

**ANADARKO PETROLEUM CORP.,
WARREN E&P, INC. &
DOUBLE EAGLE PETROLEUM COMPANY**

**80-ACRE WELL DENSITY
FOR THE MESAVERDE COALS
ATLANTIC RIM AREA
CARBON COUNTY, WY**

**LIST OF
ENGINEERING EXHIBITS**

- Exhibit E-1: Engineering Summary
- Exhibit E-2: Methodology for Calculating Original Gas-in-Place (OGIP)
- Exhibit E-3: OGIP and Recovery Summary (Sun Dog Pod)
- Exhibit E-4: OGIP and Recovery Summary (Doty Mountain Pod)
- Exhibit E-5: OGIP and Recovery Summary (Blue Sky Pod)
- Exhibit E-6: OGIP and Recovery Summary (Red Rim Pod)
- Exhibit E-7: Methodology for Estimating In-situ Gas Content (Doty Mountain Pod)
- Exhibit E-8: Methodology for Estimating In-situ Gas Content (Red Rim Pod)
- Exhibit E-9: Gas and Water Production Histories (Sun Dog Pod)
- Exhibit E-10: Gas and Water Production Histories (Doty Mountain Pod)
- Exhibit E-11: Gas and Water Production Histories (Blue Sky Pod)
- Exhibit E-12: Gas and Water Production Histories (Red Rim Pod)
- Exhibit E-13: Typical Mesaverde Gas Adsorption Isotherm vs. Coal Reservoir Pressure
- Exhibit E-14: Atlantic Rim Directional CBM Wells: Viability and Concerns
- Exhibit E-15: Engineering Conclusions



EXHIBIT E-1

ENGINEERING SUMMARY

- CBM wells in the following pods were evaluated to determine the appropriate well density for the Mesaverde coals in the Atlantic Rim area:
 - ◆ Sun Dog Pod
 - ◆ Doty Mountain Pod
 - ◆ Blue Sky Pod
 - ◆ Red Rim Pod

- Equation 1 on Exhibit E-2 was used to calculate the OGIP for the wells in the pods listed above. The equation variables are defined and their sources cited on the exhibit.

- Exhibits E-3 through E-6 list the wells and associated parameters for the Sun Dog, Doty Mountain, Blue Sky and Red Rim Pods, respectively. The origin of the column parameters (OGIP, estimated ultimate recovery (EUR) and recovery factors) are explained in the notes below each table.

- Plots of gas content versus summation of ash and moisture content shown on Exhibits E-7 and E-8 were generated using coal sample analyses data from the Doty Mountain and Red Rim pods, respectively. The pure gas content and average ash and moisture content values shown were then used in Equation 2 to derive the corrected gas content. As shown, the resulting gas content was 192 scf/ton for both pods. This value was used in Equation 1 to calculate the OGIP for all of the wells in each of the four evaluated pod.

- Exhibits E-9 through E-12 are graphs of the gas and water production and well count versus time for the evaluated pods. A brief history of each pod follows:
 - ◆ Sun Dog Pod - Exhibit E-9
 - initial water production began in 4/2002
 - initial gas production began in 6/2003 from 10 80-acre spaced wells
 - two additional 80-acre wells began producing in 4/2005 resulting in the recent rate increase
 - rates are currently increasing; collectively and on an individual well basis
 - current pod rate (12 wells) is 5.5 MMcfd, or 400 Mcfd and 1000 BWPD per well
 - water production decrease in 3/2005 was due to allocation issues, not actual well performance

 - ◆ Doty Mountain Pod - Exhibit E-10
 - initial water production began in 5/2004
 - initial gas production began in 2/2005 from 24 80-acre spaced wells
 - rates are currently increasing; collectively and on an individual well basis
 - current pod rate is 1.4 MMcfd, or 60 Mcfd and 300 BWPD per well
 - water production decreases in 3/2005 and 12/2005 were due to allocation issues, not actual well performance

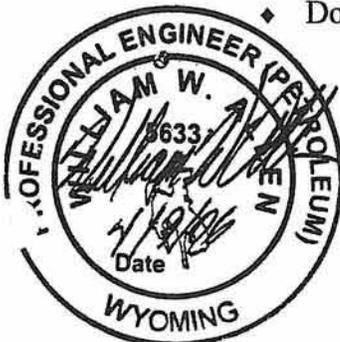


EXHIBIT E-1

ENGINEERING SUMMARY
(continued)

- ◆ Blue Sky Pod - Exhibit E-11
 - initial water and gas production began in 7/2003 from 12 160-acre spaced wells
 - based on poor well performance and a lack of an incline in the pod gas production, as compared to the 80-acre pods, APC conducted a reservoir simulation study, which concluded that 80-acre spacing was necessary to improve performance and maximize gas recovery
 - 12 80-acre infill wells were drilled and began production in 12/2005; too early to realize a gas increase from the infill program
 - water production decrease in 3/2005 was due to allocation issues, not actual well performance
 - reduced water production in 10/2005 and 11/2005 was due to downtime associated with new well hookups
 - relatively high gas production in 1/2006 was due to allocation, not actual well performance
 - currently injection limited resulting in not being able to produce wells at maximum potential
 - APC plans to drill an additional injection well in 2006 after the sage grouse stipulations are lifted

- ◆ Red Rim Pod - Exhibit E-12
 - initial water production began in 3/2004 from 4 160-acre spaced wells
 - an additional 12 160-acre spaced wells began producing water in 4/2005
 - current production averages 200 BWPDP per well with no gas
 - water production decrease in 3/2005 was due to allocation issues, not actual well performance
 - reduced water production in 11/2005 was due to downtime associated with new well hookups

- Exhibit E-13 represents a typical coal adsorption isotherm showing the coal adsorption content versus pressure for the AR Fee 1890-NW5 well located in Sec. 5-T18N-R90W. The graph and accompanying notes demonstrate that the greater the reservoir pressure reduction, the greater the incremental gas recovery. Further, the graph illustrates that, for the same pressure reduction, the incremental recovery is greater in the lower pressure range due to the increased slope of the isotherm curve.

- Safety and operational concerns related to directionally drilled Mesaverde CBM wells in the Atlantic Rim Field are addressed on Exhibit E-14.

