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FIGURES

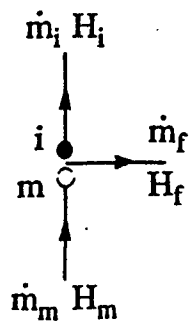
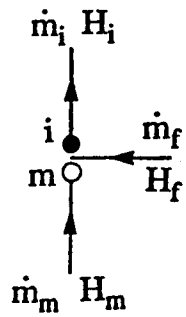
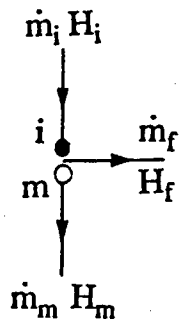
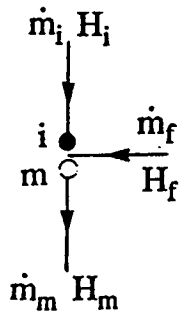
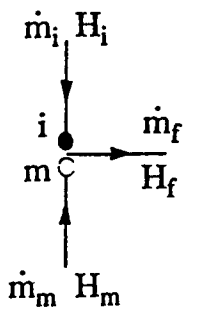
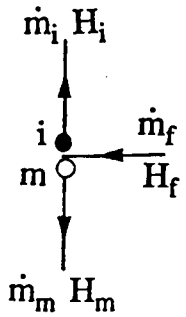
Case 1 $\dot{m}_i > 0 > \dot{m}_f$	Case 4 $\dot{m}_i > \dot{m}_f > 0$
 $\dot{m}_m = \dot{m}_i - \dot{m}_f$ $H_m = H_i = H_f$	 $\dot{m}_m = \dot{m}_i - \dot{m}_f$ $H_m = \dfrac{H_i\dot{m}_i - H_f\dot{m}_f}{\dot{m}_m}$
Case 2 $\dot{m}_i < \dot{m}_f < 0$	**Case 5** $\dot{m}_f > 0 > \dot{m}_i$
 $\dot{m}_m = \dot{m}_i - \dot{m}_f$ $H_m = H_i = H_f$	 $\dot{m}_m = \dot{m}_i - \dot{m}_f$ $H_m = \dfrac{H_i\dot{m}_i - H_f\dot{m}_f}{\dot{m}_m}$
Case 3 $\dot{m}_f < \dot{m}_i < 0$	**Case 6** $\dot{m}_f > \dot{m}_i > 0$
 $\dot{m}_m = \dot{m}_i - \dot{m}_f$ $H_m = \dfrac{H_i\dot{m}_i - H_f\dot{m}_f}{\dot{m}_m}$	 $\dot{m}_m = \dot{m}_i - \dot{m}_f$ $H_m = H_i = H_f$

Figure 2.1 Possible flow configurations that can occur at a feedzone (modified after Bjornsson, 1987).

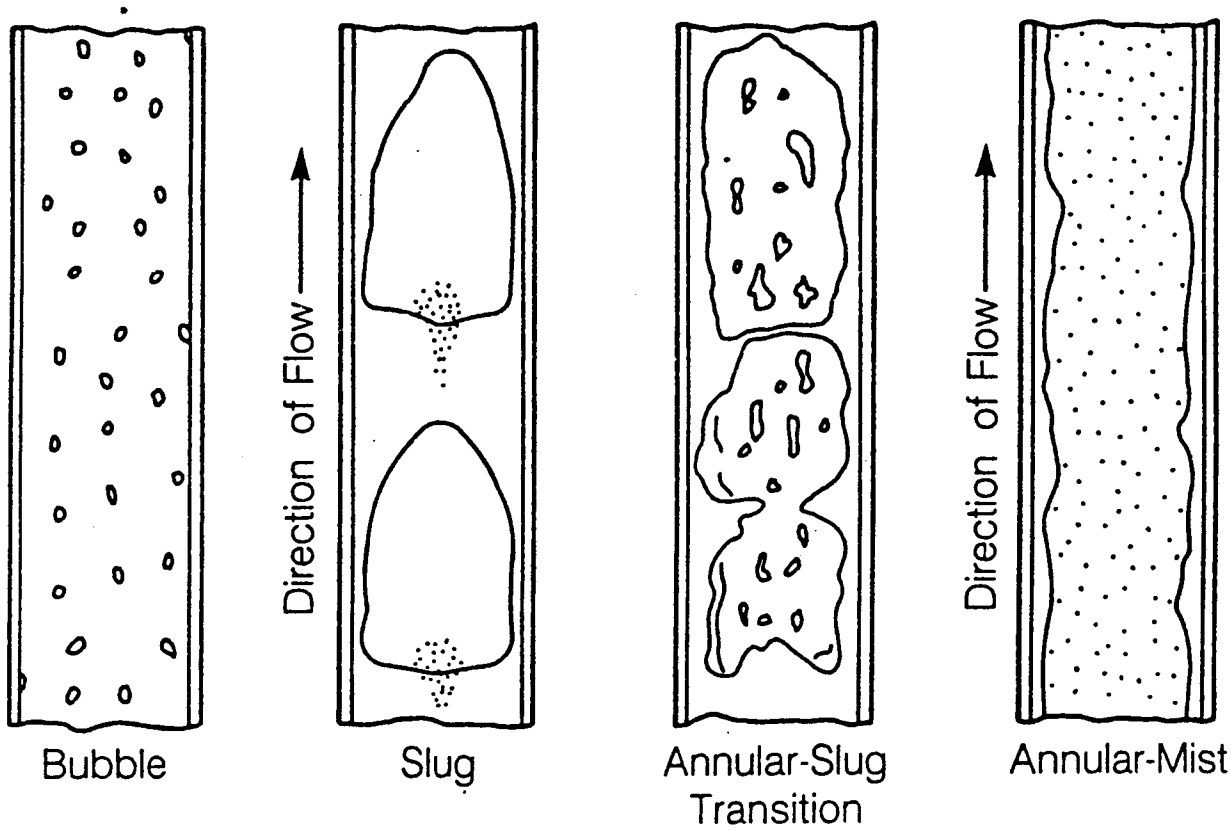


Figure 4.1 Illustration of the different flow regimes (after Orkiszewski, 1967).

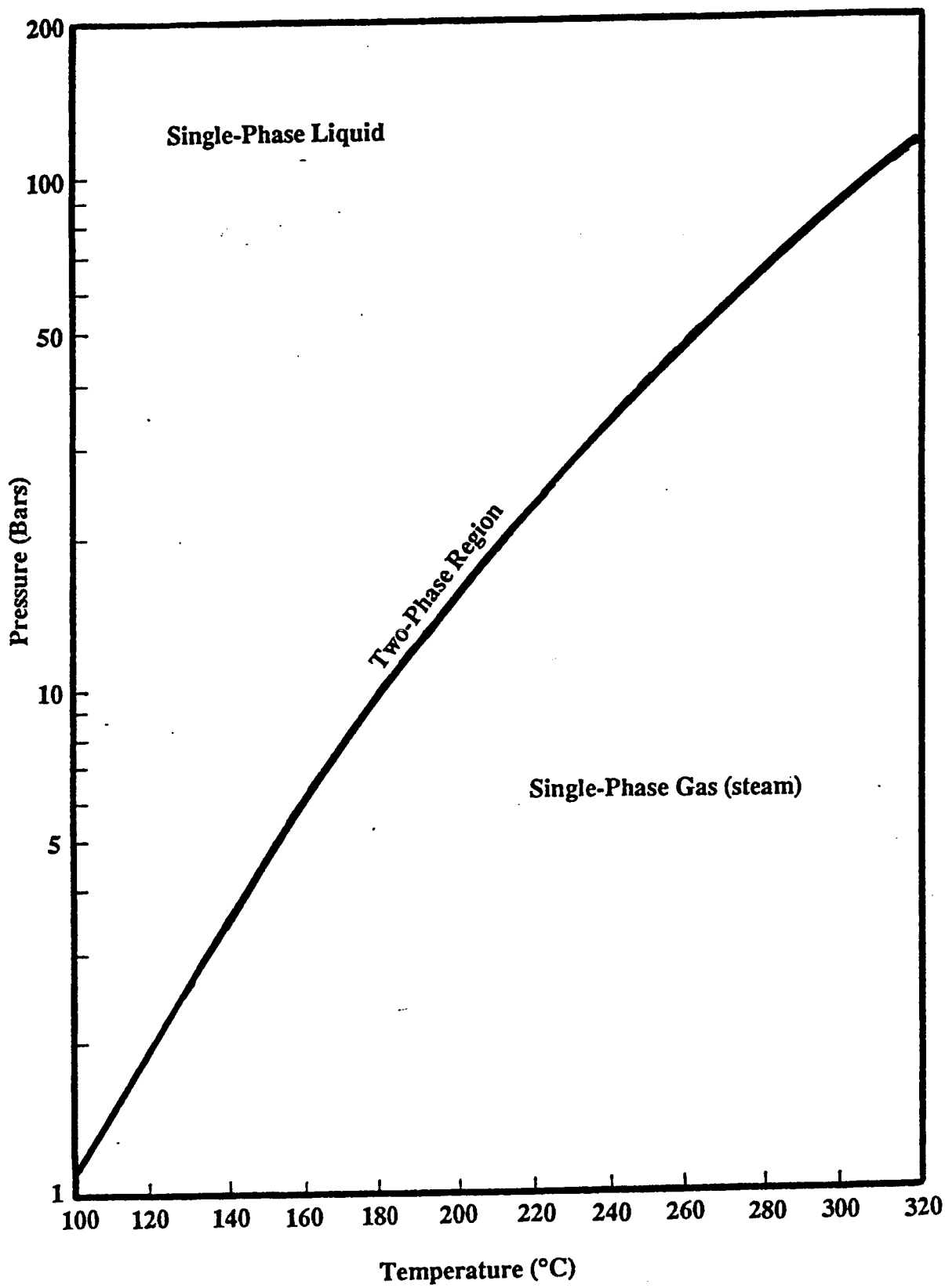


Figure 5.1 Saturation curve for H_2O (after Pritchett et al., 1981).

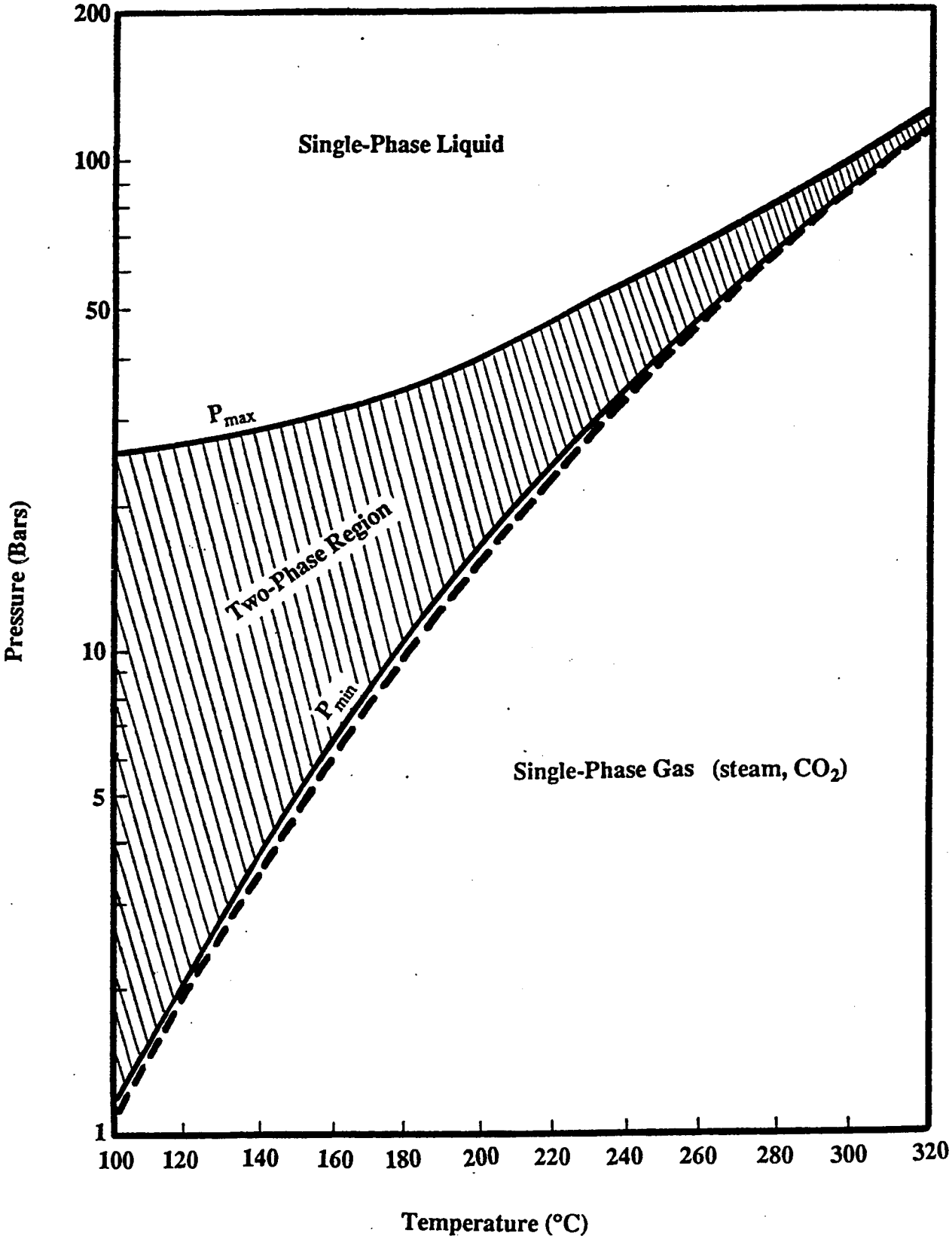


Figure 5.2 Saturation curve for H_2O-CO_2 system with 1% CO_2 (after Pritchett et al., 1981).

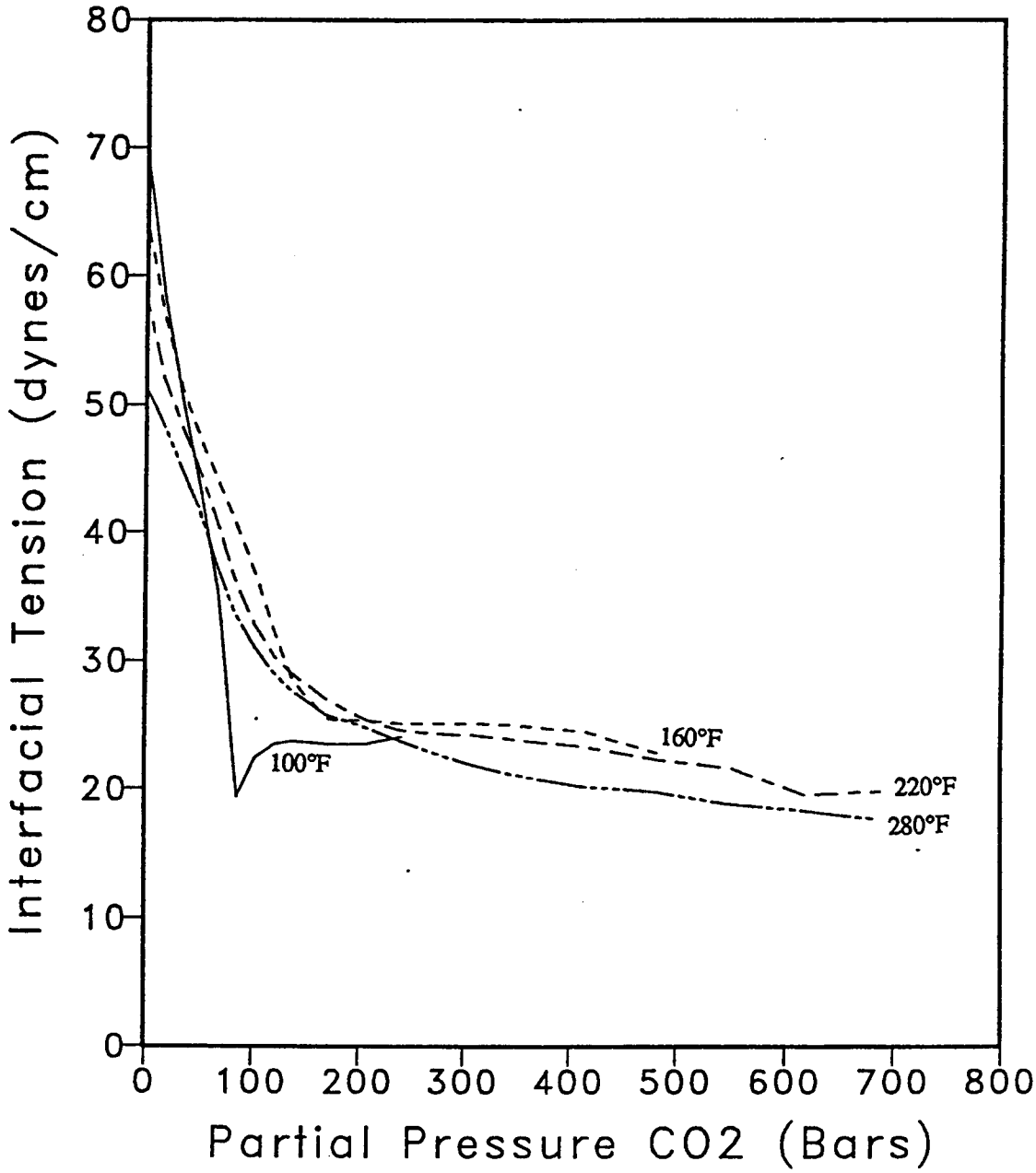


Figure 5.3 Effect of CO_2 on the surface tension of H_2O at different temperatures.

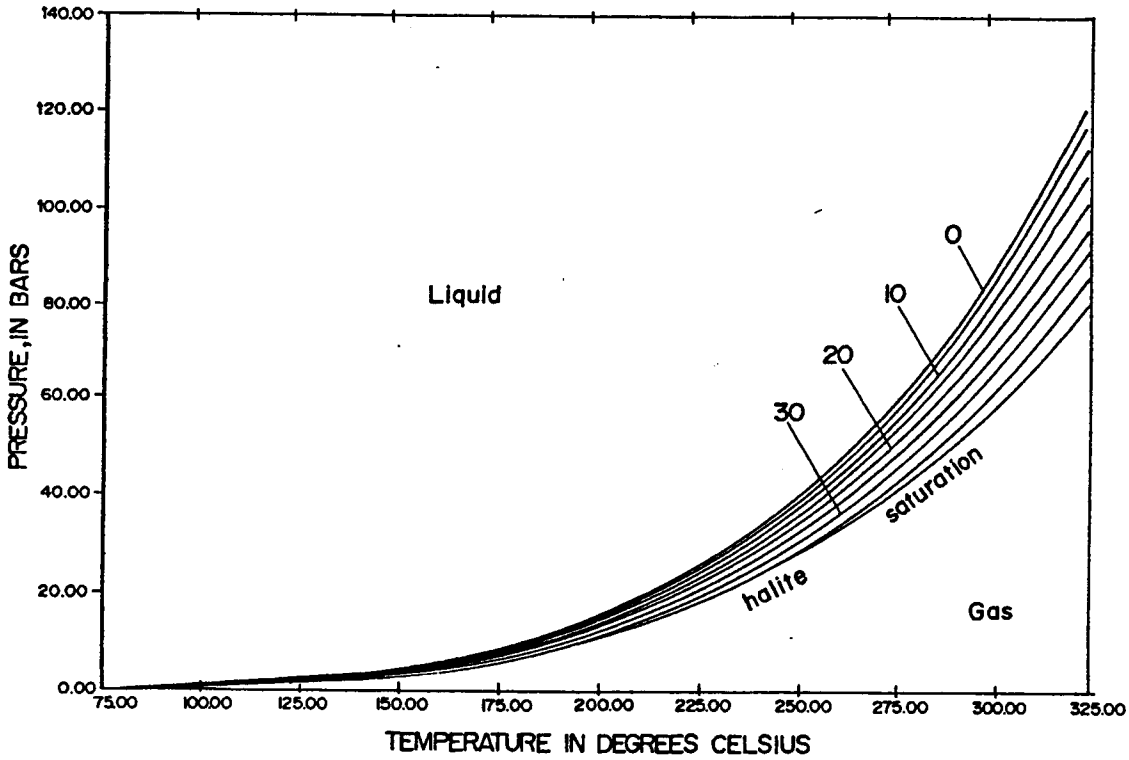


Figure 5.4 Saturation curve for H_2O-NaCl system (after Haas, 1976).

