

POTENTIOMETRIC LEVEL OF THE DEEP-BASIN
BRINE AQUIFER, PALO DURO BASIN,
TEXAS PANHANDLE

by

D. A. Smith

Prepared for the
U.S. Department of Energy
Office of Nuclear Waste Isolation
under contract no. DE-AC-97-83WM46615

Bureau of Economic Geology
W.L. Fisher, Director
The University of Texas at Austin
University Station, P.O. Box X
Austin, Texas 78713

Potentiometric Level of the Deep-Basin Brine Aquifer,
Palo Duro Basin, Texas Panhandle

INTRODUCTION

As a part of the investigation of the hydrology of the Palo Duro Basin, potentiometric surface maps have been constructed to describe the potential distribution within the Wolfcamp aquifer, the upper Pennsylvanian aquifer and the lower Pennsylvanian aquifer. The Wolfcamp and upper Pennsylvanian maps were submitted with earlier CSR sections (December 1982 and February 1984). In this report geostatistical analysis is used to map the hydraulic head distribution in rocks of lower Pennsylvanian age over the greater Permian Basin (Palo Duro, Delaware, Midland and Anadarko Basins). The lower Pennsylvanian consists of rocks of the Bend and Strawn groups. Variogram analysis was used to describe the data variation. Kriging was then used to estimate head values based on the available data with the characteristic that the estimates have minimum variance. The resulting estimates were then contoured using CPS-1.(1979, Radian Corporation) There were very few lower Pennsylvanian data actually from the Palo Duro Basin. As a result the lower Pennsylvanian potential surface is poorly defined in the Palo Duro Basin, but can be constrained by the heads in surrounding basins where data is more prevalent.

Lower Pennsylvanian

Data Base

The data base for this study is a combination of data from the Petroleum Information Corporation (PI) file and from drill-stem test(DST) records provided to the Bureau by operators in the region. There have been no lower Pennsylvanian well tests in Department of Energy (DOE) test wells. All data are in the form of pressure measurements and have been subsequently converted to equivalent fresh water heads. The PI files at the Bureau contain 4609 lower Pennsylvanian DST pressure measurements of varying quality. These DSTs were performed in 2638 wells in the Anadarko, Palo Duro, Midland, Hardeman, and Delaware Basins. To these data were added 11 lower Pennsylvanian pressures from test records obtained from Palo Duro Basin operators. Where there was more than one test in a well the data were examined to choose the best head measurement for that well. Duplicate measurements were deleted from the data set by using a quality ranking scheme whereby the tests were ranked by the number and internal consistency of their shut in pressures. The highest ranked test was chosen to represent a well, and if more than one test of the highest class was available the highest pressure was chosen. Deletion of duplicate measurements resulted in a data base of one head measurement per well for 2647 wells. The data distribution by basin after deletion of duplicate measurements in the same well is listed in table 1.

Table 1. Lower Pennsylvanian DST Data Distribution by Basin
with duplicate values deleted and no screening applied.

Class	Palo Duro	Anadarko	Midland	Delaware	
-----	-----	-----	-----	-----	
H	11	0	0	0	
A	255	333	113	736	
B	117	210	35	235	
C	110	413	23	56	
					Total
-----	-----	-----	-----	-----	-----
Total	493	956	171	1027	2647

Class H data are from horner analyses.

Class A data have $(ISIP - FSIP) < 10\%$

Class B data have $(ISIP - FSIP) > 10\%$

Class C data have ISIP

Of these 2647 pressures 1678 were initially considered reliable based on a pressure gradient of at least 0.3 psi/foot. The pressure gradient is defined as shut in pressure divided by depth.

In the Anadarko and Delaware Basins there are enough DSTs so that only the highest quality (class A) data need be used. This results in a data base of 265 class A data in the Anadarko Basin and 528 class A data in the Delaware Basin. In the Palo Duro, Midland, and Hardeman basins there is such limited data that all classes of data are used. Because lesser quality B and C data are used further screening is necessary. After screening pressures which are either too low or too high to be considered reasonable the Palo Duro and Hardeman Basin data base together contain 202 pressures and the Midland Basin data base contains 89 pressures. The method used to delete the outliers was to calculate the mean and standard deviation of the pressures on a county by county basis and to delete values greater than the mean plus twice the standard deviation and less than the mean minus twice the standard deviation.

While deletion of these data values is a necessary step in analysis of the data, deletion of data values, even by a step by step objective method, leaves the analysis open to questions of bias. In an effort to delineate any possible bias inherent in these methods of data screening, work is underway to examine the set of deleted data and describe the reasons for their deletion. Possible reasons for deletion of data include depressuring due to oil and gas production, overpressuring due to any of several reasons, mechanical or methodological errors in the test or clerical errors in the test report.

Appendix 1 lists the final data sets used in this analysis. Data from the original data base which was not used in this study will be listed in the followup report on data deletion biases.

Geostatistical Analysis

Variograms were estimated for lower Pennsylvanian head data for the entire Permian Basin data set and for subareas of the data comprising the Anadarko Basin, the Palo Duro, Midland and Hardeman Basins together, and the Delaware Basin. Geostatistical analysis showed that while a single variogram can be calculated for the entire data set, the three subareas can be better modeled by different variograms. Separate variograms were calculated for the entire Permian Basin data set (fig.1), the Palo Duro, Midland, and Hardeman Basin data together, (fig.2), the Anadarko data (fig.3), and the Delaware Basin set (fig.4).

Each region was then kriged using the variogram parameters from its respective variogram and the data in its respective area. In the central Palo Duro Basin area and in New Mexico west of the the Palo Duro the data was too scarce to calculate kriged block estimates. In this area two data points were considered to be sufficiently reliable and were included with the block estimates to be contoured. This technique was described in Orr and Dutton (1983). The kriged block estimates and selected raw data values were then contoured using CPS-1, a Radian Corporation contouring package. The block estimates and selected raw data values for the Palo Duro, Midland, Hardeman, and Delaware Basins were contoured together and the block estimates for the Anadarko Basin were contoured separately.

The lower Pennsylvanian potentiometric surface map presented here (fig.5) infers a west to east direction of flow from the Delaware to the Midland and Hardeman Basins. Heads in the Hardeman basin area approach

land surface and rise to higher than land surface in the eastern part of the basin, indicating that there is potential for discharge from the deep basin in this area.

Krige block estimates for each basin are posted on figure 5. In the central Palo Duro Basin and in New Mexico west of the Palo Duro Basin, where there are no krige block estimates posted, there were insufficient data to calculate krige blocks and the most reliable raw data was used. In this area, which is unfortunately the critical area of the map, the map is poorly defined because there is little data. Figure 6 shows the distribution of pressure measurements in the study area. However, the head distribution in the Midland and Hardeman Basins, which is well constrained, can be used to constrain the heads in the Palo Duro Basin and imply a west to east flow across the Palo Duro Basin.

In the Delaware Basin the potentiometric surface shows closed highs which are in deeper overpressured regions where heads are higher than five thousand feet. In the Anadarko Basin overpressured areas are also evident where heads are higher than land surface. This may be evidence that these fluids are not in connection with the regional flow system of the more normally pressured Palo Duro and Hardeman Basins.

List of References - Lower Pennsylvanian Potentiometric Surface Map

Orr, Elizabeth D., and Alan R. Dutton, 1983; An application of Statistics to determine regional ground-water flow in the San Andres Formation, Texas and New Mexico: Ground Water, v. 21, no. 5, p. 619-624.

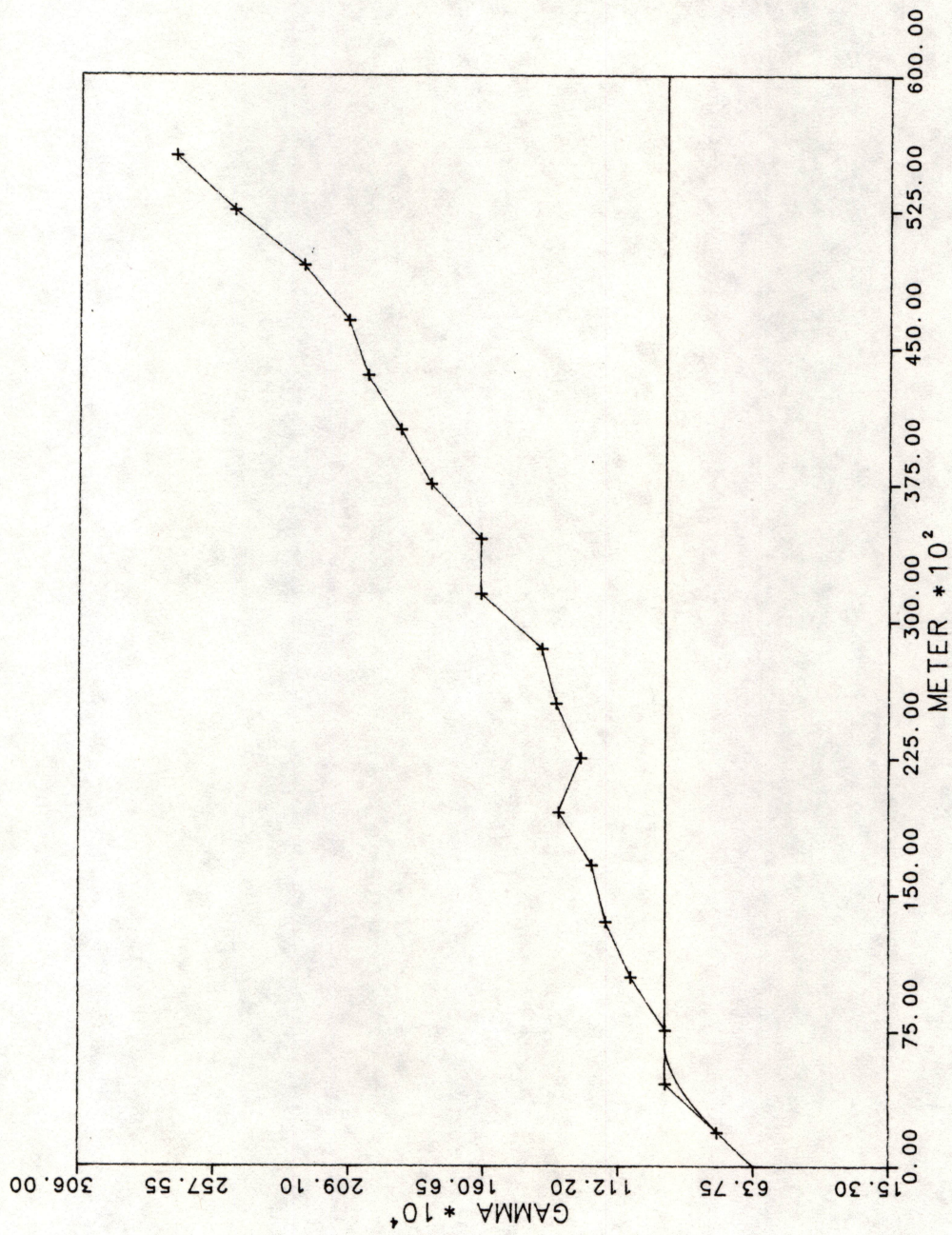
Radian Corporation, 1979; CPS-1 Contour Plotting System, Radian Corporation, Austin, Texas.

Smith, David A and Elizabeth D. Orr, 1982; Use of kriging to estimate the Wolfcampian and San Andres Potentiometric Surfaces, Palo Duro Basin; Open File Report WTWI-1982-3, Bureau of Economic Geology, The University of Texas at Austin.

Smith, David A, 1984; Potentiometric Level of the Deep-Basin Brine Aquifer, Palo Duro Basin, Texas Panhandle; Open File Report WTWI-1984-7, Bureau of Economic Geology, The University of Texas at Austin.

List of Figures - Lower Pennsylvanian Potentiometric Surface Map

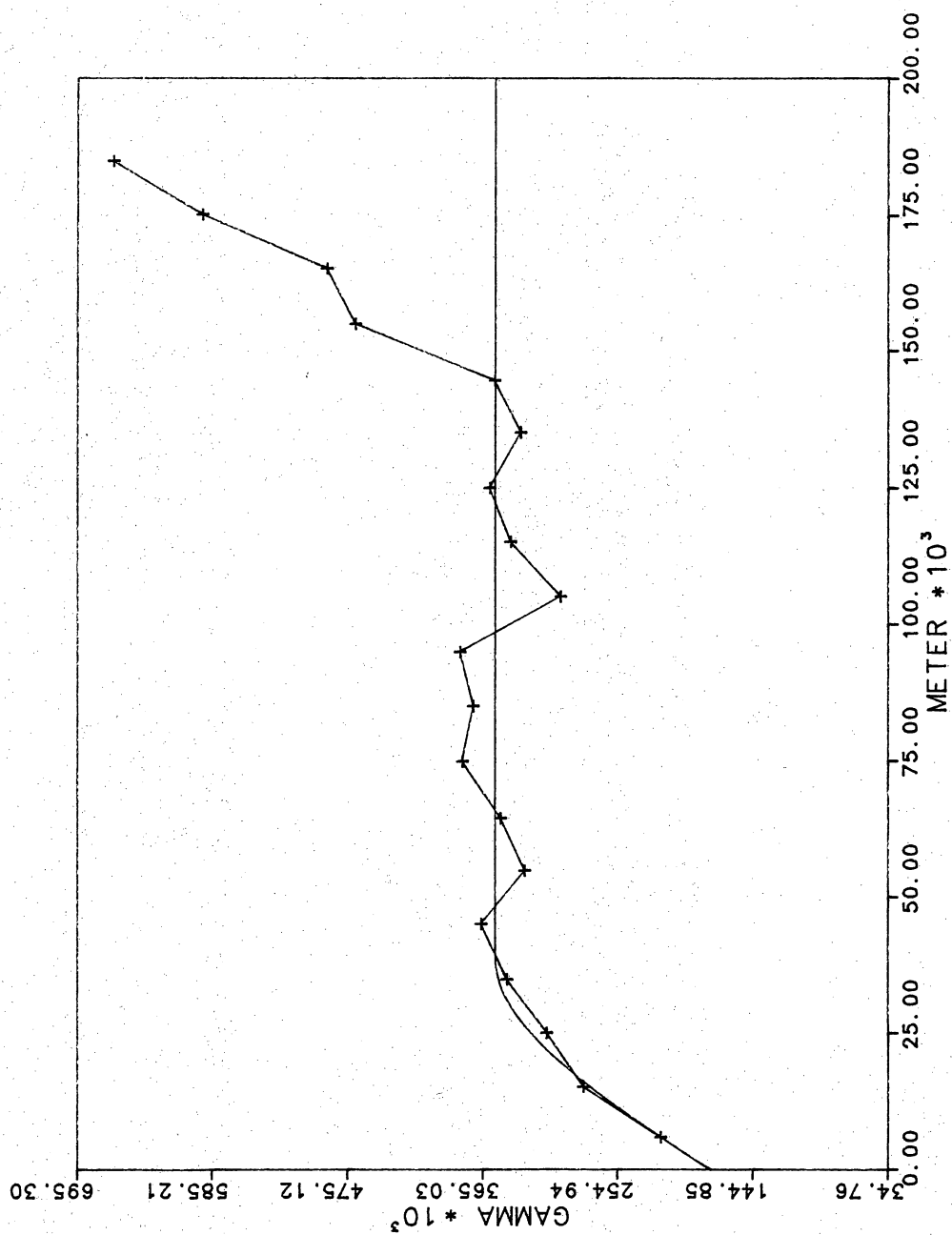
- Figure 1 - Empirical variogram calculated using the entire greater Permian Basin data base.
- Figure 2 - Empirical variogram calculated using only Palo Duro, Midland, and Hardeman Basin data.
- Figure 3 - Empirical variogram calculated using only Anadarko basin data.
- Figure 4 - Empirical variogram calculated using only Delaware basin data.
- Figure 5 - Potentiometric surface map of lower Pennsylvanian aquifer of greater Permian Basin (Delaware, Palo Duro, Hardeman, Midland, and Anadarko basins).
- Figure 6 - Location of pressure measurements in greater Permian Basin (Delaware, Palo Duro, Hardeman, Midland, and Anadarko basins) after deletion of data considered unreliable.



