



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS MANAGEMENT

WELL LOCATION PLAT

PAGE 1 Surface Location

DEP USE ONLY	Auth ID: CC 959856	FF
	Permit #: 003-22240	3-7-13
	Project #:	DP

☐ Denotes location of top of well on topo map.

Well is located on topo map 5,190 feet south of latitude 40° 15' 00"

True Latitude: NORTH
40° 14' 09.00"

True Longitude: WEST
79° 54' 45.00"

Horizontal Coordinate System: NAD 83

NOTE:
THE PURPOSE OF THIS PLAT IS FOR THE LOCATION OF A PROPOSED GAS WELL AND DOES NOT REPRESENT A CLOSED BOUNDARY SURVEY. PROPERTY LINES AND OWNERS WERE OBTAINED FROM VARIOUS FIELD EVIDENCE, TAX RECORDS, AND AERIAL MAPPING.

NO STRUCTURES EXIST WITHIN 500 FEET OF PROPOSED WELL LOCATION.

THERE ARE NO COAL MINES WITHIN 1000 FEET OF PROPOSED WELL LOCATION.

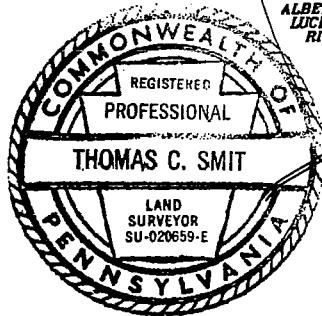
THE EQUITRANS, LP. BUNOLA STORAGE BOUNDARY LIES WITHIN THE 3000' BOUNDARY.

JAN 15 2013

DEP SOUTHWEST REGION
OIL & GAS

LEGEND

- PROPERTY LINE (SURFACE TRACT OWNER)
- INTERIOR PROPERTY LINE (SURFACE TRACT OWNER)
- BUFFER
- PROPOSED WELL LOCATION
- ⊕ OTHER WELL LOCATION
- == ROADWAY
- STREAM
- TIE LINE
- ↑ PROPERTY LANDHOOK
- Ⓢ SPRING
- Ⓦ WATER WELL



Thomas C. Smit

Applicant / Well Operator Name: EQT Production Company		DEP ID#: 146983	Well (Farm) Name: Oliver West		Well #: 591627	Serial #:
Address: 455 Rocetrock Road, Suite 101, Washington, PA 15301		County: Allegheny		Municipality: Forward Township	Well Type: Gas	
911 address of well site: 2850 Pangburn Hollow Road, Elizabeth, PA 15037		USGS 7 1/2' Quadrangle Map Name: Monongahela, PA		Map Section: 3	Surface Elevation: 1160 ft.	
Surveyor or Engineer: Thomas C. Smit, PLS	Phone #: (412) 278-2100	Dwg #:	Date: 01/09/2013	Scale: 1"=1000'	Unit Acreage: 230.12	
Lat & Long Metadata Method: GPS	Accuracy: 3± ft.	Datum: NAD 83	Elevation Metadata Method: GPS	Accuracy: 5± ft.	Datum: NAVD 88	Survey Date: 05/14/2012

Gob-Pittsburgh Coal Seam

Inside Bunola Gas Storage Field - Equitrans, LP

Well is located on topo map 10,465 feet west of longitude 79° 52' 30"

Page 2 Notifications

[illegible]

WELL LOCATION PLAT

PAGE 3 Plan View of Deviated Well Bore

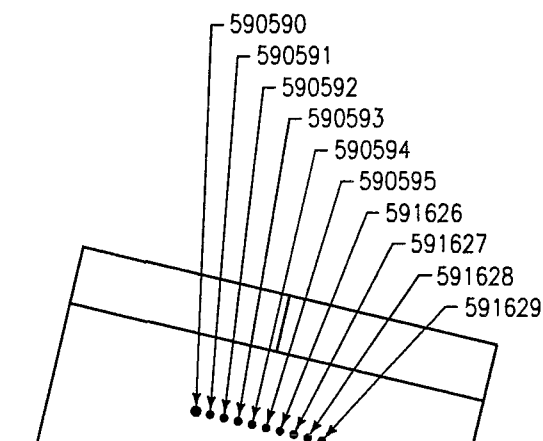
003-22240-00, 01

Applicant / Well Operator Name: EQT Production Company	DEP ID#: 146983	Well (Farm) Name: Oliver West	Well #: 591627
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True Latitude: NORTH
40° 14' 09.00"

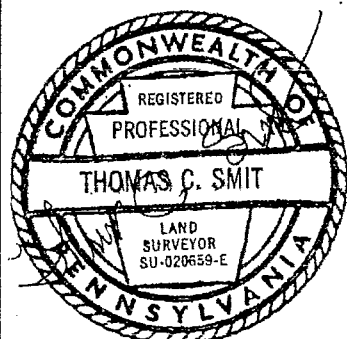
True Longitude: WEST
79° 54' 45.00"

Horizontal Coordinate System:
NAD 83



LOCATION AT
TOTAL DEPTH
LAT 40°14'45.36"
LON 79°55'12.21"
(NAD 83)

PROPOSED OLIVER WEST
PAD LAYOUT



Vertical Section	
TVD	8,088'
TMD	8,088'
Horizontal Section	
TVD	7,844'
TMD	11,845'

NAD 27 Coordinates	
Tophole	
LAT	40°14'08.75"
LON	-79°54'45.82"
KOP	
LAT	40°14'08.75"
LON	-79°54'45.82"
Landing	
LAT	40°14'14.52"
LON	-79°54'48.60"
Bottomhole	
LAT	40°14'45.11"
LON	-79°55'13.03"

TOTAL UNIT
ACREAGE
230.12 Ac.

N28°25'51"W
4241'
(DEVIATION)

N18°52'06"W
623'
(DEVIATION)

LOCATION
AT LANDING
LAT 40°14'14.77"
LON 79°54'47.78"
(NAD 83)

PANCAUR
ROAD
1-509

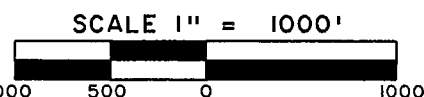
N49°E 355'
(TIE)

PROPOSED
ACCESS
ROAD

PROPOSED
OLIVER WEST
591627
WELL LOCATION
& KOP

JAN 15 2013

DEP, SOUTHWEST-REGION
OIL & GAS



WELL LOCATION PLAT

PAGE 4 Well Plan

 DEP Use Only
 Permit # 003-22240-003

Applicant / Well Operator Name:

DEP ID#:

Well (Form) Name:

Well #:

EQT Production Company

146983

Oliver West

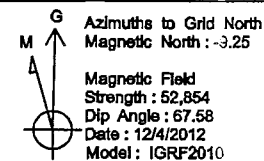
591627

Latitude

Longitude

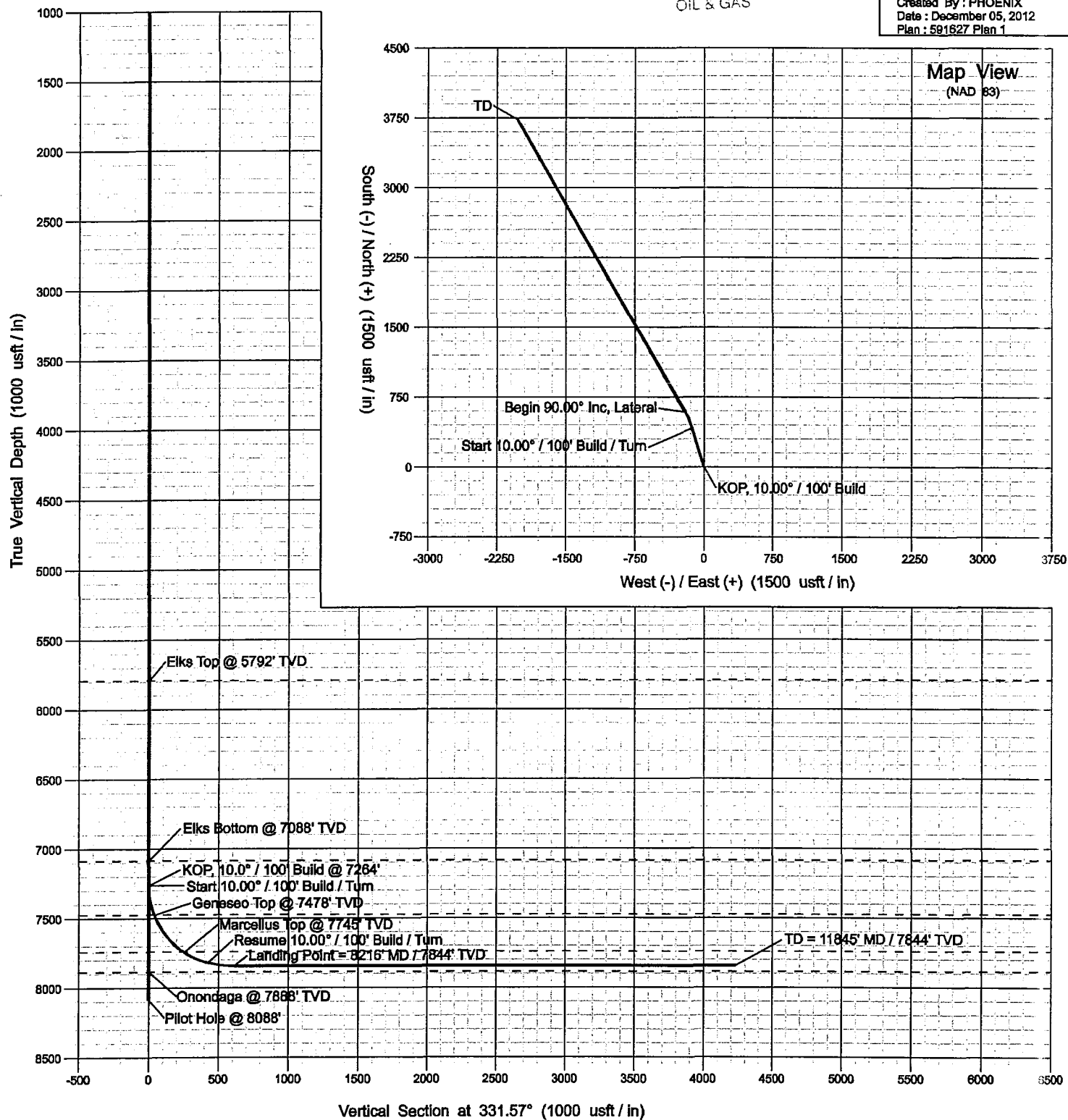
KOP: TVD: 7,264' TMD: 7,264' 40° 14' 09.00" 79° 54' 45.00"

Landing Point: TVD: 7,844' TMD: 8,216' 40° 14' 14.77" 79° 54' 47.78" JAN 15 2013



NAD 83

 Created By: PHOENIX
 Date: December 05, 2012
 Plan: 591627 Plan 1

 DEP SOUTHWEST REGION
 OIL & GAS




pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS MANAGEMENT

DEP USE ONLY
Application Tracking #

Proposed Alternate Method or Material for Casing, Plugging, Venting or Equipping a Well

Well Operator EQT Production Company		DEP ID# 146983		Well Permit or Registration Number Pending 003-22240	
Address 455 Racetrack Road, Suite 101		Well Farm Name Oliver West			
City Washington	State PA	Zip Code 15301	Well # 591627	Serial #	
Phone 412-395-5557	Fax 412-395-3298	County Allegheny	Municipality Forward Township		

A proposed alternate method is subject to provisions in §3221 of the 2012 Oil and Gas Act, 58 Pa. C.S. §3221 Section 13 of the Coal and Gas Resource Coordination Act, 58 P.S. §513 and 25 PA Code §§78.75-78.75a (relating to Alternate Methods.) **Attach proof of notification of coal operator(s).**

Describe in reasonable detail using a written description and / or diagram:

1. the proposed alternate method or materials, and
2. the manner in which the alternative will satisfy the goals of the laws and regulations.

EQT Production will drill no more than 100 feet below the bottom of the abandoned mine in the Pittsburgh Coal Seam. Coal protection casing will then be set at least 30 feet (and perhaps more than 50 feet if hole conditions dictate) below the bottom of the coal mine and cement to surface according to 25 PA Code Section 78.83 (h). The reason for this request is to ensure that the casing shoe is able to reach a depth of 30'-50' below the mine. We need to drill an additional 30' to capture the 15'-25' of fill produced by the mine void. There are no gas zones known to exist within 100 feet below the mine.

EQT Production has identified the potential for the Redstone coal to be mined on this pad. Coal maps from 1956 show it is mined 100' away. If the maps are wrong and the Redstone is found to be mined, per our meeting with the PA DEP on 2/6/2013, EQT will then run 20" casing through both the Redstone and the Pittsburgh Coal mines to a planned set depth of 30' below the Pittsburgh Coal. Cement baskets will be placed below above and below each mine. A grout tube will be installed and banded to the casing to grout the space between the two mines. A conventional balance job will be performed on the lower mine. Cement will be brought to surface by grouting from surface. Prior to start of cementing operations, the grout string will be tested to be sure it isn't plugged off. If unable to cement through the grout tube the casing will be removed and the issue resolved. If we are unable to get casing through both mines, per our PA DEP meeting on 2/6/2013, the casing program will be changed to add a 16" string to case the Pittsburgh Coal.

FEB 08 2013

DEP SOUTHWEST REGION
OIL & GAS

Optional: Approval by Coal Owner or Operator		Signature of Applicant / Well Operator	
Signature	Date	Signature	Date
			2/7/13
Print or Type Signer's Name and Title		Print or Type Signer's Name and Title	
		Todd Klauer - Permitting Supervisor	

If optional approval is signed by coal owner or operator, the 15-day objection period may be waived.

DEP USE ONLY

Approved by (DEP Manager)	Conditions	Date
	☐ YES, See Attached ☒ NO	3/7/13



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS MANAGEMENT
WELL LOCATION PLAT

PAGE 1 Surface Location

DEP USE ONLY	Auth ID: C 957858	G: TF 3-7-13 JD
	Permit #: 003-22241-00	
	Project #:	

☐ Denotes location of top of well on topo map.

GEO COPY Well is located on topo map **5,190** feet south of latitude **40° 15' 00"**

True Latitude: NORTH
40° 14' 08.97"

True Longitude: WEST
79° 54' 44.81"

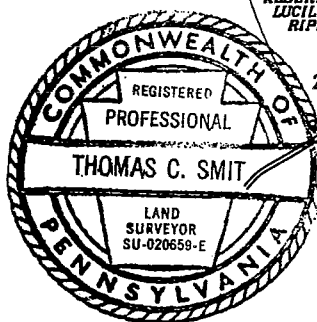
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THE PURPOSE OF THIS PLAT IS FOR THE LOCATION OF A PROPOSED GAS WELL AND DOES NOT REPRESENT A CLOSED BOUNDARY SURVEY. PROPERTY LINES AND OWNERS WERE OBTAINED FROM VARIOUS FIELD EVIDENCE, TAX RECORDS, AND AERIAL MAPPING.

NO STRUCTURES EXIST WITHIN 500 FEET OF PROPOSED WELL LOCATION.

Horizontal Coordinate System: NAD 83
THERE ARE NO COAL MINES WITHIN 1000 FEET OF PROPOSED WELL LOCATION.

LEGEND

- PROPERTY LINE (SURFACE TRACT OWNER)
- INTERIOR PROPERTY LINE (SURFACE TRACT OWNER)
- BUFFER
- PROPOSED WELL LOCATION
- ⊕ OTHER WELL LOCATION
- == ROADWAY
- STREAM
- - - TIE LINE
- ↑ PROPERTY LANDHOOK
- Ⓢ SPRING
- Ⓜ WATER WELL



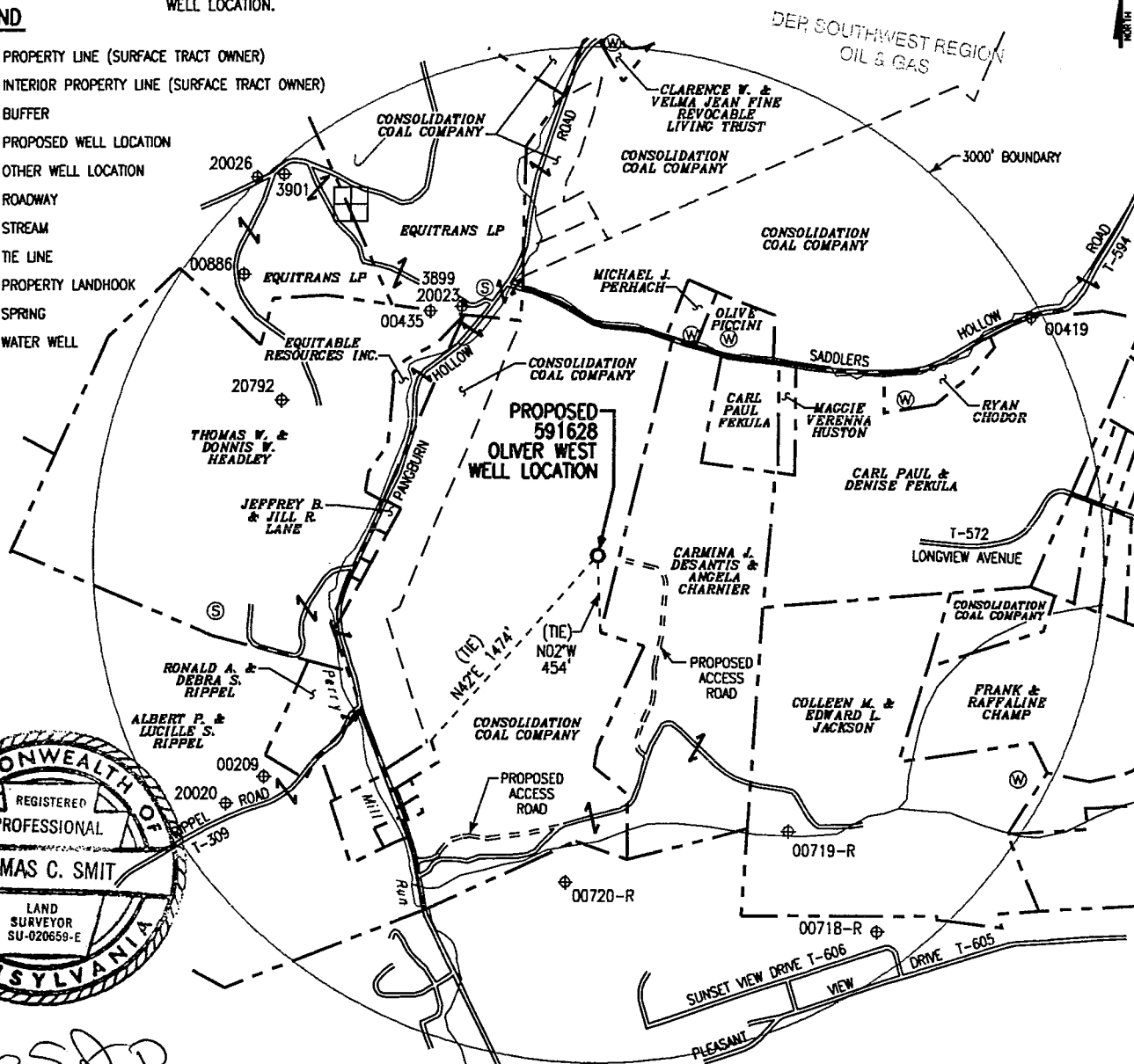
Thomas C. Smitt, PLS

Applicant / Well Operator Name: EQT Production Company		DEP ID#: 146983	Well (Form) Name: Oliver West		Well #: 591628	Serial #:
Address: 455 Racetrack Road, Suite 101, Washington, PA 15301		County: Allegheny	Municipality: Forward Township	Well Type: Gas		
911 address of well site: 2850 Pangburn Hollow Road, Elizabeth, PA 15037		USGS 7 1/2' Quadrangle Map Name: Monongahela, PA	Map Section: 3	Surface Elevation: 1160 ft.		
Surveyor or Engineer: Thomas C. Smitt, PLS	Phone #: (412) 278-2100	Dwg #:	Date: 01/09/2013	Scale: 1"=1000'	Unit Acreage: 230.12	
Lat & Long Metadata Method: GPS	Accuracy: 3± ft.	Datum: NAD 83	Elevation Metadata Method: GPS	Accuracy: 5± ft.	Datum: NAVD 88	Survey Date: 05/14/2012

Gob - Pittsburgh Coal Seam

Inside Bunola Gas Storage Field - Equitrans, LP

Well is located on topo map **10,450** feet west of longitude **79° 52' 30"**



Page 2 Notifications

Applicant / Well Operator Name EQT Production Company	DEP ID# 146983	Well (Farm) Name Oliver West	Well # 591628	Serial #
Surface Landowner / Lessor: Consolidation Coal Company		Angle & Course of Deviation (Drilling): N 19° 25' 05" W – 4,357'	Anticipated True Vertical Depth Feet (TVD): 7,844'	Anticipated Total Measured Depth Feet (TMD): 12,221'
Target Formation(s): Marcellus		Deepest Formation to be penetrated: Marcellus	Number of laterals: 1	Total footage to be drilled all laterals: 12,221'
Surface Owner/Water Purveyor w/Water Supply within 1000'/3000'		Latitude Longitude of Water Supply		
Clarence W. & Velma Jean Fine Revocable Living Trust		40° 14' 38.88" - 79° 54' 44.84"		
Michael J. Perhach		40° 14' 21.99" - 79° 54' 38.11"		
Olive Piccini		40° 14' 21.83" - 79° 54' 35.22"		
Thomas W. & Donnis W. Headley		40° 14' 05.14" - 79° 55' 14.02"		
Equitrans LP		40° 14' 24.37" - 79° 54' 54.15"		
Ryan Chodor		40° 14' 18.61" - 79° 54' 21.56"		
Colleen M. & Edward L. Jackson		40° 13' 56.70" - 79° 54' 12.09"		
Municipality: where the well will be drilled, adjacent to the well, or within 3000 feet		Municipality: where the well will be drilled, adjacent to the well, or within 3000 feet		
Forward Township, Allegheny County		Elizabeth Township, Allegheny County		
Borough of Jefferson Hills, Allegheny County				
West Elizabeth Borough, Allegheny County				
Elizabeth Borough, Allegheny County		Coal related parties		
Rostraver Township, Westmoreland County		Reserve Coal Properties Company – All Coal Seams		
Carroll Township, Washington County				
City of Monongahela, Washington County				
New Eagle Borough, Washington County		Gas Storage Field Operators		
Union Township, Washington County		Equitrans, L.P. – Operator – Bunola		

WELL LOCATION PLAT

PAGE 3 Plan View of Deviated Well Bore

003-22241-00

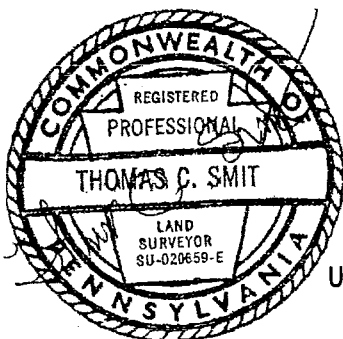
Applicant / Well Operator Name:	DEP ID#:	Well (Farm) Name:	Well #:
EQT Production Company	146983	Oliver West	591628

True Latitude: NORTH
40° 14' 08.97"

True Longitude: WEST
79° 54' 44.81"

Horizontal Coordinate System:
NAD 83

LOCATION AT
TOTAL DEPTH
LAT 40°14'49.22"
LON 79°55'04.78"
(NAD 83)



UNIT BOUNDARY

3.782'
330° (CN)
N16°25'05"W
4357'
(DEVIATION)

PROPOSED OLIVER WEST
PAD LAYOUT

LOCATION
AT LANDING
LAT 40°14'17.33"
LON 79°54'39.32"
(NAD 83)

N28°04'47"E
947'
(DEVIATION)

(TIE)
S62°W 1892'

JAN 15 2013

DEP. SOUTHWEST REGION
OIL & GAS

S89°E 417'
(TIE)

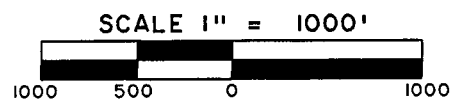
PROPOSED
OLIVER WEST
591628
WELL LOCATION
& KOP

PROPOSED ACCESS ROAD

RIPPLE ROAD
T-509

TOTAL UNIT
ACREAGE
230.12 Ac.

NAD 27 Coordinates	
Tophole	
LAT	40°14'08.72"
LON	-79°54'45.63"
KOP	
LAT	40°14'08.72"
LON	-79°54'45.63"
Landing	
LAT	40°14'17.08"
LON	-79°54'40.15"
Bottomhole	
LAT	40°14'48.96"
LON	-79°55'05.61"



WELL LOCATION PLAT

PAGE 4 Well Plan

 DEP Use Only
 Permit # 003-22241-00

Applicant / Well Operator Name:

DEP ID#:

Well (Farm) Name:

Well #:

EQT Production Company

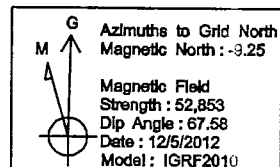
146983

Oliver West

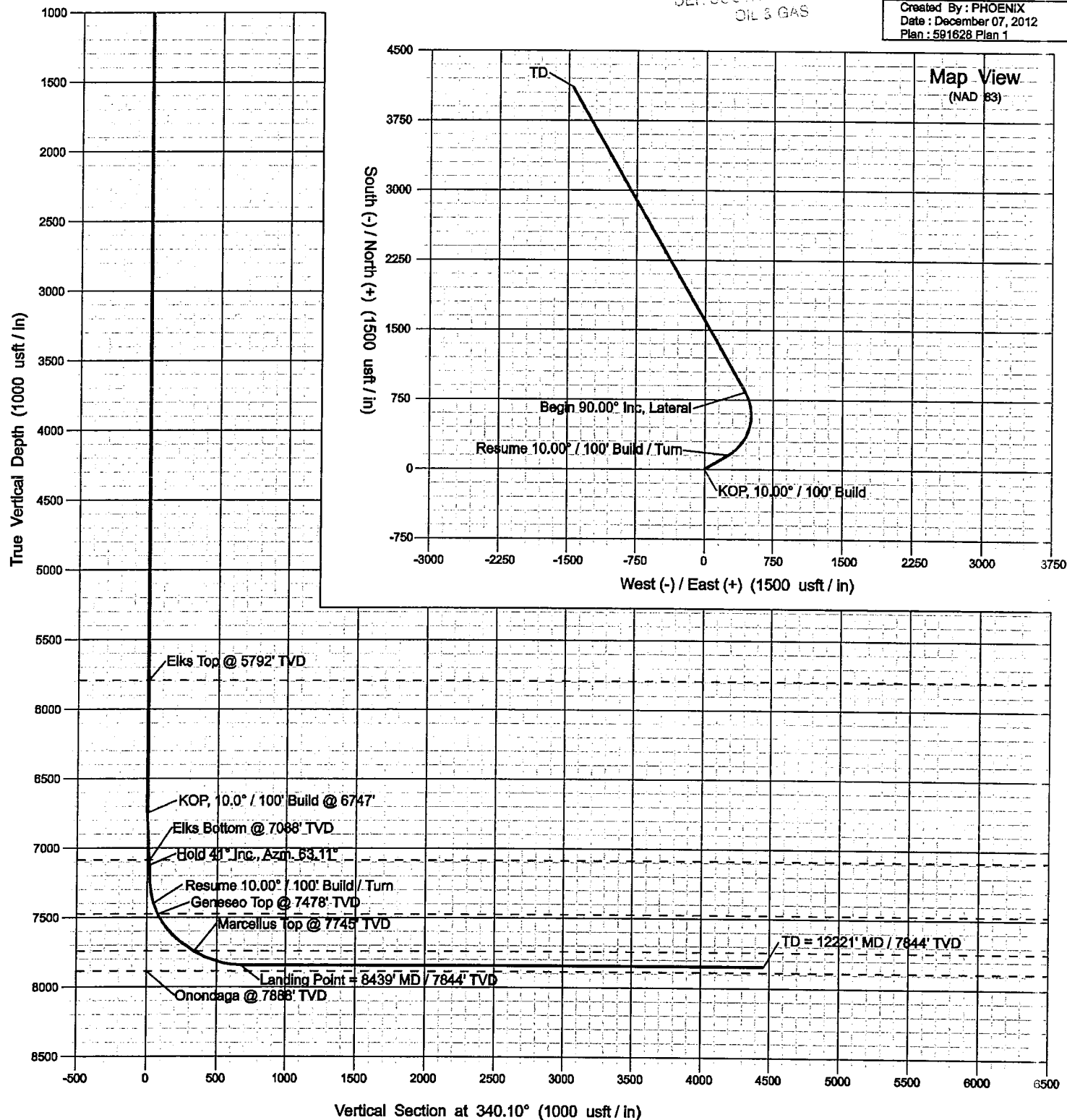
591628

			Latitude	Longitude
KOP:	TVD: 6,747'	TMD: 6,747'	40° 14' 08.97"	79° 54' 44.81"
Landing Point:	TVD: 7,844'	TMD: 8,439'	40° 14' 17.33"	79° 54' 39.32"

JAN 15 2013

 DEP SOUTHWEST REGION
 OIL & GAS


NAD 83

 Created By: PHOENIX
 Date: December 07, 2012
 Plan: 591628 Plan 1




COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS MANAGEMENT

DEP USE ONLY
Application Tracking #

Proposed Alternate Method or Material for Casing, Plugging, Venting or Equipping a Well

Well Operator EQT Production Company		DEP ID# 146983		Well Permit or Registration Number Pending 003-22241	
Address 455 Racetrack Road, Suite 101		Well Farm Name Oliver West			
City Washington	State PA	Zip Code 15301	Well # 591628		Serial #
Phone 412-395-5557	Fax 412-395-3298	County Allegheny		Municipality Forward Township	

A proposed alternate method is subject to provisions in §3221 of the 2012 Oil and Gas Act, 58 Pa. C.S. §3221 Section 13 of the Coal and Gas Resource Coordination Act, 58 P.S. §513 and 25 PA Code §§78.75-78.75a (relating to Alternate Methods.) **Attach proof of notification of coal operator(s).**

Describe in reasonable detail using a written description and / or diagram:

1. the proposed alternate method or materials, and
2. the manner in which the alternative will satisfy the goals of the laws and regulations.

