

ROUTE SLIP FOR CORRECTION/CHANGE OF EXISTING PERMITS

County: Belmont Township: Pultney Permit : 2-0970-00

Person Receiving Request: Patty Nicklaus Date: 02/23/2016

Owner/Operator: XTO Energy Inc.

Lease Name: Wassmann Unit B Well No: 5H

CHANGES:

 Change in acreage/drill unit and or/ As Drilled Plat for a (x) Horizontal Drill () Directional Drill

 Unit Configuration only Plat Information: New Plat Submitted...Yes x No
Fee Submitted.....Yes No x
Check #

 Change in type of tool ✓ Correction to Footage Information:
Description: Surface ✓ Target ✓ Take-Point

 Change in Formation/Total Depth ✓ Correction To X, Y Coordinates
Description: Surface ✓ Target ✓ Take-Point

 Change in Lease Name/Well Number

 Change to Casing Program x Other (describe): Reduced Spacing Request from
Take-point to Unit Boundary

CORRECTION TO BE MADE:

LTP: 3823'SL E' 2288' WL, SEC 4, PULTNEY TWP
X: 2,479,641
Y: 729,411
TGT: 328'SL E' 833' WL, SEC 33, MEAD TWP.
X: 2,483,247
Y: 721,266

CHANGES AUTHORIZED BY: (Geologist Initials): SD Date: 3/31/2016
DATA ENTERED INTO COMPUTER BY (Initials): DN Date: 3-31-16

Reissue Permit: Yes ✓ No Add Change/Correction to Permit List: ✓ Yes No

Date Correction Needed: To Be Mailed: Faxed: E-mailed:

Fax Number: E-mail address:

Additional Comments:

Memorandum

To: Permit File-API 34-013-20970-00-00

SO for RJS
From: Richard J. Simmers, Chief

Date: March 31, 2016

Subject: Variance Request-XTO Energy, Inc
Wassmann Unit B 5H, Belmont County, Pultney and Mead Townships

Pursuant to Section 1501:9-1-04 (E)(2) of the OAC, I hereby grant the variance request to the spacing requirements of Sections 1501:9-1-04 (C)(4)(c) of the OAC to XTO Energy Inc. Approval of this variance reduces the setback distance at the heel and toe portions of this horizontal shale well from 500 feet to no less than 150 feet to the unit boundary.

In the attached documents, the applicant has demonstrated that the approval of the variance will protect correlative rights and promote conservation by permitting oil and gas to be produced that could not otherwise be produced.

An "as drilled" survey plat showing the location of the perforations at the heel and toe sections of the well shall be submitted within 60 days of perforating the well.

c: Steve Opritza, Geologist

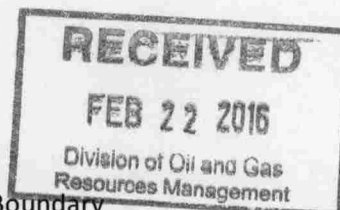


XTO Energy Inc.
190 Thorn Hill Road
Warrendale PA 15086
(724) 772-3500
(724) 772-3505 Fax

February 18, 2016

Ohio Dept of Natural Resources
Division of Oil & Gas Resources Management
Attn: Mr. Steve Opritza
2045 Morse Road, Building F-2
Columbus, OH 43229-6693

Re: Wassmann Unit B 5H (34-013-2-0970-00-00)
Reduced Spacing Request from Takepoint to Unit Boundary
Pultney Township, Belmont County



Dear Mr. Opritza,

XTO Energy, Inc. respectfully requests a variance to reduce spacing from take point to unit boundary for the Wassmann Unit B 5H (34-013-2-0970-00-00) located in Pultney Township, Belmont County. In accordance with OAC 1501.9-1-04(E)(2) XTO requests reduced spacing from the toe/last take point to a minimum distance of 156 feet of the horizontal wellbore to unit boundary. This reduction in spacing will still protect correlative rights while enabling XTO to more efficiently recover resources that would otherwise be left unrecovered. Please find enclosed a revised Wassmann Unit B 5H plat for your review.

In support of this request, please find attached a copy of Antero's Decreased Setback to Unit Boundary for Take Points at Toe & Heel request submitted May 9, 2014, applied to permit numbers 34121244830000, 34121244840000, 34121244880000 and 34121244890000, approved through your office on May 22nd, 2014. Antero's request demonstrates through FMI and microseismic that there is less than 110' of effective fracture growth along the minimum stress direction. Using the same data, Antero sought a setback of 350' along the maximum stress direction, a request which was approved. It is XTO's opinion, consistent with the information made public by Antero, that the current setback distance of 500' for the take points to the unit boundary will leave substantial reserves undeveloped. Reducing the take point setbacks will improve well economics; allow access to reserves that would otherwise be left behind within the proposed drilling unit, and protect correlative rights. As such, XTO requests a reduced spacing "not less than" distance calculated by applying the previously approved Antero effective fracture ellipse, oriented in the direction of maximum stress, and located along the wellbore such that ellipse is wholly positioned within unit boundaries.