N=1203 DATE 4/23/84 FILE=LWRPGR3/PRMUTMM ALL PERMIAN BASIN
 DIRECTION = 0. WINDOW = 90. MEAN = 2950.000
 CLASS SIZE = 3000.00 VARIANCE = 2840000.00
 LOGARITHMS - NO NO. OF SAMPLES = 1201

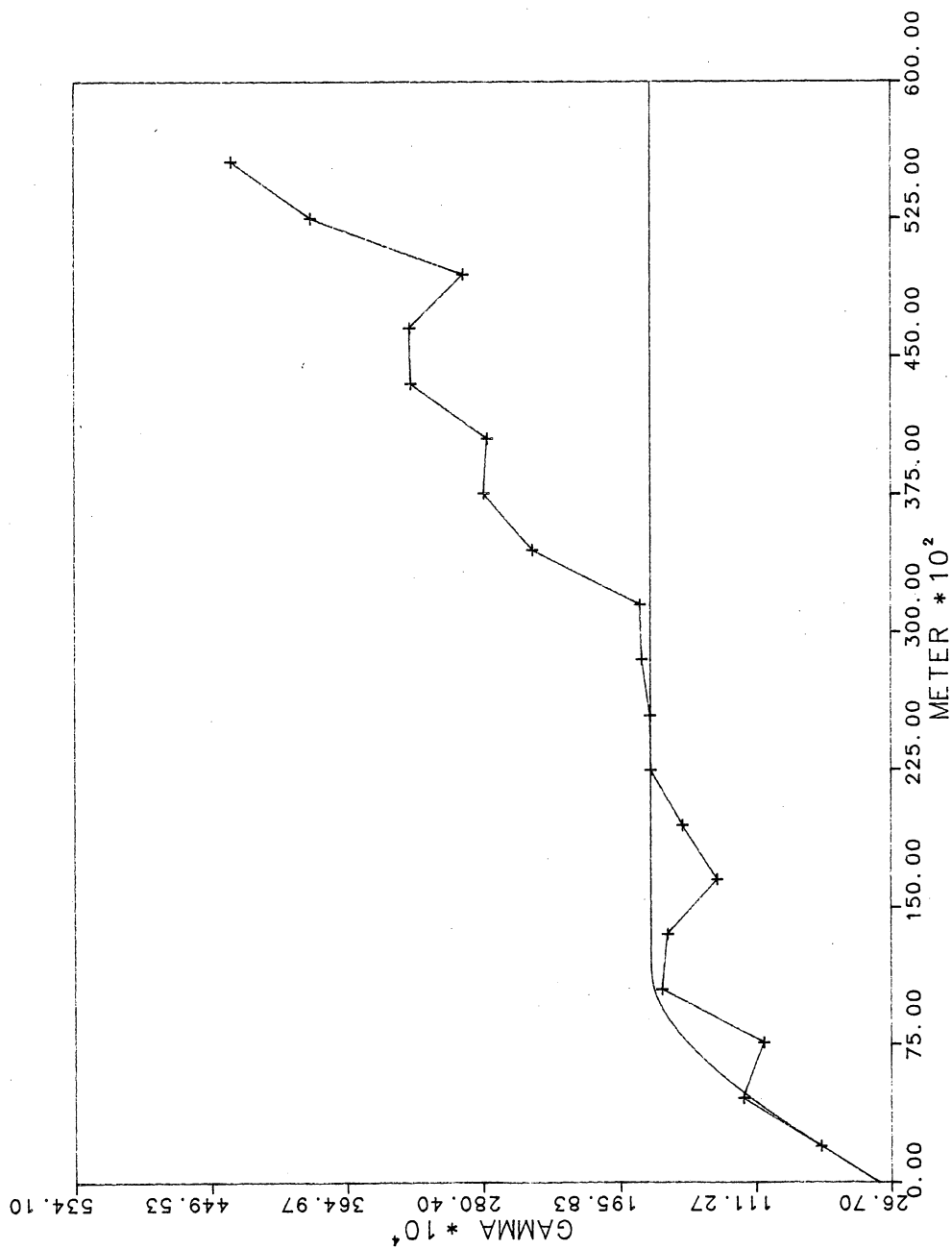
Figure 1. Empirical variogram calculated using the entire greater Permian Basin data base.

Figure 1 - Empirical Variogram of the Greater Permian Basin Data Set



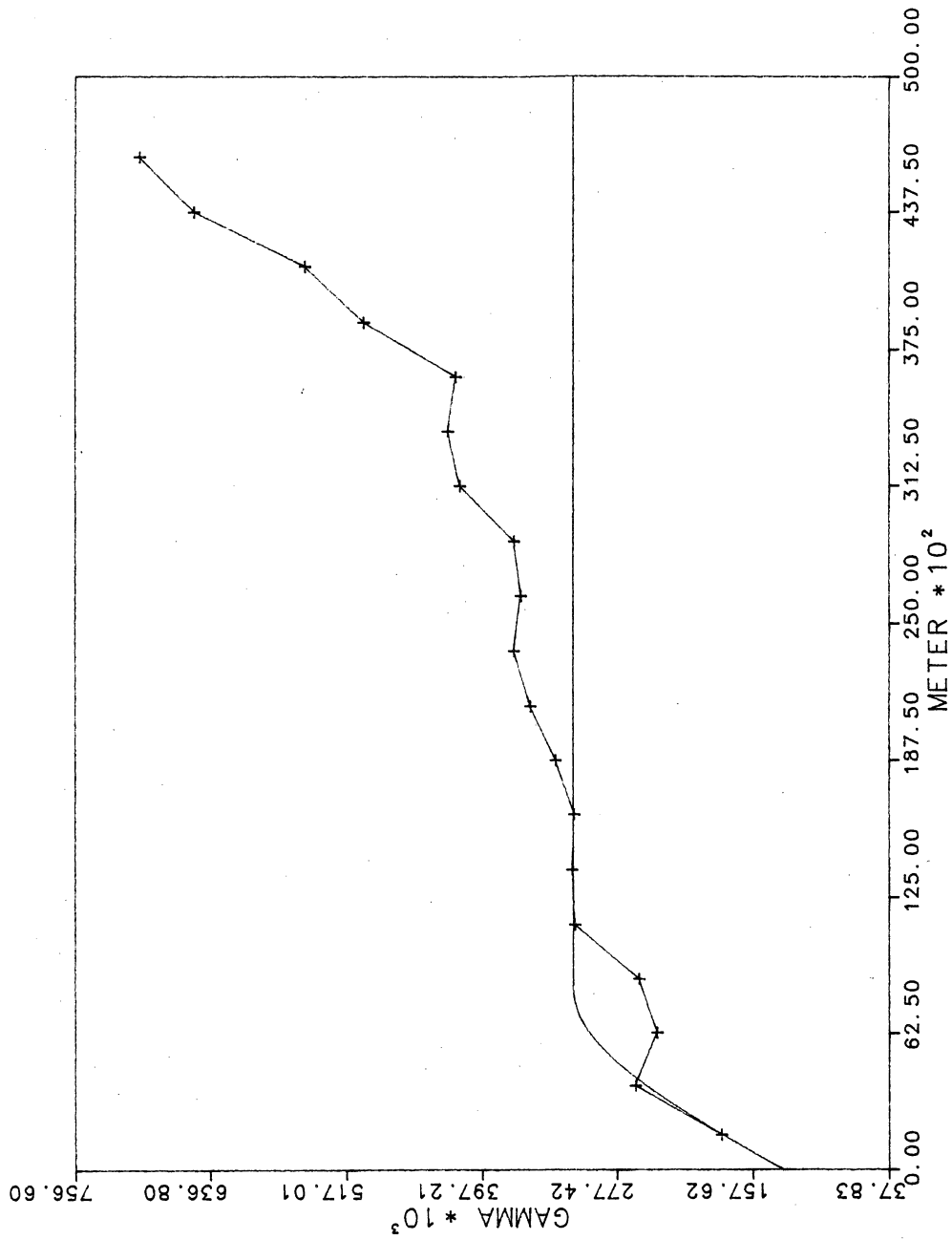
N=315 DATE 5/21/84 FILE=LWRPGR3/PMABUT PAL AND MID A B C(HORNERS ADDED)
 DIRECTION = 0. WINDOW = 90. MEAN = 2119.000
 CLASS SIZE = 10000.00 VARIANCE = 683400.000
 LOGARITHMS - NO NO. OF SAMPLES = 315

Figure 2. Empirical variogram calculated using only Palo Duro, Midland, and Hardeman Basin data.



N=264 DATE 4/26/84 FILE=LWRPGR3/ANAUTMA ANADARKO BASIN
 DIRECTION = 0. WINDOW = 90. MEAN = 2524.000
 CLASS SIZE = 3000.00 VARIANCE = 3863000.00
 LOGARITHMS - NO NO. OF SAMPLES = 264

Figure 3. Empirical variogram calculated using only Anadarko Basin data.



N=528 DATE 4/30/84 FILE=LWRPGR3/OUTUTMA OUTSIDE OF THREE BASINS(IN N.MEX)
 DIRECTION = 0. WINDOW = 90. MEAN = 3298.000
 CLASS SIZE = 2500.00 VARIANCE = 869900.000
 LOGARITHMS - NO NO. OF SAMPLES = 528

Figure 4. Empirical variogram calculated using only Delaware Basin data.

See separate files for figures 5 and 6

MIDLAND BASIN LOWER PENNSYLVANIAN HEAD DATA N=89

ELEV	LAT	LONG	DEPTH	TSELEV	GRAD	HEAD	DTWATER	CLASS
----	-----	-----	-----	-----	-----	-----	-----	-----
3819	33.14960	103.08720	9638	-5819	.386	2766.	1053.	C
3879	33.09520	103.22040	11300	-7421	.397	2941.	938.	A
3798	33.05119	103.12180	10627	-6829	.368	2203.	1595.	B
3846	33.13380	103.16080	11062	-7216	.389	2714.	1132.	A
3531	32.55380	103.23300	7662	-4131	.409	3094.	437.	A
3821	32.91640	103.26199	11469	-7648	.357	1788.	2033.	A
3821	33.14600	103.07359	10279	-6458	.437	3901.	-80.	B
3585	32.58940	103.15880	7863	-4278	.378	2585.	1000.	A
3827	33.21449	103.09540	9989	-6162	.414	3376.	451.	A
3749	32.84840	103.22420	10733	-6984	.429	3648.	101.	A
3791	33.14120	103.06380	11050	-7259	.393	2766.	1025.	B
3581	32.62621	103.13820	8656	-5075	.367	2254.	1327.	A
3890	33.22180	103.18170	9611	-5721	.362	2305.	1585.	A
3827	33.24400	103.10899	11098	-7271	.380	2465.	1362.	A
3867	33.12750	103.21150	11342	-7475	.397	2912.	955.	A
3783	32.99100	103.18440	10653	-6870	.433	3780.	3.	A
3877	33.12383	103.22385	11657	-7780	.364	2023.	1854.	A
3888	33.17892	103.18579	11237	-7349	.368	2184.	1704.	A
3776	32.98936	103.17108	10508	-6732	.442	3983.	-207.	A
3800	32.85080	103.27103	10761	-6961	.377	2413.	1387.	B
3750	32.96700	103.15660	10657	-6907	.394	2785.	965.	C
3813	32.91870	103.24440	6264	-2451	.459	4183.	-370.	B
3709	32.91150	103.12849	10846	-7137	.403	2948.	761.	C
2886	33.47301	101.50960	7774	-4888	.346	1319.	1567.	C
2936	32.53740	102.07719	10775	-7839	.421	2631.	305.	A
2436	33.58340	100.89120	7249	-4813	.370	1383.	1053.	B
2442	33.57320	100.91119	5208	-2766	.390	1916.	526.	C
2506	33.03758	101.35889	7916	-5410	.460	2988.	-482.	A
2341	32.98772	101.28580	7603	-5262	.430	2277.	64.	B
2519	32.14491	101.53574	9374	-6855	.427	2380.	139.	A
2638	32.42924	101.66495	10434	-7796	.432	2598.	40.	A
1721	33.59579	100.18420	5410	-3689	.426	1635.	86.	A
1780	33.55040	100.10640	5415	-3635	.419	1603.	177.	A
1638	33.78380	100.01759	5945	-4307	.422	1487.	151.	A
1701	33.69940	100.02361	5393	-3692	.429	1643.	58.	A
1818	33.56320	100.19000	5459	-3641	.388	1251.	567.	A
1796	33.53461	100.18961	5274	-3478	.407	1481.	315.	A
1672	33.47800	100.13631	5249	-3577	.380	1027.	645.	A
1835	33.53000	100.16600	5449	-3614	.401	1426.	409.	A
1837	33.53940	100.19420	5310	-3473	.418	1643.	194.	A
1713	33.51019	100.06090	5436	-3723	.430	1677.	36.	A
1824	33.53191	100.17270	5437	-3613	.371	1046.	778.	A
1768	33.65840	100.11740	5533	-3765	.410	1471.	297.	A
1777	33.56410	100.08681	5414	-3637	.410	1486.	291.	A
1761	33.55231	100.08800	2862	-1101	.378	1398.	363.	A
1691	33.42191	100.14740	5236	-3545	.417	1492.	199.	A
1807	33.44859	100.08430	5312	-3505	.397	1359.	448.	A
1563	33.41750	100.11211	5167	-3604	.399	1150.	413.	A
1810	33.49809	100.12199	5795	-3985	.410	1500.	310.	A

