Waskada Unit No. 3

Waterflood Progress Report

January 1st – December 31st, 2013

PennWest

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Introduction:

The Waskada Unit No.3 pressure maintenance project commenced water injection into the Lower Amaranth designed and in accordance with Manitoba Energy and Mines Approval No. PM 58.

Please refer to Attachment 1 – Area Map.

PRESSURE MAINTENANCE: Governed by Board Order No. PM 58

Unit Information

UNITIZED ZONE: Lower Amaranth
Original Unit, May 1, 1984 Board Order – Voluntary
First Enlargement, September 1, 1984 Board Order - Voluntary
Second Enlargement, August 1, 1985 Board Order – Voluntary
Third Enlargement, July 1, 1986 Board Order – Voluntary
Fourth Enlargement, November 1, 1986 - Voluntary

POOL: Waskada Lower Amaranth A (03 29A)

This report documents the performance of the Waskada Unit No.3 pressure maintenance project for the period of January 1 to December 31, 2013. The Unit had 56 active producers and no active injectors at the end of 2013. There were 21 new drills in 2013.

Please refer to Attachment 1A – Area Map of New Drills

Unit No. 3 is part of the main Waskada field. The Waskada field is situated on the northeast rim of the Williston Basin in southern Manitoba. It comprises a large portion of Township 1 and 2, Ranges 25 and 26 W1.

Geology

The Waskada Fields produce light density crude (approximately 36^{o} API), predominantly from the Lower Amaranth formation. This is an interlaminated, shallow marine to subtidal succession of sandstones, siltones, and shale progressively onlaps the Mississippian unconformity surface from basin center, up dip to the north and eastern basin limits in Saskatchewan and Manitoba. The fine grained reservoir rock has a complex reservoir characterization with 13 to 16 % porosity and permeability on the order of 0.5 to15 md. The Lower Amaranth, the oldest Mesozoic unit, is a clastic red bed sequence lying directly on the Paleozoic erosional surface. It consists of a series of dolomitic siltstones and sandstones interbedded with argillaceous siltstones and shales. The section is usually subdivided into a lower sandy unit and an overlying shale unit.

The lower sequence is the oil production zone. The bulk of pay is found in the laminated sandstone/siltstone facies.

The Lower Amaranth has been classified into four general lithological types:

1. Interbedded shale/siltstone/sandstone by grain size, color and texture
2. Siltstone – This lithology occurs in distinct intervals up to two or three metres in thickness. It is generally light green in color and dolomitic.
3. Laminated sandstone – This occurs in distinct sandy intervals with a wide range of grain sizes and primary sedimentary structures.
4. Massive sandstone – This lithology occurs in thin intervals and usually associated with the laminated sandstones facies. Beds are usually light grey to reddish grey in color and coarse to medium – grained.

Discussion

Production and Injection Performance

Board Order No. PM 58 provided for pressure maintenance operations in Waskada Unit No.3. From the startup of injection in June 1984, injection rates fluctuated to the same degree in each injector, making it difficult to link any production responses to any injector. The Unit includes 15 injection wells, at the end of 2013 none are currently active, and 56 active producers. Injector 14-30 had 5 months of injection but this ceased at the end of December 2013. This is believed to be incorrectly assigned disposal water. We are investigating this with our Production Accounting team. 21 wells were drilled in 2013, all horizontal, and helping to maintain Unit production.

Please refer to Attachment 2 – A Summary of the Unit Well List and History with New Drills
Please refer to Attachment 3 – A Production and Injection plot of the Unit.
Please refer to Attachment 3A – A Production Plot of the New Drills
Please refer to Attachment 4 – A Summary of Unit Annual Volumes and Rates.
Please refer to Attachment 5 – A Cumulative Production and Injection plot of the Unit.

Voidage Replacement Ratio Calculation:

The Cumulative VRR from production start stabilized at 1 for many years and has declined in the last 3 years to approximately 0.5. The Cumulative VRR from injection start stabilized at approximately 1.2 dropping in the last 3 years to 0.6. The decline in both Cumulative VRR's in the last 3 years is coincident with essentially no injection from 2007 onwards and the startup of new producers from 2010 to 2013. Currently there are no active injector in this Unit and PennWest has no plans to reactivate at this time any of the old injectors.

Please refer to Attachment 6 – A Unit Voidage Replacement Ratio Plot.
Please refer to Attachment 7 – Individual Injection Well Performance Plots (15).

Pressure Surveys:

9 pressure surveys were conducted in 2013. Average pressures were in the range of 1600 to 5600 kPa. Initial reservoir pressure was approximately 8700 kPa with bubble point at about 4200 kPa.

Please refer to Attachment 1B - Area Map of 2013 Pressure Surveys with Values Posted.

Corrosion and Scale Prevention Program:

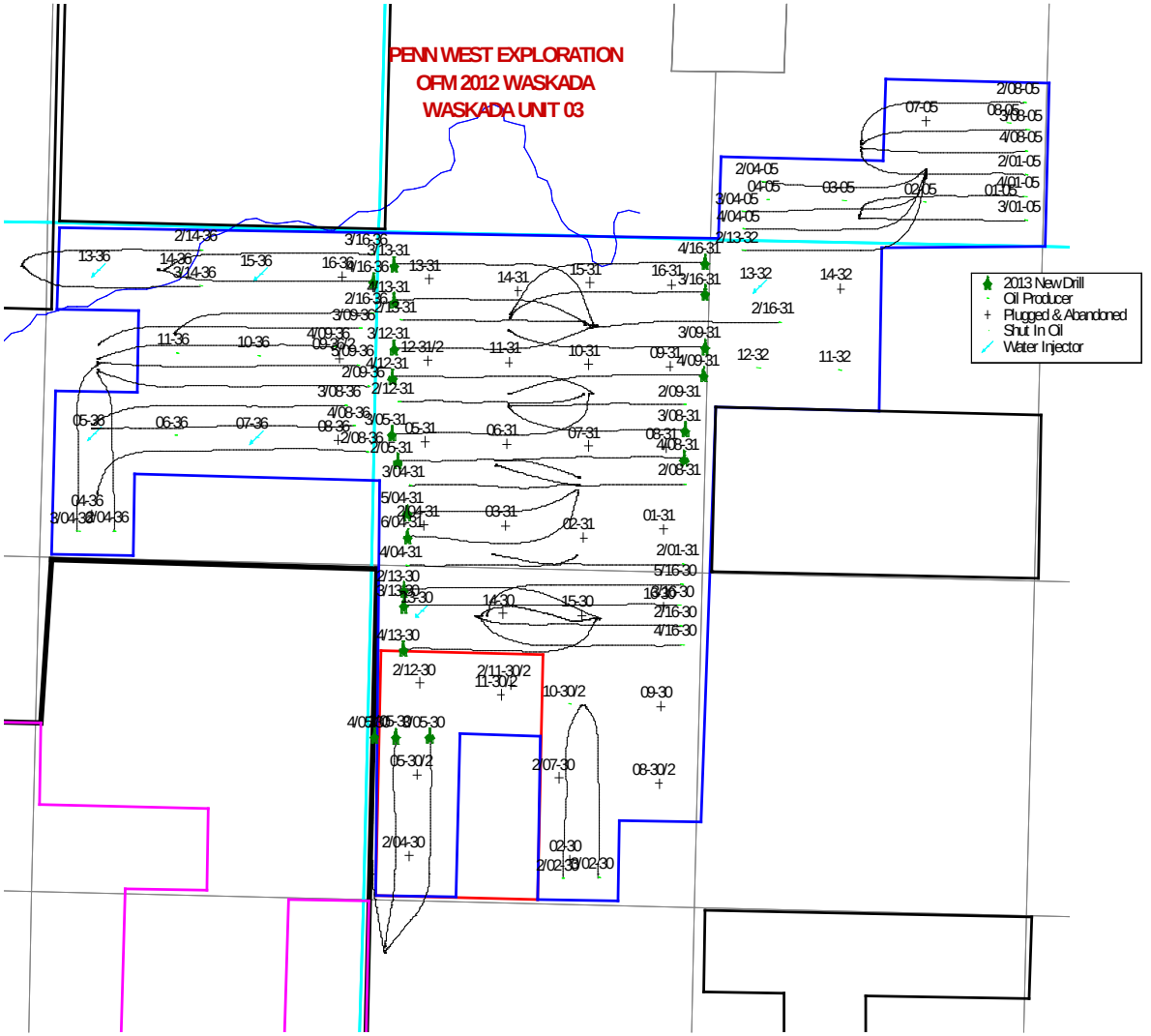
We currently inject ScalCor down all the new horizontal wells. PennWest will be installing cathodic protection on the wells. The new gathering system is Fibreglass and as such is not susceptible to corrosion.

Summary and Recommendations

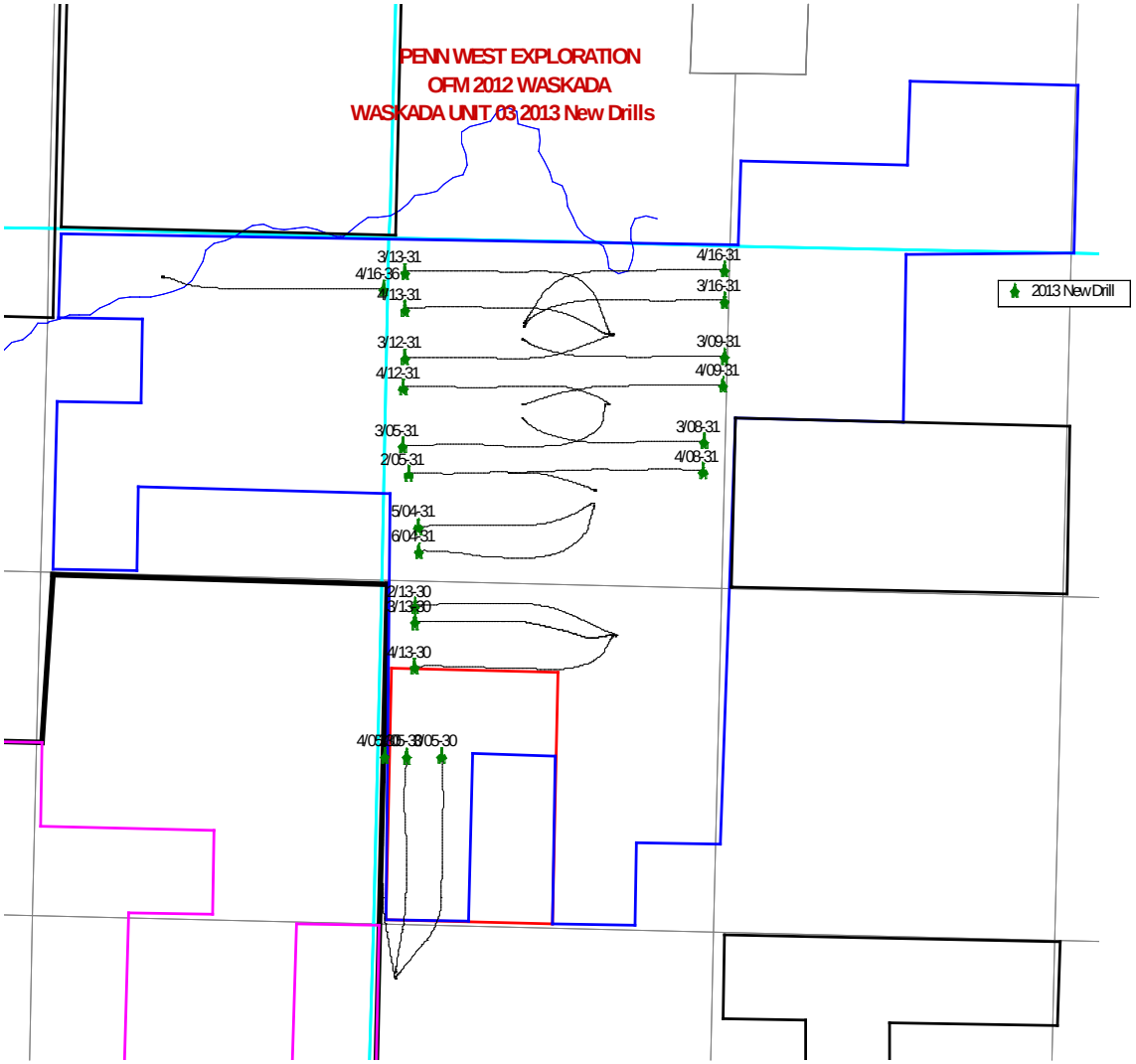
The behaviour of Waskada Unit 3 producers are indicated by good initial oil productivity, rapidly declining to low rates, with almost no discernible water flood response. It is also believed that fracture stimulation treatments, performed on these wells prior to initiation of water injection, "broke through" into the higher productivity Mississippian and that the majority of injected water to date has entered this zone. This is one of the major explanations for lack of waterflood response to date and the continued decline in oil productivities.

A horizontal producer and conversion of vertical producers to injector well pilot was contemplated for the Lower Amaranth targeting Unit 13 with results scalable to all Lower Amaranth Units. It is currently inactive pending evaluation of alternative schemes.

