

TUNDRA OIL AND GAS LTD.

2000



KOLA UNIT NO. 1

PROGRESS REPORT

January 1 - December 31, 2000

MARCH, 2001

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INTRODUCTION

The Kola Unit No.1 was unitized in October, 1993 for the purposes of waterflooding. Water injection commenced during the same month through well 13-21-10-29. During August, 1995, a second injector was added at 2-28-10-29. A third injector was added at 12-28-10-29 during June, 1998. Table No.1 outlines the Unit well list. The subject Progress Report covers the operating period from January 1, 2000 thru to December 31, 2000.

DISCUSSION

1. Production Performance

Oil production averaged 6.9 m³/day during the month of January, 2000 and declined to 5.6 m³/day by December 31, 2000. The decline in annual daily oil production was 19% over the aforementioned period. The average daily oil rate during 2000 was 6 m³/day. Total oil production during 2000 was 2,156.5 m³. Cumulative oil production in the Unit to 2000.12.31 was 94,335.3 m³. Table No.3 summarizes the 2000 production statistics of the Kola Unit No.1.

Water-cut averaged 87% during January, 2000 and increased to 89% by year end. The average water-cut is not representative of the unitized zone (Bakken "A" Pool), since the majority of the water is produced from the overlying Lodgepole, as a result of hydraulic fracture treatments that have gone out of zone. The majority of out of zone water is produced from wells 10-21 and 6-28-10-29. Currently, the majority of producers in the waterflood areas of the Unit have indicated increasing water-cuts as water breakthrough occurs from offsetting injectors at 13-21, 2-28, and 12-28-10-29. Figure No.2 outlines the Unit's historical production data.

Remaining recoverable oil reserves of 111.4 M STB (17,720 m³) are estimated at 2000.12.31 from the Kola Unit No.1. Figure No.2 outlines the ultimate oil recovery prediction estimated from the Bakken "A" Pool in the Unit. Appendix B outlines the 2000 individual well production data.

2. Reserves

The total oil-in-place in the Unit in both the upper and lower zones of the Middle Bakken Member is estimated at 3.1 MM STB (487,000 m³). The oil-in-place estimates of the individual wells in both the upper and lower zones are outlined in Tables No.2a and No.2b, respectively.

3. Recovery Profiles

Current recovery to 2000.12.31 is estimated at 19.4% of the oil-in-place (includes both upper and lower layers). Ultimate oil recovery in the Unit is estimated at 704,810 STB (112,050 m³) or 33.3% of the oil-in-place (lower zone only considered to be productive). This is approaching the upper end of the recovery spectrum from the Bakken formation with 16 hectare spacing and pressure maintenance. The addition of injector 12-28-10-29 in the northern sector of the Unit during 1998 should further improve oil recovery in the Unit. Table No.4 outlines current and ultimate recoveries of the individual wells in the Unit. Appendix C outlines the 2000 individual well ultimate oil recovery predictions.

4. Injector Performance

Figures No.3, No.4, and No.5 outline the wellhead injection pressures vs cumulative injection volume for injection wells 13-21, 2-28, and 12-28-10-29, respectively. All three injection wells indicate a continuous increase in wellhead injection pressures with increasing cumulative injection volume (although there has been some flattening at 2-28 and 12-28 by reducing injection rates). This trend is attributable to low matrix permeability associated with the Bakken formation. The high injection pressures are also due to a low mobility ratio identified from relative permeability testing. As a result, during a pressure maintenance operation in the Bakken formation, as reservoir fill-up is approached, it will become progressively more difficult to maintain injection rates at acceptable levels. Further well stimulation or re-fracturing (based on actual programs) will not correct this condition over the long term.

Hall Plots were also prepared for injection wells 13-21, 2-28, and 12-28-10-29 to confirm that injection rates cannot be improved with further remedial programs. Figures No.6, No.7, and No.8 outline the Hall Plots for injectors 13-21, 2-28, and 12-28-10-29, respectively. The Hall Plots for all three injectors indicate that there is no significant change in the slope of the injection profile at any of these injectors. As a result, from a reservoir engineering standpoint, the high injection pressures are due to the low permeability conditions of the Bakken "A" Pool, and no workover program will significantly change this condition over the long term.

In summary, total injection during 2000 was 11,742.6 m³ (up 600 m³ from 1999). The total average annual daily injection during 2000 was 32.1 m³/day (up 1.6 m³/day from 1999). Cumulative injection to 2000.12.31 was 69,304.6 m³. Tables No.5, No.6, and No.7 summarize the 2000 injection data for injectors 13-21, 2-28, and 12-28-10-29, respectively. Tables No.8, No.9, and No.10 outline the injection history (pressure, rates, and volumes) for injectors 13-21, 2-28, and 12-28-10-29, respectively.

5. Voidage Replacement

Table No.11 outlines the voidage calculations for the Unit. Total voidage in the Unit during 2000 was 6,659.4 m³ (up 156 Rm³ from 1999). Total injection during 2000 equalled 11,742.6 m³ (up 600 Rm³ from 1999). The resulting voidage replacement ratio in the Unit during 2000 was 1.76 Rm³/m³. A cumulative voidage replacement ratio of 0.49 Rm³/m³ has been achieved in the Unit to 2000.12.31.

The produced water in the Unit had to be adjusted for out of zone contribution from the overlying Lodgepole formation. Water production from the Lodgepole formation is due to completion problems where the well has been hydraulically fractured out of zone. A common occurrence in the Bakken "A" Pool is for the hydraulic fracture to break into the Lodgepole, which results in high water production from the Bakken wellbore. In determining voidage replacement in the Unit, this producing condition had to be accounted for in the voidage calculations. An unfractured Bakken well generally produces at a water-cut below 20% on primary recovery. As a result, water production above this volume under primary recovery was

interpreted to be coming from the Lodgepole formation. Table No.12 outlines all the wells that have been hydraulically fractured before waterflooding where the water-cut significantly exceeded the 20% threshold representative of out of zone Bakken water production. All water production in excess of a 20% water-cut on initial completion was considered to be coming from the Lodgepole formation in these wells. The total adjusted Bakken water production volumes are identified in Table No.12, and were carried forward to Table No.11 to obtain an estimate of the water coming from the Bakken formation in the Unit. Table No.11 provides an estimate of the cumulative voidage in the Unit.

The voidage replacement calculations were further fine tuned by focusing only on the initial areas that are being waterflooded in the Unit (area around injector 12-28-10-29 excluded). The initial pressure maintenance area included wells 9-20, 16-20, 13-21, 15-21, 1-28, 2-28, 3-28, 4-28, and 6-28-10-29 (refer to Figure No.1). Table No. 13 outlines the voidage replacement calculations for the initial areas that are being waterflooded in the Unit. A VRR of 1.86 Rm³/m³ was achieved during 2000 in the initial areas receiving waterflood support in the Unit. Cumulative voidage replacement of 0.61 Rm³/m³ has been achieved in the initial pressure maintenance areas in the Unit to 2000.12.31.

In summary, good voidage replacement is being achieved in the initial areas of waterflooding in the Unit through injectors 13-21 and 2-28-10-29. Voidage replacement will be further improved in the northern portion of the Unit, as a result of the conversion of well 12-28-10-29 to injection service during mid-1998.

6. Individual Well Performance

A review of the production performance of each of the producing wells is presented here-after. The analysis is referenced to the wells outlined in Appendices B and C.

a. 9-20-10-29

Oil production at the beginning of 2000 was 0.79 m³/day at a water-cut of 60%. By December 31, 2000 oil production increased to 0.97 m³/day with a decline in water-cut to 12%. The difference in water-cuts is attributable to testing practices. Oil production was relatively flat during 2000, averaging 0.89 m³/day. There has been an increase in total fluid production at 9-20 after injector 13-21 went into service with the total fluid being relatively flat there-after. Although the overall waterflood contribution has been small at 9-20, some incremental oil recovery is being captured at this location. No corrective work is required at 9-20 during 2001.

b. 16-20-10-29

Oil production at the beginning of 2000 was 0.78 m³/day at a water-cut of 83%. By year end, oil production declined to 0.39 m³/day as a result of a significant increase in water-cut to 91%. Well 16-20 has indicated the best waterflood response in the Unit with both a significant increase in total fluid and a corresponding decrease in water-cut. There is good connectivity between injector 13-21 and 16-20, which accounts for the strong waterflood performance at this location. Waterflood breakthrough commenced at 16-20 in mid-1996 and has accounted for the significant decline in oil production. Total fluid has remained relatively flat at 16-20 during 2000, and no corrective work is required at this location during 2001.

c. 10-21-10-29

Oil production at the beginning of 2000 was 0.97 m³/day at a water-cut of 96%. By December 31, 2000 oil production declined to 0.62 m³/day with a slight increase in water-cut to 97%. The 10-21 well was hydraulically fractured in 1994 to improve productivity. Based on the high water-cut and significant increase in total fluid, the majority of the produced water is coming from the Lodgepole formation. Since the total fluid production has remained relatively unchanged after fracturing, no corrective work is required at this location to improve productivity during 2001. The 10-21 well is not receiving waterflood support at this time, however, oil production has remained relatively flat during 2000, averaging 0.7 m³/day.

d. 12-21-10-29

The 12-21 well was abandoned during 1986. The 12-21 well was fractured out of zone during the initial completion program, and as a result, was a poor producer throughout its producing life. No further potential is evident at this location in the Unit.

e. 15-21-10-29

The 15-21 well was abandoned during November, 1998 after a review indicated no further waterflood potential or corrective action was possible at this location.

f. 1-28-10-29

Oil production at the beginning of 2000 was 0.77 m³/day at a water-cut of 73%. By year end, oil productivity had declined to 0.65 m³/day with a moderate increase in water-cut to 77%. The decrease in oil productivity during 2000 is attributable to continuing water breakthrough from injector 2-28-10-29. The 1-28 well was hydraulically fractured in 1994 to improve oil productivity, and a portion of the water currently being produced is out of zone water, based on post frac performance. Total fluid production has remained relatively flat during 2000. No corrective action is planned at 1-28 during 2001.

g. 2-28-10-29

The 2-28 well was converted to injection service in August, 1995. The addition of 2-28 as an injector has expanded pressure maintenance to the eastern sector of the Unit. No corrective work is required at 2-28 during 2001.

h. 3-28-10-29

Oil production at the beginning of 2000 was 0.32 m³/day at a water-cut of 81%. By year end, oil production had declined to 0.18 m³/day with water-cut increasing to 88%. Water breakthrough from injector 2-28 has been

occurring since mid-1997, and is attributable to further decline in oil production at 3-28 during 2000. The 3-28 well has benefited from waterflood support from 2-28 injector in terms of incremental oil production after injector 2-28 went into service in 1995. Total fluid production has remained flat during 2000. Oil productivity at 3-28 is currently at the economic limit, and the 3-28 well will be abandoned during 2001.

i. 4-28-10-29

Oil production at the beginning of 2000 was 0.81 m³/day at a water-cut of 66%. By year end, oil production had declined moderately to 0.65 m³/day with an increase in water-cut to 74%. Well 4-28 has indicated the second best waterflood response in the Unit. This is supported by an increase in both oil and total fluid production. Water breakthrough has occurred at 4-28 from injector 13-21. Total fluid production at 4-28 has remained flat during 2000. No corrective work is envisioned at 4-28 during 2001.

j. 5-28-10-29

The 5-28-10-29 well was fractured out of zone on initial completion, and was not economic to operate. The 5-28 well is currently used as a water disposal well for excess unit water.

k. 6-28-10-29

Oil production at the beginning of 2000 was 0.93 m³/day at a water-cut of 91%. By year end, oil production had declined to 0.84 m³/day with no change in water-cut. Total fluid production remained relatively flat during 2000. The 6-28 well was hydraulically fractured during 1993 to improve oil production. The fracture treatment broke into the overlying Lodgepole formation and resulted in a high water-cut well. The 6-28 well has been pumped at high volume rates since the fracture program. The improvement in oil productivity during the period 1995 to 1998 is coincident with the installation of the new injector at 2-28. Oil production at 6-28 began to increase 4 months after the installation of the 2-28 injector. The progressive increase in oil production at 6-28 may be attributable to waterflood response from injector 2-28. There was also a decrease in water-cut during the

aforementioned period, which would further support the observation that waterflooding from 2-28 injector has resulted in incremental oil recovery at 6-28. Oil production at 6-28 during 2000 was essentially flat averaging 0.84 m³/day. No corrective work is planned at 6-28 during 2001.

l. 11-28-10-29

Oil production at the beginning of 2000 was 1.0 m³/day a water-cut of 45%. By year end, oil productivity had declined to 0.69 m³/day with an increase in water-cut to 60%. Waterflood support is being provided by injector 12-28, which is supported by stabilization in the total fluid production. More production time is required to assess the long term impact of the injector at 12-28 on 11-28. Total fluid production has remained relatively flat at 11-28 during 2000. No corrective work is planned at 11-28 during 2001.

m. 12-28-10-29

The 12-28 well was converted to injection service during June, 1998 to provide pressure maintenance in the northern sector of the Unit. No further corrective work is planned at 12-28 during 2001.

n. 9-29-10-29

Oil production at the beginning of the year was 0.68 m³/day at a water-cut of 4%. By year end oil production increased to 0.88 m³/day at a water-cut of 9%. Oil production averaged 0.56 m³/day during 2000. The 9-29 well was fractured after initial completion, which has contributed historically to the high water-cut at this location. More recently, the decline in water-cut may potentially be attributed to some waterflood support at 9-29 from injector 12-28. The performance of 9-29 will be monitored to determine the long term impact of injector 12-28 at the 9-29 well location. No further work is planned at this location during 2001.

7. Bakken Waterflood Performance Parameters

A simulation study (completed in 1994) of the Bakken "A" Pool in the Unit indicated an ultimate oil recovery of 30% of the oil-in-place with waterflooding on 40 acre spacing. Currently, ultimate oil recovery is forecasted at 23% of the total oil-in-place in the Unit. By installing pressure maintenance in the northern sector of the Unit with the addition of injector 12-28, an ultimate oil recovery of 23% of the total oil-in-place should be achievable (both the upper and lower Bakken zones have been used in the ultimate oil recovery prediction). However, field testing suggests that the majority of the recoverable oil is found in the lower zone. As a result, the ultimate oil recovery from the Unit is forecasted to be 33.3% of the oil-in-place. This would support the findings in the aforementioned reservoir simulation study. For further information pertaining to Bakken waterflood performance in the Unit, please refer to the Kola Field Bakken "A" Pool Pressure Maintenance Application (July, 1993) at Manitoba Industry, Trade and Mines, Petroleum Branch.

8. Pressure Surveys

Since the Bakken formation has low reservoir permeability, extended shut-in periods are required to reach the radial flow period, in order to make reliable pressure and formation parameter assessments. As a result, no pressure surveys were conducted in the Unit during 2000. The Manitoba Petroleum Branch has waived the requirement of conducting annual pressure surveys in recognition of this reservoir condition. However, Tundra will consider running pressure recorder devices in new wells where this information will be beneficial in reservoir management. Currently, running pressure buildup tests in mature Bakken wells is not economic.

9. Summary

The Kola Unit No.1 is a mature pressure maintenance scheme with current recovery estimated at about 37 M STB/well (does not include D&A's). Ultimate oil recovery is estimated at 44 M STB/well (D&A's not included).



Since 5 D&A's were drilled to define the Kola Unit No.1 Bakken "A" Pool, an ultimate oil recovery of 33.5 M STB/well is projected under full cycle development (primary and secondary). The number of areas available for pressure maintenance in the Unit are limited because of historical well completion problems (fractured out of zone into overlying Lodgepole). Oil recovery should improve in the northern sector of the Unit with the conversion of 12-28-10-29 to injection service. The remaining economic life of the Unit is forecasted to be 17 years.

CONCLUSIONS

The following conclusions are offered by Tundra Oil and Gas Ltd. in our efforts to maximize oil recovery from the Kola Unit No.1:

1. Waterflood response has been confirmed in the Unit. The best producer/injector orientation is in an east-west direction (based on waterflood response). The Kola Unit No.1 is a mature waterflood project based on the observation that the majority of the oil producers in the waterflood areas have indicated water breakthrough.
2. The existing complement of injectors is providing both acceptable annual voidage and cumulative voidage replacement.
3. Current performance indicates that the 12-28 injector is pressuring up similar to other Bakken injection wells. This suggests that the majority of water is quite likely being injected into the Bakken formation (12-28 injector was considered to be fractured out of zone based on the high water-cut after initial completion).
4. Improving oil recovery with horizontal drilling would not be practical in the Unit, since prevailing reservoir pressures and recoveries would not yield attractive economics in the application of this technology.



5. Conventional pressure buildup tests have been discontinued in the Unit, since extended shut-in times are required to obtain reliable data. The extended shut-in times would result in too much postponed production, which would negatively impact the economic performance of the Unit. As an alternative, if a new well is drilled in the future adjacent to the Unit, a DST will be run to obtain the average reservoir pressure in the area.
6. The potential to add more injectors in the Unit beyond the existing three injectors is limited at this time.
7. Enhanced oil recovery (chemical flooding) has been investigated in the Bakken "D" Pool and found to be not economic at this time. It is unlikely that this conclusion would be any different for the Bakken "A" Pool in the Unit.
8. Well 3-28-10-29 is at it's economic limit and will be scheduled for abandonment operations during 2001.

