Airborne Gamma-Ray Spectrometer and Magnetometer Survey **MASTER**

Seattle Quadrangle
(Washington)

Final Report

Volume II

B

prepared by

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LOCATION MAP

Seattle

SEATTLE QUADRANGLE

GEOLOGY

The geologic map of the Seattle quadrangle, which provided the geologic background for the interpretation of the radiometric data, was prepared for Bendix Field Engineering Corporation by ESCA-TECH Corp. The explanation of the geologic legend, Appendix C, was taken from this map.

The Seattle quadrangle is in three physiographic provinces: the Willapa Hills, the Puget Lowlands, and the Olympic Mountains.

The Willapa Hills, an extension of the Oregon Coast Range, are chiefly of Tertiary age and are part of the same eugeosynclinal accumulation of marine sedimentary and submarine volcanic rocks that make up the Olympic Mountains. Near the close of the Miocene there was a regional uplift which formed the present Willapa Hills as exposed in the southwest portion of the quadrangle.

The Puget Lowlands lie nearly at sea level. The underlying formations are part of the same eugeosynclinal accumulation which make up the Olympic Mountains and Willapa Hills. During Pleistocene time, glaciofluvial deposits were accumulated in the lowlying Puget Lowlands.

The Olympic Mountains are chiefly of Tertiary age and are part of an eugeosynclinal accumulation of marine sedimentary and submarine volcanic rocks that total 50,000 feet as deposited. The earliest Tertiary rocks are a sequence of Eocene argillites and graywackes more than 30,000 feet thick that forms the core of the Olympic Mountains. This was followed by a thick sequence of submarine volcanic rocks. Near centers of volcanism, the accumulated thickness exceeds 20,000 feet, while away from these centers the basalt flows and breccias may exceed 10,000 feet in thickness. In the present Olympic Mountains, these volcanic rocks form

many of the structural and topographic highs as they were more resistant to erosion. An uplift is late Eocene time raised the area of the Olympic Mountains above sea level and erosion provided much of the material which was deposited in nearby low areas. Further uplift near the close of the Miocene with intense deformation formed the present Olympic Mountains.

Marine sedimentary deposits and submarine basalt flows crop out throughout the western half of the quadrangle. Quaternary eolian deposits, lacustrine deposits, glacial deposits, and alluvium are widespread in the eastern half.

RADIOACTIVE MINERAL OCCURRENCES IN WASHINGTON

Huntting, 1956; and Weissenborn, 1966 documented the radioactive occurrences in Washington (Figure 2). They did not record any in the Seattle quadrangle.

The following types of radioactive occurrence have been found in Washington (Huntting, 1956; Weissenborn, 1966):

- 1) Secondary uranium minerals along the contact between preCambrian metamorphosed sedimentary rocks and porphyritic quartz-monzonite of Cretaceous age - Midnite mine, Stevens County.
- 2) Autunite filling fractures and open spaces in pegmatitic alaskite - Mount Spokane area, Spokane County; Lost Creek area, Pend Oreille County.
- 3) Secondary uranium minerals in interbedded tuffaceous sandstone, arkose, and carbonaceous shale - Midnite mine area, Stevens County.
- 4) Radioactivity in pegmatitic lenses in gneiss.

Radioactive Occurrences in Washington

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- 5) Strong radioactivity in soil and gravel around a radioactive spring - Bumping Lake, Yakima County.

The major uranium production from Washington state has been from the Midnite mine, Stevens County; and the Daybreak mine, Spokane County. Minor production has been reported from several other properties in the state (Weissenborn, 1966).

GEOPHYSICAL DATA INTERPRETATION

Radiometric Data

A total of one (1) uranium anomaly meets the minimum statistical requirements as defined in Volume I. This anomaly is listed in Table 1 and is shown on the Uranium Anomaly Interpretation Map, Figure 3.

Potassium (%K), equivalent Uranium (ppm eU), equivalent Thorium (ppm eT), eU/eT, eU/K, eT/K, and magnetic pseudo-contour maps are presented in Appendix E. Stacked Profiles showing geologic strip maps along each flight-line, together with sensor data, and ancillary data are presented in Appendix F. All maps and profiles were prepared on a scale of 1:250,000, but have been reduced to 1:500,000 for presentation in Volume II.

Geologic unit designations given in Table 1 are those given on the Geology Map, Appendix B, and in the Explanation of the Geologic Legend, Appendix C.