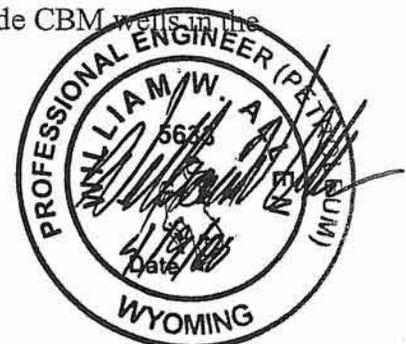


EXHIBIT E-2

**METHODOLOGY FOR CALCULATING
ORIGINAL GAS-IN-PLACE (OGIP)
FOR THE MESAVERDE COALS
IN THE ATLANTIC RIM AREA**

$$\text{OGIP} = 1.359 Ah\rho G_c \dots\dots\dots (\text{Equation 1})$$

where:

- OGIP = original volumetric gas-in-place, Mscf
- A = average well spacing, acres (80 or 160 acres per well)
- h = net coal thickness, feet (see Exhibits G-4b, G-5b, G-6b & G-7b)
- ρ = average in-situ bulk coal density, g/cm³ (1.35 g/cm³)
- G_c = in-situ gas content corrected for ash and moisture content, scf/ton (see Exhibits E-7 & E-8)



EXHIBIT E-3

ORIGINAL GAS-IN-PLACE AND GAS RECOVERY SUMMARY

SUN DOG POD
SEC. 8, 16 & 17, T16N-R91W
CARBON COUNTY, WY

Well	Total Coal Thickness (ft) (see Note 1)	Total Original Gas-in-Place (MMscf) (see Note 2)	Cumulative Gas Production (MMscf) (see Note 3)	Estimated Ultimate Gas Recovery (MMscf) (see Note 4)	Gas Recovery (% OGIP) (see Note 5)	Gas Recovery (% EUR) (see Note 6)
AR Federal 1691 10-8	46	1,296.3	271.2	842.6	20.9	32.2
AR Federal 1691 12-8	43	1,211.7	100.3	787.6	8.3	12.7
AR Federal 1691 14-8	43	1,211.7	375.7	787.6	31.0	47.7
AR Federal 1691 16-8	43	1,211.7	114.0	787.6	9.4	14.5
AR State 1690 4-16	35	986.3	38.7	641.1	3.9	6.0
AR State 1690 12-16	44	1,239.9	69.5	806.0	5.6	8.6
AR Federal 1691 2-17	43	1,211.7	411.8	787.6	34.0	52.3
AR Federal 1691 6-17	29	817.2	422.9	531.2	51.7	79.6
AR Federal 1691 8-17	52	1,465.4	937.9	952.5	64.0	98.5
AR Federal 1691 10-17	45	1,268.1	286.6	824.3	22.6	34.8
AR Federal 1691 14-17	55	1,549.9	157.6	1007.4	10.2	15.6
AR Federal 1691 16-17	48	1,352.7	321.3	879.2	23.8	36.5
Average	43.8	1,235.2		802.9	23.8	36.6

Notes:

- Total coal thickness from summation of net coal thicknesses from Almond, Pine Ridge, and Allen Ridge coals (see Exhibit G-4b)
- Total original gas-in-place (OGIP) from Almond, Pine Ridge, and Allen Ridge coals calculated using 80-acre spacing per well, average bulk coal density of 1.35 g/cm³, and average gas content of 192 scf/ton (see Exhibits E-7 & E-8).
- Cumulative gas production as of January 31, 2006
- Ultimate gas recovery (EUR) calculated as 65% of total OGIP on 80-acre spacing. Recovery factor of 65% determined from simulation study.
- Gas Recovery = (Cumulative Gas Production / OGIP) * 100
- Gas Recovery = (Estimated Ultimate Recovery / OGIP) * 100



EXHIBIT E-4

ORIGINAL GAS-IN-PLACE AND GAS RECOVERY SUMMARY

DOTY MOUNTAIN POD
SEC. 14, 22 & 23, T17N-R91W
CARBON COUNTY, WY

Well	Total Coal Thickness (ft) (see Note 1)	Total Original Gas-in-Place (MMscf) (see Note 2)	Cumulative Gas Production (MMscf) (see Note 3)	Estimated Ultimate Gas Recovery (MMscf) (see Note 4)	Gas Recovery (% OGIP) (see Note 5)	Gas Recovery (% EUR) (see Note 6)
AR Federal 1791 1-14	52	1,465.4	11.5	952.5	0.78	1.20
AR Federal 1791 5-14	52	1,465.4	44.7	952.5	3.05	4.69
AR Federal 1791 7-14	63	1,775.4	6.4	1,154.0	0.36	0.56
AR Federal 1791 9-14	48	1,352.7	3.1	879.2	0.23	0.35
AR Federal 1791 11-14	57	1,606.3	10.4	1,044.1	0.65	0.99
AR Federal 1791 13-14	61	1,719.0	10.9	1,117.3	0.63	0.98
AR Federal 1791 15-14	45	1,268.1	16.5	824.3	1.30	2.01
AR Federal 1791 1-22	49	1,380.8	48.5	897.5	3.51	5.40
AR Federal 1791 3-22	56	1,578.1	52.6	1,025.8	3.33	5.13
AR Federal 1791 5-22	51	1,437.2	45.2	934.2	3.14	4.83
AR Federal 1791 7-22	53	1,493.6	24.9	970.8	1.67	2.57
AR Federal 1791 9-22	48	1,352.7	17.5	879.2	1.30	2.00
AR Federal 1791 11-22	48	1,352.7	2.8	879.2	0.20	0.31
AR Federal 1791 13-22	47	1,324.5	10.6	860.9	0.80	1.23
AR Federal 1791 15-22	51	1,437.2	3.9	934.2	0.27	0.41
AR Fee 1791 1-23	50	1,409.0	0.1	915.9	0.01	0.01
AR Fee 1791 3-23	45	1,268.1	14.2	824.3	1.12	1.72
AR Fee 1791 5-23	51	1,437.2	12.8	934.2	0.89	1.37
AR Fee 1791 7-23	46	1,296.3	1.6	842.6	0.12	0.19
AR Fee 1791 9-23	49	1,380.8	1.5	897.5	0.11	0.17
AR Fee 1791 11-23	52	1,465.4	2.1	952.5	0.14	0.22
AR Fee 1791 13-23	55	1,549.9	0.4	1,007.4	0.02	0.04
AR Fee 1791 15-23	48	1,352.7	0.0	879.2	0.00	0.00
Average	51.2	1,442.1		937.4	1.03	1.58

Notes:

