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Analysis of Subsidence Data for the West Hackberry Site, Louisiana

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ANALYSIS OF SUBSIDENCE DATA
FOR THE
WEST HACKBERRY SITE, LOUISIANA

Stephen J. Bauer, Editor
Underground Storage Technology

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Abstract

The elevation change data measured at the West Hackberry SPR site over the last 14+ years has been studied and a model utilized to project elevation changes into the future. The subsidence rate has decreased with time due to instituting maintenance of higher operating pressures for caverns (since about 1990) and the normal decrease in creep closure rate of caverns with time. However, the subsidence at the site is projected to continue. As a result, low lying regions exist and the extents of these regions are projected to increase with time. These low lying regions are susceptible to inundation with water from Black Lake and/or hurricane storm surges. This work may assist DOE in planning the construction and location of mitigative measures for flood control.

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for the
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Introduction

The subsidence monument elevations at the West Hackberry SPR site have been surveyed 15 times beginning in January 1983. The earlier survey data has been most recently reported on by Osnes (1995). This report provides an update which includes additional measurements completed in the past two years. The changes in elevation, the rates of subsidence, as well as projections of future elevation changes are presented. Of specific interest to the DOE at West Hackberry is the subsidence of the land surface because part the site is close to sea level.

Elevation data represents the raw data. The most recent data set included 143 data points. The number of data points varies from year to year because it is a function of ability to find monuments, destruction of monuments, damage to monuments, etc. The measurements have been made at various time intervals; the current time interval is about a year.

In practice, measurements of subsidence are difficult at best. At West Hackberry the reference is an off-site benchmark. This introduces error in traversing the distance to the site. Since 1988, the leveling surveys have been performed to Second-Order First-Class accuracy, with allowable vertical closure not to exceed 6 mm/km$^{0.5}$ (approximately 0.025 ft/mile$^{0.5}$). The standard errors in elevation for pre-1990 survey points are greater than 0.037 ft and 0.069 ft at 95 per cent and 50 per cent of the points, respectively (Osnes, 1995).

At West Hackberry and SPR sites in general, elevation changes are measured because they document surface subsidence resulting from creep closure of caverns. General subsidence on the scale of the site or portions thereof is seen in the survey data taken. This type of subsidence will capture gross effects of creep closure of underground openings in response to the state of stress.

Localized subsidence is sometimes observed and reported to be seen by workers at the site because the survey measurements at the site are only made annually. However the detailed long term subsidence provided by the surveys is important, especially because it permits the long term extrapolation of elevation changes into the future. In the following presentation, important elevation values are +2.5 feet, the mean elevation of Black Lake which abuts the site and +4.5 feet, the estimated hurricane storm surge. Changes resulting in elevations approaching these values will represent a threat of flooding of portions of the site.

Results and Analysis

Results of 14+ years of measurements are presented in **Table 1** and graphically in **Figures 1-4**. All elevation data are printed in **Table 1** in feet above sea level. The absolute values of vertical displacements and the elevations are of interest. The site has subsided during the past 14+ years as seen in **Figures 1-4**. The average subsidence for the past 14+ years over the whole site is about 2 feet, with locally greater values. The northern area of the site occupies the lowest elevations. More subsidence has occurred and greater subsidence rates are observed in the northern sector of the site. This is likely a result of a combination of cavern creep closure and oil production from the fields in and around Black Lake. The central portion of the site remains relatively high with average elevations greater than 10 feet.

The contour maps were generated with a commercially available plotting routine. The program generates a map, and contours it by developing a symmetric matrix of information that fills a rectangular shaped area based on the input information. It is important to understand that the program creates contours based on the mathematical rules assigned. The program also creates (extrapolates based on mathematical rules) contours in map areas where there are no data. In some cases the extrapolation can be misleading. This is quite evident for the 1000' x 3000' area on the southwest and southeast sides of the maps where the contours are angular. The exact placement of these contours in the area is uncertain because of sparse data in this region. The greatest confidence is in contours drawn through map areas with abundant data as depicted by (+) on the plots.

It should be noted that the survey stations are located in some cases on the well head flanges. The flange elevations may be higher than the surrounding ground; actual contours of the ground surface may be lower than represented here.

The rate of subsidence is calculated by dividing the amount of elevation change in a time period by the time span of the period in years. The rate of subsidence has decreased during the measurement period. For the first five years of measurement the site was subsiding at about 2-3 inches per year, whereas for the past 3-4 years the rate has dropped off to 1-2 inches per year (compare **Figures 5** and **6** and see **Table 2**). This decrease is probably due to the operational procedure adopted of maintaining the caverns at relatively high operating pressure and the corresponding decrease in creep closure rate of the caverns with time. Transient creep effects are also diminishing with time (Ehgartner, 1992).

An attempt was made to evaluate data quality. Inspection of the data shows some to be suspicious. For example, vertical movements of more than a few inches were sometimes recorded from one year to the next. Some of these monuments are located on well head flanges physically connected to other monuments that showed no movement for the same time period. For the analyses in which values of subsidence and subsidence rate are

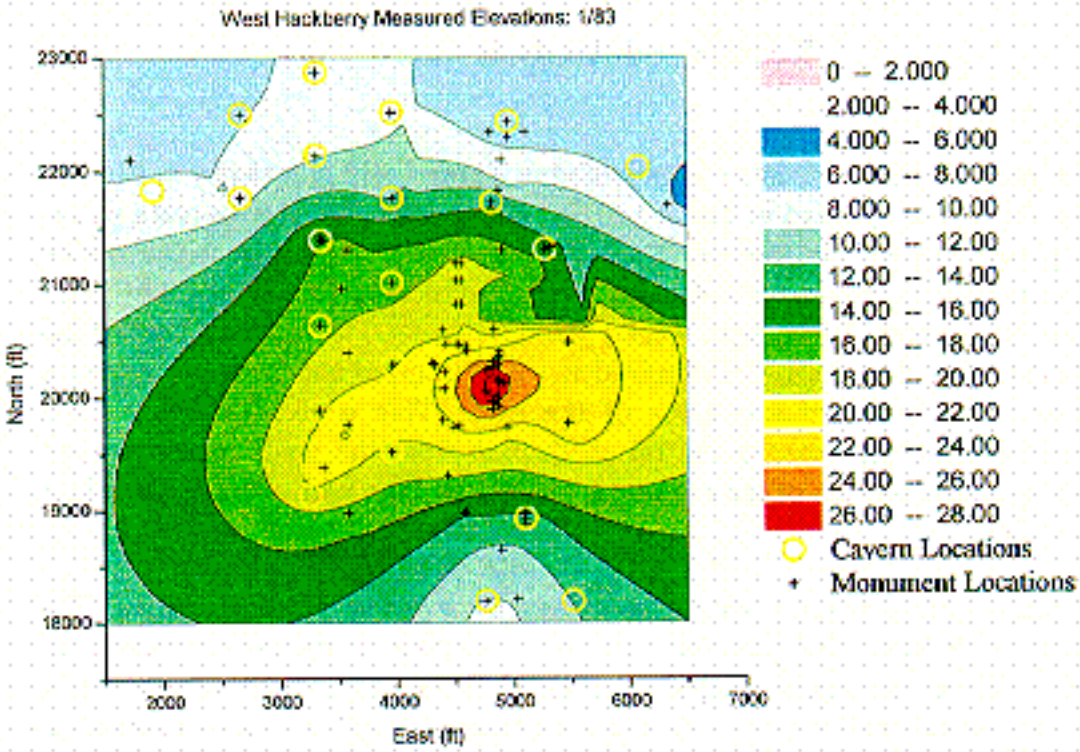

Figure 1. West Hackberry site measured elevations (feet), January, 1983. The yellow circles center on DOE oil storage caverns, the black crosses represent elevation monument stations. The contour interval is 2 feet.

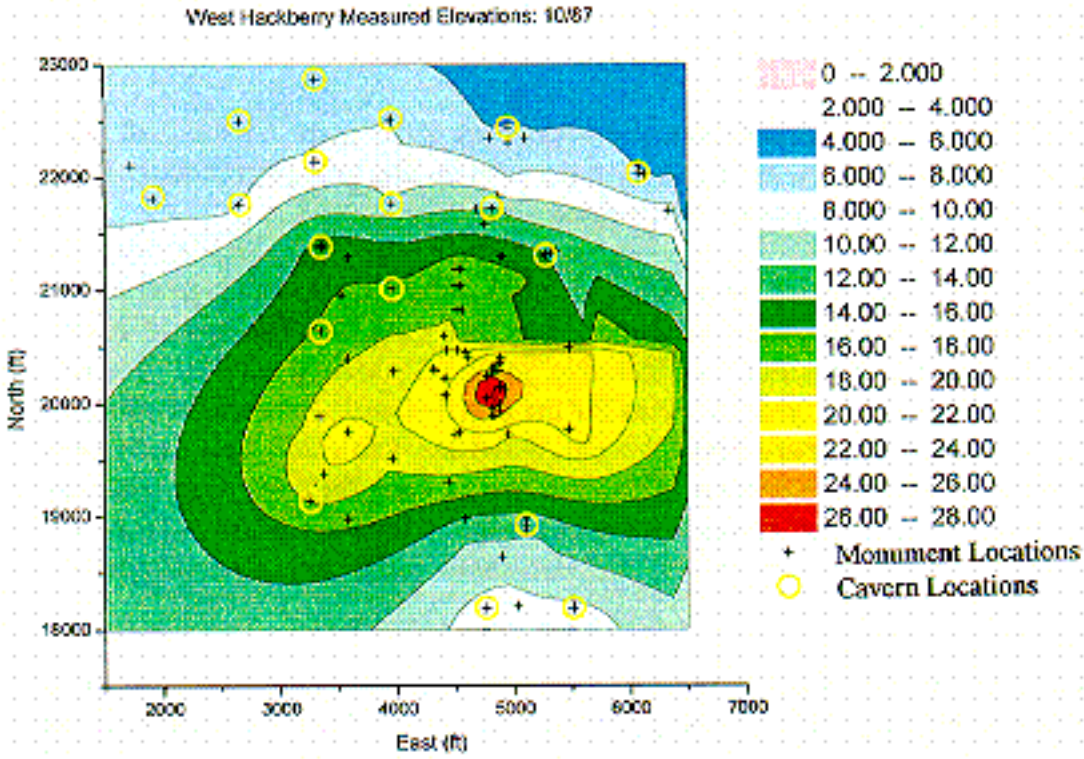

Figure 2. West Hackberry site measured elevations (feet), October, 1987. The yellow circles center on DOE oil storage caverns, the black crosses represent elevation monument stations. The contour interval is 2 feet.

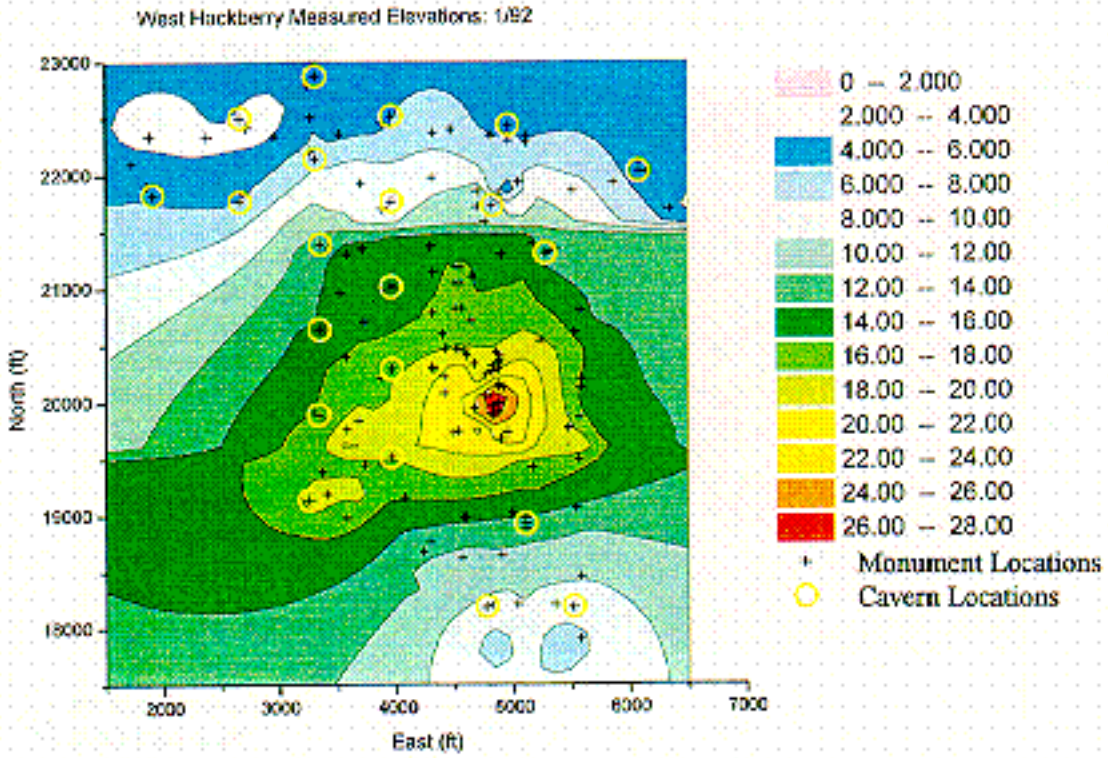

Figure 3. West Hackberry site measured elevations (feet), January, 1992. The yellow circles center on DOE oil storage caverns, the black crosses represent elevation monument stations. The contour interval is 2 feet.

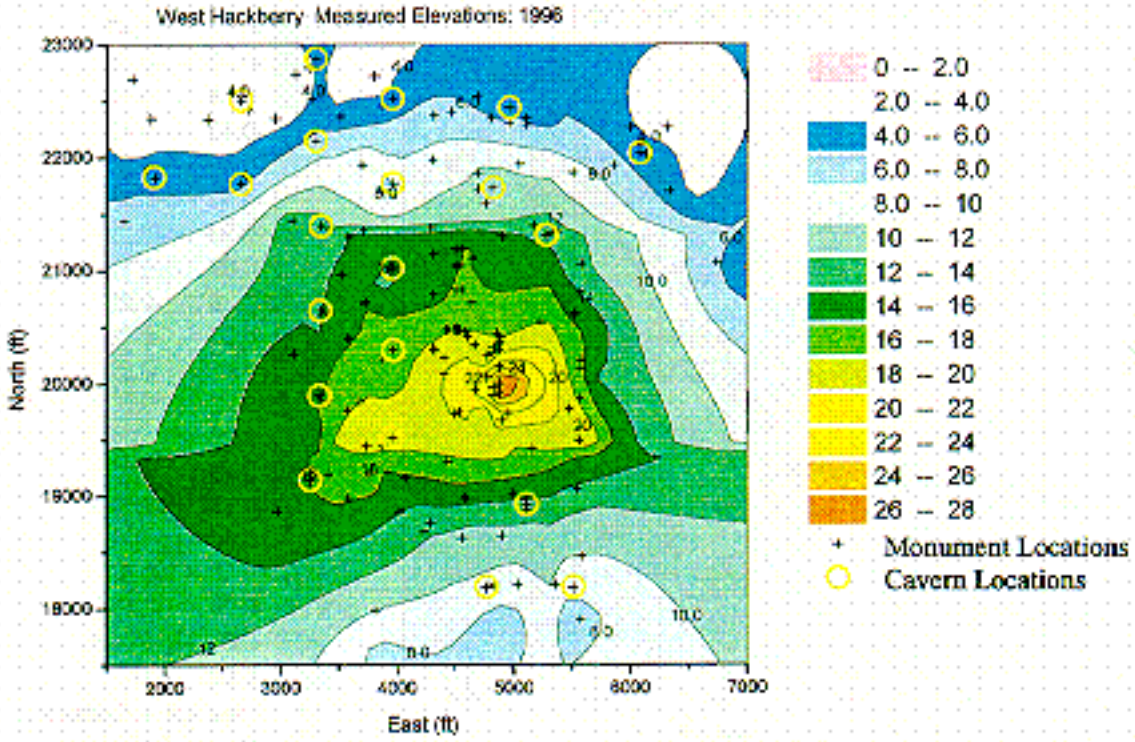

Figure 4. West Hackberry site measured elevations (feet), October, 1996. The yellow circles center on DOE oil storage caverns, the black crosses represent elevation monument stations. The contour interval is 2 feet.

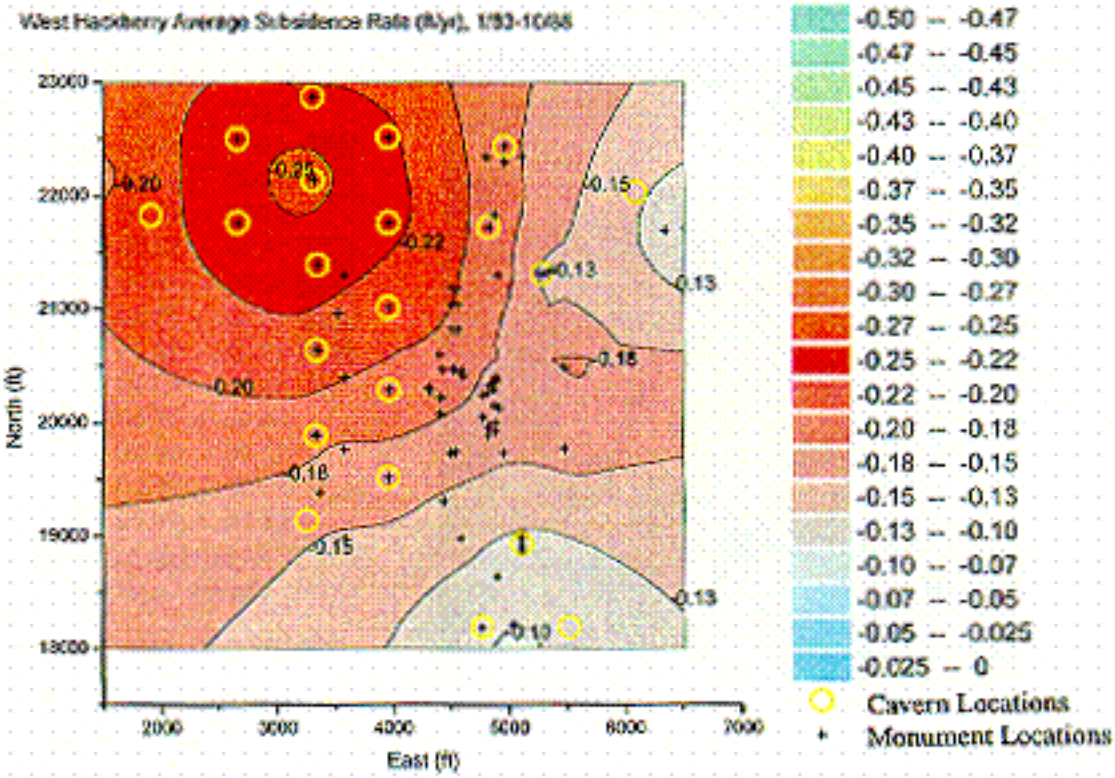

Figure 5. West Hackberry site subsidence rate (ft/yr) calculated for the time period 1/83-10/88. The yellow circles center on DOE oil storage caverns, the black crosses represent elevation monument stations. The contour interval is 0.025 ft/yr (0.3 in/yr).