TABLE 1 - URANIUM ANOMALIES IN THE SEATTLE QUADRANGLE

ANOMALY #	LINE #	GEOLOGIC UNIT	TYPE	STANDARD DEVIATIONS FROM MEAN * URANIUM										
				-2	-1	0	1	2	3	4	5	6	7	
1	2	Tur/Qc	U	-	-	-	1	-	2	-	-	-	-	

Anomaly #1 is over the contact area between undifferentiated Tertiary rocks (Tur) and Pleistocene glacial deposits (Qc).

REFERENCES

Huntting, M.T., (1956); Inventory of Washington Minerals, Part
II: Metallic Minerals. Bulletin 37, Department of
Natural Resources, State of Washington.

Weissenborn, A.E., (1966); Uranium IN Mineral and Water Resources
of Washington. Prepared by the United States Geological
Survey.

APPENDIX A - FLIGHT LINE MAP

APPENDIX B - GEOLOGY MAP

This is a detailed geological map of a coastal region, likely the Pacific Northwest. The map displays various geological units, each labeled with a specific code. These codes include T1, T2, T3, T4, T5, T6, T7, T8, T9, T10, T11, T12, T13, T14, T15, T16, T17, T18, T19, T20, T21, T22, T23, T24, T25, T26, T27, T28, T29, T30, T31, T32, T33, T34, T35, T36, T37, T38, T39, T40, T41, T42, T43, T44, T45, T46, T47, T48, T49, T50, T51, T52, T53, T54, T55, T56, T57, T58, T59, T60, T61, T62, T63, T64, T65, T66, T67, T68, T69, T70, T71, T72, T73, T74, T75, T76, T77, T78, T79, T80, T81, T82, T83, T84, T85, T86, T87, T88, T89, T90, T91, T92, T93, T94, T95, T96, T97, T98, T99, and T100. The map also features numerous contour lines, a grid system, and a scale bar. The coastline is clearly defined, and the map shows a complex network of geological features and boundaries.

Compiled 1980

GEOLOGY OF THE SEATTLE QUADRANGLE, WASHINGTON

APPENDIX C - EXPLANATION OF GEOLOGIC LEGEND

SEDIMENTARY ROCKS

GEOLOGIC SYMBOLS

- CONTACT, dashed where approximate
- ANTICLINE, dashed where approximate, dotted where concealed
- SYNCLINE, dashed where approximate, dotted where concealed
- FAULT, dashed where approximate, dotted where concealed
- THRUST FAULT, dashed where approximate, dotted where concealed, sawteeth on upper plate
- PHOTOLINEAR

