

AOGCC Pool Statistics

Northstar Unit, Northstar Oil Pool

Alaska Oil and Gas Conservation Commission > Annual Reports > Pool Statistics - 2004: Updated 25 July 2005

Page: [1](#) > [2](#) > [3](#)**Operator:** BP Exploration (Alaska) INC.**Discovery Well:** Shell Western E&P INC.

Seal Island BF-47 No. 1

Permit #183-074

API No. 50-029-20954-00-00

Sec. 02, T13N, R13E, UM

Depth: 14,541' MD / 12,461' TVD

January 30, 1984

Status: **Producing****Location:** **Arctic Ocean**[Area Location Map](#)[Unit Location Map](#)[DNR Unit Map](#)**Orders:** [Complete List](#)**Summary:**

Northstar Island is a five-acre, man-made island located in the Beaufort Sea, 12 miles northwest of Prudhoe Bay and 6 miles offshore. Discovered by the Shell Island BF-47 No. 1 exploration well in 1984, construction of the development island began during the winter of 1999-2000, and the first production modules were installed during 2000. Northstar is connected to onshore processing facilities by a pipeline that is buried 7 to 11 feet below the seafloor to avoid ice impacts. This pipeline has a wall thickness triple those of typical onshore North Slope pipelines, and three separate leak detection systems. Regular production began in November 2001, and climbed rapidly, regularly exceeding 50,000 barrels of oil per day ("BOPD") by June 2002 and 70,000 BOPD by June 2003. During mid-February, 2004, failure of a compressor motor shut down production from Northstar for two weeks, resulting a "loss"(delay) of about 1 million barrels of oil production. For all of 2004, the pool produced at an average rate of 68,700 BOPD. The Northstar development area spans the boundary between State of Alaska and Federal waters, and the Federal percentage Northstar production is allocated at 17.840%. During 2004, the Federal portion of Northstar oil production was 4,474,097 barrels for an average rate of 12,224 BOPD.

Geology:

The Northstar Oil Pool is defined as the accumulation of hydrocarbons common to and correlating with the interval between measured depths of 12,418 feet and 13,044 feet the Seal A-01 well. The reservoir interval consists of the Sag River, Shublik, and Ivishak Formations. The Sag River Formation is typically 100 feet thick in this area, and it was deposited as Triassic-aged transgressive marine sandstone, siltstone and shale. The sandstone mineralogy is mature: quartz with minor amounts of feldspar and authigenic clay. The primary cementing agents are calcite, silica and siderite. The Shublik Formation is also Triassic-aged, and is stratigraphically complex, being characterized by marine siltstone, shale, sandstone and phosphatic limestone. Within the Shublik Formation, reservoir quality rock is limited to a basal sandstone member, the Shublik D. The Ivishak Formation comprises a series of Permian and Triassic-aged delta-front sandstones and shales that grade upward to fluvial sandstone and medium to coarse-grained pebbly conglomerates. Within the pool, the Ivishak is about 325 feet thick, and it is more proximal, coarser grained, more deeply buried and cemented than at the Prudhoe Bay Field. Here, the Ivishak is primarily cemented with calcite, silica and siderite. The pool structure consists of a faulted anticline defined by three-way dip closure on west, south and east. Closure to the north is obtained through fault seal or structural dip. Faults within the pool have interpreted maximum vertical displacements of less than 200 feet, and they are not expected to significantly effect reservoir performance. The oil-water contact is placed at 11,100 feet true vertical depth subsea, based on core, RFT, MDT and well test data. Operator-provided estimates of hydrocarbons in place for the Northstar Oil Pool suggest an original oil in place of 247 million stock tank barrels, 7 billion cubic feet ("BCF") of gas in an inferred gas cap, and 480 BCF total gas including solution gas.

[Structure Map](#)[Strat Column](#)[Type Log](#)**Orig. Oil in Place:** 247 MMSTB (CO 458)**Orig. Gas in Place:** 480 MMSTB including 7 BCF in gas cap (CO 458)**Production:** [Prod Chart](#)[Prod Report](#)[Prod Data](#)

	Oil (bbls)	NGL (bbls)	Gas (mcf)	Water (bbls)
Cumulative	67,214,704	0	225,546,155	3,870,835
2001 Total	1,265,552	0	2,686,066	7,086
2002 Total	17,902,653	0	47,615,650	152,461
2003 Total	22,968,022	0	70,861,557	894,229
2004 Total	25,078,477	0	104,382,882	2,817,059
2003 Daily Rate	62,926	0	194,141	2,450
2004 Daily Rate	68,708	0	285,980	7,718
Change (%)	9%	0	47%	215%

Continued: 1 > 2 > 3

[1_Oil_1](#)
[Home](#)
[Orders](#)
[Staff](#)
[Calendar](#)
[Contact Us](#)
[Webmaster](#)

AOGCC Pool Statistics

Northstar Unit, Northstar Oil Pool

Alaska Oil and Gas Conservation Commission > Annual Reports > Pool Statistics - 2004: Updated 25 July 2005

Page: 1 > 2 > 3

EOR Injection:

Chart

Report

Data

	Gas (Mcf)	Water
Cumulative	300,862,589	0
2001 Total	3,696,775	0
2002 Total	64,396,277	0
2003 Total	101,268,254	0
2004 Total	131,501,283	0
2003 Rate (per day)	277,477	0
2004 Rate (per day)	360,277	0
Change (%)	30%	0

Disposal Injection in Field:

Chart

Report

Data

	Disposed Fluids
Cumulative	5,448,217
2001 Total	290,113
2002 Total	935,119
2003 Total	1,193,004
2004 Total	3,029,981
2003 Rate (per day)	3,269
2004 Rate (per day)	8,301
Change (%)	154%

Field Development Information:

Wells In Field

Type Well	Status	2004	2003	2002	2001	2000
Producer	Oil Producer	15	14	6	2	0
Injector	Water Injector	0	1	0	0	0
	Gas Injector	6	3	2	1	0
	WAG Injector	0	1	1	1	0
	Water Supply	0	0	0	0	0
	Disposal	2	1	1	1	0
Non-Operating	Opr Shut Down	0	0	1	2	0
	Suspended	1	1	1	0	0
	Abandoned	0	0	0	7	7
Total		24	21	12	*14	*7

* 7 P&A Exploratory Wells have delineated this field.