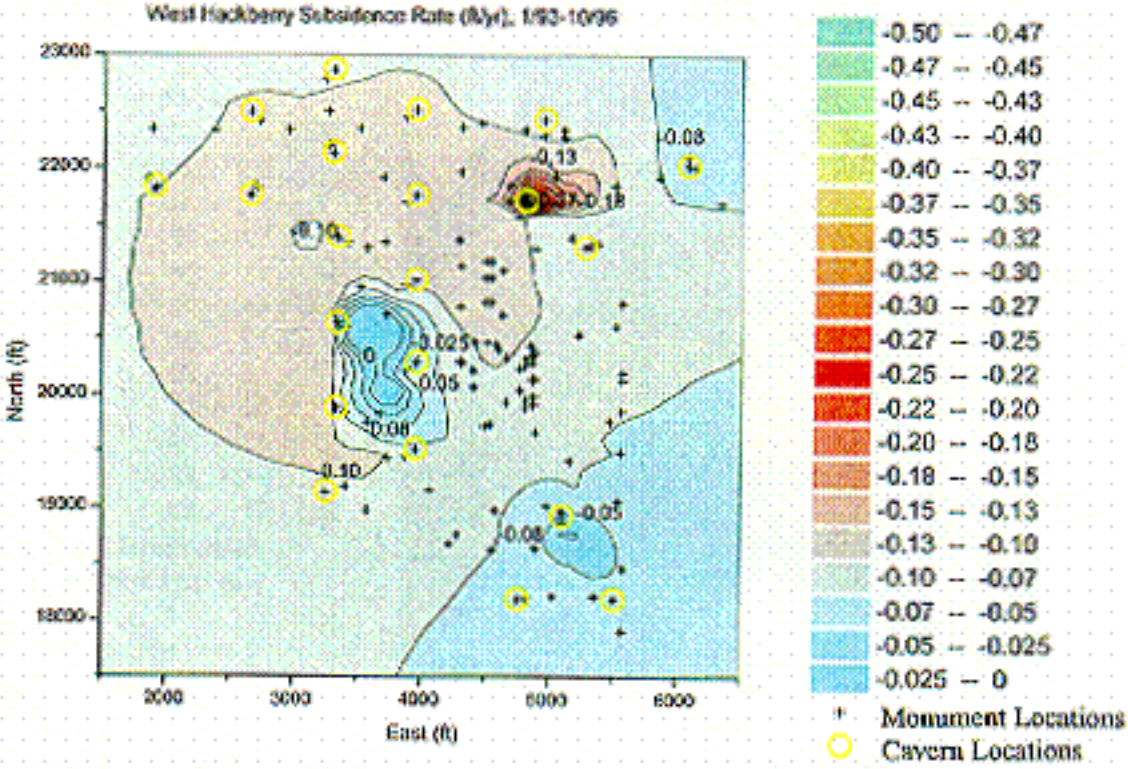

Figure 6. West Hackberry site subsidence rate (ft/yr) calculated for the time period 1/93-10/96. The yellow circles center on DOE oil storage caverns, the black crosses represent elevation monument stations. The contour interval is 0.025 ft/yr (0.3 in/yr).

considered the suspicious data points were omitted; these data points are in bold in **Table 1**. More than 90% of all data collected was useable for analysis purposes. **Figure 7** plots 35 data sets, elevation versus time. Regardless of initial elevation, much of the data appears to be of the same functional form. All data was fit to a bank of possible equations. This fitting routine chose a first order exponential decay as the best mathematical representation of the data of the form:

$$Y = Y_o + A_1 e^{-(x-xi)/t_1}$$

where Y and Y_o represent elevation, A_1 is a constant, x and xi are time, and t1 is a fitting parameter.

Examples of the first order exponential decay representations are given in **Figure 8a-c**. Mathematically the data is well fit by this function. The first order exponential decay function was fit to each data set [1]. This allowed the data to be projected into the future with confidence. **Table 3** contains fitting parameters for equations fit to data for each measurement station allowing the reader to make projections to any time in the future.

---

[1] Some of the monument stations are represented by measurements taken for the past 4 - 8 years. In order to develop a meaningful time versus elevation relationship, an elevation needs to be defined at a realistic value for a time of zero. Since the average subsidence for the site was about 2 feet since January 1983, 2 feet was added to the 10/96 elevation to provide a realistic estimate to define the curve at zero time. Through analysis it was found that varying the zero time elevation up from 2 feet to 5 feet did not make an appreciable difference (less than 0.1 feet) in the predicted elevation in 2007.

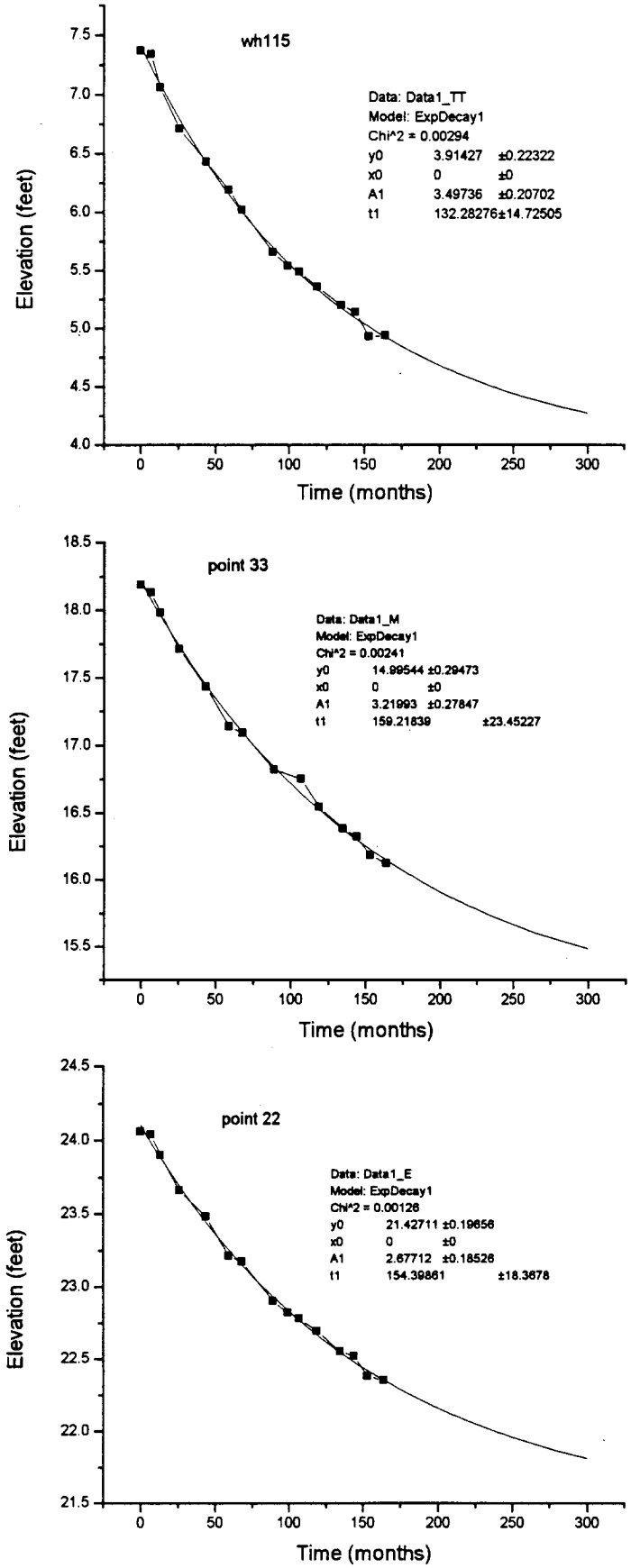

Figure 7 a,b,c. Examples of first order exponential decay representations of elevation data (feet above sea level) versus time (months) for three monuments representing three elevation ranges.

The projected elevations for 2007 are presented in **Figure 8**. The low elevation regions at the site are projected to increase in area as compared to 1996 data (**Figure 4**). In **Figures 9** and **10** the contour interval has been changed to 2.5 feet for illustrative purposes. In these figures the boundary separating the dark and light blue (4.5 feet) marks the elevation for the estimated hurricane storm surge. The area that includes Caverns 7, 111, and 113 are reasonably susceptible to flooding now, and Caverns 110, 114, 115, and 116 will be susceptible to flooding in the future. Thus current areas of concern are clearly depicted as well as areas of future concern.

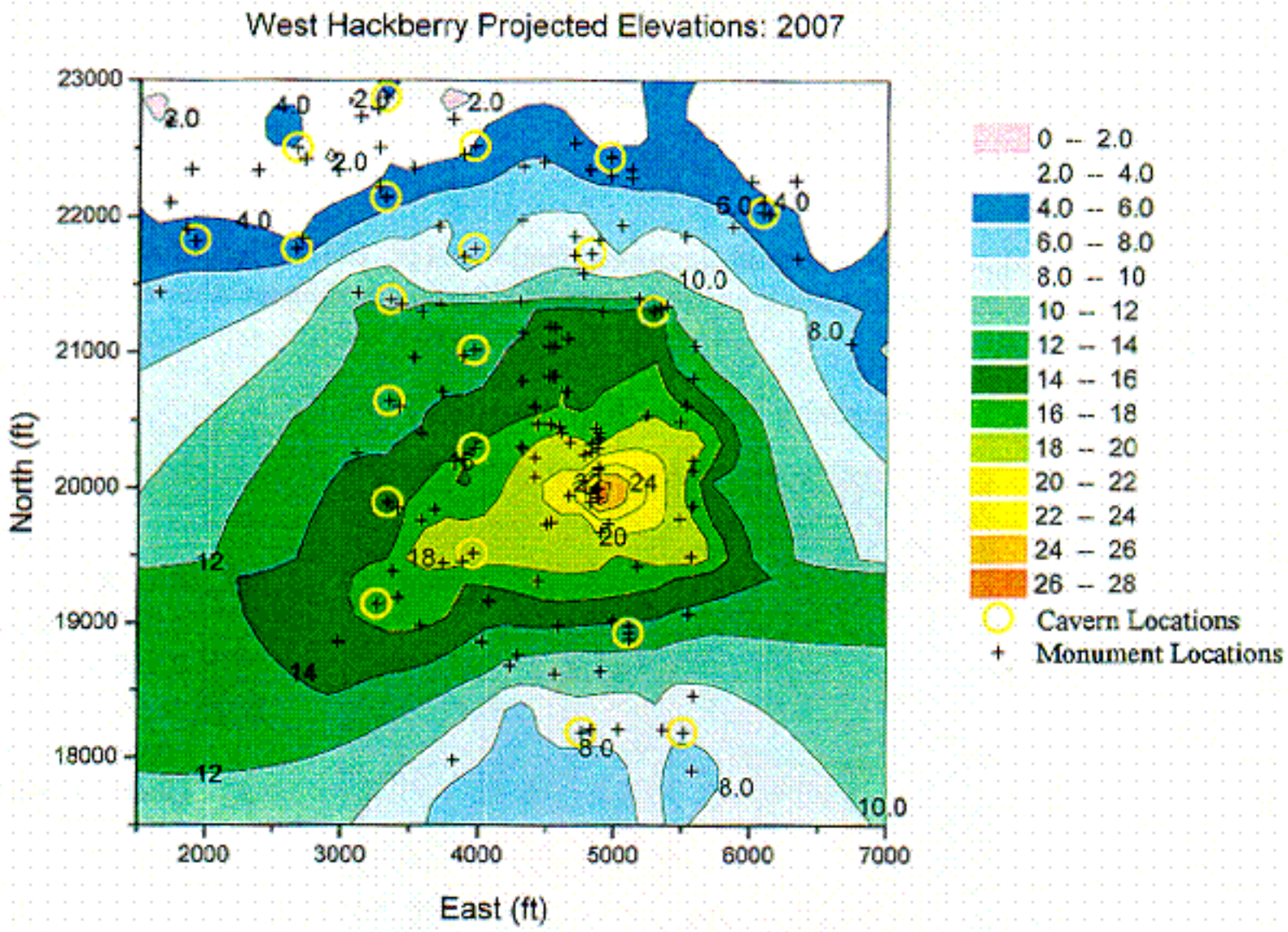

Figure 8. West Hackberry site projected elevations (feet) for the year 2007. The yellow circles center on DOE oil storage caverns, the black crosses represent elevation monument stations. The contour interval is 2 feet.

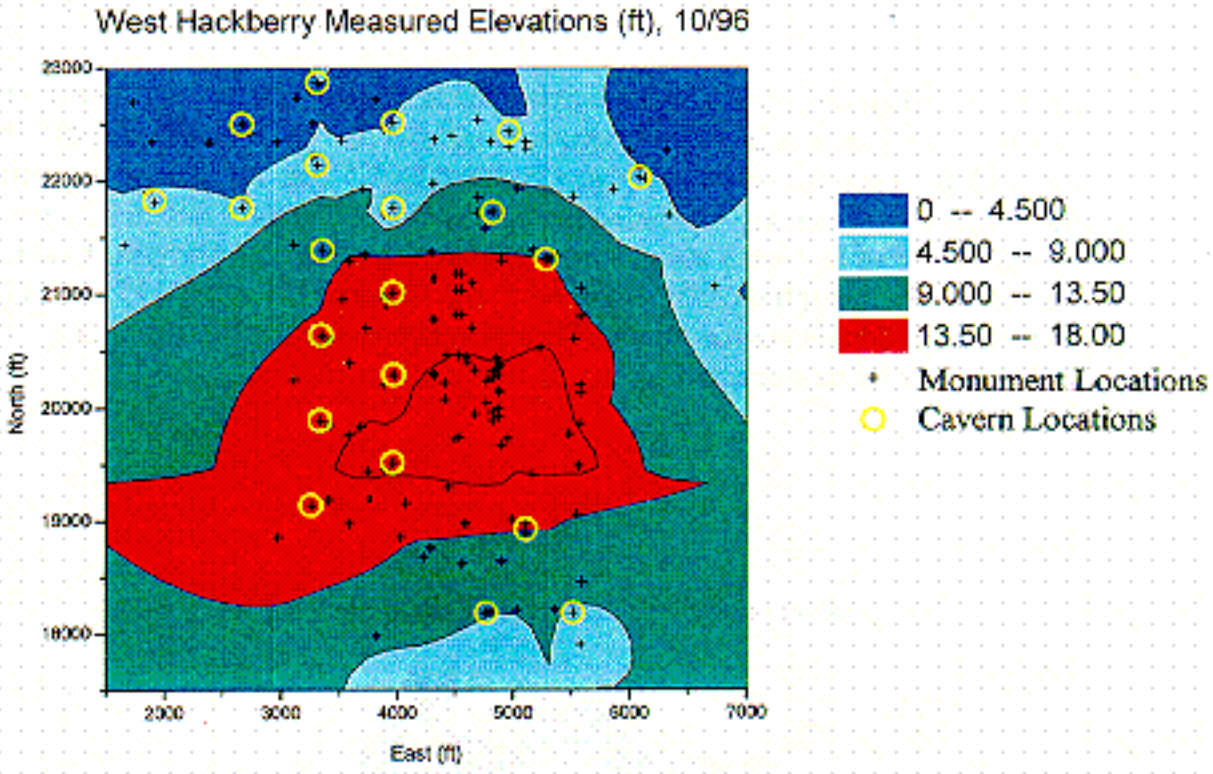

Figure 9. West Hackberry site measured elevations (feet) October, 1996. The yellow circles center on DOE oil storage caverns, the black crosses represent elevation monument stations. The contour interval is 4.5 feet.

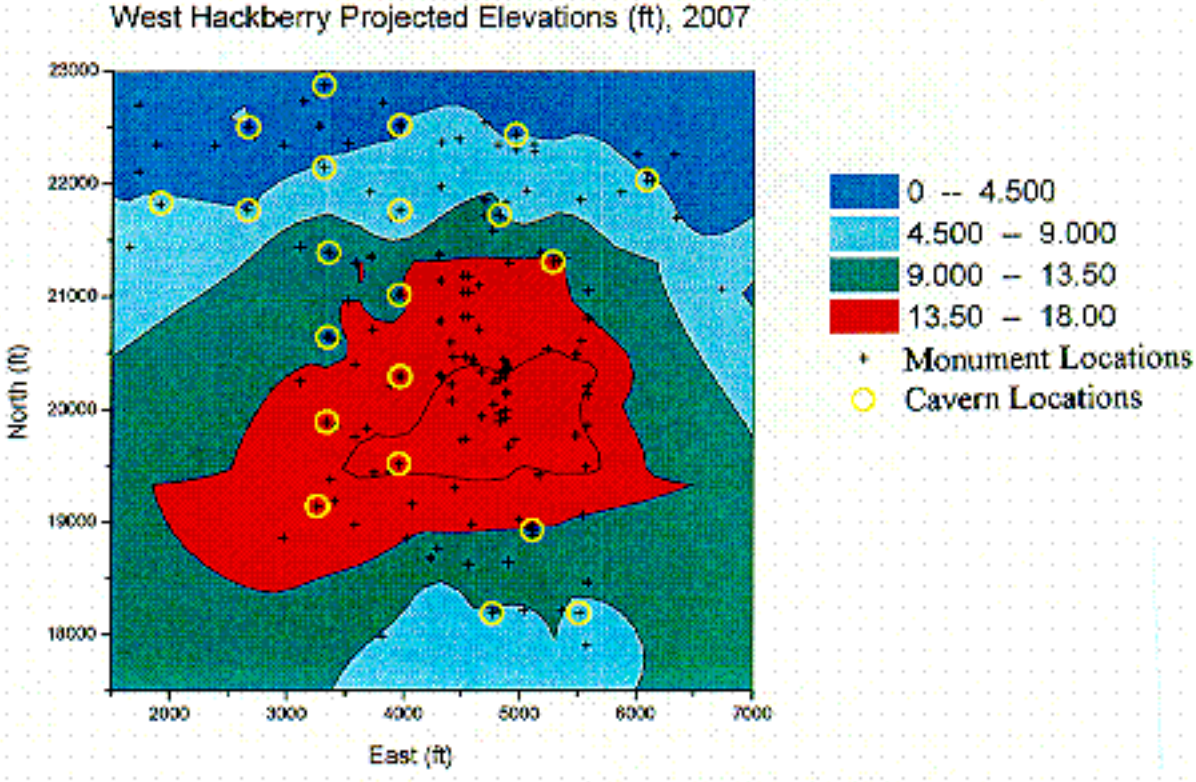

Figure 10. West Hackberry site projected elevations (feet) for the year 2007. The yellow circles center on DOE oil storage caverns, the black crosses represent elevation monument stations. The contour interval is 4.5 feet.

Discussion and Conclusions

The elevation change data at the West Hackberry SPR site has been studied and a model utilized to project elevation changes into the future. This work may assist DOE in planning the construction and location of mitigative measures for flood control. There exists situations related to possible indications of the low elevations at the West Hackberry site and the predicted elevations suggest mitigation will be required, if not now then in the future. The results presented indicate that two caverns (111 & 113) are currently susceptible to flooding, four caverns (7, 110, 114, & 116) are bordering on being susceptible. These four and caverns 6 and 115 will be susceptible to flooding in ten years or less.

Operationally it is prudent to continue the practice of maintaining the caverns at relatively high operating pressure. The measured subsidence rate is increased for time periods when higher cavern pressures were not maintained, and decreased for time periods when relatively high cavern pressures were maintained.

The results of analyses warrant the following conclusions:

- Low lying regions exist and the extents of these regions are projected to increase with time. For example caverns 111 and 113 are reasonably susceptible to flooding now, and caverns 6, 7, 110, 114, 115, and 116 will be susceptible to flooding in ten years, some sooner than others.
- These low lying regions are susceptible to inundation with water from Black Lake and/or hurricane storm surges.
- The subsidence rate has decreased with time due to relatively high operating pressures of caverns and the decrease in creep closure of caverns with time.
- The subsidence at the site is projected to continue, however, if the cavern pressure is maintained at current levels, the subsidence rate can be expected to slightly decrease.

References

Osnes, J., 1995, “Update to subsidence analyses of SPR site for fiscal years 1993 and 1994," Re/Spec Topical Report RSI-0590 for DynMcdermott, published 3/95.

Ehgartner, B., 1992, “Effects of Cavern Spacing and Pressure on Subsidence and Storage Losses for the U.S. Strategic Petroleum Reserve“ SAND91-2575, Sandia National Laboratories, Albuquerque, NM.