MIDLAND BASIN LOWER PENNSYLVANIAN HEAD DATA N=89

ELEV	LAT	LONG	DEPTH	TSELEV	GRAD	HEAD	DTWATER	CLASS
1794	33.70990	100.11070	5357	-3563	.431	1768.	26.	A
1702	33.58279	100.10950	5345	-3643	.411	1429.	273.	A
1667	33.44220	100.09779	5127	-3460	.415	1450.	217.	A
1710	33.48250	100.08009	5683	-3973	.405	1334.	376.	A
1699	33.58791	100.10539	4809	-3110	.391	1228.	471.	A
1788	33.54800	100.10400	5441	-3653	.410	1500.	288.	A
1696	33.50520	100.02260	5919	-4223	.413	1421.	275.	A
1823	33.51060	100.07660	5204	-3381	.454	2074.	-251.	A
1793	33.65480	100.26740	5400	-3607	.388	1230.	563.	A
1756	33.58044	100.28175	5612	-3856	.418	1562.	194.	A
1855	33.57024	100.13098	5520	-3665	.404	1481.	374.	A
1771	33.50259	100.26720	5532	-3761	.410	1477.	294.	C
1833	33.50549	100.07170	5635	-3802	.426	1736.	97.	C
1793	33.45670	100.11070	5943	-4150	.423	1651.	142.	A
3189	33.34221	101.83060	9396	-6207	.420	2906.	283.	A
3052	33.25191	101.74181	9023	-5971	.419	2750.	302.	A
2312	32.10780	101.12010	8210	-5898	.451	2638.	-326.	A
2627	32.82959	101.14816	7956	-5329	.345	1012.	1615.	A
2387	32.72952	101.14915	7445	-5058	.356	1059.	1328.	A
3559	33.34070	102.58150	10354	-6795	.408	2962.	597.	A
3223	33.19299	102.08080	10091	-6868	.387	2155.	1068.	A
3457	33.37041	102.33080	10792	-7335	.403	2694.	763.	A
3202	32.99429	102.23540	9294	-6092	.412	2737.	465.	B
3181	33.01221	102.20419	9424	-6243	.386	2162.	1019.	A
3222	33.02701	102.26660	10687	-7465	.423	2977.	245.	A
3155	33.01945	102.15347	9570	-6415	.408	2587.	568.	A
3242	33.23477	102.11595	9392	-6150	.409	2725.	517.	A
3267	33.23468	102.13435	9434	-6167	.406	2676.	591.	A
3412	33.14734	102.48022	11441	-8029	.409	2766.	646.	B
3181	32.97894	102.20837	10417	-7236	.412	2657.	524.	A
3264	33.28070	102.10800	10269	-7005	.425	3073.	191.	B
1117	33.94669	98.91637	3593	-2476	.381	685.	432.	C
1082	33.94128	98.93086	3749	-2667	.533	1948.	-866.	B
1119	33.94263	98.90204	3627	-2508	.426	1057.	62.	B
1064	33.93488	98.95485	4446	-3382	.422	945.	119.	C
2464	32.75360	101.22301	7713	-5249	.388	1651.	813.	A
2430	32.82317	101.36745	8227	-5797	.436	2483.	-53.	A
2689	32.87447	101.21135	7854	-5165	.381	1737.	952.	A
2375	32.67297	101.28467	7958	-5583	.375	1301.	1074.	A
2460	32.82211	101.36150	7941	-5481	.361	1130.	1330.	A

PALO DURO BASIN LOWER PENNSYLVANIAN HEAD DATA N=202

ELEV	LAT	LONG	DEPTH	TSELEV	GRAD	HEAD	DTWATER	CLASS
1225	34.70380	98.12804	6743	-5518	.431	1183.	42.	A
1430	34.71404	99.29584	2638	-1208	.424	1374.	56.	A
4480	34.56151	104.10789	6609	-2129	.374	3571.	909.	A
4309	33.40120	103.62379	9662	-5353	.340	2228.	2081.	A
4289	33.35680	103.62120	9830	-5541	.361	2649.	1640.	A
4272	33.38921	103.60001	9945	-5673	.343	2210.	2062.	A
4235	33.38519	103.58701	9496	-5261	.334	2066.	2169.	A
4222	33.31680	103.55260	10323	-6101	.377	2880.	1342.	A
4229	33.25140	103.56100	10269	-6040	.339	2002.	2227.	A
4279	33.41541	103.61459	9606	-5327	.351	2445.	1834.	A
4230	33.32021	103.56540	10120	-5890	.368	2706.	1524.	A
4038	33.30940	103.31540	10114	-6076	.388	2989.	1049.	A
4319	33.34261	103.64729	10199	-5880	.334	1989.	2330.	A
4309	33.37160	103.64680	10137	-5828	.359	2572.	1737.	A
4307	33.34241	103.63840	9386	-5079	.366	2852.	1455.	A
4411	33.55280	103.62219	9454	-5043	.377	3186.	1225.	A
4285	33.33501	103.62560	9475	-5190	.350	2467.	1818.	A
4168	33.31619	103.43620	10068	-5900	.352	2288.	1880.	A
4394	33.51961	103.61360	9130	-4736	.341	2452.	1942.	A
4218	33.44901	103.46719	9974	-5756	.379	2976.	1242.	A
4288	33.29140	103.62520	9579	-5291	.349	2417.	1871.	A
4165	33.19720	103.49640	10250	-6085	.347	2116.	2049.	A
4323	33.34241	103.65581	10187	-5864	.350	2374.	1949.	A
4127	33.35260	103.38921	10245	-6118	.366	2538.	1589.	A
4287	33.17900	103.64281	9688	-5401	.319	1739.	2548.	A
4221	33.56419	103.40680	9695	-5474	.353	2425.	1796.	A
4316	33.16820	103.68179	9743	-5427	.353	2500.	1816.	A
4312	33.16119	103.68159	9862	-5550	.350	2425.	1887.	A
4155	33.35921	103.45680	10429	-6274	.376	2786.	1369.	A
4321	33.37140	103.65540	9191	-4870	.323	1977.	2344.	A
4068	33.53940	103.25060	9867	-5799	.411	3566.	502.	A
4284	33.31300	103.62160	9301	-5017	.340	2271.	2013.	A
4325	33.37140	103.66420	9290	-4965	.361	2768.	1557.	A
4333	33.51700	103.63620	8972	-4639	.341	2427.	1906.	A
4285	33.18559	103.63940	9634	-5349	.320	1768.	2517.	A
4205	33.44881	103.45419	10348	-6143	.371	2718.	1487.	A
4302	33.15021	103.68010	9955	-5653	.356	2516.	1786.	A
4069	33.55721	103.23750	9876	-5807	.362	2441.	1628.	A
4271	33.29860	103.61681	9323	-5052	.402	3599.	672.	A
4185	33.47000	103.61880	8810	-4625	.348	2457.	1728.	A
4306	33.41200	103.62740	9236	-4930	.325	1998.	2308.	A
4048	33.52521	103.24680	9775	-5727	.393	3146.	902.	A
4254	33.29140	103.60840	9214	-4960	.377	3061.	1193.	A
4220	33.48192	103.59740	9089	-4869	.353	2525.	1695.	A
4144	33.35271	103.48320	11650	-7506	.418	3719.	425.	A
4314	33.32060	103.66380	9670	-5356	.319	1770.	2544.	A
3920	33.33501	103.16840	10307	-6387	.396	3035.	885.	A
4292	33.30620	103.66000	9585	-5293	.347	2380.	1912.	A
4403	33.29916	103.73840	11160	-6757	.366	2658.	1745.	A
4426	33.56012	103.68788	10948	-6522	.378	3027.	1399.	A

PALO DURO BASIN LOWER PENNSYLVANIAN HEAD DATA N=202

ELEV	LAT	LONG	DEPTH	TSELEV	GRAD	HEAD	DTWATER	CLASS
4391	33.29910	103.72910	10482	-6091	.334	1995.	2396.	A
4245	33.30910	103.58659	9286	-5041	.322	1852.	2393.	A
4404	33.55721	103.61790	9266	-4862	.340	2398.	2006.	A
4421	33.45500	103.76680	10894	-6473	.349	2312.	2109.	A
4260	33.57260	103.77820	8540	-4280	.399	3591.	669.	A
3902	33.17400	103.91479	9703	-5801	.363	2317.	1585.	A
4062	33.65109	103.91280	7209	-3147	.347	2627.	1435.	A
4176	33.59061	103.86510	9080	-4904	.358	2591.	1585.	A
4304	33.55020	103.76559	10272	-5968	.355	2437.	1867.	A
3503	33.04800	104.20880	8169	-4666	.402	2908.	595.	A
3534	33.06300	104.20540	8221	-4687	.391	2732.	802.	A
3555	33.04739	104.15601	8566	-5011	.360	2097.	1458.	A
3470	33.06200	104.19180	8262	-4792	.367	2209.	1261.	A
3517	33.04311	104.18539	8412	-4895	.361	2116.	1401.	A
3551	33.03580	104.19160	8379	-4828	.360	2136.	1415.	A
3537	33.04100	104.16760	8571	-5034	.409	3052.	485.	A
3779	33.33771	104.20500	6875	-3096	.397	3197.	582.	A
4020	33.55051	103.93941	8552	-4532	.325	1890.	2130.	A
3523	33.03600	104.20061	8326	-4803	.341	1755.	1768.	A
4074	33.67450	104.05099	6751	-2677	.338	2594.	1480.	A
3988	33.46680	103.94431	7163	-3175	.322	2144.	1844.	A
4015	33.54700	103.94820	7733	-3718	.422	3810.	205.	A
4049	33.73120	104.14500	6649	-2600	.364	2989.	1060.	A
4000	33.54657	103.95683	8955	-4955	.332	1913.	2087.	A
3948	33.43481	103.95284	9347	-5399	.336	1859.	2089.	A
3920	33.43523	103.96564	9036	-5116	.335	1872.	2048.	A
3984	33.43468	103.94437	9320	-5336	.419	3682.	302.	A
1136	34.31348	98.88252	5150	-4014	.462	1478.	-342.	A
1759	33.89101	100.10001	5548	-3789	.394	1464.	295.	H
2012	34.04900	100.30299	6807	-4795	.423	1816.	196.	H
1727	33.89670	100.24249	6786	-5059	.430	1672.	55.	A
1614	33.97940	100.10361	5882	-4268	.417	1395.	219.	A
1879	33.94940	100.36501	6822	-4943	.381	1048.	831.	A
1811	34.05080	100.10741	5585	-3774	.425	1704.	107.	A
1764	33.84900	100.16470	6157	-4393	.423	1614.	150.	A
1764	33.84610	100.15680	6137	-4373	.429	1701.	63.	H
1776	33.85980	100.17410	6213	-4437	.446	1950.	-174.	A
2022	34.00481	100.38780	7022	-5000	.406	1579.	443.	A
1719	34.25549	100.26131	5709	-3990	.400	1281.	438.	A
1847	33.97321	100.32320	5194	-3347	.394	1381.	466.	A
1880	33.94200	100.33800	7071	-5191	.441	2010.	-130.	H
1790	34.20599	100.35440	4066	-2276	.431	1767.	23.	A
1804	33.86099	100.22000	6349	-4545	.420	1638.	166.	H
1723	33.84700	100.09599	6144	-4421	.431	1721.	2.	H
1865	33.84708	100.10516	6322	-4457	.427	1890.	-25.	H
1786	33.85928	100.18211	6230	-4444	.420	1597.	189.	A
1875	33.92329	100.36407	5765	-3890	.420	1697.	178.	A
1817	34.01007	100.28381	6784	-4967	.444	2010.	-193.	H
3163	33.90320	101.37740	7987	-4824	.370	2000.	1163.	A
1392	33.97668	99.67982	5202	-3810	.442	1497.	-105.	A

PALO DURO BASIN LOWER PENNSYLVANIAN HEAD DATA N=202

ELEV	LAT	LONG	DEPTH	TSELEV	GRAD	HEAD	DTWATER	CLASS
1570	33.92825	99.86943	5329	-3759	.418	1387.	183.	A
1765	34.05399	100.03307	6371	-4606	.409	1403.	362.	A
1574	33.92780	99.86916	5381	-3807	.426	1477.	97.	A
1412	34.00198	99.62172	4127	-2715	.411	1199.	213.	A
3424	33.91380	101.93359	9935	-6511	.383	2279.	1145.	A
1895	34.33302	100.41924	4232	-2337	.448	2040.	-145.	A
1435	34.11063	99.57245	7264	-5829	.428	1348.	87.	B
3417	33.72881	102.17999	7895	-4478	.431	3382.	35.	A
3457	33.66960	102.24260	6927	-3470	.371	2454.	1003.	A
3372	33.74699	102.12320	9930	-6558	.405	2733.	639.	A
3504	33.41493	102.45467	9922	-6418	.378	2233.	1271.	A
3540	33.47807	102.44812	9922	-6382	.392	2599.	941.	A
3500	33.41858	102.45456	9128	-5628	.395	2682.	818.	A
3444	33.57179	102.26849	10398	-6954	.397	2577.	867.	A
3460	33.41370	102.32620	10487	-7027	.383	2238.	1222.	A
1835	33.76060	100.23920	5634	-3799	.404	1448.	387.	A
1713	33.83420	100.14101	6119	-4406	.432	1700.	13.	A
1800	33.80400	100.22169	6173	-4373	.421	1622.	178.	A
2088	33.82274	100.43063	5281	-3193	.416	1881.	207.	A
3465	33.86040	102.11800	8453	-4988	.390	2627.	838.	H
3337	33.60580	102.05881	10099	-6762	.397	2499.	838.	A
3332	33.56480	102.06760	10021	-6689	.384	2191.	1141.	A
3262	33.70580	101.75481	9293	-6031	.401	2563.	699.	A
3326	33.76500	101.94200	10050	-6724	.406	2689.	637.	A
3249	33.74060	101.70399	6534	-3285	.374	2350.	899.	A
3239	33.73000	101.70746	9287	-6048	.376	2006.	1233.	A
3338	33.74525	101.95470	9910	-6572	.392	2391.	947.	A
3287	33.74991	101.76416	9723	-6436	.389	2299.	988.	A
3190	33.49693	101.85999	9543	-6353	.409	2661.	529.	A
1998	33.93250	100.55040	3360	-1362	.369	1499.	499.	A
1331	34.31831	99.43616	5459	-4128	.401	926.	405.	A
1215	34.08842	99.06964	4270	-3055	.421	1094.	121.	A
1301	34.06757	99.34737	4887	-3586	.448	1465.	-164.	A
1296	34.16873	99.10233	4883	-3587	.444	1414.	-118.	A
1400	34.32697	99.34218	5352	-3952	.422	1265.	135.	A
1382	34.32402	99.33882	5394	-4012	.425	1282.	100.	A
1098	34.00677	99.09743	3887	-2789	.446	1215.	-117.	A
1866	34.36812	100.35811	5657	-3791	.412	1581.	285.	A
1440	34.53751	99.62885	6746	-5306	.431	1409.	31.	B
4166	33.28360	103.48740	9968	-5802	.340	2026.	2140.	B
4376	33.55600	103.60580	9084	-4708	.313	1857.	2519.	B
4239	33.33521	103.57780	9197	-4958	.331	2060.	2179.	B
3849	33.28020	103.09599	9526	-5677	.348	1964.	1885.	B
4177	33.18660	103.53461	10288	-6111	.347	2116.	2061.	B
4309	33.17220	103.67700	9812	-5503	.353	2486.	1823.	B
4296	33.18660	103.64720	9687	-5391	.356	2577.	1719.	B
4406	33.53560	103.60561	9171	-4765	.330	2225.	2181.	B
4230	33.17500	103.59100	9606	-5376	.348	2334.	1896.	B
4315	33.32800	103.65559	8756	-4441	.343	2496.	1819.	B
4401	33.29880	103.69901	9844	-5443	.412	3910.	491.	B