APPENDIX D - FLIGHT LINE/GEOLOGY MAP

APPENDIX E - PSEUDO-CONTOUR MAPS

Magnetic

CONTOUR INTERVAL =
REFERENCE CONTOUR

250.00
0.00

Total Count

eTh

CONTOUR INTERVAL =
REFERENCE CONTOUR

(00000) =

25
6.00

SEATTLE

eU/eTH

CONTOUR INTERVAL =
REFERENCE CONTOUR

(00000) =

20
0.00

eTh/K_{40}

APPENDIX F - STACKED PROFILES

APPENDIX G - ANOMALY MAPS

SEATTLE, WA

EU

HIGH LIFE - QEB

0 4 8 12 16 MILES

SEATTLE, WA

ETH

HIGH LIFE - QEB

0 4 8 12 16 MILES

SEATTLE, WA

K

HIGH LIFE - QEB

0 4 8 12 16 MILES

SECTION 1

EU/ETH

HIGH LIFE - QEB

MILES 0 4 8 12 16

G-4

SEATTLE, WA

CU/K

HIGH LIFE - QEB

0 4 8 12 16 MILES

SEATTLE, WA

ETH/K

HIGH LIFE - QEB

0 4 8 12 16 MILES

APPENDIX H - GEOLOGIC HISTOGRAMS

UNIT QAL

UNIT QC

UNIT QO

UNIT QA

UNIT TH

UNIT TR

UNIT TH

UNIT TR

UNIT TLC

UNIT TBK

UNIT TP

UNIT TN

UNIT, TL

UNIT TCS

UNIT TBM

UNIT TB

UNIT TCB

UNIT TCBB

APPENDIX I - SPEED AND ALTITUDE HISTOGRAMS

APPENDIX J - STATISTICAL TABLES

UNIT	ETH			EU			K			EU/ETH			EU/K			ETH/K		
	MEAN	ST.DEV.	EVENTS DIS.	MEAN	ST.DEV.	EVENTS DIS.	MEAN	ST.DEV.	EVENTS DIS.	MEAN	ST.DEV.	EVENTS DIS.	MEAN	ST.DEV.	EVENTS DIS.	MEAN	ST.DEV.	EVENTS DIS.
QA	1.81	.48	21 N	1.00	.30	21 U	.41	.07	21 L	.64	.44	21 U	2.47	.82	21 U	4.56	1.49	21 U
QAL	2.25	1.01	3590 N	1.17	.46	3383 N	.53	.23	3647 N	.66	.88	3373 N	2.57	1.60	3381 N	4.55	2.11	3588 N
QC	1.66	.82	22916 N	.95	.44	22266 N	.43	.19	23055 N	.84	3.45	22022 N	2.99	16.06	22124 N	4.29	9.14	22839 N
QD	1.64	.73	3379 N	.65	.32	2489 N	.22	.13	3488 N	.55	1.25	2471 N	5.44	14.59	2469 U	10.25	18.64	3334 U
TA	2.85	.94	554 N	.90	.37	450 N	.42	.17	553 N	.38	.32	450 N	2.86	2.46	449 N	7.73	3.85	553 N
TAL	.92	.38	49 N	.65	.20	49 N	.29	.07	40 L	.95	.75	49 U	2.43	1.07	49 N	3.29	1.46	49 U
TB	1.23	.57	1571 N	.64	.33	1403 N	.24	.11	1596 N	.82	1.38	1379 N	3.66	3.68	1400 N	5.92	4.32	1568 N
TBK	2.05	.81	60 U	1.22	.30	60 N	.51	.11	60 N	.78	.70	60 U	2.63	1.61	60 U	3.93	1.24	60 L
TBM	1.63	.72	463 N	.69	.31	266 N	.50	.21	504 L	.76	2.41	251 N	1.97	1.52	266 L	3.43	1.57	463 N
TCB	.81	.56	2860 U	.45	.25	2110 N	.23	.22	3901 N	3.64	33.31	1783 U	8.45	35.70	2017 U	6.57	29.27	2790 U
TCBB	.99	.55	2377 N	.54	.31	1912 N	.20	.10	2689 N	2.33	29.56	1835 N	5.22	30.36	1902 U	6.55	25.55	2362 U
TCS	1.29	.92	31 N	.60	.43	30 U	.26	.13	34 L	.57	.37	30 U	5.74	14.73	30 U	10.68	22.55	31 U
TL	1.04	.39	71 L	.68	.25	70 U	.31	.07	71 N	.79	.49	70 L	2.33	.93	70 L	3.59	1.47	71 U
TLC	1.69	.71	284 N	.67	.33	253 N	.24	.12	288 N	.48	.48	253 N	3.61	2.94	253 U	8.34	5.72	284 U
TM	2.34	1.11	757 N	.77	.36	671 N	.38	.18	757 N	.44	.52	671 N	2.74	3.85	671 N	6.98	6.38	757 L
TN	2.52	1.17	34 N	.95	.43	35 U	.47	.18	35 N	.47	.35	34 L	2.13	.87	35 L	5.31	1.79	34 N
TP	2.00	1.14	74 N	.91	.58	74 U	.53	.34	74 L	.52	.27	74 L	1.95	.97	74 L	4.00	1.25	74 N
TT	1.68	.59	72 L	.90	.37	72 L	.40	.09	72 N	.59	.30	72 L	2.44	1.41	72 U	4.27	1.22	72 L
TUR	2.88	1.46	929 L	.90	.51	455 L	.55	.23	935 L	.42	.32	453 L	2.09	1.34	455 L	5.52	2.14	929 L
WA	.61	.66	3351 U	.47	.31	5189 U	.13	.17	3931 U	8.47	167.62	3087 N	31.16	215.26	3520 U	15.80	115.29	2497 U