- Total coal thickness from summation of net coal thicknesses from Almond, Pine Ridge, and Allen Ridge coals (see Exhibit G-5b)
- Total original gas-in-place (OGIP) from Almond, Pine Ridge, and Allen Ridge coals calculated using 80-acre spacing per well, average bulk coal density of 1.35 g/cm³, and average gas content of 192 scf/ton (see Exhibits E-7 & E-8).
- Cumulative gas production as of January 31, 2006
- Ultimate gas recovery (EUR) calculated as 65% of total OGIP on 80-acre spacing. Recovery factor of 65% determined from simulation study.
- Gas Recovery = (Cumulative Gas Production / OGIP) * 100
- Gas Recovery = (Estimated Ultimate Recovery / OGIP) * 100

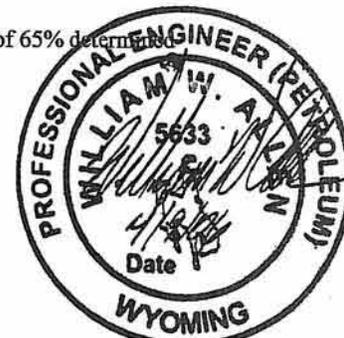


EXHIBIT E-5

ORIGINAL GAS-IN-PLACE AND GAS RECOVERY SUMMARY

BLUE SKY POD
SEC. 5, 9, 9, & 16, T15N-R91W
CARBON COUNTY, WY

Well	Total Coal Thickness (ft) (see Note 1)	Total Original Gas-in-Place (MMscf) (see Note 2)	Cumulative Gas Production (MMscf) (see Note 3)	Estimated Ultimate Gas Recovery (MMscf) (see Note 4)	Gas Recovery (% OGIP) (see Note 5)	Gas Recovery (% EUR) (see Note 6)
AR Federal 1591 1-5	44	1,239.9	0.0	806.0	0.0	0.0
AR Federal 1591 3-5	53	1,493.6	0.0	970.8	0.0	0.0
AR Federal 1591 5-5	62	1,747.2	9.3	1,135.7	0.5	0.8
AR Federal 1591 7-5	58	1,634.5	12.5	1,062.4	0.8	1.2
AR Federal 1591 9-5	50	1,409.0	0.0	915.9	0.0	0.0
AR Federal 1591 11-5	46	1,296.3	0.0	842.6	0.0	0.0
AR Federal 1591 13-5	54	1,521.7	28.3	989.1	1.9	2.9
AR Federal 1591 15-5	50	1,409.0	59.7	915.9	4.2	6.5
AR Federal 1591 1-8	46	1,296.3	0.0	842.6	0.0	0.0
AR Federal 1591 3-8	36	1,014.5	0.0	659.4	0.0	0.0
AR Federal 1591 5-8	46	1,296.3	16.6	842.6	1.3	2.0
AR Federal 1591 7-8	60	1,690.8	4.2	1,099.0	0.2	0.4
AR Federal 1591 9-8	36	1,014.5	0.0	659.4	0.0	0.0
AR Federal 1591 15-8	40	1,127.2	5.9	732.7	0.5	0.8
AR Federal 1591 3-9	48	1,352.7	0.0	879.2	0.0	0.0
AR Federal 1591 5-9	46	1,296.3	14.4	842.6	1.1	1.7
AR Federal 1591 11-9	53	1,493.6	0.0	970.8	0.0	0.0
AR Federal 1591 13-9	44	1,239.9	1.0	806.0	0.1	0.1
AR Federal 1591 15-9	43	1,211.7	24.7	787.6	2.0	3.1
AR State 1591 1-16	49	1,380.8	0.0	897.5	0.0	0.0
AR State 1591 3-16	52	1,465.4	0.0	952.5	0.0	0.0
AR State 1591 5-16	50	1,409.0	2.4	915.9	0.2	0.3
AR State 1591 7-16	53	1,493.6	2.3	970.8	0.2	0.2
AR State 1591 11-16	57	1,606.3	0.0	1,044.1	0.0	0.0
Average	49.0	1,380.8		897.5	0.54	0.83

Notes:

- Total coal thickness from summation of net coal thicknesses from Almond, Pine Ridge, and Allen Ridge coals (see Exhibit G-6b)
- Total original gas-in-place (OGIP) from Almond, Pine Ridge, and Allen Ridge coals calculated using 80-acre spacing per well, average bulk coal density of 1.35 g/cm³, and average gas content of 192 scf/ton (see Exhibits E-1, E-2, E-3, E-4, E-5, E-6, E-7, E-8, E-9, E-10, E-11, E-12, E-13, E-14, E-15, E-16, E-17, E-18, E-19, E-20, E-21, E-22, E-23, E-24, E-25, E-26, E-27, E-28, E-29, E-30, E-31, E-32, E-33, E-34, E-35, E-36, E-37, E-38, E-39, E-40, E-41, E-42, E-43, E-44, E-45, E-46, E-47, E-48, E-49, E-50, E-51, E-52, E-53, E-54, E-55, E-56, E-57, E-58, E-59, E-60, E-61, E-62, E-63, E-64, E-65, E-66, E-67, E-68, E-69, E-70, E-71, E-72, E-73, E-74, E-75, E-76, E-77, E-78, E-79, E-80, E-81, E-82, E-83, E-84, E-85, E-86, E-87, E-88, E-89, E-90, E-91, E-92, E-93, E-94, E-95, E-96, E-97, E-98, E-99, E-100)
- Cumulative gas production as of January 31, 2006
- Ultimate gas recovery (EUR) calculated as 65% of total OGIP on 80-acre spacing. Recovery factor of 65% determined from simulation study.
- Gas Recovery = (Cumulative Gas Production / OGIP) * 100
- Gas Recovery = (Estimated Ultimate Recovery / OGIP) * 100