PALO DURO BASIN LOWER PENNSYLVANIAN HEAD DATA N=202

ELEV	LAT	LONG	DEPTH	TSELEV	GRAD	HEAD	DTWATER	CLASS
4128	33.22220	103.45320	10582	-6454	.371	2599.	1529.	B
4333	33.46680	103.66280	9053	-4720	.336	2304.	2029.	B
4320	33.50336	103.64073	10527	-6207	.433	4321.	-1.	B
4041	33.49580	103.91360	9196	-5155	.387	3056.	985.	B
4293	33.55724	103.76556	8688	-4395	.493	5489.	-1196.	B
3959	33.92419	104.10220	6187	-2228	.442	4079.	-120.	B
3993	33.56123	103.96129	8702	-4709	.456	4443.	-450.	B
3601	33.25766	104.23959	6572	-2971	.349	2318.	1283.	B
1727	33.99080	100.21980	6642	-4915	.417	1479.	248.	B
1461	33.95662	99.73407	5101	-3640	.404	1114.	347.	B
1406	34.07607	99.72495	5818	-4412	.413	1126.	280.	B
1403	34.02531	99.64789	3827	-2424	.429	1360.	43.	B
1415	33.86548	99.69051	5713	-4298	.402	1005.	410.	B
3400	33.67349	102.11951	10042	-6642	.448	3743.	-343.	B
2575	33.91600	100.76740	4340	-1765	.319	1433.	1142.	B
2367	33.87260	100.73412	4286	-1919	.371	1748.	619.	B
1199	34.06940	99.09727	3947	-2748	.472	1549.	-350.	B
1187	33.94339	99.15791	4111	-2924	.454	1380.	-193.	B
1215	34.17549	99.35204	7250	-6035	.446	1423.	-208.	B
1367	34.42822	99.53316	5162	-3795	.426	1282.	85.	C
4270	33.34621	103.65581	9462	-5192	.345	2331.	1939.	C
4214	33.25490	103.54820	10213	-5999	.343	2078.	2136.	C
1293	34.34846	99.07269	4717	-3424	.376	672.	621.	C
1113	34.23500	99.00439	4959	-3846	.476	1600.	-487.	C
1114	34.22375	99.00838	5704	-4590	.432	1091.	23.	C
1178	34.25922	98.90388	5112	-3934	.412	923.	255.	C
1205	34.30566	98.98579	4030	-2825	.462	1467.	-262.	C
1218	34.33270	98.96635	4233	-3015	.459	1473.	-255.	C
1194	34.31973	99.00359	4164	-2970	.449	1345.	-151.	C
1258	34.35030	99.06163	4499	-3241	.456	1489.	-231.	C
1226	34.33417	99.05482	4066	-2840	.462	1498.	-272.	C
1190	34.31081	98.99284	4040	-2850	.420	1061.	129.	C
1196	34.26134	99.17700	6098	-4902	.415	936.	260.	C
1160	34.26051	98.99199	5442	-4282	.440	1245.	-85.	C
1195	34.31107	98.95306	4558	-3363	.463	1506.	-311.	C
1149	34.20230	98.90497	5708	-4559	.441	1256.	-107.	C
1115	34.21973	99.02911	5766	-4651	.460	1476.	-361.	C
1230	34.32027	98.97479	3894	-2664	.460	1466.	-236.	C
1294	34.33569	99.10304	4802	-3508	.454	1523.	-229.	C
1199	34.32874	99.04227	3968	-2769	.465	1488.	-289.	C
1168	34.25433	99.06166	5535	-4367	.457	1471.	-303.	C
1199	34.31953	99.02927	3971	-2772	.456	1405.	-206.	C
1204	34.32684	99.02036	3964	-2760	.453	1382.	-178.	C
1164	34.25601	98.89900	5129	-3965	.411	904.	260.	C
1423	33.89586	99.66798	4867	-3444	.428	1365.	58.	C
1448	33.90269	99.70340	5594	-4146	.482	2080.	-632.	C
3235	33.69550	101.75060	9278	-6043	.393	2380.	855.	C
3223	33.74870	101.61980	9551	-6328	.401	2506.	717.	C
3636	34.98288	101.83751	7223	-3587	.360	2413.	1223.	C
1208	34.05685	99.08279	3174	-1966	.394	918.	290.	C

PALO DURO BASIN LOWER PENNSYLVANIAN HEAD DATA N=202

<u>ELEV</u>	<u>LAT</u>	<u>LONG</u>	<u>DEPTH</u>	<u>TSELEV</u>	<u>GRAD</u>	<u>HEAD</u>	<u>DTWATER</u>	<u>CLASS</u>
1127	34.00526	99.08026	3870	-2743	.401	834.	293.	C
1674	34.32602	100.04730	5593	-3919	.397	1204.	470.	C

ANADARKO BASIN LOWER PENNSYLVANIAN HEAD DATA N=265

ELEV	LAT	LONG	DEPTH	TSELEV	GRAD	HEAD	DTWATER	CLASS
1794	35.73534	99.38826	15595	-13801	.554	6119.	-4325.	A
2045	35.97664	99.46333	12197	-10152	.466	2965.	-920.	A
2047	35.97308	99.45424	9988	-7941	.508	3775.	-1728.	A
2061	35.98955	99.43886	9941	-7880	.506	3725.	-1664.	A
2112	35.96735	99.44661	10125	-8013	.614	6332.	-4220.	A
2031	35.98970	99.43002	9945	-7914	.501	3578.	-1547.	A
1790	35.26462	99.22527	11333	-9543	.505	3662.	-1872.	A
1824	35.28215	99.22600	11291	-9467	.350	-344.	2168.	A
1631	35.14186	99.05582	6406	-4775	.373	745.	886.	A
1838	35.28764	99.11031	12387	-10549	.469	2852.	-1014.	A
1843	35.44234	99.28734	13731	-11888	.568	6112.	-4269.	A
1805	35.30049	99.29868	11962	-10157	.668	8282.	-6477.	A
1527	35.11836	98.91861	5104	-3577	.397	1096.	431.	A
1775	35.73418	98.83810	10901	-9126	.571	5242.	-3467.	A
1649	35.79031	98.72513	11115	-9466	.467	2525.	-876.	A
1845	35.77501	99.21330	13404	-11559	.539	5105.	-3260.	A
1638	35.52008	99.04890	11943	-10305	.552	4921.	-3283.	A
1772	35.74818	99.04642	12413	-10641	.651	7996.	-6224.	A
1788	35.71468	98.96437	12664	-10876	.592	6432.	-4644.	A
1745	35.68558	98.93790	12875	-11130	.577	6016.	-4271.	A
1736	35.72881	98.72549	10015	-8279	.481	2835.	-1099.	A
1738	35.72852	98.71631	10000	-8262	.425	1536.	202.	A
1787	35.75800	98.74992	11540	-9753	.497	3477.	-1690.	A
1765	35.69838	98.91734	13018	-11253	.567	5780.	-4015.	A
1610	35.58357	98.66273	12816	-11206	.756	11161.	-9551.	A
646	35.54776	98.87437	12337	-11691	.707	8439.	-7793.	A
1784	35.78455	98.76265	9726	-7942	.428	1669.	115.	A
1821	35.77789	99.03296	12045	-10224	.511	3980.	-2159.	A
2661	36.30939	99.65186	9442	-6781	.397	1861.	800.	A
2478	36.40073	99.91768	9072	-6594	.441	2637.	-159.	A
2083	36.39703	99.65242	8492	-6409	.485	3087.	-1004.	A
2161	36.37227	99.70172	7472	-5311	.421	1947.	214.	A
2335	36.50394	99.74385	8190	-5855	.366	1054.	1281.	A
2259	36.59216	99.83575	7730	-5471	.303	-63.	2322.	A
2101	36.48795	99.63530	6947	-4846	.418	1860.	241.	A
2288	36.38533	99.86285	8905	-6617	.374	1065.	1223.	A
2352	36.38353	99.87984	8997	-6645	.382	1289.	1063.	A
2045	36.58835	99.68948	7370	-5325	.344	518.	1527.	A
2096	36.38712	99.65781	8507	-6411	.373	918.	1178.	A
2332	36.39314	99.83627	8868	-6536	.437	2399.	-67.	A
2262	36.58833	99.89873	7737	-5475	.305	-33.	2295.	A
2367	36.37132	99.86356	9224	-6857	.404	1753.	614.	A
2344	36.37024	99.85110	9078	-6734	.336	314.	2030.	A
2196	36.46645	99.66431	8047	-5851	.341	474.	1722.	A
2386	36.48981	99.73521	8325	-5939	.345	682.	1704.	A
2269	36.45914	99.71960	8331	-6062	.363	912.	1357.	A
2369	36.14845	99.44955	9348	-6979	.506	3936.	-1567.	A
2308	36.08952	99.54063	9013	-6705	.406	1746.	562.	A
2351	36.45547	99.79558	8515	-6164	.351	740.	1611.	A
2403	36.36369	99.85526	9172	-6769	.374	1137.	1266.	A

ANADARKO BASIN LOWER PENNSYLVANIAN HEAD DATA N=265

ELEV	LAT	LONG	DEPTH	TSELEV	GRAD	HEAD	DTWATER	CLASS
----	-----	-----	-----	-----	-----	-----	-----	-----
2242	36.54022	99.72618	6989	-4747	.364	1124.	1118.	A
2418	36.41074	99.91460	8884	-6466	.429	2331.	87.	A
2375	36.03368	99.95862	12271	-9896	.509	4532.	-2157.	A
2164	36.32858	99.61139	9263	-7099	.403	1513.	651.	A
2129	36.35934	99.60924	9024	-6895	.445	2370.	-241.	A
2337	36.37325	99.87845	9191	-6854	.305	-392.	2729.	A
2122	36.37589	99.60744	8705	-6583	.375	951.	1171.	A
2124	36.59009	99.70859	7482	-5358	.346	619.	1505.	A
2383	36.37347	99.89780	9113	-6730	.397	1612.	771.	A
2255	36.49724	99.69202	8063	-5808	.328	296.	1959.	A
2378	36.47498	99.73563	8467	-6089	.357	892.	1486.	A
2462	36.16225	99.89465	11321	-8859	.446	2793.	-331.	A
2334	36.22289	99.78114	10143	-7809	.406	1703.	631.	A
2135	36.40298	99.67520	8350	-6215	.403	1548.	587.	A
2367	36.14018	99.46063	10639	-8272	.418	1997.	370.	A
2041	36.58737	99.63789	7498	-5457	.363	822.	1219.	A
2338	36.54779	99.99429	8254	-5916	.419	2064.	274.	A
2285	36.25536	99.61168	9947	-7662	.392	1331.	954.	A
2297	36.04729	99.95670	11863	-9566	.498	4077.	-1780.	A
2438	36.38644	99.92068	9166	-6728	.406	1854.	584.	A
2226	36.39534	99.81589	8724	-6498	.376	1069.	1157.	A
2470	36.42503	99.96770	8984	-6514	.443	2671.	-201.	A
2370	36.22833	99.71663	10410	-8040	.479	3459.	-1089.	A
2253	35.99149	99.77786	12252	-9999	.485	3707.	-1454.	A
2205	36.29483	99.92261	9417	-7212	.413	1758.	447.	A
2461	36.40337	99.95917	9065	-6604	.360	926.	1535.	A
2044	36.56192	99.61118	7572	-5528	.402	1496.	548.	A
2189	36.29420	99.90581	9796	-7607	.426	2018.	171.	A
2244	36.54137	99.78847	7997	-5753	.319	136.	2108.	A
2179	36.56232	99.65552	6794	-4615	.411	1832.	347.	A
2226	36.30876	99.86925	9539	-7313	.321	-241.	2467.	A
2113	36.36761	99.63605	8684	-6571	.393	1298.	815.	A
2317	36.07684	99.46634	11102	-8785	.457	2934.	-617.	A
2344	36.13458	99.41293	10460	-8116	.443	2585.	-241.	A
2139	36.31554	99.78857	9175	-7036	.428	2019.	120.	A
2083	36.38184	99.63335	7396	-5313	.389	1319.	764.	A
2323	36.07841	99.47742	11331	-9008	.469	3267.	-944.	A
2435	36.22482	99.96597	10277	-7842	.397	1573.	862.	A
2297	36.06277	99.62576	11612	-9315	.391	1160.	1137.	A
2320	36.10715	99.83459	11556	-9236	.458	2969.	-649.	A
2300	36.58405	99.91417	7821	-5521	.336	550.	1750.	A
2299	36.28835	99.99638	9812	-7513	.437	2392.	-93.	A
2198	36.30019	99.71980	9185	-6987	.398	1457.	741.	A
2260	36.44005	99.81465	7333	-5073	.409	1841.	419.	A
2441	36.52074	99.99580	8384	-5943	.368	1174.	1267.	A
2295	36.15443	99.49590	10667	-8372	.453	2772.	-477.	A
2362	36.12555	99.56750	9334	-6972	.547	4816.	-2454.	A
2306	36.24071	99.69604	9818	-7512	.474	3219.	-913.	A
2225	36.38588	99.79546	8782	-6557	.416	1866.	359.	A
2363	36.46994	99.81462	8410	-6047	.357	887.	1476.	A