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TABLE NO.1
KOLA UNIT NO.1

WELL LIST

<u>WELL</u>	<u>STATUS</u>
9-20-10-29 W1M	PRODUCING
16-20-10-29 W1M	PRODUCING
10-21-10-29 W1M	PRODUCING
12-21-10-29 W1M	ABANDONED
13-21-10-29 W1M	INJECTOR
14-21-10-29 W1M	ABANDONED
15-21-10-29 W1M	ABANDONED
1-28-10-29 W1M	PRODUCING
2-28-10-29 W1M	INJECTOR
3-28-10-29 W1M	PRODUCING
4-28-10-29 W1M	PRODUCING
5-28-10-29 W1M	WATER DISPOSAL
6-28-10-29 W1M	PRODUCING
11-28-10-29 W1M	PRODUCING
12-28-10-29 W1M	INJECTOR
9-29-10-29 W1M	PRODUCING

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TABLE NO.2B

TABLE NO.2B											
KOLA UNIT NO.1											
ORIGINAL OIL-IN-PLACE ESTIMATES											
BAKKEN 'A' POOL											
Middle Member											
Lower Zone											
Well	Constant	Area (hectares)	Porosity (fraction)	Net Pay (metres)	PHI-H (metres)	Sw (fraction)	1-Sw (fraction)	FVF (R m3/m3)	HCPV (phi-metres)	OOIP (m3)	OOIP (STB)
9-20-10-29	10,000	16.17	0.15	2.5	0.38	0.58	0.42	1.06	0.16	24,026	151,125
16-20-10-29	10,000	16.17	0.2	2.8	0.56	0.58	0.42	1.06	0.24	35,879	225,680
10-21-10-29	10,000	16.17	0.16	2.2	0.35	0.58	0.42	1.06	0.15	22,553	141,856
12-21-10-29	10,000	16.17	0.17	1.8	0.31	0.58	0.42	1.06	0.13	19,605	123,318
13-21-10-29	10,000	16.17	0.19	2.4	0.46	0.58	0.42	1.06	0.19	29,216	183,768
14-21-10-29	10,000	16.17	0.16	1.5	0.24	0.58	0.42	1.06	0.10	15,377	96,720
15-21-10-29	10,000	16.17	0.17	1.4	0.24	0.58	0.42	1.06	0.10	15,249	95,914
1-28-10-29	10,000	16.17	0.17	1.4	0.24	0.58	0.42	1.06	0.10	15,249	95,914
2-28-10-29	10,000	16.17	0.19	1.6	0.30	0.58	0.42	1.06	0.13	19,477	122,512
3-28-10-29	10,000	16.17	0.18	2.4	0.43	0.58	0.42	1.06	0.18	27,878	174,096
4-28-10-29	10,000	16.17	0.18	2	0.36	0.58	0.42	1.06	0.15	23,065	145,080
5-28-10-29	10,000	16.17	0.18	1.8	0.32	0.58	0.42	1.06	0.14	20,759	130,572
6-28-10-29	10,000	16.17	0.16	1.5	0.24	0.58	0.42	1.06	0.10	15,377	96,720
11-28-10-29	10,000	16.17	0.15	1.6	0.24	0.58	0.42	1.06	0.10	15,377	96,720
12-28-10-29	10,000	16.17	0.14	2	0.28	0.58	0.42	1.06	0.12	17,940	112,840
9-29-10-29	10,000	16.17	0.15	2	0.30	0.58	0.42	1.06	0.13	19,221	120,900
Totals		259								336,046	2,113,730

TABLE NO. 3												
	KOLA UNIT NO.1											
	2000 PRODUCTION DATA											
	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
OIL (m3)	207.3	184.1	189.8	190.1	197.8	171.4	180.9	181.5	160.7	166.7	160.9	165.3
WATER (m3)	1,388.2	1,265.8	1,352.8	1,284.2	1,380.0	1,303.2	1,341.2	1,324.8	1,287.6	1,287.7	1,253.0	1,280.1
TOTAL FLUID (m3)	1595.5	1449.9	1542.6	1474.3	1,577.8	1474.6	1522.1	1506.3	1448.3	1454.4	1413.9	1445.4
DAILY OIL (m3/day)	6.9	6.4	6.1	6.5	6.4	5.7	5.9	5.9	5.4	5.4	5.4	5.6
WATER-CUT (%)	87.0	87.3	87.7	87.1	87.5	88.4	88.1	87.9	88.9	88.5	88.6	88.6
AVERAGE MONTHLY OIL =					179.7	m3						
AVERAGE MONTHLY WATER =					1,312.4	m3						
AVERAGE MONTHLY TOTAL FLUID =					1,492.1	m3						
AVERAGE ANNUAL DAILY OIL =					6.0	m3/day						
AVERAGE MONTHLY WATER-CUT =					88.0	%						
2000 CUM. OIL PRODUCTION =					2,156.5	m3						
2000 CUM. WATER PRODUCTION =					15,748.6	m3						
CUM. OIL PRODUCTION TO 2000.12.31					94,335.3	m3						

TABLE NO.4

TABLE NO.4												
KOLA UNIT NO.1												
RECOVERY PROFILES												
(Based on Cumulative Production to 2000.12.31)												
Well	Cum. Prod. to Dec.31/2000 (m3)	Cum. Prod. to Dec.31/200 (STB)	Lower Zone OOIP (STB)	Upper Zone OOIP (STB)	Total OOIP (STB)	Ultimate Recovery Prediction (m3)	Ultimate Recovery Prediction (STB)	Ultimate Rec. Fac. Upper & Lower Zones (%)	Remaining Proved Producing Oil (STB)	Current Recovery Factor Lower Zone Only (%)	Current Rec. Fac. Lower & Upper Zone (%)	Ultimate Recovery Factor Lower Zone Only (%)
9-20-10-29	6,050.2	38,055.8	151,126	96,720	247,846	8,718	54,836	22.1	16,780	25.2	15.4	36.3
16-20-10-29	12,116.7	76,214.0	225,682	54,885	280,567	12,881	81,021	28.9	4,807	33.8	27.2	35.9
10-21-10-29	3,904.1	24,556.8	141,857	79,832	221,689	5,713	35,935	16.2	11,378	17.3	11.1	25.3
12-21-10-29	2,873.5	18,074.3	123,319	86,357	209,676	2,874	18,074	8.6	0	14.7	8.6	14.7
13-21-10-29	11,668.4	73,394.2	183,770	49,895	233,665	11,668	73,394	31.4	0	39.9	31.4	39.9
14-21-10-29	737.5	4,638.9	96,721	53,733	150,454	738	4,639	3.1	0	4.8	3.1	4.8
15-21-10-29	1,511.2	9,505.4	95,915	57,571	153,486	1,511	9,505	6.2	0	9.9	6.2	9.9
1-28-10-29	3,862.3	24,293.9	95,915	69,086	165,000	6,834	42,986	26.1	18,692	25.3	14.7	44.8
2-28-10-29	9,200.1	57,868.6	122,513	53,733	176,246	9,200	57,869	32.8	0	47.2	32.8	47.2
3-28-10-29	8,166.5	51,367.3	174,097	39,916	214,014	8,167	51,370	24.0	3	29.5	24.0	29.5
4-28-10-29	12,321.7	77,503.5	145,081	23,029	168,110	15,377	96,721	57.5	19,218	53.4	46.1	66.7
5-28-10-29	1,883.5	11,847.2	130,573	63,328	193,902	1,884	11,847	6.1	0	9.1	6.1	9.1
6-28-10-29	4,894.0	30,783.3	96,721	53,733	150,454	7,788	48,987	32.6	18,203	31.8	20.5	50.6
11-28-10-29	4,418.5	27,792.4	96,721	42,987	139,707	6,513	40,967	29.3	13,174	28.7	19.9	42.4
12-28-10-29	6,872.3	43,226.8	112,841	69,853	182,694	6,872	43,227	23.7	0	38.3	23.7	38.3
9-29-10-29	3,854.8	24,246.7	120,901	53,733	174,634	5,315	33,431	19.1	9,185	20.1	13.9	27.7
Totals	94,335.3	593,369.0	2,113,752	948,392	3,062,145	112,053	704,810	23.0	111,441	28.1	19.4	33.3

TABLE NO.5												
KOLA UNIT NO.1												
2000 WATER INJECTION SUMMARY												
INJECTION WELL 13-21-10-29												
	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
TOTAL(m3)	476.0	451.8	479.4	461.6	480.9	457.0	479.0	489.2	481.3	496.2	467.5	504.6
DAILY(m3/day)	15.4	15.6	15.5	15.4	15.5	15.2	15.5	15.8	16.0	16.0	15.6	16.3
2000 AVERAGE ANNUAL DAILY INJECTION												
					15.7	m3/day						
CUMULATIVE INJECTION TO 99-12-31 =												
					34,412.7	m3						
TOTAL 2000 ANNUAL INJECTION =												
					5,724.5	m3						
CUMULATIVE INJECTION TO 2000-12-31												
					40,137.2	m3						

TABLE NO.6												
KOLA UNIT NO.1												
2000 WATER INJECTION SUMMARY												
INJECTION WELL 2-28-10-29												
	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
TOTAL(m3)	289.7	258.4	286.0	288.9	295.4	287.1	308.9	298.3	289.4	289.0	286.4	295.1
DAILY(m3/day)	9.3	8.9	9.2	9.6	9.5	9.6	9.9	9.6	9.6	9.3	9.5	9.5
2000 AVERAGE ANNUAL DAILY INJECTION												
					9.5	m3/day						
CUMULATIVE INJECTION TO 99-12-31 =												
					18,830.7	m3						
TOTAL 2000 ANNUAL INJECTION =												
					3,472.6	m3						
CUMULATIVE INJECTION TO 2000-12-31												
					22,303.3	m3						

TABLE NO.7												
KOLA UNIT NO.1												
2000 WATER INJECTION SUMMARY												
INJECTION WELL 12-28-10-29												
	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
TOTAL(m3)	194.3	200.8	198.1	185.2	204.8	210.8	225.1	222.7	215.2	229.1	226.1	233.3
DAILY(m3/day)	6.0	6.9	6.4	6.2	6.6	7.0	7.3	7.2	7.2	7.4	7.5	7.5
2000 AVERAGE ANNUAL DAILY INJECTION 6.9 m3/day												
CUMULATIVE INJECTION TO 99-12-31 = 4,318.6 m3												
TOTAL 2000 ANNUAL INJECTION = 2,545.5 m3												
CUMULATIVE INJECTION TO 2000-12-31 6,864.1 m3												

TABLE NO. 8

KOLA UNIT NO.1										INJH1321.XLS
INJECTION HISTORY WELL 13-21-10-29										
Year	Month	Oilj (m3/day)	Month Injection (m3)	Cum Injection (m3)	Pinj (psig)	Oilj (m3/day)	Pinj* Time (psig.days)	Cum. Injection (m3)	Cum. Pres* Chge Time (psig.days)	
1993	10	15.7	487.8	487.8	840	15.7	9,600	488	9,600	
	11	20.5	615.5	1,103.3	760	20.5	22,800	1,103	32,400	
	12	19.8	613.2	1,716.5	911	19.8	28,241	1,717	60,641	
1994	1	20.3	628.6	2,345.1	1,062	20.3	32,822	2,345	93,563	
	2	20.7	578.4	2,924.5	1,072	20.7	29,736	2,925	123,299	
	3	20.01	620.4	3,544.9	1,092	20.01	33,852	3,545	157,151	
	4	20.41	612.3	4,157.2	1,128	20.41	33,840	4,157	190,991	
	5	20.14	624.4	4,781.6	1,174	20.14	36,384	4,782	227,385	
	6	19.96	598.7	5,380.3	1,221	19.96	36,830	5,380	264,015	
	7	19.35	599.8	5,980.1	1,255	19.35	38,905	5,980	302,920	
	8	19.73	611.6	6,591.7	1,299	19.73	40,268	6,592	343,189	
	9	19.3	579	7,170.7	1,341	19.3	40,230	7,171	383,419	
	10	18.99	588.7	7,759.4	1,357	18.99	42,067	7,759	425,486	
	11	14.97	449.2	8,208.6	1,183	14.97	35,790	8,209	461,276	
	12	19.6	607.5	8,816.1	1,383	19.6	42,873	8,816	504,149	
1995	1	13.9	431.9	9,248.0	1,307	13.9	40,517	9,248	544,666	
	2	19.6	547.4	9,795.4	1,382	19.6	38,976	9,795	583,642	
	3	18.2	563.6	10,359.0	1,369	18.2	42,439	10,359	626,081	
	4	17.7	530.3	10,889.3	1,328	17.7	39,840	10,889	665,921	
	5	18.1	561.6	11,450.9	1,426	18.1	44,206	11,451	710,127	
	6	11.9	356.8	11,807.7	1,402	11.9	42,060	11,808	752,187	
	7	15.4	477	12,284.7	1,284	15.4	39,804	12,285	791,991	
	8	15.3	474.6	12,759.2	1,382	15.3	42,842	12,759	834,833	
	9	15.9	475.8	13,234.8	1,423	15.9	42,680	13,235	877,523	
	10	14.4	447.1	13,681.9	1,388	14.4	42,966	13,682	920,489	
	11	16.1	483.7	14,165.6	1,466	16.1	43,980	14,166	964,469	
	12	14.9	462.3	14,627.9	1,491	14.9	46,221	14,628	1,010,690	
1996	1	18.5	574.7	15,202.6	1,502	18.5	46,562	15,203	1,057,252	
	2	15.5	434.9	15,637.5	1,446	15.5	40,488	15,638	1,097,740	
	3	14.7	456.6	16,094.1	1,503	14.7	46,593	16,094	1,144,333	
	4	14.6	439.4	16,533.5	1,446	14.6	43,380	16,534	1,187,713	
	5	12.1	373.8	16,907.3	1,517	12.1	47,027	16,907	1,234,740	
	6	14	157.6	17,064.9	1,095	14	32,850	17,065	1,267,590	
	7	15.1	487.4	17,552.3	1,378	15.1	42,718	17,532	1,310,308	
	8	15.6	483.9	18,036.2	1,482	15.6	45,942	18,016	1,356,250	
	9	15.5	468.2	18,484.4	1,520	15.5	45,600	18,482	1,401,850	
	10	14.9	461.5	18,945.9	1,537	14.9	47,647	18,944	1,449,497	
	11	14.1	423.6	19,369.5	1,514	14.1	46,420	19,368	1,494,917	
	12	15.7	487.7	19,857.2	1,582	15.7	49,042	19,855	1,543,959	
1997	1	15.2	471.9	20,327.1	1,579	15.2	48,949	20,327	1,592,908	
	2	13.5	378.5	20,705.6	1,520	13.5	42,560	20,706	1,635,468	
	3	14.6	452.3	21,157.9	1,594	14.6	49,414	21,158	1,684,882	
	4	15.3	459.5	21,617.4	1,804	15.3	48,120	21,617	1,733,002	
	5	15.9	492.2	22,109.6	1,825	15.9	50,375	22,110	1,783,377	
	6	15.9	478.3	22,587.9	1,839	15.9	49,170	22,588	1,832,547	
	7	15.5	480.7	23,068.6	1,844	15.5	50,984	23,067	1,883,511	
	8	15.8	489.1	23,557.7	1,838	15.8	50,778	23,556	1,934,289	
	9	15.5	484.1	24,041.8	1,869	15.5	50,070	24,020	1,984,359	
	10	16	496.2	24,538.0	1,868	16	51,708	24,516	2,036,067	
	11	15.5	483.9	24,979.9	1,883	15.5	50,490	24,980	2,086,557	
	12	16.3	505.2	25,485.1	1,700	16.3	52,700	25,485	2,139,257	
1998	1	15.7	488	25,973.1	1,678	15.7	52,018	25,973	2,191,275	
	2	10.6	297.5	26,270.6	1,853	10.6	46,284	26,271	2,237,559	
	3	9.9	305.8	26,576.4	1,468	9.9	45,508	26,576	2,283,067	
	4	7.4	221.5	26,797.9	1,323	7.4	39,690	26,798	2,322,757	
	5	12.9	402	27,199.9	1,038	12.9	32,178	27,200	2,354,935	
	6	8.4	251.8	27,451.7	1,343	8.4	40,290	27,452	2,395,225	
	7	14.5	450.5	27,902.2	1,409	14.5	43,879	27,902	2,438,904	
	8	12.4	384.4	28,286.6	1,168	12.4	38,208	28,287	2,475,112	
	9	9.2	277.4	28,564.0	1,297	9.2	38,910	28,564	2,514,022	
	10	5.6	173.5	28,737.5	1,382	5.6	42,842	28,738	2,556,864	
	11	0	0	28,737.5	1,200	0	36,000	28,738	2,592,864	
	12	13.9	429.6	29,167.1	1,275	13.9	39,525	29,167	2,632,389	
1999	1	15.7	485.5	29,652.6	1,431	15.7	44,361	29,653	2,676,750	
	2	15.5	432.9	30,085.5	1,495	15.5	43,355	30,086	2,720,105	
	3	15.4	476.6	30,562.1	1,535	15.4	47,585	30,562	2,767,690	
	4	8.4	252.5	30,814.6	1,503	8.4	45,090	30,815	2,812,780	
	5	14.2	438.8	31,253.4	1,466	14.2	45,446	31,253	2,858,226	
	6	14.9	447.5	31,700.9	1,576	14.9	47,280	31,701	2,905,506	
	7	15.7	487	32,187.9	1,600	15.7	49,600	32,188	2,955,106	
	8	14.7	456.9	32,644.8	1,606	14.7	49,788	32,645	3,004,892	
	9	11.8	355.4	33,000.2	1,616	11.8	48,480	33,000	3,053,372	
	10	12.8	395.4	33,395.6	1,561	12.8	48,391	33,396	3,101,763	
	11	18.1	481.6	33,877.2	1,623	18.1	48,690	33,877	3,150,453	
	12	15.8	535.5	34,412.7	1,642	15.8	50,902	34,413	3,201,355	
2000	1	15.4	476	34,888.7	1,652	15.4	51,212	34,889	3,252,567	
	2	15.6	451.8	35,340.5	1,658	15.6	48,082	35,341	3,300,649	
	3	15.5	479.4	35,819.9	1,667	15.5	51,677	35,820	3,352,326	
	4	15.4	481.6	36,281.5	1,665	15.4	49,950	36,282	3,402,276	
	5	15.5	480.9	36,762.4	1,680	15.5	52,080	36,762	3,454,356	
	6	15.2	457	37,219.4	1,678	15.2	50,340	37,219	3,504,696	
	7	15.5	479	37,698.4	1,678	15.5	52,018	37,698	3,556,714	
	8	15.8	489.2	38,187.6	1,704	15.8	52,824	38,188	3,609,538	
	9	16	481.3	38,668.9	1,714	16	51,420	38,669	3,660,958	
	10	16	496.2	39,165.1	1,725	16	53,475	39,165	3,714,433	
	11	15.6	487.5	39,652.6	1,688	15.6	50,840	39,633	3,765,073	
	12	16.3	504.6	40,157.2	1,719	16.3	53,289	40,137	3,818,362	