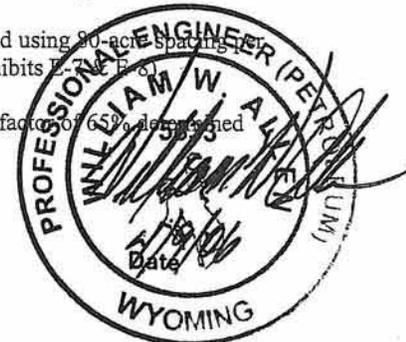


EXHIBIT E-6

ORIGINAL GAS-IN-PLACE AND GAS RECOVERY SUMMARY

RED RIM POD
SEC. 16, 20, 21, & 29, T20N-R89W
CARBON COUNTY, WY

Well	Total Coal Thickness (ft) (see Note 1)	Total Original Gas-in-Place (MMscf) (see Note 2)	Cumulative Gas Production (MMscf) (see Note 3)	Estimated Ultimate Gas Recovery (MMscf) (see Note 4)	Gas Recovery (% OGIP) (see Note 5)	Gas Recovery (% EUR) (see Note 6)
AR State 2089 NE-16	31	1,747.2	0.00	0.0	0.0	0.0
AR State 2089 SE-16	30	1,690.8	0.00	0.0	0.0	0.0
AR Fee 2089 SW-16	36	2,029.0	0.00	0.0	0.0	0.0
AR Federal 2089 NE-20	41	2,310.8	0.00	0.0	0.0	0.0
AR Federal 2089 SE-20	41	2,310.8	0.00	0.0	0.0	0.0
AR Federal 2089 SW-20	51	2,874.4	0.00	0.0	0.0	0.0
AR Fee 2089 NE-21	33	1,859.9	0.00	0.0	0.0	0.0
AR Fee 2089 NW-21	34	1,916.3	0.00	0.0	0.0	0.0
AR Fee 2089 SW-21	35	1,972.6	0.00	0.0	0.0	0.0
AR Fee 2089 SE-21	38	2,141.7	0.00	0.0	0.0	0.0
AR Federal 2089 NE-28	38	2,141.7	0.00	0.0	0.0	0.0
AR Federal 2089 NW-28	39	2,198.1	0.00	0.0	0.0	0.0
AR Fee 2089 NE-29	45	2,536.2	0.00	0.0	0.0	0.0
AR Fee 2089 NW-29	42	2,367.1	0.00	0.0	0.0	0.0
AR Fee 2089 SW-29	37	2,085.3	0.00	0.0	0.0	0.0
AR Fee 2089 SE-29	43	2,423.5	0.00	0.0	0.0	0.0
Average	38.4	2,162.8		0.0	0.0	0.0

Notes:

- Total coal thickness from summation of net coal thicknesses from Almond, Pine Ridge, and Allen Ridge coals (see Exhibit G-7b).
- Total original gas-in-place (OGIP) from Almond, Pine Ridge, and Allen Ridge coals calculated using 160-acre spacing per well, average bulk coal density of 1.35 g/cm³, and average gas content of 192 scf/ton (see Exhibits E-7 & E-8).
- Cumulative gas production as of January 31, 2006
- Ultimate gas recovery (EUR) calculated as 65% of total OGIP on 80-acre spacing. Recovery factor of 65% determined from simulation study.
- Gas Recovery = (Cumulative Gas Production / OGIP) * 100
- Gas Recovery = (Estimated Ultimate Recovery / OGIP) * 100



EXHIBIT E-7

METHODOLOGY FOR ESTIMATING IN-SITU GAS CONTENT
DOTY MOUNTAIN POD MESAVERDE COAL SAMPLES

$$G_c = G_{cp} [1 - (\alpha + \omega)] \dots\dots\dots \text{(Equation 2)}$$

$$= (344)[1 - (0.089 + 0.354)]$$

$$= 192 \text{ scf/ton}$$

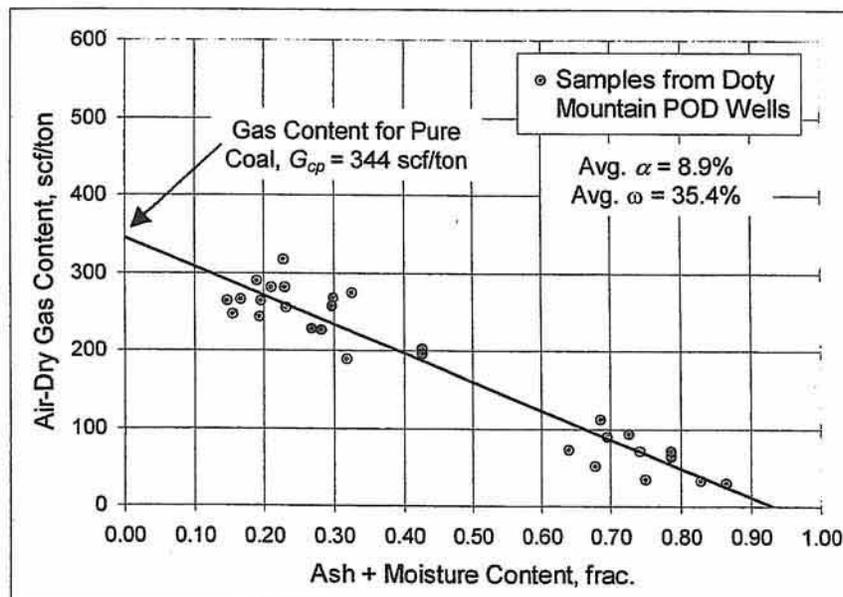
where:

G_c = in-situ gas content (from Doty Mountain samples) corrected for ash and moisture content, scf/ton

G_{cp} = pure coal gas content (from plot below), scf/ton

α = 0.089 = average in-situ coal ash content from coal samples, weight fraction

ω = 0.354 = average in-situ equilibrium moisture content from coal samples, weight fraction



References for Methodology

1. Mavor, M.J., et al.: "Quantitative Evaluation of Coal Seam Gas Content," paper SPE 29577 presented at the 1995 SPE Rocky Mountain Regional/Low-Permeability Reservoirs Symposium, Denver, CO, 20-22 March.
2. Mavor, M.J., et al.: "Improved Gas-in-Place Determination for Coal Gas Reservoirs," paper SPE 35623 presented at the 1996 SPE Gas Technology Symposium, Calgary, Alberta, Canada, 28 April-1 May.
3. Nelson, C.R.: "Effects of Coalbed Methane Reservoir Property Analysis Methods on Gas-in-Place Estimates," paper SPE 57443 presented at the 1999 SPE Eastern Regional Meeting, Charleston, WVA, 21-22 October.