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FEB 08 2013

DEP SOUTHWEST REGION
OIL & GAS

Optional: Approval by Coal Owner or Operator		Signature of Applicant / Well Operator	
Signature	Date	Signature	Date
			2/14/13
Print or Type Signer's Name and Title		Print or Type Signer's Name and Title	
		Todd Klauer - Permitting Supervisor	

If optional approval is signed by coal owner or operator, the 15-day objection period may be waived.

DEP USE ONLY	
Approved by (DEP Manager)	Conditions
	☒ YES, See Attached ☐ NO
	Date 3/7/13



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS MANAGEMENT
WELL LOCATION PLAT

DEP USE ONLY	Auth ID: 959859	TF 3-7-13
	Permit #: 003-22242	
	Project #:	

PAGE 1 Surface Location

☐ Denotes location of top of well on topo map.

Well is located on topo map 5,195 feet south of latitude 40° 15' 00"

True Latitude: NORTH
40° 14' 08.94"

True Longitude: WEST
79° 54' 44.62"

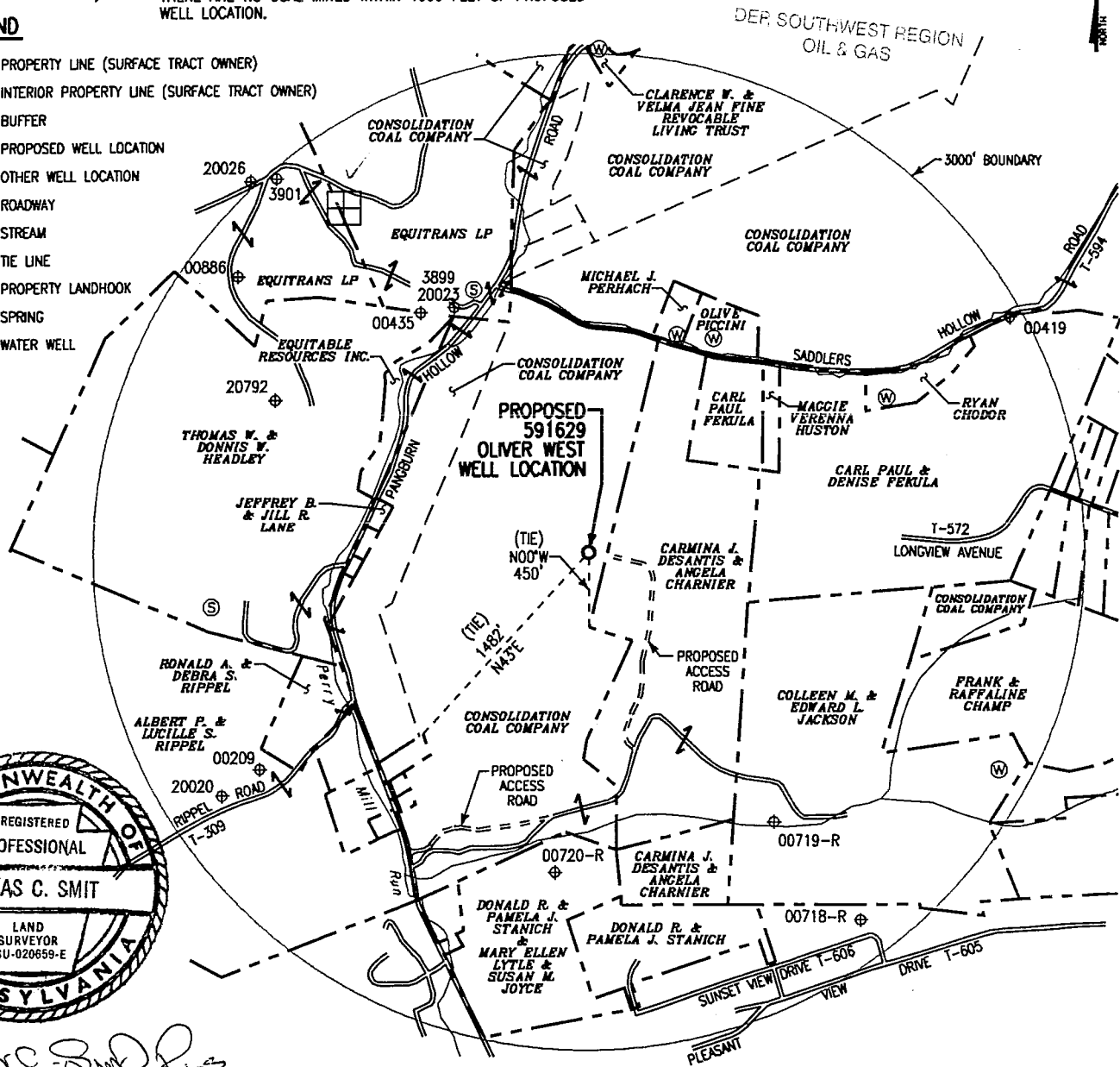
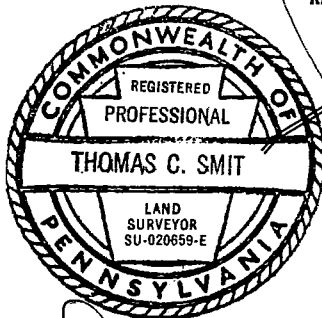
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NO STRUCTURES EXIST WITHIN 500 FEET OF PROPOSED WELL LOCATION.

THE EQUITRANS, L.P. BUNOLA STORAGE BOUNDARY LIES WITHIN THE 3000' BOUNDARY.

Horizontal Coordinate System: NAD 83
THERE ARE NO COAL MINES WITHIN 1000 FEET OF PROPOSED WELL LOCATION.

LEGEND

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- ⊕ OTHER WELL LOCATION
- == ROADWAY
- STREAM
- TIE LINE
- ↑ PROPERTY LANDHOOK
- Ⓢ SPRING
- Ⓜ WATER WELL



Well is located on topo map 10,435 feet west of longitude 79° 52' 30"

Applicant / Well Operator Name: EQT Production Company		DEP ID#: 146983	Well (Farm) Name: Oliver West		Well #: 591629	Serial #:
Address: 455 Racetrack Road, Suite 101, Washington, PA 15301		County: Allegheny	Municipality: Forward Township		Well Type: Gas	
911 address of well site: 2850 Pangburn Hollow Road, Elizabeth, PA 15037		USGS 7 1/2' Quadrangle Map Name: Monongahela, PA	Map Section: 3		Surface Elevation: 1160 ft.	
Surveyor or Engineer: Thomas C. Smit, PLS	Phone #: (412) 278-2100	Dwg #:	Date: 01/09/2013	Scale: 1"=1000'	Unit Acreage: 230.12	
Lat & Long Metadata Method: GPS	Accuracy: 3± ft.	Datum: NAD 83	Elevation Metadata Method: GPS	Accuracy: 5± ft.	Datum: NAVD 88	Survey Date: 05/14/2012

Inside Bunola Gas Storage Field

Gob-Pittsburgh Coal Seam

Page 2 Notifications

[illegible]

WELL LOCATION PLAT

PAGE 3 Plan View of Deviated Well Bore

Applicant / Well Operator Name: EQT Production Company	DEP ID#: 146983	Well (Farm) Name: Oliver West	Well #: 591629
--	---------------------------	---	--------------------------

True Latitude: NORTH
40° 14' 08.94"

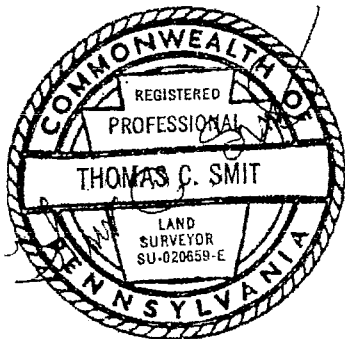
True Longitude: WEST
79° 54' 44.62"

Horizontal Coordinate System:
NAD 83

LOCATION AT
TOTAL DEPTH
LAT 40°14'53.79"
LON 79°54'57.93"
(NAD 83)

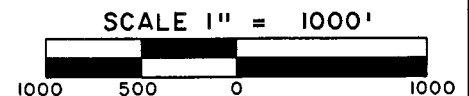
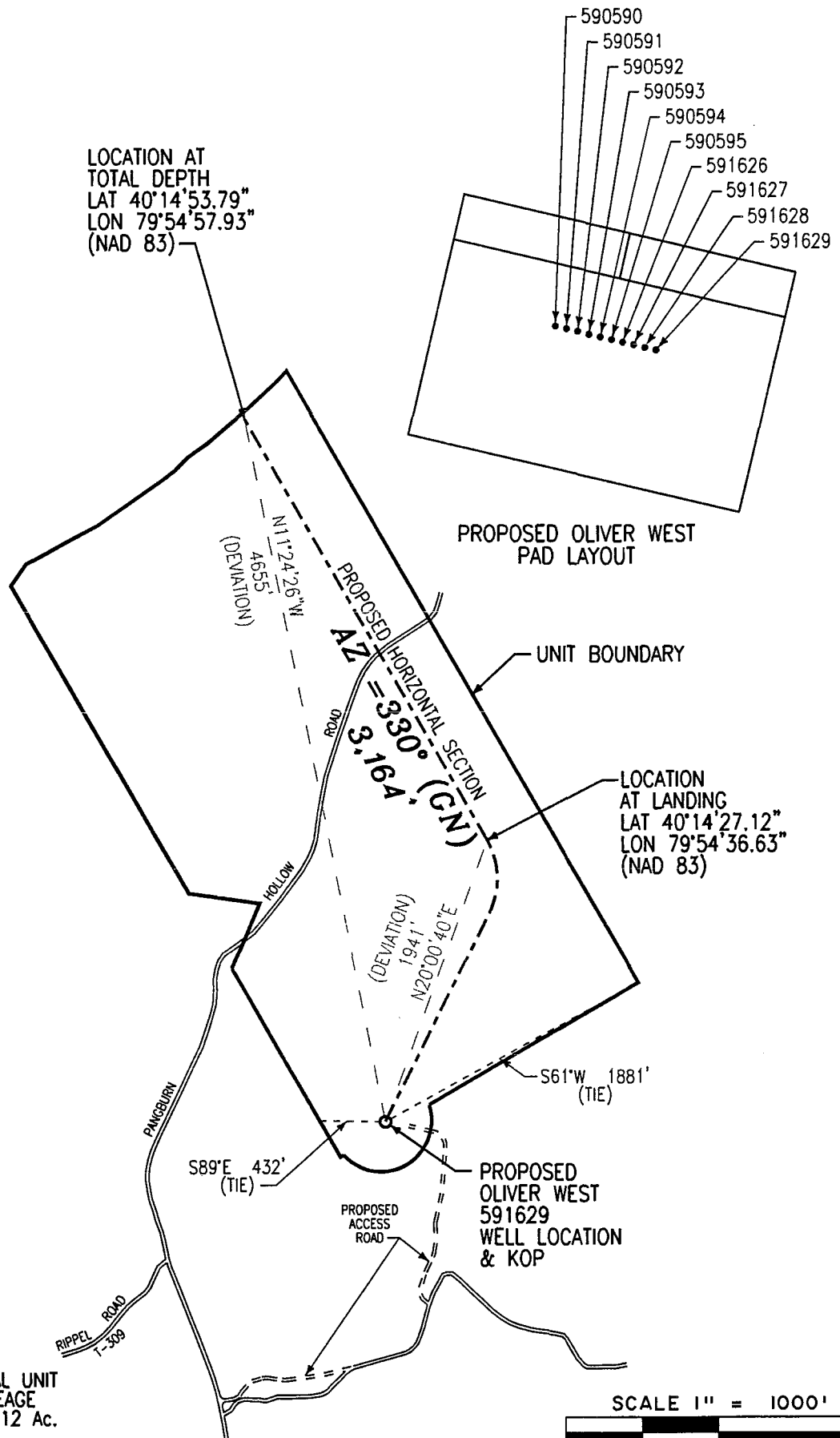
JAN 15 2013

DEP SOUTHWEST REGION
OIL & GAS



NAD 27 Coordinates	
Tophole	
LAT	40°14'08.69"
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LON	-79°54'45.44"
Landing	
LAT	40°14'26.87"
LON	-79°54'37.46"
Bottomhole	
LAT	40°14'53.54"
LON	-79°54'58.75"

TOTAL UNIT
ACREAGE
230.12 Ac.



WELL LOCATION PLAT

PAGE 4 Well Plan

 DEP Use Only
 Permit # 003-22242-00

Applicant / Well Operator Name:

EQT Production Company

DEP ID#:

146983

Well (Form) Name:

Oliver West

Well #:

591629

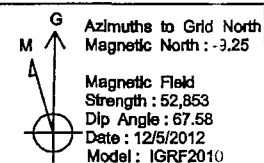
Latitude

Longitude

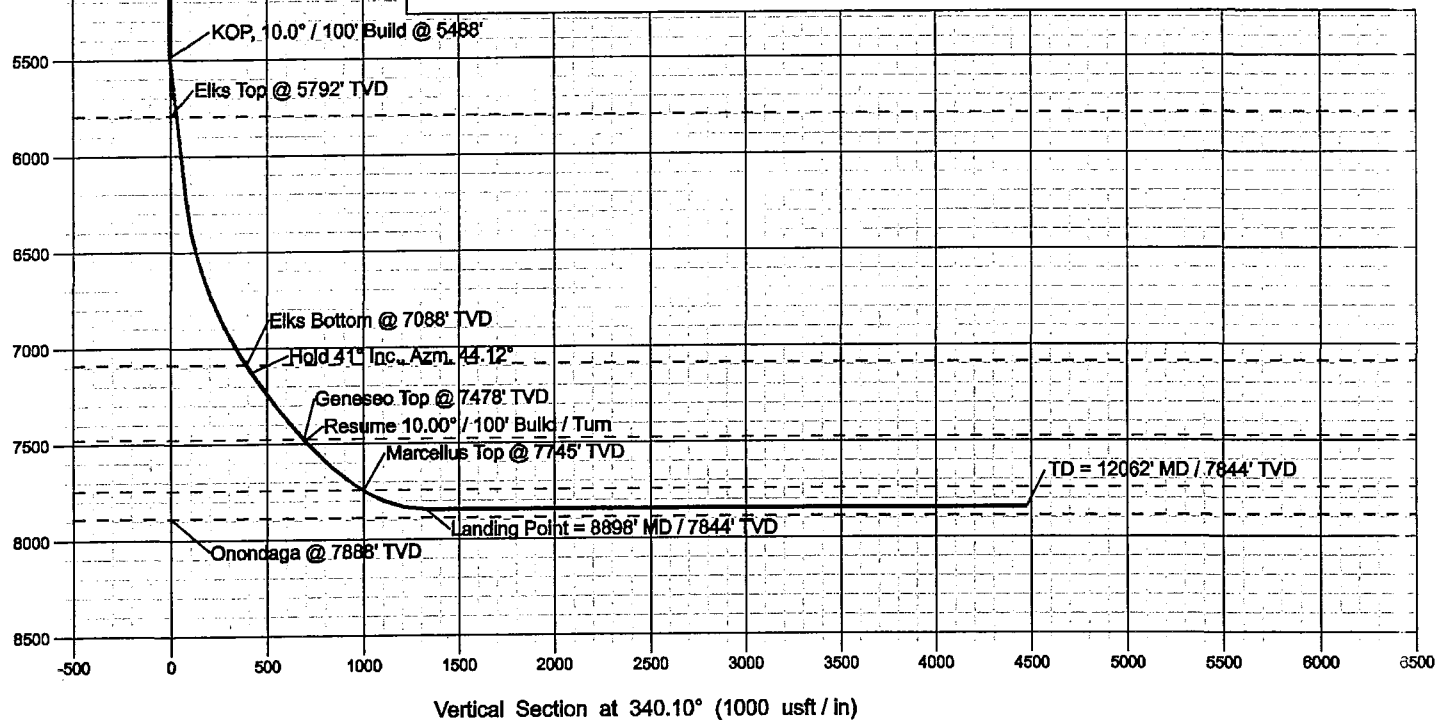
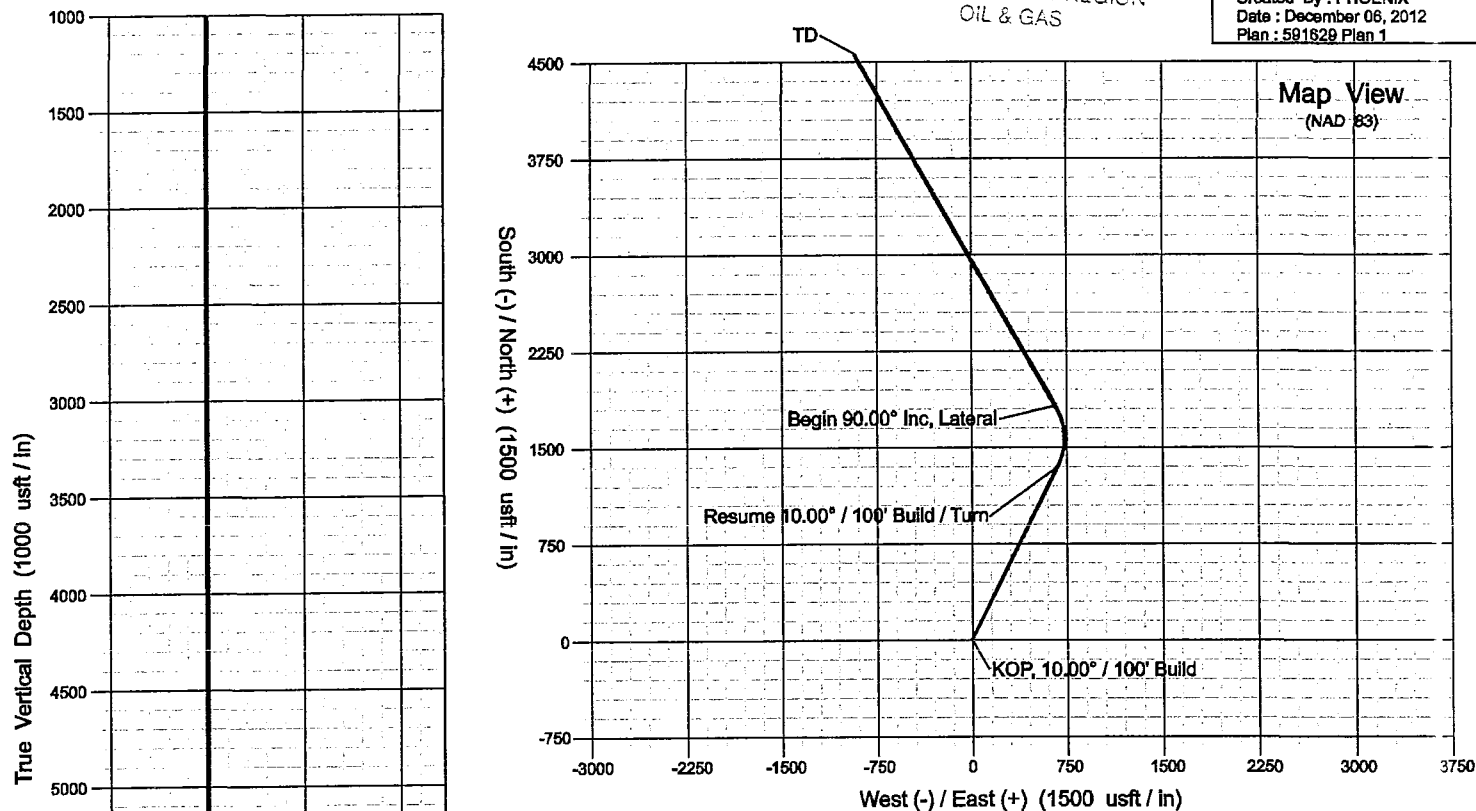
KOP: TVD: 5,488' TMD: 5,488' 40° 14' 08.94" 79° 54' 44.62"

Landing Point: TVD: 7,844' TMD: 8,898' 40° 14' 27.12" 79° 54' 36.63"

JAN 15 2013

DEP SOUTHWEST REGION
OIL & GAS

NAD 83

 Created By: PHOENIX
 Date: December 08, 2012
 Plan: 591629 Plan 1




pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS MANAGEMENT

DEP USE ONLY
Application Tracking #

Proposed Alternate Method or Material for Casing, Plugging, Venting or Equipping a Well

Well Operator EQT Production Company		DEP ID# 146983		Well Permit or Registration Number Pending 003-22242	
Address 455 Racetrack Road, Suite 101		Well Farm Name Oliver West			
City Washington	State PA	Zip Code 15301	Well # 591629		Serial #
Phone 412-395-5557	Fax 412-395-3298	County Allegheny		Municipality Forward Township	

*A proposed alternate method is subject to provisions in §3221 of the 2012 Oil and Gas Act, 58 Pa. C.S. §3221 Section 13 of the Coal and Gas Resource Coordination Act, 58 P.S. §513 and 25 PA Code §§78.75-78.75a (relating to Alternate Methods.) **Attach proof of notification of coal operator(s).***

Describe in reasonable detail using a written description and / or diagram:

1. the proposed alternate method or materials, and
2. the manner in which the alternative will satisfy the goals of the laws and regulations.

EQT Production will drill no more than 100 feet below the bottom of the abandoned mine in the Pittsburgh Coal Seam. Coal protection casing will then be set at least 30 feet (and perhaps more than 50 feet if hole conditions dictate) below the bottom of the coal mine and cement to surface according to 25 PA Code Section 78.83 (h). The reason for this request is to ensure that the casing shoe is able to reach a depth of 30'-50' below the mine. We need to drill an additional 30' to capture the 15'-25' of fill produced by the mine void. There are no gas zones known to exist within 100 feet below the mine.

EQT Production has identified the potential for the Redstone coal to be mined on this pad. Coal maps from 1956 show it is mined 100' away. If the maps are wrong and the Redstone is found to be mined, per our meeting with the PA DEP on 2/6/2013, EQT will then run 20" casing through both the Redstone and the Pittsburgh Coal mines to a planned set depth of 30' below the Pittsburgh Coal. Cement baskets will be placed below above and below each mine. A grout tube will be installed and banded to the casing to grout the space between the two mines. A conventional balance job will be performed on the lower mine. Cement will be brought to surface by grouting from surface. Prior to start of cementing operations, the grout string will be tested to be sure it isn't plugged off. If unable to cement through the grout tube the casing will be removed and the issue resolved. If we are unable to get casing through both mines, per our PA DEP meeting on 2/6/2013, the casing program will be changed to add a 16" string to case the Pittsburgh Coal.

FEB 08 2013

DEP SOUTHWEST REGION
OIL & GAS

Optional: Approval by Coal Owner or Operator		Signature of Applicant / Well Operator	
Signature	Date	Signature	Date
			2/7/13
Print or Type Signer's Name and Title		Print or Type Signer's Name and Title	
		Todd Klauer - Permitting Supervisor	

If optional approval is signed by coal owner or operator, the 15-day objection period may be waived.

DEP USE ONLY	
Approved by (DEP Manager)	Conditions
	☐ YES, See Attached ☒ NO
	Date 3/7/13



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS MANAGEMENT
WELL LOCATION PLAT

PAGE 1 Surface Location

DEP USE ONLY	Auth ID: 945979	TF: 11-15-12
	Permit #: 003-22234	
	Project #:	

☐ Denotes location of top of well on topo map.

Well is located on topo map 2,405 feet south of latitude 40° 15' 00"

True Latitude: NORTH
40° 14' 36.47"

True Longitude: WEST
79° 54' 16.43"

Horizontal Coordinate System:
NAD 83

NOTE:
THE PURPOSE OF THIS PLAT IS FOR THE LOCATION OF A PROPOSED GAS WELL AND DOES NOT REPRESENT A CLOSED BOUNDARY SURVEY. PROPERTY LINES AND OWNERS WERE OBTAINED FROM VARIOUS FIELD EVIDENCE, TAX RECORDS, AND AERIAL MAPPING.