TABLE NO.9

TABLE NO.9										
KOLA UNIT NO.1										
WELL 2-28-10-28 INJECTION HISTORY										
Year	Month	Qinj (m3/day)	Month Injection (m3)	Cum Injection (m3)	Pinj (psig)	Qinj (m3/day)	Pinj Time (psig.days)	Cum. Injection (m3)	Cum. Pres* Chge Time (psig.days)	
1995	9	22.44	673.3	673.3	614	22.44	18,420	673	18,420	
	10	22.19	687.8	1,361.1	1,018	22.19	30,540	1,361	48,960	
	11	19.23	577	1,938.1	944	18.23	24,544	1,938	73,504	
	12	13.51	418.9	2,357.0	979	13.51	14,686	2,367	88,189	
1996	1	18.5	572.3	2,929.3	1107	18.5	34,317	2,929	122,506	
	2	18.9	530.1	3,459.4	1237	18.9	34,636	3,469	157,142	
	3	18.9	588.3	4,047.7	1280	18.9	39,680	4,048	186,822	
	4	17	511.9	4,559.6	1322	17	39,680	4,560	236,482	
	5	17	127.3	4,686.9	1339	17	41,508	4,687	277,991	
	6	15.7	470.1	5,157.0	1241	15.7	37,230	5,157	315,221	
	7	15.1	487.1	5,624.1	1361	15.1	42,181	5,624	367,412	
	8	14.7	455.1	6,079.2	1400	14.7	43,400	6,079	400,812	
	9	13.8	415	6,494.2	1394	13.8	41,820	6,494	442,632	
	10	11.9	369.2	6,863.4	1387	11.9	42,987	6,863	485,628	
	11	12.6	379.4	7,242.8	1386	12.6	41,850	7,243	527,479	
	12	12.4	363.8	7,606.6	1348	12.4	41,788	7,627	569,267	
1997	1	12.8	386.4	8,023.0	1298	12.8	40,238	8,023	609,505	
	2	10.7	300.9	8,323.9	1256	10.7	36,168	8,324	644,673	
	3	12.3	382	8,705.9	1273	12.3	39,463	8,708	684,136	
	4	12.1	362.2	9,068.1	1271	12.1	38,130	9,088	722,266	
	5	12.4	385.6	9,453.7	1297	12.4	40,207	9,454	762,473	
	6	12.8	384.8	9,838.5	1337	12.8	40,110	9,839	802,583	
	7	12.1	375.2	10,213.7	1326	12.1	41,106	10,214	843,689	
	8	12.9	400.6	10,614.3	1347	12.9	41,757	10,614	885,446	
	9	13.1	391.9	11,006.2	1386	13.1	41,880	11,006	927,326	
	10	13.6	422.2	11,428.4	1427	13.6	44,237	11,428	971,563	
	11	12.4	372.6	11,801.0	1383	12.4	41,490	11,801	1,013,063	
	12	11.8	369.9	12,170.9	1323	11.9	41,013	12,171	1,054,066	
1998	1	12.1	373.9	12,544.8	1318	12.1	40,858	12,545	1,094,924	
	2	8.4	236.3	12,781.1	1338	8.4	37,464	12,781	1,132,388	
	3	8.1	283.8	13,064.7	1324	9.1	41,044	13,065	1,173,432	
	4	12.4	370.5	13,435.2	1315	12.4	38,450	13,435	1,212,882	
	5	10.6	327.2	13,762.4	1316	10.8	40,796	13,762	1,253,678	
	6	9.3	279.3	14,041.7	1215	9.3	36,450	14,042	1,290,128	
	7	9.6	299.1	14,340.8	1218	9.6	37,758	14,341	1,327,886	
	8	7	217.1	14,557.9	1212	7	37,572	14,558	1,365,458	
	9	7.7	231.3	14,789.2	1221	7.7	36,630	14,789	1,402,088	
	10	9.9	307.6	15,096.8	1210	9.9	37,510	15,097	1,439,588	
	11	9.8	294.6	15,391.4	1230	9.8	36,900	15,391	1,476,488	
	12	9.4	291.6	15,683.0	1212	9.4	37,572	15,683	1,514,070	
1999	1	8.7	300.2	15,983.2	1222	9.7	37,882	15,983	1,551,952	
	2	8.9	276.1	16,259.3	1224	9.9	36,486	16,259	1,587,448	
	3	8.9	277.1	16,536.4	1190	8.9	36,880	16,536	1,624,338	
	4	8.5	288.2	16,822.6	1200	8.5	36,000	16,823	1,660,338	
	5	9.3	286.7	17,111.3	1203	9.3	37,283	17,111	1,697,631	
	6	9.5	284.6	17,395.9	1204	9.5	36,120	17,396	1,733,751	
	7	9.5	294.1	17,690.0	1206	9.5	37,386	17,690	1,771,137	
	8	9.3	287.5	17,977.5	1224	9.3	37,844	17,878	1,809,081	
	9	0	0	17,977.5	1227	0	36,810	17,978	1,845,891	
	10	9.1	282.2	18,259.7	1272	9.1	39,432	18,260	1,885,323	
	11	9.4	283.2	18,542.9	1246	9.4	37,380	18,543	1,922,703	
	12	9.5	287.8	18,830.7	1240	9.5	38,440	18,831	1,961,143	
2000	1	9.3	289.7	19,120.4	1245	9.3	38,595	19,120	1,999,738	
	2	8.9	258.4	19,378.8	1243	8.9	36,047	19,379	2,035,785	
	3	9.2	266	19,644.8	1250	9.2	38,750	19,665	2,074,535	
	4	9.6	288.9	19,953.7	1272	9.6	38,180	19,954	2,112,886	
	5	9.5	285.4	20,249.1	1280	9.5	39,680	20,249	2,152,375	
	6	9.6	287.1	20,536.2	1281	9.6	38,730	20,536	2,191,105	
	7	9.9	308.9	20,845.1	1325	9.9	41,075	20,845	2,232,180	
	8	9.6	288.3	21,133.4	1309	9.6	40,579	21,143	2,272,759	
	9	9.6	289.4	21,422.8	1313	9.6	39,390	21,433	2,312,149	
	10	9.3	289	21,711.8	1281	9.3	39,711	21,722	2,351,860	
	11	9.5	286.4	22,008.2	1282	9.5	38,480	22,008	2,390,320	
	12	9.5	285.1	22,303.3	1275	9.5	39,525	22,303	2,429,845	

TABLE NO. 10

KOLA UNIT NO.1											
WELL 12-28-10-29 INJECTION HISTORY											
Year	Month	Qinj (m3/day)	Month Injection (m3)	Cum. Injection (m3)	Pinj (psig)	Qinj (m3/day)	Pinj*Time (psig.days)	Cum. Injection (m3)	Cum.Pres*Chge Time (psig.days)		
1998	1	-	-	-	-	-	-	-	-		
	2	-	-	-	-	-	-	-	-		
	3	-	-	-	-	-	-	-	-		
	4	-	-	-	-	-	-	-	-		
	5	-	-	-	-	-	-	-	-		
	6	3.5	105.2	105.2	50	3.5	1,500	105.2	1,500		
	7	5.5	169.7	274.9	70	5.5	2,170	274.9	3,670		
	8	8.5	262.3	537.2	481	8.5	14,911	537.2	18,581		
	9	6	181.2	718.4	587	6	17,610	718.4	36,191		
	10	8.7	268.6	987.0	642	8.7	19,902	987.0	56,093		
	11	9.6	288	1,275.0	756	9.6	22,680	1,275.0	78,773		
1999	12	8.2	253.1	1,528.1	795	8.2	24,845	1,528.1	103,418		
	1	6.9	216.6	1,744.7	808	6.9	25,048	1,744.7	128,466		
	2	5.9	164	1,908.7	795	5.9	22,260	1,908.7	150,726		
	3	6.4	198.5	2,107.2	786	6.4	24,366	2,107.2	175,092		
	4	8.8	263.4	2,370.6	734	8.8	22,020	2,370.6	197,112		
	5	8.3	257.8	2,628.4	738	8.3	22,878	2,628.4	219,990		
	6	8.4	251.9	2,880.3	753	8.4	22,590	2,880.3	242,580		
	7	8.3	256.4	3,136.7	75	8.3	2,325	3,136.7	244,905		
	8	7.9	244.2	3,380.9	746	7.9	23,126	3,380.9	268,031		
	9	8.2	245.2	3,626.1	722	8.2	21,660	3,626.1	289,691		
	10	7.8	241.7	3,867.8	730	7.8	22,630	3,867.8	312,321		
	11	7.9	235.8	4,103.6	758	7.9	22,740	4,103.6	335,061		
2000	12	6.9	215	4,318.6	756	6.9	23,436	4,318.6	358,497		
	1	6	194.3	4,512.9	778	6	24,118	4,512.9	382,615		
	2	6.9	200.8	4,713.7	783	6.9	21,924	4,713.7	404,539		
	3	6.4	198.1	4,911.8	783	6.4	24,273	4,911.8	428,812		
	4	6.2	185.2	5,097.0	788	6.2	23,640	5,097.0	452,452		
	5	6.6	204.8	5,301.8	774	6.6	23,994	5,301.8	476,446		
	6	7	210.8	5,512.6	759	7	22,770	5,512.6	499,216		
	7	7.3	225.1	5,737.7	760	7.3	23,560	5,737.7	522,776		
	8	7.2	222.7	5,960.4	789	7.2	23,839	5,960.4	546,615		
	9	7.2	215.2	6,175.6	770	7.2	23,100	6,175.6	569,715		
	10	7.4	229.1	6,404.7	766	7.4	23,746	6,404.7	593,461		
	11	7.5	226.1	6,630.8	772	7.5	23,160	6,630.8	616,621		
	12	7.5	233.3	6,864.1	763	7.5	23,653	6,864.1	640,274		

TABLE NO.11									
KOLA UNIT NO.1									
VOIDAGE CALCULATIONS									
FROM JAN 1, 2000 TO DEC. 31, 2000									
OIL FORMATION VOLUME FACTOR = 1.063 Rm3									
MONTH	OIL PRODUCTION	WATER PRODUCTION	OUT OF ZONE WATER	ADJUSTED WATER PRODUCTION	OIL VOIDAGE	TOTAL VOIDAGE	TOTAL INJECTION	NET VOIDAGE	VOIDAGE REPLACEMENT RATIO
	m3	m3	m3	m3	Rm3	Rm3	Rm3	Rm3	VRR
JAN.	207.3	1,388.2	1,017	371	220.4	591.5	960.0	-368.54	1.62
FEB.	184.1	1,265.8	926	340	195.7	535.8	911	-375.20	1.70
MARCH	189.8	1,352.8	989	364	201.8	565.6	963.5	-397.94	1.70
APRIL	190.1	1,284.2	940	344	202.1	546.0	935.7	-389.72	1.71
MAY	197.8	1,380.0	1,003	377	210.3	587.5	981.1	-393.64	1.67
JUNE	171.4	1,303.2	941	362	182.2	544.3	954.9	-410.60	1.75
JULY	180.9	1,341.2	959	382	192.3	574.6	1,013.00	-438.40	1.76
AUG.	181.5	1,324.8	942	383	192.9	575.4	1010.2	-434.77	1.76
SEPT.	160.7	1,287.6	921	366	170.8	537.1	985.9	-448.78	1.84
OCT.	166.7	1,287.7	925	362	177.2	539.5	1014.3	-474.80	1.88
NOV.	160.9	1,253.0	900	353	171.0	524.1	980.00	-455.86	1.87
DEC.	165.3	1,280.1	918	362	175.7	538.0	1033	-494.99	1.92
TOTAL	2,156.5	15,748.6	31,380.9	4,367	2,292.4	6,659.4	11,742.6	-5,083.2	1.76
CUM. POOL VOIDAGE (to 2000.12.31) =									
CUM. POOL INJECTION (2000.12.31) =									
CUM. NET VOIDAGE (2000.12.31) =									
CUMULATIVE VRR (2000.12.31) =									

TABLE NO.13									
KOLA UNIT NO.1									
INITIAL AREA OF WATERFLOODING									
VOIDAGE CALCULATIONS									
FROM JAN 1, 2000 TO DEC. 31, 2000									
OIL FORMATION VOLUME FACTOR = 1.063 Rm3									
MONTH	OIL PRODUCTION	WATER PRODUCTION	OUT OF ZONE WATER	ADJUSTED WATER PRODUCTION	OIL VOIDAGE	TOTAL VOIDAGE	TOTAL INJECTION	NET VOIDAGE	VOIDAGE REPLACEMENT RATIO
	m3	m3	m3	m3	Rm3	Rm3	Rm3	Rm3	VRR
JAN.	125.7	597.8	308	290	133.6	423.4	765.7	-342.28	1.81
FEB.	124.2	541.9	278	264	132.0	395.9	710.2	-314.28	1.79
MARCH	130.9	580.5	298	283	139.1	421.6	765.4	-343.75	1.82
APRIL	129.4	549.7	282	268	137.6	405.3	750.5	-345.25	1.85
MAY	132.5	587.4	293	294	140.8	435.2	776.3	-341.05	1.78
JUNE	118	579.8	294	286	125.4	411.2	744.1	-332.87	1.81
JULY	115.4	589	285	304	122.7	426.7	787.9	-361.23	1.85
AUG.	118.6	581.9	277	305	126.1	431.0	787.5	-356.53	1.83
SEPT.	103	567	276	291	109.5	400.5	770.7	-370.21	1.92
OCT.	109.2	566.1	280	286	116.1	402.2	785.2	-383.02	1.95
NOV.	111.2	547.3	269	278	118.2	396.5	753.9	-357.39	1.90
DEC.	113.7	567.5	280	288	120.9	408.4	799.7	-391.34	1.96
TOTAL	1,431.8	6,855.9	3,420	3,435.9	1,522.0	4,957.9	9,197.1	-4,239.2	1.86
CUM. POOL VOIDAGE (to 2000.12.31) =									
CUM. POOL INJECTION (2000.12.31) =									
CUM. NET VOIDAGE (2000.12.31) =									
CUMULATIVE VRR (2000.12.31) =									

Note: Total out of zone water at 6-28 is estimated at 90%.
Total out of zone water at 1-28 is estimated at 50%

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FIGURES**

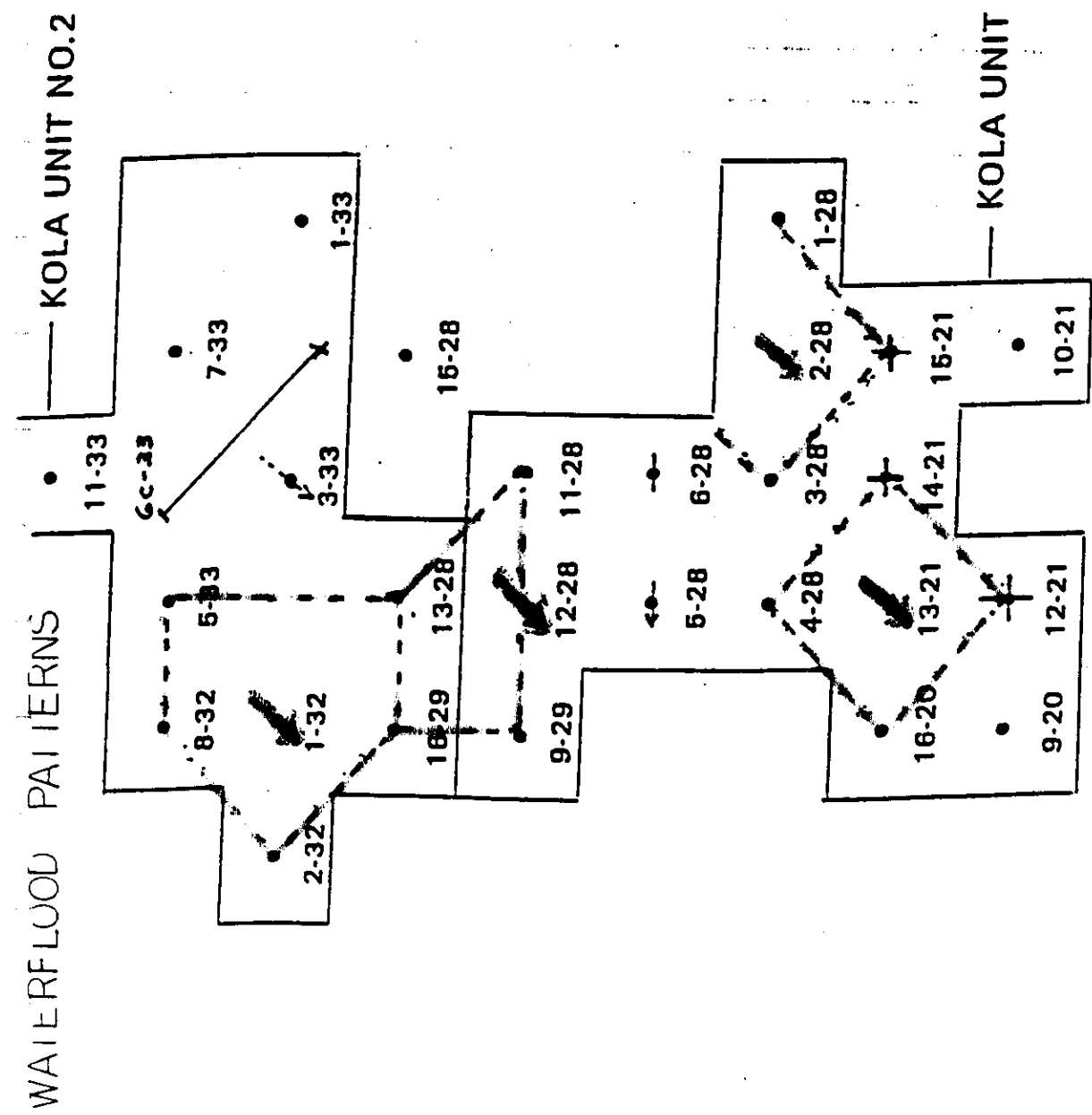


FIGURE NO.2

Operator: kofu Date: 10/95-12/00
 Field: Avg Daily Oil FC 1 (Rate-Time)
 Zone: qf: 6.1793 m3/d, Jan, 1998
 Type: CH qf: 1.4808 m3/d, Jul, 2017
 Group: kofu1 d(FC): 7.3354 CTD: 9435.3 m3
 RR: 1723.6 m3 For 12059 m3
 Production Cum: 0 m3
 Oil: 9435.3 m3
 Gas: 0 m3
 Water: 15625 m3
 Cond: 0 m3

