APPENDIX A

LAKE BOTTOM SEDIMENT SAMPLING

A total of 165 lake-bottom sediment samples were taken to supplement HSSR data in areas devoid of streams and water wells. A pilot study in Minnesota had shown that bedrock uranium concentrations may be reflected in lake sediments (Meineke et al, 1978).

Samples were analysed under BFEC specification for fluorometric U_3O_8, loss on ignition, Cu, Mo, Ni, Pb and Zn and, in areas underlain by Lake Superior Sandstones, for As, Se and V_2O_5. The association of specific elements with anomalous U_3O_8 is potentially diagnostic of certain classes of uranium deposits.

Lake bottom sediment samples were collected with a Hornbrook sampler. One sample was taken near the center of small lakes and taken at several locations in large lakes. Sediment in the center of lakes was sampled because the distribution of uranium here is generally homogeneous, in contrast to near shore locations where local surface and ground-water influx may cause heterogneity of sediment and U_3O_8 content.

Center lake-sediments are typically organic-rich fine silts and collected samples weighed approximately 0.5 to 1 kg (1 to 2 lbs). All samples were air-dried prior to shipment to Rocky Mountain Geochemical Corporation in Sparks, Nevada.

Description of the sample, local surficial and bedrock geology was recorded at the time of sampling. Where check sampling was subsequently carried out to confirm high U_3O_8 analyses, Eh, pH, conductivity and alkalinity measurements of lake water were obtained. Results are summarized on Table 2. Sample locations, analyses, frequency histograms and cumulative probability graphs for the nine elements analysed are presented on Plates 8 to 17. Of the 165 lake-sediment samples collected, four were check samples used to verify higher results and one duplicate sample was taken to confirm the relation of high organic content with increased U_3O_8 values. These samples are not included in the statistical analysis.

In general, absolute concentrations of the nine elements are low and approximate lognormal distribution. No apparent association between elements is manifest in the linear regression correlation matrix of Table 3. The highest U_3O_8 value (28 ppm in MFI-369) was found in Iron Lake located in the center of the quadrangle approximately 5 miles south of Iron River, Wisconsin. Loss on ignition for this sample was 70 percent (a measure of the high organic content) and the lake waters were characterized by very high conductivity (80 umhos) with Eh of zero, pH of 7.3 and an alkalinity of 88.9 mg/litre. These physico-chemical factors contrast significantly with many of the other lakes in the region where organic content averages about 44 percent L.O.I., conductivity is 25 to 40 umhos, Eh is generally oxidizing at 40 to 80 umhos and pH is generally slightly acidic. Alkalinity at Iron Lake is higher than at most other lakes in the quadrangle. Iron Lake is a man-made lake and the anomalous U_3O_8 is interpreted as reflecting contamination rather than a natural source.

Although there is no linear relationship between uranium content of lake sediments and loss-on-ignition (L.O.I.) many of the higher uranium analyses have correspondingly high L.O.I. suggesting that the generally low uranium content is being collected in the organics.

Statistical treatment of analyses according to bedrock lithology underlying the lakes was undertaken to ascertain if any bedrock units had a unique geochemical signature. The highest values, greatest range and variability of data for U_3O_8, Mo, As, V_2O_5 and Se is found in pitted outwash deposits overlying the Oronto Group sediments in the west-central area of the quadrangle. The variability is in part a function of the greater number of samples and the sample density in this area. Oronto bedrock here is penetrated by a considerable number of drill holes which were inspected during subsurface data acquisition (Plate 3). Lack of anomalous radioactivity in the drill core suggests that the underlying Oronto sediments have not contributed U_3O_8 to the anomalies at surface.

APPENDIX A

Table 2. Summary of Lake Sediment Geochemical Sampling

	Element/ Parameter	No. of Analyses	Range (ppm)	Median (ppm)	Arithmetic Mean (ppm)	Std. Dev
Ashland Quad.	U_3O_8	159	<1-28	3.10	3.37	3.15
	As	129	<10-40	10.80	11.3	8.48
	Cu	158	10-495	34.80	40.2	42.1
	Mo	158	<1-54	2.88	4.14	6.33
	Ni	156	<5-580	27.60	42.7	68.8
	Pb	156	<5-395	26.60	34.7	40.5
	Se	84	<1-28	2.50	5.9	6.56
	V_2O_5	84	60-860	255	278	146
	Zn	158	<5-540	117	134	99.3
	L.O.I.	160	4-86%	-	44.0%	
	U_3O_8					
Cambrian Sandstone		6	2-5	4.16	3.00	1.09
Bayfield/Jacobsville Sandstone		7	2-4	2.44	2.43	0.98
Oronto Group		68	1-28	2.83	4.22	4.34
PreG X and Y volcanics and intrusives		27	1-7	3.16	2.78	1.50
PreC X Granites		3	2-3	2.19	2.00	1.00
Marquette Range Supergroup		9	2-5	3.16	2.56	1.13
PreC W Volcanics		2	5	-	-	-
PreGW Granites & Gneisses		37	<1-8	2.92	2.78	1.84

APPENDIX A

Table 3. Linear Regression Correlation Matrix - Lake Sediments

	U_3O_8	As	Cu	Mo	Ni	Pb	Se	V_2O_3	Zn	L.O.I.
U_3O_8	1	.411 (128)	.045 (157)	.042 (157)	-.116 (155)	.086 (155)	-.152 (83)	.245 (83)	-.127 (157)	.152 (159)
As		1	.062 (129)	.124 (129)	-.036 (127)	.180 (127)	.093 (83)	-.109 (84)	.102 (129)	.120 (129)
Cu			1	.082 (158)	.187 (156)	.160 (156)	.158 (84)	.257 (84)	.215 (158)	.266 (158)
Mo				1	.293 (156)	.230 (156)	-.275 (95)	.253 (84)	.010 (158)	.321 (158)
Ni					1	.086 (156)	.387 (84)	.022 (84)	.287 (156)	.032 (156)
Pb						1	-.041 (84)	.145 (84)	.043 (156)	.343 (156)
Se							1	-.337 (82)	.658 (84)	.134 (84)
V_2O_5								1	-.207 (84)	.290 (84)
Zn									1	.323 (158)
L.O.I.										1

Note:
(128) - no. of samples.
Analyses below detection limit (d.l.) raised to d.l.