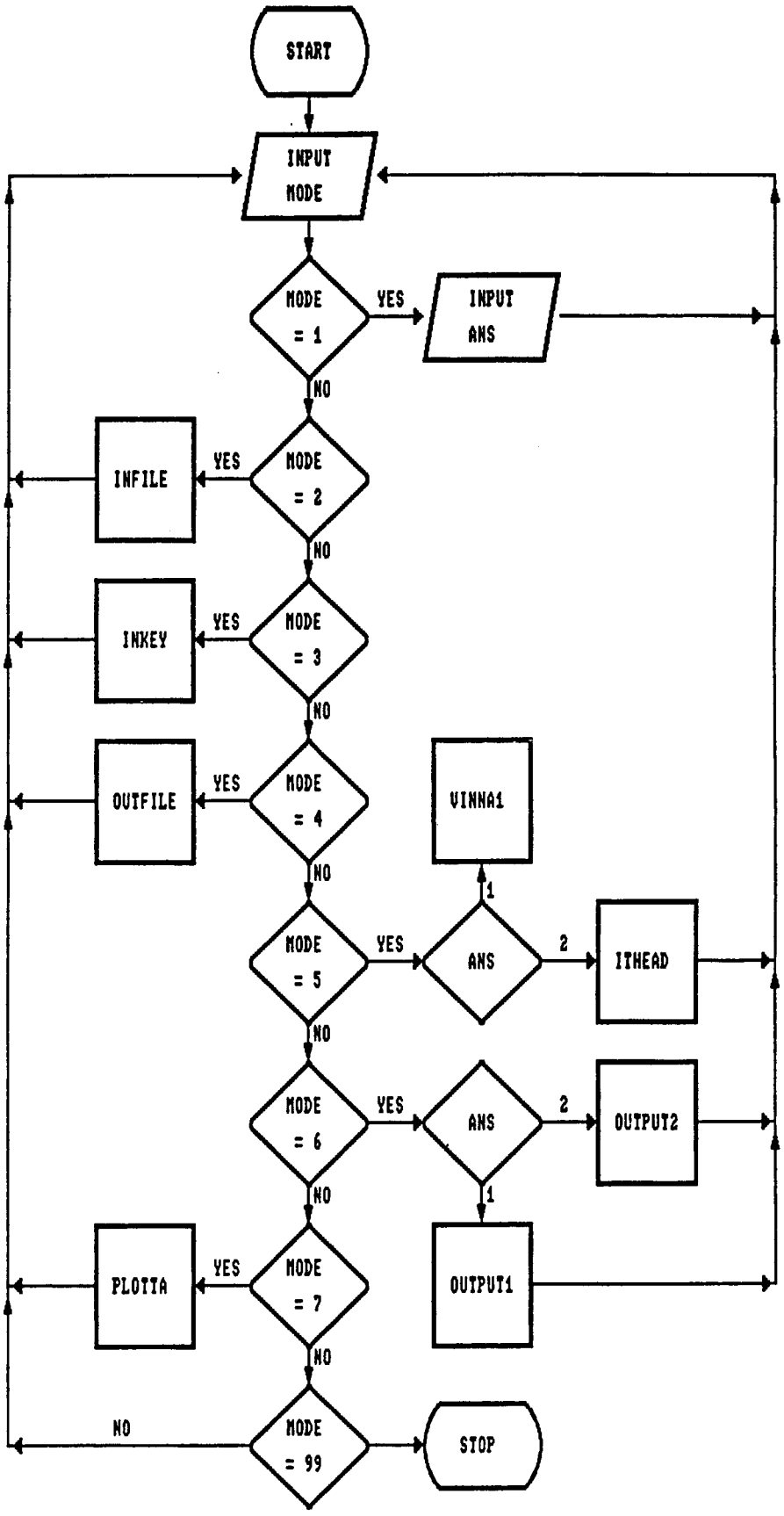


Figure 6.1 Simplified flowchart.

APPENDIX A

(SAMPLE RUNS FOR GWELL)

SAMPLE 1 INPUT FILE

```
Sample 1 for Simulator GWELL
 - Option 1  used -
 - The well is producing two-phase fluid at the wellhead -
0.7000E+06
161.0
100.0000
0.03
2530.000
0.000
2800.000
1000.000
6.0480E+05
20
  300.0  0.1102 4.6E-5    25.0   90.0
   30.0  0.1102 4.6E-5    15.0   88.0
   30.0  0.1102 4.6E-5    15.0   86.0
   30.0  0.1102 4.6E-5    15.0   84.0
   30.0  0.1102 4.6E-5    15.0   82.0
   30.0  0.1102 4.6E-5    15.0   80.0
   30.0  0.1102 4.6E-5    15.0   78.0
   30.0  0.1102 4.6E-5    15.0   76.0
   30.0  0.1102 4.6E-5    15.0   74.0
   30.0  0.1102 4.6E-5    15.0   72.0
   30.0  0.1102 4.6E-5    15.0   70.0
   30.0  0.1102 4.6E-5    15.0   68.0
   30.0  0.1102 4.6E-5    15.0   66.0
   30.0  0.1102 4.6E-5    15.0   64.0
   30.0  0.1102 4.6E-5    15.0   62.0
   30.0  0.1102 4.6E-5    15.0   60.0
  150.0  0.1102 4.6E-5    25.0   60.0
   10.0  0.1102 4.6E-5    10.0   60.0
 1600.0  0.0873 1.5E-5    25.0   60.0
   20.0  0.0873 1.5E-5    20.0   60.0
4
    0.0   25.00
 1000.0  260.00
 2000.0  310.00
 2500.0  330.00
3
 1110.0  20.00   1.7000E+06  0.10
 1810.0  40.00   1.2000E+06  0.02
```

SAMPLE 1 GWELL.LOG FILE

```
   Two phase to water phase
   Temperature        X2          Depth
 0.271164E+03  -0.00095425     1310.0
```

SAMPLE 1 OUTPUT FILE

****

GWELL - MODEL RESULTS

****

Sample 1 for Simulator GWELL
- Option 1 used -
- The well is producing two-phase fluid at the wellhead -

Wellhead pressure (bar abs.)	:	7.00
Wellhead temperature (C)	:	161.00
Wellhead dryness	:	0.316
Wellhead enthalpy (kJ/kg)	:	1258.92
Wellhead total flow (kg/s)	:	100.00
Wellhead CO2	:	0.0300

Feedzone no:	Depth (m)	Flow (kg/s)	Enthalpy (kJ/kg)	XCO2
1	1110.0	20.0000	1700.0	0.1000
2	1810.0	40.0000	1200.0	0.0200
3	2530.0	40.0000	1180.2	0.0050

****

Depth (m)	Press (Pa)	Temp (C)	Dryness	Hw (J/kg)	Hs (J/kg)	Vw (m/s)	Vs (m/s)	Dw (kg/m3)	Ds (kg/m3)	H_t (J/kg)	Rad (m)	Reg	XCO2
0.0	700000.	161.00	0.31592	679670.	2513235.	165.63	202.19	906.28	4.14	1258922.	0.110	Mi	0.030
25.0	1122540.	180.21	0.28934	763764.	2510816.	102.21	118.61	886.68	6.53	1269261.	0.110	Mi	0.030
50.0	1294425.	186.34	0.27974	790886.	2507513.	87.52	100.24	880.07	7.50	1271090.	0.110	Tr	0.030
75.0	1436944.	190.94	0.27226	811325.	2504188.	77.89	88.41	874.99	8.30	1272228.	0.110	Tr	0.030
100.0	1562217.	194.68	0.26602	828030.	2500922.	70.82	79.85	870.78	9.01	1273056.	0.110	Sl	0.030
125.0	1675801.	197.87	0.26061	842301.	2497730.	65.31	73.23	867.14	9.66	1273714.	0.110	Sl	0.030
150.0	1780811.	200.66	0.25578	854842.	2494611.	60.82	67.89	863.91	10.26	1274269.	0.110	Sl	0.030
175.0	1879207.	203.16	0.25142	866083.	2491559.	57.07	63.45	860.99	10.82	1274755.	0.110	Sl	0.030
200.0	1972318.	205.42	0.24741	876308.	2488567.	53.86	59.68	858.31	11.35	1275193.	0.110	Sl	0.030
225.0	2061098.	207.50	0.24369	885715.	2485628.	51.08	56.42	855.82	11.86	1275596.	0.110	Sl	0.030

250.0	2146260.	209.43	0.24021	894447.	2482737.	48.62	53.56	853.50	12.35	1275973.	0.110	Sl	0.030
275.0	2228355.	211.22	0.23694	902613.	2479888.	46.43	51.03	851.31	12.82	1276330.	0.110	Sl	0.030
300.0	2307816.	212.91	0.23384	910297.	2477075.	44.46	48.75	849.24	13.28	1276671.	0.110	Sl	0.030
315.0	2354364.	213.88	0.23205	914704.	2475404.	43.37	47.50	848.05	13.55	1276869.	0.110	Sl	0.030
330.0	2400157.	214.81	0.23032	918973.	2473744.	42.34	46.31	846.89	13.81	1277063.	0.110	Sl	0.030
345.0	2445236.	215.72	0.22863	923114.	2472094.	41.37	45.19	845.76	14.07	1277254.	0.110	Sl	0.030
360.0	2489669.	216.60	0.22698	927137.	2470453.	40.44	44.13	844.66	14.33	1277441.	0.110	Sl	0.030
375.0	2533473.	217.45	0.22537	931050.	2468821.	39.56	43.12	843.59	14.59	1277625.	0.110	Sl	0.030
390.0	2576720.	218.28	0.22381	934860.	2467197.	38.72	42.17	842.54	14.84	1277806.	0.110	Sl	0.030
405.0	2619405.	219.09	0.22227	938573.	2465581.	37.92	41.25	841.52	15.09	1277984.	0.110	Sl	0.030
420.0	2661607.	219.88	0.22077	942197.	2463972.	37.15	40.38	840.52	15.33	1278160.	0.110	Sl	0.030
435.0	2703299.	220.65	0.21930	945734.	2462371.	36.42	39.55	839.54	15.58	1278334.	0.110	Sl	0.030
450.0	2744571.	221.40	0.21786	949193.	2460774.	35.72	38.76	838.58	15.82	1278505.	0.110	Sl	0.030
465.0	2785375.	222.13	0.21645	952572.	2459186.	35.05	37.99	837.63	16.06	1278674.	0.110	Sl	0.030
480.0	2825809.	222.85	0.21506	955883.	2457601.	34.40	37.26	836.71	16.29	1278842.	0.110	Sl	0.030
495.0	2865808.	223.55	0.21370	959121.	2456023.	33.78	36.56	835.80	16.53	1279007.	0.110	Sl	0.030
510.0	2905482.	224.24	0.21236	962299.	2454449.	33.18	35.88	834.91	16.76	1279171.	0.110	Sl	0.030
525.0	2944745.	224.91	0.21104	965409.	2452881.	32.61	35.23	834.03	16.99	1279332.	0.110	Sl	0.030
540.0	2983722.	225.57	0.20975	968465.	2451316.	32.05	34.61	833.17	17.22	1279493.	0.110	Sl	0.030
555.0	3022305.	226.22	0.20848	971459.	2449758.	31.51	34.01	832.32	17.45	1279651.	0.110	Sl	0.030
570.0	3060637.	226.86	0.20722	974403.	2448201.	31.00	33.42	831.49	17.68	1279808.	0.110	Sl	0.030
585.0	3098586.	227.48	0.20599	977290.	2446651.	30.50	32.86	830.67	17.90	1279962.	0.110	Sl	0.030
600.0	3136313.	228.09	0.20477	980131.	2445103.	30.01	32.32	829.86	18.12	1280116.	0.110	Sl	0.030
615.0	3173665.	228.69	0.20357	982918.	2443561.	29.54	31.80	829.06	18.35	1280267.	0.110	Sl	0.030
630.0	3210821.	229.28	0.20239	985664.	2442020.	29.09	31.29	828.28	18.57	1280417.	0.110	Sl	0.030
645.0	3247606.	229.86	0.20123	988358.	2440486.	28.65	30.80	827.51	18.78	1280565.	0.110	Sl	0.030
660.0	3284216.	230.43	0.20008	991014.	2438953.	28.23	30.32	826.74	19.00	1280712.	0.110	Sl	0.030
675.0	3320455.	230.99	0.19894	993621.	2437426.	27.81	29.86	825.99	19.22	1280856.	0.110	Sl	0.030
690.0	3356540.	231.54	0.19782	996193.	2435900.	27.41	29.41	825.25	19.43	1281000.	0.110	Sl	0.030
705.0	3392250.	232.08	0.19672	998718.	2434382.	27.02	28.98	824.52	19.65	1281141.	0.110	Sl	0.030
720.0	3427823.	232.62	0.19563	1001211.	2432863.	26.65	28.56	823.80	19.86	1281281.	0.110	Sl	0.030
735.0	3463017.	233.14	0.19455	1003657.	2431352.	26.28	28.15	823.09	20.07	1281419.	0.110	Sl	0.030
750.0	3498088.	233.66	0.19349	1006074.	2429841.	25.92	27.76	822.39	20.28	1281556.	0.110	Sl	0.030
775.0	3556292.	234.50	0.19173	1010043.	2427319.	25.35	27.12	821.23	20.63	1281784.	0.110	Sl	0.030
800.0	3614215.	235.34	0.19001	1013941.	2424793.	24.79	26.51	820.09	20.98	1282011.	0.110	Sl	0.030
825.0	3777165.	237.61	0.18506	1024600.	2417288.	5.03	45.94	816.96	21.97	1282333.	0.110	Sl	0.030
850.0	3985297.	240.38	0.17882	1037647.	2407309.	4.97	43.12	813.09	23.24	1282575.	0.110	Sl	0.030
875.0	4197275.	243.06	0.17264	1050347.	2396872.	4.92	40.48	809.28	24.55	1282812.	0.110	Sl	0.030
900.0	4413005.	245.66	0.16651	1062710.	2385972.	4.87	38.01	805.53	25.89	1283046.	0.110	Sl	0.030
910.0	4500316.	246.68	0.16407	1067561.	2381482.	4.86	37.07	804.05	26.44	1283139.	0.110	Sl	0.030
935.0	4704758.	248.99	0.15837	1078568.	2370585.	7.45	58.07	800.67	27.72	1283183.	0.087	Sl	0.030
960.0	4981267.	251.97	0.15095	1092805.	2355698.	7.39	53.84	796.24	29.48	1283444.	0.087	Sl	0.030
985.0	5259448.	254.79	0.14370	1106389.	2340267.	7.34	49.91	791.97	31.28	1283696.	0.087	Sl	0.030

1010.0	5538785.	257.48	0.13661	1119334.	2324320.	7.30	46.24	787.85	33.10	1283942.	0.087	Sl	0.030
1035.0	5818600.	260.02	0.12968	1131648.	2307896.	7.27	42.81	783.89	34.95	1284182.	0.087	Sl	0.030
1060.0	6098097.	262.43	0.12293	1143332.	2291049.	7.25	39.59	780.08	36.81	1284416.	0.087	Sl	0.030
1085.0	6376409.	264.70	0.11636	1154388.	2273842.	7.24	36.58	776.44	38.70	1284647.	0.087	Sl	0.030
1110.0	6652647.	266.84	0.10999	1164817.	2256346.	7.23	33.78	772.97	40.59	1284875.	0.087	Sl	0.030
1110.0	6652647.	265.68	0.02108	1158718.	2220567.	5.45	7.62	774.85	41.06	1181106.	0.087	Sl	0.013
1135.0	6831288.	266.59	0.01776	1162962.	2196839.	5.33	6.84	773.37	42.47	1181319.	0.087	Sl	0.013
1160.0	7004521.	267.41	0.01466	1166777.	2173505.	5.21	6.18	772.03	43.86	1181533.	0.087	Sl	0.013
1185.0	7173127.	268.16	0.01176	1170218.	2150549.	5.07	5.61	770.80	45.22	1181746.	0.087	Sl	0.013
1210.0	7338836.	268.85	0.00902	1173350.	2127803.	4.92	5.18	769.67	46.58	1181959.	0.087	Bu	0.013
1235.0	7503628.	269.48	0.00640	1176231.	2105048.	4.76	4.83	768.61	47.95	1182172.	0.087	Bu	0.013
1260.0	7668261.	270.08	0.00387	1178887.	2082231.	4.60	4.51	767.63	49.34	1182385.	0.087	Bu	0.013
1285.0	7832916.	270.63	0.00144	1181334.	2059375.	4.45	4.23	766.70	50.73	1182598.	0.087	Bu	0.013
1310.0	8086022.	271.16	0.00000	1182812.	0.	4.34	0.00	769.46	0.00	1182812.	0.087	1p	0.013
1335.0	8261922.	271.22	0.00000	1183025.	0.	4.34	0.00	769.62	0.00	1183025.	0.087	1p	0.013
1360.0	8437853.	271.27	0.00000	1183237.	0.	4.34	0.00	769.78	0.00	1183237.	0.087	1p	0.013
1385.0	8613815.	271.32	0.00000	1183450.	0.	4.34	0.00	769.94	0.00	1183450.	0.087	1p	0.013
1410.0	8789808.	271.38	0.00000	1183662.	0.	4.34	0.00	770.10	0.00	1183662.	0.087	1p	0.013
1435.0	8965833.	271.43	0.00000	1183875.	0.	4.34	0.00	770.25	0.00	1183875.	0.087	1p	0.013
1460.0	9141888.	271.48	0.00000	1184087.	0.	4.34	0.00	770.41	0.00	1184087.	0.087	1p	0.013
1485.0	9317975.	271.54	0.00000	1184300.	0.	4.34	0.00	770.57	0.00	1184300.	0.087	1p	0.013
1510.0	9494092.	271.59	0.00000	1184512.	0.	4.34	0.00	770.73	0.00	1184512.	0.087	1p	0.013
1535.0	9670241.	271.64	0.00000	1184725.	0.	4.33	0.00	770.88	0.00	1184725.	0.087	1p	0.013
1560.0	9846420.	271.70	0.00000	1184937.	0.	4.33	0.00	771.04	0.00	1184937.	0.087	1p	0.013
1585.0	10022630.	271.75	0.00000	1185150.	0.	4.33	0.00	771.20	0.00	1185150.	0.087	1p	0.013
1610.0	10198871.	271.80	0.00000	1185362.	0.	4.33	0.00	771.35	0.00	1185362.	0.087	1p	0.013
1635.0	10375143.	271.86	0.00000	1185575.	0.	4.33	0.00	771.51	0.00	1185575.	0.087	1p	0.013
1660.0	10551445.	271.91	0.00000	1185787.	0.	4.33	0.00	771.67	0.00	1185787.	0.087	1p	0.013
1685.0	10727778.	271.96	0.00000	1186000.	0.	4.33	0.00	771.82	0.00	1186000.	0.087	1p	0.013
1710.0	10904142.	272.02	0.00000	1186212.	0.	4.33	0.00	771.98	0.00	1186212.	0.087	1p	0.013
1735.0	11080536.	272.07	0.00000	1186425.	0.	4.33	0.00	772.13	0.00	1186425.	0.087	1p	0.013
1760.0	11256960.	272.12	0.00000	1186637.	0.	4.33	0.00	772.29	0.00	1186637.	0.087	1p	0.013
1785.0	11433415.	272.17	0.00000	1186850.	0.	4.33	0.00	772.44	0.00	1186850.	0.087	1p	0.013
1810.0	11609900.	272.23	0.00000	1187062.	0.	4.32	0.00	772.59	0.00	1187062.	0.087	1p	0.013
1810.0	11609900.	268.74	0.00000	1174129.	0.	2.15	0.00	778.48	0.00	1174129.	0.087	1p	0.005
1835.0	11778418.	268.79	0.00000	1174341.	0.	2.15	0.00	778.62	0.00	1174341.	0.087	1p	0.005
1860.0	11946966.	268.84	0.00000	1174554.	0.	2.15	0.00	778.76	0.00	1174554.	0.087	1p	0.005
1885.0	12115542.	268.89	0.00000	1174766.	0.	2.14	0.00	778.90	0.00	1174766.	0.087	1p	0.005
1910.0	12284147.	268.94	0.00000	1174979.	0.	2.14	0.00	779.04	0.00	1174979.	0.087	1p	0.005
1935.0	12452782.	268.99	0.00000	1175191.	0.	2.14	0.00	779.18	0.00	1175191.	0.087	1p	0.005
1960.0	12621445.	269.04	0.00000	1175404.	0.	2.14	0.00	779.32	0.00	1175404.	0.087	1p	0.005
1985.0	12790138.	269.09	0.00000	1175616.	0.	2.14	0.00	779.46	0.00	1175616.	0.087	1p	0.005
2010.0	12958859.	269.14	0.00000	1175829.	0.	2.14	0.00	779.60	0.00	1175829.	0.087	1p	0.005
2035.0	13127610.	269.19	0.00000	1176041.	0.	2.14	0.00	779.74	0.00	1176041.	0.087	1p	0.005