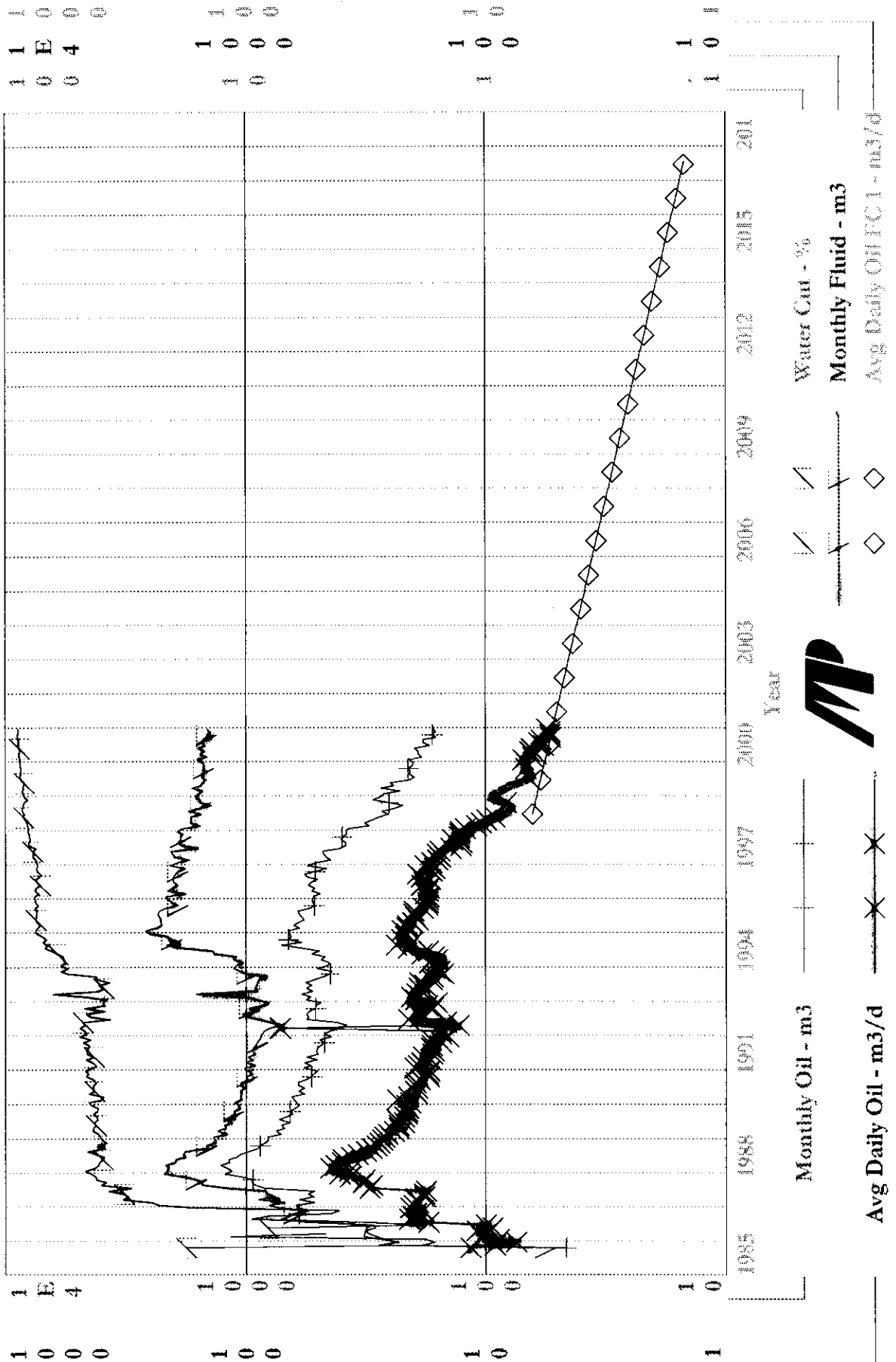


FIGURE NO.3
INJECTION PRESSURE AND INJECTION RATE PROFILE 13-21-10-29

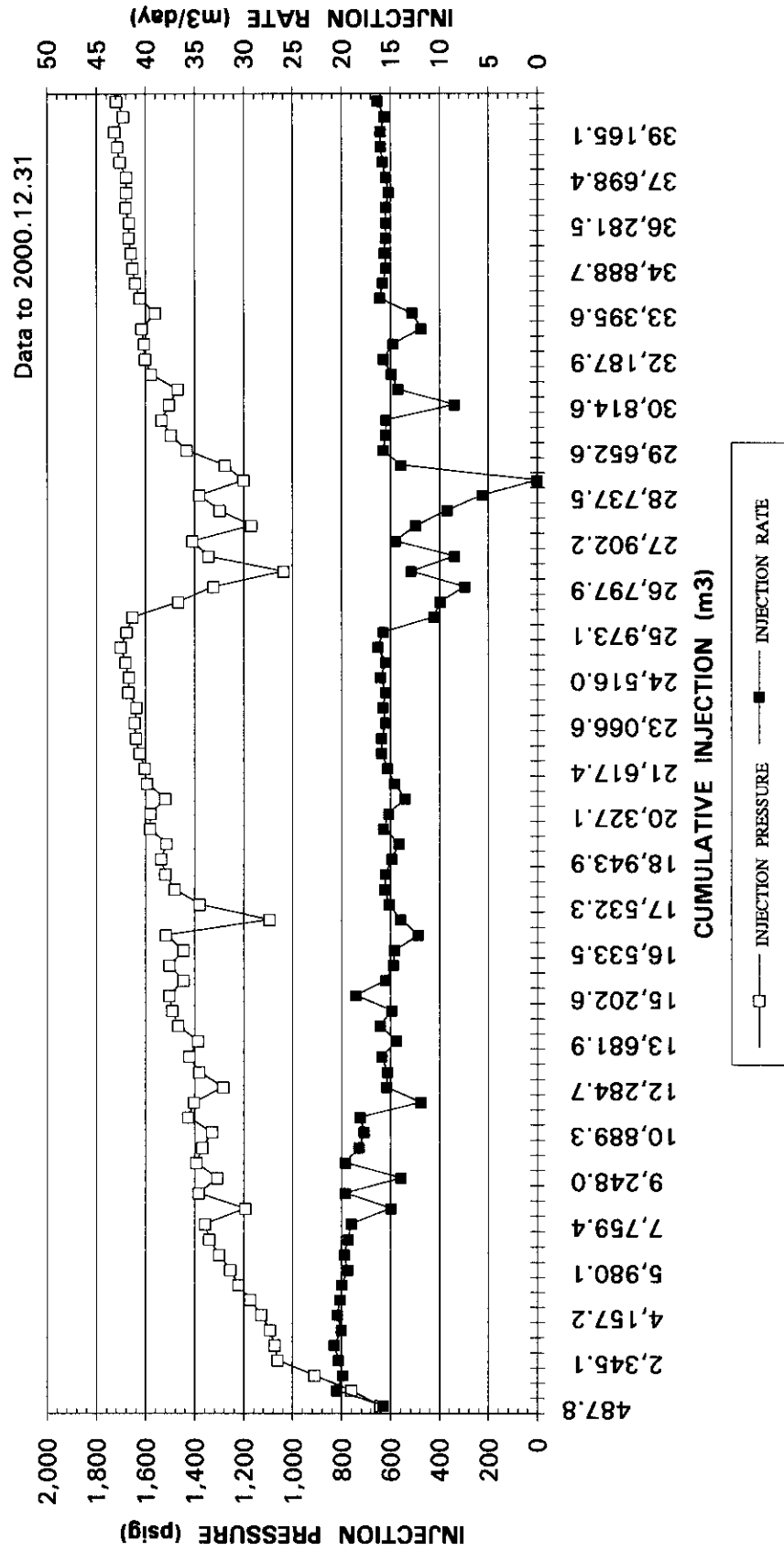


FIGURE NO.4
INJECTION PRESSURE AND INJECTION RATE PROFILE 2-28-10-29

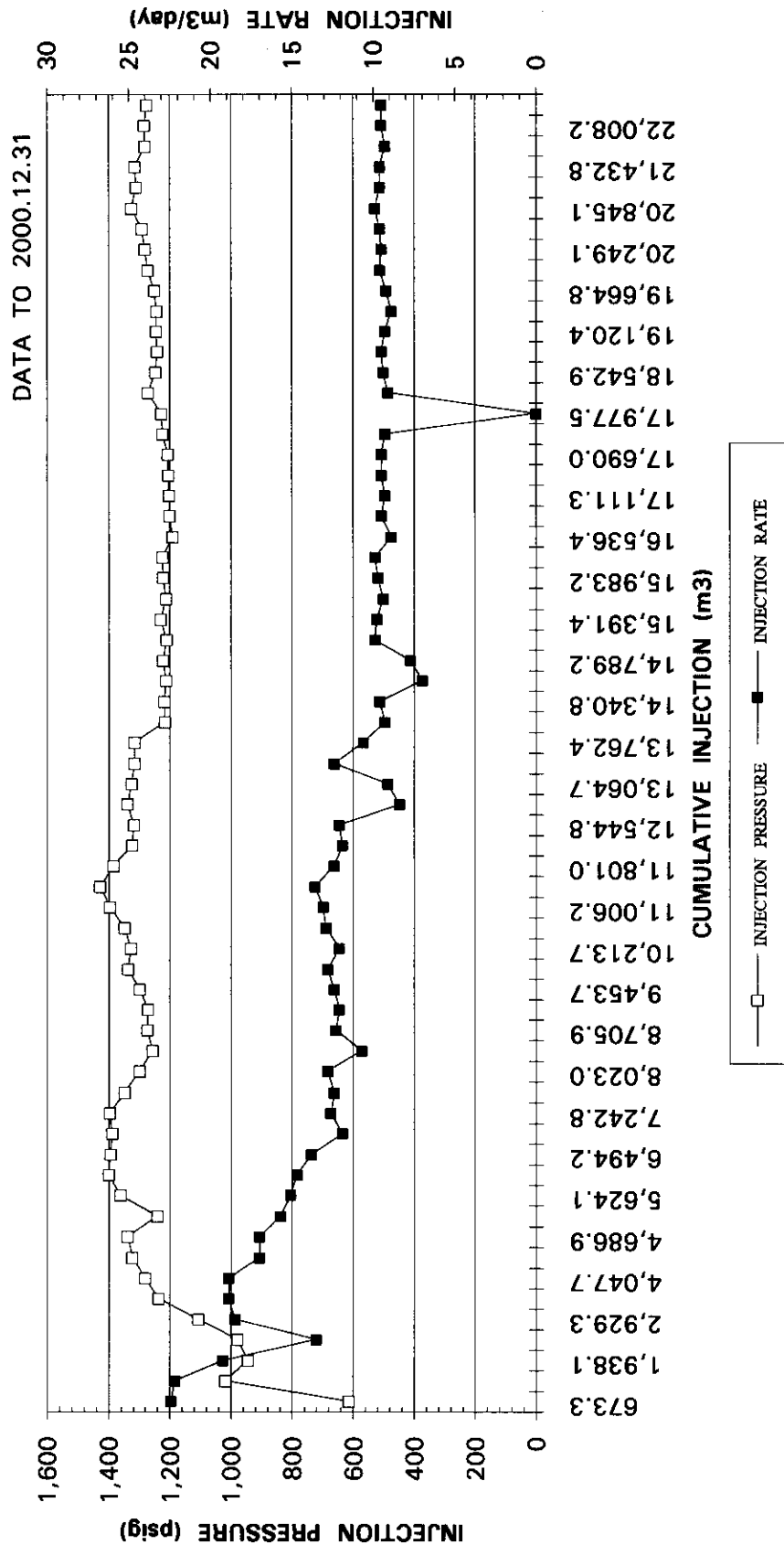


FIGURE NO.5
INJECTION PRESSURE AND INJECTION RATE PROFILE 12-28-10-29

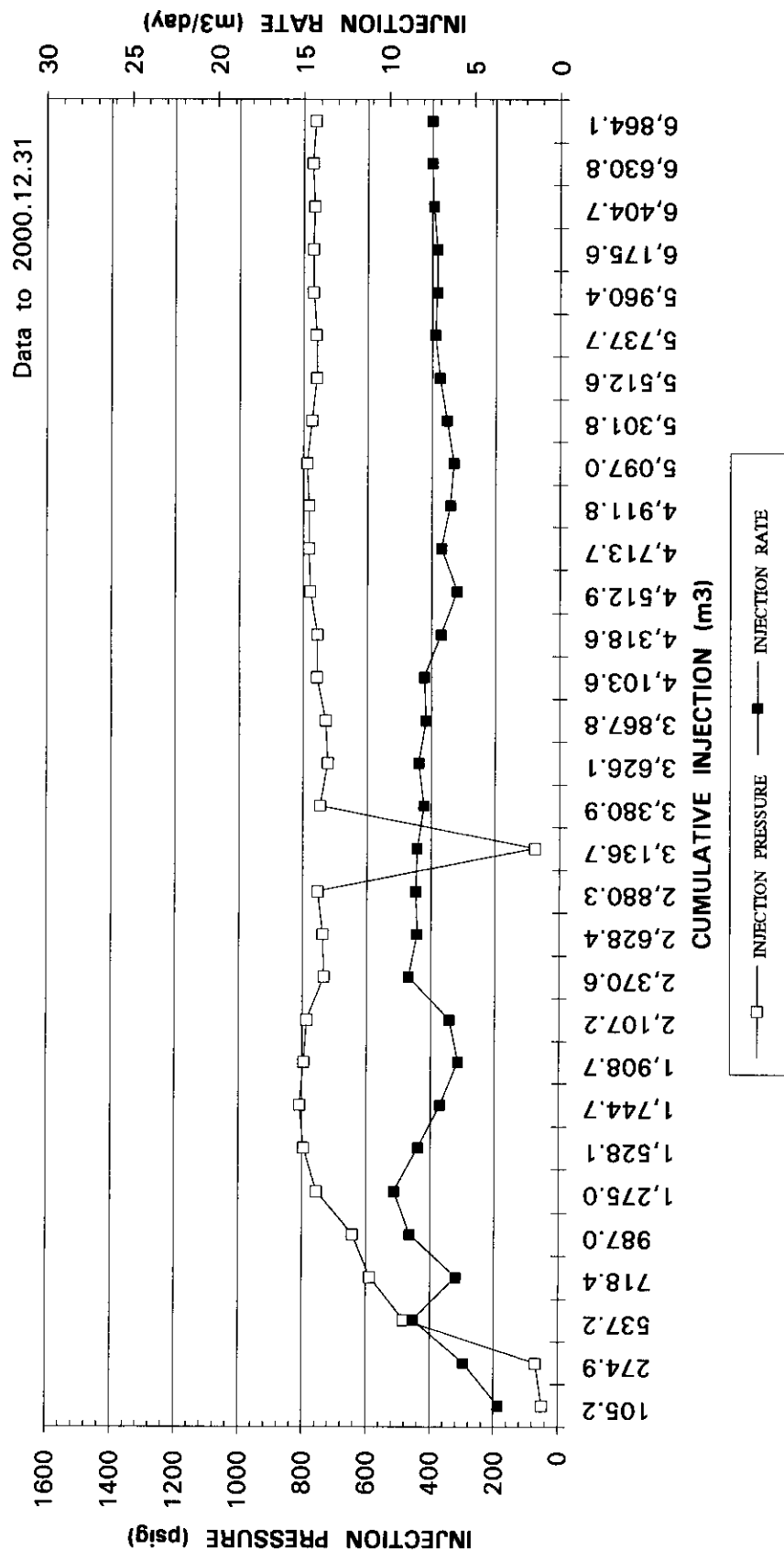


FIGURE NO.6
HALL PLOT INJECTION WELL 13-21-10-29

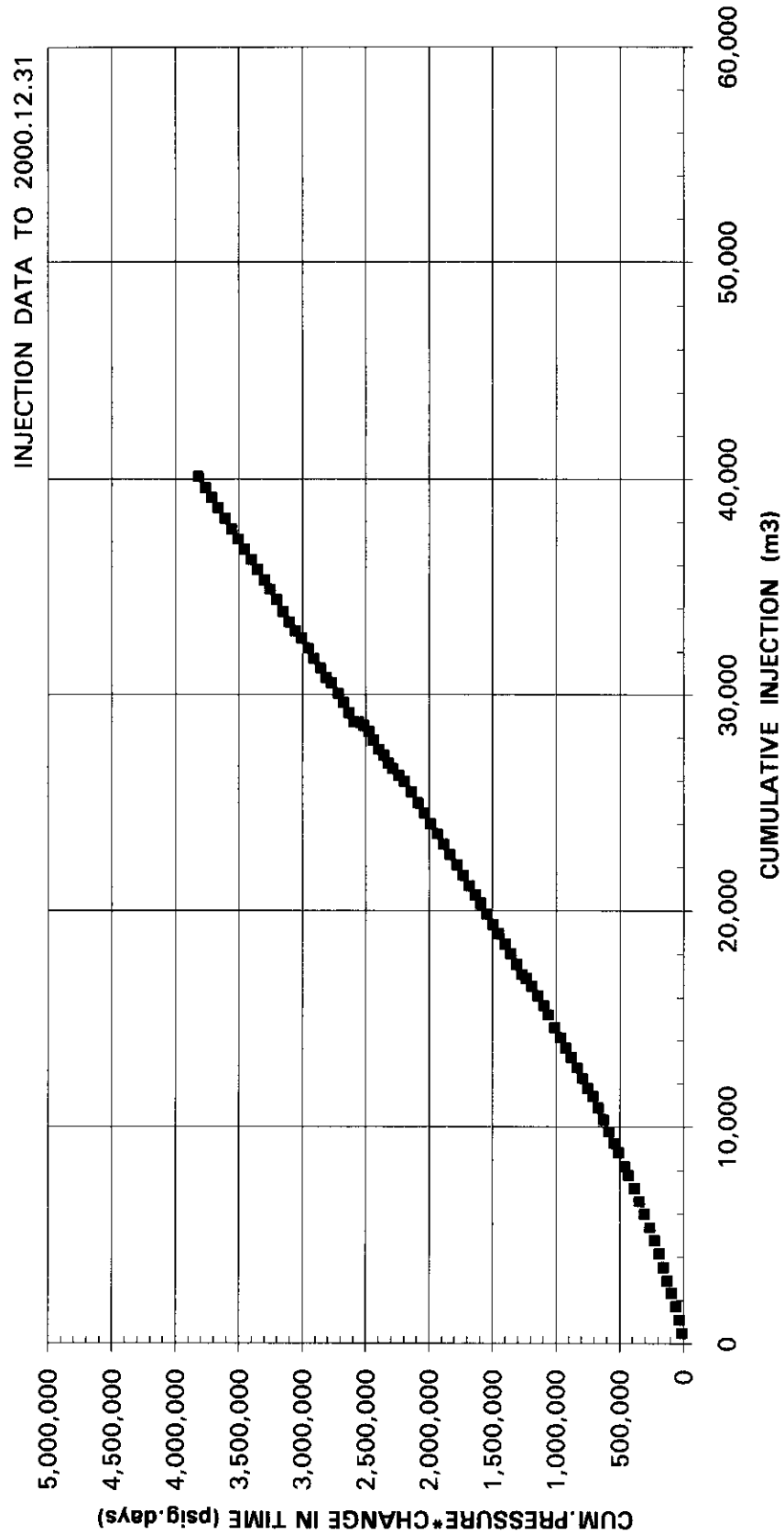


FIGURE NO.7
HALL PLOT INJECTION WELL 2-28-10-29

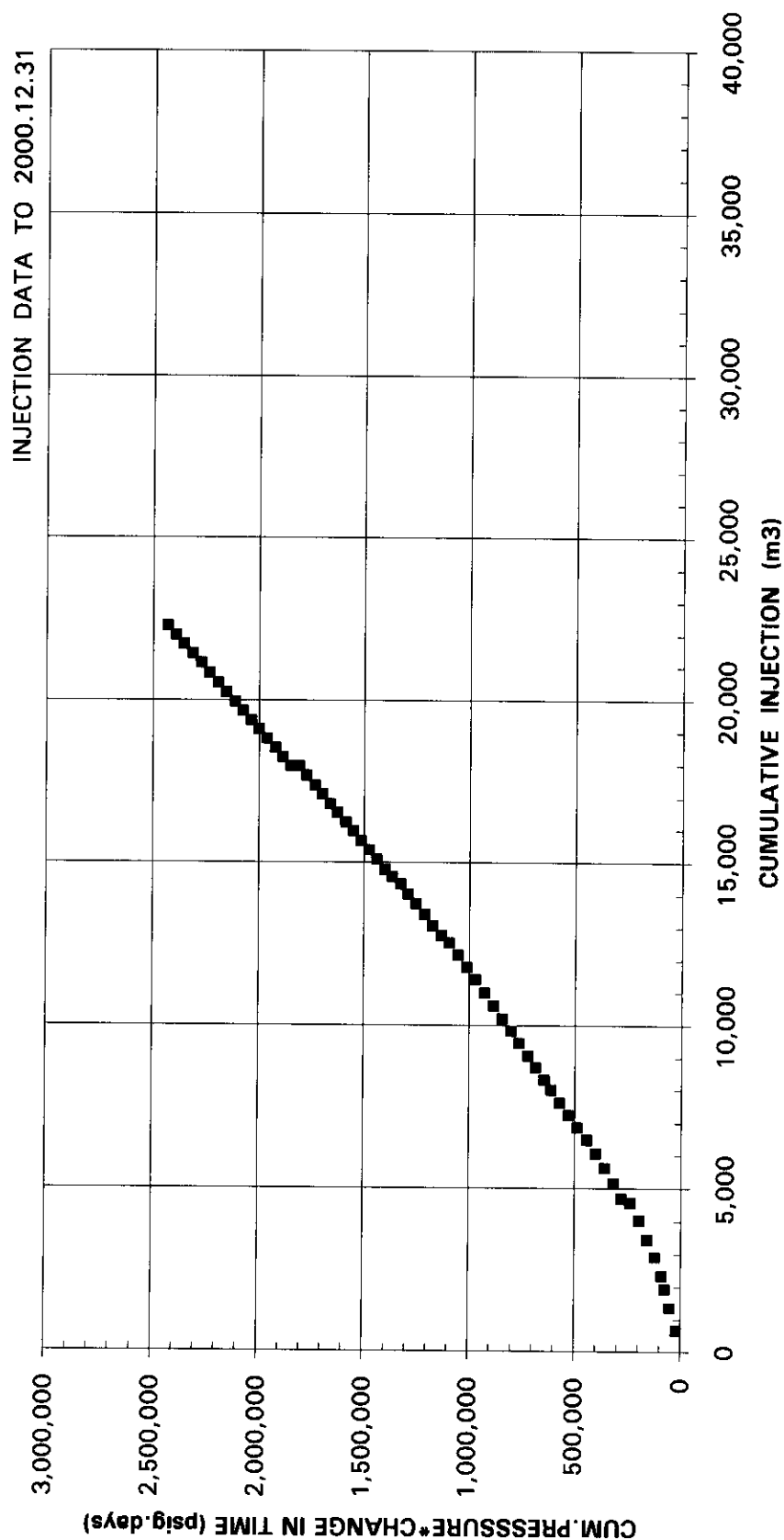
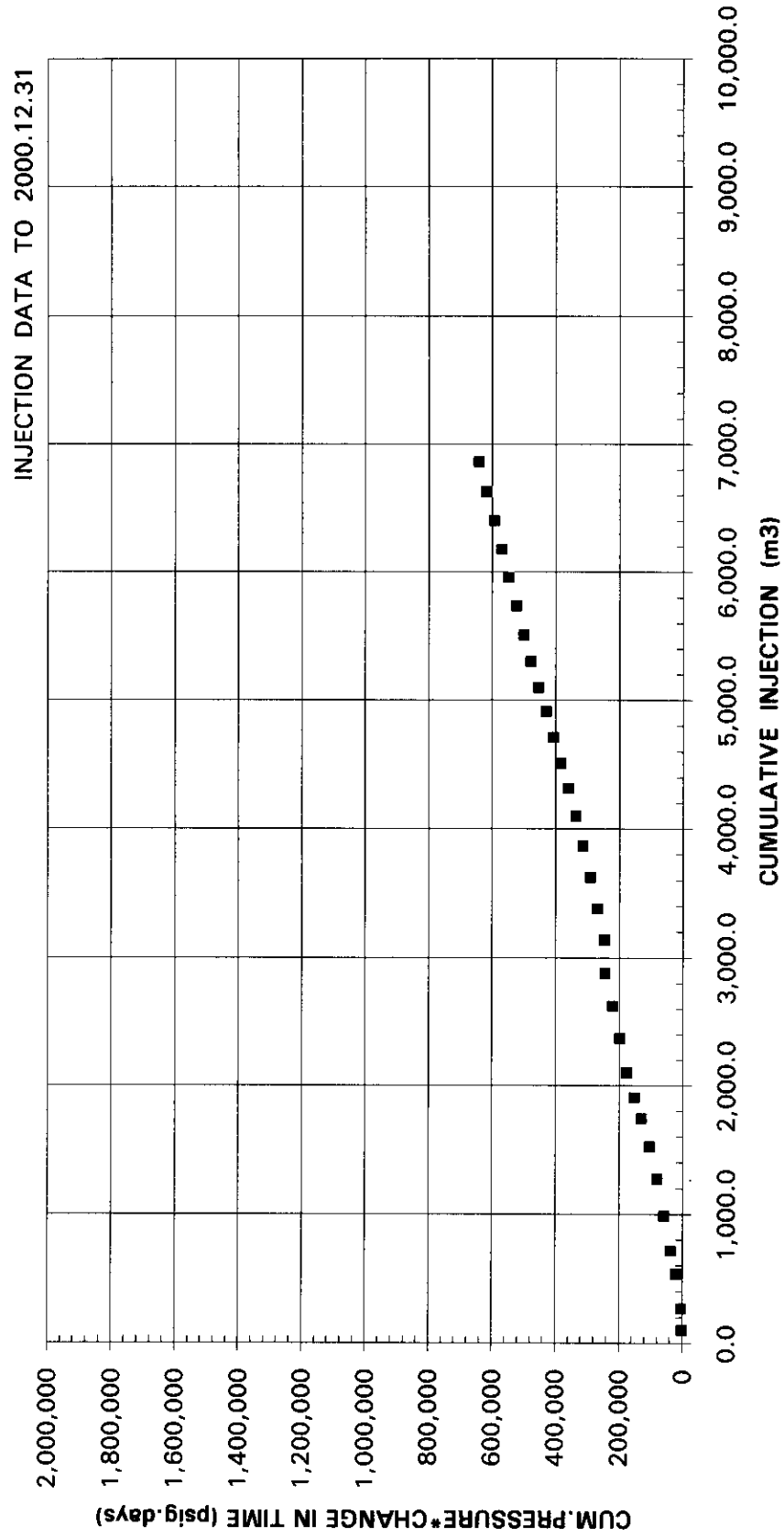