Table 1

West Hackberry Elevation Data

January 1983-October 1996

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WEST HACKBERRY SUBSIDENCE MONITORING
ELEVATIONS (feet)

PT #	EAST	NORTH	JAN 83	AUG 83	FEB 84	MAR 85	SEP 86	DEC 87	OCT 88	JUL 90	MAY 91	JAN 92	JAN 93	MAY 94	FEB 95	Nov 95	Oct 96
			0	7	13	26	44	59	68	89	99	107	119	135	144	153	164
1	4496	19729	21.72	21.69	21.57	21.34	21.13	20.81	20.82	20.57	20.47	20.44	20.33	20.18	20.14	20.01	20.00
2	4535	19745	21.74	21.70	21.58	21.36	21.10	20.80	20.83	20.61	20.47	20.44	20.34	20.17	20.15	20.02	20.00
3	4411	20079	22.58	22.54	22.40	22.16	21.80	21.65	21.60	21.29	21.22	21.19	21.09	20.92	20.89	20.73	20.70
4	4410	20223	22.60	22.54	22.42	22.14	21.87	21.62	21.55	21.24	21.15	21.12	21.02	20.85	20.80	20.80	20.77
5	4318	20290	21.52	21.46	21.32	21.05	20.81	20.57	20.45	20.15	20.06	20.03	19.92	19.75	19.71	19.55	19.54
6	4311	20305	21.56	21.50	21.35	21.08	20.84	20.56	20.49	20.17	20.09	20.06	19.95	19.78	19.74	19.56	19.54
7	4425	20470	21.67	21.60	21.47	21.17	20.88	20.64	20.60	20.27	20.16	20.13	20.03	19.84	19.80	19.65	19.61
8	4522	20470	21.62	21.58	21.43	21.16	20.91	20.61	20.57	20.31	20.19	19.94	20.04	19.88	19.86	19.71	19.64
9	4590	20451	21.66	21.61	21.46	21.21	20.91	20.69	20.62	20.36	20.24	20.20	20.11	19.94	19.89	19.75	19.71
10	4606	20410	21.64	21.57	21.44	21.18	20.92	20.66	20.59	20.31	20.21	20.19	20.07	19.90	19.86	19.71	19.65
11	4885	20408	24.24	24.21	24.08	23.84	23.64	23.41	23.31	23.03	22.94	22.89	22.80	22.66	22.61	22.47	22.43
12	4885	20370	24.20	24.17	24.04	23.81	23.62	23.34	23.27	23.05	23.11	22.85	22.78	22.67	22.61	22.49	22.45
13	4874	20349	24.15	24.13	24.00	23.77	23.56	23.30	23.23	22.96	23.07	22.83	22.74	22.59	22.55	22.40	22.37
14	4824	20321	24.17	24.16	24.02	23.79	23.56	23.33	23.25	23.01	23.07	22.84	22.75	22.60	22.55	22.41	22.38
15	4874	20291	24.18	24.16	24.04	23.81	23.60	23.33	23.27	23.04	23.11	22.87	22.78	22.63	22.58	22.44	22.42
16	4824	20271	24.15	24.17	23.99	23.76	23.56	23.33	23.22	22.98	23.07	22.82	22.73	22.57	22.52	22.39	22.36
17	4773	20242	31.54	31.52	31.39	31.15	30.95	30.72	30.60	30.35	30.24	30.21	30.11	29.96	29.92	29.76	29.74
18	4880	20154	31.52	31.50	31.36	31.14	30.95	30.67	30.60	30.38	30.25	30.22	30.12	29.97	29.94	29.79	29.78
19	4880	20138	30.52	30.50	30.37	30.14	29.95	29.69	29.61	**30.32**	**29.26**	29.23	29.13	29.00	28.97	28.82	28.79
20	4773	20050	30.51	30.48	30.36	#N/A	29.95	29.68	29.64	29.41	#N/A	29.22	29.13	29.03	28.94	28.84	28.82
21	4880	19996	24.13	24.11	23.97	23.74	23.57	23.30	23.25	22.98	22.90	22.87	22.78	22.64	22.61	22.46	22.44
22	4824	19962	24.06	24.04	23.90	23.66	23.48	23.21	23.17	22.90	22.82	22.78	22.69	22.55	22.52	22.38	22.35
23	4880	19926	24.10	24.08	23.95	23.72	23.54	23.28	23.24	22.98	22.89	22.85	22.76	22.62	22.59	22.44	22.42
24	4824	19892	24.08	24.06	23.92	23.69	23.52	23.22	23.20	22.95	22.84	22.81	22.71	22.58	22.56	22.42	22.39
25	5480	19770	24.59	24.58	24.46	24.24	24.06	23.78	23.69	23.36	23.35	23.31	23.21	23.08	23.06	**23.94**	**22.91**
26	4920	20128	24.66	24.68	#N/A	#N/A	24.05	23.84	23.78	23.57	#N/A	23.87	#N/A	#N/A	#N/A	#N/A	#N/A
27	5480	20489	24.29	24.23	24.11	23.87	23.63	23.33	23.26	22.94	22.87	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
29	4552	21183	18.73	18.69	18.54	18.28	17.95	17.68	17.61	17.32	17.47	17.20	17.07	16.90	16.83	16.69	16.64
31	4551	21039	19.08	19.04	18.89	18.62	18.31	18.01	17.97	17.66	17.64	17.47	17.42	17.25	17.19	17.05	17.01
33	4553	20824	18.19	18.13	17.98	17.71	17.43	17.14	17.09	16.82	17.02	16.75	16.54	16.38	16.32	16.18	16.12
35	4509	20823	19.04	18.98	18.84	18.56	18.27	17.98	17.93	17.66	17.75	17.45	17.38	17.21	17.15	17.00	16.96
37	4508	21039	18.70	18.67	18.51	18.25	17.91	17.64	17.58	17.28	17.24	17.18	17.04	16.87	16.80	16.66	16.62
39	4508	21189	18.68	18.64	18.49	18.23	17.91	17.64	17.55	17.26	17.23	17.05	17.00	16.83	16.77	16.62	16.59
WH6	4959	22434	6.00	5.95	5.83	5.63	5.30	5.12	4.98	**4.46**	4.65	4.64	4.53	4.39	4.35	4.19	4.20

WEST HACKBERRY SUBSIDENCE MONITORING
ELEVATIONS (feet)

PT #	EAST	NORTH	JAN 83	AUG 83	FEB 84	MAR 85	SEP 86	DEC 87	OCT 88	JUL 90	MAY 91	JAN 92	JAN 93	MAY 94	FEB 95	Nov 95	Oct 96
			0	7	13	26	44	59	68	89	99	107	119	135	144	153	164
WH6A	4959	22298	8.69	8.66	8.53	8.34	8.00	7.77	7.67	**6.45**	**7.30**	7.31	7.20	7.09	7.06	6.88	6.86
WH6B	5109	22343	6.16	6.14	6.01	5.83	5.54	5.33	5.19	**4.62**	4.87	4.85	4.76	4.65	4.62	4.45	4.43
WH6C	4806	22343	6.28	6.24	6.11	5.90	5.55	5.33	5.19	**4.61**	4.83	4.82	4.71	4.59	4.54	4.38	4.36
WH7	6084	22031	#N/A	5.88	5.78	5.64	5.46	5.24	5.23	**4.70**	5.00	4.98	4.93	4.87	4.87	4.73	4.70
WH7A	6084	22104	#N/A	5.08	4.94	4.87	4.54	4.36	4.32	**6.32**	6.56	**4.09**	4.00	3.98	3.98	3.85	3.82
WH7B	6134	22019	#N/A	5.04	4.90	4.89	4.59	4.40	4.37	**6.38**	6.62	**4.16**	4.08	4.04	4.02	3.89	3.85
WH8	5282	21308	14.42	14.41	14.29	14.09	13.86	13.85	13.80	**15.88**	16.10	**13.44**	13.08	12.97	12.94	12.77	12.74
WH8A	5329	21324	14.04	14.03	13.90	13.71	13.42	13.19	13.15	**15.05**	**15.61**	**12.79**	12.70	12.56	12.54	12.38	12.35
WH8B	5377	21342	14.05	14.07	13.93	13.74	13.48	13.35	13.18	**15.07**	**15.66**	**12.86**	12.76	12.65	12.60	12.45	12.42
WH9	4820	21727	14.70	14.66	14.52	14.29	13.94	**13.31**	13.61	**12.98**	13.23	13.15	13.10	**11.43**	11.37	11.19	11.15
WH9A	4761	21583	#N/A	12.45	12.29	12.08	11.71	12.24	**11.38**	**13.22**	13.42	**10.96**	10.85	10.70	10.67	10.51	10.47
WH9B	4695	21716	#N/A	11.85	11.68	11.48	11.10	11.50	**10.75**	**12.64**	12.82	**10.33**	10.23	10.11	10.08	9.86	9.84
WH11	5109	18925	10.89	10.88	10.80	10.62	10.50	10.37	10.26	**12.45**	12.37	**10.24**	9.88	9.91	9.86	9.66	9.68
WH11A	5108	18975	12.16	12.16	12.08	11.89	11.77	11.66	11.54	**13.57**	13.77	**11.25**	11.22	11.13	11.11	11.41	11.41
WH11B	5112	18877	13.16	13.16	13.09	12.91	12.79	12.67	12.57	12.37	**13.45**	**12.33**	12.21	12.18	12.10	12.00	11.97
WH101	3966	20292	19.75	19.68	19.51	19.26	18.96	18.76	18.65	**17.90**	18.22	18.16	18.07	17.93	17.82	17.69	17.64
WH102	3344	20641	17.06	#N/A	16.78	16.47	16.16	15.90	15.80	**14.98**	15.34	15.29	15.18	15.02	14.91	14.78	14.73
WH103	3959	21015	17.12	17.04	16.89	16.58	16.14	16.07	15.91	**15.11**	15.45	15.41	15.29	15.12	15.04	14.92	14.84
WH104	3335	19891	18.74	#N/A	18.48	18.27	18.01	17.77	17.69	**16.94**	17.28	17.23	17.14	16.98	16.89	16.76	16.71
WH105	3958	19515	18.67	18.66	18.49	18.27	18.04	17.81	17.72	**17.02**	17.35	17.33	17.25	17.14	16.96	16.92	16.89
WH106	3259	19140	#N/A	17.17	17.05	16.77	16.62	16.41	16.29	16.08	15.94	15.92	15.85	15.71	15.63	15.54	15.49
WH107	3350	21390	15.84	15.73	15.50	15.15	14.82	14.54	14.41	**13.61**	13.96	13.90	13.79	13.62	13.53	13.40	13.48
WH108	4764	18186	8.02	8.01	7.92	7.76	7.71	7.56	7.48	**6.87**	7.26	7.25	7.25	#N/A	7.08	7.04	7.00
WH109	3960	21765	10.61	10.48	10.27	9.98	9.73	9.40	9.24	9.29	**8.78**	8.75	8.63	8.47	8.41	8.22	8.19
WH110	3958	22515	7.98	7.91	7.69	7.38	7.11	6.81	6.67	**5.89**	6.24	6.23	6.10	5.96	5.93	5.73	5.69
WH111	3309	22870	8.08	8.04	7.85	#N/A	7.27	6.94	6.81	**6.05**	6.39	6.40	6.26	6.12	6.09	5.94	5.89
WH112	5514	18186	#N/A	8.48	8.31	8.14	8.11	7.99	7.92	**7.37**	7.75	7.74	7.75	7.64	7.60	7.56	7.56
WH113	2660	22502	7.45	7.43	**7.17**	6.81	6.51	6.28	6.11	**5.31**	5.66	5.61	5.49	5.37	5.29	#N/A	5.09
WH114	2660	21765	7.37	7.34	**7.06**	6.71	6.43	6.19	6.02	5.66	5.54	5.49	5.36	5.20	5.14	4.93	4.94
WH115	3307	22139	9.15	9.07	8.87	8.43	8.10	7.79	7.62	**6.80**	7.13	7.09	6.99	6.82	6.77	6.59	6.54
WH116	1911	21821	#N/A	8.01	7.83	7.49	7.25	7.00	6.88	**6.15**	6.44	6.39	6.30	6.14	6.08	5.96	5.91
WH117A	4230	18680	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	12.62	**12.06**	12.34	12.31	12.27	12.14	12.10	12.02	11.98
WH117B	4230	18680	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	12.67	**12.09**	12.39	12.36	12.31	12.18	12.15	12.05	12.01
BM1	4900	18641	10.61	10.60	10.53	10.35	10.23	10.03	9.98	9.85	9.76	9.75	9.67	9.58	9.58	9.48	9.45

WEST HACKBERRY SUBSIDENCE MONITORING
ELEVATIONS (feet)

PT #	EAST	NORTH	JAN 83	AUG 83	FEB 84	MAR 85	SEP 86	DEC 87	OCT 88	JUL 90	MAY 91	JAN 92	JAN 93	MAY 94	FEB 95	Nov 95	Oct 96
			0	7	13	26	44	59	68	89	99	107	119	135	144	153	164
BM3	4840	20600	18.14	18.11	17.98	17.74	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
BM4	4400	20600	18.83	18.76	18.62	18.35	18.11	17.84	17.74	17.45	#N/A	17.29	#N/A	#N/A	#N/A	#N/A	#N/A
BM5	4900	21300	16.16	16.11	15.97	15.75	15.45	15.22	15.11	14.86	14.75	14.73	14.63	14.47	14.44	14.26	14.22
BM7A	4900	22100	7.79	#N/A	7.62	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	6.34	#N/A	#N/A
BM8	4435	19308	17.48	17.45	17.34	17.12	16.94	16.70	16.66	16.41	#N/A	#N/A	#N/A	16.08	16.05	15.93	15.89
BM9	4395	19798	20.49	#N/A	20.31	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
BM11	4584	18978	12.40	12.39	12.30	12.09	11.94	11.77	11.68	11.46	11.39	11.38	11.31	11.17	11.16	11.04	11.01
BM12	3579	18978	16.31	16.29	16.19	15.96	15.80	15.60	15.51	15.32	15.20	15.19	15.12	14.98	14.94	14.82	14.77
BM13	3579	19758	23.50	23.45	23.33	23.19	22.94	22.70	22.60	22.30	22.22	22.19	22.09	21.94	21.86	21.73	21.68
BM14	3579	20399	19.05	18.98	18.85	18.55	18.27	18.01	17.92	17.60	17.49	17.45	17.34	17.18	17.09	16.95	16.90
BM15	3579	21300	17.49	17.39	17.25	16.89	16.57	16.33	16.19	15.83	15.73	15.69	15.57	15.39	15.32	15.16	15.10
SMS1	5035	18210	10.11	10.11	10.04	9.88	9.80	9.67	9.60	9.45	9.43	9.42	9.41	9.28	9.26	#N/A	9.18
SMS2	4956	19731	19.08	19.05	18.93	18.70	18.53	18.22	18.23	17.98	17.90	17.90	#N/A	17.64	17.61	17.48	17.44
SMS3	6338	21696	3.51	3.54	3.45	#N/A	3.19	3.01	2.98	2.84	2.79	2.79	2.73	2.66	2.66	2.50	2.48
SMS4	4876	21830	8.03	8.01	7.88	7.67	7.30	7.10	6.98	6.71	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
SMS5	1727	22103	6.65	6.63	6.47	6.16	5.94	5.66	5.57	5.29	5.19	5.13	#N/A	#N/A	#N/A	#N/A	#N/A
SMS6	3522	20961	17.08	16.99	16.85	16.54	16.22	15.99	15.86	16.06	**15.40**	15.36	15.24	15.07	14.98	14.82	14.75
SMS7	3372	19379	21.33	21.28	21.17	20.91	20.73	20.50	20.42	20.22	20.07	20.04	19.97	#N/A	#N/A	#N/A	#N/A
P8	NA	NA	#N/A	18.31	18.18	17.98	17.67	17.38	17.38	16.99	17.05	17.02	16.93	16.80	16.77	16.60	16.55
P9	NA	NA	#N/A	18.22	18.08	17.83	17.49	17.18	17.14	16.85	16.74	16.71	16.60	16.45	16.40	16.22	16.17
PB1	NA	NA	#N/A	16.69	16.56	16.37	#N/A	15.94	16.11	24.05	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
P11	NA	NA	#N/A	13.78	13.71	13.54	13.37	13.18	13.14	12.98	12.87	12.86	12.77	12.74	12.66	12.54	12.50
1	5578	17903	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	9.67	9.67	9.66	9.67	9.56	9.55	9.50	9.48
2	5362	18209	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	5.72	5.67	5.66	5.67	5.54	5.52	5.46	5.45
3	4829	18208	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	7.60	**5.34**	5.32	5.32	5.18	5.16	5.09	5.08
4	4562	18619	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	10.91	10.83	10.83	10.77	10.65	10.62	10.53	10.50
5	4289	18760	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	10.02	9.94	9.93	9.86	9.74	9.71	9.60	9.56
6	4072	19158	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	13.96	13.94	13.87	13.72	13.67	13.56	13.52
7	3741	19442	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	19.60	19.47	19.44	19.36	19.21	19.14	19.02	18.97
8	3409	19187	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	16.88	16.73	16.71	16.63	16.48	16.43	16.31	16.27
9	3880	19452	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	15.56	15.46	15.44	15.35	15.21	15.15	15.01	14.98
10	3679	19837	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	20.17	20.14	20.04	19.88	19.81	19.67	19.63
11	3411	19847	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	15.14	15.03	15.00	14.90	14.74	14.67	14.53	14.49
12	3881	20211	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	16.32	16.19	16.16	**15.06**	**15.91**	15.83	15.68	15.64

WEST HACKBERRY SUBSIDENCE MONITORING
ELEVATIONS (feet)

PT #	EAST	NORTH	JAN 83	AUG 83	FEB 84	MAR 85	SEP 86	DEC 87	OCT 88	JUL 90	MAY 91	JAN 92	JAN 93	MAY 94	FEB 95	Nov 95	Oct 96
			0	7	13	26	44	59	68	89	99	107	119	135	144	153	164
13	3414	20600	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	13.14	13.02	12.99	12.87	12.71	12.61	12.48	12.43
14	3727	20710	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	15.72	15.61	15.56	15.47	15.28	15.19	**16.58**	16.51
15	3884	20974	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	13.26	13.13	13.10	12.98	12.81	12.73	12.58	12.53
16	3425	21352	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	11.96	11.84	11.80	11.68	11.51	11.43	11.28	11.22
17	3715	21354	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	14.85	14.74	14.70	14.59	14.42	14.34	14.17	14.12
18	3881	21704	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	7.16	7.05	7.03	6.89	6.74	6.67	6.49	6.46
19	3701	21928	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	10.96	11.05	11.02	10.89	10.73	10.67	10.48	10.44
20	3881	22453	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	3.84	**3.74**	3.37	3.60	3.45	3.43	3.23	3.19
21	3513	22356	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	4.50	4.41	4.39	4.25	4.10	4.06	3.88	3.84
22	3268	22209	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	5.03	4.93	4.90	4.77	4.61	4.57	4.40	4.34
23	3267	22505	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	4.10	3.99	3.97	3.83	3.69	3.64	3.48	3.43
24	3248	22789	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	3.98	3.88	3.87	3.73	3.60	3.56	3.40	3.36
25	2959	22340	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	2.71	2.64	2.61	2.47	2.32	2.29	2.11	2.05
26	2721	22420	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	3.37	3.30	3.26	3.13	3.00	2.96	#N/A	2.74
27	2702	21841	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	4.50	4.40	4.36	4.23	4.08	4.02	3.84	3.80
28	2376	22336	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	3.06	2.97	2.93	2.81	2.67	2.64	2.47	2.44
29	1882	22343	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	3.33	3.25	3.20	3.09	2.96	2.95	2.79	2.76
30	1852	21906	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	4.04	3.90	3.86	3.75	3.61	3.57	3.42	3.39
31	5585	18458	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	8.70	8.64	8.64	8.60	8.51	8.50	8.43	8.41
32	5546	19062	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	10.96	10.94	10.94	10.89	10.78	10.79	10.67	10.65
33	5165	19419	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	15.86	15.81	15.80	15.74	15.66	15.59	15.46	15.44
34	4897	19674	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	18.42	18.36	18.32	18.24	18.10	18.08	17.94	17.91
35	4670	19943	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	18.13	18.07	18.03	17.94	17.80	17.75	17.61	17.58
36	4668	20336	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	17.63	17.53	17.49	17.40	17.24	17.20	17.05	17.02
37	4857	20439	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	16.84	16.74	16.70	16.61	16.46	16.41	16.27	16.23
38	4640	20711	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	16.60	16.47	16.44	16.35	16.18	16.13	15.99	15.95
39	4642	21103	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	15.05	14.94	14.91	14.81	14.65	14.59	14.45	14.40
40	4295	21373	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	15.47	15.21	15.18	15.06	14.90	14.85	14.67	14.63
41	4307	21974	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	9.67	9.53	9.52	9.40	9.25	9.20	9.02	8.99
42	4315	22367	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	7.48	7.35	7.34	7.23	7.09	7.05	6.87	6.84
43	4468	22397	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	6.85	6.73	6.72	6.61	6.48	6.45	6.26	6.24
44	5113	22281	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	4.38	4.27	4.26	4.17	4.05	4.03	3.85	3.83
45	5045	21937	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	9.53	9.43	9.41	9.32	9.19	9.15	8.98	8.95
46	4693	21855	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	11.75	11.68	11.66	11.55	11.41	11.37	11.19	11.15