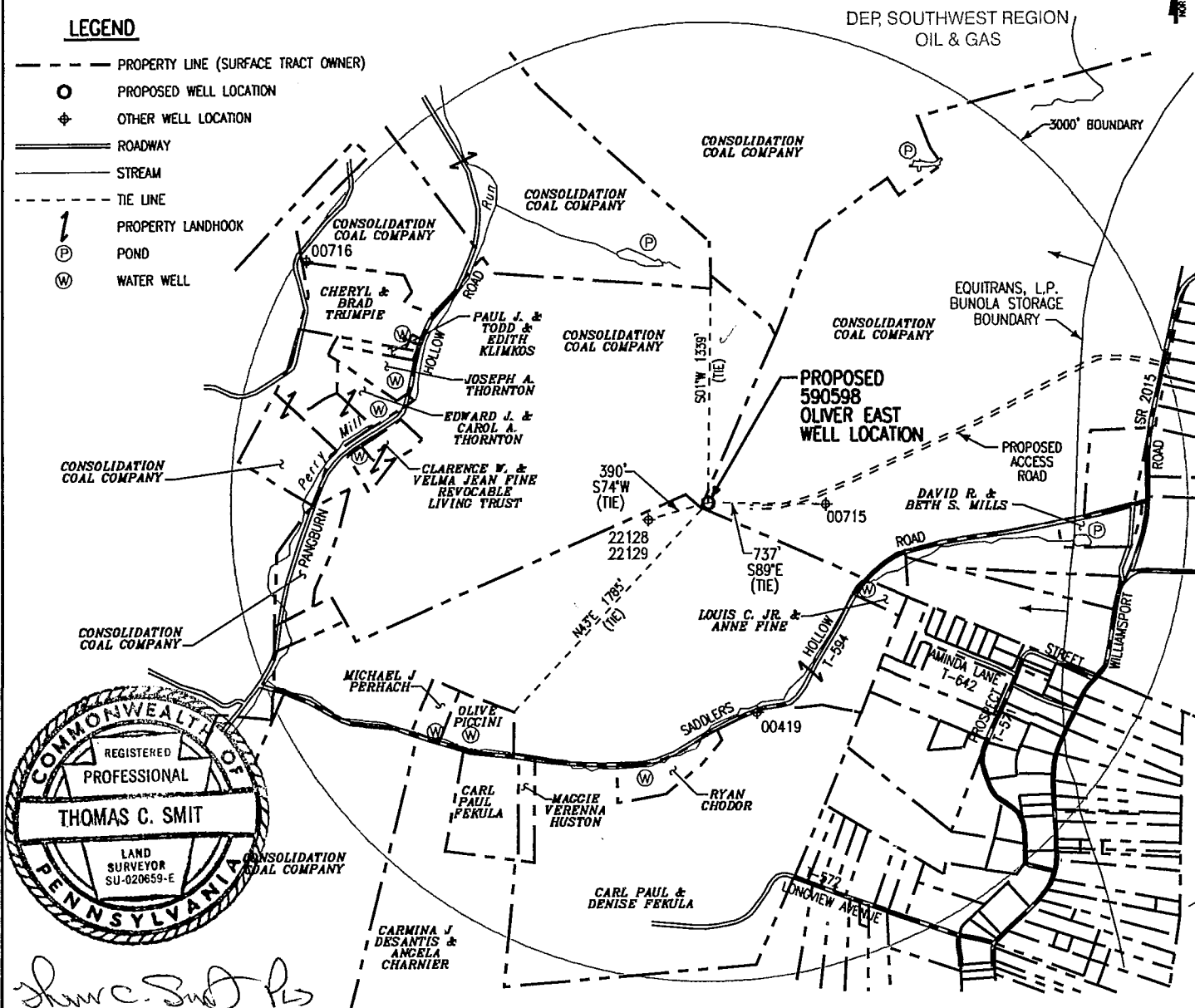
NO STRUCTURES EXIST WITHIN 500 FEET OF PROPOSED WELL LOCATION.

THERE ARE NO COAL MINES WITHIN 1000 FEET OF PROPOSED WELL LOCATION.

OCT 04 2012

LEGEND

- PROPERTY LINE (SURFACE TRACT OWNER)
- PROPOSED WELL LOCATION
- ⊕ OTHER WELL LOCATION
- == ROADWAY
- STREAM
- - - TIE LINE
- ↑ PROPERTY LANDHOOK
- (P) POND
- (W) WATER WELL



Well is located on topo map 8,250 feet west of longitude 79° 52' 30"

Applicant / Well Operator Name: EQT Production Company		DEP ID#: 146983	Well (Form) Name: Oliver East		Well #: 590598	Serial #:
Address: 455 Racetrack Road, Suite 101, Washington, PA 15301			County: Allegheny	Municipality: Forward Township	Well Type: Gas	
911 address of well site: 4778 Williamsport Rd, Elizabeth PA Not yet available			USGS 7 1/2' Quadrangle Map Name: Monongahela, PA	Map Section: 3	Surface Elevation: 1190 ft.	
Surveyor or Engineer: Thomas C. Smit, PLS	Phone #: (412) 278-2100	Dwg #:	Date: 07/25/2012	Scale: 1"=1000'	Unit Acreage: 289.17	
Lat & Long Metadata Method: GPS	Accuracy: 3± ft.	Datum: NAD 83	Elevation Metadata Method: GPS	Accuracy: 5± ft.	Datum: NAVD 88	Survey Date: 04/02/12

Inside Bunola Gas Storage Field

Gob- Pittsburgh Coal Seam

WELL LOCATION PLAT

003-22234-00

Page 2 Notifications

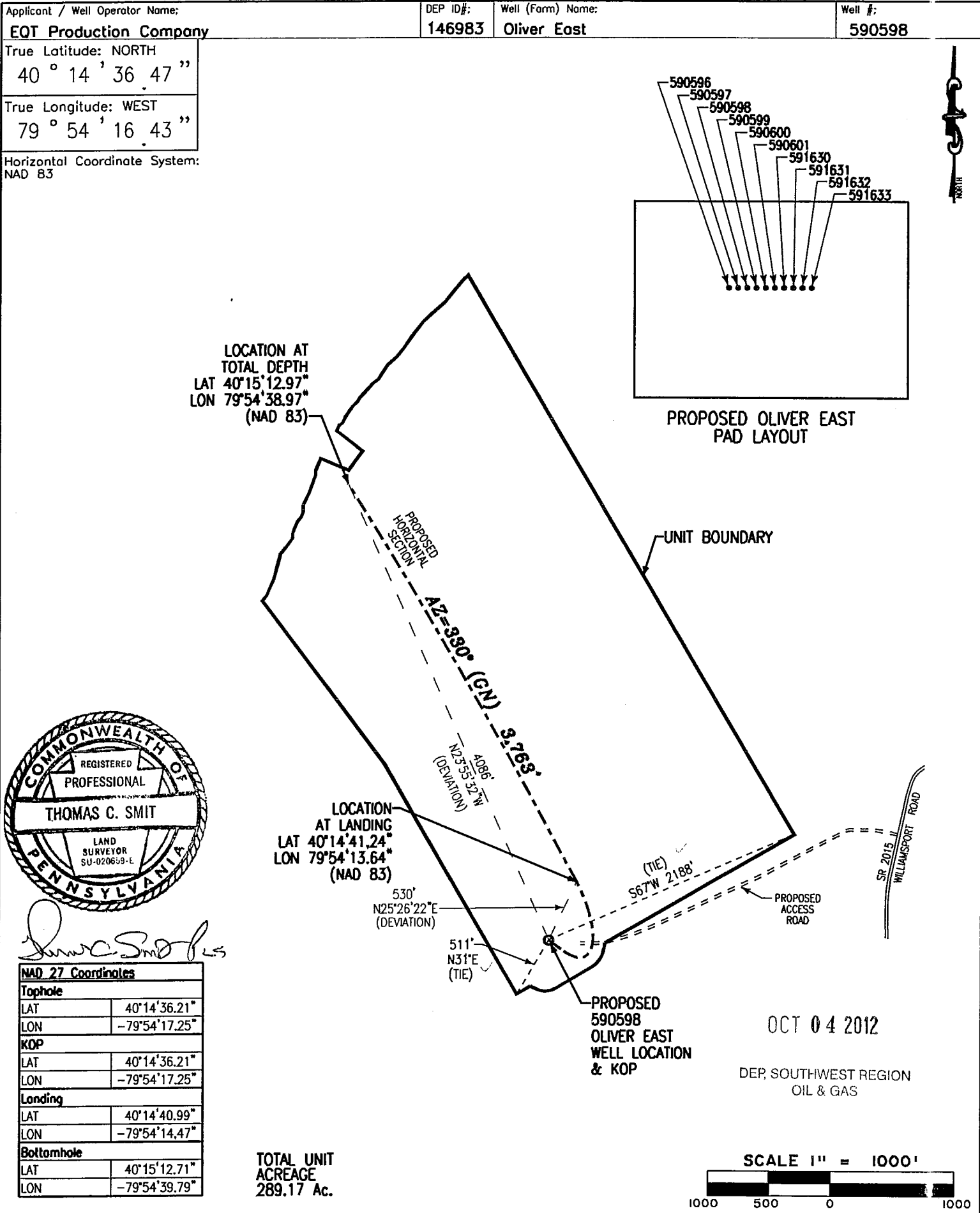
DEP Statewide toll-free phone number for reporting cases of water contamination which may be associated with development of oil and gas resources is **1-866-255-5158**.

Applicant / Well Operator Name EQT Production Company	DEP ID# 146983	Well (Farm) Name Oliver East	Well # 590598	Serial #
Surface Landowner / Lessor: Consolidation Coal Company ✓		Angle & Course of Deviation (Drilling): N 24° 18' 44" W – 4360'	Anticipated True Vertical Depth Feet (TVD): 7,874'	Anticipated Total Measured Depth Feet (TMD): 12,101'
Target Formation(s): Marcellus		Deepest Formation to be penetrated: Marcellus	Number of laterals: 1	Total footage to be drilled all laterals: 12,101'
Surface Owner/Water Purveyor w/Water Supply within 1000'/3000'		Latitude Longitude of Water Supply		
Consolidation Coal Company		40° 14' 51.43" - 79° 54' 22.44"		
Consolidation Coal Company		40° 14' 57.72" - 79° 53' 59.50"		
David R. & Beth S. Mills		40° 14' 34.75" - 79° 53' 46.07"		
Louis C. Jr. & Anne Fine		40° 14' 31.36" - 79° 54' 03.36"		
Ryan Chodor		40° 14' 18.61" - 79° 54' 21.43"		
Olive Piccini		40° 14' 21.83" - 79° 54' 35.22"		
Michael J. Perhach		40° 14' 21.99" - 79° 54' 38.11"		
Clarence W. & Velma Jean Fine Revocable Living Trust (THE)		40° 14' 38.88" - 79° 54' 44.84"		
Joseph A. Thornton		40° 14' 41.82" - 79° 54' 43.39"		
Edward J. & Carol A. Thornton		40° 14' 43.61" - 79° 54' 42.10"		
Brad & Cheryl Trumpie		40° 14' 46.50" - 79° 54' 41.63"		
		OCT 04 2012		
		DEP, SOUTHWEST REGION OIL & GAS		
Municipality: where the well will be drilled, adjacent to the well, or within 3000 feet		Municipality: where the well will be drilled, adjacent to the well, or within 3000 feet		
Forward Township, Allegheny County		Elizabeth Township, Allegheny County		
Borough of Jefferson Hills, Allegheny County				
West Elizabeth Borough, Allegheny County				
Elizabeth Borough, Allegheny County		Coal related parties		
Rostraver Township, Westmoreland County		Reserve Coal Company – Owner - Redstone Seam		
Carroll Township, Washington County		Consolidation Coal Company – Owner - Upper Freeport Seam		
City of Monongahela, Washington County				
New Eagle Borough, Washington, County		Gas Storage Field Operators		
Union Township, Washington, County		Equitrans, L.P. – Operator – Bunola		

WELL LOCATION PLAT

PAGE 3 Plan View of Deviated Well Bore

003 - 22234-00



WELL LOCATION PLAT

PAGE 4 Well Plan

DEP Use Only	Permit # 003- 22234-00
--------------------	------------------------------

Applicant / Well Operator Name:

DEP ID#:

Well (Farm) Name:

Well #:

EQT Production Company

146983

Oliver East

590598

Latitude

Longitude

OCT 04 2012

KOP: TVD: 6630'

TMD: 6630'

40° 14' 36.47"

79° 54' 16.43"

Landing Point: TVD: 7874'

TMD: 8338'

40° 14' 41.24"

79° 54' 13.64"

DEP SOUTHWEST REGION
OIL & GAS

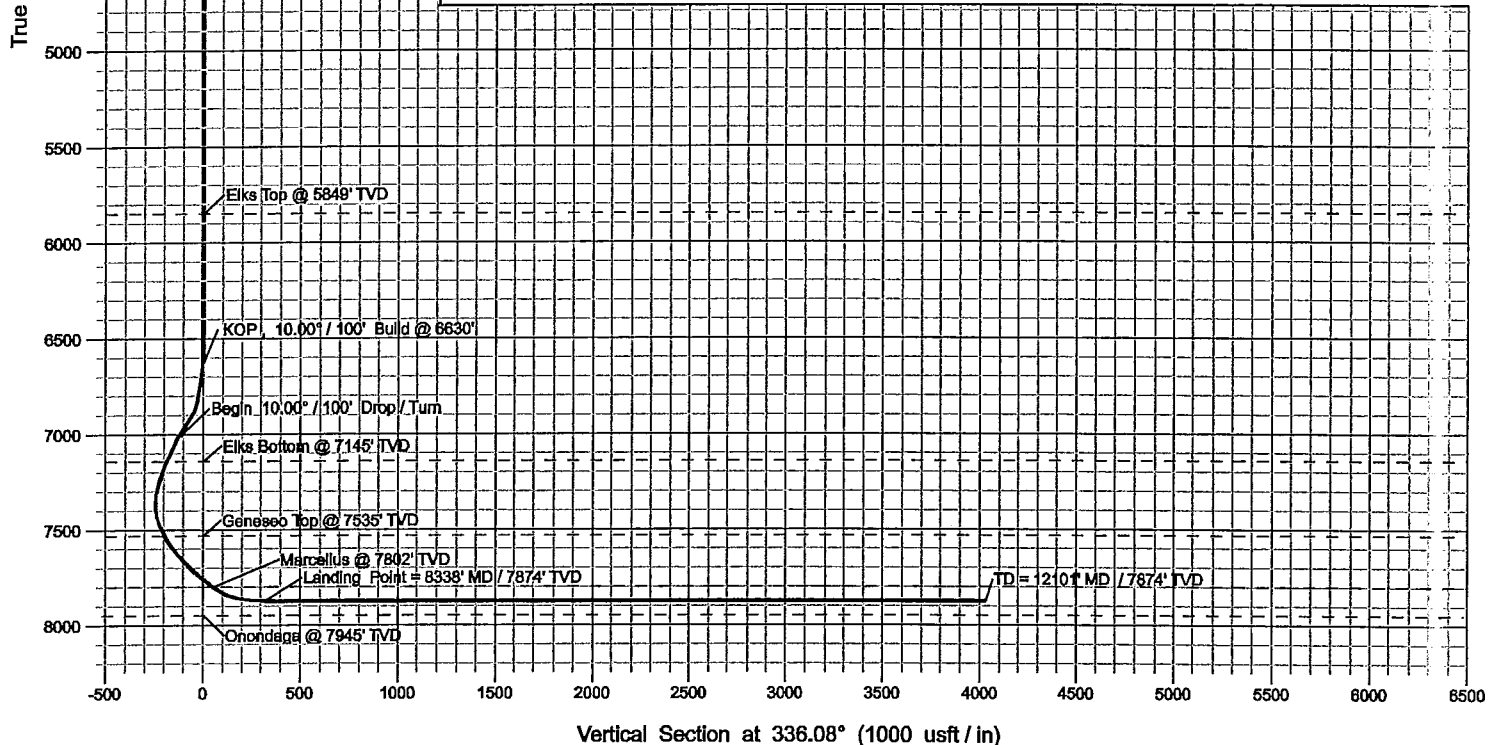
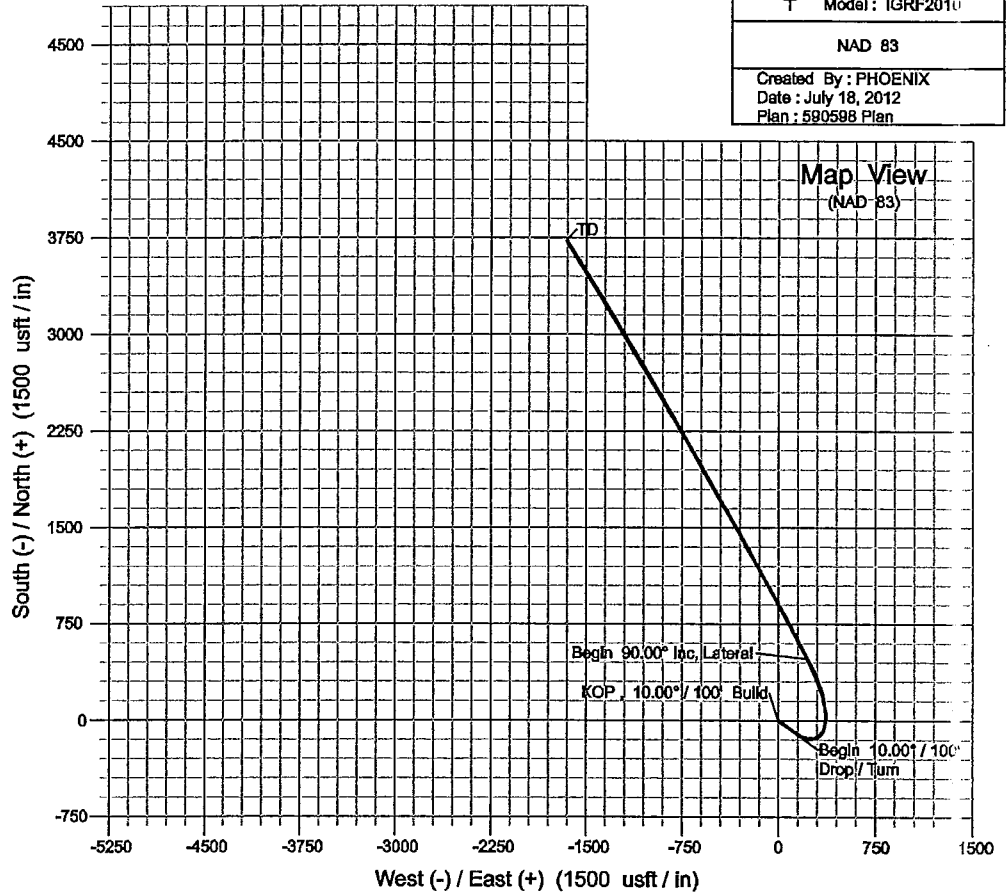
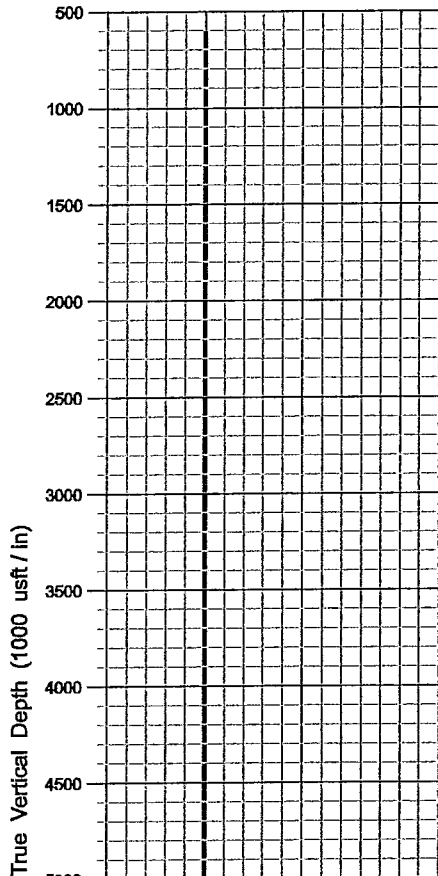
G
M

Azimuths to Grid North
Magnetic North: -9.25

Magnetic Field
Strength: 52,903
Dip Angle: 67.62
Date: 7/17/2012
Model: IGRF2010

NAD 83

Created By: PHOENIX
Date: July 18, 2012
Plan: 590598 Plan





COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS MANAGEMENT

DEP USE ONLY
Application Tracking #

Proposed Alternate Method or Material for Casing, Plugging, Venting or Equipping a Well

Well Operator EQT Production Company		DEP ID# 146983		Well Permit or Registration Number Pending 003-22234-00	
Address 455 Racetrack Road, Suite 101				Well Farm Name Oliver East	
City Washington		State PA	Zip Code 15301	Well # 590598	Serial #
Phone 412-395-5557	Fax 412-395-3298	County Allegheny		Municipality Forward Township	

A proposed alternate method is subject to provisions in §3221 of the 2012 Oil and Gas Act, 58 Pa. C.S. §3221 Section 13 of the Coal and Gas Resource Coordination Act, 58 P.S. §513 and 25 PA Code §§78.75-78.75a (relating to Alternate Methods.) **Attach proof of notification of coal operator(s).**

Describe in reasonable detail using a written description and / or diagram:

1. the proposed alternate method or materials, and
2. the manner in which the alternative will satisfy the goals of the laws and regulations.

EQT Production will drill no more than 100 feet below the bottom of the abandoned mine on the Pittsburgh Seam. Coal protection casing will then be set at least 30 feet (and perhaps more than 50 feet if hole conditions dictate) below the bottom of the coal mine and cement to surface according to 25 PA Code Section 78.83 (h). The reason for this request is to ensure that the casing shoe is able to reach a depth of 30'-50' below the mine. We need to drill an additional 30' to capture the 15'-25' of fill produced by the mine void. There are no gas zones known to exist within 100 feet below the mine.

OCT 04 2012

DEP, SOUTHWEST REGION
OIL & GAS

Optional: Approval by Coal Owner or Operator		Signature of Applicant / Well Operator	
Signature	Date	Signature	Date
			10/3/12
Print or Type Signer's Name and Title		Print or Type Signer's Name and Title	
		Todd Klauer - Permitting Supervisor	

If optional approval is signed by coal owner or operator, the 15-day objection period may be waived.

DEP USE ONLY	
Approved by (DEP Manager)	Conditions
	☐ YES, See Attached ☒ NO
	Date 11/16/12

Casing and Cementing Plan Through the Equitrans Gas Storage Zones

Well: Oliver East Pad

003-22234-00

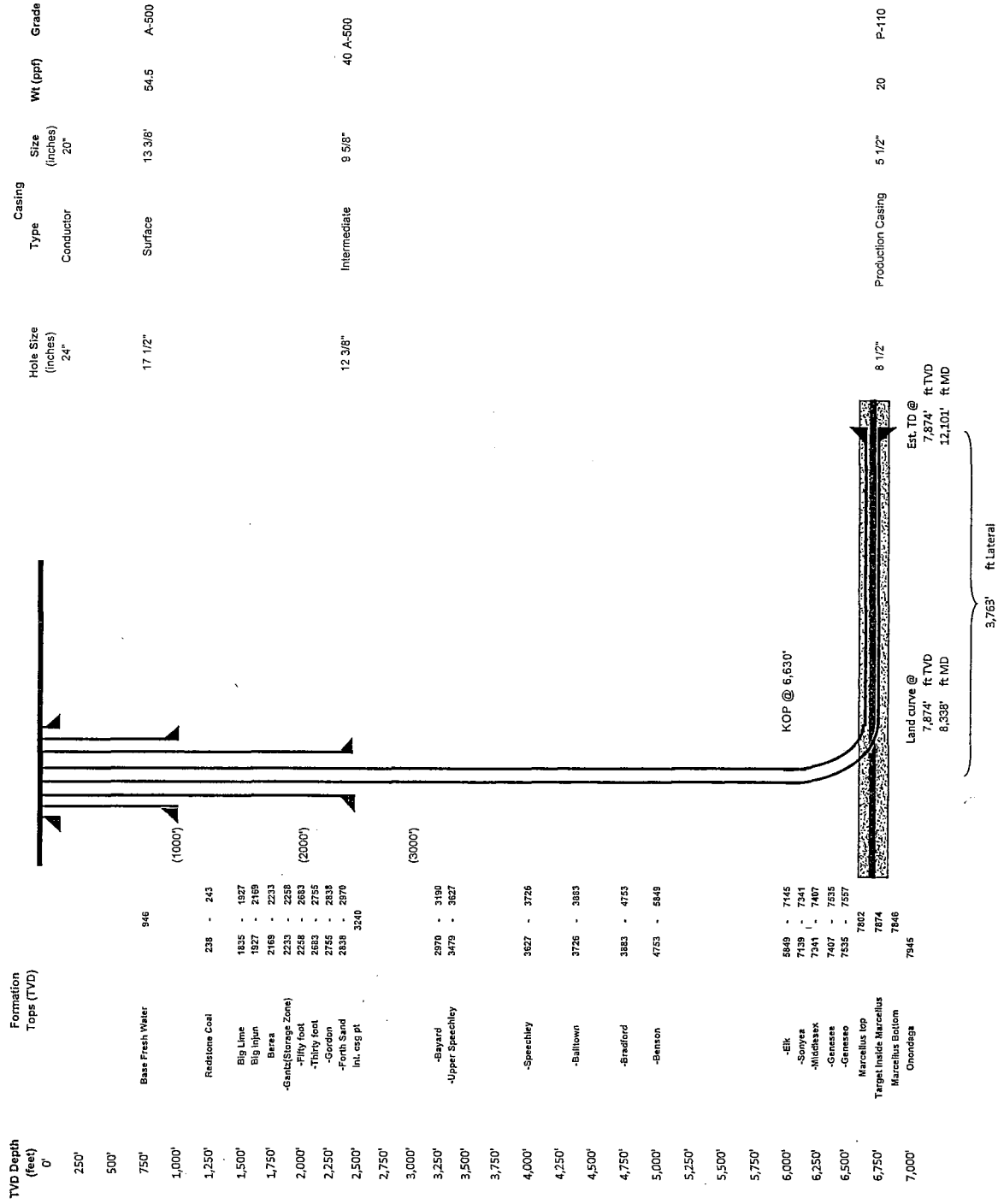
After setting the surface casing, EQT plans to drill a 12 3/8" hole to a depth of approximately 3,240' through both gas storage zones, which runs from a depth of 2,233' to 2,258' and 2,838' to 2,970'. We then plan to run a string of 9 5/8" casing from the surface to at least 100' below the deepest storage zone. This casing will be at least a quality of Grade MC-50 with a weight of 40 pounds per foot. We will then cement to the surface with Type 1 Cement. This cement will contain 2% CaCl plus 0.25 lb/sk flake. The tail portion of this cement will have gas scavenger added to approximately 500' above the storage zone. EQT will allow the cement to set for a minimum of 18 hours prior to the resumption of actual drilling, which will satisfy the requirements of §78.85 *Cement Standards*. Please refer to the attached diagram for more detail. EQT Production is planning to drill these well in approximately 90 days.

OCT 10 2012

DEP, SOUTHWEST REGION
OIL & GAS

Well 590598(MON23H3)
 Equitable Resources
 Monongahela Quad
 Allegheny County Pennsylvania

Admuth 339
 Vertical Section 4086





COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS MANAGEMENT

GWELL LOCATION PLAT

PAGE 1 Surface Location

DEP USE ONLY	Auth ID	C 945980	TF
	Permit #	003-22235	11-15-12
	Project #		

☐ Denotes location of top of well on topo map.