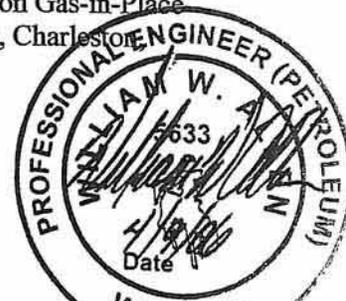


EXHIBIT E-8

METHODOLOGY FOR ESTIMATING IN-SITU GAS CONTENT

RED RIM POD MESAVERDE OAL SAMPLES

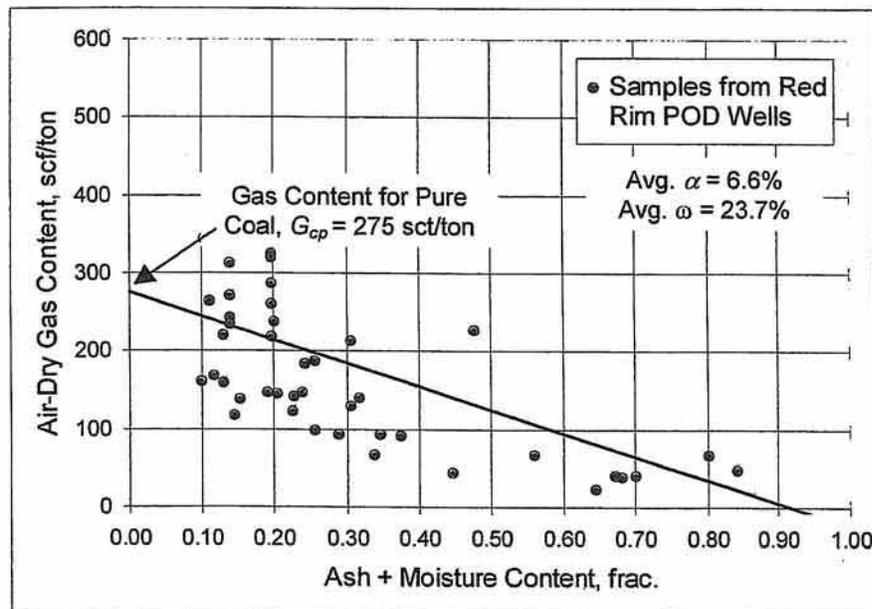
$$G_c = G_{cp} [1 - (\alpha + \omega)] \dots\dots\dots \text{(Equation 2)}$$

$$= (275)[1 - (0.066 + 0.237)]$$

$$= 192 \text{ scf/ton}$$

where:

- G_c = in-situ gas content (from Red Rim samples) corrected for ash and moisture content, scf/ton
 G_{cp} = pure coal gas content (from plot below), scf/ton
 α = 0.066 = average in-situ coal ash content from coal samples, weight fraction
 ω = 0.237 = average in-situ equilibrium moisture content from coal samples, weight fraction



References for Methodology

1. Mavor, M.J., et al.: "Quantitative Evaluation of Coal Seam Gas Content," paper SPE 29577 presented at the 1995 SPE Rocky Mountain Regional/Low-Permeability Reservoirs Symposium, Denver, CO, 20-22 March.
2. Mavor, M.J., et al.: "Improved Gas-in-Place Determination for Coal Gas Reservoirs," paper SPE 35623 presented at the 1996 SPE Gas Technology Symposium, Calgary, Alberta, Canada, 28 April-1 May.
3. Nelson, C.R.: "Effects of Coalbed Methane Reservoir Property Analysis Methods on Gas-in-Place Estimates," paper SPE 57443 presented at the 1999 SPE Eastern Regional Meeting, Charleston, WVA, 21-22 October.



EXHIBIT E-9

GAS & WATER PRODUCTION HISTORIES

SUN DOG POD (WELL SPACING OF 80 ACRES PER WELL)

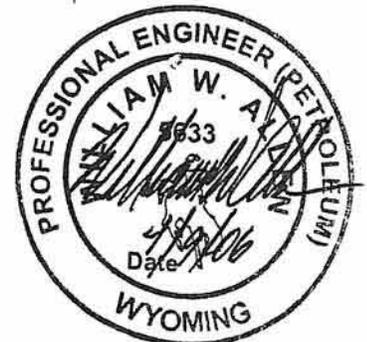
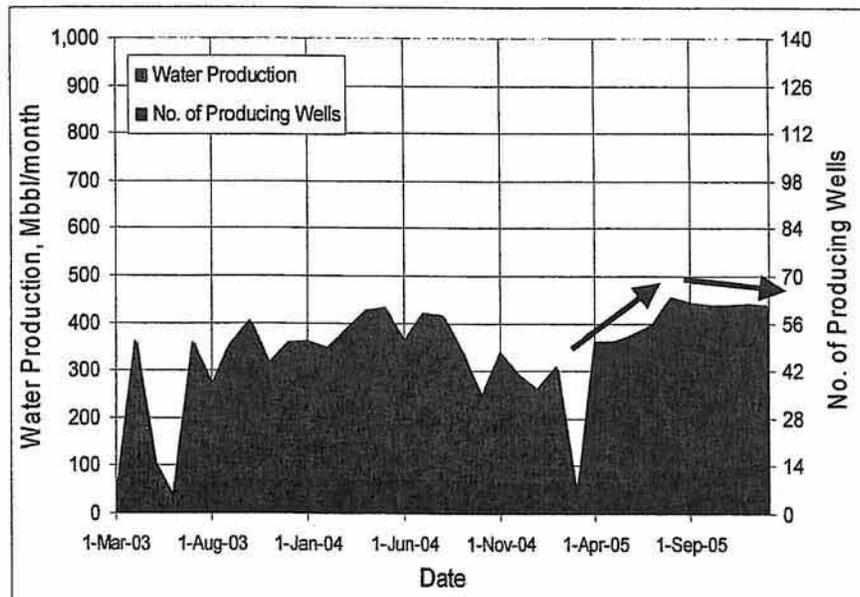
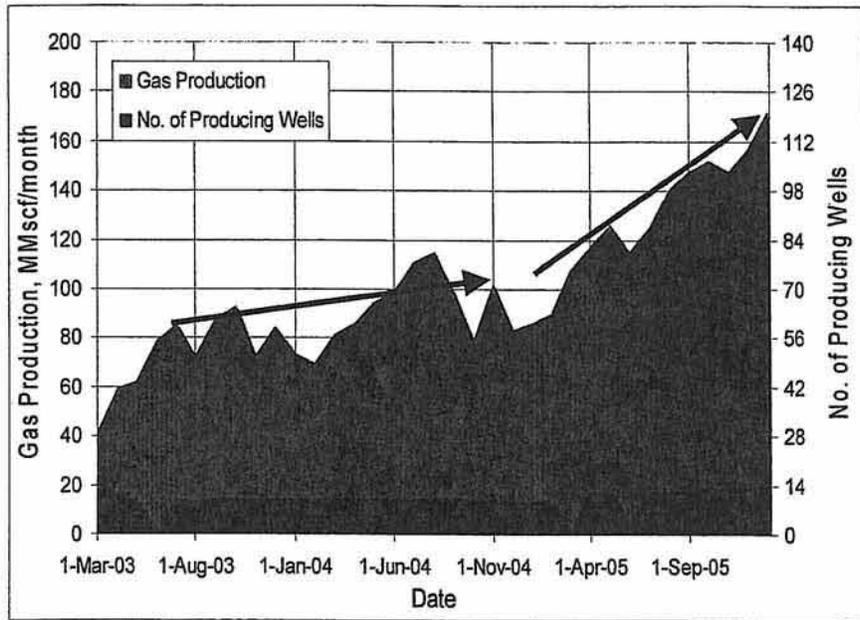