ANADARKO BASIN LOWER PENNSYLVANIAN HEAD DATA N=265

ELEV	LAT	LONG	DEPTH	TSELEV	GRAD	HEAD	DTWATER	CLASS
----	-----	-----	-----	-----	-----	-----	-----	-----
2182	36.46977	99.66647	7235	-5053	.408	1755.	427.	A
2323	36.16226	99.51759	10572	-8249	.490	3693.	-1370.	A
2264	36.29482	99.67007	9392	-7128	.428	2142.	122.	A
2219	36.31027	99.86459	9313	-7094	.394	1380.	839.	A
2343	36.48856	99.71913	8264	-5921	.302	-167.	2510.	A
2324	36.41542	99.77312	7475	-5151	.394	1647.	677.	A
2245	36.31384	99.62975	7830	-5585	.425	2088.	157.	A
2124	36.49966	99.61842	7907	-5783	.398	1486.	638.	A
2311	36.42532	99.86519	8723	-6412	.470	3049.	-738.	A
2305	36.44511	99.74159	8464	-6159	.351	695.	1610.	A
2469	36.49879	99.88618	8438	-5969	.332	492.	1977.	A
2267	36.25529	99.88577	9988	-7721	.421	1971.	296.	A
2365	36.13924	99.51857	8899	-6534	.421	2117.	248.	A
2394	36.20786	99.83875	10596	-8202	.481	3567.	-1173.	A
2251	36.25523	99.73767	9633	-7382	.394	1387.	864.	A
2453	36.37901	99.90837	9091	-6638	.395	1656.	797.	A
2462	36.41502	99.96970	9014	-6552	.412	2021.	441.	A
2474	36.39668	99.93851	9081	-6607	.459	3016.	-542.	A
2209	36.44087	99.68423	8254	-6045	.429	2119.	90.	A
2178	36.58916	99.76027	6483	-4305	.424	2041.	137.	A
2458	36.46941	99.96944	8648	-6190	.390	1598.	860.	A
2452	36.45844	99.96921	8713	-6261	.382	1423.	1029.	A
2394	36.41154	99.86758	8669	-6275	.398	1686.	708.	A
2279	36.30925	99.93497	9557	-7278	.486	3430.	-1151.	A
2360	36.44109	99.75526	7233	-4873	.401	1819.	541.	A
2391	36.41577	99.75955	8645	-6254	.434	2400.	-9.	A
2385	36.33894	99.95322	9348	-6963	.393	1518.	867.	A
2456	36.20747	99.96373	10893	-8437	.464	3217.	-761.	A
2180	36.33923	99.67014	7649	-5469	.424	2017.	163.	A
2377	36.23779	99.60222	8362	-5985	.414	1999.	378.	A
2110	36.47321	99.61246	8051	-5941	.373	982.	1128.	A
2248	36.26617	99.72424	9592	-7344	.413	1787.	461.	A
2197	36.55988	99.72403	7717	-5520	.354	780.	1417.	A
2391	36.01045	99.67094	9963	-7572	.453	2840.	-449.	A
1809	35.26015	99.54771	7285	-5476	.422	1622.	187.	A
1904	35.28723	99.52840	12630	-10726	.572	5947.	-4043.	A
1926	35.30180	99.54726	12631	-10705	.425	1676.	250.	A
1706	35.26112	99.38979	9972	-8266	.419	1373.	333.	A
1882	35.32494	99.68716	11001	-9119	.427	1711.	171.	A
1970	35.28590	99.85233	4928	-2958	.514	2892.	-922.	A
2907	35.52744	100.58582	8704	-5797	.385	1934.	973.	A
3023	35.60495	100.56848	12582	-9559	.421	2679.	344.	A
3019	35.56937	100.56876	11315	-8296	.300	-463.	3482.	A
2720	35.46124	100.66115	10681	-7961	.426	2539.	181.	A
2852	35.58846	100.54326	11466	-8614	.467	3732.	-880.	A
2943	35.59541	100.54465	11230	-8287	.463	3713.	-770.	A
2939	35.52556	100.58914	8877	-5938	.380	1848.	1091.	A
3272	36.25893	101.48120	6835	-3563	.311	1345.	1927.	A
3215	36.32127	101.43095	6893	-3678	.334	1641.	1574.	A
3252	36.06966	101.44020	6045	-2793	.302	1423.	1829.	A

ANADARKO BASIN LOWER PENNSYLVANIAN HEAD DATA N=265

ELEV	LAT	LONG	DEPTH	TSELEV	GRAD	HEAD	DTWATER	CLASS
3232	36.22945	101.46529	7087	-3855	.317	1323.	1909.	A
3028	36.43394	101.21756	6086	-3058	.316	1377.	1651.	A
3328	36.21619	101.55499	5917	-2589	.302	1539.	1789.	A
3093	36.46301	101.30579	6062	-2969	.313	1408.	1685.	A
3250	36.08511	101.44768	5969	-2719	.301	1421.	1829.	A
2825	36.39139	101.15247	6469	-3644	.370	1876.	949.	A
3208	36.35632	101.44475	6213	-3005	.324	1638.	1570.	A
3003	36.48441	101.19382	6736	-3733	.392	2359.	644.	A
3004	36.48396	101.17883	6190	-3186	.325	1454.	1550.	A
3236	36.34895	101.46651	6142	-2906	.308	1455.	1781.	A
3236	36.37167	101.49385	6086	-2850	.330	1781.	1455.	A
3214	36.47095	101.50908	6280	-3066	.321	1584.	1630.	A
3153	36.07013	101.20345	8423	-5270	.309	730.	2423.	A
3065	36.41222	101.28522	6077	-3012	.330	1615.	1450.	A
2898	36.41353	101.15321	6529	-3631	.345	1573.	1325.	A
3160	36.38808	101.38666	6905	-3745	.301	1043.	2117.	A
3039	36.42586	101.20596	6575	-3536	.330	1476.	1563.	A
2625	36.02762	100.08939	11557	-8932	.464	3449.	-824.	A
2380	35.92023	100.22881	13010	-10630	.553	5976.	-3596.	A
2456	35.89973	100.52106	12972	-10516	.488	4106.	-1650.	A
2386	35.94298	100.50331	12005	-9619	.567	6087.	-3701.	A
2828	35.77242	100.46272	12195	-9367	.401	1908.	920.	A
2672	35.76503	100.39081	12732	-10060	.389	1361.	1311.	A
2810	35.67154	100.47696	12380	-9570	.412	2206.	604.	A
2455	35.91895	100.09302	11894	-9439	.727	10523.	-8068.	A
2800	35.68588	100.50658	11156	-8356	.410	2204.	596.	A
2489	35.69756	100.10083	13659	-11170	.622	8446.	-5957.	A
2694	36.04514	100.28947	12302	-9608	.488	4250.	-1556.	A
2703	36.05157	100.12802	11862	-9159	.498	4468.	-1765.	A
2661	36.03217	100.53117	11160	-8499	.547	5590.	-2929.	A
2396	35.94247	100.48672	12333	-9937	.515	4722.	-2326.	A
2448	35.92802	100.46864	11012	-8564	.578	6136.	-3688.	A
2751	36.04929	100.33742	11014	-8263	.672	8814.	-6063.	A
3172	36.03195	101.18079	7285	-4113	.354	1841.	1331.	A
3092	35.99016	101.11678	8375	-5283	.321	918.	2174.	A
2798	35.98103	101.09531	8275	-5477	.365	1494.	1304.	A
3201	35.99869	101.25893	6305	-3104	.317	1511.	1690.	A
2525	36.47095	100.07297	8786	-6261	.364	1112.	1413.	A
2699	36.19725	100.49718	10145	-7446	.491	4046.	-1347.	A
2715	36.35844	100.29193	9454	-6739	.407	2148.	567.	A
2829	36.36183	100.54364	9497	-6668	.417	2468.	361.	A
2553	36.16815	100.34183	10737	-8184	.377	1167.	1386.	A
2813	36.15941	100.50763	10571	-7758	.419	2474.	339.	A
2494	36.16782	100.03716	11282	-8788	.428	2360.	134.	A
2475	36.25395	100.42703	9805	-7330	.429	2371.	104.	A
2550	36.24197	100.49980	9953	-7403	.505	4205.	-1655.	A
2438	36.31393	100.10899	10008	-7570	.331	68.	2370.	A
2584	36.11652	100.07304	11772	-9188	.425	2351.	233.	A
2564	36.22052	100.41380	9441	-6877	.402	1892.	672.	A
2780	36.36298	100.49950	8807	-6027	.384	1775.	1005.	A

ANADARKO BASIN LOWER PENNSYLVANIAN HEAD DATA N=265

ELEV	LAT	LONG	DEPTH	TSELEV	GRAD	HEAD	DTWATER	CLASS
2487	36.23122	100.40092	9857	-7370	.423	2253.	234.	A
2585	36.21667	100.45905	10218	-7633	.421	2295.	290.	A
2520	36.15179	100.08876	11217	-8697	.472	3534.	-1014.	A
2621	36.20944	100.39656	10458	-7837	.436	2681.	-60.	A
2629	36.48672	100.16814	9024	-6395	.388	1686.	943.	A
2607	36.23364	100.51642	9982	-7375	.504	4244.	-1637.	A
2640	36.46439	100.19511	8888	-6248	.405	2060.	580.	A
2803	36.46971	100.43106	8946	-6143	.387	1846.	957.	A
2575	36.29611	100.43256	8948	-6373	.381	1487.	1088.	A
2622	36.27834	100.45950	9853	-7231	.436	2692.	-70.	A
2766	36.35457	100.50894	9442	-6676	.408	2220.	546.	A
2828	36.37193	100.54433	9366	-6538	.408	2270.	558.	A
2585	36.43091	100.20085	9109	-6524	.423	2361.	224.	A
2923	36.18460	100.72644	9309	-6386	.444	3145.	-222.	A
2910	36.13155	100.69685	9274	-6364	.421	2647.	263.	A
2904	36.48701	100.72382	8246	-5342	.320	743.	2161.	A
2853	36.16724	100.64487	10102	-7249	.388	1797.	1056.	A
3048	36.15791	100.96440	9036	-5988	.353	1371.	1677.	A
2907	36.43013	101.06508	7522	-4615	.313	810.	2097.	A
2842	36.37700	100.58156	9166	-6324	.423	2630.	212.	A
3008	36.16278	100.88147	8531	-5523	.302	419.	2589.	A
2906	36.42749	100.66750	8567	-5661	.404	2317.	589.	A
2856	36.39824	100.57693	9038	-6182	.368	1498.	1358.	A
2816	36.31859	100.55020	8947	-6131	.398	2091.	725.	A
3022	36.18114	100.95282	8887	-5865	.386	2050.	972.	A
2759	36.18471	100.63234	10050	-7291	.441	2927.	-168.	A
2809	36.24261	100.65756	8644	-5835	.521	4550.	-1741.	A
2815	36.14641	100.58813	10562	-7747	.432	2771.	44.	A
2907	36.39304	100.68875	8235	-5328	.516	4480.	-1573.	A
3027	36.15559	100.94400	9082	-6055	.374	1775.	1252.	A
2998	36.17485	100.86107	9465	-6467	.387	1991.	1007.	A
2703	36.19760	100.65981	9612	-6909	.434	2719.	-16.	A
3011	36.07249	100.97972	8814	-5803	.369	1711.	1300.	A
2563	35.95131	100.72549	9525	-6962	.312	-110.	2673.	A
2642	35.90668	100.60910	12075	-9433	.468	3610.	-968.	A
2930	35.80273	100.67683	10931	-8001	.392	1899.	1031.	A
2513	35.94345	100.68839	10964	-8451	.450	2926.	-413.	A
2897	35.83003	100.78278	8053	-5156	.368	1684.	1213.	A
2982	35.80820	100.72243	9043	-6061	.344	1123.	1859.	A
2690	35.88347	100.73007	9617	-6927	.335	508.	2182.	A
2498	35.99573	100.73251	9098	-6600	.331	346.	2152.	A
2540	36.02455	100.66837	10694	-8154	.552	5462.	-2922.	A
2584	35.92537	100.68391	11094	-8510	.437	2678.	-94.	A
2743	35.88797	100.58000	12132	-9389	.560	6280.	-3537.	A
2634	36.03087	100.64453	10899	-8265	.488	4021.	-1387.	A
2707	36.03558	100.73276	9273	-6566	.301	-115.	2822.	A
2537	35.95889	100.65256	9408	-6871	.516	4335.	-1798.	A
2678	35.92056	100.72594	9598	-6920	.325	278.	2400.	A
2911	35.77116	100.60715	10871	-7960	.402	2113.	798.	A
2507	35.95763	100.59830	9450	-6943	.553	5115.	-2608.	A

ANADARKO BASIN LOWER PENNSYLVANIAN HEAD DATA N=265

ELEV	LAT	LONG	DEPTH	TSELEV	GRAD	HEAD	DTWATER	CLASS
2856	35.78471	101.04117	6753	-3897	.385	2103.	753.	A
2618	35.51398	100.43633	10881	-8263	.432	2583.	35.	A
2569	35.59444	100.10442	15483	-12914	.458	3455.	-886.	A
2208	35.37521	100.08875	14501	-12293	.479	3741.	-1533.	A
2583	35.53726	100.46861	13977	-11394	.647	9473.	-6890.	A
2491	35.42154	100.22932	14417	-11926	.556	6582.	-4091.	A
2582	35.55492	100.43858	14668	-12086	.680	10918.	-8336.	A
2605	35.54079	100.29185	13972	-11367	.300	-1701.	4306.	A
3024	35.61787	100.53796	11854	-8830	.397	2035.	989.	A
2334	35.40417	100.13341	16365	-14031	.531	6035.	-3701.	A
2773	35.59459	100.40401	12790	-10017	.422	2445.	328.	A
2991	35.59586	100.53806	11716	-8725	.399	2061.	930.	A
2722	35.60902	100.40060	13625	-10903	.428	2553.	169.	A
2700	35.61000	100.45000	13710	-11010	.421	2306.	394.	B
2212	35.38261	100.09782	16521	-14309	.511	5157.	-2945.	A