Well is located on topo map 2,405 feet south of latitude 40° 15' 00"

True Latitude: NORTH
40° 14' 36.47"

True Longitude: WEST
79° 54' 16.23"

Horizontal Coordinate System:
NAD 83

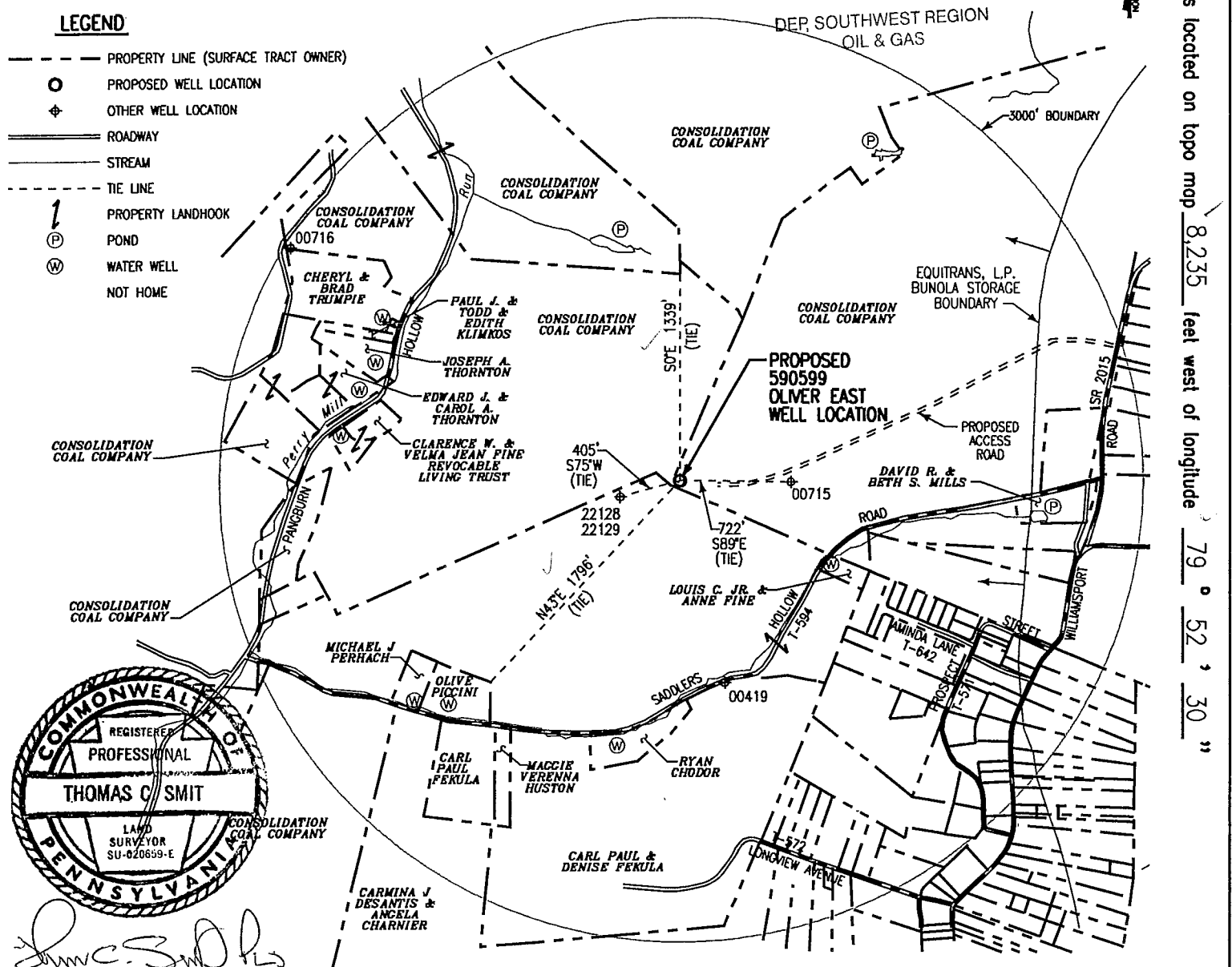
NOTE:
THE PURPOSE OF THIS PLAT IS FOR THE LOCATION OF A PROPOSED GAS WELL AND DOES NOT REPRESENT A CLOSED BOUNDARY SURVEY. PROPERTY LINES AND OWNERS WERE OBTAINED FROM VARIOUS FIELD EVIDENCE, TAX RECORDS, AND AERIAL MAPPING.

NO STRUCTURES EXIST WITHIN 500 FEET OF PROPOSED WELL LOCATION.
THERE ARE NO COAL MINES WITHIN 1000 FEET OF PROPOSED WELL LOCATION.

OCT 04 2012

LEGEND

- PROPERTY LINE (SURFACE TRACT OWNER)
- PROPOSED WELL LOCATION
- ⊕ OTHER WELL LOCATION
- == ROADWAY
- STREAM
- - - TIE LINE
- ↑ PROPERTY LANDHOOK
- (P) POND
- (W) WATER WELL
- NOT HOME



Well is located on topo map 8,235 feet west of longitude 79° 52' 30"

Applicant / Well Operator Name: EQT Production Company		DEP ID#: 146983	Well (Form) Name: Oliver East		Well #: 590599	Serial #:
Address: 455 Racetrack Road, Suite 101, Washington, PA 15301		County: Allegheny	Municipality: Forward Township	Well Type: Gas		
911 address of well site: 4778 Williamsport Rd, Elizabeth PA Not yet available		USGS 7 1/2' Quadrangle Map Name: Monongahela, PA	Map Section: 3	Surface Elevation: 1190 ft.		
Surveyor or Engineer: Thomas C. Smit, PLS	Phone #: (412) 278-2100	Dwg #:	Date: 07/25/2012	Scale: 1"=1000'	Unit Acreeger: 289.17	
Lat & Long Metadata Method: GPS	Accuracy: 3± ft.	Datum: NAD 83	Elevation Metadata Method: GPS	Accuracy: 5± ft.	Datum: NAVD 88	Survey Date: 04/02/12

Inside Benda Gas Storage Field

GoB - Pittsburgh Coal Seam

WELL LOCATION PLAT

003-22235-00

Page 2 Notifications

DEP Statewide toll-free phone number for reporting cases of water contamination which may be associated with development of oil and gas resources is **1-866-255-5158**.

Applicant / Well Operator Name EQT Production Company	DEP ID# 146983	Well (Farm) Name Oliver East	Well # 590599	Serial #
Surface Landowner / Lessor: Consolidation Coal Company		Angle & Course of Deviation (Drilling): N 16° 01' 24" W – 4839'	Anticipated True Vertical Depth Feet (TVD): 7,874'	Anticipated Total Measured Depth Feet (TMD): 12,858'
Target Formation(s): Marcellus		Deepest Formation to be penetrated: Marcellus	Number of laterals: 1	Total footage to be drilled all laterals: 12,858'
Surface Owner/Water Purveyor w/Water Supply within 1000'/3000'		Latitude Longitude of Water Supply		
Consolidation Coal Company		40° 14' 51.43" - 79° 54' 22.44"		
Consolidation Coal Company		40° 14' 57.72" - 79° 53' 59.50"		
David R. & Beth S. Mills		40° 14' 34.75" - 79° 53' 46.07"		
Louis C. Jr. & Anne Fine		40° 14' 31.36" - 79° 54' 03.36"		
Ryan Chodor		40° 14' 18.61" - 79° 54' 21.43"		
Olive Piccini		40° 14' 21.83" - 79° 54' 35.22"		
Michael J. Perhach		40° 14' 21.99" - 79° 54' 38.11"		
Clarence W. & Velma Jean Fine Revocable Living Trust (THE)		40° 14' 38.88" - 79° 54' 44.84"		
Joseph A. Thornton		40° 14' 41.82" - 79° 54' 43.39"		
Edward J. & Carol A. Thornton		40° 14' 43.61" - 79° 54' 42.10"		
Brad & Cheryl Trumple		40° 14' 46.50" - 79° 54' 41.63"		
		OCT 04 2012		
		DEP, SOUTHWEST REGIONAL OIL & GAS		
Municipality: where the well will be drilled, adjacent to the well, or within 3000 feet		Municipality: where the well will be drilled, adjacent to the well, or within 3000 feet		
Forward Township, Allegheny County		Elizabeth Township, Allegheny County		
Borough of Jefferson Hills, Allegheny County				
West Elizabeth Borough, Allegheny County				
Elizabeth Borough, Allegheny County		Coal related parties		
Rostraver Township, Westmoreland County		Reserve Coal Company – Owner - Redstone Seam		
Carroll Township, Washington County		Consolidation Coal Company – Owner - Upper Freeport Seam		
City of Monongahela, Washington County				
New Eagle Borough, Washington, County		Gas Storage Field Operators		
Union Township, Washington, County		Equitrans, L.P. – Operator – Bunola		

Applicant / Well Operator Name:

EQT Production Company

DEP ID#:

146983

Well (Farm) Name:

Oliver East

Well #:

590599

True Latitude: NORTH

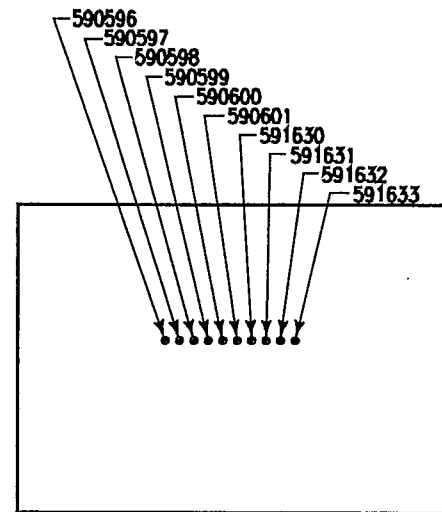
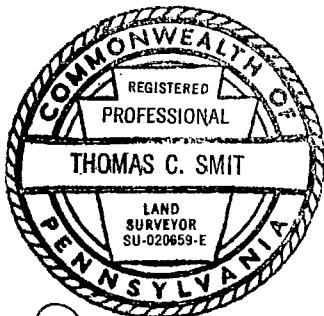
40° 14' 36.47"

True Longitude: WEST

79° 54' 16.23"

Horizontal Coordinate System:
NAD 83

LOCATION AT
TOTAL DEPTH
LAT 40°15'22.10"
LON 79°54'34.92"
(NAD 83)

PROPOSED OLIVER EAST
PAD LAYOUT

Thomas C. Smit

NAD 27 Coordinates

Tophole

LAT	40°14'36.22"
LON	-79°54'17.06"

KOP

LAT	40°14'36.22"
LON	-79°54'17.06"

Landing

LAT	40°14'46.48"
LON	-79°54'07.51"

Bottomhole

LAT	40°15'21.84"
LON	-79°54'35.74"

TOTAL UNIT
ACREAGE
289.17 Ac.

PROPOSED
HORIZONTAL
SECTION

AZ=330° (GN) A.185°

4839'
N16°01'24"N
(DEVIATION)

(DEVIATION)
1276'
N36°51'53"E

(TIE)
519'
N32°E

UNIT BOUNDARY

LOCATION
AT LANDING
LAT 40°14'46.74"
LON 79°54'06.69"
(NAD 83)

PROPOSED
ACCESS
ROAD

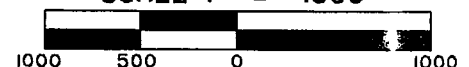
SR 2015 II
WILLIAMSPORT ROAD

PROPOSED
590599
OLIVER EAST
WELL LOCATION
& KOP

OCT 04 2012

DEP SOUTHWEST REGION
OIL & GAS

SCALE 1" = 1000'



WELL LOCATION PLAT

PAGE 4 Well Plan

DEP Use Only	Permit # 003- 22235-00
--------------------	------------------------------

Applicant / Well Operator Name:

DEP ID#:

Well (Form) Name:

Well #:

EQT Production Company

146983

Oliver East

590599

KOP: TVD: 6457' TMD: 6457' Latitude 40° 14' 36.47" Longitude 79° 54' 16.23"

Landing Point: TVD: 7874' TMD: 8663' Latitude 40° 14' 46.74" Longitude 79° 54' 06.69"

OCT 04 2012

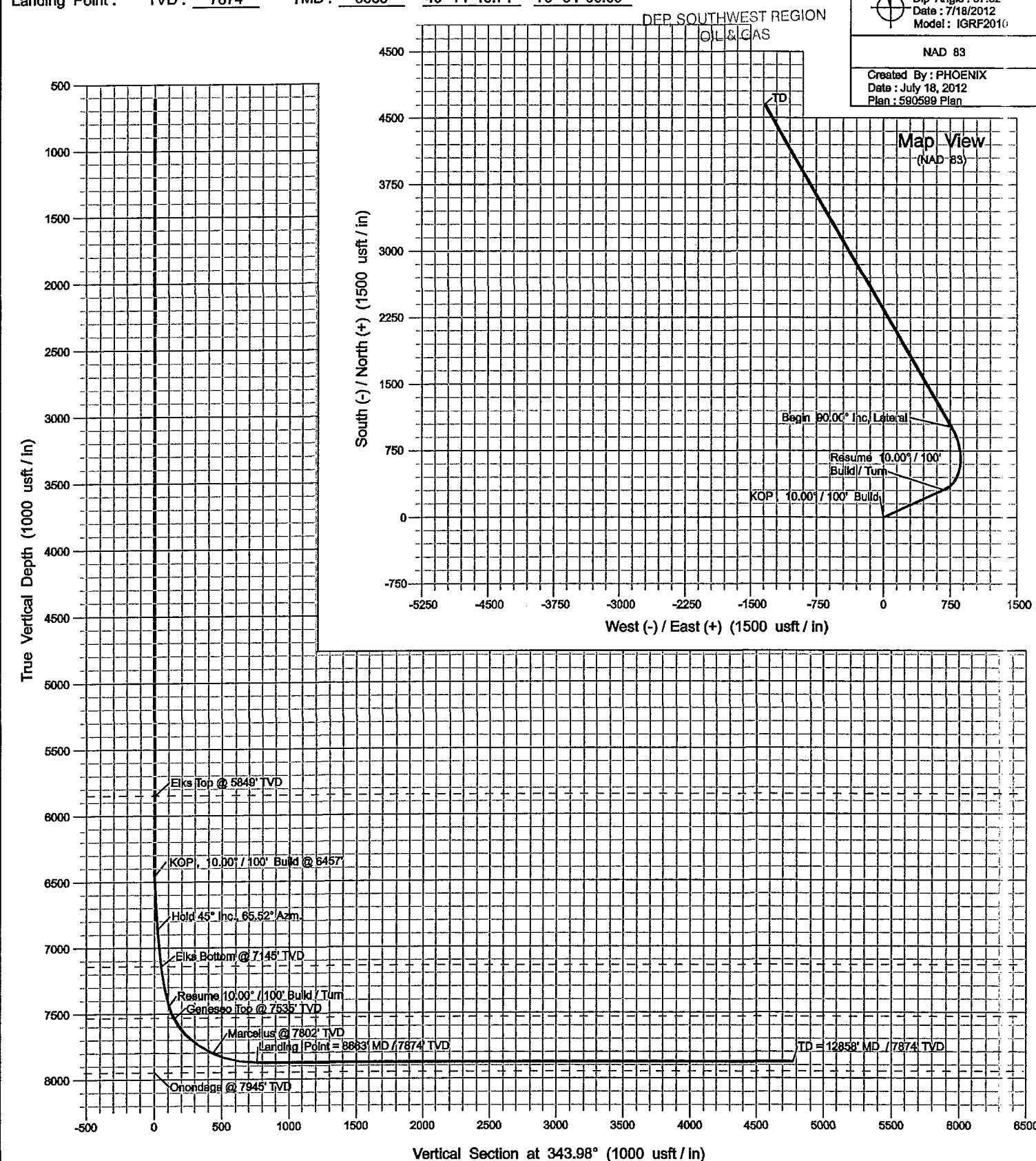
G
M

Azimuths to Grid North
Magnetic North: -3.25

Magnetic Field
Strength: 52,902
Dip Angle: 67.62
Date: 7/18/2012
Model: IGRF2010

NAD 83

Created By: PHOENIX
Date: July 18, 2012
Plan: 590599 Plan





COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS MANAGEMENT

DEP USE ONLY
Application Tracking #

Proposed Alternate Method or Material for Casing, Plugging, Venting or Equipping a Well

Well Operator EQT Production Company		DEP ID# 146983		Well Permit or Registration Number Pending 003-22235-00	
Address 455 Racetrack Road, Suite 101				Well Farm Name Oliver East	
City Washington	State PA	Zip Code 15301	Well # 590599	Serial #	
Phone 412-395-5557	Fax 412-395-3298	County Allegheny	Municipality Forward Township		

A proposed alternate method is subject to provisions in §3221 of the 2012 Oil and Gas Act, 58 Pa. C.S. §3221 Section 13 of the Coal and Gas Resource Coordination Act, 58 P.S. §513 and 25 PA Code §§78.75-78.75a (relating to Alternate Methods.) **Attach proof of notification of coal operator(s).**

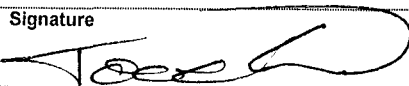
Describe in reasonable detail using a written description and / or diagram:

1. the proposed alternate method or materials, and
2. the manner in which the alternative will satisfy the goals of the laws and regulations.

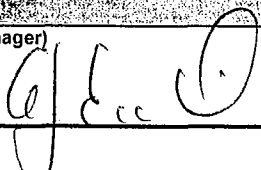
EQT Production will drill no more than 100 feet below the bottom of the abandoned mine on the Pittsburgh Seam. Coal protection casing will then be set at least 30 feet (and perhaps more than 50 feet if hole conditions dictate) below the bottom of the coal mine and cement to surface according to 25 PA Code Section 78.83 (h). The reason for this request is to ensure that the casing shoe is able to reach a depth of 30'-50' below the mine. We need to drill an additional 30' to capture the 15'-25' of fill produced by the mine void. There are no gas zones known to exist within 100 feet below the mine.

OCT 04 2012

DEP, SOUTHWEST REGION
OIL & GAS

Optional: Approval by Coal Owner or Operator		Signature of Applicant / Well Operator	
Signature	Date	Signature	Date
			10/3/12
Print or Type Signer's Name and Title		Print or Type Signer's Name and Title	
		Todd Klawns - Permitting Supervisor	

If optional approval is signed by coal owner or operator, the 15-day objection period may be waived.

DEP USE ONLY	
Approved by (DEP Manager) 	Conditions ☐ YES, See Attached ☒ NO Date 11/16/12

Casing and Cementing Plan Through the Equitrans Gas Storage Zones

Well: Oliver East Pad

003-22235-00

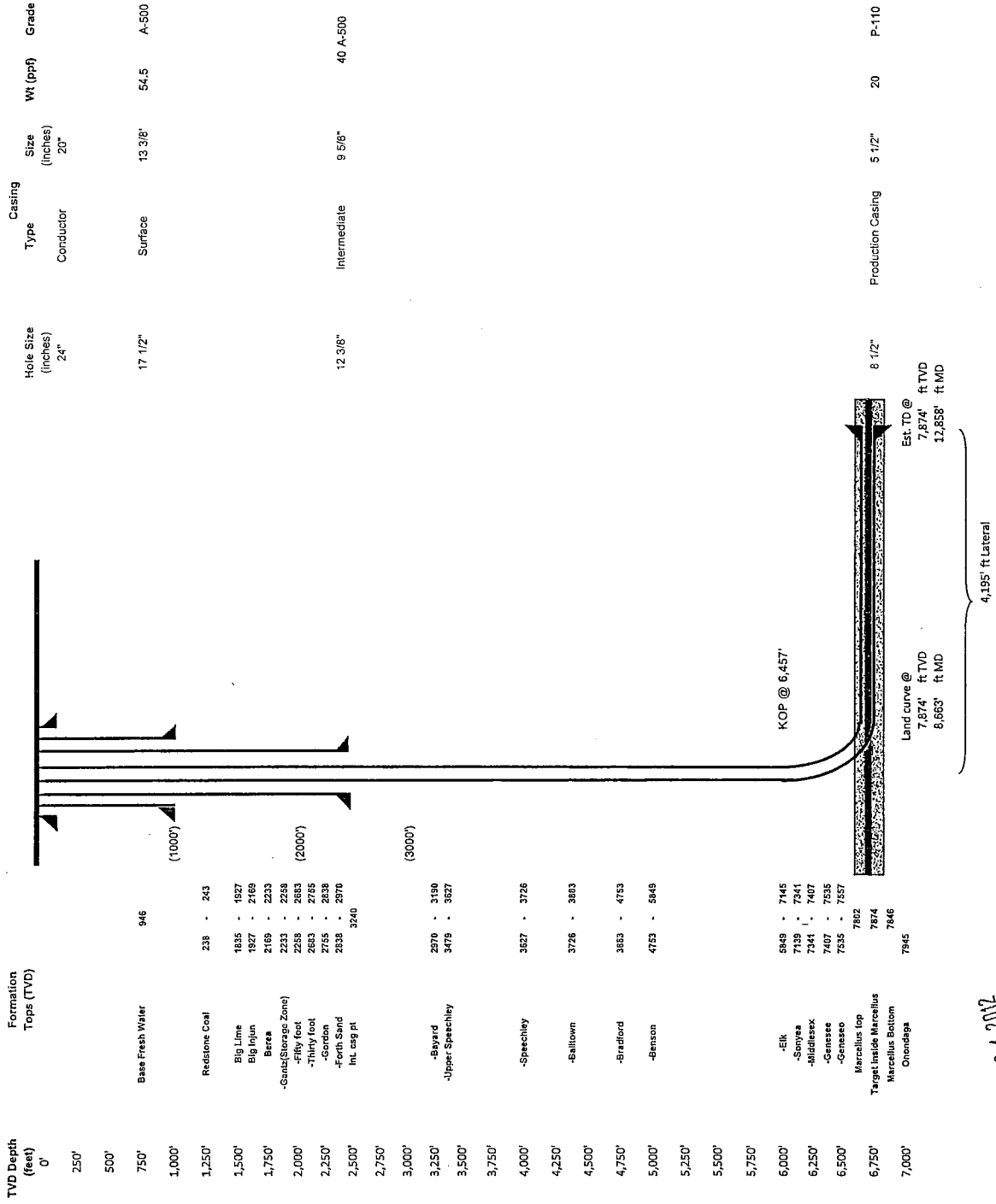
After setting the surface casing, EQT plans to drill a 12 3/8" hole to a depth of approximately 3,240' through both gas storage zones, which runs from a depth of 2,233' to 2,258' and 2,838' to 2,970'. We then plan to run a string of 9 5/8" casing from the surface to at least 100' below the deepest storage zone. This casing will be at least a quality of Grade MC-50 with a weight of 40 pounds per foot. We will then cement to the surface with Type 1 Cement. This cement will contain 2% CaCl plus 0.25 lb/sk flake. The tail portion of this cement will have gas scavenger added to approximately 500' above the storage zone. EQT will allow the cement to set for a minimum of 18 hours prior to the resumption of actual drilling, which will satisfy the requirements of §78.85 *Cement Standards*. Please refer to the attached diagram for more detail. EQT Production is planning to drill these well in approximately 90 days.

OCT 10 2012

DEP, SOUTHWEST REGION
OIL & GAS

Well 590599(MON23H4)
 Equitable Resources
 Monongahela Quad
 Allegheny County Pennsylvania

330
 Azimuth
 4838
 Vertical Section



OCT 04 2012
 DEP. SOUTHWEST REGION
 OIL & GAS



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS MANAGEMENT

WELL LOCATION PLAT
PAGE 1 - Surface Location

DEP USE ONLY	Auth ID: C945987	TF: 11-15-12
	Permit #: 003-222316	
	Project #:	

☐ Denotes location of top of well on topo map.

Well is located on topo map 2,405 feet south of latitude 40° 15' 00"

True Latitude: NORTH
40° 14' 36.47"

True Longitude: WEST
79° 54' 16.04"

Horizontal Coordinate System:
NAD 83

NOTE:
THE PURPOSE OF THIS PLAT IS FOR THE LOCATION OF A PROPOSED GAS WELL AND DOES NOT REPRESENT A CLOSED BOUNDARY SURVEY. PROPERTY LINES AND OWNERS WERE OBTAINED FROM VARIOUS FIELD EVIDENCE, TAX RECORDS, AND AERIAL MAPPING.

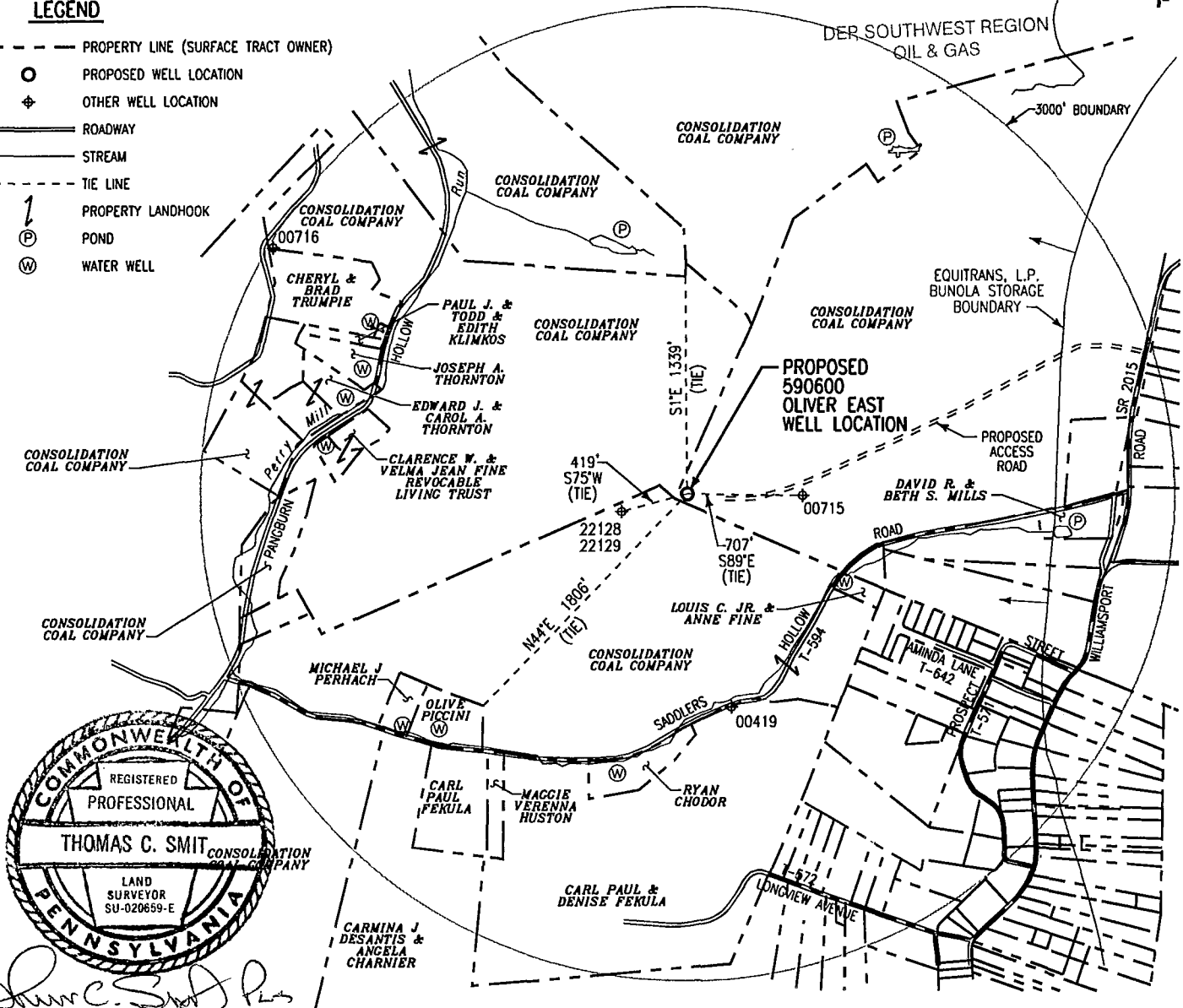
NO STRUCTURES EXIST WITHIN 500 FEET OF PROPOSED WELL LOCATION.