Active Completions in Pool (Month of December):

Type Well	Status	2004	2003	2002	2001	2000
Oil Producer	Flowing	15	11	6	2	0
	Gas Lift	0	0	0	0	0
	Shut-In	0	2	0	0	0
Service Well	Water Injector	0	0	0	1	0
	Gas Injector	5	4	3	1	0
	WAG Injector	0	0	0	0	0
	Water Supply	0	0	0	0	0
	Shut-In	1	1	0	0	0
Disposal Undef.	Disposal Injector	1	1	1	1	0
	Shut-In	1	0	0	0	0
Total		23	19	10	5	0

Continued: 1 > 2 > 3

AOGCC Pool Statistics

Northstar Unit, Northstar Oil Pool

Alaska Oil and Gas Conservation Commission > Annual Reports > Pool Statistics - 2004: Updated 25 July 2005

Page: [1](#) > [2](#) > [3](#)

Permitted Wells in Field:

Type Well	Status	2004	2003	2002	2001	2000
Development	New	0	0	13	6	0
	Sidetrack	0	0	0	0	0
	Multilateral	0	0	0	0	0
Service	New	0	2	1	1	0
	Sidetrack	0	0	0	0	0
	Multilateral	0	0	0	0	0
Exploration	New	0	0	0	0	0
	Sidetrack	0	0	0	0	0
Total		0	2	14	7	0

Reservoir Properties:

Description	2004	2003	2002	2001	2000
Reference Datum - ft. below sea level	11100	11100	11100	11100	11100
Temperature - ° F	254	254	247	247	247
Porosity - %	15	15	15	15	15
Permeability - md	10-366	200	53	53	53
Swi - %	55	55	58	58	58
Oil Viscosity @ Orig. Press. cp	.14	.14	.14	.14	.14
Oil Viscosity @ Sat. Press. cp	.14	-	-	-	-
Orig. Press. - psi	5300	5300	5290	5290	5290
Bubble Point - psi	4960	4960	5010	5010	5010
Current Reservoir Press. - psi	5160	5187	5175	5175	5290
Oil Gravity - ° API	44	44	44	44	44
Gas Specific Gravity (Air = 1.0)	.8	.8	.8	.8	.8
Gross Pay - ft.	121	121	130	130	130
Net Pay - ft.	113	113	125	125	125
Orig. FVF - RB/STB	2.2	2.3	2.2	2.2	2.2
Bubble Point FVF - RB/STB	2.3	-	-	-	-
Orig. GOR - SCF/STB	2150	2100	2150	2150	2150
GOR (current yr.) - SCF/STB	4162	3085	2660	2122	-

References / Summary

Continued: [1](#) > [2](#) > [3](#)

State of Alaska, Oil and Gas Conservation Commission

Production History for: NORTHSTAR, NORTHSTAR OIL Pool

Jan 1958 Dec 2004

<u>Month</u>	<u>DaysProd</u>	<u>Oil (BBL)</u>	<u>Gas (MCF)</u>	<u>Water (BBL)</u>	<u>Producing Wells</u>
Oct 2001	1	363	746	0	1
Nov 2001	54	353070	762654	1260	2
Dec 2001	56	912119	1922666	5826	2
Year Total		1265552	2686066	7086	
Jan 2002	78	1106393	2371951	4025	3
Feb 2002	86	1011221	1808454	2192	4
Mar 2002	134	1554091	3005458	2214	5
Apr 2002	92	1092774	2348619	384	5
May 2002	132	1083388	2496116	1231	6
Jun 2002	173	1827325	4470141	3719	6
Jul 2002	176	1772269	4919165	9527	7
Aug 2002	185	1846220	5563595	17402	6
Sep 2002	158	1356555	3661002	13963	6
Oct 2002	174	1858524	5589003	34269	6
Nov 2002	168	1678500	5417074	28861	6
Dec 2002	184	1715393	5965072	34674	6
Year Total		17902653	47615650	152461	
Jan 2003	183	1514557	5356036	25583	8
Feb 2003	243	1992106	6167624	56022	9
Mar 2003	274	1955963	6971443	84264	9
Apr 2003	210	1355557	4659382	49375	10
May 2003	330	2067781	6605755	72340	12
Jun 2003	351	2141501	7109864	67223	12
Jul 2003	353	1907547	6473155	61206	12
Aug 2003	322	1904771	5811839	66209	13
Sep 2003	300	2064610	4394750	89999	13
Oct 2003	341	2325081	6451658	111597	11
Nov 2003	289	1908148	5490566	113186	12
Dec 2003	265	1830400	5369485	97225	11
Year Total		22968022	70861557	894229	
Jan 2004	333	2439547	7259210	174855	11
Feb 2004	171	1140067	3445664	86573	12
Mar 2004	321	2252145	7421939	173380	11
Apr 2004	312	1901916	6659911	162910	13
May 2004	368	2336229	9943734	190675	13
Jun 2004	368	2188374	9447001	239292	14
Jul 2004	392	2165121	10317879	264002	13
Aug 2004	310	1538797	6349335	200058	15
Sep 2004	398	2289965	10332264	307306	14
Oct 2004	393	2306964	10253492	354728	14
Nov 2004	364	2213766	10962097	313590	14
Dec 2004	410	2305586	11990356	349690	15
Year Total		25078477	104382882	2817059	
Pool Total		67,214,704	225,546,155	3,870,835	