EXHIBIT E-10

GAS & WATER PRODUCTION HISTORIES

DOTY MOUNTAIN POD (WELL SPACING OF 80 ACRES PER WELL)

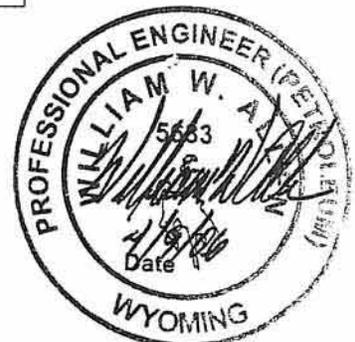
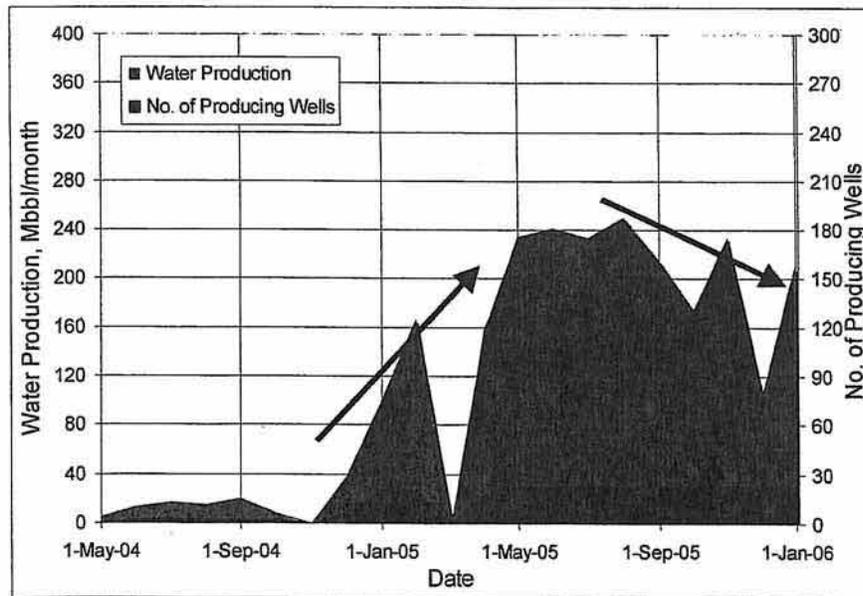
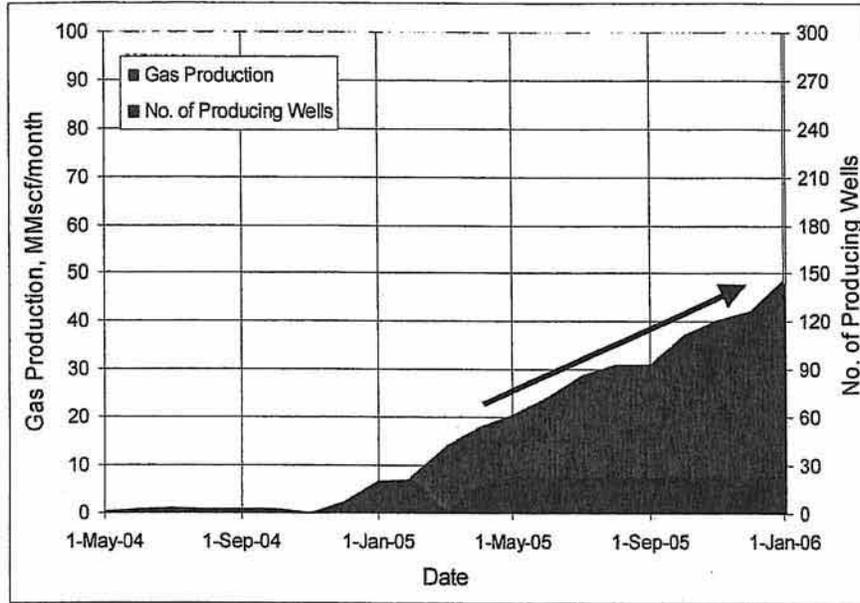


EXHIBIT E-11

GAS & WATER PRODUCTION HISTORIES

BLUE SKY POD (INITIAL WELL SPACING OF 160 ACRES PER WELL, BUT RECENTLY DOWNSPACED TO 80 ACRES PER WELL IN DEC. 2005)

