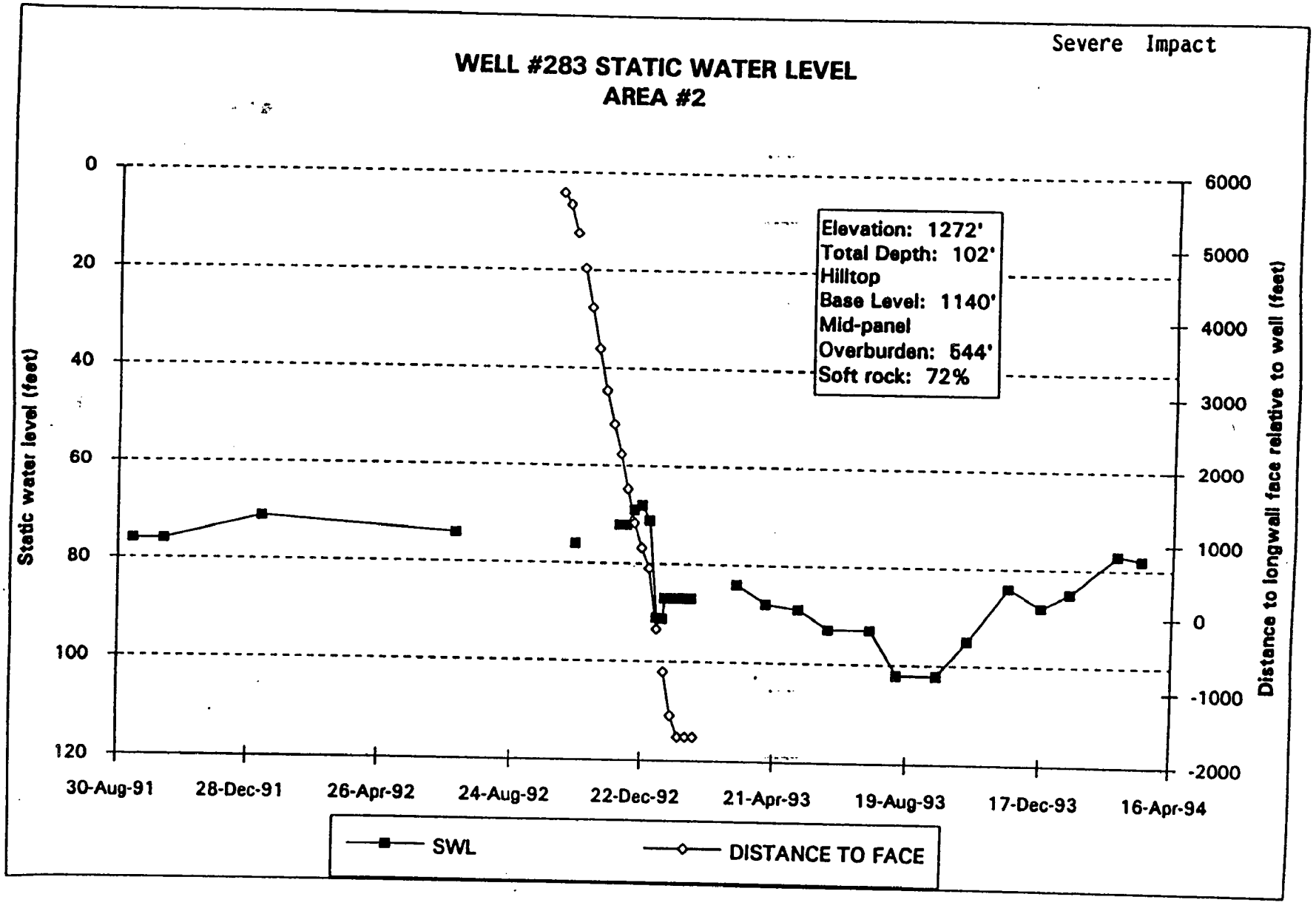
Prepared by: Moody and Assoc., Inc. 4/13/97

AEC 05085


WELL #282A STATIC WATER LEVEL
AREA #
Severe Impact
Elevation: 1272'
Total Depth: 118'
Hilltop
Base Level: 1080'
Mid-panel
Overburden: 544'
Static water level (feet)
0
20
40
60
80
100
120
Distance to longwall face relative to well (feet)
6000
5000
4000
3000
2000
1000
0
-1000
-2000
30-Aug-91
28-Dec-91
26-Apr-92
24-Aug-92
22-Dec-92
21-Apr-93
19-Aug-93
17-Dec-93
16-Apr-94
SWL
DISTANCE TO FACE

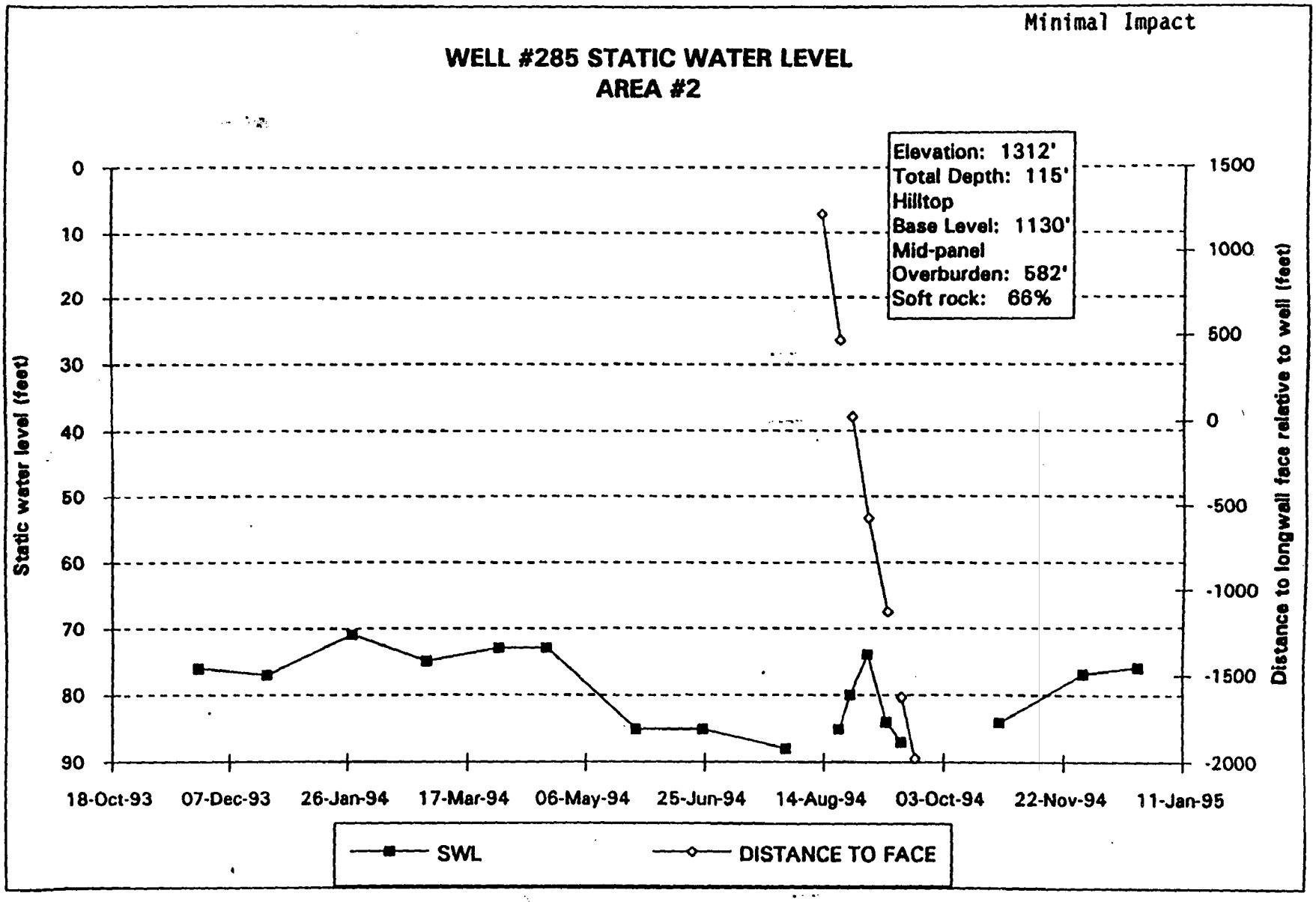
AEC 05086

Severe Impact

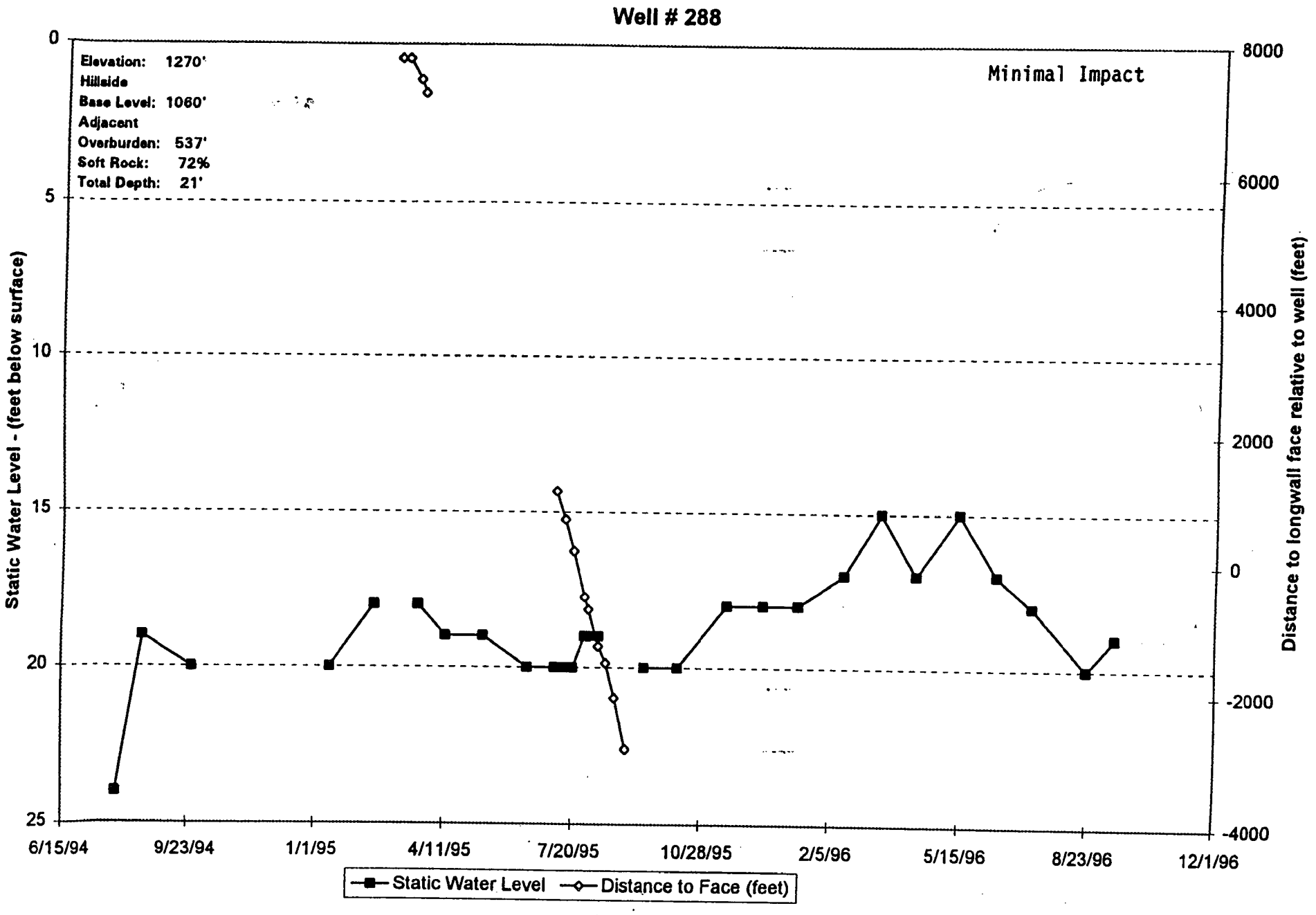


AEC 05087

Minimal Impact

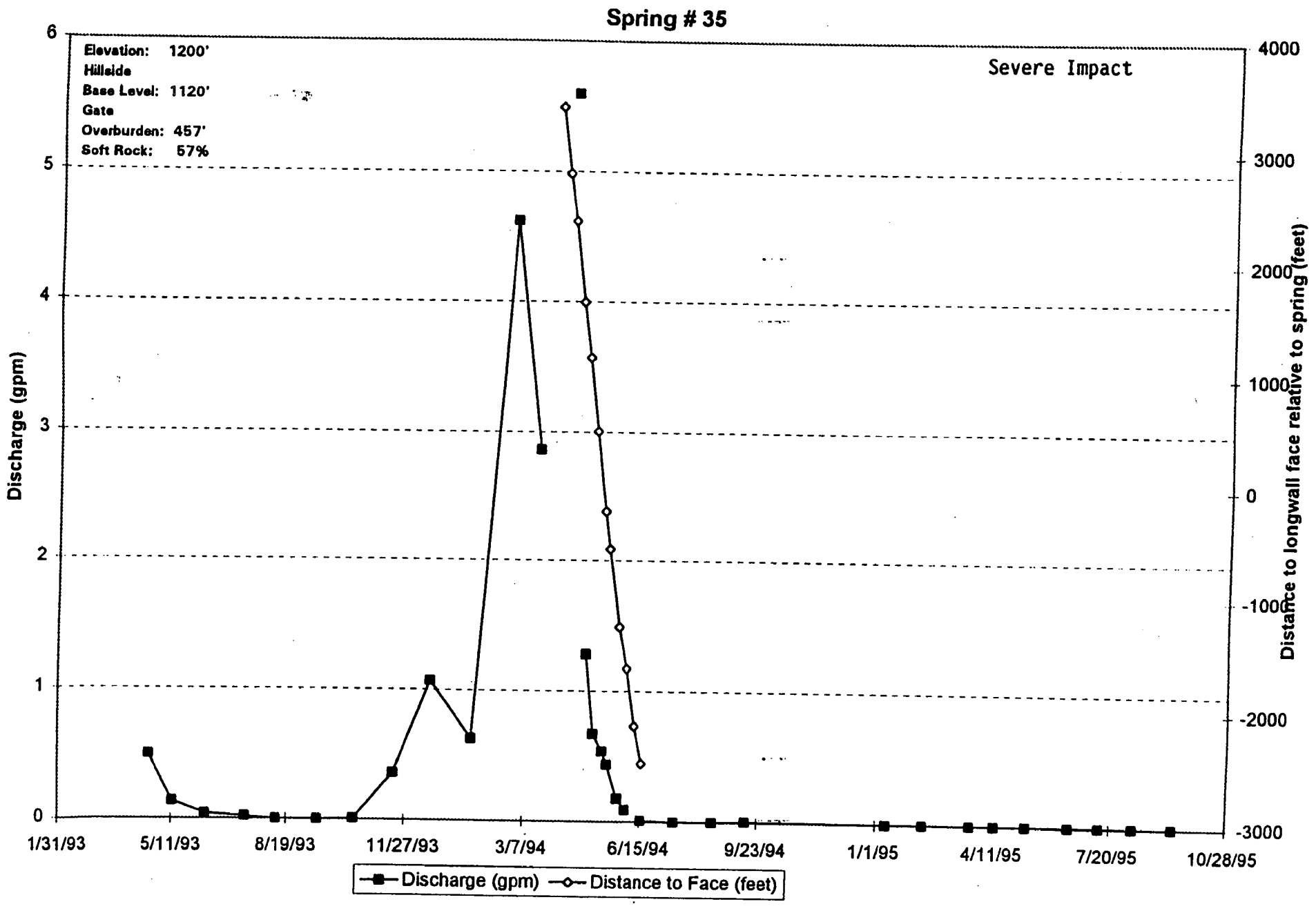


AEC 05088



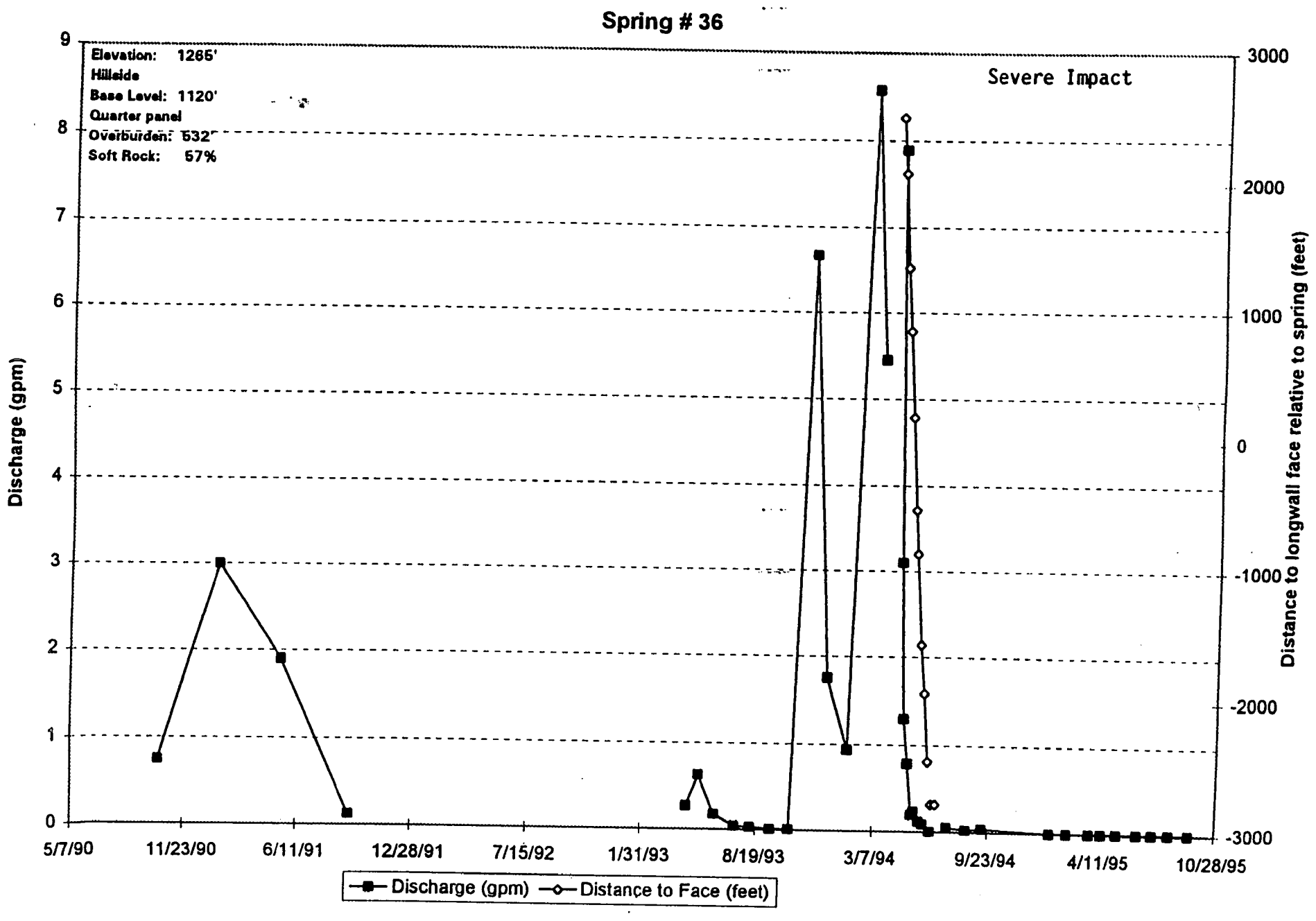
Prepared by: Moody and Assoc., Inc. 4/13/97

AEC 05089



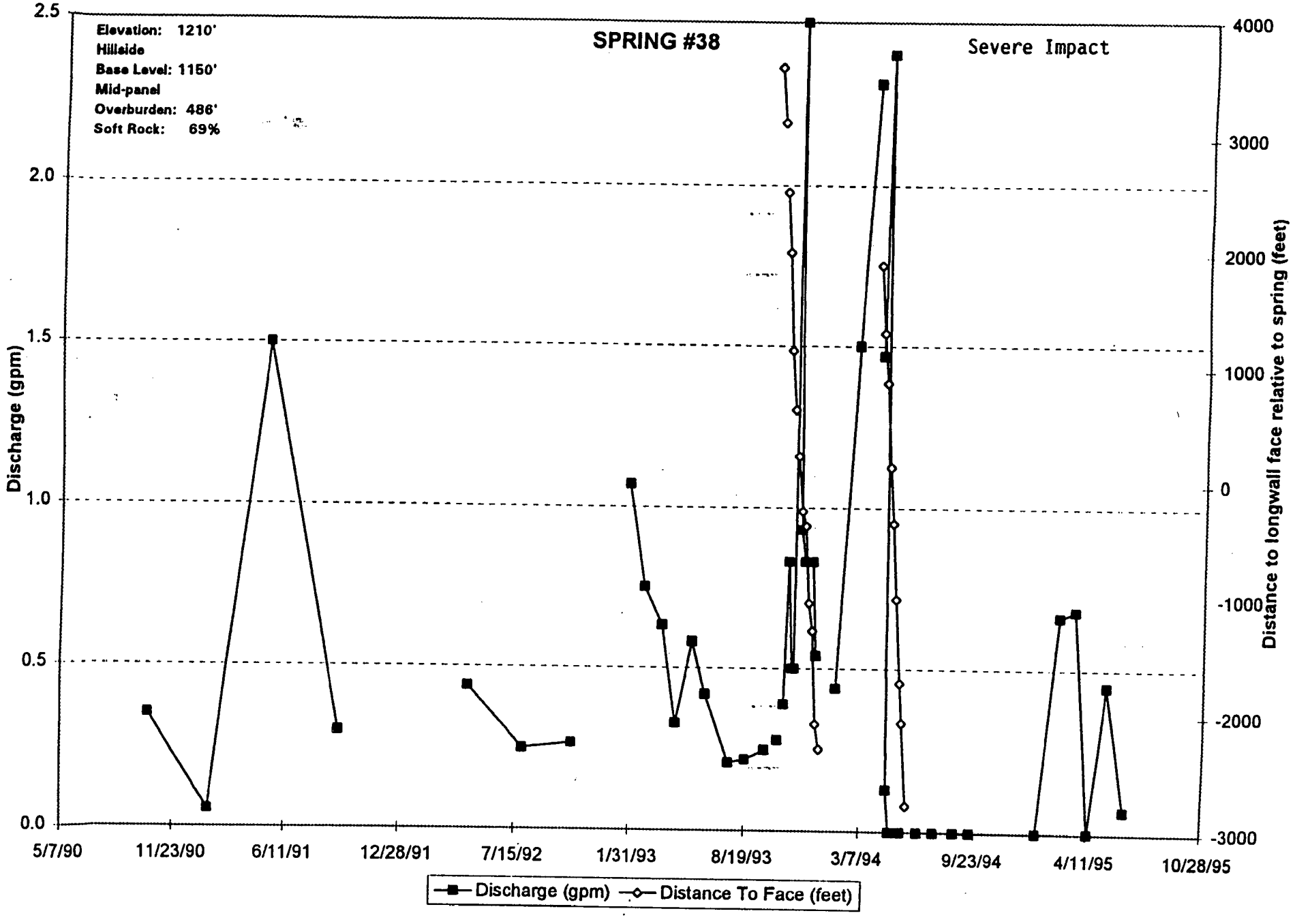
Prepared by: Moody and Assoc. Inc. 4/13/97

AEC 05090



Prepared by: Moody and Assoc., Inc. 4/14/97

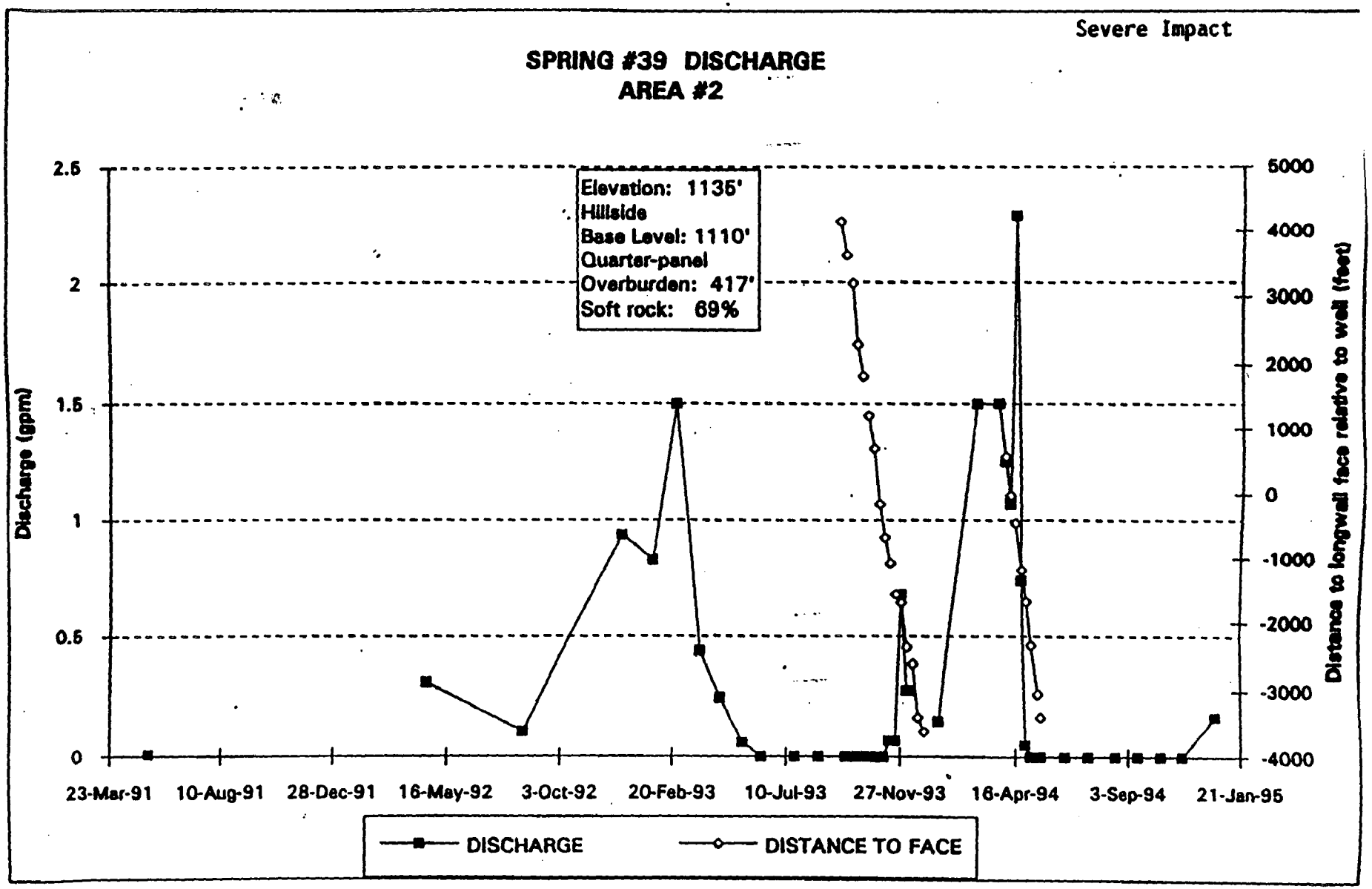
AEC 05091



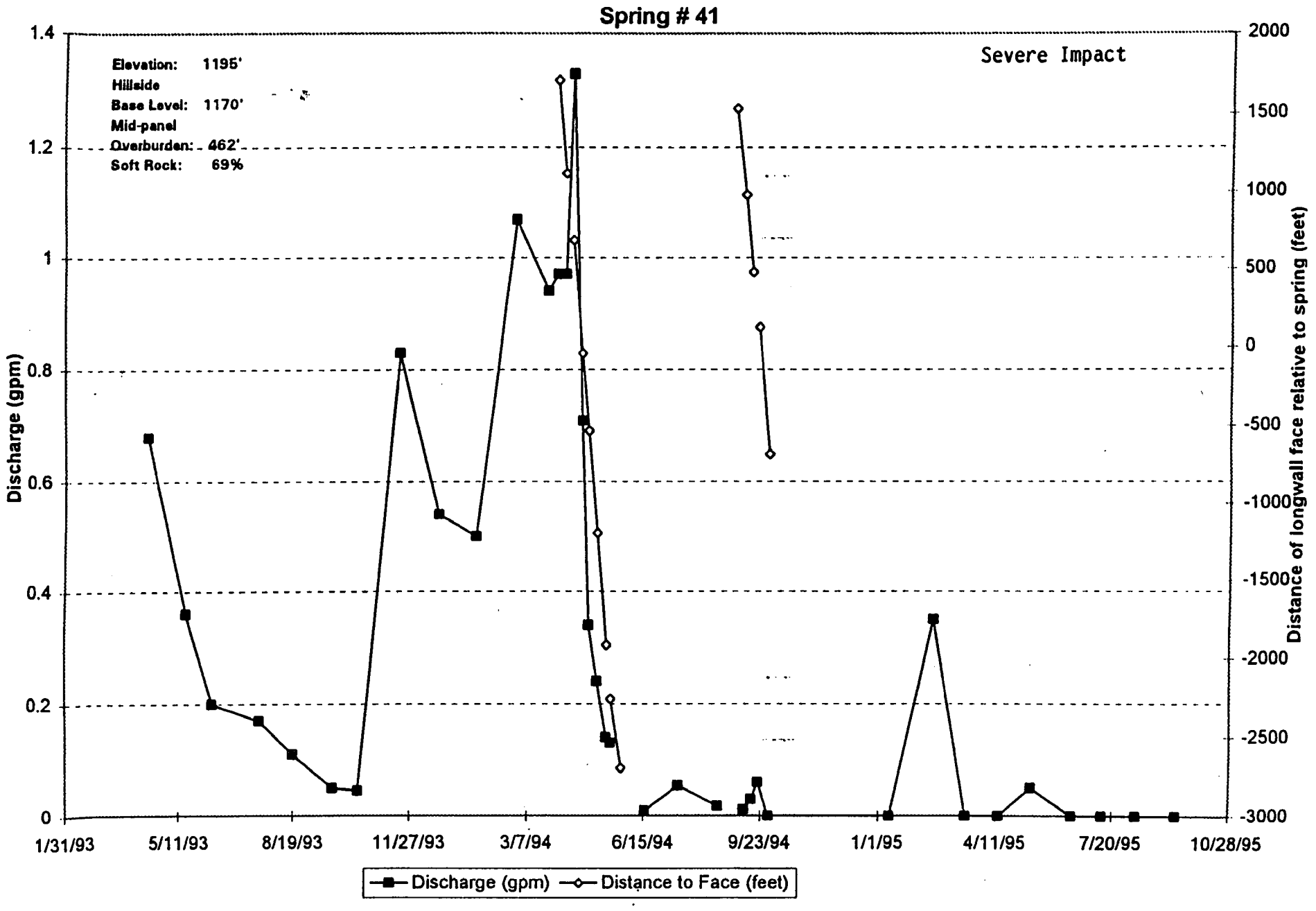
Prepared by: Moody and Assoc. Inc. 4/12/97

AEC 05092

Severe Impact



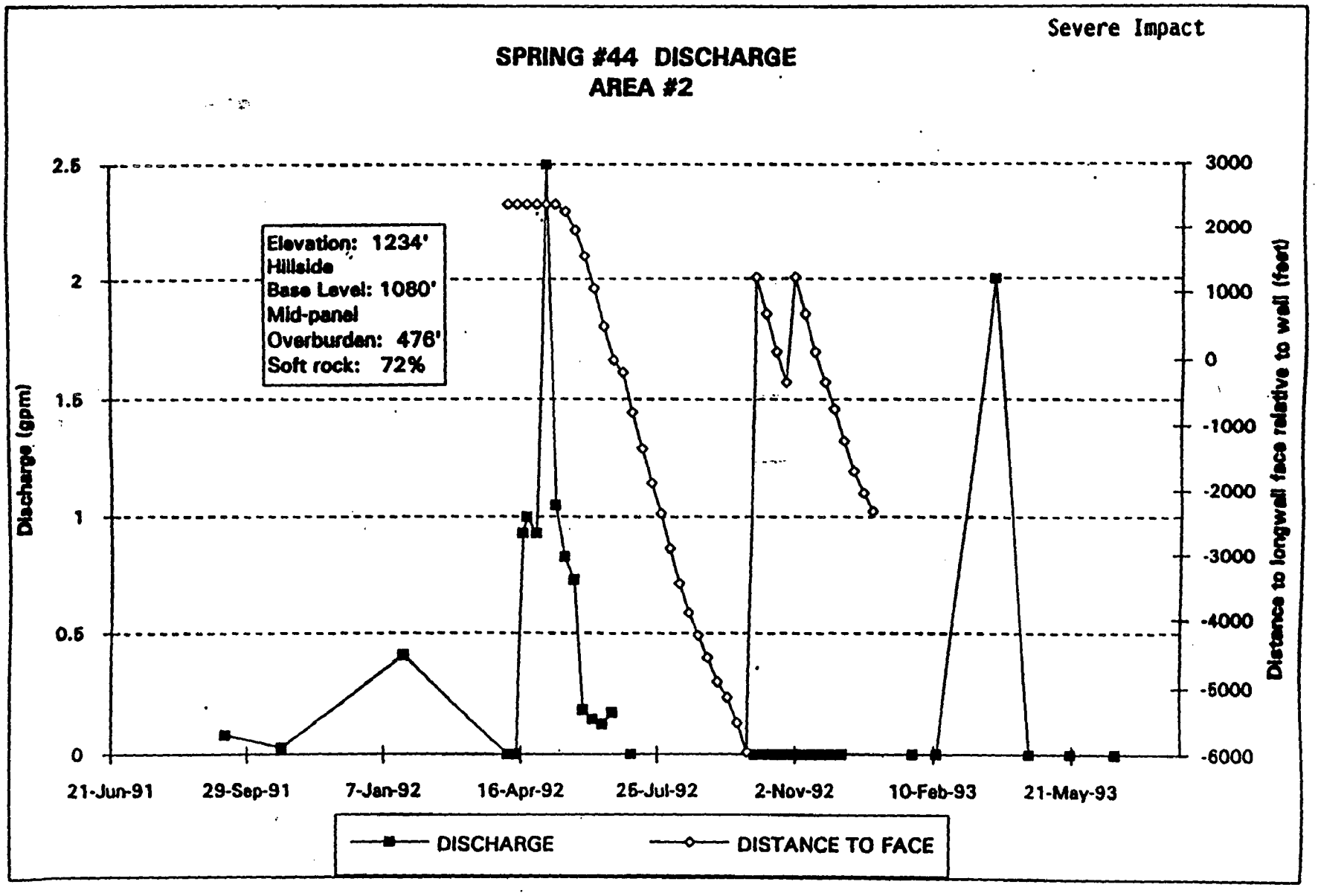
AEC 05093
AEC 05093



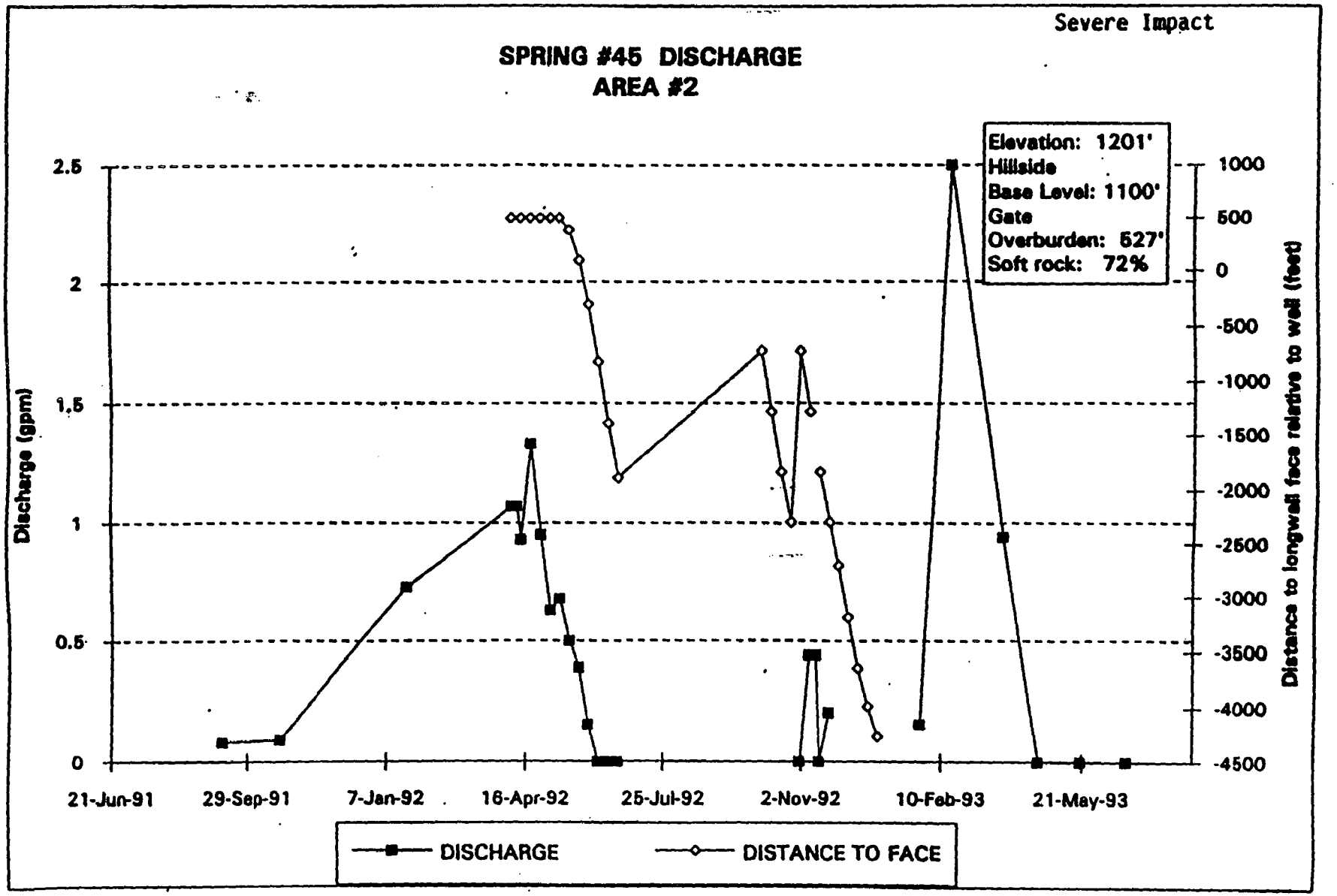
Prepared by: Moody and Assoc., Inc. 4/13/97

AEC 05094

Severe Impact

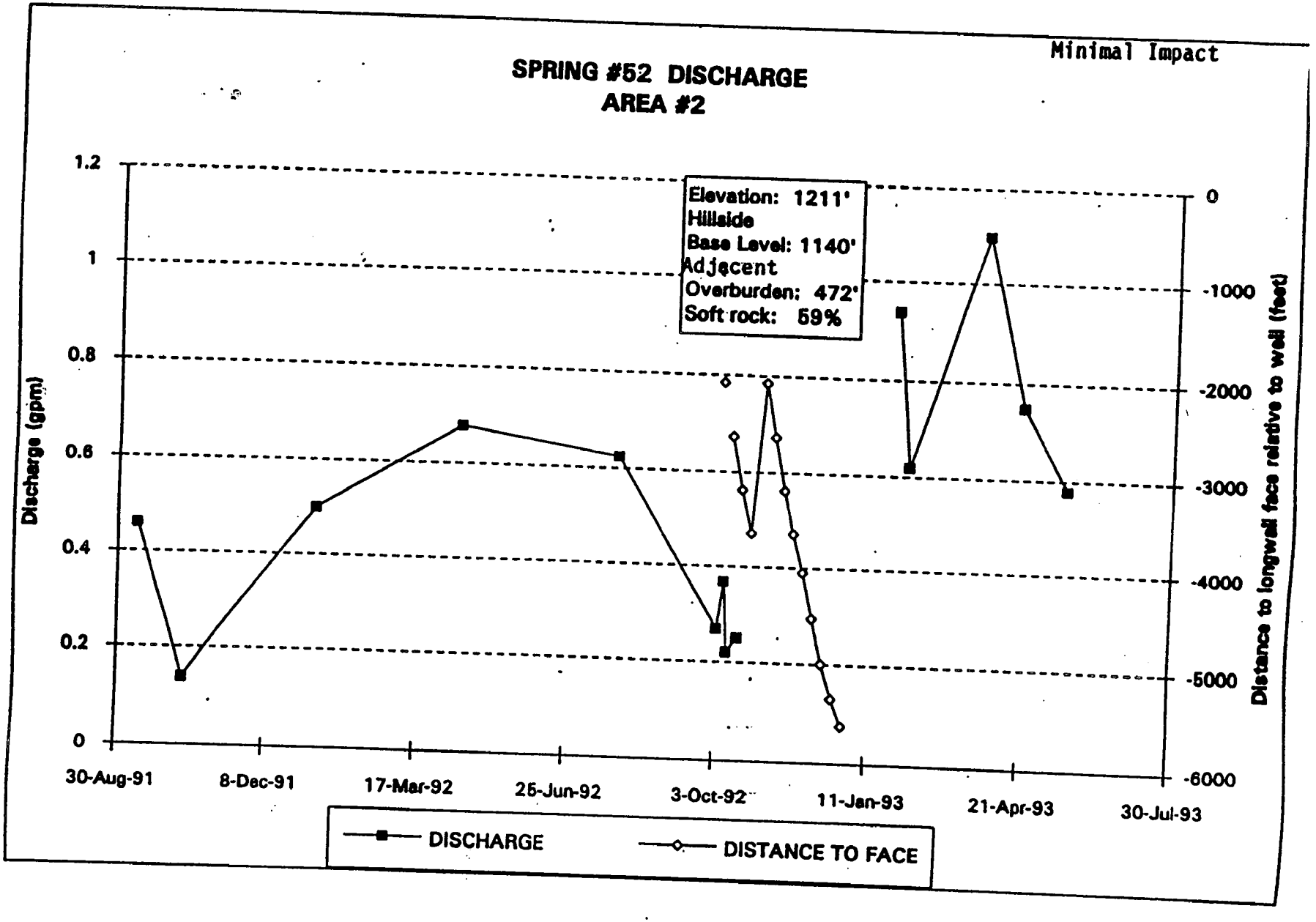


AEC 05095
AEC 05095



AEC 05096
AEC 05096

Minimal Impact



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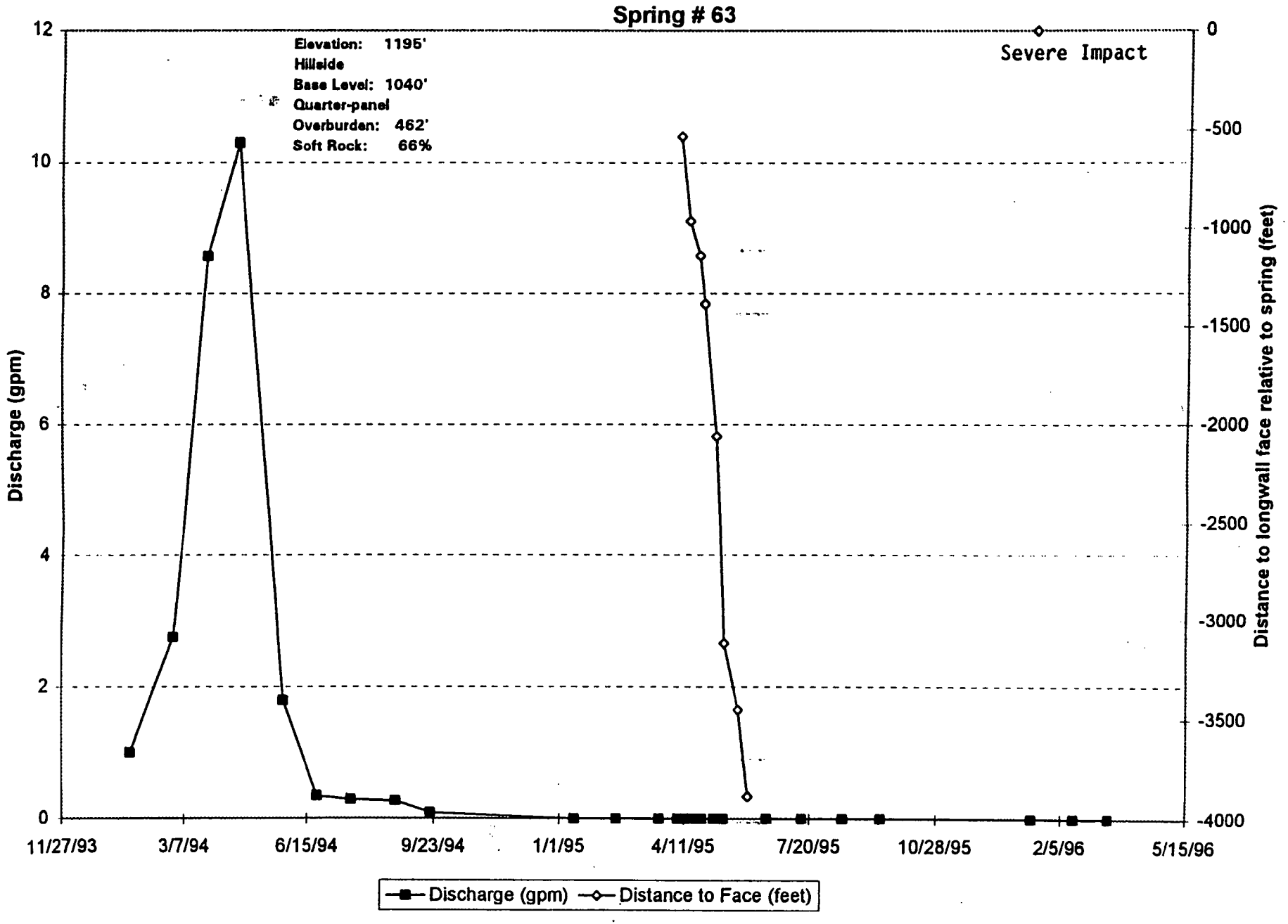
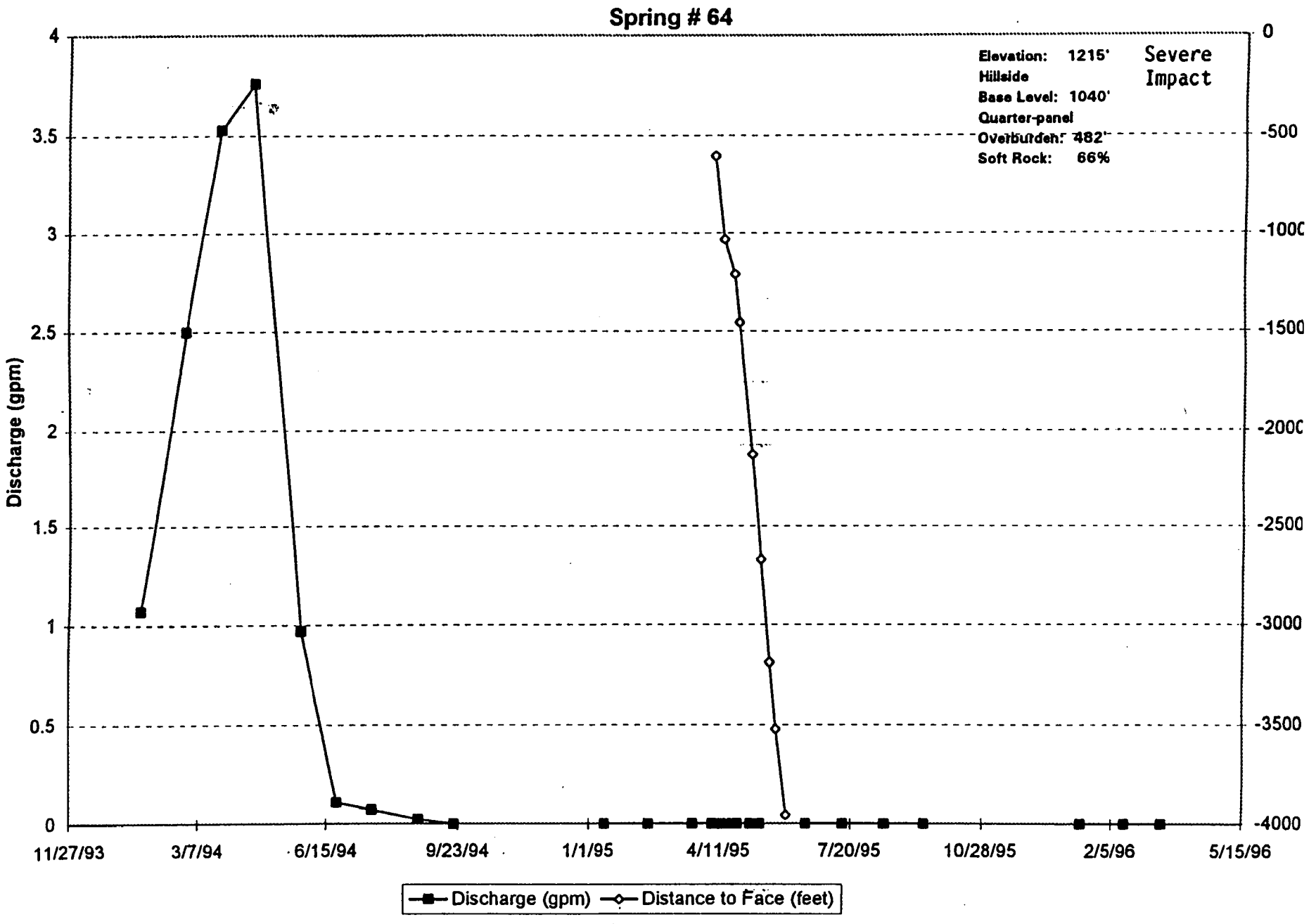


Prepared by: Moody and Assoc., Inc. 4/13/9

AEC 05098



Prepared by : Moody and Assoc., Inc. 4/13/97

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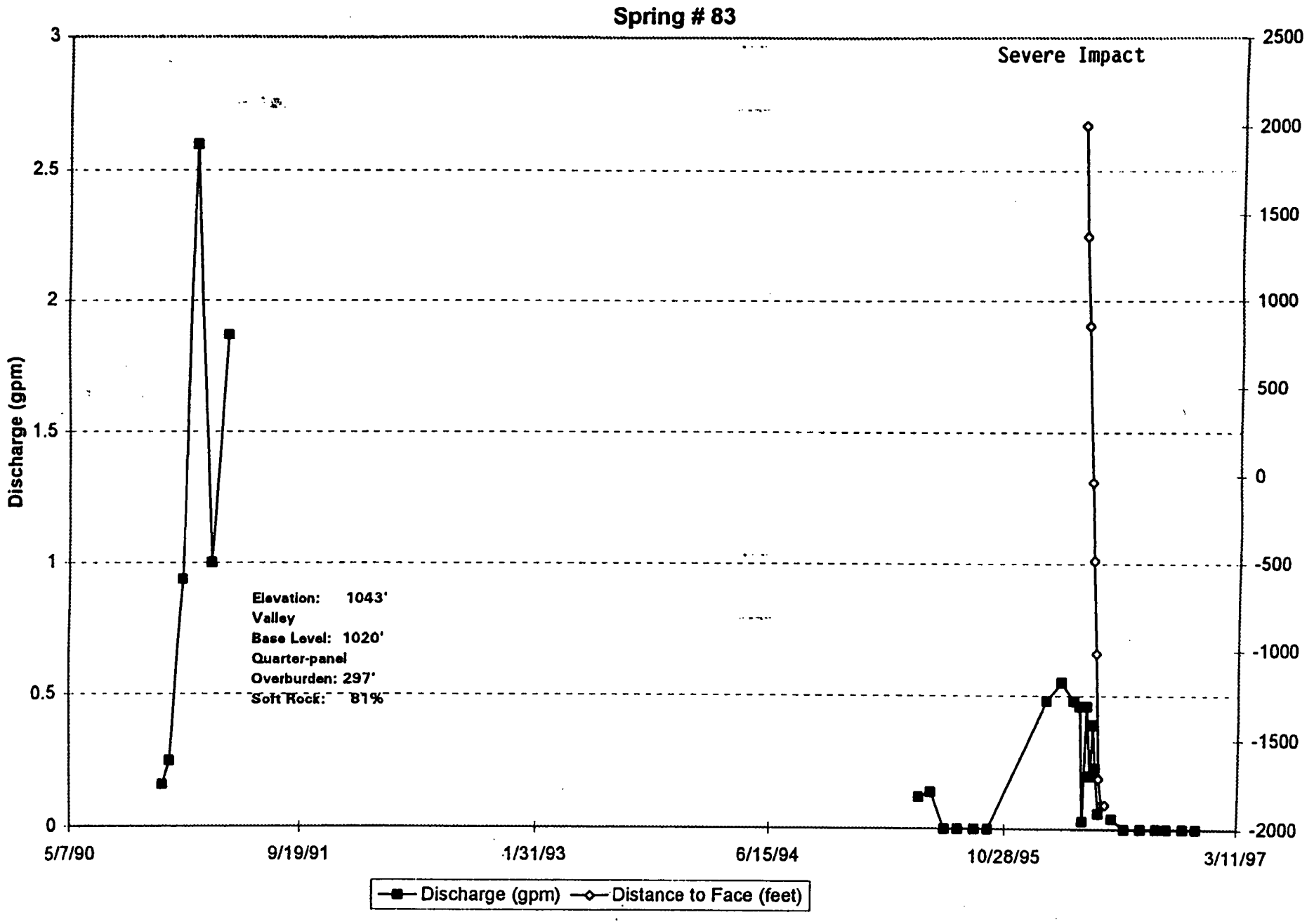
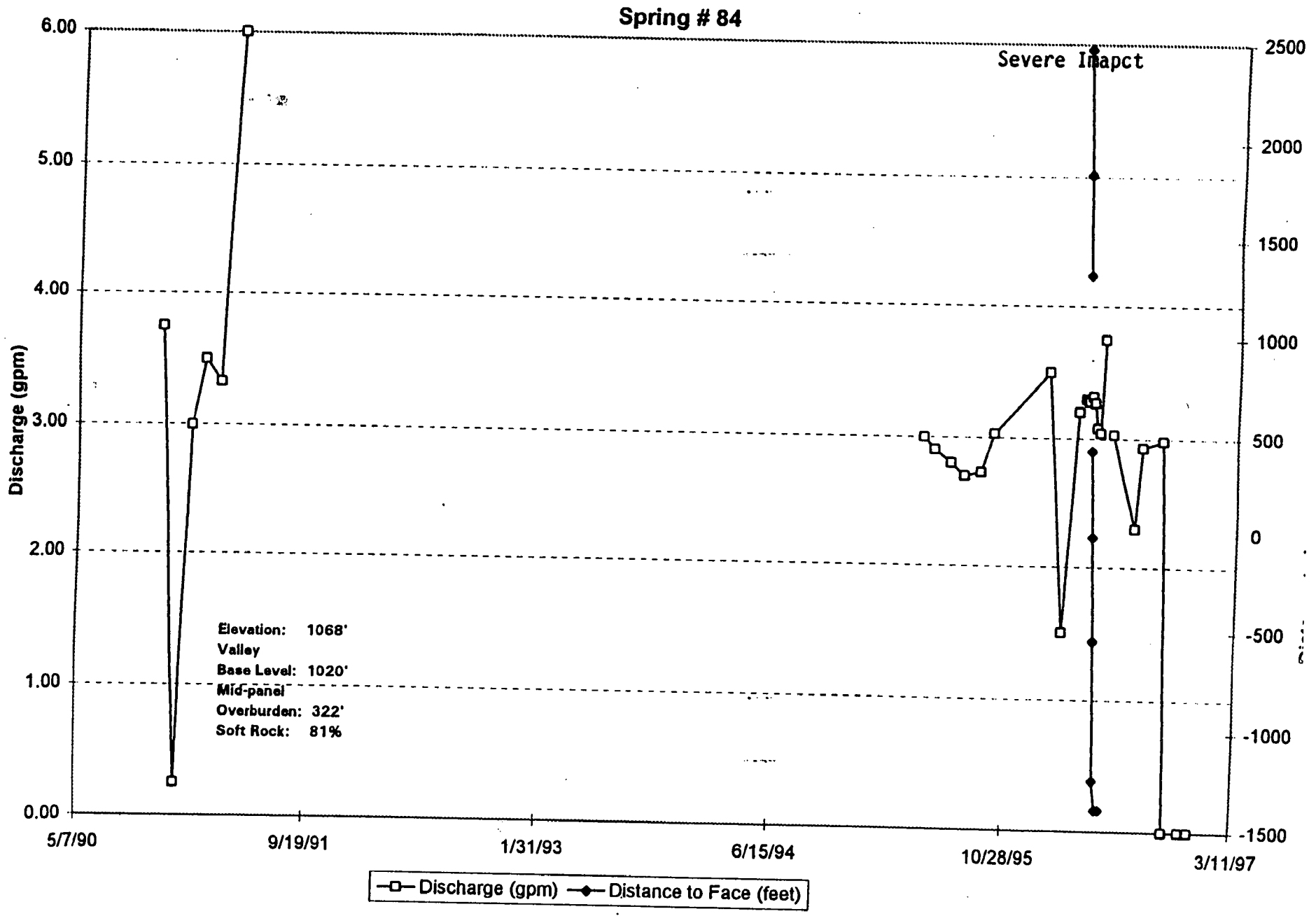


Prepared by: Moody and Assoc., Inc. 4/13/97

AEC 05100



Prepared by: Moody and Assoc. Inc. 4/12/97

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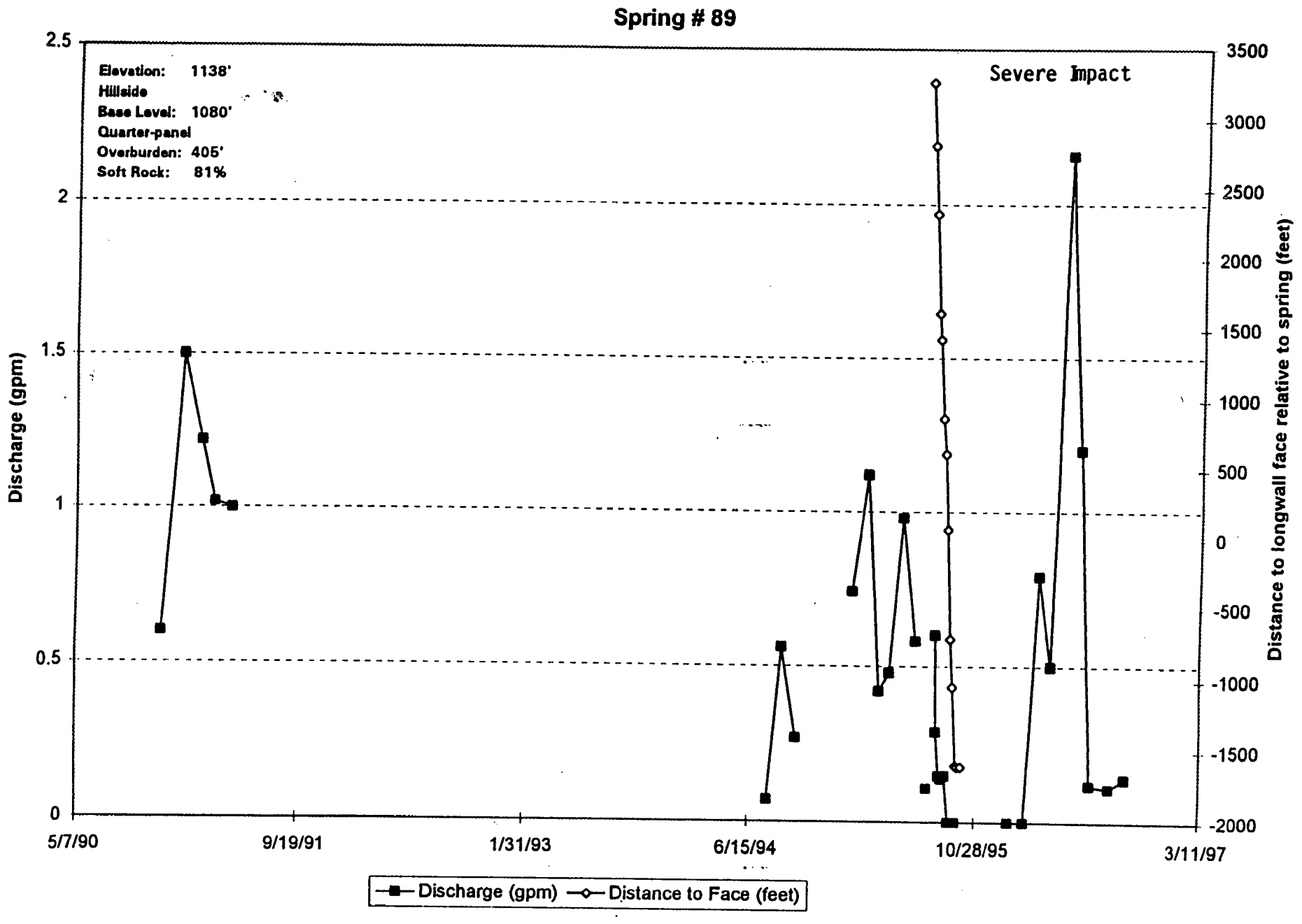
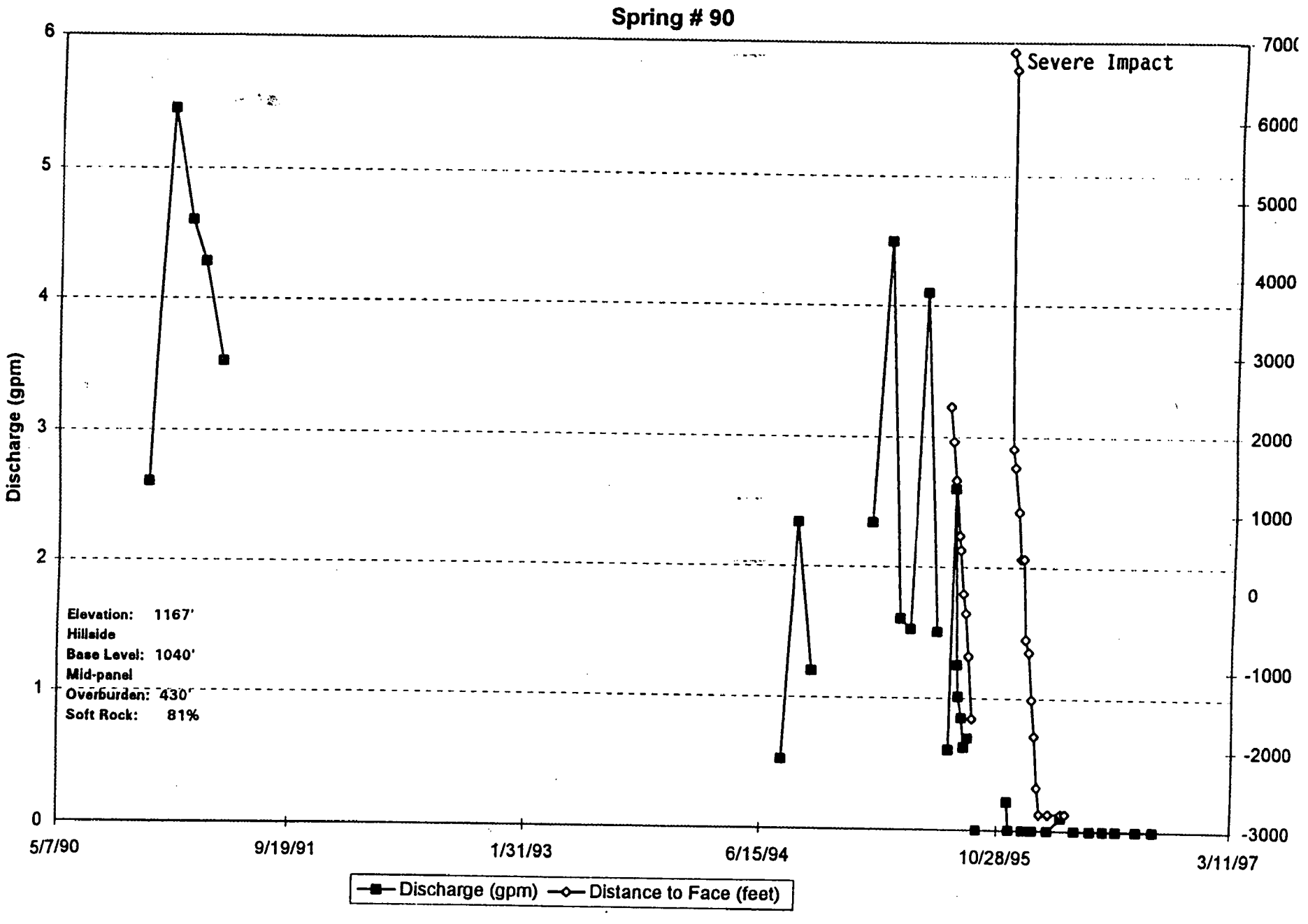