WEST HACKBERRY SUBSIDENCE MONITORING
ELEVATIONS (feet)

PT #	EAST	NORTH	JAN 83	AUG 83	FEB 84	MAR 85	SEP 86	DEC 87	OCT 88	JUL 90	MAY 91	JAN 92	JAN 93	MAY 94	FEB 95	Nov 95	Oct 96
			0	7	13	26	44	59	68	89	99	107	119	135	144	153	164
47	5514	21859	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	8.75	8.71	8.69	8.61	8.51	8.49	8.33	8.29
48	5862	21926	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	5.86	5.78	5.78	5.70	5.62	5.60	5.46	5.43
49	5174	21395	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	13.07	12.99	12.96	12.86	12.73	12.70	12.53	12.50
50	5524	20610	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	16.11	16.05	16.05	15.95	15.82	15.80	15.66	15.62
51	5232	20536	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	19.17	19.14	19.13	19.04	18.89	18.85	18.70	18.66
52	5578	20203	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	13.62	13.58	13.59	13.50	13.37	13.34	13.22	13.20
53	5574	19863	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	15.44	15.38	15.37	15.29	15.16	14.99	15.03	15.01
54	5566	19492	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	15.18	15.16	15.15	15.08	14.97	14.96	14.84	14.83
55	5576	20131	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	14.23	14.20	14.20	14.11	13.98	13.96	13.83	13.82
56	5576	20808	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	13.51	13.49	13.49	13.38	13.27	13.25	13.11	13.07
57	4311	20784	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	16.41	16.13	16.10	15.99	15.82	15.76	15.60	15.56
58	4312	21143	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	15.12	15.00	14.97	14.85	14.69	14.63	14.66	14.41
59	4989	19018	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	12.08	12.01	12.01	11.91	11.88	11.80	11.70	11.67
60	3818	17981	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	6.58	6.56	6.49	6.45
61	4023	18856	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	12.61	12.57	12.47	12.42
62	2973	18856	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	15.57	15.54	15.42	15.38
63	3109	20252	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	15.90	15.83	15.68	15.64
64	3106	21439	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	14.69	14.62	14.46	14.40
65	1651	21443	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	7.07	7.04	6.89	6.87
66	1723	22695	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	2.00	1.99	1.83	1.82
67	3129	22732	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	2.26	2.22	2.05	2.01
68	3802	22716	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	1.74	1.72	1.53	1.49
69	4692	22538	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	4.53	4.51	4.32	4.30
70	6003	22258	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	2.20	2.19	2.05	2.03
71	6320	22264	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	2.81	2.81	2.68	2.65
72	6735	21066	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	2.99	2.99	2.89	2.88
73	5585	21051	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	11.43	11.41	11.25	11.22

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Table 2

West Hackberry Calculated Subsidence and Subsidence Rate Data

January 1983-October 1996

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WEST HACKBERRY SUBSIDENCE RATE (ft/yr)

PT #	east	north	DELTA (0-7) AUG 83	0.58 RATE
1	4496	19728.6	-0.03	-0.05
2	4535	19744.8	-0.04	-0.07
3	4411	20079.1	-0.04	-0.07
4	4410	20222.5	-0.06	-0.10
5	4318	20289.5	-0.06	-0.10
6	4311	20304.8	-0.06	-0.10
7	4425	20470.1	-0.07	-0.12
8	4522	20470.2	-0.04	-0.07
9	4590	20450.8	-0.05	-0.09
10	4606	20410.1	-0.07	-0.12
11	4885	20407.9	-0.03	-0.05
12	4885	20369.8	-0.03	-0.05
13	4874	20349	-0.02	-0.03
14	4824	20320.8	-0.01	-0.02
15	4874	20291	-0.02	-0.03
16	4824	20270.6	0.02	0.03
17	4773	20242.1	-0.02	-0.03
18	4880	20154	-0.02	-0.03
19	4880	20138.1	-0.02	-0.03
20	4773	20049.9	-0.03	-0.05
21	4880	19996.2	-0.02	-0.03
22	4824	19961.8	-0.02	-0.03
23	4880	19926.2	-0.02	-0.03
24	4824	19891.8	-0.02	-0.03
25	5480	19770.2	-0.01	-0.02
26	4920	20127.9	0.02	0.03
27	5480	20488.8	-0.06	-0.10
29	4552	21183.4	-0.04	-0.07
31	4551	21039	-0.04	-0.07
33	4553	20823.8	-0.06	-0.10
35	4509	20823.4	-0.06	-0.10
37	4508	21038.9	-0.03	-0.05
39	4508	21188.8	-0.04	-0.07
WH6	4959	22433.8	-0.05	-0.09
WH6A	4959	22298.3	-0.03	-0.05
WH6B	5109	22343	-0.02	-0.03
WH6C	4806	22343.1	-0.04	-0.07
WH7	5282	21308	-0.01	-0.02
WH8A	5329	21324.3	-0.01	-0.02
WH8B	5377	21341.7	0.02	0.03

PT #	east	north	DELTA (7-13) FEB 84	0.5 RATE
1	4496	19728.6	-0.12	-0.24
2	4535	19744.8	-0.12	-0.24
3	4411	20079.1	-0.14	-0.28
4	4410	20222.5	-0.12	-0.24
5	4318	20289.5	-0.14	-0.28
6	4311	20304.8	-0.15	-0.30
7	4425	20470.1	-0.13	-0.26
8	4522	20470.2	-0.15	-0.30
9	4590	20450.8	-0.15	-0.30
10	4606	20410.1	-0.13	-0.26
11	4885	20407.9	-0.13	-0.26
12	4885	20369.8	-0.13	-0.26
13	4874	20349	-0.13	-0.26
14	4824	20320.8	-0.14	-0.28
15	4874	20291	-0.12	-0.24
16	4824	20270.6	-0.18	-0.36
17	4773	20242.1	-0.13	-0.26
18	4880	20154	-0.14	-0.28
19	4880	20138.1	-0.13	-0.26
20	4773	20049.9	-0.12	-0.24
21	4880	19996.2	-0.14	-0.28
22	4824	19961.8	-0.14	-0.28
23	4880	19926.2	-0.13	-0.26
24	4824	19891.8	-0.14	-0.28
25	5480	19770.2	-0.12	-0.24
27	5480	20488.8	-0.12	-0.24
29	4552	21183.4	-0.15	-0.30
31	4551	21039	-0.15	-0.30
33	4553	20823.8	-0.15	-0.30
35	4509	20823.4	-0.14	-0.28
37	4508	21038.9	-0.16	-0.32
39	4508	21188.8	-0.15	-0.30
WH6	4959	22433.8	-0.12	-0.24
WH6A	4959	22298.3	-0.13	-0.26
WH6B	5109	22343	-0.13	-0.26
WH6C	4806	22343.1	-0.13	-0.26
WH7	6084	22031.2	-0.10	-0.20
WH7A	6084	22104	-0.14	-0.28
WH7B	6134	22019.4	-0.14	-0.28
WH8	5282	21308	-0.12	-0.24

PT #	east	north	DELTA (13-26) MAR 85	1.08 RATE
1	4496	19728.6	-0.23	-0.21
2	4535	19744.8	-0.22	-0.20
3	4411	20079.1	-0.24	-0.22
4	4410	20222.5	-0.28	-0.26
5	4318	20289.5	-0.27	-0.25
6	4311	20304.8	-0.27	-0.25
7	4425	20470.1	-0.30	-0.28
8	4522	20470.2	-0.27	-0.25
9	4590	20450.8	-0.25	-0.23
10	4606	20410.1	-0.26	-0.24
11	4885	20407.9	-0.24	-0.22
12	4885	20369.8	-0.23	-0.21
13	4874	20349	-0.23	-0.21
14	4824	20320.8	-0.23	-0.21
15	4874	20291	-0.23	-0.21
16	4824	20270.6	-0.23	-0.21
17	4773	20242.1	-0.24	-0.22
18	4880	20154	-0.22	-0.20
19	4880	20138.1	-0.23	-0.21
21	4880	19996.2	-0.23	-0.21
22	4824	19961.8	-0.24	-0.22
23	4880	19926.2	-0.23	-0.21
24	4824	19891.8	-0.23	-0.21
25	5480	19770.2	-0.22	-0.20
27	5480	20488.8	-0.24	-0.22
29	4552	21183.4	-0.26	-0.24
31	4551	21039	-0.27	-0.25
33	4553	20823.8	-0.27	-0.25
35	4509	20823.4	-0.28	-0.26
37	4508	21038.9	-0.26	-0.24
39	4508	21188.8	-0.26	-0.24
WH6	4959	22433.8	-0.20	-0.18
WH6A	4959	22298.3	-0.19	-0.18
WH6B	5109	22343	-0.18	-0.17
WH6C	4806	22343.1	-0.21	-0.19
WH7	6084	22031.2	-0.14	-0.13
WH7A	6084	22104	-0.07	-0.06
WH7B	6134	22019.4	-0.01	-0.01
WH8	5282	21308	-0.20	-0.18
WH8A	5329	21324.3	-0.19	-0.18

WEST HACKBERRY SUBSIDENCE RATE (ft/yr) , (cont.)

PT #	east	north	DELTA (0-7) AUG 83	0.58333 RATE
WH9	4820	21727	-0.04	-0.07
WH9A	5109	18925.1	-0.01	-0.02
WH11A	5108	18974.5	0.00	0.00
WH11B	5112	18876.8	0.00	0.00
WH101	3966	20291.5	-0.07	-0.12
WH103	3959	21015.3	-0.08	-0.14
WH105	3958	19515.4	-0.01	-0.02
WH107	3350	21390.2	-0.11	-0.19
WH108	4764	18186	-0.01	-0.02
WH109	3960	21764.5	-0.13	-0.22
WH110	3958	22514.5	-0.07	-0.12
WH111	3309	22870.1	-0.04	-0.07
WH113	2660	22501.6	-0.02	-0.03
WH114	2660	21764.6	-0.03	-0.05
WH115	3307	22139.3	-0.08	-0.14
BM1	4900	18640.6	-0.01	-0.02
BM3	4840	20599.9	-0.03	-0.05
BM4	4400	20600	-0.07	-0.12
BM5	4900	21300.1	-0.05	-0.09
BM8	4435	19308.1	-0.03	-0.05
BM11	4584	18977.7	-0.01	-0.02
BM12	3579	18977.9	-0.02	-0.03
BM13	3579	19758	-0.05	-0.09
BM14	3579	20398.6	-0.07	-0.12
BM15	3579	21300	-0.10	-0.17
SMS1	5035	18209.9	0.00	0.00
SMS2	4956	19731.1	-0.03	-0.05
SMS3	6338	21695.5	0.03	0.05
SMS4	4876	21829.9	-0.02	-0.03
SMS5	1727	22103.2	-0.02	-0.03
SMS6	3522	20960.9	-0.09	-0.15
SMS7	3372	19379.4	-0.05	-0.09

PT #	east	north	DELTA (7-13) FEB 84	0.5 RATE
WH8A	5329	21324.3	-0.13	-0.26
WH8B	5377	21341.7	-0.14	-0.28
WH9	4820	21727	-0.14	-0.28
WH9A	4761	21583.4	-0.16	-0.32
WH9B	4695	21716.1	-0.17	-0.34
WH11	5109	18925.1	-0.08	-0.16
WH11A	5108	18974.5	-0.08	-0.16
WH11B	5112	18876.8	-0.07	-0.14
WH101	3966	20291.5	-0.17	-0.34
WH103	3959	21015.3	-0.15	-0.30
WH105	3958	19515.4	-0.17	-0.34
WH106	3259	19139.5	-0.12	-0.24
WH107	3350	21390.2	-0.23	-0.46
WH108	4764	18186	-0.09	-0.18
WH109	3960	21764.5	-0.21	-0.42
WH110	3958	22514.5	-0.22	-0.44
WH111	3309	22870.1	-0.19	-0.38
WH112	5514	18185.7	-0.17	-0.34
WH113	**2660**	**22501.6**	**-0.26**	**-0.52**
WH114	**2660**	**21764.6**	**-0.28**	**-0.56**
WH115	3307	22139.3	-0.20	-0.40
WH116	1911	21820.5	-0.18	-0.36
BM1	4900	18640.6	-0.07	-0.14
BM3	4840	20599.9	-0.13	-0.26
BM4	4400	20600	-0.14	-0.28
BM5	4900	21300.1	-0.14	-0.28
BM8	4435	19308.1	-0.11	-0.22
BM11	4584	18977.7	-0.09	-0.18
BM12	3579	18977.9	-0.10	-0.20
BM13	3579	19758	-0.12	-0.24
BM14	3579	20398.6	-0.13	-0.26
BM15	3579	21300	-0.14	-0.28
SMS1	5035	18209.9	-0.07	-0.14
SMS2	4956	19731.1	-0.12	-0.24
SMS3	6338	21695.5	-0.09	-0.18
SMS4	4876	21829.9	-0.13	-0.26
SMS5	1727	22103.2	-0.16	-0.32
SMS6	3522	20960.9	-0.14	-0.28
SMS7	3372	19379.4	-0.11	-0.22

PT #	east	north	DELTA (13-26) MAR 85	1.08333 RATE
WH8B	5377	21341.7	-0.19	-0.18
WH9	4820	21727	-0.23	-0.21
WH9A	4761	21583.4	-0.21	-0.19
WH9B	4695	21716.1	-0.20	-0.18
WH11	5109	18925.1	-0.18	-0.17
WH11A	5108	18974.5	-0.19	-0.18
WH11B	5112	18876.8	-0.18	-0.17
WH101	3966	20291.5	-0.25	-0.23
WH102	3344	20640.5	-0.31	-0.29
WH103	3959	21015.3	-0.31	-0.29
WH104	3335	19890.7	-0.21	-0.19
WH105	3958	19515.4	-0.22	-0.20
WH106	3259	19139.5	-0.28	-0.26
WH107	3350	21390.2	-0.35	-0.32
WH108	4764	18186	-0.16	-0.15
WH109	3960	21764.5	-0.29	-0.27
WH110	3958	22514.5	-0.31	-0.29
WH112	5514	18185.7	-0.17	-0.16
WH113	2660	22501.6	-0.36	-0.33
WH114	2660	21764.6	-0.35	-0.32
WH115	3307	22139.3	-0.44	-0.41
WH116	1911	21820.5	-0.34	-0.31
BM1	4900	18640.6	-0.18	-0.17
BM3	4840	20599.9	-0.24	-0.22
BM4	4400	20600	-0.27	-0.25
BM5	4900	21300.1	-0.22	-0.20
BM8	4435	19308.1	-0.22	-0.20
BM11	4584	18977.7	-0.21	-0.19
BM12	3579	18977.9	-0.23	-0.21
BM13	3579	19758	-0.14	-0.13
BM14	3579	20398.6	-0.30	-0.28
BM15	3579	21300	-0.36	-0.33
SMS1	5035	18209.9	-0.16	-0.15
SMS2	4956	19731.1	-0.23	-0.21
SMS4	4876	21829.9	-0.21	-0.19
SMS5	1727	22103.2	-0.31	-0.29
SMS6	3522	20960.9	-0.31	-0.29
SMS7	3372	19379.4	-0.26	-0.24

WEST HACKBERRY SUBSIDENCE RATE (ft/yr)

PT #	east	north	DELTA (26-44) SEP 86	1.5 RATE
1	4496	19728.6	-0.21	-0.14
2	4535	19744.8	-0.26	-0.17
3	4411	20079.1	-0.36	-0.24
4	4410	20222.5	-0.27	-0.18
5	4318	20289.5	-0.24	-0.16
6	4311	20304.8	-0.24	-0.16
7	4425	20470.1	-0.29	-0.19
8	4522	20470.2	-0.25	-0.17
9	4590	20450.8	-0.30	-0.20
10	4606	20410.1	-0.26	-0.17
11	4885	20407.9	-0.20	-0.13
12	4885	20369.8	-0.19	-0.13
13	4874	20349	-0.21	-0.14
14	4824	20320.8	-0.23	-0.15
15	4874	20291	-0.21	-0.14
16	4824	20270.6	-0.20	-0.13
17	4773	20242.1	-0.20	-0.13
18	4880	20154	-0.19	-0.13
19	4880	20138.1	-0.19	-0.13
21	4880	19996.2	-0.17	-0.11
22	4824	19961.8	-0.18	-0.12
23	4880	19926.2	-0.18	-0.12
24	4824	19891.8	-0.17	-0.11
25	5480	19770.2	-0.18	-0.12
27	5480	20488.8	-0.24	-0.16
29	4552	21183.4	-0.33	-0.22
31	4551	21039	-0.31	-0.21
33	4553	20823.8	-0.28	-0.19
35	4509	20823.4	-0.29	-0.19
37	4508	21038.9	-0.34	-0.23
39	4508	21188.8	-0.32	-0.21
WH6	4959	22433.8	-0.33	-0.22
WH6A	4959	22298.3	-0.34	-0.23
WH6B	5109	22343	-0.29	-0.19
WH6C	4806	22343.1	-0.35	-0.23
WH7	6084	22031.2	-0.18	-0.12
WH7A	6084	22104	-0.33	-0.22
WH7B	6134	22019.4	-0.30	-0.20
WH8	5282	21308	-0.23	-0.15
WH8A	5329	21324.3	-0.29	-0.19

PT #	east	north	DELTA (44-59) DEC 87	1.25 RATE
1	4496	19728.6	-0.32	-0.25
2	4535	19744.8	-0.30	-0.24
3	4411	20079.1	-0.15	-0.12
4	4410	20222.5	-0.25	-0.20
5	4318	20289.5	-0.24	-0.19
6	4311	20304.8	-0.28	-0.22
7	4425	20470.1	-0.24	-0.19
8	4522	20470.2	-0.30	-0.24
9	4590	20450.8	-0.22	-0.17
10	4606	20410.1	-0.26	-0.21
11	4885	20407.9	-0.23	-0.18
12	4885	20369.8	-0.28	-0.22
13	4874	20349	-0.26	-0.21
14	4824	20320.8	-0.23	-0.18
15	4874	20291	-0.27	-0.21
16	4824	20270.6	-0.23	-0.18
17	4773	20242.1	-0.23	-0.18
18	4880	20154	-0.28	-0.22
19	4880	20138.1	-0.26	-0.21
20	4773	20049.9	-0.27	-0.21
21	4880	19996.2	-0.27	-0.21
22	4824	19961.8	-0.27	-0.21
23	4880	19926.2	-0.26	-0.21
24	4824	19891.8	-0.30	-0.24
25	5480	19770.2	-0.28	-0.22
26	4920	20127.9	-0.21	-0.17
27	5480	20488.8	-0.30	-0.24
29	4552	21183.4	-0.27	-0.21
31	4551	21039	-0.30	-0.24
33	4553	20823.8	-0.29	-0.23
35	4509	20823.4	-0.29	-0.23
37	4508	21038.9	-0.27	-0.21
39	4508	21188.8	-0.27	-0.21
WH6	4959	22433.8	-0.18	-0.14
WH6A	4959	22298.3	-0.23	-0.18
WH6B	5109	22343	-0.21	-0.17
WH6C	4806	22343.1	-0.22	-0.17
WH7	6084	22031.2	-0.22	-0.17
WH7A	6084	22104	-0.18	-0.14
WH7B	6134	22019.4	-0.19	-0.15

PT #	east	north	DELTA (59-68) OCT 88	0.92 RATE
1	4496	19728.6	0.01	0.01
2	4535	19744.8	0.03	0.03
3	4411	20079.1	-0.05	-0.06
4	4410	20222.5	-0.07	-0.08
5	4318	20289.5	-0.12	-0.13
6	4311	20304.8	-0.07	-0.08
7	4425	20470.1	-0.04	-0.05
8	4522	20470.2	-0.04	-0.05
9	4590	20450.8	-0.07	-0.08
10	4606	20410.1	-0.07	-0.08
11	4885	20407.9	-0.10	-0.11
12	4885	20369.8	-0.07	-0.08
13	4874	20349	-0.07	-0.08
14	4824	20320.8	-0.08	-0.09
15	4874	20291	-0.06	-0.07
16	4824	20270.6	-0.11	-0.12
17	4773	20242.1	-0.12	-0.13
18	4880	20154	-0.07	-0.08
19	4880	20138.1	-0.08	-0.09
20	4773	20049.9	-0.04	-0.05
21	4880	19996.2	-0.05	-0.06
22	4824	19961.8	-0.04	-0.05
23	4880	19926.2	-0.04	-0.05
24	4824	19891.8	-0.02	-0.03
25	5480	19770.2	-0.09	-0.10
26	4920	20127.9	-0.06	-0.07
27	5480	20488.8	-0.07	-0.08
29	4552	21183.4	-0.07	-0.08
31	4551	21039	-0.04	-0.05
33	4553	20823.8	-0.05	-0.06
35	4509	20823.4	-0.05	-0.06
37	4508	21038.9	-0.06	-0.07
39	4508	21188.8	-0.09	-0.10
WH6	4959	22433.8	-0.14	-0.16
WH6A	4959	22298.3	-0.10	-0.11
WH6B	5109	22343	-0.14	-0.16
WH6C	4806	22343.1	-0.14	-0.16
WH7	6084	22031.2	-0.01	-0.01
WH7A	6084	22104	-0.04	-0.05
WH7B	6134	22019.4	-0.03	-0.04

WEST HACKBERRY SUBSIDENCE RATE (ft/yr), (cont.)