FIGURE NO.8
HALL PLOT INJECTION WELL 12-28-10-29



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APPENDICES

APPENDIX A

HISTORICAL UNIT PRODUCTION DATA

Production Report

Group : kolaun1	Date : 7/28/6 5:11:41 am
Well : kolau	User : George
: 000000003	
Hist.Data : 10/85-12/00	On Prod : 02/09
Operator :	Status : Oil
Field :	Zone :

Production Data from October, 1985 to December, 2000

Year	Monthly Oil m3	Cum Oil m3	Avg Daily Oil m3/d	Water Cut %	Monthly Water m3	Cum Water m3
Oct., 1985	46.1999	46.1999	11.55	17.787	9.99984	9.99984
Nov., 1985	273.3	319.5	9.10999	1.83113	5.10008	15.0999
Dec., 1985	230.2	549.7	7.42581	1.62307	3.79962	18.8995
Jan., 1986	265.099	814.799	8.78782	1.77766	4.79995	23.6995
Feb., 1986	285.401	1100.2	10.3625	11.6091	37.5006	61.2001
Mar., 1986	307.5	1407.7	9.91934	4.67898	15.1008	76.3008
Apr., 1986	316.901	1724.6	10.8497		0	76.3008
May., 1986	288.9	2013.5	9.31935	8.13665	25.6001	101.901
Jun., 1986	293.199	2306.7	9.95302	1.80754	5.39964	107.301
Jul., 1986	532.699	2839.4	17.2534	3.16167	17.3998	124.7
Aug., 1986	645.401	3484.8	20.8194	9.46466	67.5006	192.201
Sep., 1986	602.7	4087.5	20.09	8.16361	53.5994	245.8
Oct., 1986	602.9	4690.4	19.4484	4.40592	27.7998	273.6
Nov., 1986	548.499	5238.9	18.2833	4.08992	23.4001	297
Dec., 1986	612.601	5851.5	20.5916	16.5334	121.4	418.4
Jan., 1987	616.9	6468.4	19.9	22.8991	183.301	601.701
Feb., 1987	520.9	6989.3	19.1449	24.6519	170.5	772.201
Mar., 1987	598.701	7588	19.5229	32.4245	287.399	1059.6
Apr., 1987	523.399	8111.4	17.894	30.8037	233.101	1292.7
May., 1987	551.001	8662.4	18.041	32.1081	260.699	1553.4
Jun., 1987	518.899	9181.3	17.6646	37.3434	309.4	1862.8
Jul., 1987	839.502	10020.8	30.3892	29.9624	359.3	2222.1
Aug., 1987	910.099	10930.9	29.6771	39.8971	604.401	2826.5
Sep., 1987	945.501	11876.4	32.5101	38.1398	583.202	3409.7
Oct., 1987	939.2	12815.6	31.8823	41.8453	676.101	4085.8
Nov., 1987	1052.4	13868	36.7651	41.9834	761.899	4847.7
Dec., 1987	1224.7	15092.7	40.7667	44.1381	968.098	5815.8
Jan., 1988	1144.2	16236.9	36.9594	46.5642	997.499	6813.3
Feb., 1988	1203.8	17440.7	44.5165	42.5369	891.503	7704.8
Mar., 1988	1279.6	18720.3	42.2427	40.9944	889.401	8594.21
Apr., 1988	1172.6	19892.9	39.7492	40.6592	803.798	9398
May., 1988	1183.5	21076.4	39.45	39.3221	767.3	10165.3
Jun., 1988	1091.5	22167.9	36.3833	38.8787	694.6	10859.9
Jul., 1988	1056.1	23224	34.1135	42.1399	769.501	11629.4
Aug., 1988	973.2	24197.2	31.606	45.7386	820.701	12450.1
Sep., 1988	891.299	25088.5	29.876	38.5461	559.301	13009.4
Oct., 1988	872.899	25961.4	28.4641	40.2998	589.499	13598.9

Production Report

Group : kolaunl
Well : kolau
: 000000003

Date : 7/28/6 5:11:41 am
User : George

Production Data from October, 1985 to December, 2000 (cont.)

Year	Monthly Oil m3	Cum Oil m3	Avg Daily Oil m3/d	Water Cut %	Monthly Water m3	Cum Water m3
Nov., 1988	829.7	26791.1	27.6951	37.9421	507.501	14106.4
Dec., 1988	809.701	27600.8	26.9153	39.5145	529.201	14635.6
Jan., 1989	811.799	28412.6	26.4	40.3377	549.099	15184.7
Feb., 1989	712.1	29124.7	25.6228	40.6675	488.3	15673
Mar., 1989	747.3	29872	24.1064	43.2078	568.8	16241.8
Apr., 1989	690.2	30562.2	23.0067	43.0938	522.902	16764.7
May., 1989	713.501	31275.7	23.0471	42.0847	518.7	17283.4
Jun., 1989	656.9	31932.6	21.8967	42.6881	489.5	17772.9
Jul., 1989	726.899	32659.5	23.5433	41.3353	512.401	18285.3
Aug., 1989	675.099	33334.6	21.9247	41.7057	483.202	18768.5
Sep., 1989	637.798	33972.4	21.3191	42.9715	480.798	19249.3
Oct., 1989	656.9	34629.3	21.1903	41.416	464.6	19713.9
Nov., 1989	622.101	35251.4	21.0288	41.0281	433	20146.9
Dec., 1989	601.9	35853.3	21.3692	43.9045	471.3	20618.2
Jan., 1990	615.598	36468.9	20.5771	44.9857	503.602	21121.8
Feb., 1990	628.999	37097.9	23.2963	39.3045	407.5	21529.3
Mar., 1990	643.1	37741	20.9422	39.0957	413.001	21942.3
Apr., 1990	572.098	38313.1	19.2571	45.0851	469.899	22412.2
May., 1990	604.699	38917.8	19.6917	42.6499	449.899	22862.1
Jun., 1990	571.199	39489	19.2539	43.2437	435.4	23297.5
Jul., 1990	604.199	40093.2	19.7289	43.0645	457.201	23754.7
Aug., 1990	607.099	40700.3	19.5838	41.9047	438.099	24192.8
Sep., 1990	562.502	41262.8	18.7501	42.7372	419.999	24612.8
Oct., 1990	532.3	41795.1	17.171	46.129	456.002	25068.8
Nov., 1990	520.1	42315.2	17.3367	45.0567	426.7	25495.5
Dec., 1990	504.901	42820.1	17.0911	46.5038	439.1	25934.6
Jan., 1991	573.501	43393.6	19.8044	43.2968	438.101	26372.7
Feb., 1991	533.799	43927.4	19.1497	41.9107	385.3	26758
Mar., 1991	567.799	44495.2	18.5404	43.1524	431.2	27189.2
Apr., 1991	505.7	45000.9	16.9508	46.1912	434.299	27623.5
May., 1991	558.901	45559.8	18.1756	42.8127	418.6	28042.1
Jun., 1991	498.201	46058	16.6529	45.4874	415.901	28458
Jul., 1991	508.701	46566.7	16.4539	46.0041	433.6	28891.6
Aug., 1991	504.598	47071.3	16.7966	45.9055	428.4	29320
Sep., 1991	502.8	47574.1	16.76	44.7181	406.9	29726.9
Oct., 1991	472.6	48046.7	15.2452	47.4195	426.401	30153.3
Nov., 1991	491.201	48537.9	16.8653	43.9416	385.2	30538.5
Dec., 1991	441.2	48979.1	14.2899	48.9773	423.7	30962.2
Jan., 1992	469.7	49448.8	15.3163	45.8263	397.501	31359.7
Feb., 1992	447.199	49896	15.4874	46.6047	390.498	31750.2
Mar., 1992	401.201	50297.2	71.8569	49.0624	386.601	32136.8

Production Report

Group : kolaun1
Well : kolau
: 000000003

Date : 7/28/6 5:11:41 am
User : George

Production Data from October, 1985 to December, 2000 (cont.)

Year	Monthly Oil m3	Cum Oil m3	Avg Daily Oil m3/d	Water Cut %	Monthly Water m3	Cum Water m3
Apr., 1992	379.501	50676.7	12.9009	46.5083	330.101	32466.9
May., 1992	419.799	51096.5	14.5595	47.658	382.4	32849.3
Jun., 1992	558.601	51655.1	20.9475	36.6563	323.399	33172.7
Jul., 1992	546.7	52201.8	18.6906	44.2661	434.401	33607.1
Aug., 1992	557.9	52759.7	18.3419	46.1481	478.301	34085.4
Sep., 1992	544.101	53303.8	19.4611	38.5649	341.701	34427.1
Oct., 1992	512.5	53816.3	16.5768	47.0447	455.497	34882.6
Nov., 1992	510.5	54326.8	17.453	38.5723	320.699	35203.3
Dec., 1992	488.101	54814.9	15.8732	39.3559	316.899	35520.2
Jan., 1993	559.701	55374.6	19.5529	38.0347	343.699	35863.9
Feb., 1993	537.699	55912.3	20.3867	46.1975	461.899	36325.8
Mar., 1993	585.301	56497.6	19.2956	63.6289	1024.4	37350.2
Apr., 1993	527.601	57025.2	17.7594	41.2563	370.702	37720.9
May., 1993	557.501	57582.7	18.9787	39.0006	356.601	38077.5
Jun., 1993	533.401	58116.1	17.9295	40.8802	368.999	38446.5
Jul., 1993	563.4	58679.5	18.8586	37.0049	331.101	38777.6
Aug., 1993	518.8	59198.3	16.7355	41.0483	361.401	39139
Sep., 1993	474.202	59672.5	16.5419	41.8194	341	39480
Oct., 1993	444.8	60117.3	14.9095	55.0552	545.099	40025.1
Nov., 1993	438.699	60556	15.4608	58.6728	623.1	40648.2
Dec., 1993	503.401	61059.4	16.2825	55.1228	618.601	41266.8
Jan., 1994	453.902	61513.3	16.1867	58.624	643.399	41910.2
Feb., 1994	449.401	61962.7	17.1473	56.3326	580	42490.2
Mar., 1994	485.501	62448.2	15.8316	56.7952	638.5	43128.7
Apr., 1994	467.199	62915.4	16.3214	57.3965	629.7	43758.4
May., 1994	530.501	63445.9	18.3195	60.6902	819.398	44577.8
Jun., 1994	494.201	63940.1	17.2396	63.8825	874.499	45452.3
Jul., 1994	584.502	64524.6	21.0316	68.1705	1252.4	46704.7
Aug., 1994	710.199	65234.8	23.5751	66.7085	1423.7	48128.4
Sep., 1994	585.199	65820	20.0927	69.6695	1344.8	49473.2
Oct., 1994	664.7	66484.7	22.4056	67.4373	1377.2	50850.4
Nov., 1994	646.701	67131.4	21.5867	69.5978	1481.1	52331.5
Dec., 1994	654.799	67786.2	21.4103	74.0002	1864.5	54196
Jan., 1995	660	68446.2	22.2785	74.8364	1963.7	56159.7
Feb., 1995	595.002	69041.2	21.2501	74.5163	1740.6	57900.3
Mar., 1995	632.499	69673.7	21.142	71.7078	1603.8	59504.1
Apr., 1995	602.302	70276	20.1046	73.2498	1650	61154.1
May., 1995	570.999	70847	19.0863	74.6982	1686.5	62840.6
Jun., 1995	584.4	71431.4	19.5343	74.1583	1677.8	64518.4
Jul., 1995	598.899	72030.3	19.9633	74.1758	1721	66239.4
Aug., 1995	605.1	72635.4	19.8393	73.584	1686.3	67925.7

Production Report

Group : kolaun1
Well : kolau
: 000000003

Date : 7/28/6 5:11:42 am
User : George

Production Data from October, 1985 to December, 2000 (cont.)

Year	Monthly Oil m3	Cum Oil m3	Avg Daily Oil m3/d	Water Cut %	Monthly Water m3	Cum Water m3
Sep., 1995	540.499	73175.9	18.1426	74.9326	1616.4	69542.1
Oct., 1995	517.801	73693.7	17.3564	72.9973	1400.4	70942.5
Nov., 1995	517.2	74210.9	17.3363	74.676	1525.8	72468.3
Dec., 1995	531	74741.9	17.3152	74.5789	1558.5	74026.8
Jan., 1996	519.7	75261.6	17.1802	75.8815	1635.8	75662.6
Feb., 1996	489	75750.6	17.7281	72.4683	1287.7	76950.3
Mar., 1996	530.1	76280.7	17.3566	74.9835	1589.6	78539.9
Apr., 1996	515.3	76796	17.2245	74.6648	1519.3	80059.2
May., 1996	547.3	77343.3	18.3967	71.6819	1386	81445.2
Jun., 1996	535.399	77878.7	17.8964	73.1664	1460.5	82905.7
Jul., 1996	504.801	78383.5	16.9444	74.7036	1491.4	84397.1
Aug., 1996	552	78935.5	18.5287	72.4091	1449.3	85846.4
Sep., 1996	569.4	79504.9	19.1933	71.0433	1397.6	87244
Oct., 1996	513.5	80018.4	16.6541	73.2758	1408.6	88652.6
Nov., 1996	461.201	80479.6	16.23	74.1178	1321.3	89973.9
Dec., 1996	553.199	81032.8	17.8451	73.1474	1507.6	91481.5
Jan., 1997	510.599	81543.4	16.6953	73.486	1415.8	92897.3
Feb., 1997	442.1	81985.5	15.7893	74.2431	1274.9	94172.2
Mar., 1997	461.8	82447.3	15.3933	76.6217	1514.2	95686.4
Apr., 1997	472.6	82919.9	15.8857	76.0495	1501.3	97187.7
May., 1997	477.5	83397.4	15.4656	76.6835	1571.1	98758.8
Jun., 1997	405.102	83802.5	13.9091	74.4025	1178	99936.8
Jul., 1997	383.4	84185.9	12.5877	79.2145	1461.8	101399
Aug., 1997	382.301	84568.2	12.5173	80.0243	1532.2	102931
Sep., 1997	398.9	84967.1	13.6766	78.685	1473.2	104404
Oct., 1997	395.6	85362.7	12.865	78.7763	1469	105873
Nov., 1997	377.7	85740.4	12.7673	79.3805	1454.7	107328
Dec., 1997	381.299	86121.7	12.71	80.254	1550.4	108878
Jan., 1998	375.2	86496.9	12.1195	79.6381	1468.1	110346
Feb., 1998	304.8	86801.7	10.8857	80.2547	1239.4	111586
Mar., 1998	317.8	87119.5	10.3772	81.3167	1383.8	112969
Apr., 1998	295.4	87414.9	9.84665	82.3841	1382.1	114352
May., 1998	277.5	87692.4	9.12329	83.7212	1427.8	115779
Jun., 1998	253.2	87945.6	8.69356	83.5471	1286.3	117066
Jul., 1998	269.2	88214.8	8.68387	84.4989	1468.1	118534
Aug., 1998	239.2	88454	7.8	84.9285	1348.5	119882
Sep., 1998	221	88675	7.5234	84.1074	1170.1	121052
Oct., 1998	253	88928	8.16129	83.6471	1294.7	122347
Nov., 1998	294.8	89222.8	9.82667	80.9935	1256.8	123604
Dec., 1998	274.6	89497.4	9.14064	83.0338	1344.5	124948
Jan., 1999	264.3	89761.7	8.79778	83.1669	1306.4	126255

Production Report

Group : kolaun1
Well : kolau
: 000000003

Date : 7/28/6 5:11:42 am
User : George

Production Data from October, 1985 to December, 2000 (cont.)