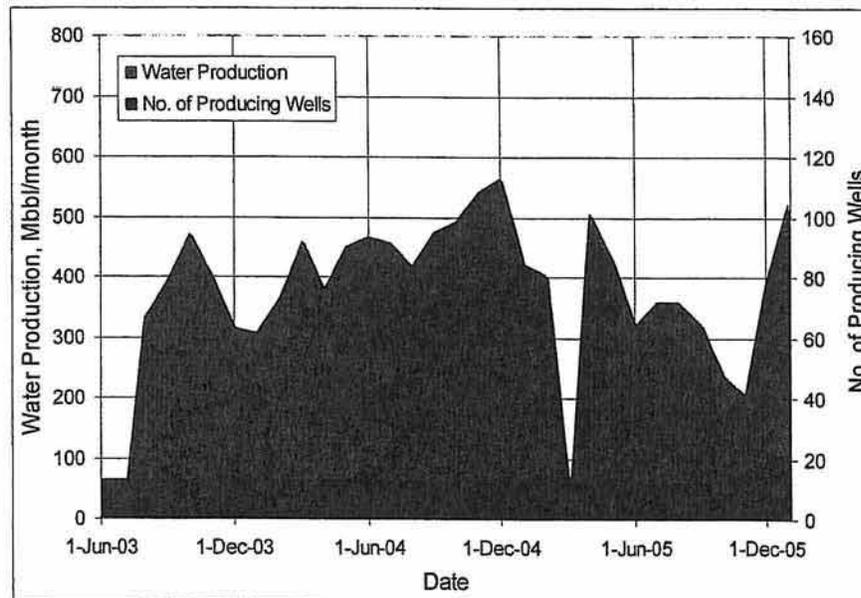
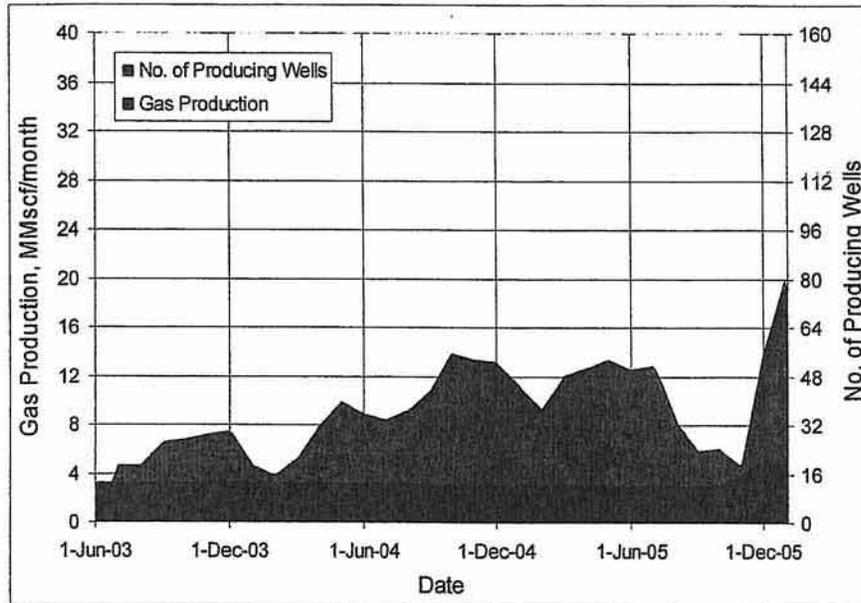


EXHIBIT E-12

GAS & WATER PRODUCTION HISTORIES

RED RIM POD (WELL SPACING OF 160 ACRES PER WELL)

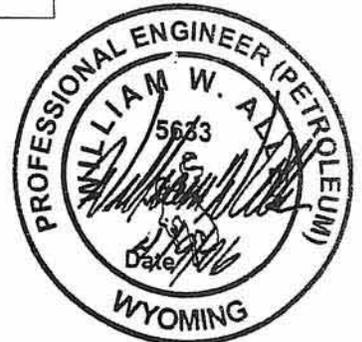
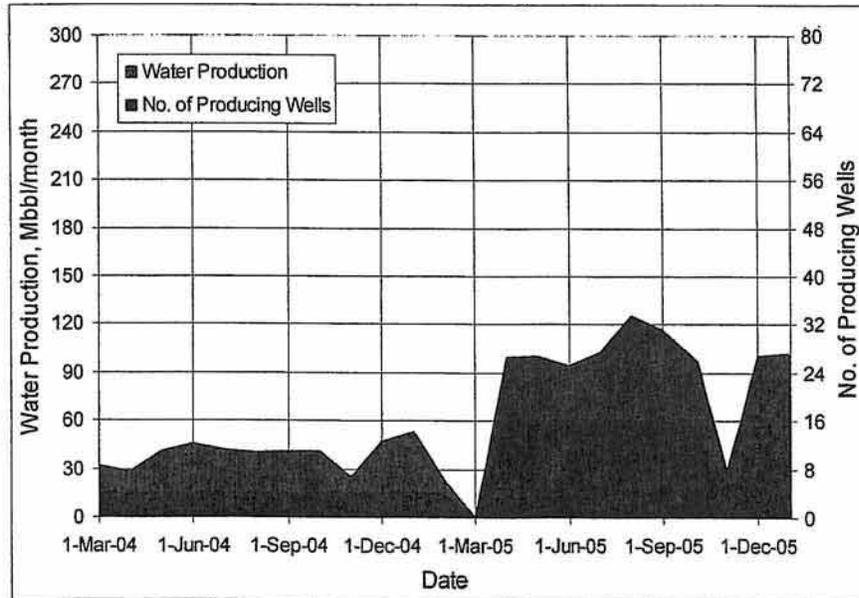
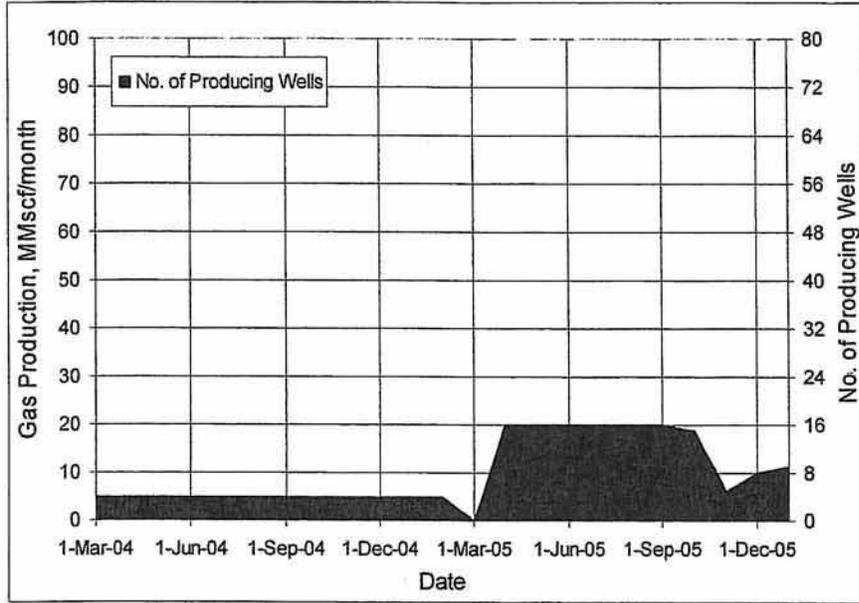
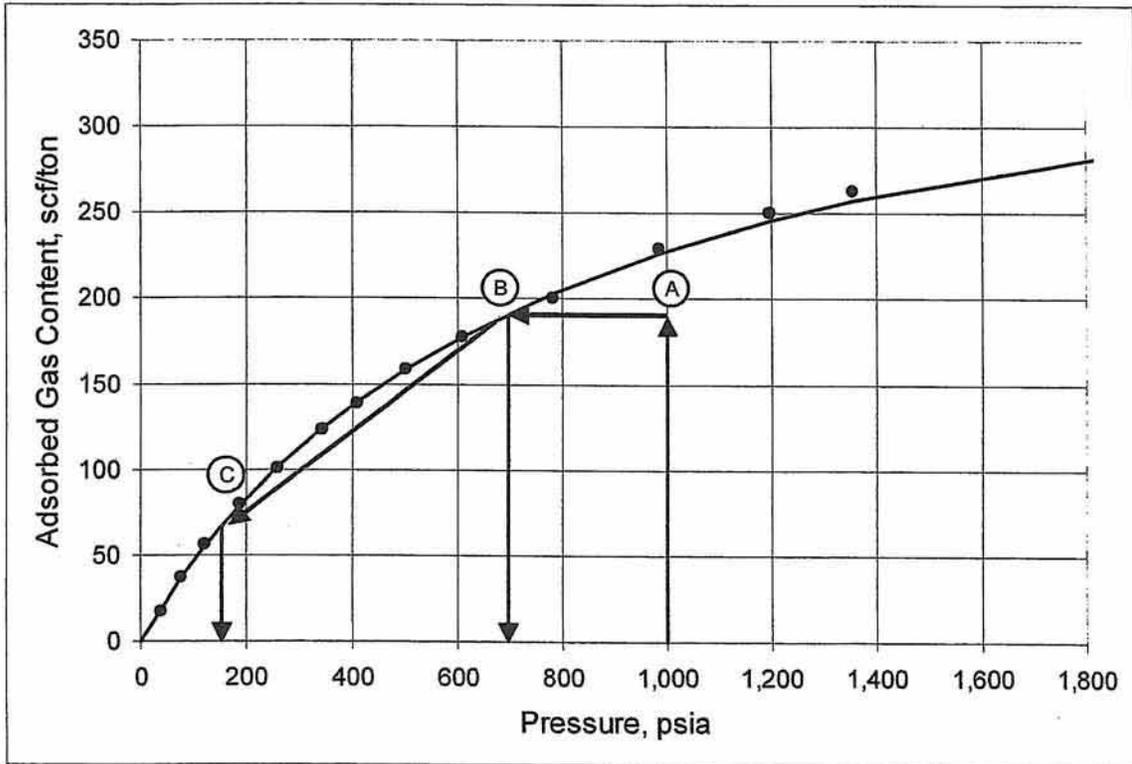