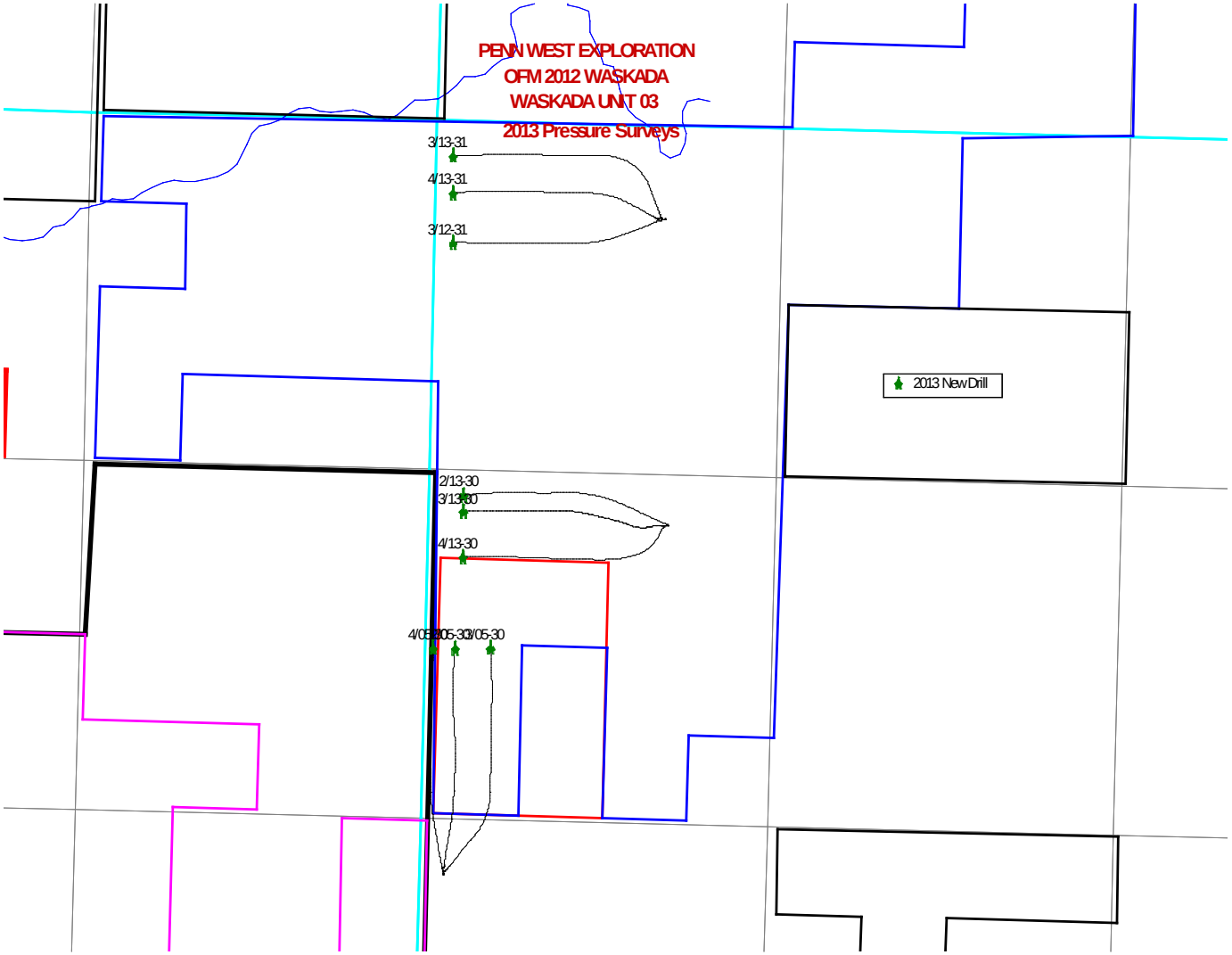
ATTACHMENT 1 – Unit Area Map

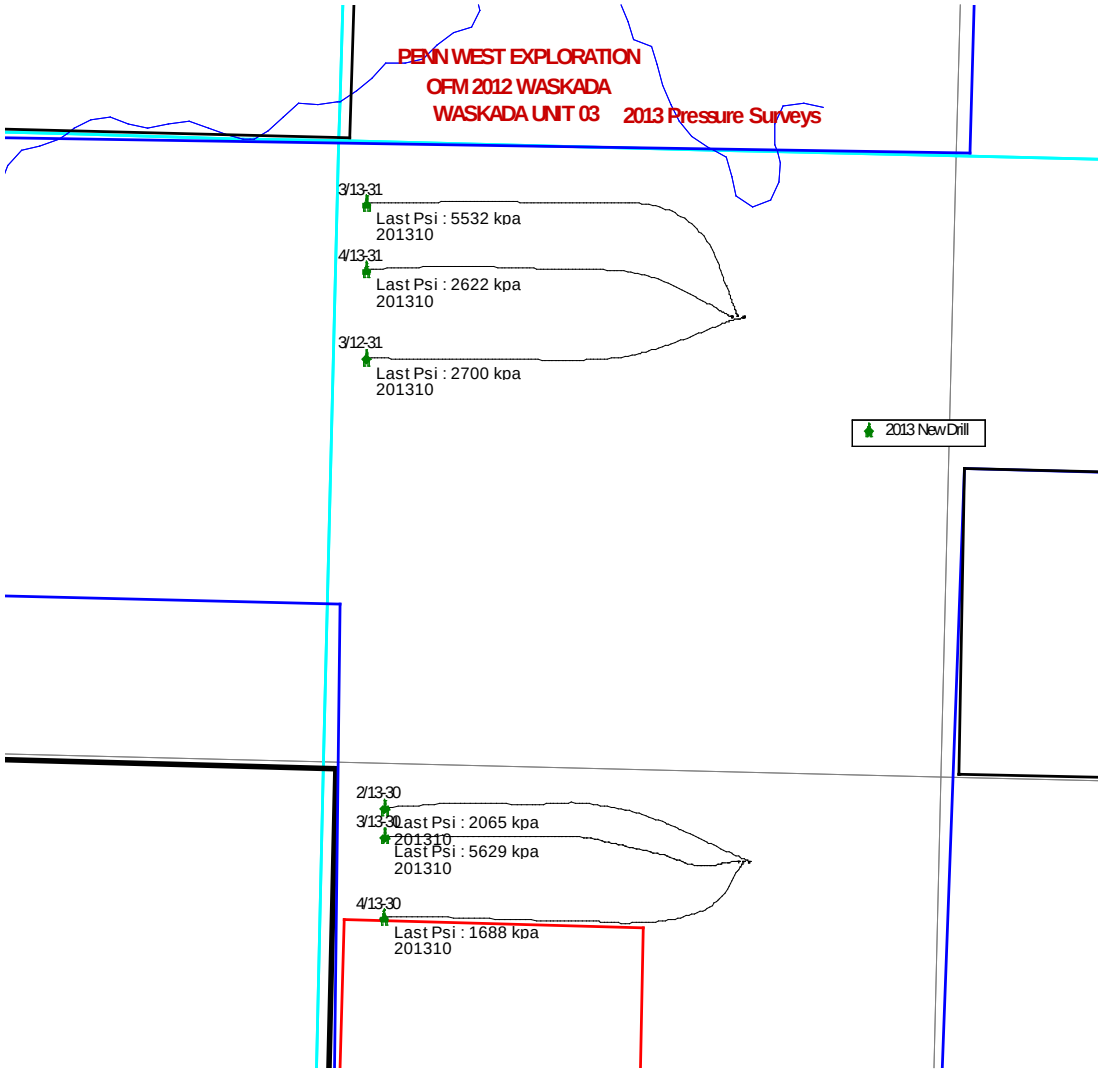


ATTACHMENT 1B – Area Map of New Drills

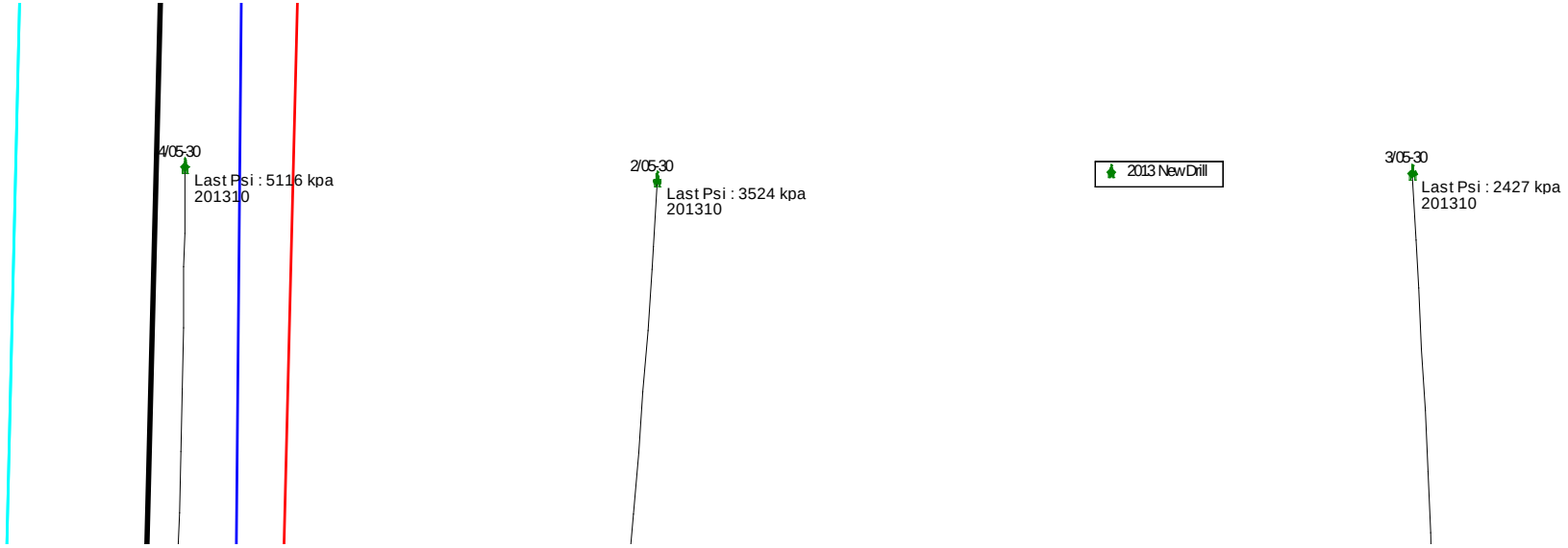


ATTACHMENT 1C – Area Maps of Unit2013 Pressure Surveys with Values Posted (3 Maps)




PERN WEST EXPLORATION
OFM 2012 WASKADA
WASKADA UNIT 03
2013 Pressure Surveys
3/13-31
Last Psi : 5532 kpa
201310
4/13-31
Last Psi : 2622 kpa
201310
3/12-31
Last Psi : 2700 kpa
201310
2013 New Drill
2/13-30
3/13-30
Last Psi : 2065 kpa
201310
Last Psi : 5629 kpa
201310
4/13-30
Last Psi : 1688 kpa
201310