Year	Monthly Oil m3	Cum Oil m3	Avg Daily Oil m3/d	Water Cut %	Monthly Water m3	Cum Water m3
Feb., 1999	227.3	89989	8.11786	85.0326	1291.9	127547
Mar., 1999	272	90261	8.79784	83.729	1400.3	128947
Apr., 1999	241.3	90502.3	8.16812	84.3619	1302.3	130249
May., 1999	249.6	90751.9	8.07332	83.5707	1270.2	131519
Jun., 1999	205.8	90957.7	6.8887	85.9689	1261.5	132781
Jul., 1999	197.6	91155.3	6.4	87.0334	1326.9	134108
Aug., 1999	206.7	91362	6.77705	86.0924	1280.1	135388
Sep., 1999	205.4	91567.4	7.0726	86.0636	1269	136657
Oct., 1999	210.2	91777.6	6.78065	86.0121	1293.1	137950
Nov., 1999	201.7	91979.3	6.78934	86.4315	1285.4	139235
Dec., 1999	199.5	92178.8	6.65925	86.6967	1300.7	140536
Jan., 2000	207.3	92386.1	6.97784	87.0022	1388.2	141924
Feb., 2000	184.1	92570.2	6.34828	87.2977	1265.8	143190
Mar., 2000	189.8	92760	6.12258	87.6913	1352.8	144543
Apr., 2000	190.1	92950.1	6.53639	87.1008	1284.2	145827
May., 2000	197.8	93147.9	6.43252	87.4587	1380	147207
Jun., 2000	171.4	93319.3	5.71333	88.372	1303.2	148510
Jul., 2000	180.9	93500.2	5.97194	88.1105	1341.2	149852
Aug., 2000	181.5	93681.7	5.85484	87.9459	1324.8	151176
Sep., 2000	160.7	93842.4	5.35667	88.8999	1287.6	152464
Oct., 2000	166.7	94009.1	5.37742	88.5338	1287.7	153752
Nov., 2000	160.9	94170	5.36333	88.6157	1253	155005
Dec., 2000	165.3	94335.3	5.5563	88.5593	1280.1	156285

APPENDIX B

2000 INDIVIDUAL WELL PRODUCTION DATA

WELL: 09201029W1 DAILY 9-20-10-29 WPM (KOLA UNIT #1)

MONTH	M3 OIL / DAY	M3 OIL / MTH	M3 H2O / MTH	M3 FLUID / MONTH	% H2O	# DAYS OF PROD./MTN	M3 FLUID / DAY	PROD. TEST OIL	WTR	HRS	DATE
01	0.79	16.5	25.1	41.6	60.34	21	1.98				
02	0.95	27.6	6.3	33.9	18.58	29	1.17				
03	0.75	23.1	12.9	36.0	35.83	31	1.16				
04	0.97	28.0	6.3	34.3	18.37	29	1.18				
05	1.12	34.8	0.8	35.6	2.25	31	1.15				
06	0.86	25.9	6.3	32.2	19.57	30	1.07				
07	0.97	29.1	5.7	34.8	16.38	30	1.16				
08	0.87	27.0	6.0	33.0	18.18	31	1.06				
09	0.79	23.7	9.3	33.0	28.18	30	1.1				
10	0.89	27.3	5.2	32.5	16.0	31	1.05				
11	0.71	21.2	10.4	31.6	32.91	30	1.05				
12	0.97	30.0	4.2	34.2	12.28	31	1.1				
	0.89	314.2	98.5	412.7	23.87	354	1.17				

TUNDRA OIL AND GAS LTD.
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WELL: 16201029W1 DAILY 16-20-10-29 WPM (KOLA #1)

MONTH	M3 OIL / DAY	M3 OIL / MTH	M3 H2O / MTH	M3 FLUID / MONTH	% H2O	# DAYS OF PROD./MTH	M3 FLUID / DAY	PROD. TEST OIL	WTR	HRS	DATE
01	0.78	23.4	114.9	138.3	83.08	30	4.61	0.73	3.54	24.0	8
02	0.7	20.4	110.1	130.5	84.37	29	4.5	0.75	3.65	24.0	12
03	0.68	21.0	115.4	136.4	84.6	31	4.4	0.68	3.55	24.0	22
04	0.54	15.6	110.1	125.7	87.59	29	4.33	0.49	3.6	24.0	4
05	0.35	11.0	134.9	145.9	92.46	31	4.71	0.27	4.17	24.0	21
06	0.31	9.1	128.9	138.0	93.41	30	4.63	0.34	3.97	24.0	14
07	0.36	10.8	142.8	153.6	92.97	30	5.12	0.34	4.46	24.0	1
08	0.44	13.7	138.0	151.7	90.97	31	4.89	0.45	4.09	24.0	9
09	0.39	11.6	125.8	137.4	91.56	30	4.58	0.34	3.89	24.0	22
10	0.45	13.8	121.6	135.4	89.81	31	4.39	0.51	3.67	24.0	20
11	0.5	15.0	117.1	132.1	88.64	30	4.4	0.41	3.63	24.0	20
12	0.39	12.0	123.4	135.4	91.14	31	4.37	0.4	3.6	24.0	15
	0.49	177.4	1483.0	1660.4	89.32	363	4.58				

TUNDRA OIL AND GAS LTD.
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WELL: 10211029W1 DAILY 10-21-10-29 WPM (KOLA #1)

MONTH	M3 OIL / DAY	M3 OIL / MTH	M3 H2O / MTH	M3 FLUID / MONTH	% H2O	# DAYS OF PROD./MTN	M3 FLUID / DAY	PROD. TEST OIL	WTR	HRS	DATE
01	0.97	30.1	763.9	794.0	96.21	31	25.61	0.94	22.52	24.0	22
02	0.75	21.7	688.6	710.3	96.94	29	24.71	0.71	22.89	24.0	12
03	0.69	21.3	730.7	752.0	97.17	31	24.42	0.7	22.58	24.0	7
04	0.51	15.3	706.6	721.9	97.88	30	24.23	0.46	22.43	24.0	4
05	0.8	24.7	755.9	780.6	96.84	31	25.18	0.68	22.01	24.0	21
06	0.67	19.7	683.1	702.8	97.2	29	23.86	0.7	21.7	24.0	25
07	0.73	22.5	719.3	741.8	96.97	31	23.93	0.67	21.79	24.0	16
08	0.69	21.3	706.1	727.4	97.07	31	23.53	0.66	21.38	24.0	9
09	0.66	19.7	687.9	707.6	97.22	30	23.69	0.65	20.97	24.0	22
10	0.66	20.5	685.7	706.2	97.1	31	22.9	0.65	21.06	24.0	20
11	0.69	20.5	660.6	681.1	96.99	30	22.83	0.64	20.81	24.0	17
12	0.62	19.0	678.9	697.9	97.28	31	22.6	0.61	19.65	24.0	27
	0.7	256.3	8467.3	8723.6	97.06	365	23.96				

TUNDRA OIL AND GAS LTD.
Fluid Production Report
Year: 2000

WELL: 01281029W1 DAILY 1-28-10-29 WPM (KOLA #1)

MONTH	M3 OIL / DAY	M3 OIL / MTH	M3 H2O / MTH	M3 FLUID / MONTH	% H2O	# DAYS OF PROD./MTH	M3 FLUID / DAY	PROD. TEST OIL	WTR	HRS	DATE
01	0.77	23.2	62.1	85.3	72.8	30	2.84	0.75	1.91	24.0	4
02	1.06	30.8	52.2	83.0	62.89	29	2.86	1.2	1.66	24.0	6
03	1.22	37.8	53.5	91.3	58.6	31	2.95	1.21	1.67	24.0	25
04	1.27	36.9	50.8	87.7	57.92	29	3.02	1.19	1.65	24.0	9
05	1.14	35.2	56.0	91.2	61.4	31	2.94	1.18	1.62	24.0	8
06	0.97	29.1	59.5	88.6	67.16	30	2.95	0.7	2.1	24.0	20
07	0.73	22.0	66.6	88.6	75.17	30	2.95	0.69	2.08	24.0	23
08	0.74	22.9	67.9	90.8	74.78	31	2.93	0.72	2.04	24.0	17
09	0.67	20.1	67.0	87.1	76.92	30	2.9	0.66	2.09	24.0	14
10	0.66	20.5	67.7	88.2	76.76	31	2.86	0.65	2.02	24.0	26
11	0.75	22.6	64.2	86.8	73.96	30	2.89	0.68	2.01	24.0	20
12	0.65	20.3	67.8	88.1	76.96	31	2.84	0.61	2.05	24.0	15
	0.89	321.4	735.3	1056.7	69.58	363	2.91				

TUNDRA OIL AND GAS LTD.
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WELL: 03281029W1 DAILY 3-28-10-29 WPM (KOLA #1)

MONTH	M3 OIL / DAY	M3 OIL / MTH	M3 H2O / MTH	M3 FLUID / MONTH	% H2O	# DAYS OF PROD./MTN	M3 FLUID / DAY	PROD. TEST OIL	WTR	HRS	DATE
01	0.32	9.6	41.0	50.6	81.03	30	1.69	0.32	1.28	24.0	9
02	0.19	5.4	38.5	43.9	87.7	29	1.51	0.21	1.26	24.0	19
03	0.19	5.9	41.4	47.3	87.53	31	1.53	0.19	1.26	24.0	14
04	0.25	7.3	37.1	44.4	83.56	29	1.53	0.16	1.3	24.0	18
05	0.15	4.5	45.0	49.5	90.91	31	1.6	0.14	1.31	24.0	14
06	0.13	4.0	42.2	46.2	91.34	30	1.54	0.13	1.32	24.0	8
07	0.16	4.7	42.0	46.7	89.94	30	1.56	0.15	1.31	24.0	4
08	0.18	5.6	41.5	47.1	88.11	31	1.52	0.18	1.23	24.0	22
09	0.17	5.0	40.8	45.8	89.08	30	1.53	0.18	1.26	24.0	19
10	0.16	4.8	41.3	46.1	89.59	31	1.5	0.16	1.27	24.0	17
11	0.18	5.3	40.2	45.5	88.35	30	1.52	0.17	1.26	24.0	23
12	0.18	5.6	42.7	48.3	88.41	31	1.56	0.19	1.23	24.0	20
	0.19	67.7	493.7	561.4	87.94	363	1.55				

WELL: 04281029M1 DAILY 4-28-10-29 WPM (KOLA #1)

MONTH	M3 OIL / DAY	M3 OIL / MTH	M3 H2O / MTH	M3 FLUID / MONTH	% H2O	# DAYS OF PROD./MTN	M3 FLUID / DAY	PROD. TEST OIL	WTR	HRS	DATE
01	0.81	24.2	46.5	70.7	65.77	30	2.36	0.78	1.46	24.0	4
02	0.61	17.7	55.3	73.0	75.75	29	2.52	0.62	1.83	24.0	19
03	0.71	22.0	55.8	77.8	71.72	31	2.51	0.82	1.59	24.0	14
04	0.49	14.3	60.2	74.5	80.81	29	2.57	0.38	2.01	24.0	18
05	0.67	20.9	56.1	77.0	72.86	31	2.48	0.94	1.36	24.0	14
06	0.76	22.8	49.2	72.0	68.33	30	2.4	0.7	1.6	24.0	25
07	0.71	21.4	52.0	73.4	70.84	30	2.45	0.65	1.66	24.0	16
08	0.7	21.8	58.0	79.8	72.68	31	2.57	0.72	1.77	24.0	22
09	0.62	18.7	54.6	73.3	74.49	30	2.44	0.61	1.8	24.0	19
10	0.69	21.2	57.3	78.5	72.99	31	2.55	0.7	1.72	24.0	17
11	0.67	20.1	51.9	72.0	72.08	30	2.4	0.62	1.76	24.0	23
12	0.65	20.0	56.2	76.2	73.75	31	2.46	0.66	1.59	24.0	20
	0.68	245.1	653.1	898.2	72.71	363	2.48				

WELL: 06281029W1 DAILY 6-28-10-29 WPM (KOLA #1)

MONTH	M3 OIL / DAY	M3 OIL / MTH	M3 H2O / MTH	M3 FLUID / MONTH	% H2O	# DAYS OF PROD./MTH	M3 FLUID / DAY	PROD. TEST OIL	WTR	HRS	DATE
01	0.93	28.8	308.2	337.0	91.45	31	10.87	0.9	9.12	24.0	1
02	0.78	22.3	279.5	301.8	92.61	29	10.5	0.8	9.26	24.0	6
03	0.69	21.1	301.5	322.6	93.46	31	10.48	0.49	9.32	24.0	25
04	0.92	27.3	285.2	312.5	91.26	30	10.49	1.0	8.96	24.0	9
05	0.89	26.1	294.6	320.7	91.86	29	10.95	0.9	9.09	24.0	8
06	0.91	27.1	293.7	320.8	91.55	30	10.78	0.9	9.1	24.0	20
07	0.88	27.4	279.9	307.3	91.08	31	9.91	0.82	8.3	24.0	27
08	0.89	27.6	270.5	298.1	90.74	31	9.64	0.9	8.15	24.0	17
09	0.8	23.9	269.5	293.4	91.85	30	9.78	0.81	8.17	24.0	14
10	0.7	21.6	273.0	294.6	92.67	31	9.55	0.74	8.41	24.0	26
11	0.9	27.0	263.5	290.5	90.71	30	9.68	0.81	8.23	24.0	17
12	0.84	25.8	273.2	299.0	91.37	31	9.68	0.79	7.92	24.0	27
	0.84	306.0	3392.3	3698.3	91.73	364	10.19				

TUNDRA OIL AND GAS LTD
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WELL: 11281029W1 DAILY 11-28-10-29 WPM (KOLA #1)

MONTH	M3 OIL / DAY	M3 OIL / MTH	M3 H2O / MTH	M3 FLUID / MONTH	% H2O	# DAYS OF PROD./MTN	M3 FLUID / DAY	PROD. TEST OIL	WTR	HRS	DATE
01	1.0	31.0	25.7	56.7	45.33	31	1.83	0.97	0.76	24.0	1
02	0.69	20.1	29.4	49.5	59.39	29	1.71	0.76	1.01	24.0	19
03	0.79	24.6	30.1	54.7	55.03	31	1.76	0.93	0.7	24.0	24
04	0.9	25.1	24.7	49.8	49.6	28	1.78	0.74	0.99	24.0	18
05	0.72	21.6	33.0	54.6	60.44	30	1.82	0.77	0.99	24.0	27
06	0.75	22.4	31.2	53.6	58.21	30	1.79	0.68	0.92	24.0	25
07	0.75	22.4	30.1	52.5	57.33	30	1.75	0.75	0.99	24.0	23
08	0.78	24.3	32.6	56.9	57.29	31	1.84				
09	0.67	20.2	29.6	49.8	59.44	30	1.66	0.61	0.95	24.0	22
10	0.66	20.2	32.0	52.2	61.3	31	1.69	0.69	1.03	24.0	20
11	0.75	22.6	31.6	54.2	58.3	30	1.81	0.72	0.94	24.0	17
12	0.69	21.3	32.6	53.9	60.48	31	1.74	0.66	0.97	24.0	15
	0.76	275.8	362.6	638.4	56.8	362	1.76				

TUNDRA OIL AND GAS LTD.
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WELL: 09291029W1 DAILY PROV 9-29-10-29 WPM (KOLA #1)

MONTH	M3 OIL / DAY	M3 OIL / MTH	M3 H2O / MTH	M3 FLUID / MONTH	% H2O	# DAYS OF PROD./MTN	M3 FLUID / DAY	PROD. TEST OIL	WTR	HRS	DATE
01	0.68	20.5	0.8	21.3	3.76	30	0.71				
02	0.62	18.1	6.0	24.1	24.9	29	0.83				
03	0.42	13.0	11.5	24.5	46.94	31	0.79				
04	0.7	20.3	3.2	23.5	13.62	29	0.81				
05	0.61	19.0	3.7	22.7	16.3	31	0.73				
06	0.38	11.3	9.1	20.4	44.61	30	0.68				
07	0.69	20.6	2.8	23.4	11.97	30	0.78				
08	0.56	17.3	4.2	21.5	19.53	31	0.69				
09	0.59	17.8	3.1	20.9	14.83	30	0.7				
10	0.54	16.8	3.9	20.7	18.84	31	0.67				
11	0.22	6.6	13.5	20.1	67.16	30	0.67				
12	0.88	11.3	1.1	12.4	8.87	13	0.97				
	0.56	192.6	62.9	255.5	24.62	345	0.74				

APPENDIX C

INDIVIDUAL WELL ULTIMATE RECOVERY PREDICTIONS

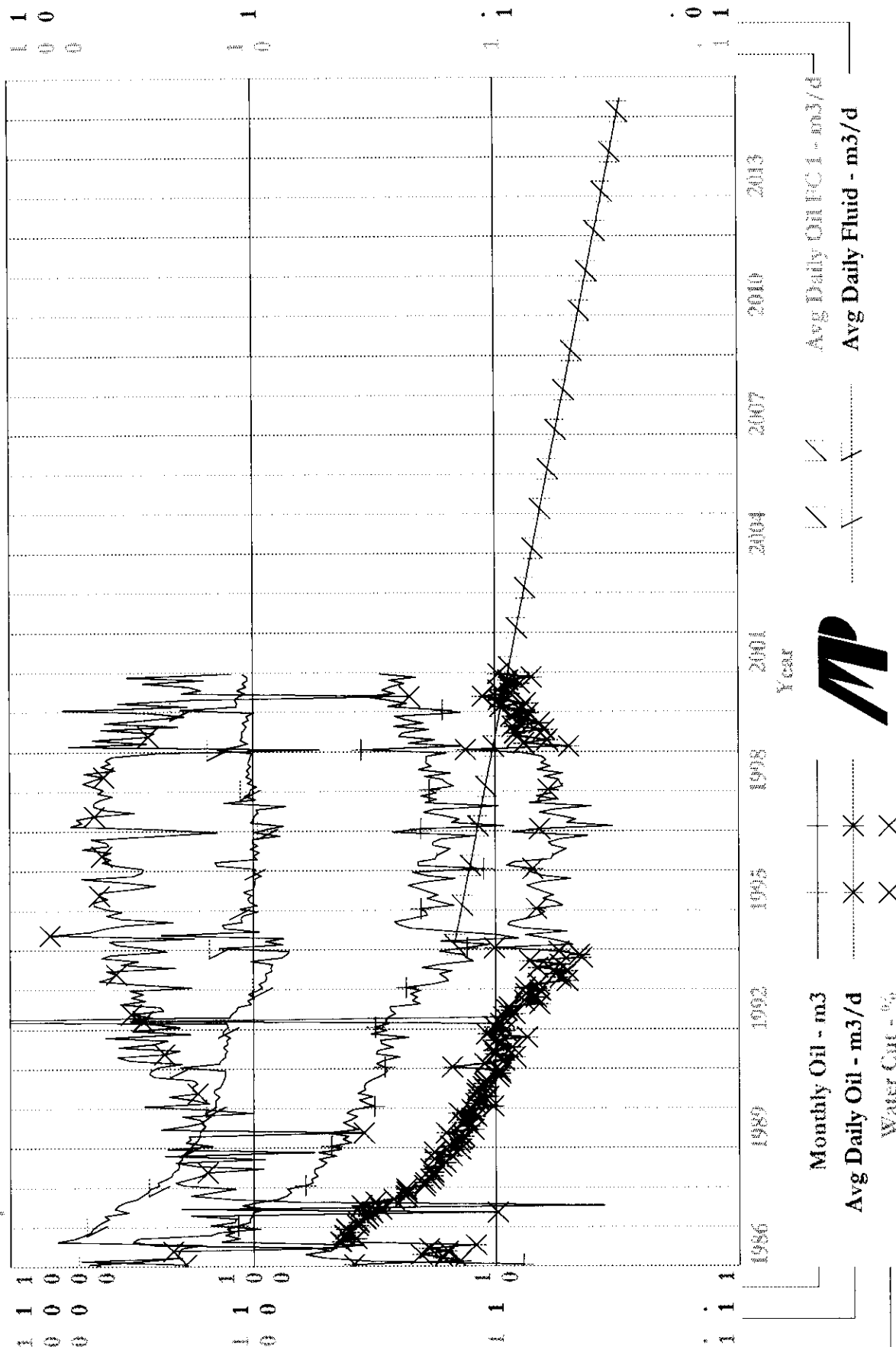
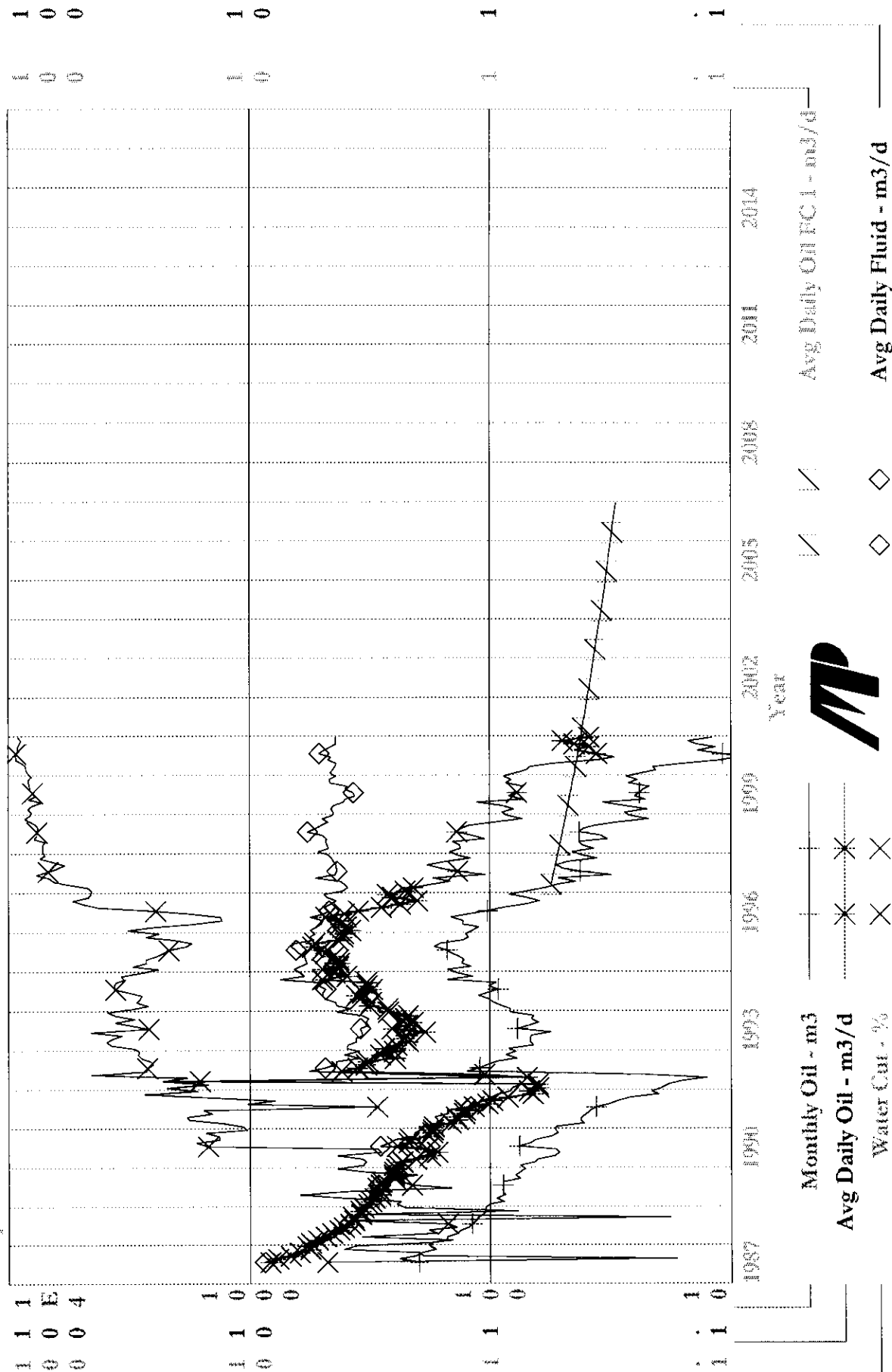
[illegible]