State of Alaska, Oil and Gas Conservation Commission

Injection History for: NORTHSTAR, NORTHSTAR OIL Pool

<u>Month</u>	<u>DaysInj</u>	<u>Liquid (BBL)</u>	<u>Gas (MCF)</u>	<u>Injecting Wells</u>
Oct 2001	3	0	20760	1
Nov 2001	30	0	1056591	1
Dec 2001	33	0	2619424	2
Year Total		0	3696775	
Jan 2002	30	0	3371029	1
Feb 2002	37	0	2669863	2
Mar 2002	62	0	5096879	2
Apr 2002	56	0	4247460	2
May 2002	61	0	3420274	2
Jun 2002	58	0	5507631	2
Jul 2002	62	0	6635548	2
Aug 2002	87	0	7138193	3
Sep 2002	90	0	5096263	3
Oct 2002	93	0	6940283	3
Nov 2002	84	0	6694217	3
Dec 2002	93	0	7578637	3
Year Total		0	64396277	
Jan 2003	86	0	7657152	3
Feb 2003	84	0	7953852	3
Mar 2003	113	0	9441988	4
Apr 2003	119	0	7232108	4
May 2003	112	0	8133291	4
Jun 2003	120	0	9558704	4
Jul 2003	152	0	8922071	5
Aug 2003	151	0	8477537	5
Sep 2003	123	0	7359483	5
Oct 2003	124	0	9633359	4
Nov 2003	121	0	8340782	5
Dec 2003	120	0	8557927	4
Year Total		0	101268254	
Jan 2004	124	0	10257349	4
Feb 2004	85	0	5661790	4
Mar 2004	145	0	10307074	5
Apr 2004	166	0	8548026	6
May 2004	186	0	12047303	6
Jun 2004	179	0	10738590	6
Jul 2004	186	0	11642745	6
Aug 2004	160	0	8264065	6
Sep 2004	159	0	13044653	6
Oct 2004	155	0	12836336	5
Nov 2004	150	0	13779562	5
Dec 2004	155	0	14373790	5
Year Total		0	131501283	
Pool Total		0	300,862,589	

State of Alaska, Oil and Gas Conservation Commission

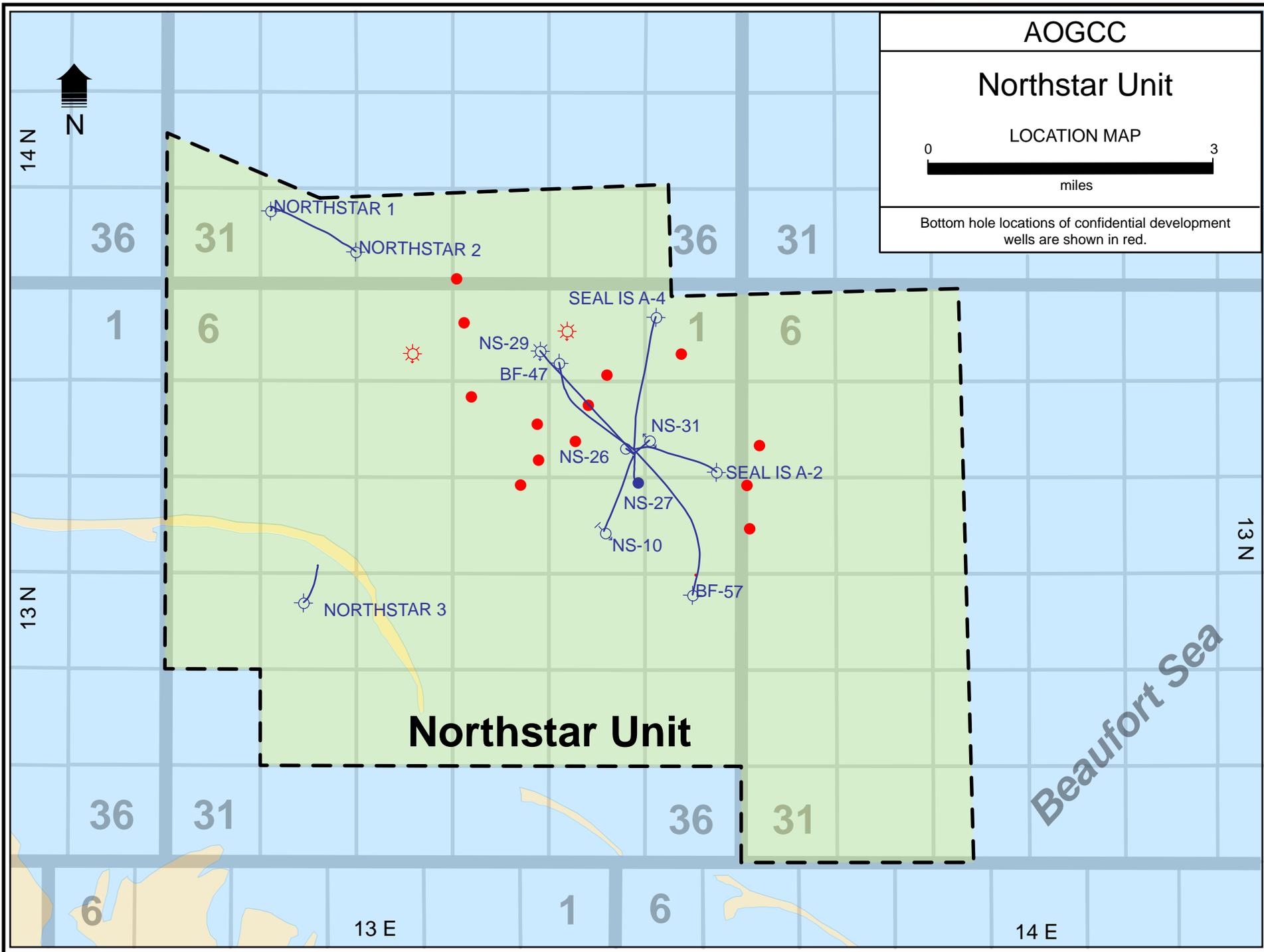
Injection History for: **NORTHSTAR, UNDEFINED WDSP Pool**