PT #	east	north	DELTA (26-44) SEP 86	1.5 RATE
WH8B	5377	21341.7	-0.26	-0.17
WH9	4820	21727	-0.35	-0.23
WH9A	4761	21583.4	-0.37	-0.25
WH9B	4695	21716.1	-0.38	-0.25
WH11	5109	18925.1	-0.12	-0.08
WH11A	5108	18974.5	-0.12	-0.08
WH11B	5112	18876.8	-0.12	-0.08
WH101	3966	20291.5	-0.30	-0.20
WH102	3344	20640.5	-0.31	-0.21
WH103	3959	21015.3	-0.44	-0.29
WH104	3335	19890.7	-0.26	-0.17
WH105	3958	19515.4	-0.23	-0.15
WH106	3259	19139.5	-0.15	-0.10
WH107	3350	21390.2	-0.33	-0.22
WH108	4764	18186	-0.05	-0.03
WH109	3960	21764.5	-0.25	-0.17
WH110	3958	22514.5	-0.27	-0.18
WH112	5514	18185.7	-0.03	-0.02
WH113	2660	22501.6	-0.30	-0.20
WH114	2660	21764.6	-0.28	-0.19
WH115	3307	22139.3	-0.33	-0.22
WH116	1911	21820.5	-0.24	-0.16
BM1	4900	18640.6	-0.12	-0.08
BM4	4400	20600	-0.24	-0.16
BM5	4900	21300.1	-0.30	-0.20
BM8	4435	19308.1	-0.18	-0.12
BM11	4584	18977.7	-0.15	-0.10
BM12	3579	18977.9	-0.16	-0.11
BM13	3579	19758	-0.25	-0.17
BM14	3579	20398.6	-0.28	-0.19
BM15	3579	21300	-0.32	-0.21
SMS1	5035	18209.9	-0.08	-0.05
SMS2	4956	19731.1	-0.17	-0.11
SMS4	4876	21829.9	-0.37	-0.25
SMS5	1727	22103.2	-0.22	-0.15
SMS6	3522	20960.9	-0.32	-0.21
SMS7	3372	19379.4	-0.18	-0.12

PT #	east	north	DELTA (44-59) DEC 87	1.25 RATE
WH8	5282	21308	-0.01	-0.01
WH8A	5329	21324.3	-0.23	-0.18
WH8B	5377	21341.7	-0.13	-0.10
WH9	**4820**	**21727**	**-0.63**	**-0.50**
WH9A	4761	21583.4	0.53	0.43
WH9B	4695	21716.1	0.40	0.32
WH11	5109	18925.1	-0.13	-0.10
WH11A	5108	18974.5	-0.11	-0.09
WH11B	5112	18876.8	-0.12	-0.09
WH101	3966	20291.5	-0.20	-0.16
WH102	3344	20640.5	-0.26	-0.21
WH103	3959	21015.3	-0.07	-0.05
WH104	3335	19890.7	-0.24	-0.19
WH105	3958	19515.4	-0.23	-0.18
WH106	3259	19139.5	-0.21	-0.17
WH107	3350	21390.2	-0.28	-0.22
WH108	4764	18186	-0.15	-0.12
WH109	3960	21764.5	-0.33	-0.26
WH110	3958	22514.5	-0.30	-0.24
WH111	3309	22870.1	-0.33	-0.26
WH112	5514	18185.7	-0.12	-0.09
WH113	2660	22501.6	-0.23	-0.18
WH114	2660	21764.6	-0.24	-0.19
WH115	3307	22139.3	-0.31	-0.25
WH116	1911	21820.5	-0.25	-0.20
BM1	4900	18640.6	-0.20	-0.16
BM4	4400	20600	-0.27	-0.21
BM5	4900	21300.1	-0.23	-0.18
BM8	4435	19308.1	-0.24	-0.19
BM11	4584	18977.7	-0.17	-0.13
BM12	3579	18977.9	-0.20	-0.16
BM13	3579	19758	-0.24	-0.19
BM14	3579	20398.6	-0.26	-0.21
BM15	3579	21300	-0.24	-0.19
SMS1	5035	18209.9	-0.13	-0.10
SMS2	4956	19731.1	-0.31	-0.25
SMS3	6338	21695.5	-0.18	-0.14
SMS4	4876	21829.9	-0.20	-0.16
SMS5	1727	22103.2	-0.28	-0.22
SMS6	3522	20960.9	-0.23	-0.18
SMS7	3372	19379.4	-0.23	-0.18

PT #	east	north	DELTA (59-68) OCT 88	0.92 RATE
WH8	5282	21308	-0.05	-0.06
WH8A	5329	21324.3	-0.04	-0.05
WH8B	5377	21341.7	-0.17	-0.19
WH9	4820	21727	0.30	0.32
WH9A	**4761**	**21583.4**	**-0.86**	**-0.94**
WH9B	**4695**	**21716.1**	**-0.75**	**-0.82**
WH11	5109	18925.1	-0.11	-0.12
WH11A	5108	18974.5	-0.12	-0.13
WH11B	5112	18876.8	-0.10	-0.11
WH101	3966	20291.5	-0.11	-0.12
WH102	3344	20640.5	-0.10	-0.11
WH103	3959	21015.3	-0.16	-0.18
WH104	3335	19890.7	-0.08	-0.09
WH105	3958	19515.4	-0.09	-0.10
WH106	3259	19139.5	-0.12	-0.13
WH107	3350	21390.2	-0.13	-0.15
WH108	4764	18186	-0.08	-0.09
WH109	3960	21764.5	-0.16	-0.18
WH110	3958	22514.5	-0.14	-0.16
WH111	3309	22870.1	-0.13	-0.15
WH112	5514	18185.7	-0.07	-0.08
WH113	2660	22501.6	-0.17	-0.19
WH114	2660	21764.6	-0.17	-0.19
WH115	3307	22139.3	-0.17	-0.19
WH116	1911	21820.5	-0.12	-0.13
BM1	4900	18640.6	-0.05	-0.06
BM4	4400	20600	-0.10	-0.11
BM5	4900	21300.1	-0.11	-0.12
BM8	4435	19308.1	-0.04	-0.05
BM11	4584	18977.7	-0.09	-0.10
BM12	3579	18977.9	-0.09	-0.10
BM13	3579	19758	-0.10	-0.11
BM14	3579	20398.6	-0.09	-0.10
BM15	3579	21300	-0.14	-0.16
SMS1	5035	18209.9	-0.07	-0.08
SMS2	4956	19731.1	0.01	0.01
SMS3	6338	21695.5	-0.03	-0.04
SMS4	4876	21829.9	-0.12	-0.13
SMS5	1727	22103.2	-0.09	-0.10
SMS6	3522	20960.9	-0.13	-0.15
SMS7	3372	19379.4	-0.08	-0.09

WEST HACKBERRY SUBSIDENCE RATE (ft/yr)

PT #	east	north	DELTA (68-89) JUL 90	0.92 RATE
1	4496	19729	-0.25	-0.27
2	4535	19745	-0.22	-0.24
3	4411	20079	-0.31	-0.33
4	4410	20223	-0.31	-0.34
5	4318	20290	-0.30	-0.33
6	4311	20305	-0.32	-0.34
7	4425	20470	-0.33	-0.36
8	4522	20470	-0.26	-0.28
9	4590	20451	-0.26	-0.29
10	4606	20410	-0.28	-0.30
11	4885	20408	-0.28	-0.30
12	4885	20370	-0.22	-0.24
13	4874	20349	-0.27	-0.29
14	4824	20321	-0.24	-0.26
15	4874	20291	-0.23	-0.25
16	4824	20271	-0.24	-0.27
17	4773	20242	-0.25	-0.27
18	4880	20154	-0.22	-0.24
19	**4880**	**20138**	**0.71**	**0.78**
20	4773	20050	-0.23	-0.25
21	4880	19996	-0.27	-0.30
22	4824	19962	-0.27	-0.29
23	4880	19926	-0.26	-0.29
24	4824	19892	-0.25	-0.28
25	5480	19770	-0.33	-0.36
26	4920	20128	-0.21	-0.23
27	5480	20489	-0.32	-0.35
29	4552	21183	-0.29	-0.31
31	4551	21039	-0.31	-0.34
33	4553	20824	-0.27	-0.30
35	4509	20823	-0.27	-0.29
37	4508	21039	-0.30	-0.33
39	4508	21189	-0.29	-0.32
WH6	**4959**	**22434**	**-0.52**	**-0.57**
WH6A	**4959**	**22298**	**-1.22**	**-1.33**
WH6B	**5109**	**22343**	**-0.57**	**-0.62**
WH6C	**4806**	**22343**	**-0.58**	**-0.63**
WH7	**6084**	**22031**	**-0.53**	**-0.58**
WH7A	**6084**	**22104**	**2.00**	**2.18**
WH7B	**6134**	**22019**	**2.01**	**2.20**

PT #	east	north	DELTA (89-99) MAY 91	0.83 RATE
1	4496	19729	-0.10	-0.12
2	4535	19745	-0.14	-0.16
3	4411	20079	-0.08	-0.09
4	4410	20223	-0.09	-0.11
5	4318	20290	-0.09	-0.11
6	4311	20305	-0.08	-0.10
7	4425	20470	-0.11	-0.13
8	4522	20470	-0.12	-0.15
9	4590	20451	-0.12	-0.14
10	4606	20410	-0.11	-0.13
11	4885	20408	-0.09	-0.11
12	4885	20370	0.06	0.08
13	4874	20349	0.11	0.13
14	4824	20321	0.06	0.07
15	4874	20291	0.07	0.08
16	4824	20271	0.09	0.11
17	4773	20242	-0.11	-0.13
18	4880	20154	-0.13	-0.16
19	**4880**	**20138**	**-1.07**	**-1.28**
21	4880	19996	-0.08	-0.09
22	4824	19962	-0.08	-0.10
23	4880	19926	-0.09	-0.10
24	4824	19892	-0.11	-0.13
25	5480	19770	-0.01	-0.01
27	5480	20489	-0.07	-0.08
29	4552	21183	0.14	0.17
31	4551	21039	-0.02	-0.02
33	4553	20824	0.20	0.24
35	4509	20823	0.09	0.11
37	4508	21039	-0.04	-0.05
39	4508	21189	-0.03	-0.03
WH6	4959	22434	0.19	0.23
WH6A	**4959**	**22298**	**0.85**	**1.02**
WH6B	5109	22343	0.25	0.30
WH6C	4806	22343	0.22	0.26
WH7	6084	22031	0.30	0.36
WH7A	6084	22104	0.24	0.28
WH7B	6134	22019	0.23	0.28
WH8	5282	21308	0.21	0.26
WH8A	**5329**	**21324**	**0.57**	**0.68**

PT #	east	north	DELTA (99-107) JAN 92	0.67 RATE
1	4496	19729	-0.03	-0.05
2	4535	19745	-0.03	-0.05
3	4411	20079	-0.03	-0.05
4	4410	20223	-0.03	-0.05
5	4318	20290	-0.03	-0.05
6	4311	20305	-0.04	-0.05
7	4425	20470	-0.04	-0.05
8	4522	20470	-0.25	-0.38
9	4590	20451	-0.04	-0.06
10	4606	20410	-0.02	-0.03
11	4885	20408	-0.05	-0.08
12	4885	20370	-0.26	-0.38
13	4874	20349	-0.24	-0.36
14	4824	20321	-0.23	-0.34
15	4874	20291	-0.24	-0.36
16	4824	20271	-0.25	-0.37
17	4773	20242	-0.03	-0.05
18	4880	20154	-0.03	-0.04
19	4880	20138	-0.03	-0.04
20	4880	19996	-0.03	-0.05
21	4824	19962	-0.04	-0.06
23	4880	19926	-0.04	-0.05
24	4824	19892	-0.02	-0.04
25	5480	19770	-0.04	-0.06
29	4552	21183	-0.27	-0.40
31	4551	21039	-0.17	-0.25
33	4553	20824	-0.27	-0.40
35	4509	20823	-0.31	-0.46
37	4508	21039	-0.06	-0.10
39	4508	21189	-0.18	-0.27
WH6	4959	22434	-0.02	-0.03
WH6A	4959	22298	0.01	0.01
WH6B	5109	22343	-0.02	-0.03
WH6C	4806	22343	-0.01	-0.01
WH7	6084	22031	-0.02	-0.04
WH7A	**6084**	**22104**	**-2.47**	**-3.70**
WH7B	**6134**	**22019**	**-2.46**	**-3.69**
WH8	**5282**	**21308**	**-2.65**	**-3.98**
WH8A	**5329**	**21324**	**-2.83**	**-4.24**
WH8B	**5377**	**21342**	**-2.80**	**-4.20**

WEST HACKBERRY SUBSIDENCE RATE (ft/yr), (cont.)

PT #	east	north	DELTA (68-89) JUL 90	0.92 RATE
WH8	5282	21308	2.08	2.27
WH8A	5329	21324	1.90	2.07
WH8B	5377	21342	1.89	2.06
WH9	4820	21727	-0.63	-0.69
WH9A	4761	21583	1.84	2.01
WH9B	4695	21716	1.89	2.06
WH11	5109	18925	2.19	2.39
WH11A	5108	18975	2.03	2.21
WH11B	5112	18877	-0.20	-0.22
WH101	3966	20292	-0.75	-0.82
WH102	3344	20641	-0.82	-0.89
WH103	3959	21015	-0.80	-0.87
WH104	3335	19891	-0.75	-0.82
WH105	3958	19515	-0.70	-0.77
WH106	3259	19140	-0.21	-0.23
WH107	3350	21390	-0.80	-0.87
WH108	4764	18186	-0.61	-0.67
WH109	3960	21765	0.05	0.05
WH110	3958	22515	-0.78	-0.86
WH111	3309	22870	-0.76	-0.83
WH112	5514	18186	-0.55	-0.60
WH113	2660	22502	-0.80	-0.88
WH114	2660	21765	-0.36	-0.40
WH115	3307	22139	-0.82	-0.89
WH116	1911	21821	-0.73	-0.80
WH117A	4230	18680	-0.56	-0.61
WH117B	4230	18680	-0.58	-0.64
BM1	4900	18641	-0.13	-0.15
BM4	4400	20600	-0.29	-0.32
BM5	4900	21300	-0.25	-0.27
BM8	4435	19308	-0.25	-0.27
BM11	4584	18978	-0.22	-0.24
BM12	3579	18978	-0.19	-0.21
BM13	3579	19758	-0.30	-0.33
BM14	3579	20399	-0.32	-0.35
BM15	3579	21300	-0.36	-0.39
SMS1	5035	18210	-0.15	-0.17
SMS2	4956	19731	-0.25	-0.27
SMS3	6338	21696	-0.14	-0.15
SMS4	4876	21830	-0.27	-0.30

PT #	east	north	DELTA (89-99) MAY 91	0.83 RATE
WH8B	5377	21342	0.59	0.71
WH9	4820	21727	0.25	0.31
WH9A	4761	21583	0.19	0.23
WH9B	4695	21716	0.18	0.22
WH11	5109	18925	-0.09	-0.10
WH11A	5108	18975	0.21	0.25
WH11B	5112	18877	1.08	1.30
WH101	3966	20292	0.32	0.38
WH102	3344	20641	0.35	0.42
WH103	3959	21015	0.33	0.40
WH104	3335	19891	0.34	0.41
WH105	3958	19515	0.33	0.40
WH106	3259	19140	-0.13	-0.16
WH107	3350	21390	0.35	0.41
WH108	4764	18186	0.39	0.47
WH109	3960	21765	-0.50	-0.61
WH110	3958	22515	0.35	0.42
WH111	3309	22870	0.34	0.40
WH112	5514	18186	0.39	0.46
WH113	2660	22502	0.35	0.42
WH114	2660	21765	-0.12	-0.14
WH115	3307	22139	0.33	0.39
WH116	1911	21821	0.30	0.36
WH117A	4230	18680	0.29	0.34
WH117B	4230	18680	0.30	0.36
BM1	4900	18641	-0.09	-0.11
BM5	4900	21300	-0.11	-0.13
BM11	4584	18978	-0.07	-0.08
BM12	3579	18978	-0.11	-0.13
BM13	3579	19758	-0.08	-0.10
BM14	3579	20399	-0.11	-0.14
BM15	3579	21300	-0.11	-0.13
SMS1	5035	18210	-0.02	-0.03
SMS2	4956	19731	-0.08	-0.10
SMS3	6338	21696	-0.05	-0.07
SMS5	1727	22103	-0.10	-0.12
SMS6	3522	20961	-0.66	-0.79
SMS7	3372	19379	-0.15	-0.18
1	5578	17903	0.00	0.00
2	5362	18209	-0.04	-0.05

PT #	east	north	DELTA (99-107) JAN 92	0.67 RATE
WH9	4820	21727	-0.08	-0.12
WH9A	4761	21583	-2.46	-3.68
WH9B	4695	21716	-2.49	-3.74
WH11	5109	18925	-2.13	-3.20
WH11A	5108	18975	-2.52	-3.78
WH11B	5112	18877	-1.12	-1.68
WH101	3966	20292	-0.05	-0.08
WH102	3344	20641	-0.05	-0.07
WH103	3959	21015	-0.03	-0.05
WH104	3335	19891	-0.05	-0.07
WH105	3958	19515	-0.02	-0.03
WH106	3259	19140	-0.02	-0.03
WH107	3350	21390	-0.05	-0.08
WH108	4764	18186	-0.01	-0.01
WH109	3960	21765	-0.04	-0.05
WH110	3958	22515	-0.01	-0.01
WH111	3309	22870	0.00	0.01
WH112	5514	18186	-0.01	-0.02
WH113	2660	22502	-0.05	-0.07
WH114	2660	21765	-0.05	-0.07
WH115	3307	22139	-0.04	-0.06
WH116	1911	21821	-0.05	-0.08
WH117A	4230	18680	-0.03	-0.05
WH117B	4230	18680	-0.03	-0.04
BM1	4900	18641	0.00	0.00
BM5	4900	21300	-0.03	-0.04
BM11	4584	18978	-0.02	-0.03
BM12	3579	18978	-0.02	-0.03
BM13	3579	19758	-0.03	-0.04
BM14	3579	20399	-0.04	-0.06
BM15	3579	21300	-0.04	-0.06
SMS1	5035	18210	-0.01	-0.01
SMS2	4956	19731	0.00	-0.01
SMS3	6338	21696	0.00	0.00
SMS5	1727	22103	-0.05	-0.08
SMS6	3522	20961	-0.04	-0.07
SMS7	3372	19379	-0:03	-0.05
1	5578	17903	-0.01	-0.01
2	5362	18209	-0.01	-0.02
3	4829	18208	-0.02	-0.03

WEST HACKBERRY SUBSIDENCE RATE (ft/yr), (cont.)