PENN WEST EXPLORATION
OFM 2012 WASKADA
WASKADA UNIT 03
2013 Pressure Surveys

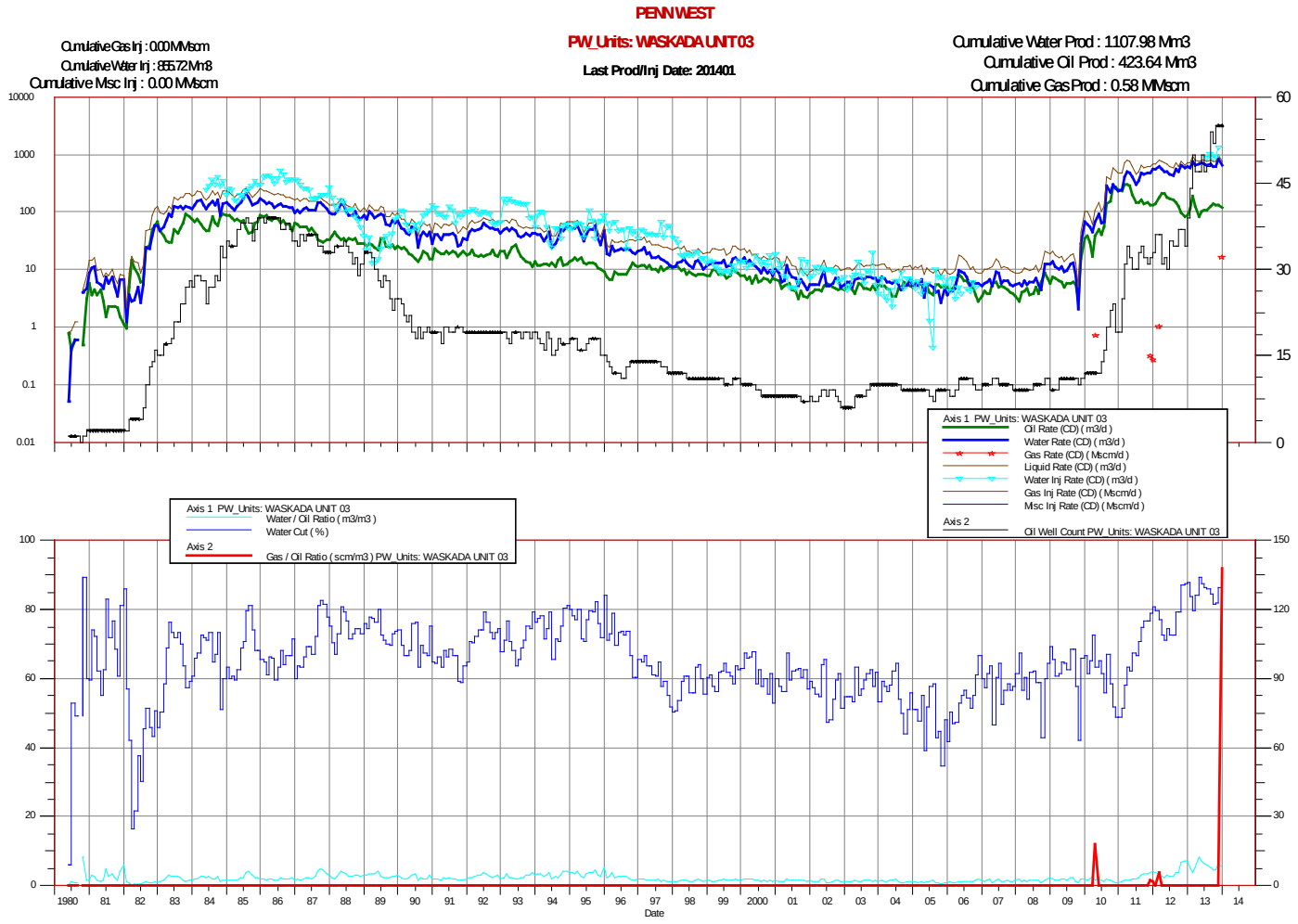


ATTACHMENT 2
Unit History: WASKADA UNIT 03

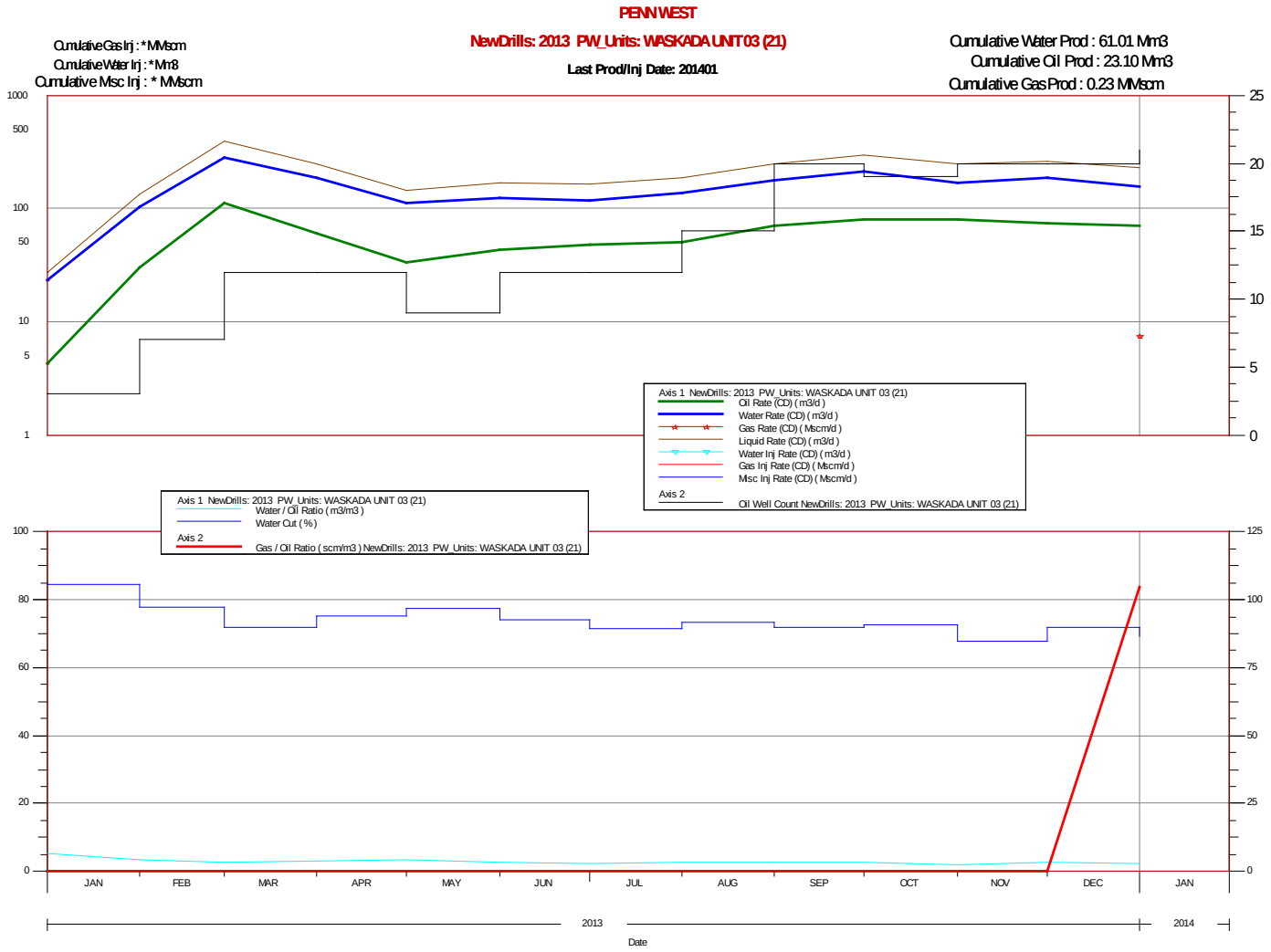
Well	Completion Date	OPERATOR	STATUS	New Drills	Kelly Bushing Elevation m	Total Depth m	First Production Date	Cum Oil Prod Mm3	Cum Water Prod Mm3	Last Production Date	First Injection Date	Cum Water Inj Mm3	Cum Gas Inj MMscm	Last Injection Date
02/05-30-001-25W1/0	2/23/2013	PENN_WEST	OIL	2013	473.5	1807	9/1/2013	1.27	2.4	1/1/2014		0	0	
03/05-30-001-25W1/0	2/28/2013	PENN_WEST	OIL	2013	473.6	1881	9/1/2013	1.36	2.61	1/1/2014		0	0	
04/05-30-001-25W1/0	3/6/2013	PENN_WEST	OIL	2013	473.7	1824	9/1/2013	1.72	1.09	1/1/2014		0	0	
02/13-30-001-25W1/0	2/23/2013	PENN_WEST	OIL	2013	475.2	1755	9/1/2013	0.34	1.99	1/1/2014		0	0	
03/13-30-001-25W1/0	3/5/2013	PENN_WEST	OIL	2013	475.2	1722	9/1/2013	0.85	3.38	1/1/2014		0	0	
04/13-30-001-25W1/0	2/27/2013	PENN_WEST	OIL	2013	475.3	1727	1/1/2014	0.32	0.67	1/1/2014		0	0	
05/04-31-001-25W1/0	2/1/2013	PENN_WEST	OIL	2013	473.9	1656	3/1/2013	2.55	3.09	1/1/2014		0	0	
06/04-31-001-25W1/0	1/26/2013	PENN_WEST	OIL	2013	474	1725	3/1/2013	1.33	4.82	1/1/2014		0	0	
02/05-31-001-25W1/0	2/6/2013	PENN_WEST	OIL	2013	474.1	1695	3/1/2013	1.69	3.46	1/1/2014		0	0	
03/05-31-001-25W1/0	2/18/2013	PENN_WEST	OIL	2013	474.5	1812	3/1/2013	1.43	3.28	1/1/2014		0	0	
03/08-31-001-25W1/0	11/29/2012	PENN_WEST	OIL	2013	473.1	1680	1/1/2013	0.44	2.5	1/1/2014		0	0	
04/08-31-001-25W1/0	12/8/2012	PENN_WEST	OIL	2013	474.9	1702	1/1/2013	0.88	7.5	1/1/2014		0	0	
03/09-31-001-25W1/0	12/16/2012	PENN_WEST	OIL	2013	475.4	1771	2/1/2013	1.18	3.28	1/1/2014		0	0	
04/09-31-001-25W1/0	12/6/2012	PENN_WEST	OIL	2013	473.3	1750	1/1/2013	1.2	4.18	1/1/2014		0	0	
03/12-31-001-25W1/0	2/19/2013	PENN_WEST	OIL	2013	476.5	1805	8/1/2013	0.03	1.46	1/1/2014		0	0	
04/12-31-001-25W1/0	2/11/2013	PENN_WEST	OIL	2013	474.5	1786	3/1/2013	0.56	1.49	1/1/2014		0	0	
03/13-31-001-25W1/0	2/25/2013	PENN_WEST	OIL	2013	475.1	1899	8/1/2013	0.5	0.8	1/1/2014		0	0	
04/13-31-001-25W1/0	3/3/2013	PENN_WEST	OIL	2013	476.4	1782	8/1/2013	0.32	0.92	1/1/2014		0	0	
03/16-31-001-25W1/0	1/5/2013	PENN_WEST	OIL	2013	475.4	1779	2/1/2013	1.93	5.52	1/1/2014		0	0	
04/16-31-001-25W1/0	1/8/2013	PENN_WEST	OIL	2013	475.4	1849	2/1/2013	1.01	5.43	1/1/2014		0	0	
04/16-36-001-26W1/0	1/10/2013	PENN_WEST	OIL	2013	469.5	1831	2/1/2013	2.18	1.14	1/1/2014		0	0	
00/02-30-001-25W1/0	8/19/1982	PENN_WEST	ABD-OIL	<N/A>	472.8	955	10/1/1982	1.32	2.66	7/1/1989		0	0	
02/02-30-001-25W1/0	10/29/2011	PENN_WEST	OIL	<N/A>	475.8	1648	12/1/2011	3.93	10.9	1/1/2014		0	0	
03/02-30-001-25W1/0	10/23/2011	PENN_WEST	OIL	<N/A>	475.8	1643	1/1/2012	0.05	11.71	11/1/2012		0	0	
02/04-30-001-25W1/0	9/19/1982	OMEGA_HYDR(	ABD-OIL	<N/A>	473.5	950	12/1/1982	6.96	34.07	6/1/1990		0	0	
00/05-30-001-25W1/2	3/21/1967	PENN_WEST	ABD-OIL	<N/A>	472.4	973.8	12/1/1980	0.57	1.3	6/1/1984	8/1/1984	97.11	0	10/1/1998
02/07-30-001-25W1/0	12/7/1985	PENN_WEST	ABD-WINJ	<N/A>	472.6	947	12/1/1985	4.18	2.45	11/1/1987	12/1/1987	20.48	0	7/1/2003
00/08-30-001-25W1/2	8/1/1982	PENN_WEST	ABD-OIL	<N/A>	473.2	952	9/1/1983	4.57	14.85	6/1/1996		0	0	
00/09-30-001-25W1/0	12/9/1981	PENN_WEST	ABD-OIL	<N/A>	473	944	3/1/1982	1.14	1.52	4/1/1989		0	0	
00/10-30-001-25W1/2	8/5/1983	PENN_WEST	CMG-OIL	<N/A>	475.7	940	5/1/1989	7.45	39.21	4/1/2013		0	0	
00/11-30-001-25W1/2	1/3/1967	PENN_WEST	ABD-OIL	<N/A>	472.4	960.1	6/1/1980	2.18	5.44	11/1/1984		0	0	
02/11-30-001-25W1/2	8/26/1985	PENN_WEST	ABD-OIL	<N/A>	472.2	937	11/1/1985	5.78	37.16	10/1/1997		0	0	
02/12-30-001-25W1/0	11/4/1983	PENN_WEST	ABD-OIL	<N/A>	472.1	925	12/1/1983	8.75	10.7	7/1/1994		0	0	
00/13-30-001-25W1/0	7/17/1982	PENN_WEST	WTR-INJ	<N/A>	471.9	954	8/1/1982	0.77	1.35	5/1/1984	6/1/1984	62.2	0	10/1/2006
00/14-30-001-25W1/0	7/21/1982	PENN_WEST	ABD-OIL	<N/A>	474.7	952.3	9/1/1982	2.88	6.79	8/1/1990	8/1/2013	154.08	0	12/1/2013
00/15-30-001-25W1/0	7/29/1982	PENN_WEST	ABD-WINJ	<N/A>	474.7	953	9/1/1982	1.77	7.39	5/1/1984	6/1/1984	86.52	0	11/1/2006
00/16-30-001-25W1/0	7/25/1982	PENN_WEST	ABD-OIL	<N/A>	473.4	956.7	9/1/1982	3.05	3.62	12/1/1991		0	0	
02/16-30-001-25W1/0	3/6/2012	PENN_WEST	OIL	<N/A>	475.1	1762	10/1/2012	0.96	24.06	1/1/2014		0	0	
03/16-30-001-25W1/0	7/21/2012	PENN_WEST	OIL	<N/A>	474.3	1731	10/1/2012	0.2	30.6	1/1/2014		0	0	
04/16-30-001-25W1/0	7/16/2012	PENN_WEST	OIL	<N/A>	474.3	1771	10/1/2012	1.13	15.36	1/1/2014		0	0	
05/16-30-001-25W1/0	7/26/2012	PENN_WEST	OIL	<N/A>	474.3	1758	11/1/2012	0.26	12.75	1/1/2014		0	0	
00/01-31-001-25W1/0	6/14/1983	OMEGA_HYDR(	ABD-OIL	<N/A>	476	951	7/1/1983	5.06	33.88	9/1/1990		0	0	
02/01-31-001-25W1/0	6/20/2010	PENN_WEST	OIL	<N/A>	475.1	1717	7/1/2010	2.96	38.76	1/1/2014		0	0	
00/02-31-001-25W1/0	7/7/1982	OMEGA_HYDR(	ABD-OIL	<N/A>	473.1	953	10/1/1982	3.54	18.48	10/1/1990		0	0	
00/03-31-001-25W1/0	10/8/1981	OMEGA_HYDR(	ABD-OIL	<N/A>	472.9	950	3/1/1982	2.83	2.33	8/1/1990		0	0	
02/04-31-001-25W1/0	7/11/1982	PENN_WEST	ABD-OIL	<N/A>	471.8	948	8/1/1982	1.96	2.8	10/1/1989		0	0	
03/04-31-001-25W1/0	9/15/2009	PENN_WEST	OIL	<N/A>	474.3	1658	12/1/2009	11.69	9.72	1/1/2014		0	0	
04/04-31-001-25W1/0	9/20/2009	PENN_WEST	OIL	<N/A>	473.6	1652	12/1/2009	1.72	12.29	1/1/2014		0	0	
00/05-31-001-25W1/0	2/22/1983	PENN_WEST	ABD-OIL	<N/A>	471.4	950	6/1/1983	0.78	0.32	5/1/1984	6/1/1984	57.65	0	2/1/1998
00/06-31-001-25W1/0	7/14/1982	PENN_WEST	ABD-OIL	<N/A>	474.4	950	9/1/1982	3.2	13.52	8/1/1990		0	0	
00/07-31-001-25W1/0	6/10/1983	OMEGA_HYDR(	ABD-OIL	<N/A>	473.5	952.8	7/1/1983	1.36	1.28	5/1/1984	6/1/1984	59.2	0	4/1/1992
00/08-31-001-25W1/0	6/17/1983	OMEGA_HYDR(	ABD-OIL	<N/A>	476.1	948	7/1/1983	5.57	22.6	7/1/1990		0	0	
02/08-31-001-25W1/0	7/4/2010	PENN_WEST	OIL	<N/A>	474.3	1710	8/1/2010	5.56	30.83	1/1/2014		0	0	
00/09-31-001-25W1/0	8/19/1984	OMEGA_HYDR(	ABD-OIL	<N/A>	475.1	945	9/1/1984	9.68	29.08	7/1/1990		0	0	

00/09-31-001-25W1/0	8/19/1984	OMEGA_HYDR(	ABD-OIL	<N/A>	475.1	945	9/1/1984	9.68	29.08	7/1/1990		0	0	
02/09-31-001-25W1/0	7/10/2010	PENN_WEST	OIL	<N/A>	473.6	1660	8/1/2010	5.26	19.72	1/1/2014		0	0	
00/10-31-001-25W1/0	8/19/1984	PENN_WEST	ABD-OIL	<N/A>	475.2	940	11/1/1984	0.57	1.95	10/1/1990		0	0	
00/11-31-001-25W1/0	9/26/1982	OMEGA_HYDR(	ABD-OIL	<N/A>	473.1	944	12/1/1982	2.39	4.84	6/1/1990		0	0	
00/12-31-001-25W1/2	6/24/1983	PENN_WEST	ABD-OIL	<N/A>	471.5	949.1	7/1/1984	4.26	16.75	9/1/1991		0	0	
02/12-31-001-25W1/0	7/24/2010	PENN_WEST	OIL	<N/A>	474.9	1713	9/1/2010	6.82	21.15	1/1/2014		0	0	
00/13-31-001-25W1/0	3/5/1983	PENN_WEST	ABD-OIL	<N/A>	472.1	951	3/1/1983	0.51	0.57	8/1/1985	10/1/1985	41.89	0	2/1/1998
02/13-31-001-25W1/0	8/23/2010	PENN_WEST	OIL	<N/A>	476.2	1708	10/1/2010	1.93	11.77	1/1/2014		0	0	
00/14-31-001-25W1/0	8/10/1983	OMEGA_HYDR(	ABD-OIL	<N/A>	474.2	936.8	9/1/1983	0.83	3.05	5/1/1990		0	0	
00/15-31-001-25W1/0	8/23/1984	PENN_WEST	ABD-WINJ	<N/A>	474	940	11/1/1984	1.03	1.66	9/1/1985	1/1/1986	20.13	0	2/1/1998
00/16-31-001-25W1/0	8/24/1984	PENN_WEST	ABD-OIL	<N/A>	475.6	940	10/1/1984	1.74	2.8	5/1/1989		0	0	
02/16-31-001-25W1/0	7/17/2010	PENN_WEST	OIL	<N/A>	474.8	1719	9/1/2010	4.74	16.03	1/1/2014		0	0	
00/11-32-001-25W1/0	8/28/1984	PENN_WEST	OIL	<N/A>	475	930	9/1/1984	7.78	21.56	6/1/2013		0	0	
00/12-32-001-25W1/0	8/21/1984	PENN_WEST	OIL	<N/A>	475.2	941	11/1/1984	5.62	2.94	6/1/2013		0	0	
00/13-32-001-25W1/0	8/31/1984	PENN_WEST	WTR-INJ	<N/A>	475	936	11/1/1984	0.7	0.7	9/1/1985	10/1/1985	60.1	0	4/1/1999
02/13-32-001-25W1/0	11/23/2011	PENN_WEST	OIL	<N/A>	476.1	1820	2/1/2012	5.66	19.61	1/1/2014		0	0	
00/14-32-001-25W1/0	9/6/1982	PENN_WEST	ABD-OIL	<N/A>	474.4	947	10/1/1982	4.59	13.37	9/1/1997		0	0	
00/04-36-001-26W1/0	1/9/1986	PENN_WEST	ABD-OIL	<N/A>	472.4	972	2/1/1986	2.43	0.7	2/1/1996		0	0	
02/04-36-001-26W1/0	7/5/2010	PENN_WEST	OIL	<N/A>	469.9	1609	9/1/2010	9.44	4.05	1/1/2014		0	0	
03/04-36-001-26W1/0	1/7/2011	PENN_WEST	OIL	<N/A>	470.1	1635	3/1/2011	7.33	3.04	1/1/2014		0	0	
00/05-36-001-26W1/0	9/7/1983	PENN_WEST	WTR-INJ	<N/A>	471.8	947	10/1/1983	3.81	0.52	11/1/1986	12/1/1986	22.66	0	6/1/2005
00/06-36-001-26W1/0	6/4/1985	PENN_WEST	OIL	<N/A>	471.8	992	7/1/1985	5.58	1.47	7/1/2013		0	0	
00/07-36-001-26W1/0	11/29/1985	PENN_WEST	WTR-INJ	<N/A>	470.9	940	12/1/1985	0.84	0.14	10/1/1986	11/1/1986	51.99	0	5/1/2004
00/08-36-001-26W1/0	6/15/1984	PENN_WEST	ABD-OIL	<N/A>	472.4	950	7/1/1984	4.92	17.33	3/1/2003		0	0	
02/08-36-001-26W1/0	6/21/2010	PENN_WEST	OIL	<N/A>	472.7	2186	7/1/2010	7.81	7.87	1/1/2014		0	0	
03/08-36-001-26W1/0	1/21/2011	PENN_WEST	OIL	<N/A>	471.4	2026	3/1/2011	1.08	5.55	1/1/2014		0	0	
04/08-36-001-26W1/0	2/3/2011	PENN_WEST	OIL	<N/A>	471.4	2080	3/1/2011	0.75	4.56	1/1/2014		0	0	
00/09-36-001-26W1/2	11/4/1982	PENN_WEST	ABD-OIL	<N/A>	473.6	942.5	2/1/1984	6.64	31.12	11/1/1995		0	0	
02/09-36-001-26W1/0	7/10/2010	PENN_WEST	OIL	<N/A>	470	2127	9/1/2010	8.91	5.53	1/1/2014		0	0	
03/09-36-001-26W1/0	1/28/2011	PENN_WEST	OIL	<N/A>	470.2	2073	3/1/2011	2.79	4.52	1/1/2014		0	0	
04/09-36-001-26W1/0	1/20/2011	PENN_WEST	OIL	<N/A>	470	1953	3/1/2011	2.87	6.43	1/1/2014		0	0	
05/09-36-001-26W1/0	1/13/2011	PENN_WEST	OIL	<N/A>	470	2057	3/1/2011	3.45	3.92	1/1/2014		0	0	
00/10-36-001-26W1/0	6/20/1984	PENN_WEST	OIL	<N/A>	474.2	950	7/1/1984	6.74	1.14	3/1/2011		0	0	
00/11-36-001-26W1/0	8/29/1983	PENN_WEST	OIL	<N/A>	470.3	949	9/1/1983	7.08	1.42	11/1/2013		0	0	
00/13-36-001-26W1/0	9/30/1983	PENN_WEST	WTR-INJ	<N/A>	469.3	950	10/1/1983	2.6	0.45	9/1/1985	10/1/1985	33.78	0	11/1/2005
00/14-36-001-26W1/0	10/12/1983	PENN_WEST	OIL	<N/A>	468.3	955.1	11/1/1983	6.25	1.2	3/1/2012		0	0	
02/14-36-001-26W1/0	9/18/2010	PENN_WEST	OIL	<N/A>	471.4	1683	11/1/2010	10.24	3.15	1/1/2014		0	0	
03/14-36-001-26W1/0	9/23/2010	PENN_WEST	OIL	<N/A>	471.5	1676	10/1/2010	6.72	3.16	1/1/2014		0	0	
00/15-36-001-26W1/0	6/24/1984	PENN_WEST	WTR-INJ	<N/A>	473.4	950	7/1/1984	1.27	0.36	9/1/1985	10/1/1985	51.99	0	1/1/2006
00/16-36-001-26W1/0	7/15/1985	OMEGA_HYDR(	ABD-OIL	<N/A>	471.4	959	8/1/1985	0.61	0.51	1/1/1989		0	0	
02/16-36-001-26W1/0	2/2/2010	PENN_WEST	OIL	<N/A>	469.7	1769	5/1/2010	5.74	12.11	6/1/2013		0	0	
03/16-36-001-26W1/0	10/1/2010	PENN_WEST	OIL	<N/A>	469.9	1813	11/1/2010	9.3	3.92	1/1/2014		0	0	
00/01-05-002-25W1/0	11/9/1984	PENN_WEST	SUS-OIL	<N/A>	475.2	935	1/1/1985	7.13	14.93	10/1/2009		0	0	
02/01-05-002-25W1/0	12/18/2010	PENN_WEST	OIL	<N/A>	475.1	1613	2/1/2011	0.29	13.41	6/1/2012		0	0	
03/01-05-002-25W1/0	12/7/2010	PENN_WEST	OIL	<N/A>	476.4	1602	2/1/2011	10.4	47.25	1/1/2014		0	0	
04/01-05-002-25W1/0	11/29/2010	PENN_WEST	OIL	<N/A>	476.4	1616	2/1/2011	7.58	27.88	1/1/2014		0	0	
00/02-05-002-25W1/0	11/12/1984	PENN_WEST	OIL	<N/A>	476.1	935	1/1/1985	9.14	1.7	9/1/2011		0	0	
00/03-05-002-25W1/0	11/14/1982	PENN_WEST	OIL	<N/A>	475.3	917.2	11/1/1982	5.97	2.22	1/1/2012		0	0	
00/04-05-002-25W1/0	9/26/1985	PENN_WEST	OIL	<N/A>	475	925	10/1/1985	7.48	13.82	1/1/2012		0	0	
02/04-05-002-25W1/0	12/8/2011	PENN_WEST	OIL	<N/A>	476.9	1619	2/1/2012	4.62	5.76	1/1/2014		0	0	
03/04-05-002-25W1/0	12/3/2011	PENN_WEST	OIL	<N/A>	476.1	1751	2/1/2012	6	21.56	1/1/2014		0	0	
04/04-05-002-25W1/0	11/27/2011	PENN_WEST	OIL	<N/A>	476.1	1750	2/1/2012	5.09	16.91	1/1/2014		0	0	
00/07-05-002-25W1/0	11/5/1984	PENN_WEST	ABD-WINJ	<N/A>	475.7	932	12/1/1984	1.19	1.19	7/1/1986	7/1/1986	35.95	0	3/1/1994
00/08-05-002-25W1/0	11/16/1984	PENN_WEST	OIL	<N/A>	477.3	934	12/1/1984	19.19	3.26	1/1/2014		0	0	
02/08-05-002-25W1/0	12/2/2010	PENN_WEST	OIL	<N/A>	474.9	1641	2/1/2011	6.05	39.54	1/1/2014		0	0	
03/08-05-002-25W1/0	12/7/2010	PENN_WEST	OIL	<N/A>	475	1597	2/1/2011	6.7	28.32	1/1/2014		0	0	
04/08-05-002-25W1/0	12/12/2010	PENN_WEST	OIL	<N/A>	475	1597	2/1/2011	10.25	36.79	1/1/2014		0	0	