Spring # 89
Elevation: 1138'
Hillside
Base Level: 1080'
Quarter-panel
Overburden: 405'
Soft Rock: 81%
Severe Impact
Discharge (gpm)
Distance to longwall face relative to spring (feet)
2.5
2
1.5
1
0.5
0
3500
3000
2500
2000
1500
1000
500
0
-500
-1000
-1500
-2000
5/7/90
9/19/91
1/31/93
6/15/94
10/28/95
3/11/97
Discharge (gpm)
Distance to Face (feet)

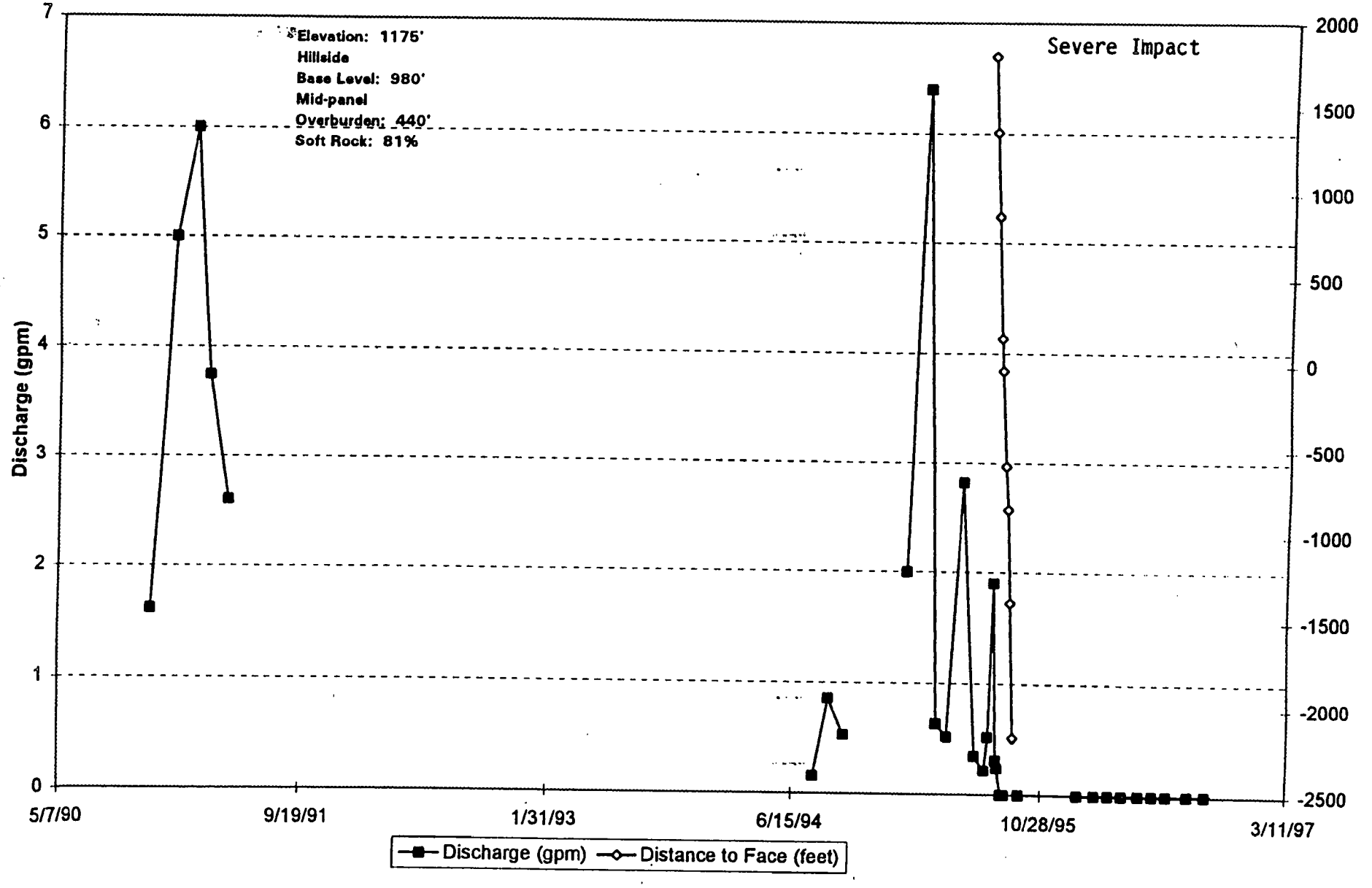
AEC 05102



Prepared by: Moody and Assoc. Inc. 4/13/97

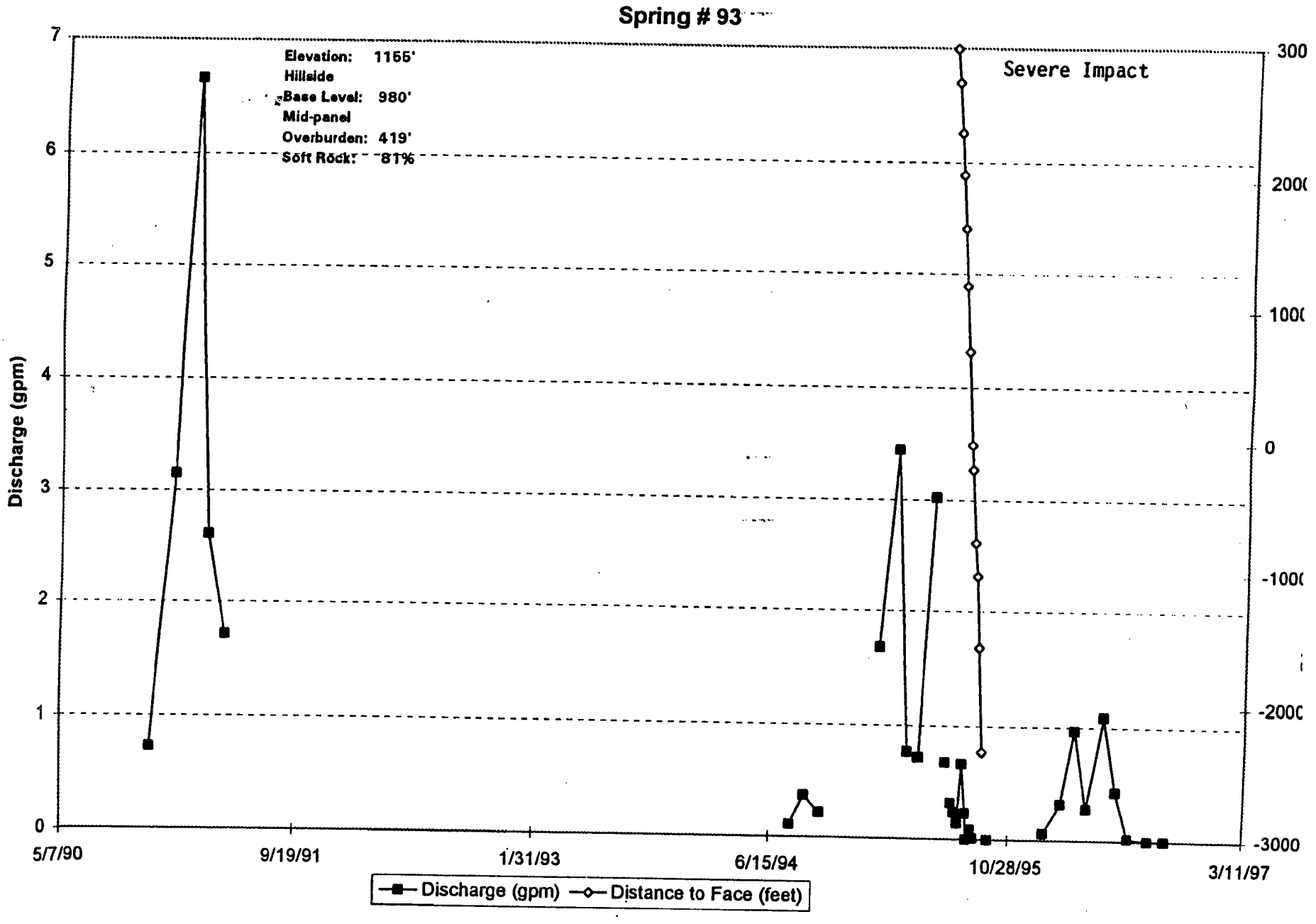
AEC 05103

Spring # 92



Prepared by: Moody and Assoc., Inc. 4/13/97

AEC 05104



Prepared by: Moody and Assoc. Inc 4/12/97

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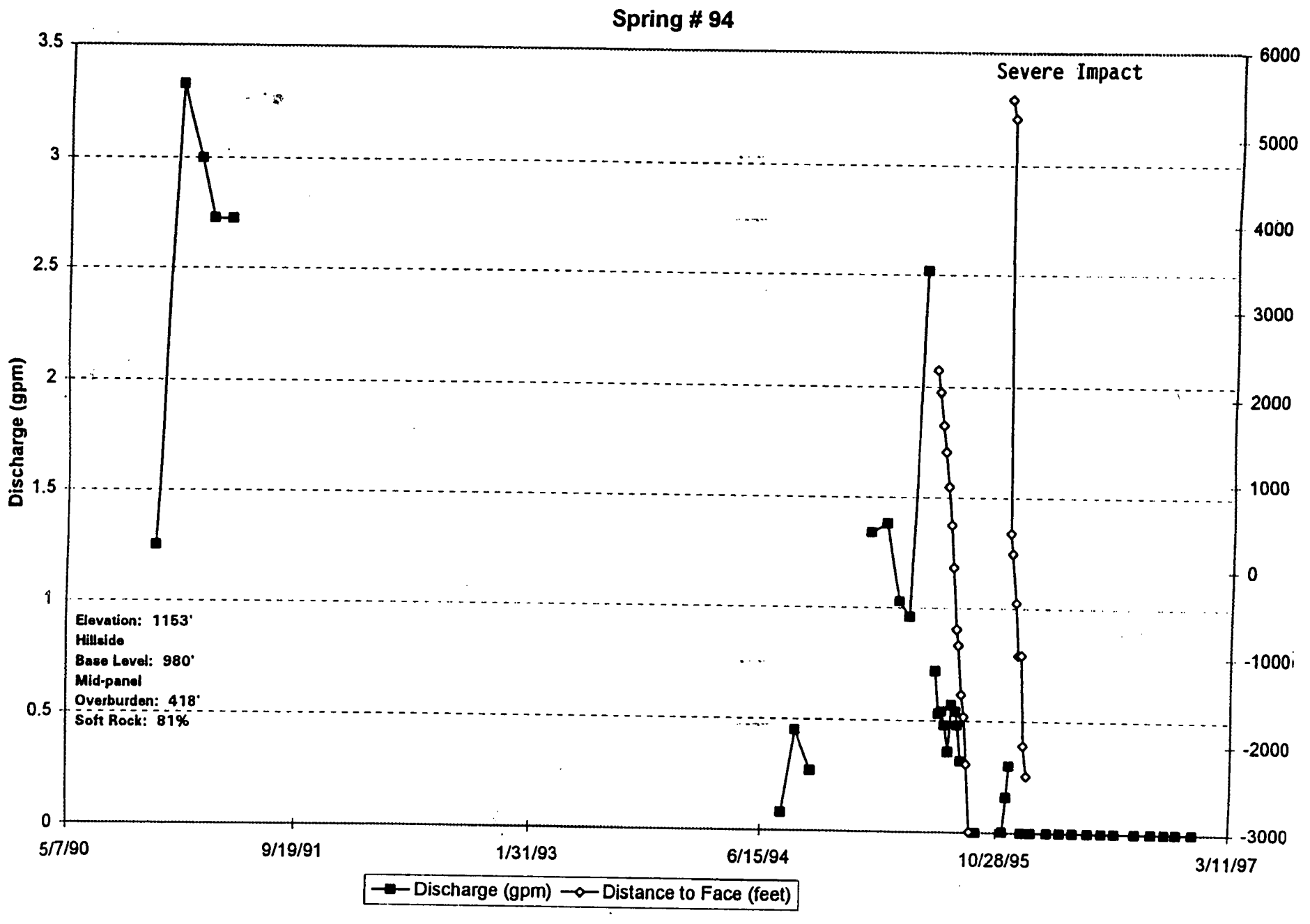
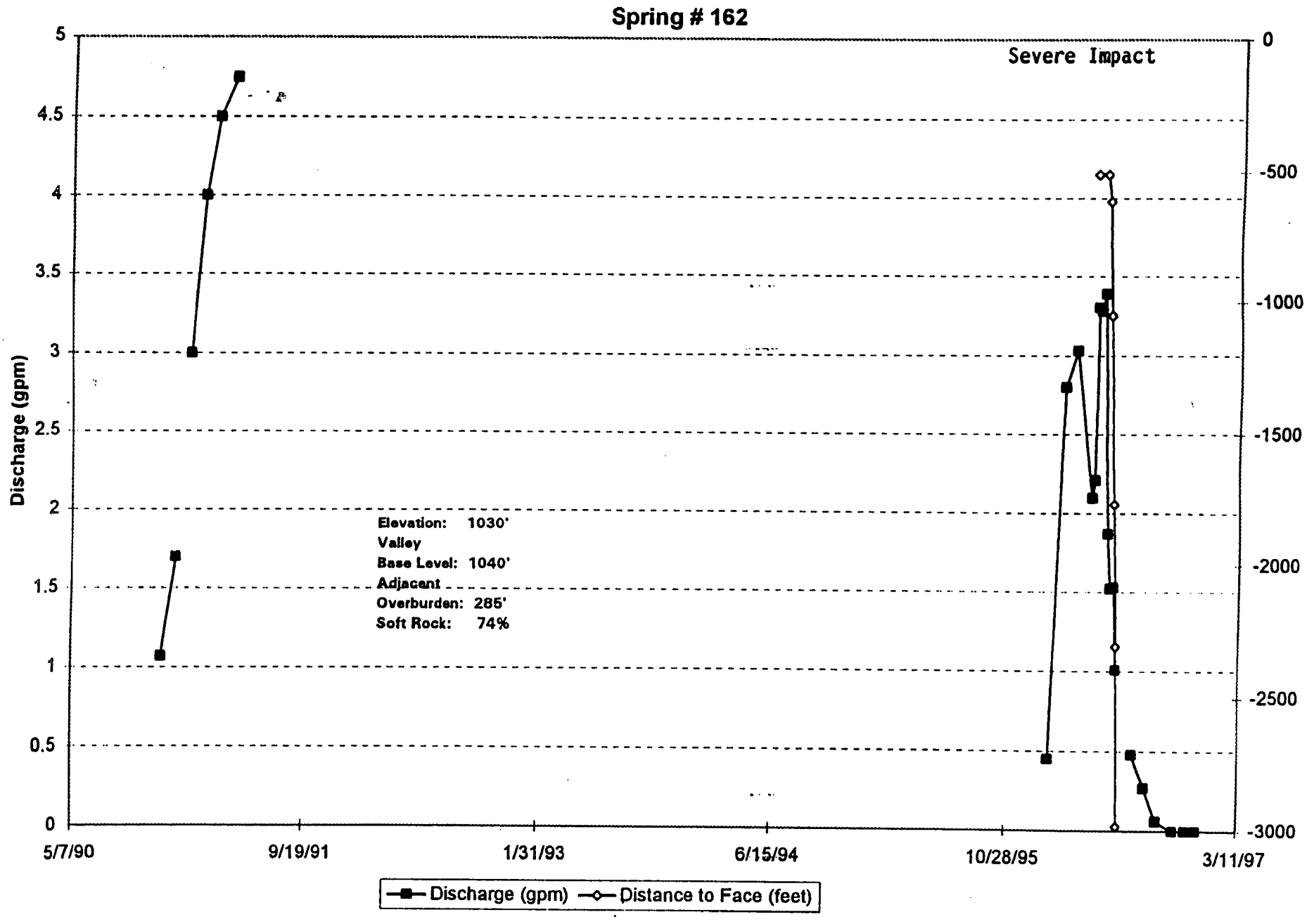


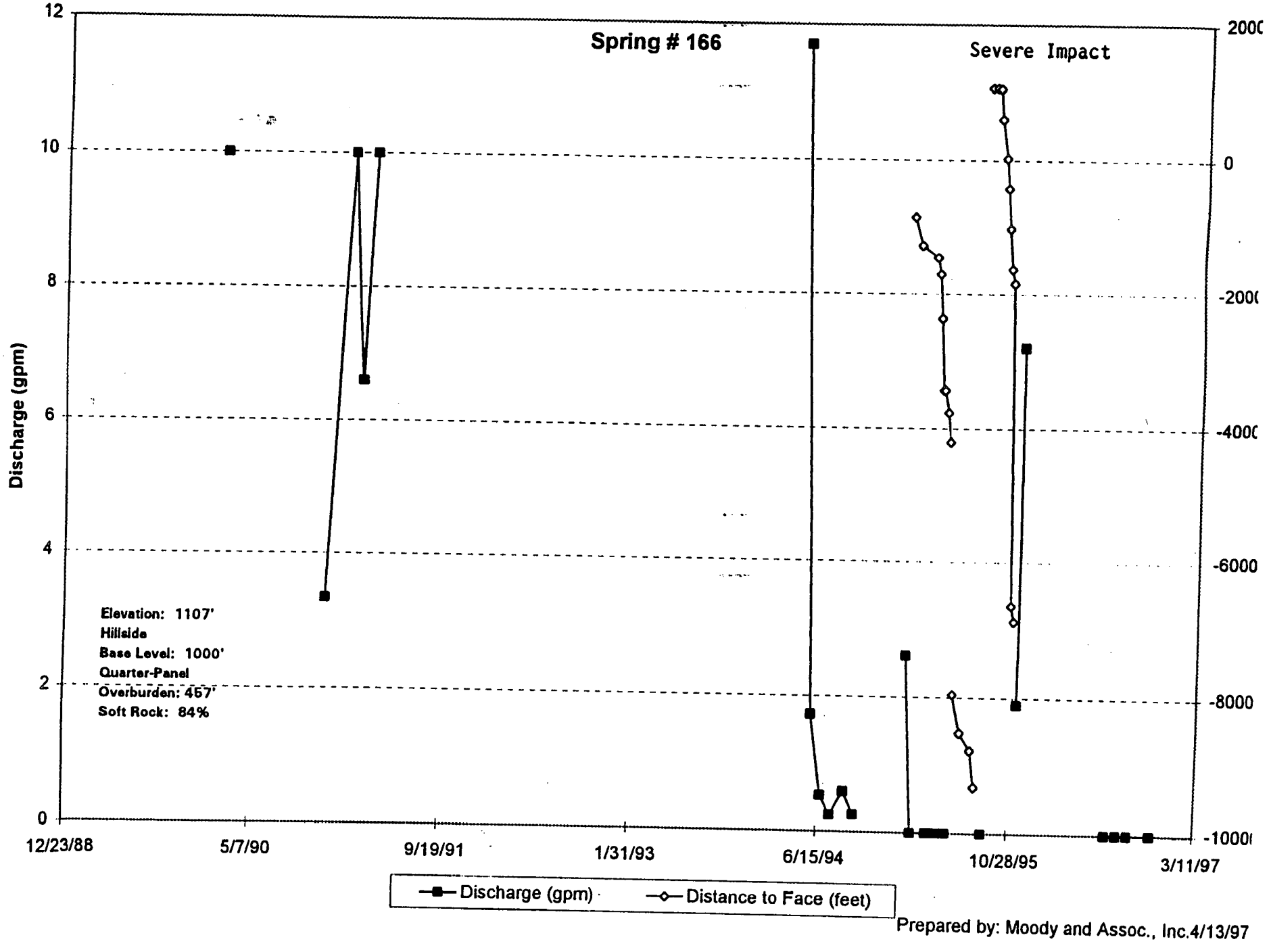
Prepared by: Moody and Assoc. Inc. 4/18/97

AEC 05106

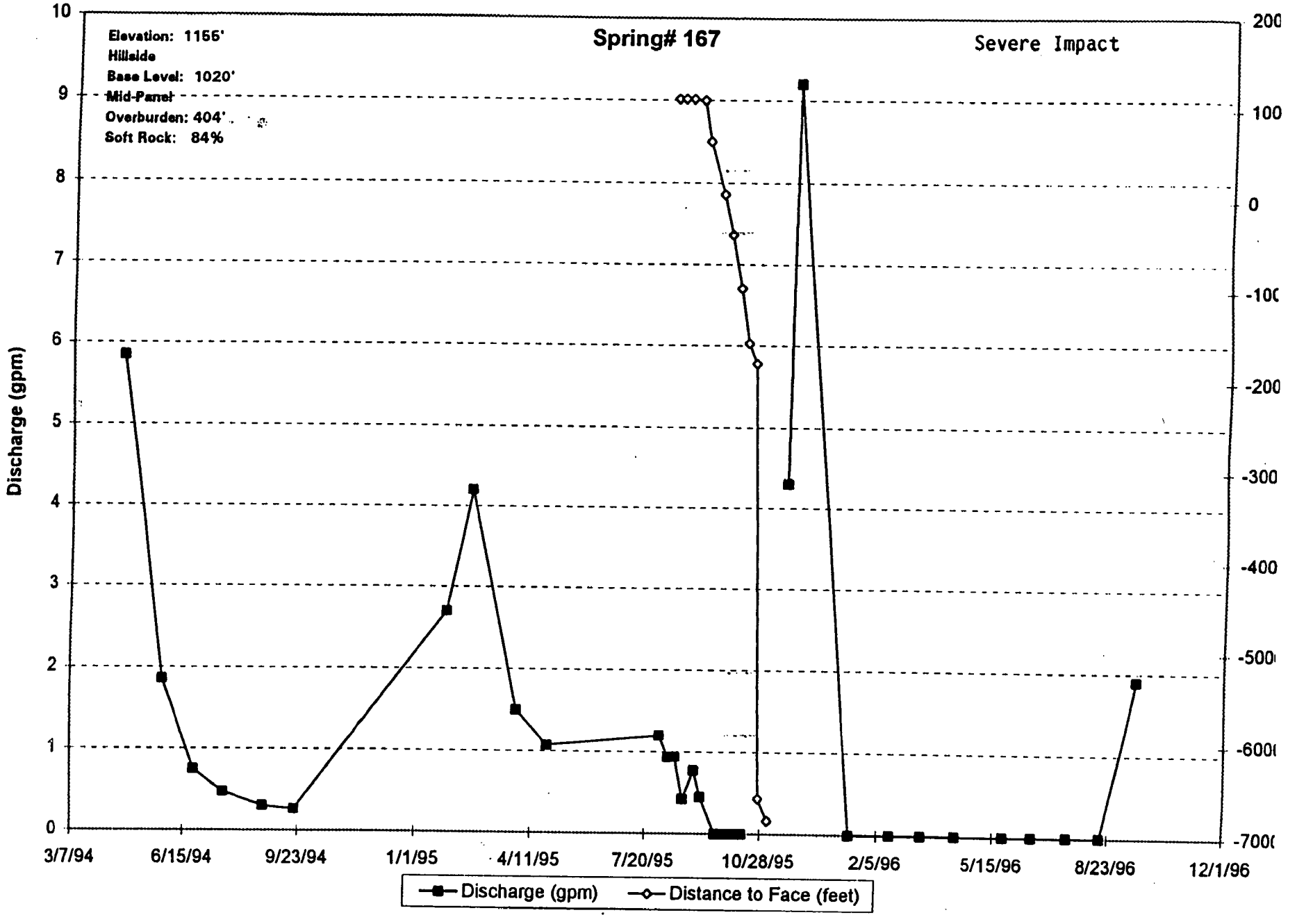


Prepared by: Moody and Assoc., Inc. 4/13/9

AEC 05107


Spring # 166
Severe Impact
Discharge (gpm)
12
10
8
6
4
2
0
2000
0
-2000
-4000
-6000
-8000
-10000
12/23/88
5/7/90
9/19/91
1/31/93
6/15/94
10/28/95
3/11/97
Elevation: 1107'
Hillside
Base Level: 1000'
Quarter-Panel
Overburden: 457'
Soft Rock: 84%
Discharge (gpm)
Distance to Face (feet)
Prepared by: Moody and Assoc., Inc.4/13/97

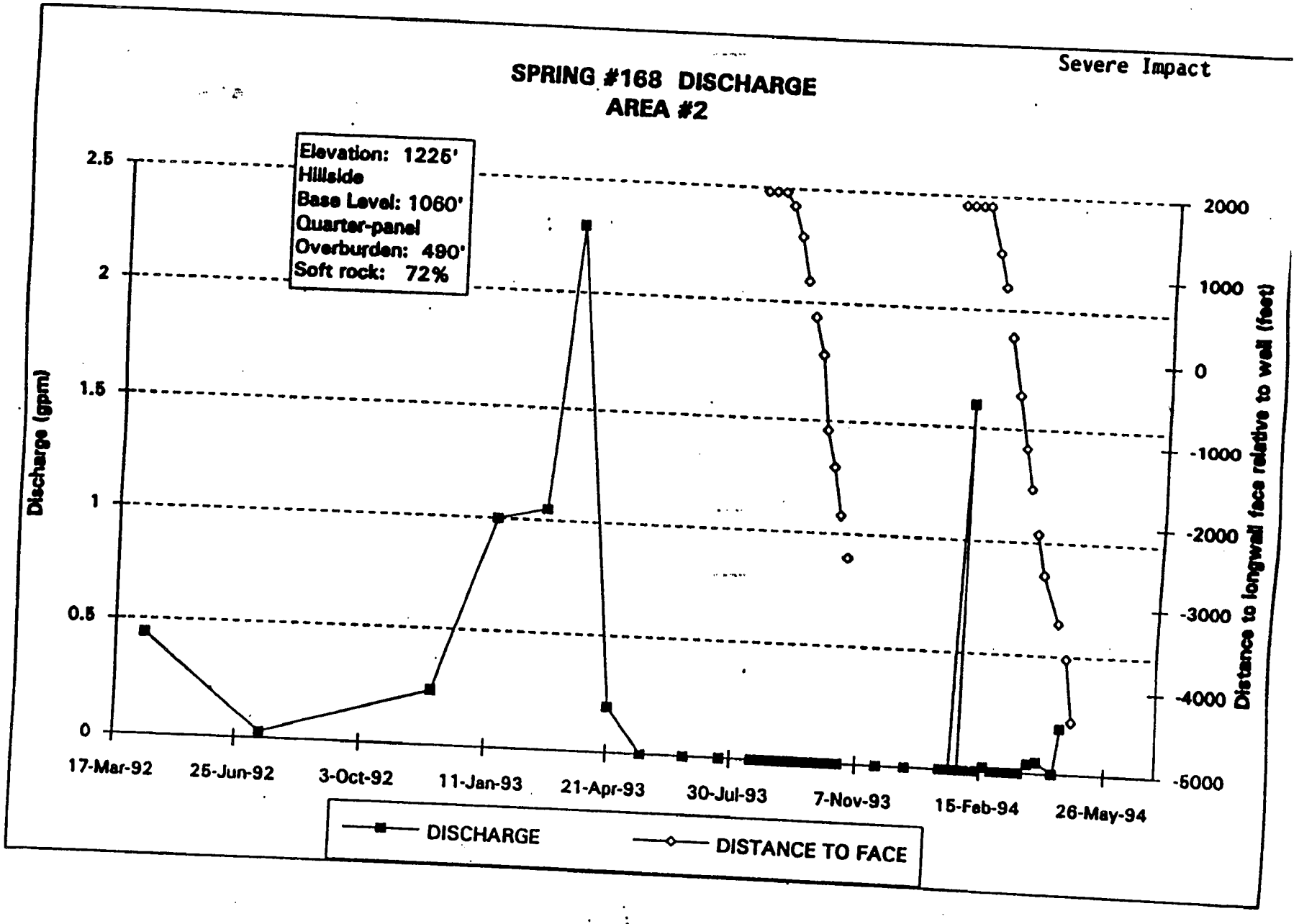
AEC 05108



Prepared by: Moody and Assoc. Inc4/13/97

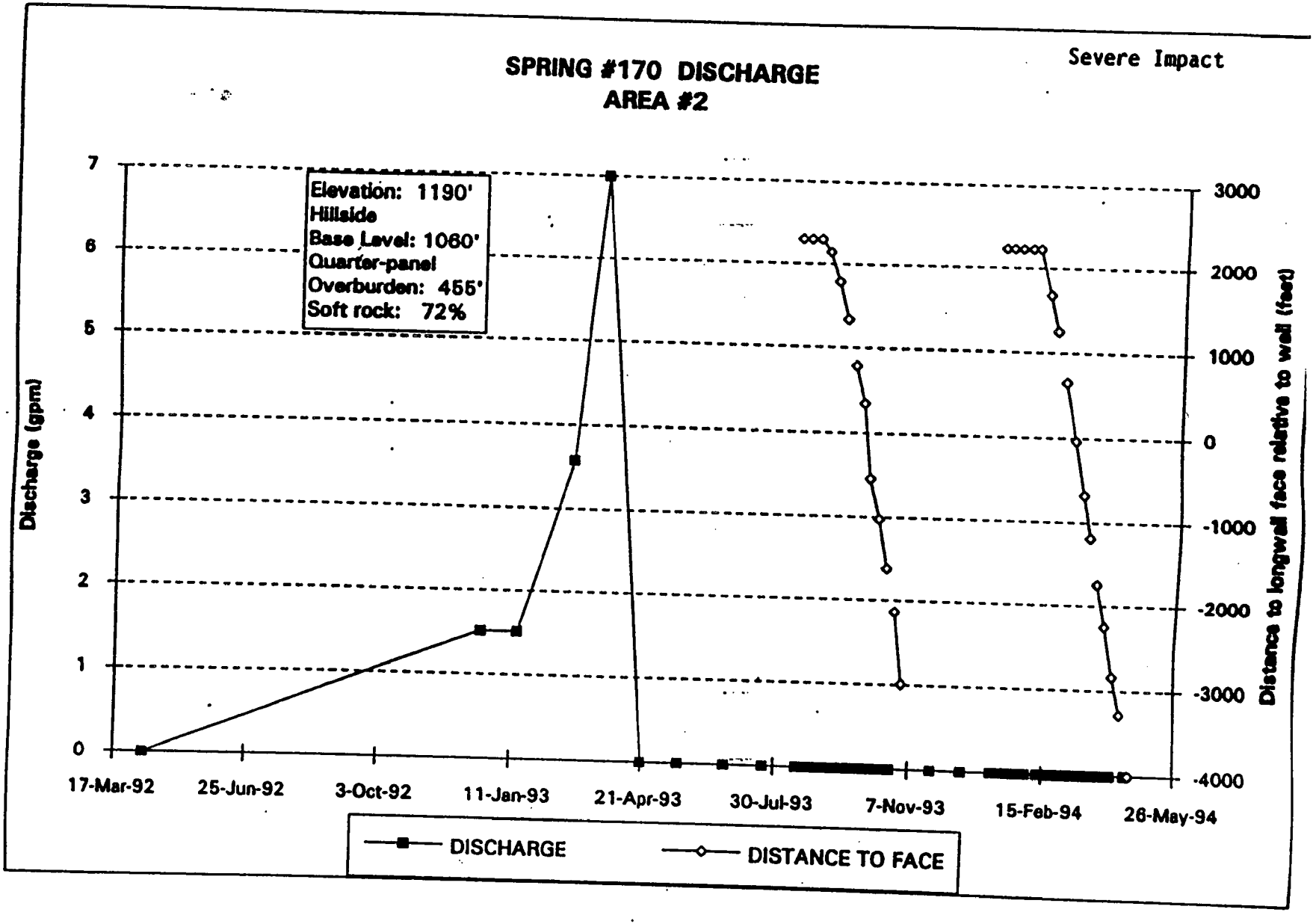
AEC 05109

Severe Impact



AEC 05110

Severe Impact



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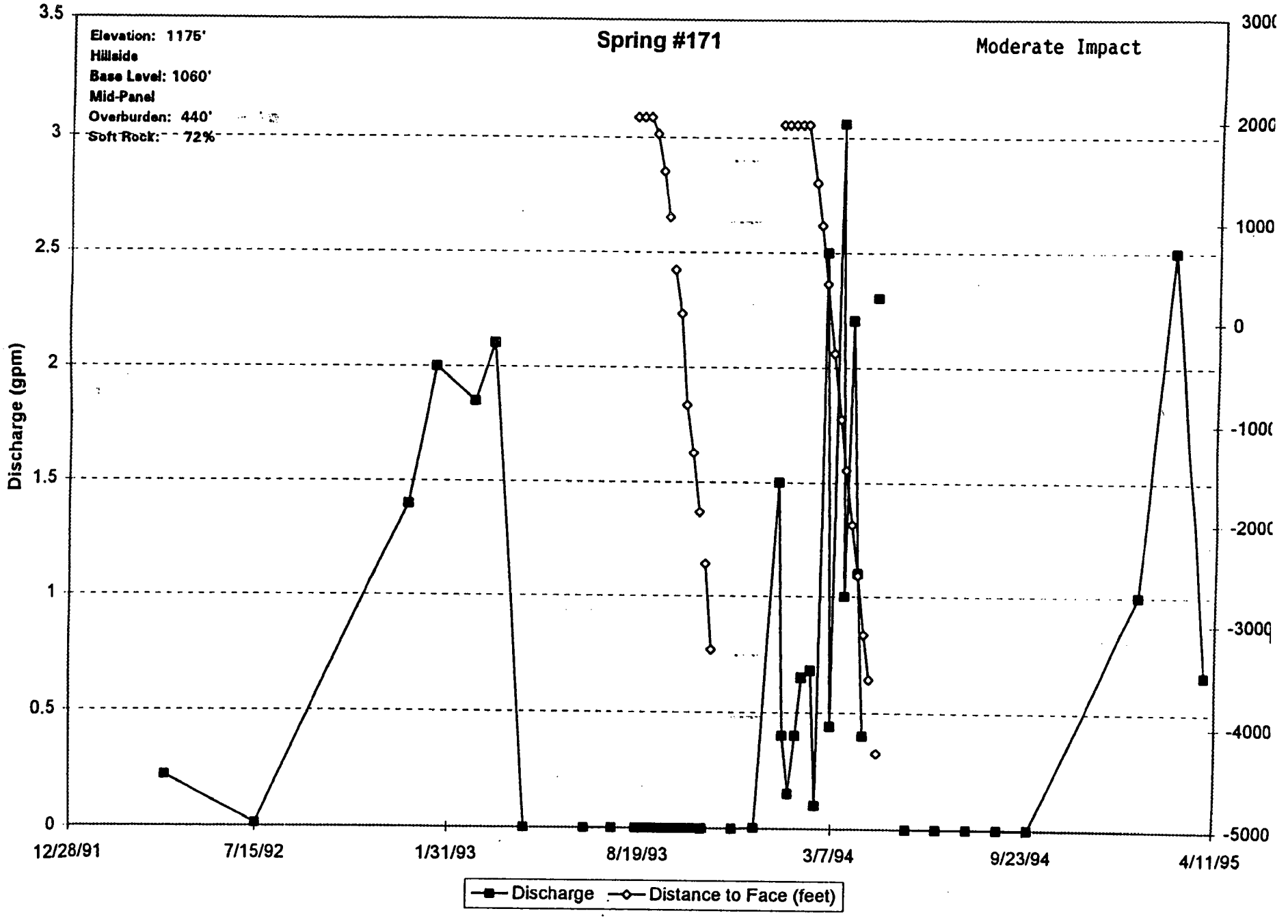
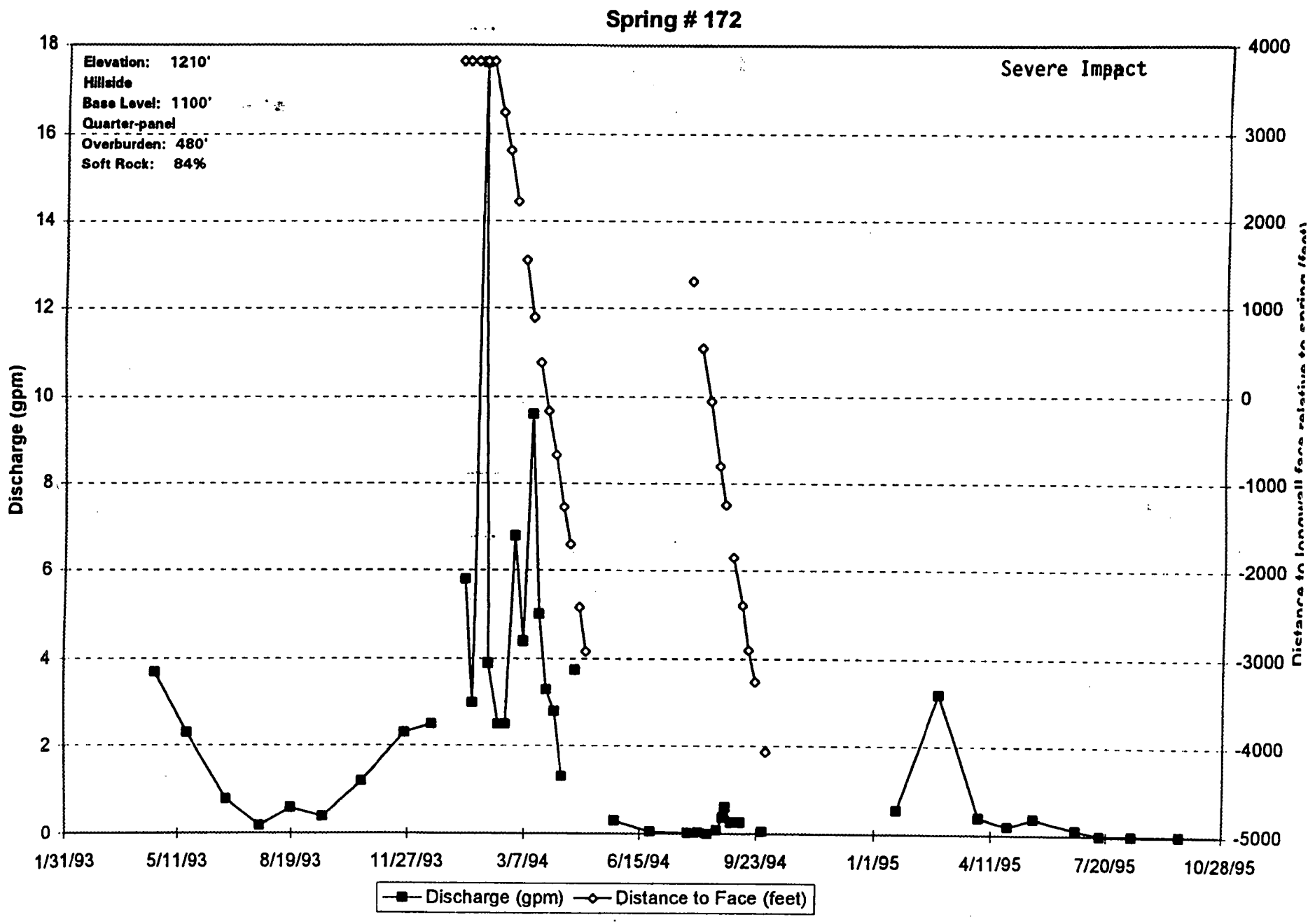


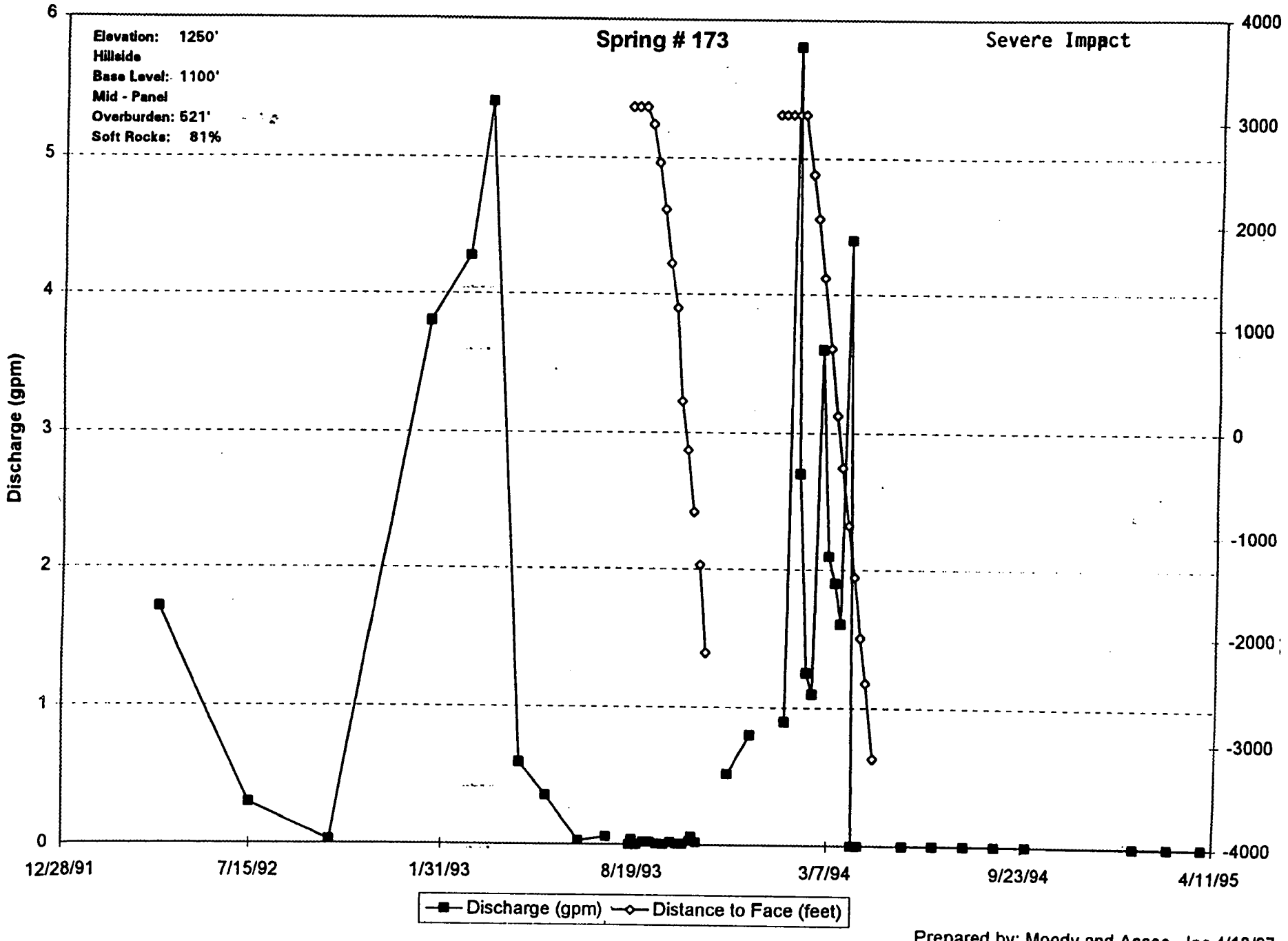
Prepared by: Moody and Assoc. Inc. 4/12/97

AEC 05112



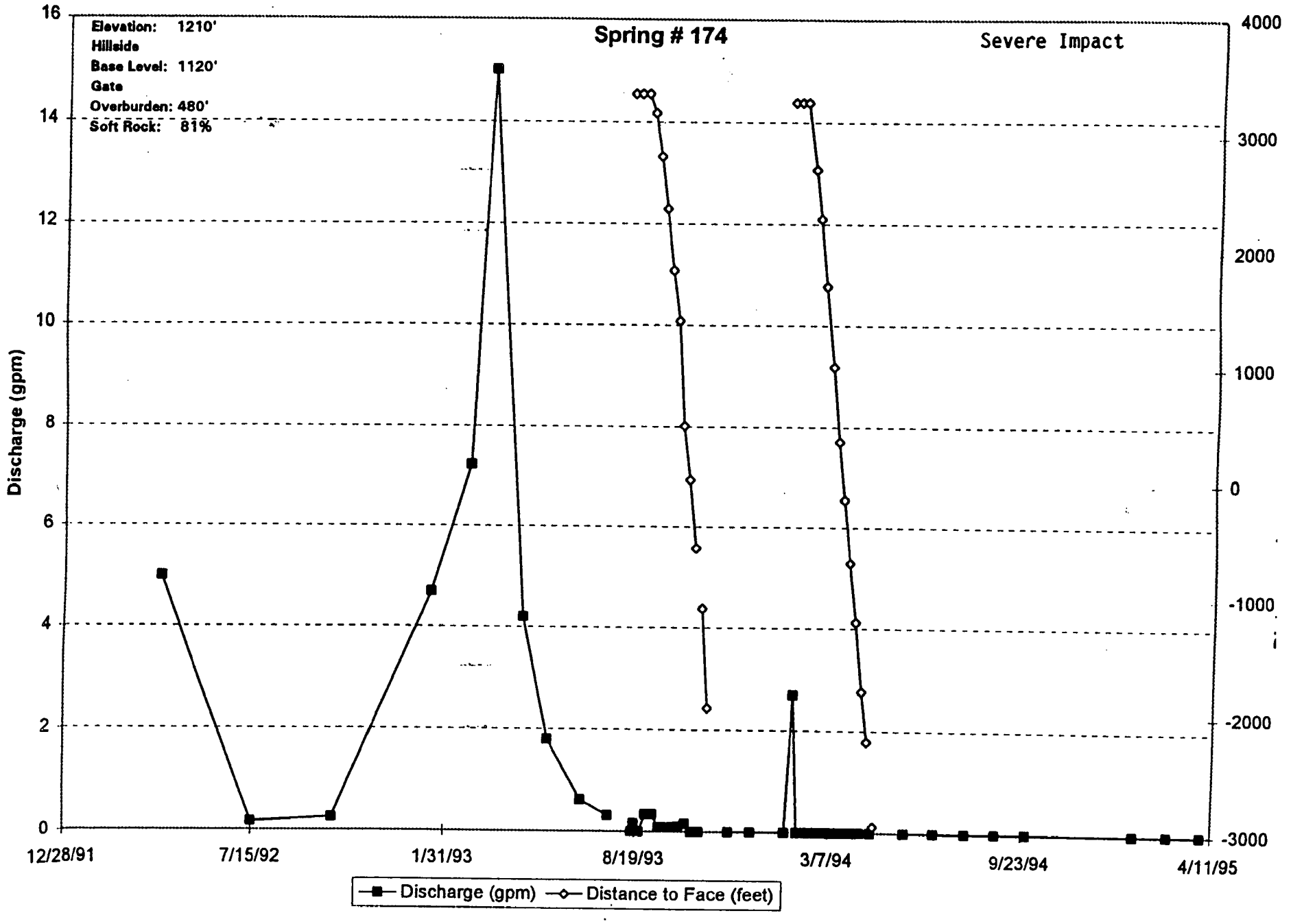
Prepared by: Moody and Assoc., Inc. 4/13/97

AEC 05113



Prepared by: Moody and Assoc., Inc.4/13/97

AEC 05114



Prepared by: Moody and Assoc., Inc. 4/13/97

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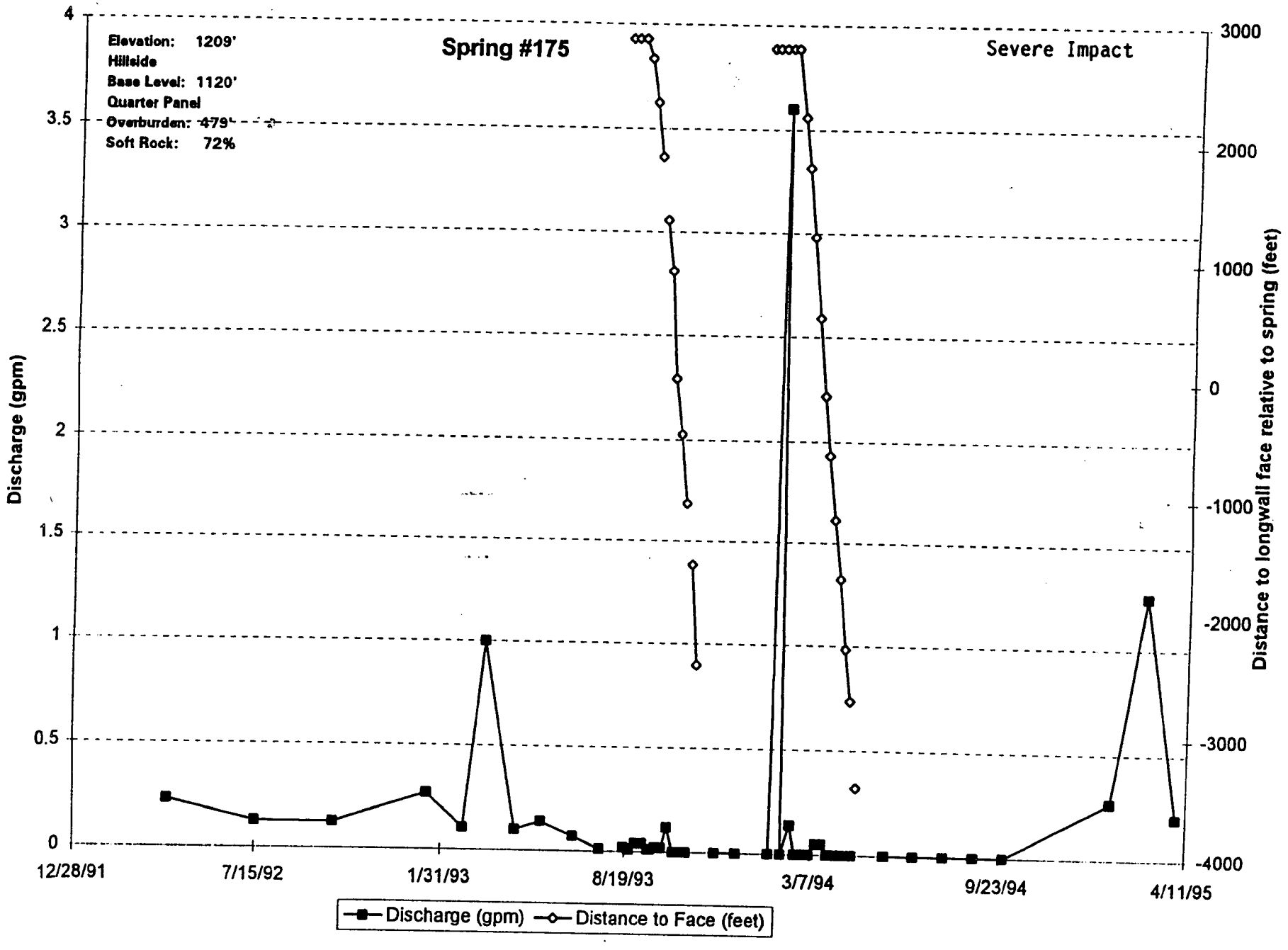

Prepared by: Moody and Assoc. Inc. 4/13/97

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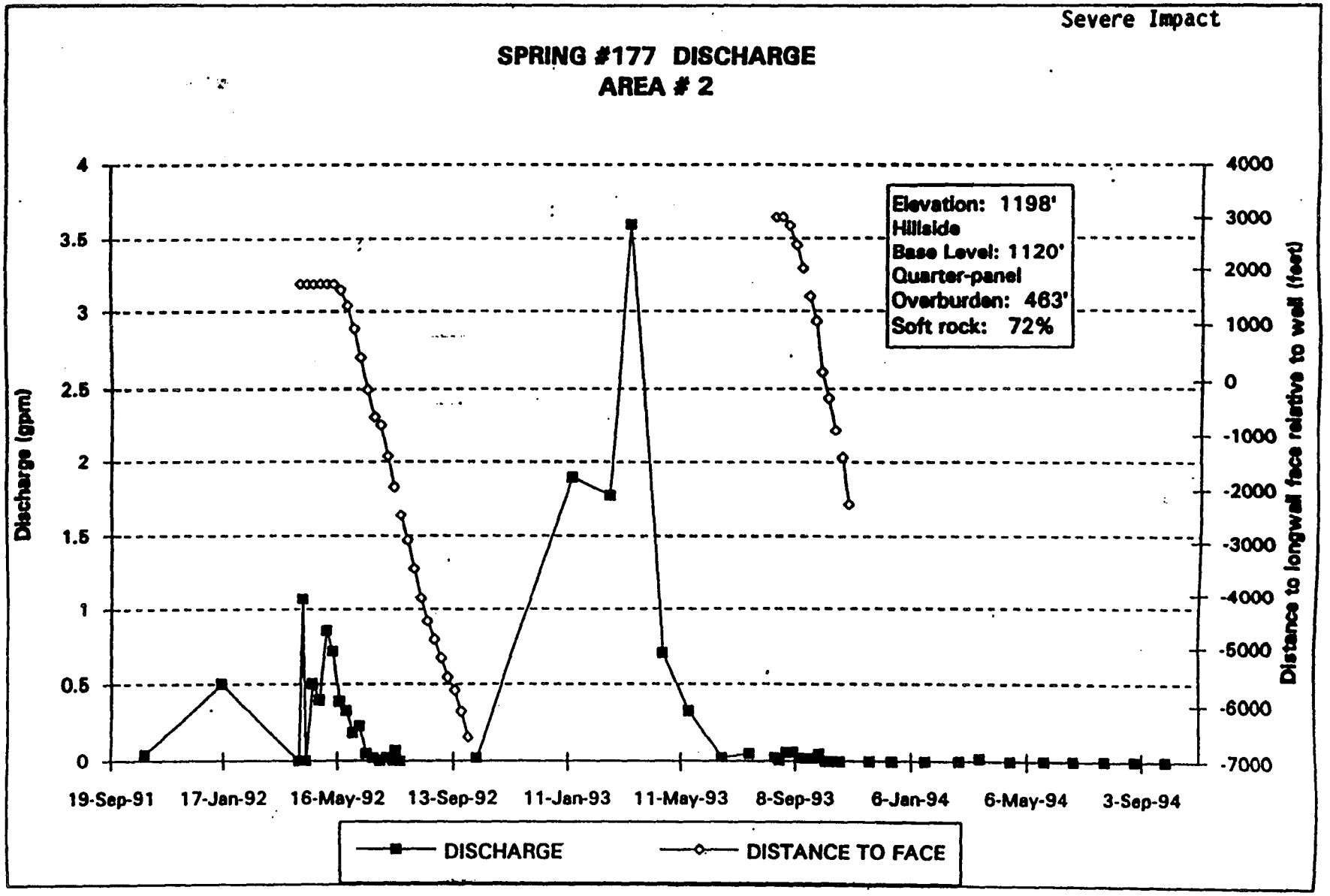
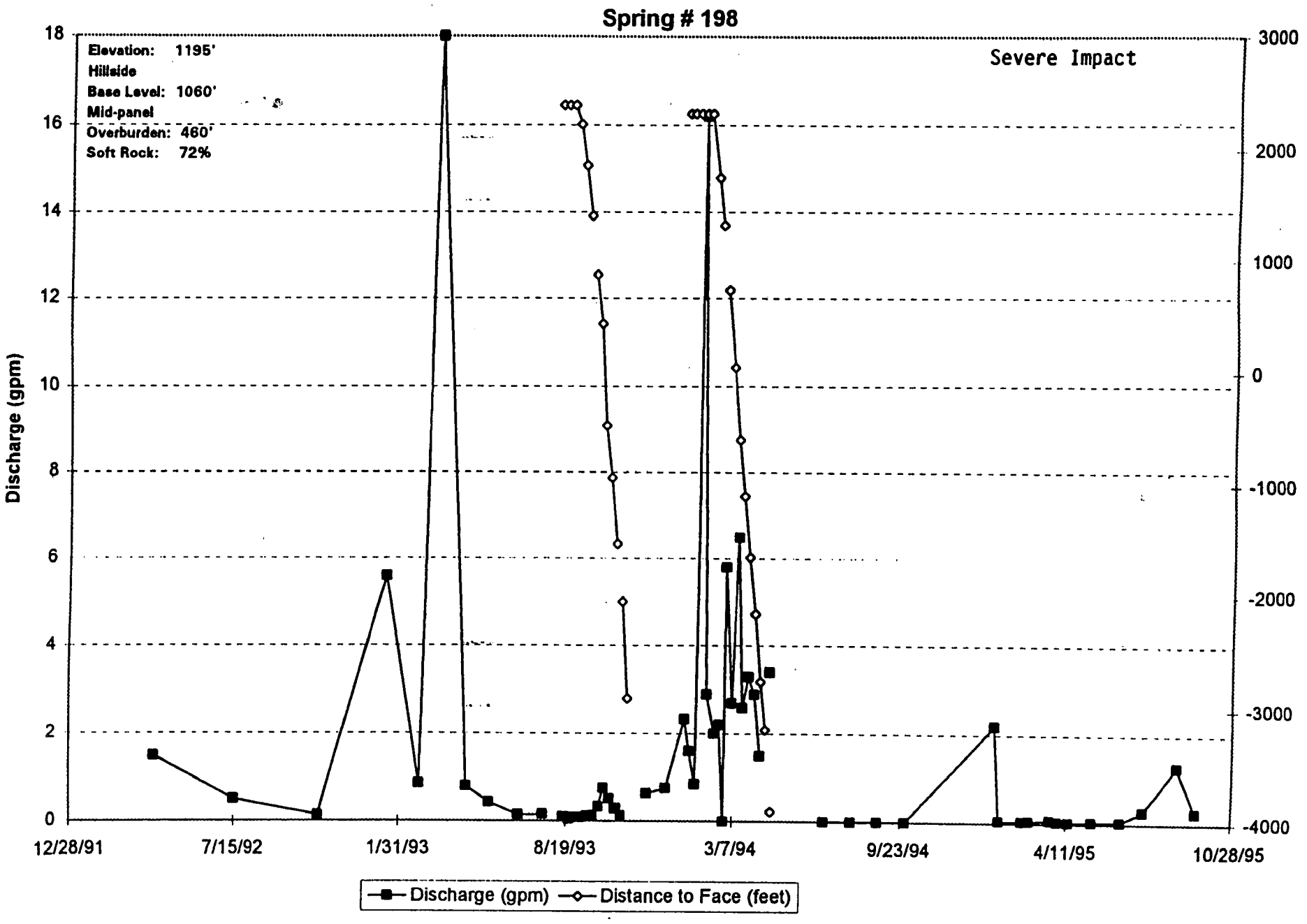
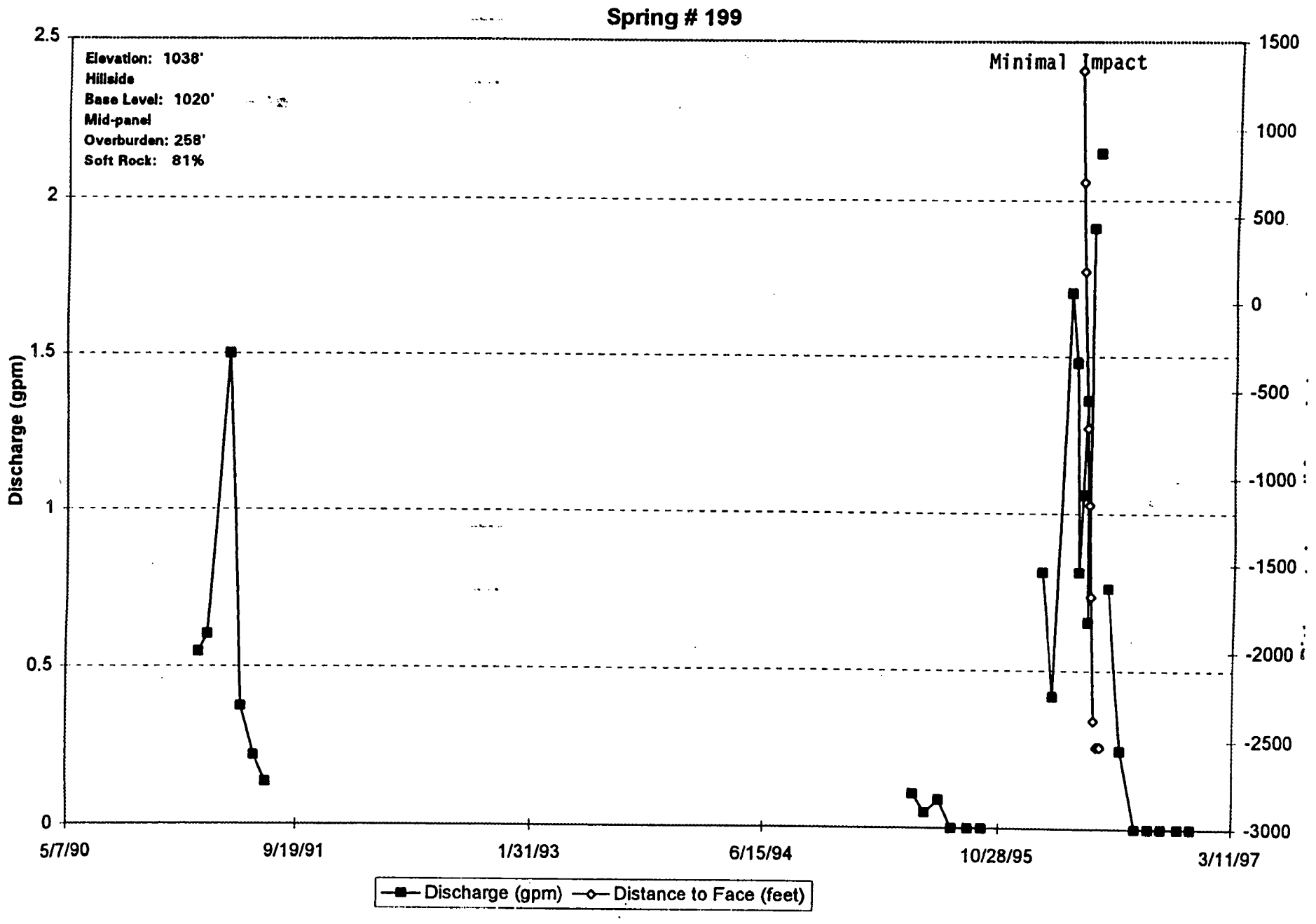