2060.0	13296389.	269.24	0.00000	1176254.	0.	2.14	0.00	779.88	0.00	1176254.	0.087	1p	0.005
2085.0	13465197.	269.29	0.00000	1176466.	0.	2.14	0.00	780.01	0.00	1176466.	0.087	1p	0.005
2110.0	13634034.	269.34	0.00000	1176679.	0.	2.14	0.00	780.15	0.00	1176679.	0.087	1p	0.005
2135.0	13802900.	269.39	0.00000	1176891.	0.	2.14	0.00	780.29	0.00	1176891:	0.087	1p	0.005
2160.0	13971794.	269.44	0.00000	1177104.	0.	2.14	0.00	780.43	0.00	1177104.	0.087	1p	0.005
2185.0	14140717.	269.49	0.00000	1177316.	0.	2.14	0.00	780.56	0.00	1177316.	0.087	1p	0.005
2210.0	14309669.	269.54	0.00000	1177529.	0.	2.14	0.00	780.70	0.00	1177529.	0.087	1p	0.005
2235.0	14478649.	269.59	0.00000	1177741.	0.	2.14	0.00	780.84	0.00	1177741.	0.087	1p	0.005
2260.0	14647658.	269.64	0.00000	1177954.	0.	2.14	0.00	780.98	0.00	1177954.	0.087	1p	0.005
2285.0	14816695.	269.69	0.00000	1178166.	0.	2.14	0.00	781.11	0.00	1178166.	0.087	1p	0.005
2310.0	14985761.	269.74	0.00000	1178379.	0.	2.14	0.00	781.25	0.00	1178379.	0.087	1p	0.005
2335.0	15154855.	269.78	0.00000	1178591.	0.	2.14	0.00	781.39	0.00	1178591.	0.087	1p	0.005
2360.0	15323978.	269.83	0.00000	1178804.	0.	2.14	0.00	781.52	0.00	1178804.	0.087	1p	0.005
2385.0	15493129.	269.88	0.00000	1179016.	0.	2.14	0.00	781.66	0.00	1179016.	0.087	1p	0.005
2410.0	15662308.	269.93	0.00000	1179229.	0.	2.14	0.00	781.79	0.00	1179229.	0.087	1p	0.005
2435.0	15831516.	269.98	0.00000	1179441.	0.	2.14	0.00	781.93	0.00	1179441.	0.087	1p	0.005
2460.0	16000752.	270.03	0.00000	1179654.	0.	2.14	0.00	782.06	0.00	1179654.	0.087	1p	0.005
2485.0	16170016.	270.08	0.00000	1179866.	0.	2.14	0.00	782.20	0.00	1179866.	0.087	1p	0.005
2510.0	16339308.	270.13	0.00000	1180079.	0.	2.14	0.00	782.33	0.00	1180079.	0.087	1p	0.005
2530.0	16474762.	270.17	0.00000	1180249.	0.	2.14	0.00	782.44	0.00	1180249.	0.087	1p	0.005

SAMPLE 2 INPUT FILE

```
Sample 2 for Simulator GWELL
 - Option 2  used -

2.0000E+06
12.40E+06
0.100E+06
0.00
2530.000
0.000
2800.000
1000.000
6.0480E+05
20
  300.0  0.1102 4.6E-5    25.0   90.0
   30.0  0.1102 4.6E-5    15.0   88.0
   30.0  0.1102 4.6E-5    15.0   86.0
   30.0  0.1102 4.6E-5    15.0   84.0
   30.0  0.1102 4.6E-5    15.0   82.0
   30.0  0.1102 4.6E-5    15.0   80.0
   30.0  0.1102 4.6E-5    15.0   78.0
   30.0  0.1102 4.6E-5    15.0   76.0
   30.0  0.1102 4.6E-5    15.0   74.0
   30.0  0.1102 4.6E-5    15.0   72.0
   30.0  0.1102 4.6E-5    15.0   70.0
   30.0  0.1102 4.6E-5    15.0   68.0
   30.0  0.1102 4.6E-5    15.0   66.0
   30.0  0.1102 4.6E-5    15.0   64.0
   30.0  0.1102 4.6E-5    15.0   62.0
   30.0  0.1102 4.6E-5    15.0   60.0
  150.0  0.1102 4.6E-5    25.0   60.0
   10.0  0.1102 4.6E-5    10.0   60.0
 1600.0  0.0873 1.5E-5    25.0   60.0
   20.0  0.0873 1.5E-5    20.0   60.0
4
    0.0   25.00
 1000.0  260.00
 2000.0  310.00
 2500.0  330.00
3
 1110.0 10.00E+06 1700.0E+03 5.0E-13  0.10
 2010.0 13.50E+06 250.0E+03  8.00E-13 0.02
 2530.0 15.35E+06 300.0      10.0E-13 0.010
```

SAMPLE 2 GWELL.LOG FILE

```
                    Iteration no :   0
 It no   0-   Single water to two phase flow at 2110.00 m depth
 It no   0-   Change of phase at a feedzone at   2010.0 m depth.
  X before=  0.01635   X after= 0.00000
  Slow convergence at 1610.0 m depth when Q=      30.49 kg/s
```

SAMPLE 2 GWELL.LOG FILE (cont)

```
New node added at  1622.0 m depth
 Slow convergence at 1610.0 m depth when Q=      30.49 kg/s
New node added at  1616.0 m depth
It no   0-   Single water to two phase flow at 1610.00 m depth
                    Iteration no :   1
It no   1-   Single water to two phase flow at 2110.00 m depth
It no   1-   Change of phase at a feedzone at   2010.0 m depth.
 X before=  0.01645   X after= 0.00000
It no   1-   Single water to two phase flow at 1610.00 m depth
                    Iteration no :   2
It no   2-   Single water to two phase flow at 2110.00 m depth
It no   2-   Change of phase at a feedzone at   2010.0 m depth.
 X before=  0.01654   X after= 0.00000
It no   2-   Single water to two phase flow at 1610.00 m depth
                    Iteration no :   3
It no   3-   Single water to two phase flow at 2110.00 m depth
It no   3-   Change of phase at a feedzone at   2010.0 m depth.
 X before=  0.01664   X after= 0.00000
It no   3-   Single water to two phase flow at 1610.00 m depth
                    Iteration no :   4
It no   4-   Single water to two phase flow at 2110.00 m depth
It no   4-   Change of phase at a feedzone at   2010.0 m depth.
 X before=  0.01674   X after= 0.00000
It no   4-   Single water to two phase flow at 1610.00 m depth
                    Iteration no :   5
It no   5-   Single water to two phase flow at 2110.00 m depth
It no   5-   Change of phase at a feedzone at   2010.0 m depth.
 X before=  0.01684   X after= 0.00000
It no   5-   Single water to two phase flow at 1610.00 m depth
```

SAMPLE 2 GWELL.ITER FILE

P required (bars)	Max Error (bars)	Step size (bars)	Pbott Max (bars)	Pbott min (bars)
20.0000	1.0000	0.0200	153.4800	20.0000

It no	P bottom (bars)	P top (bars)	Difference (bars)	Q top (kg/s)	H top (kJ/kg)
0	124.0000	21.1408	1.1408	44.170	1255.522
1	123.9800	21.1089	1.1089	44.195	1255.596
2	123.9600	21.0741	1.0741	44.221	1255.681
3	123.9400	21.0392	1.0392	44.246	1255.768
4	123.9200	21.0042	1.0042	44.272	1255.852
5	123.9000	20.9691	0.9691	44.298	1255.938

SAMPLE 2 OUTPUT FILE

****

GWELL - MODEL RESULTS

****

Sample 2 for Simulator GWELL
- Option 2 used -

Wellhead pressure (bar abs.)	:	20.97
Wellhead temperature (C)	:	206.35
Wellhead dryness	:	0.248
Wellhead enthalpy (kJ/kg)	:	1255.94
Wellhead total flow (kg/s)	:	44.30
Wellhead CO2	:	0.0395

Feedzone no:	Depth (m)	Flow (kg/s)	Enthalpy (kJ/kg)	Res.Pres (Bar)	Satur.	Prod. Ind. (m3)	XCO2
1	1110.0	13.7107	1700.0	100.000	0.90	0.500000E-12	0.1000
2	2010.0	7.1739	250.0	135.000	0.00	0.800000E-12	0.0200
3	2530.0	23.4132	1332.4	153.500	0.00	0.100000E-11	0.0100

****

Depth (m)	Press (Pa)	Temp (C)	Dryness	Hw (J/kg)	Hs (J/kg)	Vw (m/s)	Vs (m/s)	Dw (kg/m3)	Ds (kg/m3)	H_t (J/kg)	Rad (m)	Reg	XCO2
0.0	2096907.	206.35	0.24812	880267.	2394349.	20.96	24.18	857.21	12.52	1255938.	0.110	Sl	0.039
25.0	2130424.	207.09	0.24684	883616.	2392974.	20.57	23.71	856.32	12.72	1256192.	0.110	Bu	0.039
50.0	2163837.	207.82	0.24559	886913.	2391597.	20.20	23.25	855.44	12.92	1256446.	0.110	Bu	0.039
75.0	2197160.	208.53	0.24435	890162.	2390220.	19.85	22.80	854.58	13.12	1256699.	0.110	Bu	0.039
100.0	2230403.	209.24	0.24312	893365.	2388840.	19.50	22.37	853.72	13.32	1256952.	0.110	Bu	0.039
125.0	2263578.	209.94	0.24192	896524.	2387458.	19.17	21.96	852.88	13.52	1257204.	0.110	Bu	0.039
150.0	2296696.	210.62	0.24072	899641.	2386074.	18.84	21.56	852.04	13.72	1257456.	0.110	Bu	0.039
175.0	2329767.	211.30	0.23954	902719.	2384688.	18.53	21.17	851.22	13.91	1257708.	0.110	Bu	0.039
200.0	2362800.	211.97	0.23837	905759.	2383298.	18.22	20.80	850.40	14.11	1257960.	0.110	Bu	0.039
225.0	2395806.	212.63	0.23721	908763.	2381905.	17.93	20.43	849.59	14.31	1258211.	0.110	Bu	0.039
250.0	2428793.	213.28	0.23607	911733.	2380508.	17.64	20.08	848.78	14.51	1258462.	0.110	Bu	0.039

275.0	2461770.	213.93	0.23493	914671.	2379108.	17.36	19.74	847.99	14.71	1258712.	0.110	Bu	0.039
300.0	2494745.	214.57	0.23381	917577.	2377703.	17.08	19.40	847.19	14.91	1258963.	0.110	Bu	0.039
315.0	2514533.	214.95	0.23313	919307.	2376858.	16.92	19.21	846.72	15.03	1259113.	0.110	Bu	0.039
330.0	2534319.	215.32	0.23247	921026.	2376012.	16.77	19.02	846.25	15.14	1259263.	0.110	Bu	0.039
345.0	2554110.	215.70	0.23180	922734.	2375163.	16.61	18.83	845.79	15.26	1259413.	0.110	Bu	0.039
360.0	2573891.	216.07	0.23114	924432.	2374314.	16.46	18.64	845.32	15.38	1259562.	0.110	Bu	0.039
375.0	2593681.	216.44	0.23049	926119.	2373463.	16.31	18.46	844.86	15.50	1259712.	0.110	Bu	0.039
390.0	2613450.	216.80	0.22983	927795.	2372611.	16.16	18.28	844.40	15.62	1259861.	0.110	Bu	0.039
405.0	2633231.	217.17	0.22918	929462.	2371757.	16.01	18.10	843.94	15.74	1260010.	0.110	Bu	0.039
420.0	2652981.	217.53	0.22854	931116.	2370903.	15.87	17.93	843.49	15.86	1260158.	0.110	Bu	0.039
435.0	2672746.	217.89	0.22789	932761.	2370046.	15.73	17.76	843.04	15.98	1260306.	0.110	Bu	0.039
450.0	2692469.	218.25	0.22725	934394.	2369190.	15.59	17.59	842.59	16.10	1260453.	0.110	Bu	0.039
465.0	2712208.	218.60	0.22661	936018.	2368331.	15.45	17.42	842.14	16.22	1260601.	0.110	Bu	0.039
480.0	2731894.	218.95	0.22598	937629.	2367473.	15.32	17.26	841.69	16.34	1260747.	0.110	Bu	0.039
495.0	2751598.	219.30	0.22535	939231.	2366613.	15.18	17.10	841.25	16.46	1260893.	0.110	Bu	0.039
510.0	2771237.	219.65	0.22472	940820.	2365754.	15.05	16.94	840.81	16.58	1261038.	0.110	Bu	0.039
525.0	2790896.	219.99	0.22410	942401.	2364892.	14.92	16.79	840.37	16.70	1261183.	0.110	Bu	0.039
540.0	2810477.	220.34	0.22348	943967.	2364032.	14.80	16.64	839.94	16.82	1261326.	0.110	Bu	0.039
555.0	2830080.	220.68	0.22287	945526.	2363170.	14.67	16.49	839.50	16.94	1261470.	0.110	Bu	0.039
570.0	2849590.	221.01	0.22225	947068.	2362310.	14.55	16.34	839.07	17.05	1261612.	0.110	Bu	0.039
585.0	2869125.	221.35	0.22164	948605.	2361447.	14.43	16.20	838.65	17.17	1261754.	0.110	Bu	0.039
600.0	2888552.	221.68	0.22104	950125.	2360587.	14.31	16.05	838.22	17.29	1261894.	0.110	Bu	0.039
615.0	2908005.	222.01	0.22044	951638.	2359724.	14.19	15.91	837.80	17.41	1262034.	0.110	Bu	0.039
630.0	2927337.	222.33	0.21984	953134.	2358865.	14.07	15.78	837.38	17.53	1262172.	0.110	Bu	0.039
645.0	2946695.	222.66	0.21925	954624.	2358004.	13.96	15.64	836.96	17.65	1262310.	0.110	Bu	0.039
660.0	2965916.	222.97	0.21866	956095.	2357146.	13.85	15.51	836.55	17.76	1262446.	0.110	Bu	0.039
675.0	2985164.	223.29	0.21807	957561.	2356286.	13.74	15.38	836.14	17.88	1262582.	0.110	Bu	0.039
690.0	3004260.	223.61	0.21749	959008.	2355431.	13.63	15.25	835.73	18.00	1262716.	0.110	Bu	0.039
705.0	3023383.	223.92	0.21691	960450.	2354573.	13.52	15.12	835.33	18.11	1262850.	0.110	Bu	0.039
720.0	3042338.	224.23	0.21634	961871.	2353720.	13.42	15.00	834.93	18.23	1262981.	0.110	Bu	0.039
735.0	3061321.	224.54	0.21577	963288.	2352865.	13.32	14.87	834.53	18.35	1263113.	0.110	Bu	0.039
750.0	3080118.	224.84	0.21520	964683.	2352016.	13.22	14.75	834.13	18.46	1263242.	0.110	Bu	0.039
775.0	3111510.	225.34	0.21427	966998.	2350596.	13.05	14.56	833.48	18.65	1263456.	0.110	Bu	0.039
800.0	3142984.	225.84	0.21333	969301.	2349168.	12.89	14.36	832.83	18.85	1263671.	0.110	Bu	0.039
825.0	3174544.	226.33	0.21240	971591.	2347733.	12.73	14.18	832.18	19.04	1263886.	0.110	Bu	0.039
850.0	3206194.	226.83	0.21147	973869.	2346291.	12.57	13.99	831.53	19.24	1264100.	0.110	Bu	0.039
875.0	3237940.	227.32	0.21055	976135.	2344841.	12.42	13.81	830.88	19.43	1264315.	0.110	Bu	0.039
900.0	3269785.	227.80	0.20963	978391.	2343383.	12.26	13.63	830.24	19.63	1264529.	0.110	Bu	0.039
910.0	3282552.	228.00	0.20926	979290.	2342798.	12.20	13.56	829.98	19.71	1264615.	0.110	Bu	0.039
935.0	3344158.	228.92	0.20734	983550.	2339636.	19.17	21.04	828.76	20.09	1264714.	0.087	Bu	0.039
960.0	3388350.	229.57	0.20604	986584.	2337514.	18.85	20.67	827.89	20.36	1264933.	0.087	Bu	0.039
985.0	3432521.	230.22	0.20476	989584.	2335386.	18.54	20.31	827.03	20.64	1265151.	0.087	Bu	0.039
1010.0	3476683.	230.86	0.20349	992552.	2333252.	18.23	19.96	826.17	20.91	1265370.	0.087	Bu	0.039
1035.0	3520849.	231.49	0.20223	995489.	2331111.	17.94	19.62	825.32	21.19	1265588.	0.087	Bu	0.039

1060.0	3565029.	232.11	0.20097	998396.	2328963.	17.65	19.28	824.48	21.46	1265806.	0.087	Bu	0.039
1085.0	3609235.	232.73	0.19973	1001276.	2326808.	17.37	18.96	823.64	21.74	1266023.	0.087	Bu	0.039
1110.0	3653477.	233.34	0.19849	1004128.	2324644.	17.09	18.65	822.81	22.01	1266241.	0.087	Bu	0.039
1110.0	3653477.	233.44	0.05079	1004584.	2328212.	2.56	6.95	822.69	21.99	1071805.	0.087	Bu	0.012
1135.0	3817056.	235.14	0.04626	1012406.	2301115.	2.55	6.10	820.37	23.17	1072018.	0.087	Bu	0.012
1160.0	3975314.	236.66	0.04212	1019391.	2273857.	2.54	5.37	818.28	24.35	1072231.	0.087	Bu	0.012
1185.0	4128346.	238.01	0.03834	1025627.	2246620.	2.52	4.76	816.39	25.51	1072443.	0.087	Bu	0.012
1210.0	4276423.	239.23	0.03489	1031200.	2219544.	2.50	4.23	814.69	26.65	1072656.	0.087	Bu	0.012
1235.0	4419944.	240.33	0.03171	1036190.	2192725.	2.47	3.79	813.15	27.78	1072868.	0.087	Bu	0.012
1260.0	4559366.	241.31	0.02880	1040670.	2166227.	2.44	3.41	811.76	28.90	1073081.	0.087	Bu	0.012
1285.0	4695170.	242.21	0.02610	1044705.	2140089.	2.40	3.09	810.49	30.01	1073293.	0.087	Bu	0.012
1310.0	4827834.	243.02	0.02360	1048353.	2114328.	2.35	2.81	809.34	31.10	1073506.	0.087	Bu	0.012
1335.0	4961014.	243.77	0.02121	1051737.	2088303.	2.27	2.65	808.25	32.22	1073718.	0.087	Bu	0.012
1360.0	5096514.	244.49	0.01889	1054909.	2061723.	2.20	2.46	807.23	33.37	1073931.	0.087	Bu	0.012
1385.0	5232641.	245.16	0.01668	1057841.	2035010.	2.13	2.29	806.27	34.55	1074143.	0.087	Bu	0.012
1410.0	5369526.	245.78	0.01457	1060550.	2008211.	2.07	2.14	805.37	35.74	1074356.	0.087	Bu	0.012
1435.0	5507286.	246.36	0.01254	1063052.	1981375.	2.00	2.01	804.53	36.96	1074568.	0.087	Bu	0.012
1460.0	5646021.	246.90	0.01059	1065360.	1954549.	1.94	1.89	803.74	38.20	1074781.	0.087	Bu	0.012
1485.0	5785815.	247.40	0.00872	1067488.	1927778.	1.88	1.78	803.00	39.46	1074993.	0.087	Bu	0.012
1510.0	5926736.	247.87	0.00692	1069449.	1901109.	1.82	1.68	802.32	40.74	1075206.	0.087	Bu	0.012
1535.0	6068835.	248.31	0.00518	1071253.	1874582.	1.76	1.59	801.67	42.04	1075418.	0.087	Bu	0.012
1560.0	6212148.	248.72	0.00351	1072912.	1848241.	1.71	1.51	801.06	43.37	1075631.	0.087	Bu	0.012
1585.0	6356696.	249.11	0.00188	1074434.	1822123.	1.65	1.44	800.50	44.72	1075843.	0.087	Bu	0.012
1610.0	6514856.	249.49	0.00018	1075927.	1794009.	1.60	1.60	799.93	46.21	1076056.	0.087	Bu	0.012
1635.0	6686897.	249.57	0.00000	1076139.	0.	1.59	0.00	802.98	0.00	1076139.	0.087	1p	0.012
1660.0	6859280.	249.62	0.00000	1076351.	0.	1.59	0.00	803.11	0.00	1076351.	0.087	1p	0.012
1685.0	7031690.	249.66	0.00000	1076564.	0.	1.59	0.00	803.24	0.00	1076564.	0.087	1p	0.012
1710.0	7204127.	249.71	0.00000	1076776.	0.	1.59	0.00	803.36	0.00	1076776.	0.087	1p	0.012
1735.0	7376591.	249.75	0.00000	1076988.	0.	1.59	0.00	803.49	0.00	1076988.	0.087	1p	0.012
1760.0	7549081.	249.80	0.00000	1077201.	0.	1.59	0.00	803.62	0.00	1077201.	0.087	1p	0.012
1785.0	7721598.	249.84	0.00000	1077413.	0.	1.59	0.00	803.75	0.00	1077413.	0.087	1p	0.012
1810.0	7894142.	249.89	0.00000	1077625.	0.	1.59	0.00	803.87	0.00	1077625.	0.087	1p	0.012
1835.0	8066713.	249.93	0.00000	1077838.	0.	1.59	0.00	804.00	0.00	1077838.	0.087	1p	0.012
1860.0	8239310.	249.98	0.00000	1078050.	0.	1.59	0.00	804.13	0.00	1078050.	0.087	1p	0.012
1885.0	8411934.	250.02	0.00000	1078262.	0.	1.59	0.00	804.25	0.00	1078262.	0.087	1p	0.012
1910.0	8584584.	250.07	0.00000	1078475.	0.	1.59	0.00	804.38	0.00	1078475.	0.087	1p	0.012
1935.0	8757261.	250.11	0.00000	1078687.	0.	1.59	0.00	804.51	0.00	1078687.	0.087	1p	0.012
1960.0	8929965.	250.16	0.00000	1078900.	0.	1.59	0.00	804.63	0.00	1078900.	0.087	1p	0.012
1985.0	9102695.	250.20	0.00000	1079112.	0.	1.59	0.00	804.76	0.00	1079112.	0.087	1p	0.012
2010.0	9275451.	250.25	0.00000	1079324.	0.	1.59	0.00	804.88	0.00	1079324.	0.087	1p	0.012
2010.0	9275451.	295.29	0.01684	1314624.	2431317.	1.64	1.63	721.78	54.30	1333426.	0.087	Bu	0.010
2035.0	9404016.	296.00	0.01382	1318377.	2422705.	1.59	1.54	720.36	55.23	1333639.	0.087	Bu	0.010
2060.0	9533233.	296.70	0.01081	1322047.	2413864.	1.54	1.46	718.96	56.17	1333851.	0.087	Bu	0.010
2085.0	9663186.	297.38	0.00781	1325634.	2404781.	1.50	1.38	717.59	57.11	1334063.	0.087	Bu	0.010