N=NORMAL DISTRIBUTION
L=LOG-NORMAL DISTRIBUTION
U=UNKNOWN DISTRIBUTION

	QA	QAL	QC	QO	TA	TAL	TB	TBK	TBM	TCB	TCBB	TCS	TL	TLC	TN
1	0.00	1.99	2.58	1.61	2.34	0.00	1.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.05
2	0.00	2.79	2.34	1.56	3.08	0.00	1.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80
3	0.00	3.27	1.70	1.87	.75	0.00	1.18	0.00	0.00	0.00	2.16	2.23	0.00	1.28	1.18
4	0.00	2.48	1.51	1.41	0.00	0.00	0.00	0.00	0.00	0.00	1.08	0.00	0.00	1.80	0.00
5	0.00	2.58	1.62	1.53	0.00	0.00	0.00	0.00	0.00	1.39	.99	.72	0.00	0.00	0.00
6	0.00	2.06	1.57	1.85	0.00	0.00	0.00	0.00	1.46	.85	1.05	0.00	0.00	0.00	0.00
7	0.00	1.91	1.55	0.00	0.00	0.00	.84	2.22	.53	.48	.96	0.00	0.00	0.00	0.00
8	0.00	1.64	1.38	0.00	0.00	0.00	0.00	0.00	0.00	.53	.55	0.00	0.00	0.00	0.00
9	1.81	1.15	1.39	0.00	0.00	0.00	0.00	0.00	0.00	.45	1.06	0.00	0.00	0.00	0.00
10	0.00	1.36	1.20	2.05	0.00	0.00	0.00	0.00	1.70	.48	.59	0.00	0.00	0.00	0.00
11	0.00	2.16	1.31	0.00	0.00	.68	0.00	0.00	1.51	.60	.78	.83	1.03	0.00	4.05
12	0.00	1.53	1.30	0.00	0.00	.96	0.00	0.00	1.74	0.00	.92	0.00	1.05	0.00	0.00
501	0.00	2.84	0.00	1.83	3.28	0.00	1.80	0.00	1.92	1.17	1.10	.54	0.00	1.62	3.49
502	0.00	1.94	1.82	1.14	0.00	0.00	1.71	0.00	0.00	1.18	1.02	0.00	0.00	0.00	0.00
503	0.00	1.26	1.51	0.00	0.00	0.00	0.00	.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00
504	0.00	1.80	1.48	0.00	0.00	0.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	TN	TP	TT	TUR	WA
1	0.00	0.00	0.00	3.03	0.00
2	0.00	0.00	0.00	1.91	.52
3	0.00	0.00	0.00	0.00	.99
4	0.00	3.44	0.00	0.00	.71
5	0.00	0.00	0.00	0.00	.89
6	0.00	1.79	0.00	0.00	.55
7	0.00	0.00	0.00	4.23	.34
8	0.00	0.00	0.00	0.00	.66
9	0.00	0.00	0.00	2.66	.30
10	2.52	0.00	0.00	1.99	.74
11	0.00	0.00	1.92	0.00	.34
12	0.00	0.00	1.34	2.03	.29
501	0.00	0.00	0.00	0.00	.83
502	0.00	0.00	0.00	0.00	1.72
503	0.00	0.00	0.00	0.00	.40
504	0.00	1.02	0.00	1.99	1.74

COMPUTER LINES 1 THRU 12 REFER TO PROFILE LINES 1 THRU 12.

COMPUTER LINES 501 THRU 504 REFER TO NORTH - SOUTH TIE LINES 1 THRU 4.

