

**STATE OF OHIO
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL AND GAS RESOURCES MANAGEMENT**

In re the Matter of the Application of :
Chesapeake Exploration, L.L.C., for :
Unit Operation :
:
Delmar South Unit :

**PREPARED TESTIMONY OF ANDREW W. HOPSON
ON BEHALF OF CHESAPEAKE EXPLORATION, L.L.C.**

R. Neal Pierce (0028379)
Katerina E. Milenkovski (0063314)
STEPTOE & JOHNSON PLLC
Huntington Center
41 South High Street, Suite 2200
Columbus, OH 43215

Attorneys for Applicant,
Chesapeake Exploration, L.L.C.

PREPARED DIRECT TESTIMONY OF ANDREW W. HOPSON

1 **Q1. Please introduce yourself.**

2 **A1.** My name is Andrew Hopson and my business address is 6100 N. Western Avenue,
3 Oklahoma City, Oklahoma 73154-0496. I am a Reservoir Engineer for Chesapeake
4 Energy Corporation.

5 **Q2. What is the purpose of your testimony today?**

6 **A2.** I am testifying in support of the Application of Chesapeake Exploration, L.L.C., for Unit
7 Operation filed with respect to the Delmar South Unit. My testimony addresses the
8 following: (1) that unit operations for the Delmar South Unit are reasonably necessary to
9 increase substantially the recovery of oil and gas, protect the correlative rights of the
10 mineral owners, and (2) that the estimated additional revenue, due to unit operations,
11 exceeds the estimated additional capital investment.

12 **Q3. Can you summarize your educational experience for me?**

13 **A3.** I hold a Bachelors of Science degree from Texas A&M University, College Station..

14 **Q4. Are you a member of any professional associations?**

15 **A4.** I am a member of the Society of Petroleum Engineers..

16 **Q5. How long have you been a Reservoir Engineer for Chesapeake?**

17 **A5.** Approximately a year and a half.

18 **Q6. What other work experiences have you had?**

19 **A6.** Prior to working that asset I supported the Utica team as a Field Engineer in Canton, OH.

20 **Q7. What do your job responsibilities entail?**

21 **A7.** I am responsible for the strategy and development of Chesapeake's Utica asset. In
22 addition to providing reserve estimates it is my job to drive development that optimizes
23 oil and gas recovery in an efficient and responsible manner. Finally I am responsible for
24 the preparation of expert engineering testimony for the Utica play in Ohio.

25 **Q8. How do you do that?**

26 **A8.** I use public and proprietary information, coupled with sound engineering practices to
27 audit the value of Chesapeake assets. Practices include, but are not limited to,
28 volumetrics, material balance, Arps (decline curve) analysis, as well as other forms of
29 rate-time analysis and analytical models.

30 **Q9. Did you perform any analysis to support Chesapeake's application for unitization**
31 **for the proposed Delmar South Unit?**

1 **A9.** Yes.

2 **Q10. What sort of analysis did you perform?**

3 **A10.** Using volumetric analysis, based on provided petrophysical data, I estimated the original
4 gas-in-place. Then, using estimates of ultimate production from analogy wells in the
5 area, I estimated the recoverable hydrocarbons (gas, condensate, and natural gas liquids)
6 foregoing unitization, observing current regulatory setbacks. Next, I calculated the
7 recoverable hydrocarbons pursuant to a unitization order. Recovery factors (RF %) for
8 the project, both unitized and abbreviated, were calculated. And lastly I calculated an
9 estimate of future cashflow associated with the extracted hydrocarbons, based on current
10 SEC pricing.

11 **Q11. Why is Chesapeake looking at drilling horizontal wells?**

12 **A11.** The permeability of unconventional resource plays is so low (in nano-darcy units (nd),
13 i.e. 1.0×10^{-9} darcies) that the hydrocarbons cannot be economically produced without
14 the use of horizontal drilling, coupled with massive stimulation treatments (i.e. hydraulic
15 fracturing). Horizontal drilling is the predominant method used to develop shale
16 formations such as the Utica/Point Pleasant.

17 **Q12. Turning specifically to the Delmar South Unit, have you made an estimate of the
18 production you anticipate from the proposed unit's operations?**

19 **A12.** Yes. I have estimated the GIP from the proposed Unit Area in the Delmar South Unit to
20 be 20.5 BCFE. Likewise I have estimated the recoverable gas to be 5.1 BCF, recoverable
21 condensate to be 291 MBBLs, and recoverable natural gas liquids to be 440 MBBLs, if
22 unitization is granted.

23 **Q13. How did you make those estimates?**

24 **A13.** I used isopleth maps of petrophysical data, obtained from other wells in the area, to
25 estimate the anticipated GIP. Then I used forecasted recoveries from all producing wells
26 within a 10 mile radius to estimate expected recovery from this unit.