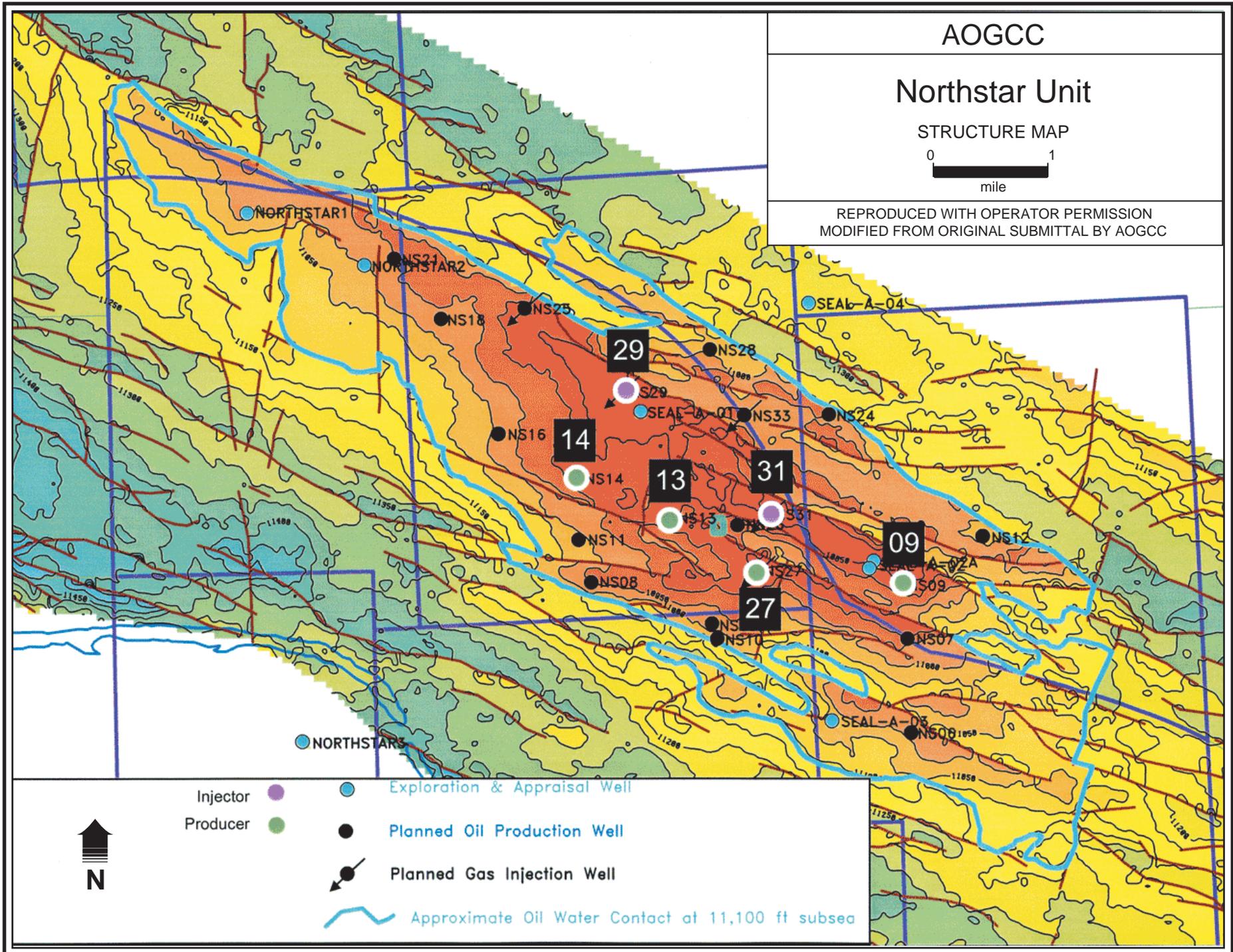
<u>Month</u>	<u>DaysInj</u>	<u>Liquid (BBL)</u>	<u>Gas (MCF)</u>	<u>Injecting Wells</u>
Jan 2001	6	5183	0	1
Feb 2001	28	19782	0	1
Mar 2001	31	23410	0	1
Apr 2001	30	21487	0	1
May 2001	31	28633	0	1
Jun 2001	30	30351	0	1
Jul 2001	31	19608	0	1
Aug 2001	31	17369	0	1
Sep 2001	30	21983	0	1
Oct 2001	31	21305	0	1
Nov 2001	30	25627	0	1
Dec 2001	31	55375	0	1
Year Total		290113	0	
Jan 2002	31	63768	0	1
Feb 2002	28	90894	0	1
Mar 2002	31	106840	0	1
Apr 2002	30	67025	0	1
May 2002	31	63138	0	1
Jun 2002	30	72281	0	1
Jul 2002	31	85741	0	1
Aug 2002	31	56560	0	1
Sep 2002	30	69746	0	1
Oct 2002	31	83675	0	1
Nov 2002	30	98065	0	1
Dec 2002	31	77386	0	1
Year Total		935119	0	
Jan 2003	31	81997	0	1
Feb 2003	28	83815	0	1
Mar 2003	31	111020	0	1
Apr 2003	30	92338	0	1
May 2003	31	108117	0	1
Jun 2003	30	88583	0	1
Jul 2003	31	70441	0	1
Aug 2003	31	72551	0	1
Sep 2003	30	98103	0	1
Oct 2003	31	122086	0	1
Nov 2003	30	125175	0	1
Dec 2003	31	138778	0	1
Year Total		1193004	0	

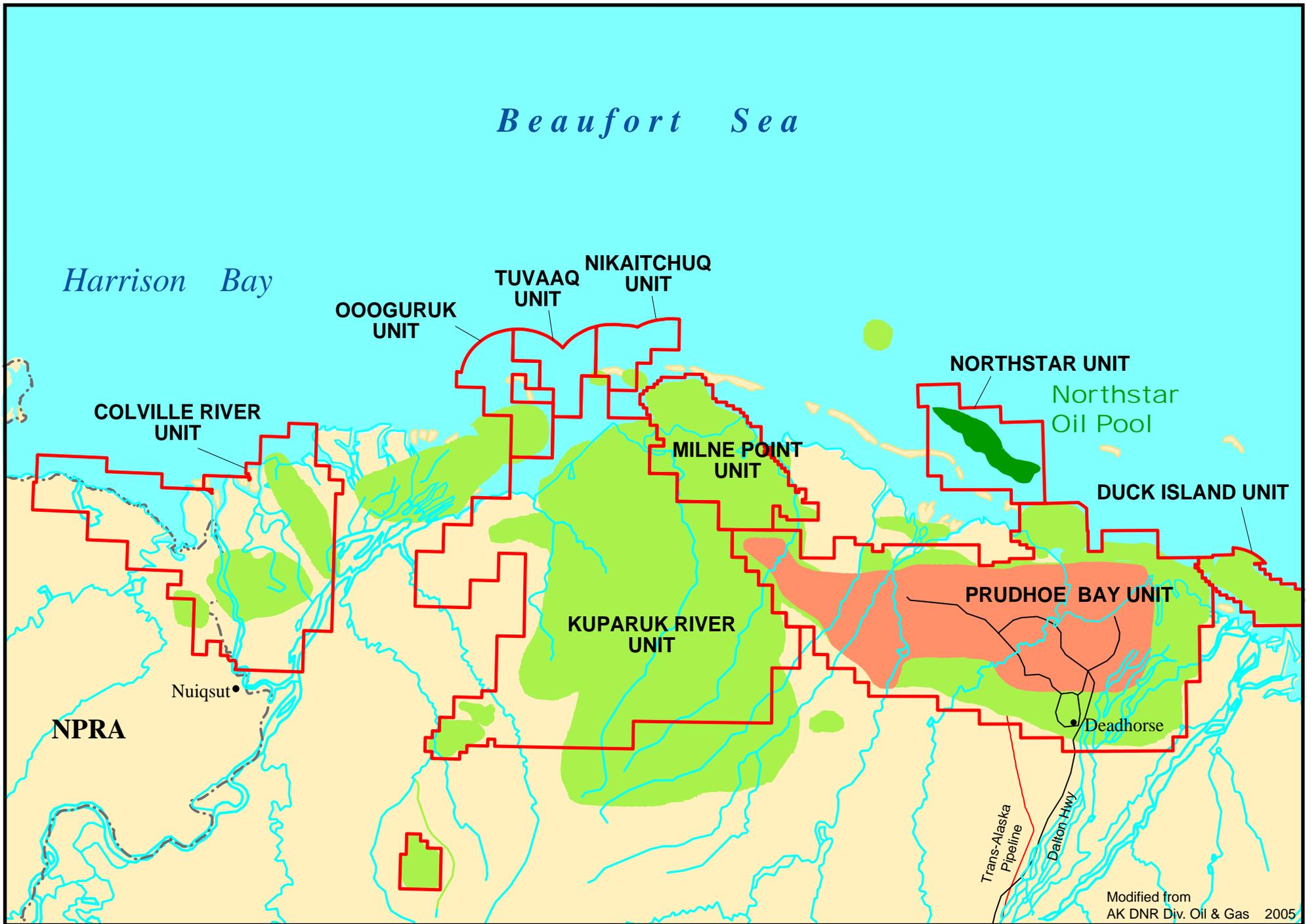
State of Alaska, Oil and Gas Conservation Commission