GEOLOGIC UNIT AVERAGE VALUE AS A
FUNCTION OF MAP LINE FOR PPM ETH

	QA	QAL	QC	QO	TA	TAL	TB	TBK	TBM	TCB	TCBB	TCS	TL	TLC	TN
1	0.00	1.08	1.35	.67	.83	0.00	.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.79
2	0.00	1.26	1.21	.66	1.04	0.00	.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.68
3	0.00	1.49	.97	.80	.42	0.00	.78	0.00	0.00	0.00	.80	.91	0.00	.82	.60
4	0.00	1.11	.70	.51	0.00	0.00	0.00	0.00	0.00	0.00	.50	0.00	0.00	.63	0.00
5	0.00	1.58	.89	.50	0.00	0.00	0.00	0.00	0.00	0.00	.42	.44	0.00	0.00	0.00
6	0.00	.98	.84	.70	0.00	0.00	0.00	0.00	.62	.40	.60	0.00	0.00	0.00	0.00
7	0.00	1.23	1.04	0.00	0.00	0.00	.58	1.23	.31	.48	.58	0.00	0.00	0.00	0.00
8	0.00	1.00	.91	0.00	0.00	0.00	0.00	0.00	0.00	.48	.44	0.00	0.00	0.00	0.00
9	1.00	.70	.85	0.00	0.00	0.00	0.00	0.00	0.00	.51	.72	0.00	0.00	0.00	0.00
10	0.00	.99	.82	.78	0.00	0.00	0.00	0.00	.71	.48	.55	0.00	0.00	0.00	0.00
11	0.00	1.13	.76	0.00	0.00	.59	0.00	0.00	.75	.40	.38	.42	.54	0.00	1.49
12	0.00	.83	.75	0.00	0.00	.67	0.00	0.00	.75	0.00	.62	0.00	.75	0.00	0.00
501	0.00	.77	0.00	.62	.72	0.00	.74	0.00	.68	.75	0.00	0.00	0.00	.71	.71
502	0.00	.71	.61	0.00	0.00	0.00	.61	0.00	0.00	.57	.47	0.00	0.00	0.00	0.00
503	0.00	.98	1.02	0.00	0.00	0.00	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
504	0.00	1.22	1.04	0.00	0.00	0.00	.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	TN	TP	TT	TUR	WA
1	0.00	0.00	0.00	1.34	0.00
2	0.00	0.00	0.00	.98	.40
3	0.00	0.00	0.00	0.00	.58
4	0.00	1.54	0.00	0.00	.41
5	0.00	0.00	0.00	0.00	.49
6	0.00	.75	0.00	0.00	.39
7	0.00	0.00	0.00	.83	.55
8	0.00	0.00	0.00	0.00	.54
9	0.00	0.00	0.00	.70	.42
10	.95	0.00	0.00	.47	.49
11	0.00	0.00	1.03	0.00	.40
12	0.00	0.00	.69	.63	.28
501	0.00	0.00	0.00	0.00	0.00
502	0.00	0.00	0.00	0.00	.68
503	0.00	0.00	0.00	0.00	.59
504	0.00	.60	0.00	1.17	1.26

COMPUTER LINES 1 THRU 12 REFER TO PROFILE LINES 1 THRU 12.

COMPUTER LINES 501 THRU 504 REFER TO NORTH - SOUTH TIE LINES 1 THRU 4.

GEOLOGIC UNIT AVERAGE VALUE AS A
FUNCTION OF MAP LINE FOR PPM EU

	QA	QAL	QC	QO	TA	TAL	TB	TBK	TBM	TCB	TCBB	TCS	TL	TLC	TN
1	0.00	.40	.60	.20	.29	0.00	.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.32
2	0.00	.55	.58	.19	.45	0.00	.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.36
3	0.00	.71	.45	.23	.05	0.00	.24	0.00	0.00	0.00	.31	.34	0.00	.22	.20
4	0.00	.58	.38	.14	0.00	0.00	0.00	0.00	0.00	0.00	.15	0.00	0.00	.24	0.00
5	0.00	.70	.42	.25	0.00	0.00	0.00	0.00	0.00	.23	.20	.15	0.00	0.00	0.00
6	0.00	.60	.42	.36	0.00	0.00	0.00	0.00	.50	.22	.21	0.00	0.00	0.00	0.00
7	0.00	.54	.38	0.00	0.00	0.00	.18	.54	.09	.11	.15	0.00	0.00	0.00	0.00
8	0.00	.48	.38	0.00	0.00	0.00	0.00	0.00	0.00	.12	.12	0.00	0.00	0.00	0.00
9	.41	.35	.38	0.00	0.00	0.00	0.00	0.00	0.00	.11	.21	0.00	0.00	0.00	0.00
10	0.00	.42	.35	.65	0.00	0.00	0.00	0.00	.27	.17	.13	0.00	0.00	0.00	0.00
11	0.00	.49	.33	0.00	0.00	.23	0.00	0.00	.44	.20	.18	.29	.24	0.00	.71
12	0.00	.38	.34	0.00	0.00	.30	0.00	0.00	.43	0.00	.25	0.00	.34	0.00	0.00
501	0.00	.54	0.00	.26	.54	0.00	.58	0.00	.66	.28	.20	.20	0.00	.32	.55
502	0.00	.49	.46	.16	0.00	0.00	.32	0.00	0.00	.31	.26	0.00	0.00	0.00	0.00
503	0.00	.32	.42	0.00	0.00	0.00	0.00	.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00
504	0.00	.41	.35	0.00	0.00	0.00	.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	TN	TP	TT	TUR	WA
1	0.00	0.00	0.00	.53	0.00
2	0.00	0.00	0.00	.34	.11
3	0.00	0.00	0.00	0.00	.21
4	0.00	.95	0.00	0.00	.15
5	0.00	0.00	0.00	0.00	.21
6	0.00	.45	0.00	0.00	.12
7	0.00	0.00	0.00	.65	.07
8	0.00	0.00	0.00	0.00	.15
9	0.00	0.00	0.00	.50	.06
10	.47	0.00	0.00	.75	.18
11	0.00	0.00	.40	0.00	.07
12	0.00	0.00	.40	.60	.06
501	0.00	0.00	0.00	0.00	.13
502	0.00	0.00	0.00	0.00	.28
503	0.00	0.00	0.00	0.00	.09
504	0.00	.28	0.00	.45	.37