27 **Q14. Once you had that data from the other Utica/Point Pleasant wells, what did you do
28 with it?**

29 **A14.** I used the porosity, water saturations, net pay, formation pressures, etc. to do volumetric
30 calculations of the GIP based on industry accepted methodologies. The RF % was then
31 calculated by dividing the estimated ultimate recovery (BCFE) by the GIP (BCF).

1 **Q15. Why do you qualify your calculations as an estimate?**

2 **A15.** There is always the possibility that the petrophysical and geological data used from offset
3 wells may be slightly different than the characteristics of the productive horizon at this
4 location. However, the volumetric calculations of GIP should be a reasonably certain
5 estimate in this statistical unconventional play.

6 **Q16. In your professional opinion, would it be economic to develop the Delmar South
7 Unit using traditional vertical drilling?**

8 **A16.** Absolutely not.

9 **Q17. Are the estimates that you made based on good engineering practices and accepted
10 methods in the industry?**

11 **A17.** Yes.

12 **Q18. Do you have the calculations you performed?**

13 **A18.** The results of my calculations are attached to this prepared testimony as Exhibit AWH-1.

14 **Q19. Can you summarize what your calculations show?**

15 **A19.** The results of my prior stated methodology are;

16 1) Capital expenditure (CAPEX) to develop the unitized project is \$8.4 million.
17 Anticipated recoverable gas from the project is 5.5 BCFE and future cashflow (CF)
18 (using current SEC pricing of \$4.350/Mcf (no btu adjustments)) is \$26.6 million. A
19 recovery factor (RF) of 27.6% is anticipated.

20 2) This unit could not be developed from the planned pad location under the current
21 scenario.

22 **Q20. Can you briefly explain why you are using current SEC pricing in this application?**

23 **A20.** Every company has its own ideas of economic indicators by which it decides to invest in
24 an opportunity or not. Current SEC pricing, un-escalated, eliminates all the issues
25 associated with corporate decision trees and reduces the evaluation of corporate assets,
26 and projects, to a single deterministic standard. We have no clear crystal ball into the
27 future of oil and gas prices. What we do know, and can verify, is the price we currently
28 and historically get for each barrel of oil and each MMbtu of gas.

29 **Q21. Can you briefly discuss why your analysis in this application considers natural gas
30 as the only product to be produced?**

31 **A21.** We know that the products ultimately purchased from these wells will be comprised of

1 natural gas, condensate, and natural gas liquids. However, for the purpose of conducting
2 a volumetric analysis of the reservoir at initial conditions, there is only natural gas in the
3 reservoir. The condensates and natural gas liquids are separated out at the surface and
4 sold separately, when economic to do so, in an attempt to maximize cashflow.
5 Ultimately, as the reservoir pressure drops below the dew point, condensate will drop out
6 in the reservoir. However, under initial conditions the reservoir is only natural gas.
7 Therefore to determine an estimate of the RF % we need to begin with initial conditions
8 in the reservoir.

9 **Q22. Can you briefly comment on the anticipated range of recovery factors that**
10 **Chesapeake would expect to achieve for the Delmar South Unit?**

11 **A22.** Based upon the current statistical distribution of known data, a range of 30% to 70% is
12 anticipated. The statistical mean of the data is 49%. I expect a 28 % recovery, of
13 original hydrocarbon, from this location.

14 **Q23. Based on this information and your professional judgment, do unit operations**
15 **increase substantially the ultimate recovery of oil and gas?**

16 **A23.** Yes. The recoverable gas in the unitized project increases by approximately 100% from
17 0.0 BCFE to 5.5 BCFE.

18 **Q24. Based on this information and your professional judgment, does the value of the**
19 **estimated additional recovery of hydrocarbons from the unitized project exceed its**
20 **estimated costs?**

21 **A24.** Yes. CAPEX increases by \$8.4 million for the unitized project from the non-unitized
22 project. The estimated additional cashflow from the proposed Delmar South Unit is
23 approximately \$26.6 million as compared to what could be realized if the ODNR does
24 not grant this application for unit operations.

25 **Q25. In your professional opinion, do you believe that the proposed unit operations for**
26 **the Delmar South Unit are reasonably necessary to increase substantially the**
27 **ultimate recovery of oil and gas from the unit area?**

28 **A25.** Yes. The unitization of the Delmar South Unit is definitely needed to maximize the
29 economic benefit to the interest owners, and protect the correlative rights of the mineral
30 owners. If the project is not unitized it will strand 100.0% of the recoverable gas, or 5.5
31 BCFE in the ground from which mineral owners would, most likely, never see financial

1 benefit, nor Chesapeake, nor the State of Ohio.

2 **Q26. Does this conclude your testimony?**

3 **A26.** Yes.