ATTACHMENT 3 – Unit Production and Injection Plot



ATTACHMENT 3A – 2013 New Drills Production Plot

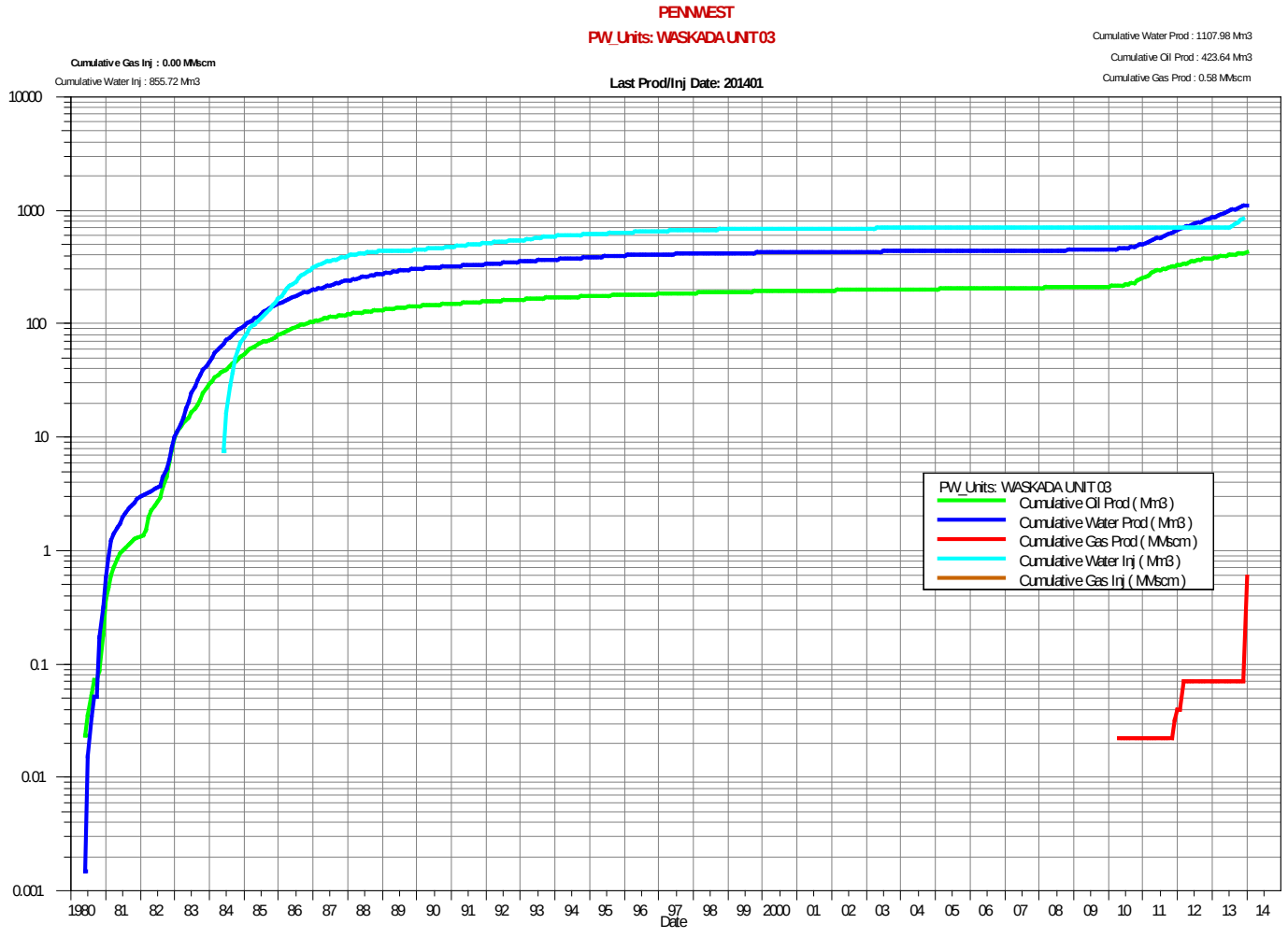


ATTACHMENT 4

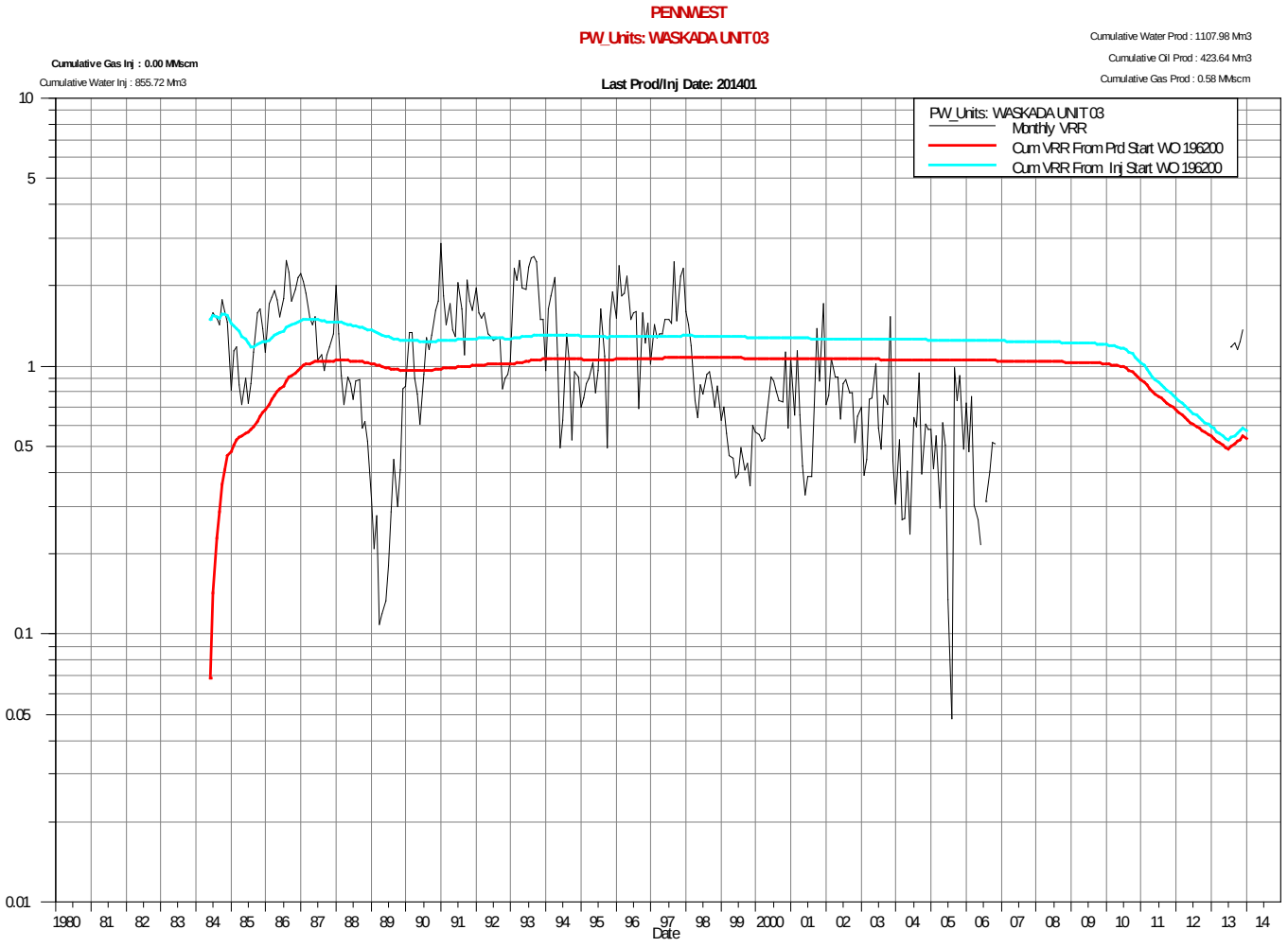
PW_Units: WASKADA UNIT 03 Rates and Volume History

Date	Annual Oil Prod m3	Annual Oil Rate m3/d	Annual Water Prod m3	Annual Water Rate m3/d	Annual Water Inj m3	Annual Water Inj Rate m3/d	Annual Gas Inj Mscm	Annual Gas Inj Rate Mscm/d	
1/1/1981	1123.6	3.08	2500	6.85					
1/1/1982	6378.6	17.48	5322.2	14.58					
1/1/1983	19166.6	52.51	34598.4	94.79					
1/1/1984	24582.2	67.16	49131	134.24	68953	188.4	0	0	
1/1/1985	24638.1	67.5	53585.2	146.81	85890	235.32	0	0	
1/1/1986	26265.4	71.96	49174.9	134.73	143288	392.57	0	0	
1/1/1987	17020.4	46.63	42395.4	116.15	88310	241.95	0	0	
1/1/1988	12534.6	34.25	36320	99.23	46449	126.91	0	0	
1/1/1989	9890.2	27.1	29043.1	79.57	11519	31.56	0	0	
1/1/1990	7042.6	19.29	16842.4	46.14	27898	76.43	0	0	
1/1/1991	7076	19.39	13139.4	36	35537	97.36	0	0	
1/1/1992	6720.2	18.36	18365.4	50.18	33244	90.83	0	0	
1/1/1993	6603.2	18.09	16060.7	44	48126	131.85	0	0	
1/1/1994	4626.4	12.68	14488.9	39.7	21512	58.94	0	0	
1/1/1995	4850.9	13.29	16719.8	45.81	22294	61.08	0	0	
1/1/1996	3297.7	9.01	8606.7	23.52	19503	53.29	0	0	
1/1/1997	3940.1	10.79	6353.2	17.41	16774	45.96	0	0	
1/1/1998	3356.8	9.2	4548.8	12.46	7958	21.8	0	0	
1/1/1999	3131.8	8.58	4875.2	13.36	4079	11.18	0	0	
1/1/2000	2519.8	6.88	4123.8	11.27	4886	13.35	0	0	
1/1/2001	1733.9	4.75	2674	7.33	3538	9.69	0	0	
1/1/2002	1707	4.68	2254.3	6.18	3284	9	0	0	
1/1/2003	1739.6	4.77	2414.6	6.62	3172	8.69	0	0	
1/1/2004	1758.6	4.8	2187.5	5.98	1967	5.37	0	0	
1/1/2005	1817.6	4.98	1742.8	4.77	1944	5.33	0	0	
1/1/2006	1944.2	5.33	2247.7	6.16	1515	4.15	0	0	
1/1/2007	1652.2	4.53	2294.5	6.29					
1/1/2008	1723.5	4.71	2515.9	6.87					
1/1/2009	2377.3	6.51	4298.1	11.78					
1/1/2010	34892.3	95.6	48051.4	131.65					
1/1/2011	74009.2	202.76	147823.3	405					
1/1/2012	55815.7	152.5	196785	537.66					
1/1/2013	43812.2	120.03	246412.5	675.1	154078	422.13			
	---		---		---				
	419748.5		1087896.1		855716				Sum

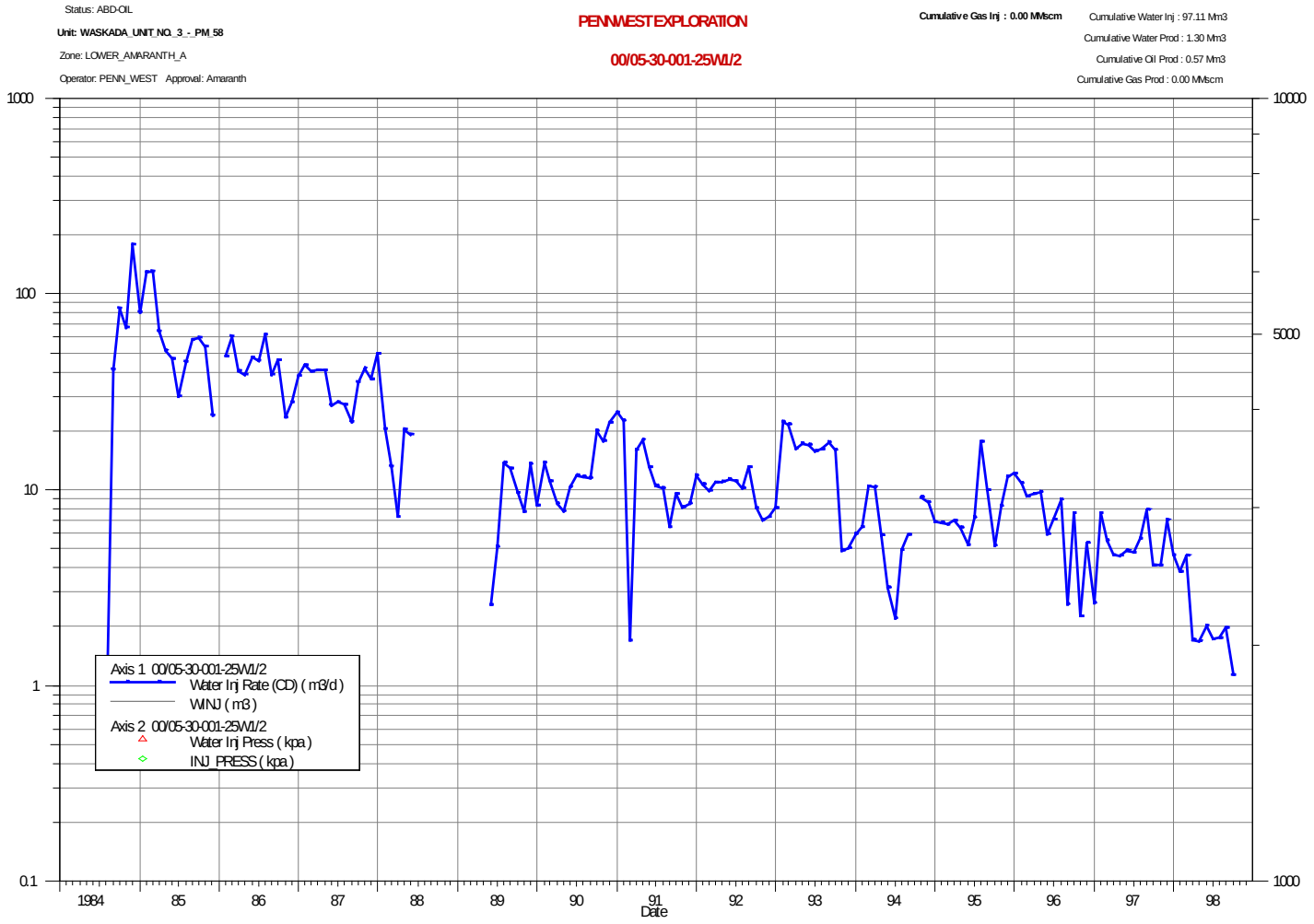
ATTACHMENT 5 – Unit Cumulative Production and Injection Plot