COMPUTER LINES 1 THRU 12 REFER TO PROFILE LINES 1 THRU 12.

COMPUTER LINES 501 THRU 504 REFER TO NORTH - SOUTH TIE LINES 1 THRU 4.

GEOLOGIC UNIT AVERAGE VALUE AS A

FUNCTION OF MAP LINE FOR %K

	QA	QAL	QC	QO	TA	TAL	TB	TBK	TBM	TCB	TCBB	TCS	TL	TLC	TM
1	0.00	.70	.65	.71	.43	0.00	.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.43
2	0.00	.48	.73	.52	.36	0.00	.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.50
3	0.00	.49	.84	.54	.95	0.00	.86	0.00	0.00	0.00	.42	.46	0.00	.84	.92
4	0.00	.53	.71	.55	0.00	0.00	0.00	0.00	0.00	0.00	.69	0.00	0.00	.40	0.00
5	0.00	.59	.65	.60	0.00	0.00	0.00	0.00	0.00	0.00	3.15	.74	0.00	0.00	0.00
6	0.00	.67	.67	.45	0.00	0.00	0.00	0.00	.45	1.66	.72	0.00	0.00	0.00	0.00
7	0.00	.74	.87	0.00	0.00	0.00	1.10	.61	1.86	3.11	.68	0.00	0.00	0.00	0.00
8	0.00	.62	.92	0.00	0.00	0.00	0.00	0.00	0.00	1.70	5.78	0.00	0.00	0.00	0.00
9	.64	1.11	.82	0.00	0.00	0.00	0.00	0.00	0.00	5.69	5.15	0.00	0.00	0.00	0.00
10	0.00	1.09	1.18	.30	0.00	0.00	0.00	0.00	.75	14.53	2.02	0.00	0.00	0.00	0.00
11	0.00	.61	.74	0.00	0.00	1.12	0.00	0.00	1.11	1.60	.78	.54	.55	0.00	.38
12	0.00	.63	.83	0.00	0.00	.92	0.00	0.00	.48	0.00	.88	0.00	.90	0.00	0.00
501	0.00	.25	0.00	.37	.23	0.00	.45	0.00	.46	.54	0.00	0.00	0.00	.39	.21
502	0.00	.38	.37	0.00	0.00	0.00	.39	0.00	0.00	.41	.57	0.00	0.00	0.00	0.00
503	0.00	1.96	1.27	0.00	0.00	0.00	0.00	2.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
504	0.00	.81	.97	0.00	0.00	0.00	.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	TH	TP	TT	TUR	WA
1	0.00	0.00	0.00	.47	0.00
2	0.00	0.00	0.00	.53	3.77
3	0.00	0.00	0.00	0.00	1.53
4	0.00	.44	0.00	0.00	40.37
5	0.00	0.00	0.00	0.00	3.21
6	0.00	.46	0.00	0.00	5.19
7	0.00	0.00	0.00	.20	14.74
8	0.00	0.00	0.00	0.00	2.95
9	0.00	0.00	0.00	.23	4.64
10	.47	0.00	0.00	.23	7.27
11	0.00	0.00	.61	0.00	11.21
12	0.00	0.00	.56	.41	3.14
501	0.00	0.00	0.00	0.00	0.00
502	0.00	0.00	0.00	0.00	.35
503	0.00	0.00	0.00	0.00	9.57
504	0.00	.67	0.00	.77	.73

COMPUTER LINES 1 THRU 12 REFER TO PROFILE LINES 1 THRU 12.