Prepared by: Moody and Assoc., Inc. 4/13/97

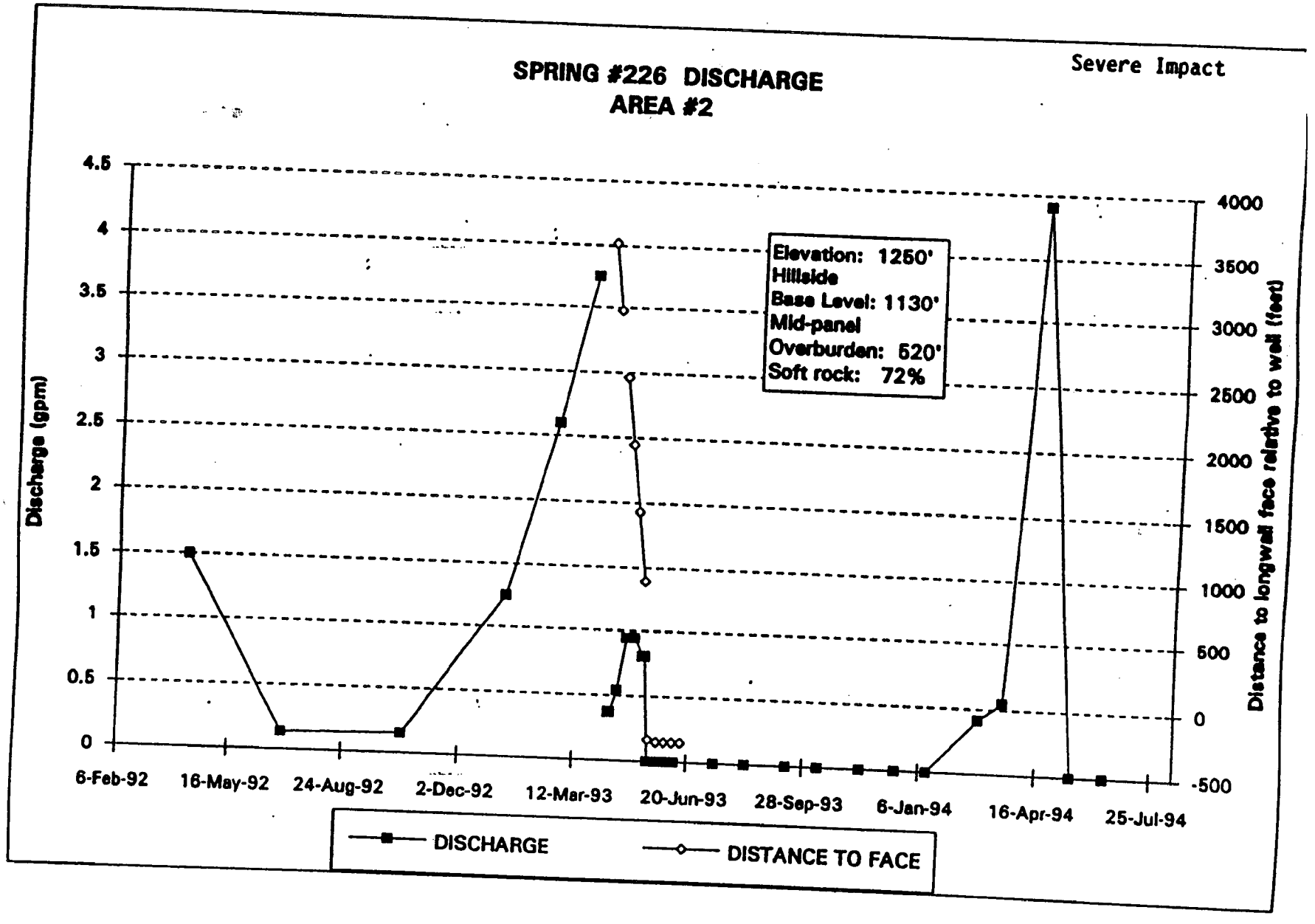
AEC 05118



Prepared by: Moody and Assoc., Inc.4/13/97

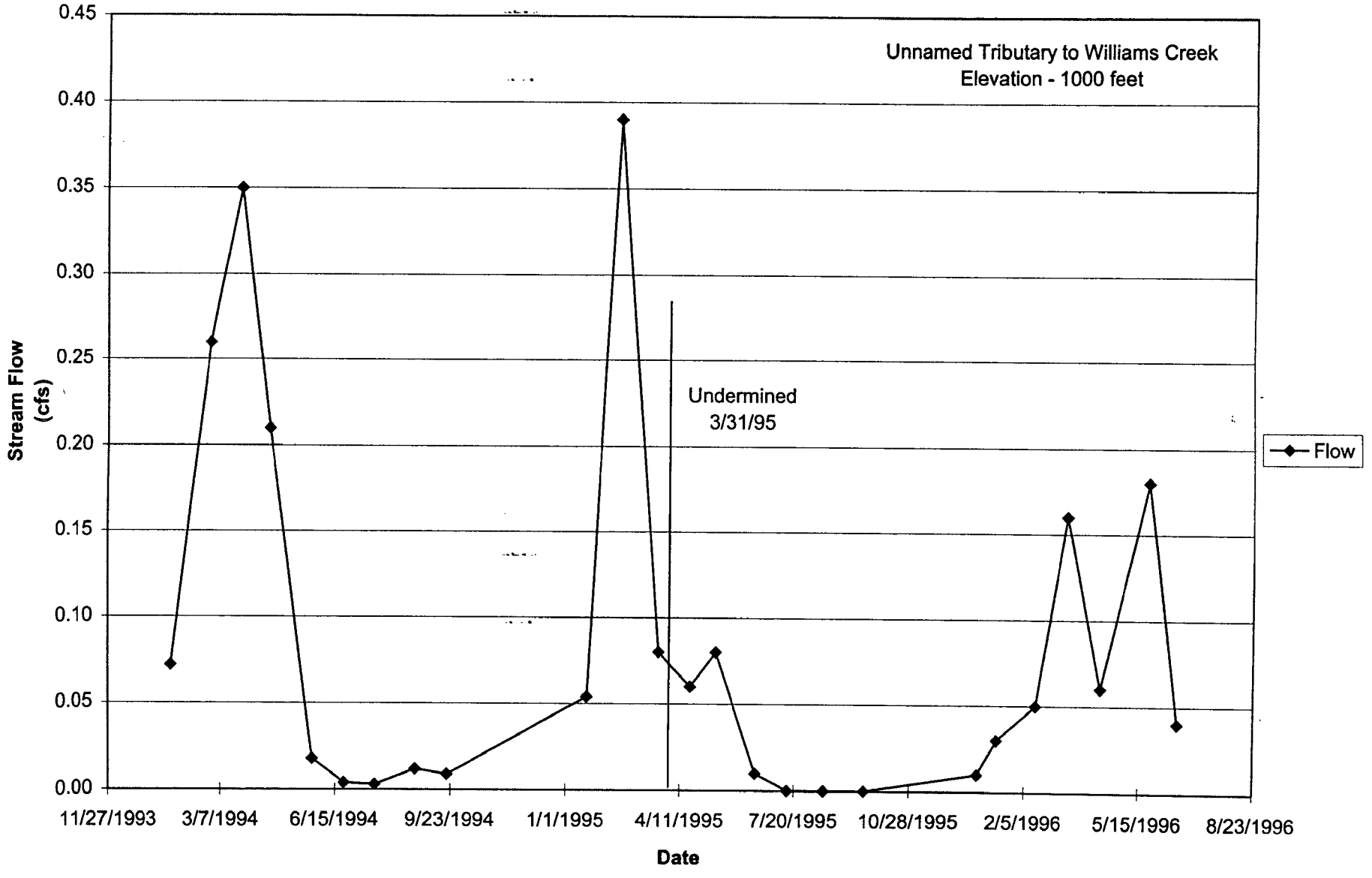
AEC 05119

Severe Impact



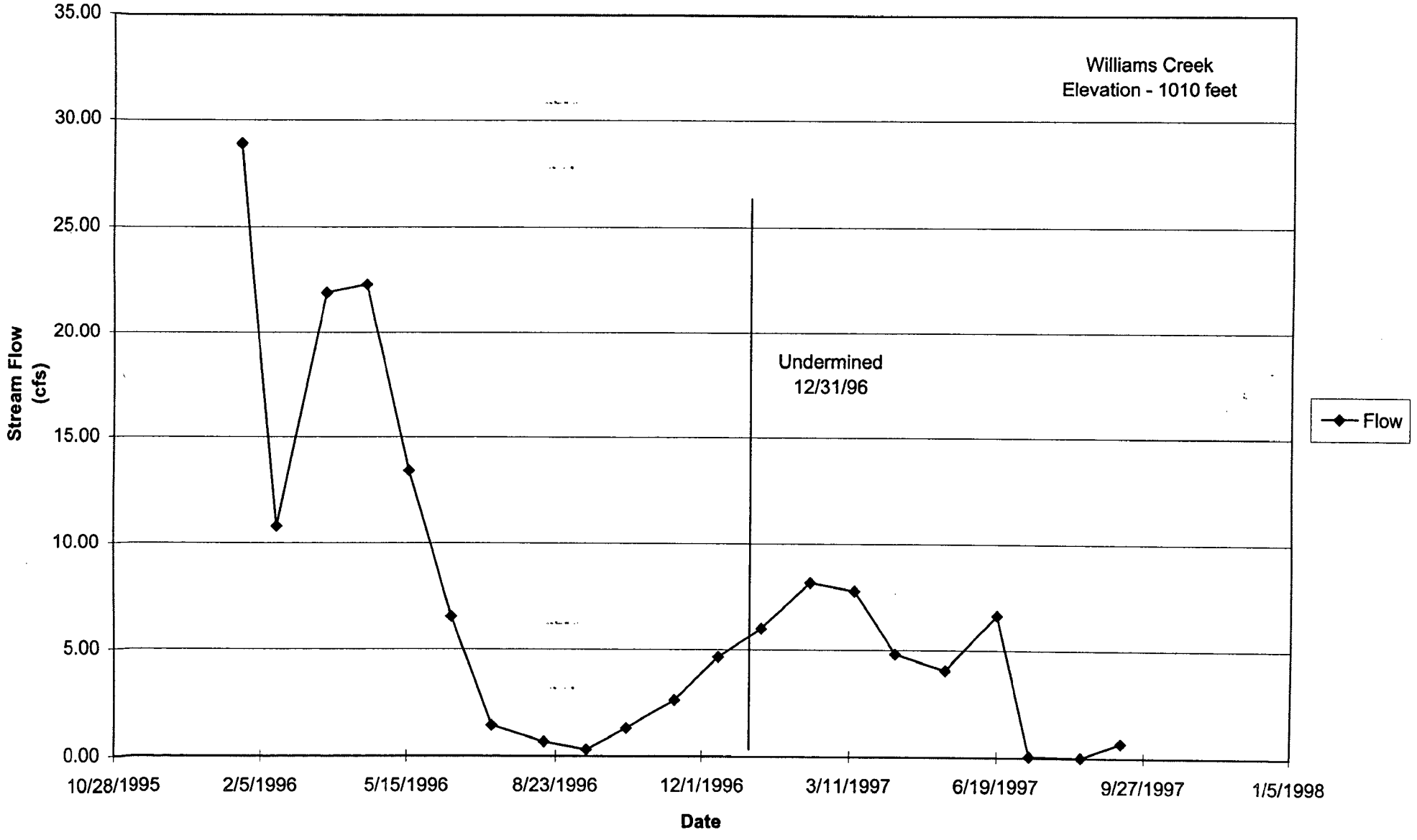
AEC 05120

Upstream Monitoring Point
U 29 - C
Steam Flow Hydrograph



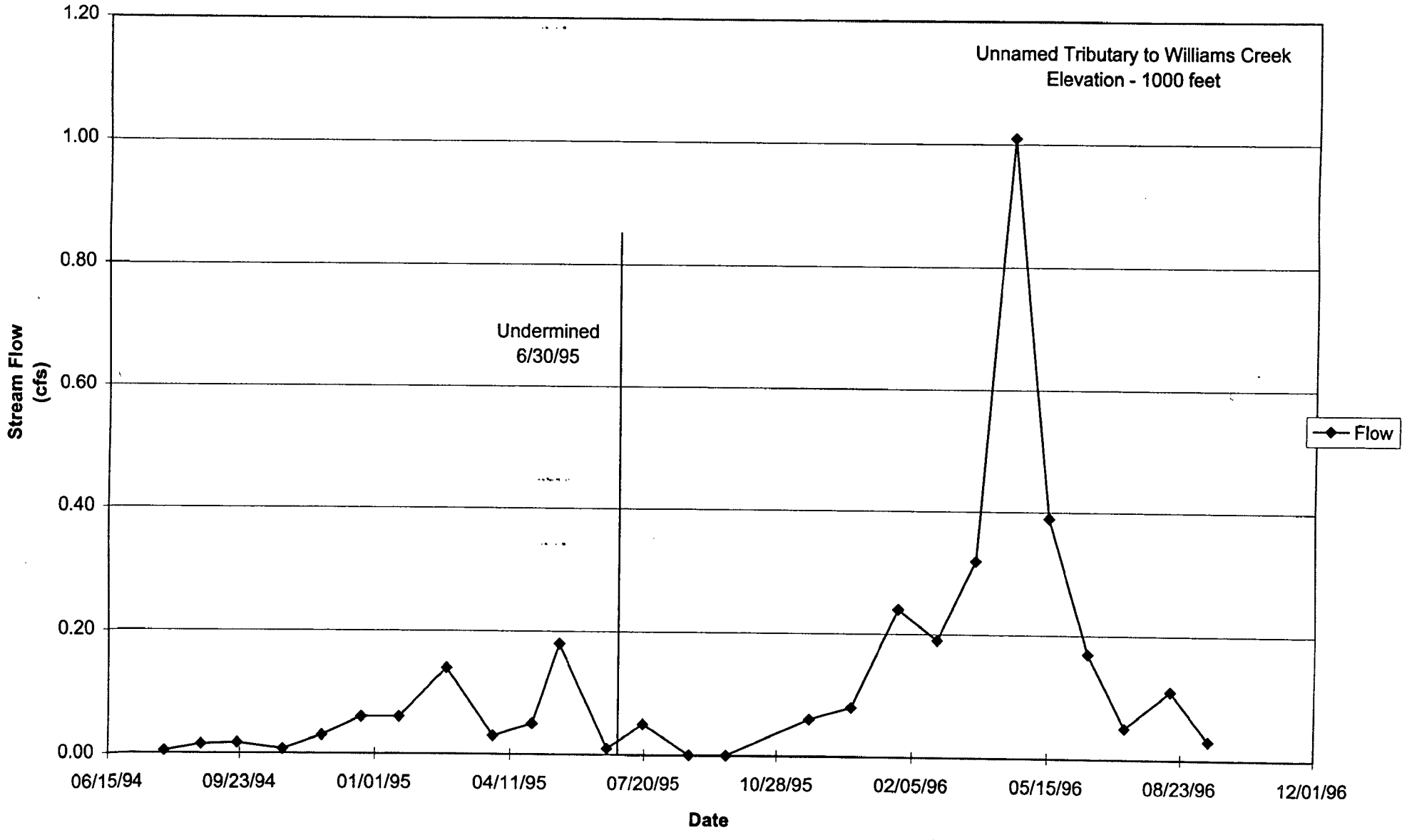
AEC 05121

Upstream Monitoring Point
U34 - 038
Stream Flow Hydrograph



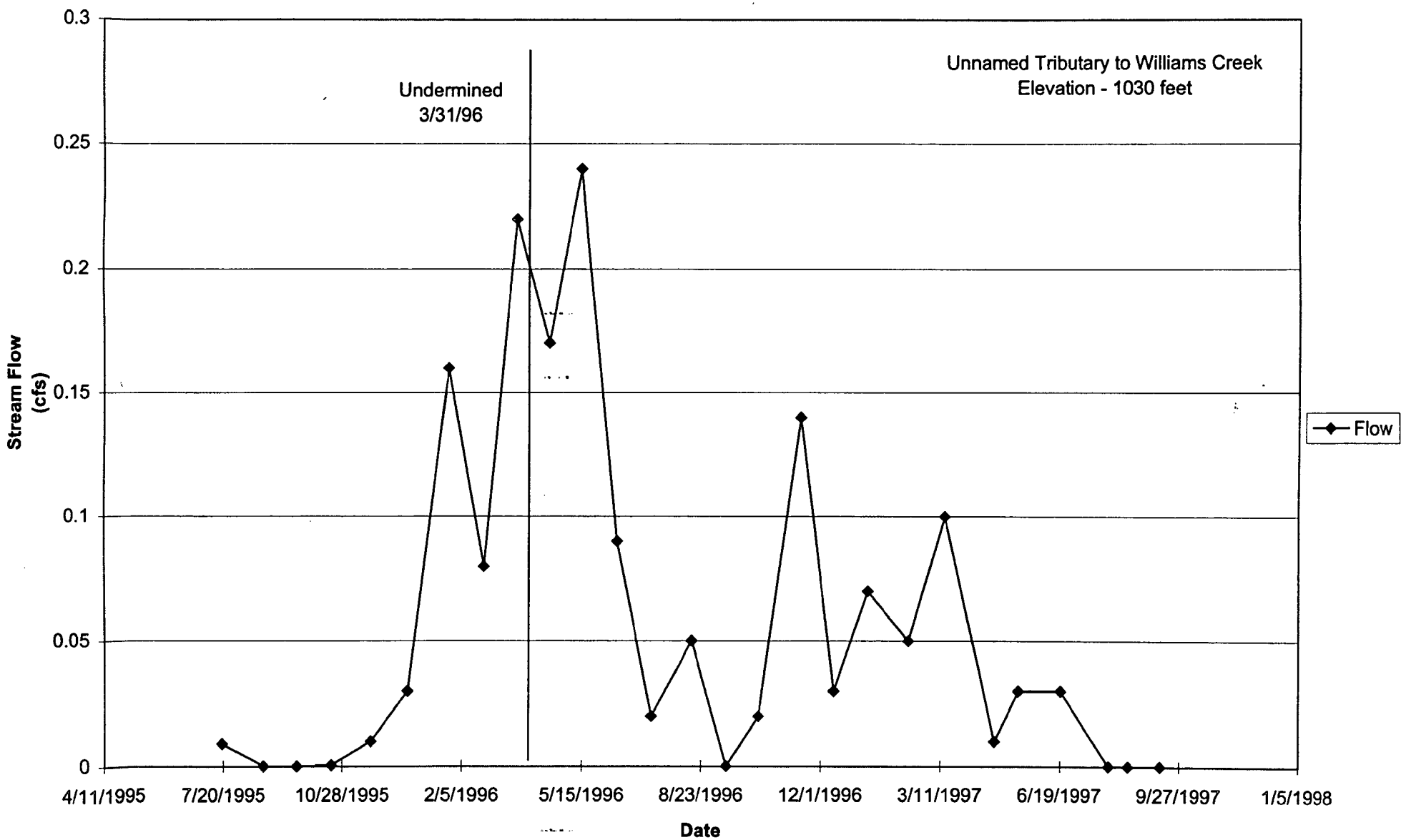
AEC 05122

Upstream Monitoring Point
U 34 - 067
Stream Flow Hydrograph



AEC 05123

Upstream Monitoring Point
U 034-144
Stream Flow Hydrograph



AEC 05124

ADDENDUM TO PART 2, PAGE 18, F(1) .
BENNOC, INC.
CENTURY MINE
PERMIT D-0425

DEVELOPED SUPPLIES OF GROUND AND SURFACE WATER THAT MAY BE IMPACTED AS A RESULT OF THE PROPOSED OPERATION

Of the supplies listed in Attachment 14C and 14D, impacts shown in Table A and Table B (see the PHC prepared by Moody and Associates, Inc.) are expected as a result of the proposed operation. According to the PHC, these sources may be impacted permanently or may have delayed or long-term recovery. Wells may experience significant declines in static water level with little or no recovery. Springs may experience significant flow declines with long-term or no recovery.

ADDENDUM TO PART 2, PAGE 18, F(2)
BENNOC, INC.
CENTURY MINE
PERMIT D-0425

ALTERNATIVE WATER SUPPLY INFORMATION

Adjacent Areas Above Full Recovery Mining

The PHC contained in this application indicate a potential for diminution and/or interruption of ground water supplies in areas above and contiguous to full recovery mining operations. However, no contamination of such water supplies is expected.

Notwithstanding its mining rights and without waiving any of its mining rights, where such diminution or interruption results from full recovery mining, BENNOC, INC. will repair or install a replacement source in the adjacent area at its own expense in a manner mutually satisfactory to BENNOC, INC., the water user, and the Division of Mines and Reclamation, and to a level sufficient to meet the water user's pre-mining quantity and quality levels which will be determined by monitoring information gathered in accordance with the Monitoring Plan. While it will be the policy of BENNOC, INC. to replace a water source, payment of water bills will be the responsibility of the water user, unless otherwise agreed upon by BENNOC, INC. and the water user.

Past experience indicates that the majority of subsidence (that detectable with surveying equipment) is complete within about 45 days after the longwall passes under the area. Water losses generally occur within that time period.

The steps which BENNOC, INC. would take to repair or replace affected water sources in the adjacent area include:

1. Repair damaged cisterns after BENNOC, INC. has determined that subsidence is complete;

2. on a site specific basis, re-drill existing wells, drill new wells, or connect the water user to public water supplies (if no public water supply exists, BENNOC, INC. may install a line of sufficient size to service those affected by BENNOC's mining operation);

3. On a site specific basis, developed springs will be replaced by a farm pond built according to accepted engineering practices, drilling of a new well, development of another spring in close proximity to the original spring, or connect the water user to public water supplies (if no public water supply exists, BENNOC may install a line of sufficient size to service those affected by BENNOC's mining operation);

4. Repair damaged farm ponds so as to be comparable to their pre-mining conditions;

5. Install an interim water supply until affected water supplies are replaced. Interim supplies may include hauled water or a tap to public water. BENNOC, INC. will only install temporary, replacement water using a public water supply if it can be connected within 48 hours. BENNOC, INC. will use the local fire department to haul county water for temporary replacement supplies. The local fire department can haul water within a matter of hours after receiving a request. Temporary tanks and water troughs for livestock are kept in stock to facilitate quick installations. Payment of interim water bills shall be the responsibility of the water user unless otherwise agreed upon by BENNOC and the water user.

6. Such other proven, cost effective, and reasonable techniques as BENNOC, INC. may now, or in the future, deem appropriate.

It is BENNOC, INC's intention to bear the cost of the installation only of both interim and permanent replacement of developed water sources being used at the time of undermining. If contamination, diminution, or interruption of a water user's ground or surface water supply used for domestic use occurs as a proximate result of the mine's operation, BENNOC, INC. will repair such water supply or install a replacement supply at BENNOC, INC's expense. BENNOC, INC. will not be responsible for non-developed sources or developed sources not being used at the time of undermining.

BENNOC, INC. will install, at BENNOC, INC.'s expense, an alternate water supply system (within 48 hours) to be used until repair or replacement is completed or will reimburse the water user for the reasonable cost of obtaining a water supply from the date of any such contamination, diminution, or interruption until the supply is repaired or replaced. In cases where temporary water cannot be provided within 48 hours, BENNOC, INC. will immediately notify the Chief of the Division of Mines and Reclamation who will determine if the circumstances warrant an extension of the 48 hours.

BENNOC, INC. will provide the affected water user with no less of an available water supply than the water user had before mining, based on the pre-mining measurements. If required, BENNOC, INC. will notify the Division of Mines and Reclamation immediately after it has been informed of the loss of developed water (ground or surface water) due to its mining activities.

As previously stated, the elevation of alternative water sources is unpredictable until the water system in the area again attains equilibrium after mining. Therefore, the alternative water supplies to be developed will be identified when the need arises.

Those supplies may include but not be limited to re-development of an existing well, spring, or pond, or replacement of the source by the Switzerland of Ohio Water District. The Village of Barnesville has been contacted by BENNOC, INC. and has assured us that there is capacity to replace each developed source with county water. A letter to that effect is enclosed.

If a water user believes that his or her underground or surface water source which is used for domestic use has been contaminated, diminished, or interrupted as a proximate result of the mine's operation, he or she should notify BENNOC, INC. by calling (740) 782-1330. BENNOC, INC. will make a determination of liability no later than sixty (60) days after notification of the contamination, diminution, or interruption of a water supply as a proximate result of the mine's operation.

Work on installing a temporary alternate water supply will be complete within 48 hours (unless an extension of the 48 hour time frame is granted by the Chief) after BENNOC learns of the contamination, diminution, or interruption to a domestic-use water supply proximately caused by the mining operation. BENNOC, INC. will pay for installation costs only for a temporary, alternate water supply. Permanent repair or the installation of a replacement water supply for an affected water supply shall be completed no later than eighteen (18) months after it has been determined that the supply has been contaminated, diminished, or interrupted as a proximate result of the mine's operation. The costs of repair of the original water supply and/or the installation of a replacement supply system to provide the affected water user with no less of an available water supply than was being used before mining, based on the pre-mining measurements, shall be paid for by BENNOC, INC. If the water user opts to do so, he may install his own temporary water supply system. BENNOC, INC. will reimburse the water user for the costs of installing a temporary water supply system. Payment for domestic water will be the responsibility of the water user unless otherwise agreed upon by BENNOC and the water user.

In repairing or replacing a water user's ground or surface water supply system used for domestic use which is damaged as a proximate result of the mine's operation, BENNOC, INC.'s first preference is to repair the affected supply system. If that is neither effective nor feasible, BENNOC, INC.'s second preference is to replace the affected supply system with a like supply system. For example, a damaged pond, if not repairable, would be replaced with a new pond. If that is not feasible, BENNOC, INC. will replace the affected supply system with a similar supply system. For example, a damaged dug well, if not repairable or replaceable with another dug well, would be replaced by a potable-type cistern, a drilled well or a similar supply system.

It should be recognized that property sites differ in such elements as geologic and hydrologic composition. Thus, the determination of whether repair of an affected water supply system is feasible or whether replacement by a specific type of water supply system is feasible must be made on a case-by-case, site specific basis by BENNOC, INC. BENNOC, INC., in the past, has always attempted to consult and negotiate with the affected water user concerning the selection of the type

sites. However, BENNOC, INC. if required by the Division of Mines and Reclamation, will make these decisions unilaterally.

In some cases, BENNOC, INC. reaches pre-subsidence agreements with water users, who are normally represented by counsel and in all cases have full opportunity to consult with counsel or anyone else of their choosing. These agreements, which are typically negotiated by BENNOC, INC. employees, normally cover all potential damage claims. In situations where such an agreement is reached, BENNOC, INC. will comply with the water replacement terms contained in the agreement. Such an agreement will satisfy, at a minimum, this permit and ORC 1513.162.

In any situation where BENNOC, INC. determines that the contamination, diminution, or interruption of a water supply was not proximately caused by the mining operation, based on evidence such as the proximity of the supply to the mining operation, site specific geologic and surface conditions, or climatological conditions, BENNOC, INC. will provide the Division of Mines and Reclamation with notice of its determination and the proof in support of that determination to allow the Division of Mines and Reclamation to issue a Chief's Order deciding the issue. This Chief's Order is then appealable in accordance with O.R.C. §1513.13. The water user's water supply system will continue in operation during the time BENNOC, INC. seeks review of this matter pursuant to O.R.C. §1513.13. If it is determined that contamination, diminution, or interruption of a supply is the proximate result of the mine's operation, BENNOC, INC. shall bear the costs of installing temporary water system. BENNOC, INC. reserves the right to proceed against the water user to recover costs incurred if it is determined that BENNOC, INC. is not liable for the contamination, diminution, or interruption of the affected water supply.

G. LAND USE INFORMATION-**Permit Area**

(1) Describe the uses of the land within the proposed permit area existing at the time of the filing of this permit application and provide a map which delineates the area of each land use.

N/A - NO PERMIT AREA

(2) Was the land use described in item G(1) above changed within five years before the anticipated date of beginning this proposed mining operation?
_____ Yes, __X__ No. If "yes," submit and addendum describing the historic use of the land.
N/A - NO PERMIT AREA

(3) Analyze the capability of the land within the proposed permit area before any mining to support a variety of uses, giving consideration to soil and foundation characteristics, topography, vegetative cover, and hydrology of the proposed permit area.

N/A - NO PERMIT AREA

(4) Analyze the productivity of the land within the proposed permit area before any mining to include average yields obtained under high level of management.
N/A - NO PERMIT AREA

(5) Is any land within the proposed permit area classified as prime farmland? _____ Yes, _____ No.
N/A - NO PERMIT AREA

(6) Submit an addendum describing the use of the land within the permit area, including the creation of permanent water impoundments, that is proposed to be made of the land following reclamation, including information regarding the utility and capacity of the reclaimed land to support a variety of alternative uses.
N/A - NO PERMIT AREA

(7) Are there existing land use classifications under local law of the proposed permit area? _____ Yes, _____ No. If "yes," describe the land use classification and submit as an addendum to the permit application, the comments of the governmental agency which would have to initiate, implement, approve or authorize the proposed use of the land following reclamation. If "no," describe the sources of information on which the determination was made.

N/A - NO PERMIT AREA

G. (8) Submit as an addendum a copy of the comments from the legal or equitable owner of record of the surface of the proposed permit area concerning the proposed land use.

N/A - NO PERMIT AREA

(9) Describe the consideration which has been given to making all of the proposed coal mining activities consistent with surface owner plans and applicable state and local land use plans and programs.

N/A - NO PERMIT AREA

(10) Describe how the proposed land use is to be achieved and the necessary support activities that may be needed to achieve the proposed land use.

N/A - NO PERMIT AREA

(11) Is the postmining land use to be different from the premining land use? _____ Yes, _____ No. If "yes," submit as an addendum to the permit application, the plans and findings required by paragraph (D) of rule 1501:13-9-17 of the Administrative Code.

N/A - NO PERMIT AREA

(12) Has the proposed permit area been previously mined? _____ Yes, _____ No. If "yes," provide the following information, if available.

(a) Type of mining method _____
(b) Coal seam mined _____
(c) Non coal mineral mined _____
(d) Extent of mining (acres) _____
(e) Approximate dates _____
(f) Land use preceding mining _____

N/A - NO PERMIT AREA

H. PRIME FARMLAND INVESTIGATION-**Permit Area**

(1) Does the proposed permit area include any land that is prime farmland, taking into consideration the negative determinations listed in paragraph (L)(2) of rule 1501:13-4-13 of the Administrative Code?
_____ Yes, _____ No.

(2) If the response to item H.(1) is "yes," submit Attachment 15.

(3) If the response to item H.(1) is "no," submit Attachment 16.

N/A - NO PERMIT AREA

PART 3 RECLAMATION AND OPERATIONS PLANS

A. GENERAL REQUIREMENTS-**Permit Area** (Item A. (1) and A. (2)-**Permit and Underground Workings)**

(1) Submit an addendum describing the type and method of coal mining procedures for this application. Explain how these procedures will maximize the use and conservation of the coal resources.

SEE ADDENDUM TO PART 3, ITEM A(1)

(2) Indicate the anticipated annual and total production of coal from this proposed operation.

Annual 3,471,548 Total 24,300,786

(3) Will this operation be combined with surface coal mining activities to the extent that contemporaneous reclamation of areas disturbed by surface mining will be delayed or such that the underground workings will be within 500 feet of the surface mining activities? _____ Yes, _____ No. If "yes," submit Attachment 30.
N/A - NO PERMIT AREA

(4) Are experimental mining practices to be employed in the proposed mining operations? _____ Yes, _____ No. If "yes," submit as an addendum to the permit application, the description, maps, and plans required by paragraph (B) of rule 1501:13-4-12 of the Administrative Code.
N/A - NO PERMIT AREA

(5) Are mountaintop removal mining practices to be employed in the proposed mining operations? _____ Yes, _____ No. If "yes," submit as an addendum to the permit application the information required by paragraph (C) of rule 1501:13-4-12 of the Administrative Code.
N/A - NO PERMIT AREA

(6) Are the natural pre-mining slopes within the permit area in excess of twenty (20) degrees? _____ Yes, _____ No. If "yes," submit an addendum demonstrating compliance with the steep slope mining provisions of paragraph (D) of rule 1501:13-4-12 and 1501:13-13-05 of the Administrative Code.
N/A - NO PERMIT AREA

(7) Is augering proposed within the permit area? _____ Yes, _____ No. If "yes," submit Attachment 18.
N/A - NO PERMIT AREA

(8) Are variances from approximate original contour to be employed for the proposed underground mining surface operations? _____ Yes, _____ No. If "yes," submit an addendum to the permit application demonstrating compliance with paragraph (E) and/or (K) of rule 1501:13-4-12 of the Administrative Code.
N/A - NO PERMIT AREA

MINING METHODS

This application area will be mined by the longwall *and room and pillar methods* of mining. Longwall mining is a method by which large panels of coal are surrounded by entries and are then extracted. The roof is temporarily supported by shields as the longwall machinery cuts the coal. The shields are then hydraulically moved forward, allowing the roof to collapse behind them. Subsidence of the surface occurs as the strata above the mine first collapses into the void left from the extracted coal, then the overlying strata deforms and comes to rest atop the rubble. Monitoring at a nearby longwall mine in the Pittsburgh No. 8 coal seam shows that the surface subsides approximately 60 to 65 percent of the seam thickness of about 60 inches. This mining method maximizes the recovery of the reserve by leaving coal only in the development entries (main and gate entries) and barrier pillars to protect the main entries.

The existing portal on D-0425 will be used to access the mine. The mining will progress from existing travelways in the D-0425 mine areas to this application area through main entries that will carry the ventilation currents and contain the haulage entries. These main entries will branch down into the gate entries that will surround the longwall panels. While continuous miners are used for these development entries, they are not considered production sections. These mining units are considered part of the longwall mining to be conducted at the CENTURY MINE. Full coal recovery (longwall mining) methods are planned for the entire application area.

A. (9) Will access to the underground workings be gained through a drift entry? ____ Yes, __X__ No. If "yes," provide as an addendum sufficient information to determine the location of the entry relative to the highest elevation of the coal reserve. Is the drift entry located so as to eliminate the potential for a gravity discharge? _____ Yes, _____ No. If "no," the applicant must demonstrate that the coal seam is not acid or iron producing. Provide an analysis of the strata immediately above and below the coal, and the coal seam itself, sufficient to demonstrate that the water quality from the entry will meet effluent limitations without treatment.

(10) For entries to underground workings other than drift entries, provide as an addendum sufficient information to determine the location of the entry relative to the coal reserve. Are the entries located so as to eliminate the potential for a gravity discharge? __X__ Yes, _____ No. If "no," provide the following demonstration:

(a) the gravity discharge will meet effluent limitations without treatment, or

(b) the water will be treated to meet effluent limitations and provisions will be made for consistent maintenance of the treatment facility throughout the anticipated period of gravity discharge.

(11) Will the permanent entry seals be designed to withstand the maximum anticipated hydraulic head when the operations are abandoned? _____ Yes, _____ No. If "yes," submit the appropriate information demonstrating that this will be accomplished. If "no," provide a typical plan for the seals to be used to close the mine entries pursuant to applicable state and federal regulations.

N/A - NO PERMIT AREA

(12) Submit an addendum describing the construction, modification, maintenance, and removal (unless to be retained for postmining land use), including the proposed engineering techniques and major equipment to be used, of the following facilities:

(a) dams, embankments, and other impoundments. Do any of the plans for water, sediment, or slurry impoundments meet the requirements of 30 CFR 77.216? _____ Yes, __X__ No. If "Yes," submit as an addendum a plan that addresses each of the requirements in 30 CFR 77.216-2.

(b) overburden and topsoil handling and storage areas and structures.

N/A - NO PERMIT AREA

A. (12) (c) coal removal, handling, storage, cleaning, and transportation areas and structures; including, but not limited to, preparation plants, beltlines, tipples, rail sidings, and primary roads. For roads, conveyors and rail systems, submit an addendum describing the information required pursuant to paragraph (L) of rule 1501:13-4-14 and 1501:13-10-01 of the Administrative Code.

N/A - NO PERMIT AREA

(d) spoil removal, handling, storage, transportation, and disposal areas and structures, including underground development waste or excess spoil disposal sites. If underground development waste or excess spoil is to be generated, submit an addendum describing the information required by paragraphs (O) and (P) of rule 1501:13-4-14 and 1501:13-9-07 of the Administrative Code.

N/A - NO PERMIT AREA

(e) mine facilities such as portal/shaft development, boreholes, de-gas holes, vents, office or shop buildings and maintenance facilities.

N/A - NO PERMIT AREA

(f) water and air pollution control facilities.

N/A - NO PERMIT AREA

(13) Provide an estimate of the cost per acre to reclaim the permit area. _____

N/A - NO PERMIT AREA

(14) Will the proposed operation include any of the following:

N/A - NO PERMIT AREA

(a) disposal of coal mine waste from a wash plant, tipple or other source? _____ Yes, _____ No. If "yes," submit Attachment 28 and, if applicable, the information required by paragraph (H) of rule 1501:13-4-14 of the Administrative Code.

(b) disposal of fly ash or other noncoal wastes? _____ Yes, _____ No. If "yes," submit an addendum which addresses the disposal material and a detailed disposal plan, pursuant to paragraph (E) of rule 1501:13-9-09 of the Administrative Code.

(c) return of slurry or other mine waste or material into the abandoned underground workings? _____ Yes, _____ No. If "yes," comply with provisions contained in paragraph (N) of rule 1501:13-4-14 and paragraph (Q) of 1501:13-9-04 of the Administrative Code, and submit copies of the required MSHA approvals as an addendum.

B. <u>EXISTING STRUCTURES-**Permit Area**</u>

(1) Are any existing structures proposed to be used in connection with or to facilitate the coal mining and reclamation operation? _____ Yes, _____ No. If "yes," submit as an addendum to the permit application a description of each structure. The description shall include the information required by paragraph (B)(1) of rule 1501:13-4-14 of the Administrative Code.

N/A - NO PERMIT AREA

B. (2) Are any existing structures proposed to be modified or reconstructed for use in connection with or to facilitate the coal mining and reclamation operation? _____ Yes, _____ No. If "yes," submit as an addendum to the permit application, a compliance plan for each structure. The plan shall include the information required by paragraph (B) (2) of rule 1501:13-4-14 of the Administrative Code.

N/A - NO PERMIT AREA

C. BLASTING-**Permit Area**

Will blasting occur within 25 feet of the surface during shaft and portal development or other on-site development? _____ Yes, _____ No. If "yes," submit Attachment 29.

N/A - NO PERMIT AREA

D. RECLAMATION PLAN - GENERAL REQUIREMENTS-**Permit Area** (Item D.12)-**Permit, Shadow, and Adjacent Area)**

(1) Provide a detailed timetable for the completion of backfilling and grading for each mining year.

N/A

(2) Provide a detailed timetable for the completion of resoiling for each mining year.

N/A

(3) Provide a detailed timetable for the completion of planting for each mining year.

N/A

(4) Describe the plan for backfilling, compacting and grading of the disturbed permit area, including the disposal of all mine generated debris.

N/A

(5) Submit an addendum describing the plan for the removal, storage, redistribution and stabilization of topsoil, subsoil, or approved alternative resoiling material to meet the requirements of rule 1501:13-9-03 of the Administrative Code. If an alternative resoiling material is to be used, submit Attachment 19.

N/A

(6) Provide the following information for the revegetation plan:

(a) Schedule for revegetation to include planting of temporary vegetation.

N/A

D. (6) (b) List the species and amounts per acre of seeds and seedlings to be used.

(c) Describe the methods to be used in planting and seeding.

(d) Describe the mulching techniques.

N/A - NO PERMIT AREA

(7) Describe the soil testing plan for evaluation of the results of topsoil handling and reclamation procedures related to revegetation.

N/A - NO PERMIT AREA

(8) Submit an addendum describing the measures to be employed to handle and place acid or toxic-forming materials in accordance with paragraph (J) of rule 1501:13-9-04, and paragraph(J) of rule 1501:13-9-14 of the Administrative Code.

N/A - NO PERMIT AREA

(9) Describe the measures, including appropriate cross-sections and maps, to be used to plug, case or manage mine openings or bore holes other than those entries utilized to gain access to the underground workings, pursuant to rule 1501:13-9-02 of the Administrative Code.

N/A - NO PERMIT AREA

(10) Is the reclamation plan consistent with local physical, environmental, and climatological conditions?
_____ Yes, _____ No.

N/A - NO PERMIT AREA

(11) Identify any other applicable air and water quality laws and regulations and health and safety standards and describe the steps to be taken to comply with each.

N/A - NO PERMIT AREA

(12) Submit an addendum describing the plan for minimizing to the extent possible and using the best technology currently available disturbances and adverse impacts of the operation on fish and wildlife and related environmental values and achieving enhancement of such resources where practical for the permit, shadow, and adjacent areas.

SEE ADDENDUM TO PART 3, PAGE 25, D(12)

ADDENDUM TO PART 3, PAGE 25, D(12)
BENNOC, INC.
CENTURY MINE
PERMIT D-0425

RECLAMATION PLAN - FISH, WILDLIFE, ENVIRONMENTAL VALUES

The proposed longwall mining operation is not expected to impact fish, wildlife, and other related environmental values. Minnows have been found in some of the larger stream segments within the application area. However, the normal annual cycle shows that during the summer and fall months, when the stream flow is minimal, the minnows swim downstream, only to return again. Observations show that stream segments that go dry following subsidence have returned to near their normal flow, and will again support minnows. The larger streams will return to normal flow faster than smaller streams because more sediment is carried in larger streams and help fill any residual cracks that may be found. In the dry weather periods, portions of Piney Creek and other streams where fish live have been known to go dry naturally, forcing fish and other aquatic creatures to seek water downstream. Longwall mining has caused some creeks to go dry temporarily, but such impacts are restored naturally within a few years at the most. Natural stream sediment fills cracks that may drain creeks to lower strata, restoring flows and wildlife habitat in a very short time period. Therefore, impacts to fish, wildlife and related environmental values will be minimized. There are several ponds overlying the application area, and larger fish live in them. Our experience at the Powhatan No. 6 Mine is that ponds are not greatly influenced by subsidence due to the amount of cover. Wildlife has never been shown to be affected by longwall mining. If surface slips are caused by mining activities, over the mining area, BENNOC, INC. will restore the land to a condition equal to its original value and reasonably foreseeable use. Undeveloped springs that are found above the application area may be dewatered and usually reposition themselves downstream. BENNOC will replace undeveloped springs if they are legitimately used according to our water replacement plan.

The ravines and rock overhangs at Raven Rocks will be undermined utilizing the room and pillar method of mining. No Subsidence will occur above the room and pillar mining areas, therefore, no impacts will occur in the ravines and rock overhangs.

The longwall mining plan has been designed to avoid all of the rock structures, the Sidwell underground house, and the Locust Hill underground building.

E. RECLAMATION PLAN - PROTECTION OF HYDROLOGIC BALANCE-**Permit and Adjacent Area**

Submit an addendum describing the measures to be taken during and after the proposed mining operations to:

(1) Minimize disturbance to the hydrologic balance, including quality and quantity, within the permit and adjacent areas and to prevent material damage outside the permit area;

(2) protect the rights of present users of surface and ground water;

(3) avoid acid or toxic drainage.

SEE ADDENDUM TO PART 3, PAGE 26, E(1-3)

F. GROUND WATER AND SURFACE WATER MONITORING PLAN-**Permit and Shadow Area**

Based upon the probable hydrologic consequences determination and analysis of all baseline hydrologic, geologic, and other information submitted in this application, address the following items in accordance with paragraph (F) of rule 1501:13-4-14 and paragraph (N) of rule 1501:13-9-04 of the Administrative Code.

(1) In addition to the quality and quantity parameters required for quarterly monitoring and NPDES monitoring, will any other parameters be monitored?
_____ Yes, __X__ No. If "yes," indicate the parameter(s) and the site(s) where such monitoring will occur.

(2) Do you propose or anticipate the need for a variation in the required monitoring frequency for ground and surface water sites and monthly monitoring for NPDES?
_____ Yes, __X__ No. If "yes," describe the variation in frequency and the monitoring sites to be affected.

(3) Describe the plan for collection, recording, and reporting of all surface and ground water quality and quantity monitoring data, including data collected for the NPDES program.

SEE ADDENDUM TO PART 3, PAGE 26, F(3)

ADDENDUM TO PART 3, PAGE 26, E(1-3)
BENNOC, INC.
CENTURY MINE
PERMIT D-0425

RECLAMATION PLAN - PROTECTION OF HYDROLOGIC BALANCE

The hydrologic balance is expected to change minimally as a result of the proposed longwall mining operation in the long term. Temporarily, the depth below the surface to ground water will increase as a result of increasing the number of cracks in the local rock units. The static level of the ground water should re-establish itself, usually at a lower elevation, within 18 months to 2 years after mining. At that time, ground water will be available in quantity at least as great as before mining. Because of increased porosity due to the cracking caused by longwall mining, the quantity of ground water that is available to users will probably increase. Minor surface cracking over longwall areas will eventually heal or be repaired, causing the ground to capture approximately the same percentage of rainfall as before. It is anticipated that stream flow in selected sections of first order streams where overburden thickness exceeds 200 ft may be temporarily reduced over relatively short stream segments. This impact is anticipated due to the fact that the headwaters of streams occasionally relocate to lower elevations following subsidence that results in the dewatering of hillside/hilltop springs. The monitoring data obtained for the ground and surface water sources over the longwall areas at the nearby Powhatan No. 6 Mine indicates there have been no lasting deleterious effects of the longwall mining on water quality, and no lasting effects are anticipated at the Century Mine. Therefore, the hydrologic balance outside the permit area will be protected.

The rights of present users of surface and ground water will be maintained through the water replacement plan found in the Addendum to Part 2, Page 18, F(2). It is anticipated that within two years, ground water will re-establish itself so that wells and springs can be replaced. Surface water drainage is not expected to be impacted seriously by longwall mining.

Acid or toxic drainage are not expected to be a problem at the CENTURY MINE. The No. 8 seam is entirely below drainage, and the openings to the surface are located high enough above the seam that they will not experience hydraulic pressure from the seam. The major watershed of this area, Captina Creek, is at the elevation of the mining for the application area at a distance of over 5 miles from the mine. Acid or toxic drainage is not expected to enter the waters of the State.

ADDENDUM TO PART 3, PAGE 26, F
BENNOC, INC.
CENTURY MINE
PERMIT D-0425

GROUND WATER AND SURFACE WATER MONITORING PLANS

1. Ground Water Monitoring Plan

All legitimately developed, used ground water supplies will be monitored quarterly for quality and monthly for quantity for at least one year prior to full recovery mining, and at least one year subsequent to mining unless access is denied by the land owner. This monitoring will include wells and springs used for domestic purposes. Weekly quantity monitoring will be conducted whenever the longwall face is within three weeks of undermining the supply and no less than three weekly pre-mining and post-mining measurements will be made. Ground water supplies located within 500 feet (measured horizontally) of the perimeter of the active longwall panel will be monitored as if they were located on the panel. Monitoring will be continued for at least one year subsequent to full recovery mining contingent upon review by the Division of Mines and Reclamation. Daily precipitation data will be submitted quarterly to evaluate spring flow.

2. Surface Water Monitoring Plan

Various surface water locations depicted on the application/hydrology map will be sampled monthly for flow and quarterly for quality. The quality requirements of OAC 1501:13-4-14(F)(2) and the other QMR parameters as stated on the QMR report sheets will apply to the surface water analysis. Each surface monitoring station will be monitored for at least one year prior to full coal recovery mining. Monitoring will be continued for at least one year subsequent to full recovery mining contingent upon review by the Division of Mines and Reclamation. Daily precipitation data will be submitted quarterly to evaluate stream flow.

With each quarterly monitoring report of ground and surface water, a map depicting the progression of the longwall face will be attached to indicate the sampling points in the full recovery areas. Notes will be submitted indicating the position relative to the longwall face, with "+" indicating the station is in advance of the face and a "-" indicating a position behind the face. An attempt will be made to monitor and sample as outlined above, however, some sources may not be accessible. These locations, if encountered, will be documented in the quarterly reports. All samples will be taken as outlined to the extent that existing well construction allows. Any samples that are unobtainable will be documented as such in the quarterly report. Quarterly sampling will include analysis for nitrates.

BENNOC,INC. will monitor all ground and surface locations in accordance with the quarterly monitoring plan outlined above regardless of the saturated zones that they access. All developed supplies have been identified and have been indicated on the application/hydrology map.

GROUND AND SURFACE WATER MONITORING

Ground water and surface water monitoring as previously proposed for CENTURY MINE will continue with respect to the future surface operations. Ground water and surface water monitoring over longwall areas of the underground operations is proposed to determine the impacts of underground mining on these areas. The proposed plan presented below is to be used in lieu of all previously proposed and existing plans for such areas.

Intermittent and perennial streams originating within the mining area will be monitored where the stream leaves the area; and the streams crossing through the mining area will be monitored both upstream and downstream of the area currently being mined.

Ground water monitoring will consist of sampling all developed water sources, with the permission of the landowner, in the following manner:

1. Monthly monitoring will be done for quantity (static water level/flow) for a one year period before and after mining for developed springs, wells, and stream monitoring points. This information will be reported quarterly but will be available at the BENNOC, INC. office.

2. Quarterly monitoring will be conducted for quality for a one year period before and after mining for developed springs, wells, and stream monitoring points. This information will be reported quarterly.

3. Daily precipitation data from the mining area will be submitted to evaluate its impact on spring and stream flow. This information will be submitted quarterly but will be available at the BENNOC, INC. office.

An attempt will be made to sample as outlined above, however, some sources may not be accessible should a landowner deny permission to sample, a well may be buried, etc.. These locations, if encountered, will be documented in the quarterly reports.

All samples will be taken as outlined to the extent that existing well construction allows. Any samples that are unobtainable will be documented as such in the quarterly report. Sampling will include analyses for nitrates.

BENNOC, INC. will monitor all developed supplies in accordance with the monitoring plan outlined above regardless of the aquifers and/or saturated zones that they access. All developed supplies have been identified and have been indicated on the Application Map. All wells, both drilled and dug have been identified. Developed springs, consisting of a french drain and catchment basin, have been shown. A map will be included in the quarterly monitoring report showing the location of the wells, streams, and springs monitored and their position relative to the active mining areas of BENNOC, INC.

G. DIVERSIONS AND DRAINAGE CONTROLS-**Permit Area**

(1) Will the proposed coal mining activities result in diversions of overland flow away from the disturbed areas? _____ Yes, _____ No. If "yes," describe, including maps and cross sections, the diversion to be constructed to achieve compliance with paragraph (I) of rule 1501:13-4-14 of the Administrative Code.

N/A - NO PERMIT AREA

(2) Will the proposed coal mining activities result in the diversion of intermittent or perennial streams within the proposed permit area? _____ Yes, _____ No. If "yes," describe, including maps and cross sections, the diversions to be constructed to achieve compliance with paragraph (I) of rule 1501:13-4-14 of the Administrative Code.

N/A - NO PERMIT AREA

(3) Will the proposed coal mining activities result in construction of diversions to direct runoff through a sediment pond or a series of sediment ponds? _____ Yes, _____ No. If "yes," submit an addendum to describe, including maps and cross sections, the diversions to be constructed to achieve compliance with paragraph (I) of rule 1501:13-4-14 of the Administrative Code.

N/A - NO PERMIT AREA

(4) Indicate which of the following are proposed to be constructed within the proposed permit area and submit as an addendum the detailed design plans for each structure in accordance with paragraph (H) of rule 1501:13-4-14 and 1501:13-9-04 of the Administrative Code.

N/A - NO PERMIT AREA

_____ sedimentation pond(s) (submit Attachment 20)

_____ water impoundment(s) (submit Attachment 20)

_____ Other (specify) _____

(5) Submit an addendum describing the plan for the control of water drainage into, through, and out of the proposed permit area. If applicable, submit as an addendum any request for variances pursuant to paragraphs (B) and (E) of rule 1501:13-9-04 of the Administrative Code.

N/A - NO PERMIT AREA

(6) Describe the treatment, when required, of ground and surface water drainage from the area to be disturbed by the proposed coal mining activities.

N/A - NO PERMIT AREA

H. PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES-**Permit and Planned Subsidence Area**

Will the proposed coal mining activities adversely affect any public park and places listed on the National Register of Historic Places? _____ Yes, __X__ No. If "yes," submit an addendum describing the measures to minimize or prevent these impacts.

I. MINING NEAR OR THROUGH A PUBLIC ROAD-**Permit Area**

If the response to Part 1, item D (6) of the permit application is "yes", submit an addendum describing the measures to be used to ensure that the interests of the public and landowners are protected. **N/A - NO PERMIT AREA**

J. SUBSIDENCE CONTROL SURVEY-**Shadow Area**

(1) Is this a full coal recovery operation?
__X__ Yes, _____ No. If "yes," complete Attachment 31, Subsidence Control Survey, and following items J(2) and (3). **SEE ATTACHMENT 31**

(2) Does the shadow area contain any of the structures or facilities listed in 1501:13-12-03(J)(1-3)?
_____ Yes, __X__ No. If "yes," complete Attachment 32, Protection of Specific Structures, and specifically identify the structures or facilities on the application map.

(3) Are any aquifers or bodies of water that serve as a significant water source for any public water supply system present in the shadow area?
_____ Yes, __X__ No. If "yes," complete Attachment 32, Protection of Specific Structures, and specifically identify the areas on the application map.

K. SUBSIDENCE CONTROL PLAN-**Shadow Area**

(1) Submit an addendum which describes the method of coal removal, and indicates the size, sequence, and timing of the development of the underground workings.

SEE ADDENDUM TO PART 3, PAGE 28, K(1)/ TIMING, STRUC., CONT., & PARCEL MAP

(2) Utilizing the application map, specifically indicate areas where planned subsidence mining methods (i.e. longwall or pillar extraction) will be used.

SEE APPLICATION MAP & TIMING, STRUC. CONT., & PARCEL MAP

(3) Utilizing the application map, specifically indicate room-and-pillar mining areas where subsidence will be prevented or minimized.