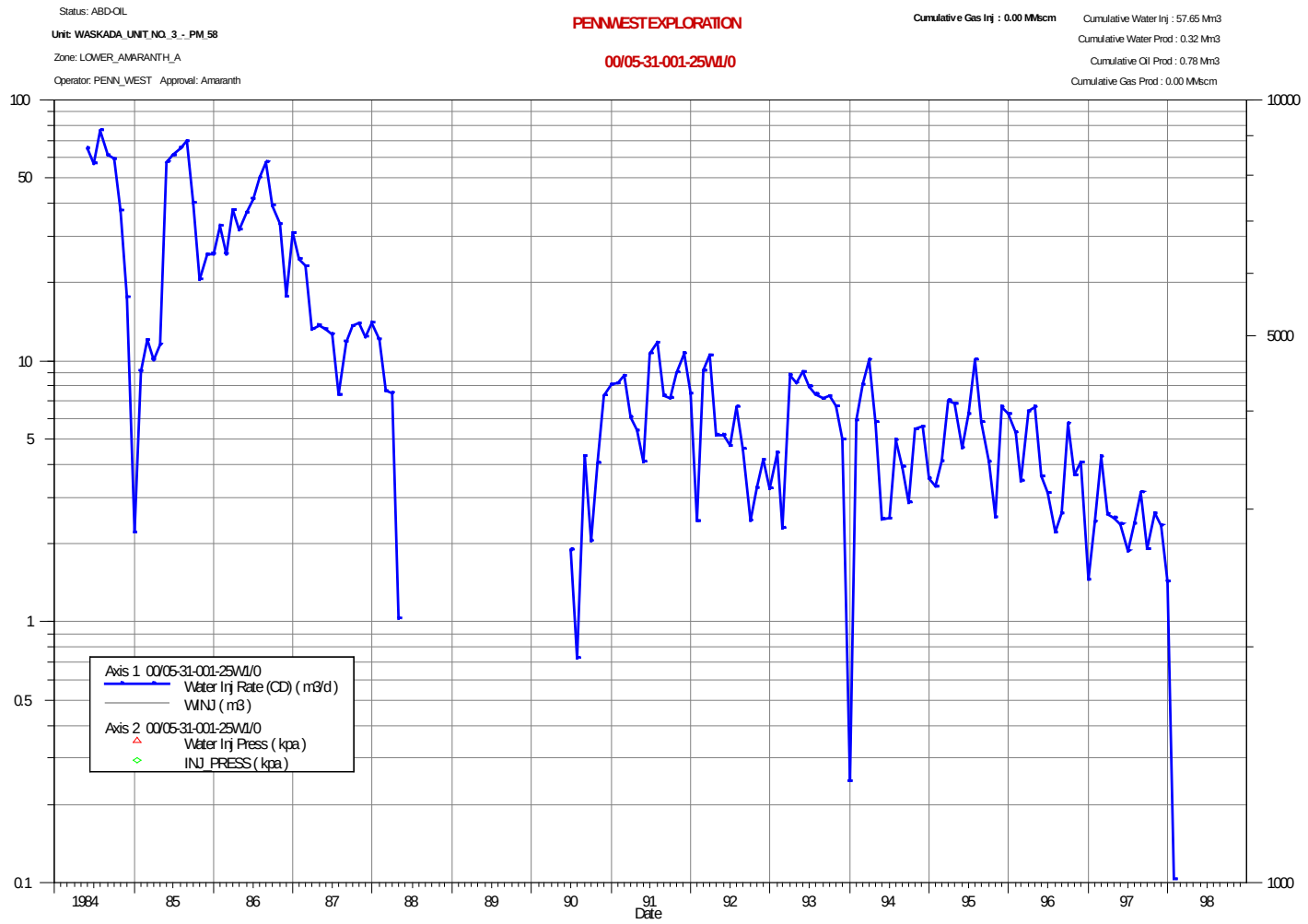


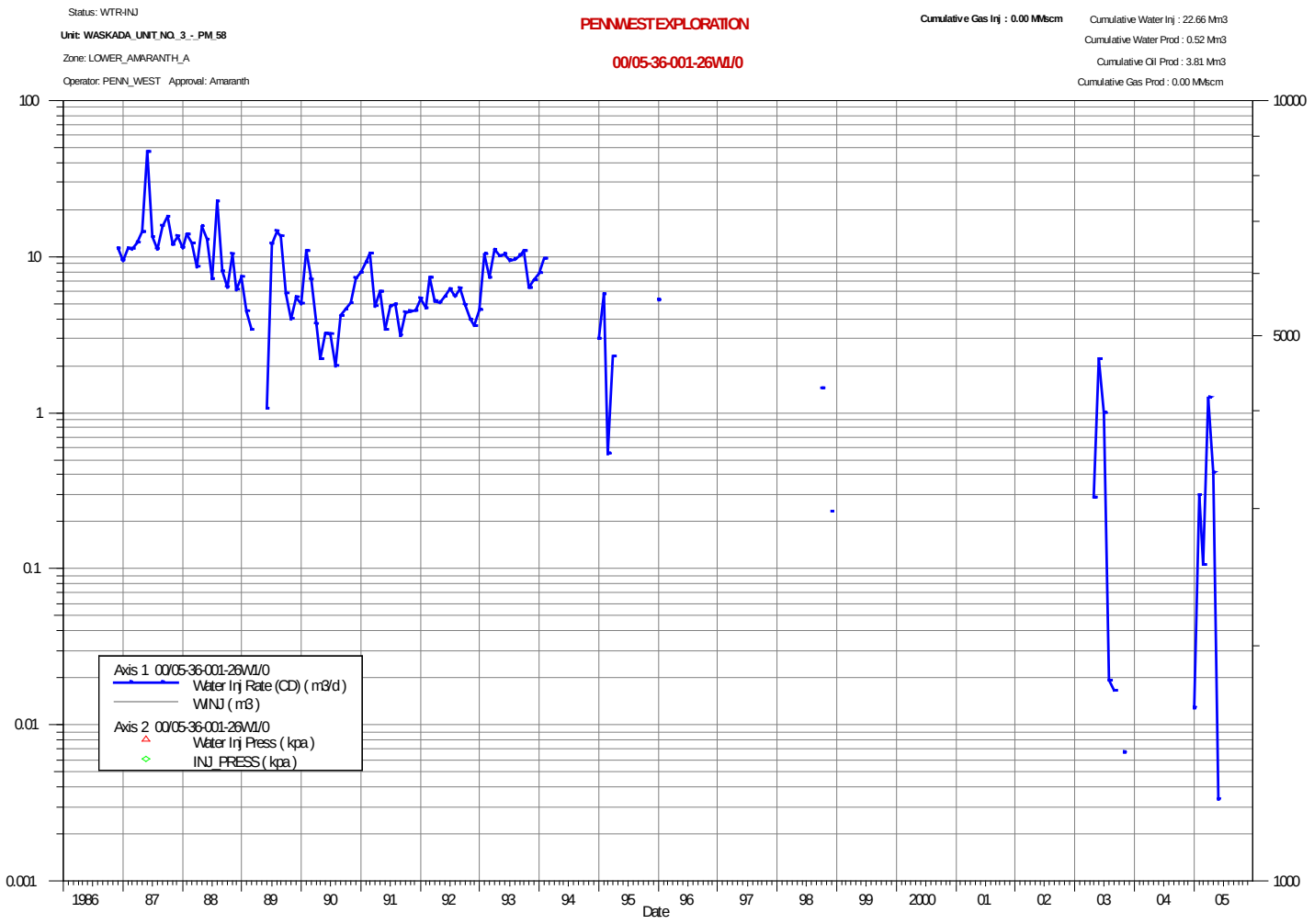
ATTACHMENT 6 – Unit Voidage Replacement Ratio Plot

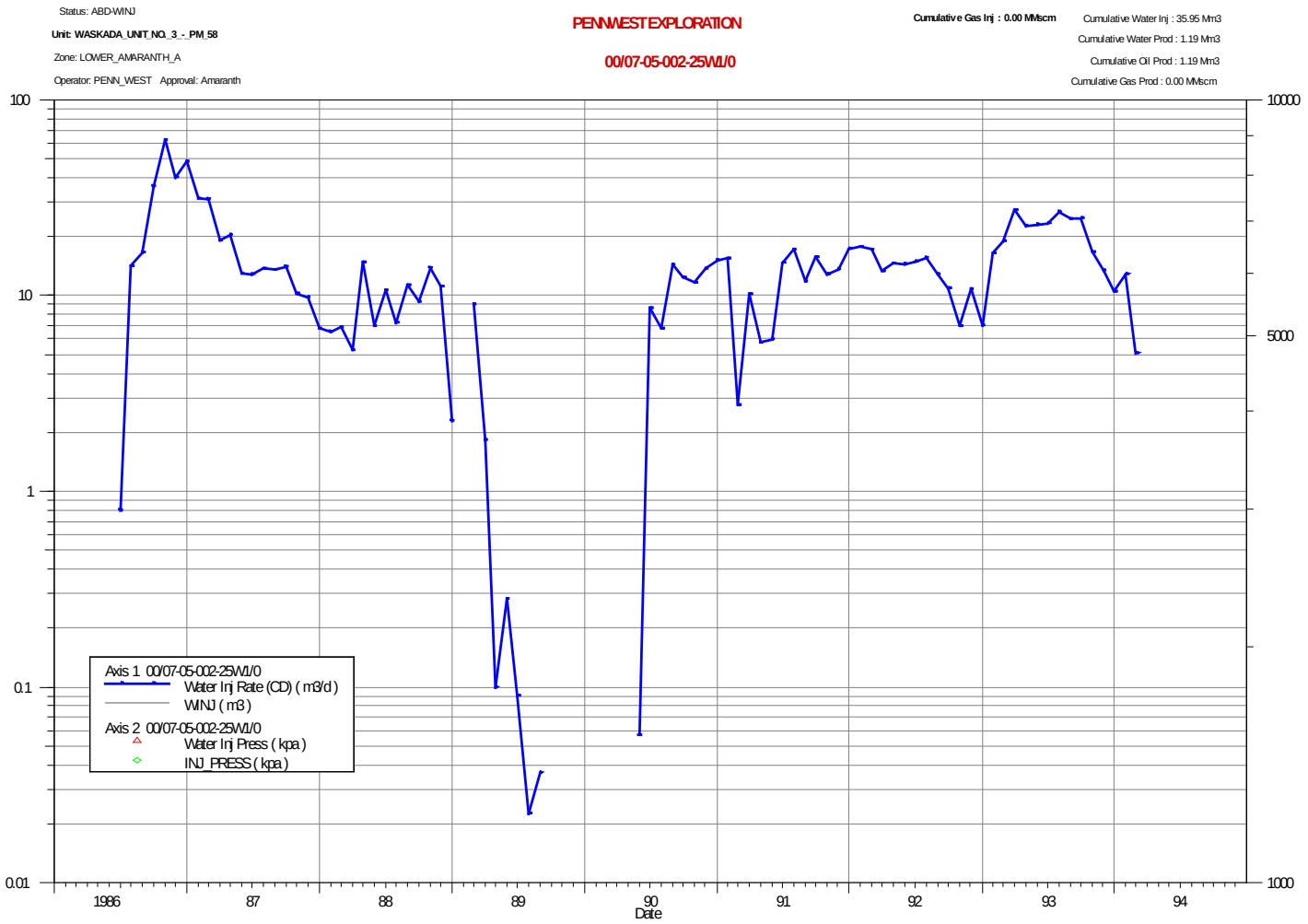


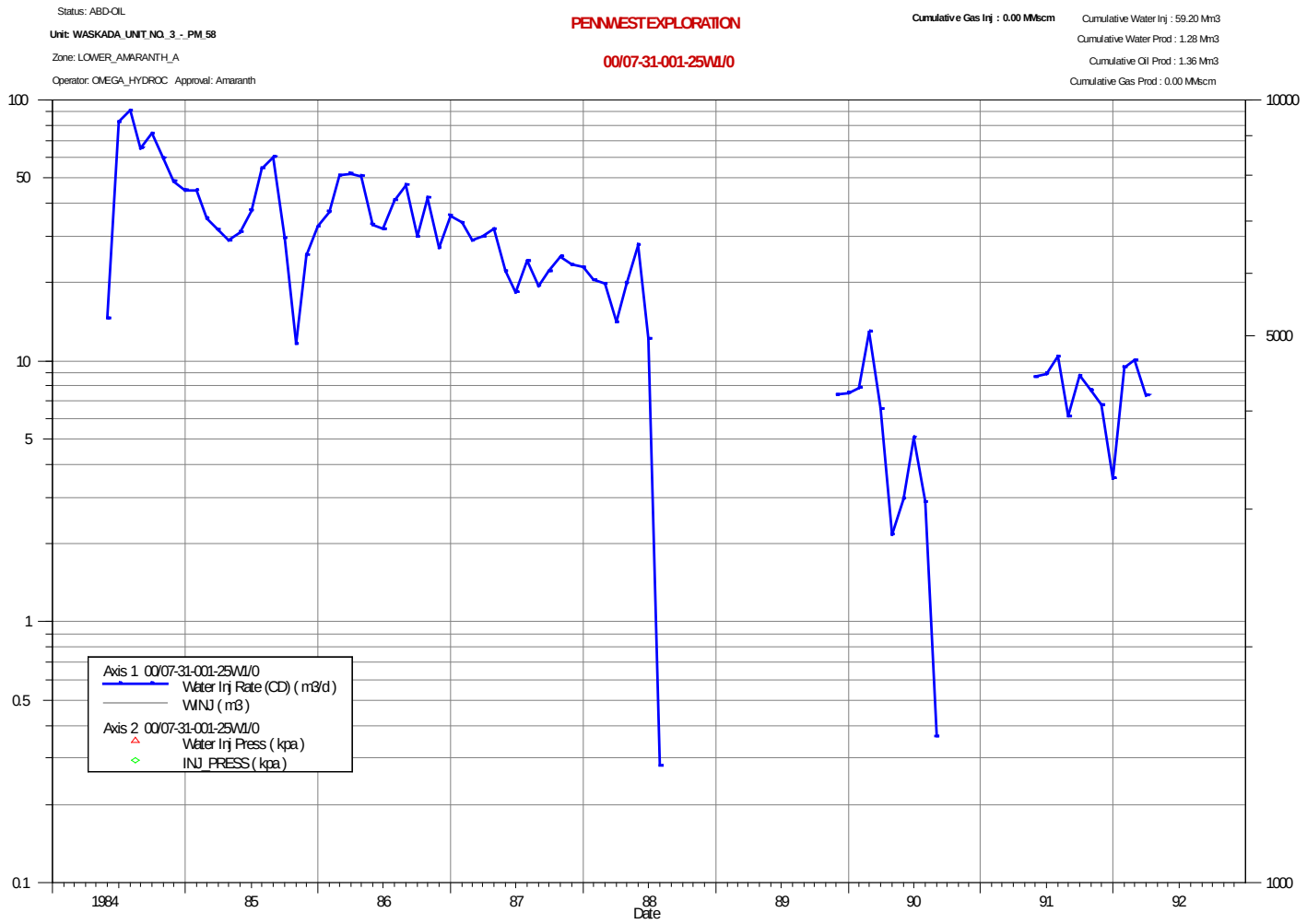
ATTACHMENT 7 – Individual Injection Well Performance Plots (15 Wells)