DELAWARE BASIN LOWER PENNSYLVANIAN HEAD DATA N=528

ELEV	LAT	LONG	DEPTH	TSELEV	GRAD	HEAD	DTWATER	CLASS
3723	32.35381	104.42709	10036	-6313	.391	2745.	978.	A
3195	32.45860	104.11929	11684	-8489	.460	3915.	-720.	A
3814	32.47569	104.57629	8450	-4636	.395	3072.	742.	A
3793	32.49570	104.56970	9438	-5645	.402	3101.	692.	A
3397	32.66580	104.40540	9358	-5961	.427	3251.	146.	A
3550	32.59711	104.52229	8682	-5132	.423	3346.	204.	A
3531	32.60800	104.51370	8923	-5392	.438	3626.	-95.	A
3875	32.43671	104.55920	8783	-4908	.375	2693.	1182.	A
4061	32.54230	104.63780	8950	-4889	.370	2749.	1312.	A
3199	32.46220	104.27409	10394	-7195	.426	3014.	185.	A
3785	32.46120	104.55930	9319	-5534	.401	3099.	686.	A
3795	32.50780	104.50670	9547	-5752	.407	3206.	589.	A
3912	32.42360	104.55260	9600	-5688	.391	2982.	930.	A
4275	32.41800	104.68961	9325	-5050	.407	3698.	577.	A
3703	32.45280	104.52480	9433	-5730	.393	2822.	881.	A
3857	32.47740	104.59320	9219	-5362	.368	2468.	1389.	A
3867	32.35960	104.40221	10762	-6895	.399	3023.	844.	A
4200	32.39461	104.52341	9919	-5719	.377	2905.	1295.	A
4100	32.41820	104.60240	8999	-4899	.390	3196.	904.	A
3579	32.81441	103.91100	11209	-7630	.444	3862.	-283.	A
3942	32.49400	104.48700	9950	-6008	.405	3297.	645.	A
3819	32.50760	104.52380	9580	-5761	.401	3100.	719.	A
3381	32.52460	103.99760	11144	-7763	.451	3831.	-450.	A
3438	32.72000	104.27280	9857	-6419	.403	2740.	698.	A
4219	32.47681	104.51759	9865	-5646	.378	2957.	1262.	A
3563	32.68179	104.49921	9084	-5521	.392	2699.	864.	A
4139	32.48161	104.66740	8690	-4551	.378	3034.	1105.	A
3198	32.32980	104.22720	11580	-8382	.405	2448.	750.	A
3961	32.32550	104.43980	10310	-6349	.411	3433.	528.	A
3395	32.70869	104.39870	9046	-5651	.394	2564.	831.	A
3878	32.39240	104.44659	9445	-5567	.376	2630.	1248.	A
3705	32.55620	104.57660	8995	-5290	.410	3228.	477.	A
3700	32.75021	104.55641	6827	-3127	.356	2480.	1220.	A
4357	32.39380	104.71080	7410	-3053	.374	3341.	1016.	A
4014	32.33260	104.43761	8743	-4729	.443	4199.	-185.	A
4000	32.48100	104.50600	9657	-5657	.399	3237.	763.	A
3467	32.66280	104.46660	9186	-5719	.406	2886.	581.	A
3566	32.79300	104.26880	9605	-6039	.402	2871.	695.	A
3303	32.56160	104.32240	10402	-7099	.417	2914.	389.	A
3709	32.52660	104.57100	7804	-4095	.388	2890.	819.	A
3309	32.51860	104.47580	10152	-6843	.404	2630.	679.	A
3330	32.20160	104.29520	11157	-7827	.444	3610.	-280.	A
3581	32.94080	104.14861	9390	-5809	.435	3627.	-46.	A
3698	32.78120	103.89740	9270	-5572	.381	2588.	1110.	A
3592	32.85100	104.16200	8215	-4623	.400	2953.	639.	A
3358	32.48120	104.38181	10172	-6814	.401	2590.	768.	A
4256	32.07539	104.58459	6641	-2385	.400	3744.	512.	A
3773	32.89819	103.99200	8851	-5078	.385	2791.	982.	A
3828	32.47760	104.55820	9384	-5556	.402	3151.	677.	A
4264	32.38139	104.60001	7540	-3276	.354	2890.	1374.	A

DELAWARE BASIN LOWER PENNSYLVANIAN HEAD DATA N=528

ELEV	LAT	LONG	DEPTH	TSELEV	GRAD	HEAD	DTWATER	CLASS
----	-----	-----	-----	-----	-----	-----	-----	-----
3723	32.35381	104.42709	10036	-6313	.391	2745.	978.	A
4805	32.45120	104.80679	6315	-1510	.333	3343.	1462.	A
3472	32.75020	104.44080	8592	-5120	.412	3040.	432.	A
3767	32.93111	104.01740	10507	-6740	.423	3520.	247.	A
3285	32.61211	104.14079	10907	-7622	.453	3783.	-498.	A
3210	32.51230	104.34290	10503	-7293	.415	2766.	444.	A
3265	32.47479	104.08130	11283	-8018	.458	3913.	-648.	A
4018	32.10321	104.53751	6787	-2769	.418	3775.	243.	A
3441	32.73621	104.42480	8850	-5409	.407	2899.	542.	A
3334	32.63020	104.00929	10692	-7358	.421	3029.	305.	A
3801	32.72820	104.59920	8421	-4620	.394	3030.	771.	A
3480	32.67371	104.47050	9149	-5669	.406	2904.	576.	A
3629	32.52820	104.50580	8607	-4978	.385	2672.	957.	A
3268	32.32970	104.25661	11018	-7750	.436	3334.	-66.	A
3821	32.68500	104.61639	8175	-4354	.376	2747.	1074.	A
3455	32.73050	104.43311	8912	-5457	.403	2823.	632.	A
3715	32.82680	104.12331	10648	-6933	.414	3232.	483.	A
3427	32.45341	104.36781	10495	-7068	.420	3100.	327.	A
3208	32.49660	104.14520	11558	-8350	.413	2662.	546.	A
4190	32.37440	104.56841	9446	-5256	.379	2996.	1194.	A
3725	32.08980	104.48820	6825	-3100	.440	3837.	-112.	A
3513	32.68840	104.47580	9065	-5552	.387	2546.	967.	A
3194	32.36560	104.24361	10887	-7693	.419	2844.	350.	A
3162	32.38040	104.24400	11586	-8424	.413	2625.	537.	A
3445	32.74220	104.43640	8697	-5252	.408	2933.	512.	A
3705	32.08569	104.48360	6882	-3177	.436	3741.	-36.	A
4393	32.40500	104.72321	8950	-4557	.381	3319.	1074.	A
3645	32.77840	104.11620	10705	-7060	.385	2443.	1202.	A
3329	32.46880	104.36330	10113	-6784	.423	3081.	248.	A
3391	32.65849	104.39760	7848	-4457	.404	2863.	528.	A
3511	32.84360	104.46140	7976	-4465	.399	2871.	640.	A
3460	32.73129	104.44060	8820	-5360	.383	2438.	1022.	A
3864	32.07471	104.51450	7452	-3588	.428	3764.	100.	A
3538	32.69460	104.17841	10885	-7347	.395	2571.	967.	A
3304	32.84750	104.33321	8369	-5065	.418	3012.	292.	A
3212	32.33220	104.23399	10377	-7165	.481	4353.	-1141.	A
3261	32.55611	103.96280	12093	-8832	.407	2515.	746.	A
3762	32.08501	104.49561	6842	-3080	.434	3774.	-12.	A
3824	32.80099	104.60820	6503	-2679	.337	2382.	1442.	A
3208	32.34711	104.23920	10360	-7152	.462	3888.	-680.	A
3638	32.77451	104.11540	10169	-6531	.428	3521.	117.	A
3542	32.68829	104.48740	8988	-5446	.385	2545.	997.	A
4374	32.39740	104.72760	9030	-4656	.383	3324.	1050.	A
3742	32.07410	104.48669	6476	-2734	.433	3734.	8.	A
3731	32.09650	104.48689	6799	-3068	.428	3645.	86.	A
3679	32.71770	104.54430	8360	-4681	.372	2498.	1181.	A
4005	32.68530	104.71091	7686	-3681	.354	2598.	1407.	A
3423	32.68750	104.26880	10016	-6593	.394	2515.	908.	A
3730	32.07350	104.48219	6832	-3102	.438	3800.	-70.	A
3310	32.47881	104.33430	10687	-7377	.415	2865.	445.	A

DELAWARE BASIN LOWER PENNSYLVANIAN HEAD DATA N=528

ELEV	LAT	LONG	DEPTH	TSELEV	GRAD	HEAD	DTWATER	CLASS
3723	32.35381	104.42709	10036	-6313	.391	2745.	978.	A
3468	32.44209	104.35519	9559	-6091	.419	3144.	324.	A
3792	32.29300	104.45430	10162	-6370	.409	3230.	562.	A
3779	32.07420	104.49519	6884	-3105	.436	3816.	-37.	A
3752	32.05721	104.46519	7102	-3350	.439	3841.	-89.	A
3534	32.67380	104.49181	9040	-5506	.388	2580.	954.	A
3375	32.46870	104.34650	10543	-7168	.435	3406.	-31.	A
3327	32.48970	104.35130	10442	-7115	.416	2914.	413.	A
3664	32.78551	104.11501	10830	-7166	.403	2909.	755.	A
3613	32.65930	104.52580	7709	-4096	.387	2783.	830.	A
3482	32.67720	104.47031	9112	-5630	.401	2793.	689.	A
3610	32.44890	104.41270	10233	-6623	.408	3002.	608.	A
3245	32.34720	104.26120	11526	-8281	.429	3137.	108.	A
3700	32.06689	104.47369	6877	-3177	.437	3751.	-51.	A
3882	32.30659	104.46581	9889	-6007	.391	2921.	961.	A
3471	32.39500	104.37740	10764	-7293	.441	3652.	-181.	A
3895	32.29300	104.46950	10102	-6207	.413	3416.	479.	A
3408	32.70551	104.27319	9910	-6502	.396	2565.	843.	A
3304	32.47791	104.34821	10546	-7242	.420	2990.	314.	A
4367	32.43001	104.71071	9085	-4718	.380	3241.	1126.	A
3584	32.81041	104.07771	10370	-6786	.457	4162.	-578.	A
3305	32.49159	104.33549	9982	-6677	.412	2805.	500.	A
3291	32.47861	104.36340	10112	-6821	.459	3901.	-610.	A
3123	32.41670	104.19800	11370	-8247	.421	2802.	321.	A
3321	32.63699	104.08200	10292	-6971	.464	4046.	-725.	A
3476	32.46880	104.38040	10700	-7224	.422	3195.	281.	A
3459	32.51720	104.00000	11260	-7801	.455	4017.	-558.	A
3869	32.36180	104.43320	10232	-6363	.408	3269.	600.	A
3149	32.38800	104.24390	11396	-8247	.394	2121.	1028.	A
3307	32.61560	104.16209	9940	-6633	.448	3650.	-343.	A
4621	32.36600	104.73700	8009	-3388	.355	3166.	1455.	A
3724	32.32201	104.35941	11435	-7711	.418	3329.	395.	A
3169	32.37090	104.21040	11170	-8001	.437	3272.	-103.	A
4295	32.42661	104.70621	8453	-4158	.404	3730.	565.	A
3162	32.37680	104.24409	11548	-8386	.416	2709.	453.	A
4631	32.54070	104.81410	7262	-2631	.317	2683.	1948.	A
3867	32.31400	104.46100	9706	-5839	.373	2517.	1350.	A
3301	32.60820	104.14951	10015	-6714	.482	4421.	-1120.	A
3185	32.51840	104.17509	10663	-7478	.486	4471.	-1286.	A
3411	32.60831	104.44090	8591	-5180	.385	2456.	955.	A
3938	32.26350	104.48300	9897	-5959	.390	2953.	985.	A
4016	32.43810	104.63519	9296	-5280	.391	3101.	915.	A
3301	32.34731	104.28239	11099	-7798	.467	4165.	-864.	A
3283	32.28600	104.26559	11506	-8223	.421	2967.	316.	A
3259	32.49339	104.17979	11330	-8071	.424	3008.	251.	A
3272	32.60471	104.13670	11078	-7806	.410	2678.	594.	A
3573	32.80360	104.08211	10366	-6793	.423	3338.	235.	A
3185	32.48199	104.27850	11099	-7914	.418	2801.	384.	A
3635	32.43980	104.36900	10418	-6783	.413	3135.	500.	A
3319	32.20100	104.28360	11502	-8183	.442	3556.	-237.	A

DELAWARE BASIN LOWER PENNSYLVANIAN HEAD DATA N=528

ELEV	LAT	LONG	DEPTH	TSELEV	GRAD	HEAD	DTWATER	CLASS
3723	32.35381	104.42709	10036	-6313	.391	2745.	978.	A
3240	32.57170	104.15050	10872	-7632	.452	3696.	-456.	A
3437	32.77930	104.43649	8435	-4998	.390	2594.	843.	A
3396	32.58949	104.24510	11015	-7619	.399	2521.	875.	A
4482	32.40800	104.72771	8973	-4491	.378	3341.	1141.	A
3952	32.30200	104.48219	10261	-6309	.395	3046.	906.	A
3478	32.64810	104.48759	9155	-5677	.402	2808.	670.	A
3475	32.59128	103.85864	12651	-9176	.429	3343.	132.	A
3394	32.11760	104.31619	11412	-8018	.435	3447.	-53.	A
3292	32.60110	104.14980	11087	-7795	.402	2502.	790.	A
3357	32.16240	104.31821	10868	-7511	.479	4501.	-1144.	A
3189	32.51540	104.28140	10905	-7716	.394	2189.	1000.	A
3708	32.52740	104.52180	9569	-5861	.399	2947.	761.	A
3084	32.39110	104.12531	12090	-9006	.434	3103.	-19.	A
4050	32.22301	104.50630	8343	-4293	.397	3350.	700.	A
3481	32.80270	104.26559	9537	-6056	.392	2579.	902.	A
3298	32.61870	104.07761	11473	-8175	.406	2583.	715.	A
4229	32.54221	104.69771	8805	-4576	.372	2977.	1252.	A
3228	32.53191	104.14200	11222	-7994	.407	2534.	694.	A
4339	32.31689	104.52080	10650	-6311	.389	3257.	1082.	A
4025	32.39240	104.46300	9645	-5620	.380	2840.	1185.	A
4270	32.41920	104.71500	8938	-4668	.345	2456.	1814.	A
3270	32.25259	104.26550	11615	-8345	.436	3341.	-71.	A
4326	32.43719	104.70621	9112	-4786	.377	3138.	1188.	A
3303	32.53200	104.00549	12224	-8921	.416	2811.	492.	A
3830	32.11420	104.50391	6237	-2407	.428	3747.	83.	A
3322	32.53180	104.00090	10960	-7638	.434	3337.	-15.	A
3437	32.75751	104.43210	8670	-5233	.414	3058.	379.	A
4262	32.43350	104.69780	9135	-4873	.374	3003.	1259.	A
3249	32.55360	104.27080	9475	-6226	.431	3194.	55.	A
3220	32.53920	104.18080	10584	-7364	.478	4306.	-1086.	A
3314	32.47780	104.31779	10862	-7548	.402	2523.	791.	A
2971	32.30791	104.03990	12617	-9646	.419	2550.	421.	A
3268	32.46840	104.30141	11040	-7772	.409	2638.	630.	A
3314	32.48250	104.18430	10272	-6958	.417	2923.	391.	A
3211	32.51100	104.31731	9055	-5844	.400	2517.	694.	A
3323	32.59711	104.08141	10571	-7248	.449	3700.	-377.	A
3490	32.78661	104.45340	8355	-4865	.384	2533.	957.	A
3241	32.55740	104.15060	11145	-7904	.406	2531.	710.	A
3514	32.56070	104.50990	9503	-5989	.398	2741.	773.	A
3213	32.50380	104.31731	10668	-7455	.419	2853.	360.	A
3688	32.09570	104.43210	11065	-7377	.450	4125.	-437.	A
3404	32.65530	104.41940	9354	-5950	.410	2909.	495.	A
3570	32.54080	104.51199	9302	-5732	.406	2973.	597.	A
3297	32.47861	104.30000	10790	-7493	.419	2945.	352.	A
3100	32.44250	104.16319	11582	-8482	.418	2690.	410.	A
3286	32.47169	104.18010	10350	-7064	.440	3457.	-171.	A
3287	32.75771	104.33000	8993	-5706	.413	2858.	429.	A
3290	32.77209	104.32941	9057	-5767	.414	2887.	403.	A
3582	32.80389	104.09030	10318	-6736	.441	3762.	-180.	A