SEE APPLICATION MAP & TIMING, STRUC. CONT., & PARCEL MAP

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 31
(Subsidence Control Survey)

SURFACE OWNER	COUNTY	TOWNSHIP/SECTION	RENEWABLE RESOURCES	STRUCTURES - USE	MAP LOC. KEY (STRUCTURES)
N.& B. LINDSEY	BELMONT	WASHINGTON/26			1-1
N.C. STUKEY, ETAL	BELMONT	WASHINGTON/26	WOODLAND		1-2
			STREAM		
J.F. & J.F. THOMAS	BELMONT	WASHINGTON/26	WOODLAND	HOUSE	1-3
			PASTURELAND	TRAILERS (2)	
			CROPLAND	GARAGE	
			WELLS	BARN	W-6, DW-7
			DEVELOPED SPRING	OUTBUILDINGS	DS-28
			STREAM		
O.R. & N. PERKINS	BELMONT	WASHINGTON/26	WOODLAND		1-5
			STREAM		
V.M. KNOTTS	BELMONT	WASHINGTON/26	CROPLAND		1-4
AMERICAN ENERGY CORP.	BELMONT	WASHINGTON/26	STREAM	AIR SHAFT	1-6
O.R. & N. PERKINS	BELMONT	WASHINGTON/26	WOODLAND		1-7
			STREAM		

AEC 05145

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 31
(Subsidence Control Survey)

SURFACE OWNER	COUNTY	TOWNSHIP/SECTION	RENEWABLE RESOURCES	STRUCTURES - USE	MAP LOC. KEY (STRUCTURES)
H.L. CROOKS	BELMONT	WASHINGTON/26	WOODLAND		1-8
			PASTURELAND		
			DEVELOPED SPRING		DS-6
			STREAM		
S. & S. SCHAFER	BELMONT	WASHINGTON/26	WOODLAND	HOUSE	1-9
			PASTURELAND	GARAGE	
			CROPLAND	BARNS	
			WELL	OUTBUILDINGS	DW-15
			DEVELOPED SPRING		DS-4
			UNDEVELOPED SPRING		
			STREAM		
J.E. & T.A. EDGE	BELMONT	WASHINGTON/26	WOODLAND	GARAGE	1-10
			CROPLAND	OUTBUILDING	
			STREAM		
			DEVELOPED SPRING		DS-80
C. & J. PERKINS	BELMONT	WASHINGTON/33	WOODLAND		1-11
			CROPLAND		
			DEVELOPED SPRING		DS-5

AEC 05146

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 31
(Subsidence Control Survey)

SURFACE OWNER	COUNTY	TOWNSHIP/SECTION	RENEWABLE RESOURCES	STRUCTURES - USE	MAP LOC. KEY (STRUCTURES)
T.R. DANFORD, ETAL	BELMONT	WASHINGTON/33,26	WOODLAND	RUINS	1-12
			CROPLAND		
			STREAM		
R. GREER, ETAL	BELMONT	WASHINGTON/26,32	WOODLAND	CABIN	1-13
			STREAM	HOUSE (OCCUPIED)	
				PRIVY	
P.G. CROOKS	BELMONT	WASHINGTON/26	WOODLAND	HOUSE	1-14
			WELL	OUTBUILDINGS	DW-8
			STREAM	RUINS	
D.W. TAYLOR	BELMONT	WASHINGTON/33	WOODLAND	HOUSE	1-17
			CROPLAND	GARAGE	
			PASTURELAND	OUTBUILDINGS	
			WELLS		W-11, W-12,DW-13
			UNDEVELOPED SPRINGS		
			STREAM		
M.C. BECKETT	BELMONT	WASHINGTON/32	WOODLAND	HOUSE	1-18
			PASTURELAND	BARN	
			CROPLAND	OUTBUILDING	
			WELLS		WL-9, DW-10

AEC 05147

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 31
(Subsidence Control Survey)

SURFACE OWNER	COUNTY	TOWNSHIP/SECTION	RENEWABLE RESOURCES	STRUCTURES - USE	MAP LOC. KEY (STRUCTURES)
J. HUML	BELMONT	WASHINGTON/31,32	WOODLAND		1-19
AMERICAN ENERGY CORP.	BELMONT	WAYNE/3	WOODLAND	TRAILER	2-1
			CROPLAND	GARAGE	
			PASTURELAND	GASWELLS	
			STREAM		U-2C
			CREEK		D-2
			DEVELOPED SPRING		DS-71
			PONDS		P-20, P-21, P-22
			WELLS		W-129, W-8Y, W-1,
					W-5Y,W-12Y,W-13Y
H.E. & M.R. PERKINS	BELMONT	WAYNE/32,33	WOODLAND	HOUSES (2)	2-2
			PASTURELAND	BARNS	
			CROPLAND	OUTBUILDINGS	
			WELLS		W-45, W-67, DW-46
			DEVELOPED SPRING		DS-70
			STREAMS		
M.D. & C.D. LALLATHIN	BELMONT	WAYNE	WOODLAND	HOUSE	2-3
		& WASHINGTON/32,2	PASTURELAND	OUTBUILDINGS	
			DEVELOPED SPRINGS	BARN	DS-26,DS-27
			WELL		W-48

AEC 05148

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 31
(Subsidence Control Survey)

SURFACE OWNER	COUNTY	TOWNSHIP/SECTION	RENEWABLE RESOURCES	STRUCTURES - USE	MAP LOC. KEY (STRUCTURES)
M.D. & C.D. LALLATHIN			POND		P-8
			STREAM		
C.L. BONDY	BELMONT	WASHINGTON/32	WOODLAND	HOUSE	2-4
			WELL	BARNS	DW-24
			UNDEVELOPED SPRINGS	GARAGE	
				OUTBUILDINGS	
F.C. ROTE, JR.	BELMONT	WASHINGTON/32	WOODLAND		2-5
			STREAM		
W.D. & J.K. SAFFELL	BELMONT	WAYNE/3	WOODLAND	TRAILERS (2)	2-6
			WELLS	GARAGES (2)	W-127, W-142
M.M & J.S. JR. PYLES	BELMONT	WAYNE/3	WOODLAND	HOUSE	2-7
			WELLS	TRAILER	W-49, DW-126
				OUTBUILDINGS	
H.J. & C.S. WARSINSKEY	BELMONT	WAYNE/2,3	WOODLAND	BUILDINGS	2-8

AEC 05149

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 31
(Subsidence Control Survey)

SURFACE OWNER	COUNTY	TOWNSHIP/SECTION	RENEWABLE RESOURCES	STRUCTURES - USE	MAP LOC. KEY (STRUCTURES)
R.W. & J. EIKLEBERRY	BELMONT	WAYNE/2	WOODLAND	HOUSE	2-9
			PASTURELAND	BARN	
			DEVELOPED SPRING	GARAGE	DS-15
			WELLS	OUTBUILDINGS	W-42,WL-43
			STREAM		
J.W. & J.A. SHRIVER	BELMONT	WAYNE/2	WOODLAND	HOUSE	2-10
			PASTURELAND	GARAGE	
			WELL	OUTBUILDINGS	W-41
E.P. & Z.I. BOSTON	BELMONT	WAYNE/2	WOODLAND	HOUSE	2-11
			WELL		DW-44
G.L. & C. HOOVER	BELMONT	WAYNE/2	STREAM	HOUSE	2-12
			DEVELOPED SPRINGS	5 OUTBUILDINGS	DS-81, DS-82
			UNDEVELOPED SPRINGS		
			DUG WELL		DW-146
			POND		P-25
T.F. & E.R. CALDWELL	BELMONT	WAYNE/2	WOODLAND	HOUSE	2-13
			PASTURELAND	GARAGE	
			STREAMS	OUTBUILDINGS	
			DEVELOPED SPRING		DS-8

AEC 05150

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 31
(Subsidence Control Survey)

SURFACE OWNER	COUNTY	TOWNSHIP/SECTION	RENEWABLE RESOURCES	STRUCTURES - USE	MAP LOC. KEY (STRUCTURES)
S. MOBLEY	BELMONT	WAYNE/1	WOODLAND	HOUSE	2-14
			PASTURELAND	TRAILER	
			WELLS	BARN	W-18, DW-19
			UNDEVELOPED SPRINGS	OUTBUILDINGS	
			STREAMS		
20 BUCKHORN CLUB INC.	BELMONT	WASHINGTON/31	WOODLAND		2-15
C. & P. RILEY	BELMONT	WAYNE/2	WOODLAND	HOUSE	2-16
			DEVELOPED SPRING	BARNS	DS-14
			WELL	GARAGE	DW-40
			POND	OUTBUILDINGS	P-6
				POOL	
C.S. WARSINSKEY	BELMONT	WAYNE/2		HOUSES	2-17
			WELL	GARAGES	WL-39
				OUTBUILDING	
T.F. & E.R. CALDWELL	BELMONT	WAYNE/2		HOUSE	2-18
				GARAGE	

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ATTACHMENT 31
(Subsidence Control Survey)

SURFACE OWNER	COUNTY	TOWNSHIP/SECTION	RENEWABLE RESOURCES	STRUCTURES - USE	MAP LOC. KEY (STRUCTURES)
T.S. JR. & C.J. COSS	BELMONT	WAYNE/2		HOUSE	2-19
				GARAGE	
				OUTBUILDING	
				POOL	
C. & T. THORNBERRY	BELMONT	WAYNE/2	WOODLAND	HOUSE	2-20
			PASTURELAND		
C.J. & T.A. LUCAS	BELMONT	WAYNE/1,2	WOODLAND	HOUSE	2-21
				GARAGE	
				POOL	
R.D. MOBLEY	BELMONT	WAYNE/1	WOODLAND	HOUSE	2-22
			WELL	POOL	W-17
D.F. WHITE	BELMONT	WAYNE/9	WOODLAND		2-23
			POND		P-12
			WELL		W-125
			STREAMS		

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 31
(Subsidence Control Survey)

SURFACE OWNER	COUNTY	TOWNSHIP/SECTION	RENEWABLE RESOURCES	STRUCTURES - USE	MAP LOC. KEY (STRUCTURES)
R. & B. LUCAS	BELMONT	WAYNE/9,15	WOODLAND	HOUSE	2-24
			PASTURELAND	BARNS	
			CROPLAND	GARAGES	
			WELLS	SILO	W-54, DW-53
			POND		P-9
			UNDEVELOPED SPRING		
			STREAMS		D-6
E.W. & M.S. LUCAS	BELMONT	WAYNE/9,15	WOODLAND	HOUSE	2-25
			TREE FARM	CABIN	
			DEVELOPED SPRING	OUTBUILDINGS	DS-29
			WELLS	RUINS	W-58, DW-59,60
			PONDS		P-10, P-11
			STREAMS		
R.D. & C.F. HICKMAN	BELMONT	WAYNE/8	WOODLAND	GASWELL	2-26
			WELL		DW-133
			UNDEVELOPED SPRING		
			STREAM		

AEC 05153

OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 31
(Subsidence Control Survey)

SURFACE OWNER	COUNTY	TOWNSHIP/SECTION	RENEWABLE RESOURCES	STRUCTURES - USE	MAP LOC. KEY (STRUCTURES)
R.D. & C.F. HICKMAN	BELMONT	WAYNE/7	WOODLAND		2-27
			CROPLAND		
			PASTURELAND		
			DEVELOPED SPRING		DS-18
			STREAM		D-3
D.J. RISER	BELMONT	WAYNE/7,8	WOODLAND		2-28
			CROPLAND		
			PASTURELAND		
			DEVELOPED SPRINGS		DS-19,20,20A & 79
			STREAM		D-3
A.C. KINDALL	BELMONT	WAYNE/7	WOODLAND	SCHOOL HOUSE	2-29
			CROPLAND	HOUSE	
			PASTURELAND	BARNS	
			WELLS	OUTBUILDINGS	DW-82,83,84
			DEVELOPED SPRINGS	RUINS	DS-32
			UNDEVELOPED SPRINGS		
			STREAMS		U-2A, 2B

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 31
(Subsidence Control Survey)

SURFACE OWNER	COUNTY	TOWNSHIP/SECTION	RENEWABLE RESOURCES	STRUCTURES - USE	MAP LOC. KEY (STRUCTURES)
RAVEN ROCKS, INC.	BELMONT	WAYNE/8,9,1,2,3,	WOODLAND	HOUSES (6)OCCUPIED*	2-30
			PASTURELAND	HOUSE (1)UNOCCUPIED	
			CROPLAND	BARNS	
			TREE FARM	GARAGES	
			STREAMS	OUTBUILDINGS	U-2,D-2
			WELLS	RUINS	DW-28, DW-31,
				CISTERN	DW-34, DW-37,
					DW-38, DW-144
					W-32, W-33, W-25,
					W-27, W-26, W-29,
					W-30, W-143
			DEVELOPED SPRINGS		DS-9, DS-10,
					DS-11, DS-12,
				GEOTHERMAL WELLS	DS-13
				WIND GENERATOR	
			UNDEVELOPED SPRINGS	CEMETERIES (2)	
			PONDS		P-2,P-3
			CREEK		PINEY CREEK
		CONCRETE STRUCTURES (2): SIDWELL HOUSE (RESIDENCE) AND LOCUST HILL (RESIDENCE, CONFERENCE AND INFORMATION CENTER)			
			RAVINES		
			ROCK FORMATIONS		

AEC 05155

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 31
(Subsidence Control Survey)

SURFACE OWNER	COUNTY	TOWNSHIP/SECTION	RENEWABLE RESOURCES	STRUCTURES - USE	MAP LOC. KEY (STRUCTURES)
H.R. JENEWEIN	BELMONT	WAYNE/8	WOODLAND	HOUSES	2-31
			CROPLAND	BARNS	
			PASTURELAND	GARAGES	
			WELLS	OUTBUILDINGS	W-73, DW-81
			DEVELOPED SPRING	GASWELL (PLUGGED)	DS-45
			STREAM		
R. KEMP	BELMONT	WAYNE/2	WOODLAND	HOUSE	2-32
			PASTURELAND	GARAGE	
			CROPLAND	BARN	
			UNDEVELOPED SPRING	OUTBUILDINGS	
			DEVELOPED SPRING	CEMETERY	DS-7, DS-17
			WELL		DW-47
			STREAM		
E. MCARDLE	BELMONT	WAYNE/15	PASTURE LAND	BARN	3-1
			WOODLAND	TRAILER	
			STREAM		
			WELL		W-96
A.G. & M.V. PHILLIPS	BELMONT	WAYNE/15	WOODLAND		3-2
			STREAM		

AEC 05156

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 31
(Subsidence Control Survey)

SURFACE OWNER	COUNTY	TOWNSHIP/SECTION	RENEWABLE RESOURCES	STRUCTURES - USE	MAP LOC. KEY (STRUCTURES)
C.H. & A.J. KINNEY	BELMONT	WAYNE/14, 15	PASTURELAND	HOUSE (1) OCCUPIED	3-3
			WOODLAND	TRAILER (1)OCCUPIED	
			CROPLAND	BARN (1)	
			STREAM	OUTBUILDINGS (4)	
			DEVELOPED SPRING	GASWELLS (2)	DS-60
			WELL		W-140
M. VUCELICH	BELMONT	WAYNE/14	WOODLAND	HOUSE	3-4
			CROPLAND	OUTBUILDINGS	
			PASTURELAND	RUINS	
			WELL		DW-62
			DEVELOPED SPRINGS		DS-30, DS-31
			UNDEVELOPED SPRING		
			GAS WELL		
			STREAM		
D. THOBURN	BELMONT	WAYNE/14	WOODLAND		3-5
N.E. JENEWEIN	BELMONT	WAYNE/8, 14	WOODLAND	HOUSE (1)UNOCCUPIED	3-6
			CROPLAND	BARN	
			PASTURELAND	OUTBUILDINGS	
			WELLS	GARAGES	W-86, W-87

AEC 05157

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 31
(Subsidence Control Survey)

SURFACE OWNER	COUNTY	TOWNSHIP/SECTION	RENEWABLE RESOURCES	STRUCTURES - USE	MAP LOC. KEY (STRUCTURES)
N.E. JENEWEIN CONT;			DEVELOPED SPRINGS	GASWELL (DRY HOLE)	DS-46,DS-47,
					DS-48
			STREAM		
			POND		P-15
R.S. DAVIS	BELMONT	WAYNE/14	WOODLAND	HOUSE	3-7
			PASTURELAND		
			WELL		DW-66,W-65
W.E. DAVIS	BELMONT	WAYNE/13,14	WOODLAND	HOUSE (2) OCCUPIED	3-8
			UNDEVELOPED SPRINGS	GARAGE	
			DEVELOPED SPRINGS	OUTBUILDINGS	DS-34, DS-35,
				CAMPER (1)	DS-36, DS-37,
					DS-38, DS-39
			WELLS	BARN	DS-78, W-141
				CISTERN	W-74,W-89, DW-135
			STREAM		D-3
C.J. & L.J. FRANCIS	BELMONT	WAYNE/13	WOODLAND	HOUSE (1) OCCUPIED	3-9
			PASTURELAND	GARAGE	
			WELLS	HOUSE (1)UNOCCUPIED	W-69, W-70, DW-71
			STREAM		D-3

AEC 05158

OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 31
(Subsidence Control Survey)

SURFACE OWNER	COUNTY	TOWNSHIP/SECTION	RENEWABLE RESOURCES	STRUCTURES - USE	MAP LOC. KEY (STRUCTURES)
L. & L. GUINDON	BELMONT	WAYNE/15	WOODLAND		3-10
			STREAM		D-5
G. A. & L.D. CRIBBEN	BELMONT	WAYNE/15	WOODLAND	HOUSE	3-11
			POND	OUTBUILDINGS	P-13
			WELL		WL-64
C.J. & C. BAKER	BELMONT	WAYNE/15	WOODLAND	HOUSE	3-12
			WELL	OUTBUILDING	W-61
				GARAGE	
R.M. & D.Y. MOORE	BELMONT	WAYNE/15	WOODLAND	TRAILER	3-13
			PASTURELAND	BARN	
			CROPLAND	GARAGE	
			WELL	RUINS	DW-130, W-131
			DEVELOPED SPRING		DS-68
			UNDEVELOPED SRINGS		
			STREAMS		U-4A, D-5
H.R. JENEWEIN	BELMONT	WAYNE/14,15	WOODLAND	HOUSE (1) OCCUPIED	3-14
			PASTURELAND	BARNS	
			CROPLAND	OUTBUILDINGS	
				GARAGES	

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OHIO DEPARTMENT OF NATURAL RESOURCES
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ATTACHMENT 31
(Subsidence Control Survey)

SURFACE OWNER	COUNTY	TOWNSHIP/SECTION	RENEWABLE RESOURCES	STRUCTURES - USE	MAP LOC. KEY (STRUCTURES)
H.R. JENEWEIN "CONT."			DEVELOPED SPRINGS	GEO. SURVEY MARKER	DS-42,DS-43,DS-44
					DS-75,DS-76,DS-77
			WELLS		DW-80
			UNDEVELOPED SPRINGS		
			STREAMS		
O.K. & J. FUCHS	BELMONT	WAYNE/14	WOODLAND	HOUSE	3-15
			PASTURELAND	BARN	
			WELL	GARAGE	W-76
			DEVELOPED SPRINGS		DS-40, DS-69
			STREAM		
			UNDEVELOPED SPRINGS		
C.D. & C.R. LEACH	BELMONT	WAYNE/14	WOODLAND	BARN	3-16
			CROPLAND	GARAGE	
			STREAM	OUTBUILDINGS	
			DEVELOPED SPRING		DS-33
K.C. & L.L. PHILLIPS	BELMONT	WAYNE/14	WOODLAND	HOUSE	3-17
			PASTURELAND	OUTBUILDINGS	
			DEVELOPED SPRING		DS-33

AEC 05160

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 31
(Subsidence Control Survey)

SURFACE OWNER	COUNTY	TOWNSHIP/SECTION	RENEWABLE RESOURCES	STRUCTURES - USE	MAP LOC. KEY (STRUCTURES)
S. & E. BATES	BELMONT	WAYNE/14	WOODLAND	TRAILER	3-18
			PASTURELAND	OUTBUILDING	
			WELL		W-63
M. & M. FUCHS	BELMONT	WAYNE/14	WOODLAND	HOUSE	3-19
			WELL		W-75
			STREAMS		
N.E. JENEWEIN	BELMONT	WAYNE/14	WOODLAND	CABIN	3-20
			PASTURELAND	OUTBUILDING	
			STREAMS		
			UNDEVELOPED SPRING		
J.E. & N.P. HAMILTON	BELMONT	WAYNE/14, 20	WOODLAND		3-21
			STREAMS		
			UNDEVELOPED SPRINGS		
			DEVELOPED SPRING		DS-65
N.P. HAMILTON	BELMONT	WAYNE/14, 20	WOODLAND		3-22
			STREAM		

AEC 05161

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 31
(Subsidence Control Survey)

SURFACE OWNER	COUNTY	TOWNSHIP/SECTION	RENEWABLE RESOURCES	STRUCTURES - USE	MAP LOC. KEY (STRUCTURES)
E.L. WARD	BELMONT	WAYNE/13	WOODLAND	HOUSE	3-23
			PASTURELAND	BARN	
			STREAMS	GARAGE	
				OUTBUILDINGS	
			UNDEVELOPED SPRING		
			WELLS		DW-92, W-93
			DEVELOPED SPRING		DS-52
E.E. & B. WINGROVE	BELMONT	WAYNE/15	WOODLAND	HOUSE	3-24
			PASTURELAND	GARAGE	
			DEVELOPED SPRING		DS-41
			WELL		W-77
			STREAMS		
			UNDEVELOPED SPRINGS		
M. WILSON	BELMONT	WAYNE/21	WOODLAND	HOUSE	3-25
			POND		P-16
			DEVELOPED SPRING		DS-55
			STREAM		
R. & M. TUBAUGH	BELMONT	WAYNE/21	WOODLAND		3-26
D.B. & M.A. CRUM	BELMONT	WAYNE/21	WOODLAND		3-27

AEC 05162

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 31
(Subsidence Control Survey)

SURFACE OWNER	COUNTY	TOWNSHIP/SECTION	RENEWABLE RESOURCES	STRUCTURES - USE	MAP LOC. KEY (STRUCTURES)
L. VANDYNE	BELMONT	WAYNE/20	WOODLAND		3-28
G.T. & D.D. BALLOG	BELMONT	WAYNE/21	WOODLAND		3-29
			STREAM		
T. & R. HAGAN	BELMONT	WAYNE/21	WOODLAND		3-30
			STREAM		
R.D. HAGAN	BELMONT	WAYNE/21	WOODLAND		3-31
			STREAM		
A.J. & L.L. SEAL	BELMONT	WAYNE/20	WOODLAND		3-32
			UNDEVELOPED SPRINGS		
			STREAM		
J.E. & N.P. HAMILTON	BELMONT	WAYNE/20	WOODLAND		3-33
			UNDEVELOPED SPRING		
			STREAM		

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DIVISION OF MINES AND RECLAMATION

ATTACHMENT 31
(Subsidence Control Survey)

SURFACE OWNER	COUNTY	TOWNSHIP/SECTION	RENEWABLE RESOURCES	STRUCTURES - USE	MAP LOC. KEY (STRUCTURES)
L. & B. DATKULIAK	BELMONT	WAYNE/13,19	WOODLAND	HOUSE (2) OCCUPIED	3-34
				BARNS	
				OUTBUILDINGS (3)	
			DEVELOPED SPRINGS	POOL	DS-56, DS-57
			WELLS		WL-98, W-99,W-100
			UNDEVELOPED SPRINGS		
N.L. BURKHART	BELMONT	WAYNE/19,20	WOODLAND	HOUSE	3-35
W. & V. CARPENTER	BELMONT	WAYNE/20	WOODLAND		3-36
M.J. JENEWEIN	BELMONT	WAYNE/14	WOODLAND	HOUSE	3-37
			WELL		W-68
D.A. & J. CROOKS	BELMONT	WASHINGTON/26	CROPLAND	--	1-20
B.& J. ROGERS	BELMONT	WAYNE/21	WOODLAND	--	3-38
			STREAM	--	U-4A, D-4

AEC 05164

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 31
(Subsidence Control Survey)

SURFACE OWNER	COUNTY	TOWNSHIP/SECTION	RENEWABLE RESOURCES	STRUCTURES - USE	MAP LOC. KEY (STRUCTURES)
WAYNE TOWNSHIP TRUSTEES	BELMONT	WAYNE/3,8,14		BRIDGES	SHEETS 2 & 3
WASHINGTON TOWNSHIP TRUSTEES	BELMONT	WASHINGTON/26		BRIDGE	SHEET 1

AEC 05165

ADDENDUM TO PAGE 28, PART 3, K(1)
BENNOC, INC.
CENTURY MINE
PERMIT D-0425

ENGINEERING AND MINING TECHNIQUES

The CENTURY MINE is an operation that uses the longwall method of mining. The engineering and mining techniques for longwall mining are as follows:

Longwall Mining

1. Longwall mining removes long panels of coal that are 600 to 900 ft. and a maximum of approximately 15,000 ft. long. A longwall shearer, a double-drum machine, removes the panel by cutting slices of coal along the width of the face. The roof is temporarily supported by hydraulic supports called shields. The shields are moved forward each time that a slice is cut from the face. The coal is transported from the face by an armored, chain conveyor.

The roof behind the shields is allowed to collapse. Surface subsidence on the order of approximately 66 percent of the mining height occurs when the roof falls.

2. The longwall face is outlined by three or four entries on each side called gate entries, on the end where the panel starts by several entries called bleeder entries, and on the panel end by the main entries or by recovery rooms (entries developed to remove the longwall mining equipment). These entries are developed using a continuous miner, shuttle cars, and roof bolters. Pillars and concrete block stoppings separate each entry from the next. These entries provide ventilation and belt haulage for the longwall mining section, with a maximum recovery of less than 50 percent of the coal. Coal pillars between the longwall panels crush after both adjacent longwall panels are extracted. Subsidence of the surface occurs over these panels and pillars during longwall mining as a result of the pillars crushing and from the extraction of both adjacent longwall panels.

Main Entry Development - Longwall Access

There will be one set of main entries driven in a general north-south direction. The main entries consist of approximately seven entries, driven with continuous miners and are primarily used for ventilation, transportation of men and materials, and haulage. These entries are designed for long-life with the pillars providing roof support. The maximum recovery factor for mains and submains is below 50 percent and is much less if one considers the barrier blocks left in place at the approaches to butt and longwall sections.

There is a lack of available information to indicate that longwall mining will destroy or de-stabilize the rock overhangs at Raven Rocks or other adjacent properties. However, the mining plan has been designed to avoid all of the rock overhangs.

The rock shelters at the Raven Rocks property will not be undermined with full coal recovery mining but may be undermined using partial coal recovery mining from which subsidence will be prevented.

The underground home and visitor center on the Raven Rocks property will not be undermined with full coal recovery mining but may be undermined using partial coal recovery.

This area of Ohio contains many slip-prone soil types. In fact, the topography of this area was formed from slippage, which still occurs today. Slip-prone soil types have been identified in the Addendum to Item K(5)(b). After mining occurs in an area, personnel examine the mining areas for damage to land. As stated in the Addendum to Item K(5)(c), damage to land will be repaired as soon as discovered and as soon as practical given weather and other conditions. If a slip is caused by subsidence from full coal recovery mining, it likely will occur within several months of subsidence. If a slip is discovered, the time frame that the area was undermined (if at all) will be determined, and if the slip occurs relatively soon after mining (within several months), it generally can be assumed to be related to the mining. However, due to the fact that the area is slip prone, there are other circumstances that may cause slippage, such as heavy rainfall, loading of the soil (with structures or other materials), and these occurrences will also be taken into consideration. In addition, recent slippage, prior to mining, may be an indicator that a slip was not mining induced. Is a slip is found to be mining related, a mitigation plan will be submitted within 30 days of discovery and determination that the slip is mining related. That time period may be expedited if significant environmental harm is possible, or public safety is compromised.

Loss of stream base flow is not identified as a "significant problem" on the adjacent D-0360 permit area. Our observations show that in large streams the flow returns within several months, even in low cover. In small streams, that time period for flow to return increases due to lower flows and lower sediment loads. Some stream base flow loss has been observed, but within several years, without any mitigation, streams have returned to normal flows. The mechanism for such natural remediation is believed to be through sediment that fills cracks induced by mining. If flow does not naturally return within five years, cracks will be filled manually. Material such as soil containing high clay content, or a bentonite clay power could be used to fill the cracks. Generally, grouting is not recommended, as the stream is the indicator of the top of the water table and if the water table is unable to reach the stream bed, it may relocate elsewhere. If a stream is needed to provide water to livestock, temporary water is usually installed prior to undermining or shortly thereafter according to the water replacement plan.

ADDENDUM TO PART 3, PAGE 28, (K)(1)
BENNOC, INC.
CENTURY MINE
PERMIT D-0425

ANNUAL MAP

In accordance with PPD Underground 91-1, a mine map will be submitted to coincide with the permit anniversary date. For ground water monitoring, the face location of the active panel will be provided quarterly with the monitoring data. The maps will contain the following:

1. Scale the same as the Division of Mines submittal, or 1 in. = 500 ft.
2. All base map requirements pursuant to ORC 4153.03.
3. Surface owner names and property lines.
4. Streams and other bodies of water.
5. Section lines and numbers.
6. Buildings and other surface structures.
7. Public roads and railroad tracks.
8. Mine openings and surveyed workings, showing pillar and entry size, configuration and location.
9. Survey extension dates for all workings, including longwall face or pillar recovery lines.
10. Areas of full extraction.
11. Coal elevations and extraction height.
12. Completion dates for individual sections (if sealed, date and location of seal).
13. Maximum extraction ratios for completed sections.
14. Ground water and subsidence monitoring stations.
15. The boundaries of the authorized mining area.
16. The location and extent of any other mine excavation (surface or underground) within the same seam being mined.
17. A map title block and notarized map certification.

K. (4) Submit as an addendum, for those areas mapped as room-and-pillar mining, the following information:
SEE ADDENDUM TO PAGE 29, ITEM K(4)

(a) the maximum and average overburden thickness.

(b) the projected maximum extraction ratios for mains, submains, and butt sections, as well as the existing ranges of values for the same areas.

(c) projected maximum width of entries and cross cuts throughout the mine, as well as the existing ranges of values for the same areas.

(d) the center spacing for entries and cross cuts.

(e) minimum pillar dimensions for mains, submains, and butt sections, as well as the existing ranges of values for these areas.

(f) the barrier pillar width between butt sections, as well as the existing ranges of values for the same areas.

(g) the engineering properties of the clay/shale, or other soft rock material in the roof and floor of the mine.

(h) measures to be taken on the surface to prevent damage or lessening of the value or reasonably forseeable use of the surface, if any.

(i) the minimum pillar safety factor, for protected structures, based upon coal strength and load.

(j) methods and calculations used to determine the safety factor.

(5) Submit as an addendum for those areas mapped as full coal recovery mining, the following information:
SEE ADDENDUM TO PART 3, PAGE 29, K(5)(a)

(a) for each method to be employed (i.e. longwall or pillar extraction), provide the following:

i) rate and direction of dip for the coal seam.

ii) dimensions of panels or butt sections.

iii) thickness of coal to be extracted (mining height).

iv) maximum angle of draw.

v) maximum anticipated subsidence.

vi) width of barrier pillars or chain pillars between sections or panels.

vii) the maximum extraction ratio within a pillaring section.

ADDENDUM TO PART 3, PAGE 29, K(4)
BENNOC, INC.
PERMIT D-0425-1

ENGINEERING PROPERTIES FOR MAIN DEVELOPMENT ENTRIES AND PARTIAL RECOVERY ROOM SECTIONS

This operation is slated to be a longwall operation. There will be areas where main entries are to be developed to access the longwall to be used for ventilation and haulage. There will be classic "room and pillar" activities whereby pillars are left. The main entries are a part of the longwall mining, but no subsidence will occur over the main entries. Main entries are designed specifically to provide long-term support of the overlying strata. Rooms that will be mined will not be second mined and will produce no subsidence.

The location of the main entries may vary depending on the mining plan in order to optimize the mining. The main entries will be designed with a minimum safety factor of 2.0 to assure that no subsidence of the surface above these areas will occur.

Within the application area, the maximum overburden is 630 feet and the average is 398. The maximum elevation over the planned underground workings is approximately 1360 feet on the western edge of the application area. The minimum elevation is 910 feet found along the eastern edge. The projected maximum extraction ratio is 50 percent for all areas of main entry development and room areas. Room and main entries and cross cuts are to be driven a maximum of 20 feet wide with entry and cross cut centers projected to be 65 feet x 90 feet. Minimum pillar dimensions will be 70 feet x 45 feet. These dimensions are nearly identical to those currently in use at the adjacent D-0360 operation. Bennoc, Inc. has chosen to design our pillars for the maximum overburden on the property, which will give an added factor of safety to the pillars in other areas such as those in the areas designated as room and pillar areas.

Barrier pillars will be left between the longwall panels and the main entries and between rooms and the main entries. Generally, those pillars are a minimum of 100 feet wide, but may be as much as 400 feet wide depending on the orientation of the mains and either the panels or the rooms.

The structural contour map with this application indicates the coal elevation (bottom) within the application area to be 670 to 795 feet msl. Table 13 shows typical compressive strengths for the immediate floor in the adjacent Powhatan No. 6 Mine, and is expected to be similar at the Century Mine. The floor primarily consists of shale or calcareous shale, with an occasional thin bed of claystone. The compressive strength of the shale is 5,034 to 9,453 psi and for the calcareous shale, 9,444 to 12,590 psi. These shale units frequently contain limestone nodules, which makes excavating the mine floor particularly difficult and costly.

The compressive strength of the coal is generally accepted to be 4,330 +- 600 psi. The strength of the Pittsburgh (No. 8) coal in this area was determined by Professor Charles Holland years ago with the use of three (3) inch cube specimens. The design strength was found to be 4,330 psi. Professor Holland and others have found that, due to the cleavage planes and other natural seam

defects, the in-situ compressive strength for a 6.5 foot seam is 850 psi.

Pillar design calculations are shown for the maximum overburden, but may vary depending on the actual location of the mains or the rooms. However, the minimum safety factor of 2.0 will be maintained regardless of the actual location.

A portion of the underground reserve has been designated as room and pillar mining beneath the sensitive portions of the Raven Rocks property including the Locust Hill and Sidwell facilities and all of the rock overhangs, in order to minimize the impact of underground mining on these structures. Where mining is conducted beneath these areas, a minimum safety factor of 2.0 will be maintained and subsidence is not anticipated. Where a safety factor of 2.0 has been used, subsidence has not occurred in the adjacent D-0360 underground mining operation.

BENNOC COAL COMPANY
CENTURY MINE - PERMIT D-0425
PILLAR SAFETY FACTOR - MAIN ENTRIES
HOLLAND METHOD

PILLAR STRENGTH 980	850	PSI	Strength of a pillar scaled down from a 3 in. cube (HOLLAND)
DEPTH	514	FT	(Avg depth + Max. depth)/2 (PENG)
PILLAR W	540	IN	Pillar width in inches
PILLAR L	840	IN	Pillar length in inches
ENTRY W	240	IN	Entry width in inches
ENTRY H	78	IN	Entry height in inches
OVERBURDEN LOAD	1.1	PSI	Per ft. of depth (PENG)

			HOLLAND FORMULAE:
AVG STRESS	1050	psi	VERT. STRESS x {[(PILLAR W + ENTRY W)x(PILLAR L + ENTRY W)]/(PILLAR W x PILLAR L)}
S1	850	psi	(HOLLAND)
S2	2236.5	psi	S1 x SQUARE ROOT OF (PILLAR W/ENTRY H)
SF	2.1		S2/AVG STRESS

From Peng , S. S. and Dutta, D., "Evaluation of Various Pillar Design Methods: A Case Study," Proceedings of the Workshop of Coal Pillar Mechanics and Design, compiled by A.T. Iannacchione, C. Mark, R. C. Repsher, R. J. Tuchman, and C.C. Jones, USBM, IC 9315, 1992, pp. 269-276.

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TABLE 13

COMPRESSIVE STRENGTH

PITTSBURGH (NO. 8) FLOOR

ROCK CORE COMPRESSIVE STRENGTH TEST RESULTS				
OHIO VALLEY COAL COMPANY				
Boring N91-3				
Sample No.	Depth (ft.)	Unit Wt. (pcf)	Compressive Strength (psi)	LITHOLOGIC DESCRIPTION
1	580.6 - 580.9	165.7	9444	Calcareous Shale
2	582.3 - 582.6	163.2	3930	Claystone
3	585.1 - 585.4	168.9	9453	Shale
4	587.2 - 587.5	162.9	3767	Shale
5	589.3 - 589.6	168.9	2995	Shale
Boring N91-4				
Sample No.	Depth (ft.)	Unit Wt. (pcf)	Compressive Strength (psi)	
1	596.2 - 596.5	183.2	10272	Claystone*
2	600.4 - 600.7	165.1	6535	Shale
3	602.9 - 603.2	163.9	5034	Shale
4	604.2-604.5	158.3	9643	Shale
Boring N91-6				
Sample No.	Depth (ft.)	Unit Wt. (pcf)	Compressive Strength (psi)	
1	453.6 - 453.9	165.9	5288	Shale
2	454.0 - 454.3	170.9	12590	Calcareous Shale
3	455.0 - 455.3	161.6	9918	Calcareous Shale
4	455.3 - 455.6	163.0	9752	Calcareous Shale
5	456.8 - 457.1	161.0	6903	Shale
6	457.3 - 457.6	163.3	6220	Shale
7	458.0 - 458.3	161.4	7585	Shale
8	464.3 - 464.7	160.6	5699	Shale

* Strength and density too high for claystone, may have had limestone nodule in prepared sample.

ADDENDUM TO PAGE 29, PART 3, K(5)(a)
BENNOC, INC.
CENTURY MINE
PERMIT D-0425

ANTICIPATED EFFECTS OF PLANNED SUBSIDENCE

General

The anticipated surface effects of subsidence during and following coal extraction by the longwall method at the Century Mine are related to the following movements of the ground surface:

1. Vertical subsidence
2. Horizontal movement

The combination of vertical and horizontal movements of points on the ground surface leads to tensile (or extension) and compression strains from curvature of the ground surface and tilt. Extension and compression of the ground surface, in the direction of the movement of the longwall face, occur as the face moves in the direction of mining. The extension and compression effects develop after passage of the longwall face. The surface curvature, with resulting extension and compression, and the tilt near the ends of a mined panel and along the sides of a mined panel, represent the permanent effects of subsidence.

There are temporary effects of subsidence from what is known as the dynamic subsidence wave. This wave begins about five days prior to undermining. As the surface begins to subside, the land goes into tension. Tension cracks result on the land surface in some locations (depending on the soil type and topography). Immediately after undermining, the land begins to subside rapidly and goes into compression. Generally, the magnitude of the compressive forces do not reach the magnitude of the tensile forces, and some cracks remain open until the weather (usually rain) fills them. These temporary effects pass very quickly due to the speed of the longwall mining at the CENTURY MINE.

Background

The dip of the coal is 26 ft. per mile at approximately South 80 Degrees East. The strike is North 10 Degrees East. The panel dimensions are approximately 600 to 900 ft. wide and up to 16,000 ft. long. The gates are approximately 140 to 200 ft. wide between panels (typically 156 ft). The coal thickness to be extracted is approximately 59 in. throughout most of the application area. There is approximately 24.53 to 34.38 percent of the overburden classified as hard rock according to the test hole data.

Time of Subsidence

The surface effects of mining occur at times generally related to the advance of the longwall face. For the Century Mine, data from the adjacent Powhatan No. 6 Mine (OVCC) were used.

1. Movements which develop over a panel being mined with passage of the face: these represent the most significant movements, start soon after the face passes, and are generally complete within thirteen (13) days of passage of the face. Approximately 99 percent of the subsidence is complete when the face is located at a distance equal to the depth of cover from any point on the surface.

2. Movements which occur over a previously mined panel as an adjacent panel is mined: such super-incumbent movements are relatively insignificant, being in the range of about 0.2 ft at the center of the previously mined panel. Such movement at this location is caused by the collapse of the pillars between the two panels and the subsequent subsidence. Therefore, it is evident that the gate entries are part of the full coal recovery mining method.

3. Movements over a long period of time due to consolidation of the gob and time dependent stress readjustment: long-term subsidence of the ground surface is not measurable, and is insufficient to cause surface damage.

Predicted Movements

The surface movements indicated below are derived from measurements made during subsidence over OVCC's first longwall panel (5 West) and over the 10 West and 11 West panels. Similar movements are anticipated within this application area.

Monitoring Over First Longwall Panel (5 West)

In February, 1990, the first longwall panel progressed beneath Smith Township Road 116. OVCC placed subsidence monuments at 25 and 50 foot intervals along the road, measured their elevations prior to mining, and on several occasions after the mining was past the road. Figure 1 shows the plan view of the subsidence monuments. The longwall gate section entries are shown on the figure also. Figure 2 shows the subsidence profile that developed. Table 1 shows the monitoring data. The longwall face was 600 ft wide (center-to-center), at a depth of 497 ft, and had a mining height of 5.2 ft (62 in). The maximum subsidence is expected to be nearly the same since the depth of cover and panel width are similar (both are super-critical in nature).

The maximum angle of draw (measured to .02 ft of displacement) was approximately 13 degrees. The angle of draw on the headgate side was identical to the angle on the tailgate side. It should be noted that the surface at the headgate showed signs of some horizontal movement that caused the monuments on the surface to move downhill. This situation caused

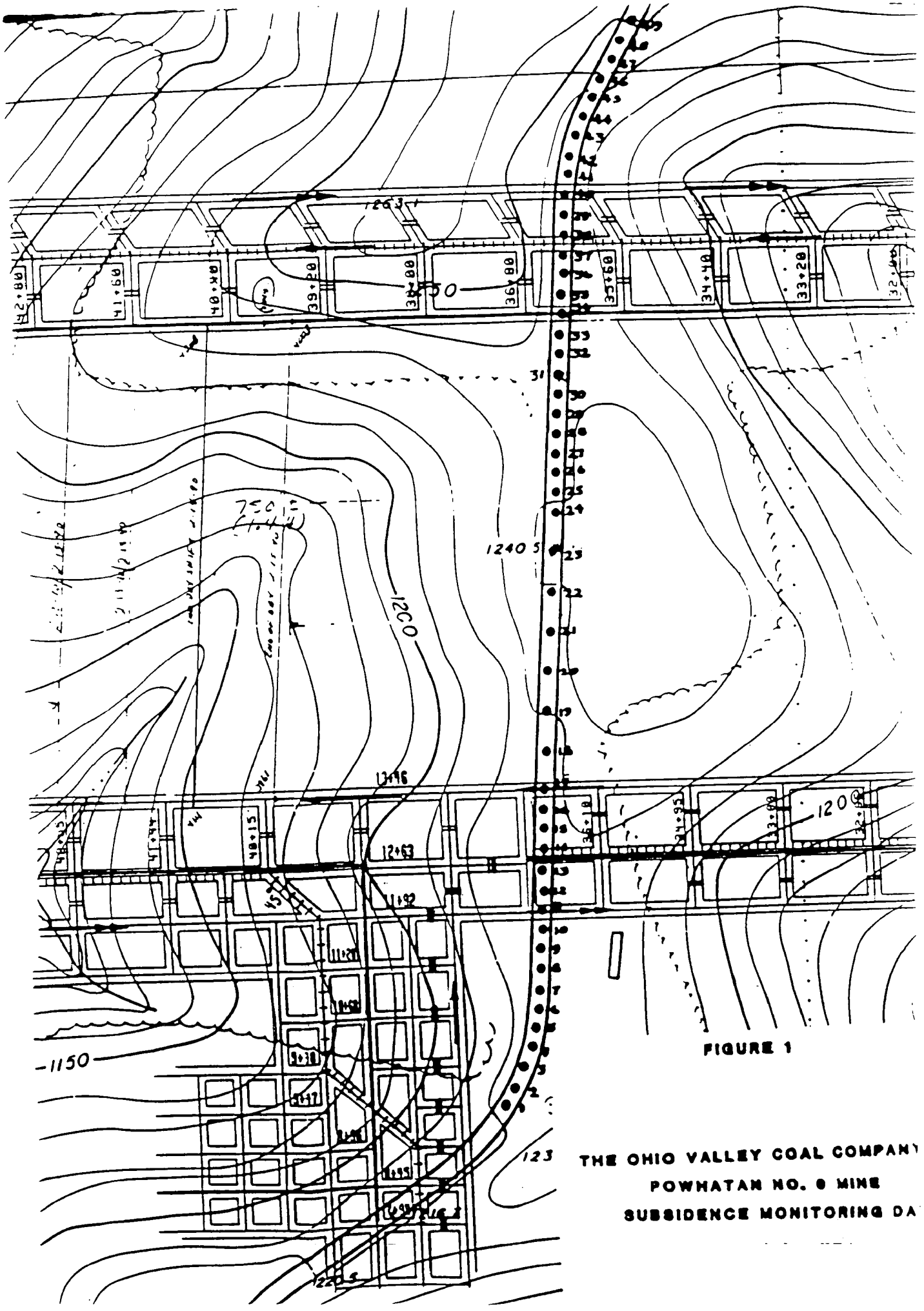

FIGURE 1

THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
SUBSIDENCE MONITORING DA

FIGURE 2

SUBSIDENCE PROFILE

FIRST LONGWALL PANEL

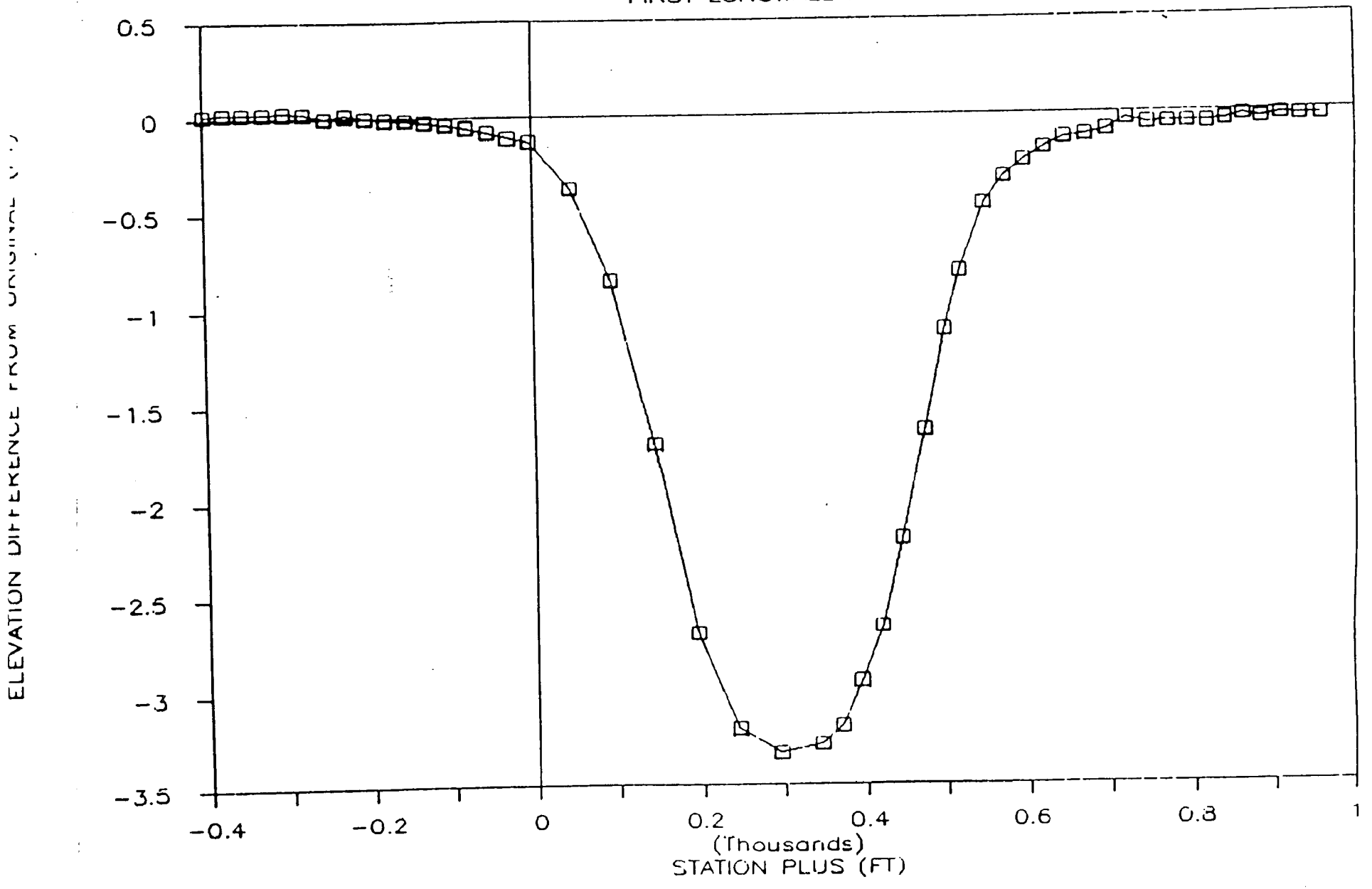

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TABLE 1

SUBSIDENCE DATA COLLECTED OVER "FIRST" PANEL

LOCATION IN PANEL	SUBSIDENCE STATION	STATION PLUS	AVERAGE SINCE 03-05-90
*******	********	********	********
	1	-399.88	0.02
	2	-376.10	0.02
	3	-352.31	0.02
	4	-327.81	0.02
	5	-302.74	0.03
	6	-277.67	0.02
	7	-252.91	0.00
	8	-228.06	0.02
	9	-203.22	0.00
	10	-178.02	-0.01
	11	-152.98	-0.01
	12	-128.17	-0.02
	13	-103.76	-0.04
	14	-79.23	-0.05
	15	-53.91	-0.08
	16	-29.53	-0.11
T. G.	17	-4.67	-0.13
	18	44.98	-0.37
	19	94.67	-0.86
	20	144.40	-1.71
	21	194.26	-2.70
	22	244.94	-3.20
CENTER	23	295.08	-3.33
	24	344.43	-3.28
	25	369.29	-3.19
	26	394.09	-2.95
	27	418.96	-2.67
	28	443.77	-2.21
	29	472.83	-1.64
	30	497.74	-1.12
	31	517.68	-0.81
	32	547.66	-0.47
	33	572.62	-0.33
H. G.	34	597.63	-0.24
	35	622.37	-0.18
	36	647.21	-0.13
	37	672.17	-0.11
	38	697.21	-0.09
	39	722.39	-0.03
	40	747.40	-0.06
	41	771.54	-0.05
	42	794.95	-0.06
	43	818.47	-0.06
	44	841.35	-0.05
	45	864.06	-0.03
	46	886.73	-0.04
	47	909.96	-0.02
	48	933.35	-0.03
	49	960.15	-0.03

Values shown in ft.
Negative value indicates downward movement.

TABLE 2

II. DIFFERENCE IN GROUND ELEVATIONS: First LW Panel

STATION NUMBER	02-14-90	02-16-90	02-21-90	02-23-90	02-26-90	02-28-90	03-02-90	03-05-90	03-12-90	03-19-90	04-12-90	06-11-90	AVERAGE SINCE 03-05-90 ********
	SURVEY DATE												
1	0.01	0.01	0.00	0.00	0.00	0.01	0.02	0.01	0.03	0.05	-0.01	0.00	0.02
2	0.00	0.02	0.01	-0.02	0.00	0.01	0.01	0.02	0.02	0.05	0.01	0.07	0.02
3	0.03	0.03	0.01	0.01	0.01	0.01	0.03	0.02	0.02	0.05	0.01	0.08	0.02
4	0.02	0.02	0.02	0.01	0.01	0.01	0.02	0.01	0.03	0.05	0.01	0.04	0.02
5	0.03	0.02	0.03	0.02	0.02	0.02	0.04	0.04	0.01	0.06	0.01	0.07	0.03
6	0.02	0.01	0.01	0.01	0.04	0.01	0.03	0.02	0.02	0.05	0.01	0.07	0.02
7	-0.03	-0.01	0.00	-0.02	-0.01	-0.00	0.01	0.00	0.00	0.03	-0.02	0.05	0.00
8	0.01	0.01	0.02	0.00	0.01	0.01	0.02	0.01	0.02	0.04	0.00	0.06	0.02
9	0.01	0.01	0.00	0.00	0.00	-0.00	0.01	-0.01	0.00	0.03	-0.01	-1.96	0.00
10	0.01	0.01	0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	0.02	-0.03	0.00	-0.01
11	0.08	0.01	0.00	-0.01	0.01	-0.01	-0.01	-0.01	-0.03	0.01	-0.02	0.03	-0.01
12	0.08	0.01	-0.01	-0.02	-0.02	-0.03	-0.03	-0.03	-0.03	0.00	-0.03	0.02	-0.02
13	-0.04	0.01	-0.01	-0.02	-0.02	-0.03	-0.03	-0.03	-0.04	-0.01	-0.06	0.00	-0.04
14	0.07	0.00	-0.01	-0.04	-0.03	-0.07	-0.05	-0.06	-0.06	-0.02	-0.07	-0.01	-0.05
15	0.08	-0.01	-0.02	-0.05	-0.07	-0.08	-0.08	-0.08	-0.08	-0.04	-0.11	-0.05	-0.08
16	0.07	0.00	-0.03	-0.08	-0.09	-0.10	-0.10	-0.11	-0.11	-0.08	-0.13	-0.07	-0.11
T.G. 17	0.11	0.05	0.01	-0.06	-0.09	-0.11	-0.12	-0.13	-0.13	-0.10	-0.15	-0.09	-0.13
18	0.03	0.01	-0.06	-0.21	-0.29	-0.34	-0.35	-0.36	-0.36	-0.34	-0.43	-0.36	-0.37
19	0.08	0.02	-0.07	-0.49	-0.68	-0.81	-0.83	-0.84	-0.85	-0.83	-0.90	-0.86	-0.84
20	0.09	0.00	-0.13	-1.13	-1.47	-1.65	-1.68	-1.69	-1.71	-1.69	-1.75	-1.73	-1.71
21	0.10	-0.01	-0.18	-1.97	-2.41	-2.60	-2.65	-2.68	-2.70	-2.67	-2.74	-2.71	-2.70
22	0.08	-0.01	-0.22	-2.43	-2.90	-3.09	-3.11	-3.17	-3.22	-3.18	-3.22	-3.21	-3.20
Center 23	0.11	0.01	-0.21	-2.54	-3.01	-3.23	-3.23	-3.31	-3.36	-3.30	-3.34	-3.34	-3.33
24	0.09	0.00	-0.21	-2.48	-2.96	-3.19	-3.20	-3.28	-3.30	-3.25	-3.30	-3.30	-3.28
25	0.08	-0.01	-0.20	-2.37	-2.85	-3.08	-3.09	-3.18	-3.21	-3.15	-3.20	-3.20	-3.19
26	0.09	-0.01	-0.17	-2.13	-2.62	-2.85	-2.87	-2.93	-2.97	-2.92	-2.98	-2.97	-2.95
27	0.06	-0.03	-0.18	-1.84	-2.32	-2.56	-2.57	-2.66	-2.70	-2.63	-2.68	-2.68	-2.67
28	0.07	-0.03	-0.15	-1.41	-1.88	-2.11	-2.13	-2.20	-2.24	-2.17	-2.22	-2.22	-2.21
29	0.08	0.00	-0.06	-0.71	-1.24	-1.52	-1.53	-1.65	-1.66	-1.60	-1.66	-1.66	-1.64
30	0.09	0.00	-0.04	-0.44	-0.79	-1.02	-1.03	-1.12	-1.15	-1.08	-1.14	-1.15	-1.12
31	0.07	-0.01	-0.05	-0.33	-0.55	-0.72	-0.73	-0.81	-0.84	-0.78	-0.83	-0.82	-0.81
32	0.09	0.00	-0.04	-0.21	-0.32	-0.40	-0.38	-0.47	-0.49	-0.42	-0.48	-0.46	-0.47
33	0.08	-0.02	-0.05	-0.16	-0.24	-0.28	-0.25	-0.33	-0.36	-0.28	-0.34	-0.31	-0.33
H.G. 34	0.08	-0.02	-0.03	-0.12	-0.18	-0.19	-0.16	-0.24	-0.30	-0.19	-0.25	-0.23	-0.24
35	0.08	-0.02	-0.02	-0.08	-0.13	-0.14	-0.11	-0.18	-0.21	-0.14	-0.19	-0.16	-0.18
36	0.09	0.00	0.01	-0.06	-0.09	-0.09	-0.06	-0.16	-0.16	-0.08	-0.13	-0.11	-0.13
37	0.07	-0.01	-0.01	-0.06	-0.09	-0.08	-0.05	-0.12	-0.15	-0.07	-0.12	-0.09	-0.11
38	0.06	-0.01	-0.03	-0.05	-0.07	-0.06	-0.03	-0.10	-0.11	-0.05	-0.10	-0.07	-0.09
39	0.10	0.03	0.05	-0.01	-0.02	0.00	0.03	-0.04	-0.06	0.01	-0.04	-0.01	-0.03
40	0.08	0.01	0.03	-0.02	-0.06	-0.03	0.00	-0.07	-0.08	-0.02	-0.07		-0.06
41	0.09	0.00	0.01	-0.03	-0.05	-0.03	0.01	-0.07	-0.08	-0.01	-0.06		-0.05
42	0.10	0.00	0.01	-0.01	-0.03	-0.02	0.01	-0.07	-0.08	-0.01	-0.06	-0.02	-0.06
43	0.06	0.00	0.03	-0.02	-0.04	-0.02	0.01	-0.07	-0.09	-0.01	-0.06	-0.03	-0.06
44	0.08	-0.01	0.03	-0.02	-0.03	-0.01	0.02	-0.08	-0.08	0.01	-0.04	-0.01	-0.05
45	0.07	-0.01	0.03	-0.01	-0.01	-0.00	0.04	-0.04	-0.05	0.02	-0.03		-0.03
46	0.07	-0.01	0.02	-0.01	-0.05	-0.01	0.02	-0.05	-0.07	0.00	-0.05	-0.01	-0.04
47	0.05	0.01	0.05	-0.01	-0.02	0.00	0.03	-0.03	-0.06	0.02	-0.03	0.01	-0.02
48	0.07	-0.01	0.00	0.00	-0.02	-0.00	0.02	-0.04	-0.06	0.01	-0.03	0.01	-0.03
49	0.06	-0.02	0.03	0.00	-0.05	0.00	-2.97	-0.03	-0.07	0.01	-0.03	0.01	-0.03

Distance LW face is from road (in feet): - sign means West of road + sign means East of road

Values shown in ft.

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some of the displacement of the monuments to the north of the angle of draw. However, with the surveying instruments that were used, an accuracy of 0.02 ft. was used, and the displacement north of the angle of draw was minimal. The angle of draw at the Century Mine is expected to be similar since the geology is nearly identical to that found at the Powhatan No. 6 Mine.

The longwall panel passed under the road on February 20, 1990. The first subsidence was observed on February 21, with 99 percent of the maximum subsidence occurring by March 5, 1990 (within 13 days). The timing of the subsidence is expected to be similar at the Century Mine.

The second longwall panel was initially instrumented and the pre-mining elevations were determined. Subsequent measurements were not made, and a search for the monuments revealed that most of the monuments could not be found. However, measurements of the monuments over the first panel showed that the ground had experienced displacements as far south as the middle of the first panel. It was attributed to the collapse of the pillars between the panels, although some movement probably occurred in a downhill direction.

The maximum subsidence occurred near the center of the panel being mined and was measured at approximately 64 percent of the extracted seam thickness. Normally, this represents about 40 in. of subsidence. At the Century Mine, the maximum subsidence is expected to be 37.8 inches based on this data.

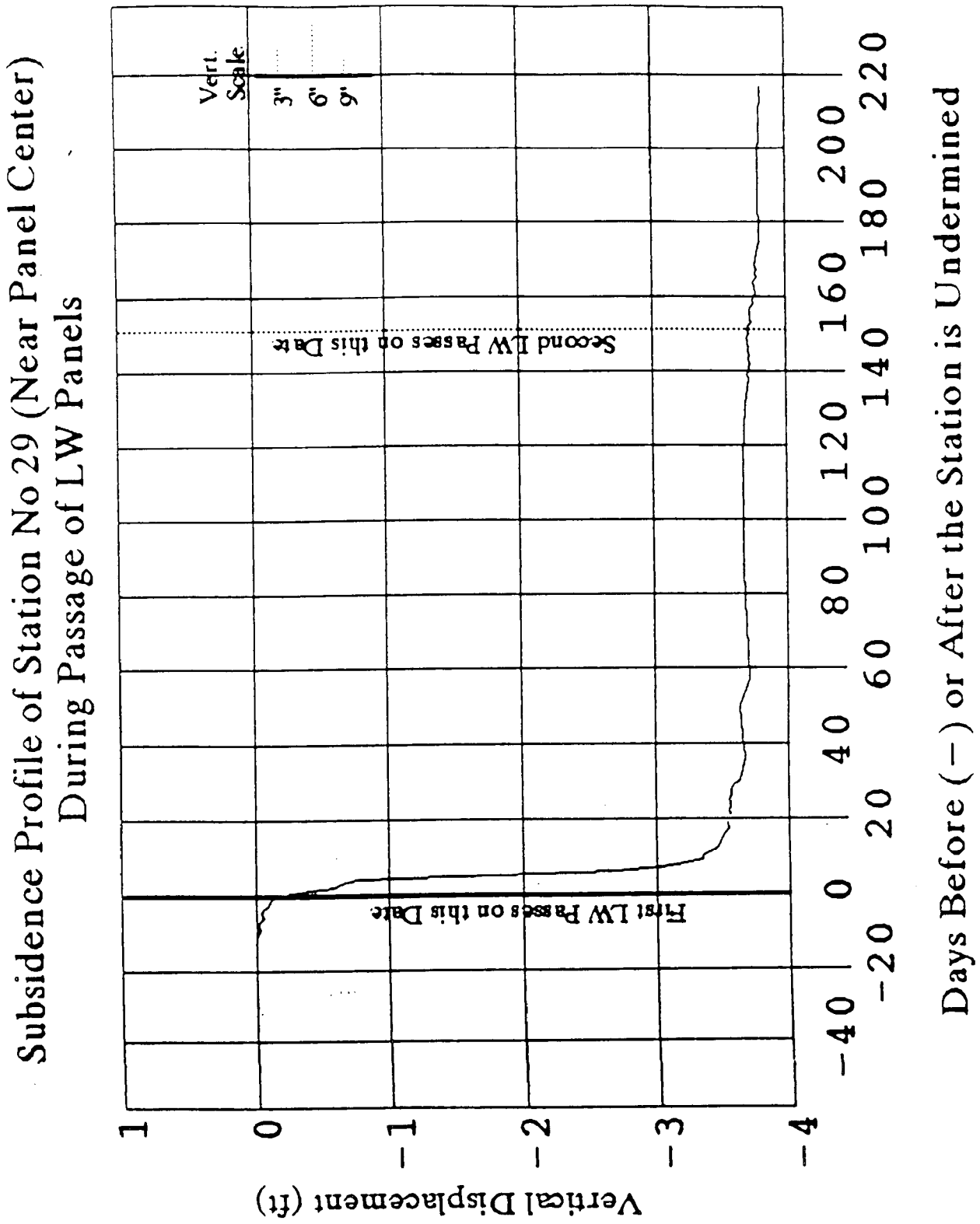
Monitoring Over Sixth (10 West) and Seventh (11 West) Panels

State Route 9 south of Centerville, Ohio was targeted for the next subsidence monitoring program. This program monitored subsidence over two subsequent panels to further show the effect of the surface movement relative to subsequent longwall panels.

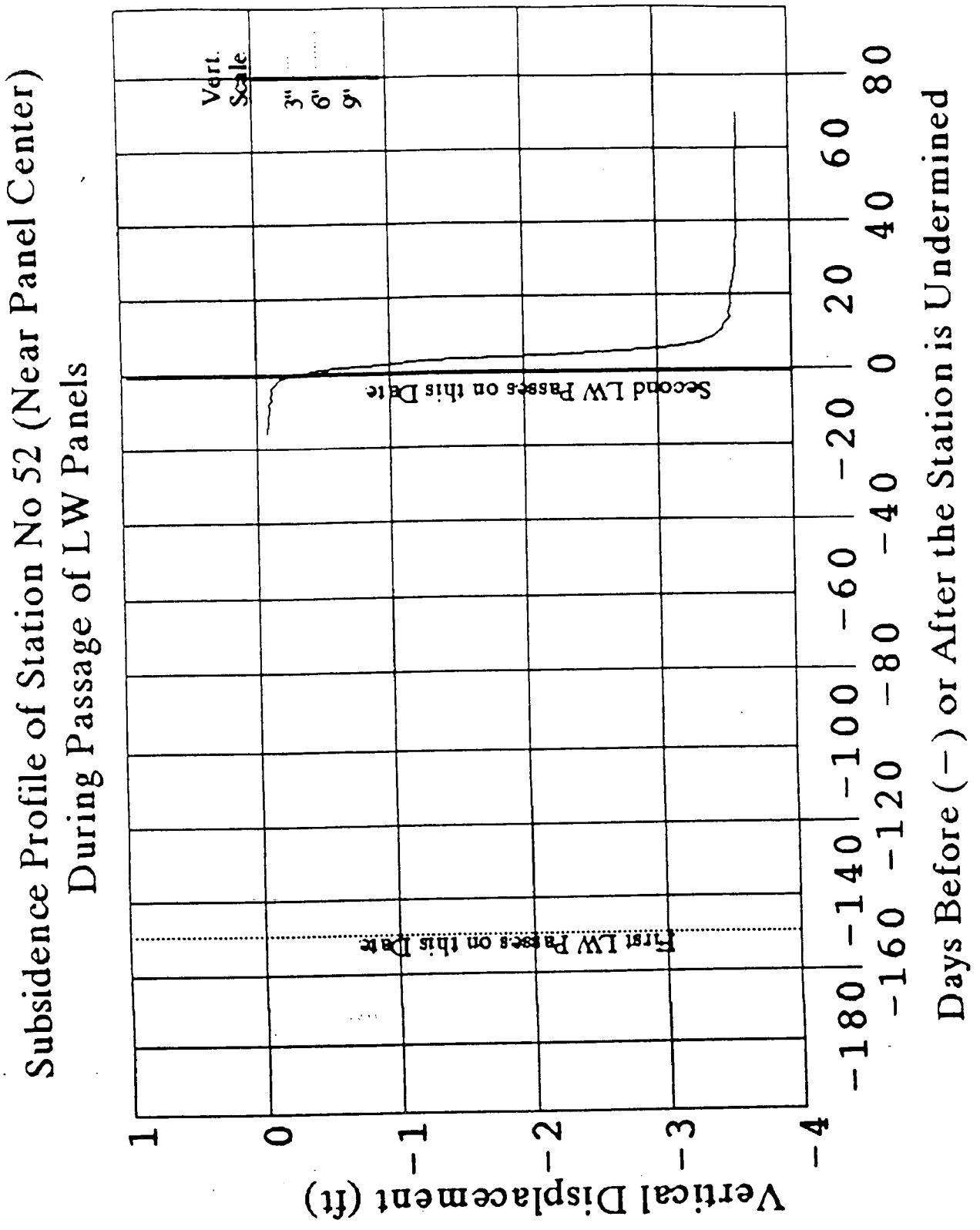
The results for the first panel mined in this set (10 West) was identical to the results for the 5 West panel, except that there were indications that subsidence occurred well into the previous panel as a result of the pillar failure and related vertical movement. Since the 9 West panel was not instrumented or monitored, the initial subsidence is not indicated over the 8 West gate entries. Graphs 1 and 2 show the time dependent subsidence during the monitoring program.

Graph 3 shows the subsidence over the common gate section when the first and second panels pass. When the second panel passes, over one ft. of subsidence occurs when the second panel subsides. If the pillars had not failed, only minor vertical movement would have occurred, similar to when the first panel passed. The maximum angle of draw was found to be 13 degrees over the solid coal to the north of the 11 West gate entries. Subsidence again extended to the middle of the 10 West panel, thus showing the predictable nature of longwall mining subsidence. In addition, the magnitude of the subsidence over these two panels was 67 and 65 percent, nearly the same as for the 5 West panel. The data shows that longwall mining subsidence also is controlled and planned as to the location and timing of the subsidence.