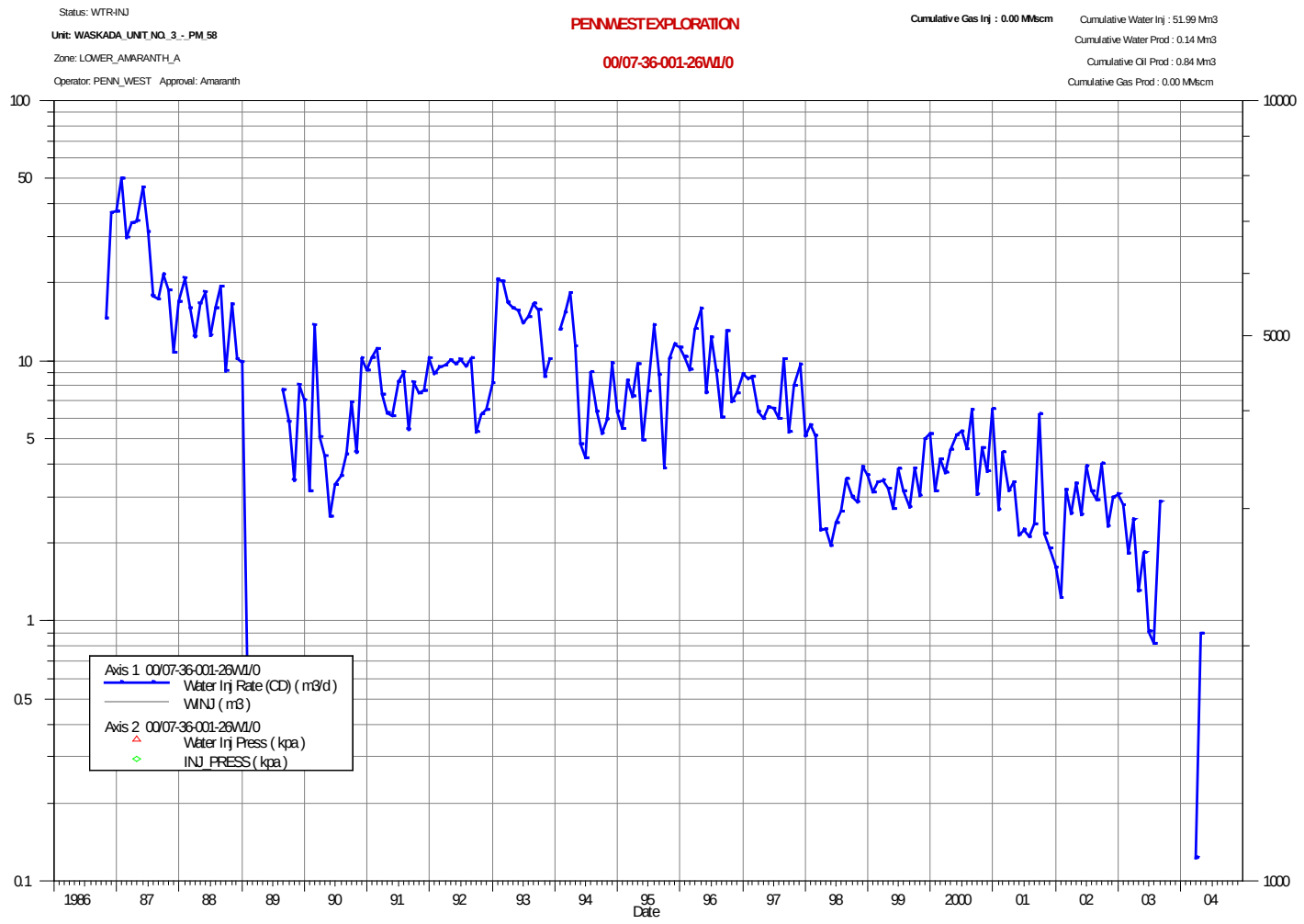


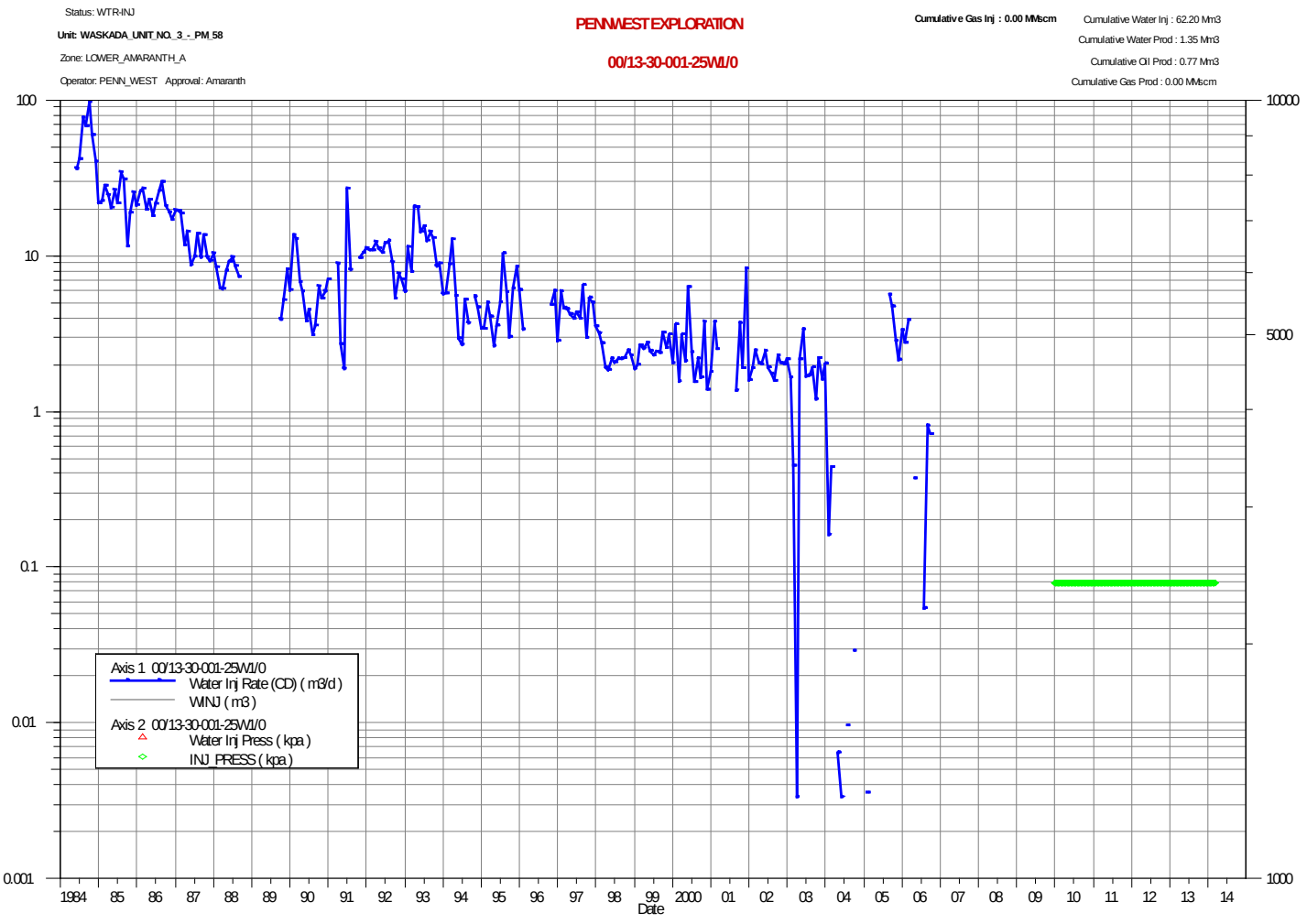

Status: ABD-OIL
Unit: WASKADA_UNIT NO_3 - PM_58
Zone: LOWER_AMARANTH_A
Operator: PENN_WEST Approval: Amaranth
PENNWEST EXPLORATION
00/05-31-001-25W1/0
Cumulative Gas Inj : 0.00 MMscm
Cumulative Water Inj : 57.65 Mm3
Cumulative Water Prod : 0.32 Mm3
Cumulative Oil Prod : 0.78 Mm3
Cumulative Gas Prod : 0.00 MMscm
100
50
10
5
1
0.5
0.1
10000
5000
1000
Axis 1 00/05-31-001-25W1/0
Water Inj Rate (CD) (m3/d)
WINJ (m3)
Axis 2 00/05-31-001-25W1/0
Water Inj Press (kpa)
INJ_PRESS (kpa)
1984
85
86
87
88
89
90
91
92
93
94
95
96
97
98
Date

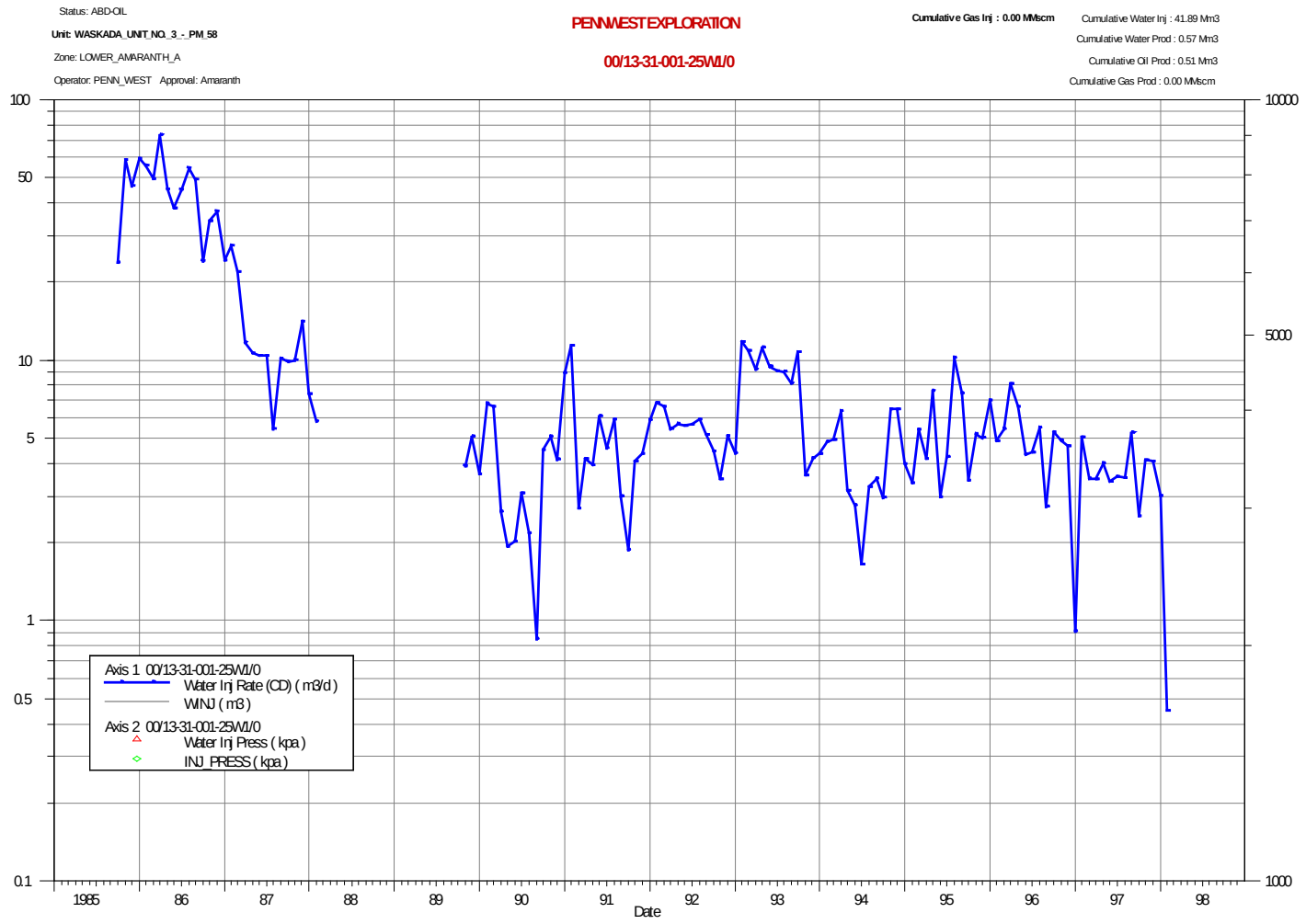

Status: WTR-INJ
Unit: WASKADA_UNIT_NO_3 - PM_58
Zone: LOWER_AMARANTH_A
Operator: PENN_WEST Approval: Amaranth
PENNWEST EXPLORATION
00/05-36-001-26W1/0
Cumulative Gas Inj : 0.00 MMscm
Cumulative Water Inj : 22.66 Mm3
Cumulative Water Prod : 0.52 Mm3
Cumulative Oil Prod : 3.81 Mm3
Cumulative Gas Prod : 0.00 MMscm
100
10
1
0.1
0.01
0.001
10000
5000
1000
1986
87
88
89
90
91
92
93
94
95
96
97
98
99
2000
01
02
03
04
05
Date
Axis 1 00/05-36-001-26W1/0
Water Inj Rate (CD) (m3/d)
WINJ (m3)
Axis 2 00/05-36-001-26W1/0
Water Inj Press (kpa)
INJ_PRESS (kpa)

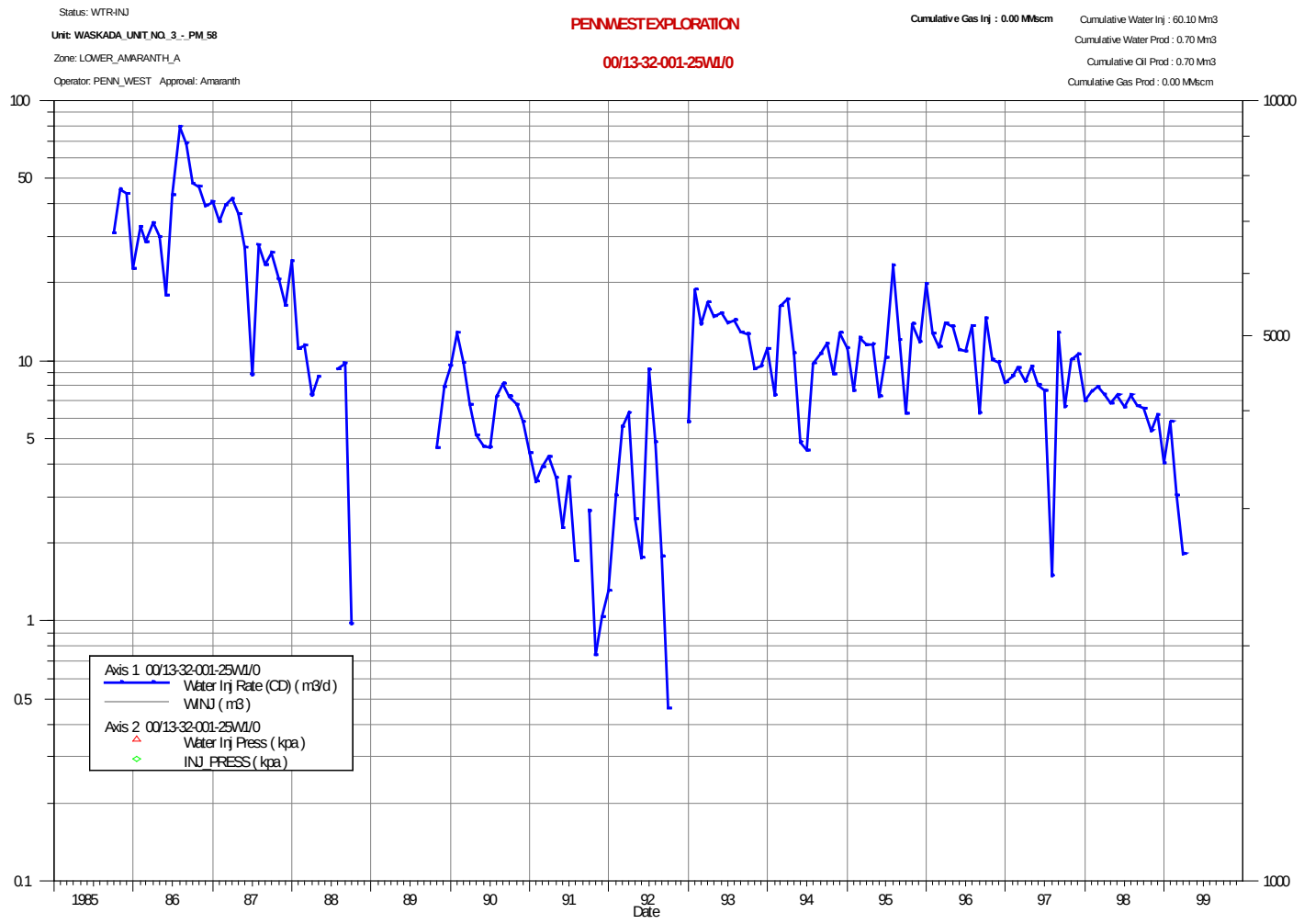

Status: ABD-WINJ
Unit: WASKADA_UNIT NO_3 - PM_58
Zone: LOWER_AMARANTH_A
Operator: PENN_WEST Approval: Amaranth
PENNWEST EXPLORATION
00/07-05-002-25W1/0
Cumulative Gas Inj : 0.00 MMscm
Cumulative Water Inj : 35.95 Mm3
Cumulative Water Prod : 1.19 Mm3
Cumulative Oil Prod : 1.19 Mm3
Cumulative Gas Prod : 0.00 MMscm
100
10
1
0.1
0.01
10000
5000
1000
1986
87
88
89
90
91
92
93
94
Date
Axis 1 00/07-05-002-25W1/0
Water Inj Rate (CD) (m3/d)
WINJ (m3)
Axis 2 00/07-05-002-25W1/0
Water Inj Press (kpa)
INJ_PRESS (kpa)