Should you have any questions concerning this request, please feel free to contact me at (724) 772-8715.

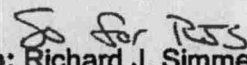
Sincerely,
XTO ENERGY, INC.

Melissa Breitenbach
Regulatory Coordinator



Memorandum

To: Permit File-API 34121244830000
API 34121244840000
API 34121244880000
API 34121244890000
APATT024624


From: Richard J. Simmers, Chief

Date: May 22, 2014

Subject: Variance Request-Antero Resources Corp
Diamond and Mahoney Units, 1H, 2H, 3H and 1H, 2H Wells, Noble County, Beaver
Township

Pursuant to Section 1501:9-1-04 (E)(2) of the OAC, I hereby grant the variance request to the spacing requirements of Sections 1501:9-1-04 (C)(4)(c) of the OAC to Antero Resources Corp. Approval of this variance reduces the setback distances at the heel and toe portions of this horizontal shale well from 500 feet to no less than 150 feet to the unit boundary.

In the attached documents, the applicant has demonstrated that the approval of the variance will protect correlative rights and promote conservation by permitting oil and gas to be produced that could not otherwise be produced.

An "as drilled" survey plat showing the location of the perforations at the heel and toe sections of the well shall be submitted within 60 days of perforating the well.

c: Steve Opritza, Geologist

May 9, 2014



Ohio Department of Natural Resources
Division of Oil & Gas Resources Management
Attn: Richard J. Simmers, Chief
2045 Morse Road, Building F2
Columbus, OH 43229

Antero Resources
1615 Wynkoop Street
Denver, CO 80202
Office 303.357.7310
Fax 303.357.7315

RE: Request for Variance – decreased setback to unit boundary for take points at toe & heel
Mahoney Unit 1H (API# 34-121-2-4484-00-00)
Mahoney Unit 2H (API# 34-121-2-4483-00-00)
Beaver Township, Noble County, OH

Mr. Simmers:

Pursuant to OAC 1501:9-1-04(E)(2), Antero Resources Corporation ("Antero") formally requests a variance to allow a decreased setback at the unit boundary for take points at the *toe* and the *heel* of the Mahoney Unit 1H and 2H horizontal wells (the "Wells"). Antero herein proposes take points to be as close as, but not closer than 150 feet from a unit boundary line that is approximately parallel to maximum present day stress direction and take points to be as close as, but not closer than 350 feet from a unit boundary line that is *not* approximately parallel to the maximum present day stress direction. Accordingly, Antero is requesting a take point setback of 150 feet at both the toe and heel of the Wells, as depicted on the attached individual Well Survey Plats.

Based on knowledge of the present day stress directions acquired through microseismic mapping and formation micro-image logging, it is Antero's professional opinion that the proposed 150 foot heel setback and 150 foot toe setback could more efficiently develop the Point Pleasant resource within the proposed unit boundary, by minimizing waste, and still be protective of correlative rights.

In support of this variance request, Antero has supplied technical justification materials as presented at the November 12, 2013 Technical Advisory Council hearing and included herein as Exhibit "A". These materials include, but are not limited to:

- Maximum present day stress direction information (hydraulic fracture direction)
- A summary of the Wayne pad microseismic mapping project performed in Noble County, OH
- A generalized Point Pleasant Formation drainage ellipse diagram derived from microseismic data

If you have any questions or need further information, please feel free to contact me at (303) 357-7323 or email at amihalcin@anteroresources.com.