PT #	east	north	DELTA (68-89) JUL 90	0.92 RATE
SMS5	1727	22103	-0.28	-0.31
SMS6	3522	20961	0.20	0.22
SMS7	3372	19379	-0.20	-0.21

PT #	east	north	DELTA (89-99) MAY 91	0.83 RATE
3	**4829**	**18208**	**-2.26**	**-2.71**
4	4562	18619	-0.07	-0.09
5	4289	18760	-0.08	-0.10
7	3741	19442	-0.13	-0.16
8	3409	19187	-0.15	-0.18
9	3880	19452	-0.10	-0.12
11	3411	19847	-0.11	-0.13
12	3881	20211	-0.13	-0.15
13	3414	20600	-0.12	-0.15
14	3727	20710	-0.12	-0.14
15	3884	20974	-0.13	-0.15
16	3425	21352	-0.12	-0.14
17	3715	21354	-0.11	-0.13
18	3881	21704	-0.11	-0.13
19	3701	21928	0.09	0.11
20	3881	22453	-0.10	-0.12
21	3513	22356	-0.09	-0.11
22	3268	22209	-0.10	-0.11
23	3267	22505	-0.11	-0.13
24	3248	22789	-0.10	-0.12
25	2959	22340	-0.07	-0.09
26	2721	22420	-0.07	-0.09
27	2702	21841	-0.11	-0.13
28	2376	22336	-0.10	-0.11
29	1882	22343	-0.09	-0.10
30	1852	21906	-0.13	-0.16
31	5585	18458	-0.06	-0.07
32	5546	19062	-0.02	-0.02
33	5165	19419	-0.05	-0.06
34	4897	19674	-0.06	-0.07
35	4670	19943	-0.06	-0.07
36	4668	20336	-0.10	-0.12
37	4857	20439	-0.10	-0.12
38	4640	20711	-0.12	-0.15
39	4642	21103	-0.12	-0.14
40	4295	21373	-0.26	-0.32
41	4307	21974	-0.14	-0.17
42	4315	22367	-0.13	-0.15
43	4468	22397	-0.12	-0.15
44	5113	22281	-0.11	-0.13

PT #	east	north	DELTA (99-107) JAN 92	0.67 RATE
4	4562	18619	0.00	0.00
5	4289	18760	-0.01	-0.02
6	4072	19158	-0.02	-0.03
7	3741	19442	-0.03	-0.04
8	3409	19187	-0.02	-0.03
9	3880	19452	-0.03	-0.04
10	3679	19837	-0.03	-0.05
11	3411	19847	-0.04	-0.05
12	3881	20211	-0.04	-0.06
13	3414	20600	-0.03	-0.05
14	3727	20710	-0.04	-0.07
15	3884	20974	-0.03	-0.05
16	3425	21352	-0.04	-0.07
17	3715	21354	-0.04	-0.06
18	3881	21704	-0.03	-0.04
19	3701	21928	-0.02	-0.04
20	**3881**	**22453**	**-0.37**	**-0.55**
21	3513	22356	-0.02	-0.03
22	3268	22209	-0.03	-0.05
23	3267	22505	-0.02	-0.03
24	3248	22789	-0.01	-0.01
25	2959	22340	-0.03	-0.05
26	2721	22420	-0.04	-0.05
27	2702	21841	-0.04	-0.06
28	2376	22336	-0.04	-0.06
29	1882	22343	-0.04	-0.07
30	1852	21906	-0.04	-0.07
31	5585	18458	-0.01	-0.01
32	5546	19062	-0.01	-0.01
33	5165	19419	-0.01	-0.01
34	4897	19674	-0.04	-0.06
35	4670	19943	-0.05	-0.07
36	4668	20336	-0.05	-0.07
37	4857	20439	-0.04	-0.06
38	4640	20711	-0.03	-0.05
39	4642	21103	-0.03	-0.04
40	4295	21373	-0.03	-0.05
41	4307	21974	-0.01	-0.02
42	4315	22367	-0.01	-0.01
43	4468	22397	-0.01	-0.02

WEST HACKBERRY SUBSIDENCE RATE (ft/yr), (cont.)

PT #	east	north	DELTA (89-99) MAY 91	0.8333 RATE
45	5045	21937	-0.11	-0.13
46	4693	21855	-0.07	-0.08
47	5514	21859	-0.04	-0.05
48	5862	21926	-0.07	-0.09
49	5174	21395	-0.08	-0.10
50	5524	20610	-0.05	-0.06
51	5232	20536	-0.03	-0.03
52	5578	20203	-0.04	-0.04
53	5574	19863	-0.06	-0.07
54	5566	19492	-0.02	-0.02
55	5576	20131	-0.03	-0.04
56	5576	20808	-0.03	-0.03
57	4311	20784	-0.29	-0.34
58	4312	21143	-0.12	-0.14
59	4989	19018	-0.07	-0.08

PT #	east	north	DELTA (99-107) JAN 92	0.6667 RATE
44	5113	22281	-0.01	-0.02
45	5045	21937	-0.02	-0.03
46	4693	21855	-0.02	-0.02
47	5514	21859	-0.02	-0.02
48	5862	21926	0.00	0.00
49	5174	21395	-0.03	-0.04
50	5524	20610	-0.01	-0.01
51	5232	20536	-0.01	-0.01
52	5578	20203	0.01	0.02
53	5574	19863	-0.01	-0.01
54	5566	19492	-0.01	-0.01
55	5576	20131	0.00	0.00
56	5576	20808	0.00	0.01
57	4311	20784	-0.02	-0.04
58	4312	21143	-0.03	-0.04
59	4989	19018	0.00	0.00

WEST HACKBERRY SUBSIDENCE RATE (ft/yr)

PT #	east	north	DELTA 107-119 JAN 93	1 RATE
1	4496	19729	-0.10	-0.10
2	4535	19745	-0.10	-0.10
3	4411	20079	-0.10	-0.10
4	4410	20223	-0.10	-0.10
5	4318	20290	-0.11	-0.11
6	4311	20305	-0.11	-0.11
7	4425	20470	-0.10	-0.10
8	4522	20470	0.10	0.10
9	4590	20451	-0.09	-0.09
10	4606	20410	-0.12	-0.12
11	4885	20408	-0.09	-0.09
12	4885	20370	-0.08	-0.08
13	4874	20349	-0.09	-0.09
14	4824	20321	-0.10	-0.10
15	4874	20291	-0.09	-0.09
16	4824	20271	-0.10	-0.10
17	4773	20242	-0.10	-0.10
18	4880	20154	-0.10	-0.10
19	4880	20138	-0.10	-0.10
20	4773	20050	-0.09	-0.09
21	4880	19996	-0.09	-0.09
22	4824	19962	-0.09	-0.09
23	4880	19926	-0.09	-0.09
24	4824	19892	-0.10	-0.10
25	5480	19770	-0.10	-0.10
29	4552	21183	-0.13	-0.13
31	4551	21039	-0.06	-0.06
33	4553	20824	-0.21	-0.21
35	4509	20823	-0.07	-0.07
37	4508	21039	-0.14	-0.14
39	4508	21189	-0.05	-0.05
WH6	4959	22434	-0.11	-0.11
WH6A	4959	22298	-0.11	-0.11
WH6B	5109	22343	-0.09	-0.09
WH6C	4806	22343	-0.11	-0.11
WH7	6084	22031	-0.04	-0.04
WH7A	6084	22104	-0.09	-0.09
WH7B	6134	22019	-0.08	-0.08
WH8	5282	21308	-0.36	-0.36
WH8A	5329	21324	-0.08	-0.08

PT #	east	north	DELTA 119-135 MAY 94	1.33 RATE
1	4496	19729	-0.15	-0.11
2	4535	19745	-0.17	-0.13
3	4411	20079	-0.17	-0.13
4	4410	20223	-0.17	-0.13
5	4318	20290	-0.17	-0.13
6	4311	20305	-0.17	-0.13
7	4425	20470	-0.18	-0.14
8	4522	20470	-0.16	-0.12
9	4590	20451	-0.17	-0.13
10	4606	20410	-0.17	-0.13
11	4885	20408	-0.14	-0.11
12	4885	20370	-0.11	-0.08
13	4874	20349	-0.15	-0.11
14	4824	20321	-0.15	-0.11
15	4874	20291	-0.15	-0.11
16	4824	20271	-0.16	-0.12
17	4773	20242	-0.15	-0.11
18	4880	20154	-0.15	-0.11
19	4880	20138	-0.13	-0.10
20	4773	20050	-0.10	-0.07
21	4880	19996	-0.14	-0.10
22	4824	19962	-0.14	-0.11
23	4880	19926	-0.14	-0.11
24	4824	19892	-0.13	-0.10
25	5480	19770	-0.13	-0.10
29	4552	21183	-0.17	-0.12
31	4551	21039	-0.17	-0.13
33	4553	20824	-0.16	-0.12
35	4509	20823	-0.16	-0.12
37	4508	21039	-0.17	-0.12
39	4508	21189	-0.17	-0.12
WH6	4959	22434	-0.14	-0.10
WH6A	4959	22298	-0.11	-0.08
WH6B	5109	22343	-0.11	-0.08
WH6C	4806	22343	-0.12	-0.09
WH7	6084	22031	-0.06	-0.05
WH7A	6084	22104	-0.02	-0.01
WH7B	6134	22019	-0.04	-0.03
WH8	5282	21308	-0.11	-0.08
WH8A	5329	21324	-0.14	-0.11

PT #	east	north	DELTA 135-144 FEB 95	0.75 RATE
1	4496	19729	-0.04	-0.05
2	4535	19745	-0.02	-0.02
3	4411	20079	-0.03	-0.04
4	4410	20223	-0.05	-0.07
5	4318	20290	-0.05	-0.06
6	4311	20305	-0.04	-0.06
7	4425	20470	-0.04	-0.05
8	4522	20470	-0.02	-0.02
9	4590	20451	-0.05	-0.06
10	4606	20410	-0.04	-0.06
11	4885	20408	-0.05	-0.07
12	4885	20370	-0.06	-0.08
13	4874	20349	-0.04	-0.06
14	4824	20321	-0.05	-0.06
15	4874	20291	-0.05	-0.06
16	4824	20271	-0.05	-0.06
17	4773	20242	-0.04	-0.05
18	4880	20154	-0.03	-0.04
19	4880	20138	-0.03	-0.04
20	4773	20050	-0.09	-0.12
21	4880	19996	-0.03	-0.04
22	4824	19962	-0.03	-0.05
23	4880	19926	-0.04	-0.05
24	4824	19892	-0.02	-0.03
25	5480	19770	-0.02	-0.03
29	4552	21183	-0.07	-0.09
31	4551	21039	-0.06	-0.08
33	4553	20824	-0.06	-0.08
35	4509	20823	-0.06	-0.08
37	4508	21039	-0.07	-0.09
39	4508	21189	-0.06	-0.08
WH6	4959	22434	-0.04	-0.05
WH6A	4959	22298	-0.03	-0.04
WH6B	5109	22343	-0.03	-0.04
WH6C	4806	22343	-0.05	-0.06
WH7	6084	22031	0.00	-0.01
WH7A	6084	22104	0.00	0.00
WH7B	6134	22019	-0.02	-0.02
WH8	5282	21308	-0.03	-0.04
WH8A	5329	21324	-0.02	-0.03

WEST HACKBERRY SUBSIDENCE RATE (ft/yr), (cont.)

PT #	east	north	DELTA 107-119 JAN 93	1 RATE
WH8B	5377	21342	-0.10	-0.10
WH9	4820	21727	-0.05	-0.05
WH9A	4761	21583	-0.11	-0.11
WH9B	4695	21716	-0.11	-0.11
WH11	5109	18925	-0.36	-0.36
WH11A	5108	18975	-0.03	-0.03
WH11B	5112	18877	-0.13	-0.13
WH101	3966	20292	-0.09	-0.09
WH102	3344	20641	-0.11	-0.11
WH103	3959	21015	-0.12	-0.12
WH104	3335	19891	-0.09	-0.09
WH105	3958	19515	-0.08	-0.08
WH106	3259	19140	-0.07	-0.07
WH107	3350	21390	-0.11	-0.11
WH108	4764	18186	0.00	0.00
WH109	3960	21765	-0.12	-0.12
WH110	3958	22515	-0.13	-0.13
WH111	3309	22870	-0.14	-0.14
WH112	5514	18186	0.01	0.01
WH113	2660	22502	-0.12	-0.12
WH114	2660	21765	-0.13	-0.13
WH115	3307	22139	-0.11	-0.11
WH116	1911	21821	-0.09	-0.09
WH117A	4230	18680	-0.04	-0.04
WH117B	4230	18680	-0.05	-0.05
BM1	4900	18641	-0.09	-0.09
BM5	4900	21300	-0.10	-0.10
BM11	4584	18978	-0.07	-0.07
BM12	3579	18978	-0.07	-0.07
BM13	3579	19758	-0.10	-0.10
BM14	3579	20399	-0.11	-0.11
BM15	3579	21300	-0.12	-0.12
SMS1	5035	18210	-0.01	-0.01
SMS3	6338	21696	-0.06	-0.06
SMS6	3522	20961	-0.12	-0.12
SMS7	3372	19379	-0.08	-0.08
1	5578	17903	0.00	0.00
2	5362	18209	0.00	0.00
3	4829	18208	-0.01	-0.01
4	4562	18619	-0.06	-0.06

PT #	east	north	DELTA 119-135 MAY 94	1.33 RATE
WH8B	5377	21342	-0.11	-0.08
WH9	**4820**	**21727**	**-1.67**	**-1.25**
WH9A	4761	21583	-0.15	-0.11
WH9B	4695	21716	-0.12	-0.09
WH11	5109	18925	0.03	0.02
WH11A	5108	18975	-0.09	-0.07
WH11B	5112	18877	-0.03	-0.02
WH101	3966	20292	-0.14	-0.11
WH102	3344	20641	-0.16	-0.12
WH103	3959	21015	-0.17	-0.13
WH104	3335	19891	-0.16	-0.12
WH105	3958	19515	-0.11	-0.08
WH106	3259	19140	-0.14	-0.10
WH107	3350	21390	-0.17	-0.13
WH109	3960	21765	-0.16	-0.12
WH110	3958	22515	-0.14	-0.10
WH111	3309	22870	-0.14	-0.10
WH112	5514	18186	-0.11	-0.08
WH113	2660	22502	-0.12	-0.09
WH114	2660	21765	-0.16	-0.12
WH115	3307	22139	-0.17	-0.12
WH116	1911	21821	-0.16	-0.12
WH117A	4230	18680	-0.13	-0.10
WH117B	4230	18680	-0.13	-0.10
BM1	4900	18641	-0.09	-0.06
BM5	4900	21300	-0.16	-0.12
BM11	4584	18978	-0.14	-0.11
BM12	3579	18978	-0.14	-0.10
BM13	3579	19758	-0.15	-0.11
BM14	3579	20399	-0.16	-0.12
BM15	3579	21300	-0.17	-0.13
SMS1	5035	18210	-0.13	-0.10
SMS3	6338	21696	-0.07	-0.05
SMS4	3522	20961	-0.17	-0.13
1	5578	17903	-0.10	-0.08
2	5362	18209	-0.13	-0.09
3	4829	18208	-0.14	-0.10
4	4562	18619	-0.12	-0.09
5	4289	18760	-0.12	-0.09
6	4072	19158	-0.15	-0.12

PT #	east	north	DELTA 135-144 FEB 95	0.75 RATE
WH8B	5377	21342	-0.05	-0.07
WH9	4820	21727	-0.06	-0.08
WH9A	4761	21583	-0.03	-0.04
WH9B	4695	21716	-0.03	-0.04
WH11	5109	18925	-0.05	-0.06
WH11A	5108	18975	-0.02	-0.02
WH11B	5112	18877	-0.08	-0.11
WH101	3966	20292	-0.11	-0.15
WH102	3344	20641	-0.11	-0.14
WH103	3959	21015	-0.08	-0.10
WH104	3335	19891	-0.09	-0.12
WH105	3958	19515	-0.18	-0.24
WH106	3259	19140	-0.08	-0.11
WH107	3350	21390	-0.09	-0.12
WH109	3960	21765	-0.06	-0.08
WH110	3958	22515	-0.03	-0.04
WH111	3309	22870	-0.03	-0.04
WH112	5514	18186	-0.04	-0.05
WH113	2660	22502	-0.08	-0.10
WH114	2660	21765	-0.06	-0.08
WH115	3307	22139	-0.05	-0.06
WH116	1911	21821	-0.06	-0.08
WH117A	4230	18680	-0.04	-0.05
WH117B	4230	18680	-0.03	-0.04
BM1	4900	18641	0.00	0.01
BM5	4900	21300	-0.03	-0.04
BM8	4435	19308	-0.03	-0.04
BM11	4584	18978	-0.01	-0.02
BM12	3579	18978	-0.04	-0.06
BM13	3579	19758	-0.08	-0.10
BM14	3579	20399	-0.09	-0.12
BM15	3579	21300	-0.07	-0.10
SMS1	5035	18210	-0.02	-0.03
SMS2	4956	19731	-0.03	-0.04
SMS3	6338	21696	0.00	0.00
SMS6	3522	20961	-0.10	-0.13
1	5578	17903	-0.01	-0.01
2	5362	18209	-0.02	-0.03
3	4829	18208	-0.02	-0.02
4	4562	18619	-0.03	-0.04

WEST HACKBERRY SUBSIDENCE RATE (ft/yr), (cont.)