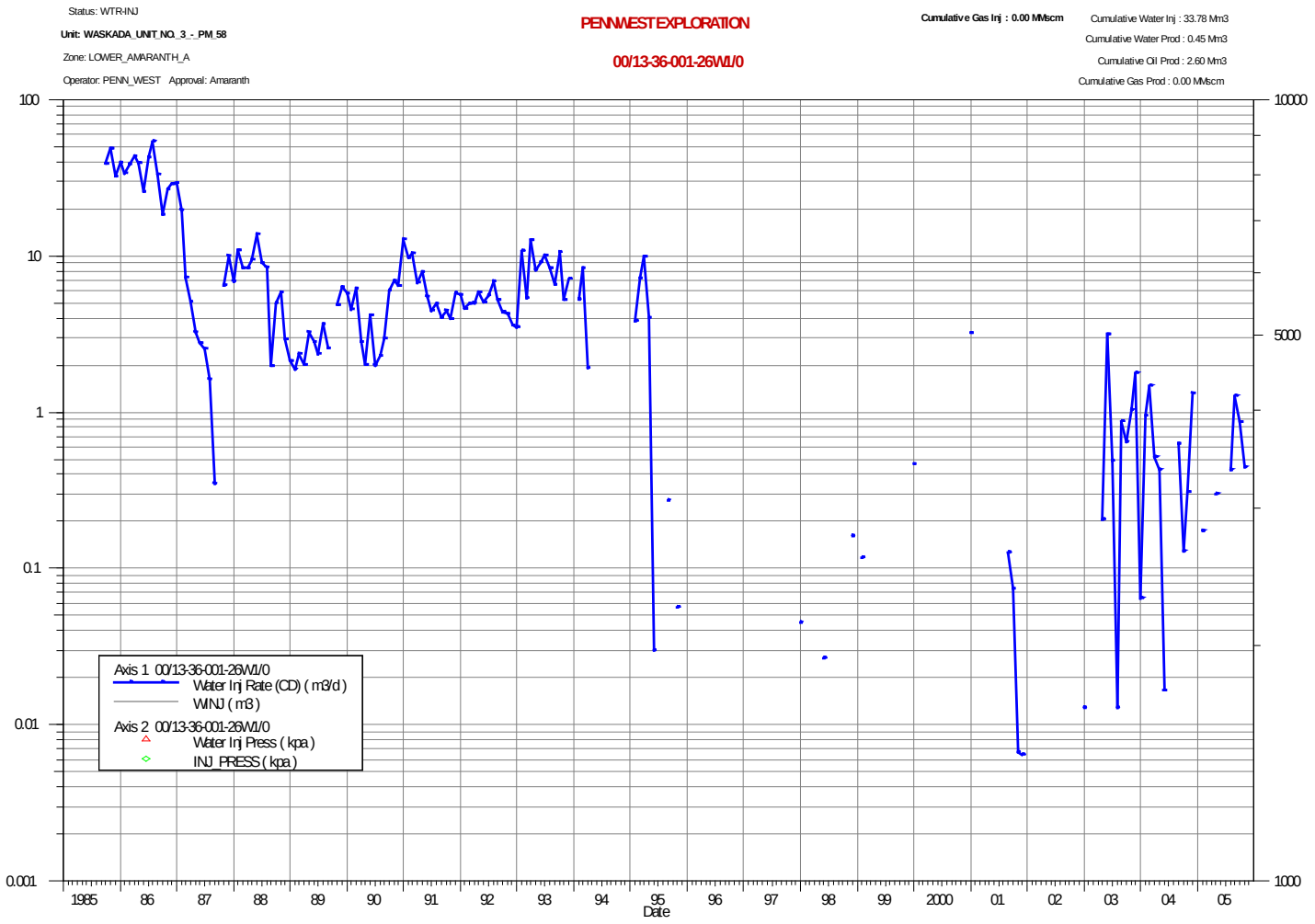

Status: ABD-OIL
Unit: WASKADA_UNIT_NO_3_-_PM_58
Zone: LOWER_AMARANTH_A
Operator: OMEGA_HYDROC Approval: Amaranth
PENNWEST EXPLORATION
00/07-31-001-25W1/0
Cumulative Gas Inj : 0.00 MMscm
Cumulative Water Inj : 59.20 Mm3
Cumulative Water Prod : 1.28 Mm3
Cumulative Oil Prod : 1.36 Mm3
Cumulative Gas Prod : 0.00 MMscm
100
50
10
5
1
0.5
0.1
10000
5000
1000
1984
85
86
87
88
89
90
91
92
Date
Axis 1 00/07-31-001-25W1/0
Water Inj Rate (CD) (m3/d)
WINJ (m3)
Axis 2 00/07-31-001-25W1/0
Water Inj Press (kpa)
INJ_PRESS (kpa)

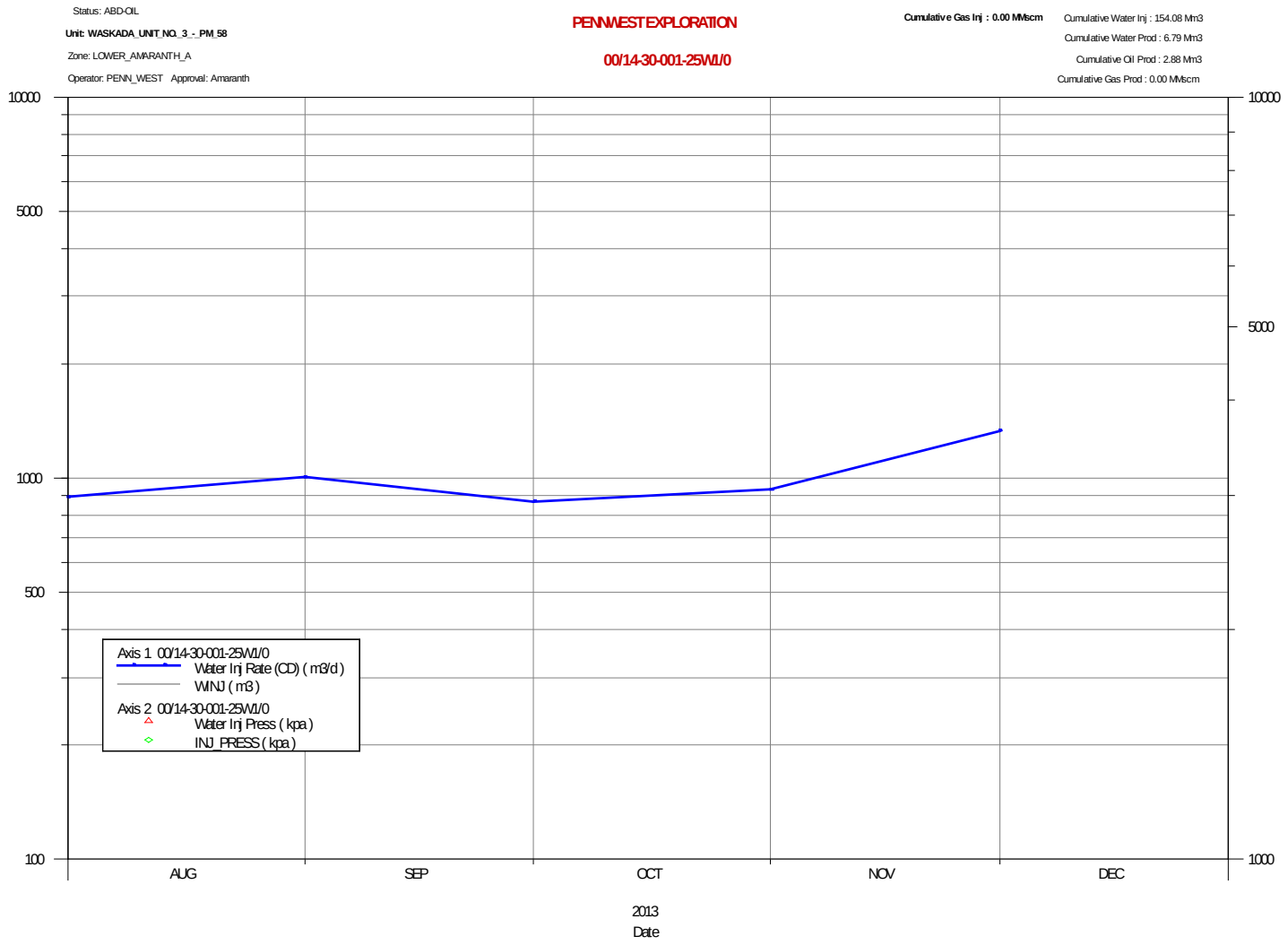

Status: WTR-INJ
Unit: WASKADA_UNIT_NO_3 - PM_58
Zone: LOWER_AMARANTH_A
Operator: PENN_WEST Approval: Amaranth
PENNWEST EXPLORATION
00/07-36-001-26W1/0
Cumulative Gas Inj : 0.00 MMscm
Cumulative Water Inj : 51.99 Mm3
Cumulative Water Prod : 0.14 Mm3
Cumulative Oil Prod : 0.84 Mm3
Cumulative Gas Prod : 0.00 MMscm
100
50
10
5
1
0.5
0.1
10000
5000
1000
Axis 1 00/07-36-001-26W1/0
Water Inj Rate (CD) (m3/d)
WINJ (m3)
Axis 2 00/07-36-001-26W1/0
Water Inj Press (kpa)
INJ_PRESS (kpa)
1986
87
88
89
90
91
92
93
94
95
96
97
98
99
2000
01
02
03
04
Date

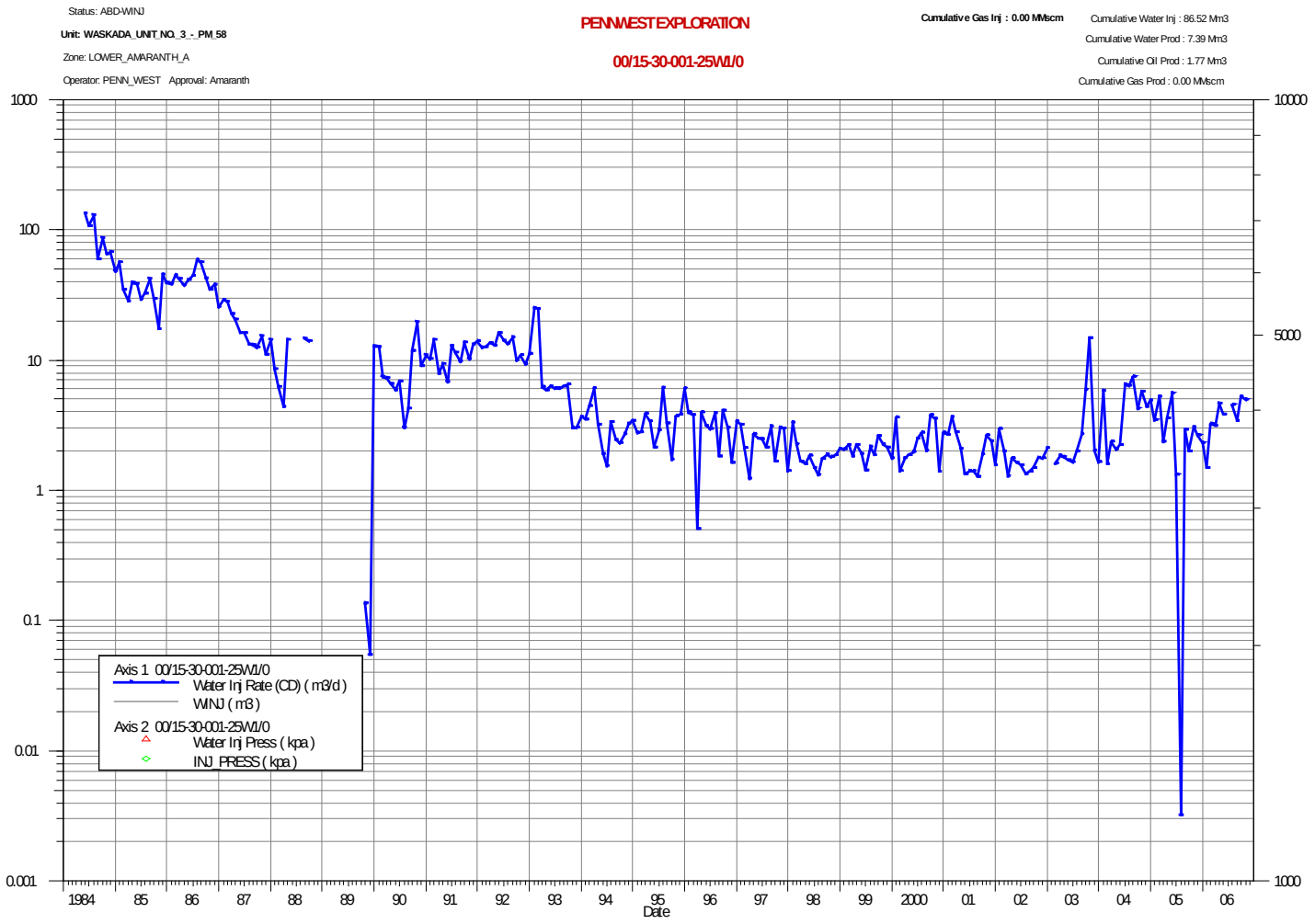

Status: WTR-INJ
Unit: WASKADA_UNIT_NO_3 - PM_58
Zone: LOWER_AMARANTH_A
Operator: PENN_WEST Approval: Amaranth
PENNWEST EXPLORATION
00/13-30-001-25W1/0
Cumulative Gas Inj : 0.00 MMscm
Cumulative Water Inj : 62.20 Mm3
Cumulative Water Prod : 1.35 Mm3
Cumulative Oil Prod : 0.77 Mm3
Cumulative Gas Prod : 0.00 MMscm
100
10
1
0.1
0.01
0.001
10000
5000
1000
Axis 1 00/13-30-001-25W1/0
Water Inj Rate (CD) (m3/d)
WINJ (m3)
Axis 2 00/13-30-001-25W1/0
Water Inj Press (kpa)
INJ_PRESS (kpa)
1984 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 2000 01 02 03 04 05 06 07 08 09 10 11 12 13 14
Date