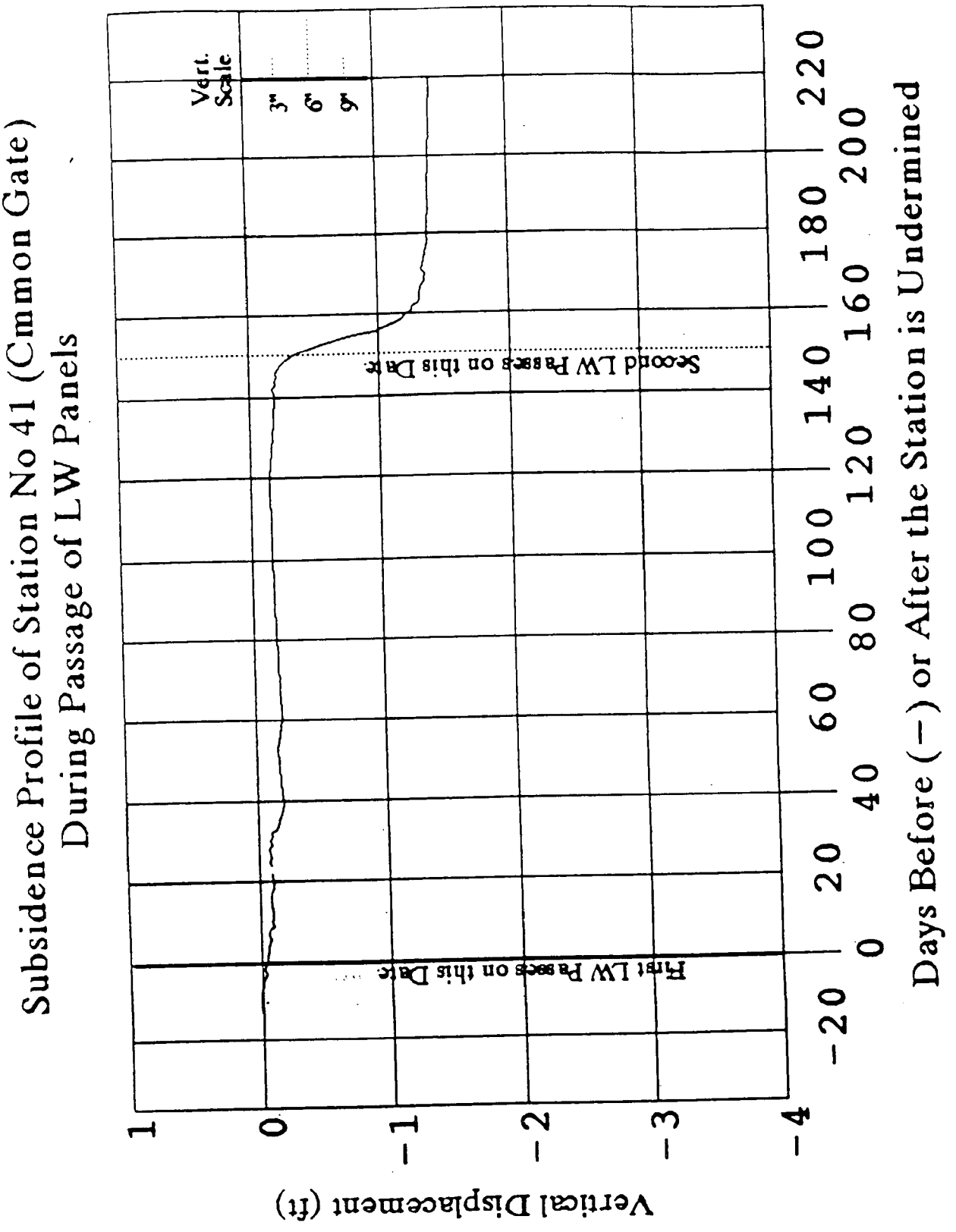
GRAPH #1


Subsidence Profile of Station No 29 (Near Panel Center)
During Passage of LW Panels
Vert. Scale
3"
6"
9"
Second LW Passes on this Date
First LW Passes on this Date
Vertical Displacement (ft)
1
0
-1
-2
-3
-4
-40
-20
0
20
40
60
80
100
120
140
160
180
200
220
Days Before (-) or After the Station is Undermined

GRAPH #2


Subsidence Profile of Station No 52 (Near Panel Center)
During Passage of LW Panels
Vertical Displacement (ft)
1
0
-1
-2
-3
-4
Days Before (−) or After the Station is Undermined
-180
-160
-140
-120
-100
-80
-60
-40
-20
0
20
40
60
80
First LW Passes on this Date
Second LW Passes on this Date
Vert. Scale
3"
6"
9"

GRAPH #3


Subsidence Profile of Station No 41 (Common Gate)
During Passage of LW Panels
Vertical Displacement (ft)
1
0
-1
-2
-3
-4
Days Before (−) or After the Station is Undermined
-20
0
20
40
60
80
100
120
140
160
180
200
220
First LW Passes on this Date
Second LW Passes on this Date
Vert. Scale
3"
6"
9"

Graph 4 shows the longwall subsidence profile similar to the one produced for the first longwall panel (5 West).

Generally, horizontal movement is minimal. Graph 5 shows the horizontal displacement factor (horizontal movement/vertical movement) for each of the panels. The effect of mining against the solid coal versus against the mined panel can be seen. Similar horizontal movement is expected at the Century Mine.

There were some small (less than 1 in.) surface cracks observed during the monitoring program. These occurred in the soil and in the pavement of Route 9. These cracks closed very quickly due to the compressive forces on the road pavement and to rainfall on the soil areas. No remedial work was required. Similar cracking is expected to occur at the Century Mine.

Other Observations

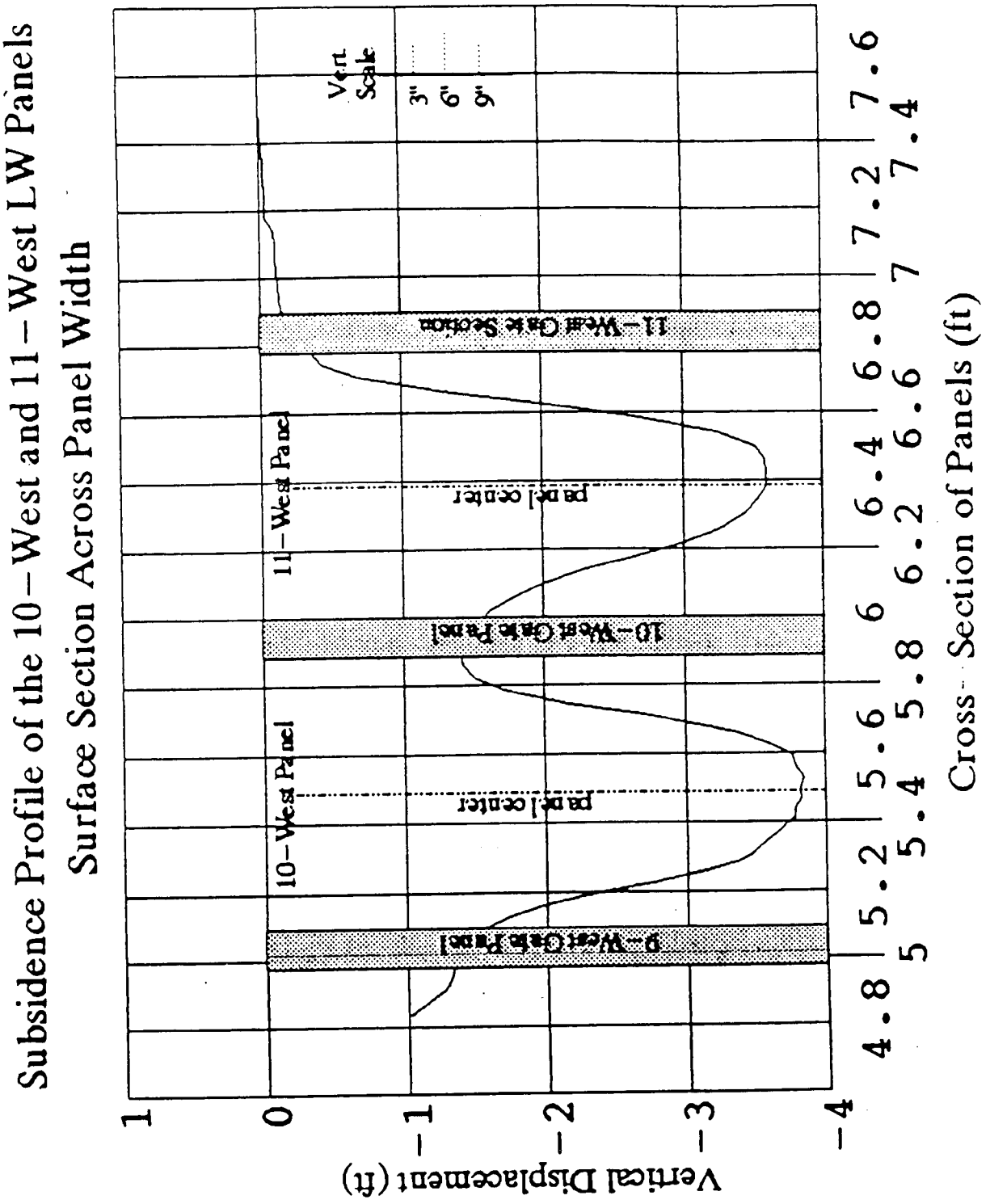
Some horizontal movement occurred in steeply sloping ground where several slips occurred. These slips were mainly in slip-prone soils. Near the center of the panel, the ground moved upwards in several small areas after subsidence as the compressive strain caused the soils to heave upward. Surface cracking up to about six inches wide occurred during the time the areas were put under tension. This surface cracking has been limited to only a few small isolated areas, where they generally closed due to compressive forces and to rainfall. Most cracks were less than 1 in. wide. Where cracks in soil were found that were wide enough to be considered hazardous, they were repaired immediately. Similar results are expected at the Century Mine.

Shear and twisting strains have never been observed on any structure at the Powhatan No.6 Mine. Twisting and shearing occur when a structure is located immediately adjacent to a corner of a longwall panel within the angle of draw according to Dr. Syd S.Peng, Professor of Mining Engineering at West Virginia University. According to Dr. Peng, "If the structure is inclined to the permanent panel edge, it will be subjected to twisting and shearing resulting in damage." There have been no structures in this position to date at the No. 6 Mine. Similar effects are expected at the Century Mine.

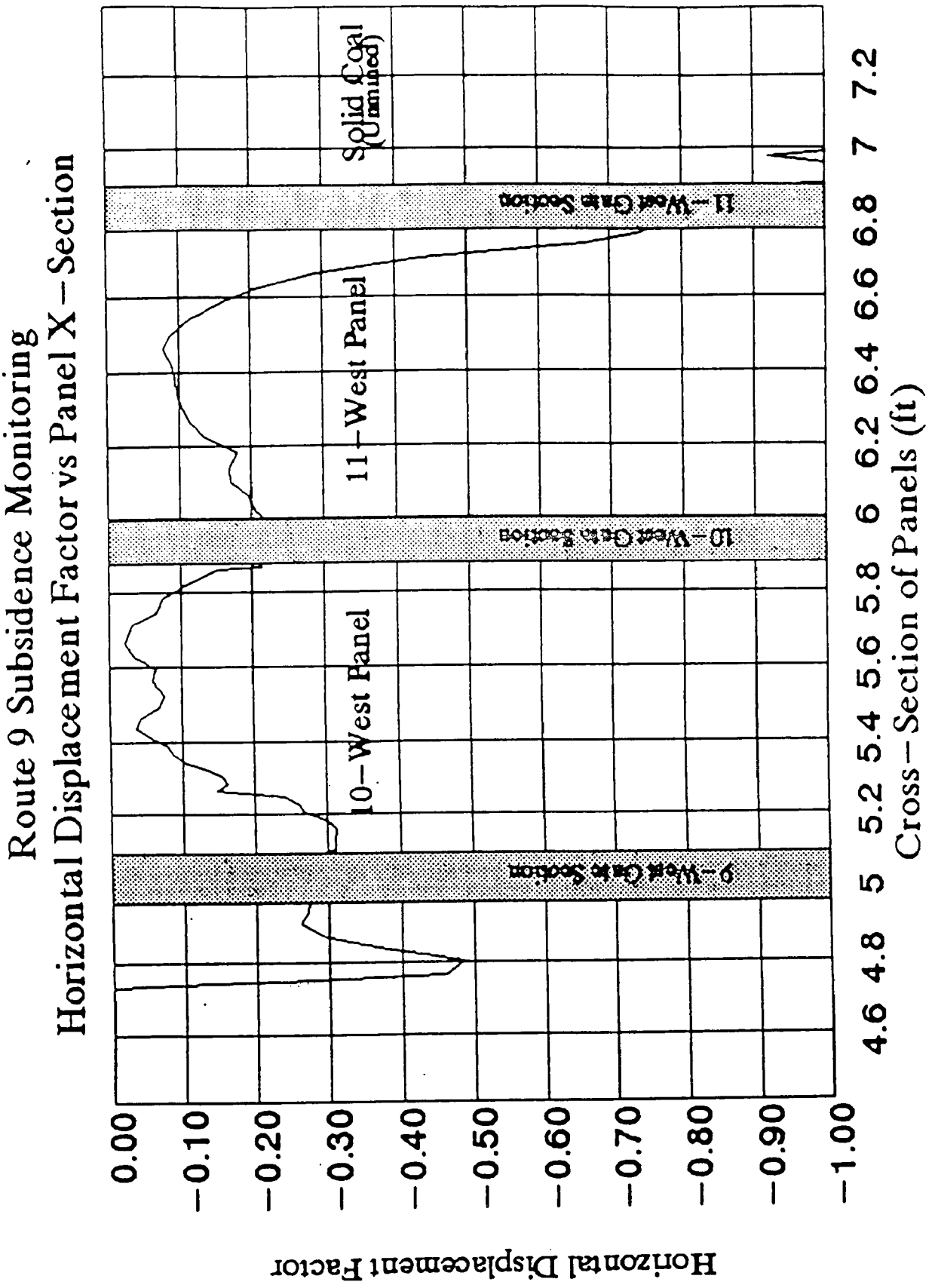
Subsidence Monitoring

Bennoc, Inc. proposes to monitor two adjacent longwall panels during the first year of longwall mining at the Century Mine. This monitoring will include direct levels across the longwall panels and for a distance outside the panels enough to measure the angle of draw. This data will be used in subsequent applications for approved mining areas.

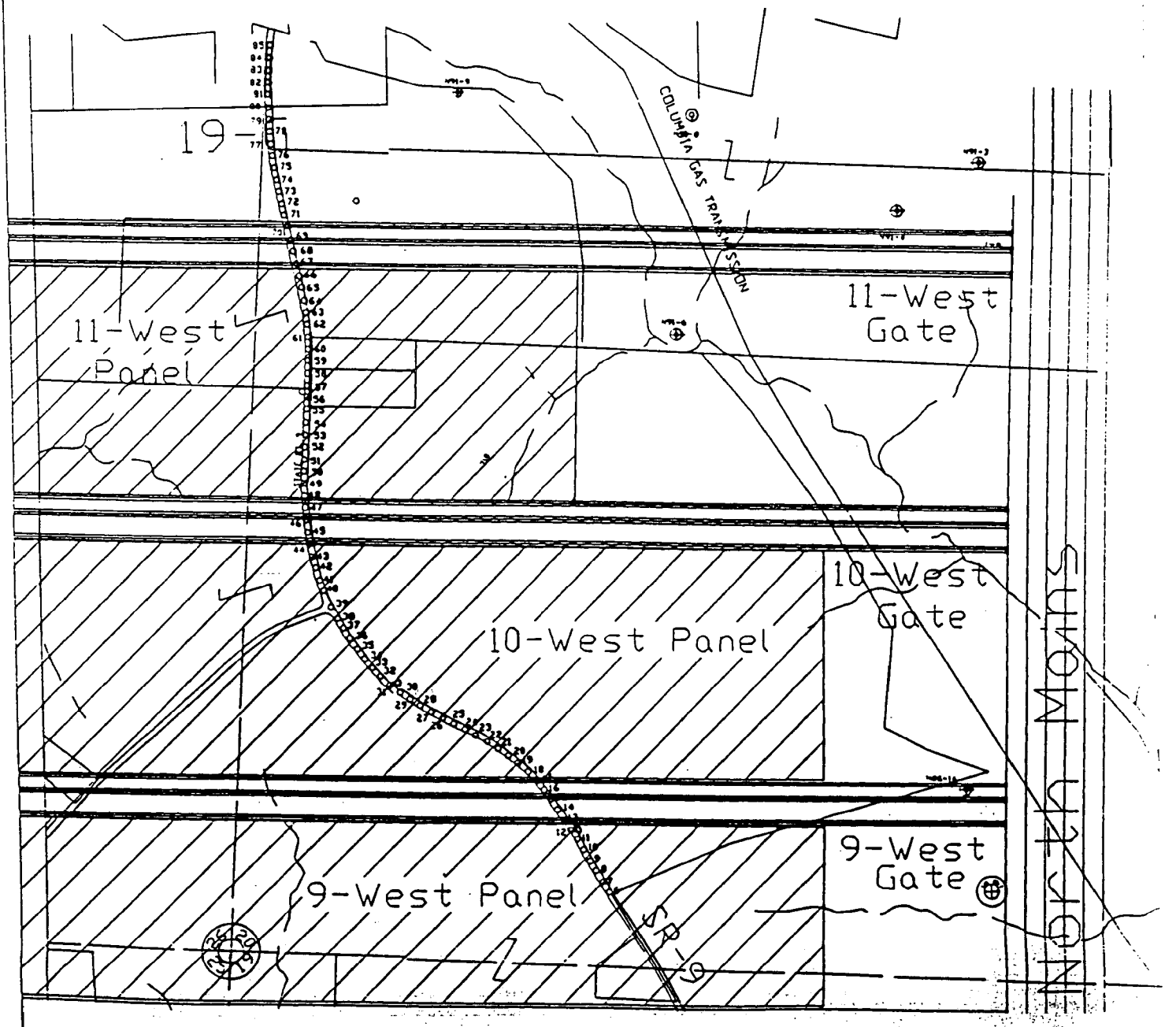
GRAPH #4


Subsidence Profile of the 10–West and 11–West LW Panels
Surface Section Across Panel Width
Vertical Displacement (ft)
1
0
-1
-2
-3
-4
Cross-Section of Panels (ft)
4.8
5
5.2
5.4
5.6
5.8
6
6.2
6.4
6.6
6.8
7
7.2
7.4
7.6
9–West Gate Panel
10–West Panel
panel center
10–West Gate Panel
11–West Panel
panel center
11–West Gate Section
Vert. Scale
3"
6"
9"

GRAPH #5


Route 9 Subsidence Monitoring
Horizontal Displacement Factor vs Panel X – Section
Horizontal Displacement Factor
0.00
−0.10
−0.20
−0.30
−0.40
−0.50
−0.60
−0.70
−0.80
−0.90
−1.00
4.6
4.8
5
5.2
5.4
5.6
5.8
6
6.2
6.4
6.6
6.8
7
7.2
Cross – Section of Panels (ft)
9 – West Gate Section
10 – West Panel
10 – West Gate Section
11 – West Panel
11 – West Gate Section
Solid Coal
(Unmined)

The Ohio Valley Coal Company
Powhatan No. 6 Mine
Permit D-0360
Location of Monitoring Points Along State Route 9
(Scale 1"= 500')



THE OHIO VALLEY COAL COMPANY
SUMMARY OF SUBSIDENCE SURVEYS ALONG STATE ROUTE 9
OVER LONGWALL PANELS DESIGINATED AS 10-WEST and 11-WEST

PANEL DESIGNATION>	10-WEST (FIRST PANEL)										
SURVEY NUMBER>	0	1	2	3	4	5	6	7	8	9	10
SURVEY DATE>	10-18-91	10-28-91	10-30-91	10-31-91	11-01-91	11-02-91	11-03-91	11-04-91	11-05-91	11-06-91	11-07-91
LONGWALL STATUS>	RUNNING	RUNNING	RUNNING	RUNNING	RUNNING	RUNNING	IDLE	RUNNING	RUNNING	RUNNING	RUNNING
DAYS AFTER 1st SURVEY>	0	10	12	13	14	15	16	17	18	19	20
FACE PLUS @ SURVEY>	3440	2842	2693	2658	2561	2500	2448	2439	2360	2288	2255
STATION NUMBER:											
4	0.00	0.00	-0.03	-0.02	-0.04	-0.06	-0.03	-0.01	-0.05	-0.05	-0.01
5	0.00	0.03	-0.03	0.00	-0.02	-0.02	0.01	0.03	-0.03	-0.02	0.00
6	0.00	-0.01	-0.04	-0.02	-0.06	-0.06	-0.02	0.01	-0.04	-0.07	-0.04
7	0.00	-0.01	-0.03	-0.03	-0.04	-0.06	-0.03	-0.01	-0.05	-0.07	-0.03
8	0.00	0.01	-0.02	-0.01	-0.03	-0.04	-0.01	0.01	-0.04	-0.06	-0.03
Edge of Gob>											
9	0.00	0.01	-0.03	-0.02	-0.04	-0.05	-0.04	-0.01	-0.04	-0.07	-0.03
10	0.00	0.01	-0.03	-0.02	-0.04	-0.05	-0.07	-0.01	-0.04	-0.07	-0.03
11	0.00	0.00	-0.04	-0.03	-0.05	-0.08	-0.08	-0.01	-0.06	-0.07	-0.04
Edge of Gob>											
12	0.00	0.02	-0.03	-0.02	-0.04	-0.05	-0.05	0.00	-0.05	-0.07	-0.03
13	0.00	0.00	-0.04	-0.03	-0.05	-0.06	-0.06	-0.02	-0.07	-0.08	-0.05
14	0.00	0.00	-0.03	-0.02	-0.05	-0.06	-0.05	-0.02	-0.08	-0.09	-0.05
15	0.00	0.00	-0.04	-0.03	-0.05	-0.07	-0.04	-0.02	-0.07	-0.08	-0.05
16	0.00	0.00	-0.03	-0.03	-0.05	-0.07	-0.05	-0.02	-0.07	-0.08	-0.05
17	0.00	0.00	-0.03	-0.03	-0.05	-0.07	-0.05	-0.03	-0.07	-0.08	-0.05
18	0.00	0.00	-0.04	-0.03	-0.05	-0.08	0.18	-0.03	-0.07	-0.08	-0.05
19	0.00	0.00	-0.04	-0.03	-0.05	-0.07	-0.08	-0.02	-0.07	-0.08	-0.05
20	0.00	0.00	-0.04	-0.03	-0.04	-0.06	-0.05	-0.01	-0.07	-0.08	-0.04
21	0.00	0.00	-0.03	-0.02	-0.04	-0.06	0.57	-0.02	-0.06	-0.07	-0.04
22	0.00	0.01	-0.02	-0.01	-0.03	-0.05	-0.03	-0.01	-0.06	-0.06	-0.03
23	0.00	0.00	-0.03	-0.02	-0.04	-0.06	-0.04	-0.02	-0.07	-0.07	-0.06
24	0.00	0.01	-0.03	-0.02	-0.04	-0.05	-0.04	-0.03	-0.07	-0.07	-0.07
25	0.00	0.00	-0.03	-0.02	-0.04	-0.06	-0.05	-0.04	-0.09	-0.08	-0.08
26	0.00	0.01	-0.02	-0.01	-0.03	-0.06	-0.03	-0.04	-0.08	-0.09	-0.09
27	0.00	0.02	-0.03	-0.02	-0.04	-0.06	-0.04	-0.04	-0.09	-0.09	-0.10
28	0.00	0.00	-0.02	-0.01	-0.03	-0.06	-0.03	-0.04	-0.08	-0.09	-0.10
Near Panel Center> 29	0.00	0.00	-0.03	-0.01	-0.03	-0.06	-0.04	-0.05	-0.09	-0.10	-0.12
30	0.00	0.00	-0.03	-0.02	-0.04	-0.06	-0.04	-0.05	-0.10	-0.11	-0.13
31	0.00	0.00	-0.03	-0.02	-0.04	-0.06	-0.04	-0.06	-0.09	-0.13	-0.15
32	0.00	-0.05	-0.08	-0.08	-0.09	-0.11	-0.10	-0.11	-0.15	-0.19	-0.22
33	0.00	0.01	-0.04	-0.02	-0.04	0.66	-0.05	-0.07	-0.10	-0.15	-0.19
34	0.00	0.00	-0.03	-0.03	-0.04	-0.06	-0.05	-0.07	-0.10	-0.15	-0.20
35	0.00	-0.01	-0.04	-0.04	-0.05	-0.07	-0.14	-0.07	-0.11	-0.16	-0.20
36	0.00	0.00	-0.03	-0.03	-0.04	-0.06	-0.05	-0.07	-0.10	-0.14	-0.18
37	0.00	0.01	-0.01	-0.02	-0.02	-0.05	-0.03	-0.04	-0.08	-0.11	-0.13
38	0.00	0.00	-0.02	-0.02	-0.03	-0.06	-0.04	-0.05	-0.08	-0.11	-0.12
39	0.00	0.01	-0.01	-0.02	-0.02	-0.04	-0.03	-0.04	-0.07	-0.08	-0.09
Edge of Gob>											
40	0.00	0.00	-0.02	0.08	-0.03	-0.05	-0.02	-0.04	-0.07	-0.07	-0.08
41	0.00	0.01	-0.01	-0.01	-0.02	-0.04	-0.02	-0.03	-0.06	-0.05	-0.05
42	0.00	0.02	0.00	-0.01	-0.01	-0.03	0.00	-0.02	-0.05	-0.03	-0.03
Edge of Gob>											
43	0.00	0.03	0.00	0.00	-0.02	-0.02	-0.01	-0.02	-0.04	-0.03	-0.01
44	0.00	0.02	0.00	-0.01	-0.01	-0.02	-0.01	-0.03	-0.03	-0.02	-0.03
45	0.00	0.03	0.01	0.00	0.00	-0.02	0.01	0.00	-0.03	-0.01	0.00
46	-	-	-	-	-	-	-	-	-	-	-
47	-	-	-	-	-	-	-	-	-	-	-
48	-	-	-	-	-	-	-	-	-	-	-
49	-	-	-	-	-	-	-	-	-	-	-
50	-	-	-	-	-	-	-	-	-	-	-
51	-	-	-	-	-	-	-	-	-	-	-
Near Panel Center> 52	-	-	-	-	-	-	-	-	-	-	-
53	-	-	-	-	-	-	-	-	-	-	-
54	-	-	-	-	-	-	-	-	-	-	-
55	-	-	-	-	-	-	-	-	-	-	-
56	-	-	-	-	-	-	-	-	-	-	-
57	-	-	-	-	-	-	-	-	-	-	-
58	-	-	-	-	-	-	-	-	-	-	-
59	-	-	-	-	-	-	-	-	-	-	-
60	-	-	-	-	-	-	-	-	-	-	-
61	-	-	-	-	-	-	-	-	-	-	-
Edge of Gob>											
62	-	-	-	-	-	-	-	-	-	-	-
63	-	-	-	-	-	-	-	-	-	-	-
64	-	-	-	-	-	-	-	-	-	-	-
Edge of Gob>											
65	-	-	-	-	-	-	-	-	-	-	-
66	-	-	-	-	-	-	-	-	-	-	-
67	-	-	-	-	-	-	-	-	-	-	-
68	-	-	-	-	-	-	-	-	-	-	-
69	-	-	-	-	-	-	-	-	-	-	-
70	-	-	-	-	-	-	-	-	-	-	-
71	-	-	-	-	-	-	-	-	-	-	-
72	-	-	-	-	-	-	-	-	-	-	-
73	-	-	-	-	-	-	-	-	-	-	-
74	-	-	-	-	-	-	-	-	-	-	-
75	-	-	-	-	-	-	-	-	-	-	-
76	-	-	-	-	-	-	-	-	-	-	-
77	-	-	-	-	-	-	-	-	-	-	-
78	-	-	-	-	-	-	-	-	-	-	-
79	-	-	-	-	-	-	-	-	-	-	-

THE OHIO VALLEY COAL COMPANY
SUMMARY OF SUBSIDENCE SURVEYS ALONG STATE ROUTE 9
OVER LONGWALL PANELS DESIGNATED AS 10-WEST and 11-WEST

PANEL DESIGNATION>	10-WEST (FIRST PANEL)										
SURVEY NUMBER>	11	12	13	14	15	16	17	18	19	20	21
SURVEY DATE>	11-08-91	11-09-91	11-10-91	11-11-91	11-12-91	11-13-91	11-14-91	11-15-91	11-16-91	11-17-91	11-18-91
LONGWALL STATUS>	RUNNING	RUNNING	IDLE	RUNNING	RUNNING	RUNNING	RUNNING	RUNNING	RUNNING	IDLE	RUNNING
DAYS AFTER 1st SURVEY>	21	22	23	24	25	26	27	28	29	30	31
FACE PLUS @ SURVEY>	2180	2128	2090	2090	2061	1980	1911	1868	1800	1754	1722
STATION NUMBER:											
4	0.00	0.01	-0.04	-0.07	0.01	-0.05	-0.01	-0.02	-0.04	-0.05	-0.03
5	0.02	0.03	-0.01	-0.03	0.02	-0.02	0.01	0.00	-0.04	-0.04	-0.01
6	-0.01	0.01	-0.06	-0.07	0.01	-0.05	-0.03	-0.03	-0.08	-0.07	-0.04
7	-0.02	-0.01	-0.04	-0.08	-0.01	-0.05	-0.02	-0.04	-0.05	-0.07	-0.08
8	0.00	0.01	-0.03	-0.05	0.00	-0.04	-0.01	-0.02	-0.05	-0.08	-0.04
Edge of Gob>											
9	0.09	0.00	-0.04	-0.05	-0.01	-0.05	-0.02	-0.02	-0.08	-0.07	-0.05
10	-0.01	-0.01	-0.04	-0.06	-0.01	-0.05	-0.02	-0.04	-0.08	-0.07	-0.05
11	-0.02	0.00	-0.05	-0.07	-0.02	-0.06	-0.03	-0.04	-0.07	-0.08	-0.06
Edge of Gob>											
12	-0.01	0.00	-0.04	-0.05	-0.01	-0.05	-0.02	-0.03	-0.06	-0.07	-0.06
13	-0.02	-0.01	-0.06	-0.07	-0.02	-0.07	-0.03	-0.05	-0.07	-0.09	-0.09
14	-0.02	-0.01	-0.05	-0.07	-0.02	-0.07	-0.03	-0.04	-0.08	-0.10	-0.10
15	-0.03	-0.02	-0.06	-0.07	-0.03	-0.07	-0.04	-0.05	-0.09	-0.12	-0.13
16	-0.03	-0.02	-0.06	-0.07	-0.03	-0.07	-0.04	-0.06	-0.10	-0.15	-0.17
17	-0.03	-0.02	-0.06	-0.08	-0.03	-0.08	-0.05	-0.07	-0.14	-0.23	-0.29
18	-0.03	-0.02	-0.06	-0.08	-0.03	-0.09	-0.06	-0.10	-0.20	-0.37	-0.48
19	-0.03	-0.03	-0.07	-0.08	-0.04	-0.09	-0.08	-0.13	-0.30	-0.59	-0.77
20	-0.03	-0.03	-0.06	-0.08	-0.03	-0.09	-0.10	-0.19	-0.49	-0.94	-1.68
21	-0.04	-0.03	-0.07	-0.12	-0.04	-0.11	-0.14	-0.30	-0.75	-1.36	-1.63
22	-0.04	-0.03	-0.07		-0.04	-0.12	-0.21	-0.49	-1.11	-1.80	-2.03
23	-0.06	-0.06	-0.09	-0.11	-0.07	-0.18	-0.40	-0.87	-1.60	-2.24	-2.41
24	-0.07	-0.07	-0.11	-0.14	-0.10	-0.28	-0.67	-1.32	-2.08	-2.58	-2.69
25	-0.08	-0.10	-0.15	-0.18	-0.15	-0.39	-1.07	-1.81	-2.44	-2.81	-2.88
26	-0.08	-0.12	-0.20	-0.23	-0.22	-0.62	-1.58	-2.30	-2.80	-3.09	-3.12
27	-0.11	-0.17	-0.30	-0.33	-0.36	-1.01	-2.07	-2.64	-2.97	-3.18	-3.21
28	-0.13	-0.23	-0.40	-0.46	-0.51	-1.43	-2.44	-2.90	-3.13	-3.29	-3.31
Near Panel Center> 29	-0.18	-0.33	-0.58	-0.64	-0.75	-1.82	-2.69	-3.02	-3.21	-3.34	-3.34
30	-0.20	-0.43	-0.79	-0.88	-1.02	-2.15	-2.85	-3.10	-3.24	-3.33	-3.35
31	-0.26	-0.58	-1.05	-1.15	-1.32	-2.39	-2.94	-3.14	-3.25	-3.31	-3.34
32	-0.38	-0.76	-1.33	-1.44	-1.61	-2.54	-2.98	-3.14	-3.23	-3.29	-3.32
33	-0.37	-0.83	-1.43	-1.54	-1.70	-2.48	-2.84	-2.97	-3.08	-3.10	-3.13
34	-0.41	-0.88	-1.44	-1.54	-1.67	-2.24	-2.53	-2.64	-2.71	-2.75	-2.81
35	-0.37	-0.70	-1.03	-1.11	-1.17	-1.48	-1.67	-1.73	-1.78	-1.80	-1.82
36	-0.30	-0.48	-0.64	-0.70	-0.72	-0.88	-1.00	-1.03	-1.07	-1.08	-1.09
37	-0.20	-0.28	-0.34	-0.37	-0.37	-0.42	-0.49	-0.50	-0.52	-0.53	-0.53
38	-0.15	-0.19	-0.22	-0.24	-0.23	-0.26	-0.31	-0.30	-0.32	-0.32	-0.32
39	-0.10	-0.12	-0.14	-0.16	-0.14	-0.16	-0.20	-0.18	-0.20	-0.20	-0.20
Edge of Gob>											
40	-0.07	-0.09	-0.10	-0.13	-0.10	-0.11	-0.15	-0.13	-0.14	-0.14	-0.14
41	-0.06	-0.06	-0.07	-0.08	-0.06	-0.07	-0.11	-0.09	-0.10	-0.10	-0.10
42	-0.01	-0.03	-0.04	-0.05	-0.03	-0.04	-0.08	-0.06	-0.07	-0.07	-0.08
Edge of Gob>											
43	-0.01	-0.01	-0.03	-0.04	-0.02	-0.03	-0.06	-0.04	-0.05	-0.05	-0.05
44	-0.02	-0.01	-0.02	-0.04	-0.01	-0.02	-0.05	-0.04	-0.03	-0.04	-0.04
45	-0.01	0.00	-0.01	-0.03	-0.01	-0.01	-0.04	-0.02	-0.03	-0.03	-0.02
46	-	-	-	-	-	-	-	-	-	-	-
47	-	-	-	-	-	-	-	-	-	-	-
48	-	-	-	-	-	-	-	-	-	-	-
49	-	-	-	-	-	-	-	-	-	-	-
50	-	-	-	-	-	-	-	-	-	-	-
51	-	-	-	-	-	-	-	-	-	-	-
Near Panel Center> 52	-	-	-	-	-	-	-	-	-	-	-
53	-	-	-	-	-	-	-	-	-	-	-
54	-	-	-	-	-	-	-	-	-	-	-
55	-	-	-	-	-	-	-	-	-	-	-
56	-	-	-	-	-	-	-	-	-	-	-
57	-	-	-	-	-	-	-	-	-	-	-
58	-	-	-	-	-	-	-	-	-	-	-
59	-	-	-	-	-	-	-	-	-	-	-
60	-	-	-	-	-	-	-	-	-	-	-
61	-	-	-	-	-	-	-	-	-	-	-
Edge of Gob>											
62	-	-	-	-	-	-	-	-	-	-	-
63	-	-	-	-	-	-	-	-	-	-	-
64	-	-	-	-	-	-	-	-	-	-	-
Edge of Gob>											
65	-	-	-	-	-	-	-	-	-	-	-
66	-	-	-	-	-	-	-	-	-	-	-
67	-	-	-	-	-	-	-	-	-	-	-
68	-	-	-	-	-	-	-	-	-	-	-
69	-	-	-	-	-	-	-	-	-	-	-
70	-	-	-	-	-	-	-	-	-	-	-
71	-	-	-	-	-	-	-	-	-	-	-
72	-	-	-	-	-	-	-	-	-	-	-
73	-	-	-	-	-	-	-	-	-	-	-
74	-	-	-	-	-	-	-	-	-	-	-
75	-	-	-	-	-	-	-	-	-	-	-
76	-	-	-	-	-	-	-	-	-	-	-
77	-	-	-	-	-	-	-	-	-	-	-
78	-	-	-	-	-	-	-	-	-	-	-
79	-	-	-	-	-	-	-	-	-	-	-

THE OHIO VALLEY COAL COMPANY
SUMMARY OF SUBSIDENCE SURVEYS ALONG STATE ROUTE 9
OVER LONGWALL PANELS DESIGNATED AS 10-WEST and 11-WEST

PANEL DESIGNATION>	10-WEST (FIRST PANEL)										
SURVEY NUMBER>	22	23	24	25	26	27	28	29	30	31	32
SURVEY DATE>	11-19-91	11-20-91	11-21-91	11-22-91	11-23-91	11-24-91	11-25-91	11-26-91	11-27-91	11-28-91	11-29-91
LONGWALL STATUS>	RUNNING	RUNNING	RUNNING	RUNNING	RUNNING	IDLE	RUNNING	RUNNING	RUNNING	IDLE HOLIDAY	IDLE HOLIDAY
DAYS AFTER 1st SURVEY>	32	33	34	35	36	37	38	39	40	41	42
FACE PLUS @ SURVEY>	1669	1625	1540	1465	1431	1404	1369	1280	1259	1238	1238
STATION NUMBER:											
4	-0.06	-0.09	-0.11	-0.13	-0.19	-0.28	-0.34	-0.41	-0.50		-0.57
5	-0.03	-0.08	-0.10	-0.17	-0.23	-0.33	-0.36	-0.49	-0.58		-0.67
6	-0.09	-0.13	-0.14	-0.21	-0.32	-0.37	-0.47	-0.56	-0.66		-0.76
7	-0.10	-0.11	-0.15	-0.23	-0.33	-0.43	-0.49	-0.61	-0.71		-0.81
8	-0.08	-0.12	-0.15	-0.24	-0.36	-0.46	-0.52	-0.64	-0.74		-0.84
Edge of Gob>											
9	-0.09	-0.12	-0.16	-0.27	-0.38	-0.48	-0.56	-0.68	-0.80		-0.89
10	-0.10	-0.13	-0.18	-0.31	-0.41	-0.52	-0.60	-0.74	-0.86		-0.94
11	-0.10	-0.14	-0.21	-0.34	-0.48	-0.59	-0.66	-0.81	-0.93		-1.02
Edge of Gob>											
12	-0.10	-0.14	-0.22	-0.39	-0.52	-0.67	-0.75	-0.91	-1.02		-1.12
13	-0.13	-0.19	-0.31	-0.53	-0.69	-0.83	-0.94	-1.10	-1.22		-1.31
14	-0.18	-0.24	-0.44	-0.73	-0.91	-1.08	-1.18	-1.34	-1.46		-1.54
15	-0.21	-0.32	-0.63	-1.00	-1.21	-1.36	-1.46	-1.61	-1.70		-1.78
16	-0.30	-0.47	-0.94	-1.36	-1.56	-1.70	-1.79	-1.92	-2.01		-2.07
17	-0.49	-0.79	-1.41	-1.82	-2.00	-2.12	-2.20	-2.30	-2.38		-2.43
18	-0.82	-1.23	-1.86	-2.20	-2.34	-2.46	-2.51	-2.58	-2.66		-2.70
19	-1.24	-1.68	-2.24	-2.53	-2.63	-2.74	-2.79	-2.83	-2.89		-2.93
20	-1.69	-2.11	-2.54	-2.78	-2.86	-2.93	-2.97	-3.00	-3.06		-3.09
21	-2.12	-2.46	-2.77	-2.94	-3.01	-3.08	-3.11	-3.12	-3.16		-3.20
22	-2.42	-2.69	-2.91	-3.04	-3.10	-3.15	-3.18	-3.18	-3.22		-3.25
23	-2.70	-2.90	-3.06	-3.16	-3.20	-3.24	-3.28	-3.27	-3.31		-3.33
24	-2.89	-3.06	-3.18	-3.25	-3.30	-3.33	-3.35	-3.35	-3.38		-3.40
25	-3.04	-3.16	-3.25	-3.30	-3.35	-3.38	-3.41	-3.39	-3.42		-3.44
26	-3.24	-3.33	-3.39	-3.43	-3.46	-3.48	-3.51	-3.50	-3.52		-3.54
27	-3.30	-3.38	-3.40	-3.44	-3.47	-3.48	-3.51	-3.50	-3.51		-3.53
28	-3.38	-3.43	-3.47	-3.49	-3.52	-3.53	-3.56	-3.55	-3.56		-3.57
Near Panel Center> 29	-3.40	-3.45	-3.47	-3.49	-3.50	-3.52	-3.56	-3.54	-3.54		-3.56
30	-3.40	-3.43	-3.45	-3.48	-3.48	-3.49	-3.52	-3.51	-3.52		-3.53
31	-3.36	-3.40	-3.42	-3.44	-3.45	-3.46	-3.48	-3.47	-3.48		-3.48
32	-3.34	-3.36	-3.38	-3.40	-3.44	-3.43	-3.44	-3.43	-3.43		-3.44
33	-3.15	-3.17	-3.19	-3.20	-3.20	-3.22	-3.24	-3.23	-3.24		-3.24
34	-2.78	-2.80	-2.81	-2.82	-2.84	-2.86	-2.87	-2.86	-2.87		-2.86
35	-1.83	-1.84	-1.85	-1.86	-1.87	-1.88	-1.90	-1.89	-1.89		-1.90
36	-1.10	-1.11	-1.12	-1.13	-1.13	-1.14	-1.16	-1.15	-1.15		-1.15
37	-0.54	-0.54	-0.56	-0.56	-0.56	-0.57	-0.59	-0.58	-0.58		-0.58
38	-0.32	-0.32	-0.33	-0.43	-0.34	-0.34	-0.37	-0.36	-0.36		-0.34
39	-0.20	-0.19	-0.20	-0.20	-0.19	-0.22	-0.24	-0.22	-0.22		-0.21
Edge of Gob>											
40	-0.14	-0.14	-0.14	-0.14	-0.16	-0.15	-0.17	-0.15	-0.16		-0.15
41	-0.09	-0.09	-0.09	-0.09	-0.10	-0.11	-0.12	-0.10	-0.10		-0.10
42	-0.06	-0.06	-0.06	-0.06	-0.06	-0.07	-0.08	-0.07	-0.07		-0.06
Edge of Gob>											
43	-0.04	-0.04	-0.04	-0.03	-0.04	-0.04	-0.06	-0.04	-0.05		-0.04
44	-0.03	-0.03	-0.03	-0.03	-0.02	-0.03	-0.05	-0.04	0.01		-0.03
45	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.03	-0.02	-0.02		-0.02
46	-	-	-	-	-	-	-	-	-	-	-
47	-	-	-	-	-	-	-	-	-	-	-
48	-	-	-	-	-	-	-	-	-	-	-
49	-	-	-	-	-	-	-	-	-	-	-
50	-	-	-	-	-	-	-	-	-	-	-
51	-	-	-	-	-	-	-	-	-	-	-
Near Panel Center> 52	-	-	-	-	-	-	-	-	-	-	-
53	-	-	-	-	-	-	-	-	-	-	-
54	-	-	-	-	-	-	-	-	-	-	-
55	-	-	-	-	-	-	-	-	-	-	-
56	-	-	-	-	-	-	-	-	-	-	-
57	-	-	-	-	-	-	-	-	-	-	-
58	-	-	-	-	-	-	-	-	-	-	-
59	-	-	-	-	-	-	-	-	-	-	-
60	-	-	-	-	-	-	-	-	-	-	-
61	-	-	-	-	-	-	-	-	-	-	-
Edge of Gob>											
62	-	-	-	-	-	-	-	-	-	-	-
63	-	-	-	-	-	-	-	-	-	-	-
64	-	-	-	-	-	-	-	-	-	-	-
Edge of Gob>											
65	-	-	-	-	-	-	-	-	-	-	-
66	-	-	-	-	-	-	-	-	-	-	-
67	-	-	-	-	-	-	-	-	-	-	-
68	-	-	-	-	-	-	-	-	-	-	-
69	-	-	-	-	-	-	-	-	-	-	-
70	-	-	-	-	-	-	-	-	-	-	-
71	-	-	-	-	-	-	-	-	-	-	-
72	-	-	-	-	-	-	-	-	-	-	-
73	-	-	-	-	-	-	-	-	-	-	-
74	-	-	-	-	-	-	-	-	-	-	-
75	-	-	-	-	-	-	-	-	-	-	-
76	-	-	-	-	-	-	-	-	-	-	-
77	-	-	-	-	-	-	-	-	-	-	-
78	-	-	-	-	-	-	-	-	-	-	-
79	-	-	-	-	-	-	-	-	-	-	-

THE OHIO VALLEY COAL COMPANY
SUMMARY OF SUBSIDENCE SURVEYS ALONG STATE ROUTE 9
OVER LONGWALL PANELS DESIGNATED AS 10-WEST and 11-WEST

PANEL DESIGNATION>	10-WEST (FIRST PANEL)										
SURVEY NUMBER>	33	34	35	36	37	38	39	40	41	42	43
SURVEY DATE>	11-30-91	12-01-91	12-02-91	12-03-91	12-04-91	12-05-91	12-06-91	12-07-91	12-08-91	12-14-91	12-20-91
LONGWALL STATUS>	RUNNING	IDLE	RUNNING	RUNNING	RUNNING	RUNNING	RUNNING	RUNNING	IDLE	RECOVERI	RECOVERI
DAYS AFTER 1st SURVEY>	43	44	45	46	47	48	49	50	51	57	63
FACE PLUS @ SURVEY>	1227	1227	1196	1146	1078	1030	983	951	924	734	715
STATION NUMBER											
4	-0.60	-0.61	-0.59	-0.62	-0.67	-0.69	-0.71	-0.75	-0.83	-0.92	-0.89
5	-0.68	-0.68	-0.70	-0.71	-0.78	-0.79	-0.83	-0.87	-0.95	-1.04	-1.00
6	-0.77	-0.77	-0.78	-0.81	-0.87	-0.90	-0.94	-0.98	-1.07	-1.13	-1.11
7	-0.82	-0.82	-0.83	-0.87	-0.94	-0.96	-0.99	-1.02	-1.10	-1.18	-1.16
8	-0.86	-0.86	-0.89	-0.90	-0.97	-0.98	-1.01	-1.06	-1.13	-1.20	-1.20
Edge of Gob>											
9	-0.89	-0.90	-0.92	-0.95	-1.01	-1.03	-1.07	-1.09	-1.18	-1.25	-1.24
10	-0.95	-0.96	-0.98	-1.00	-1.06	-1.08	-1.11	-1.14	-1.21	-1.29	-1.28
11	-1.03	-1.03	-1.04	-1.08	-1.14	-1.16	-1.19	-1.21	-1.29	-1.27	-1.35
Edge of Gob>											
12	-1.12	-1.12	-1.14	-1.17	-1.24	-1.24	-1.28	-1.30	-1.37	-1.47	-1.42
13	-1.32	-1.32	-1.33	-1.36	-1.42	-1.43	-1.46	-1.49	-1.55	-1.63	-1.60
14	-1.54	-1.54	-1.56	-1.59	-1.64	-1.66	-1.67	-1.69	-1.76	-1.84	-1.80
15	-1.79	-1.79	-1.80	-1.82	-1.87	-1.87	-1.90	-1.92	-1.98	-2.06	-2.02
16	-2.08	-2.07	-2.09	-2.09	-2.15	-2.15	-2.17	-2.19	-2.25	-2.31	-2.28
17	-2.43	-2.43	-2.44	-2.44	-2.50	-2.49	-2.51	-2.53	-2.59	-2.66	-2.62
18	-2.70	-2.69	-2.70	-2.70	-2.75	-2.74	-2.76	-2.78	-2.84	-2.89	-2.86
19	-2.93	-2.93	-2.93	-2.93	-2.98	-2.97	-2.98	-3.00	-3.06	-3.11	-3.08
20	-3.08	-3.08	-3.09	-3.08	-3.12	-3.11	-3.12	-3.14	-3.20	-3.25	-3.21
21	-3.19	-3.19	-3.19	-3.18	-3.21	-3.21	-3.22	-3.23	-3.29	-3.36	-3.30
22	-3.25	-3.24	-3.24	-3.23	-3.27	-3.25	-3.26	-3.28	-3.34	-3.39	-3.34
23	-3.33	-3.24	-3.32	-3.31	-3.35	-3.33	-3.35	-3.36	-3.42	-3.47	-3.42
24	-3.40	-3.39	-3.39	-3.38	-3.41	-3.40	-3.41	-3.42	-3.48	-3.52	-3.49
25	-3.44	-3.44	-3.43	-3.42	-3.46	-3.44	-3.46	-3.46	-3.52	-3.57	-3.56
26	-3.53	-3.54	-3.53	-3.53	-3.56	-3.54	-3.56	-3.56	-3.62	-3.66	-3.63
27	-3.52	-3.52	-3.53	-3.52	-3.54	-3.54	-3.54	-3.56	-3.60	-3.64	-3.63
28	-3.56	-3.57	-3.57	-3.56	-3.59	-3.58	-3.58	-3.60	-3.65	-3.69	-3.65
Near Panel Center> 29	-3.56	-3.56	-3.56	-3.56	-3.57	-3.57	-3.57	-3.58	-3.63	-3.67	-3.65
30	-3.52	-3.53	-3.53	-3.52	-3.54	-3.53	-3.54	-3.55	-3.60	-3.64	-3.62
31	-3.48	-3.49	-3.48	-3.48	-3.50	-3.50	-3.50	-3.51	-3.56	-3.62	-3.57
32	-3.43	-3.45	-3.44	-3.43	-3.46	-3.46	-3.46	-3.46	-3.51	-3.58	-3.54
33	-3.23	-3.25	-3.23	-3.23	-3.25	-3.25	-3.26	-3.26	-3.31	-3.36	-3.33
34	-2.86	-2.87	-2.86	-2.85	-2.88	-2.87	-2.88	-2.88	-2.93	-3.00	-2.96
35	-1.88	-1.90	-1.89	-1.88	-1.91	-1.90	-1.91	-1.91	-1.96	-2.03	-1.98
36	-1.14	-1.16	-1.15	-1.14	-1.17	-1.15	-1.17	-1.17	-1.22	-1.27	-1.23
37	-0.56	-0.58	-0.57	-0.56	-0.59	-0.58	-0.59	-0.59	-0.64	-0.70	-0.66
38	-0.33	-0.34	-0.34	-0.32	-0.35	-0.34	-0.35	-0.35	-0.40	-0.46	-0.41
39	-0.19	-0.22	-0.21	-0.20	-0.22	-0.21	-0.22	-0.22	-0.27	-0.37	-0.29
Edge of Gob>											
40	-0.13	-0.15	-0.14	-0.13	-0.15	-0.14	-0.15	-0.16	-0.20	-0.26	-0.23
41	-0.08	-0.10	-0.09	-0.08	-0.11	-0.09	-0.11	-0.10	-0.16	-0.21	-0.19
42	-0.05	-0.06	-0.06	-0.04	-0.06	-0.06	-0.07	-0.08	-0.12	-0.19	-0.15
Edge of Gob>											
43	-0.03	-0.04	-0.03	-0.02	-0.04	-0.03	-0.04	-0.04	-0.10	-0.16	-0.12
44	-0.02	-0.04	-0.03	-0.01	-0.03	-0.03	-0.04	-0.04	-0.09	-0.15	-0.09
45	0.00	-0.02	-0.01	-0.01	-0.02	-0.01	-0.02	-0.01	-0.07	-0.13	-0.08
46	-	-	-	-	-	-	-	-	-	-	-
47	-	-	-	-	-	-	-	-	-	-	-
48	-	-	-	-	-	-	-	-	-	-	-
49	-	-	-	-	-	-	-	-	-	-	-
50	-	-	-	-	-	-	-	-	-	-	-
51	-	-	-	-	-	-	-	-	-	-	-
Near Panel Center> 52	-	-	-	-	-	-	-	-	-	-	-
53	-	-	-	-	-	-	-	-	-	-	-
54	-	-	-	-	-	-	-	-	-	-	-
55	-	-	-	-	-	-	-	-	-	-	-
56	-	-	-	-	-	-	-	-	-	-	-
57	-	-	-	-	-	-	-	-	-	-	-
58	-	-	-	-	-	-	-	-	-	-	-
59	-	-	-	-	-	-	-	-	-	-	-
60	-	-	-	-	-	-	-	-	-	-	-
61	-	-	-	-	-	-	-	-	-	-	-
Edge of Gob>	-	-	-	-	-	-	-	-	-	-	-
62	-	-	-	-	-	-	-	-	-	-	-
63	-	-	-	-	-	-	-	-	-	-	-
64	-	-	-	-	-	-	-	-	-	-	-
Edge of Gob>	-	-	-	-	-	-	-	-	-	-	-
65	-	-	-	-	-	-	-	-	-	-	-
66	-	-	-	-	-	-	-	-	-	-	-
67	-	-	-	-	-	-	-	-	-	-	-
68	-	-	-	-	-	-	-	-	-	-	-
69	-	-	-	-	-	-	-	-	-	-	-
70	-	-	-	-	-	-	-	-	-	-	-
71	-	-	-	-	-	-	-	-	-	-	-
72	-	-	-	-	-	-	-	-	-	-	-
73	-	-	-	-	-	-	-	-	-	-	-
74	-	-	-	-	-	-	-	-	-	-	-
75	-	-	-	-	-	-	-	-	-	-	-
76	-	-	-	-	-	-	-	-	-	-	-
77	-	-	-	-	-	-	-	-	-	-	-
78	-	-	-	-	-	-	-	-	-	-	-

THE OHIO VALLEY COAL COMPANY
SUMMARY OF SUBSIDENCE SURVEYS ALONG STATE ROUTE 9
OVER LONGWALL PANELS DESIGINATED AS 10-WEST and 11-WEST

PANEL DESIGNATION>	10-WEST (FIRST PANEL)			
SURVEY NUMBER>	44	45	46	47
SURVEY DATE>	12-28-91	01-04-92	02-03-9	03-04-92
LONGWALL STATUS>	RECOVERI	RECOVERI	RECOVERI	RECOVERED
DAYS AFTER 1st SURVEY>	71	78	108	138
FACE PLUS @ SURVEY>	715	715	715	715
STATION NUMBER				
4	-0.86	-0.99	-0.96	-1.00
5	-0.97	-1.11	-1.07	-1.12
6	-1.10	-1.21	-1.19	-1.23
7	-1.14	-1.25	-1.22	-1.27
8	-1.17	-1.28	-1.26	-1.30
Edge of Gob>				
9	-1.20	-1.33	-1.30	-1.34
10	-1.25	-1.37	-1.33	-1.38
11	-1.31	-1.43	-1.40	-1.44
Edge of Gob>				
12	-1.41	-1.52	-1.47	-1.52
13	-1.57	-1.69	-1.64	-1.69
14	-1.77	-1.89	-1.84	-1.89
15	-1.99	-2.11	-2.06	-2.11
16	-2.25	-2.37	-2.32	-2.36
17	-2.59	-2.70	-2.65	-2.68
18	-2.80	-2.94	-2.89	-2.91
19	-3.05	-3.16	-3.11	-3.13
20	-3.19	-3.30	-3.25	-3.27
21	-3.27	-3.39	-3.34	-3.36
22	-3.32	-3.43	-3.38	-3.40
23	-3.39	-3.49	-3.46	-3.47
24	-3.46	-3.57	-3.53	-3.54
25	-3.50	-3.60	-3.57	-3.58
26	-3.61	-3.70	-3.66	-3.67
27	-3.59	-3.68	-3.65	-3.65
28	-3.63	-3.73	-3.69	-3.69
Near Panel Center> 29	-3.63	-3.71	-3.67	-3.67
30	-3.59	-3.68	-3.64	-3.65
31	-3.56	-3.63	-3.61	-3.61
32	-3.51	-3.59	-3.56	-3.56
33	-3.31	-3.39	-3.36	-3.36
34	-2.93	-3.01	-2.98	-2.98
35	-1.96	-2.04	-2.00	-2.00
36	-1.20	-1.29	-1.26	-1.25
37	-0.64	-0.71	-0.66	-0.68
38	-0.38	-0.46	-0.41	-0.40
39	-0.26	-0.33	-0.28	-0.29
Edge of Gob>				
40	-0.20	-0.26	-0.22	-0.20
41	-0.17	-0.21	-0.17	-0.15
42	-0.12	-0.17	-0.13	-0.12
Edge of Gob>				
43	-0.10	-0.15	-0.11	-0.10
44	-0.08	-0.14	-0.10	-0.09
45	-0.05	-0.13	-0.08	-0.08
46	-	-	-	-
47	-	-	-	-
48	-	-	-	-
49	-	-	-	-
50	-	-	-	-
51	-	-	-	-
Near Panel Center> 52	-	-	-	-
53	-	-	-	-
54	-	-	-	-
55	-	-	-	-
56	-	-	-	-
57	-	-	-	-
58	-	-	-	-
59	-	-	-	-
60	-	-	-	-
61	-	-	-	-
Edge of Gob>	-	-	-	-
62	-	-	-	-
63	-	-	-	-
64	-	-	-	-
Edge of Gob>	-	-	-	-
65	-	-	-	-
66	-	-	-	-
67	-	-	-	-
68	-	-	-	-
69	-	-	-	-
70	-	-	-	-
71	-	-	-	-
72	-	-	-	-
73	-	-	-	-
74	-	-	-	-
75	-	-	-	-
76	-	-	-	-
77	-	-	-	-
78	-	-	-	-
79	-	-	-	-

THE OHIO VALLEY COAL COMPANY
SUMMARY OF SUBSIDENCE SURVEYS ALONG STATE ROUTE 9
OVER LONGWALL PANELS DESIGNATED AS 10-WEST and 11-WEST

PANEL DESIGNATION>	11-WEST (SECOND PANEL)										
SURVEY NUMBER>	48	49	50	51	52	53	54	55	56	57	58
SURVEY DATE>	03/18/92	03/25/92	03/26/92	03/27/92	03/28/92	03/29/92	03/30/92	03/31/92	04/01/92	04/02/92	04/03/92
LONGWALL STATUS>	RUNNING	RUNNING	RUNNING	RUNNING	RUNNING	SUNDAY	RUNNING	RUNNING	RUNNING	RUNNING	RUNNING
DAYS AFTER 1st SURVEY>	152	159	160	161	162	163	164	165	166	167	168
FACE PLUS @ SURVEY>	3265	2961	2881	2785	2694	2646	2649	2549	2482	2430	2347
STATION NUMBER	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-
Edge of Gob>											
9	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-	-	-	-	-
Edge of Gob>											
12	-	-	-	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-	-
24	-	-	-	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-
26	-	-	-	-	-	-	-	-	-	-	-
27	-	-	-	-	-	-	-	-	-	-	-
28	-3.71	-3.74	-3.72	-3.75	-3.74	-3.74	-3.73	-3.75	-3.73	-3.74	-3.73
Near Panel Center> 29	-3.69	-3.72	-3.70	-3.73	-3.72	-3.73	-3.71	-3.73	-3.71	-3.72	-3.71
30	-3.66	-3.69	-3.67	-3.71	-3.69	-3.70	-3.69	-3.70	-3.69	-3.70	-3.69
31	-3.62	-3.65	-3.63	-3.68	-3.65	-3.66	-3.64	-3.66	-3.65	-3.68	-3.64
32	-3.57	-3.60	-3.58	-3.61	-3.60	-3.60	-3.59	-3.61	-3.60	-3.61	-3.60
33	-3.37	-3.40	-3.38	-3.40	-3.39	-3.40	-3.39	-3.40	-3.40	-3.41	-3.41
34	-2.99	-3.02	-3.00	-3.03	-3.01	-3.02	-3.01	-3.03	-3.03	-3.04	-3.05
35	-2.02	-2.04	-2.02	-2.05	-2.04	-2.05	-2.05	-2.06	-2.06	-2.08	-2.11
36	-1.27	-1.29	-1.27	-1.31	-1.29	-1.31	-1.30	-1.31	-1.32	-1.34	-1.38
37	-0.68	-0.70	-0.69	-0.73	-0.70	-0.72	-0.71	-0.73	-0.74	-0.77	-0.81
38	-0.43	-0.44	-0.43	-0.46	-0.46	-0.46	-0.46	-0.48	-0.49	-0.52	-0.57
39	-0.31	-0.32	-0.31	-0.34	-0.33	-0.34	-0.33	-0.36	-0.37	-0.40	-0.46
Edge of Gob>											
40	-0.23	-0.24	-0.23	-0.26	-0.25	-0.26	-0.25	-0.27	-0.29	-0.32	-0.37
41	-0.19	-0.20	-0.18	-0.21	-0.20	-0.22	-0.21	-0.23	-0.24	-0.27	-0.33
42	-0.15	-0.16	-0.14	-0.17	-0.16	-0.18	-0.17	-0.19	-0.20	-0.23	-0.29
Edge of Gob>											
43	-0.12	-0.13	-0.12	-0.14	-0.13	-0.15	-0.14	-0.16	-0.17	-0.20	-0.26
44	-0.11	-0.12	-0.11	-0.13	-0.12	-0.14	-0.13	-0.15	-0.16	-0.19	-0.25
45	-0.09	-0.11	-0.09	-0.11	-0.10	-0.12	-0.11	-0.13	-0.14	-0.16	-0.23
46	-0.08	-0.10	-0.08	-0.11	-0.10	-0.11	-0.10	-0.12	-0.13	-0.16	-0.24
47	-0.08	-0.10	-0.08	-0.10	-0.10	-0.11	-0.10	-0.12	-0.13	-0.16	-0.26
48	-0.08	-0.10	-0.08	-0.11	-0.10	-0.11	-0.10	-0.12	-0.14	-0.17	-0.27
49	-0.08	-0.11	-0.09	-0.11	-0.11	-0.12	-0.11	-0.13	-0.15	-0.18	-0.29
50	-0.08	-0.10	-0.09	-0.11	-0.11	-0.12	-0.11	-0.13	-0.15	-0.19	-0.30
51	-0.08	-0.10	-0.08	-0.11	-0.10	-0.11	-0.11	-0.13	-0.15	-0.19	-0.30
Near Panel Center> 52	-0.08	-0.10	-0.09	-0.12	-0.11	-0.12	-0.11	-0.14	-0.16	-0.20	-0.33
53	-0.07	-0.09	-0.07	-0.10	-0.10	-0.10	-0.10	-0.12	-0.14	-0.18	-0.30
54	-0.09	-0.11	-0.10	-0.12	-0.12	-0.12	-0.12	-0.14	-0.16	-0.20	-0.31
55	-0.09	-0.10	-0.09	-0.11	-0.11	-0.11	-0.11	-0.13	-0.14	-0.18	-0.29
56	-0.10	-0.10	-0.09	-0.11	-0.11	-0.12	-0.11	-0.13	-0.14	-0.18	-0.26
57	-0.09	-0.08	-0.09	-0.11	-0.10	-0.11	-0.11	-0.12	-0.14	-0.16	-0.24
58	-0.09	-0.10	-0.08	-0.10	-0.10	-0.11	-0.10	-0.12	-0.13	-0.15	-0.22
59	-0.09	-0.09	-0.08	-0.10	-0.10	-0.11	-0.10	-0.11	-0.12	-0.15	-0.20
60	-0.09	-0.09	-0.09	-0.09	-0.09	-0.10	-0.10	-0.11	-0.12	-0.14	-0.17
61	-0.08	-0.09	-0.08	-0.09	-0.09	-0.10	-0.09	-0.11	-0.11	-0.13	-0.16
Edge of Gob>											
62	-0.07	-0.08	-0.07	-0.09	-0.09	-0.09	-0.09	-0.10	-0.10	-0.11	-0.13
63	-0.07	-0.09	-0.08	-0.09	-0.09	-0.09	-0.10	-0.10	-0.10	-0.11	-0.12
64	-0.08	-0.10	-0.09	-0.10	-0.10	-0.10	-0.11	-0.10	-0.11	-0.11	-0.12
Edge of Gob>											
65	-0.07	-0.09	-0.08	-0.09	-0.09	-0.09	-0.09	-0.10	-0.10	-0.10	-0.11
66	-0.07	-0.09	-0.08	-0.10	-0.09	-0.09	-0.10	-0.10	-0.10	-0.10	-0.11
67	-0.08	-0.09	-0.09	-0.10	-0.10	-0.09	-0.09	-0.10	-0.10	-0.10	-0.11
68	-0.07	-0.09	-0.08	-0.09	-0.09	-0.09	-0.08	-0.09	-0.09	-0.09	-0.10
69	-0.08	-0.09	-0.09	-0.10	-0.10	-0.09	-0.10	-0.10	-0.10	-0.10	-0.10
70	-0.09	-0.10	-0.09	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.11	-0.11
71	-0.08	-0.09	-0.08	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.10	-0.10
72	-0.01	-0.02	-0.02	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
73	-0.02	-0.02	-0.02	-0.02	-0.03	-0.02	-0.03	-0.03	-0.03	-0.03	-0.03
74	-0.02	-0.02	-0.02	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
75	-0.02	-0.02	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
76	-0.01	-0.01	-0.01	-0.01	-0.02	-0.02	-0.02	-0.01	-0.01	-0.02	-0.02
77	-0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01	0.00	-0.00	-0.01	-0.01
78	-0.00	0.00	0.00	0.00	-0.00	-0.00	-0.00	0.00	-0.00	0.00	-0.00