Injection History for: NORTHSTAR, UNDEFINED WDSP Pool

<u>Month</u>	<u>DaysInj</u>	<u>Liquid (BBL)</u>	<u>Gas (MCF)</u>	<u>Injecting Wells</u>
Jan 2004	31	195430	0	1
Feb 2004	29	130573	0	1
Mar 2004	31	224756	0	1
Apr 2004	30	196749	0	1
May 2004	31	197711	0	1
Jun 2004	30	245057	0	1
Jul 2004	33	266305	0	2
Aug 2004	32	212038	0	2
Sep 2004	30	312999	0	1
Oct 2004	31	361447	0	1
Nov 2004	30	324574	0	1
Dec 2004	31	362342	0	1
Year Total		3029981	0	
Pool Total		5,448,217	0	







Modified from
AK DNR Div. Oil & Gas 2005

North Slope, Alaska

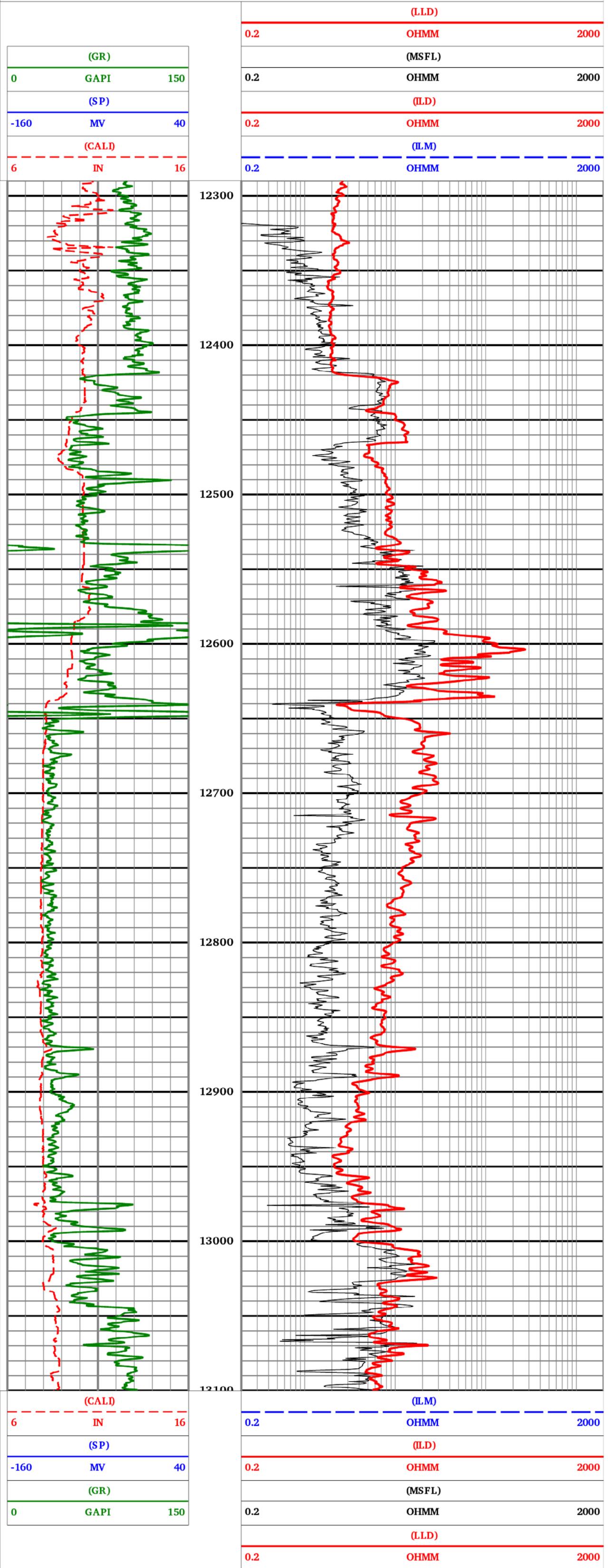
SHELL WESTERN E&P INC

BF-47 No. 1

API 50-029-20954-00-00

PTD 1830740

Format: Logrithmic Resistivity 3Track Vertical Scale: 2" per 100 feet Creation Date: Fri, Sep 16, 2005, 02:33:34 PM



Format: Logrithmic Resistivity 3Track Vertical Scale: 2" per 100 feet Creation Date: Fri, Sep 16, 2005, 02:33:34 PM

NORTHSTAR, NORTHSTAR OIL

Reference List

Alaska Oil and Gas Conservation Commission, 2001, Conservation Order No. 458, Northstar Field , Northstar Oil Pool; available on line at http://www.aogcc.alaska.gov/orders/co/co400_499/co458.htm

Alaska Oil and Gas Conservation Commission, 2005, Well and Production Information Database

BP, 2001, Public Information, Northstar Unit, Beaufort Sea, Alaska, in Alaska Oil and Gas Conservation Commission, 2001, Conservation Order No. 458 File, p. 119, 138.