Sincerely,

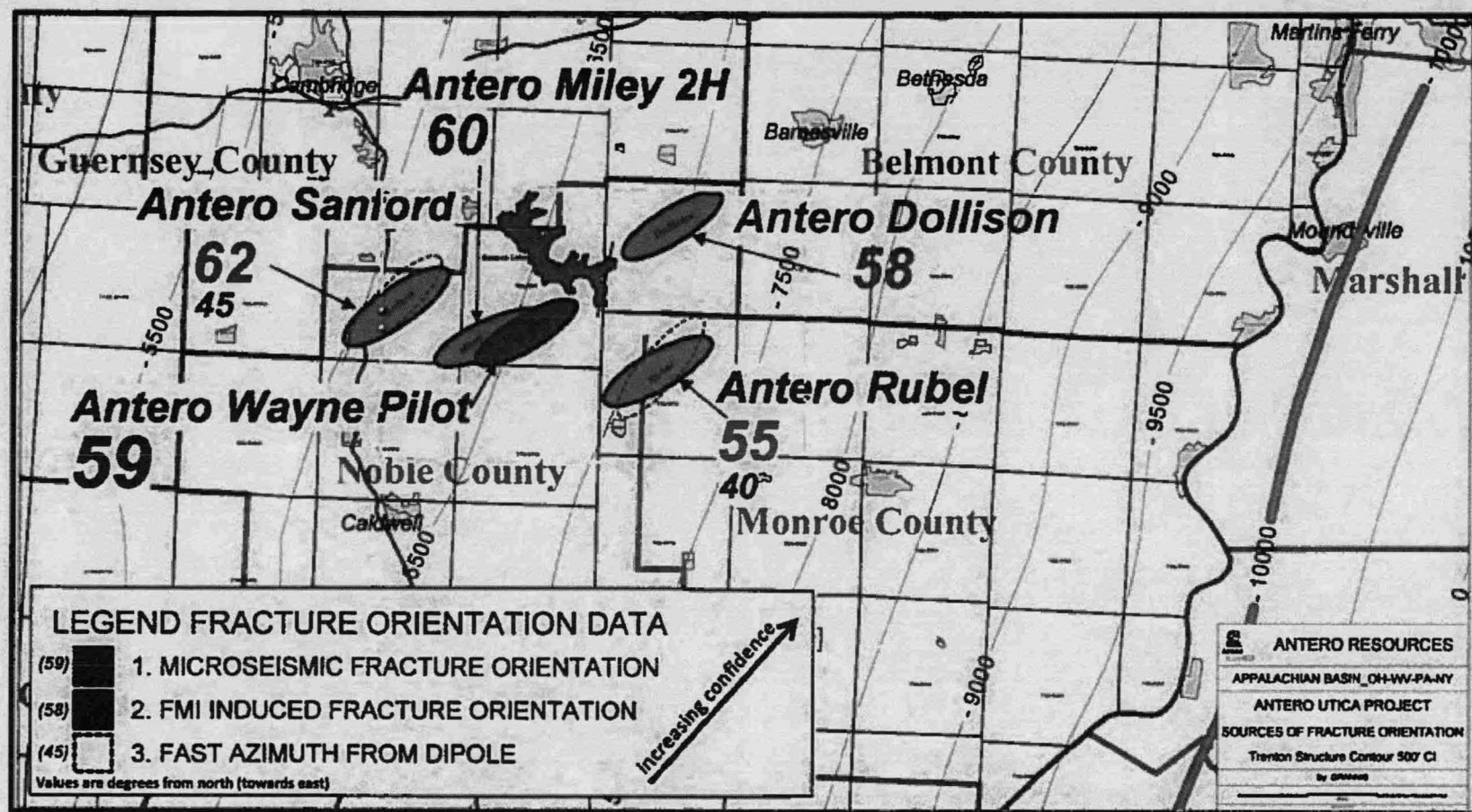
A handwritten signature in dark ink, appearing to read "Ashlie Mihalcin", is written over a horizontal line.

Ashlie Mihalcin
Permit Representative
Antero Resources Corporation

Enclosures



Maximum Present Day Stress Direction Data



average across **Antero Resources** acreage = **N58°E**

(approx. 200 sq. mile area in Guernsey, Noble, and Monroe Counties – yellow box)

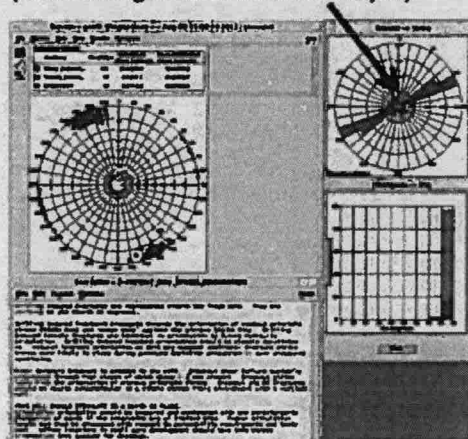
Exhibit A - Sheet 1



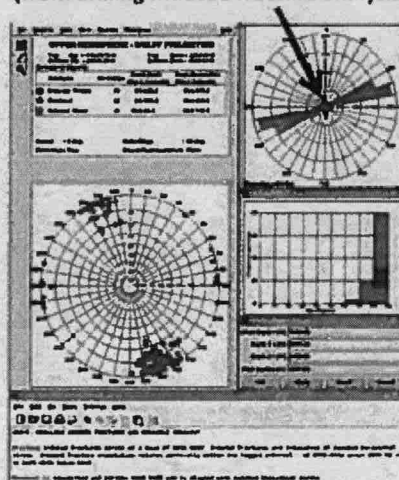
Maximum Present Day Stress Direction Data

FMI = Formation Micro Imaging Tool (Schlumberger)

Antero Resources: Sanford Unit 1H
maximum principle stress direction: N62°E
(from drilling induced fracture analysis)