PT #	east	north	DELTA 107-119 JAN 93	1 RATE
5	4289	18760	-0.07	-0.07
6	4072	19158	-0.07	-0.07
7	3741	19442	-0.08	-0.08
8	3409	19187	-0.08	-0.08
9	3880	19452	-0.09	-0.09
10	3679	19837	-0.10	-0.10
11	3411	19847	-0.10	-0.10
12	**3881**	**20211**	**-1.10**	**-1.10**
13	3414	20600	-0.11	-0.11
14	3727	20710	-0.09	-0.09
15	3884	20974	-0.12	-0.12
16	3425	21352	-0.12	-0.12
17	3715	21354	-0.12	-0.12
18	3881	21704	-0.14	-0.14
19	3701	21928	-0.13	-0.13
20	3881	22453	0.23	0.23
21	3513	22356	-0.14	-0.14
22	3268	22209	-0.13	-0.13
23	3267	22505	-0.15	-0.15
24	3248	22789	-0.14	-0.14
25	2959	22340	-0.14	-0.14
26	2721	22420	-0.13	-0.13
27	2702	21841	-0.12	-0.12
28	2376	22336	-0.13	-0.13
29	1882	22343	-0.12	-0.12
30	1852	21906	-0.11	-0.11
31	5585	18458	-0.03	-0.03
32	5546	19062	-0.04	-0.04
33	5165	19419	-0.06	-0.06
34	4897	19674	-0.09	-0.09
35	4670	19943	-0.09	-0.09
36	4668	20336	-0.08	-0.08
37	4857	20439	-0.09	-0.09
38	4640	20711	-0.10	-0.10
39	4642	21103	-0.10	-0.10
40	4295	21373	-0.12	-0.12
41	4307	21974	-0.12	-0.12
42	4315	22367	-0.11	-0.11
43	4468	22397	-0.11	-0.11
44	5113	22281	-0.09	-0.09

PT #	east	north	DELTA 119-135 MAY 94	1.33 RATE
7	3741	19442	-0.15	-0.11
8	3409	19187	-0.15	-0.11
9	3880	19452	-0.14	-0.11
10	3679	19837	-0.16	-0.12
11	3411	19847	-0.16	-0.12
12	**3881**	**20211**	**0.86**	**0.64**
13	3414	20600	-0.16	-0.12
14	3727	20710	-0.19	-0.14
15	3884	20974	-0.17	-0.13
16	3425	21352	-0.17	-0.13
17	3715	21354	-0.17	-0.13
18	3881	21704	-0.15	-0.11
19	3701	21928	-0.16	-0.12
20	3881	22453	-0.15	-0.11
21	3513	22356	-0.15	-0.11
22	3268	22209	-0.16	-0.12
23	3267	22505	-0.14	-0.10
24	3248	22789	-0.13	-0.10
25	2959	22340	-0.15	-0.12
26	2721	22420	-0.13	-0.10
27	2702	21841	-0.15	-0.12
28	2376	22336	-0.14	-0.10
29	1882	22343	-0.13	-0.10
30	1852	21906	-0.14	-0.11
31	5585	18458	-0.09	-0.07
32	5546	19062	-0.11	-0.08
33	5165	19419	-0.08	-0.06
34	4897	19674	-0.14	-0.10
35	4670	19943	-0.14	-0.10
36	4668	20336	-0.16	-0.12
37	4857	20439	-0.15	-0.11
38	4640	20711	-0.16	-0.12
39	4642	21103	-0.16	-0.12
40	4295	21373	-0.16	-0.12
41	4307	21974	-0.15	-0.11
42	4315	22367	-0.14	-0.10
43	4468	22397	-0.13	-0.10
44	5113	22281	-0.12	-0.09
45	5045	21937	-0.13	-0.10
46	4693	21855	-0.14	-0.10

PT #	east	north	DELTA 135-144 FEB 95	0.75 RATE
5	4289	18760	-0.03	-0.04
6	4072	19158	-0.05	-0.06
7	3741	19442	-0.07	-0.09
8	3409	19187	-0.05	-0.07
9	3880	19452	-0.06	-0.08
10	3679	19837	-0.07	-0.10
11	3411	19847	-0.07	-0.09
12	3881	20211	-0.08	-0.11
13	3414	20600	-0.10	-0.13
14	3727	20710	-0.09	-0.12
15	3884	20974	-0.08	-0.10
16	3425	21352	-0.08	-0.11
17	3715	21354	-0.08	-0.10
18	3881	21704	-0.08	-0.10
19	3701	21928	-0.06	-0.09
20	3881	22453	-0.03	-0.03
21	3513	22356	-0.04	-0.06
22	3268	22209	-0.04	-0.06
23	3267	22505	-0.05	-0.06
24	3248	22789	-0.04	-0.06
25	2959	22340	-0.03	-0.04
26	2721	22420	-0.04	-0.05
27	2702	21841	-0.06	-0.09
28	2376	22336	-0.03	-0.04
29	1882	22343	-0.02	-0.02
30	1852	21906	-0.04	-0.06
31	5585	18458	-0.02	-0.02
32	5546	19062	0.01	0.01
33	5165	19419	-0.07	-0.09
34	4897	19674	-0.03	-0.03
35	4670	19943	-0.05	-0.06
36	4668	20336	-0.04	-0.06
37	4857	20439	-0.05	-0.06
38	4640	20711	-0.05	-0.07
39	4642	21103	-0.06	-0.08
40	4295	21373	-0.05	-0.07
41	4307	21974	-0.05	-0.06
42	4315	22367	-0.04	-0.05
43	4468	22397	-0.04	-0.05
44	5113	22281	-0.02	-0.02

WEST HACKBERRY SUBSIDENCE RATE (ft/yr), (cont.)

PT #	east	north	DELTA 107-119 JAN 93	1 RATE
45	5045	21937	-0.09	-0.09
46	4693	21855	-0.12	-0.12
47	5514	21859	-0.08	-0.08
48	5862	21926	-0.08	-0.08
49	5174	21395	-0.10	-0.10
50	5524	20610	-0.10	-0.10
51	5232	20536	-0.10	-0.10
52	5578	20203	-0.09	-0.09
53	5574	19863	-0.08	-0.08
54	5566	19492	-0.07	-0.07
55	5576	20131	-0.09	-0.09
56	5576	20808	-0.11	-0.11
57	4311	20784	-0.12	-0.12
58	4312	21143	-0.12	-0.12
59	4989	19018	-0.10	-0.10

PT #	east	north	DELTA 119-135 MAY 94	1.3333 RATE
47	5514	21859	-0.10	-0.08
48	5862	21926	-0.08	-0.06
49	5174	21395	-0.13	-0.10
50	5524	20610	-0.13	-0.10
51	5232	20536	-0.15	-0.11
52	5578	20203	-0.13	-0.10
53	5574	19863	-0.13	-0.10
54	5566	19492	-0.11	-0.08
55	5576	20131	-0.13	-0.10
56	5576	20808	-0.11	-0.08
57	4311	20784	-0.17	-0.13
58	4312	21143	-0.16	-0.12
59	4989	19018	-0.03	-0.02

PT #	east	north	DELTA 135-144 FEB 95	0.75 RATE
45	5045	21937	-0.04	-0.05
46	4693	21855	-0.04	-0.05
47	5514	21859	-0.02	-0.03
48	5862	21926	-0.02	-0.02
49	5174	21395	-0.04	-0.05
50	5524	20610	-0.03	-0.03
51	5232	20536	-0.04	-0.05
52	5578	20203	-0.03	-0.04
53	5574	19863	-0.17	-0.23
54	5566	19492	-0.01	-0.01
55	5576	20131	-0.02	-0.03
56	5576	20808	-0.02	-0.03
57	4311	20784	-0.06	-0.08
58	4312	21143	-0.06	-0.07
59	4989	19018	-0.08	-0.10
60	3818	17981	-0.02	-0.02
61	4023	18856	-0.04	-0.05
62	2973	18856	-0.03	-0.04
63	3109	20252	-0.07	-0.10
64	3106	21439	-0.07	-0.09
65	1651	21443	-0.03	-0.03
66	1723	22695	-0.01	-0.01
67	3129	22732	-0.04	-0.06
68	3802	22716	-0.02	-0.03
69	4692	22538	-0.02	-0.03
70	6003	22258	-0.01	-0.01
71	6320	22264	0.00	-0.01
72	6735	21066	0.00	0.00
73	5585	21051	-0.02	-0.03

WEST HACKBERRY SUBSIDENCE RATE (ft/yr)

PT #	east	north	DELTA 144-153 Nov 95	0.75 RATE
1	4496	19729	-0.13	-0.18
2	4535	19745	-0.14	-0.18
3	4411	20079	-0.16	-0.21
4	4410	20223	0.00	0.00
5	4318	20290	-0.15	-0.21
6	4311	20305	-0.18	-0.24
7	4425	20470	-0.15	-0.20
8	4522	20470	-0.15	-0.21
9	4590	20451	-0.14	-0.19
10	4606	20410	-0.15	-0.20
11	4885	20408	-0.14	-0.19
12	4885	20370	-0.12	-0.15
13	4874	20349	-0.15	-0.19
14	4824	20321	-0.14	-0.19
15	4874	20291	-0.15	-0.20
16	4824	20271	-0.14	-0.18
17	4773	20242	-0.16	-0.21
18	4880	20154	-0.15	-0.20
19	4880	20138	-0.15	-0.21
20	4773	20050	-0.11	-0.14
21	4880	19996	-0.15	-0.20
22	4824	19962	-0.14	-0.18
23	4880	19926	-0.14	-0.19
24	4824	19892	-0.14	-0.19
25	**5480**	**19770**	**0.89**	**1.18**
29	4552	21183	-0.15	-0.19
31	4551	21039	-0.15	-0.19
33	4553	20824	-0.15	-0.19
35	4509	20823	-0.15	-0.20
37	4508	21039	-0.14	-0.19
39	4508	21189	-0.15	-0.21
WH6	4959	22434	-0.16	-0.21
WH6A	4959	22298	-0.18	-0.24
WH6B	5109	22343	-0.18	-0.24
WH6C	4806	22343	-0.16	-0.21
WH7	6084	22031	-0.13	-0.18
WH7A	6084	22104	-0.13	-0.17
WH7B	6134	22019	-0.13	-0.17
WH8	5282	21308	-0.17	-0.23
WH8A	5329	21324	-0.16	-0.21

PT #	east	north	DELTA 153-164 Oct 96	0.92 RATE
1	4496	19729	-0.01	-0.02
2	4535	19745	-0.01	-0.02
3	4411	20079	-0.03	-0.03
4	4410	20223	-0.03	-0.03
5	4318	20290	-0.01	-0.01
6	4311	20305	-0.02	-0.02
7	4425	20470	-0.04	-0.04
8	4522	20470	-0.07	-0.07
9	4590	20451	-0.04	-0.04
10	4606	20410	-0.07	-0.07
11	4885	20408	-0.04	-0.04
12	4885	20370	-0.04	-0.05
13	4874	20349	-0.03	-0.03
14	4824	20321	-0.03	-0.03
15	4874	20291	-0.02	-0.02
16	4824	20271	-0.03	-0.03
17	4773	20242	-0.03	-0.03
18	4880	20154	-0.01	-0.02
19	4880	20138	-0.03	-0.03
20	4773	20050	-0.02	-0.02
21	4880	19996	-0.02	-0.03
22	4824	19962	-0.03	-0.03
23	4880	19926	-0.02	-0.02
24	4824	19892	-0.04	-0.04
25	**5480**	**19770**	**-1.04**	**-1.13**
29	4552	21183	-0.05	-0.05
31	4551	21039	-0.04	-0.04
33	4553	20824	-0.05	-0.06
35	4509	20823	-0.05	-0.05
37	4508	21039	-0.04	-0.04
39	4508	21189	-0.03	-0.03
WH6	4959	22434	0.00	0.00
WH6A	4959	22298	-0.01	-0.02
WH6B	5109	22343	-0.02	-0.02
WH6C	4806	22343	-0.02	-0.02
WH7	6084	22031	-0.03	-0.03
WH7A	6084	22104	-0.03	-0.03
WH7B	6134	22019	-0.04	-0.04
WH8	5282	21308	-0.03	-0.03
WH8A	5329	21324	-0.03	-0.03

PT #	east	north	TOTAL (0-164) Oct 96	AVG. 13.67 RATE
1	4496	19729	-1.72	-0.13
2	4535	19745	-1.74	-0.13
3	4411	20079	-1.88	-0.14
4	4410	20223	-1.83	-0.13
5	4318	20290	-1.98	-0.14
6	4311	20305	-2.02	-0.15
7	4425	20470	-2.06	-0.15
8	4522	20470	-1.98	-0.14
9	4590	20451	-1.95	-0.14
10	4606	20410	-2.00	-0.15
11	4885	20408	-1.81	-0.13
12	4885	20370	-1.75	-0.13
13	4874	20349	-1.78	-0.13
14	4824	20321	-1.79	-0.13
15	4874	20291	-1.76	-0.13
16	4824	20271	-1.79	-0.13
17	4773	20242	-1.81	-0.13
18	4880	20154	-1.74	-0.13
19	4880	20138	-1.73	-0.13
20	4773	20050	-1.69	-0.12
21	4880	19996	-1.69	-0.12
22	4824	19962	-1.71	-0.13
23	4880	19926	-1.68	-0.12
24	4824	19892	-1.70	-0.12
25	5480	19770	-1.68	-0.12
29	4552	21183	-2.09	-0.15
31	4551	21039	-2.07	-0.15
33	4553	20824	-2.07	-0.15
35	4509	20823	-2.08	-0.15
37	4508	21039	-2.08	-0.15
39	4508	21189	-2.09	-0.15
WH6	4959	22434	-1.80	-0.13
WH6A	4959	22298	-1.83	-0.13
WH6B	5109	22343	-1.73	-0.13
WH6C	4806	22343	-1.92	-0.14
WH7	6084	22031	-1.18	-0.06
WH7A	6084	22104	-1.26	-0.06
WH7B	6134	22019	-1.19	-0.06
WH8	5282	21308	-1.68	-0.12
WH8A	5329	21324	-1.69	-0.12

WEST HACKBERRY SUBSIDENCE RATE (ft/yr), (cont.)

PT #	east	north	DELTA 144-153 Nov 95	0.75 RATE
WH8B	5377	21342	-0.16	-0.21
WH9	4820	21727	-0.18	-0.24
WH9A	4761	21583	-0.16	-0.22
WH9B	4695	21716	-0.22	-0.29
WH11	5109	18925	-0.20	-0.27
WH11A	5108	18975	0.29	0.39
WH11B	5112	18877	-0.10	-0.14
WH101	3966	20292	-0.13	-0.18
WH102	3344	20641	-0.13	-0.18
WH103	3959	21015	-0.12	-0.16
WH104	3335	19891	-0.12	-0.17
WH105	3958	19515	-0.03	-0.04
WH106	3259	19140	-0.09	-0.12
WH107	3350	21390	-0.14	-0.18
WH108	4764	18186	-0.04	-0.05
WH109	3960	21765	-0.19	-0.26
WH110	3958	22515	-0.20	-0.27
WH111	3309	22870	-0.14	-0.19
WH112	5514	18186	-0.04	-0.06
WH113	2660	21765	-0.21	-0.28
WH115	3307	22139	-0.18	-0.25
WH116	1911	21821	-0.13	-0.17
WH117A	4230	18680	-0.08	-0.11
WH117B	4230	18680	-0.10	-0.13
BM1	4900	18641	-0.11	-0.14
BM5	4900	21300	-0.17	-0.23
BM8	4435	19308	-0.13	-0.17
BM11	4584	18978	-0.12	-0.16
BM12	3579	18978	-0.12	-0.16
BM13	3579	19758	-0.13	-0.18
BM14	3579	20399	-0.15	-0.19
BM15	3579	21300	-0.16	-0.21
SMS2	4956	19731	-0.13	-0.17
SMS3	6338	21696	-0.16	-0.22
SMS6	3522	20961	-0.16	-0.21
1	5578	17903	-0.05	-0.07
2	5362	18209	-0.06	-0.08
3	4829	18208	-0.07	-0.09
4	4562	18619	-0.09	-0.12
5	4289	18760	-0.11	-0.15

PT #	east	north	DELTA 153-164 Oct 96	0.92 RATE
WH8B	5377	21342	-0.03	-0.03
WH9	4820	21727	-0.05	-0.05
WH9A	4761	21583	-0.04	-0.04
WH9B	4695	21716	-0.02	-0.02
WH11	5109	18925	0.02	0.02
WH11A	5108	18975	0.00	0.00
WH11B	5112	18877	-0.02	-0.02
WH101	3966	20292	-0.05	-0.05
WH102	3344	20641	-0.05	-0.06
WH103	3959	21015	-0.08	-0.09
WH104	3335	19891	-0.05	-0.05
WH105	3958	19515	-0.04	-0.04
WH106	3259	19140	-0.05	-0.06
WH107	3350	21390	0.08	0.09
WH108	4764	18186	-0.04	-0.04
WH109	3960	21765	-0.03	-0.03
WH110	3958	22515	-0.04	-0.05
WH111	3309	22870	-0.06	-0.06
WH112	5514	18186	0.00	0.00
WH114	2660	21765	0.01	0.01
WH115	3307	22139	-0.05	-0.05
WH116	1911	21821	-0.05	-0.05
WH117A	4230	18680	-0.04	-0.04
WH117B	4230	18680	-0.04	-0.05
BM1	4900	18641	-0.03	-0.03
BM5	4900	21300	-0.04	-0.05
BM8	4435	19308	-0.04	-0.04
BM11	4584	18978	-0.03	-0.04
BM12	3579	18978	-0.04	-0.05
BM13	3579	19758	-0.05	-0.06
BM14	3579	20399	-0.05	-0.06
BM15	3579	21300	-0.06	-0.07
SMS2	4956	19731	-0.03	-0.04
SMS3	6338	21696	-0.02	-0.02
SMS6	3522	20961	-0.07	-0.07
1	5578	17903	-0.02	-0.02
2	5362	18209	-0.01	-0.02
3	4829	18208	-0.02	-0.02
4	4562	18619	-0.03	-0.03
5	4289	18760	-0.05	-0.05

PT #	east	north	TOTAL (0-164) Oct 96	AVG. 13.67 RATE
WH8B	5377	21342	-1.63	-0.12
WH9	4820	21727	-3.56	-0.26
WH9A	4761	21583	-1.98	-0.10
WH9B	4695	21716	-2.01	-0.10
WH11	5109	18925	-1.22	-0.09
WH11A	5108	18975	-0.76	-0.06
WH11B	5112	18877	-1.19	-0.09
WH101	3966	20292	-2.11	-0.15
WH102	3344	20641	-2.33	-0.17
WH103	3959	21015	-2.28	-0.17
WH104	3335	19891	-2.03	-0.15
WH105	3958	19515	-1.78	-0.13
WH106	3259	19140	-1.68	-0.08
WH107	3350	21390	-2.36	-0.17
WH108	4764	18186	-1.02	-0.07
WH109	3960	21765	-2.42	-0.18
WH110	3958	22515	-2.29	-0.17
WH111	3309	22870	-2.20	-0.16
WH112	5514	18186	-0.92	-0.05
WH113	2660	22502	-2.36	-0.17
WH114	2660	21765	-2.43	-0.18
WH115	3307	22139	-2.61	-0.19
WH116	1911	21821	-2.10	-0.10
WH117A	4230	18680	-0.64	-0.01
WH117B	4230	18680	-0.66	-0.01
BM1	4900	18641	-1.16	-0.09
BM5	4900	21300	-1.94	-0.14
BM8	4435	19308	-1.59	-0.12
BM11	4584	18978	-1.39	-0.10
BM12	3579	18978	-1.54	-0.11
BM13	3579	19758	-1.82	-0.13
BM14	3579	20399	-2.16	-0.16
BM15	3579	21300	-2.39	-0.18
SMS1	5035	18210	-0.93	-0.07
SMS2	4956	19731	-1.64	-0.12
SMS3	6338	21696	-1.03	-0.08
SMS6	3522	20961	-2.33	-0.17
1	5578	17903	-0.19	-0.01
2	5362	18209	-0.23	-0.02
3	4829	18208	-0.27	-0.02

WEST HACKBERRY SUBSIDENCE RATE (ft/yr), (cont.)