THERE ARE NO COAL MINES WITHIN 1000 FEET OF PROPOSED WELL LOCATION.

OCT 04 2012

LEGEND

- PROPERTY LINE (SURFACE TRACT OWNER)
- PROPOSED WELL LOCATION
- ◆ OTHER WELL LOCATION
- == ROADWAY
- STREAM
- - - TIE LINE
- ↑ PROPERTY LANDHOOK
- Ⓟ POND
- Ⓢ WATER WELL



Well is located on topo map 8,220 feet west of longitude 79° 52' 30"

Applicant / Well Operator Name: EQT Production Company		DEP ID#: 146983	Well (Farm) Name: Oliver East		Well #: 590600	Serial #:
Address: 455 Racetrack Road, Suite 101, Washington, PA 15301			County: Allegheny	Municipality: Forward Township	Well Type: Gas	
911 address of well site: 4778 Williamsport Rd, Elizabeth PA Not yet available			USGS 7 1/2' Quadrangle Map Name: Monongahela, PA	Map Section: 3	Surface Elevation: 1190 ft.	
Surveyor or Engineer: Thomas C. Smit, PLS	Phone #: (412) 278-2100	Dwg #:	Date: 07/25/2012	Scale: 1" = 1000'	Unit Acreage: 289.17	
Lat & Long Metadata Method: GPS	Accuracy: 3± ft.	Datum: NAD 83	Elevation Metadata Method: GPS	Accuracy: 5± ft.	Datum: NAVD 88	Survey Date: 04/02/12

Inside Bunola Gas Storage Field

Gas - Pittsburgh Coal Seam

WELL LOCATION PLAT

OCT 04 2012

Page 2 Notifications

DEP Statewide toll-free phone number for reporting cases of water contamination which may be associated with development of oil and gas resources is **1-866-255-5158**.

WEST REGION
OIL & GAS

003-22236-00

Applicant / Well Operator Name EQT Production Company	DEP ID# 146983	Well (Farm) Name Oliver East	Well # 590600	Serial #
Surface Landowner / Lessor: Consolidation Coal Company		Angle & Course of Deviation (Drilling): N 08° 55' 47" W – 5300'	Anticipated True Vertical Depth Feet (TVD): 7,874'	Anticipated Total Measured Depth Feet (TMD): 13,341'
Target Formation(s): Marcellus		Deepest Formation to be penetrated: Marcellus	Number of laterals: 1	Total footage to be drilled all laterals: 13,341'
Surface Owner/Water Purveyor w/Water Supply within 1000'/3000'		Latitude Longitude of Water Supply		
Consolidation Coal Company		40° 14' 51.43" - 79° 54' 22.44"		
Consolidation Coal Company		40° 14' 57.72" - 79° 53' 59.50"		
David R. & Beth S. Mills		40° 14' 34.75" - 79° 53' 46.07"		
Louis C. Jr. & Anne Fine		40° 14' 31.36" - 79° 54' 03.36"		
Ryan Chodor		40° 14' 18.61" - 79° 54' 21.43"		
Olive Piccini		40° 14' 21.83" - 79° 54' 35.22"		
Michael J. Perhach		40° 14' 21.99" - 79° 54' 38.11"		
Clarence W. & Velma Jean Fine Revocable Living Trust (THE)		40° 14' 38.88" - 79° 54' 44.84"		
Joseph A. Thornton		40° 14' 41.82" - 79° 54' 43.39"		
Edward J. & Carol A. Thornton		40° 14' 43.61" - 79° 54' 42.10"		
Brad & Cheryl Trumpie		40° 14' 46.50" - 79° 54' 41.63"		
Municipality: where the well will be drilled, adjacent to the well, or within 3000 feet		Municipality: where the well will be drilled, adjacent to the well, or within 3000 feet		
Forward Township, Allegheny County		Elizabeth Township, Allegheny County		
Borough of Jefferson Hills, Allegheny County				
West Elizabeth Borough, Allegheny County				
Elizabeth Borough, Allegheny County		Coal related parties		
Rostraver Township, Westmoreland County		Reserve Coal Company – Owner - Redstone Seam		
Carroll Township, Washington County		Consolidation Coal Company – Owner - Upper Freeport Seam		
City of Monongahela, Washington County				
New Eagle Borough, Washington, County		Gas Storage Field Operators		
Union Township, Washington, County		Equitrans, L.P. – Operator – Bunola		

WELL LOCATION PLAT

PAGE 3 Plan View of Deviated Well Bore

003-22236-00

Applicant / Well Operator Name:
EQT Production Company

DEP ID#:

146983

Well (Farm) Name:

Oliver East

Well #:

590600

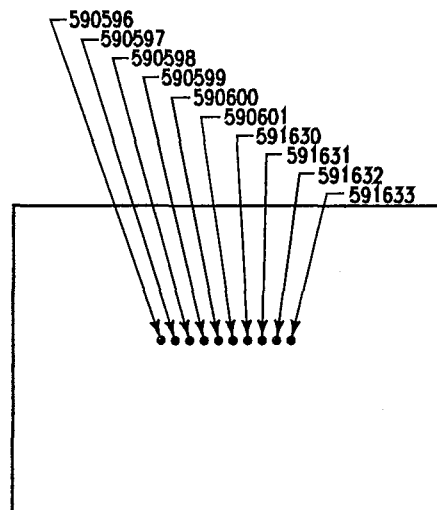
True Latitude: NORTH

40° 14' 36.47"

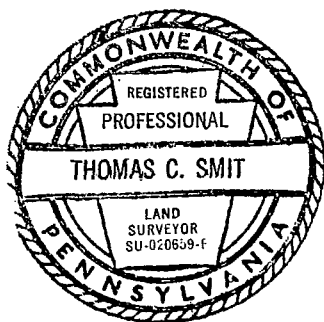
True Longitude: WEST

79° 54' 16.04"Horizontal Coordinate System:
NAD 83

LOCATION AT
TOTAL DEPTH
LAT 40°15'28.00"
LON 79°54'28.30"
(NAD 83)



**PROPOSED OLIVER EAST
PAD LAYOUT**



NAD 27 Coordinates	
Tophole	
LAT	40°14'36.22"
LON	-79°54'16.86"
KOP	
LAT	40°14'36.22"
LON	-79°54'16.86"
Landing	
LAT	40°14'50.29"
LON	-79°53'59.21"
Bottomhole	
LAT	40°15'27.75"
LON	-79°54'29.12"

**TOTAL UNIT
ACREAGE
289.17 Ac.**

5300'
N08°55'47"W
(DEVIATION)

AZ=380° (GN)

UNIT BOUNDARY

LOCATION
AT LANDING
LAT 40°14'50.54"
LON 79°53'58.39"
(NAD 83)

(DEVIATION)
1975'
N45°16'37"E

(TIE)
2160'
S66°W

PROPOSED
ACCESS
ROAD

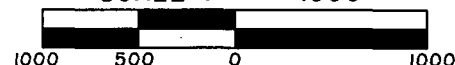
SR 2015 II
WILLIAMSPORT ROAD

**PROPOSED
590600
OLIVER EAST
WELL LOCATION
& KOP**

OCT 04 2012

DEP, SOUTHWEST REGION
OIL & GAS

SCALE 1" = 1000'



WELL LOCATION PLAT

PAGE 4 Well Plan

DEP
Use
Only

Permit #

003-
22226-00

Applicant / Well Operator Name:

DEP ID#:

Well (Farm) Name:

Well #:

EQT Production Company

146983

Oliver East

590600

KOP: TVD: 5460' TMD: 5460' Latitude 40° 14' 36.47" Longitude 79° 54' 16.04"

Landing Point: TVD: 7874' TMD: 8898' Latitude 40° 14' 50.54" Longitude 79° 53' 58.39"

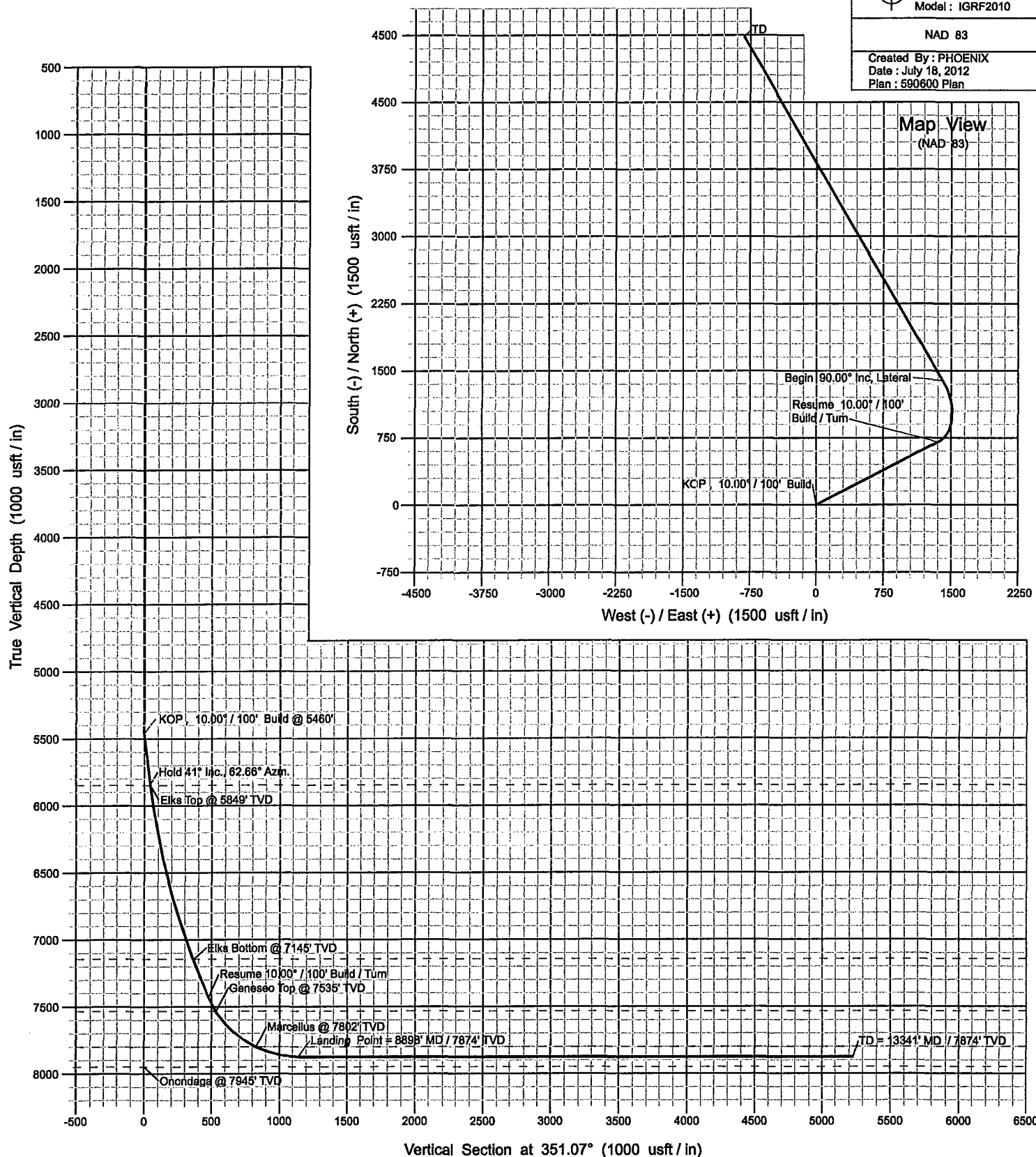
OCT 04 2012

DEP, SOUTHWEST REGION
OIL & GAS


 Azimuths to Grid North
 Magnetic North: -9.25
 Magnetic Field
 Strength: 52,902
 Dip Angle: 67.62
 Date: 7/18/2012
 Model: IGRF2010

NAD 83

Created By: PHOENIX
 Date: July 18, 2012
 Plan: 590600 Plan





COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS MANAGEMENT

DEP USE ONLY
Application Tracking #

Proposed Alternate Method or Material for Casing, Plugging, Venting or Equipping a Well

Well Operator EQT Production Company		DEP ID# 146983		Well Permit or Registration Number Pending 003-22236-00	
Address 455 Racetrack Road, Suite 101				Well Farm Name Oliver East	
City Washington	State PA	Zip Code 15301	Well # 590600	Serial #	
Phone 412-395-5557	Fax 412-395-3298	County Allegheny	Municipality Forward Township		

A proposed alternate method is subject to provisions in §3221 of the 2012 Oil and Gas Act, 58 Pa. C.S. §3221 Section 13 of the Coal and Gas Resource Coordination Act, 58 P.S. §513 and 25 PA Code §§78.75-78.75a (relating to Alternate Methods.) **Attach proof of notification of coal operator(s).**

Describe in reasonable detail using a written description and / or diagram:

1. the proposed alternate method or materials, and
2. the manner in which the alternative will satisfy the goals of the laws and regulations.

EQT Production will drill no more than 100 feet below the bottom of the abandoned mine on the Pittsburgh Seam. Coal protection casing will then be set at least 30 feet (and perhaps more than 50 feet if hole conditions dictate) below the bottom of the coal mine and cement to surface according to 25 PA Code Section 78.83 (h). The reason for this request is to ensure that the casing shoe is able to reach a depth of 30'-50' below the mine. We need to drill an additional 30' to capture the 15'-25' of fill produced by the mine void. There are no gas zones known to exist within 100 feet below the mine.

OCT 04 2012

DEP SOUTHWEST REGION
OIL & GAS

Optional: Approval by Coal Owner or Operator		Signature of Applicant / Well Operator	
Signature	Date	Signature	Date
			10/3/12
Print or Type Signer's Name and Title		Print or Type Signer's Name and Title	
		Todd Klawer - Permitting Supervisor	

If optional approval is signed by coal owner or operator, the 15-day objection period may be waived.

DEP USE ONLY	
Approved by (DEP Manager)	Conditions
	☐ YES, See Attached ☒ NO
	Date 11/19/12

Casing and Cementing Plan Through the Equitrans Gas Storage Zones

Well: Oliver East Pad

003-22236-00

After setting the surface casing, EQT plans to drill a 12 3/8" hole to a depth of approximately 3,240' through both gas storage zones, which runs from a depth of 2,233' to 2,258' and 2,838' to 2,970'. We then plan to run a string of 9 5/8" casing from the surface to at least 100' below the deepest storage zone. This casing will be at least a quality of Grade MC-50 with a weight of 40 pounds per foot. We will then cement to the surface with Type 1 Cement. This cement will contain 2% CaCl plus 0.25 lb/sk flake. The tail portion of this cement will have gas scavenger added to approximately 500' above the storage zone. EQT will allow the cement to set for a minimum of 18 hours prior to the resumption of actual drilling, which will satisfy the requirements of §78.85 *Cement Standards*. Please refer to the attached diagram for more detail. EQT Production is planning to drill these well in approximately 90 days.

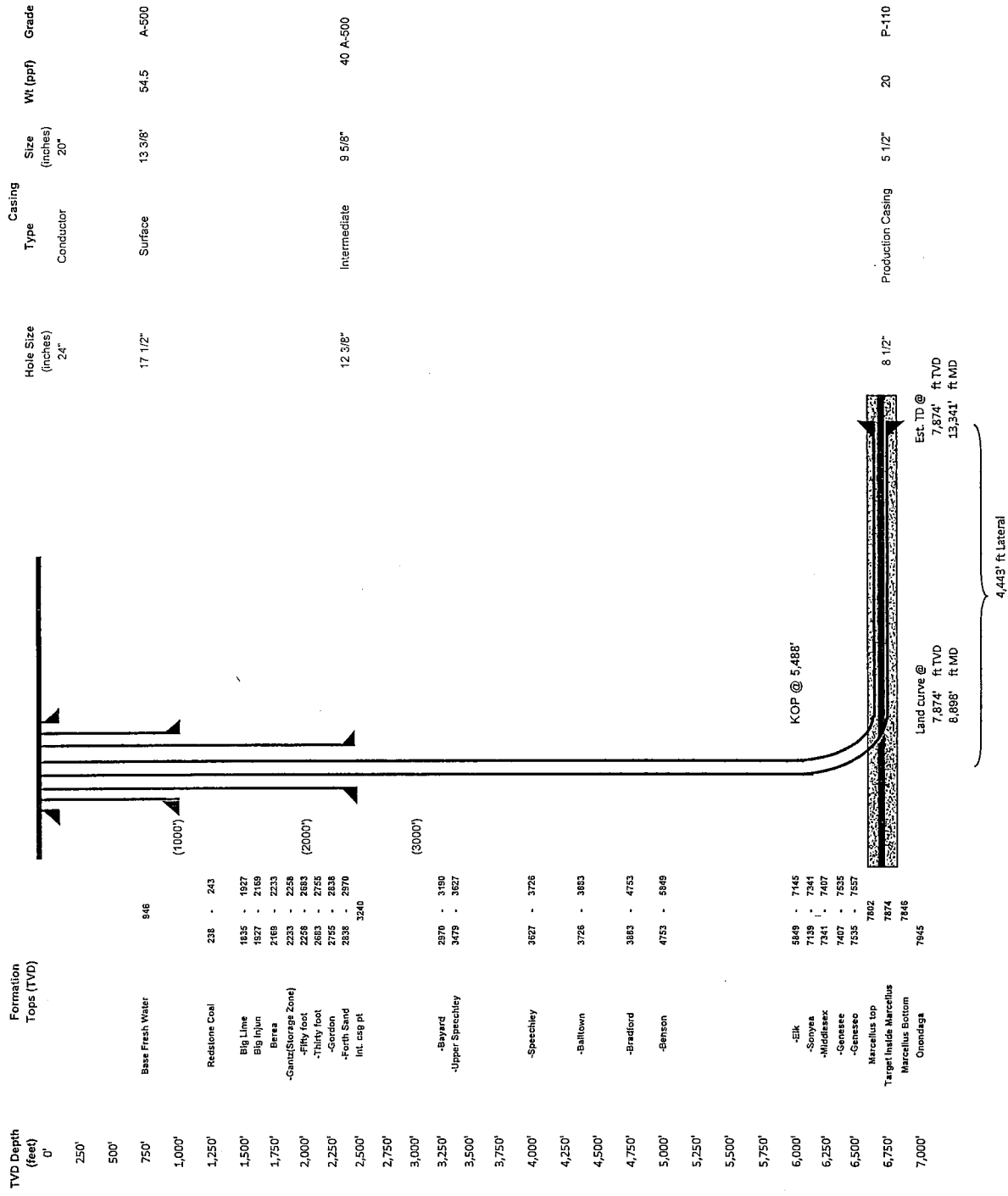
OCT 10 2012

DER, SOUTHWEST REGION
OIL & GAS

Well 590600(MON23H5)

Equitable Resources
Monongahela Quad
Allegheny County, Pennsylvania

Admuth 530
Vertical Section 5300





COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS MANAGEMENT

WELL LOCATION PLAT

PAGE 1. Surface Location

DEP USE ONLY	Auth ID: C947759	DMM G: 116112 CRP
	Permit #: 003-22237	
	Project #:	

☐ Denotes location of top of well on topo map.

Well is located on topo map 2,405 feet south of latitude 40° 15' 00"

True Latitude: NORTH
40° 14' 36.46"

True Longitude: WEST
79° 54' 16.81"

Horizontal Coordinate System:
NAD 83

NOTE:
THE PURPOSE OF THIS PLAT IS FOR THE LOCATION OF A PROPOSED GAS WELL AND DOES NOT REPRESENT A CLOSED BOUNDARY SURVEY. PROPERTY LINES AND OWNERS WERE OBTAINED FROM VARIOUS FIELD EVIDENCE, TAX RECORDS, AND AERIAL MAPPING.

NO STRUCTURES EXIST WITHIN 500 FEET OF PROPOSED WELL LOCATION.
THERE ARE NO COAL MINES WITHIN 1000 FEET OF PROPOSED WELL LOCATION.

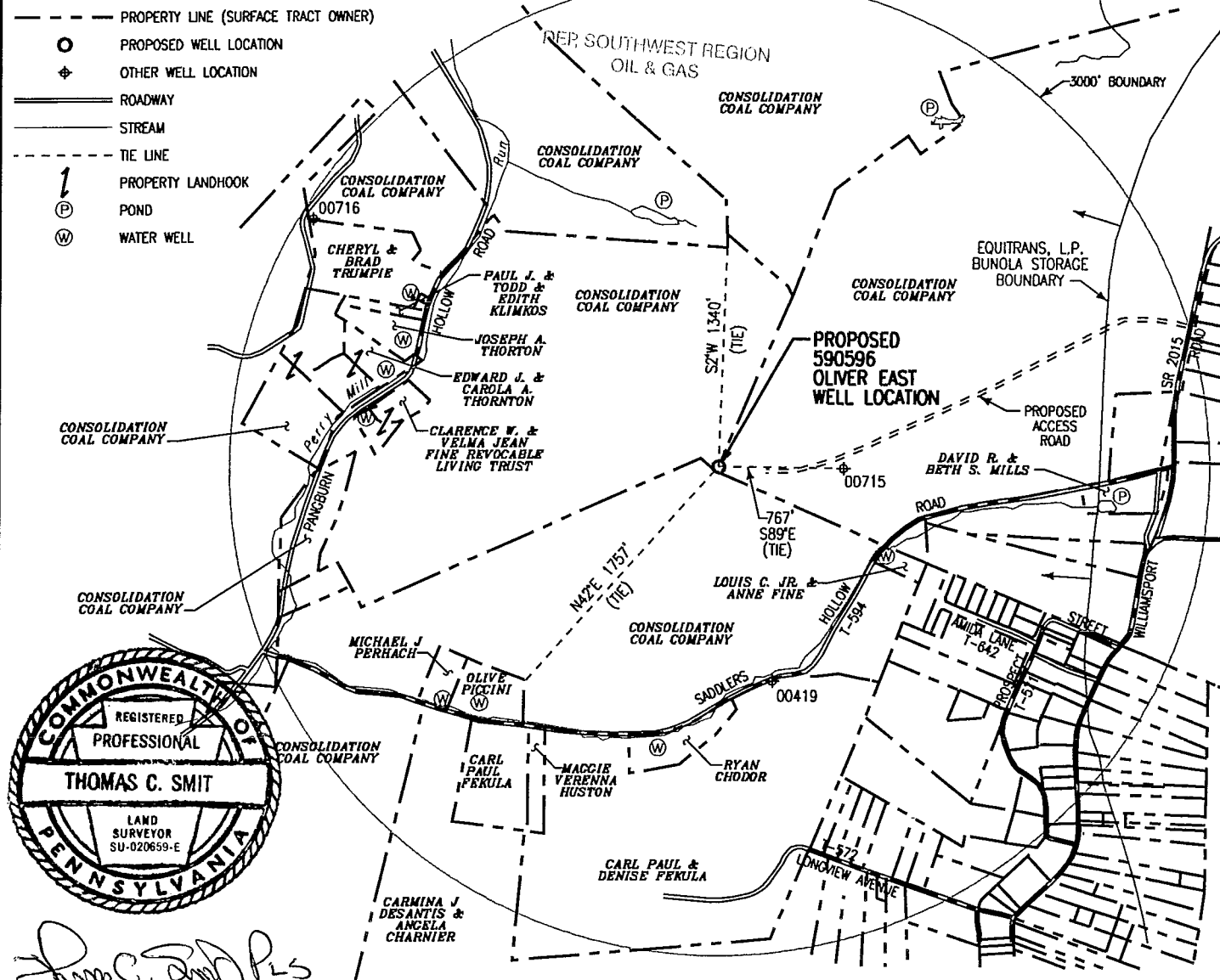
OCT 22 2012



Well is located on topo map 8,280 feet west of longitude 79° 52' 30"

LEGEND

- PROPERTY LINE (SURFACE TRACT OWNER)
- PROPOSED WELL LOCATION
- ⊕ OTHER WELL LOCATION
- == ROADWAY
- STREAM
- - - TIE LINE
- ↑ PROPERTY LANDHOOK
- (P) POND
- (W) WATER WELL



WELL LOCATION PLAT

Page 2 Notifications

DEP Statewide toll-free phone number for reporting cases of water contamination which may be associated with development of oil and gas resources is **1-866-255-5158**. 003-22237-00

Applicant / Well Operator Name EQT Production Company ✓	DEP ID# 146983 ✓	Well (Farm) Name Oliver East ✓	Well # 590596 ✓	Serial #
Surface Landowner / Lessor: Consolidation Coal Company		Angle & Course of Deviation (Drilling): N 48° 22' 04" W – 3,522'	Anticipated True Vertical Depth Feet (TVD): 7,874'	Anticipated Total Measured Depth Feet (TMD): 11,511'
Target Formation(s): Marcellus		Deepest Formation to be penetrated: Marcellus	Number of laterals: 1	Total footage to be drilled all laterals: 11,511'
Surface Owner/Water Purveyor w/Water Supply within 1000'/3000'		Latitude Longitude of Water Supply		
✓ Consolidation Coal Company		40° 14' 51.43" - 79° 54' 22.44"		
✓ Consolidation Coal Company		40° 14' 57.72" - 79° 53' 59.50"		
✓ David R. & Beth S. Mills		40° 14' 34.75" - 79° 53' 46.07"		
✓ Louis C. Jr. & Anne Fine		40° 14' 31.36" - 79° 54' 03.36"		
✓ Ryan Chodor		40° 14' 18.61" - 79° 54' 21.43"		
✓ Olive Piccini		40° 14' 21.83" - 79° 54' 35.22"		
✓ Michael J. Perhach		40° 14' 21.99" - 79° 54' 38.11"		
✓ Clarence W. & Velma Jean Fine Revocable Living Trust (THE)		40° 14' 38.88" - 79° 54' 44.84"		
✓ Joseph A. Thornton		40° 14' 41.82" - 79° 54' 43.39"		
✓ Edward J. & Carol A. Thornton		40° 14' 43.61" - 79° 54' 42.10"		
✓ Brad & Cheryl Trumpie		40° 14' 46.50" - 79° 54' 41.63"		
Municipality: where the well will be drilled, adjacent to the well, or within 3000 feet		Municipality: where the well will be drilled, adjacent to the well, or within 3000 feet		
✓ Forward Township, Allegheny County		✓ Elizabeth Township, Allegheny County		
✓ Borough of Jefferson Hills, Allegheny County				
✓ West Elizabeth Borough, Allegheny County				
✓ Elizabeth Borough, Allegheny County		Coal related parties		
✓ Rostraver Township, Westmoreland County		Reserve Coal Company – Owner - Redstone Seam		
✓ Carroll Township, Washington County		Consolidation Coal Company – Owner -Upper Freeport Seam		
✓ City of Monongahela, Washington County				
✓ New Eagle Borough, Washington, County		Gas Storage Field Operators		
✓ Union Township, Washington, County		✓ Equitrans, L.P. – Operator – Bunola		

Applicant / Well Operator Name:

EQT Production Company ✓

DEP ID#:

146983 ✓

Well (Form) Name:

Oliver East ✓

Well #:

590596 ✓

True Latitude: NORTH

40° 14' 36.46"

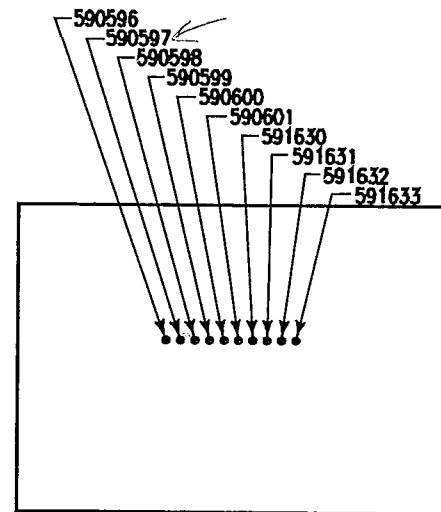
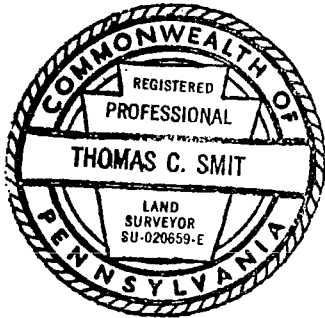
True Longitude: WEST

79° 54' 16.81"

Horizontal Coordinate System:

NAD 83

OCT 22 2012

DEP, SOUTHWEST REGION
OIL & GASPROPOSED OLIVER EAST
PAD LAYOUT

LOCATION AT
TOTAL DEPTH
LAT 40°14'58.94"
LON 79°54'51.49"
(NAD 83)

UNIT BOUNDARY

PROPOSED HORIZONTAL
SECTION

3522'
N48°22'04"W
(DEVIATION)
AZ=890°29'12"
(GN)

(DEVIATION)
1188'
S81°16'18"W

(TIE)

2215' S67°W

PROPOSED
ACCESS
ROADSR 2015 II
WILLIAMSPORT ROAD

LOCATION
AT LANDING
LAT 40°14'34.39"
LON 79°54'31.89"
(NAD 83)

(TIE)
N49°E
1437'PROPOSED
590596
OLIVER EAST
WELL LOCATION
& KOP

NAD 27 Coordinates

Tophole

LAT 40°14'36.21"

LON -79°54'17.64"

KOP

LAT 40°14'36.21"

LON -79°54'17.64"

Landing

LAT 40°14'34.14"

LON -79°54'32.72"

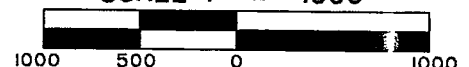
Bottomhole

LAT 40°14'58.68"

LON -79°54'52.31"

TOTAL UNIT
ACREAGE
370.05 Ac.