DELAWARE BASIN LOWER PENNSYLVANIAN HEAD DATA N=528

ELEV	LAT	LONG	DEPTH	TSELEV	GRAD	HEAD	DTWATER	CLASS
----	-----	-----	-----	-----	-----	-----	-----	-----
3723	32.35381	104.42709	10036	-6313	.391	2745.	978.	A
3186	32.51849	104.24420	9415	-6229	.441	3362.	-176.	A
3490	32.55740	104.49680	9402	-5912	.406	2899.	591.	A
3459	32.44910	104.38049	10446	-6987	.405	2768.	691.	A
3285	32.57159	104.07739	11577	-8292	.409	2646.	639.	A
3352	32.76511	104.37309	8660	-5308	.455	3787.	-435.	A
3523	32.84711	104.46719	7651	-4128	.383	2640.	883.	A
3525	32.59010	104.51810	9441	-5916	.421	3266.	259.	A
3288	32.48920	104.29610	10872	-7584	.415	2835.	453.	A
3229	32.54671	104.18060	11160	-7931	.397	2304.	925.	A
3047	32.35800	104.12480	12173	-9126	.424	2791.	256.	A
3194	32.51480	104.39861	9872	-6678	.456	3711.	-517.	A
3308	32.77240	104.34950	8575	-5267	.422	3075.	233.	A
3470	32.51410	104.01720	11221	-7751	.434	3481.	-11.	A
4410	32.26180	104.65820	10017	-5607	.390	3418.	992.	A
3339	32.81580	104.36320	8513	-5174	.410	2875.	464.	A
3561	32.57130	104.52251	9447	-5886	.396	2749.	812.	A
3730	32.55780	104.59030	8932	-5202	.416	3364.	366.	A
4156	32.32091	104.60310	9938	-5782	.391	3193.	963.	A
3453	32.79739	104.43761	8311	-4858	.381	2450.	1003.	A
3438	32.31419	104.33150	10615	-7177	.443	3678.	-240.	A
3206	32.53940	104.28310	10947	-7741	.432	3174.	32.	A
3300	32.48320	104.17580	10415	-7115	.475	4292.	-992.	A
4181	32.31660	104.53951	9915	-5734	.399	3400.	781.	A
3242	32.52840	104.31810	9425	-6183	.430	3168.	74.	A
3179	32.50510	104.28799	10737	-7558	.421	2873.	306.	A
3255	32.57610	104.13300	10660	-7405	.464	4004.	-749.	A
3688	32.43510	104.35710	10940	-7252	.405	2973.	715.	A
3632	32.77209	104.52220	8271	-4639	.360	2224.	1408.	A
3242	32.48981	104.31290	10892	-7650	.415	2792.	450.	A
3549	32.64481	104.50960	9135	-5586	.395	2742.	807.	A
3146	32.11320	104.21809	11816	-8670	.450	3612.	-466.	A
3501	32.79761	104.45380	7983	-4482	.359	2136.	1365.	A
3218	32.53481	104.31810	10636	-7418	.408	2600.	618.	A
4411	32.49060	104.74030	8060	-3649	.380	3410.	1001.	A
3526	32.55020	104.49651	9360	-5834	.406	2944.	582.	A
3516	32.71719	104.46620	8902	-5386	.397	2774.	742.	A
3606	32.54980	104.54311	9259	-5653	.396	2812.	794.	A
3678	32.77390	104.12590	10783	-7105	.396	2758.	920.	A
3322	32.77139	104.36320	8855	-5533	.411	2874.	448.	A
3255	32.46690	104.29640	10850	-7595	.436	3327.	-72.	A
3569	32.67380	104.52240	8657	-5088	.390	2707.	862.	A
3323	32.59720	104.21480	10830	-7507	.411	2767.	556.	A
3434	32.79390	104.42799	8396	-4962	.422	3221.	213.	A
3195	32.53191	104.28410	10706	-7511	.407	2548.	647.	A
3202	32.50369	104.29990	10701	-7499	.412	2676.	526.	A
3220	32.47951	104.23981	10581	-7361	.427	3054.	166.	A
3286	32.59740	104.14560	11259	-7973	.405	2545.	741.	A
3419	32.24890	104.30280	11668	-8249	.423	3139.	280.	A
3290	32.73460	104.33310	9195	-5905	.431	3247.	43.	A

DELAWARE BASIN LOWER PENNSYLVANIAN HEAD DATA N=528

ELEV	LAT	LONG	DEPTH	TSELEV	GRAD	HEAD	DTWATER	CLASS
3723	32.35381	104.42709	10036	-6313	.391	2745.	978.	A
3704	32.01489	104.39980	9254	-5550	.408	3161.	543.	A
4021	32.33200	104.48711	10553	-6532	.406	3354.	667.	A
3792	32.72490	104.59489	8297	-4505	.376	2693.	1099.	A
4068	32.43010	104.65511	8980	-4912	.395	3271.	797.	A
3365	32.60410	104.21480	9502	-6137	.410	2856.	509.	A
3402	32.64760	104.14909	11019	-7617	.401	2588.	814.	A
3356	32.49319	104.37740	10345	-6989	.418	2980.	376.	A
3137	32.26311	104.14220	12273	-9136	.403	2264.	873.	A
3128	32.37990	104.21010	11440	-8312	.424	2878.	250.	A
4032	32.48830	104.49120	9116	-5084	.386	3032.	1000.	A
3373	32.53481	103.98380	11114	-7741	.475	4448.	-1075.	A
3445	32.79021	104.43381	8062	-4617	.380	2454.	991.	A
3676	32.26041	104.38651	10977	-7301	.413	3164.	512.	A
3548	32.58662	104.52666	9322	-5774	.398	2792.	756.	A
3548	32.79390	104.47940	8357	-4809	.422	3321.	227.	A
3560	32.60460	104.52631	9226	-5666	.408	3025.	535.	A
3428	32.80080	104.42560	7850	-4422	.379	2452.	976.	A
3345	32.63319	104.13220	9795	-6450	.484	4488.	-1143.	A
3541	32.55341	104.52229	9555	-6014	.403	2875.	666.	A
3583	32.60100	104.53909	9197	-5614	.404	2959.	624.	A
3290	32.75211	104.33000	9162	-5872	.385	2262.	1028.	A
3994	32.33940	104.46640	10521	-6527	.395	3073.	921.	A
3473	32.65860	104.16080	11032	-7559	.398	2563.	910.	A
3604	32.77800	103.91010	11660	-8056	.414	3083.	521.	A
3515	32.80080	104.46660	8251	-4736	.404	2948.	567.	A
3439	32.48320	104.42760	8418	-4979	.364	2096.	1343.	A
3571	32.42821	104.36940	10818	-7247	.399	2704.	867.	A
3359	32.83701	104.37219	8373	-5014	.398	2668.	691.	A
3320	32.17140	104.26620	11308	-7988	.435	3359.	-39.	A
3368	32.54620	104.22920	11092	-7724	.411	2801.	567.	A
3296	32.74980	104.33881	9118	-5822	.418	2982.	314.	A
3355	32.25240	104.28239	11598	-8243	.423	3079.	276.	A
3023	32.21519	104.09061	12294	-9271	.475	4197.	-1174.	A
3421	32.70641	104.11200	11080	-7659	.401	2596.	825.	A
3307	32.53520	104.23300	11125	-7818	.429	3197.	110.	A
3167	32.41022	104.26561	11172	-8005	.417	2749.	418.	A
3678	32.52840	104.51421	9660	-5982	.407	3096.	582.	A
3352	32.55341	104.23260	10121	-6769	.476	4352.	-1000.	A
3558	32.61220	104.52600	9277	-5719	.398	2794.	764.	A
3810	32.03720	104.42101	8742	-4932	.436	3865.	-55.	A
3548	32.70160	104.21640	10208	-6660	.400	2767.	781.	A
3523	32.66299	104.50160	7100	-3577	.444	3701.	-178.	A
3606	32.65640	104.54581	7829	-4223	.377	2596.	1010.	A
3128	32.43420	104.21800	11393	-8265	.424	2872.	256.	A
3307	32.75060	104.34979	9035	-5728	.399	2596.	711.	A
4517	32.47701	104.75439	8219	-3702	.362	3156.	1361.	A
3455	32.71280	104.09860	11145	-7690	.405	2718.	737.	A
3601	32.61560	104.53920	9133	-5532	.392	2739.	862.	A
3296	32.57281	104.41594	9702	-6406	.424	3083.	213.	A

DELAWARE BASIN LOWER PENNSYLVANIAN HEAD DATA N=528

ELEV	LAT	LONG	DEPTH	TSELEV	GRAD	HEAD	DTWATER	CLASS
3723	32.35381	104.42709	10036	-6313	.391	2745.	978.	A
3566	32.71780	104.49159	8824	-5258	.362	2117.	1449.	A
3305	32.72340	104.30260	9143	-5838	.456	3773.	-468.	A
3468	32.81540	104.44160	8129	-4661	.382	2500.	968.	A
3944	32.49280	104.63800	8674	-4730	.381	2892.	1052.	A
3298	32.29601	104.27460	11611	-8313	.414	2778.	520.	A
3112	32.44080	104.22600	11403	-8291	.434	3141.	-29.	A
3973	32.23520	104.49940	9737	-5764	.400	3224.	749.	A
3527	32.67599	104.21240	9797	-6270	.424	3323.	204.	A
3393	32.18961	104.29840	11204	-7811	.412	2834.	559.	A
3238	32.43480	104.29660	10857	-7619	.412	2706.	532.	A
3574	32.77879	104.09840	10284	-6710	.433	3559.	15.	A
3518	32.61200	104.50500	9294	-5776	.401	2832.	686.	A
3344	32.16220	104.26640	11297	-7953	.445	3652.	-308.	A
3477	32.67406	104.15205	10918	-7441	.419	3124.	353.	A
3387	32.62199	104.26840	10673	-7286	.410	2824.	563.	A
3416	32.47115	104.29697	10385	-6969	.474	4385.	-969.	A
3260	32.57440	104.40260	9902	-6642	.486	4453.	-1193.	A
3220	32.42580	104.27921	11053	-7833	.396	2272.	948.	A
3648	32.73160	103.88901	11667	-8019	.427	3469.	179.	A
4460	32.48039	104.75960	8203	-3743	.361	3083.	1377.	A
3144	32.39510	104.24454	11379	-8235	.421	2817.	327.	A
3300	32.55379	104.21910	10946	-7646	.410	2711.	589.	A
4111	32.49216	104.65778	8876	-4765	.382	3067.	1044.	A
4706	32.28000	104.69000	6432	-1726	.327	3129.	1577.	A
3280	32.61954	104.10277	10240	-6960	.443	3519.	-239.	A
3761	32.54300	104.44980	10101	-6340	.410	3228.	533.	A
3551	32.74380	104.48746	8633	-5082	.402	2919.	632.	A
3352	32.66600	104.09900	11168	-7816	.408	2696.	656.	A
3628	32.39037	104.40103	10193	-6565	.411	3113.	515.	A
3190	32.49541	104.10609	11744	-8554	.432	3165.	25.	A
3573	32.72870	104.50467	8657	-5084	.388	2660.	913.	A
3122	32.40741	104.23993	11670	-8548	.396	2125.	997.	A
3377	32.76649	104.38953	8836	-5459	.415	3003.	374.	A
3633	32.73639	103.89235	11561	-7928	.423	3357.	276.	A
3636	32.73277	103.87819	11237	-7601	.408	2980.	656.	A
3368	32.61562	104.21341	10620	-7252	.446	3668.	-300.	A
3127	32.40202	104.24344	11524	-8397	.450	3580.	-453.	A
3461	32.71359	104.11179	10902	-7441	.412	2932.	529.	A
3364	32.81157	104.29866	9047	-5683	.414	2968.	396.	A
3513	32.66966	104.21658	9821	-6308	.437	3592.	-79.	A
4224	32.44872	104.67599	9133	-4909	.381	3131.	1093.	A
3622	32.72572	103.88864	11212	-7590	.412	3076.	546.	A
3353	32.55022	104.25024	11055	-7702	.426	3163.	190.	A
3179	32.40515	104.27409	11015	-7836	.421	2874.	305.	A
3325	32.60162	104.41974	9547	-6222	.421	3048.	277.	A
3581	32.72137	104.50462	8689	-5108	.382	2544.	1037.	A
3360	32.75920	104.38324	8600	-5240	.487	4420.	-1060.	A
3616	32.56442	104.54384	9427	-5811	.410	3106.	510.	A
3399	32.64806	104.15865	11083	-7684	.391	2308.	1091.	A