Minerals Management Service, 2005, Annual Production Totals for the Federal OCS Northstar Project: available online at http://www.mms.gov/alaska/fo/annual_production.pdf

PI/Dwights, 2004, Beaufort Sea's Northstar Field Resumes Production; in PI/Dwights Drilling Wire, V. 50, No. 9, March 3, 2004

Northstar, Northstar Oil

Summary

Northstar Island is a five-acre,¹ man-made island located in the Beaufort Sea, 12 miles northwest of Prudhoe Bay and 6 miles offshore. Discovered by the Shell Island BF-47 No. 1 exploration well in 1984, construction of the development island began during the winter of 1999-2000, and the first production modules were installed during 2000.² Northstar is connected to onshore processing facilities by a pipeline that is buried 7 to 11 feet below the seafloor to avoid ice impacts.³ This pipeline has a wall thickness triple those of typical onshore North Slope pipelines, and three separate leak detection systems.⁴ Regular production began in November 2001, and climbed rapidly, regularly exceeding 50,000 barrels of oil per day ("BOPD") by June 2002 and 70,000 BOPD by June 2003.⁵ During mid-February, 2004, failure of a compressor motor shut down production from Northstar for two weeks, resulting a "loss" (delay) of about 1 million barrels of oil production.⁶ For all of 2004, the pool produced at an average rate of 68,700 BOPD.⁷ The Northstar development area spans the boundary between State of Alaska and Federal waters, and the Federal percentage Northstar production is allocated at 17.840%. During 2004, the Federal portion of Northstar oil production was 4,474,097 barrels for an average rate of 12,224 BOPD.⁸

Geology

The Northstar Oil Pool is defined as the accumulation of hydrocarbons common to and correlating with the interval between measured depths of 12,418 feet and 13,044 feet the Seal A-01 well. The reservoir interval consists of the Sag River, Shublik, and Ivishak Formations. The Sag River Formation is typically 100 feet thick in this area, and it was deposited as Triassic-aged transgressive marine sandstone, siltstone and shale. The sandstone mineralogy is mature: quartz with minor amounts of feldspar and authigenic clay. The primary cementing agents are calcite, silica and siderite. The Shublik Formation is also Triassic-aged, and is stratigraphically complex, being characterized by marine siltstone, shale, sandstone and phosphatic limestone. Within the Shublik Formation, reservoir quality rock is limited to a basal sandstone member, the Shublik D. The Ivishak Formation comprises a series of Permian and Triassic-aged delta-front sandstones and shales that grade upward to fluvial sandstone and medium to coarse-grained pebbly conglomerates. Within the pool, the Ivishak is about 325 feet thick, and it is more proximal, coarser grained, more deeply buried and cemented than at the Prudhoe Bay Field. Here, the Ivishak is primarily cemented with calcite, silica and siderite. The pool structure consists of a faulted anticline defined by three-way dip closure on west, south and east. Closure to the north is obtained through fault seal or structural dip. Faults within the pool have interpreted maximum vertical displacements of less than 200 feet, and they are not expected to significantly effect reservoir performance. The oil-water contact is placed at 11,100 feet true vertical depth subsea, based on core, RFT, MDT and well test data.⁹ Operator-provided estimates of hydrocarbons in place for the Northstar Oil Pool suggest an original oil in place of 247 million stock tank barrels, 7 billion cubic feet ("BCF") of gas in an inferred gas cap, and 480 BCF total gas including solution gas.¹⁰

SFD

September 16, 2005

¹ BP, 2003, North Slope Oil Fields, published as alaska_north_slope_oilfields[1].pdf available online through link on BP Web Site at <http://www.bp.com/sectiongenericarticle.do?categoryId=2011310&contentId=2016538>, p. 2

² PI/Dwights, 2004, Beaufort Sea's Northstar Field Resumes Production; in PI/Dwights Drilling Wire, V. 50, No. 9, March 3, 2004

³ PI/Dwights, 2004, Beaufort Sea's Northstar Field Resumes Production; in PI/Dwights Drilling Wire, V. 50, No. 9, March 3, 2004

⁴ BP, 2003, North Slope Oil Fields, published as [alaska_north_slope_oilfields\[1\].pdf](#) available online through link on BP Web Site at <http://www.bp.com/sectiongenericarticle.do?categoryId=2011310&contentId=2016538>, p. 2

⁵ Alaska Oil and Gas Conservation Commission, 2005, Well and Production Information Database

⁶ PI/Dwights, 2004, Beaufort Sea's Northstar Field Resumes Production; in PI/Dwights Drilling Wire, V. 50, No. 9, March 3, 2004

⁷ Alaska Oil and Gas Conservation Commission, 2005, Well and Production Information Database

⁸ Minerals Management Service, 2005, Annual Production Totals for the Federal OCS Northstar Project: available online at http://www.mms.gov/alaska/fo/annual_production.pdf

⁹ Alaska Oil and Gas Conservation Commission, 2001, Conservation Order No. 458, Northstar Field, Northstar Oil Pool ; http://www.state.ak.us/local/akpages/ADMIN/ogc/orders/co/co400_499/co458.htm

¹⁰ BP, 2001, Public Information, Northstar Unit, Beaufort Sea, Alaska, in Alaska Oil and Gas Conservation Commission, 2001, Conservation Order No. 458 File, p. 119.