SCALE 1" = 1000'



WELL LOCATION PLAT

PAGE 4 Well Plan

 DEP Use Only
 Permit # 003-22237-00

Applicant / Well Operator Name:

DEP ID#:

Well (Form) Name:

Well #:

EQT Production Company ✓

146983 ✓

Oliver East ✓

590596 ✓

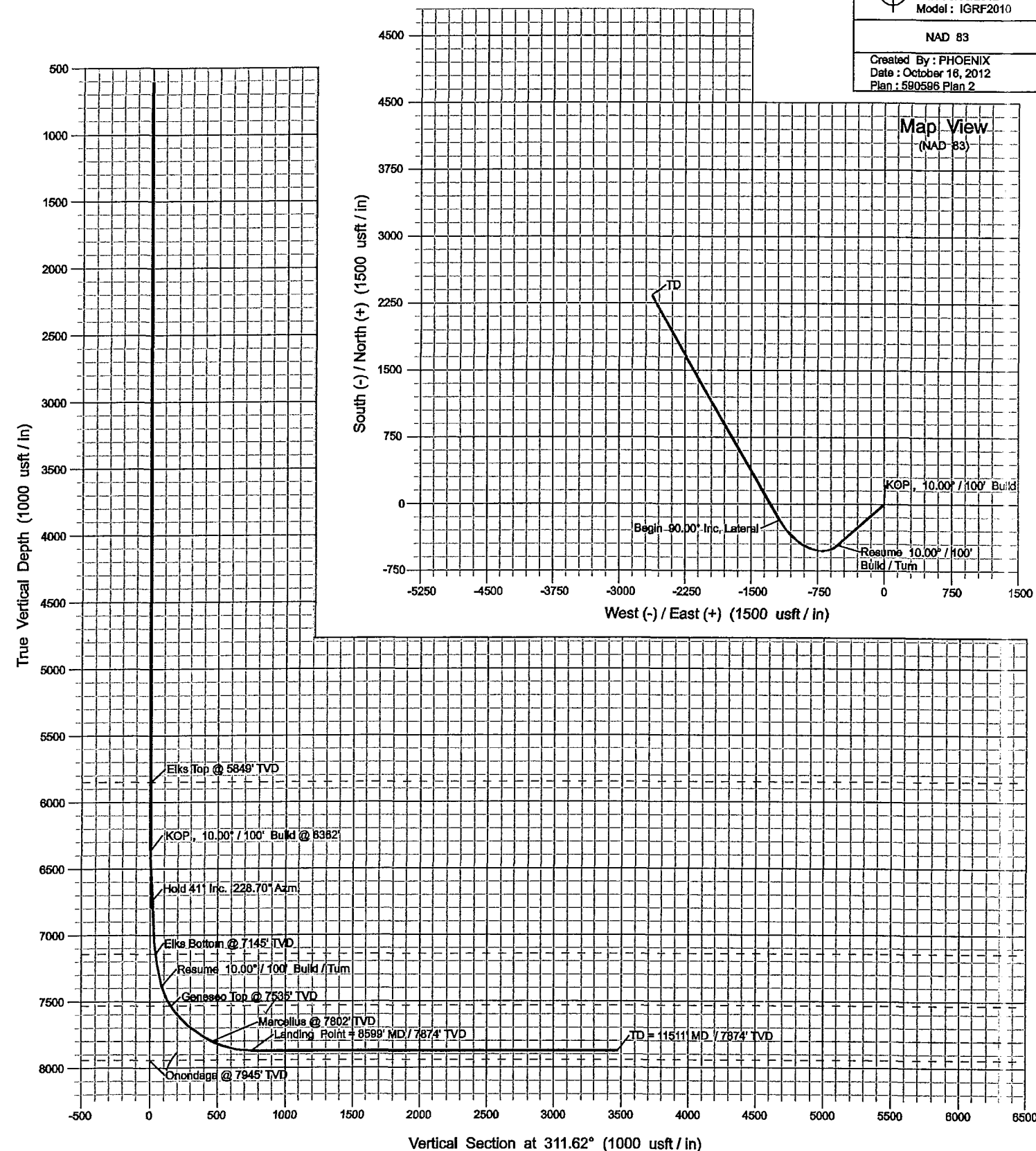
Latitude Longitude
 KOP: TVD: 6362' TMD: 6362' 40° 14' 36.46" 79° 54' 16.81"

OCT 22 2012

Landing Point: TVD: 7874' TMD: 8599' 40° 14' 34.39" 79° 54' 31.89"

DEP SOUTHWEST REGION
OIL & GAS

G
 M
 Azimuths to Grid North
 Magnetic North: -9.25
 Magnetic Field
 Strength: 52,888
 Dip Angle: 67.61
 Date: 9/06/2012
 Model: IGRF2010
 NAD 83
 Created By: PHOENIX
 Date: October 16, 2012
 Plan: 590596 Plan 2





COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS MANAGEMENT

DEP USE ONLY
Application Tracking #

Proposed Alternate Method or Material for Casing, Plugging, Venting or Equipping a Well

Well Operator		DEP ID#		Well Permit or Registration Number	
EQT Production Company		146983		Pending 003-22237-00	
Address				Well Farm Name	
455 Racetrack Road, Suite 101				Oliver East	
City		State	Zip Code	Well #	Serial #
Washington		PA	15301	590596	
Phone	Fax			County	Municipality
412-395-5557	412-395-3298			Allegheny	Forward Township

A proposed alternate method is subject to provisions in §3221 of the 2012 Oil and Gas Act, 58 Pa. C.S. §3221 Section 13 of the Coal and Gas Resource Coordination Act, 58 P.S. §513 and 25 PA Code §§78.75-78.75a (relating to Alternate Methods.) **Attach proof of notification of coal operator(s).**

Describe in reasonable detail using a written description and / or diagram:

1. the proposed alternate method or materials, and
2. the manner in which the alternative will satisfy the goals of the laws and regulations.

EQT Production will drill no more than 100 feet below the bottom of the abandoned mine on the Pittsburgh Seam. Coal protection casing will then be set at least 30 feet (and perhaps more than 50 feet if hole conditions dictate) below the bottom of the coal mine and cement to surface according to 25 PA Code Section 78.83 (h). The reason for this request is to ensure that the casing shoe is able to reach a depth of 30'-50' below the mine. We need to drill an additional 30' to capture the 15'-25' of fill produced by the mine void. There are no gas zones known to exist within 100 feet below the mine.

OCT 27 2012
OIL & GAS
SOUTHWEST REGION

Optional: Approval by Coal Owner or Operator		Signature of Applicant / Well Operator	
Signature	Date	Signature	Date
			10/19/2012
Print or Type Signer's Name and Title		Print or Type Signer's Name and Title	
		Todd Klawner - Permitting Supervisor	

If optional approval is signed by coal owner or operator, the 15-day objection period may be waived.

DEP USE ONLY	
Approved by (DEP Manager)	Conditions
	☐ YES, See Attached ☒ NO
	Date
	11/6/12

Casing and Cementing Plan Through the Equitrans Gas Storage Zones

Well: Oliver East Pad

After setting the surface casing, EQT plans to drill a 12 3/8" hole to a depth of approximately 3,240' through both gas storage zones, which runs from a depth of 2,233' to 2,258' and 2,838' to 2,970'. We then plan to run a string of 9 5/8" casing from the surface to at least 100' below the deepest storage zone. This casing will be at least a quality of Grade MC-50 with a weight of 40 pounds per foot. We will then cement to the surface with Type 1 Cement. This cement will contain 2% CaCl plus 0.25 lb/sk flake. The tail portion of this cement will have gas scavenger added to approximately 500' above the storage zone. EQT will allow the cement to set for a minimum of 18 hours prior to the resumption of actual drilling, which will satisfy the requirements of §78.85 *Cement Standards*. Please refer to the attached diagram for more detail. EQT Production is planning to drill these well in approximately 90 days.

OCT 23 2012

DEP, SOUTHWEST REGION
OIL & GAS

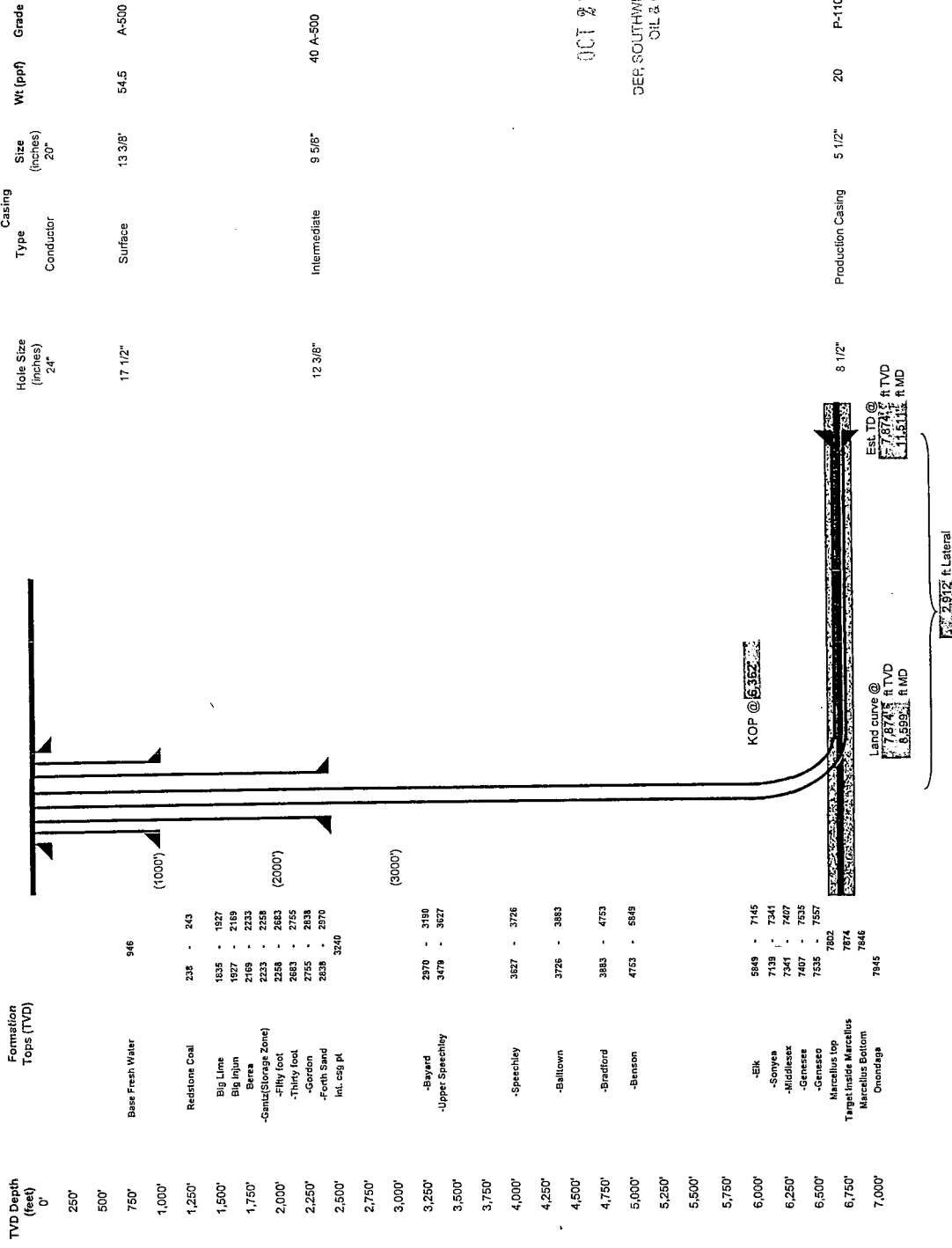
Well: 590596 (MON23H1)

Equitable Resources

Monongahela Quad

Allegheny County Pennsylvania

Vertical Section
Azimuth: 330°
3572'



OCT 28 2012

DEP. SOUTHWEST REGION
OIL & GAS



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS MANAGEMENT

GWELL LOCATION PLAT

PAGE 1 Surface Location

DEP USE ONLY	Auth ID: CC-936195
	Permit #: 003-72229
	Project #:

☐ Denotes location of top of well on topo map.

Well is located on topo map 2,405 feet south of latitude 40° 15' 00"

True Latitude: NORTH
40° 14' 36.46"

True Longitude: WEST
79° 54' 16.62"

NOTE:
THE PURPOSE OF THIS PLAT IS FOR THE LOCATION OF A PROPOSED GAS WELL AND DOES NOT REPRESENT A CLOSED BOUNDARY SURVEY. PROPERTY LINES AND OWNERS WERE OBTAINED FROM VARIOUS FIELD EVIDENCE, TAX RECORDS, AND AERIAL MAPPING.

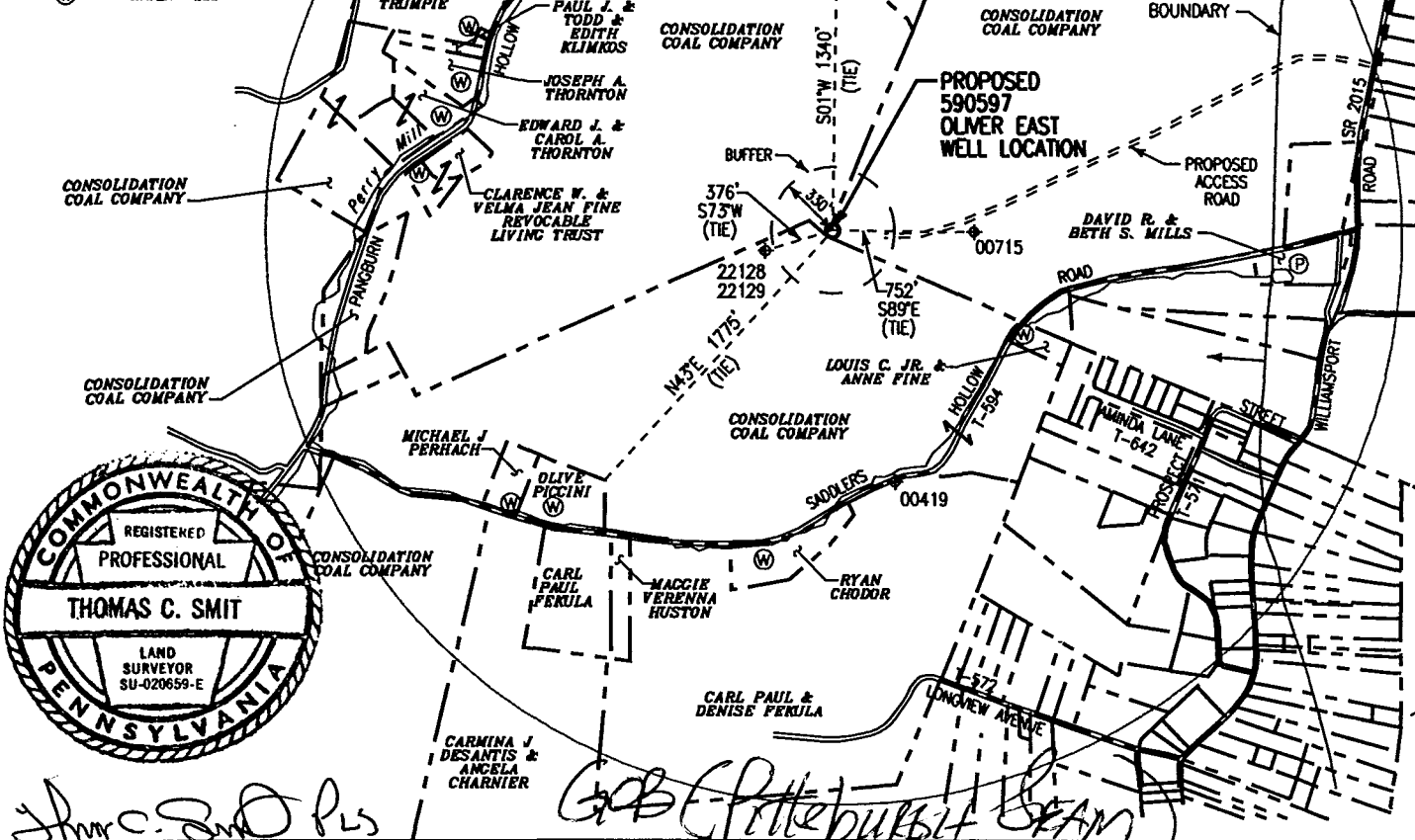
NO STRUCTURES EXIST WITHIN 500 FEET OF PROPOSED WELL LOCATION.
THERE ARE NO COAL MINES WITHIN 1000 FEET OF PROPOSED WELL LOCATION.

Horizontal Coordinate System:
NAD 83

JUL 27 2012

LEGEND

- PROPERTY LINE (SURFACE TRACT OWNER)
- - - BUFFER
- PROPOSED WELL LOCATION
- ◆ OTHER WELL LOCATION
- == ROADWAY
- == STREAM
- - - TIE LINE
- ↑ PROPERTY LANDHOOK
- (P) POND
- (W) WATER WELL



Applicant / Well Operator Name: EQT Production Company		DEP ID#: 146983	Well (Farm) Name: Oliver East		Well #: 590597	Serial #:
Address: 455 Rocetrock Road, Suite 101, Washington, PA 15301			County: Allegheny	Municipality: Forward Township	Well Type: Gas	
911 address of well site: Not yet available			USGS 7 1/2" Quadrangle Map Name: Monongahela, PA	Map Section: 3	Surface Elevation: 1190 ft.	
Surveyor or Engineer: Thomas C. Smit, PLS	Phone #: (412) 278-2100	Dwg #:	Date: 07/25/2012	Scale: 1"=1000'	Unit Acreage: 289.17	
Lot & Long Metadata Method: GPS	Accuracy: 3± ft.	Datum: NAD 83	Elevation Metadata Method: GPS	Accuracy: 5± ft.	Datum: NAVD 88	Survey Date: 04/02/12

Within Bunola Storage Field of Equitrans, L.P.

Well is located on topo map 8,265 feet west of longitude 79° 52' 30"

WELL LOCATION PLAT

003-22229

Page 2 Notifications

DEP Statewide toll-free phone number for reporting cases of water contamination which may be associated with development of oil and gas resources is **1-866-255-5158**.

Applicant / Well Operator Name EQT Production Company	DEP ID# 146983	Well (Farm) Name Oliver East	Well # 590597	Serial #
Surface Landowner / Lessor: Consolidation Coal Company		Angle & Course of Deviation (Drilling): N 34° 35' 44" W – 3798'	Anticipated True Vertical Depth Feet (TVD): 8,145'	Anticipated Total Measured Depth Feet (TMD): 11,791'
Target Formation(s): Vertical – Onondaga Horizontal - Marcellus		Deepest Formation to be penetrated: Onondaga	Number of laterals: 1	Total footage to be drilled all laterals: 13,350'
Surface Owner/Water Purveyor w/Water Supply within 1000'/3000'		Latitude/Longitude of Water Supply		
Consolidation Coal Company		40° 14' 51.43" - 79° 54' 22.44"		
Consolidation Coal Company		40° 14' 57.72" - 79° 53' 59.50"		
David R. & Beth S. Mills		40° 14' 34.75" - 79° 53' 46.07"		
Louis C. Jr. & Anne Fine		40° 14' 31.36" - 79° 54' 03.36"		
Ryan Chodor		40° 14' 18.61" - 79° 54' 21.43"		
Olive Piccini		40° 14' 21.83" - 79° 54' 35.22"		
Michael J. Perhach		40° 14' 21.99" - 79° 54' 38.11"		
Clarence W. & Velma Jean Fine Revocable Living Trust (THE)		40° 14' 38.88" - 79° 54' 44.84"		
Joseph A. Thornton		40° 14' 41.82" - 79° 54' 43.39"		
Edward J. & Carol A. Thornton		40° 14' 43.61" - 79° 54' 42.10"		
Brad & Cheryl Trumpie		40° 14' 46.50" - 79° 54' 41.63"		
		JUL 27 2012		
		DEP SOUTHWEST REGION OIL & GAS		
Municipality where the well will be drilled, adjacent to the well, or within 3000 feet		Municipality where the well will be drilled, adjacent to the well, or within 3000 feet		
Forward Township, Allegheny County		Elizabeth Township, Allegheny County		
Borough of Jefferson Hills, Allegheny County				
West Elizabeth Borough, Allegheny County				
Elizabeth Borough, Allegheny County		Coal Related Parties		
Rostraver Township, Westmoreland County		Reserve Coal Company – Owner - Redstone Seam		
Carroll Township, Washington County		Consolidation Coal Company – Owner -Upper Freeport Seam		
City of Monongahela, Washington County				
New Eagle Borough, Washington, County		Gas Storage Field Operators		
Union Township, Washington, County		Equitrans, L.P. – Operator – Bunola		

WELL LOCATION PLAT

PAGE 3 Plan View of Deviated Well Bore

003-22229

Applicant / Well Operator Name:	DEP ID#:	Well (Farm) Name:	Well #:
EQT Production Company	146983	Oliver East	590597

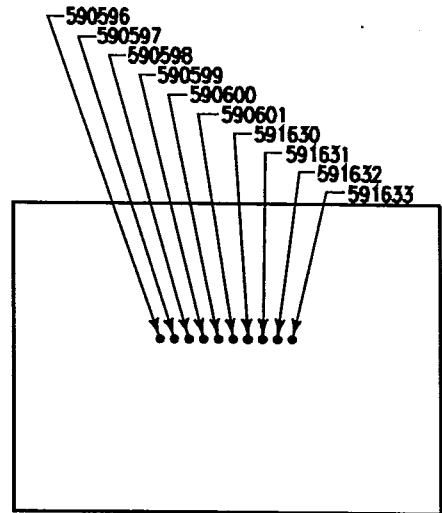
True Latitude: NORTH
40° 14' 36.46"

True Longitude: WEST
79° 54' 16.62"

Horizontal Coordinate System:
NAD 83

JUL 27 2012

DEP, SOUTHWEST REGION
OIL & GAS



PROPOSED OLIVER EAST
PAD LAYOUT

LOCATION AT
TOTAL DEPTH
LAT 40°15'06.83"
LON 79°54'45.41"
(NAD 83)



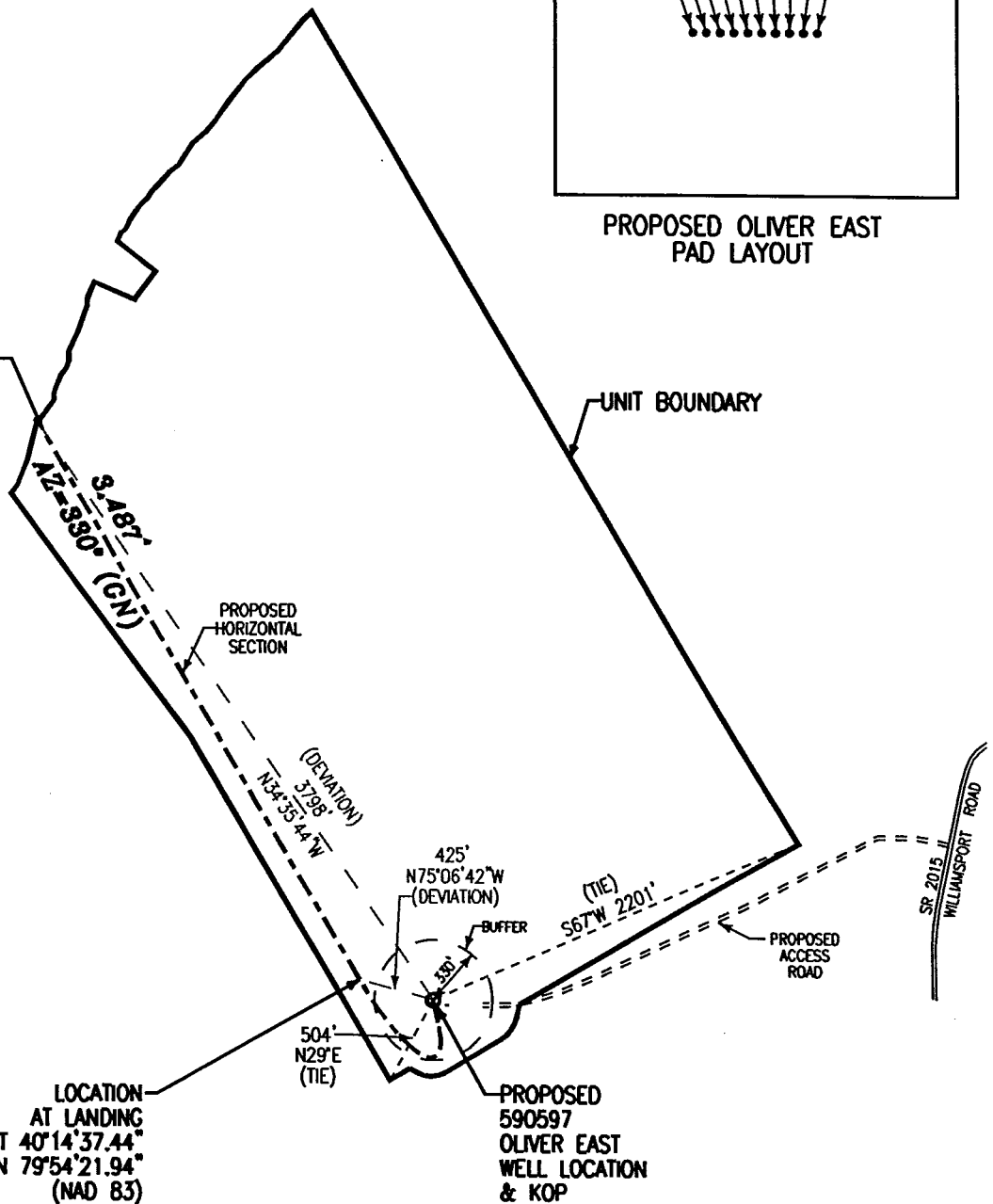
THOMAS C. SMIT

Vertical Section	
TVD	8,145'
TMD	8,145'
Horizontal Section	
TVD	7,874'
TMD	11,791'

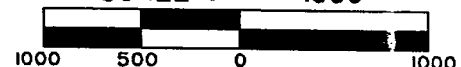
NAD 27 Coordinates	
Tophole	
LAT	40°14'36.21"
LON	-79°54'17.44"
KOP	
LAT	40°14'36.21"
LON	-79°54'17.44"
Landing	
LAT	40°14'37.19"
LON	-79°54'22.77"
Bottomhole	
LAT	40°15'06.58"
LON	-79°54'46.23"

LOCATION
AT LANDING
LAT 40°14'37.44"
LON 79°54'21.94"
(NAD 83)

TOTAL UNIT
ACREAGE
289.17 Ac.