2110.0	9801154.	298.07	0.00465	1329322.	2394901.	1.37	1.37	716.17	58.13	1334276.	0.087	Bu	0.010
2135.0	9954724.	298.51	0.00000	1329532.	2402845.	1.36	1.36	718.65	57.20	1329532.	0.087	1p	0.010
2160.0	10108580.	298.58	0.00000	1329745.	2392872.	1.36	1.36	718.83	58.22	1329745.	0.087	1p	0.010
2185.0	10262472.	298.65	0.00000	1329957.	0.	1.36	0.00	719.01	0.00	1329957.	0.087	1p	0.010
2210.0	10416403.	298.71	0.00000	1330169.	0.	1.36	0.00	719.19	0.00	1330169.	0.087	1p	0.010
2235.0	10570371.	298.78	0.00000	1330381.	0.	1.36	0.00	719.36	0.00	1330381.	0.087	1p	0.010
2260.0	10724376.	298.85	0.00000	1330593.	0.	1.36	0.00	719.54	0.00	1330593.	0.087	1p	0.010
2285.0	10878419.	298.91	0.00000	1330805.	0.	1.36	0.00	719.72	0.00	1330805.	0.087	1p	0.010
2310.0	11032499.	298.98	0.00000	1331017.	0.	1.36	0.00	719.90	0.00	1331017.	0.087	1p	0.010
2335.0	11186616.	299.05	0.00000	1331230.	0.	1.36	0.00	720.07	0.00	1331230.	0.087	1p	0.010
2360.0	11340770.	299.11	0.00000	1331442.	0.	1.36	0.00	720.25	0.00	1331442.	0.087	1p	0.010
2385.0	11494962.	299.18	0.00000	1331654.	0.	1.36	0.00	720.42	0.00	1331654.	0.087	1p	0.010
2410.0	11649190.	299.25	0.00000	1331866.	0.	1.36	0.00	720.60	0.00	1331866.	0.087	1p	0.010
2435.0	11803456.	299.31	0.00000	1332078.	0.	1.36	0.00	720.77	0.00	1332078.	0.087	1p	0.010
2460.0	11957758.	299.38	0.00000	1332290.	0.	1.36	0.00	720.95	0.00	1332290.	0.087	1p	0.010
2485.0	12112097.	299.45	0.00000	1332503.	0.	1.36	0.00	721.12	0.00	1332503.	0.087	1p	0.010
2510.0	12266473.	299.51	0.00000	1332715.	0.	1.36	0.00	721.30	0.00	1332715.	0.087	1p	0.010
2530.0	12390000.	299.57	0.00000	1332884.	0.	1.36	24.11	721.44	0.00	1332884.	0.087	1p	0.010
2530.0	12390000.	299.57	0.00000	1332884.	0.	1.36	24.11	721.44	0.00	1332884.	0.087	1p	0.010

APPENDIX B
(SAMPLE RUNS FOR GWNACL)

SAMPLE 1 INPUT FILE

```
Sample 1 for Simulator GWNACL
 - Option 1  used -
 - The well is producing two-phase fluid at the wellhead -
2.0000E+06
1.4000E+06
100.0000
0.008
2530.000
0.000
2800.000
1000.000
6.0480E+05
20
  300.0  0.1102 4.6E-5    25.0   90.0
   30.0  0.1102 4.6E-5    15.0   88.0
   30.0  0.1102 4.6E-5    15.0   86.0
   30.0  0.1102 4.6E-5    15.0   84.0
   30.0  0.1102 4.6E-5    15.0   82.0
   30.0  0.1102 4.6E-5    15.0   80.0
   30.0  0.1102 4.6E-5    15.0   78.0
   30.0  0.1102 4.6E-5    15.0   76.0
   30.0  0.1102 4.6E-5    15.0   74.0
   30.0  0.1102 4.6E-5    15.0   72.0
   30.0  0.1102 4.6E-5    15.0   70.0
   30.0  0.1102 4.6E-5    15.0   68.0
   30.0  0.1102 4.6E-5    15.0   66.0
   30.0  0.1102 4.6E-5    15.0   64.0
   30.0  0.1102 4.6E-5    15.0   62.0
   30.0  0.1102 4.6E-5    15.0   60.0
  150.0  0.1102 4.6E-5    25.0   60.0
   10.0  0.1102 4.6E-5    10.0   60.0
 1600.0  0.0873 1.5E-5    25.0   60.0
   20.0  0.0873 1.5E-5    20.0   60.0
4
    0.0   25.00
 1000.0  260.00
 2000.0  310.00
 2500.0  330.00
3
 1110.0  20.00   1.7000E+06  0.0001
 1810.0  40.00   1.2000E+06  0.0070
```

SAMPLE 1 GWNACL.LOG FILE

```
   Two phase to water phase
   Pressure          X2        Depth
 0.888494E+07  -0.00088472    1185.0
  Change of phase at a feedzone at   1810.0 m depth.
  X before=  0.00000   X after= 0.00059
   Two phase to water phase
   Pressure          X2        Depth
0.131155E+08  -0.00338873    1835.0
```

SAMPLE 1 OUTPUT FILE

****

GWNACL - MODEL RESULTS

****

Sample 1 for Simulator GWNACL
- Option 1 used -
- The well is producing two-phase fluid at the wellhead -

Wellhead pressure (bar abs.)	:	20.00
Wellhead temperature (C)	:	212.70
Wellhead dryness	:	0.263
Wellhead enthalpy (kJ/kg)	:	1400.00
Wellhead total flow (kg/s)	:	100.00
Wellhead NaCl	:	0.0080

Feedzone no:	Depth (m)	Flow (kg/s)	Enthalpy (kJ/kg)	XNaCl
1	1110.0	20.0000	1700.0	0.0001
2	1810.0	40.0000	1200.0	0.0070
3	2530.0	40.0000	1498.9	0.0129

****

Depth (m)	Press (Pa)	Temp (C)	Dryness	Hw (J/kg)	Hs (J/kg)	Vw (m/s)	Vs (m/s)	Dw (kg/m3)	Ds (kg/m3)	H_t (J/kg)	Rad (m)	Reg	XNaCl
0.0	2000000.	212.70	0.26316	899939.	2800127.	63.96	71.30	840.44	10.03	1400000.	0.110	Sl	0.008
25.0	2105104.	215.30	0.25865	911800.	2801222.	60.18	66.83	836.95	10.55	1400501.	0.110	Sl	0.008
50.0	2204725.	217.68	0.25448	922664.	2802122.	56.92	63.01	833.73	11.04	1400954.	0.110	Sl	0.008
75.0	2299792.	219.87	0.25060	932715.	2802865.	54.07	59.68	830.74	11.51	1401370.	0.110	Sl	0.008
100.0	2391011.	221.91	0.24695	942091.	2803479.	51.55	56.75	827.95	11.96	1401759.	0.110	Sl	0.008
125.0	2478932.	223.82	0.24350	950897.	2803987.	49.29	54.13	825.31	12.39	1402126.	0.110	Sl	0.008
150.0	2563995.	225.62	0.24023	959213.	2804403.	47.26	51.78	822.81	12.82	1402477.	0.110	Sl	0.008
175.0	2646559.	227.32	0.23710	967105.	2804742.	45.41	49.66	820.43	13.23	1402814.	0.110	Sl	0.008
200.0	2726919.	228.94	0.23411	974627.	2805012.	43.72	47.71	818.15	13.63	1403140.	0.110	Sl	0.008
225.0	2805327.	230.48	0.23124	981821.	2805222.	42.16	45.93	815.97	14.02	1403456.	0.110	Sl	0.008
250.0	2881993.	231.96	0.22846	988724.	2805379.	40.72	44.29	813.87	14.40	1403765.	0.110	Sl	0.008
275.0	2957099.	233.38	0.22579	995366.	2805489.	39.38	42.77	811.85	14.77	1404067.	0.110	Sl	0.008

300.0	3030805.	234.74	0.22319	1001775.	2805556.	38.14	41.36	809.89	15.14	1404363.	0.110	Sl	0.008
315.0	3074405.	235.54	0.22167	1005517.	2805577.	37.43	40.56	808.75	15.36	1404539.	0.110	Sl	0.008
330.0	3117578.	236.32	0.22018	1009187.	2805585.	36.75	39.79	807.62	15.58	1404712.	0.110	Sl	0.008
345.0	3160329.	237.08	0.21871	1012788.	2805581.	36.09	39.04	806.52	15.79	1404884.	0.110	Sl	0.008
360.0	3202701.	237.83	0.21726	1016325.	2805564.	35.46	38.33	805.44	16.01	1405055.	0.110	Sl	0.008
375.0	3244683.	238.56	0.21584	1019798.	2805537.	34.85	37.64	804.37	16.22	1405224.	0.110	Sl	0.008
390.0	3286328.	239.29	0.21443	1023214.	2805498.	34.26	36.98	803.32	16.43	1405392.	0.110	Sl	0.008
405.0	3327606.	239.99	0.21305	1026572.	2805450.	33.69	36.34	802.28	16.64	1405558.	0.110	Sl	0.008
420.0	3368584.	240.69	0.21168	1029877.	2805391.	33.14	35.72	801.27	16.84	1405723.	0.110	Sl	0.008
435.0	3409214.	241.37	0.21034	1033129.	2805323.	32.60	35.12	800.26	17.05	1405886.	0.110	Sl	0.008
450.0	3449576.	242.05	0.20901	1036333.	2805246.	32.09	34.54	799.27	17.25	1406049.	0.110	Sl	0.008
465.0	3489604.	242.71	0.20770	1039487.	2805161.	31.59	33.98	798.30	17.46	1406209.	0.110	Sl	0.008
480.0	3529393.	243.36	0.20640	1042598.	2805067.	31.10	33.44	797.34	17.66	1406369.	0.110	Sl	0.008
495.0	3568857.	244.00	0.20512	1045661.	2804966.	30.63	32.91	796.39	17.86	1406527.	0.110	Sl	0.008
510.0	3608108.	244.64	0.20385	1048685.	2804856.	30.17	32.40	795.45	18.06	1406685.	0.110	Sl	0.008
525.0	3647039.	245.26	0.20260	1051664.	2804740.	29.73	31.91	794.53	18.26	1406840.	0.110	Sl	0.008
540.0	3685779.	245.87	0.20136	1054607.	2804616.	29.30	31.43	793.62	18.46	1406995.	0.110	Sl	0.008
555.0	3724202.	246.48	0.20014	1057506.	2804486.	28.88	30.96	792.72	18.65	1407147.	0.110	Sl	0.008
570.0	3762455.	247.07	0.19893	1060372.	2804349.	28.47	30.51	791.83	18.85	1407300.	0.110	Sl	0.008
585.0	3800389.	247.66	0.19773	1063197.	2804207.	28.07	30.06	790.95	19.04	1407450.	0.110	Sl	0.008
600.0	3838172.	248.24	0.19654	1065991.	2804058.	27.68	29.63	790.08	19.24	1407599.	0.110	Sl	0.008
615.0	3875633.	248.81	0.19537	1068744.	2803903.	27.31	29.22	789.22	19.43	1407746.	0.110	Sl	0.008
630.0	3912958.	249.38	0.19421	1071470.	2803743.	26.94	28.81	788.37	19.62	1407893.	0.110	Sl	0.008
645.0	3949956.	249.93	0.19306	1074155.	2803577.	26.58	28.41	787.54	19.81	1408038.	0.110	Sl	0.008
660.0	3986833.	250.48	0.19192	1076816.	2803406.	26.23	28.03	786.71	20.00	1408182.	0.110	Sl	0.008
675.0	4023374.	251.02	0.19079	1079436.	2803231.	25.90	27.65	785.89	20.19	1408323.	0.110	Sl	0.008
690.0	4059807.	251.56	0.18967	1082033.	2803050.	25.56	27.28	785.08	20.38	1408464.	0.110	Sl	0.008
705.0	4176047.	253.24	0.18599	1090223.	2802436.	5.00	51.07	782.52	20.98	1408677.	0.110	Sl	0.008
720.0	4311166.	255.16	0.18170	1099560.	2801653.	4.97	49.26	779.60	21.68	1408829.	0.110	Sl	0.008
735.0	4446222.	257.03	0.17745	1108708.	2800799.	4.92	47.66	776.72	22.39	1408975.	0.110	Sl	0.008
750.0	4583499.	258.88	0.17318	1117826.	2799862.	4.89	45.98	773.86	23.11	1409121.	0.110	Sl	0.008
775.0	4816612.	261.94	0.16601	1132921.	2798122.	4.84	43.29	769.11	24.34	1409361.	0.110	Sl	0.008
800.0	5055065.	264.95	0.15878	1147893.	2796161.	4.80	40.71	764.38	25.61	1409598.	0.110	Sl	0.008
825.0	5298674.	267.91	0.15147	1162740.	2793984.	4.77	38.23	759.69	26.92	1409831.	0.110	Sl	0.008
850.0	5547091.	270.83	0.14411	1177450.	2791596.	4.74	35.82	755.03	28.27	1410062.	0.110	Sl	0.008
875.0	5799790.	273.70	0.13669	1192003.	2789007.	4.72	33.49	750.41	29.66	1410290.	0.110	Sl	0.008
900.0	6056050.	276.51	0.12922	1206372.	2786229.	4.70	31.22	745.85	31.08	1410516.	0.110	Sl	0.008
910.0	6159382.	277.62	0.12622	1212062.	2785067.	4.70	30.32	744.05	31.66	1410606.	0.110	Sl	0.008
935.0	6405109.	280.20	0.11907	1225366.	2782215.	7.40	45.89	739.82	33.04	1410737.	0.087	Sl	0.008
960.0	6702984.	283.23	0.11050	1241088.	2778598.	7.40	41.98	734.83	34.74	1410977.	0.087	Sl	0.008
985.0	6998679.	286.13	0.10202	1256290.	2774845.	7.40	38.21	730.00	36.44	1411212.	0.087	Sl	0.008
1010.0	7290448.	288.91	0.09367	1270924.	2770997.	7.42	34.60	725.35	38.15	1411442.	0.087	Sl	0.008
1035.0	7576529.	291.55	0.08550	1284943.	2767092.	7.44	31.18	720.90	39.85	1411669.	0.087	Sl	0.008

1060.0	7855282.	294.05	0.07754	1298310.	2763169.	7.46	27.95	716.65	41.52	1411892.	0.087	Sl	0.008
1085.0	8125298.	296.41	0.06982	1311000.	2759266.	7.47	24.96	712.63	43.17	1412113.	0.087	Sl	0.008
1110.0	8385500.	298.63	0.06236	1323001.	2755413.	7.49	22.20	708.83	44.77	1412331.	0.087	Sl	0.008
1110.0	8385500.	298.70	0.01425	1319954.	2755845.	5.44	7.14	711.03	44.75	1340414.	0.087	Sl	0.010
1135.0	8559767.	300.15	0.00897	1327839.	2753222.	5.24	6.08	708.52	45.84	1340628.	0.087	Bu	0.010
1160.0	8725913.	301.52	0.00394	1335271.	2750688.	4.98	5.17	706.16	46.89	1340841.	0.087	Bu	0.010
1185.0	8889907.	302.58	0.00000	1341055.	0.	4.75	0.00	703.03	0.00	1341055.	0.087	1p	0.010
1210.0	9052852.	302.62	0.00000	1341267.	0.	4.75	0.00	703.23	0.00	1341267.	0.087	1p	0.010
1235.0	9215838.	302.66	0.00000	1341480.	0.	4.75	0.00	703.43	0.00	1341480.	0.087	1p	0.010
1260.0	9378863.	302.70	0.00000	1341692.	0.	4.75	0.00	703.64	0.00	1341692.	0.087	1p	0.010
1285.0	9541927.	302.74	0.00000	1341905.	0.	4.75	0.00	703.84	0.00	1341905.	0.087	1p	0.010
1310.0	9705032.	302.78	0.00000	1342117.	0.	4.75	0.00	704.05	0.00	1342117.	0.087	1p	0.010
1335.0	9868176.	302.82	0.00000	1342329.	0.	4.74	0.00	704.25	0.00	1342329.	0.087	1p	0.010
1360.0	10031359.	302.86	0.00000	1342542.	0.	4.74	0.00	704.46	0.00	1342542.	0.087	1p	0.010
1385.0	10194583.	302.90	0.00000	1342754.	0.	4.74	0.00	704.66	0.00	1342754.	0.087	1p	0.010
1410.0	10357845.	302.94	0.00000	1342967.	0.	4.74	0.00	704.87	0.00	1342967.	0.087	1p	0.010
1435.0	10521148.	302.98	0.00000	1343179.	0.	4.74	0.00	705.07	0.00	1343179.	0.087	1p	0.010
1460.0	10684490.	303.01	0.00000	1343392.	0.	4.74	0.00	705.28	0.00	1343392.	0.087	1p	0.010
1485.0	10847872.	303.05	0.00000	1343604.	0.	4.74	0.00	705.48	0.00	1343604.	0.087	1p	0.010
1510.0	11011294.	303.09	0.00000	1343816.	0.	4.73	0.00	705.69	0.00	1343816.	0.087	1p	0.010
1535.0	11174755.	303.13	0.00000	1344029.	0.	4.73	0.00	705.89	0.00	1344029.	0.087	1p	0.010
1560.0	11338256.	303.17	0.00000	1344241.	0.	4.73	0.00	706.10	0.00	1344241.	0.087	1p	0.010
1585.0	11501797.	303.21	0.00000	1344454.	0.	4.73	0.00	706.30	0.00	1344454.	0.087	1p	0.010
1610.0	11665377.	303.25	0.00000	1344666.	0.	4.73	0.00	706.51	0.00	1344666.	0.087	1p	0.010
1635.0	11828997.	303.29	0.00000	1344878.	0.	4.73	0.00	706.71	0.00	1344878.	0.087	1p	0.010
1660.0	11992657.	303.33	0.00000	1345091.	0.	4.73	0.00	706.92	0.00	1345091.	0.087	1p	0.010
1685.0	12156357.	303.37	0.00000	1345303.	0.	4.73	0.00	707.12	0.00	1345303.	0.087	1p	0.010
1710.0	12320096.	303.41	0.00000	1345516.	0.	4.72	0.00	707.33	0.00	1345516.	0.087	1p	0.010
1735.0	12483875.	303.45	0.00000	1345728.	0.	4.72	0.00	707.53	0.00	1345728.	0.087	1p	0.010
1760.0	12647693.	303.49	0.00000	1345941.	0.	4.72	0.00	707.74	0.00	1345941.	0.087	1p	0.010
1785.0	12811551.	303.53	0.00000	1346153.	0.	4.72	0.00	707.94	0.00	1346153.	0.087	1p	0.010
1810.0	12975449.	303.57	0.00000	1346365.	0.	4.72	0.00	708.15	0.00	1346365.	0.087	1p	0.010
1810.0	12975449.	331.30	0.00059	1492034.	2678709.	2.54	2.49	659.70	77.35	1492731.	0.087	Bu	0.013
1835.0	13119065.	331.45	0.00000	1492943.	0.	2.54	0.00	657.70	0.00	1492943.	0.087	1p	0.013
1860.0	13262489.	331.49	0.00000	1493156.	0.	2.54	0.00	657.90	0.00	1493156.	0.087	1p	0.013
1885.0	13405953.	331.53	0.00000	1493368.	0.	2.54	0.00	658.09	0.00	1493368.	0.087	1p	0.013
1910.0	13549456.	331.57	0.00000	1493581.	0.	2.54	0.00	658.28	0.00	1493581.	0.087	1p	0.013
1935.0	13693000.	331.60	0.00000	1493793.	0.	2.54	0.00	658.47	0.00	1493793.	0.087	1p	0.013
1960.0	13836583.	331.64	0.00000	1494006.	0.	2.54	0.00	658.66	0.00	1494006.	0.087	1p	0.013
1985.0	13980207.	331.68	0.00000	1494219.	0.	2.54	0.00	658.86	0.00	1494219.	0.087	1p	0.013
2010.0	14123870.	331.71	0.00000	1494431.	0.	2.53	0.00	659.05	0.00	1494431.	0.087	1p	0.013
2035.0	14267573.	331.75	0.00000	1494644.	0.	2.53	0.00	659.24	0.00	1494644.	0.087	1p	0.013
2060.0	14411316.	331.79	0.00000	1494856.	0.	2.53	0.00	659.43	0.00	1494856.	0.087	1p	0.013
2085.0	14555098.	331.83	0.00000	1495069.	0.	2.53	0.00	659.63	0.00	1495069.	0.087	1p	0.013