PT #	east	north	DELTA 144-153 Nov 95	0.75 RATE
6	4072	19158	-0.11	-0.14
7	3741	19442	-0.13	-0.17
8	3409	19187	-0.12	-0.15
9	3880	19452	-0.14	-0.18
10	3679	19837	-0.14	-0.18
11	3411	19847	-0.14	-0.18
12	3881	20211	-0.15	-0.20
13	3414	20600	-0.14	-0.18
14	**3727**	**20710**	**1.39**	**1.85**
15	3884	20974	-0.15	-0.20
16	3425	21352	-0.15	-0.20
17	3715	21354	-0.17	-0.23
18	3881	21704	-0.18	-0.24
19	3701	21928	-0.18	-0.25
20	3881	22453	-0.20	-0.26
21	3513	22356	-0.18	-0.24
22	3268	22209	-0.17	-0.23
23	3267	22505	-0.17	-0.22
24	3248	22789	-0.16	-0.21
25	2959	22340	-0.19	-0.25
27	2702	21841	-0.18	-0.24
28	2376	22336	-0.17	-0.23
29	1882	22343	-0.16	-0.21
30	1852	21906	-0.15	-0.19
31	5585	18458	-0.06	-0.08
32	5546	19062	-0.12	-0.16
33	5165	19419	-0.13	-0.17
34	4897	19674	-0.13	-0.18
35	4670	19943	-0.14	-0.18
36	4668	20336	-0.15	-0.20
37	4857	20439	-0.14	-0.19
38	4640	20711	-0.14	-0.19
39	4642	21103	-0.15	-0.20
40	4295	21373	-0.18	-0.24
41	4307	21974	-0.18	-0.24
42	4315	22367	-0.18	-0.25
43	4468	22397	-0.18	-0.25
44	5113	22281	-0.19	-0.25
45	5045	21937	-0.17	-0.23
46	4693	21855	-0.18	-0.24

PT #	east	north	DELTA 153-164 Oct 96	0.92 RATE
6	4072	19158	-0.04	-0.05
7	3741	19442	-0.05	-0.05
8	3409	19187	-0.05	-0.05
9	3880	19452	-0.03	-0.04
10	3679	19837	-0.04	-0.04
11	3411	19847	-0.04	-0.05
12	3881	20211	-0.03	-0.04
13	3414	20600	-0.05	-0.06
14	3727	20710	-0.06	-0.07
15	3884	20974	-0.06	-0.06
16	3425	21352	-0.06	-0.07
17	3715	21354	-0.05	-0.05
18	3881	21704	-0.03	-0.03
19	3701	21928	-0.04	-0.05
20	3881	22453	-0.04	-0.04
21	3513	22356	-0.04	-0.04
22	3268	22209	-0.06	-0.06
23	3267	22505	-0.05	-0.06
24	3248	22789	-0.04	-0.04
25	2959	22340	-0.06	-0.07
27	2702	21841	-0.03	-0.04
28	2376	22336	-0.03	-0.03
29	1882	22343	-0.03	-0.03
30	1852	21906	-0.03	-0.03
31	5585	18458	-0.03	-0.03
32	5546	19062	-0.01	-0.01
33	5165	19419	-0.02	-0.03
34	4897	19674	-0.03	-0.03
35	4670	19943	-0.03	-0.04
36	4668	20336	-0.03	-0.03
37	4857	20439	-0.03	-0.04
38	4640	20711	-0.04	-0.05
39	4642	21103	-0.04	-0.05
40	4295	21373	-0.04	-0.05
41	4307	21974	-0.04	-0.04
42	4315	22367	-0.03	-0.03
43	4468	22397	-0.03	-0.03
44	5113	22281	-0.01	-0.01
45	5045	21937	-0.03	-0.04
46	4693	21855	-0.04	-0.04

PT #	east	north	TOTAL (0-164) Oct 96	AVG. 13.7 RATE
4	4562	18619	-0.33	-0.05
5	4289	18760	-0.38	-0.06
6	4072	19158	-0.44	-0.07
7	3741	19442	-0.50	-0.08
8	3409	19187	-0.46	-0.07
9	3880	19452	-0.49	-0.08
10	3679	19837	-0.54	-0.09
11	3411	19847	-0.54	-0.09
12	3881	20211	-0.55	-0.09
13	3414	20600	-0.59	-0.09
14	3727	20710	0.91	0.15
15	3884	20974	-0.60	-0.10
16	3425	21352	-0.63	-0.10
17	3715	21354	-0.62	-0.10
18	3881	21704	-0.60	-0.10
19	3701	21928	-0.61	-0.10
20	3881	22453	-0.55	-0.09
21	3513	22356	-0.57	-0.09
22	3268	22209	-0.59	-0.10
23	3267	22505	-0.57	-0.09
24	3248	22789	-0.52	-0.08
25	2959	22340	-0.60	-0.10
26	2721	22420	-0.55	-0.09
27	2702	21841	-0.59	-0.09
28	2376	22336	-0.53	-0.09
29	1882	22343	-0.49	-0.08
30	1852	21906	-0.51	-0.08
31	5585	18458	-0.24	-0.04
32	5546	19062	-0.29	-0.05
33	5165	19419	-0.37	-0.06
34	4897	19674	-0.45	-0.07
35	4670	19943	-0.49	-0.08
36	4668	20336	-0.52	-0.08
37	4857	20439	-0.50	-0.08
38	4640	20711	-0.53	-0.08
39	4642	21103	-0.53	-0.09
40	4295	21373	-0.58	-0.09
41	4307	21974	-0.54	-0.09
42	4315	22367	-0.51	-0.08
43	4468	22397	-0.50	-0.08

WEST HACKBERRY SUBSIDENCE RATE (ft/yr), (cont.)

PT #	east	north	DELTA 144-153 Nov 95	0.75 RATE
47	5514	21859	-0.16	-0.22
48	5862	21926	-0.14	-0.19
49	5174	21395	-0.16	-0.22
50	5524	20610	-0.14	-0.18
51	5232	20536	-0.15	-0.20
52	5578	20203	-0.12	-0.16
53	5574	19863	0.04	0.05
54	5566	19492	-0.12	-0.16
55	5576	20131	-0.13	-0.17
56	5576	20808	-0.14	-0.19
57	4311	20784	-0.16	-0.21
58	4312	21143	0.02	0.03
59	4989	19018	-0.10	-0.13
60	3818	17981	-0.08	-0.10
61	4023	18856	-0.11	-0.14
62	2973	18856	-0.12	-0.16
63	3109	20252	-0.15	-0.19
64	3106	21439	-0.16	-0.22
65	1651	21443	-0.15	-0.21
66	1723	22695	-0.17	-0.22
67	3129	22732	-0.17	-0.22
68	3802	22716	-0.19	-0.26
69	4692	22538	-0.19	-0.25
70	6003	22258	-0.14	-0.18
71	6320	22264	-0.13	-0.17
72	6735	21066	-0.10	-0.14
73	5585	21051	-0.15	-0.20

PT #	east	north	DELTA 153-164 Oct 96	0.92 RATE
47	5514	21859	-0.03	-0.04
48	5862	21926	-0.03	-0.03
49	5174	21395	-0.03	-0.04
50	5524	20610	-0.04	-0.04
51	5232	20536	-0.04	-0.04
52	5578	20203	-0.03	-0.03
53	5574	19863	-0.02	-0.02
54	5566	19492	-0.01	-0.01
55	5576	20131	-0.02	-0.02
56	5576	20808	-0.04	-0.04
57	4311	20784	-0.04	-0.05
58	4312	21143	-0.24	-0.27
59	4989	19018	-0.03	-0.04
60	3818	17981	-0.04	-0.04
61	4023	18856	-0.04	-0.05
62	2973	18856	-0.04	-0.04
63	3109	20252	-0.05	-0.05
64	3106	21439	-0.06	-0.06
65	1651	21443	-0.02	-0.03
66	1723	22695	-0.01	-0.01
67	3129	22732	-0.04	-0.05
68	3802	22716	-0.04	-0.04
69	4692	22538	-0.02	-0.02
70	6003	22258	-0.02	-0.02
71	6320	22264	-0.03	-0.04
72	6735	21066	-0.01	-0.01
73	5585	21051	-0.03	-0.03

PT #	east	north	TOTAL (0-164) Oct 96	AVG. 13.67 RATE
44	5113	22281	-0.44	-0.07
45	5045	21937	-0.48	-0.08
46	4693	21855	-0.53	-0.08
47	5514	21859	-0.42	-0.07
48	5862	21926	-0.35	-0.06
49	5174	21395	-0.49	-0.08
50	5524	20610	-0.43	-0.07
51	5232	20536	-0.48	-0.08
52	5578	20203	-0.38	-0.06
53	5574	19863	-0.36	-0.06
54	5566	19492	-0.33	-0.05
55	5576	20131	-0.39	-0.06
56	5576	20808	-0.42	-0.07
57	4311	20784	-0.57	-0.09
58	4312	21143	-0.59	-0.09
59	4989	19018	-0.34	-0.05

Table 3

Fitting Parameters for Long Term Subsidence Prediction

The fitting parameter x_o (x_1 at time = 0) is equal to zero for all predictions.

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Pt. I.D.	EAST	NORTH	Y_0	A_1	t1
1	4495.5	19728.6	19.04899	2.71794	154.3842
2	4535.3	19744.8	19.10037	2.68022	149.59436
3	4410.6	20079.1	19.84932	2.77006	141.34977
4	4409.9	20222.5	20.12046	2.54095	113.34691
5	4318.2	20289.5	18.47026	3.08713	152.95448
6	4310.6	20304.8	18.47939	3.1136	152.90129
7	4425.1	20470.1	18.59509	3.10631	147.70182
8	4521.7	20470.2	18.83469	2.84288	132.31099
9	4590.1	20450.8	18.75885	2.93562	147.12119
10	4606.0	20410.1	18.59227	3.07444	156.85924
11	4885.0	20407.9	21.22726	3.05738	175.5789
12	4884.8	20369.8	21.23431	2.99989	181.44918
13	4874.1	20349.0	20.91666	3.26928	202.33681
14	4823.8	20320.8	20.82917	3.37794	209.8873
15	4874.1	20291.0	20.84722	3.36909	213.44391
16	4823.7	20270.6	20.74033	3.45254	214.96423
17	4772.6	20242.1	28.48662	3.10337	179.57359
18	4880.2	20154.0	28.66834	2.89911	168.77261
19	4880.1	20138.1	27.73131	2.83727	166.23117
20	4772.5	20049.9	27.65089	2.90376	176.86737
21	4880.0	19996.2	21.47702	2.69664	159.07063
22	4823.6	19961.8	21.42711	2.67711	154.39849
23	4880.0	19926.2	21.3756	2.76724	167.83172
24	4823.6	19891.8	21.48609	2.63992	152.95099
25	5480.1	19770.2	22.10408	2.561	140.7155
27	5480.3	20488.8	19.6124	4.71184	262.22199
29	4551.8	21183.4	15.60759	3.17372	148.135471
31	4550.9	21039.0	16.05371	3.08104	141.06362
33	4552.9	20823.8	14.99544	3.21993	159.21839
35	4508.9	20823.4	15.93924	3.14116	147.08477
37	4508.2	21038.9	16.05207	2.70181	121.94077
39	4508.2	21188.8	15.51934	3.21653	148.78438
Well 6	4959.3	22433.8	3.33337	2.71528	141.55407
Well 6a	4959.0	22298.3	6.0979	2.65891	132.71952
Well 6b	5108.6	22343.0	3.60029	2.62296	143.33264
Well 6c	4805.5	22343.1	3.53932	2.80631	133.63941
Well 7	6083.9	22031.2	4.41944	1.5549	103.43618
Well 7a	6084.2	22104.0	3.6434	1.56349	82.43133
Well 7b	6134.0	22019.4	3.54283	1.58839	108.4644
Well 8	5282.3	21308.0	-46.40777	60.83844	5717.19913
Well 8a	5329.3	21324.3	11.45945	2.63503	153.42614
Well 8b	5376.9	21341.7	11.23345	2.8759	186.23825

Pt. I.D.	EAST	NORTH	Y_0	A_1	t1
Well 9	4819.5	21727.0	-19.14788	33.98343	1357.79476
Well 9a	4761.1	21583.4	9.64164	2.94279	131.07755
Well 9b	4695.3	21716.1	9.04183	2.94429	128.74907
Well 11	5109.3	18925.1	8.68886	2.23058	203.50112
Well 11a	5107.8	18974.5	10.2726	1.92861	167.10788
Well 11b	5111.6	18876.8	10.86667	2.33079	220.95726
Well 101	3965.7	20291.5	16.38568	3.398457	166.13549
Well 102	3343.5	20640.5	13.57125	3.48089	149.85348
Well 103	3959.0	21015.3	13.77991	3.36919	144.46256
Well 104	3335.1	19890.7	15.27542	3.4483	187.61195
Well 105	3957.9	19515.4	15.84392	2.87212	160.12379
Well 106	3258.7	19139.5	14.60471	2.65807	150.50444
Well 107	3349.6	21390.2	12.72795	3.13974	107.30507
Well 108	4764.3	18186.0	6.31173	1.72881	178.3349
Well 109	3960.3	21764.5	7.11961	3.49393	139.00836
Well 110	3957.6	22514.5	4.88643	3.12688	123.40922
Well 112	5514.1	18185.7	5.1384	3.00942	119.30258
Well 113	2659.8	22501.6	7.33692	1.14903	100.74653
Well 114	2659.6	21764.6	4.3585	3.214934	115.77566
Well 115	3307.4	22139.3	3.91427	3.49736	132.28276
Well 116	1911.2	21820.5	5.79261	3.41751	109.90291
Well 117a	4230.1	18680.0	5.10964	3.02586	124.16791
Well 117b	4230.0	18680.0	11.0368	1.57484	187.55137
BM 1	4900.0	18640.6	8.86434	1.78753	148.35082
BM4	4400.0	20600.0	15.56735	3.29471	162.52275
BM5	4900.4	21300.1	13.24252	2.95949	150.94359
BM8	4435.1	19308.1	14.98764	2.53279	159.28126
BM11	4583.9	18977.7	10.13198	2.31267	169.60758
BM12	3578.6	18977.9	13.76623	2.58141	176.49276
BM13	3579.1	19758	19.93177	3.60924	225.42546
BM14	3579.1	20398.6	15.72725	3.36015	156.96739
BM15	3579.1	21300.0	14.05401	3.46888	138.87841
SMS1	5035.3	18209.9	8.76542	1.37751	139.89022
SMS2	4955.9	19731.1	16.58251	2.53569	153.20174
SMS3	6338.0	21695.5	1.91097	1.64768	162.72086
SMS4	4875.7	21829.9	3.07146	5.01898	272.89622
SMS5	1727.0	22103.2	3.64195	3.06494	145.62278
SMS6	3521.9	20960.9	13.35817	3.74645	168.11477
SMS7	3371.5	19379.4	18.85253	2.51185	143.31415
WH 1	5577.7	17903.3	9.42682	2.05295	47.99537
WH 2	5361.7	18208.7	5.37873	2.07069	51.012

Pt. I.D.	EAST	NORTH	Y_0	A_1	t1
WH 3	4829.4	18207.8	4.89841	2.18177	56.25559
WH 4	4562.1	18619.4	10.28646	2.21151	73.29703
WH 5	4288.8	18759.8	9.26621	2.29125	83.56897
WH 6	4072.2	19157.9	12.9022	2.61618	114.68396
WH 7	3740.7	19441.8	18.09276	2.87468	139.74661
WH 8	3409.1	19187.4	15.54996	2.71841	124.34977
WH 9	3879.8	19451.6	14.26068	2.71603	125.03372
WH 10	3678.9	19837.0	18.29176	3.33644	179.29109
WH 11	3410.6	19846.7	13.32764	3.15918	164.72939
WH 12	3880.7	20210.6	14.36851	3.26938	174.19509
WH 13	3414.3	20600.1	10.58907	3.83792	222.95938
WH 14	3727.1	20709.6	13.65948	3.339	187.40731
WH 15	3883.8	20973.8	10.46643	4.06069	242.1485
WH 16	3424.9	21351.5	8.94167	4.27517	261.16982
WH 17	3715.1	21353.7	11.86936	4.24639	259.40583
WH 18	3881.2	21704.4	4.64773	3.80857	220.78958
WH 19	3700.8	21927.8	7.95567	4.48213	277.51163
WH 20	3881.0	22452.7	2.14753	3.03878	156.35921
WH 21	3512.5	22356.0	2.50119	3.33486	181.27635
WH 22	3268.1	22208.8	2.80067	3.53555	199.64442
WH 23	3266.6	22505.3	2.14296	3.28393	176.69616
WH 24	3247.5	22789.0	2.4272	2.92963	145.07639
WH 25	2959.1	22339.6	0.70174	3.34365	183.90411
WH 26	2720.8	22420.3	1.09775	3.36878	234.88747
WH 27	2701.8	21841.0	2.04999	3.7464	216.31579
WH 28	2376.0	22335.5	1.492	2.94523	145.73518
WH 29	1881.9	22343.0	2.10583	2.65203	118.62568
WH 30	1851.5	21906.3	2.41425	2.97465	146.93826
WH 31	5585.4	18457.7	8.33873	2.07018	53.18755
WH 32	5545.9	19062.2	10.55798	2.08978	59.0959
WH 33	5164.8	19418.8	15.20243	2.23406	78.19887
WH 34	4896.7	19673.7	17.43788	2.46921	101.47363
WH 35	4669.7	19942.7	16.92633	2.65014	118.97973
WH 36	4668.4	20335.6	16.14443	2.87286	138.7803
WH 37	4856.6	20438.8	15.38134	2.84583	136.98284
WH 38	4639.5	20710.5	14.89484	3.05281	154.90019
WH 39	4642.0	21103.4	13.28302	3.11375	161.51066
WH 40	4294.8	21373.0	11.92735	4.70481	292.88497
WH 41	4307.0	21974.2	7.67922	3.30773	177.98137
WH 42	4314.8	22366.7	5.86515	2.97157	148.95701
WH 43	4468.3	22397.2	5.42784	2.80887	134.0994
WH 44	5113.2	22280.6	3.30386	2.52303	107.5375
WH 45	5045.4	21936.5	8.27024	2.67609	122.5101

Pt. I.D.	EAST	NORTH	Y_0	A_1	t1
WH 46	4693.1	21854.8	10.26351	2.88155	142.54376
WH 47	5513.8	21859.0	7.98716	2.29895	86.92097
WH 48	5862.4	21925.5	5.21848	2.20904	75.18602
WH 49	5174.4	21394.9	11.82656	2.6699	121.6748
WH 50	5524.1	20609.7	15.21313	2.40324	96.25628
WH51	5232.4	20535.9	18.11312	2.54161	110.86374
WH 52	5577.8	20203.0	12.91006	2.28657	82.44124
WH 53	5573.7	19862.6	14.61502	2.39328	88.02273
WH 54	5566.0	19492.4	14.66404	2.16347	67.55508
WH 55	5575.5	20131.3	13.53574	2.28104	81.25985
WH 56	5576.4	20808.0	12.75863	2.30737	86.94685
WH 57	4311.0	20783.9	12.8332	4.73	293.46732
WH 58	4312.0	21142.6	13.39234	3.01514	161.89568
WH 59	4989.1	19017.9	11.47615	2.19156	72.37772
WH 60	3818.3	17980.6	6.10691	2.34307	85.46598
WH61	4022.8	18855.8	11.58053	2.83947	134.0027
WH 62	2972.9	18856.2	14.47227	2.90772	139.89374
WH 63	3109.0	20251.6	13.07429	4.56585	280.88154
WH64	3105.9	21439.3	9.47907	6.92104	476.37054
WH 65	1651.0	21442.5	5.72909	3.14096	159.70604
WH 66	1722.9	22694.9	0.88913	2.93088	140.89063
WH 67	3128.9	22732	-0.49105	4.5011	276.12863
WH 68	3802.4	22716.2	-1.34022	4.83022	303.92406
WH 69	4691.5	22537.5	2.27973	4.02032	235.08372
WH 70	6002.5	22257.8	1.26397	2.76603	126.3368
WH 71	6320.2	22263.9	1.99413	2.65583	116.63152
WH 72	6734.6	21066.0	2.57972	2.30027	79.684
WH 73	5585.2	21050.9	9.85039	3.36962	180.28181

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