SCALE 1" = 1000'



WELL LOCATION PLAT

PAGE 4 Well Plan

 DEP
Use
Only
Permit #
003-
22229

Applicant / Well Operator Name:

DEP ID#:

Well (Form) Name:

JUL 27 2012

Well #:

EQT Production Company

146983

Oliver East

590597

KOP: TVD: 6586'

TMD: 6586'

Latitude
40° 14' 36.46"Longitude
79° 54' 16.62"DEP, SOUTHWEST REGION
OIL & GAS

Landing Point: TVD: 7874'

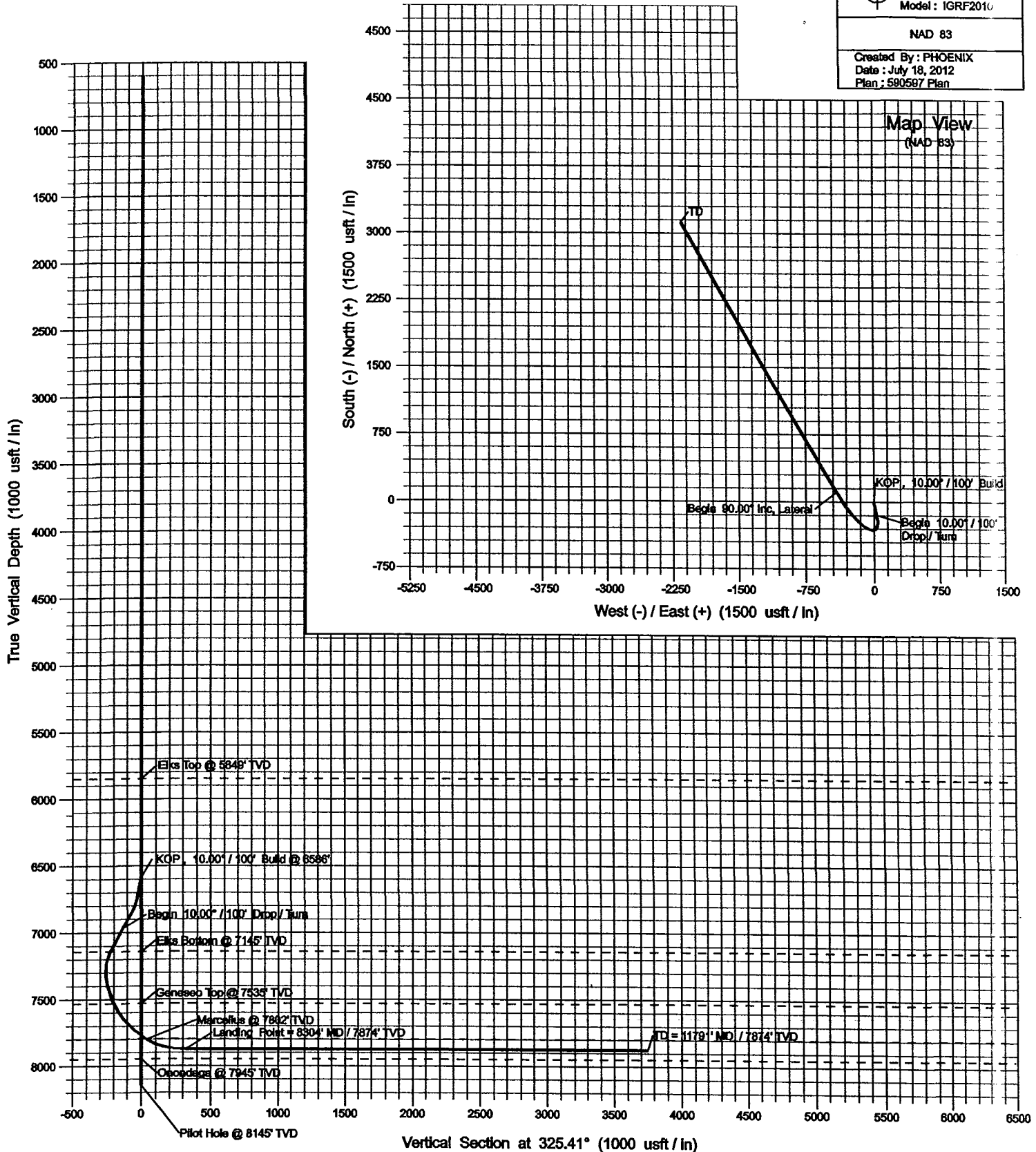
TMD: 8304'

40° 14' 37.44"

79° 54' 21.94"

 G
M
Azimuths to Grid North
Magnetic North: -3.25
Magnetic Field
Strength: 52,902
Dip Angle: 67.62
Date: 7/18/2012
Model: IGRF2010

NAD 83

 Created By: PHOENIX
Date: July 18, 2012
Plan: 590597 Plan




COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS MANAGEMENT

DEP USE ONLY
Application Tracking #

**Proposed Alternate Method or Material for
Casing, Plugging, Venting or Equipping a Well**

JUL 27 2012

Well Operator EQT Production Company		DEP ID# 146983	Well Permit or Registration Number Pending- 003-22229-00,01		DEP, SOUTHWEST REGION OIL & GAS
Address 455 Racetrack Road, Suite 101			Well Farm Name Oliver East		
City Washington	State PA	Zip Code 15301	Well # 590597	Serial #	
Phone 412-395-5557	Fax 412-395-3298	County Allegheny	Municipality Forward Township		

A proposed alternate method is subject to provisions in §3221 of the 2012 Oil and Gas Act, 58 Pa. C.S. §3221 Section 13 of the Coal and Gas Resource Coordination Act, 58 P.S. §513 and 25 PA Code §§78.75-78.75a (relating to Alternate Methods.) **Attach proof of notification of coal operator(s).**

Describe in reasonable detail using a written description and / or diagram:

1. the proposed alternate method or materials, and
2. the manner in which the alternative will satisfy the goals of the laws and regulations.

EQT Production will drill no more than 100 feet below the bottom of the abandoned mine on the Pittsburgh Seam. Coal protection casing will then be set at least 30 feet (and perhaps more than 50 feet if hole conditions dictate) below the bottom of the coal mine and cement to surface according to 25 PA Code Section 78.83 (h). The reason for this request is to ensure that the casing shoe is able to reach a depth of 30'-50' below the mine. We need to drill an additional 30' to capture the 15'-25' of fill produced by the mine void. There are no gas zones known to exist within 100 feet below the mine.

Optional: Approval by Coal Owner or Operator		Signature of Applicant / Well Operator	
Signature	Date	Signature	Date
			7/26/12
Print or Type Signer's Name and Title		Print or Type Signer's Name and Title	
		Todd Klawner - Permitting Supervisor	

If optional approval is signed by coal owner or operator, the 15-day objection period may be waived.

DEP USE ONLY	
Approved by (DEP Manager) 	Conditions ☐ YES, See Attached ☒ NO
	Date 8/14/12

Casing and Cementing Plan Through the Equitrans Gas Storage Zones

Well: Oliver East Pad

After setting the surface casing, EQT plans to drill a 12 3/8" hole to a depth of approximately 3,240' through both gas storage zones, which runs from a depth of 2,233' to 2,258' and 2,838' to 2,970'. We then plan to run a string of 9 5/8" casing from the surface to at least 100' below the deepest storage zone. This casing will be at least a quality of Grade MC-50 with a weight of 40 pounds per foot. We will then cement to the surface with Type 1 Cement. This cement will contain 2% CaCl plus 0.25 lb/sk flake. The tail portion of this cement will have gas scavenger added to approximately 500' above the storage zone. EQT will allow the cement to set for a minimum of 18 hours prior to the resumption of actual drilling, which will satisfy the requirements of §78.85 *Cement Standards*. Please refer to the attached diagram for more detail. EQT Production is planning to drill these wells in approximately 60 days.

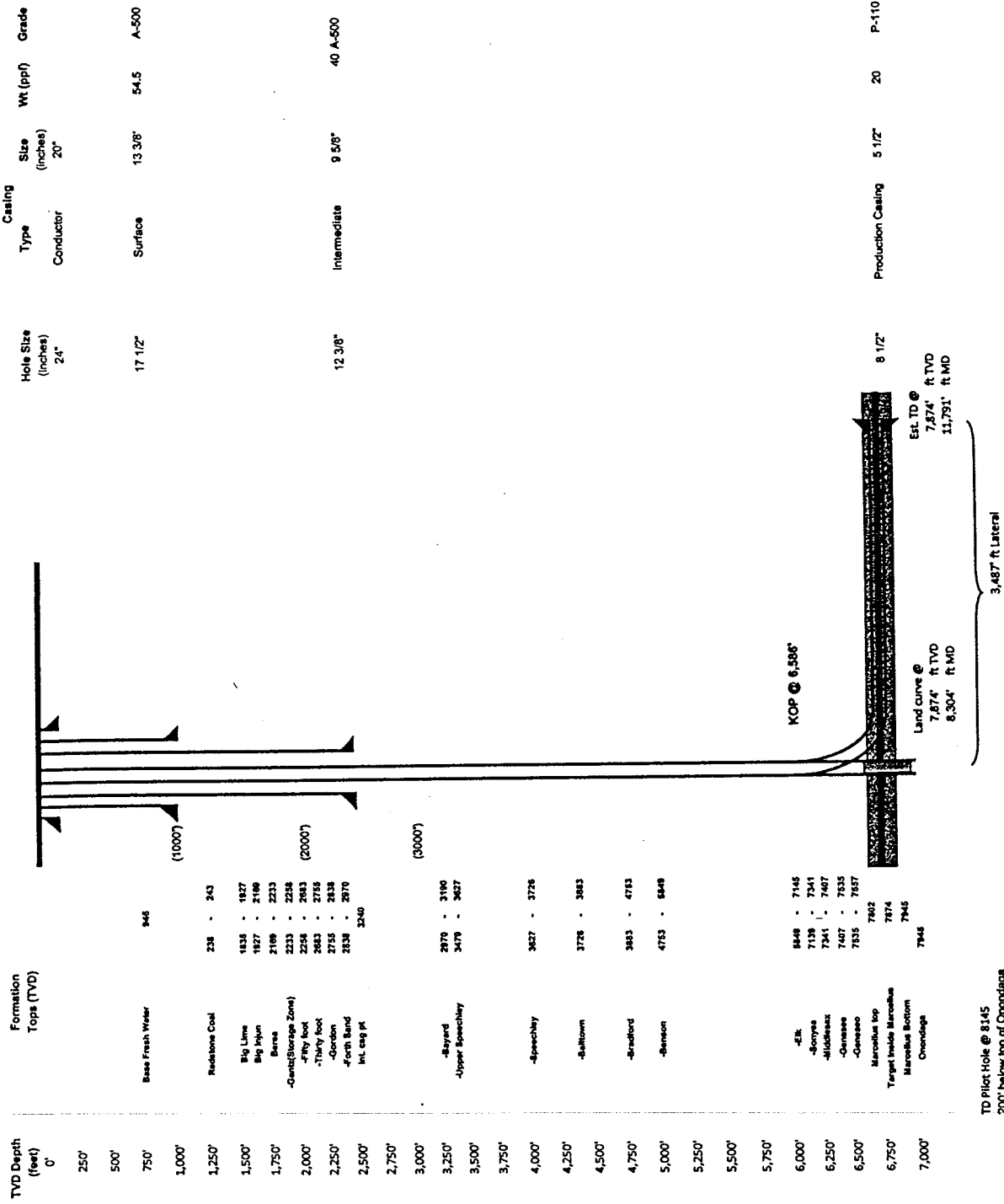
JUL 27 2012

DEP, SOUTHWEST REGION
OIL & GAS

Well 590597(MON23H2)

Equitable Resources
Monongahela Quad
Allegheny County, Pennsylvania

Admuth 338
Vertical Section 3798



TD Pilot Hole @ 8145
200' below top of Onondaga
Run Logs, Plug back to KOP at 6586



pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Oil and Gas Management Program
WELL LOCATION PLAT

DEP Application Tracking # **CC-835282** G: **RS**
Permit # **003-22128-00** C: **1/14/10**
Project # **003-22128** **RP**

☐ Denotes location of well on topo map.

True Latitude: NORTH

40°14'35.3"

True Longitude: WEST

79°54'21.5"

Well is located on topo map 2,517 feet south of latitude 40°15'00"

NAD 27 COORDINATES

TOP HOLE	
LAT	N 40°14'35.1"
LONG	W 79°54'22.3"
BOTTOM HOLE	
LAT	N 40°15'06.2"
LONG	W 79°54'38.2"

NAD 83 GEOGRAPHIC

ADJOINER LEGEND

NO.	TAX MAP	NOW OR FORMERLY
1	1273-M-249	RESERVE COAL PROPERTIES Co.
2	1420-F-252	RESERVE COAL PROPERTIES Co.
3	1420-F-254	GEORGE W. LUTES
4	1240-F-119	GERTRUDE HOFMEISTER
5	1273-M-119	CONSOLIDATION COAL CO.
6	1273-M-119	CONSOLIDATION COAL CO.
7	1575-B-025	RESERVE COAL PROPERTIES Co.
8	1575-F-398	PAUL J. KLIMKOS
9	1575-F-379	JOSEPH A. THORNTON
10	1575-F-361	CLARENCE W. & VELMA JEAN FINE
11	1575-E-116	CLARENCE W. & VELMA JEAN FINE
12	1575-P-113	ARLENE M. SLATE
13	1575-P-021	CARL PAUL FEKULA
14	1575-S-029	CARL PAUL & DENISE FEKULA
15	1574-N-286	DANA P. FERRAIUOLO
16	1574-N-259	DAVIS HAUGHTON & CONCETTA J. THOMAS
17	1574-N-251	GREGORY V. & JONI A. LVESEY
18	1575-M-054	KEITH & ARLENE SUE FINE
19	1574-N-109	GERALD & DAO T. FELEN
20	1574-F-344	MARY P. & LYNN DORA
21	1574-B-319	PAMELA & JESSE AYERS
22	1574-B-297	LOUIS P. & DOROTHY CALABRO
23	1574-B-292	CHARLES H. & ESTHER A. WEIS
24	1419-F-025	CAROL ANN SHIFFMAN

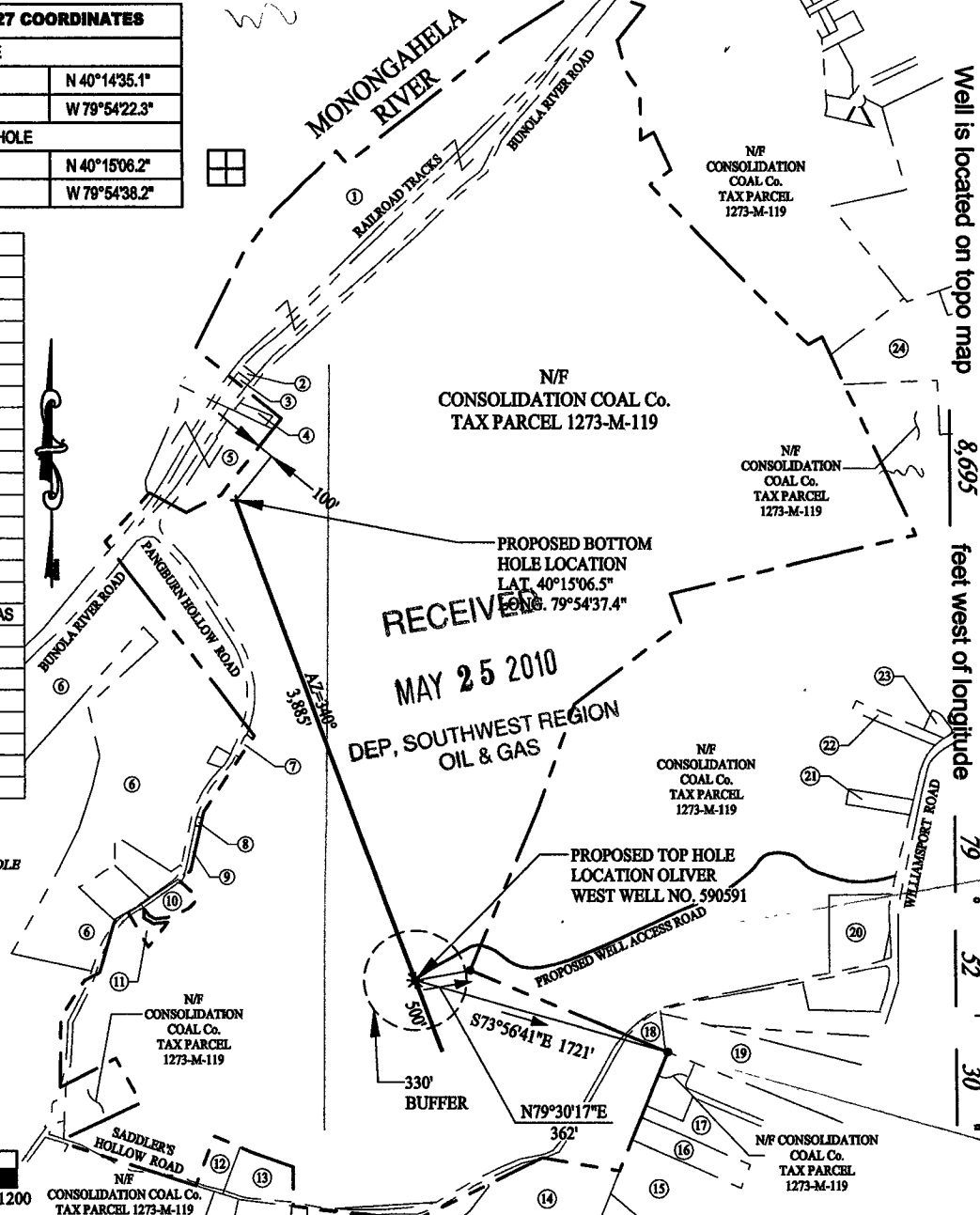
LEGEND

- PROPERTY/LEASE LINE
- * PROPOSED WELL LOCATION TOP HOLE
- PROPOSED HORIZONTAL SECTION
- TIE LINE
- + BOTTOM HOLE LOCATION

NOTE: THE PURPOSE OF THIS PLAT IS FOR THE LOCATION OF PROPOSED NATURAL GAS WELLS AND DOES NOT REPRESENT A FINISHED BOUNDARY SURVEY. SOME PROPERTY LINES AND OWNERS WERE OBTAINED FROM TAX RECORDS.

NOTE: DETAILS OF PROPOSED WELL BORE IS PROVIDED IN OTHER SECTIONS OF PERMIT PACKAGE.

SCALE



Surveyor or Engineer **CHARLES ERIC SHIELDS** Phone # **412-476-2000** Dwg. # **C100286.04.070.02-D-A002** Date **5/04/2010** Scale **1"=1200'** Tract Acreage **±522**

Lat. & Long Metadata Method **GPS** Accuracy **10±** ft. Datum **NAD 83** Elevation Metadata Method **USGS QUAD MAP** Accuracy **10** ft. Datum **NAVD 88** Survey Date **4/15/2010**

Applicant/Well Operator Name **BQT PRODUCTION COMPANY** Well(Farm) Name **OLIVER WEST** Well # **590591** Serial #

Address **455 RACETRACK ROAD, SUITE 101 WASHINGTON, PA 15301** County - Code **ALLEGHENY-002** Municipality **FORWARD TOWNSHIP** **912** Well Type **NATURAL GAS**

Surface Landowner/Lessor **CONSOLIDATION COAL COMPANY** USGS 71/2 Quadrangle Map Name **MONONGAHELA** **1706** Map Section **3** Surface Elevation **1140±** ft.

Target Formation(s) **MARCELLUS** Angle & Course of Deviation (Drilling) **HORIZONTAL** Anticipated Total Depth **TVD 7,800** **TMD 10,750**

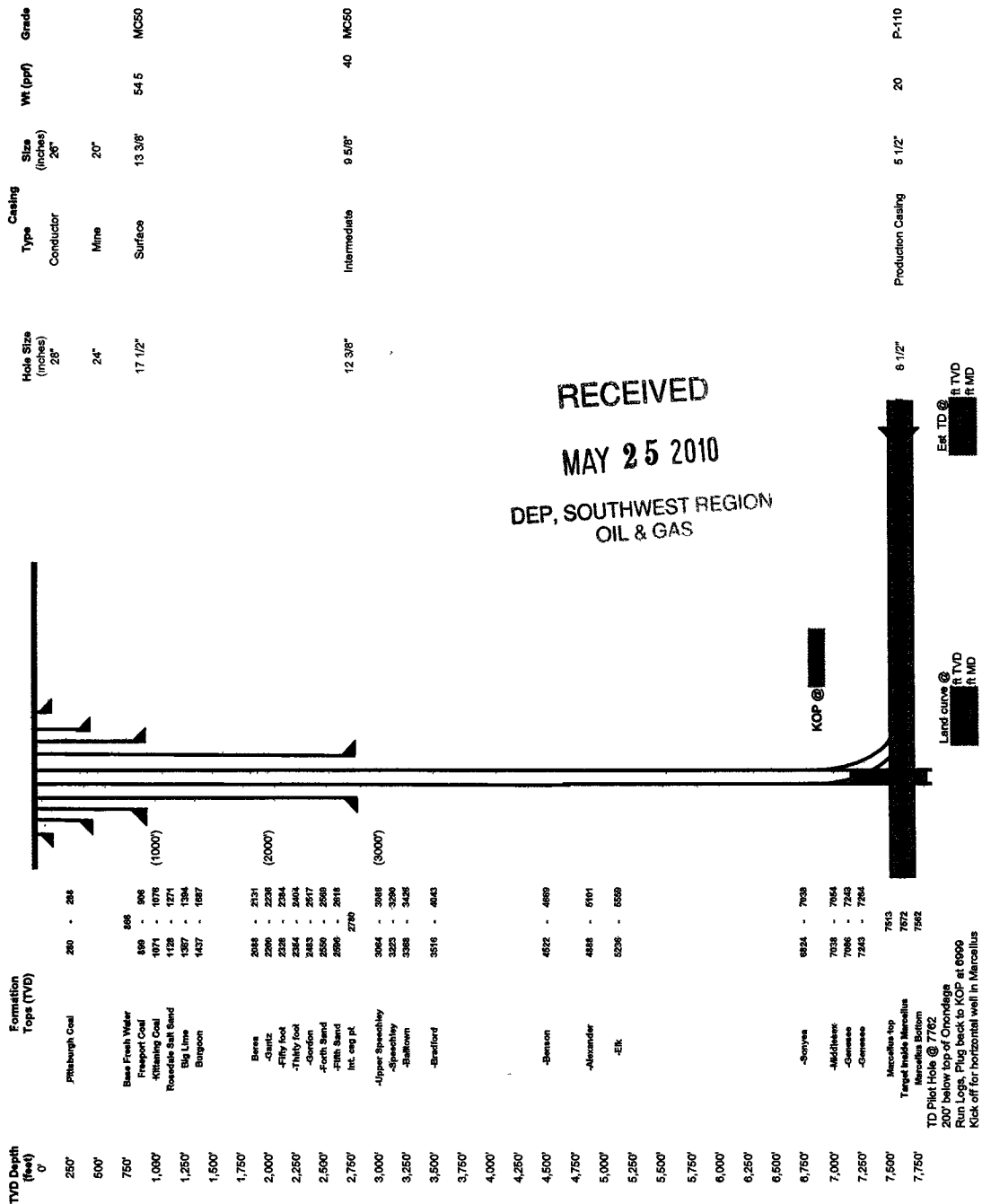
NONE **CONSOL ENERGY, INC.** **FREEPORT SEAM**

NONE **But Pittsburgh Seam**

NONE **Within Bunkle Gas Storage Field**

Pennsylvania

10





pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Oil and Gas Management Program

WELL LOCATION PLAT

DEP Application Tracking # **CC-835081**
Permit # **003-22129-00**
Project # **RP**

Denotes location of well on topo map.