DELAWARE BASIN LOWER PENNSYLVANIAN HEAD DATA N=528

ELEV	LAT	LONG	DEPTH	TSELEV	GRAD	HEAD	DTWATER	CLASS
3723	32.35381	104.42709	10036	-6313	.391	2745.	978.	A
3492	32.64764	104.19504	10953	-7461	.391	2414.	1078.	A
4549	32.47392	104.78712	7662	-3113	.325	2635.	1914.	A
3857	32.29565	104.38010	11202	-7345	.419	3494.	363.	A
3779	32.50723	104.63985	8984	-5205	.433	3774.	5.	A
3543	32.76434	104.10272	10861	-7318	.396	2617.	926.	A
3218	32.52882	104.29636	9676	-6458	.422	2969.	249.	A
3589	32.76366	104.11147	10966	-7377	.387	2410.	1179.	A
3281	32.43462	104.31715	11006	-7725	.416	2844.	437.	A
3969	32.24448	104.50269	9670	-5701	.403	3292.	677.	A
3364	32.68889	104.40981	9187	-5823	.400	2651.	713.	A
3461	32.71782	104.12402	10957	-7496	.399	2605.	856.	A
3517	32.53603	104.44041	9926	-6409	.412	3039.	478.	A
4455	32.49585	104.75484	8262	-3807	.366	3164.	1291.	A
3227	32.54362	104.31763	10399	-7172	.422	2950.	277.	A
3567	32.95944	104.24187	8447	-4880	.382	2571.	996.	A
3688	32.80463	104.12752	10747	-7059	.378	2315.	1373.	A
3365	32.68178	104.41895	9137	-5772	.402	2697.	668.	A
3474	32.72150	104.00462	11750	-8276	.389	2279.	1195.	A
3516	32.76775	104.08627	10855	-7339	.417	3108.	408.	A
3139	32.36726	104.20917	11700	-8561	.431	3086.	53.	A
4592	32.47017	104.77223	7924	-3332	.349	3042.	1550.	A
3142	32.30145	104.19682	11825	-8683	.406	2403.	739.	A
3508	32.64755	104.21658	9649	-6141	.371	2123.	1385.	A
3617	32.72473	104.52193	8593	-4976	.380	2568.	1049.	A
3204	32.46289	104.10562	11077	-7873	.455	3762.	-558.	A
3228	32.54794	104.20132	11185	-7957	.389	2091.	1137.	A
3611	32.70718	103.86658	11304	-7693	.467	4482.	-871.	A
3376	32.68884	104.41861	9266	-5890	.400	2669.	707.	A
3754	32.30313	104.38060	10985	-7231	.389	2639.	1115.	A
4612	32.43657	104.76410	8352	-3740	.371	3402.	1210.	A
4562	32.46262	104.77255	7920	-3358	.349	3016.	1546.	A
3474	32.22922	104.31149	11293	-7819	.462	4216.	-742.	A
3102	32.32411	104.17880	11871	-8769	.404	2308.	794.	A
3813	32.63699	104.63112	8531	-4718	.382	2807.	1006.	A
3279	32.25568	104.26517	11906	-8627	.415	2773.	506.	A
4203	32.46368	104.66719	8826	-4623	.376	3034.	1169.	A
3378	32.68163	104.40575	9330	-5952	.404	2753.	625.	A
3614	32.71800	103.86177	11605	-7991	.432	3580.	34.	A
3420	32.61942	104.24319	10731	-7311	.412	2901.	519.	A
3391	32.61833	104.22136	10770	-7379	.430	3319.	72.	A
3441	32.61304	103.90955	12436	-8995	.414	2876.	565.	A
4428	32.21710	104.44852	10862	-6434	.392	3381.	1047.	A
3036	32.27618	104.06984	12998	-9962	.428	2871.	165.	A
3392	32.69077	104.41846	7867	-4475	.389	2591.	801.	A
3472	32.69987	104.45676	8357	-4885	.453	3854.	-382.	A
3289	32.67424	104.33685	7971	-4682	.424	3118.	171.	A
3326	32.16148	104.24940	11180	-7854	.439	3481.	-155.	A
2989	32.28046	104.04384	12472	-9483	.444	3288.	-299.	A
2952	32.33006	103.98099	11977	-9025	.447	3333.	-381.	A

DELAWARE BASIN LOWER PENNSYLVANIAN HEAD DATA N=528

ELEV	LAT	LONG	DEPTH	TSELEV	GRAD	HEAD	DTWATER	CLASS
3723	32.35381	104.42709	10036	-6313	.391	2745.	978.	A
3536	32.74966	104.10748	9330	-5794	.417	3176.	360.	A
4329	32.26266	104.61964	8217	-3888	.407	3826.	503.	A
3382	32.62646	104.19579	10331	-6949	.437	3461.	-79.	A
3693	32.82285	104.15182	10329	-6636	.380	2433.	1260.	A
4247	32.28796	104.61949	9987	-5740	.364	2648.	1599.	A
3319	32.66248	104.05161	10703	-7384	.432	3291.	28.	A
3665	32.52560	104.49168	9802	-6137	.399	2891.	774.	A
3665	32.74396	103.87479	11745	-8080	.398	2706.	959.	A
3422	32.78760	104.42206	8454	-5032	.406	2883.	539.	A
3437	32.61946	104.23039	10895	-7458	.392	2396.	1041.	A
3316	32.58281	104.23225	10818	-7502	.420	2980.	336.	A
3385	32.81926	104.29889	9007	-5622	.381	2296.	1089.	A
3360	32.71370	104.37119	9060	-5700	.406	2795.	565.	A
3324	32.66257	104.05699	10480	-7156	.427	3166.	158.	A
3632	32.76086	104.18294	10397	-6765	.393	2671.	961.	A
3749	32.51111	104.52028	9787	-6038	.397	2939.	810.	A
3501	32.70218	104.25142	8402	-4901	.384	2550.	951.	A
3740	32.51035	104.62244	9660	-5920	.386	2688.	1052.	A
3386	32.55780	104.24062	11206	-7820	.402	2565.	821.	A
3651	32.39420	104.31694	11178	-7527	.426	3469.	182.	A
3327	32.14626	104.24977	11173	-7846	.439	3480.	-153.	A
3384	32.69209	104.12366	11048	-7664	.407	2725.	659.	A
3376	32.12450	104.29462	10947	-7571	.425	3162.	214.	A
3463	32.64748	104.23842	10085	-6622	.462	4120.	-657.	A
3377	32.66968	104.04721	10793	-7416	.473	4369.	-992.	A
3635	32.76427	104.18224	10367	-6732	.395	2720.	915.	A
3439	32.67461	104.45721	9044	-5605	.408	2917.	522.	A
3437	32.69949	104.42563	9040	-5603	.407	2882.	555.	A
3629	32.79880	103.91431	10945	-7316	.420	3288.	341.	A
3303	32.52119	104.39391	10074	-6771	.420	3002.	301.	A
3537	32.61481	103.79871	12855	-9318	.411	2860.	677.	A
3101	32.11760	103.28081	11526	-8425	.572	6794.	-3693.	A
3589	32.64400	103.78580	11477	-7888	.493	5160.	-1571.	A
4170	33.15320	103.53520	10675	-6505	.396	3238.	932.	A
4176	33.14639	103.54340	10359	-6183	.447	4513.	-337.	A
4101	33.09520	103.47040	10622	-6521	.389	3010.	1091.	A
4205	33.14360	103.57260	9732	-5527	.345	2222.	1983.	A
4179	32.99699	103.60800	10146	-5967	.390	3155.	1024.	A
4177	32.90199	103.63161	11280	-7103	.394	3155.	1022.	A
4029	32.81081	103.76540	12581	-8552	.477	5304.	-1275.	A
3838	32.73100	103.66180	11191	-7353	.395	2852.	986.	A
3832	32.49541	103.64360	13978	-10146	.491	5687.	-1855.	A
3810	32.72360	103.68330	13300	-9490	.483	5332.	-1522.	A
4154	33.13440	103.51360	10319	-6165	.346	2064.	2090.	A
4205	33.13541	103.58141	9852	-5647	.342	2132.	2073.	A
3788	32.71640	103.68761	13440	-9652	.482	5307.	-1519.	A
3960	32.89079	103.39600	10510	-6550	.364	2272.	1688.	A
4307	33.08099	103.69400	9762	-5455	.367	2809.	1498.	A
4308	33.08820	103.69000	9892	-5584	.362	2680.	1628.	A

DELAWARE BASIN LOWER PENNSYLVANIAN HEAD DATA N=528

ELEV	LAT	LONG	DEPTH	TSELEV	GRAD	HEAD	DTWATER	CLASS
3723	32.35381	104.42709	10036	-6313	.391	2745.	978.	A
4300	33.08099	103.68581	10069	-5769	.358	2539.	1761.	A
3746	32.70860	103.73500	12305	-8559	.481	5107.	-1361.	A
4311	33.07780	103.69920	9844	-5533	.342	2228.	2083.	A
4095	33.07001	103.47501	10437	-6342	.380	2803.	1292.	A
4304	33.07359	103.69400	9745	-5441	.364	2751.	1553.	A
4128	33.06281	103.52660	10442	-6314	.380	2831.	1297.	A
4337	33.11700	103.70779	9683	-5346	.364	2779.	1558.	A
4326	32.99339	103.74220	10250	-5924	.376	2961.	1365.	A
4314	33.07060	103.69881	9823	-5509	.365	2764.	1550.	A
4013	33.06219	103.39320	11099	-7086	.388	2849.	1164.	A
4345	33.04120	103.73360	9918	-5573	.371	2917.	1428.	A
4236	32.97141	103.65520	10407	-6171	.367	2635.	1601.	A
3825	32.81500	103.31000	9927	-6102	.426	3659.	166.	A
3713	32.64020	103.58859	13304	-9591	.500	5748.	-2035.	A
3776	32.71620	103.70500	12475	-8699	.474	4958.	-1182.	A
3507	32.32780	103.27200	9570	-6063	.424	3304.	203.	A
4058	32.83659	103.54221	12406	-8348	.525	6685.	-2627.	A
4294	33.11000	103.68120	10185	-5891	.368	2767.	1527.	A
3995	33.08760	103.36740	10509	-6514	.395	3067.	928.	A
3722	32.61600	103.52859	13471	-9749	.461	4575.	-853.	A
4135	33.06650	103.51360	10460	-6325	.372	2661.	1474.	A
3927	32.69501	103.49049	13065	-9138	.497	5858.	-1931.	A
4165	32.94580	103.58890	10486	-6321	.439	4306.	-141.	A
4131	33.07300	103.51320	10511	-6380	.371	2611.	1520.	A
4304	33.11729	103.69450	9862	-5558	.356	2537.	1767.	A
4291	33.12120	103.69040	9807	-5516	.346	2314.	1977.	A
4296	33.11050	103.69810	9975	-5679	.376	2970.	1326.	A
3642	32.65820	103.75999	12590	-8948	.435	3682.	-40.	A
3677	32.65770	103.26801	8530	-4853	.379	2608.	1069.	A
3581	32.54570	103.70480	13206	-9625	.497	5521.	-1940.	A
3967	32.94160	103.39180	11465	-7498	.377	2469.	1498.	A
3693	32.62950	103.42140	12575	-8882	.519	6185.	-2492.	A
3852	32.74890	103.69569	13351	-9499	.471	5003.	-1151.	A
3920	32.71609	103.59740	13208	-9288	.517	6469.	-2549.	A
3980	32.91991	103.43030	10389	-6409	.378	2646.	1334.	A
4240	32.92360	103.68311	12939	-8699	.416	3716.	524.	A
3952	32.67740	103.55170	13626	-9674	.483	5520.	-1568.	A
3767	32.73470	103.78590	11552	-7785	.494	5392.	-1625.	A
3805	32.47380	103.60980	14460	-10655	.506	6245.	-2440.	A
4328	33.06691	103.73381	9838	-5510	.362	2717.	1611.	A
3548	32.56779	103.72200	12987	-9439	.445	3904.	-356.	A
4016	32.68620	103.55110	13356	-9340	.508	6318.	-2302.	A
3644	32.57040	103.39079	11530	-7886	.455	4225.	-581.	A
3666	32.68810	103.75920	12798	-9132	.467	4654.	-988.	A
3725	32.63670	103.44360	12522	-8797	.511	5984.	-2259.	A
3784	32.72340	103.70461	12099	-8315	.504	5744.	-1960.	A
4282	33.01520	103.68581	10268	-5986	.371	2811.	1471.	A
4075	32.96800	103.50500	13155	-9080	.515	6566.	-2491.	A
3744	32.72380	103.75220	12641	-8897	.449	4211.	-467.	A

DELAWARE BASIN LOWER PENNSYLVANIAN HEAD DATA N=528

ELEV	LAT	LONG	DEPTH	TSELEV	GRAD	HEAD	DTWATER	CLASS
-----	-----	-----	-----	-----	-----	-----	-----	-----
3723	32.35381	104.42709	10036	-6313	.391	2745.	978.	A
3719	32.50696	103.67307	12745	-9026	.533	6639.	-2920.	A
4222	32.88741	103.68300	12997	-8775	.464	5129.	-907.	A
4161	32.94580	103.60080	12385	-8224	.515	6506.	-2345.	A
3665	32.67619	103.69600	13241	-9576	.489	5362.	-1697.	A
4234	32.89502	103.68570	13000	-8766	.505	6389.	-2155.	A
3576	32.21971	103.50504	13870	-10294	.506	5904.	-2328.	A
4201	32.90581	103.65140	13103	-8902	.496	6107.	-1906.	A
3689	32.70328	103.76363	11660	-7971	.471	4698.	-1009.	A
4038	32.93213	103.49866	11168	-7130	.370	2408.	1630.	A
3516	32.36839	103.27036	10023	-6507	.385	2389.	1127.	A
4222	32.88043	103.68140	13413	-9191	.493	6063.	-1841.	A
4202	32.87575	103.66302	12925	-8723	.493	5993.	-1791.	A
4105	32.87997	103.57982	12596	-8491	.473	5263.	-1158.	A
3770	32.65874	103.56541	12520	-8750	.520	6283.	-2513.	A
3782	32.68433	103.60089	13089	-9307	.504	5931.	-2149.	A
4000	32.70163	103.54607	12662	-8662	.522	6587.	-2587.	A
3634	32.55025	103.38274	11301	-7667	.435	3685.	-51.	A
3697	32.69165	103.70396	12618	-8921	.493	5421.	-1724.	A
3628	32.66667	103.76367	12595	-8967	.461	4418.	-790.	A
3547	32.38089	103.28053	9280	-5733	.417	3188.	359.	A
3791	32.66226	103.56313	13478	-9687	.485	5406.	-1615.	A
4108	32.93846	103.54436	11855	-7747	.530	6759.	-2651.	A
3666	32.68864	103.76378	12607	-8941	.475	4871.	-1205.	A
3698	32.70663	103.76357	11733	-8035	.487	5147.	-1449.	A
3692	32.70308	103.77213	12074	-8382	.467	4636.	-944.	A
3545	32.55788	103.73833	13480	-9935	.500	5610.	-2065.	A
4167	33.10280	103.53520	10401	-6234	.380	2886.	1281.	A
4022	32.92680	103.47200	12499	-8477	.503	6022.	-2000.	A
4302	32.91161	103.73911	11899	-7597	.498	6085.	-1783.	A
3735	32.71260	103.75560	12003	-8268	.492	5371.	-1636.	A
3577	32.63280	103.78140	11382	-7805	.507	5515.	-1938.	A
3602	33.02139	104.14160	8445	-4843	.389	2742.	860.	A
3618	33.01390	104.18530	8515	-4897	.388	2718.	900.	A
3656	33.04010	104.09560	7984	-4328	.373	2540.	1116.	A
3535	33.02840	104.15041	8796	-5261	.369	2237.	1298.	A
3538	33.02167	104.15903	8793	-5255	.377	2397.	1141.	A
3591	32.97771	104.19032	8882	-5291	.369	2264.	1327.	A