2110.0	14698921.	331.86	0.00000	1495281.	0.	2.53	0.00	659.82	0.00	1495281.	0.087	1p	0.013
2135.0	14842783.	331.90	0.00000	1495494.	0.	2.53	0.00	660.01	0.00	1495494.	0.087	1p	0.013
2160.0	14986685.	331.94	0.00000	1495706.	0.	2.53	0.00	660.20	0.00	1495706.	0.087	1p	0.013
2185.0	15130627.	331.98	0.00000	1495919.	0.	2.53	0.00	660.40	0.00	1495919.	0.087	1p	0.013
2210.0	15274609.	332.01	0.00000	1496131.	0.	2.53	0.00	660.59	0.00	1496131.	0.087	1p	0.013
2235.0	15418631.	332.05	0.00000	1496344.	0.	2.53	0.00	660.78	0.00	1496344.	0.087	1p	0.013
2260.0	15562693.	332.09	0.00000	1496556.	0.	2.53	0.00	660.97	0.00	1496556.	0.087	1p	0.013
2285.0	15706794.	332.13	0.00000	1496769.	0.	2.53	0.00	661.17	0.00	1496769.	0.087	1p	0.013
2310.0	15850936.	332.16	0.00000	1496981.	0.	2.53	0.00	661.36	0.00	1496981.	0.087	1p	0.013
2335.0	15995117.	332.20	0.00000	1497194.	0.	2.53	0.00	661.55	0.00	1497194.	0.087	1p	0.013
2360.0	16139339.	332.24	0.00000	1497406.	0.	2.52	0.00	661.75	0.00	1497406.	0.087	1p	0.013
2385.0	16283600.	332.27	0.00000	1497619.	0.	2.52	0.00	661.94	0.00	1497619.	0.087	1p	0.013
2410.0	16427901.	332.31	0.00000	1497831.	0.	2.52	0.00	662.13	0.00	1497831.	0.087	1p	0.013
2435.0	16572242.	332.35	0.00000	1498044.	0.	2.52	0.00	662.32	0.00	1498044.	0.087	1p	0.013
2460.0	16716623.	332.39	0.00000	1498256.	0.	2.52	0.00	662.52	0.00	1498256.	0.087	1p	0.013
2485.0	16861044.	332.42	0.00000	1498469.	0.	2.52	0.00	662.71	0.00	1498469.	0.087	1p	0.013
2510.0	17005505.	332.46	0.00000	1498681.	0.	2.52	0.00	662.90	0.00	1498681.	0.087	1p	0.013
2530.0	17121102.	332.49	0.00000	1498851.	0.	2.52	0.00	663.06	0.00	1498851.	0.087	1p	0.013

SAMPLE 2 INPUT FILE

```
Sample 2 for Simulator GWNACL
 - Option 2  used -

1.5000E+06
11.60E+06
0.100E+06
0.00
2530.000
0.000
2800.000
1000.000
6.0480E+05
20
  300.0  0.1102 4.6E-5    25.0   90.0
   30.0  0.1102 4.6E-5    15.0   88.0
   30.0  0.1102 4.6E-5    15.0   86.0
   30.0  0.1102 4.6E-5    15.0   84.0
   30.0  0.1102 4.6E-5    15.0   82.0
   30.0  0.1102 4.6E-5    15.0   80.0
   30.0  0.1102 4.6E-5    15.0   78.0
   30.0  0.1102 4.6E-5    15.0   76.0
   30.0  0.1102 4.6E-5    15.0   74.0
   30.0  0.1102 4.6E-5    15.0   72.0
   30.0  0.1102 4.6E-5    15.0   70.0
   30.0  0.1102 4.6E-5    15.0   68.0
   30.0  0.1102 4.6E-5    15.0   66.0
   30.0  0.1102 4.6E-5    15.0   64.0
   30.0  0.1102 4.6E-5    15.0   62.0
   30.0  0.1102 4.6E-5    15.0   60.0
  150.0  0.1102 4.6E-5    25.0   60.0
   10.0  0.1102 4.6E-5    10.0   60.0
 1600.0  0.0873 1.5E-5    25.0   60.0
   20.0  0.0873 1.5E-5    20.0   60.0
4
    0.0   25.00
 1000.0  260.00
 2000.0  310.00
 2500.0  330.00
3
 1010.0  2.00E+06 1700.0E+03 5.0E-13 0.002
 1810.0 11.50E+06 1500.0E+03 8.0E-13 0.006
 2530.0 14.35E+06 310.0     12.0E-13 0.010
```

SAMPLE 2 GWNACL.LOG FILE

```
                    Iteration no :   0
It no   0-   Single water to two phase flow at 2210.00 m depth
 Slow convergence at 1510.0 m depth when Q=      48.79 kg/s
New node added at  1522.0 m depth
                    Iteration no :   1
It no   1-   Single water to two phase flow at 2210.00 m depth
 Slow convergence at 1510.0 m depth when Q=      48.83 kg/s
New node added at  1522.0 m depth
                   Iteration no :   2
It no   2-   Single water to two phase flow at 2210.00 m depth
 Slow convergence at 1510.0 m depth when Q=      48.86 kg/s
New node added at  1522.0 m depth
```

SAMPLE 2 GWNACL.ITER FILE

P required (bars)	Max Error (bars)	Step size (bars)	Pbott Max (bars)	Pbott min (bars)
15.0000	1.0000	0.0200	143.4800	15.0000

It no	P bottom (bars)	P top (bars)	Difference (bars)	Q top (kg/s)	H top (kJ/kg)
0	116.0000	16.1018	1.1018	47.962	1418.676
1	115.9800	16.0262	1.0262	48.003	1418.667
2	115.9600	15.9509	0.9509	48.044	1418.653

SAMPLE 2 OUTPUT FILE

****

GWNACL - MODEL RESULTS

****

Sample 2 for Simulator GWNACL
- Option 2 used -

Wellhead pressure (bar abs.)	:	15.95
Wellhead temperature (C)	:	201.54
Wellhead dryness	:	0.293
Wellhead enthalpy (kJ/kg)	:	1418.65
Wellhead total flow (kg/s)	:	48.04
Wellhead NaCl	:	0.0081

Feedzone no:	Depth (m)	Flow (kg/s)	Enthalpy (kJ/kg)	Res.Pres (Bar)	Satur.	Prod. Ind. (m3)	XNaCl
1	1010.0	-0.8192	1428.6	20.000	0.94	0.500000E-12	0.0020
2	1810.0	23.7298	1500.0	115.000	0.27	0.800000E-12	0.0060
3	2530.0	25.1336	1381.3	143.500	0.00	0.120000E-11	0.0100

****

Depth (m)	Press (Pa)	Temp (C)	Dryness	Hw (J/kg)	Hs (J/kg)	Vw (m/s)	Vs (m/s)	Dw (kg/m3)	Ds (kg/m3)	H_t (J/kg)	Rad (m)	Reg	XNaCl
0.0	1595089.	201.54	0.29269	849429.	2794239.	39.31	47.02	855.28	8.05	1418653.	0.110	Mi	0.008
25.0	1641638.	202.93	0.29045	855649.	2795077.	38.10	45.42	853.50	8.28	1418953.	0.110	Bu	0.008
50.0	1687330.	204.27	0.28829	861632.	2795855.	36.97	43.95	851.78	8.50	1419248.	0.110	Bu	0.008
75.0	1732233.	205.55	0.28620	867400.	2796579.	35.92	42.57	850.11	8.72	1419538.	0.110	Bu	0.008
100.0	1776411.	206.79	0.28419	872971.	2797253.	34.94	41.29	848.50	8.94	1419824.	0.110	Bu	0.008
125.0	1819917.	207.98	0.28223	878361.	2797882.	34.01	40.09	846.94	9.15	1420107.	0.110	Bu	0.008
150.0	1862802.	209.14	0.28033	883585.	2798470.	33.14	38.97	845.42	9.36	1420386.	0.110	Bu	0.008
175.0	1905111.	210.26	0.27848	888655.	2799019.	32.32	37.91	843.94	9.57	1420662.	0.110	Bu	0.008
200.0	1946885.	211.35	0.27669	893584.	2799534.	31.54	36.91	842.50	9.77	1420936.	0.110	Bu	0.008
225.0	1988163.	212.40	0.27494	898381.	2800015.	30.81	35.97	841.09	9.98	1421208.	0.110	Bu	0.008
250.0	2028980.	213.43	0.27323	903055.	2800466.	30.10	35.08	839.72	10.18	1421478.	0.110	Bu	0.008
275.0	2069366.	214.43	0.27156	907616.	2800889.	29.44	34.23	838.38	10.38	1421746.	0.110	Bu	0.008
300.0	2109351.	215.41	0.26992	912070.	2801285.	28.80	33.43	837.06	10.57	1422012.	0.110	Bu	0.008

315.0	2133161.	215.99	0.26896	914693.	2801510.	28.43	32.96	836.29	10.69	1422171.	0.110	Bu	0.008
330.0	2156838.	216.56	0.26801	917282.	2801727.	28.07	32.51	835.52	10.81	1422330.	0.110	Bu	0.008
345.0	2180391.	217.11	0.26707	919838.	2801936.	27.72	32.07	834.77	10.92	1422488.	0.110	Bu	0.008
360.0	2203815.	217.67	0.26614	922361.	2802136.	27.39	31.65	834.02	11.04	1422645.	0.110	Bu	0.008
375.0	2227125.	218.21	0.26522	924853.	2802329.	27.05	31.23	833.28	11.15	1422802.	0.110	Bu	0.008
390.0	2250306.	218.75	0.26432	927313.	2802514.	26.73	30.83	832.55	11.27	1422958.	0.110	Bu	0.008
405.0	2273382.	219.28	0.26342	929744.	2802692.	26.42	30.44	831.83	11.38	1423114.	0.110	Bu	0.008
420.0	2296330.	219.80	0.26253	932145.	2802862.	26.11	30.05	831.11	11.49	1423269.	0.110	Bu	0.008
435.0	2319181.	220.32	0.26166	934519.	2803026.	25.81	29.68	830.40	11.60	1423423.	0.110	Bu	0.008
450.0	2341905.	220.83	0.26079	936864.	2803183.	25.52	29.32	829.70	11.72	1423581.	0.110	Bu	0.008
465.0	2364539.	221.33	0.25993	939183.	2803334.	25.23	28.96	829.01	11.83	1423738.	0.110	Bu	0.008
480.0	2387042.	221.83	0.25909	941475.	2803478.	24.95	28.62	828.33	11.94	1423894.	0.110	Bu	0.008
495.0	2409462.	222.33	0.25825	943742.	2803616.	24.68	28.28	827.65	12.05	1424050.	0.110	Bu	0.008
510.0	2431747.	222.81	0.25742	945982.	2803748.	24.41	27.95	826.98	12.16	1424204.	0.110	Bu	0.008
525.0	2453957.	223.29	0.25660	948200.	2803874.	24.15	27.63	826.31	12.27	1424357.	0.110	Bu	0.008
540.0	2476027.	223.77	0.25578	950391.	2803995.	23.90	27.32	825.66	12.38	1424509.	0.110	Bu	0.008
555.0	2498026.	224.24	0.25498	952561.	2804110.	23.65	27.01	825.01	12.49	1424661.	0.110	Bu	0.008
570.0	2519882.	224.70	0.25418	954704.	2804220.	23.41	26.71	824.36	12.60	1424810.	0.110	Bu	0.008
585.0	2541673.	225.16	0.25339	956827.	2804325.	23.17	26.42	823.72	12.70	1424960.	0.110	Bu	0.008
600.0	2563314.	225.61	0.25261	958924.	2804425.	22.93	26.13	823.09	12.81	1425107.	0.110	Bu	0.008
615.0	2584895.	226.06	0.25183	961003.	2804519.	22.71	25.85	822.47	12.92	1425255.	0.110	Bu	0.008
630.0	2606320.	226.51	0.25106	963055.	2804609.	22.48	25.58	821.85	13.03	1425400.	0.110	Bu	0.008
645.0	2627689.	226.95	0.25030	965090.	2804694.	22.26	25.31	821.24	13.13	1425545.	0.110	Bu	0.008
660.0	2648895.	227.38	0.24955	967099.	2804775.	22.05	25.05	820.63	13.24	1425687.	0.110	Bu	0.008
675.0	2670050.	227.81	0.24880	969091.	2804851.	21.84	24.79	820.03	13.34	1425829.	0.110	Bu	0.008
690.0	2691033.	228.23	0.24806	971057.	2804923.	21.63	24.54	819.43	13.45	1425969.	0.110	Bu	0.008
705.0	2711969.	228.65	0.24733	973008.	2804991.	21.43	24.30	818.84	13.55	1426109.	0.110	Bu	0.008
720.0	2732725.	229.06	0.24660	974932.	2805054.	21.24	24.06	818.26	13.65	1426246.	0.110	Bu	0.008
735.0	2753437.	229.47	0.24588	976842.	2805114.	21.04	23.82	817.68	13.76	1426383.	0.110	Bu	0.008
750.0	2773961.	229.88	0.24517	978725.	2805170.	20.85	23.59	817.11	13.86	1426518.	0.110	Bu	0.008
775.0	2808076.	230.55	0.24400	981835.	2805254.	20.54	23.22	816.17	14.03	1426744.	0.110	Bu	0.008
800.0	2842083.	231.20	0.24283	984908.	2805329.	20.25	22.86	815.24	14.20	1426970.	0.110	Bu	0.008
825.0	2875990.	231.85	0.24168	987948.	2805395.	19.95	22.51	814.31	14.37	1427195.	0.110	Bu	0.008
850.0	2909804.	232.50	0.24054	990956.	2805451.	19.67	22.16	813.40	14.54	1427420.	0.110	Bu	0.008
875.0	2943534.	233.13	0.23941	993932.	2805499.	19.39	21.83	812.49	14.71	1427644.	0.110	Bu	0.008
900.0	2977188.	233.76	0.23829	996879.	2805538.	19.12	21.50	811.59	14.87	1427868.	0.110	Bu	0.008
910.0	2990628.	234.01	0.23785	998050.	2805551.	19.01	21.38	811.24	14.94	1427956.	0.110	Bu	0.008
935.0	3073821.	235.54	0.23477	1005222.	2805604.	29.58	32.78	809.04	15.36	1427900.	0.087	Bu	0.008
960.0	3127326.	236.50	0.23296	1009764.	2805613.	28.93	32.02	807.65	15.63	1428132.	0.087	Bu	0.008
985.0	3180372.	237.45	0.23119	1014216.	2805602.	28.32	31.30	806.28	15.89	1428364.	0.087	Bu	0.008
1010.0	3232992.	238.37	0.22944	1018583.	2805573.	27.72	30.61	804.94	16.16	1428594.	0.087	Bu	0.008
1010.0	3232992.	238.37	0.22944	1018583.	2805573.	28.22	31.13	804.94	16.16	1428594.	0.087	Bu	0.008
1035.0	3286181.	239.29	0.22769	1022950.	2805527.	27.63	30.45	803.60	16.43	1428824.	0.087	Bu	0.008

1060.0	3338977.	240.20	0.22596	1027237.	2805463.	27.06	29.79	802.28	16.69	1429053.	0.087	Bu	0.008
1085.0	3391405.	241.08	0.22426	1031451.	2805383.	26.52	29.16	800.98	16.96	1429281.	0.087	Bu	0.008
1110.0	3443492.	241.96	0.22259	1035594.	2805288.	26.00	28.55	799.70	17.22	1429508.	0.087	Bu	0.008
1135.0	3495262.	242.81	0.22094	1039671.	2805178.	25.49	27.97	798.44	17.49	1429734.	0.087	Bu	0.008
1160.0	3546739.	243.65	0.21930	1043686.	2805053.	25.00	27.41	797.20	17.75	1429960.	0.087	Bu	0.008
1185.0	3597945.	244.48	0.21769	1047641.	2804915.	24.53	26.87	795.98	18.01	1430185.	0.087	Bu	0.008
1210.0	3648900.	245.30	0.21610	1051540.	2804765.	24.08	26.34	794.77	18.27	1430409.	0.087	Bu	0.008
1235.0	3699625.	246.10	0.21452	1055387.	2804601.	23.64	25.84	793.58	18.53	1430632.	0.087	Bu	0.008
1260.0	3750138.	246.89	0.21296	1059183.	2804425.	23.21	25.35	792.40	18.78	1430855.	0.087	Bu	0.008
1285.0	3800458.	247.67	0.21142	1062931.	2804238.	22.80	24.88	791.23	19.04	1431078.	0.087	Bu	0.008
1310.0	3850602.	248.44	0.20989	1066634.	2804039.	22.40	24.42	790.08	19.30	1431300.	0.087	Bu	0.008
1335.0	3900586.	249.20	0.20838	1070294.	2803828.	22.01	23.98	788.94	19.56	1431521.	0.087	Bu	0.008
1360.0	3950428.	249.95	0.20687	1073913.	2803607.	21.63	23.55	787.81	19.81	1431743.	0.087	Bu	0.008
1385.0	4000141.	250.69	0.20538	1077494.	2803376.	21.27	23.13	786.70	20.07	1431963.	0.087	Bu	0.008
1410.0	4049742.	251.42	0.20391	1081037.	2803134.	20.91	22.72	785.59	20.33	1432184.	0.087	Bu	0.008
1435.0	4099244.	252.14	0.20244	1084546.	2802882.	20.56	22.33	784.50	20.58	1432404.	0.087	Bu	0.008
1460.0	4148662.	252.86	0.20098	1088022.	2802620.	20.22	21.94	783.41	20.84	1432623.	0.087	Bu	0.008
1485.0	4198014.	253.57	0.19954	1091466.	2802348.	19.89	21.57	782.33	21.09	1432848.	0.087	Bu	0.008
1510.0	4247308.	254.27	0.19810	1094880.	2802067.	19.57	21.21	781.26	21.35	1433073.	0.087	Bu	0.008
1522.0	4289805.	254.87	0.19683	1097803.	2801817.	3.93	39.99	780.35	21.57	1433209.	0.087	Bu	0.008
1535.0	4395087.	256.33	0.19359	1104969.	2801166.	3.91	38.92	778.10	22.12	1433331.	0.087	Bu	0.008
1560.0	4601347.	259.13	0.18730	1118695.	2799773.	3.87	36.93	773.79	23.20	1433562.	0.087	Bu	0.008
1585.0	4812634.	261.89	0.18095	1132357.	2798192.	3.83	35.04	769.48	24.32	1433791.	0.087	Bu	0.008
1610.0	5028947.	264.63	0.17453	1145957.	2796424.	3.80	33.22	765.19	25.47	1434018.	0.087	Bu	0.008
1635.0	5250209.	267.34	0.16804	1159495.	2794472.	3.77	31.46	760.91	26.66	1434244.	0.087	Bu	0.008
1660.0	5476258.	270.02	0.16148	1172965.	2792337.	3.75	29.76	756.64	27.88	1434468.	0.087	Bu	0.008
1685.0	5706835.	272.66	0.15485	1186356.	2790022.	3.73	28.12	752.40	29.14	1434691.	0.087	Bu	0.008
1710.0	5941570.	275.28	0.14816	1199652.	2787535.	3.72	26.51	748.18	30.44	1434912.	0.087	Bu	0.008
1735.0	6179973.	277.85	0.14141	1212833.	2784881.	3.70	24.95	743.99	31.77	1435133.	0.087	Bu	0.008
1760.0	6421430.	280.38	0.13461	1225873.	2782071.	3.69	23.43	739.85	33.13	1435352.	0.087	Bu	0.008
1785.0	6665203.	282.86	0.12778	1238744.	2779117.	3.69	21.94	735.76	34.52	1435571.	0.087	Bu	0.008
1810.0	6910437.	285.29	0.12093	1251413.	2776034.	3.69	20.49	731.73	35.93	1435788.	0.087	Bu	0.008
1810.0	6910437.	285.36	0.08287	1248551.	2776430.	1.94	7.44	734.04	35.91	1375163.	0.087	Bu	0.010
1835.0	7127131.	287.45	0.07654	1259478.	2773627.	1.95	6.79	730.55	37.17	1375376.	0.087	Bu	0.010
1860.0	7339286.	289.45	0.07036	1269987.	2770808.	1.95	6.18	727.19	38.42	1375589.	0.087	Bu	0.010
1885.0	7546130.	291.36	0.06434	1280062.	2767991.	1.95	5.60	723.98	39.65	1375801.	0.087	Bu	0.010
1910.0	7747058.	293.17	0.05850	1289697.	2765192.	1.95	5.07	720.90	40.85	1376014.	0.087	Bu	0.010
1935.0	7941641.	294.90	0.05284	1298890.	2762426.	1.94	4.58	717.97	42.02	1376227.	0.087	Bu	0.010
1960.0	8129629.	296.53	0.04737	1307648.	2759705.	1.94	4.14	715.18	43.17	1376439.	0.087	Bu	0.010
1985.0	8310935.	298.08	0.04210	1315986.	2757036.	1.93	3.73	712.53	44.29	1376652.	0.087	Bu	0.010
2010.0	8485620.	299.55	0.03701	1323921.	2754424.	1.91	3.36	710.00	45.37	1376864.	0.087	Bu	0.010
2035.0	8653869.	300.94	0.03210	1331476.	2751873.	1.89	3.02	707.59	46.43	1377077.	0.087	Bu	0.010
2060.0	8815967.	302.27	0.02737	1338676.	2749384.	1.86	2.72	705.31	47.45	1377289.	0.087	Bu	0.010
2085.0	8972275.	303.52	0.02280	1345548.	2746955.	1.83	2.44	703.12	48.45	1377502.	0.087	Bu	0.010