True Latitude: NORTH

40°14'35.4"

True Longitude: WEST

79°54'21.3"

Well is located on topo map **2,509** feet south of latitude **40° 15' 00"**

NAD 27 COORDINATES

TOP HOLE

LAT **N 40°14'35.2"**

LONG **W 79°54'22.1"**

BOTTOM HOLE

LAT **N 40°15'24.5"**

LONG **W 79°54'34.5"**

NAD 83 GEOGRAPHIC

ADJOINER LEGEND

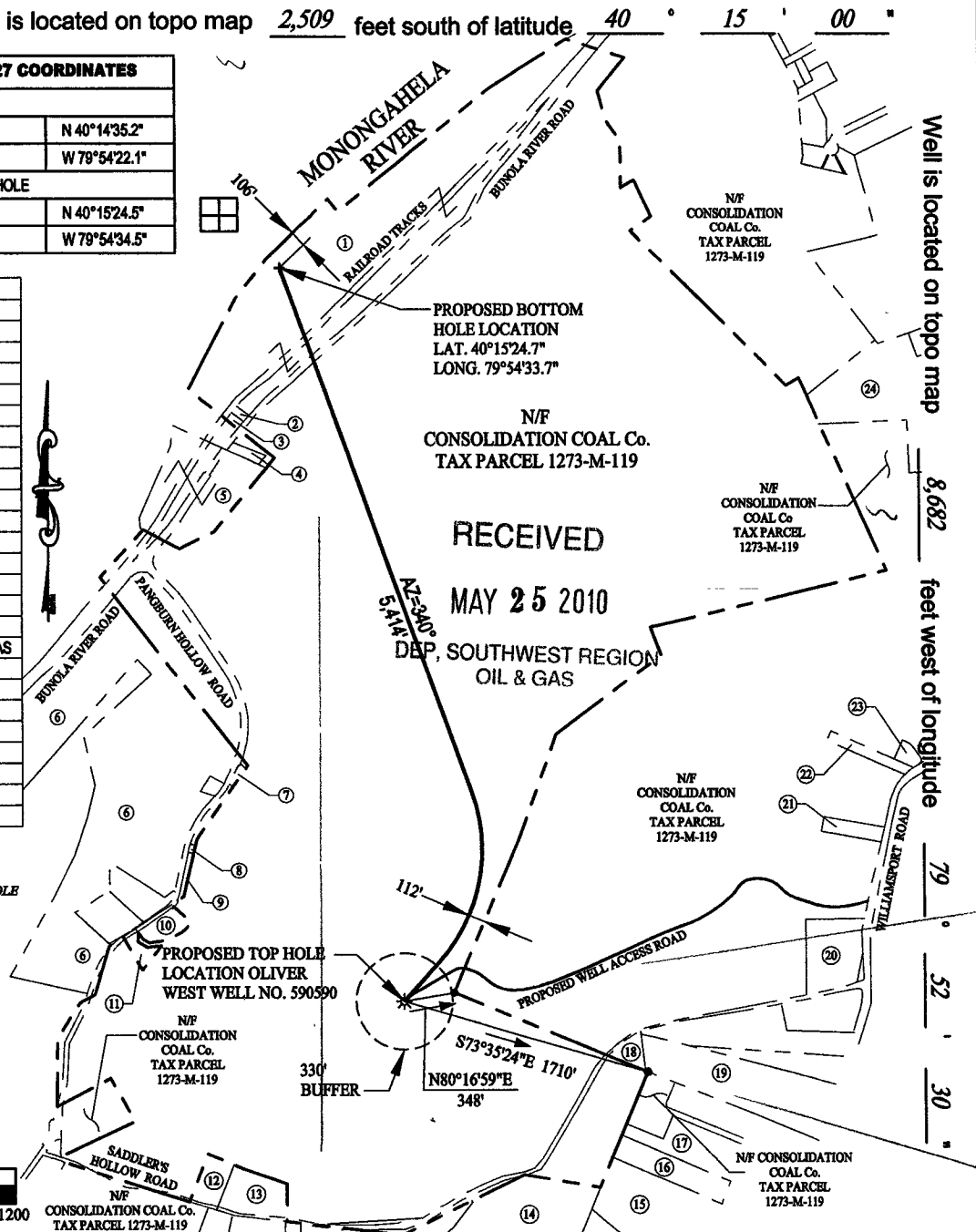
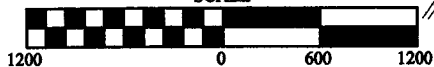
NO.	TAX MAP	NOW OR FORMERLY
1	1273-M-249	RESERVE COAL PROPERTIES Co.
2	1420-F-252	RESERVE COAL PROPERTIES Co.
3	1420-F-254	GEORGE W. LUTES
4	1240-F-119	GERTRUDE HOFMEISTER
5	1273-M-119	CONSOLIDATION COAL CO.
6	1273-M-119	CONSOLIDATION COAL CO.
7	1575-B-025	RESERVE COAL PROPERTIES Co.
8	1575-F-396	PAUL J. KLIMKOS
9	1575-F-379	JOSEPH A. THORNTON
10	1575-F-361	CLARENCE W. & VELMA JEAN FINE
11	1575-E-116	CLARENCE W. & VELMA JEAN FINE
12	1575-P-113	ARLENE M. SLATE
13	1575-P-021	CARL PAUL FEKULA
14	1575-S-029	CARL PAUL & DENISE FEKULA
15	1574-N-286	DANA P. FERRAIUOLO
16	1574-N-259	DAVIS HAUGHTON & CONCETTA J. THOMAS
17	1574-N-251	GREGORY V. & JONI A. LIVESEY
18	1575-M-054	KEITH & ARLENE SUE FINE
19	1574-N-109	GERALD & DAO T. FELEN
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21	1574-B-319	PAMELA & JESSE AYERS
22	1574-B-297	LOUIS P. & DOROTHY CALABRO
23	1574-B-292	CHARLES H. & ESTHER A. WEIS
24	1419-F-025	CAROL ANN SHIFFMAN

LEGEND

- PROPERTY/LEASE LINE
- * PROPOSED WELL LOCATION TOP HOLE
- PROPOSED HORIZONTAL SECTION
- TIE LINE
- + BOTTOM HOLE LOCATION

NOTE: THE PURPOSE OF THIS PLAT IS FOR THE LOCATION OF PROPOSED NATURAL GAS WELLS AND DOES NOT REPRESENT A FINISHED BOUNDARY SURVEY. SOME PROPERTY LINES AND OWNERS WERE OBTAINED FROM TAX RECORDS.

SCALE



Surveyor or Engineer **CHARLES ERIC SHIELDS** Phone # **412-476-2000** Dwg. # **C100286.04.070.02-D-A001** Date **5/04/2010** Scale **1"=1200'** Tract Acreage **±522**

Lat. & Long Metadata Method GPS Accuracy 10± ft. Datum NAD 83		Elevation Metadata Method USGS QUAD MAP Accuracy 10 ft. Datum NAVD 88		Survey Date 4/15/2010	
Applicant / Well Operator Name BQT PRODUCTION COMPANY		Well(Farm) Name OLIVER WEST		Well # 590590	Serial #
Address 455 RACETRACK ROAD, SUITE 101 WASHINGTON, PA 15301		County - Code ALLEGHENY-002	Municipality FORWARD TOWNSHIP	912	
Surface Landowner / Lessor CONSOLIDATION COAL COMPANY		USGS 71/2 Quadrangle Map Name MONONGAHELA		Map Section 3	Surface Elevation 1140± ft.
Target Formation(s) MARCELLUS		Angle & Course of Deviation (Drilling) HORIZONTAL		Anticipated Total Depth TVD 7,800 TMD 12,600	
NONE		CONSOL ENERGY, INC.		FREEPORT SEAM	
NONE		Don Pittsburgh, Sean			
NONE		Within Bundla Gas Storage Field			
NONE		Equitan, LP			

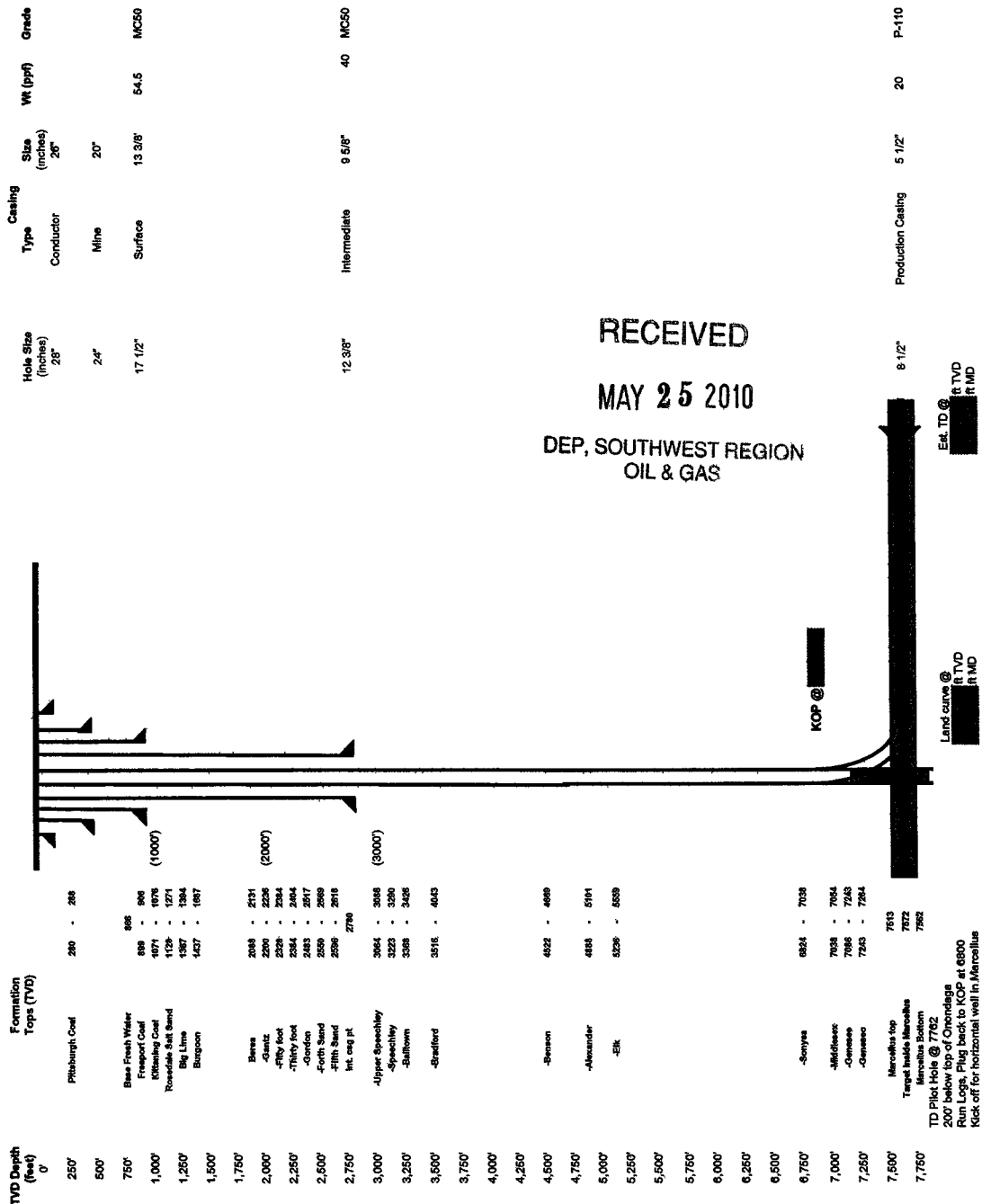
ON22H1)

Equitable Resources

Adm. & Prod. Section

Pennsylvania

Adm. & Prod. Section



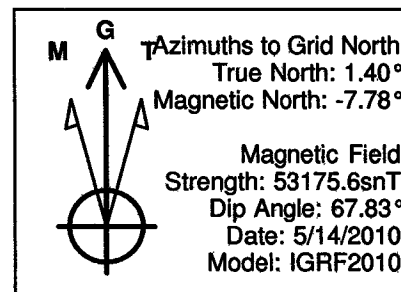
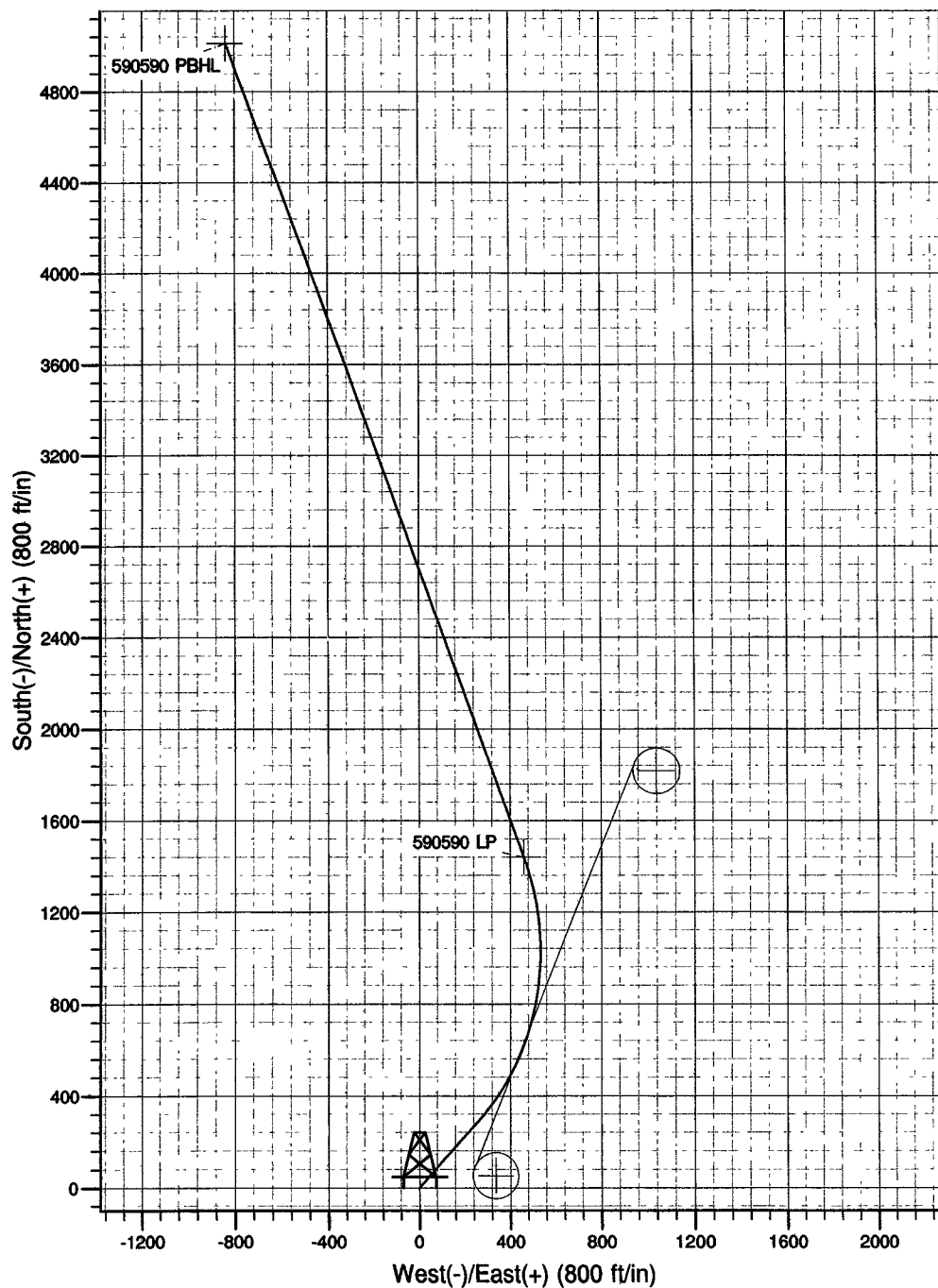
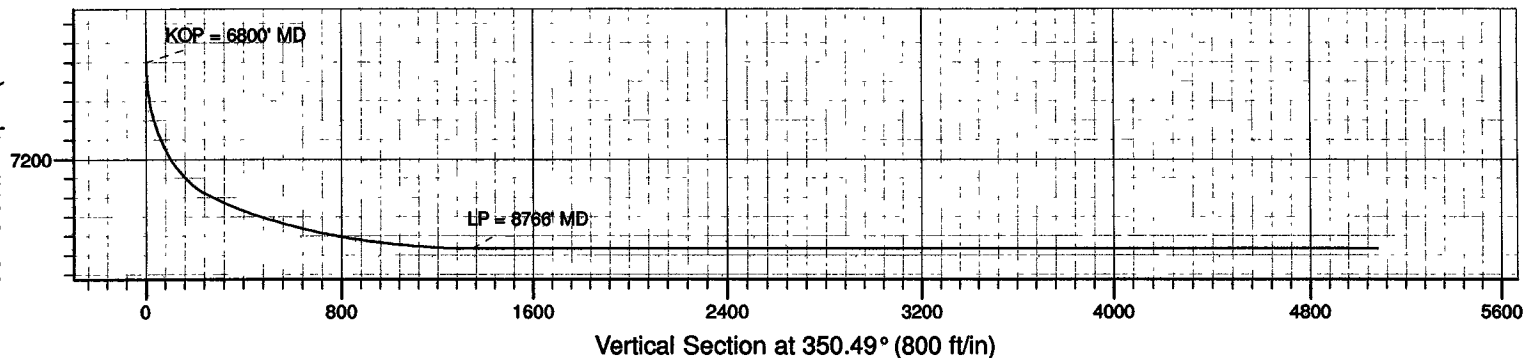
RECEIVED
MAY 25 2010
DEP, SOUTHWEST REGION
OIL & GAS



EQT Production - Marcellus

Project: Allegheny County, PA
Site: Allegheny County 590590
Well: Well #590590
Wellbore: Well #590590
Design: 590590 Plan

True Vertical Depth (ft/in)



RECEIVED

MAY 25 2010

DEP, SOUTHWEST REGION
OIL & GAS



Planning Report

Database: 2003.21 Single User Dbase
Company: EQT Production - Marcellus
Project: Allegheny County, PA
Site: Allegheny County 590590
Well: Well #590590
Wellbore: Well #590590
Design: 590590 Plan

Local Co-ordinate Reference: Site Allegheny County 590590
TVD Reference: WELL @ 0 00ft (Original Well Elev)
MD Reference: WELL @ 0.00ft (Original Well Elev)
North Reference: Gnd
Survey Calculation Method: Minimum Curvature

Project	Allegheny County, PA		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Pennsylvania South 3702		Using geodetic scale factor

Site	Allegheny County 590590			
Site Position:		Northing:	338,761 57 ft	Latitude: 40° 14' 35 200 N
From:	Lat/Long	Easting:	1,398,144 47 ft	Longitude: 79° 54' 22 100 W
Position Uncertainty:	0 00 ft	Slot Radius:	in	Grid Convergence: -1 40 °

Well	Well #590590			
Well Position	+N/-S	0 00 ft	Northing:	338,761.57 ft
	+E/-W	0 00 ft	Easting:	1,398,144 47 ft
Position Uncertainty	0 00 ft	Wellhead Elevation:	ft	Ground Level: 0 00ft

Wellbore	Well #590590				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	IGRF2010	5/14/2010	(°) -9 18	(°) 67 83	(nT) 53,176

Design	590590 Plan			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	6,800.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	0 00	0 00	0 00	350.49

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
6,800 00	0 00	0 00	6,800 00	0.00	0.00	0 00	0 00	0.00	0 00	
7,508.13	70 81	41 92	7,341 13	286 22	256.97	10.00	10 00	0 00	41.92	
8,765.75	90.00	340 00	7,572 00	1,440 00	460.00	5 06	1 53	-4.92	-80.05	590590 LP
12,565 63	90 00	340 00	7,572 00	5,010 84	-839 33	0 00	0.00	0 00	0.00	590590 PBHL

RECEIVED

MAY 25 2010

DEP, SOUTHWEST REGION
OIL & GAS



Planning Report

Database: 2003 21 Single User Dbase
 Company: EQT Production - Marcellus
 Project: Allegheny County, PA
 Site: Allegheny County 590590
 Well: Well #590590
 Wellbore: Well #590590
 Design: 590590 Plan

Local Co-ordinate Reference: Site Allegheny County 590590
 TMD Reference: WELL @ 0.00ft (Original Well Elev)
 MVD Reference: WELL @ 0.00ft (Original Well Elev)
 North Reference: Gnd
 Survey Calculation Method: Minimum Curvature

RECEIVED

MAY 25 2010

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,800.00	0.00	0.00	6,800.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP = 6800' MD									
6,900.00	10.00	41.92	6,899.49	6.48	5.82	5.43	10.00	10.00	0.00
7,000.00	20.00	41.92	6,995.96	25.71	23.08	21.54	10.00	10.00	0.00
7,100.00	30.00	41.92	7,086.48	57.12	51.28	47.86	10.00	10.00	0.00
7,200.00	40.00	41.92	7,168.29	99.74	89.55	83.58	10.00	10.00	0.00
7,300.00	50.00	41.92	7,238.91	152.29	136.73	127.61	10.00	10.00	0.00
7,400.00	60.00	41.92	7,296.20	213.17	191.39	178.62	10.00	10.00	0.00
7,500.00	70.00	41.92	7,338.40	280.52	251.86	235.06	10.00	10.00	0.00
7,508.13	70.81	41.92	7,341.13	286.22	256.97	239.83	10.00	10.00	0.00
Start DLS 5.06 TFO -80.05									
7,600.00	71.68	37.10	7,370.68	353.32	312.29	296.87	5.06	0.94	-5.25
7,700.00	72.75	31.91	7,401.24	431.77	366.20	365.34	5.06	1.08	-5.19
7,800.00	73.96	26.78	7,429.90	515.26	413.12	439.93	5.06	1.21	-5.13
7,900.00	75.29	21.72	7,456.42	603.14	452.70	520.07	5.06	1.33	-5.06
8,000.00	76.73	16.73	7,480.61	694.73	484.62	605.13	5.06	1.44	-5.00
8,100.00	78.26	11.79	7,502.27	789.32	508.64	694.45	5.06	1.53	-4.94
8,200.00	79.88	6.91	7,521.24	886.17	524.58	787.34	5.06	1.62	-4.88
8,300.00	81.57	2.08	7,537.37	984.53	532.30	883.06	5.06	1.69	-4.83
8,400.00	83.32	357.29	7,550.53	1,083.62	531.74	980.89	5.06	1.75	-4.79
8,500.00	85.11	352.54	7,560.62	1,182.69	522.92	1,080.05	5.06	1.79	-4.75
8,600.00	86.93	347.81	7,567.56	1,280.95	505.89	1,179.78	5.06	1.83	-4.73
8,700.00	88.78	343.10	7,571.30	1,377.65	480.80	1,279.29	5.06	1.85	-4.71
8,765.75	90.00	340.00	7,572.00	1,440.00	460.00	1,344.22	5.06	1.85	-4.71
LP = 8766' MD									
8,800.00	90.00	340.00	7,572.00	1,472.19	448.29	1,377.90	0.00	0.00	0.00
8,900.00	90.00	340.00	7,572.00	1,566.16	414.09	1,476.23	0.00	0.00	0.00
9,000.00	90.00	340.00	7,572.00	1,660.13	379.90	1,574.56	0.00	0.00	0.00
9,100.00	90.00	340.00	7,572.00	1,754.11	345.71	1,672.89	0.00	0.00	0.00
9,200.00	90.00	340.00	7,572.00	1,848.08	311.51	1,771.22	0.00	0.00	0.00
9,300.00	90.00	340.00	7,572.00	1,942.05	277.32	1,869.55	0.00	0.00	0.00
9,400.00	90.00	340.00	7,572.00	2,036.02	243.12	1,967.88	0.00	0.00	0.00
9,500.00	90.00	340.00	7,572.00	2,130.00	208.93	2,066.21	0.00	0.00	0.00
9,600.00	90.00	340.00	7,572.00	2,223.97	174.74	2,164.54	0.00	0.00	0.00
9,700.00	90.00	340.00	7,572.00	2,317.94	140.54	2,262.87	0.00	0.00	0.00
9,800.00	90.00	340.00	7,572.00	2,411.91	106.35	2,361.20	0.00	0.00	0.00
9,900.00	90.00	340.00	7,572.00	2,505.88	72.15	2,459.53	0.00	0.00	0.00
10,000.00	90.00	340.00	7,572.00	2,599.86	37.96	2,557.86	0.00	0.00	0.00
10,100.00	90.00	340.00	7,572.00	2,693.83	3.77	2,656.19	0.00	0.00	0.00
10,200.00	90.00	340.00	7,572.00	2,787.80	-30.43	2,754.52	0.00	0.00	0.00
10,300.00	90.00	340.00	7,572.00	2,881.77	-64.62	2,852.85	0.00	0.00	0.00
10,400.00	90.00	340.00	7,572.00	2,975.75	-98.82	2,951.18	0.00	0.00	0.00
10,500.00	90.00	340.00	7,572.00	3,069.72	-133.01	3,049.51	0.00	0.00	0.00
10,600.00	90.00	340.00	7,572.00	3,163.69	-167.20	3,147.84	0.00	0.00	0.00
10,700.00	90.00	340.00	7,572.00	3,257.66	-201.40	3,246.17	0.00	0.00	0.00
10,800.00	90.00	340.00	7,572.00	3,351.63	-235.59	3,344.50	0.00	0.00	0.00
10,900.00	90.00	340.00	7,572.00	3,445.61	-269.79	3,442.83	0.00	0.00	0.00
11,000.00	90.00	340.00	7,572.00	3,539.58	-303.98	3,541.16	0.00	0.00	0.00
11,100.00	90.00	340.00	7,572.00	3,633.55	-338.17	3,639.49	0.00	0.00	0.00
11,200.00	90.00	340.00	7,572.00	3,727.52	-372.37	3,737.82	0.00	0.00	0.00
11,300.00	90.00	340.00	7,572.00	3,821.50	-406.56	3,836.15	0.00	0.00	0.00
11,400.00	90.00	340.00	7,572.00	3,915.47	-440.75	3,934.48	0.00	0.00	0.00
11,500.00	90.00	340.00	7,572.00	4,009.44	-474.95	4,032.81	0.00	0.00	0.00



Planning Report

Database: 2003 21 Single User Dbase
Company: EQT Production - Marcellus
Project: Allegheny County, PA
Site: Allegheny County 590590
Well: Well #590590
Wellbore: Well #590590
Design: 590590 Plan

Local Co-ordinate Reference: Site Allegheny County 590590
TVD Reference: WELL @ 0 00ft (Original Well Elev)
MD Reference: WELL @ 0 00ft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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Planned Survey										DEP, SOUTHWEST REGION OIL & GAS
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn & Gas Rate (°/100ft)	
11,600.00	90.00	340.00	7,572.00	4,103.41	-509.14	4,131.14	0.00	0.00	0.00	
11,700.00	90.00	340.00	7,572.00	4,197.38	-543.34	4,229.47	0.00	0.00	0.00	
11,800.00	90.00	340.00	7,572.00	4,291.36	-577.53	4,327.80	0.00	0.00	0.00	
11,900.00	90.00	340.00	7,572.00	4,385.33	-611.72	4,426.13	0.00	0.00	0.00	
12,000.00	90.00	340.00	7,572.00	4,479.30	-645.92	4,524.46	0.00	0.00	0.00	
12,100.00	90.00	340.00	7,572.00	4,573.27	-680.11	4,622.79	0.00	0.00	0.00	
12,200.00	90.00	340.00	7,572.00	4,667.24	-714.31	4,721.12	0.00	0.00	0.00	
12,300.00	90.00	340.00	7,572.00	4,761.22	-748.50	4,819.45	0.00	0.00	0.00	
12,400.00	90.00	340.00	7,572.00	4,855.19	-782.69	4,917.78	0.00	0.00	0.00	
12,500.00	90.00	340.00	7,572.00	4,949.16	-816.89	5,016.11	0.00	0.00	0.00	
12,565.63	90.00	340.00	7,572.00	5,010.84	-839.33	5,080.65	0.00	0.00	0.00	
TD = 12565' MD										

Design Targets									
Target Name	hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude Longitude
Property Corner 1		0.00	0.00	0.00	1,816.96	1,037.21	340,578.47	1,399,181.65	40° 14' 53.400 N 79° 54' 9.300 W
- plan misses target center by 7114.57ft at 6800.00ft MD (6800.00 TVD, 0.00 N, 0.00 E)									
- Circle (radius 100.00)									
Property Corner 2		0.00	360.00	0.00	52.56	334.84	338,814.13	1,398,479.30	40° 14' 35.800 N 79° 54' 17.800 W
- plan misses target center by 6808.44ft at 6800.00ft MD (6800.00 TVD, 0.00 N, 0.00 E)									
- Circle (radius 100.00)									
Property Corner 3		0.00	0.00	0.00	-485.39	1,640.45	338,276.20	1,399,784.87	40° 14' 30.800 N 79° 54' 0.800 W
- plan misses target center by 7011.90ft at 6800.00ft MD (6800.00 TVD, 0.00 N, 0.00 E)									
- Circle (radius 100.00)									
590590 PBHL		0.00	0.00	7,572.00	5,010.84	-839.33	343,772.24	1,397,305.17	40° 15' 24.500 N 79° 54' 34.500 W
- plan hits target center									
- Point									
590590 LP		0.00	360.00	7,572.00	1,440.00	460.00	340,201.53	1,398,604.45	40° 14' 49.537 N 79° 54' 16.623 W
- plan hits target center									
- Point									

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
6,800.00	6,800.00	0.00	0.00	KOP = 6800' MD
7,508.13	7,341.13	286.22	256.97	Start DLS 5.06 TFO -80.05
8,765.75	7,572.00	1,440.00	460.00	LP = 8766' MD
12,565.63	7,572.00	5,010.84	-839.33	TD = 12565' MD

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OIL & GAS