NORTHSTAR FIELD

NORTHSTAR OIL POOL

Current Orders

Order No.	AA	Operator	Date	Description	Current
CO	551	0	11-Feb-05	Adoption of rules regulating the use of multiphase meters for well testing and allocation of production.	Y
CO	502	0 BP EXPLORATI	16-Oct-03	Rules regulating sustained casing pressures in development wells within the Northstar Field.	Y
CO	458 A	0 BP EXPLORATI	20-Nov-02	Request for a variance from the setting depth requirements of 20 AAC 25.265(a)(2) for SSSV, in order to allow a SSSV setting depth to 500' in Northstar Wells.	Y
AIO	23	0 BP EXPLORATI	09-Oct-01	Authorizes underground injection of fluids for enhanced recovery in Northstar Oil Pool	Y

NORTHSTAR FIELD NORTHSTAR OIL POOL

Obsolete Orders

Order No.	AA	Operator	Date	Description	Current
CO	458	0	BP EXPLORATI	09-Oct-01 Pool Rules for development of Northstar Oil Pool. Amended by CO 502.	N

NORTHSTAR FIELD UNDEFINED WDSP POOL

Current Orders

Order No.	AA	Operator	Date	Description	Current
CO	551	0	11-Feb-05	Adoption of rules regulating the use of multiphase meters for well testing and allocation of production.	Y

