FORSPAN ASSESSMENT MODEL FOR CONTINUOUS ACCUMULATIONS--BASIC INPUT DATA FORM (NOGA, Version 9, 2-10-03)

IDENTIFICATION INFORMATION

Assessment Geologist:	T.S. Dyman and S.M. Condon	Date:	4/18/2005
Region:	North America	Number:	5
Province:	Hanna, Laramie, Shirley Basins	Number:	5030
Total Petroleum System:	Niobrara	Number:	503003
Assessment Unit:	Niobrara Continuous Oil	Number:	50300361
Based on Data as of:	PI/Dwights 4/2004		

Notes from Assessor:

CHARACTERISTICS OF ASSESSMENT UNIT

Assessment-unit type: Oil (<20,000 cfg/bo) **or Gas** (≥20,000 cfg/bo), incl. disc. & pot. additions: Oil

What is the minimum total recovery per cell? 0.001 (mmbo for oil A.U.; bcfg for gas A.U.)

Number of tested cells: 76

Number of tested cells with total recovery per cell ≥ minimum: 10

Established (discovered cells): X Hypothetical (no cells):

Median total recovery per cell (for cells ≥ min.): (mmbo for oil A.U.; bcfg for gas A.U.)

1st 3rd discovered _____ 2nd 3rd _____ 3rd 3rd _____

Assessment-Unit Probabilities:

Attribute	Probability of occurrence (0-1.0)
1. **CHARGE:** Adequate petroleum charge for an untested cell with total recovery ≥ minimum.	1.0
2. **ROCKS:** Adequate reservoirs, traps, seals for an untested cell with total recovery ≥ minimum.	1.0
3. **TIMING:** Favorable geologic timing for an untested cell with total recovery ≥ minimum.	1.0

Assessment-Unit GEOLOGIC Probability (Product of 1, 2, and 3): 1.0

NO. OF UNTESTED CELLS WITH POTENTIAL FOR ADDITIONS TO RESERVES

1. Total assessment-unit area (acres): (uncertainty of a fixed value)

   calculated mean 841,000 minimum 799,000 mode 841,000 maximum 883,000

2. Area per cell of untested cells having potential for additions to reserves (acres): (values are inherently variable)

   calculated mean 173 minimum 40 mode 160 maximum 320

   uncertainty of mean: minimum 130 maximum 215

3. Percentage of total assessment-unit area that is untested (%): (uncertainty of a fixed value)

   calculated mean 98.4 minimum 98 mode 98.5 maximum 98.9

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NO. OF UNTESTED CELLS WITH POTENTIAL FOR ADDITIONS TO RESERVES (Continued)

4. Percentage of untested assessment-unit area that has potential for additions to reserves (%):
(a necessary criterion is that total recovery per cell ≥ minimum; uncertainty of a fixed value)

calculated mean 10 minimum 1 mode 4 maximum 25

Geologic evidence for estimates: Sweetspots related to areas of enhanced fractures.

TOTAL RECOVERY PER CELL

Total recovery per cell for untested cells having potential for additions to reserves:
(values are inherently variable; mmbo for oil A.U.; bcfg for gas A.U.)

calculated mean 0.08 minimum 0.001 median 0.04 maximum 1.6

AVERAGE COPRODUCT RATIOS FOR UNTESTED CELLS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

Oil assessment unit:	minimum	mode	maximum
Gas/oil ratio (cfg/bo)	300	600	900
NGL/gas ratio (bngl/mmcfg)			
Gas assessment unit:			
Liquids/gas ratio (bliq/mmcfg)			

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SELECTED ANCILLARY DATA FOR UNTESTED CELLS

(values are inherently variable)

Oil assessment unit:	minimum	mode	maximum
API gravity of oil (degrees)	35	39	45
Sulfur content of oil (%)	0.02	0.1	0.5
Depth (m) of water (if applicable)			

Drilling depth (m)

minimum	F75	mode	F25	maximum
200		1000		5500

Gas assessment unit:	minimum	mode	maximum
Inert-gas content (%)			
CO_2 content (%)			
Hydrogen sulfide content (%)			
Heating value (BTU)			
Depth (m) of water (if applicable)			

Drilling depth (m)

minimum	F75	mode	F25	maximum

Success ratios:	calculated mean	minimum	mode	maximum
Future success ratio (%)	25	5	20	50

Historic success ratio, tested cells (%) 13.2

Completion practices:

1. Typical well-completion practices (conventional, open hole, open cavity, other)	Conventional
2. Fraction of wells drilled that are typically stimulated	1
3. Predominant type of stimulation (none, frac, acid, other)	frac, acid
4. Fraction of wells drilled that are horizontal	0

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ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO STATES
Surface Allocations (uncertainty of a fixed value)

1. Wyoming represents 100 area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity		100	
Gas in gas assessment unit: Volume % in entity			

2. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

3. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

4. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

5. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

6. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

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7. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity	_____	_____	_____
Gas in gas assessment unit: Volume % in entity	_____	_____	_____

8. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity	_____	_____	_____
Gas in gas assessment unit: Volume % in entity	_____	_____	_____

9. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity	_____	_____	_____
Gas in gas assessment unit: Volume % in entity	_____	_____	_____

10. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity	_____	_____	_____
Gas in gas assessment unit: Volume % in entity	_____	_____	_____

11. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity	_____	_____	_____
Gas in gas assessment unit: Volume % in entity	_____	_____	_____

12. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity	_____	_____	_____
Gas in gas assessment unit: Volume % in entity	_____	_____	_____

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ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO GENERAL LAND OWNERSHIPS
Surface Allocations (uncertainty of a fixed value)

1. Federal Lands represents 41.18 area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity		41	
Gas in gas assessment unit: Volume % in entity			

2. Private Lands represents 53.09 area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity		53	
Gas in gas assessment unit: Volume % in entity			

3. Tribal Lands represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

4. Other Lands represents 1.47 area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity		2	
Gas in gas assessment unit: Volume % in entity			

5. WY State Lands represents 4.26 area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity		4	
Gas in gas assessment unit: Volume % in entity			

6. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

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7. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity	_____	_____	_____
Gas in gas assessment unit: Volume % in entity	_____	_____	_____

8. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity	_____	_____	_____
Gas in gas assessment unit: Volume % in entity	_____	_____	_____

9. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity	_____	_____	_____
Gas in gas assessment unit: Volume % in entity	_____	_____	_____

10. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity	_____	_____	_____
Gas in gas assessment unit: Volume % in entity	_____	_____	_____

11. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity	_____	_____	_____
Gas in gas assessment unit: Volume % in entity	_____	_____	_____

12. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity	_____	_____	_____
Gas in gas assessment unit: Volume % in entity	_____	_____	_____

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ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO FEDERAL LAND SUBDIVISIONS
Surface Allocations (uncertainty of a fixed value)

1. Bureau of Land Management (BLM) represents 40.3 area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity		40.59	
Gas in gas assessment unit: Volume % in entity			

2. BLM Wilderness Areas (BLMW) represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

3. BLM Roadless Areas (BLMR) represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

4. National Park Service (NPS) represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

5. NPS Wilderness Areas (NPSW) represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

6. NPS Protected Withdrawals (NPSP) represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

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7. US Forest Service (FS) represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

8. USFS Wilderness Areas (FSW) represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

9. USFS Roadless Areas (FSR) represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

10. USFS Protected Withdrawals (FSP) represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

11. US Fish and Wildlife Service (FWS) represents 0 area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity		0	
Gas in gas assessment unit: Volume % in entity			

12. USFWS Wilderness Areas (FWSW) represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

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13. USFWS Protected Withdrawals (FWSP) represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

14. Wilderness Study Areas (WS) represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

15. Department of Energy (DOE) represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

16. Department of Defense (DOD) represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

17. Bureau of Reclamation (BOR) represents 0.88 area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity		0.41	
Gas in gas assessment unit: Volume % in entity			

18. Tennessee Valley Authority (TVA) represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

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19. Other Federal _____ represents _____ area % of the AU

Oil in oil assessment unit:	minimum	mode	maximum
Volume % in entity	_____	_____	_____

Gas in gas assessment unit:			
Volume % in entity	_____	_____	_____

20. _____ represents _____ area % of the AU

Oil in oil assessment unit:	minimum	mode	maximum
Volume % in entity	_____	_____	_____

Gas in gas assessment unit:			
Volume % in entity	_____	_____	_____

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ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO ECOSYSTEMS
Surface Allocations (uncertainty of a fixed value)

1. Central Basin and Hills (CNBH) represents 93.14 area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity		93	
Gas in gas assessment unit: Volume % in entity			

2. Greater Green River Basin (GGRV) represents 6.86 area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity		7	
Gas in gas assessment unit: Volume % in entity			

3. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

4. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

5. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

6. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity			
Gas in gas assessment unit: Volume % in entity			

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7. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity	_____	_____	_____
Gas in gas assessment unit: Volume % in entity	_____	_____	_____

8. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity	_____	_____	_____
Gas in gas assessment unit: Volume % in entity	_____	_____	_____

9. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity	_____	_____	_____
Gas in gas assessment unit: Volume % in entity	_____	_____	_____

10. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity	_____	_____	_____
Gas in gas assessment unit: Volume % in entity	_____	_____	_____

11. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity	_____	_____	_____
Gas in gas assessment unit: Volume % in entity	_____	_____	_____

12. _____ represents _____ area % of the AU

	minimum	mode	maximum
Oil in oil assessment unit: Volume % in entity	_____	_____	_____
Gas in gas assessment unit: Volume % in entity	_____	_____	_____

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