EXHIBIT E-13

TYPICAL GAS ADSORPTION ISOTHERM FOR MESAVERDE COALS SHOWING GAS PRODUCTION AS A FUNCTION OF COAL SEAM RESERVOIR PRESSURE

(WELL AR FEE 1890-NW5, SEC 5, T18N-R90W, CARBON CO., WY)



Notes:

1. Example isotherm for slightly under saturated Mesaverde coal illustrating the magnitude of pressure reduction required to recover 65% of the OGIP.
2. Initial gas content is 192 scf/ton (see Exhibits E-7 & E-8).
3. Initial reservoir pressure for this example (indicated by Point A) is 1,000 psia.
4. Pressure must be reduced to 700 psia (Point A to B or 30% reduction) before gas starts to desorb.
5. Pressure must be reduced to 150 psia (Point B to C) in order to achieve ultimate recovery factor of 65% of the OGIP on spacing of 80 acres per well.



EXHIBIT E-14

ATLANTIC RIM AREA
DIRECTIONAL CBM WELLS:
VIABILITY AND CONCERNS

- The RMG has concluded that “Directional drilling does not appear to be a viable technical or economic alternative.” – page 1, June 16, 2005, RMG (Exhibit L-7)
- Although directional drilling may be technically feasible in the westernmost side of the Atlantic Rim EIS area, completing and producing directional wells are not feasible due to operational and safety concerns.
- Due to the large volumes of water, electrical submersible pump (ESP) and progressive cavity (PC) pump appear to be best suited for Atlantic Rim CBM wells. Each has significant drawbacks in directional CBM wells:
 - ◆ ESP
 - Well control issues during workover operations
 - Killing the well with fluid will result in formation damage that will affect productivity.
 - Tubing and ESP cannot be pulled safely due to the electrical cable.
 - High failure rate due to coal fines
 - ◆ PC pump
 - Increase in rod parts and holes in tubing
 - Well control issues during workover operations
 - Killing the well with fluid will result in formation damage that will affect productivity.
 - Safety issues cannot be resolved in directional wells with polyethylene tubing which is necessary to reduce friction.

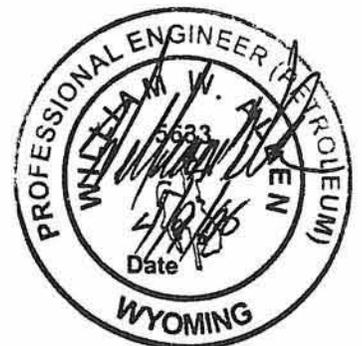


EXHIBIT E-15

ENGINEERING CONCLUSIONS

- Based on the 80-acre reservoir simulation model developed by APC, the average current recovery factors derived for the evaluated Atlantic Rim Pods are as follows:

Pod	Well Density, acres/well	Exhibit No.	OGIP Recovery, %	EUR Recovery, %
Sun Dog	80	E-3	23.8	36.6
Doty Mountain	80	E-4	1.03	1.58
Blue Sky	160 to 80 (12/05)	E-5	0.54	0.83
Red Rim	160	E-6	0.00	0.00

- The reservoir simulation indicated that a typical Atlantic Rim CBM well on 80-acre spacing should recover approximately 65% of the OGIP. In other words, at the end of the economic life, the OGIP and EUR recovery factors should be more or less 65% and 100%, respectively, for the pods with 80-acre spacing.
- As shown in the table, the pods initially developed on 80-acre spacing have the highest current recoveries, followed by the Blue Sky Pod which was recently down spaced from 160 to 80 acres. The Red Rim Pod on 160-acre spacing has yet to produce any gas.
- The Sun Dog and Doty Mountain production history plots on Exhibits E-9 and E-10 provide compelling evidence in support of 80-acre density. The increasing gas and decreasing water rates clearly indicate that the wells are dewatering the coals, thereby reducing the reservoir pressure and allowing gas to desorb from the coals.
- Conversely, the Blue Sky and Red Rim graphs show minimal or no gas production and no decline in water production, both of which are indicative that the well spacing is too great.
- As discussed in Exhibit E-14, the operational and safety issues associated with attempting to produce directional Mesaverde CBM wells in the Atlantic Rim area are insurmountable.
- Commission approval of 80-acre well density for the affected lands will prevent waste by allowing reserves to be recovered that would otherwise be lost under the existing 160-acre well density. Approval will also protect correlative rights.