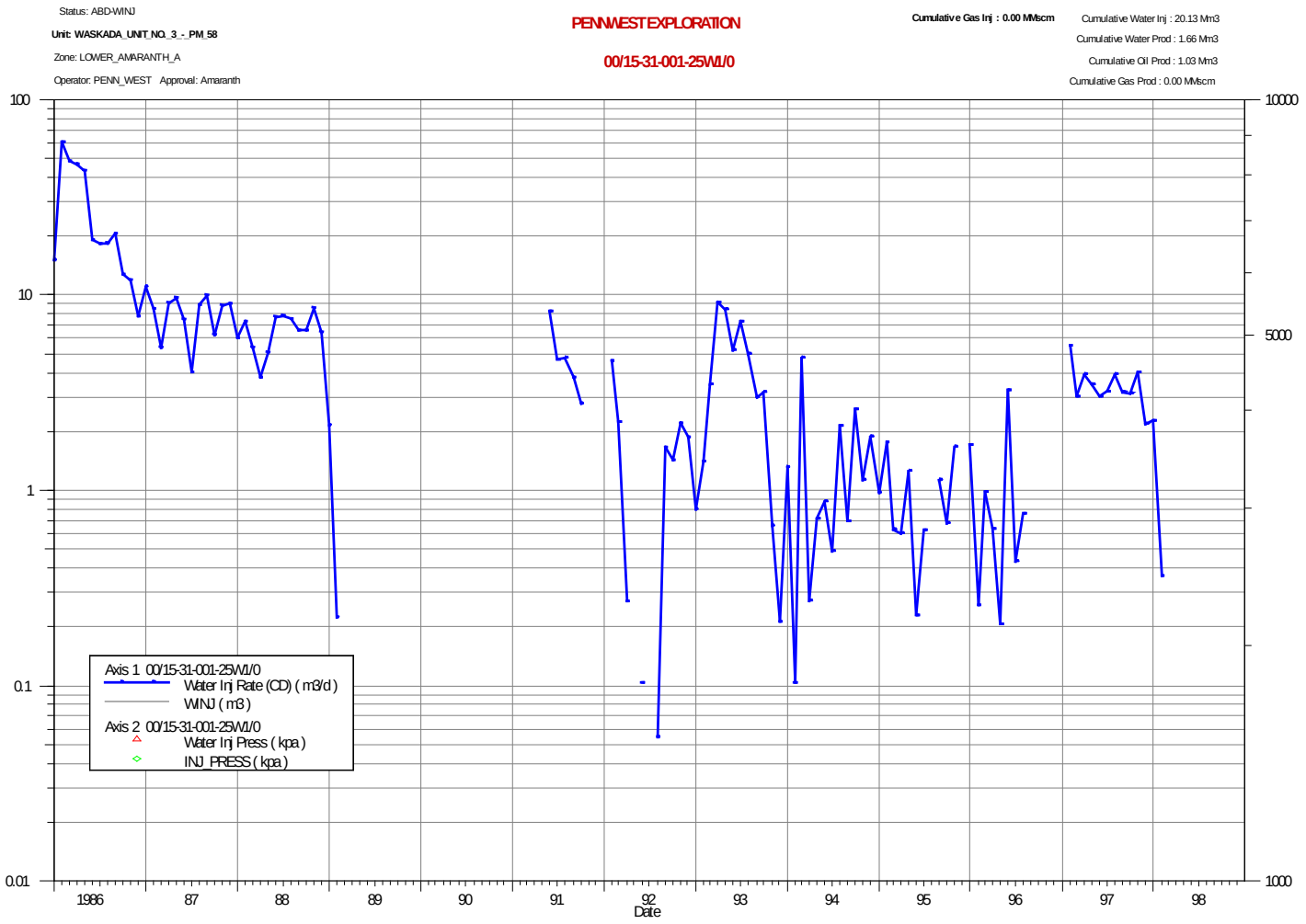

Status: ABD-OIL
Unit: WASKADA_UNIT NO_3 - PM_58
Zone: LOWER_AMARANTH_A
Operator: PENN_WEST Approval: Amaranth
PENNWEST EXPLORATION
00/13-31-001-25W1/0
Cumulative Gas Inj : 0.00 MMscm
Cumulative Water Inj : 41.89 Mm3
Cumulative Water Prod : 0.57 Mm3
Cumulative Oil Prod : 0.51 Mm3
Cumulative Gas Prod : 0.00 MMscm
100
50
10
5
1
0.5
0.1
10000
5000
1000
Axis 1 00/13-31-001-25W1/0
Water Inj Rate (CD) (m3/d)
WINJ (m3)
Axis 2 00/13-31-001-25W1/0
Water Inj Press (kpa)
INJ_PRESS (kpa)
1985
86
87
88
89
90
91
92
93
94
95
96
97
98
Date

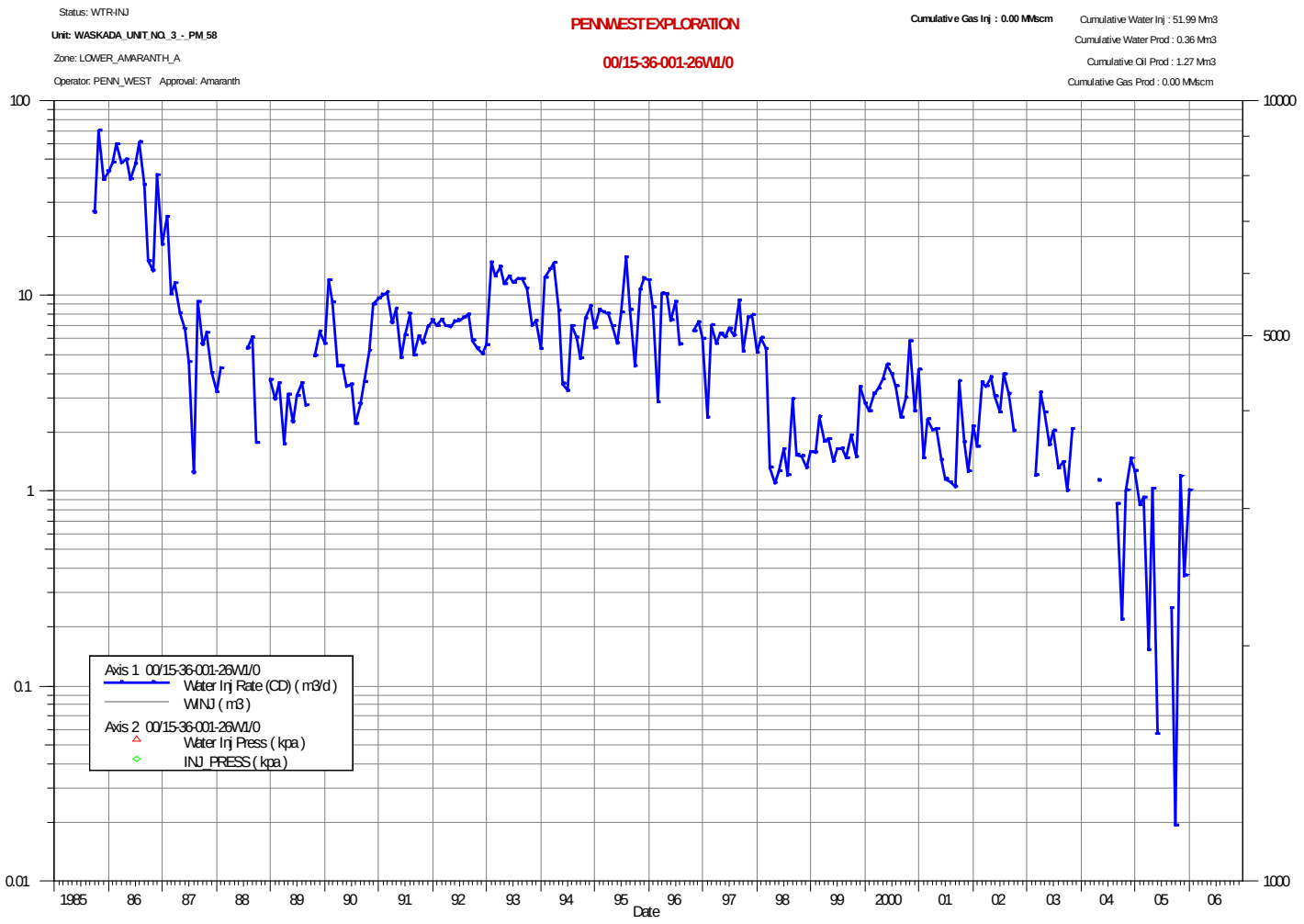

Status: WTR-INJ
Unit: WASKADA_UNIT_NO_3 - PM_58
Zone: LOWER_AMARANTH_A
Operator: PENN_WEST Approval: Amaranth
PENNWEST EXPLORATION
00/13-32-001-25W1/0
Cumulative Gas Inj : 0.00 MMscm
Cumulative Water Inj : 60.10 Mm3
Cumulative Water Prod : 0.70 Mm3
Cumulative Oil Prod : 0.70 Mm3
Cumulative Gas Prod : 0.00 MMscm
100
50
10
5
1
0.5
0.1
10000
5000
1000
1985
86
87
88
89
90
91
92
93
94
95
96
97
98
99
Date
Axis 1 00/13-32-001-25W1/0
Water Inj Rate (CD) (m3/d)
WINJ (m3)
Axis 2 00/13-32-001-25W1/0
Water Inj Press (kpa)
INJ_PRESS (kpa)

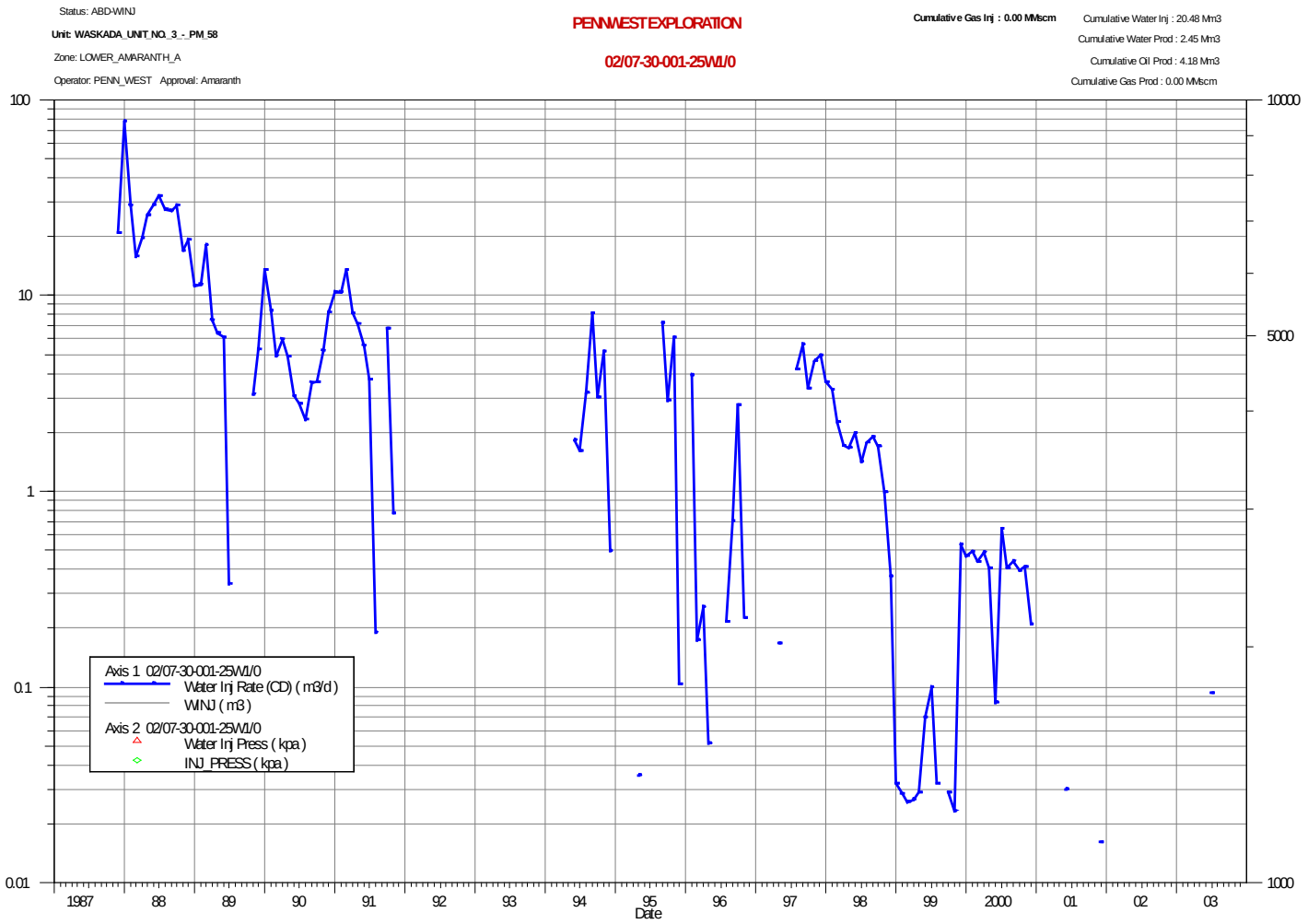

Status: WTR-INJ
Unit: WASKADA_UNIT NO_3 - PM_58
Zone: LOWER_AMARANTH_A
Operator: PENN_WEST Approval: Amaranth
PENNWEST EXPLORATION
00/13-36-001-26W1/0
Cumulative Gas Inj : 0.00 MMscm
Cumulative Water Inj : 33.78 Mm3
Cumulative Water Prod : 0.45 Mm3
Cumulative Oil Prod : 2.60 Mm3
Cumulative Gas Prod : 0.00 MMscm
100
10
1
0.1
0.01
0.001
10000
5000
1000
Axis 1 00/13-36-001-26W1/0
Water Inj Rate (CD) (m3/d)
WINJ (m3)
Axis 2 00/13-36-001-26W1/0
Water Inj Press (kpa)
INJ_PRESS (kpa)
1985
86
87
88
89
90
91
92
93
94
95
96
97
98
99
2000
01
02
03
04
05
Date


Status: ABD-OIL
Unit: WASKADA_UNIT NO_3 - PM_58
Zone: LOWER_AMARANTH_A
Operator: PENN_WEST Approval: Amaranth
PENNWEST EXPLORATION
00/14-30-001-25W1/0
Cumulative Gas Inj : 0.00 MMscm
Cumulative Water Inj : 154.08 Mm3
Cumulative Water Prod : 6.79 Mm3
Cumulative Oil Prod : 2.88 Mm3
Cumulative Gas Prod : 0.00 MMscm
10000
5000
1000
500
100
Axis 1 00/14-30-001-25W1/0
Water Inj Rate (CD) (m3/d)
WINJ (m3)
Axis 2 00/14-30-001-25W1/0
Water Inj Press (kpa)
INJ_PRESS (kpa)
AUG
SEP
OCT
NOV
DEC
2013
Date


Status: ABD-WINJ
Unit: WASKADA_UNIT NO. 3 - PM 58
Zone: LOWER_AMARANTH_A
Operator: PENN_WEST Approval: Amaranth
PENNWEST EXPLORATION
00/15-30-001-25W1/0
Cumulative Gas Inj : 0.00 MMscm
Cumulative Water Inj : 86.52 Mm3
Cumulative Water Prod : 7.39 Mm3
Cumulative Oil Prod : 1.77 Mm3
Cumulative Gas Prod : 0.00 MMscm
1000
100
10
1
0.1
0.01
0.001
10000
5000
1000
Axis 1 00/15-30-001-25W1/0
Water Inj Rate (CD) (m3/d)
WINJ (m3)
Axis 2 00/15-30-001-25W1/0
Water Inj Press (kpa)
INJ_PRESS (kpa)
1984
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
2000
01
02
03
04
05
06
Date


Status: ABD-WINJ
Unit: WASKADA_UNIT_NO_3 - PM_58
Zone: LOWER_AMARANTH_A
Operator: PENN_WEST Approval: Amaranth
PENNWEST EXPLORATION
00/15-31-001-25W1/0
Cumulative Gas Inj : 0.00 MMscm
Cumulative Water Inj : 20.13 Mm3
Cumulative Water Prod : 1.66 Mm3
Cumulative Oil Prod : 1.03 Mm3
Cumulative Gas Prod : 0.00 MMscm
100
10
1
0.1
0.01
10000
5000
1000
1986
87
88
89
90
91
92
93
94
95
96
97
98
Date
Axis 1 00/15-31-001-25W1/0
Water Inj Rate (CD) (m3/d)
WINJ (m3)
Axis 2 00/15-31-001-25W1/0
Water Inj Press (kpa)
INJ_PRESS (kpa)


Status: WTR-INJ
Unit: WASKADA_UNIT_NO_3_-_PM_58
Zone: LOWER_AMARANTH_A
Operator: PENN_WEST Approval: Amaranth
PENNWEST EXPLORATION
00/15-36-001-26W1/0
Cumulative Gas Inj : 0.00 MMscm
Cumulative Water Inj : 51.99 Mm3
Cumulative Water Prod : 0.36 Mm3
Cumulative Oil Prod : 1.27 Mm3
Cumulative Gas Prod : 0.00 MMscm
100
10
1
0.1
0.01
10000
5000
1000
Axis 1 00/15-36-001-26W1/0
Water Inj Rate (CD) (m3/d)
WINJ (m3)
Axis 2 00/15-36-001-26W1/0
Water Inj Press (kpa)
INJ_PRESS (kpa)
1985
86
87
88
89
90
91
92
93
94
95
96
97
98
99
2000
01
02
03
04
05
06
Date


Status: ABD-WINJ
Unit: WASKADA_UNIT NO. 3 - PM 58
Zone: LOWER_AMARANTH_A
Operator: PENN_WEST Approval: Amaranth
PENNWEST EXPLORATION
02/07-30-001-25W1/0
Cumulative Gas Inj : 0.00 MMscm
Cumulative Water Inj : 20.48 Mm3
Cumulative Water Prod : 2.45 Mm3
Cumulative Oil Prod : 4.18 Mm3
Cumulative Gas Prod : 0.00 MMscm
100
10
1
0.1
0.01
10000
5000
1000
1987
88
89
90
91
92
93
94
95
96
97
98
99
2000
01
02
03
Date
Axis 1 02/07-30-001-25W1/0
Water Inj Rate (CD) (m3/d)
WINJ (m3)
Axis 2 02/07-30-001-25W1/0
Water Inj Press (kpa)
INJ_PRESS (kpa)