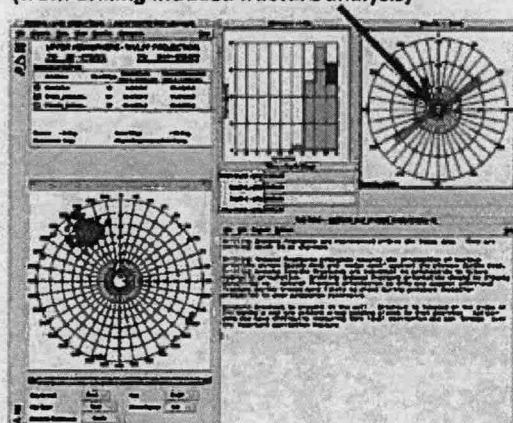


Antero Resources: Miley Unit 2H
maximum principle stress direction: N60°E
(from drilling induced fracture analysis)



****Hydraulic fracture orientation
is equivalent to drilling induced
fracture orientation**

Antero Resources: ET Rubel Unit 1H
maximum principle stress direction: N55°E
(from drilling induced fracture analysis)



Antero Resources: Dollison Unit 2H
maximum principle stress direction: N58°E
(from drilling induced fracture analysis)

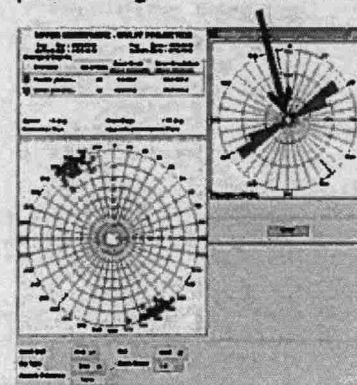


Exhibit A - Sheet 2



Wayne Pad Microseismic Mapping Project

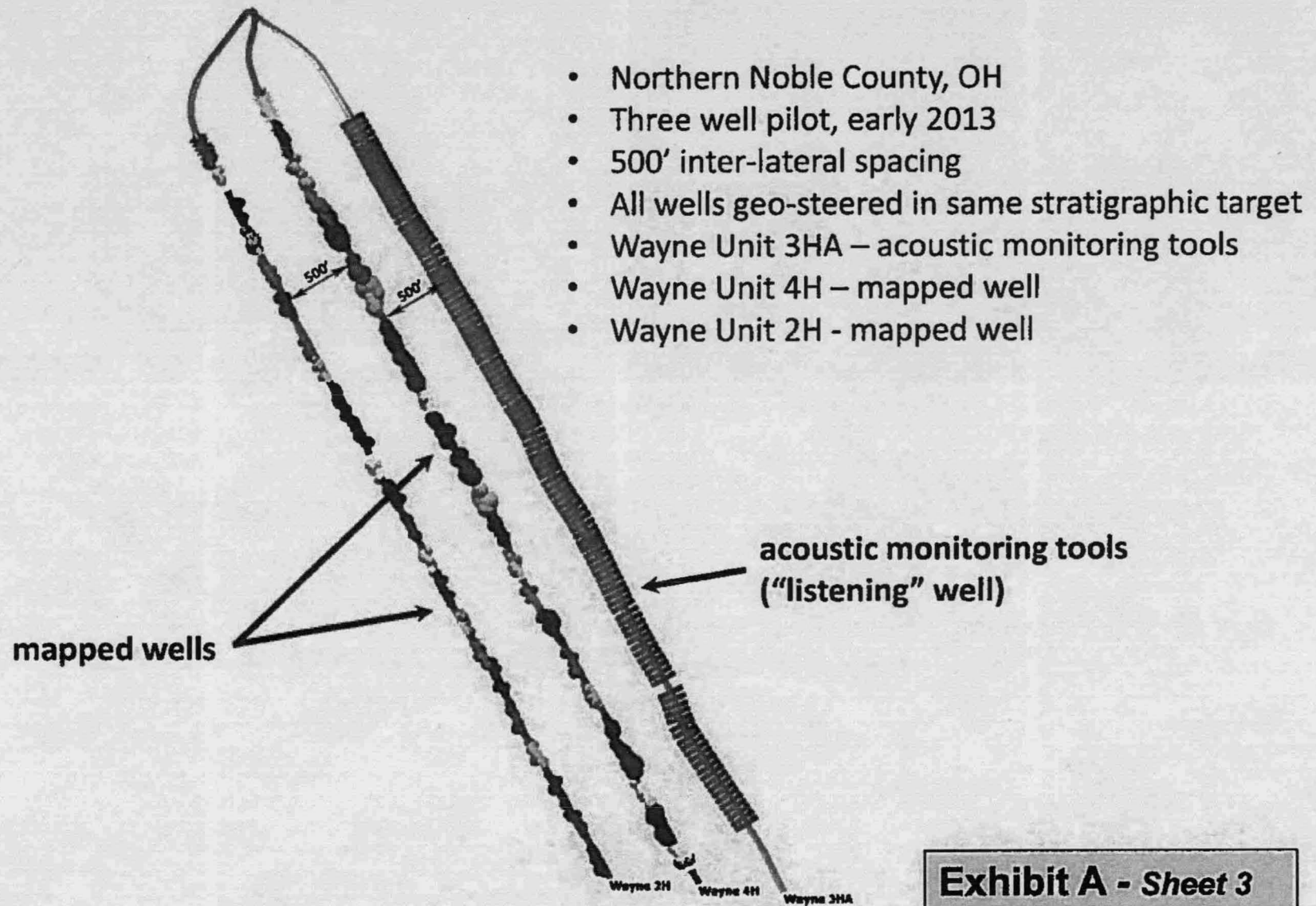


Exhibit A - Sheet 3