4

EXHIBIT "AWH-1"

Delmar South Unit

UNITIZED

Well Name	Lateral Length (ft)	Anticipated Gas Recovery, BCFE	Capital (MM\$)
Delmar 24-13-6 6H	7473	5.5	\$8.40

NON-UNITIZED

Well Name	Lateral Length (ft)	Anticipated Gas Recovery, BCFE	Capital (MM\$)
Delmar 24-13-6 6H	0	0.0	
Abbreviated Totals		0	\$0.0

	Unitized	Non-Unitized	Increases due to Unitization
Total Capital (MM\$) *	\$8.40	\$0.00	\$8.40
Anticipated Recoverable Gas, BCFE	5.46	0.00	5.46
Anticipated Recoverable Gas, BCF	5.1	0.0	5.06
Anticipated Recoverable Oil, MBBL	290.9	0.0	290.94
Anticipated Recoverable NGLs, MBBL	440.3	0.0	440.33
Estimated Project CF, (MM\$) @ SEC Prices	\$26.56	\$0.00	\$26.56

* CAPEX for compression and pipeline will be burden of midstream operator

Est. Disc. Time to PO (Unitized), Yrs:	1.5
Est. Disc. Time to PO (Abbreviated), Yrs:	NA
Anticipated Initial LOE per well, \$/month:	\$18,473
Est. RF% due to Unitization:	28%
Est. Abbreviated RF%:	0%

* Used Toe Setback of 150'

** Used Heel Setback of 150'

EXHIBIT "AWH-2"

Support Data

Delmar South Unit

LEASE	API	OPERATOR	LL, FT.	MILES
CUMMINGS 17-14-6	3401922147	CHESAPEAKE EXPLORATION LL	5,404	5.7
BURGETT 7-15-6 6H	3401922110	CHESAPEAKE EXPLORATION LLC	6,491	7.7
BURGETT 7-15-6	3401922085	CHESAPEAKE EXPLORATION LL	6,499	7.7
WALTERS 30-12-5 8H	3401922122	CHESAPEAKE EXPLORATION LLC	5,255	5.9
FLIGIEL 29-12-5	3401922234	CHESAPEAKE EXPLORATION LL	4,013	5.7
FLIGIEL 29-12-5	3401922233	CHESAPEAKE EXPLORATION LL	4,132	5.7
FLIGIEL 29-12-5	3401922194	CHESAPEAKE EXPLORATION LL	5,453	5.7
FLIGIEL 29-12-5	3401922200	CHESAPEAKE EXPLORATION LL	4,132	5.7
FLIGIEL 29-12-5	3401922232	CHESAPEAKE EXPLORATION LL	4,095	5.7
FLIGIEL 29-12-5	3401922193	CHESAPEAKE EXPLORATION LL	5,391	5.7
FLIGIEL 29-12-5	3401922117	CHESAPEAKE EXPLORATION LL	5,341	5.7
FLIGIEL 29-12-5	3401922235	CHESAPEAKE EXPLORATION LL	5,453	5.7
SCOTT 24-12-5 3H	3401922119	CHESAPEAKE EXPLORATION LLC	5,113	6.9
HENDERSON STUART 11-12-6 1H	3406721064	CHESAPEAKE EXPLORATION LLC	5,106	6.6
HOUYOUSE 15-13-5 6H	3401922100	CHESAPEAKE EXPLORATION LLC	3,656	8.5
APPALACHIAN 16-12-5	3401922266	CHESAPEAKE EXPLORATION LL	6,653	8.0
APPALACHIAN 16-12-5	3401922241	CHESAPEAKE EXPLORATION LL	3,576	8.0
APPALACHIAN 16-12-5	3401922264	CHESAPEAKE EXPLORATION LL	6,574	8.0
COLESCOTT 11-12-5	3401922206	CHESAPEAKE EXPLORATION LL	5,402	8.4
COLESCOTT 11-12-5	3401922179	CHESAPEAKE EXPLORATION LL	5,350	8.4
COLESCOTT 11-12-5	3401922188	CHESAPEAKE EXPLORATION LL	5,285	8.4
GOTSHALL 14-12-5	3406721079	CHESAPEAKE EXPLORATION LL	5,353	8.0
GOTSHALL 14-12-5	3406721085	CHESAPEAKE EXPLORATION LL	4,731	8.0
SNODDY 11-13-5 6H	3401922105	CHESAPEAKE EXPLORATION LLC	4,238	10.0
SNODDY 11-13-5 1H	3401922098	CHESAPEAKE EXPLORATION LLC	5,286	10.0
WALKER 12-12-5	3401922261	CHESAPEAKE EXPLORATION LL	4,349	8.8
WALKER 12-12-5	3401922262	CHESAPEAKE EXPLORATION LL	4,482	8.8
WALKER 12-12-5	3401922157	CHESAPEAKE EXPLORATION LL	4,972	8.8
WALKER 12-12-5	3401922263	CHESAPEAKE EXPLORATION LL	4,552	8.8
WALKER 12-12-5	3401922158	CHESAPEAKE EXPLORATION LL	5,374	8.8
WALKER 12-12-5	3401922159	CHESAPEAKE EXPLORATION LL	5,400	8.8
BROWN P 9-13-5 1H	3401922139	CHESAPEAKE EXPLORATION LLC	4,687	9.8