Figure 1 illustrates the construction of a fuzzy membership function for the fuzzy number 'small'. The diagrams show the progression from a single point to a complex, multi-peaked fuzzy membership function. The diagrams are labeled (a) through (l).

[illegible]

536

Figure 1 is a schematic representation of the experimental design. It shows a flowchart with the following steps: 1. Selection of 1000 subjects, 2. Random assignment to two groups (500 each), 3. Pre-test, 4. Training (10 days), 5. Post-test, 6. Follow-up (10 days), 7. Post-follow-up. The groups are labeled 'Group 1' and 'Group 2'.



00/10-21/01/0-20W1/0 Chukchi Kola Unit No. 1 10-21-10-20W1 Data 03/88-12/01

Operator:

Field:

Zone: 60A

Type: Unknown

Group: Kola

Production Cum:

Oil: 3904.1 m3

Gas: 0.56 m3

Water: 3564.5 m3

Cond: 0 m3

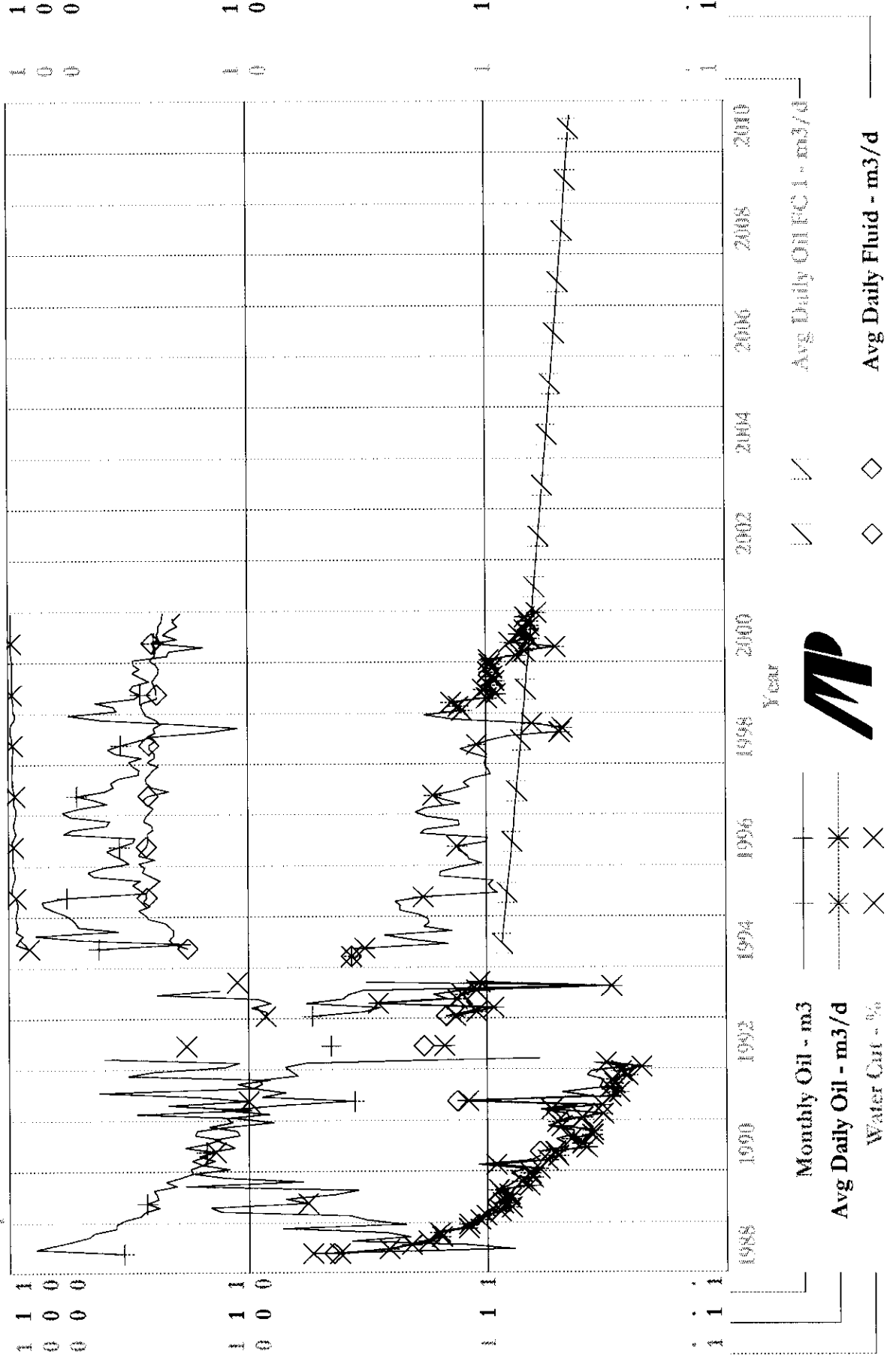
Avg Daily Oil FC 1 (Rate-Time)

qr: 0.862681 m3/d, Jan, 1994

qr: 0.437598 m3/d, Sep, 2010

dr (Type): 4.77001 CTD: 3904.1 m3

RR: 1808.75 m3 Tot: 5712.35 m3



00/0128-000-20W1/0 (Tanda Kola Unit No. 101-28-10-20W1) Tag 02/93-12/00

Operator:

Field: 1

Zone: 60A

Type: Unknown

Group: kolaul

Production Cums

Oil: 3862.3 m3

Gas: 0.0 m3

Water: 5096.1 m3

Cond: 0 m3

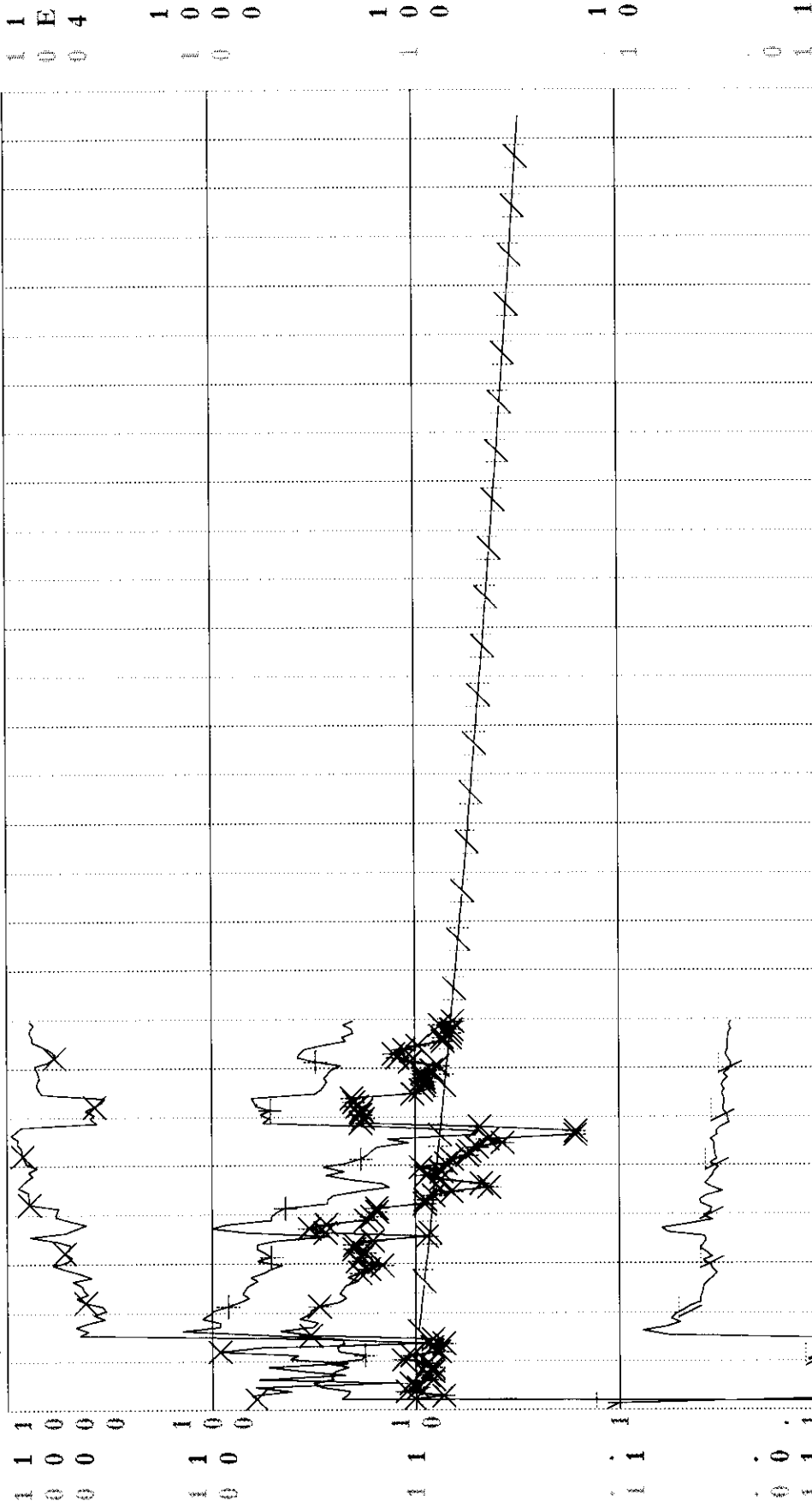
Avg Daily Oil FC 1 (Rev-Time)

qt: 0.97035 m3/d, Aug, 1994

qs: 0.29582 m3/d, Jun, 2019

at(Epp): 6.12144 CIP: 3362.3 m3

RR: 2074.3 m3 Tot: 6833.63 m3



Monthly Oil - m3

Avg Daily Oil - m3/d

Water Cut - %

Avg Daily Oil FC 1 - m3/d

Avg Daily Fluid - m3/d



01/01/28-01/02/99W1/0 (Circles Kola Unit No. 103-28-10-29W1) Date: 11/87-12/10

Operator:

Field: I

Zone: 60A

Type: Unknown

Group: KolaUnit

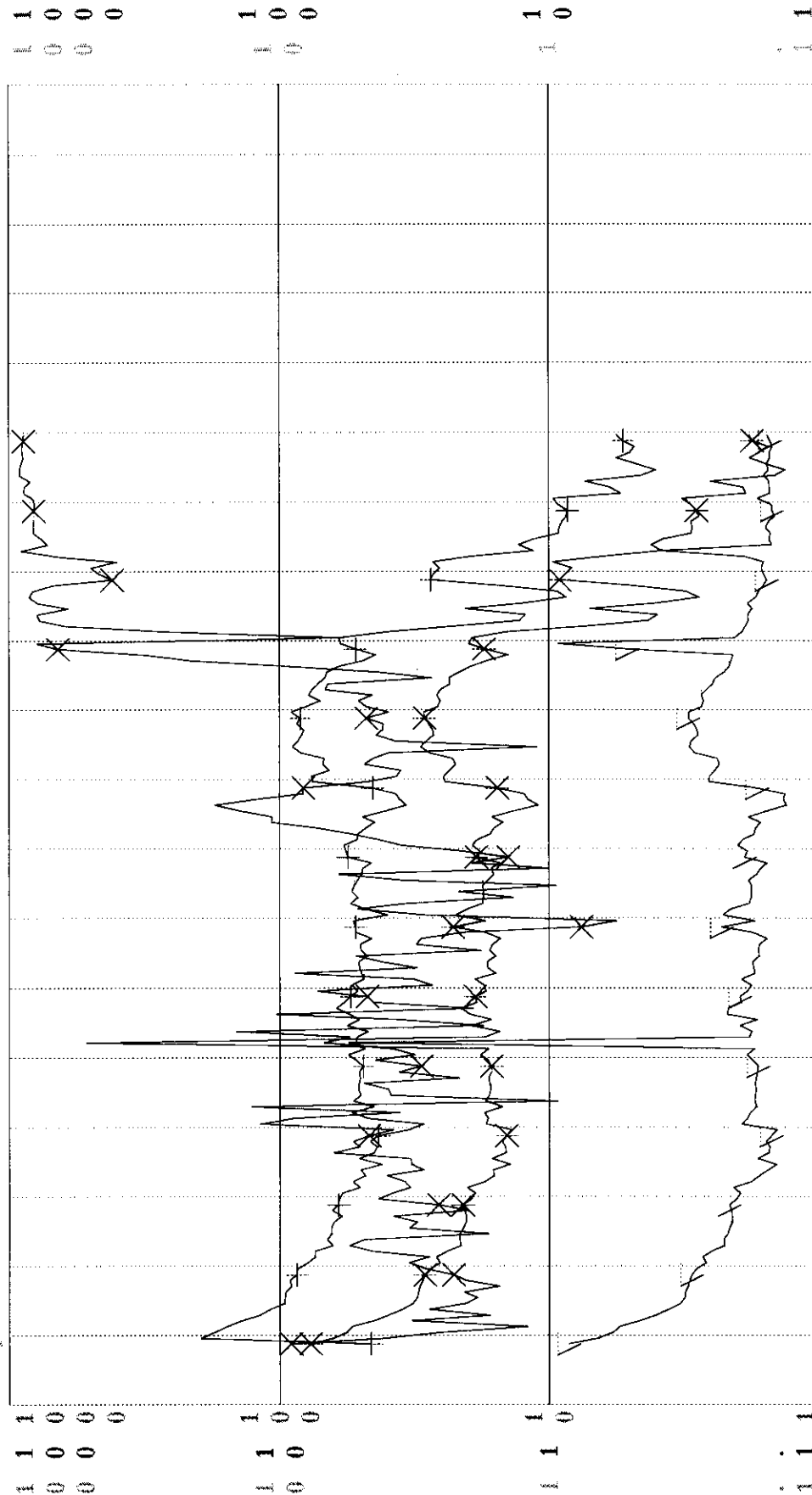
Production Cums

Oil: 8100.5 m3

Gas: 0.0 m3

Water: 2025.1 m3

Cond: 0 m3



Monthly Oil - m3

Avg Daily Oil - m3/d

Water Cut - %

Year



Not Assigned

Avg Daily Fluid - m3/d

01/01-28-01-20W1/0 (Thunder Koh Unit No. 104-28-10-20W1) Data 06/06-12/00

Operator:

Field: 1

Zone: 604

Type: Unknown

Group: kohund

Avg Daily Oil FC 1 (Rate-Time)

q: 0.784258 m3/d, Apr, 1999

q: 0.299231 m3/d, Jan, 2020

dq(tau): 7.16254 CRD: 12321.7 m3

RR: 3054.9 m3 TFC: 15376.6 m3

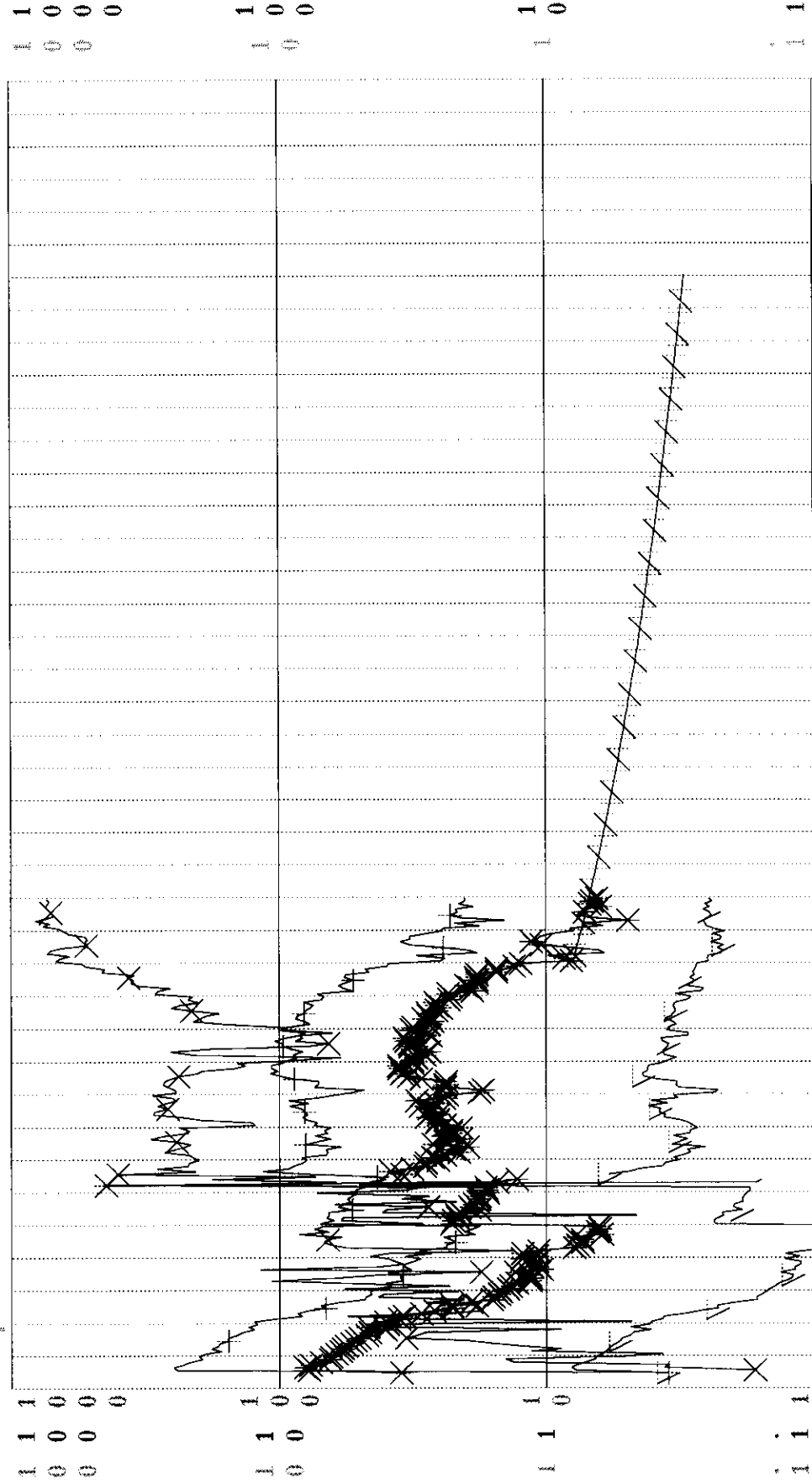
Production Cum:

Oil: 12321.7 m3

Gas: 0.66m3

Water: 119 m3

Cond: 0 m3



Monthly Oil - m3

Avg Daily Oil - m3/d

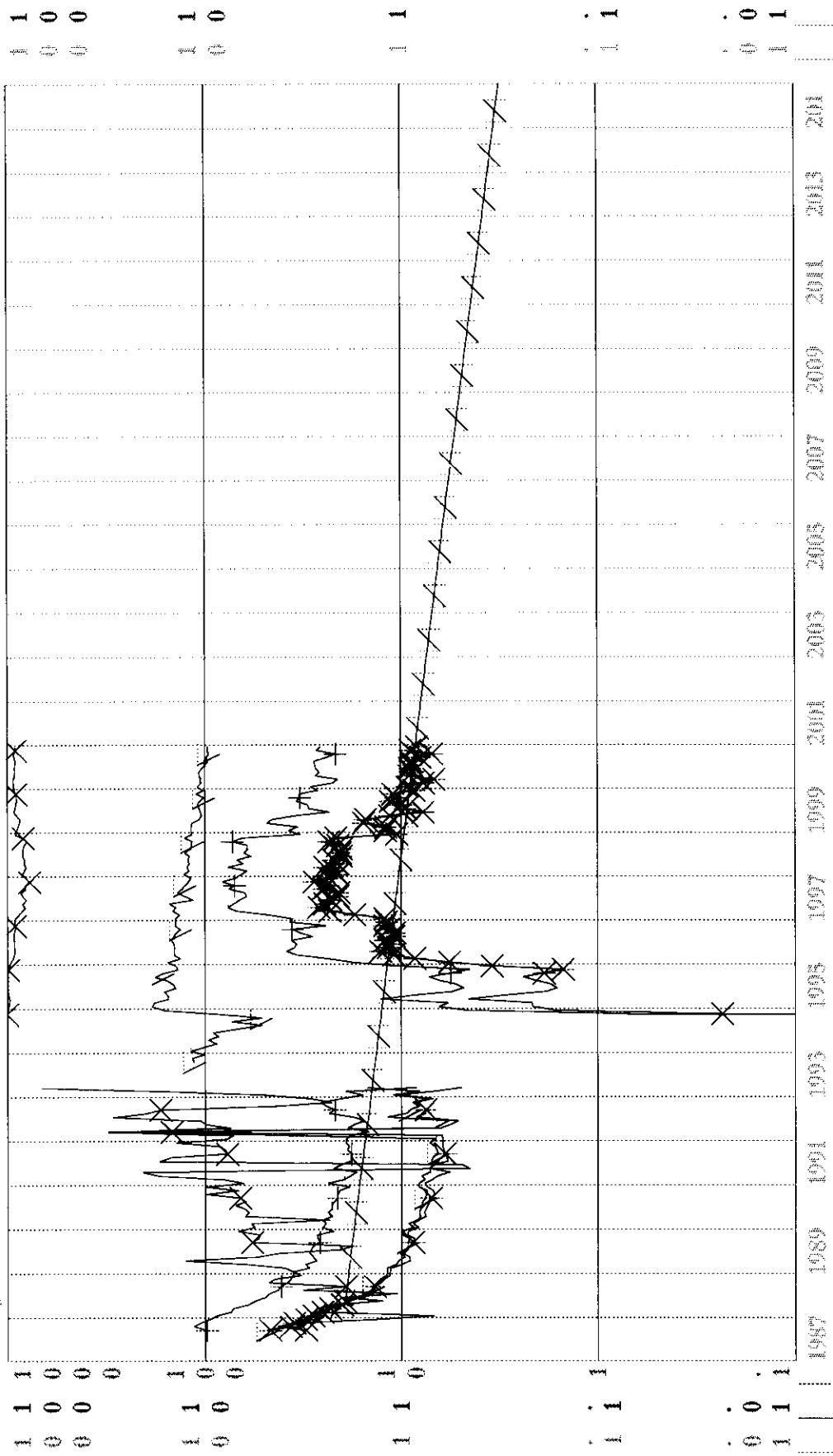
Water Cut - %

Avg Daily Oil FC 1 - m3/d

Avg Daily Fluid - m3/d



Operator: 00/06-28-010-29W1/0 (Thunder Kola 1 Unit No. 1 06-28-10-29W1) Data 09/07.12/01
 Field: 1
 Zone: 60A
 Type: Unknown
 Group: Kola 1 Unit
 Production Cums:
 Oil: 4894 m3
 Gas: 0.56 m3
 Water: 28777.1 m3
 Cond: 0 m3
 Avg Daily OUPC 1 (Rate-Time)
 qd: 1.93091 m3/d, May, 1988
 qd: 0.298378 m3/d, Aug, 2016
 dR(Est): 6.4068 CTD: 4894 m3
 RR: 2894.34 m3 Tot: 7788.34 m3



1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2016
 Year
 Monthly Oil - m3
 Avg Daily Oil - m3/d
 Water Cut - %
 Avg Daily OUPC 1 - m3/d
 Avg Daily Fluid - m3/d

01/09-29-00-29W1/0 (Tundra Kola 1 in No. 1 Prod. (P 29-10-29W1) Dan 01/87-12/00

Operator:

Field: 1

Zone: 60A

Type: Unknown

Group: Kolaund

Avg Daily Oil FC 1 (Rate-Time)

Oil: 0.929257 m3/d, Dec, 1993

QC: 0.299257 m3/d, Nov, 2010

d(Csp): 6.478 CTD: 3837.1 m3

RF: 1457.49 m3 Tot: 5314.59 m3

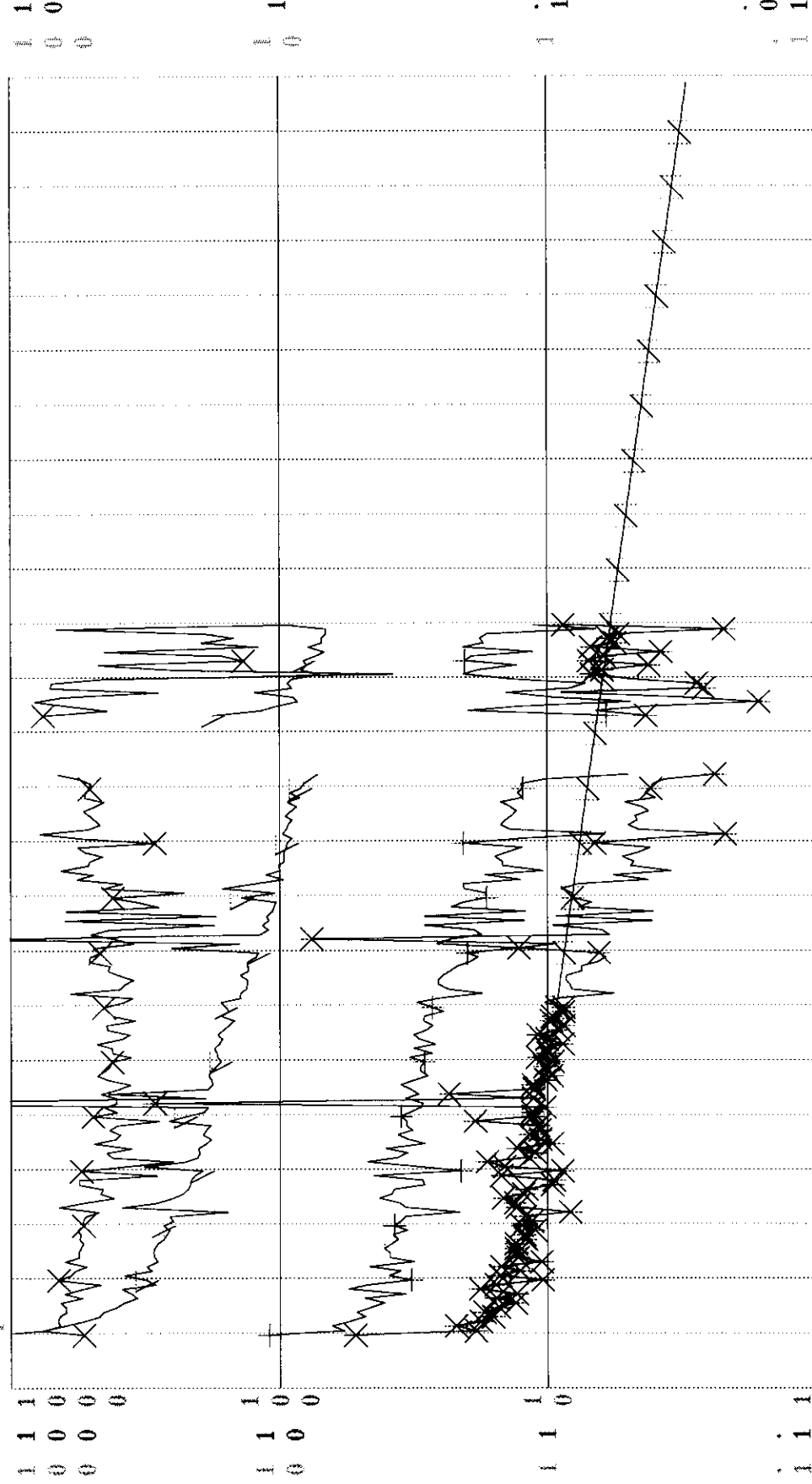
Production Cums

Oil: 3837.1 m3

Gas: 0.00 m3

Water: 3922.2 m3

Cond: 0 m3



Monthly Oil - m3

Avg Daily Oil - m3/d

Water Cut - %

Avg Daily Oil FC 1 - m3/d

Avg Daily Fluid - m3/d



APPENDIX D
INJECTOR 13-21-10-29

HISTORICAL INJECTION DATA

00/13-21-00-20W-1/1 (Tundra Ridge Unit No. 1 WW 13-21-00-20W1) Date: 10/25/00

Operator:

Field:

Zone: 60A

Type: Unknown

Group: Isolaund

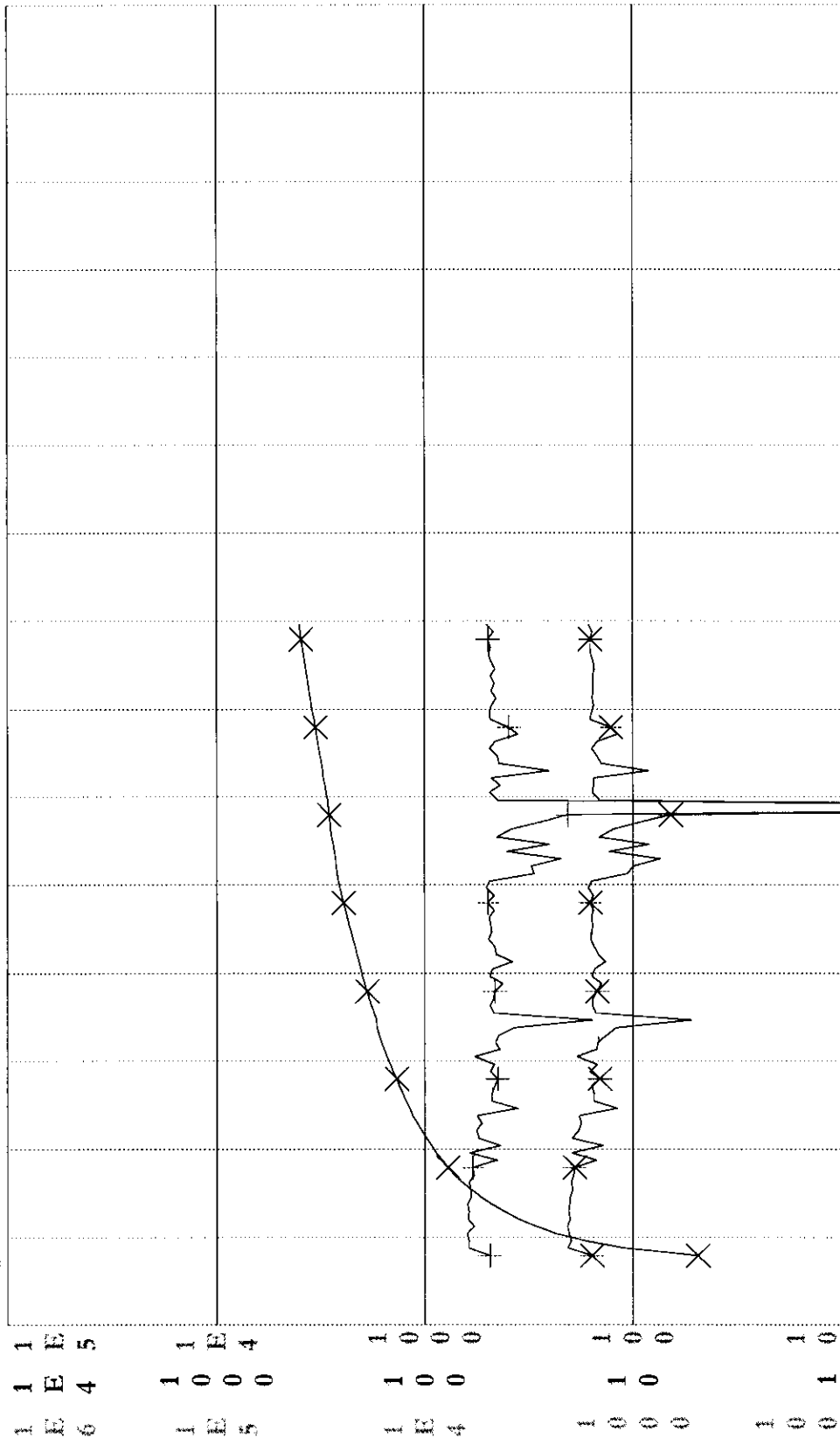
Production Cums

Oil: 116684 m3

Gas: 0136m3

Water: 352.2 m3

Cond: 0 m3



Month Water Inj - m3
Cal Day Water Inj - m3/d
Cum Water Inj - m3

APPENDIX E
INJECTOR 2-28-10-29

HISTORICAL INJECTION DATA

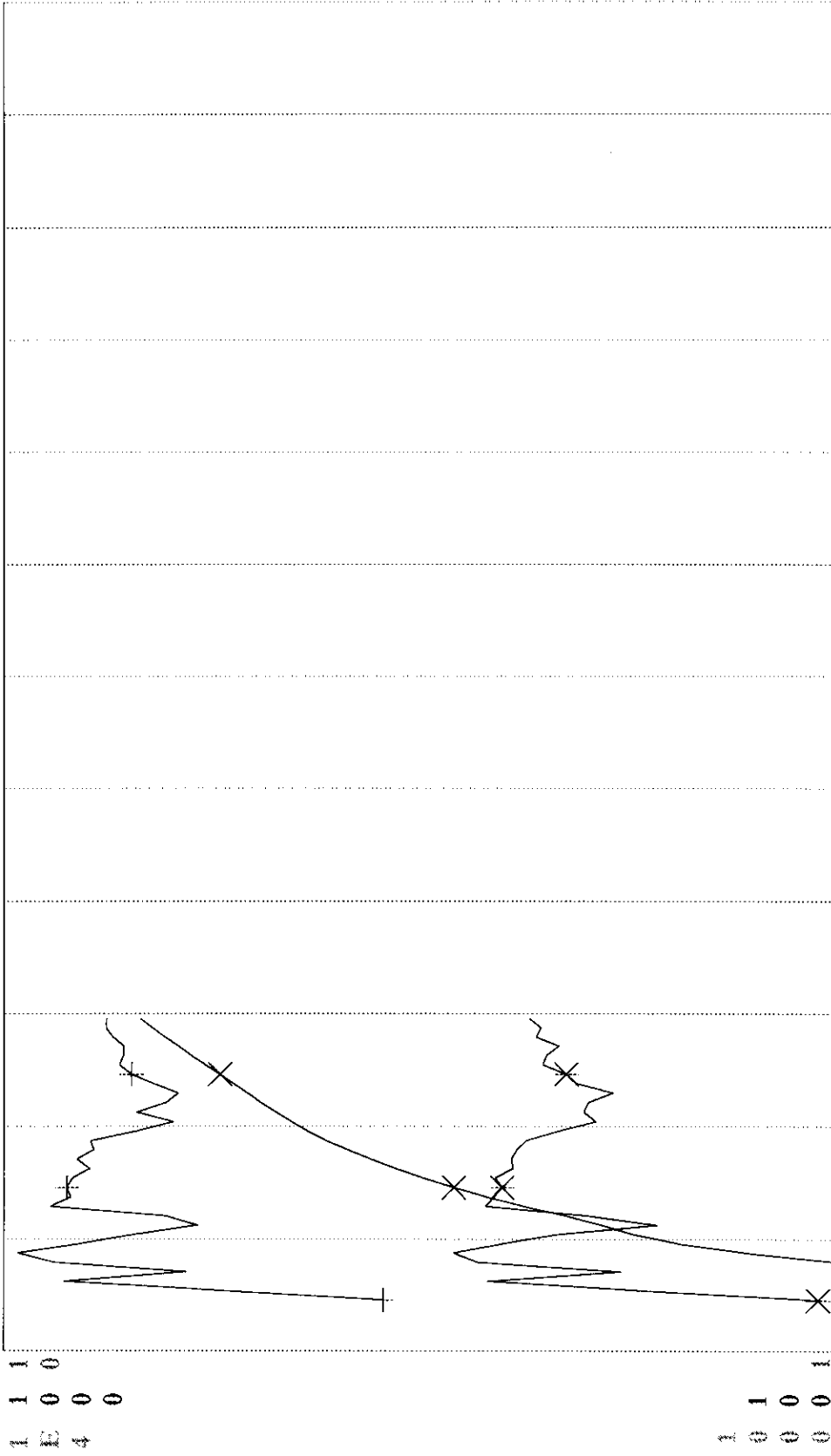
APPENDIX F
INJECTOR 12-28-10-29

HISTORICAL INJECTION DATA

01/12-28-010-29X1/0 (Panda-Rokh Unit No. 1 Rev. WPP 12-28-10-2) Date 10/27/12/10

Operator:
Field: J
Zone: GHA
Type: Unknown
Group: Rokh Unit

Production Cums
Oil: 68723 m3
Gas: 0.66 m3
Water: 9511.9 m3
Cond: 0 m3



Cal Day Water Inj - m3/d
Month Water Inj - m3
Cum Water Inj - m3