Wayne Pad Microseismic Mapping Project

All mapped
events



High confidence
stages only

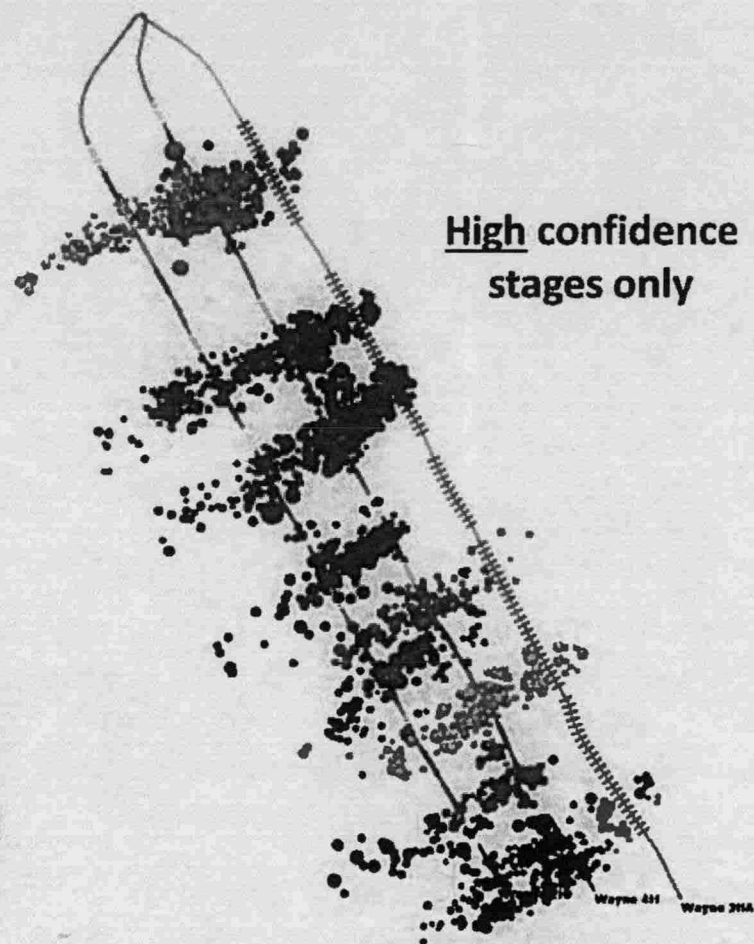


Exhibit A - Sheet 4



Wayne Pad Microseismic Mapping Project

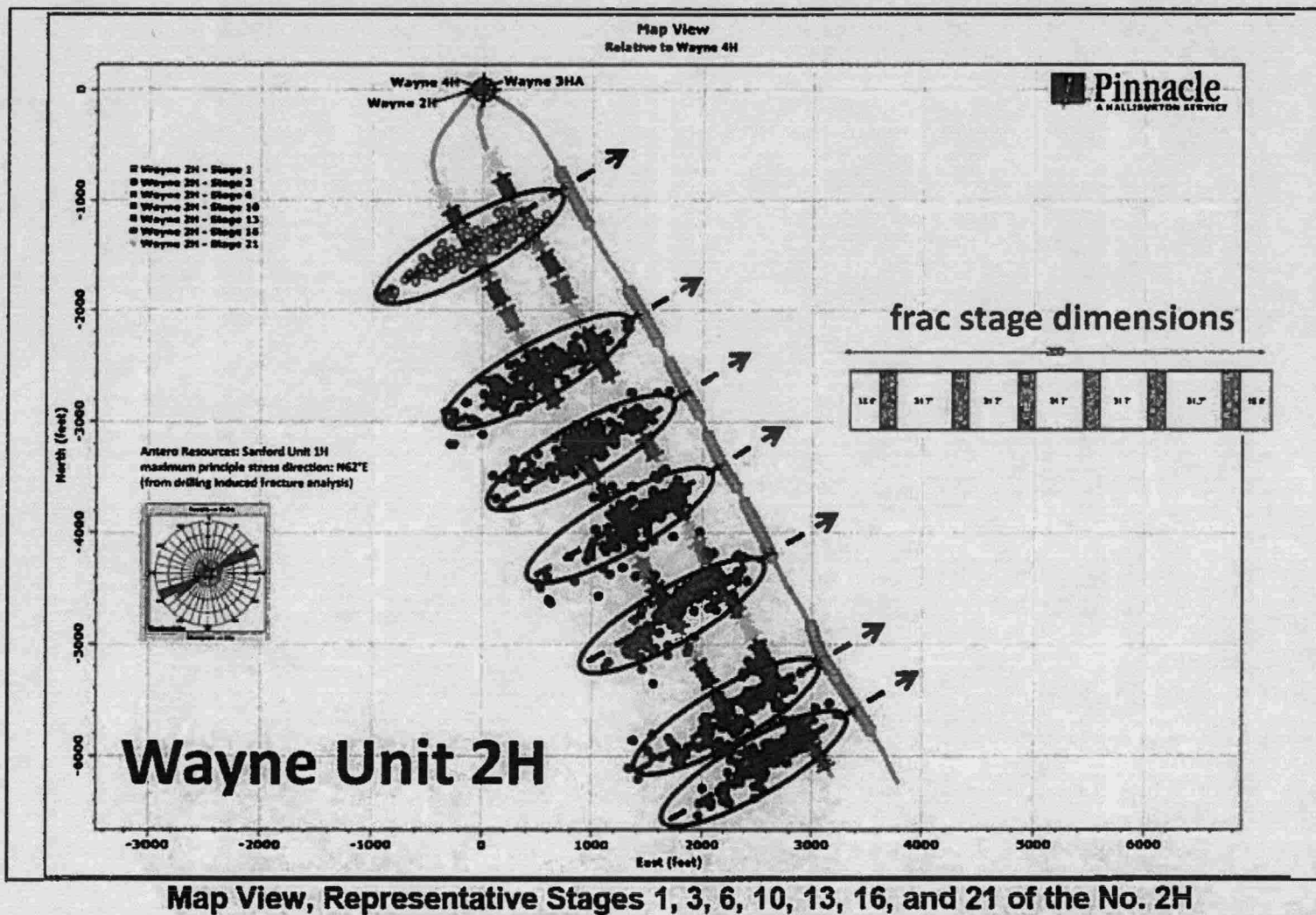


Exhibit A - Sheet 5



Wayne Pad Microseismic Mapping Project

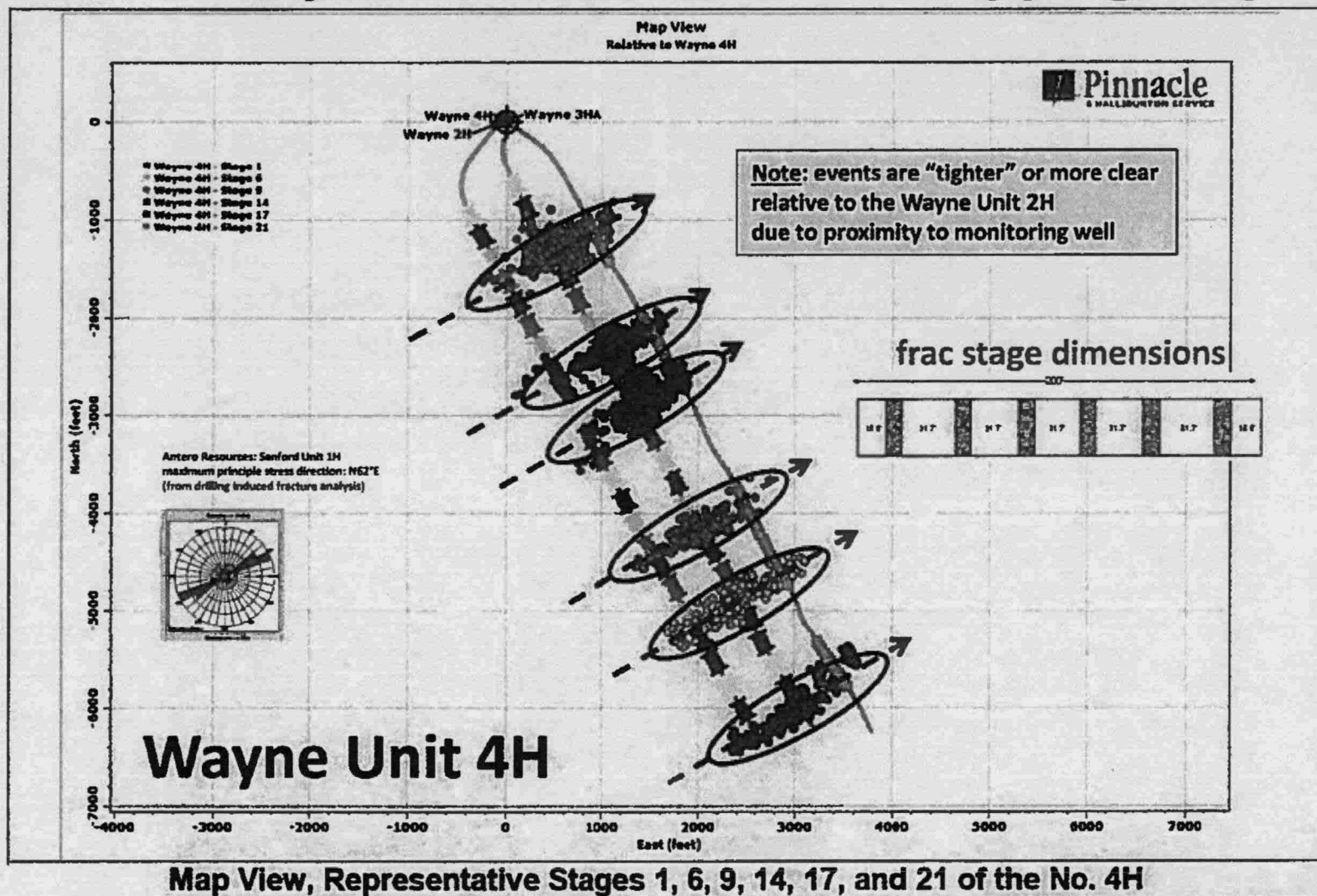