2110.0	9123215.	304.72	0.01838	1352120.	2744584.	1.79	2.19	701.03	49.42	1377714.	0.087	Bu	0.010
2135.0	9269247.	305.87	0.01410	1358421.	2742266.	1.74	1.97	699.04	50.37	1377927.	0.087	Bu	0.010
2160.0	9411257.	306.97	0.00992	1364494.	2739990.	1.68	1.77	697.11	51.29	1378139.	0.087	Bu	0.010
2185.0	9551401.	308.04	0.00579	1370438.	2737725.	1.62	1.62	695.23	52.22	1378352.	0.087	Bu	0.010
2210.0	9695434.	309.13	0.00000	1378563.	2735371.	1.52	1.52	691.18	53.17	1378564.	0.087	Bu	0.010
2235.0	9843685.	309.54	0.00000	1378776.	2735338.	1.52	1.52	691.36	53.19	1378776.	0.087	1p	0.010
2260.0	9991976.	309.58	0.00000	1378988.	2735305.	1.52	1.52	691.55	53.20	1378988.	0.087	1p	0.010
2285.0	10140305.	309.62	0.00000	1379200.	0.	1.52	0.00	691.73	0.00	1379200.	0.087	1p	0.010
2310.0	10288673.	309.66	0.00000	1379413.	0.	1.52	0.00	691.92	0.00	1379413.	0.087	1p	0.010
2335.0	10437081.	309.70	0.00000	1379625.	0.	1.52	0.00	692.10	0.00	1379625.	0.087	1p	0.010
2360.0	10585528.	309.74	0.00000	1379838.	0.	1.52	0.00	692.29	0.00	1379838.	0.087	1p	0.010
2385.0	10734013.	309.78	0.00000	1380050.	0.	1.52	0.00	692.47	0.00	1380050.	0.087	1p	0.010
2410.0	10882538.	309.81	0.00000	1380262.	0.	1.52	0.00	692.66	0.00	1380262.	0.087	1p	0.010
2435.0	11031102.	309.85	0.00000	1380475.	0.	1.52	0.00	692.85	0.00	1380475.	0.087	1p	0.010
2460.0	11179704.	309.89	0.00000	1380687.	0.	1.51	0.00	693.03	0.00	1380687.	0.087	1p	0.010
2485.0	11328346.	309.93	0.00000	1380899.	0.	1.51	0.00	693.22	0.00	1380899.	0.087	1p	0.010
2510.0	11477027.	309.97	0.00000	1381112.	0.	1.51	0.00	693.40	0.00	1381112.	0.087	1p	0.010
2530.0	11596000.	310.00	0.00000	1381282.	0.	1.51	46.71	693.55	0.00	1381282.	0.087	1p	0.010
2530.0	11596000.	310.00	0.00000	1381282.	0.	1.51	46.71	693.55	0.00	1381282.	0.087	1p	0.010

APPENDIX C
(SAMPLE RUNS FOR HOLA)

SAMPLE 1 INPUT FILE

```
Sample 1 for Simulator HOLA
 - Option 1  used -
 - The well is producing two-phase fluid at the wellhead -
0.7000E+06
1.3000E+06
100.0000

2530.000
2.000
2800.000
1000.000
6.0480E+05
20
  300.0  0.1102 4.6E-5    25.0   90.0
   30.0  0.1102 4.6E-5    15.0   88.0
   30.0  0.1102 4.6E-5    15.0   86.0
   30.0  0.1102 4.6E-5    15.0   84.0
   30.0  0.1102 4.6E-5    15.0   82.0
   30.0  0.1102 4.6E-5    15.0   80.0
   30.0  0.1102 4.6E-5    15.0   78.0
   30.0  0.1102 4.6E-5    15.0   76.0
   30.0  0.1102 4.6E-5    15.0   74.0
   30.0  0.1102 4.6E-5    15.0   72.0
   30.0  0.1102 4.6E-5    15.0   70.0
   30.0  0.1102 4.6E-5    15.0   68.0
   30.0  0.1102 4.6E-5    15.0   66.0
   30.0  0.1102 4.6E-5    15.0   64.0
   30.0  0.1102 4.6E-5    15.0   62.0
   30.0  0.1102 4.6E-5    15.0   60.0
  150.0  0.1102 4.6E-5    25.0   60.0
   10.0  0.1102 4.6E-5    10.0   60.0
 1600.0  0.0873 1.5E-5    25.0   60.0
   20.0  0.0873 1.5E-5    20.0   60.0
4
    0.0   25.00
 1000.0  260.00
 2000.0  310.00
 2500.0  330.00
3
 1110.0 -10.00   1.0000E+06
 1810.0  40.00   1.5000E+06
```

SAMPLE 1 HOLA.LOG FILE

```
   Two phase to water phase
   Pressure          X2        Depth
 0.834715E+07  -0.00033092    1235.0
```

SAMPLE 1 OUTPUT FILE

****

HOLA - MODEL RESULTS

****

Sample 1 for Simulator HOLA
- Option 1 used -
- The well is producing two-phase fluid at the wellhead -

Wellhead pressure (bar abs.)	:	7.00
Wellhead temperature (C)	:	164.96
Wellhead dryness	:	0.292
Wellhead enthalpy (kJ/kg)	:	1300.00
Wellhead total flow (kg/s)	:	100.00

Feedzone no:	Depth (m)	Flow (kg/s)	Enthalpy (kJ/kg)
1	1110.0	-10.0000	1331.9
2	1810.0	40.0000	1500.0
3	2530.0	70.0000	1250.3

****

Depth (m)	Press (Pa)	Temp (C)	Dryness	Hw (J/kg)	Hs (J/kg)	Vw (m/s)	Vs (m/s)	Dw (kg/m3)	Ds (kg/m3)	H_t (J/kg)	Rad (m)	Reg
0.0	700000.	164.96	0.29199	697061.	2762005.	172.10	211.22	902.37	3.67	1300000.	0.110	Mi
25.0	1145098.	185.86	0.26232	789068.	2781146.	103.11	119.92	880.60	5.86	1311624.	0.110	Mi
50.0	1324071.	192.45	0.25170	818478.	2786077.	87.62	100.54	873.30	6.73	1313729.	0.110	Tr
75.0	1471438.	197.38	0.24349	840570.	2789381.	77.57	88.20	867.71	7.46	1315093.	0.110	Sl
100.0	1600442.	201.38	0.23666	858621.	2791819.	70.25	79.33	863.07	8.09	1316128.	0.110	Sl
125.0	1717067.	204.79	0.23073	874054.	2793713.	64.55	72.49	859.05	8.66	1316985.	0.110	Sl
150.0	1824643.	207.78	0.22547	887633.	2795234.	59.94	66.99	855.48	9.19	1317731.	0.110	Sl
175.0	1925256.	210.46	0.22069	899823.	2796480.	56.08	62.44	852.25	9.68	1318404.	0.110	Sl
200.0	2020318.	212.89	0.21631	910931.	2797516.	52.79	58.57	849.27	10.15	1319023.	0.110	Sl
225.0	2110841.	215.12	0.21225	921169.	2798387.	49.93	55.23	846.51	10.59	1319602.	0.110	Sl
250.0	2197577.	217.19	0.20844	930691.	2799123.	47.41	52.30	843.92	11.02	1320150.	0.110	Sl
275.0	2281109.	219.12	0.20485	939615.	2799749.	45.17	49.70	841.48	11.43	1320672.	0.110	Sl
300.0	2361895.	220.94	0.20145	948030.	2800281.	43.15	47.37	839.16	11.83	1321174.	0.110	Sl

315.0	2409193.	221.98	0.19949	952864.	2800561.	42.04	46.09	837.83	12.06	1321466.	0.110	SL
330.0	2455706.	222.99	0.19758	957553.	2800815.	40.98	44.88	836.52	12.29	1321752.	0.110	SL
345.0	2501478.	223.97	0.19572	962108.	2801044.	39.98	43.73	835.26	12.52	1322032.	0.110	SL
360.0	2546581.	224.93	0.19391	966540.	2801251.	39.04	42.65	834.02	12.74	1322308.	0.110	SL
375.0	2591034.	225.85	0.19214	970856.	2801437.	38.13	41.62	832.81	12.97	1322577.	0.110	SL
390.0	2634912.	226.75	0.19040	975065.	2801604.	37.27	40.64	831.62	13.18	1322843.	0.110	SL
405.0	2678210.	227.63	0.18871	979172.	2801753.	36.45	39.70	830.47	13.40	1323103.	0.110	SL
420.0	2721012.	228.49	0.18704	983188.	2801886.	35.67	38.81	829.33	13.61	1323359.	0.110	SL
435.0	2763291.	229.33	0.18541	987111.	2802002.	34.92	37.96	828.22	13.82	1323611.	0.110	SL
450.0	2805140.	230.15	0.18381	990955.	2802103.	34.20	37.14	827.12	14.03	1323859.	0.110	SL
465.0	2846509.	230.95	0.18224	994716.	2802191.	33.51	36.36	826.05	14.24	1324102.	0.110	SL
480.0	2887503.	231.73	0.18069	998407.	2802265.	32.84	35.61	825.00	14.44	1324342.	0.110	SL
495.0	2928052.	232.50	0.17917	1002022.	2802327.	32.21	34.89	823.96	14.65	1324577.	0.110	SL
510.0	2968275.	233.25	0.17767	1005575.	2802377.	31.59	34.20	822.94	14.85	1324808.	0.110	SL
525.0	3008078.	233.99	0.17619	1009058.	2802415.	31.00	33.53	821.93	15.05	1325035.	0.110	SL
540.0	3047595.	234.72	0.17474	1012486.	2802443.	30.43	32.89	820.94	15.25	1325259.	0.110	SL
555.0	3086713.	235.43	0.17330	1015850.	2802461.	29.87	32.27	819.97	15.44	1325479.	0.110	SL
570.0	3125581.	236.13	0.17189	1019164.	2802469.	29.34	31.67	819.01	15.64	1325695.	0.110	SL
585.0	3164062.	236.81	0.17049	1022418.	2802468.	28.82	31.09	818.06	15.83	1325906.	0.110	SL
600.0	3202326.	237.49	0.16911	1025627.	2802457.	28.32	30.53	817.12	16.03	1326115.	0.110	SL
615.0	3240211.	238.15	0.16775	1028779.	2802439.	27.84	29.99	816.20	16.22	1326319.	0.110	SL
630.0	3277906.	238.80	0.16641	1031891.	2802412.	27.37	29.47	815.29	16.41	1326520.	0.110	SL
645.0	3315226.	239.44	0.16508	1034948.	2802377.	26.92	28.96	814.39	16.60	1326716.	0.110	SL
660.0	3352381.	240.08	0.16376	1037969.	2802335.	26.48	28.47	813.51	16.78	1326910.	0.110	SL
675.0	3389161.	240.70	0.16247	1040938.	2802286.	26.05	28.00	812.63	16.97	1327098.	0.110	SL
690.0	3425797.	241.31	0.16118	1043874.	2802229.	25.63	27.53	811.76	17.16	1327284.	0.110	SL
705.0	3543846.	243.26	0.15691	1053194.	2802000.	5.18	49.04	809.00	17.76	1327591.	0.110	SL
720.0	3674421.	245.35	0.15216	1063267.	2801666.	5.13	46.80	805.98	18.42	1327783.	0.110	SL
735.0	3804811.	247.38	0.14748	1073094.	2801252.	5.08	44.79	803.03	19.09	1327968.	0.110	SL
750.0	3937150.	249.40	0.14279	1082846.	2800755.	5.04	42.74	800.07	19.77	1328150.	0.110	SL
775.0	4161386.	252.69	0.13496	1098895.	2799745.	4.98	39.48	795.16	20.93	1328447.	0.110	SL
800.0	4389935.	255.91	0.12712	1114692.	2798517.	4.94	36.39	790.27	22.13	1328737.	0.110	SL
825.0	4622255.	259.05	0.11926	1130224.	2797077.	4.90	33.45	785.41	23.35	1329019.	0.110	SL
850.0	4857567.	262.11	0.11141	1145464.	2795436.	4.87	30.63	780.59	24.60	1329296.	0.110	SL
875.0	5094843.	265.09	0.10359	1160375.	2793609.	4.85	27.94	775.82	25.87	1329565.	0.110	SL
900.0	5332825.	267.97	0.09582	1174910.	2791613.	4.84	25.36	771.12	27.15	1329829.	0.110	SL
910.0	5427942.	269.09	0.09274	1180610.	2790771.	4.84	24.36	769.26	27.67	1329933.	0.110	SL
935.0	5661605.	271.79	0.08517	1194361.	2788602.	7.45	37.33	764.75	28.95	1330135.	0.087	SL
960.0	5942978.	274.93	0.07612	1210482.	2785807.	7.45	32.79	759.41	30.51	1330398.	0.087	SL
985.0	6216612.	277.87	0.06738	1225738.	2782907.	7.46	28.56	754.29	32.04	1330653.	0.087	SL
1010.0	6480278.	280.62	0.05898	1240078.	2779952.	7.47	24.69	749.43	33.53	1330901.	0.087	SL
1035.0	6732220.	283.16	0.05098	1253476.	2776986.	7.47	21.19	744.84	34.97	1331146.	0.087	SL
1060.0	6971313.	285.51	0.04340	1265937.	2774050.	7.45	18.09	740.53	36.36	1331391.	0.087	SL

1085.0	7197111.	287.67	0.03625	1277492.	2771171.	7.40	15.37	736.50	37.68	1331635.	0.087	Sl
1110.0	7409798.	289.66	0.02951	1288199.	2768369.	7.31	13.02	732.73	38.94	1331880.	0.087	Sl
1110.0	7409798.	289.66	0.02951	1288199.	2768369.	8.01	14.48	732.73	38.94	1331880.	0.087	Sl
1135.0	7617584.	291.57	0.02292	1298504.	2765549.	7.85	12.14	729.08	40.18	1332123.	0.087	Sl
1160.0	7813146.	293.32	0.01670	1308070.	2762823.	7.62	10.14	725.66	41.36	1332367.	0.087	Sl
1185.0	7997969.	294.95	0.01082	1316999.	2760185.	7.30	8.44	722.45	42.49	1332611.	0.087	Sl
1210.0	8174593.	296.48	0.00518	1325435.	2757608.	6.89	7.07	719.40	43.57	1332856.	0.087	Bu
1235.0	8354269.	297.86	0.00000	1333103.	0.	6.41	0.00	716.63	0.00	1333103.	0.087	1p
1260.0	8531547.	297.94	0.00000	1333345.	0.	6.41	0.00	716.85	0.00	1333345.	0.087	1p
1285.0	8708863.	298.02	0.00000	1333586.	0.	6.41	0.00	717.06	0.00	1333586.	0.087	1p
1310.0	8886217.	298.10	0.00000	1333826.	0.	6.41	0.00	717.27	0.00	1333826.	0.087	1p
1335.0	9063609.	298.18	0.00000	1334064.	0.	6.40	0.00	717.48	0.00	1334064.	0.087	1p
1360.0	9241038.	298.25	0.00000	1334301.	0.	6.40	0.00	717.69	0.00	1334301.	0.087	1p
1385.0	9418506.	298.33	0.00000	1334536.	0.	6.40	0.00	717.91	0.00	1334536.	0.087	1p
1410.0	9596011.	298.41	0.00000	1334771.	0.	6.40	0.00	718.12	0.00	1334771.	0.087	1p
1435.0	9773553.	298.48	0.00000	1335003.	0.	6.40	0.00	718.33	0.00	1335003.	0.087	1p
1460.0	9951134.	298.56	0.00000	1335235.	0.	6.39	0.00	718.54	0.00	1335235.	0.087	1p
1485.0	10128753.	298.63	0.00000	1335465.	0.	6.39	0.00	718.76	0.00	1335465.	0.087	1p
1510.0	10306409.	298.71	0.00000	1335693.	0.	6.39	0.00	718.97	0.00	1335693.	0.087	1p
1535.0	10484103.	298.78	0.00000	1335921.	0.	6.39	0.00	719.18	0.00	1335921.	0.087	1p
1560.0	10661835.	298.85	0.00000	1336147.	0.	6.39	0.00	719.39	0.00	1336147.	0.087	1p
1585.0	10839605.	298.93	0.00000	1336371.	0.	6.38	0.00	719.61	0.00	1336371.	0.087	1p
1610.0	11017414.	299.00	0.00000	1336595.	0.	6.38	0.00	719.82	0.00	1336595.	0.087	1p
1635.0	11195260.	299.07	0.00000	1336817.	0.	6.38	0.00	720.03	0.00	1336817.	0.087	1p
1660.0	11373144.	299.15	0.00000	1337037.	0.	6.38	0.00	720.25	0.00	1337037.	0.087	1p
1685.0	11551066.	299.22	0.00000	1337256.	0.	6.38	0.00	720.46	0.00	1337256.	0.087	1p
1710.0	11729026.	299.29	0.00000	1337474.	0.	6.37	0.00	720.67	0.00	1337474.	0.087	1p
1735.0	11907024.	299.36	0.00000	1337691.	0.	6.37	0.00	720.89	0.00	1337691.	0.087	1p
1760.0	12085060.	299.43	0.00000	1337906.	0.	6.37	0.00	721.10	0.00	1337906.	0.087	1p
1785.0	12263134.	299.50	0.00000	1338119.	0.	6.37	0.00	721.31	0.00	1338119.	0.087	1p
1810.0	12441246.	299.57	0.00000	1338332.	0.	6.37	0.00	721.53	0.00	1338332.	0.087	1p
1810.0	12441246.	282.34	0.00000	1245950.	0.	3.87	0.00	755.89	0.00	1245950.	0.087	1p
1835.0	12611546.	282.39	0.00000	1246129.	0.	3.87	0.00	756.06	0.00	1246129.	0.087	1p
1860.0	12781880.	282.44	0.00000	1246305.	0.	3.87	0.00	756.24	0.00	1246305.	0.087	1p
1885.0	12952250.	282.49	0.00000	1246479.	0.	3.87	0.00	756.41	0.00	1246479.	0.087	1p
1910.0	13122654.	282.53	0.00000	1246651.	0.	3.86	0.00	756.59	0.00	1246651.	0.087	1p
1935.0	13293094.	282.58	0.00000	1246821.	0.	3.86	0.00	756.77	0.00	1246821.	0.087	1p
1960.0	13463569.	282.63	0.00000	1246989.	0.	3.86	0.00	756.94	0.00	1246989.	0.087	1p
1985.0	13634080.	282.68	0.00000	1247154.	0.	3.86	0.00	757.12	0.00	1247154.	0.087	1p
2010.0	13804626.	282.72	0.00000	1247318.	0.	3.86	0.00	757.30	0.00	1247318.	0.087	1p
2035.0	13975208.	282.77	0.00000	1247479.	0.	3.86	0.00	757.48	0.00	1247479.	0.087	1p
2060.0	14145826.	282.81	0.00000	1247639.	0.	3.86	0.00	757.66	0.00	1247639.	0.087	1p
2085.0	14316479.	282.86	0.00000	1247797.	0.	3.86	0.00	757.83	0.00	1247797.	0.087	1p