THE OHIO VALLEY COAL COMPANY
SUMMARY OF SUBSIDENCE SURVEYS ALONG STATE ROUTE 9
OVER LONGWALL PANELS DESIGINATED AS 10-WEST and 11-WEST

PANEL DESIGNATION>	11-WEST (SECOND PANEL)										
SURVEY NUMBER>	59	60	61	62	63	64	65	66	67	68	69
SURVEY DATE>	04/04/92	04/05/92	04/06/92	04/07/92	04/08/92	04/09/92	04/10/92	04/11/92	04/12/92	04/13/92	04/14/92
LONGWALL STATUS>	RUNNING	IDLE	RUNNING	RUNNING	RUNNING	RUNNING	RUNNING	RUNNING	IDLE	RUNNING	RUNNING
DAYS AFTER 1st SURVEY>	169	170	171	172	173	174	175	176	177	178	179
FACE PLUS @ SURVEY>	2307	2251	2221	2159	2094	2008	1926	1874	1843	1802	1726
STATION NUMBER											
4	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-
Edge of Gob>											
9	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-	-	-	-	-
Edge of Gob>											
12	-	-	-	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-	-
24	-	-	-	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-
26	-	-	-	-	-	-	-	-	-	-	-
27	-	-	-	-	-	-	-	-	-	-	-
28	-3.73	-3.72	-3.74	-3.73	-3.73	-3.75	-3.74	-3.75	-3.74	-3.74	-3.76
Near Panel Center> 29	-3.71	-3.70	-3.72	-3.71	-3.71	-3.74	-3.73	-3.73	-3.73	-3.73	-3.76
30	-3.69	-3.68	-3.70	-3.69	-3.69	-3.72	-3.71	-3.72	-3.71	-3.72	-3.75
31	-3.66	-3.64	-3.66	-3.66	-3.66	-3.69	-3.68	-3.69	-3.68	-3.69	-3.72
32	-3.60	-3.59	-3.62	-3.61	-3.62	-3.65	-3.66	-3.66	-3.66	-3.66	-3.69
33	-3.41	-3.40	-3.43	-3.43	-3.44	-3.46	-3.47	-3.49	-3.50	-3.50	-3.53
34	-3.06	-3.07	-3.10	-3.12	-3.14	-3.19	-3.20	-3.22	-3.23	-3.24	-3.27
35	-2.14	-2.18	-2.23	-2.30	-2.36	-2.44	-2.48	-2.52	-2.54	-2.56	-2.60
36	-1.43	-1.48	-1.54	-1.63	-1.71	-1.83	-1.89	-1.94	-1.96	-1.98	-2.03
37	-0.87	-0.94	-1.00	-1.10	-1.20	-1.33	-1.40	-1.46	-1.49	-1.52	-1.56
38	-0.63	-0.70	-0.78	-0.87	-0.97	-1.11	-1.18	-1.24	-1.28	-1.31	-1.36
39	-0.51	-0.59	-0.66	-0.77	-0.88	-1.02	-1.10	-1.16	-1.20	-1.23	-1.28
Edge of Gob>											
40	-0.44	-0.52	-0.59	-0.71	-0.82	-0.97	-1.06	-1.12	-1.16	-1.19	-1.24
41	-0.39	-0.46	-0.56	-0.69	-0.81	-0.97	-1.06	-1.13	-1.18	-1.21	-1.26
42	-0.36	-0.46	-0.54	-0.70	-0.84	-1.02	-1.12	-1.19	-1.24	-1.27	-1.32
Edge of Gob>											
43	-0.34	-0.46	-0.55	-0.74	-0.91	-1.12	-1.23	-1.31	-1.36	-1.39	-1.46
44	-0.32	-0.46	-0.57	-0.82	-1.04	-1.28	-1.41	-1.49	-1.54	-1.57	-1.62
45	-0.30	-0.48	-0.60	-0.93	-1.20	-1.48	-1.62	-1.71	-1.76	-1.79	-1.84
46	-0.31	-0.56	-0.69	-1.11	-1.34	-1.76	-1.92	-2.00	-2.05	-2.08	-2.13
47	-0.36	-0.66	-0.84	-1.39	-1.81	-2.17	-2.33	-2.41	-2.46	-2.49	-2.53
48	-0.39	-0.75	-0.98	-1.66	-2.15	-2.52	-2.69	-2.78	-2.81	-2.84	-2.88
49	-0.41	-0.83	-1.10	-1.86	-2.42	-2.80	-2.96	-3.04	-3.08	-3.11	-3.15
50	-0.43	-0.88	-1.16	-1.98	-2.57	-2.97	-3.13	-3.21	-3.26	-3.28	-3.32
51	-0.44	-0.90	-1.20	-2.06	-2.66	-3.06	-3.22	-3.29	-3.34	-3.37	-3.41
Near Panel Center> 52	-0.47	-0.95	-1.25	-2.15	-2.75	-3.13	-3.30	-3.37	-3.42	-3.46	-3.49
53	-0.46	-0.93	-1.23	-2.17	-2.76	-3.15	-3.31	-3.38	-3.43	-3.46	-3.50
54	-0.44	-0.91	-1.21	-2.15	-2.75	-3.14	-3.30	-3.37	-3.42	-3.44	-3.48
55	-0.41	-0.84	-1.13	-2.06	-2.67	-3.07	-3.23	-3.30	-3.35	-3.37	-3.41
56	-0.37	-0.72	-0.96	-1.80	-2.39	-2.79	-2.96	-3.03	-3.07	-3.10	-3.13
57	-0.31	-0.57	-0.75	-1.40	-1.89	-2.20	-2.42	-2.49	-2.53	-2.56	-2.59
58	-0.27	-0.44	-0.57	-0.99	-1.36	-1.66	-1.79	-1.84	-1.88	-1.90	-1.93
59	-0.23	-0.33	-0.40	-0.61	-0.82	-1.01	-1.10	-1.15	-1.17	-1.19	-1.21
60	-0.19	-0.24	-0.28	-0.36	-0.44	-0.53	-0.56	-0.59	-0.61	-0.61	-0.62
61	-0.16	-0.20	-0.21	-0.25	-0.28	-0.32	-0.34	-0.32	-0.36	-0.36	-0.37
Edge of Gob>											
62	-0.14	-0.15	-0.16	-0.19	-0.20	-0.22	-0.23	-0.24	-0.25	-0.24	-0.25
63	-0.12	-0.14	-0.14	-0.16	-0.16	-0.18	-0.18	-0.19	-0.19	-0.18	-0.19
64	-0.12	-0.10	-0.12	-0.14	-0.14	-0.16	-0.16	-0.17	-0.17	-0.16	-0.17
Edge of Gob>											
65	-0.10	-0.10	-0.12	-0.12	-0.12	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13
66	-0.10	-0.11	-0.11	-0.11	-0.11	-0.12	-0.11	-0.12	-0.12	-0.11	-0.12
67	-0.10	-0.10	-0.11	-0.11	-0.11	-0.12	-0.11	-0.12	-0.12	-0.11	-0.12
68	-0.09	-0.09	-0.10	-0.10	-0.09	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10
69	-0.09	-0.10	-0.10	-0.10	-0.10	-0.11	-0.10	-0.10	-0.11	-0.10	-0.10
70	-0.10	-0.10	-0.10	-0.10	-0.10	-0.11	-0.10	-0.10	-0.10	-0.10	-0.10
71	-0.09	-0.09	-0.09	-0.09	-0.09	-0.10	-0.09	-0.09	-0.09	-0.09	-0.09
72	-0.02	-0.02	-0.03	-0.03	-0.02	-0.03	-0.02	-0.03	-0.03	-0.02	-0.03
73	-0.02	-0.02	-0.03	-0.02	-0.02	-0.03	-0.02	-0.03	-0.03	-0.02	-0.03
74	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.03	-0.03	-0.02	-0.02
75	-0.01	-0.02	-0.02	-0.02	-0.01	-0.02	-0.02	-0.02	-0.02	-0.01	-0.02
76	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.02	-0.00	-0.01
77	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00
					-0.00	-0.00	0.00	-0.00	0.00	-0.01	0.00

THE OHIO VALLEY COAL COMPANY
SUMMARY OF SUBSIDENCE SURVEYS ALONG STATE ROUTE 9
OVER LONGWALL PANELS DESIGNATED AS 10-WEST and 11-WEST

PANEL DESIGNATION>	11-WEST (SECOND PANEL)									
SURVEY NUMBER>	70	71	72	73	74	75	76	77	78	79
SURVEY DATE>	04/15/92	04/16/92	04/17/92	04/18/92	04/20/92	04/21/92	04/22/92	04/23/92	04/24/92	05/01/92
LONGWALL STATUS>			RECOVERING	RECOVERING	RECOVERING	RECOVERING	RECOVERING	RECOVERED	RECOVERED	RECOVERED
DAYS AFTER 1st SURVEY>	180	181	182	183	185	186	187	188	189	196
FACE PLUS @ SURVEY>	1571	1575	1545	1537	1536	1528	1526	1525	1525	1525
STATION NUMBER										
4	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-
Edge of Gob>										
9	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-	-	-	-
Edge of Gob>										
12	-	-	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-
24	-	-	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-
26	-	-	-	-	-	-	-	-	-	-
27	-	-	-	-	-	-	-	-	-	-
28	-3.78	-3.78	-3.80	-3.78	-3.78	-3.80	-3.78	-3.80	-3.78	-3.81
Near Panel Center> 29	-3.75	-3.77	-3.78	-3.77	-3.76	-3.79	-3.77	-3.79	-3.77	-3.91
30	-3.73	-3.76	-3.77	-3.75	-3.75	-3.78	-3.76	-3.78	-3.75	-3.79
31	-3.70	-3.73	-3.75	-3.73	-3.73	-3.75	-3.74	-3.75	-3.73	-3.75
32	-3.68	-3.71	-3.72	-3.71	-3.71	-3.73	-3.72	-3.73	-3.71	-3.74
33	-3.52	-3.55	-3.56	-3.55	-3.55	-3.57	-3.56	-3.57	-3.56	-3.58
34	-3.25	-3.29	-3.30	-3.30	-3.30	-3.31	-3.31	-3.31	-3.30	-3.32
35	-2.58	-2.63	-2.64	-2.64	-2.64	-2.66	-2.66	-2.66	-2.65	-2.68
36	-2.02	-2.07	-2.08	-2.09	-2.09	-2.10	-2.10	-2.11	-2.09	-2.12
37	-1.56	-1.60	-1.61	-1.61	-1.62	-1.64	-1.64	-1.65	-1.63	-1.57
38	-1.36	-1.40	-1.41	-1.41	-1.42	-1.44	-1.44	-1.45	-1.43	-1.47
39	-1.26	-1.32	-1.33	-1.33	-1.34	-1.36	-1.36	-1.37	-1.36	-1.39
Edge of Gob>										
40	-1.24	-1.29	-1.30	-1.30	-1.31	-1.33	-1.33	-1.34	-1.32	-1.36
41	-1.26	-1.31	-1.32	-1.32	-1.33	-1.35	-1.35	-1.36	-1.34	-1.38
42	-1.33	-1.38	-1.39	-1.40	-1.40	-1.42	-1.42	-1.43	-1.42	-1.45
Edge of Gob>										
43	-1.46	-1.50	-1.52	-1.52	-1.53	-1.55	-1.55	-1.55	-1.54	-1.57
44	-1.63	-1.68	-1.69	-1.70	-1.71	-1.72	-1.73	-1.73	-1.72	-1.75
45	-1.86	-1.89	-1.91	-1.91	-1.92	-1.93	-1.93	-1.94	-1.93	-1.96
46	-2.14	-2.17	-2.20	-2.19	-2.21	-2.22	-2.21	-2.23	-2.21	-2.24
47	-2.54	-2.57	-2.60	-2.59	-2.60	-2.61	-2.61	-2.62	-2.61	-2.63
48	-2.89	-2.92	-2.95	-2.94	-2.95	-2.96	-2.96	-2.97	-2.96	-2.98
49	-3.18	-3.19	-3.22	-3.20	-3.21	-3.23	-3.22	-3.23	-3.22	-3.25
50	-3.33	-3.38	-3.38	-3.37	-3.38	-3.39	-3.39	-3.40	-3.39	-3.42
51	-3.41	-3.44	-3.47	-3.46	-3.47	-3.48	-3.47	-3.48	-3.47	-3.50
Near Panel Center> 52	-3.49	-3.52	-3.55	-3.53	-3.55	-3.55	-3.55	-3.55	-3.55	-3.58
53	-3.50	-3.52	-3.56	-3.53	-3.55	-3.55	-3.55	-3.56	-3.56	-3.58
54	-3.48	-3.50	-3.53	-3.52	-3.53	-3.54	-3.54	-3.55	-3.54	-3.57
55	-3.41	-3.43	-3.46	-3.45	-3.46	-3.47	-3.46	-3.48	-3.46	-3.49
56	-3.14	-3.16	-3.19	-3.17	-3.19	-3.19	-3.19	-3.20	-3.19	-3.22
57	-2.59	-2.62	-2.64	-2.63	-2.64	-2.65	-2.64	-2.66	-2.65	-2.67
58	-1.93	-1.96	-1.98	-1.97	-1.98	-1.99	-1.98	-1.99	-1.98	-2.01
59	-1.20	-1.23	-1.25	-1.24	-1.25	-1.26	-1.25	-1.26	-1.25	-1.27
60	-0.62	-0.64	-0.66	-0.65	-0.66	-0.68	-0.66	-0.67	-0.66	-0.67
61	-0.38	-0.38	-0.40	-0.39	-0.40	-0.40	-0.40	-0.41	-0.39	-0.41
Edge of Gob>										
62	-0.26	-0.27	-0.28	-0.27	-0.28	-0.28	-0.28	-0.29	-0.26	-0.29
63	-0.20	-0.20	-0.22	-0.21	-0.21	-0.22	-0.21	-0.22	-0.19	-0.22
64	-0.17	-0.18	-0.19	-0.18	-0.19	-0.19	-0.19	-0.19	-0.17	-0.19
Edge of Gob>										
65	-0.13	-0.14	-0.15	-0.14	-0.15	-0.15	-0.15	-0.15	-0.13	-0.16
66	-0.12	-0.12	-0.14	-0.13	-0.14	-0.13	-0.13	-0.14	-0.12	-0.14
67	-0.12	-0.12	-0.13	-0.12	-0.13	-0.13	-0.12	-0.13	-0.11	-0.14
68	-0.10	-0.10	-0.12	-0.10	-0.11	-0.11	-0.11	-0.12	-0.09	-0.12
69	-0.10	-0.10	-0.12	-0.10	-0.11	-0.11	-0.11	-0.12	-0.09	-0.12
70	-0.10	-0.10	-0.11	-0.10	-0.11	-0.11	-0.10	-0.12	-0.09	-0.12
71	-0.09	-0.09	-0.10	-0.09	-0.10	-0.10	-0.09	-0.10	-0.08	-0.11
72	-0.02	-0.03	-0.04	-0.03	-0.04	-0.03	-0.03	-0.04	-0.02	-0.04
73	-0.02	-0.02	-0.04	-0.03	-0.03	-0.04	-0.03	-0.04	-0.02	-0.04
74	-0.02	-0.02	-0.03	-0.03	-0.04	-0.03	-0.03	-0.04	-0.01	-0.04
75	-0.01	-0.01	-0.03	-0.02	-0.03	-0.03	-0.02	-0.03	-0.01	-0.03
76	-0.01	-0.01	-0.03	-0.02	-0.02	-0.02	-0.02	-0.03	-0.01	-0.02
77	-0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.02	0.00	-0.01
78	0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.00	-0.01	0.00	-0.01
									0.01	-0.00

AEC 05195

THE OHIO VALLEY COAL COMPANY
SUMMARY OF SUBSIDENCE SURVEYS ALONG STATE ROUTE 9
OVER LONGWALL PANELS DESIGNATED AS 10-WEST and 11-WEST

PANEL DESIGNATION>	11-WEST (SECOND PANEL)		
SURVEY NUMBER>	80	81	82
SURVEY DATE>	05/15/92	05/22/92	06/12/92
LONGWALL STATUS>	RECOVERED	RECOVERED	RECOVERED
DAYS AFTER 1st SURVEY>	210	217	238
FACE PLUS @ SURVEY>	1525	1525	1525
STATION NUMBER			
4	-	-	-1.02
5	-	-	-1.15
6	-	-	-1.26
7	-	-	-1.31
8	-	-	-1.33
Edge of Gob>			
9	-	-	-1.38
10	-	-	-1.42
11	-	-	-1.49
Edge of Gob>		-	
12	-	-	-1.57
13	-	-	-1.74
14	-	-	-1.94
15	-	-	-2.16
16	-	-	-2.43
17	-	-	-2.76
18	-	-	-3.00
19	-	-	-3.22
20	-	-	-3.36
21	-	-	-3.46
22	-	-	-3.51
23	-	-	-3.58
24	-	-	-3.64
25	-	-	-3.69
26	-	-	-3.78
27	-	-	-3.78
28	-3.80	-3.81	-3.83
Near Panel Center> 29	-3.80	-3.80	-3.82
30	-3.79	-3.79	-3.84
31	-3.76	-3.76	-3.79
32	-3.74	-3.75	-3.77
33	-3.58	-3.59	-3.61
34	-3.33	-3.34	-3.36
35	-2.68	-2.70	-2.71
36	-2.13	-2.15	-2.17
37	-1.68	-1.69	-1.71
38	-1.47	-1.49	-1.51
39	-1.40	-1.42	-1.43
Edge of Gob>			
40	-1.37	-1.38	-1.40
41	-1.39	-1.40	-1.42
42	-1.46	-1.48	-1.50
Edge of Gob>			
43	-1.59	-1.60	-1.62
44	-1.77	-1.78	-1.80
45	-1.97	-1.99	-2.00
46	-2.26	-2.27	-2.28
47	-2.66	-2.68	-2.68
48	-2.99	-3.00	-3.01
49	-3.26	-3.27	-3.28
50	-3.43	-3.44	-3.44
51	-3.51	-3.52	-3.53
Near Panel Center> 52	-3.59	-3.59	-3.60
53	-3.59	-3.60	-3.60
54	-3.57	-3.58	-3.59
55	-3.00	-3.51	-3.52
56	-3.22	-3.24	-3.24
57	-2.68	-2.69	-2.70
58	-2.02	-2.02	-2.04
59	-1.28	-1.29	-1.30
60	-0.68	-0.69	-0.70
61	-0.41	-0.41	-0.43
Edge of Gob>			
62	-0.29	-0.28	-0.29
63	-0.21	-0.22	-0.22
64	-0.19	-0.18	-0.20
Edge of Gob>			
65	-0.15	-0.15	-0.15
66	-0.13	-0.13	-0.14
67	-0.13	-0.12	-0.13
68	-0.11	-0.11	-0.12
69	-0.11	-0.11	-0.11
70	-0.11	-0.10	-0.11
71	-0.10	-0.09	-0.10
72	-0.03	-0.03	-0.04
73	-0.04	-0.03	-0.04
74	-0.03	-0.03	-0.04
75	-0.03	-0.02	-0.03
76	-0.03	-0.02	-0.03
77	-0.01	-0.01	-0.02
78	-0.00	-0.00	-0.01

K. (5) (b) the anticipated effects of planned subsidence upon the land and water resources identified in the subsidence control survey and survey of ground and surface water resources.

SEE ADDENDUM TO PART 3, PAGE 30, K(5)(b) & ATT. 31

(c) the measures to be taken to mitigate the anticipated effects of planned subsidence to the land and water resources.

SEE ADDENDUM TO PART 3, PAGE 30, K(5)(c)

(d) the anticipated effects of planned subsidence upon the structures identified in the subsidence control survey.

SEE ADDENDUM TO PART 3, PAGE 30, K(5)(d)

(e) the proposed measures to be taken to mitigate anticipated effects to structures.

SEE ADDENDUM TO PART 3, PAGE 30, K(5)(e)

(f) the proposed measures to determine the extent of mining related damages including a presubsidence survey with an indication of the timing of the survey.

SEE ADDENDUM TO PART 3, PAGE 30, k(5)(f)

(g) the provisions for repair and/or compensation for damages to structures.

SEE ADDENDUM TO PART 3, PAGE 30, k(5)(g)

(h) describe the monitoring, if any, needed to determine the commencement and degree of subsidence so that, when appropriate, other measures can be taken to prevent, reduce, or correct material damage in accordance with rule 1501:13-12-03 of the Administrative code.

SEE ADDENDUM TO PART 3, PAGE 30, K(5)(h)

(6) Will planned subsidence operations be conducted within the angle of draw of urbanized areas, cities, towns, communities, industrial or commercial buildings, major impoundments, or **perennial streams**?
__X__ Yes, _____ No. If "yes," describe any measures or activities that will prevent a condition or practice that could result in an imminent danger to the health or safety of the public.

MINING UNDER THE THREE (3) PERENNIAL STREAMS LOCATED WITHIN THE APPLICATION AREA WILL NOT RESULT IN IMMINENT DANGER TO THE HEALTH OR SAFETY OF THE PUBLIC.

(7) Will planned subsidence operations be conducted within the angle of draw of transmission pipelines?
_____ Yes, __X__ No. If "yes," describe the procedural plan to avoid the creation of a situation of imminent danger to the health and safety of the public.

ADDENDUM TO PAGE 30, PART 3, K(5)(b)
BENNOC, INC.
CENTURY MINE
PERMIT D-0425

ANTICIPATED EFFECTS OF PLANNED SUBSIDENCE

Effect on Surface Lands

1. Tension cracking of the ground surface may occur. These cracks in the surface may vary in width from hairline, up to several inches wide.

2. BENNOC believes that there will be no effect on the crop production as a result of mining. This fact is supported by a paper written by Dr. Frank L. Himes, Ph.D., entitled "Agronomic Evaluation of the Land in the Southern Ohio Coal Company Area", June, 1983. A copy is included.

3. Slip-Prone Soils - A search of the Belmont County Soils Maps (specifically Map No. 74, 75,and 80)* revealed several potential slide/slip areas within the following soil types:

Soil Type	Slope	No. of Potential Slide/Slip Areas
BsC	8-15	3
BsD	15-25	4
BsE	25-40	2
LeE	25-40	3
LoE	25-40	33
LoF	40-70	14
LpF	30-70	5
RcD	15-25	5
RcE	25-40	2

These areas have been mapped on the enclosed map showing the limits of the application area and slip prone soils. Please note - the Soil Survey of Belmont County does not describe subsidence as a source of potential slippage. Rather, it notes soil types that are slip prone for construction sites. Of the types of slip-prone soils identified, only LpF (Lowell-Westmoreland silt loam) has been known to be slip prone during longwall mining-induced subsidence in some areas. Other soil types have been undermined before without slippage occurring.

During the pre-subsidence survey, areas known to be slip prone during subsidence, as well as other similar sites that may have a significant impact to existing structures, may be inspected. Should conditions dictate, site specific measures, not limited to but including installation of cut-off trenches, drainage systems, and retaining walls, may be taken to minimize adverse effects.

*Soil Survey of Belmont County
ODNR, USDA March, 1974

Streams in this area begin as undeveloped or developed springs near the head of hollows and are fed throughout its length by springs and surface runoff. Streams that are fed by springs near the head of hollows continue to receive this groundwater, but at a lower elevation. Since rainfall is unaffected by subsidence, runoff continues to supply the water for streams.

Other Surface Water and Land Features

Ponds primarily are the other surface water feature in this area. Our experience at the CENTURY MINE has been that ponds are not substantially affected by subsidence in this area. Several ponds have been undermined with no visible effects. Cisterns, catch basins, etc. have been unaffected to date.

Anticipated effects of planned subsidence on the rock formations and large overhangs at Raven Rocks include some rock sloughage during subsidence. During subsidence, signs will be posted at access to rock overhangs at Raven Rocks to alert the public to potential dangers. Such signs will ask the public to stay out of overhang areas, and during periods of active subsidence of the overhang areas, personnel will inspect the sites daily to examine the areas for signs of instability. After subsidence, the area will be inspected for potential hazards and appropriate measures will be taken to safeguard the public. The measures are unknown at this time, but will be described in a plan to be submitted to the DMRM within 30 days of discovery of the hazard.

AGRONOMIC EVALUATION OF LAND

IN THE

SOUTHERN OHIO COAL COMPANY AREA

AMERICAN ELECTRIC POWER
SERVICE CORPORATION

JUNE, 1983

FRANK L. HIMES, Ph.D.
Professor of Agronomy
Ohio State University

AEC 05200

INTRODUCTION

Areas considered typical of different surface effects of the Meigs County Mine #2 were observed on May 26, 1983. Mr. Keith Peluchette assisted me in reading the detailed mining map in respect to surface locations and data of mining. The dates of mining varied from three (3) years to present.

OBSERVATIONS

The areas of observation made by walking, included a small corn field (fallow this year) and the adjacent woods, an orchard, and a meadow area near a road. Additional areas were observed by driving around the area.

1. Subsidence with associated cracking did not result in mixing of soil layers except possibly for some sloughing at the cracks.

2. The trees in the subsided areas did not show damage when compared to those in the areas that had not been subsided.

3. After the cracks close in the later stages of subsidence, they are difficult to locate in densely vegetated meadows and woods.

AEC 05201

DISCUSSION

1. No evidence was obtained that the subsidence would alter soil management practices. Since the soil horizons (topsoil, subsoil, and parent material) have the same respective locations, the chemical properties of the soil have not been changed. Therefore, fertilizer and liming recommendations would not change with subsidence. After any cracks have closed, the same equipment could be used on both the subsided and the non-subsided areas. The surface slopes were not altered appreciably in respect to equipment use.

2. Although no sloughing was observed on the cracks, common sense would indicate that plant residues and a little topsoil would enter any such cracks. The extent of sloughing would depend upon the surface conditions and activities. The coating of the surface of the cracks with the surface "debris" would produce a plane of weakness. By this is meant, during very dry periods when the soil contracts, shrinkage cracks would be along these faces. Also, plant roots would grow more extensively in the remnant of the crack than in the adjacent zone because the fertility and aeration are better. Plant roots

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are not drill bits and penetrate the soil only by entering pores (or voids) that are larger than the root.

As indicated on the map included, the Monongahela soils (and likewise for the Latham soils) have a compact layer at 20 to 30 inches that impedes root penetration and percolation of water. The fracturing of this layer and partial filling with debris would increase the rooting depth of and available water to the plants growing within a few inches of the crack. In some areas of Ohio, farmers subsoil their land which is a practice to fracture the dense layers 15 to 24 inches below the surface. The practice called vertical mulching is more effective because plant residues are incorporated. It improves both root penetration and the infiltration and percolation of water. In most instances, the additional infiltration results in less runoff and less erosion.

Erosion is a natural hazard for the Gilpin, Dekalb, Latham, Monongahela, and Upshur soils. These soils usually occur on slopes exceeding six (6) percent. Therefore, practices or occurrences that decrease the amount of water runoff will decrease erosion. Because these soils are rated highly erosive (see map

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and Table 1), farming practices should be selected for erosion control to hold erosion to a minimum. Although no waterways were observed, if subsidence caused a shift in a waterway, the farmer would need to make minor changes in his tillage practices.

3. Tables 2, 3, and 4 summarize other properties of the soils and the type of agriculture in Meigs County. The productivity of these soils is often limited by fairly acid subsoils, low fertility, shallow (less than 36 inches) rooting, low moisture holding capacity, and steep slopes. The soil management practices needed to make these soils productive do not change with subsidence. Although a detailed soil survey of the area is not available, a generalized map and publications containing additional information about these soils are included.

CONCLUSION

The fertility of the soils was not altered by subsidence except within cracks if sloughing occurred. The fracturing of layers that restrict water movement and root penetration should be beneficial to the plants growing near the fractures. The maintenance of the farmer's erosion control waterways may have to be adjusted accordingly if subsidence were to change the flow in them.

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The soils in this area are difficult to maintain on a high state of productivity, and subsidence has little impact on the chemical and physical properties of the soils. Based on practices in other areas of the world, the fracturing of the layers inhibiting root development will be beneficial to plant growth. The agronomic uses of the soils are not influenced by longwalling.

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TABLE 1[1]

Soil Series	K*
Dekalb	0.24
Gilpin	0.32
Latham	0.43
Monongahela	0.43
Upshur	0.43

*K is the soil erodibility factor. The highest value for Ohio soils is 0.49 and most are below 0.40.

[1]"Ohio Erosion Control and Sediment Pollution Abatement Guide." Bulletin 594, Cooperative Extension Service, The Ohio State University.

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TABLE 2

Meigs County - Soil and Water Conservation Needs - 1967

Total Land Area	277,610 A
Non-Inventory Acreage (Urban, etc.)	13,058 A
Inventory Acreage	264,552 A
Cropland[2]	48,263 A
Pasture[2]	41,251 A
Forest[2]	168,100 A
Other Land[2]	6,938 A

IRRIGATED AND NON-IRRIGATED CROPLAND
BY LAND CAPABILITY CLASSES, 1967[3]

LAND CAPABILITY CLASS SUB-CLASS	TILLAGE ROTATION ALL ROW CROPS	FIELD CROPS CLOSE GROWN	ROTATION HAY AND PASTURE	HAY-LAND	CONSER-VATION USE ONLY	TEMPORAR-ILY IDLE CROPLAND	ORCHARDS VINEYARDS AND BUSH FRUITS	TOTAL CROPLAND
1	867	434	2842	908	864	1246	0	7161
2E	1127	217	1516	909	2013	1091	0	6873
3E	1084	651	1326	2181	2589	623	160	8614
4E	2212	217	2463	2181	576	1246	0	8895
6E	1864	217	2652	3635	575	312	0	9255
2W	867	1301	1894	182	290	779	0	5313
3W	434	217	757	0	0	0	0	1408
7S	0	0	380	364	0	0	0	744
TOTAL	8455	3254	13830	10360	6907	5297	160	48263

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PASTURE, FOREST, AND OTHER LAND ACRES BY LAND CAPABILITY CLASSES, 1967[4]

LAND CAPABILITY CLASS SUB-CLASS	PASTURE & RANGE			FOREST			
	PASTURE	COMMER-CIAL	NON-COMMER-CIAL	COMMER-CIAL GRAZED	IN FARMS	NOT IN FARMS	TOTAL LAND IN INVENTORY
1	2633	5433	0	217	867	0	16094
2E	1229	1654	0	0	651	0	10407
3E	4740	5433	0	867	867	0	19654
4E	8601	25042	200	7156	217	0	42955
6E	13692	49612	0	9541	867	0	73426
7E	4213	11341	0	1735	217	0	15771
2W	1404	1181	0	217	0	0	7898
3W	351	945	0	0	0	0	2704
6S	175	2[illegible]7[illegible]	0	0	0	0	412
7S	4213	66622	200	9107	1084	1301	74164
8S	0	0	200	0	0	867	1067
TOTAL	41251	167500	600	28840	4770	2168	264552

Ohio Soil and Water Conservation Needs Inventory, Sponsored by USDA, 1971.

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3. Page 29
4. Page 48

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TABLE 3

MEIGS COUNTY - AGRICULTURAL STATISTICS

	1980	1981
Number of Farms[1]	620	610
Average Size of Farm[1]	177 A	182 A
Land in Farms[1]	110,000 A	111,000 A
Corn for Grain[2]	3,700 A	5,200 A
Yield[2]	130 bu./A	85 bu./A
Soybeans[3]	(Less than 1,000 A)	
Wheat[4]	(Less than 1,000 A)	
Oats[5]	(Less than 1,000 A)	
Hay (all)[6]	16,800 A	15,800 A
Yield[6]	2.2 T/A	2.2 T/A
All Cattle and Milk Cows[7]	13,000	14,000
Hogs and Pigs[8]	2,000	1,900
Stock Sheep[8]	(Less than 1,000)	
Hens and Pullets, Laying Age[8]	30,000	30,000

Published by Ohio Co-op Reporting Service, June 1981-1982, Ohio Agricultural Statistics.

1. Page 7
2. Page 9
3. Page 11
4. Page 13
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TABLE 4

Available Moisture Capacity for the Surface Layer[1]

Dekalb Soil	0.13-0.17 in./in. of soil
Gilpin Soil	0.17-0.22 in./in. of soil
Latham Soil	0.18-0.22 in./in. of soil
Upshur Soil	0.18-0.22 in./in. of soil

[1]Soil Survey of Monroe County, Ohio. Published by USDA, 1974, pp. 39-43.

AEC 05210

Frank L. Himes: Professor, Department of Agronomy, The Ohio State University, 1885 Neil Avenue, Columbus, Ohio 43210.
Phone: (614)422-2002

Date of Birth: July 30, 1927. Place of Birth: Crawfordsville, Indiana.

Education:

A.B. Wabash College (Chemistry), 1949.
M.Sc. Purdue University (Organic Chemistry), 1951.
Massachusetts Institute of Technology (Westinghouse Science Teacher Institute), Summer 1952.
Ph.D. Purdue University (Soil Fertility and Chemistry), 1956.

Professional and Technical Societies:

American Society of Agronomy, Soil Science Society of America, International Soil Science Society, American Chemical Society, Sigma Xi, Gamma Sigma Delta.

Professional Experience:

1949-1951	Teaching Assistant, Department of Chemistry, Purdue University.
1951-1953	High School Science Teacher, Remington High School, Remington, Indiana.
1953-1955	Fellowship, Department of Agronomy, Purdue University.
1955-1957	Assistant Professor in the Departments of Agriculture and Chemistry, Middle Tennessee State University, Murfreesboro, Tennessee.
1957-present	Assistant Professor, Associate Professor, Professor, Department of Agronomy, Ohio State University.

Publications:

Books written

Himes, F. L. 1969. Audio Tutorial Notes for Soils, 1st ed. Bugess Publishing Co.

Himes, F. L. 1972. ibid, 2nd ed.

Himes, F. L. 1975. ibid, 3rd ed.

Himes, F. L. 1979. ibid, 4th ed.

Chapters of books written:

Himes, F. L. 1974. Inventorying Soil Resources. Chapter 28 of "Man's Finite Earth", R. O. Utgard and C. D. McKenzie, eds.

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Technical Papers

Himes, F. L. and S. A. Barber. 1957. Chelating ability of soil organic matter. Soil Sci. Soc. Amer. Proc. 21:368-373.

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De Datta, S. K., R. E. Franklin and F. L. Himes. 1965. Partial Characterization of Soil Polysaccharide-Strontium 90-Yttrium 90 Complexes. Soil Sci. 103:(1)47-55.

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Himes, F. L. and R. Shufeldt. 1969. Influence of Some Organic Compounds on the Movement of Sr^{90} in Soils. Proc. of Internat. Symposium on Radioecology, Cadarache, France.

Street, J. R., P. R. Henderlong and F. L. Himes. 1974. The Silica Content of Merion Kentucky Bluegrass Under Several Cultural Regimes and Its Relation to Thatch Accumulation. Turf and Landscape Research. OARDC Res. Sum 79. Sept. pp 9-12.

Street, J. R., P. R. Henderlong and F. L. Himes. 1977. Influence of silica on chemical composition and decomposition of turfgrass tissue. Proceed. III International Turfgrass Res. Conf. Chapt. 38, pp. 329-336.

Lueking, M. A., J. W. Johnson, and F. L. Himes. 1983. Effects of Increasing the Rates of Potassium and Nitrapyrin on Nitrogen Uptake by Corn. Agron. J. 75:247-249.

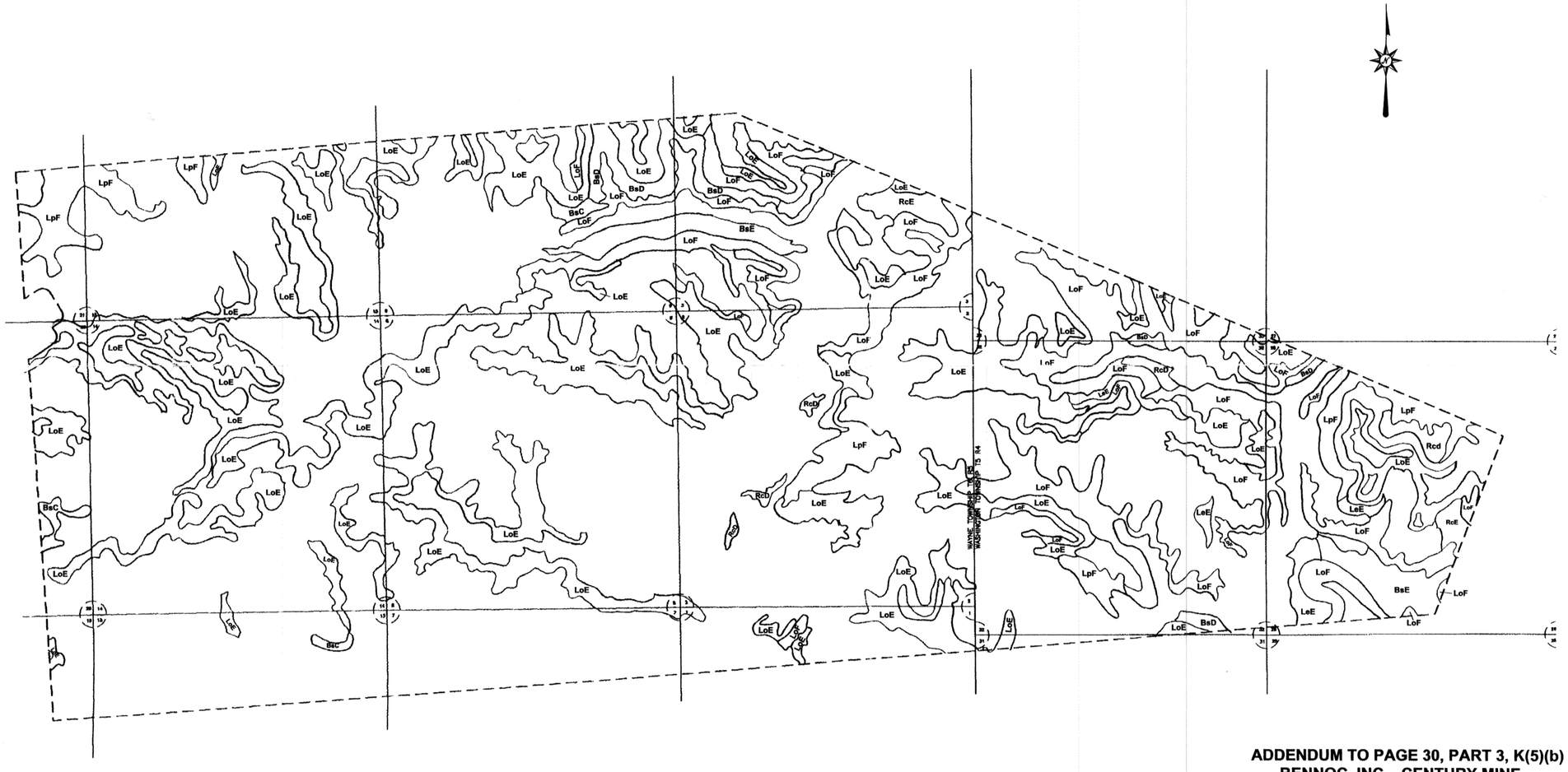
Non-Technical Papers

Himes, F. L. 1963. Careers in Agronomy. The Ohio Farmer.

Himes, F. L. 1964. Radioactive isotope demonstration for improved teaching of soil chemistry. Agron. J. 56:239.

Himes, F. L. 1972. Inventorying Soil Resources. The Science Teacher. 39:2.

Himes, F. L. 1976. Use of the Overhead Projector to Illustrate Ion Exchange Reactions. J. of Agron. Educ. 5:33-34.



ADDENDUM TO PAGE 30, PART 3, K(5)(b)
BENNOC, INC. CENTURY MINE
PEMIT D-0425
SLIP PRONE SOILS

ANTICIPATED EFFECTS OF PLANNED SUBSIDENCE

Effect on Water Resources

The effect of subsidence on water resources varies greatly. The effect on wells, streams, and other surface water each differ in the type and duration of effects. Each will be discussed below.

Wells

Depending upon the depth of the well, its location within the longwall subsidence area, and its surface elevation compared to the elevation of the coal, the effect of subsidence on wells may vary from complete dewatering to some dewatering to no dewatering. Generally, as the subsidence opens new places for the ground water to go, the elevation of the water decreases. The ground water is still present, but at a lower elevation. Aquicludes prevent further downward migration of water into the mine. In addition, the soft rock, particularly the clay stones in the strata, tend to swell, erode, and fill voids, causing some recovery in the elevation of the water. Wells may become completely dry permanently, may become completely dry temporarily, may hold less water, or as has been experienced in some instances, may not be affected. In some cases, the water level actually increases temporarily. This effect is caused by the strata being placed in compression and closing some of the joints, cracks, or bedding planes (secondary porosity features) that hold the water. However, as a general rule, the water level in wells decreases. As new surfaces are opened that water begins to flow over, the quality of the water also varies, usually temporarily. Normally, some increase in suspended solids, iron, manganese, and sulfates has been observed. These effects usually return to near normal after the water "washes" out the new chemicals.

Springs

Springs, given the fact that they are located on the surface, generally decrease in flow and usually dry completely with little or no recovery. The water stops flowing because it is no longer at the elevation of the surface installation. The water begins to flow horizontally, through different bedding planes, than before subsidence, and can and has been developed, successfully, as a spring at a lower elevation. Water quality varies as with wells. However, because of the increased porosity of the strata, springs developed over longwall panels, generally have higher flows.

ADDENDUM TO PAGE 30, PART 3, K(5)(b)
BENNOC, INC.
CENTURY MINE
PERMIT D-0425
PAGE THREE

Streams

Generally, streams are temporarily affected by subsidence, decreasing in flow as cracks open in the stream bed. However, because the streams contain a high concentration of sediment during rains, the cracks fill quickly and the effect is short lived. The water re-establishes itself within several months.

Streams in this area begin as undeveloped or developed springs near the head of hollows and are fed throughout its length by springs and surface runoff. Streams that are fed by springs near the head of hollows continue to receive this groundwater, but at a lower elevation. Since rainfall is unaffected by subsidence, runoff continues to supply the water for streams.

Other Surface Water Features

Ponds primarily are the other surface water feature in this area. Our experience at the Powhatan No. 6 Mine has been that ponds are not substantially affected by subsidence in this area. Several ponds have been undermined with no visible effects.

ADDENDUM TO PAGE 30, PART 3, K(5)(c)
BENNOC, INC.
CENTURY MINE
PERMIT D-0425

ANTICIPATED EFFECTS OF PLANNED SUBSIDENCE

Damage Repairs - Surface Lands

If subsidence due to mining operations causes slippage which reduces the value or reasonably foreseeable use of the surface land, BENNOC will restore the land to a condition capable of supporting uses it was capable of supporting before subsidence. If slips are triggered by mining activities, these areas would be stabilized in accordance with accepted site specific procedures for such work if technologically and economically feasible. If not feasible, BENNOC will arrange alternative mitigatory measures.

1. Notwithstanding its mining rights and without waiving nor releasing any of its rights, BENNOC will make repairs of damage caused to surface lands by BENNOC's mining operations if the damage reduces the foreseeable use or value of the surface lands. If such damage occurs, BENNOC will submit to the Chief within thirty days after the damage occurs:

    a. Site specific plans for the repair or mitigation of the damage, including a time schedule for performance of the remedial action.

    b. A request for more time to prepare such plans; or

    c. Written notification that BENNOC believes that repair or restoration measures are not technologically feasible. If repair or restoration measures are not desired by the owner or if repair or restoration measures are not technologically feasible, other mitigatory measures will be described.

2. Damage to surface land will be repaired by local contractors. As surface damage occurs, the landowner will be notified and permission to repair the damage will be requested. Surface cracks will usually be repaired by the following method: After the length of the subsidence crack has been determined, a trench will be made in the crack. During the excavation topsoil will be segregated from subsoil and rock. Upon completion of the excavation, the material will be compacted using the track of the bulldozer or the wheel of the backhoe. Once the soil material has been replaced, the area will be seeded in a hayfield, pasturefield, or a yard.

    BENNOC will employ a program to monitor surface cracking and settling resulting from subsidence. Areas being mined will be inspected at various intervals, ranging from daily to weekly. These areas will be visually inspected for any subsidence related problems. If a problem is found, the landowner will be notified immediately.

In most cases, surface cracks are expected to open and close relatively rapidly, however, some surface cracks may take weeks to close. For this reason, most cracks will not be repaired until BENNOC determines that the cracks are not going to close themselves. If the surface cracks are in an area that is commonly traveled by man or livestock, the cracks will be repaired immediately. Surface cracking that is found in areas not commonly traveled, may be marked by brightly colored tape. This tape alerts anyone in the area of the depression or opening. If the cracks do not close within the period of time BENNOC determines is adequate, a contractor will repair the cracks.

Monitoring of these areas will continue for up to six months after mining, and if the cracks reopen, they will once again be repaired. Monitoring of panel areas before mining consists of visual inspection or aerial photo review. BENNOC's subsidence control program will adequately assure that the value and reasonably foreseeable use of the surface land is maintained.

Anticipated effects of planned subsidence on the rock formations and large overhangs at Raven Rocks include some rock sloughage during subsidence. During subsidence, signs will be posted at access to rock overhangs at Raven Rocks to alert the public to potential dangers. Such signs will ask the public to stay out of overhang areas and during periods of active subsidence of the overhang areas, personnel will inspect the sites daily to examine the areas for signs of instability. After subsidence, the area will be inspected for potential hazards and appropriate measures will be taken to safeguard the public. The measures are unknown at this time, but will be described in a plan to be submitted to the DMRM within 30 days of discovery of the hazard.

3. Prior to the introduction of farm equipment into fields that have been undermined, BENNOC will inspect the field for cracks or slips if requested by the landowner. Repairs needed (to maintain access into the fields) will be made at appropriate times. Crop lands damaged by subsidence will be repaired at appropriate times to permit harvest or cultivation without damage to personnel or equipment. Note: "appropriate times" indicates that the repairs will be made 1) at a time when access is needed and 2) when damage to adjacent plants will be minimized.

ADDENDUM TO PAGE 30, PART 3, K(5)(d)
BENNOC, INC.
CENTURY MINE
PERMIT D-0425

ANTICIPATED EFFECTS - SURFACE STRUCTURES

Structures situated over a panel or within the angle of draw may be damaged due to subsidence. When the longwall passes directly under a structure, the structure experiences first moderate tensile stress, then moderate compressive stress. As the structure subsides, the end that was undermined first subsides first, causing some tilting away from the advancing face. As the surface over the panel subsides, it takes on the shape of a trough, with the edges remaining in tension and the center in compression. Because the Powhatan No. 6 face moves quickly, damage to structure from this type of movement is minimized.

The damage that may be expected may involve cracking of plaster, cracking of concrete block or brick, cracking of dirt and cement floors, cracking along mortar joints, and separation of existing cracks. Cracks may close partially or completely after subsidence is complete. Additions to houses may separate away from the original structure. Cracks that occur during separation may close partially or completely after subsidence is complete.

The anticipated effects of planned subsidence on the underground houses at the Raven Rocks community are minimal as the mining plan has been designed to avoid these structures. In addition, the wind generator and geothermal wells will be avoided as well.

Geologic survey marker - anticipated effects are that the marker will subside and possibly move horizontally due to subsidence. The marker will not be re-positioned, but can be relocated by survey methods, should the geologic survey require such relocation.

Ponds may become partially dry temporarily as a result of subsidence-induced surface cracks. However, cracks in ponds have not caused de-watering to date at the CENTURY MINE.

ADDENDUM TO PAGE 30, PART 3, K(5)(e)
BENNOC, INC.
CENTURY MINE
PERMIT D-0425

MITIGATING MEASURES

Damage to Public Roads

BENNOC will notify the appropriate road authority at least six months prior to undermining the road. In the event that roadways are permanently damaged by subsidence, BENNOC, at the request of the road authority, will pay to repair the road surface to its pre-mining condition.

Many roads have been undermined by longwalls in this part of Ohio. Routinely, during subsidence, the roads are monitored several times per day for cracks that may be hazardous to travelers. In some instances, roads may be patrolled continuously. Cracks on gravel roads are filled as soon as possible with gravel to maintain a smooth surface. Where offsets occur on paved roads, traffic is alerted to slow down by personnel on the scene, and the offsets are excavated and the area filled with fine gravel. After subsidence is over, these areas are covered with asphalt as soon as possible.

Damage to Public Water Lines

BENNOC will notify the owner of public water lines at least six months prior to undermining the lines. In the event that the pipelines are damaged by subsidence, BENNOC, at the request of the public water line authority, will pay to repair the pipeline to its pre-mining conditions.

After 10 years of subsidence above the D-0360 approved mining areas, only a few instances have occurred where water service has been disrupted by subsidence affecting a water line. Those instances almost always involved subsidence of asbestos-concrete pipes. Where such lines exist, they will be monitored routinely during subsidence and will be repaired as soon as possible to restore service as soon as possible. Most water lines made of plastic move with subsidence and service is not interrupted. However, as these lines are located along roads, they will be monitored with roads and if a problem develops, it will be corrected as soon as possible. In no cases was a temporary water supply needed, and none is anticipated in this area. Public water is routinely used to provide temporary water supplies due to their reliability. Should public water be disrupted such that it is rendered unavailable, water will be hauled to water users who are without water.

Damage to Other Utility Lines

BENNOC will notify the owner of other utility lines (electric lines and sub-stations) at least six months prior to undermining the lines to allow the utility to take measures that they deem necessary and proper to protect their property and the public health and safety.

ADDENDUM TO PAGE 30, PART 3, K(5)(f)
BENNOC, INC.
CENTURY MINE
PERMIT D-0425

NOTICE OF MINING, PRE-SUBSIDENCE SURVEY, MONITORING OF STRUCTURES

Notice of Mining

BENNOC will mail written notice to owners and occupants of surface property or structures of BENNOC intent to mine under such property or structures at least six months prior to any mining by BENNOC under their property.

Pre-Subsidence Survey

A pre-subsidence survey of all structures to be undermined will be conducted by BENNOC personnel or by someone contracted to do this work and will be used to determine the condition of the structures and facilities prior to the mining unless a private agreement exists between BENNOC and the landowner. This survey may include, but not be limited to: still and video photography, land surveying, making various measurements, interviewing landowners, tenants, or other individuals, and making various drawings. This survey will be performed in accordance with Underground PPD 90-3. Refusal of the landowner to allow a pre-subsidence survey will result in the amount of damage caused by subsidence to be indeterminate. In such cases, BENNOC will enforce the terms of its deed language, which deeds represent valid agreements between the coal owner and the owner of the surface estates and address all damage that may occur due to the removal of all coal. Such agreements vary from tract to tract, but are shown in the Addendum to Part 1, Page 10, C.(8)(b).

ADDENDUM TO PAGE 30, PART 3, K(5)(g)
BENNOC, INC.
CENTURY MINE
PERMIT D-0425

REPAIRS TO STRUCTURES

After mining, structures will be repaired or replaced as required by law or the owner will be compensated for the diminution in value to the extent required by law. A private agreement may be used to satisfy the requirements of OAC 1501:13-12-03. If repaired, structures will be returned to their pre-mining condition.

Repair of and compensation for damage under the terms and conditions of OAC 1501:13-12-03(F) and (H) can be determined only after review and analysis of the damage in each particular situation. BENNOC will comply with all legal requirements if subsidence damage occurs.

ADDENDUM TO PAGE 30, PART 3, K(5)(h)
BENNOC, INC.
CENTURY MINE
PERMIT D-0425

Monitoring of Structures

After BENNOC has completed its pre-subsidence survey, BENNOC will notify the Division of Mines and Reclamation if a private agreement (pursuant to OAC 1501:13-12-03(E)) between BENNOC and the landowner exists. If no agreement exists, the Division of Mines and Reclamation, after discussions with BENNOC, will decide the need for any monitoring of the structure(s). If monitoring is required, BENNOC will submit a plan for the monitoring. If, prior to subsidence, a private agreement is reached, BENNOC shall be released from any and all monitoring requirements.

PART 4 FORMAT AND CONTENT

A. FILING OF ADDENDA

If an addendum is needed to present the information required by the items in the permit application, the addendum is to be submitted with the permit application and each page, map, plan or other document in the addendum should include the applicant's name and indicate to what item the addendum applies. For example, "Addendum to Part 3, item K(2) Zebco Coal Company."

B. Provide the information requested below for all technical data submitted in the application.

Identification of Technical Data (1)	Person/Organization that Collected Data and Date	Methodology for Collecting Data	Person/Organization that Analyzed Data and Date	Methodology Used to Analyze data
PART 2, B(4) ATTACHMENT 13	BILL BEAM, RON DOMB, L.G. HETAGER, INC. 10/98	CORE DRILL	RICHARD WHITT, TRA-DET INC. 10/98, 11/98	ANALYZE AS NECESSARY FOR PARAMETERS
PART 2, C ATTACHMENT 14A	FRED BLACKMAN, QUALITY ENVIRONMENTAL SERVICES, 7/98, 8/98, 9/98, 10/98	GRAB SAMPLES & INTERVIEWS	RICHARD WHITT, TRA-DET INC., 7/98, 8/98, 9/98, 10/98 3/94	ANALYZE AS NECESSARY FOR PARAMETERS
			ILA MANIAR, INDUSTRIAL LAB ANALYSIS 12/93, 3/94	ANALYZE AS NECESSARY FOR PARAMETERS

(1) The technical data is to be identified by referencing the particular item in the application for which the data was used in preparing the response (e.g. Part 2, B(1); Attachment 14; Part 4, A)

AEC 05224

C. Provide the name, address and position of officials of each private or academic research organization or governmental agency contacted in the preparation of the application for information on land uses, soils, geology, vegetation, fish and wildlife, water quantity and quality, air quality, and archeological, cultural, and historic features.

Name and Address of Official	Position of Official	Name of Agency/ Organization	Type of information (e.g.Geology)
RICHARD WHITT P.O. BOX 2019 WHEELING, WV 26003	ANALYST	TRA-DET INC.	HYDROLOGY / ROOF,COAL, FLOOR ANALYSIS
BILL HAIKER 1855 FOUNTAIN SQUARE COURT, COLUMBUS, OH 43224	HYDROGEOLOGIST	ODNR, DIVISION OF WATER	HYDROLOGY
GEOLOGICAL RECORDS CENTER, 4383 FOUNTAIN SQUARE COURT, COLUMBUS, OHIO 43224	N/A	ODNR, DIVISION OF GEOLOGICAL SURVEY	OIL/GAS WELL LOGS
ILA MANIAR 2240 WILLIAMSBURG DRIVE GLAN DALE, WV 26083	ANALYST	INDUSTRIAL LAB ANALYSIS	HYDROLOGY

D. APPLICATION FOR ABANDONED MINED LAND DIRECT NEGOTIATED CONTRACT (IF APPLICABLE)

N/A

In accordance with Section 1513.27 of the Ohio Revised Code, the chief of the Division of Reclamation has been granted the authority to enter into contracts with licensed operators for reclamation of abandoned mined lands affected by coal mining prior to April 10, 1972 and located adjacent to a permit area. To be eligible for reclamation funding, the abandoned mined land must be causing offsite environmental problems, will not be affected by the operator during the normal course of mining, and is not likely to be mined in the foreseeable future. If such lands exist adjacent to your permit area and you are interested in contracting for reclamation of the lands, complete this application, detach and send directly to:

Robert S. Baker
Mined Land Reclamation
Division of Reclamation
Fountain Square, H-2
Columbus, Ohio 43224

Upon receipt, a representative from the Mined Land Reclamation section will contact you.

Applicant: _____

Address: _____

City: _____ State _____ Zip: _____

Business Telephone: _____

Contact Person: _____

Description of Abandoned Mined Land:

County: _____
Township: _____
Section/Lot: _____
Approximate Acreage: _____

Environmental Problems Associated with Site:

_____

_____

_____

_____

Ohio Department of Natural Resources

BOB TAFT, GOVERNOR | SAMUEL W. SPECK, DIRECTOR

Division of Mineral Resources Management
Michael L. Sponsler • Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

May 24, 2001

Ms. Jan Tague
212 S. Gould Road
Columbus, Ohio 43209

Dear Ms. Tague:

This is to inform you that Bennoc, Inc.'s Adjacent Area Coal Mine Permit Application #D-0425-1 has been approved. The Division has performed a thorough review of the application, taking into consideration the concerns raised at the October 25, 1999 informal conference, and has found that the revised application meets all the requirements of Chapter 1513. of the Ohio Revised Code.

Enclosed is a copy of the written findings resulting from concerns raised at the informal conference. These written findings address the general and specific comments made relative to the permit revisions proposed in application #D-0425-1.

If you are a person having an interest that is or may be adversely affected by the Chief's decision of approval, and if you want to appeal the Chief's decision, you may do so by filing a notice of appeal with the Reclamation Commission, Ohio Department of Natural Resources, 1855 Fountain Square Court, Columbus, Ohio 43224, (614) 262-1269 within thirty days after the applicant is notified of this decision. Also, it would be necessary to file a copy of this notice of appeal with the Chief of the Division of Mineral Resources Management, Ohio Department of Natural Resources, 1855 Fountain Square Court, Columbus Ohio 43224, within three days after filing the notice of appeal with the Commission. Further essential provisions governing appeals to the Commission, including request for temporary relief, are found in Section 1513.07(I)(3) and 1513.13 of the Ohio Revised Code.

Sincerely,

Michael L. Sponsler

Michael L. Sponsler, Chief
Division of Mineral Resources Management

MS: kr
Enclosure
cc: Cambridge District Office
Certified Mail # 7000 0600 0027 4777 0065

Ohio Department of Natural Resources

BOB TAFT, GOVERNOR SAMUEL W. SPECK, DIRECTOR

Division of Mineral Resources Management
Michael L. Sponsler • Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

May 24, 2001

Mr. John Morgan
53650 Belmont Ridge
Beallsville, Ohio 43716

Dear Mr. Morgan:

This is to inform you that Bennoc, Inc.'s Adjacent Area Coal Mine Permit Application #D-0425-1 has been approved. The Division has performed a thorough review of the application, taking into consideration the concerns raised at the October 25, 1999 informal conference, and has found that the revised application meets all the requirements of Chapter 1513. of the Ohio Revised Code.

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Sincerely,

Michael L. Sponsler

Michael L. Sponsler, Chief
Division of Mineral Resources Management

MS: kr
Enclosure
cc: Cambridge District Office
Certified Mail # 7000 0600 0027 4777 0027

Ohio Department of Natural Resources

BOB TAFT, GOVERNOR | SAMUEL W. SPECK, DIRECTOR

Division of Mineral Resources Management
Michael L. Sponsler • Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

May 24, 2001

Mr. John Rockwell
54551 Crum Road
Beallsville, Ohio 43716

Dear Mr. Rockwell:

This is to inform you that Bennoc, Inc.'s Adjacent Area Coal Mine Permit Application #D-0425-1 has been approved. The Division has performed a thorough review of the application, taking into consideration the concerns raised at the October 25, 1999 informal conference, and has found that the revised application meets all the requirements of Chapter 1513. of the Ohio Revised Code.

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Sincerely,

Michael L. Sponsler

Michael L. Sponsler, Chief
Division of Mineral Resources Management

MS: kr
Enclosure
cc: Cambridge District Office
Certified Mail # 7000 0600 0027 4777 0058

Ohio Department of Natural Resources

BOB TAFT, GOVERNOR | SAMUEL W. SPECK, DIRECTOR

Division of Mineral Resources Management
Michael L. Sponsler • Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

May 24, 2001

Mr. Leonard Guindon
55951 SR 26
Jerusalem, Ohio 43747

Dear Mr. Guindon:

This is to inform you that Bennoc, Inc.'s Adjacent Area Coal Mine Permit Application #D-0425-1 has been approved. The Division has performed a thorough review of the application, taking into consideration the concerns raised at the October 25, 1999 informal conference, and has found that the revised application meets all the requirements of Chapter 1513. of the Ohio Revised Code.

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Sincerely,

Michael L. Sponsler

Michael L. Sponsler, Chief
Division of Mineral Resources Management

MS: kr
Enclosure
cc: Cambridge District Office
Certified Mail # 7000 0600 0027 4777 0041

Ohio Department of Natural Resources

BOB TAFT, GOVERNOR

SAMUEL W. SPECK, DIRECTOR

Division of Mineral Resources Management
Michael L. Sponsler • Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

May 24, 2001

Mr. & Mrs. Richard and Mary Sidwell
54061 Crum Road
Beallsville, Ohio 43716

Dear Mr. & Mrs. Sidwell:

This is to inform you that Bennoc, Inc.'s Adjacent Area Coal Mine Permit Application #D-0425-1 has been approved. The Division has performed a thorough review of the application, taking into consideration the concerns raised at the October 25, 1999 informal conference, and has found that the revised application meets all the requirements of Chapter 1513. of the Ohio Revised Code.