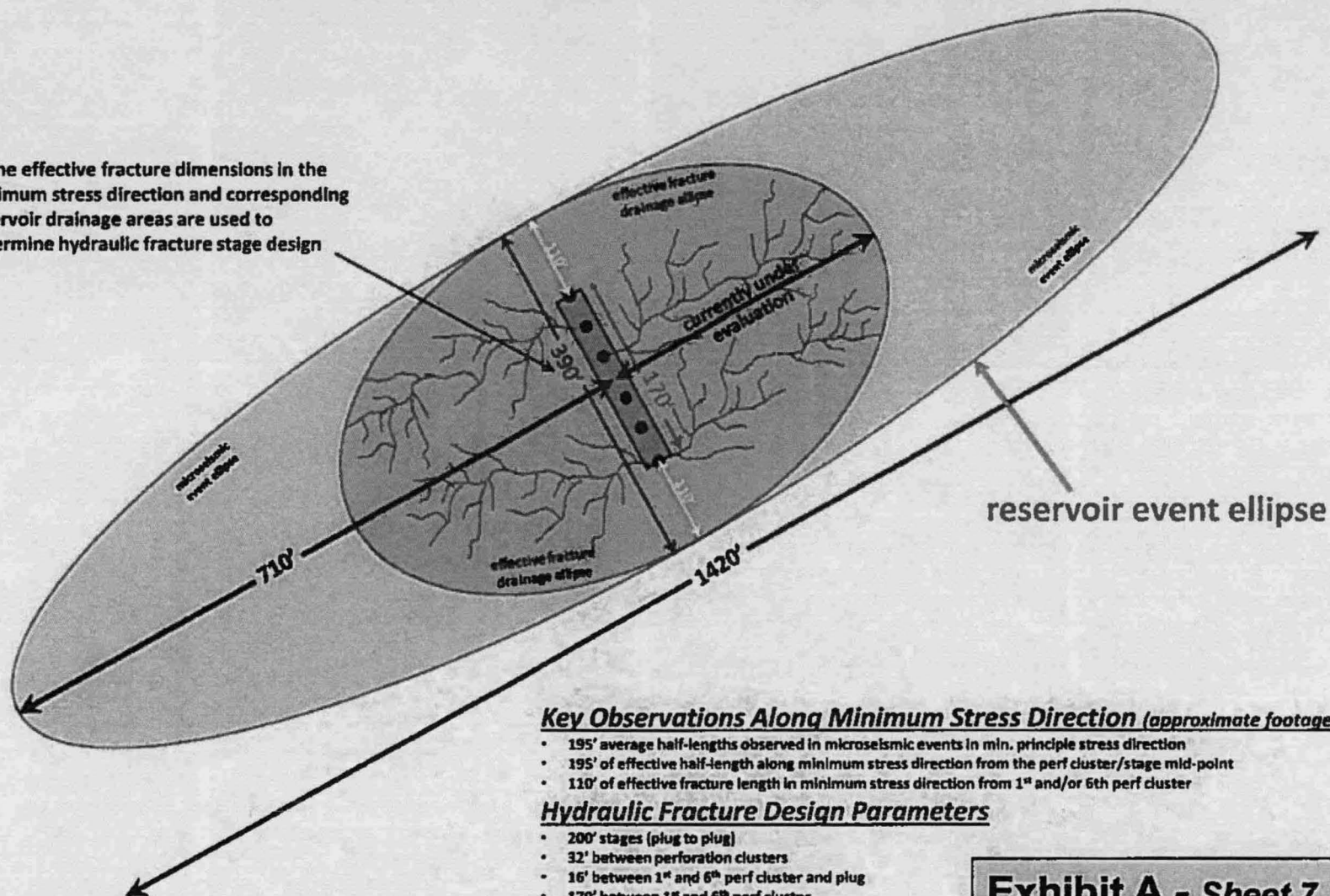
Exhibit A - Sheet 6



Wayne Pad Microseismic Mapping Project

Antero Interpretation of Microseismic Mapping

**The effective fracture dimensions in the minimum stress direction and corresponding reservoir drainage areas are used to determine hydraulic fracture stage design