2110.0	14487168.	282.90	0.00000	1247953.	0.	3.86	0.00	758.01	0.00	1247953.	0.087	1p
2135.0	14657893.	282.95	0.00000	1248108.	0.	3.86	0.00	758.19	0.00	1248108.	0.087	1p
2160.0	14828654.	282.99	0.00000	1248261.	0.	3.86	0.00	758.37	0.00	1248261.	0.087	1p
2185.0	14999451.	283.03	0.00000	1248412.	0.	3.85	0.00	758.55	0.00	1248412.	0.087	1p
2210.0	15170285.	283.08	0.00000	1248562.	0.	3.85	0.00	758.73	0.00	1248562.	0.087	1p
2235.0	15341154.	283.12	0.00000	1248709.	0.	3.85	0.00	758.92	0.00	1248709.	0.087	1p
2260.0	15512060.	283.16	0.00000	1248855.	0.	3.85	0.00	759.10	0.00	1248855.	0.087	1p
2285.0	15683002.	283.20	0.00000	1248999.	0.	3.85	0.00	759.28	0.00	1248999.	0.087	1p
2310.0	15853980.	283.24	0.00000	1249142.	0.	3.85	0.00	759.46	0.00	1249142.	0.087	1p
2335.0	16024995.	283.29	0.00000	1249283.	0.	3.85	0.00	759.64	0.00	1249283.	0.087	1p
2360.0	16196046.	283.33	0.00000	1249421.	0.	3.85	0.00	759.83	0.00	1249421.	0.087	1p
2385.0	16367134.	283.37	0.00000	1249559.	0.	3.85	0.00	760.01	0.00	1249559.	0.087	1p
2410.0	16538259.	283.41	0.00000	1249694.	0.	3.85	0.00	760.19	0.00	1249694.	0.087	1p
2435.0	16709420.	283.44	0.00000	1249828.	0.	3.84	0.00	760.38	0.00	1249828.	0.087	1p
2460.0	16880618.	283.48	0.00000	1249960.	0.	3.84	0.00	760.56	0.00	1249960.	0.087	1p
2485.0	17051853.	283.52	0.00000	1250090.	0.	3.84	0.00	760.74	0.00	1250090.	0.087	1p
2510.0	17223125.	283.56	0.00000	1250219.	0.	3.84	0.00	760.93	0.00	1250219.	0.087	1p
2530.0	17360170.	283.59	0.00000	1250320.	0.	3.84	0.00	761.08	0.00	1250320.	0.087	1p

SAMPLE 2 INPUT FILE

```
Sample 2 for Simulator HOLA
 - Option 1  used , the well is injecting separated
   single-phase waste water-
0.4000E+06
700.0E+03
-100.000

2530.000
0.000
2800.000
1000.000
6.0480E+05
20
  300.0  0.1102 4.6E-5    25.0   90.0
   30.0  0.1102 4.6E-5    15.0   88.0
   30.0  0.1102 4.6E-5    15.0   86.0
   30.0  0.1102 4.6E-5    15.0   84.0
   30.0  0.1102 4.6E-5    15.0   82.0
   30.0  0.1102 4.6E-5    15.0   80.0
   30.0  0.1102 4.6E-5    15.0   78.0
   30.0  0.1102 4.6E-5    15.0   76.0
   30.0  0.1102 4.6E-5    15.0   74.0
   30.0  0.1102 4.6E-5    15.0   72.0
   30.0  0.1102 4.6E-5    15.0   70.0
   30.0  0.1102 4.6E-5    15.0   68.0
   30.0  0.1102 4.6E-5    15.0   66.0
   30.0  0.1102 4.6E-5    15.0   64.0
   30.0  0.1102 4.6E-5    15.0   62.0
   30.0  0.1102 4.6E-5    15.0   60.0
  150.0  0.1102 4.6E-5    25.0   60.0
   10.0  0.1102 4.6E-5    10.0   60.0
 1600.0  0.0873 1.5E-5    25.0   60.0
   20.0  0.0873 1.5E-5    20.0   60.0
4
    0.0   25.00
 1000.0  260.00
 2000.0  310.00
 2500.0  330.00
3
 1110.0 -40.00   0.0000E+06
 1810.0 -40.00   0.0000E+06
```

SAMPLE 2 HOLA.LOG FILE

```
   Two phase to water phase
   Pressure          X2          Depth
0.817824E+06  -0.01470524        25.0
```

SAMPLE 2 OUTPUT FILE

****

HOLA - MODEL RESULTS

****

Sample 2 for Simulator HOLA
- Option 1 used , the well is injecting separated single-phase waste water-

Wellhead pressure (bar abs.)	:	4.00
Wellhead temperature (C)	:	143.62
Wellhead dryness	:	0.045
Wellhead enthalpy (kJ/kg)	:	700.00
Wellhead total flow (kg/s)	:	-100.00

Feedzone no:	Depth (m)	Flow (kg/s)	Enthalpy (kJ/kg)
1	1110.0	-40.0000	711.2
2	1810.0	-40.0000	717.2
3	2530.0	-20.0000	723.3

****

Depth (m)	Press (Pa)	Temp (C)	Dryness	Hw (J/kg)	Hs (J/kg)	Vw (m/s)	Vs (m/s)	Dw (kg/m3)	Ds (kg/m3)	H_t (J/kg)	Rad (m)	Reg
0.0	400000.	143.62	0.04469	604670.	2737639.	-45.09	-57.62	922.62	2.16	700000.	0.110	Sl
25.0	740281.	165.91	0.00000	701257.	0.	-2.91	0.00	901.43	0.00	701257.	0.110	1p
50.0	967483.	165.94	0.00000	701503.	0.	-2.91	0.00	901.55	0.00	701503.	0.110	1p
75.0	1194714.	165.97	0.00000	701748.	0.	-2.91	0.00	901.67	0.00	701748.	0.110	1p
100.0	1421972.	165.99	0.00000	701993.	0.	-2.91	0.00	901.78	0.00	701993.	0.110	1p
125.0	1649258.	166.02	0.00000	702239.	0.	-2.91	0.00	901.90	0.00	702239.	0.110	1p
150.0	1876572.	166.05	0.00000	702484.	0.	-2.91	0.00	902.02	0.00	702484.	0.110	1p
175.0	2103914.	166.08	0.00000	702729.	0.	-2.91	0.00	902.13	0.00	702729.	0.110	1p
200.0	2331284.	166.10	0.00000	702974.	0.	-2.91	0.00	902.25	0.00	702974.	0.110	1p
225.0	2558681.	166.13	0.00000	703220.	0.	-2.90	0.00	902.37	0.00	703220.	0.110	1p
250.0	2786106.	166.16	0.00000	703465.	0.	-2.90	0.00	902.48	0.00	703465.	0.110	1p
275.0	3013559.	166.18	0.00000	703710.	0.	-2.90	0.00	902.60	0.00	703710.	0.110	1p
300.0	3241039.	166.21	0.00000	703956.	0.	-2.90	0.00	902.71	0.00	703956.	0.110	1p

315.0	3377460.	166.23	0.00000	704103.	0.	-2.90	0.00	902.78	0.00	704103.	0.110	1p
330.0	3513891.	166.24	0.00000	704250.	0.	-2.90	0.00	902.85	0.00	704250.	0.110	1p
345.0	3650089.	166.26	0.00000	704396.	0.	-2.90	0.00	902.92	0.00	704396.	0.110	1p
360.0	3786296.	166.27	0.00000	704543.	0.	-2.90	0.00	902.99	0.00	704543.	0.110	1p
375.0	3922110.	166.29	0.00000	704690.	0.	-2.90	0.00	903.06	0.00	704690.	0.110	1p
390.0	4057933.	166.31	0.00000	704836.	0.	-2.90	0.00	903.13	0.00	704836.	0.110	1p
405.0	4193201.	166.32	0.00000	704982.	0.	-2.90	0.00	903.20	0.00	704982.	0.110	1p
420.0	4328478.	166.34	0.00000	705127.	0.	-2.90	0.00	903.27	0.00	705127.	0.110	1p
435.0	4463039.	166.35	0.00000	705272.	0.	-2.90	0.00	903.34	0.00	705272.	0.110	1p
450.0	4597610.	166.37	0.00000	705417.	0.	-2.90	0.00	903.40	0.00	705417.	0.110	1p
465.0	4731306.	166.38	0.00000	705561.	0.	-2.90	0.00	903.47	0.00	705561.	0.110	1p
480.0	4865010.	166.40	0.00000	705705.	0.	-2.90	0.00	903.54	0.00	705705.	0.110	1p
495.0	4997680.	166.42	0.00000	705848.	0.	-2.90	0.00	903.61	0.00	705848.	0.110	1p
510.0	5130360.	166.43	0.00000	705991.	0.	-2.90	0.00	903.67	0.00	705991.	0.110	1p
525.0	5261847.	166.45	0.00000	706132.	0.	-2.90	0.00	903.74	0.00	706132.	0.110	1p
540.0	5393343.	166.46	0.00000	706274.	0.	-2.90	0.00	903.81	0.00	706274.	0.110	1p
555.0	5523492.	166.48	0.00000	706414.	0.	-2.90	0.00	903.87	0.00	706414.	0.110	1p
570.0	5653649.	166.49	0.00000	706554.	0.	-2.90	0.00	903.94	0.00	706554.	0.110	1p
585.0	5782303.	166.51	0.00000	706692.	0.	-2.90	0.00	904.00	0.00	706692.	0.110	1p
600.0	5910966.	166.52	0.00000	706830.	0.	-2.90	0.00	904.07	0.00	706830.	0.110	1p
615.0	6037974.	166.54	0.00000	706967.	0.	-2.90	0.00	904.13	0.00	706967.	0.110	1p
630.0	6164990.	166.55	0.00000	707103.	0.	-2.90	0.00	904.20	0.00	707103.	0.110	1p
645.0	6290200.	166.57	0.00000	707237.	0.	-2.90	0.00	904.26	0.00	707237.	0.110	1p
660.0	6415418.	166.58	0.00000	707372.	0.	-2.90	0.00	904.32	0.00	707372.	0.110	1p
675.0	6538681.	166.59	0.00000	707504.	0.	-2.90	0.00	904.38	0.00	707504.	0.110	1p
690.0	6661952.	166.61	0.00000	707636.	0.	-2.90	0.00	904.45	0.00	707636.	0.110	1p
705.0	6783122.	166.62	0.00000	707766.	0.	-2.90	0.00	904.51	0.00	707766.	0.110	1p
720.0	6904300.	166.64	0.00000	707896.	0.	-2.90	0.00	904.57	0.00	707896.	0.110	1p
735.0	7023232.	166.65	0.00000	708024.	0.	-2.90	0.00	904.63	0.00	708024.	0.110	1p
750.0	7142172.	166.66	0.00000	708151.	0.	-2.90	0.00	904.69	0.00	708151.	0.110	1p
775.0	7340422.	166.69	0.00000	708364.	0.	-2.90	0.00	904.79	0.00	708364.	0.110	1p
800.0	7538693.	166.71	0.00000	708576.	0.	-2.90	0.00	904.89	0.00	708576.	0.110	1p
825.0	7736983.	166.73	0.00000	708788.	0.	-2.90	0.00	904.99	0.00	708788.	0.110	1p
850.0	7935294.	166.76	0.00000	709001.	0.	-2.90	0.00	905.09	0.00	709001.	0.110	1p
875.0	8133626.	166.78	0.00000	709213.	0.	-2.90	0.00	905.18	0.00	709213.	0.110	1p
900.0	8331978.	166.80	0.00000	709426.	0.	-2.90	0.00	905.28	0.00	709426.	0.110	1p
910.0	8411325.	166.81	0.00000	709511.	0.	-2.90	0.00	905.32	0.00	709511.	0.110	1p
935.0	8602817.	166.83	0.00000	709717.	0.	-4.61	0.00	905.42	0.00	709717.	0.087	1p
960.0	8811808.	166.85	0.00000	709929.	0.	-4.61	0.00	905.53	0.00	709929.	0.087	1p
985.0	9020819.	166.87	0.00000	710141.	0.	-4.61	0.00	905.63	0.00	710141.	0.087	1p
1010.0	9229851.	166.90	0.00000	710354.	0.	-4.61	0.00	905.74	0.00	710354.	0.087	1p
1035.0	9438904.	166.92	0.00000	710566.	0.	-4.61	0.00	905.85	0.00	710566.	0.087	1p
1060.0	9647978.	166.94	0.00000	710779.	0.	-4.61	0.00	905.95	0.00	710779.	0.087	1p

1085.0	9857072.	166.96	0.00000	710991.	0.	-4.61	0.00	906.06	0.00	710991.	0.087	1p
1110.0	10066187.	166.98	0.00000	711203.	0.	-4.61	0.00	906.16	0.00	711203.	0.087	1p
1110.0	10066187.	166.98	0.00000	711203.	0.	-2.77	0.00	906.16	0.00	711203.	0.087	1p
1135.0	10264788.	167.00	0.00000	711416.	0.	-2.77	0.00	906.26	0.00	711416.	0.087	1p
1160.0	10463409.	167.03	0.00000	711628.	0.	-2.76	0.00	906.36	0.00	711628.	0.087	1p
1185.0	10662050.	167.05	0.00000	711841.	0.	-2.76	0.00	906.46	0.00	711841.	0.087	1p
1210.0	10860711.	167.07	0.00000	712053.	0.	-2.76	0.00	906.56	0.00	712053.	0.087	1p
1235.0	11059393.	167.09	0.00000	712266.	0.	-2.76	0.00	906.66	0.00	712266.	0.087	1p
1260.0	11258095.	167.12	0.00000	712478.	0.	-2.76	0.00	906.75	0.00	712478.	0.087	1p
1285.0	11456817.	167.14	0.00000	712690.	0.	-2.76	0.00	906.85	0.00	712690.	0.087	1p
1310.0	11655559.	167.16	0.00000	712903.	0.	-2.76	0.00	906.95	0.00	712903.	0.087	1p
1335.0	11854321.	167.18	0.00000	713115.	0.	-2.76	0.00	907.05	0.00	713115.	0.087	1p
1360.0	12053104.	167.21	0.00000	713328.	0.	-2.76	0.00	907.15	0.00	713328.	0.087	1p
1385.0	12251907.	167.23	0.00000	713540.	0.	-2.76	0.00	907.24	0.00	713540.	0.087	1p
1410.0	12450729.	167.25	0.00000	713752.	0.	-2.76	0.00	907.34	0.00	713752.	0.087	1p
1435.0	12649572.	167.28	0.00000	713965.	0.	-2.76	0.00	907.44	0.00	713965.	0.087	1p
1460.0	12848435.	167.30	0.00000	714177.	0.	-2.76	0.00	907.54	0.00	714177.	0.087	1p
1485.0	13047319.	167.32	0.00000	714390.	0.	-2.76	0.00	907.63	0.00	714390.	0.087	1p
1510.0	13246222.	167.34	0.00000	714602.	0.	-2.76	0.00	907.73	0.00	714602.	0.087	1p
1535.0	13445145.	167.37	0.00000	714814.	0.	-2.76	0.00	907.83	0.00	714814.	0.087	1p
1560.0	13644088.	167.39	0.00000	715027.	0.	-2.76	0.00	907.93	0.00	715027.	0.087	1p
1585.0	13843052.	167.41	0.00000	715239.	0.	-2.76	0.00	908.02	0.00	715239.	0.087	1p
1610.0	14042035.	167.43	0.00000	715452.	0.	-2.76	0.00	908.12	0.00	715452.	0.087	1p
1635.0	14241038.	167.46	0.00000	715664.	0.	-2.76	0.00	908.22	0.00	715664.	0.087	1p
1660.0	14440062.	167.48	0.00000	715876.	0.	-2.76	0.00	908.31	0.00	715876.	0.087	1p
1685.0	14639105.	167.50	0.00000	716089.	0.	-2.76	0.00	908.41	0.00	716089.	0.087	1p
1710.0	14838168.	167.52	0.00000	716301.	0.	-2.76	0.00	908.51	0.00	716301.	0.087	1p
1735.0	15037251.	167.54	0.00000	716514.	0.	-2.76	0.00	908.60	0.00	716514.	0.087	1p
1760.0	15236355.	167.57	0.00000	716726.	0.	-2.76	0.00	908.70	0.00	716726.	0.087	1p
1785.0	15435478.	167.59	0.00000	716939.	0.	-2.76	0.00	908.80	0.00	716939.	0.087	1p
1810.0	15634621.	167.61	0.00000	717151.	0.	-2.76	0.00	908.89	0.00	717151.	0.087	1p
1810.0	15634621.	167.61	0.00000	717151.	0.	-0.92	0.00	908.89	0.00	717151.	0.087	1p
1835.0	15828408.	167.64	0.00000	717363.	0.	-0.92	0.00	908.99	0.00	717363.	0.087	1p
1860.0	16022216.	167.66	0.00000	717576.	0.	-0.92	0.00	909.08	0.00	717576.	0.087	1p
1885.0	16216043.	167.68	0.00000	717788.	0.	-0.92	0.00	909.17	0.00	717788.	0.087	1p
1910.0	16409890.	167.70	0.00000	718001.	0.	-0.92	0.00	909.26	0.00	718001.	0.087	1p
1935.0	16603756.	167.73	0.00000	718213.	0.	-0.92	0.00	909.36	0.00	718213.	0.087	1p
1960.0	16797642.	167.75	0.00000	718425.	0.	-0.92	0.00	909.45	0.00	718425.	0.087	1p
1985.0	16991547.	167.77	0.00000	718638.	0.	-0.92	0.00	909.54	0.00	718638.	0.087	1p
2010.0	17185472.	167.80	0.00000	718850.	0.	-0.92	0.00	909.63	0.00	718850.	0.087	1p
2035.0	17379416.	167.82	0.00000	719063.	0.	-0.92	0.00	909.72	0.00	719063.	0.087	1p
2060.0	17573380.	167.84	0.00000	719275.	0.	-0.92	0.00	909.82	0.00	719275.	0.087	1p
2085.0	17767363.	167.87	0.00000	719487.	0.	-0.92	0.00	909.91	0.00	719487.	0.087	1p

2110.0	17961366.	167.89	0.00000	719700.	0.	-0.92	0.00	910.00	0.00	719700.	0.087	1p
2135.0	18155388.	167.91	0.00000	719912.	0.	-0.92	0.00	910.09	0.00	719912.	0.087	1p
2160.0	18349430.	167.93	0.00000	720125.	0.	-0.92	0.00	910.18	0.00	720125.	0.087	1p
2185.0	18543490.	167.96	0.00000	720337.	0.	-0.92	0.00	910.28	0.00	720337.	0.087	1p
2210.0	18737571.	167.98	0.00000	720549.	0.	-0.92	0.00	910.37	0.00	720549.	0.087	1p
2235.0	18931671.	168.00	0.00000	720762.	0.	-0.92	0.00	910.46	0.00	720762.	0.087	1p
2260.0	19125790.	168.03	0.00000	720974.	0.	-0.92	0.00	910.55	0.00	720974.	0.087	1p
2285.0	19319928.	168.05	0.00000	721187.	0.	-0.92	0.00	910.64	0.00	721187.	0.087	1p
2310.0	19514086.	168.07	0.00000	721399.	0.	-0.92	0.00	910.73	0.00	721399.	0.087	1p
2335.0	19708263.	168.10	0.00000	721611.	0.	-0.92	0.00	910.82	0.00	721611.	0.087	1p
2360.0	19902460.	168.12	0.00000	721824.	0.	-0.92	0.00	910.92	0.00	721824.	0.087	1p
2385.0	20096676.	168.14	0.00000	722036.	0.	-0.92	0.00	911.01	0.00	722036.	0.087	1p
2410.0	20290911.	168.16	0.00000	722249.	0.	-0.92	0.00	911.10	0.00	722249.	0.087	1p
2435.0	20485165.	168.19	0.00000	722461.	0.	-0.92	0.00	911.19	0.00	722461.	0.087	1p
2460.0	20679439.	168.21	0.00000	722674.	0.	-0.92	0.00	911.28	0.00	722674.	0.087	1p
2485.0	20873732.	168.23	0.00000	722886.	0.	-0.92	0.00	911.37	0.00	722886.	0.087	1p
2510.0	21068044.	168.26	0.00000	723098.	0.	-0.92	0.00	911.46	0.00	723098.	0.087	1p
2530.0	21223508.	168.27	0.00000	723268.	0.	-0.92	0.00	911.53	0.00	723268.	0.087	1p

SAMPLE 3 INPUT FILE

```
Sample 3 for Simulator HOLA
 - Option 2  used -

3.0000E+06
14.10E+06
0.100E+06

2530.000
0.000
2800.000
1000.000
6.0480E+05
20
  300.0  0.1102 4.6E-5    25.0   90.0
   30.0  0.1102 4.6E-5    15.0   88.0
   30.0  0.1102 4.6E-5    15.0   86.0
   30.0  0.1102 4.6E-5    15.0   84.0
   30.0  0.1102 4.6E-5    15.0   82.0
   30.0  0.1102 4.6E-5    15.0   80.0
   30.0  0.1102 4.6E-5    15.0   78.0
   30.0  0.1102 4.6E-5    15.0   76.0
   30.0  0.1102 4.6E-5    15.0   74.0
   30.0  0.1102 4.6E-5    15.0   72.0
   30.0  0.1102 4.6E-5    15.0   70.0
   30.0  0.1102 4.6E-5    15.0   68.0
   30.0  0.1102 4.6E-5    15.0   66.0
   30.0  0.1102 4.6E-5    15.0   64.0
   30.0  0.1102 4.6E-5    15.0   62.0
   30.0  0.1102 4.6E-5    15.0   60.0
  150.0  0.1102 4.6E-5    25.0   60.0
   10.0  0.1102 4.6E-5    10.0   60.0
 1600.0  0.0873 1.5E-5    25.0   60.0
   20.0  0.0873 1.5E-5    20.0   60.0
4
    0.0   25.00
 1000.0  260.00
 2000.0  310.00
 2500.0  330.00
3
 1110.0 10.0E+06 1600.0E+03 5.0E-13
 2010.0 13.5E+06 1200.0E+03 8.00E-13
 2530.0 15.35E+06 290.0 5.00E-13
```