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Sincerely,

Michael L. Sponsler

Michael L. Sponsler, Chief
Division of Mineral Resources Management

MS: kr
Enclosure
cc: Cambridge District Office
Certified Mail # 7000 0600 0027 4777 0034

Ohio Department of Natural Resources

BOB TAFT, GOVERNOR | SAMUEL W. SPECK, DIRECTOR

Division of Mineral Resources Management
Michael L. Sponsler • Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

May 24, 2001

Ms. Diane Burnham
P. O. Box 405
Barnesville, Ohio 43713

Dear Ms. Burnham:

This is to inform you that Bennoc, Inc.'s Adjacent Area Coal Mine Permit Application #D-0425-1 has been approved. The Division has performed a thorough review of the application, taking into consideration the concerns raised at the October 25, 1999 informal conference, and has found that the revised application meets all the requirements of Chapter 1513. of the Ohio Revised Code.

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Sincerely,

Michael L. Sponsler

Michael L. Sponsler, Chief
Division of Mineral Resources Management

MS: kr
Enclosure
cc: Cambridge District Office
Certified Mail # 7000 0600 0027 4777 0010

Ohio Department of Natural Resources

BOB TAFT, GOVERNOR

SAMUEL W. SPECK, DIRECTOR

Division of Mineral Resources Management
Michael L. Sponsler • Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

May 24, 2001

Mr. Melvin Vucelich
54839 Kinney Road
Beallsville, Ohio 43716

Dear Mr. Vucelich:

This is to inform you that Bennoc, Inc.'s Adjacent Area Coal Mine Permit Application #D-0425-1 has been approved. The Division has performed a thorough review of the application, taking into consideration the concerns raised at the October 25, 1999 informal conference, and has found that the revised application meets all the requirements of Chapter 1513. of the Ohio Revised Code.

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Sincerely,

Michael L. Sponsler

Michael L. Sponsler, Chief
Division of Mineral Resources Management

MS: kr
Enclosure
cc: Cambridge District Office
Certified Mail # 7000 0600 0027 4777 0003

DNR 0001

Ohio Department of Natural Resources

BOB TAFT, GOVERNOR

SAMUEL W. SPECK, DIRECTOR

Division of Mineral Resources Management
Michael L. Sponsler • Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

May 24, 2001

Mr. Warren Stetzel
Raven Rocks, Inc.
54118 Crum Road
Beallsville, Ohio 43716

Dear Mr. Stetzel:

This is to inform you that Bennoc, Inc.'s Adjacent Area Coal Mine Permit Application #D-0425-1 has been approved. The Division has performed a thorough review of the application, taking into consideration the concerns raised at the October 25, 1999 informal conference, and has found that the revised application meets all the requirements of Chapter 1513. of the Ohio Revised Code.

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Sincerely,

Michael L. Sponsler

Michael L. Sponsler, Chief
Division of Mineral Resources Management

MS: kr
Enclosure
cc: Cambridge District Office
Certified Mail # 7000 0600 0027 4776 9991

DNR 0001

AEC 05234

Ohio Department of Natural Resources

BOB TAFT, GOVERNOR

SAMUEL W. SPECK, DIRECTOR

Division of Mineral Resources Management
Michael L. Sponsler • Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

May 24, 2001

Mr. Chris Joyner
Raven Rocks, Inc.
54118 Crum Road
Beallsville, Ohio 43716

Dear Mr. Joyner:

This is to inform you that Bennoc, Inc.'s Adjacent Area Coal Mine Permit Application #D-0425-1 has been approved. The Division has performed a thorough review of the application, taking into consideration the concerns raised at the October 25, 1999 informal conference, and has found that the revised application meets all the requirements of Chapter 1513. of the Ohio Revised Code.

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Sincerely,

Michael L. Sponsler

Michael L. Sponsler, Chief
Division of Mineral Resources Management

MS: kr
Enclosure
cc: Cambridge District Office
Certified Mail # 7000 0600 0027 4776 9984

Ohio Department of Natural Resources

BOB TAFT, GOVERNOR

SAMUEL W. SPECK, DIRECTOR

Division of Mineral Resources Management
Michael L. Sponsler • Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

May 24, 2001

Mrs. Marjorie Baumberger
50037 German Ridge Road
Beallsville, Ohio 43716

Dear Mrs. Baumberger:

This is to inform you that Bennoc, Inc.'s Adjacent Area Coal Mine Permit Application #D-0425-1 has been approved. The Division has performed a thorough review of the application, taking into consideration the concerns raised at the October 25, 1999 informal conference, and has found that the revised application meets all the requirements of Chapter 1513. of the Ohio Revised Code.

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Sincerely,

Michael L. Sponsler

Michael L. Sponsler, Chief
Division of Mineral Resources Management

MS: kr
Enclosure
cc: Cambridge District Office
Certified Mail # 7000 0600 0027 4776 9977

Ohio Department of Natural Resources

BOB TAFT, GOVERNOR

SAMUEL W. SPECK, DIRECTOR

Division of Mineral Resources Management
Michael L. Sponsler • Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

May 24, 2001

Ms. Lisa Helms
Buckeye Forest Council
P. O. Box 243
Barnesville, Ohio 43713-0243

Dear Ms. Helms:

This is to inform you that Bennoc, Inc.'s Adjacent Area Coal Mine Permit Application #D-0425-1 has been approved. The Division has performed a thorough review of the application, taking into consideration the concerns raised at the October 25, 1999 informal conference, and has found that the revised application meets all the requirements of Chapter 1513. of the Ohio Revised Code.

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Sincerely,

Michael L. Sponsler

Michael L. Sponsler, Chief
Division of Mineral Resources Management

MS: kr
Enclosure
cc: Cambridge District Office
Certified Mail # 7000 0600 0027 4776 9960

Ohio Department of Natural Resources

BOB TAFT, GOVERNOR

SAMUEL W. SPECK, DIRECTOR

Division of Mineral Resources Management
Michael L. Sponsler • Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

May 24, 2001

Mr. Herb Smith
54515 Crum Road
Beallsville, Ohio 43716

Dear Mr. Smith:

This is to inform you that Bennoc, Inc.'s Adjacent Area Coal Mine Permit Application #D-0425-1 has been approved. The Division has performed a thorough review of the application, taking into consideration the concerns raised at the October 25, 1999 informal conference, and has found that the revised application meets all the requirements of Chapter 1513. of the Ohio Revised Code.

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Sincerely,

Michael L. Sponsler

Michael L. Sponsler, Chief
Division of Mineral Resources Management

MS: kr
Enclosure
cc: Cambridge District Office
Certified Mail # 7000 0600 0028 2174 3800

Ohio Department of Natural Resources

BOB TAFT, GOVERNOR

SAMUEL W. SPECK, DIRECTOR

Division of Mineral Resources Management
Michael L. Sponsler • Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

May 24, 2001

Mr. Mark Forni
45192 SR 800
Woodsfield, Ohio 43793

Dear Mr. Forni:

This is to inform you that Bennoc, Inc.'s Adjacent Area Coal Mine Permit Application #D-0425-1 has been approved. The Division has performed a thorough review of the application, taking into consideration the concerns raised at the October 25, 1999 informal conference, and has found that the revised application meets all the requirements of Chapter 1513. of the Ohio Revised Code.

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Sincerely,

Michael L. Sponsler

Michael L. Sponsler, Chief
Division of Mineral Resources Management

MS: kr
Enclosure
cc: Cambridge District Office
Certified Mail # 7000 0600 0028 2174 3794

Ohio Department of Natural Resources

BOB TAFT, GOVERNOR

SAMUEL W. SPECK, DIRECTOR

Division of Mineral Resources Management
Michael L. Sponsler • Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

May 24, 2001

Ms. Barbara Rogers
Rainbow's End
Route 1
Jerusalem, Ohio 43747

Dear Ms. Rogers:

This is to inform you that Bennoc, Inc.'s Adjacent Area Coal Mine Permit Application #D-0425-1 has been approved. The Division has performed a thorough review of the application, taking into consideration the concerns raised at the October 25, 1999 informal conference, and has found that the revised application meets all the requirements of Chapter 1513. of the Ohio Revised Code.

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Sincerely,

Michael L. Sponsler

Michael L. Sponsler, Chief
Division of Mineral Resources Management

MS: kr
Enclosure
cc: Cambridge District Office
Certified Mail # 7000 0600 0028 2174 3787

Ohio Department of Natural Resources

BOB TAFT, GOVERNOR | SAMUEL W. SPECK, DIRECTOR

Division of Mineral Resources Management
Michael L. Sponsler • Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

May 24, 2001

Ms. Patricia Jacobson
20 Fairfax Drive
Wheeling, WV 26003

Dear Ms. Jacobson:

This is to inform you that Bennoc, Inc.'s Adjacent Area Coal Mine Permit Application #D-0425-1 has been approved. The Division has performed a thorough review of the application, taking into consideration the concerns raised at the October 25, 1999 informal conference, and has found that the revised application meets all the requirements of Chapter 1513. of the Ohio Revised Code.

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Sincerely,

Michael L. Sponsler

Michael L. Sponsler, Chief
Division of Mineral Resources Management

MS: kr
Enclosure
cc: Cambridge District Office
Certified Mail # 7000 0600 0028 2174 3770

Ohio Department of Natural Resources

BOB TAFT, GOVERNOR | SAMUEL W. SPECK, DIRECTOR

Division of Mineral Resources Management
Michael L. Sponsler • Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

May 24, 2001

Ms. Miriam Kinney
40135 Caldwell Road
Jerusalem, Ohio 43747

Dear Ms. Kinney:

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Sincerely,

Michael L. Sponsler, Chief
Division of Mineral Resources Management

MS: kr
Enclosure
cc: Cambridge District Office
Certified Mail # 7000 0600 0028 2174 3763

Ohio Department of Natural Resources

BOB TAFT, GOVERNOR | SAMUEL W. SPECK, DIRECTOR

Division of Mineral Resources Management
Michael L. Sponsler • Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

May 24, 2001

Mr. & Mrs. Cecil and Amanda Kinney
55061 Kinney Road
Beallsville, Ohio 43716

Dear Mr. & Mrs. Kinney:

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Michael L. Sponsler

Michael L. Sponsler, Chief
Division of Mineral Resources Management

MS: kr
Enclosure
cc: Cambridge District Office
Certified Mail # 7000 0600 0028 2174 3756

Ohio Department of Natural Resources

BOB TAFT, GOVERNOR

SAMUEL W. SPECK, DIRECTOR

Division of Mineral Resources Management
Michael L. Sponsler • Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

May 24, 2001

Mr. Larry Conway
Bennoc, Inc.
P. O. Box 208
Morristown, Ohio 43759

Dear Mr. Conway:

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Sincerely,

Michael L. Sponsler

Michael L. Sponsler, Chief
Division of Mineral Resources Management

MS: kr
Enclosure
cc: Cambridge District Office
Certified Mail # 7000 0600 0028 2174 3749

Ohio Department of Natural Resources

BOB TAFT, GOVERNOR

SAMUEL W. SPECK, DIRECTOR

Division of Mineral Resources Management
Michael L. Sponsler • Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

May 24, 2001

Mr. Jason Tockman
Buckeye Forest Council
P. O. Box 99
Athens, Ohio 45701

Dear Mr. Tockman:

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MS: kr
Enclosure
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Certified Mail # 7000 0600 0028 2174 3732

Ohio Department of Natural Resources

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Ohio Department of Natural Resources

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May 24, 2001

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Sincerely,

Michael L. Sponsler

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Division of Mineral Resources Management

MS: kr
Enclosure
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Certified Mail # 7000 0600 0028 2174 3749

Ohio Department of Natural Resources

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May 24, 2001

Mr. & Mrs. Cecil and Amanda Kinney
55061 Kinney Road
Beallsville, Ohio 43716

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MS: kr
Enclosure
cc: Cambridge District Office
Certified Mail # 7000 0600 0028 2174 3756

Ohio Department of Natural Resources

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May 24, 2001

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Division of Mineral Resources Management

MS: kr
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Certified Mail # 7000 0600 0028 2174 3756

Ohio Department of Natural Resources

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May 24, 2001

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Sincerely,

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Division of Mineral Resources Management

MS: kr
Enclosure
cc: Cambridge District Office
Certified Mail # 7000 0600 0028 2174 3763

Ohio Department of Natural Resources

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SAMUEL W. SPECK, DIRECTOR

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Michael L. Sponsler • Chief
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May 24, 2001

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Wheeling, WV 26003

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Michael L. Sponsler

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Division of Mineral Resources Management

MS: kr
Enclosure
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Certified Mail # 7000 0600 0028 2174 3770

MAY 24

OHIO DEPARTMENT OF NATURAL RESOURCES
Division of Mineral Resources Management

WRITTEN FINDINGS - INFORMAL CONFERENCE – OCTOBER 25, 1999
BENNOC, INC.
ADJACENT AREA COAL PERMIT APPLICATION #D-0425-1

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1) **CONCERN:** The burning of fossil fuels to produce electric energy contributes to problems and poses a threat to the earth. Our big appetite and demand for cheap energy is followed by social and environmental problems. A successor to coal burning is needed. Raven Rocks has been cooperatively operated under a unique philosophy for 30 years and is an experiment in energy generation and use, an ongoing learning experience in minimizing consumption of energy. Efficient refrigeration, washing machines, gardening practices, and super-insulation standards for building design and construction at Raven Rocks result in use of a fraction of the energy and generate greater yields than conventional equipment and methods. Wind generation and solar equipment produces energy from the sun and wind. Construction and installation of fusion and fuel cell technologies are anticipated in the near future.

   Archeological study has found the ravines at Raven Rocks to have been visited and/or used by countless people since at least 760 C.E. The ravines have a long history of being visited as places of natural beauty and have long served as the sites of weddings, meditation, and general recreation.

   The members of Raven Rocks have spoken to people who been undermined and have found water always lost and houses damaged to some extent from subsidence after undermining. Repairs have been possible, but rarely satisfactory. Though many grumbled about city water, most were happy to finally have a reliable water supply. Because of the way the operations were handled, people were often left feeling powerless and angry. Concern is for the potential for longwall mining subsidence damage to ravines, geologic formations, ecological/biological communities and organisms, unique structures, both completed and under construction, and other features on the Raven Rocks, Inc. property. More specific concerns with respect to the property and land use follow:

   a) Given the archeological significance of Raven Rocks and the precedent of protecting such areas from subsidence damage, is there documentation to support a conclusion that the ravines and rock overhangs can be subsided without damage? Is there any proof longwall mining subsidence will not damage the geologic formations? ***Response:*** *Revisions to the approved mining plan have eliminated longwall mining from all but the smallest ravine at Raven Rocks. This ravine is being longwall mined with the support of the landowners in order to research the impact of such mining on ravine areas. No subsidence is anticipated in any of the other ravines on the property due to the revisions made to the mining plan.*

   b) Even if only cracking occurs and the rocks don't fall immediately, as the formations undergo normal weathering such as freeze-thaw action, what is the potential for accelerated "aging" and further damage over time? How long would mine-related damage be expected to continue after mining in light of this potential? ***Response:*** *No mine related damage is anticipated in any ravines except the smallest ravine on the property that is being longwall mined and monitored.*

c) How would repairs to such geologic formations be possible if damages occur? ***Response:*** *No geologic formation damages are anticipated due to changes in the mining plan that eliminate longwall mining from the Raven Rocks ravine areas.*

d) If a monetary settlement would be paid for damages to the geologic formations, how would such a settlement value be arrived at? Any such settlement might be paid to current property owners, but the loss is to the public and future generations. ***Response:*** *Mining plans have been revised to prevent such damages.*

e) Public safety is a concern as many people visit Raven Rocks, Inc. and hike the ravines and geologic formations. Subsidence could impact the stability of the formations and overhangs and threaten the safety of visitors. Is there any documentation that would assure Raven Rocks, Inc. or an insurance company that the safety of visitors would not be endangered over the short and long terms? ***Response:*** *Surface impacts and/or subsidence that might create instability to rock overhangs has been prevented as a result of changes that have been made to the mining plan. The only ravine in which longwall mining will occur is not open to the public.*

f) The Sidwell House, designed by Malcom Wells, is a two-story, reinforced concrete underground structure. The Locust Home under construction and also designed by Wells, is another underground house of unique design and construction. How will subsidence impact the waterproofing systems, vapor barriers, adhered exterior insulation, radon collection systems, plumbing and wiring conduits cast into the concrete, the tight fit of doors and windows necessary in a house designed to require minimal energy input, the large glass areas to collect solar heat, and the reinforced concrete construction, which if cracked could allow water to come in contact with the steel and shorten the life of the building? What documentation is available to show that such structures could be repaired? If the buildings are damaged will the mining company be required to repair it to original condition, or replace it if it is damaged beyond repair? ***Response:*** *No subsidence is anticipated in the area of any of the structures on the Raven Rocks property. Mining plans have been revised such that no longwall mining shall occur within the area of any of the structures.*

g) Wind, geothermal and passive/active solar systems currently generate energy and negotiations are ongoing with a manufacture to integrate fusion/fuel cell equipment in the near future. What are the potential impacts to these facilities? ***Response:*** *There should be no surface impacts to the Raven Rocks area. As a result, no impacts are anticipated with respect to wind or passive/active solar energy systems. Current regulatory requirements do not address potential impacts on geothermal energy systems, though no impacts to such systems are anticipated due to revisions that have been made to the approved mining plan.*

May affect

2) **CONCERN:** The following discrepancies on the applications map and hydrologic information have been noted for the Raven Rocks, Inc. property and need to be corrected:

a) The old homestead site known as the "McGilton Place" shows an unoccupied building, however, no building exists, only a water well and a few foundation stones. ***Response:*** *This discrepancy was corrected during the revision process.*

b) The dry hole oil well drilled in the field across TR 804 from the wind generator located at Locust Hill is not shown. ***Response:*** *This discrepancy was corrected during the revision process.*

c) A metal-sided farm shed on the portion of Raven Rocks, Inc. known as the "Perkins Place" is not shown. ***Response:*** *This discrepancy was corrected during the revision process.*

d) A dug well is not shown in the Piney Creek valley near the mouth of the First Ravine's unnamed creek. ***Response:*** *This discrepancy was corrected during the revision process.*

e) The Sidwells' dug well (behind the "Roscoe Crum House") has been identified by two different numbers on different versions of the application map. The initial map showed this well as DW 30, while a later version showed it as DW 31. ***Response:*** *This discrepancy was corrected during the revision process. The Sidwell well is identified on the map as DW-31.*

f) Table A, Well Date and Predicted Hydrologic Impacts Summary, Page 1 of 5 indicates the surface elevation for DW 31 is 1230'; the actual elevation is 1130'. Thus, the elevations for bottom elevation and depth are also incorrect. Further, this well is identified as being in the middle of the panel, which does not appear to be accurate. ***Response:*** *This discrepancy was corrected during the revision process. The Sidwell well is now shown on the map and Table A at an elevation of 1,130'. The map and Table A now identify this well as being over a gate entry and no longer over a longwall panel.*

3. CONCERN: A print shop business is located along SR 145 just inside the southern edge of proposed mining area. The printing press needs to be on solid footing and level to machinist standards to allow for operation. How will use of the press be maintained in light in light of the planned subsidence? ***Response:*** *The structure containing the print shop is outside the proposed underground mining limits. Additionally, the approved mining plan proposes room and pillar mining in the general vicinity, however mining will not occur within 750 feet of the print shop. No subsidence impacts to this structure are anticipated as a result of revisions that have been made to the approved mining plan.*

4. CONCERN: The Leonard Guindon property is located at 55951 SR 26. The dwelling is of 6" x 8" mortise-tenon timber frame construction on a concrete slab. The paneling inside is ship-lapped of native hardwoods.

a) What can be done to maintain the integrity of this construction style and repair any subsidence damage? ***Response:*** *This dwelling is located approximately 1,300 feet north of the limits of the proposed underground mining activities. No surface subsidence is expected.*

b) What impacts can be expected to the slab flooring? Will there be cracking and will it be possible to repair? ***Response:*** *No impacts are anticipated due to the location of this structure.*

c) A hydrologist has studied the stream and spring flow into the south fork of Captiva Creek on neighboring Rogers property, but not on his property to his knowledge. Wants to make sure if study is needed, that it be done on his property also. ***Response:*** *The permit application identifies and provides monitoring plans for one stream located on Mr. Guindon's property. Full coal recovery operations require the applicant to inventory all wells, springs and streams*

within 1,000 feet of the underground mining limits. The permittee is required to include this stream on Mr. Guindon's property in their monitoring activities.

d) The address listed in the application is inaccurate. This needs to be corrected, as the owner hasn't live in Caldwell since 1982. ***Response:*** *This inaccuracy has been corrected during the revision period.*

5. **CONCERN:** An August 15, 1997 letter from Douglas Crowell, Division of Geological Survey, states:

"The Allison mine map indicates that the Pittsburgh coal has been mined out north and east of section 2. If the remaining Pittsburgh coal from section 2 were to be mined, it is likely that this would occur by a new mine approaching section 2 from the west or the south. At present there is no mine operating in an area west or south of section 2. Also, if the Pittsburgh coal were mined from section 2, a buffer of about 500 feet would be left surrounding the Allison to prevent accidental flooding of any new mine."

Application #D-0425-1 shows mining proposed in section 2 and extending to the north, south, east & west of the old works. If the same laws apply as at the time of Crowell's letter, the permit, Where is the 500' buffer? The permit should be revised or identify the new rules or laws in effect. ***Response:*** *D-0425-1 proposes to access and mine the coal reserves by using the existing entry to the Allison Mine. The application further identifies plans to upgrade the facilities at D-0425 to allow for long term extraction of the remaining coal reserves. Portions of the existing Allison Mine works will be upgraded and used to facilitate the permitted mining activities. Since the existing Allison Mine works will be used to develop the permitted mine, a 500-foot buffer is neither proposed nor required for this application.*

6. **CONCERN:** The law requires productivity and previous use of mine land be restored after mining. If damages occur to the ravines and geologic formations, how can these be repaired and the area returned to its previous productivity and land use. ***Response:*** *Revisions to the approved mining plan eliminate the risk of subsidence in the ravines area of Raven Rocks. These revisions were implemented due to the difficulty that would be encountered in trying to mitigate surface impacts to the ravines. The sole exception is the smallest ravine on the site; mitigation is not anticipated and/or expected.*

7. **CONCERN:** Social responsibility and acceptance of such is important to community. There are victims of the coal mining industry and we are not taking responsibility to change the system. Articles in local and national newspapers, magazines and journals cover the all impacts, from extraction to combustion, of coal on the air, land, water, and climate. Local experiences related by landowners and surveys taken of Ohio and Pennsylvania residents who have been undermined by longwall methods have found common, consistent problems:

- Permanent decrease or loss of water quality or quantity and new fees for water. Water problems are very costly in terms of impact on the health of individuals, livestock and pets and mine operators are not settling water problems satisfactorily.

- Major and minor damages to homes and buildings with no real way to predict how one's property will fare when subsided.
- Unresponsive government agencies that have failed to explain or protected the rights of surface owners.
- High legal and documentation costs to local residents create financial pressures and are not recovered in most settlements.
- Anxiety, frustration, depression, and fear.

There are fewer mine jobs for local residents now than ever before, yet the mine company makes significant profits. The government is pressured by big business not to act. Who is going to take responsibility, come to the aid of these victims, and explain what to expect when the longwall gets under their property? Who will offer disaster counseling through these hardships? Who will teach the current laws, the ways of the government, or how to contact state/federal regulators? What rights residents have? The Division should develop an educational packet and work to deliver this information to the people in this permit area. ***Response:*** *Local Division of Mineral Resources Management Inspectors familiar with underground mining operations should be contacted in order to address these concerns on a case-by-case basis. DMRM inspectors are familiar with the operations, familiar with the law and regulations, and can assist landowners when specific problems arise that have not been addressed by the mine operator. The Division has also prepared a "Citizen's Guide to Coal Mining and Reclamation" which is available at no cost by either requesting a copy or visiting the Division's web site at www.dnr.state.oh.us.com. In addition, an underground mining fact sheet has been developed which is also available at no cost upon request. The Division is committed to ensuring that interim water supplies are promptly replaced, that water supplies which do no recover from subsidence are replaced permanently such that domestic and agricultural land uses are maintained for the foreseeable future, and that ALL structures damaged by subsidence are repaired or the owner compensated for the diminished value of such structures.*

8. **CONCERN:** The Melvin Vucelich well is 400' deep, dug by hand. What will happen to this well? What kind of replacement supply is proposed, tapped in to some chlorine water? ***Response:*** *Within the replacement plan, the applicant clearly identifies the various options for water replacement in the addendum to Part 2, Page 18, F(2) of the permit application. Note that the Probable Hydrologic Consequence (PHC) response in the application and the response to Part 2, Page 18, F(1) acknowledges the potential for adverse impacts to wells in the area. The fact that a well may have been overlooked during the review process does not mean that the rights of any adversely affected landowner will be compromised, as the adversely affected landowner is entitled to equitable water replacement. Please see response to Comment #10 for further information.*

9. **CONCERN:** What happens to free gas supplies from wells? ***Response:*** *Chapter 1513 does not directly address this issue. However, oil and gas wells and lines that remain operational during the mining are required to be repaired as is any other structure in the event of subsidence related damage. If oil and gas wells are propped to be plugged in order to insure mine safety, please see response to Concern #65.*

AEC 05257

10. **CONCERN:** Loss of water is the third major concern. Prior to mining, the coal companies should be required to provide adequate permanent replacement of water, with permanent replacement being the lifetime of the surface, not the ownership of the property.

Barnesville Water Department is mentioned in this permit as the replacement supplier. The water plant in Barnesville does not have the lines in place nor the upgrades needed in order to supply water to this area. Is Bennoc going to pay for the upgrades needed to the water plant and who is going to pay for the lines to be run to this remote area? The residents of the area should not pay for this; it is a direct cost of the mining operation and nothing else. If Bennoc did not longwall mine this area, wells and springs would go on as they have for centuries. Therefore Bennoc should bear the full expense of upgrading the plant, running water lines from the nearest water supplier, and pay the monthly bills for each homeowner that will result for as long as the natural water is lost. ***Response:*** *All water supplies developed for a legitimate use, such as domestic, agricultural, or industrial use, impacted by mining are required to be replaced with a suitable alternative source. A suitable alternative source may be a new well, a new spring, or a public water supply. Generally, due to the cost associated with the delivery of water, public water is not an acceptable permanent replacement for an agricultural water supply. Negotiation for the replacement of water supplies should include compensation for the operation and maintenance costs in excess of the customary and reasonable delivery costs of the pre-mining water supply. If agreed to by the water supply owner, a one-time lump sum payment based upon the present worth of the increased annual costs for an agreed period of time may be used to fulfill the obligation to pay for these increased operations and maintenance costs. Surface owners of water supplies damaged by subsidence are entitled to interim water replacement within 48 hours of a loss due to subsidence. All costs associated with the delivery of interim water are to be borne by the mine operator until such time as the water is replaced on a permanent basis.*

11. **CONCERN:** If the possibility exists that the natural surface of the land cannot be restored to pre-mining condition, the areas should be declared unsuitable for mining without having to make a formal application for such. Approval of this application would preclude consideration of this land as being unsuitable for mining. The Division should assess the suitability of longwall mining in the vicinity of the rock formations and consider prohibiting mining. ***Response:*** *The Division determined that longwall mining within the rock formation area of Raven Rocks was not feasible due to the sensitive nature of this area and the difficulty that would be encountered in attempting to mitigate potential subsidence impacts to rock overhangs. As a result, revisions were made to the approved mining plan that eliminated longwall mining from all but the smallest ravine area in Raven Rocks. By mutual agreement between the landowners and the mine operator, this small ravine shall be monitored to research the impact of longwall mining on rock overhangs and ravine areas.*

12. **CONCERN:** The coal companies don't use the longwall mining method close to their own facilities to avoid subsidence damages. They should afford the same respect to natural wonders such as the Raven Rock area. ***Response:*** *Significant revisions made to the approved mining plan are indicative of the mining company's responsiveness to these concerns. Mining plans were dramatically altered to eliminate longwall mining from the significant ravine areas in Raven Rocks.*

AEC 05258

13. **CONCERN:** The Division should require that mining companies give accurate information in the permit application. For example, some of the surface landowner information contained in longwall mining permit applications is inaccurate, incomplete, or outdated. Has the Division reviewed this information for accuracy and completeness? ***Response:*** *The Division has completed a comprehensive review of the permit application for completeness and accuracy. This application is a complex document that required nearly two years of review and revision. The permit application is in compliance with Chapter 1513 of the Ohio Revised Code and Chapter 1501:13 of the Ohio Administrative Code.*

14. **CONCERN:** Some longwall mining companies are not fulfilling their responsibility to survey water wells a year in advance of mining activity. This indicates a failure to comply with regulations for pre-mining surveys. ***Response:*** *It is the responsibility of the Division of Mineral Resources Management inspector to ensure that the operator is fulfilling the monitoring requirements of a permit. If you have knowledge of non-compliance with monitoring requirements, such information should be brought to the attention of the DMRM Inspector so that appropriate enforcement action can be taken.*

15. **CONCERN:** The applicant has not received a waiver from landowners to mine within 300' of occupied dwellings, despite the probability of subsidence, a surface impact incident to longwall mining. SMCRA Section 701(28) includes these impacts as surface coal mining operations, hence Bennoc must acquire waivers to engage in the proposed mining. This question is currently the subject of rule-making (FR, January 31, 1997, pages 4864-4872) and the Buckeye Forest Council believes the interim position by OSMRE is not a legal interpretation of federal law. ***Response:*** *The Division has consistently interpreted the application of the mining prohibitions contained in Ohio Administrative Code 1501:13-3-03 as applying only to those areas on the surface within the "permit area" as defined by the OAC definitions. Such areas do not include areas above the underground workings of an underground mine where the only potential disturbance is subsidence. This position is entirely consistent with the Office of Surface Mining, Reclamation and Enforcement (OSMRE) position on the 522(e) prohibitions in SMCRA.*

16. **CONCERN:** How will the mining company make the Raven Rock area whole again, in the event of subsidence damages due to the longwall mining? ***Response:*** *Subsidence damage in the Raven Rocks area is not anticipated except in the area of the smallest of ravine areas where longwall mining will occur. Revisions to the mining plans have resulted in the greatest prevention of any surface affectment within the area.*

17. **CONCERN:** What information has been provided as to the anticipated impacts on natural features of the Raven Rocks property and what steps has Bennoc indicated will be taken to minimize material damage to the rocks? Has the Division assessed the damage likely to be caused by the proposal to undermine the ravines? ***Response:*** *Yes, the Division has determined that longwall mining within all but the smallest ravine area within the Ravine Rocks area is not feasible. As a result, significant revisions have been made to the mining plan to eliminate longwall mining within all but the smallest ravine. As a result, subsidence damage has been avoided in all but the smallest ravine.*

18. **CONCERN:** Regarding permit approval/rejection:

a) Who is assigned to approve/reject the petition for this permit? Please provide names and titles. ***Response:*** *Only the chief of the Division of Mineral Resources Management is statutorily authorized to approve a mining permit. The chief's name is Michael L. Sponsler.*

b) What are the verifiable credentials of these individuals as they relate to the tasks they have been assigned? ***Response:*** *Mr. Sponsler is a biologist by training and has many years experience in the regulation of mining activities.*

c) For what part of the permit is each person responsible? ***Response:*** *Mr. Scott Stiteler, Environmental Specialist within the Division of Mineral Resources Management, is conducting the regulatory review of the permit application. Other staff involved in the technical review of the permit application are George Mychkovsky, Hydrogeologist who conducted the hydrology review; Jeffery Reichwien, PhD in Archaeology who conducted the archaeological review; Joe Noonan, PE reviewed the engineering components; and Kevin Ricks, Field Environmental Specialist who conducted the field review of the permit application. Additionally, Kathy Rossmann completed the pre-initial review and conducted the informal conference..*

d) Who is responsible for reading the permit in its entirety, organizing and following all the data through attachments, amendments to the final answer for each question? Is there a method in place to document the verification process by all involved parties? ***Response:*** *Scott Stiteler. Mr. Stiteler has been very diligent in providing all requested information to involved parties.*

e) Please describe the processes used to insure the permit and all of these comments are entered into the administrative and public open record, and the method by which the Division can assure us that all the information received has actually been entered. Is there a log of entry? Is there a periodic check against this log? How do we know that statements are not lost or missing? ***Response:*** *The Division maintains a log of all entries/revisions etc., to the permit. Permit documents and revisions received by the Division of Mineral Resources Management are public records and available upon request. To the best of our knowledge, no documents have been lost or misplaced throughout this review process.*

19. **CONCERN:** Does the mining company circumvent providing particular criteria/data by applying for an application to an existing permit? What questions are asked on an application for an original permit that are not included on an application to an existing permit? ***Response:*** *The applicant proposes to develop D-425-1 coal reserves by using the existing entry and facilities permitted under D-425. The Division required the applicant to update the original D-425 permit to bring it to current regulatory standards. When considering the updated information provided by D-425 and D-425-1, these documents provide all information required by current permitting regulations outlined in Chapter 1513 of the Revised Code.*

20. **CONCERN:** Section 1513.074 of the Ohio Coal Mining and Reclamation Law, Application for extension to contiguous land, states:

"An operator may file an application for an extension of a currently active permit to land contiguous to the permit area of the permit. The application shall be subject to the full standards applicable to new applications under this chapter, except that the applicant may incorporate by reference current information contained in the application for the original permit. If the original

permit in unavailable or the information is not current, the applicant shall replace or supply such information at all appropriate locations."

According to this, the operator cannot file this application for an extension because the permit from which it is being extended is not active. D-0425 has been temporarily inactive (TINA) for over 16 years. D-0425 would have to be activated and reclaimed before an application for extension could be filed. This application for extension is not legal and should be rejected. ***Response:*** *While the mining operations are temporarily inactive, the original permit D-425 has always been an "active permit". Appropriate fees have been consistently paid and permit renewals have been completed in a timely manner. As a result of D-425 being an "active permit" (even though the operations have been temporarily inactive), the application for an adjacent area (D-425-1) is indeed consistent with current regulatory standards and requirements. In light of the extended period of inactivity of mining operations on the original permit, the Division of Mineral Resources Management has required the applicant to update the original permit to current regulatory standards. This was completed via the submission, review and subsequent approval of a significant Application to Revise a Permit (ARP) numbered R-425-5. This ARP was approved on May 24, 2001.*

21. **CONCERN:** The original permit is not available and is not current. The old version has been outdated since it went "temporarily inactive" (TINA) 16 years ago. This information should be replaced and made available for public view before an extension is granted. In order to make D-0425 active, according to Bennoc Coal, there would have to be millions of dollars in reclamation activities. How can Bennoc afford to spend this money in order to activate the permit before even one ton of coal is mined? Please provide a consolidated statement of financial condition in light of these extensive financial demands. ***Response:*** *Please see the response provided under concern #20. The information that was submitted as a component of R-425-5 meets the regulatory requirements of Chapter 1513 of the Revised Code. We do not have the regulatory responsibility and/or authority to request or require a consolidated statement of financial condition of Bennoc, Inc.*

22. **CONCERN:** While Chapter 1513 of the Ohio Revised Code apparently does not address market value of property according to the Division, this is a valid concern for the property owner who will be adversely affected. The value of property holdings is a direct reflection of a person's net worth and the ability to get financing if wanted. The local banks will not loan money for development to properties for up to 15 years post-longwall mining. The impact can be drastic while those in the permitted area wait for the mine to pass under the property and discover the affects to the surface that they own. According to the tax assessor for each county this surface land will be reassessed post mining and a reduction in property value would most likely result.

    a) Please provide information about the degree/percentage of property tax reduction that will occur to the local tax bases. Is the company going to be accountable to the individual landowners for this loss of property value? How can Bennoc afford to repay the homeowner for the loss of property value? Who is going to make up the lost revenue to the public school system and other public system for the erosion to the tax base? ***Response:*** *Impacts on property values are not addressed by Chapter 1513 of the Ohio Revised Code and therefore are not within the regulatory jurisdiction of the Division.*

AEC 05261

b) Information related to the degree the value of surface property will be affected due to subsidence (caving in of the land, sinking, etc.) and loss of water, either temporarily or permanently, all expected consequences, according to the Division. This information should be provided to the landowners. ***Response:*** *Subsidence impacts related specifically to property values are not within the regulatory jurisdiction or authority of the Division.*

c) What is our property now worth compared to a few months back when no permit was on public record? ***Response:*** *Such information is beyond the scope of our authority to collect or require from permit applicants for the purpose of regulating underground coal mining.*

d) The mining practices in place when the coal deeds were sold did not include longwall mining. And, while many people in this area knew that the number 8 coal was sold, some did not know this until time of purchase; of those that did know, few believed that this would actually happen to them. The certainty is that whatever value their property held prior to the permit being public knowledge, an impact on that value has now occurred and will continue to be in place as long as the property is within this permit or those that follow (see Addendum to Part One, Page 8, Item C (7), Future Application Areas and Sequence; the sequence can be changed per the Division). ***Response:*** *Once again, this issue is not within the regulatory jurisdiction or authority of the Division.*

23. **CONCERN:** According to the Division, the permit (all or in part) will be approved within 60 days after the informal conference. This is not acceptable: ***Response:*** *As mentioned previously, the permit application was a very complex document, requiring nearly two years of comprehensive review and revision. Since the informal conference was conducted in October, 1999, the permit was clearly not approved within 60 days of the informal conference.*

a) At least one other permit has been delayed in order to determine the full environmental impact on the surface lands within the permit area (# D-0360-7). Questions relating to the surface must be answered, as there is no doubt that the surface will be affected, and the mining company held accountable for the damages. Initial reports are showing a loss of water, minerals, and surface value. Buckeye Forest Council (BFC) deserves and requests an environmental impact review of the full effects of longwall mining on the surface. ***Response:*** *Following the nearly two-year review and revision process associated with this permit application, the applicant has met all regulatory requirements outlined in Chapter 1513 of the Revised code.*

b) According to the Division, commenters will receive written findings/responses at the time of determination (approval of the permit). This is not acceptable. On the basis of the request for an environmental review and the amount of questions being presented here today, an extension of 6 months is requested to have the fair opportunity to view all the responses from the Division and view the corrected permit for accuracy. ***Response:*** *Chapter 1513 of the Ohio Revised Code provides a process for public notice, public comment and outlines the informal conference process. Following a determination of the Chief concerning this permit, any person having an interest that is or may be adversely affected by the Chief's decision may file a notice of appeal with the Reclamation Commission, Ohio Department of Natural Resources, 1855 Fountain Square Court, Suite 124, Columbus, Ohio 43224 within thirty days after the applicant is notified of this decision. Additional provisions governing appeals are found Section 1513.07(I)(3) and 1513.13 of the Ohio Revised Code. Commenters will receive written*

findings/responses via certified mail following a determination by the Chief on the permit application.

c) BFC deserves to have answers, with an opportunity to review the answers and have another meeting to discuss the findings. BFC therefore request that no permit be granted until the responses generated from this meeting are given, and BFC requests another informal conference be held in 90 days, after the answers have been received by interested parties, to once again meet and discuss the response to the open record. ***Response:*** *Chapter 1513 of the Revised Code does not provide for or authorize an informal conference on the findings of an informal conference. Please see the above information concerning an interested party's right to appeal permit determinations of the Chief. At this point, if you feel that you are adversely affected or may be adversely affected, your appeal rights (to the Commission) under Chapter 1513 remain.*

d) After all errors on the permit application are corrected, and all addenda or changes are complete, when will the public be able to review the changes and again comment? ***Response:*** *Permitting documents are public documents open to review. Should you wish to view copies of the application files, please contact either the DMRM Cambridge District Office at 740-439-9079 or the central office at 614-265-6663. Throughout the review and revision process, several parties have requested and received all copies of documents associated with this application.*

24. **CONCERN:** According to the Division, a permit is rarely rejected. Please cite the permits that have been rejected and the reason(s) for rejection. ***Response:*** *The regulatory action that has been taken on previous permit applications is not relevant to the review and/or action of D-425-1.*

25. **CONCERN:** Who is responsible for verifying that <u>all</u> information is accurate and that no false data has been entered? This should be done with each and every permit application, not just on those where the information might be considered "shaky". This is not to say that false data may be in this permit, it just makes sense to know someone is making sure all information is accurate; while not criminal offenses, errors do occur. ***Response:*** *All applications undergo a careful regulatory and comprehensive administrative review to insure accuracy, completeness and compliance with Chapter 1513 of the Revised Code. In the case of D-425-1 it has been determined that this application has met all permitting requirements of Chapter 1513 of the Revised Code and Chapter 1501:13 of the Ohio Administrative Code.*

26. **CONCERN:** According to the Division, the various townships are required to do on-site monitoring of the township roads as the mine goes by; the township employees have to monitor roads to ensure immediate repair, especially to those who might not have any other method of access to their property. How many employees are in the townships involved? The taxpayers should not have to pay one of our county employees to monitor and report on the public lands. Why are our taxes expected to be used for monitoring damage done by a coal company? Why cannot Bennoc provide their own labor at their own expense? Also, portions of State Route 26 are included in the shadow area (and also in the hydrologic boundary (see southeast corner of the location map). Who is responsible for damage done to this state road and the cost of repair? ***Response:*** *The permittee and the Division's inspection staff are responsible for monitoring all public roads where subsidence is anticipated. Any damage resulting from subsidence to public roads is completely the responsibility of the permittee. The public road authority appropriately*

determines the need for repair to public roads. Should repairs be necessary to maintain the value or use of public roads, the mine operator will be required to repair or compensate the road authority for such damages. In addition, ORC 1563.11 grants the applicable public road authority the right to require a bond sufficient to cover any damages resulting from mining activities under any road within its jurisdiction, requires that such roads shall be kept safe for passage while being undermined, and further requires the restoration of the roadway to its original safe and passable condition as soon as practicable.

27. **CONCERN:** Adjacent Area Application (AAA), page 3, # 11 asks: Submit any required right of entry documentation unless previously submitted and filed with the Division and valid for this adjacent area application. The applicant's response is: "See previously approved permit transfer and U/G permit application, Page 10 – Affidavits and Addenda." What previously approved permit transfer? What U/G application? Do they refer to D-0425, Permit Application # 0277, and this application #D-0425-1, or some other documents? ***Response:*** *The applicant is referencing portions of D-425 that have relevance to the surface operations under that permit. Since D-425 was issued to Y&O Coal Company, the name was changed to Wyoming Pocahontas Land Company and subsequently transferred to Bennoc, Inc. The applicant's response "see previously approved transfer application" refers to right-of-entry information contained in the transfer permit. The "U/G permit application" portion of this response refers to application D-425-1 in which all right-of-entry documentation is contained in the referenced affidavits and addenda.*

28. **CONCERN:** AAA, page 3, #12 states that a complete copy of this adjacent area permit application and approved application for the original permit are to be filed.

    a) Does this refer to the approved transfer permit as well? ***Response:*** *This refers to all portions of D-425 (including the approved transfer permit) and Application D-425-1.*

    b) Is/was this information from these unidentifiable documents available with this application at the Belmont County Courthouse for public inspection? If not, how would an interested party know what documents to ask to see? ***Response:*** *The required information was filed at the Belmont County Recorder's Office for public display and review for sixty days from June 30, 1999 (which is the date the permit application was deemed complete).*

    c) Since this information is considered part of this permitting process, while not required to be attached for the Division's review, was it included with this permit application when copied and sent to interested parties? If not, how would the requesting parties know what to ask for since there are no identifying numbers regarding these documents? ***Response:*** *Permit applications are filed for public review and comment only after the application has been deemed complete. Applicants are required to advertise the filing of the application at a public office (in this case, the Belmont County Recorder's Office). Advertisements must appear once per week for four consecutive weeks. The Division requires, consistent with Chapter 1513 requirements that the "complete copy" of the application include a current copy of permit D-425 (including all approved revisions to the permit), and the D-425-1 permit application. Any person having questions about the accuracy or completeness of a public file copy of a permit application should contact the Division of Mineral Resources Management. The DMRM field environmental specialist assigned to the application viewed the public file copy for D-425-1. All required documents were on file for public review.*

d) If these unlabeled documents were not with this application, therefore not readily available for public inspection since the public would not know what to request, would that not make the entire time of Public Notice and the opportunity for public inspection invalid? ***Response:*** *No. 1501:13-5-01(A)(4)(a) of the Ohio Administrative Code requires that the applicant shall make a FULL copy of the complete application for a permit, a significant permit revision, or a permit renewal available for the public to inspect. As referenced earlier, the applicant complied with the requirement of this rule by placing a full copy of the application on file with the Belmont County Recorder on June 30, 1999.*

e) In what timeframe will another public notice be published, which will also provide interested parties the opportunity for public inspection of the full and complete permit application? ***Response:*** *There are no provisions of rule or law authorizing or requiring additional public display and/or comment periods for this permit application.*

29. **CONCERN:** Part 1, Legal, Financial, Compliance, and Related Information, Page 3, #5 asks: "Is the operator of the mine to be a person different from the applicant?" The response is NO.

a) Who is responsible for checking the credential and qualifications of Bennoc, Inc.'s employees to determine they have the ability to operate a longwall mine? ***Response:*** *The Division's regulatory authority is limited to Chapter 1513 of the Revised Code. Evaluating the credential and qualifications of a permit applicant's employee is not housed within this authority.*

b) While Permit #D-0425 was transferred to Bennoc sometime during 1995 from Wyoming Pocahontas Land Company, a Notification of Temporary Cessation of Operations was received by the Division on October 11, 1995. Did Bennoc actually do any longwall mining in this period of time? Have they done any longwall mining since October 11, 1995? If not, have they ever done any longwall mining? ***Response:*** *No. According to permit documents submitted in association with D-425-1 and R-425-5, the operator of this mine will be American Energy Corporation. The permit holder is Bennoc, Inc. The Division is not aware of whether American Energy Corporation is experienced with longwall mining. The responsibility for legally implementing the approved mining plan rests with Bennoc, Inc.*

c) What documentation does Bennoc provide to prove that they are competent and capable of longwall mining, when they have may never have done anything but surface mining in the past? They own nothing; they have no experience, and have not provided any evidence of financial responsibility to the homeowners. Without the backing of another entity, Bennoc does not have the financial wherewithal to take on a project of this size. ***Response:*** *As the permit holder, Bennoc, Inc. is responsible for any and all liabilities associated with this permit. The financial backing that a company may possess is not within the regulatory scope of the Division's authority granted under Chapter 1513 of the Revised Code.*

d) What education, training and experience are required to validate that Bennoc is competent to longwall mine? ***Response:*** *Chapter 1513 of the Revised Code does not authorize the Division to consider an applicant's training and experience with longwall mining.*

e) Rumor is that Ohio Valley Coal will actually be operating the mine, yet this permits says Bennoc will be operating the mine. What process must be followed to change the operator of

the mine? ***Response:*** *Information provided by the applicant indicates that American Energy Corporation shall be the operator of this mine. A permittee is free to select an operator of its choosing to operate mining activities on a permit. The responsibility to meet all provisions of Chapter 1513 of the Revised Code rest solely with the permittee, which in this case is Bennoc, Inc.*

f) What other data must be supplied by Ohio Valley Coal, or any other coal mining company later named as operator, before they are allowed to mine? ***Response:*** *A permit applicant is required to identify the operator of the mine. Once such information is provided, the Division conducts a review of the Applicant Violator System to insure that the operator and the permittee are eligible to receive a permit. In this case, the review of AVS was conducted on May 16, 2001 and it was determined that the applicant and proposed operator are eligible to receive a mining permit.*

g) What proof must be provided to ensure the Division that the named company has the expertise, appropriate equipment, trained and competent personnel, and the financial wherewithal to keep the agreements to "make whole" for the loss and potential suffering of the land owners? ***Response:*** *Chapter 1513 of the Ohio Revised Code requires that applicants provide sufficient bond and maintain liability insurance consistent with the requirements of rule and law. Such an evaluation was completed and it was determined that the applicant meets all regulatory requirements.*

h) Can a permit be approved, that will affect those named property owners and their families (via property values, structural damage, emotional rigors, etc.), without this financial proof of fiscal responsibility? If so, what justification does a government agency have for neglecting the rights of the property owners? ***Response:*** *Please see above.*

i) Is the bond collected sufficient to cover all costs that will come from loss of water, minerals and property value? What is the amount of the bond that must be posted? Does this cover fiscal responsibility for damages that will not be included in insurance coverage or if the insurance coverage proves to be inadequate? Since there is no bonding for the shadow area of a permit, how do we know that Bennoc will be in business long enough to make good on the damages to the homeowners? ***Response:*** *The Division has not interpreted bonding requirements in Chapter 1513 of the Revised Code and 1501:13 of the Administrative Code to apply to shadow areas of underground mine operations since they do not meet the statutory definition of "permit area". The provision for bonding areas damaged by subsidence is meant to address operator default on an obligation to repair or compensate when subsidence damage occurs. In the event of an operator default on areas damaged by subsidence, the Division may use the reclamation forfeiture fund to address such needs. This fund is comprised of severance taxes paid by Ohio coal operators. Therefore, in the event of an operator default, the landowner is protected by the Division's existing program.*

30. **CONCERN:** Part 1, Legal, Financial, Compliance, and Related Information, Page 3, #6 requires the name of a <u>person</u> who will pay the abandoned mine land reclamation fee for the applicant, yet the response is Bennoc, Inc. This does not answer the question, as Bennoc, Inc. is not a <u>person</u>. ***Response:*** *The listing of business entities as the "person" responsible for paying abandoned mine land reclamation fees is consistent with current Division policy and regulatory requirements.*

31. **CONCERN:** Part 1, Legal, Financial, Compliance, and Related Information, Page 4, #14 requests a Certificate of Liability Insurance as Attachment 22. According to Attachment 22, The Public Liability Insurance Policy Shall: (1) be in effect during the term of the permit or any renewal, etc. and (2) provide for personal injury and property damage protection in the amounts not less than the following:

(a) Three hundred thousand dollars ($300,000) for all damages because of bodily injury sustained by one person as the result of any occurrence, and five hundred thousand dollars ($500,000) for all damages because of bodily injury sustained by two or more persons as the result of <u>any one</u> occurrence, and

(b) Three hundred thousand dollars ($300,000) for all claims arising out of damage to property as the result of any one occurrence including completed operations, <u>with an aggregate limit of five hundred thousand dollars ($500,000) for all property damage to which the policy applies.</u>

a) Regarding paragraph (a): This seems to indicate that a maximum of $500,000 will be paid per <u>any one</u> occurrence of bodily injury, so if there is more than one occurrence involving 2 or more people there is insurance coverage for all these occasions. Is this statement accurate? Or does this mean that the maximum paid will be $500,000, and for only one occurrence, so that if there are two or more occurrences, the second and others will have no coverage? Does bodily injury include pain and suffering, mental anguish, and other forms of psychological damage done to the individuals involved? ***Response:*** *The details of a specific insurance policy are not within the scope of the regulatory authority granted to the Division under Chapter 1513 of the Revised Code. We are authorized only to require that insurance provisions of rule/law be met by the permittee. So that you understand, we receive notice from the insurance provider that very generally outlines the terms and liabilities of the permitee's coverage. We do not receive, nor are we authorized to require the submission of copies of an applicant's insurance policy. Our review indicates that the applicant has met all regulatory standards and requirements for carrying sufficient liability insurance. For details concerning specific details of insurance carried by the permittee, we recommend that you talk with the permittee and/or legal counsel.*

b) Regarding paragraph (b): This seems to indicate that the <u>maximum amount for all property damage is $500,000 (aggregate limit)</u>, is this accurate? If this is accurate, what happens to the other parties who sustain property damage once the $500,000 has been utilized to pay claims? Who will pay for their damages and/or losses? Does this portion of the policy include the damages and compensation for loss of water? Loss of minerals? Loss of use of the property, while waiting for the land to settle? ***Response:*** *ORC 1513.07 B(2)(q) establishes the requirement for insurance for coal mining operations.*

c) What is the replacement value of all physical property included in the permit area? How many homes are in the permitted area, and what is their replacement value? How many other structures are in the permitted area (barns, garages, grain storage buildings, etc.) and what is their replacement value? How many wells, springs, and other sources of water can be affected, and what is the estimated cost to restore/replace the water? ***Response:*** *The aggregate replacement value/cost of real and other property that could be damaged by subsidence is not*

required to be assessed by the applicant for a permit. However, the condition of all structures on a specific property is required to be assessed at least six months in advance of planned subsidence in the form of a pre-subsidence survey. The survey is used as a baseline to document the condition of the structures in the event damages occur subsequent to mining. A copy of the pre-subsidence survey shall be provided to the owner of the surface structures.

d) Is the amount of insurance coverage supplied by the applicant sufficient to cover all potential claims? If it is not, what recourse does the property owner have, and what individual or company will be responsible for these claims? Are these parties fiscally able to pay these claims? If not, who ultimately compensates for the losses sustained by the property owner? Will they provide the fiscal wherewithal to provide enough to cover ongoing loss of water costs, possible for generations? ***Response:*** *In the event that an operator defaults on his obligations to repair or compensate for damages, the state may step in to address the problem. Please see the response to Concern #29 (i).*

e) Who is responsible for determining damage to dwellings and other structures? ***Response:*** *Anyone suspecting subsidence damage to land, structures or water resources, should first contact the mining company with their claim. If a satisfactory outcome is not reached, citizens should contact the local Division of Mineral Resources Management office. If the company is found liable, the regulations require the company to repair lands damaged by subsidence, regardless of any private agreement. If structures are damaged by subsidence resulting from active mining, the mining company is required to repair the structure or compensate the owner for the diminished value of the structure. In the event a company fails to comply with a Subsidence Damage Notice from the Division, a Notice of Violation will be issued. Failure to comply with the Notice of Violation may result in the cessation of the underground mining operation or termination of the operator's permit.*

f) What insurance is applicable once the mine is abandoned (which is always deemed as unpredictable in terms of future damage)? ***Response:*** *Please see previous response under Concern #29(i); in addition the Ohio Mine Subsidence Insurance program covers subsidence damages to dwellings, and is required to be carried through most of the coal region of southeast Ohio.*

32. **CONCERN:** Part 1, Legal, Financial, Compliance, and Related Information, Page 7, C. (1) (b), pages 1 through 12:

a) A minimum of two entries are incorrect. Either the address is wrong or the party listed has moved. ***Response:*** *During the review and processing of this permit application, the Division required many revisions. The above referenced discrepancies were corrected during the revision process.*

b) On most entries on these twelve pages, the owner holds the surface rights. How does "Dash 7" and a pending law suit in Belmont County regarding property owners' surface mineral rights, which could be impaired due to long wall mining, affect the process of this permit? Since the Supreme Court has ruled in favor of the property owners in this regard, why is Ohio not abiding by this decision? Can any mining be done while Dash 7 is pending? Can this permit or any other longwall permit application be approved while this suit is pending and going through the court process, including appeals if any? ***Response:*** *No injunctive relief was provided or*

ordered as a result of this pending litigation. Subsequently, the Division has not been instructed by the courts to deny or delay permits awaiting the outcome of this particular matter.

33. **CONCERN:** Part 1, Legal, Financial, Compliance, and Related Information, Page 8, C. (6) asks if the applicant holds lands, interests in lands, etc. or interests in lands which are contiguous to the property to be mined. The response is Yes, and an Addendum to Part 1, Page 8, Item C (6) is referenced. Does the Division have this document? Was this submitted to interested parties who requested a copy of the permit? Is it at the Belmont County Courthouse? ***Response:*** *The document is contained in the original submittal of the permit application. Those individuals requesting copies of the permit application should have received a copy of this document in the original permit application copy they received.*

34. **CONCERN:** Part 1, Legal, Financial, Compliance, and Related Information, Page 9, C. (8) (a) (ii): Does the Division have the required affidavits for parcels 2-5-44, 2-13-63 (not listed with Affidavit on Page 1 of 40 Page 10s), or 2-5-2? Or, is Addendum to AAA, Item 14. B) Page 9, Item C (8)(a) sufficient as an Affidavit? ***Response:*** *The referenced items are included in permit D-425. The applicant may reference applicable materials contained in the original permit when submitting an Adjacent Application Area such as D-425-1.*

35. **CONCERN:** Part 1, Legal, Financial, Compliance, and Related Information, Page 10, C. (8) (b) (I) and (ii) (there are 40 pages of Page 10s): These are affidavits showing the legal right to mine – coal parcel ownership. They list parcel numbers and refer to addenda of lease rights - Addendum to Part 1, Page 10, Item C (8) (b) (ii) (Items 1 through 39, depending on which particular Page 10 you are viewing). Some are listed as a two digit number, some are a combination of letters and numbers (X-###-#) some look like #-##-#. Some will look like this last example and then have a Parcel # in parenthesis.

    a) Regarding these particular addenda, these reflect portions from the original leases but do not document the entire lease. Whose job is it to figure this all out, study the addenda (of which there are many that refer to these pages, but are utilized in different places), and verify that the information is correct and that the rights are indeed severed ad infinitum? ***Response:*** *The permit applicant is responsible for providing adequate and accurate information required as part of the Chapter 1513 permitting process. Division staff routinely performs a comprehensive review of information for completeness and accuracy; however, the Division does not routinely perform research of titles and/or land deeds.*

    b) Could the possibility exist that some of these have dated leases in which the lease reverts to the owner if the coal is not mined in X period of time, as are written in some leases in Pennsylvania? How would anyone know without researching each and every deed? If it has been researched, who did the research and what certified document proves this was done? Please provide proof of verification to the interested parties here today, and to each property owner listed in the permit. ***Response:*** *The applicant (or the applicant's consultant) is responsible for verifying the accuracy of their research into titles and deeds. The affidavits provided with the application packet verify the accuracy for regulatory purposes under Chapter 1513 of the Revised Code. Disputes and/or differences of opinion about coal ownership and deeds are not within the regulatory authority of the Division.*

36. **CONCERN:** Part 1, Legal, Financial, Compliance, and Related Information, Page 11, C. (9) (a) requests information regarding each surface owner of land within the proposed permit area. Only American Energy Corporation is listed. Why? Why are other surface owners within the permitted area not listed when their surface will be affected, even though this is for an underground mine? ***Response:*** *American Energy Corporation is the current surface owner of the "permit area". The permit area is defined as the surface area needed to facilitate underground operations. This includes all area disturbed for operating surface facilities such as conveyors, coal storage areas, portals, buildings, parking areas, air shafts, load out facilities, etc. In this instance, "permit area" refers only to the area permitted under the original D-425 permit. Areas where only underground mining occurs are not considered part of the "permit area".*

37. **CONCERN:** Part 1, Legal, Financial, Compliance, and Related Information, Page 12, C. (9) (b) includes a list of each surface owner. A minimum of one owner is incorrect. ***Response:*** *During the course of the nearly two years that were involved in the review and consideration of this application, a number of revisions were required. This particular issue was corrected during the revision process.*

38. **CONCERN:** Part 1, Legal, Financial, Compliance, and Related Information, Pages 13 and 14, D. (1) through (10), Areas where mining is prohibited or limited: All answers are "N/A" (not applicable), yet there are recreational waters or river corridors within the adjacent area (D (3)); there may be places listed on the National Register of Historic Places (D (5)); there are public highways within the permitted area (D (6)); there are occupied dwellings, public buildings, and cemeteries above the proposed mining area that will be affected (D(7, 8, 9)). It is a known fact that all of the above will be affected by subsidence or loss of water, yet because they are on the surface the answers are not applicable. Why is the mining company not required to fill in these answers, when they are responsible for any damage done? ***Response:*** *The Division has consistently interpreted the application of the mining prohibitions contained in OAC 1501:13-3-03 as applying only to those areas on the surface within the "permit area" as defined by the Ohio Administrative Code. Such areas do not include areas above the underground workings of an underground mine where the only potential disturbance is subsidence. This position is consistent with the OSMRE position on the 522(e) prohibitions in SMCRA.*

39. **CONCERN:** Part 1, Legal, Financial, Compliance, and Related Information, Page 14, E., regarding areas where mining is prohibited or limited, but with different questions than referenced above. What types of areas are considered unsuitable for coal mining operations under rule 1501:13-3-07 of the Administrative Code? ***Response:*** *1501:13-3-07 of the Administrative Code deals only with procedures for designating areas unsuitable for coal mining operations. Lands Unsuitable for Coal Mining are determined on a case-by-case basis upon receiving and conducting a regulatory review of a petition for declaration of unsuitability.*

40. **CONCERN:** Part 1, Legal, Financial, Compliance, and Related Information, Page 15, F. (2): The question, "Does the applicant propose a permit term in excess of (5) years?" is answered "No", yet the anticipated/actual date for starting mining operations (1) (a) is January 1, 2001 and the termination date (1) (b) is listed as January, 2023. Further, Addendum to Part 1, Page 8, Item C (7), a timing map showing current and future permitting areas indicates that the current permit will take approximately 7 years, and the Location Map details a 7 year plan. It is obvious the answer of 'No" is incorrect, therefore "an addendum with the information required by 1501:13-4-03 (E) (3) Ohio Administrative Code" should be attached. Will the Division require that the mining applicant

change their answer to "yes" and further require the addendum? When will this addendum be available for the public record? ***Response:*** *Mining permits issued under Chapter 1513 of the Revised Code are issued for a period limited to five years. However, coal mining permits are subject to renewal if coal mining operations extend beyond five years. There is no requirement for an applicant to respond to this question with a "yes" when it is evident that mining the coal reserves in the area will likely take more than five years. Applicants receive a permit only for a five year period; subject to successive renewal after the initial five year period. The Division will not require this response to be changed in the application since it only applies to the five year permit issuance period..*

41. **CONCERN:** Part 2, A. Environmental Resources Information, Page 16, A (2), Cultural, Historic, and Archeological Information - Permit and Planned Subsidence Area: What criteria was used to determine that there are no archeological sites within the proposed permit or planned subsidence area? How many archeologists have walked the land? How many acres did they cover? Has the Raven Rocks area been thoroughly investigated by a team of archeologists? What about the signs that there are indeed archeological sites, like the findings of arrowheads, which are indications of potential sites? To what depth has this been researched? ***Response:*** *Upon the original submission of application D-425-1, a copy of the permit and shadow area map was forwarded to the State Historic Preservation Office (SHPO) for review and comment. No comments were received. When the mining plans were revised to prevent possible damage to the ravine areas in Raven Rocks, the revised map was also forwarded to SHPO for further review and comment. As of this date, no comments have been forthcoming from SHPO.*

    The Division's archaeologist, Dr. Jeffery Reichwein, has visited the areas included in D-425-1, including shadow areas and particularly the ravines at Raven Rocks. The Raven Rocks area was the site of a rather extensive archaeological excavation and study during the late 1960's by a team of archaeologists from Kent State University. The "Rock Shelter" at Raven Rocks was extensively studied with the bulk of the artifacts found at the site removed. In part, due to the possibility of additional archaeological features being found in the Raven Rocks area, the mining plan was revised to prevent surface subsidence in this area. These revisions satisfactorily address concerns with archaeological features in the Raven Rocks area.