Key Observations Along Minimum Stress Direction (approximate footages):

- 195' average half-lengths observed in microseismic events in min. principle stress direction
- 195' of effective half-length along minimum stress direction from the perf cluster/stage mid-point
- 110' of effective fracture length in minimum stress direction from 1st and/or 6th perf cluster

Hydraulic Fracture Design Parameters

- 200' stages (plug to plug)
- 32' between perforation clusters
- 16' between 1st and 6th perf cluster and plug
- 170' between 1st and 6th perf cluster

Exhibit A - Sheet 7



Bypassed Resources

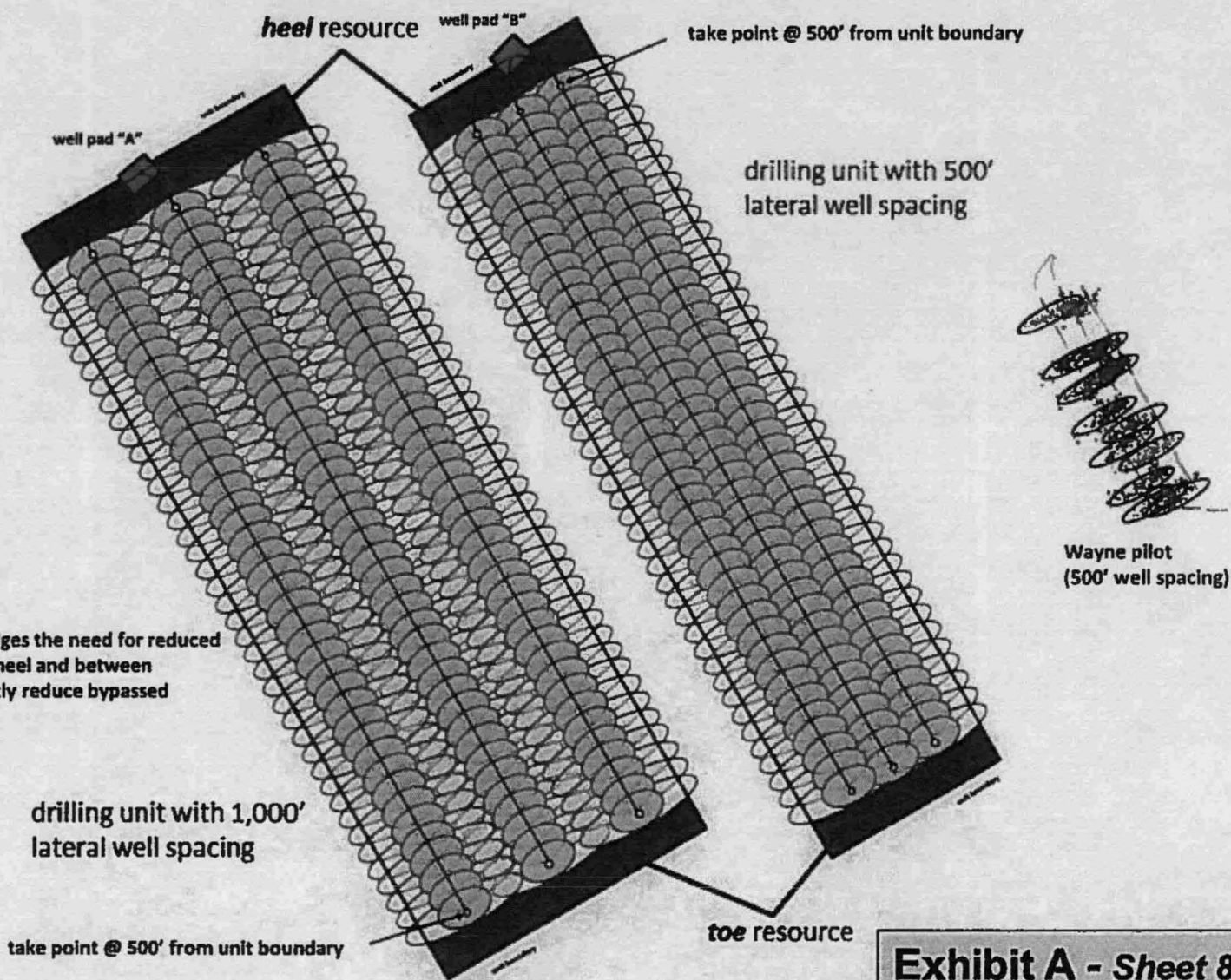


Exhibit A - Sheet 8