COMPUTER LINES 501 THRU 504 REFER TO NORTH - SOUTH TIE LINES 1 THRU 4.

GEOLOGIC UNIT AVERAGE VALUE AS A
FUNCTION OF MAP LINE FOR EU/ETH

	QA	QAL	QC	QD	TA	TAL	TB	TBK	TBM	TCB	TCBB	TCS	TL	TLC	TM
1	0.00	3.50	2.77	7.42	3.38	0.00	3.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.20
2	0.00	2.56	2.29	5.62	2.44	0.00	3.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.06
3	0.00	2.23	3.50	5.50	11.77	0.00	3.76	0.00	0.00	0.00	2.78	2.88	0.00	4.77	3.58
4	0.00	2.15	2.28	5.42	0.00	0.00	0.00	0.00	0.00	0.00	4.31	0.00	0.00	3.39	0.00
5	0.00	2.03	2.54	3.27	0.00	0.00	0.00	0.00	0.00	0.00	7.31	15.57	0.00	0.00	0.00
6	0.00	1.96	2.15	2.32	0.00	0.00	0.00	0.00	1.23	6.45	3.36	0.00	0.00	0.00	0.00
7	0.00	2.52	3.63	0.00	0.00	0.00	4.21	2.34	4.80	14.84	4.17	0.00	0.00	0.00	0.00
8	0.00	2.12	2.92	0.00	0.00	0.00	0.00	0.00	0.00	6.39	10.89	0.00	0.00	0.00	0.00
9	2.47	2.38	2.69	0.00	0.00	0.00	0.00	0.00	0.00	11.93	4.64	0.00	0.00	0.00	0.00
10	0.00	3.05	6.18	.98	0.00	0.00	0.00	0.00	3.10	6.66	8.66	0.00	0.00	0.00	0.00
11	0.00	2.64	2.65	0.00	0.00	2.79	0.00	0.00	1.80	3.78	2.66	1.45	2.34	0.00	2.05
12	0.00	2.64	2.58	0.00	0.00	2.37	0.00	0.00	1.83	0.00	2.77	0.00	2.33	0.00	0.00
501	0.00	1.30	0.00	2.64	1.40	0.00	1.54	0.00	1.25	2.30	0.00	0.00	0.00	1.96	1.31
502	0.00	1.37	1.34	0.00	0.00	0.00	2.39	0.00	0.00	1.69	1.80	0.00	0.00	0.00	0.00
503	0.00	3.90	3.42	0.00	0.00	0.00	0.00	4.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00
504	0.00	3.26	3.53	0.00	0.00	0.00	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	TN	TP	TT	TUR	WA
1	0.00	0.00	0.00	2.39	0.00
2	0.00	0.00	0.00	3.07	14.00
3	0.00	0.00	0.00	0.00	58.16
4	0.00	1.67	0.00	0.00	16.18
5	0.00	0.00	0.00	0.00	13.58
6	0.00	1.93	0.00	0.00	22.17
7	0.00	0.00	0.00	1.29	35.43
8	0.00	0.00	0.00	0.00	32.77
9	0.00	0.00	0.00	1.24	39.56
10	2.13	0.00	0.00	.91	24.93
11	0.00	0.00	2.89	0.00	28.00
12	0.00	0.00	1.78	1.17	37.77
501	0.00	0.00	0.00	0.00	0.00
502	0.00	0.00	0.00	0.00	1.40
503	0.00	0.00	0.00	0.00	47.68
504	0.00	2.24	0.00	2.86	3.63

COMPUTER LINES 1 THRU 12 REFER TO PROFILE LINES 1 THRU 12.

COMPUTER LINES 501 THRU 504 REFER TO NORTH - SOUTH TIE LINES 1 THRU 4.

GEOLOGIC UNIT AVERAGE VALUE AS A
FUNCTION OF MAP LINE FOR EU/2K.