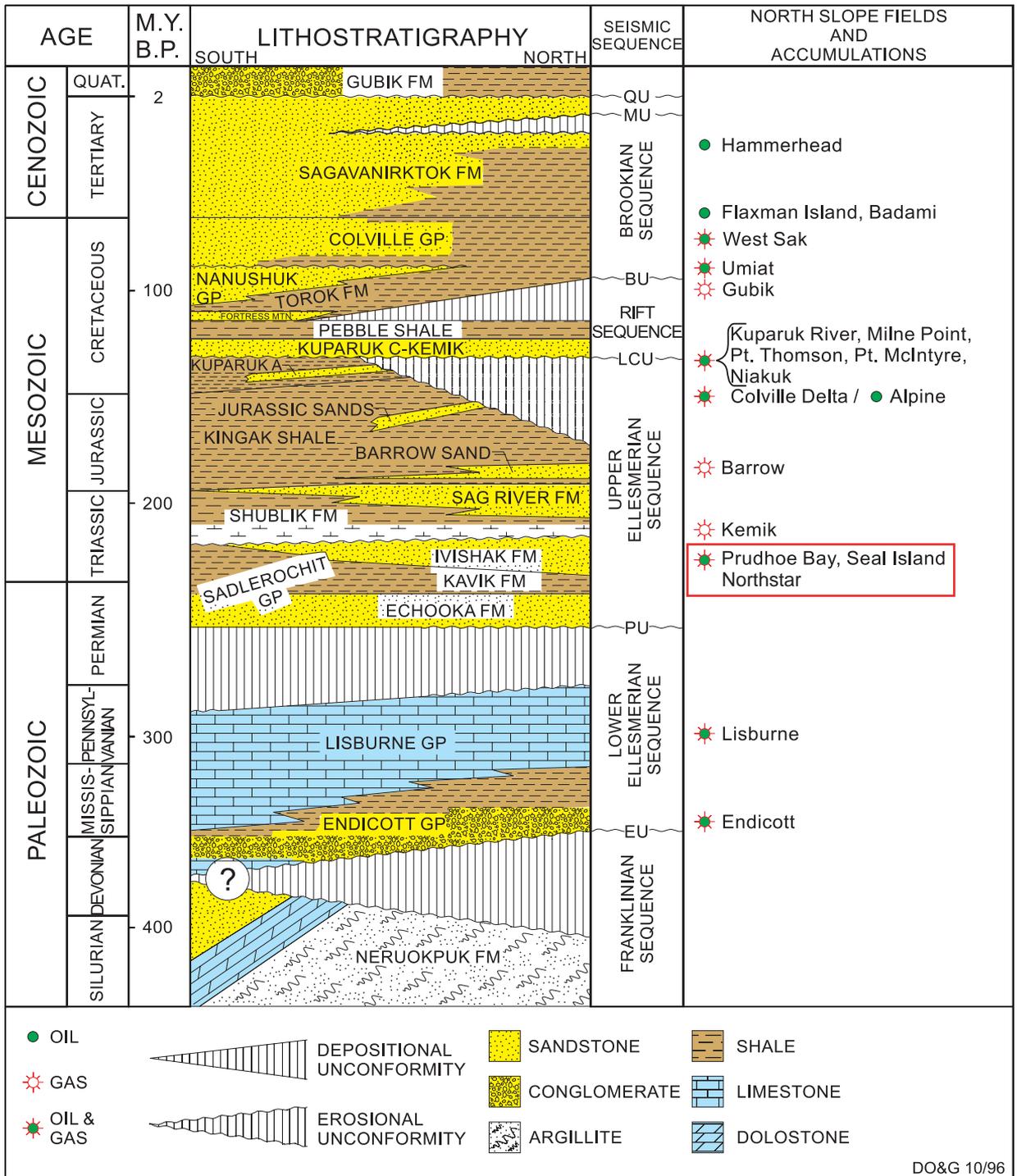
NORTHSTAR FIELD

No Pool

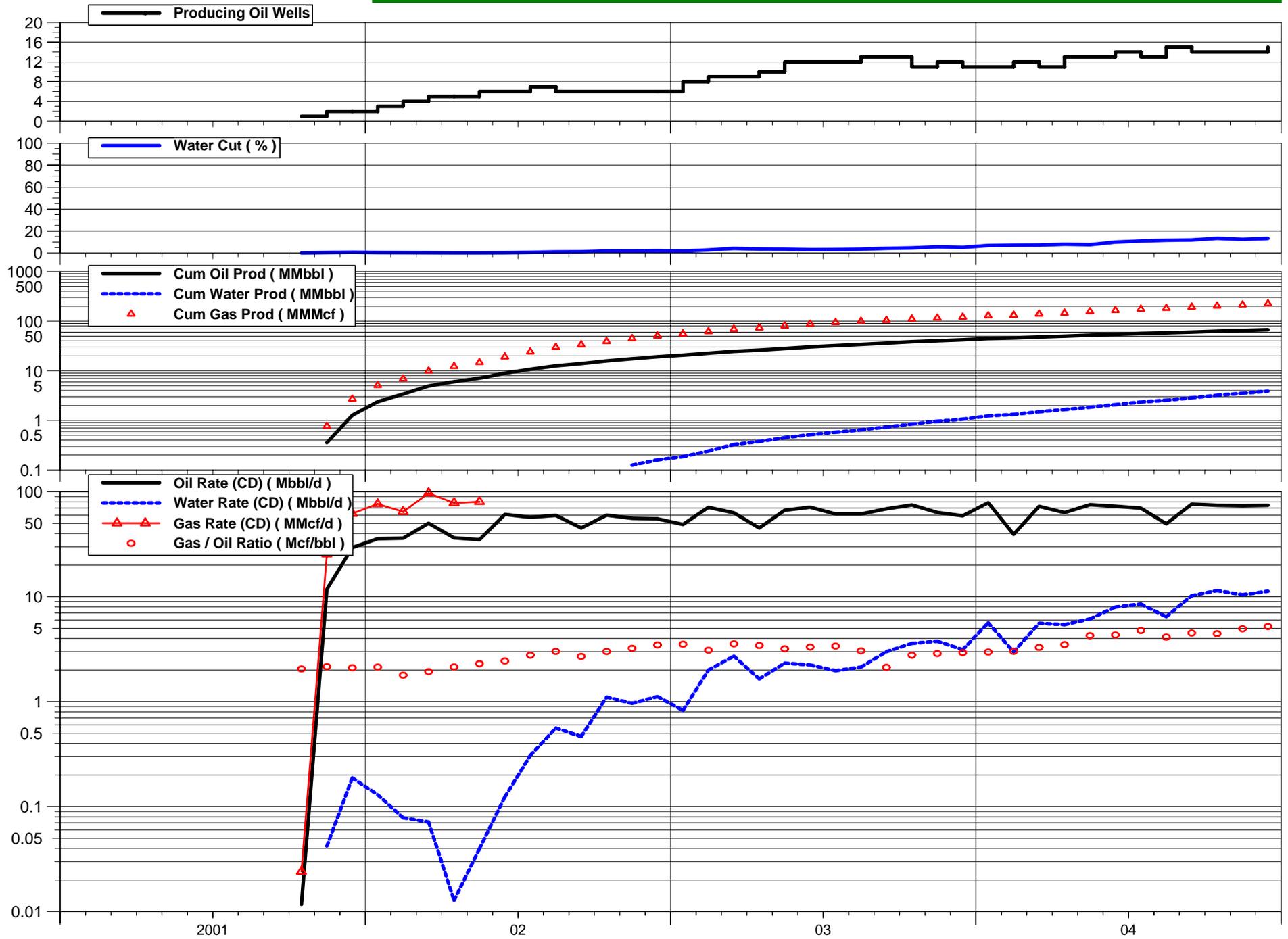
Spacing Exception Orders

Order No.	AA	Operator	Date	Description	Current	
CO	322	0	AMERADA HES	04-Nov-93	Spacing exception for Northstar #3 well.	Y

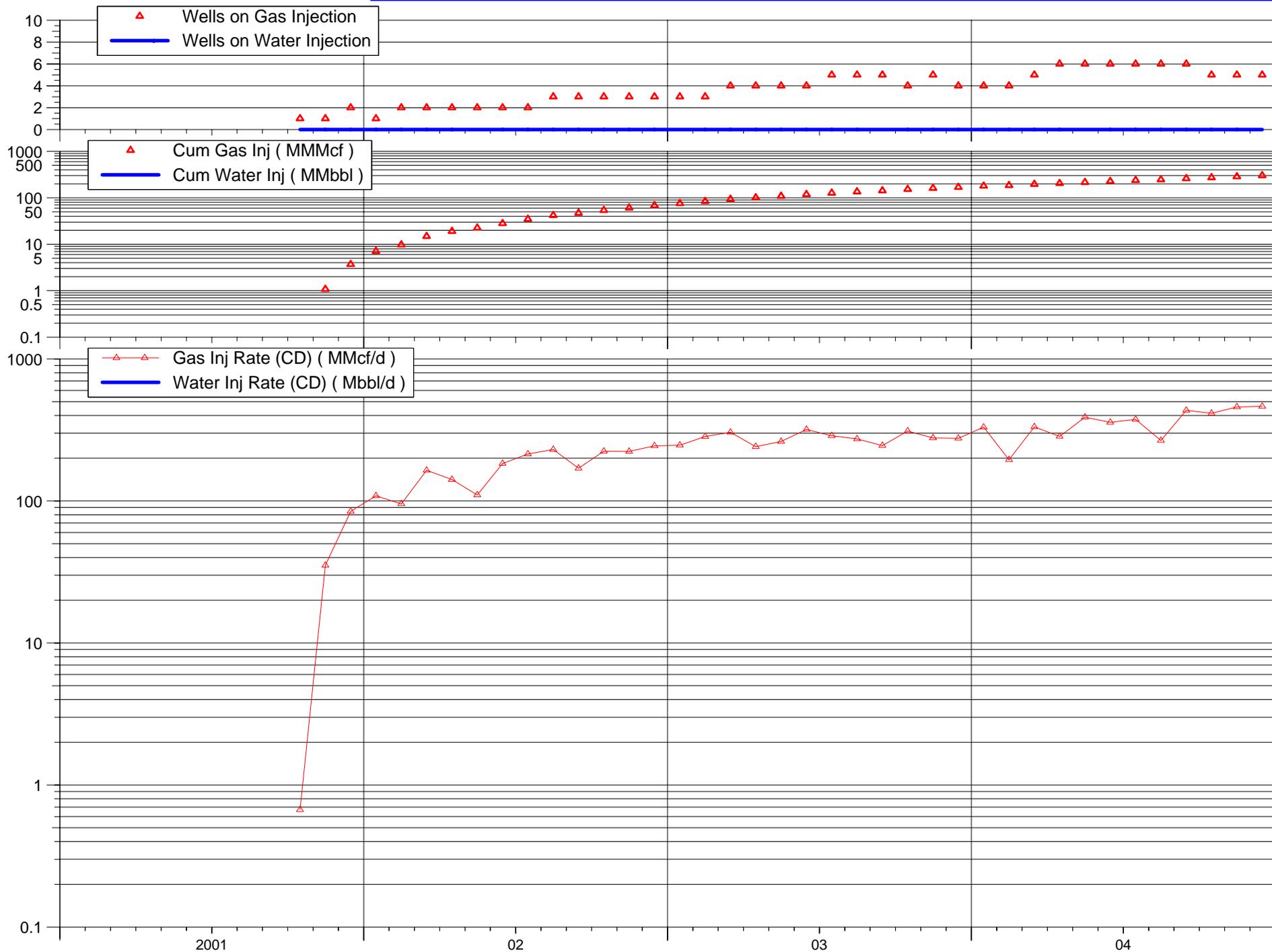
Generalized North Slope Stratigraphic Column displaying oil and gas reservoirs and associated accumulations.



NORTHSTAR FIELD, NORTHSTAR OIL POOL



NORTHSTAR FIELD, NORTHSTAR OIL POOL - EOR INJECTION



NORTHSTAR FIELD, UNDEFINED WASTE DISPOSAL POOL