    With regard to shadow areas of the permit, the permittee is required to submit Attachment 27A's at least six months prior to subsiding overlying areas. The Division forwards these notices to the SHPO for review and comment. Additionally, the Division's archaeologist reviews all Attachment 27's and may require avoidance, further investigation or mitigation.

42. **CONCERN:** Part 2, D. Surface Water Information – Permit, Shadow Area, and Adjacent Area, Page 17: The drainage basin listed on the permit is Captina Creek. According to the Ohio EPA, Captina Creek has one of the highest IBI scores (meaning clean water) in the state. Further it may contain endangered species. What studies have been done to determine the potential damage to this major watershed? How will the quality of water, flow of water, and availability of water be affected? What is the potential pollution and potential causes of pollution? How does the company plan to compensate the community for the diminution of water to Captina Creek through loss of springs and streams? ***Response:*** *Streams shall be monitored as addressed in the response to Page 26, F(3) of the permit application. Data that is subsequently gathered should help to determine whether adverse impacts have occurred to this stream. While it is true that longwall mining has*

affected some streams in other areas of Ohio, the proposed operation is designed to have at least 200 feet of overburden in areas beneath perennial streams. There is no evidence to suggest that water loss from Captina Creek is in any way likely.

43. **CONCERN:** Part 2, D. Surface Water Information – Permit, Shadow Area, and Adjacent Area, Page 17, Attachment 14 D, Page 1 of 3: Captina Creek's listed Known Uses of Surface Water is only recreational. This is not accurate. Captina Creek is also used for agricultural purposes, for livestock, as a water supply for fighting potential fires, and for wildlife, in addition to fishing, hiking, white water rafting and swimming. They represent that there will be no undermining of Captina Creek, that is a down right misrepresentation. To harm this watershed would be devastating to humans, animals, birds, fish, and the other creatures that make this watershed their sanctuary. Additionally, many unnamed springs flow into Captina from areas within the permit area.

    Studies must be conducted as to the long-term effect on the water quality and quantity of the Captina Basin. This creek is a major tributary to the Ohio River and would adversely affect the area in many ways if the waters to Captina were diminished or polluted in any way. Why hasn't Bennoc provided a contingency plan for protection of that natural waterway, as they will be required to undermine it if they plan to get the equipment near the mine? ***Response:*** *While it is true that Captina Creek may be used for agricultural uses along various reaches of its length, there was no documentation that this stream was used for anything other than the indicated uses shown on Attachment 14D. It is important to note that indicated uses of a stream are those found to exist within the hydrology review area, which is the area defined by the application area and the area within the surrounding 1000-foot perimeter. The Probable Hydrologic Consequences narrative of the permit application supplied documentation in the form of monitoring data from the nearby Powhatan #6 Deep Mine, permit D-360, which showed minimal stream flow loss from undermined stations. It should also be noted that there is virtually no potential for mine discharge to Captina Creek, as the #8 Coal seam is located considerably below this perennial stream.*

44. **CONCERN:** Part 2, F. Alternative Water Supply Information – Permit, Shadow Area, and Adjacent Area, Page 18, (2), regarding alternative sources of water:

    a) Will new wells be drilled to replace lost water supplies? ***Response:*** *The response to Part 2, Page 18, F(2) lists the various options for the replacement of adversely affected supplies, of which drilling of new wells is one such option.*

    b) Who will haul the water short-term? ***Response:*** *Consistent with the response to Concern #10, the operator will pay for this service. Determining who will haul water is not within the regulatory jurisdiction of the Division.*

    c) For those with cattle or other livestock, how will any lost water supply be handled? (Treated "city" water is not sufficient or acceptable, as the animals can't drink it). How will water supplies in the pasture be replaced at the various locations? ***Response:*** *Ponds have been constructed to provide ample water for cattle and other livestock. Additionally, where it is appropriate, springs have been developed. It has not been Division policy to allow public*

water to serve as a replacement supply for adversely affected agricultural supplies, nor does the applicant propose to do this.

d) Regarding the Addendum from Village of Barnesville, is the water treatment plant to be built in 2000 still on the agenda? Will Barnesville still be able to supply water if it is not? What will be the eventual cost for those who have large amounts of livestock? What about watering crops? Will they make sure Captina still continues to flow? Who will pay for that water? ***Response:*** *A letter was provided in the application as documentation that the village of Barnesville water system has sufficient capacity to provide water for residents whose water supplies might be adversely affected by the proposed longwall mining operation. It is not within the regulatory authority or jurisdiction of the Division to investigate the operations and/or plans for the Village of Barnesville Water Department.*

e) Water replacement, temporary vs. permanent, needs to be clarified. There are people in Monroe County who were undermined by Quarto fifteen to seventeen years ago and are still on temporary water systems. That's not a permanent replacement. ***Response:*** *Mine operators are required to provide interim water replacement at no cost within 48 hours of a reported loss, until such supply is permanently replaced. Subsequent to interim replacement, the original water supply is monitored to assess the degree of recovery of the diminished supply—if any. In some cases, it may take up to two years to assess recovery. At that time, or earlier if it is evident the supply will not recover, the company should negotiate with the landowner the terms of a permanent replacement, to include operation and maintenance costs in excess of the customary and reasonable delivery costs of the pre-mining water supply. Landowners experiencing difficulty obtaining permanent replacement within a reasonable time period should contact the local Division inspector for assistance.*

45. **CONCERN:** Part 2, G. Land Use Information – Permit Area (Page 19) and H. Prime Farmland Investigation- Permit Area (Page 20): All responses are "N/A – No Permit Area." "Not applicable" is not an acceptable answer. If a full environmental impact review/study was/is being done for D-0360-7, then this permit should have the same. There will be an impact on the surface, so it should be known what the surface is currently used for and what the impact will be with subsidence and loss of water. ***Response:*** *The permit area has already been disturbed by activities associated with D-425. Application D-425-1 is for additional underground expansion and is not considered part of the "permit area". Any prime farmland with the "permit area" was addressed in D-425. Despite not legally being considered part of the "permit area", the area overlying D-425-1 is satisfactorily addressed in the Subsidence Control Plan which addresses both water loss issues/concerns as well as impacts to surface areas resulting from subsidence.*

46. **CONCERN:** Part 3, Reclamation and Operation Plans:

a) If this permit calls for the disposal of waste into a valley fill, it must be rejected as illegal. A recent Federal Supreme Court Ruling by Judge Haden says the state agencies have a non-discretionary duty to protect the state's waterways when issuing a permit. This ruling was specific to Mountaintop Removal in West Virginia but this is a Federal ruling that can be applied to any mining where the valley fills are large enough to make the streams unrecoverable or "where waste assimilates the stream." Please provide the specifications provided by the coal company that addresses the size and scope of the valley fills and its full

short and long term effects, i.e. the amount of time required for full recovery, allowances for the established buffer zones (min 100 feet) near these streams and springs etc., in relation to this latest ruling. ***Response:*** *Under the provisions provided in this permit application, coal waste shall be shipped from the D-425-1 permit area and disposed of in the Ohio Valley Coal D-360 permit coal waste disposal area. There are no current provisions of D-425 that call for the establishment of a coal waste disposal area. There are no valley fills proposed for this permit area.*

b) According to a 1996 report submitted to Governor Voinovich by the head of the OEPA, the coalfields of OH have lost 1300 miles of streams to longwall mining. We cannot allow any further degradation to the water quality and quantity caused by this high-extraction mining process. ***Response:*** *This is not a question and requires no further response. For further information about possible impacts to surface waters caused by subsidence, we recommend that you review the Cumulative Hydrologic Impact Assessment (CHIA) and Probable Hydrologic Consequences (PHC) portions of the permit application.*

47. **CONCERN:** Part 3, Reclamation and Operation Plans, A.(2), "Indicate the anticipated annual and total production of coal from this proposed operation." Neither Annual or Total answers were given, both are blank. Why was this not filled out, and when will these answers be given, and available for viewing in a complete and final application permit? ***Response:*** *This discrepancy was corrected during the revision process.*

48. **CONCERN:** Part 3, Reclamation and Operation Plans, A.(3), "Will this operation be combined with surface coal mining activities . . . ?": According to Surface Permit D-1159, Sections 3 and 4 of Wayne Township have surface mining activities, and indeed this permit names the mine as the Allison Mine. All questions (3 through 8) relating to the affect of the surface must be answered, as this is over the same mine that is going to be re-named the Century Mine. Therefore there is indeed activity in the permit area, in spite of answers that state: N/A – No Permit Area. How can this surface land not be in the permit area? ***Response:*** *Permits D-425 and D-1159 are distinctly different permits. Permit "area" refers only to surface disturbance under D-425. D-1159 is a surface mining permit in which a completely different seam of coal was mined. Activities associated with D-425 and D-425-1 are strictly underground mining operations, in which a different coal seam is being mined. As mentioned previously, there is no "permit area" for D-425-1; since it is an expansion of underground workings only, the area is considered "shadow area" and not "permit area" in the legal sense.*

49. **CONCERN:** Part 3, Reclamation and Operation Plans, A.(9), "Will access to the underground workings be gained through a drift entry?": Please explain what this means. The answer to the question is No. ***Response:*** *A "drift " entry is a mine opening into the coal on the same plane as the natural coal seam, usually where the coal outcrops.*

50. **CONCERN:** Part 3, Reclamation and Operation Plans, A.(10), "For entries to underground workings <u>other than drift entries</u>, provide as an addendum. . .": There is no addendum provided, therefore none is available for public viewing. When will interested parties have access to this information? ***Response:*** *This information is addressed in permit D-425.*

51. **CONCERN:** Part 3, Reclamation and Operation Plans, A.(11), "Will the permanent entry seals be designed to withstand the maximum anticipated hydraulic head when the operations are

abandoned?": "N/A – No Permit Area" is the response, instead of yes or no. Does this mean there will be no entry seals, or is this information covered in the Allison Mine Permit D0425? If so, what is the response on that permit, of which this is an extension?

In fact, all answers from A. (11) through (14) are answered in the same manner, "N/A – No Permit Area", yet many of the questions relate to coal removal, handling, storage, spoil removal, shaft development, water and pollution control facilities, waste, etc. in an area covering 1000s of acres. Therefore answers that might refer to D-0425 cannot be considered answers to these questions. Certainly D-0425 responses probably did not discuss, minimally, full shaft development covering the land now covered in this permit. Utilizing answers from D-0425, if this is indeed the case, is not acceptable; a response to these questions on this application should be required. In fact, since D-0425 has been inactive for a number of years, the answers may now be different given new technology advances. ***Response:*** *The response to these questions means the permit application is for underground development only and does not include any "permit area". All information related to the permanent entry seals is contained in Bennoc's D-425 permit. The permittee plans to reopen and use the existing entry. If additional surface expansion is needed in the future, the permittee will be required to apply for the needed additional permit(s) at that time.*

52. **CONCERN:** Part 3, Reclamation and Operation Plans, A.(12), asks for an addendum describing the construction, modification, etc, including the <u>proposed engineering techniques and major equipment to be used</u> for various items. If no one has mined D-0425, let alone that Bennoc does not seem to have any long wall mining expertise, how can N/A be an acceptable answer? Who is responsible for making sure that Bennoc is using the most efficient and safe engineering methodologies available? How can the responsible party discover this information if the answers are "N/A (not appropriate) – No Permit Area"? ***Response:*** *Mine permit applications involve the review and consideration of certified engineers employed by the Division of Mineral Resources Management. Activities proposed by the applicant have been reviewed and approved by professional engineers employed by the Division of Mineral Resources Management. The applicant's response "N/A" again deals with the issue of "permit area" as it is defined for underground operations.*

53. **CONCERN:** Part 3, Reclamation and Operation Plans, B. – Existing Structures – Proposed or Existing: Responses are again "N/A (not appropriate) – No Permit Area". Again, the only conclusion, while an assumption, is that the company must feel no need to answer these questions due to D-0425. There are existing structures on D-0425, and they have not been used in years. How can N/A be an acceptable answer to the Division's questions? ***Response:*** *This information is included in D-425 permit.*

54. **CONCERN:** Part 3, Reclamation and Operation Plans, D.(1) through (11), regarding reclamation: Some of these questions do relate to an underground mine, specifically (8) through (11). Again, since D-0425 has not been active in years, how can answers given years ago be reflective to this permit, given the advances in technology? D.(11) specifically relates to applicable air and water quality laws and regulations and health and safety standards. Surely there have been new laws and regulations created since the original permit was filed. These questions must be answered on this permit. ***Response:*** *The Division of Mineral Resources Management required that the original D-425 permit be updated to current regulatory standards via the significant ARP R-425-5 that was approved by the Division on May 24, 2001.*

55. **CONCERN:** Part 3, Reclamation and Operation Plans, D.(12), regarding potential adverse impacts on fish, wildlife, and related environmental values: The addendum to Part 3, Page 25, D(12) states that this mining operation is not expected to have an impact. It does discuss minnows, as if that is the only fish that lives in the streams. This is inaccurate. There are multiple species of fish in Captina Creek, if not in mouths of the adjacent waters that flow into Captina. There are also other creatures that live in these waters, mussels and crayfish, etc.. What environmental impact will affect these creatures? What studies have been done to show that nothing but a few minnows will be impacted? Were other studies performed to determine affects on creatures other than minnows? ***Response:*** *Consistent with responses to Concerns #42 & 43, the assigned monitoring will help to assess any potential impact of longwall mining operations on streams in the permit area. Monitoring data collected to date from the nearby Powhatan #6 Deep Mine, permit D-0360 showed minimal stream flow loss from undermined stations. Conversely, there has been no documentation submitted to substantiate claims of adverse impacts to fish and wildlife by longwall mining in the area by opponents of the proposed operation. Note that the permit cannot be denied on the basis of speculation regarding adverse environmental impacts, when information in fact suggests, that such impacts are unlikely to occur. Neither do the rules require an applicant (or the Division) to exhaustively research every possible impact that could occur as a result of a proposed operation.*

56. **CONCERN:** Part 3, Reclamation and Operation Plans, E, regarding Protection of Hydrologic Balance: According to Addendum to Part 3, Page 26, E (1-3), "the hydrologic balance is expected to change minimally". Yet Addendum to Part 2, Page 18, F (1) states, "According to the PHC, these sources may be impacted permanently or may have delayed or long-term recovery. Wells may experience significant declines in static water level with little or now recovery. Springs may experience significant flow declines with long-term or no recovery." Obviously, these reports conflict. Who is responsible for providing the truth about the consequences to the hydrologic balance? Who is responsible for verifying this information? ***Response:*** *There is a significant difference between impacts to the hydrologic balance, which deals with the hydrologic regime as a whole, and impacts individual supplies such as wells and developed springs. Longwall mining will inevitably affect undermined water supplies. However, insofar as the aquifers in the area are of very limited extent and yield very small quantities of water, no regional aquifer will be affected. Mining will redistribute ground water in the area, as is witnessed by the re-location of hilltop and hillside springs to springs located in the stream valley, or the increase in water levels in certain wells while others are completely de-watered. The question to be answered in Part 3, Page 26, E(1-3) is not whether adverse impacts will occur to used water supplies, but whether the operation has been designed to minimize impact on the hydrologic regime in the area.*

57. **CONCERN:** Part 3, Reclamation and Operation Plans, F., regarding ground water and surface mining monitoring plan: Addendum to Part 3, Page 26, F (3) states, "The major watershed of this area, Captina Creek, is at the elevation of the mining for the application area at a distance of over 5 miles from the mine." In reality, portions of Captina Creek are within the hydrological boundary of the mine, which is within 1000 feet of the mine boundary. Who wrote this report and how did they obtain the information? Will the accurate data affect the permitting process? ***Response:*** *The person expressing this concern evidently misunderstood the narrative in the application which accurately pointed out that Captina Creek is located considerably above the elevation of the #8 Pittsburgh Coal seam in the proposed application area. Based on the dip of the #8 coal seam and the gradient of the creek, the elevations of each relative to each other remains constant as far away*

as five miles from the mine site. However, within the permit and shadow areas of D-425-1, Captina Creek is clearly within the hydrology review area.

58. **CONCERN:** Part 3, Reclamation and Operation Plans, G. (1) through (6), regarding Diversions and Drainage Control: Again, all answers are "N/A – No permit area." These are not acceptable answers since it is known that springs will be rerouted because of the mining process via the movement of the ground. Obviously water will go where it has not gone in the past, while depletion occurs in other areas. ***Response:*** *Again, this item pertains only to the "permit area" of D-425. The drainage control system plan has been updated as part of the R-425-5 ARP.*

59. **CONCERN:** Part 3, Reclamation and Operation Plans, H, regarding Protection of Public Parks and Historic Places: Will the mining activities adversely affect any of these? The response is no, yet, Attachment 27A documents structures which are listed or eligible for listing on the National Register of Historic Places. Obviously more than one person was responsible for gathering data on the subject or the answers would be the same. How many different people are responsible for answering these questions, and what methods do they utilize? Do they then discuss their findings with each other? Since there are places of historical value within the permit area, the requested addendum describing the measure to minimize or prevent damage should be submitted. Will the insurance company cover the full extent of damage done to these old structures and restore them appropriately? ***Response:*** *Underground mining permits are issued with the conditions that prior to subsidence or mitigating impacts to historic structures, consultation with the State Historic Preservation Office is required. Such consultation is conducted to insure that remediation is is consistent with the historic nature of such structures.*

60. **CONCERN:** Part 3, Reclamation and Operation Plans, I, regarding mining near or through a public road: An answer of "N/A – No Permit Area" is not acceptable. Both township roads and at least one state highway are on the surface of this mining permit. Who will determine the damage to these roadways, who will fix them, and who will pay for the time and materials to make the necessary repairs? ***Response:*** *The public road authority appropriately makes the determination of the need for repair to public roads. Should repairs be necessary to maintain the value or use of public roads, the mine operator is required to repair or compensate for such damages. In addition, ORC 1563.11 grants the appropriate road authority the right to require bond sufficient to cover any damages resulting from mining activities under any road within its jurisdiction, requires that such roads shall be kept safe for passage while being undermined, and further requires the restoration of the roadway to its original safe and passable condition as practicable.*

61. **CONCERN:** Part 3, Reclamation and Operation Plans, J, regarding subsidence control survey: J (3) asks if there are any aquifers or bodies of water that serve as a significant water source for any public water supply system, and the response is no. In reality, most of those who live in the area rely on these aquifers. These individuals are part of the "public" served by these aquifers, therefore the response should have been Yes, and Attachment 32 – Protection of Specific Structures should be filed listing the wells that supply this public sector. ***Response:*** *The applicant clearly demonstrated in the application that there are no regional aquifers in the area that could serve as a source of public water supply. In fact, the strata in the area have very poor hydrologic continuity, due to the extensive changes in rock type over very short distances. This assessment of the characteristics of the aquifers in the area is supported by the Ground Water Resources Map of Belmont County, which indicates meager yields of no more than 2 gallons per minute in the area. A source of public water supply would be a regional aquifer with exceptional water-bearing*

characteristics that recharge a well field that serves a municipality, county, or other public entity, as opposed to the wells in the study area, which serve individual families, and are therefore private water supplies.

62. **CONCERN:** Part 3, Reclamation and Operation Plans, K (5), regarding subsidence control plan: Addendum to Part 3, Page 29, K(5) (a) is utilizing information from the mining operations of Ohio Valley Coal to answer this question. If Bennoc is responsible for this mine, why are we not offered data from Bennoc's longwall mining experience? Who is the responsible individual for putting this addendum together? What experience does this individual have to make these comparisons? ***Response:*** *The information provided that includes subsidence data and experience from D-0360 was provided due to the proximity of the two mines with one another, and the similarity of geologic conditions between the two areas. Bennoc Inc. is the applicant and permittee; however, they have indicated that American Energy Corporation will be the operator of the mine. Information submitted in the application was prepared by sources affiliated with American Energy Corporation, Bennoc Inc., and Jack Hamilton & Associates. It is not within our regulatory authority to inquire about the experience of an applicant in making comparisons such as you describe. Within the Division of Mineral Resources Management, subsidence plans and information were reviewed and approved by a registered Professional Engineer employed by the Division.*

63. **CONCERN:** Part 3, Reclamation and Operation Plans, K (6), regarding subsidence operation within the angle of draw of . . . .perennial streams: Response: "Mining under the three perennial streams located within the application area will not result in imminent danger to the health or safety of the public." Please name the three streams. Will there be public notification when this undermining will occur? How will an individual out for a walk or hunting, or whatever, know when it will <u>not be safe</u> to walk in or near one of these three streams? How will these people be protected? According to Page 3 of Addendum to Page 29, Part 3, K (5)(a), "At the Century Mine, the maximum subsidence is expected to be 37.8 inches. An unexpected fall into a 3-foot hole in a stream can indeed cause injury, therefore a threat to one's safety and well-being. What protective measures will the mining company take to ensure that this does not happen? ***Response:*** *The Ohio Administrative Code requires underground mine operators to provide written notice to all owners and occupants of surface property or structures at least six months in advance of mining. The formation of fissures or cracks in the land surface is a subsidence induced impact resulting from tensile strain associated with horizontal displacement and curvature of the surface overlying the longwall mine panel. Such cracks develop ahead of the face advancement of a longwall panel, and at the edges of the panels near gate development pillars. The cracks associated with face advance generally close as the face progresses, and require little if any, restoration in accordance with the subsidence control plan. While such cracks may cause a temporary disruption of land use, no long-term impacts are anticipated. Most significant movement occurs soon after the face of the panel advances and is generally complete within two weeks of passage of the face. Approximately 99 percent of the subsidence movement is complete when the face is located at a distance equal to the depth of the cover from any point on the surface. This is the maximum subsidence referenced in the application. This subsidence will not occur as a sinkhole or sudden opening in a stream. Sudden sinkhole subsidence occurs where the overburden is shallow, and is a phenomenon associated with abandoned room and pillar mines.*

64. **CONCERN:** Part 4 – Format and Content, Item B, requests information regarding those who submitted technical date for this permit. Only two people are listed. Is the Subsidence Data, just to

name one report included, not considered technical? Please provide the names of all individuals who supplied information for this permit. ***Response:*** *Information was provided on behalf of Bennoc, Inc. by the applicant's consultant, Jack Hamilton & Associates as well as L. G. Hetager, Inc., and Quality Environmental Services.*

65. **CONCERN:** Regarding gas and oil wells, currently in use or capped for future use, according to the Division, wells in the path of mining fall under mine safety regulations, a different chapter of Ohio law, and are handled by Mine Safety Inspectors. Requirements pursuant to the Mine Safety Law are handled by a different process and different individuals other than those who work on Permit D-0425-1. Based on this information:

    a) What information must a pending applicant provide to Mine Safety to validate that the gas and oil will be preserved for the owners? ***Response:*** *There are no provisions with ORC 1513 to preserve gas and oil for landowners.*

    b) What information must be provided to ensure that the lives of the miners will be protected in the event that a gas or oil line is hit by machinery used in long wall mining? ***Response:*** *A plan must be submitted that addressed the plugging of the well to a depth of 200-feet below the coal seam. This involves a plugging permit issued under Chapter 1509 of the Revised Code and a safety plan for mining through the well that is approved by the Mine Safety Section of the Division of Mineral Resources Management and MSHA.*

    c) When is this information given to the public for review and question? Surely approval of any permit must be dependent on the mining company providing a Mining Plan. *There are no formal provisions for public review of these permits/plans however, all documents received by the Division are public documents and available for review upon request.*

    d) Who is responsible for reviewing this plan and assuring (1) the property owner will not lose wells and (2) the safety of miners is not in question? ***Response:*** *There are no provisions for assuring that property owners will not lose well when such wells are to be plugged for mine safety concerns. Plans are reviewed by the Division of Mineral Resources Management Mine Safety Section, MSHA, and a representative of the miners from the underground mine. A Mine Safety Inspector from the Division observes plugging of the well.*

    e) What reports are required by the Federal Mine Safety and Health Administration? ***Response:*** *The plan must be reviewed and approved by MSHA and a copy of the completed plugging report filed with MSHA.*

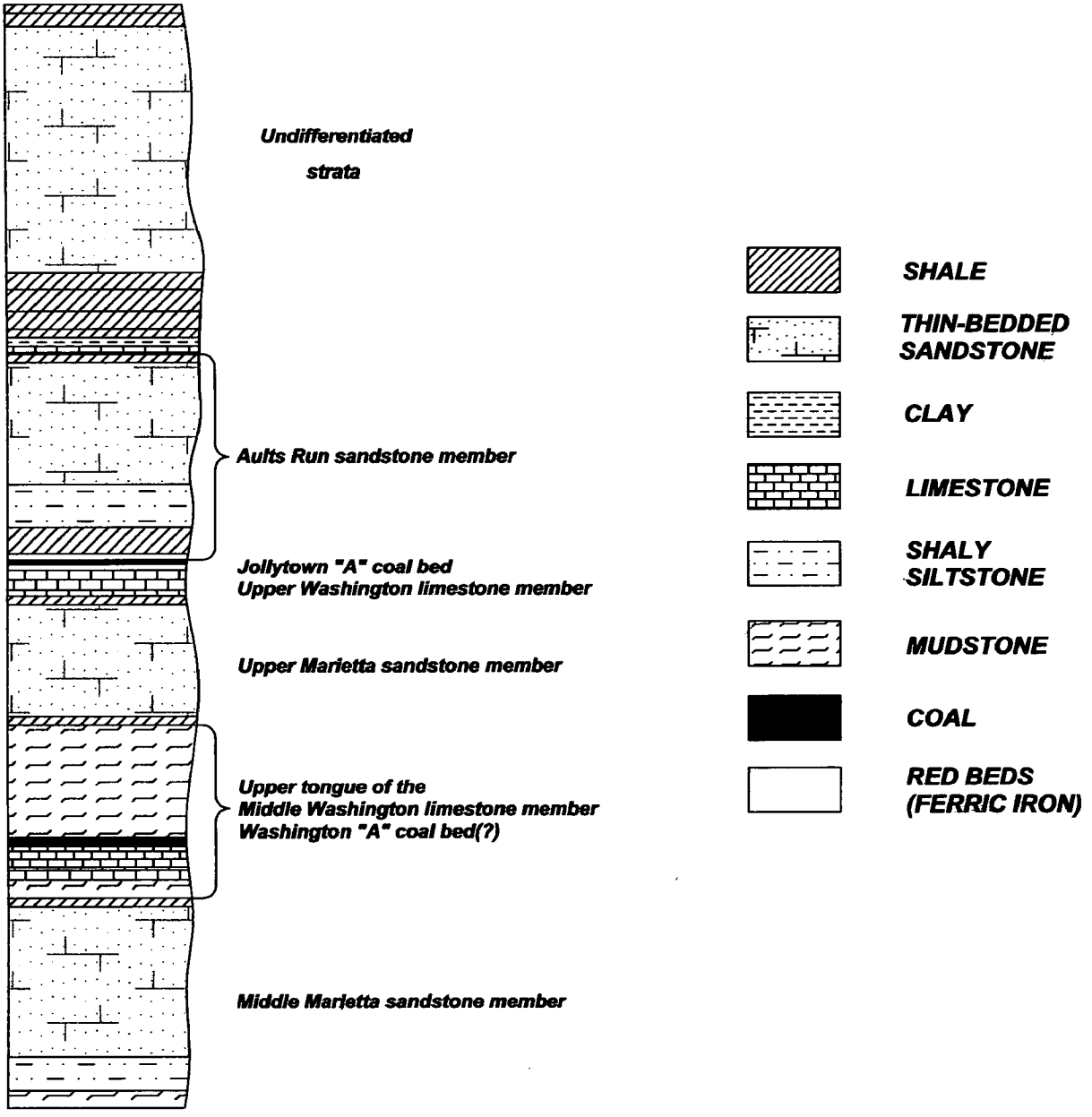
    f) Who is responsible at the Federal level for validating that the mining plan is acceptable? ***Response:*** *The mining plan must be reviewed and approved at the MSHA district office in Morgantown, WV.*

66. **CONCERN:** The "angle of draw" as it relates to longwall mining subsidence needs to be better research. Landowner experiences seem to show the "angle" is much greater than currently thought. ***Response:*** *Angle of draw has been specifically monitored at every longwall mine in the state of Ohio. It establishes the limits of the subsidence basin above a longwall panel. For planning purposes, the Division uses a conservative figure of 30-degree angle of draw. Monitoring data from active longwall mines indicates that the angle is usually much less than 30 degrees.*

67. **CONCERN:** How soon can a property owner get to minerals (other seams, oil and gas reserves) below the coal being longwall mined? When the mine is active, there are processes in place; however, how long does an owner have to wait after the area is subsided to drill for oil/gas reserves? A landowner above the Quarto Mine was told by ODNR Division of Oil & Gas that there would not be any suitable sites to drill through the old works, ever. ***Response:*** *There are no specific provisions within either the surface mining law (Chapter 1513) or the oil & gas law that specify a "waiting period" following the passing of a longwall mining panel before drilling may commence. Neither is there specific language that would prohibit drilling through an underground mine void or collapsed longwall panel. Section 1509.08 of the Revised Code requires that the Division shall notify any mine owner whenever a drilling permit application is requested for any coal bearing townships in Ohio. The owner of the mine has six days to express an objection to the issuance of a drilling permit. The Chief of the Division would then make a determination on the mine owner's objection and decide whether to issue or deny the drilling permit. Other than this provision, there are no specific limitations on drilling within an area of a subsided longwall coal operation.*

AEC 05280

ILLUSTRATION OF STRATIGRAPHIC INTERVAL, FROM TOP OF HIGHEST SURFACE ELEVATION HOLE (C98-2) TO MAXIMUM SURFACE ELEVATION WITHIN THE APPLICATION AREA. (TAKEN FROM UNITED STATES DEPT. OF THE INTERIOR, GEOLOGICAL SURVEY, PROFESSIONAL PAPER 380, PLATE 2)



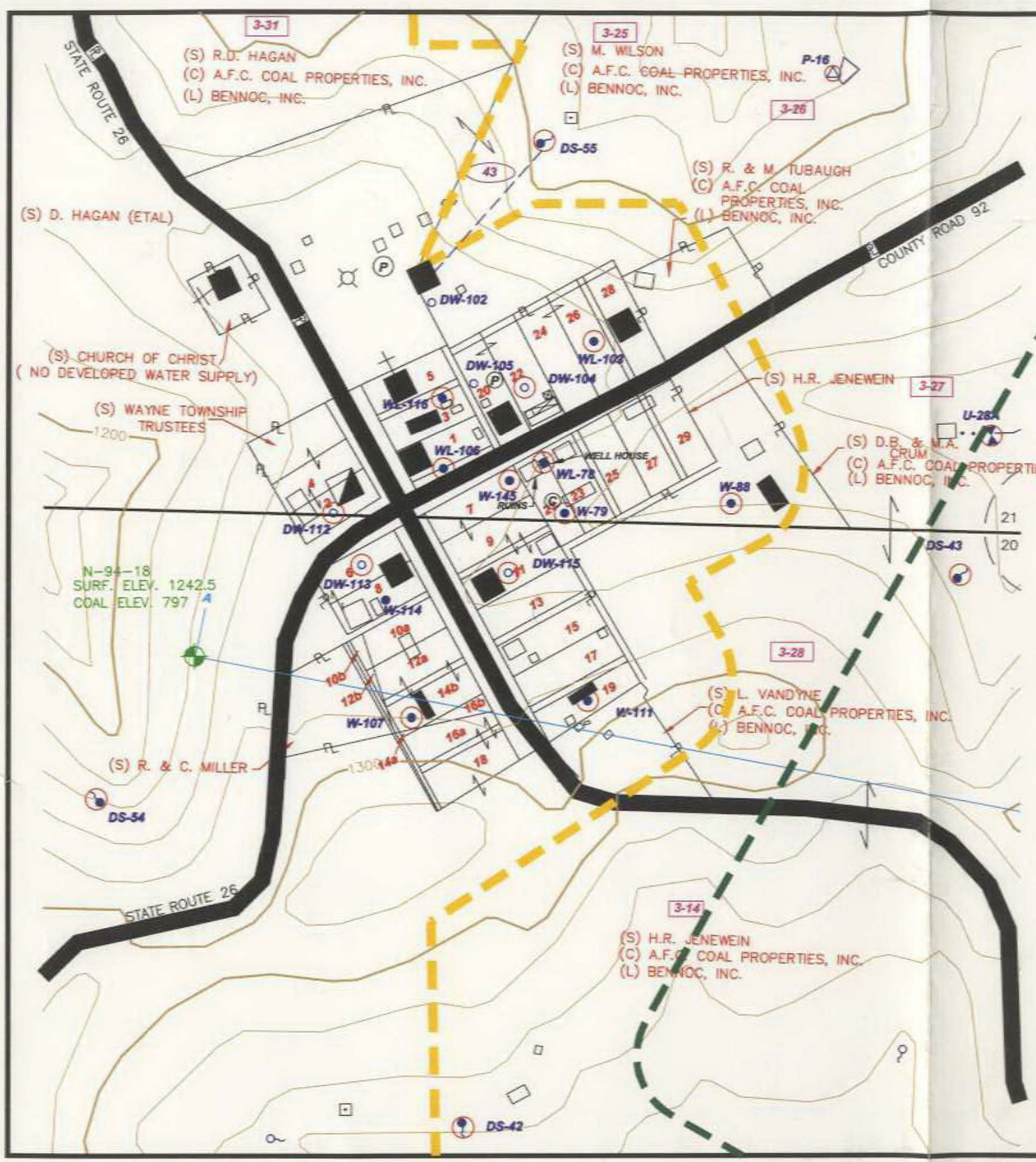
ADDENDUM TO PART 2, PAGE 17, ITEM B(4)

BENNOC, INC.

SUPPLEMENTAL GEOLOGIC DATA

SCALE: 1" = 20'

ATT13.DWG



NEW CASTLE LOTS

LOT 1 – (S) E.V. KERNEN & C.R. LEACH
LOT 2 & 4 – (S) WAYNE TWP. TRUSTEES
LOT 3 – (S) H. & L. MOWERY
LOT 5 – (S) CAPTINA CREEK PRESERVE LTD.
LOTS 6 & 8 – (S) R. & C. MILLER
LOTS 7 & 9 – (S) L. & G. CRIBBEN
LOTS 10a, 12a, 14b & 16b – (S) J. MURRAY
LOTS 10b, 12b & 14a – (S) R. & C. MILLER
LOTS 11 & 13 – (S) L. & G. CRIBBEN
LOTS 15, 17 & 19 – (S) L. VANDYNE
LOT 16a & 18 – (S) H.R. JENEWEIN
LOTS 20 & 22 – (S) J. & B. WARD
LOTS 21, 23, 25, 27 & 29 – (S) H.R. JENEWEIN
LOTS 24, 26 & 28 – (S) R. & M. TUBAUGH

SEE SHEET 1 OF 3 FOR LEGEND

ENLARGEMENT OF NEW CASTLE AREA

ADDENDUM TO ADJACENT AREA APPLICATION & HYDROLOGY MAP SHEET 3 OF 3

BENNOC, INC., MORRISTOWN, OHIO

SECTIONS: 20 & 21, T-6 R-5, WAYNE TOWNSHIP, BELMONT COUNTY, OHIO.

SCALE: 1" = 200'	CONTOUR INTERVAL: 20'
DATE PREPARED: JUNE 1, 2000	DRAWING:NEWCAST.DWG DRAWN BY: SSU
JACK A. HAMILTON & ASSOCIATES, INC. P.O. BOX 471, 342 HIGH STREET FLUSHING, OHIO 43977	DATE REVISED: DATE REVISED: DATE REVISED: DATE REVISED:

AEIC 052832

ANALYSIS OF RETREAT MINING PILLAR STABILITY (ARMPS)

Name of Mine: century

Mining Height (ft)	7.0	Overburden Depth (ft)	468
In-situ Coal Strength (psi)	850	Crosscut Angle (deg)	60.0
Entry Width (ft)	17.0	Crosscut Spacing (ft)	52.0

Entry Spacing (ft)

PILLAR:	1	86.0	PILLAR:	2	86.0	PILLAR:	3	86.0
PILLAR:	4	86.0						

LOADING CONDITION: 1 DEVELOPMENT

ARMPS STABILITY FACTORS

Development Loading: 2.06

ARMPS module build: 5.0.29
Project File: UnTitled
Input Units: (ft) (psi)

[PROJECT TITLE]
AEC CENTURY MINE

[PROJECT DESCRIPTION]
PILLARS IN MURRAY MINING SYSTEM

[DEVELOPMENT GEOMETRY PARAMETERS]
Entry Height.....7 (ft)
Depth of Cover.....530 (ft)
Crosscut Angle.....60 (deg)
Entry Width.....16.6 (ft)
Number of Entries.....5
Crosscut Spacing.....52 (ft)
Center to Center Distance #1.....87 (ft)
Center to Center Distance #2.....87 (ft)
Center to Center Distance #3.....87 (ft)
Center to Center Distance #4.....87 (ft)

[DEFAULT PARAMETERS]
In Situ Coal Strength.....900 (psi)
Unit Weight of Overburden.....162 (pcf)
Breadth of AMZ.....115 (ft)
AMZ set automatically

[RETREAT MINING PARAMETERS]
Loading Condition.....DEVELOPMENT

[ARMPS STABILITY FACTORS]

DEVELOPMENT.....1.99

[DATA ABOUT THE ACTIVE MINING ZONE (AMZ)]

AMZ Width.....348.0 (ft)
AMZ Breadth.....115.0 (ft)
AMZ Area.....40020.0 (ft)*(ft)
Extraction Ratio Within AMZ.....0.49
Development Load on AMZ.....3.44E+09 (lbs)

TOTAL LOADINGS ON AMZ, INCLUDING TRANSFER FROM BARRIERS

LOAD CONDITION	ABUTMENT LOAD (lbs)	LTRANSBAR (lbs)	LTRANSREM (lbs)	TOTAL (lbs)
DEVELOPMENT	0.00E+00	0.00E+00	0.00E+00	3.44E+09

R-Factor for front abutment is the percent of the total front abutment load that is applied to the AMZ.

R-Factor for side abutment is the percent of the total side abutment load that is applied to the barrier pillar (the remainder is applied to the AMZ).

LTRANBAR is the load transferred to the AMZ from the barrier pillar between the side and active gob if the barrier's SF is less than 1.5.

LTRANSREM is the load transferred to the AMZ from the remnant barrier between the side and active gob if the remnant's SF is less than 1.5.

[PILLAR PARAMETERS]

PILLAR	ENTRY CENTER (ft)	MINIMUM DIMENSION (ft)	MAXIMUM DIMENSION (ft)
1	87.00	28.43	81.29
2	87.00	28.43	81.29
3	87.00	28.43	81.29
4	87.00	28.43	81.29

PILLAR	AREA (ft)*(ft)	STRENGTH (psi)	LOAD-BEARING CAPACITY (lbs)
1	2.31E+03	2.32E+03	7.72E+08
2	2.31E+03	2.32E+03	7.72E+08
3	2.31E+03	2.32E+03	7.72E+08
4	2.31E+03	2.32E+03	7.72E+08

TOTAL LOAD-BEARING CAPACITY OF PILLARS WITHIN AMZ: 6.83E+09 (lbs)

To view the distribution of Pillar Load Bearing Capacity
select 'View Plots->Settings->Pillar Load Bearing Capacity'

[BARRIER PILLAR PARAMETERS]
none

[STRESS ON INDIVIDUAL PILLARS WITHIN THE AMZ]

DEVELOPMENT STRESSES.....1167 (psi)

ARMPS module build: 5.0.29
Project File: C:\Program Files\NIOSH\Analysis of Retreat Mining Pillar Stability\CENTURY MMM PIL
Input Units: (ft) (psi)

[PROJECT TITLE]
AEC CENTURY MINE

[PROJECT DESCRIPTION]
PILLARS IN MURRAY MINING SYSTEM - ROOMS

[DEVELOPMENT GEOMETRY PARAMETERS]
Entry Height.....7 (ft)
Depth of Cover.....530 (ft)
Crosscut Angle.....60 (deg)
Entry Width.....16.6 (ft)
Number of Entries.....4
Crosscut Spacing.....120 (ft)
Center to Center Distance #1.....52 (ft)
Center to Center Distance #2.....52 (ft)
Center to Center Distance #3.....52 (ft)

[DEFAULT PARAMETERS]
In Situ Coal Strength.....900 (psi)
Unit Weight of Overburden.....162 (pcf)
Breadth of AMZ.....115 (ft)
AMZ set automatically

[RETREAT MINING PARAMETERS]
Loading Condition.....DEVELOPMENT

[ARMPS STABILITY FACTORS]

DEVELOPMENT.....2.63

[DATA ABOUT THE ACTIVE MINING ZONE (AMZ)]

AMZ Width.....156.0 (ft)
AMZ Breadth.....115.0 (ft)
AMZ Area.....17940.0 (ft)*(ft)
Extraction Ratio Within AMZ.....0.43
Development Load on AMZ.....1.54E+09 (lbs)

TOTAL LOADINGS ON AMZ, INCLUDING TRANSFER FROM BARRIERS

LOAD CONDITION	ABUTMENT LOAD (lbs)	LTRANSBAR (lbs)	LTRANSREM (lbs)	TOTAL (lbs)
DEVELOPMENT	0.00E+00	0.00E+00	0.00E+00	1.54E+09

R-Factor for front abutment is the percent of the total front abutment load that is applied to the AMZ.

R-Factor for side abutment is the percent of the total side abutment load that is applied to the barrier pillar (the remainder is applied to the AMZ).

LTRANBAR is the load transferred to the AMZ from the barrier pillar between the side and active gob if the barrier's SF is less than 1.5.

LTRANSREM is the load transferred to the AMZ from the remnant barrier between the side and active gob if the remnant's SF is less than 1.5.

[PILLAR PARAMETERS]

PILLAR	ENTRY CENTER (ft)	MINIMUM DIMENSION (ft)	MAXIMUM DIMENSION (ft)
1	52.00	35.40	100.83
2	52.00	35.40	100.83
3	52.00	35.40	100.83

PILLAR	AREA (ft)*(ft)	STRENGTH (psi)	LOAD-BEARING CAPACITY (lbs)
1	3.57E+03	2.75E+03	1.41E+09
2	3.57E+03	2.75E+03	1.41E+09
3	3.57E+03	2.75E+03	1.41E+09

TOTAL LOAD-BEARING CAPACITY OF PILLARS WITHIN AMZ: 4.06E+09 (lbs)

To view the distribution of Pillar Load Bearing Capacity
select 'View Plots->Settings->Pillar Load Bearing Capacity'

[BARRIER PILLAR PARAMETERS]
none

[STRESS ON INDIVIDUAL PILLARS WITHIN THE AMZ]

DEVELOPMENT STRESSES.....1042 (psi)

AMERICAN ENERGY CORPORATION
CENTURY MINE
MSHA ID NO. 33-01070
DMRM PERMIT NO. D-0425

EVALUATION OF PILLARS IN MURRAY MINING METHOD MAINS AND ROOMS
HOLLAND FORMULA

STABLE	SF>1.5
MARGINAL	1.3<SF<1.5
UNSTABLE	SF<1.3

	PILLAR	LENGTH FT	WIDTH FT	(PW) LEAST SIDE	(D) COVER	PILLAR AREA SQ FT	TRIB AREA SQ FT	(ER) EXTR RATIO	PILLAR STRENGTH PSI	PILLAR LOAD PSI	PILLAR STABILITY FACTOR	PILLAR CONDITION (STABILITY)
MAINS	A	83	28	28	467.5	2324	4545	49%	1700	1029	1.7	STABLE
ROOMS	B	103	28	28	467.5	2884	5445	47%	1700	993	1.7	STABLE

DESIGN PARAMETERS	ENTRY CENTERS (FT)	CROSSCUT CENTERS (FT)	PILLAR LENGTH (FT)	PILLAR WIDTH (FT)	ENTRY W (FT)	DEPTH OF COVER (FT)
MAIN PILLARS	86	52	69	35	17	530
ROOM PILLARS	120	52	103	35	17	530

OB LOAD	1.125 PSI/FT	(L)	PILLAR STRENGTH = PS X SQRT(PW/H)
PILLAR STRENGTH	850 PSI	(PS)	PILLAR LOAD = D X L / (1-ER)
MINING HEIGHT	7 FT	(H)	PILLAR STABILITY FACTOR = PILLAR STRENGTH/PILLAR LOAD

STATE OF OHIO
DAVID L. BARTSCH
E-50596
REGISTERED PROFESSIONAL ENGINEER

REGISTERED PROFESSIONAL ENGINEER

AEC 05288

ADDENDUM TO PART 3, PAGE 28, K(4)
AMERICAN ENERGY CORPORATION – CENTURY MINE
PERMIT D-0425

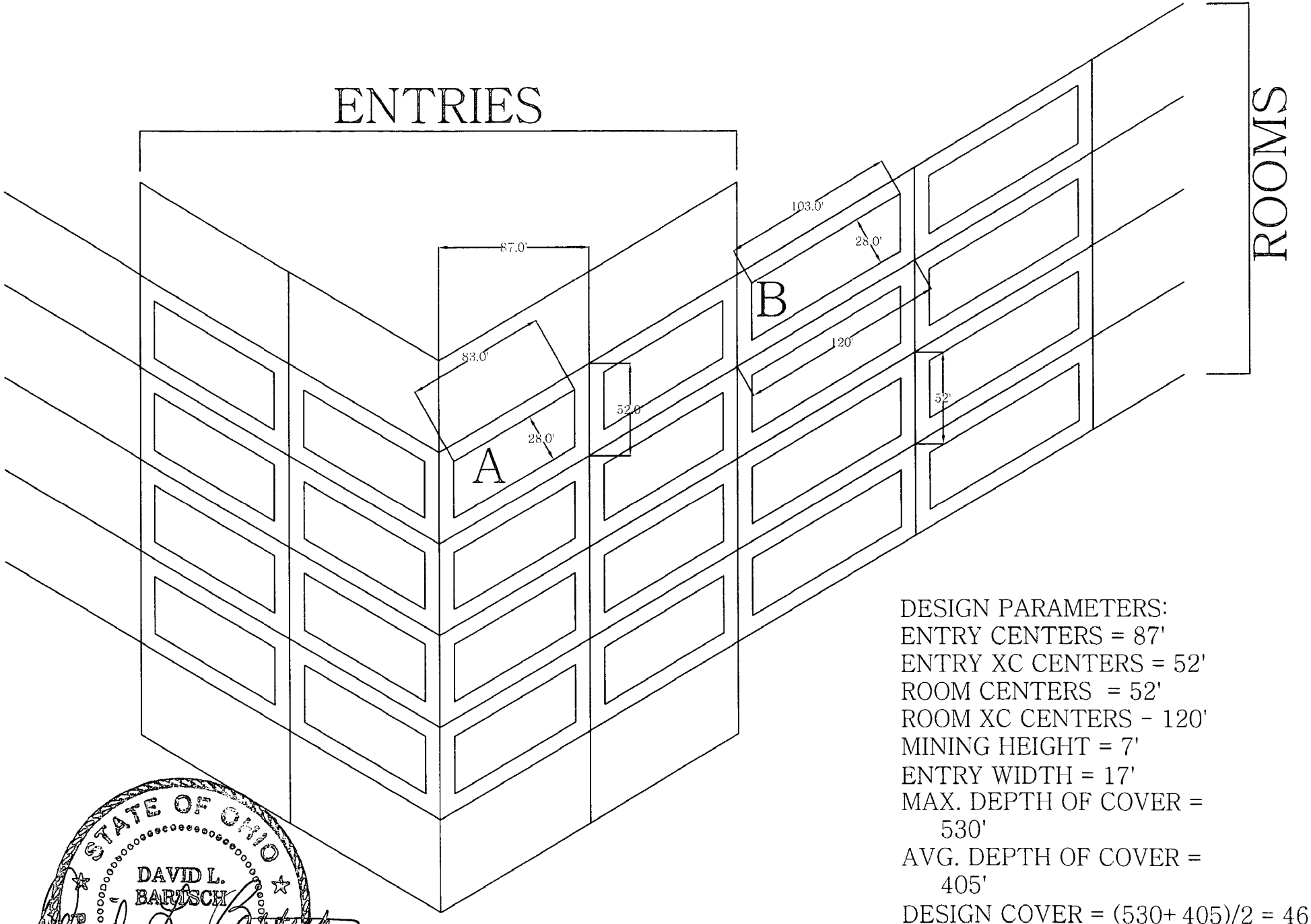
ENGINEERING PROPERTIES FOR MAIN DEVELOPMENT ENTRIES AND PARTIAL RECOVERY ROOM SECTIONS

The Century Mine intends to use the Murray Mining System to mine areas where longwall mining was not possible. This system is a partial coal recovery system, where pillars will remain to support the overburden and prevent or minimize subsidence. The main entries are to be driven on 87 ft centers with crosscuts to be driven at 60-degree angles on 52 ft centers. Entry and crosscut widths are projected at 17 ft. The pillars in the mains are 83 ft x 28 ft in size. Rooms are to be driven on 52 ft centers, with room crosscuts to be driven on 120 ft centers. The resulting pillars in the rooms are 103 ft x 28 ft. The mean depth of cover over the area where the Murray Mining Method will be used is 405 ft. The maximum cover over this area is 530 ft. For design considerations, the depth of cover to be used is an average of the maximum cover and the mean cover (467.5 ft). A map is enclosed that shows the design parameters.

At the adjacent Powhatan No. 6 Mine (Permit D-0360), where mining has been conducted for 35 years, pillars are designed using data developed by Professor Charles Holland and used by Mr. Lawrence R. Artler, who was the Chief Engineer for the North American Coal Corporation (operator of the Powhatan No. 6 Mine since it first began in 1972). According to Professor Holland, the coal strength was determined to be 850 psi, based on laboratory tests. Today, mines do not have the advantage of Professor Holland's work, and a value of 900 psi is typically used for Pittsburgh (No. 8 Seam) coal. Mr. Artler always used this lower value for coal strength, as it was developed from Pittsburgh Seam mines in the local area. This value continues in use today, as the results yield 1.) Typically more conservative stability factors; and 2.) Values that correspond well with the experience gained with pillar stability at this mine.

Pillars are designed at this mine using the Holland formula that examines the tributary load applied to the pillars. The experience at the Powhatan No. 6 Mine shows that pillars with stability factors of less than 1.3 are not stable; those with stability factors from 1.3 to 1.5 are marginal (stable in the short-term); and those with stability factors of 1.5 and greater are stable in the long term.

Pillars in the area of the Murray Mining System have stability factors of 1.7, indicating that they will be stable over the long-term. Pillar stability factor calculations are shown.

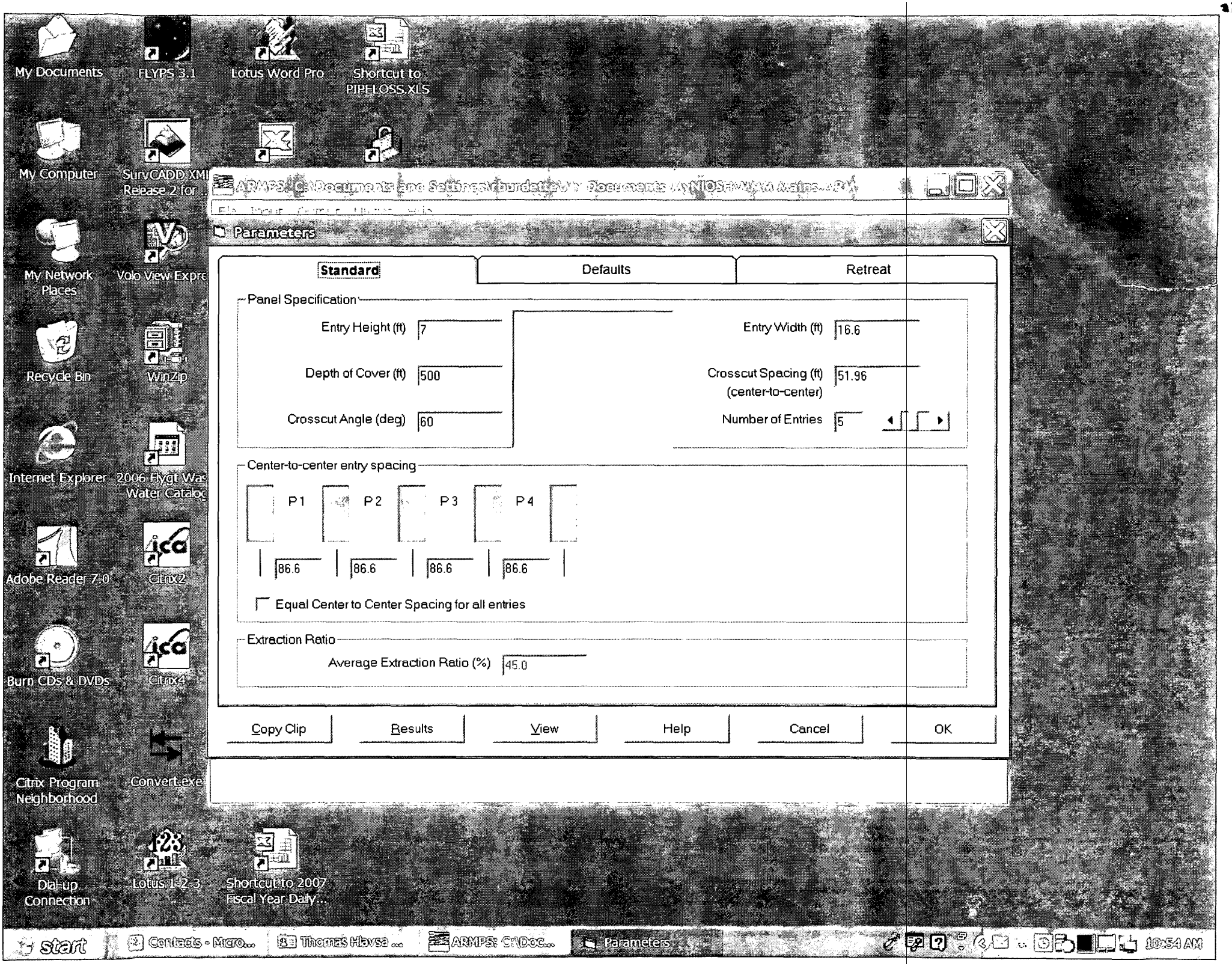


DESIGN PARAMETERS:
ENTRY CENTERS = 87'
ENTRY XC CENTERS = 52'
ROOM CENTERS = 52'
ROOM XC CENTERS - 120'
MINING HEIGHT = 7'
ENTRY WIDTH = 17'
MAX. DEPTH OF COVER = 530'
AVG. DEPTH OF COVER = 405'
DESIGN COVER = (530+ 405)/2 = 467.5'

STATE OF OHIO
DAVID L. BARTSCH
E-50396
REGISTERED
PROFESSIONAL ENGINEER

AMERICAN ENERGY CORPORATION
CENTURY MINE - PERMIT D-0425
PILLAR CONFIGURATION - MURRAY MINING SYSTEM
SCALE: AS NOTED

AEC 05290


Parameters
Standard
Defaults
Retreat
Panel Specification
Entry Height (ft) 7
Depth of Cover (ft) 500
Crosscut Angle (deg) 60
Entry Width (ft) 16.6
Crosscut Spacing (ft) (center-to-center) 51.96
Number of Entries 5
Center-to-center entry spacing
P1
P2
P3
P4
86.6
86.6
86.6
86.6
Equal Center to Center Spacing for all entries
Extraction Ratio
Average Extraction Ratio (%) 45.0
Copy Clip
Results
View
Help
Cancel
OK

AEC 05291

ARMPS module build: 5.0.43
Project File: C:\Documents and Settings\rburdette\My Documents\MyNIOSH\MMM Mains.ARM
Input Units: (ft) (psi)

[PROJECT TITLE]
MMM Mains

[PROJECT DESCRIPTION]

[DEVELOPMENT GEOMETRY PARAMETERS]
Entry Height.....7 (ft)
Depth of Cover.....500 (ft)
Crosscut Angle.....60 (deg)
Entry Width.....16.6225 (ft)
Number of Entries.....5
Crosscut Spacing.....51.96 (ft)
Center to Center Distance #1.....86.6 (ft)
Center to Center Distance #2.....86.6 (ft)
Center to Center Distance #3.....86.6 (ft)
Center to Center Distance #4.....86.6 (ft)

[DEFAULT PARAMETERS]
In Situ Coal Strength.....900 (psi)
Unit Weight of Overburden.....162 (pcf)
Breadth of AMZ.....111 (ft)
AMZ set automatically

[RETREAT MINING PARAMETERS]
Loading Condition.....DEVELOPMENT

[ARMPS STABILITY FACTORS]

DEVELOPMENT.....2.10

[DATA ABOUT THE ACTIVE MINING ZONE (AMZ)]

AMZ Width.....346.4 (ft)
AMZ Breadth.....111.0 (ft)
AMZ Area.....38450.4 (ft)*(ft)
Extraction Ratio Within AMZ.....0.49
Development Load on AMZ.....1.56E+06 (tons)

TOTAL LOADINGS ON AMZ, INCLUDING TRANSFER FROM BARRIERS

LOAD CONDITION	ABUTMENT LOAD (tons)	LTRANSBAR (tons)	LTRANSREM (tons)	TOTAL (tons)
DEVELOPMENT	0.00E+00	0.00E+00	0.00E+00	1.56E+06

R-Factor for front abutment is the percent of the total front abutment load that is applied to the AMZ.

R-Factor for side abutment is the percent of the total side abutment load that is applied to the barrier pillar (the remainder is applied to the AMZ).

LTRANBAR is the load transferred to the AMZ from the barrier pillar between the side and active gob if the barrier's SF is less than 1.5.

LTRANSREM is the load transferred to the AMZ from the remnant barrier between the side and active gob if the remnant's SF is less than 1.5.

[PILLAR PARAMETERS]

PILLAR	ENTRY CENTER (ft)	MINIMUM DIMENSION (ft)	MAXIMUM DIMENSION (ft)
1	86.60	28.38	80.80
2	86.60	28.38	80.80
3	86.60	28.38	80.80
4	86.60	28.38	80.80

PILLAR	AREA (ft)*(ft)	STRENGTH (psi)	LOAD-BEARING CAPACITY (tons)
1	2.29E+03	2.32E+03	3.82E+05
2	2.29E+03	2.32E+03	3.82E+05
3	2.29E+03	2.32E+03	3.82E+05
4	2.29E+03	2.32E+03	3.82E+05

TOTAL LOAD-BEARING CAPACITY OF PILLARS WITHIN AMZ: 3.27E+06 (tons)

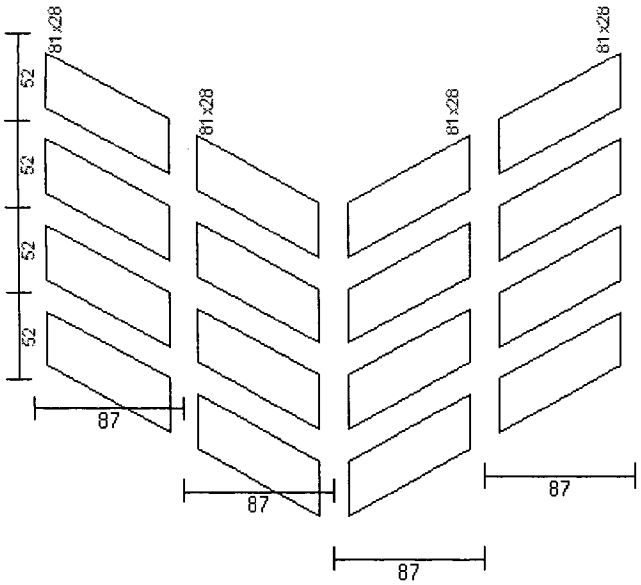
To view the distribution of Pillar Load Bearing Capacity
select 'View Plots->Settings->Pillar Load Bearing Capacity'

[BARRIER PILLAR PARAMETERS]
none

[STRESS ON INDIVIDUAL PILLARS WITHIN THE AMZ]

DEVELOPMENT STRESSES.....1104 (psi)

ARMPS: Actual Pillar Dimensions (width*length, ft). Entries shown from left to right.



9/88

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

PLICANT BENNOC, INC. (D-0425-1)

	Identification No. of Sampling Station from Hydrology Map	D-1	D-1	D-1	D-1	D-1	D-1
2	Identification Number 98-	08079	09284	10121	11247	12192	99-02150
3	High (H)/Low (L) Designation (if applicable)	SIX MONTH SAMPLING					
4	Surface Elevation for Sampling Station (msl)	912	912	912	912	912	912
5	Depth of Well Below Land Surface (feet)	---	---	---	---	---	---
6	Static Water Level of Well Below Land Surface (feet)	---	---	---	---	---	---
7	Flow for Spring and Stream (gpm or cfs)	0.24 CFS	0.10 CFS	0.22 CFS	0.59 CFS	0.71 CFS	4.8 CFS
8	Date Above Measurements Made	8-8-98	9-24-98	10-6-98	11-12-98	12-9-98	1-30-99
9	Aquifer/Zone Identification For Well/Spring	---	---	---	---	---	---
10	pH (Standard Units)	7.34	8.30	8.50	7.80	8.70	8.20
	Total Acidity (mg/l CaCO3)	5.60	0.00	0.00	11.0	0.00	<1.0
12	Total Alkalinity (mg/l CaCO3)	63.0	160.0	150.0	150.0	150.0	54.0
13	Specific Conductivity (umhos/cm at 25° C)	190.0	400.0	400.0	400.0	420.0	240.0
14	Total Dissolved Solids (mg/l)	---	---	---	---	---	---
15	Total Manganese (mg/l)	0.60	<0.02	0.02	<0.02	<0.02	<0.02
16	Total Sulfates (mg/l)	8.40	62.0	65.0	70.0	70.0	41.0
17	Total Iron (mg/l)	0.87	0.08	0.05	0.11	<0.05	<0.05
18	Total Suspended Solids (mg/l)	9.50	<1.0	2.0	<1.0	<1.0	<1.0
19	Total Hardness (mg/l as CaCO3)	70.0	200.0	190.0	190.0	210.0	90.0
20	Nitrates	0.19	0.11	<0.09	<0.09	<0.09	0.24
21	Date Sampled for Analysis	8-8-98	9-24-98	10-6-98	11-12-98	12-9-98	1-30-99
22	Date Last Precipitation Event Occurred	7-30-98	9-22-98	10-4-98	11-10-98	12-9-98	1-23-99

Laboratory Name TRA-DET, INC.
Address P.O. BOX 2019 City WHEELING
State WEST VIRGINIA Zip 26003-0219

NOTE: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A a statement giving the reasons why the information is unobtainable.
TE: For each sample provide data for either item 13 or 14.