SAMPLE 3 HOLA.LOG FILE

```
                    Iteration no :   0
 It no   0-   Single water to two phase flow at 1285.00 m depth
                    Iteration no :   1
 It no   1-   Single water to two phase flow at 1285.00 m depth
                    Iteration no :   2
 It no   2-   Single water to two phase flow at 1285.00 m depth
```

SAMPLE 3 HOLA.LOG FILE

```
                    Iteration no :   3
It no   3-   Single water to two phase flow at 1285.00 m depth
                    Iteration no :   4
It no   4-   Single water to two phase flow at 1285.00 m depth
                    Iteration no :   5
It no   5-   Single water to two phase flow at 1285.00 m depth
                    Iteration no :   6
It no   6-   Single water to two phase flow at 1285.00 m depth
                    Iteration no :   7
It no   7-   Single water to two phase flow at 1285.00 m depth
                    Iteration no :   8
It no   8-   Single water to two phase flow at 1285.00 m depth
                    Iteration no :   9
It no   9-   Single water to two phase flow at 1285.00 m depth
                    Iteration no :  10
It no  10-   Single water to two phase flow at 1285.00 m depth
                    Iteration no :  11
It no  11-   Single water to two phase flow at 1285.00 m depth
                    Iteration no :  12
It no  12-   Single water to two phase flow at 1285.00 m depth
                    Iteration no :  13
It no  13-   Single water to two phase flow at 1285.00 m depth
                    Iteration no :  14
It no  14-   Single water to two phase flow at 1285.00 m depth
                    Iteration no :  15
It no  15-   Single water to two phase flow at 1285.00 m depth
```

SAMPLE 3 HOLA.ITER FILE

P required (bars)	Max Error (bars)	Step size (bars)	Pbott Max (bars)	Pbott min (bars)
30.0000	1.0000	0.0200	153.4800	30.0000

It no	P bottom (bars)	P top (bars)	Difference (bars)	Q top (kg/s)	H top (kJ/kg)
0	141.0000	31.4348	1.4348	36.906	1448.689
1	140.9800	31.4059	1.4059	36.939	1448.576
2	140.9600	31.3769	1.3769	36.973	1448.462
3	140.9400	31.3478	1.3478	37.006	1448.349
4	140.9200	31.3188	1.3188	37.040	1448.235
5	140.9000	31.2897	1.2897	37.074	1448.121
6	140.8800	31.2605	1.2605	37.107	1448.008
7	140.8600	31.2314	1.2314	37.141	1447.894
8	140.8400	31.2022	1.2022	37.174	1447.780
9	140.8200	31.1729	1.1729	37.208	1447.666
10	140.8000	31.1437	1.1437	37.242	1447.552
11	140.7800	31.1144	1.1144	37.275	1447.438
12	140.7600	31.0851	1.0851	37.309	1447.323
13	140.7400	31.0557	1.0557	37.342	1447.209
14	140.7200	31.0264	1.0264	37.376	1447.094
15	140.7000	30.9970	0.9970	37.410	1446.980

SAMPLE 3 OUTPUT FILE

****

HOLA - MODEL RESULTS

****

Sample 3 for Simulator HOLA
- Option 2 used -

Wellhead pressure (bar abs.)	:	31.00
Wellhead temperature (C)	:	235.66
Wellhead dryness	:	0.241
Wellhead enthalpy (kJ/kg)	:	1446.98
Wellhead total flow (kg/s)	:	37.41

Feedzone no:	Depth (m)	Flow (kg/s)	Enthalpy (kJ/kg)	Res.Pres (Bar)	Satur.	Prod. Ind. (m3)
1	1110.0	10.5567	1600.0	100.000	0.68	0.500000E-12
2	2010.0	16.7768	1200.0	135.000	0.00	0.800000E-12
3	2530.0	10.0761	1284.4	153.500	0.00	0.500000E-12

****

Depth (m)	Press (Pa)	Temp (C)	Dryness	Hw (J/kg)	Hs (J/kg)	Vw (m/s)	Vs (m/s)	Dw (kg/m3)	Ds (kg/m3)	H_t (J/kg)	Rad (m)	Reg
0.0	3099696.	235.66	0.24084	1016960.	2802465.	14.31	16.26	819.65	15.51	1446980.	0.110	Sl
25.0	3130763.	236.22	0.23985	1019604.	2802469.	14.13	16.05	818.88	15.66	1447233.	0.110	Bu
50.0	3161868.	236.77	0.23887	1022233.	2802468.	13.96	15.84	818.11	15.82	1447485.	0.110	Bu
75.0	3193015.	237.32	0.23790	1024848.	2802461.	13.80	15.64	817.35	15.98	1447737.	0.110	Bu
100.0	3224207.	237.87	0.23692	1027451.	2802448.	13.63	15.43	816.59	16.14	1447989.	0.110	Bu
125.0	3255450.	238.41	0.23595	1030040.	2802429.	13.47	15.24	815.83	16.29	1448241.	0.110	Bu
150.0	3286747.	238.96	0.23499	1032617.	2802404.	13.31	15.05	815.08	16.45	1448493.	0.110	Bu
175.0	3318103.	239.49	0.23402	1035183.	2802374.	13.15	14.86	814.33	16.61	1448744.	0.110	Bu
200.0	3349522.	240.03	0.23306	1037737.	2802339.	13.00	14.67	813.57	16.77	1448996.	0.110	Bu
225.0	3381007.	240.56	0.23210	1040282.	2802297.	12.85	14.49	812.82	16.93	1449247.	0.110	Bu
250.0	3412564.	241.09	0.23114	1042816.	2802251.	12.70	14.31	812.07	17.09	1449498.	0.110	Bu
275.0	3444194.	241.62	0.23019	1045340.	2802199.	12.55	14.13	811.33	17.25	1449749.	0.110	Bu
300.0	3475904.	242.14	0.22924	1047855.	2802141.	12.41	13.96	810.58	17.41	1450000.	0.110	Bu

315.0	3494969.	242.46	0.22866	1049360.	2802104.	12.32	13.86	810.14	17.51	1450150.	0.110	Bu
330.0	3514057.	242.77	0.22809	1050862.	2802065.	12.24	13.75	809.69	17.61	1450299.	0.110	Bu
345.0	3533177.	243.08	0.22752	1052360.	2802024.	12.15	13.65	809.24	17.70	1450449.	0.110	Bu
360.0	3552308.	243.39	0.22695	1053854.	2801981.	12.07	13.55	808.80	17.80	1450598.	0.110	Bu
375.0	3571472.	243.70	0.22638	1055345.	2801937.	11.99	13.46	808.35	17.90	1450747.	0.110	Bu
390.0	3590633.	244.01	0.22582	1056831.	2801890.	11.91	13.36	807.91	18.00	1450895.	0.110	Bu
405.0	3609829.	244.32	0.22525	1058314.	2801842.	11.83	13.26	807.47	18.09	1451044.	0.110	Bu
420.0	3629008.	244.63	0.22468	1059791.	2801792.	11.75	13.17	807.03	18.19	1451192.	0.110	Bu
435.0	3648223.	244.93	0.22412	1061265.	2801740.	11.67	13.07	806.58	18.29	1451340.	0.110	Bu
450.0	3667407.	245.24	0.22356	1062732.	2801686.	11.59	12.98	806.15	18.39	1451487.	0.110	Bu
465.0	3686628.	245.54	0.22299	1064197.	2801631.	11.51	12.89	805.71	18.49	1451634.	0.110	Bu
480.0	3705804.	245.84	0.22243	1065653.	2801574.	11.43	12.80	805.27	18.58	1451780.	0.110	Bu
495.0	3725017.	246.15	0.22187	1067107.	2801515.	11.36	12.71	804.83	18.68	1451926.	0.110	Bu
510.0	3744170.	246.45	0.22132	1068552.	2801454.	11.28	12.62	804.40	18.78	1452071.	0.110	Bu
525.0	3763361.	246.74	0.22076	1069994.	2801392.	11.21	12.53	803.96	18.88	1452215.	0.110	Bu
540.0	3782476.	247.04	0.22020	1071427.	2801329.	11.14	12.44	803.53	18.98	1452359.	0.110	Bu
555.0	3801630.	247.34	0.21965	1072857.	2801263.	11.06	12.35	803.10	19.08	1452502.	0.110	Bu
570.0	3820691.	247.63	0.21910	1074276.	2801196.	10.99	12.27	802.67	19.17	1452644.	0.110	Bu
585.0	3839792.	247.92	0.21855	1075693.	2801128.	10.92	12.19	802.24	19.27	1452786.	0.110	Bu
600.0	3858784.	248.21	0.21800	1077097.	2801058.	10.85	12.10	801.82	19.37	1452926.	0.110	Bu
615.0	3877815.	248.50	0.21746	1078500.	2800987.	10.78	12.02	801.39	19.47	1453066.	0.110	Bu
630.0	3896721.	248.79	0.21691	1079889.	2800915.	10.71	11.94	800.97	19.57	1453204.	0.110	Bu
645.0	3915666.	249.07	0.21637	1081277.	2800841.	10.65	11.86	800.55	19.66	1453342.	0.110	Bu
660.0	3934469.	249.36	0.21583	1082650.	2800765.	10.58	11.78	800.13	19.76	1453478.	0.110	Bu
675.0	3953310.	249.64	0.21530	1084022.	2800689.	10.51	11.70	799.71	19.86	1453614.	0.110	Bu
690.0	3971991.	249.92	0.21476	1085377.	2800611.	10.45	11.63	799.30	19.95	1453748.	0.110	Bu
705.0	3990711.	250.19	0.21423	1086732.	2800532.	10.38	11.55	798.89	20.05	1453882.	0.110	Bu
720.0	4009253.	250.47	0.21370	1088069.	2800452.	10.32	11.48	798.48	20.15	1454013.	0.110	Bu
735.0	4027833.	250.74	0.21318	1089405.	2800371.	10.26	11.40	798.07	20.24	1454145.	0.110	Bu
750.0	4046216.	251.01	0.21266	1090724.	2800289.	10.20	11.33	797.67	20.34	1454274.	0.110	Bu
775.0	4076939.	251.46	0.21179	1092918.	2800149.	10.09	11.21	797.00	20.50	1454490.	0.110	Bu
800.0	4107770.	251.91	0.21092	1095109.	2800005.	9.99	11.09	796.32	20.66	1454706.	0.110	Bu
825.0	4138711.	252.36	0.21005	1097298.	2799856.	9.89	10.97	795.65	20.82	1454921.	0.110	Bu
850.0	4169765.	252.81	0.20918	1099484.	2799704.	9.80	10.86	794.98	20.98	1455137.	0.110	Bu
875.0	4200935.	253.25	0.20831	1101668.	2799547.	9.70	10.74	794.31	21.14	1455353.	0.110	Bu
900.0	4232225.	253.70	0.20744	1103849.	2799385.	9.60	10.63	793.63	21.30	1455568.	0.110	Bu
910.0	4244774.	253.88	0.20709	1104722.	2799319.	9.56	10.59	793.36	21.37	1455654.	0.110	Bu
935.0	4297035.	254.61	0.20552	1108336.	2799039.	15.13	16.55	792.25	21.64	1455801.	0.087	Bu
960.0	4338496.	255.19	0.20433	1111183.	2798810.	14.93	16.32	791.36	21.86	1456020.	0.087	Bu
985.0	4380009.	255.77	0.20315	1114017.	2798574.	14.73	16.10	790.48	22.08	1456239.	0.087	Bu
1010.0	4473568.	257.05	0.20037	1120342.	2798020.	3.24	27.15	788.51	22.57	1456496.	0.087	Bu
1035.0	4641400.	259.30	0.19528	1131482.	2796950.	3.22	25.92	785.02	23.45	1456717.	0.087	Bu
1060.0	4811969.	261.53	0.19017	1142547.	2795768.	3.19	24.75	781.52	24.35	1456937.	0.087	Bu
1085.0	4985228.	263.73	0.18503	1153541.	2794474.	3.17	23.63	778.01	25.28	1457156.	0.087	Bu

1110.0	5161106.	265.90	0.17985	1164463.	2793069.	3.15	22.55	774.50	26.22	1457374.	0.087	Bu
1110.0	5161106.	265.90	0.03555	1164463.	2793069.	2.32	3.83	774.50	26.22	1222367.	0.087	Bu
1135.0	5294781.	267.51	0.03086	1172613.	2791943.	2.29	3.34	771.86	26.95	1222580.	0.087	Bu
1160.0	5423259.	269.04	0.02637	1180330.	2790813.	2.25	2.91	769.35	27.64	1222792.	0.087	Bu
1185.0	5549470.	270.51	0.02197	1187805.	2789661.	2.15	2.59	766.91	28.33	1223005.	0.087	Bu
1210.0	5676192.	271.95	0.01758	1195208.	2788462.	2.05	2.28	764.47	29.03	1223218.	0.087	Bu
1235.0	5803616.	273.39	0.01317	1202555.	2787216.	1.93	1.99	762.04	29.73	1223430.	0.087	Bu
1260.0	5932366.	274.81	0.00873	1209882.	2785916.	1.80	1.72	759.61	30.45	1223643.	0.087	Bu
1285.0	6077794.	276.39	0.00000	1223855.	2784400.	1.49	1.49	754.77	31.26	1223856.	0.087	Bu
1310.0	6239615.	277.56	0.00000	1224067.	0.	1.49	0.00	754.93	0.00	1224067.	0.087	1p
1335.0	6401469.	277.61	0.00000	1224280.	0.	1.49	0.00	755.09	0.00	1224280.	0.087	1p
1360.0	6563356.	277.67	0.00000	1224492.	0.	1.48	0.00	755.24	0.00	1224492.	0.087	1p
1385.0	6725275.	277.73	0.00000	1224704.	0.	1.48	0.00	755.40	0.00	1224704.	0.087	1p
1410.0	6887228.	277.78	0.00000	1224916.	0.	1.48	0.00	755.56	0.00	1224916.	0.087	1p
1435.0	7049213.	277.84	0.00000	1225128.	0.	1.48	0.00	755.71	0.00	1225128.	0.087	1p
1460.0	7211232.	277.89	0.00000	1225341.	0.	1.48	0.00	755.87	0.00	1225341.	0.087	1p
1485.0	7373283.	277.95	0.00000	1225553.	0.	1.48	0.00	756.02	0.00	1225553.	0.087	1p
1510.0	7535366.	278.01	0.00000	1225765.	0.	1.48	0.00	756.18	0.00	1225765.	0.087	1p
1535.0	7697483.	278.06	0.00000	1225977.	0.	1.48	0.00	756.33	0.00	1225977.	0.087	1p
1560.0	7859631.	278.12	0.00000	1226190.	0.	1.48	0.00	756.49	0.00	1226190.	0.087	1p
1585.0	8021813.	278.17	0.00000	1226402.	0.	1.48	0.00	756.64	0.00	1226402.	0.087	1p
1610.0	8184027.	278.23	0.00000	1226614.	0.	1.48	0.00	756.79	0.00	1226614.	0.087	1p
1635.0	8346273.	278.28	0.00000	1226826.	0.	1.48	0.00	756.95	0.00	1226826.	0.087	1p
1660.0	8508551.	278.34	0.00000	1227039.	0.	1.48	0.00	757.10	0.00	1227039.	0.087	1p
1685.0	8670862.	278.39	0.00000	1227251.	0.	1.48	0.00	757.26	0.00	1227251.	0.087	1p
1710.0	8833205.	278.45	0.00000	1227463.	0.	1.48	0.00	757.41	0.00	1227463.	0.087	1p
1735.0	8995581.	278.51	0.00000	1227675.	0.	1.48	0.00	757.56	0.00	1227675.	0.087	1p
1760.0	9157989.	278.56	0.00000	1227887.	0.	1.48	0.00	757.71	0.00	1227887.	0.087	1p
1785.0	9320428.	278.62	0.00000	1228100.	0.	1.48	0.00	757.87	0.00	1228100.	0.087	1p
1810.0	9482900.	278.67	0.00000	1228312.	0.	1.48	0.00	758.02	0.00	1228312.	0.087	1p
1835.0	9645404.	278.73	0.00000	1228524.	0.	1.48	0.00	758.17	0.00	1228524.	0.087	1p
1860.0	9807940.	278.78	0.00000	1228736.	0.	1.48	0.00	758.32	0.00	1228736.	0.087	1p
1885.0	9970508.	278.84	0.00000	1228949.	0.	1.48	0.00	758.47	0.00	1228949.	0.087	1p
1910.0	10133107.	278.89	0.00000	1229161.	0.	1.48	0.00	758.63	0.00	1229161.	0.087	1p
1935.0	10295739.	278.95	0.00000	1229373.	0.	1.48	0.00	758.78	0.00	1229373.	0.087	1p
1960.0	10458402.	279.00	0.00000	1229585.	0.	1.48	0.00	758.93	0.00	1229585.	0.087	1p
1985.0	10621098.	279.06	0.00000	1229798.	0.	1.48	0.00	759.08	0.00	1229798.	0.087	1p
2010.0	10783824.	279.11	0.00000	1230010.	0.	1.48	0.00	759.23	0.00	1230010.	0.087	1p
2010.0	10783824.	288.62	0.00000	1279976.	0.	0.57	0.00	741.12	0.00	1279976.	0.087	1p
2035.0	10941481.	288.68	0.00000	1280189.	0.	0.57	0.00	741.28	0.00	1280189.	0.087	1p
2060.0	11099172.	288.74	0.00000	1280401.	0.	0.57	0.00	741.44	0.00	1280401.	0.087	1p
2085.0	11256896.	288.80	0.00000	1280613.	0.	0.57	0.00	741.60	0.00	1280613.	0.087	1p
2110.0	11414654.	288.86	0.00000	1280825.	0.	0.57	0.00	741.75	0.00	1280825.	0.087	1p
2135.0	11572446.	288.92	0.00000	1281037.	0.	0.57	0.00	741.91	0.00	1281037.	0.087	1p

2160.0	11730272.	288.98	0.00000	1281250.	0.	0.57	0.00	742.07	0.00	1281250.	0.087	1p
2185.0	11888131.	289.04	0.00000	1281462.	0.	0.57	0.00	742.23	0.00	1281462.	0.087	1p
2210.0	12046024.	289.10	0.00000	1281674.	0.	0.57	0.00	742.39	0.00	1281674.	0.087	1p
2235.0	12203951.	289.16	0.00000	1281886.	0.	0.57	0.00	742.55	0.00	1281886.	0.087	1p
2260.0	12361911.	289.22	0.00000	1282099.	0.	0.57	0.00	742.71	0.00	1282099.	0.087	1p
2285.0	12519904.	289.28	0.00000	1282311.	0.	0.57	0.00	742.86	0.00	1282311.	0.087	1p
2310.0	12677931.	289.34	0.00000	1282523.	0.	0.57	0.00	743.02	0.00	1282523.	0.087	1p
2335.0	12835991.	289.40	0.00000	1282735.	0.	0.57	0.00	743.18	0.00	1282735.	0.087	1p
2360.0	12994085.	289.46	0.00000	1282947.	0.	0.57	0.00	743.33	0.00	1282947.	0.087	1p
2385.0	13152212.	289.52	0.00000	1283160.	0.	0.57	0.00	743.49	0.00	1283160.	0.087	1p
2410.0	13310372.	289.57	0.00000	1283372.	0.	0.57	0.00	743.65	0.00	1283372.	0.087	1p
2435.0	13468565.	289.63	0.00000	1283584.	0.	0.57	0.00	743.80	0.00	1283584.	0.087	1p
2460.0	13626791.	289.69	0.00000	1283796.	0.	0.57	0.00	743.96	0.00	1283796.	0.087	1p
2485.0	13785050.	289.75	0.00000	1284008.	0.	0.57	0.00	744.12	0.00	1284008.	0.087	1p
2510.0	13943342.	289.81	0.00000	1284221.	0.	0.57	0.00	744.27	0.00	1284221.	0.087	1p
2530.0	14070000.	289.86	0.00000	1284390.	2802465.	0.57	16.23	744.39	15.52	1284390.	0.087	1p
2530.0	14070000.	289.86	0.00000	1284390.	2802465.	0.57	16.23	744.39	15.52	1284390.	0.087	1p