	QA	QAL	QC	QO	TA	TAL	TB	TBK	TBM	TCB	TCBB	TCS	TL	TLC	TM
1	0.00	5.80	4.77	14.21	8.92	0.00	7.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.76
2	0.00	5.78	4.27	11.00	7.25	0.00	5.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.11
3	0.00	4.78	5.46	11.36	18.19	0.00	5.33	0.00	0.00	0.00	7.24	7.67	0.00	6.86	6.58
4	0.00	4.59	4.49	12.74	0.00	0.00	0.00	0.00	0.00	0.00	8.70	0.00	0.00	9.15	0.00
5	0.00	3.71	4.09	6.97	0.00	0.00	0.00	0.00	0.00	6.77	8.46	26.36	0.00	0.00	0.00
6	0.00	3.69	3.92	5.15	0.00	0.00	0.00	0.00	2.90	6.75	5.33	0.00	0.00	0.00	0.00
7	0.00	3.81	4.33	0.00	0.00	0.00	5.19	4.13	4.43	12.33	6.62	0.00	0.00	0.00	0.00
8	0.00	3.50	3.85	0.00	0.00	0.00	0.00	0.00	0.00	5.67	6.00	0.00	0.00	0.00	0.00
9	4.56	3.85	3.89	0.00	0.00	0.00	0.00	0.00	0.00	8.58	5.88	0.00	0.00	0.00	0.00
10	0.00	3.85	3.80	3.16	0.00	0.00	0.00	0.00	6.62	4.03	5.90	0.00	0.00	0.00	0.00
11	0.00	4.62	4.19	0.00	0.00	2.87	0.00	0.00	3.39	3.90	5.01	3.01	4.39	0.00	5.61
12	0.00	4.49	4.07	0.00	0.00	3.36	0.00	0.00	4.11	0.00	3.89	0.00	3.23	0.00	0.00
501	0.00	5.38	0.00	7.76	6.36	0.00	2.74	0.00	2.99	4.39	6.14	2.64	0.00	5.60	6.68
502	0.00	3.89	4.02	7.75	0.00	0.00	5.54	0.00	0.00	4.37	4.17	0.00	0.00	0.00	0.00
503	0.00	3.51	3.97	0.00	0.00	0.00	0.00	2.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
504	0.00	4.64	4.71	0.00	0.00	0.00	4.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	TN	TP	TT	TUR	WA
1	0.00	0.00	0.00	6.43	0.00
2	0.00	0.00	0.00	6.22	8.06
3	0.00	0.00	0.00	0.00	28.68
4	0.00	3.84	0.00	0.00	10.09
5	0.00	0.00	0.00	0.00	15.60
6	0.00	4.24	0.00	0.00	16.53
7	0.00	0.00	0.00	6.76	15.21
8	0.00	0.00	0.00	0.00	7.29
9	0.00	0.00	0.00	5.52	13.29
10	5.31	0.00	0.00	2.63	21.68
11	0.00	0.00	4.84	0.00	16.39
12	0.00	0.00	3.42	3.48	18.41
501	0.00	0.00	0.00	0.00	6.88
502	0.00	0.00	0.00	0.00	4.20
503	0.00	0.00	0.00	0.00	23.03
504	0.00	3.75	0.00	4.36	56.51

COMPUTER LINES 1 THRU 12 REFER TO PROFILE LINES 1 THRU 12.

COMPUTER LINES 501 THRU 504 REFER TO NORTH - SOUTH TIE LINES 1 THRU 4.

GEOLOGIC UNIT AVERAGE VALUE AS A
FUNCTION OF MAP LINE FOR ETH/2K

APPENDIX K - MAGNETIC AND ANCILLARY PROFILES

APPENDIX L - TEST LINE DATA

PRE-FLIGHT AND POST-FLIGHT TEST LINE DATA

SEATTLE QUADRANGLE

	<u>2/22/80</u>	<u>2/23/80</u>	<u>4/13/80</u>	<u>7/31/80</u>	<u>8/4/80</u>
Pre TL	14.99	15.36	18.64	21.13	10.33
Post TL	15.95	15.66	19.93	20.49	9.52
Pre Bi	15.91	15.50	16.29	10.30	2.22
Post Bi	15.79	14.60	16.51	9.99	2.15
Pre K	63.46	68.98	69.70	59.94	38.96
Post K	64.04	65.90	68.61	56.81	40.58
Pre TC	799.38	776.39	851.20	695.54	365.70
Post TC	769.09	752.95	884.30	715.24	380.38

NOTE: NEW TEST LINE (4/13/80), (7/31/80), (8/4/80)