APPENDIX B

RADON SURVEY

A total of 35 line km (21.7 line mi) of radon soil gas surveying were undertaken in four areas to provide additional subsurface information in the vicinity of ARR and BFEC-HSSR anomalies and where geochemical data had not been acquired.

The surveys utilized an EDA Instruments Inc. model RD-200 emanometer and 1 m soil probe. The static-volume measurement design of this instrument permits differentiation of radon (222 Rn) and thoron (220 Rn) components of soil gas by mathematical treatment of successive readings recorded at timed intervals. Radon and thoron are daughter radionuclides of the 238 U and 232 Th decay series respectively. The presence of radon and much shorter-lived thoron gas in soils and their migration rates and distance is a function of a relative abundance of their immediate parent isotopes of radium, and soil permeability, rate of ground water movement, as well as atmospheric conditions such as barometric pressure and wind velocity. The relative decay rates of radon and thoron, in addition to that of precursor radioelements and their variable geochemical mobility, must be considered during interpretation of survey results.

Two single line profiles totalling 6.5 line km (4 line mi) were conducted across the Douglas Fault near Maple and Wentworth, Wisconsin in the vicinity of BFEC-HSSR and ARR areas of interest No. 2 (Figures 3 and 4). The thrust fault is not exposed and, it is assumed to coincide with a break in terrain slope. Higher radon and thoron gas values occur slightly south and up-drainage of the surface trace of the thrust fault. The relatively low absolute values do not suggest the presence of significant amounts of radium or uranium either at the fault or to the south. The fault plane may represent a permeability barrier for ground waters carrying small amounts of radon and thoron gas.

Two closely-spaced single-line radon traverses totalling 15 line km (9.25 line mi) were conducted across the inferred position of the Keweenawan Thrust Fault and Jacobsville Sandstone north of Bessemer, Michigan (Figure 5). Stream sediment sampling 3-8 km (2 to 5 mi) south of the fault indicates a slightly higher uranium background in the area (ARR and BFEC-HSSR Anomaly No. 5). Relatively low radon and thoron gas values were very erratic and no pronounced relationship to the geology or the topography is apparent. A radon value of 67 cpm, and thoron of 150 cpm, was obtained at the northern end of the traverse. This reading occurred over what is thought to be land fill and therefore is probably not representative of bedrock. A value of 161 cpm radon, and 84 cpm thoron at the south end of the profile may be related to impeded ground-water and radon gas movements at the contact between Jacobsville sandstones and Powder Mill series volcanics or to trace radium precipitated at the water table level where it intersects a break in terrain slope.

A single 8 km (5 mi) radon traverse was conducted over the Precambrian W Puritan Quartz-Monzonite Batholith south of Ironwood, Michigan (Figure 6a, 6b). Stream-sediment sampling

(HSSR and DMB) in the area indicate relatively higher background uranium values which coincide with the Bendix Data Integration Group's HSSR and ARR area of interest No. 5. Low radon and thoron values reflect the high soil-moisture content and lack of ground-water movement in the low-lying swampy area in the vicinity of this radon survey traverse. Slightly higher erratic values of radon and thoron were recorded over topographically higher areas, a reflection of increased soil permeability.

A 3.9 km (2.4 mi) survey line was run over the Bayfield Group sandstones on the Bayfield Peninsula, near Cornucopia, Wisconsin in an area where sparce geochemical data is available (Figure 7). Comparatively high radon readings of 178 and 127 cpm were recorded over the inferred location of the unexposed contact between the Chequamegon Sandstone and Devil's Island Sandstone. Thoron values were correspondingly high. A soil sample taken on site of the highest radon reading (MFI-262) returned fluorometric U_3O_8 of 1 ppm. The depth of lacustrine clays in this area is 30 to 60 m (100 to 200 ft) (Trotta and Cotter, 1973) and the relatively high values of thoron along with their characteristically short migration distances suggest that these values are not related to mineralization along the buried contact. The sources of these higher values is likely to be more permeable soils related to bank materials of the Siskiwit River located immediately west of the radon survey traverse at this site.

A traverse 1.1 km (0.71 mi) in length was carried out near a geoMetrics airborne radiometric anomaly No. 14 in an area underlain by Chequamegon Sandstone (Figure 8). This area is deeply mantled by pitted outwash sands. Low background radon and thoron values were encountered. The high permeability of sandy glacial soils would not be expected to mask any uranium minerals present in the vicinity of Anomaly No. 14.

Radon surveys disclosed only low absolute amounts of radon and thoron in the areas tested. Comparatively higher radon values within given profiles were accompanied by correspondingly high thoron suggestive of short migration distances. These might be related to small near-surface sources in surficial materials but are more likely to be caused by increased permeability of soils or natural radon content accumulated in ground water either impeded at impermeability barriers or where the water table broaches surface levels.

APPENDIX B

EXPLANATION

(figures 3 to 8)

2 x 9	Location of radon soil gas reading (x); Net thoron content in counts per minute (9); Net radon content in counts per minute (2)
14	Geometrics ARR anomaly and number
Zos	Lithologic code - see Plate 19
	Geologic contact
	Thrust fault location
	Stream
880	Contour elevation
	Road
28	Section number
	Swamp

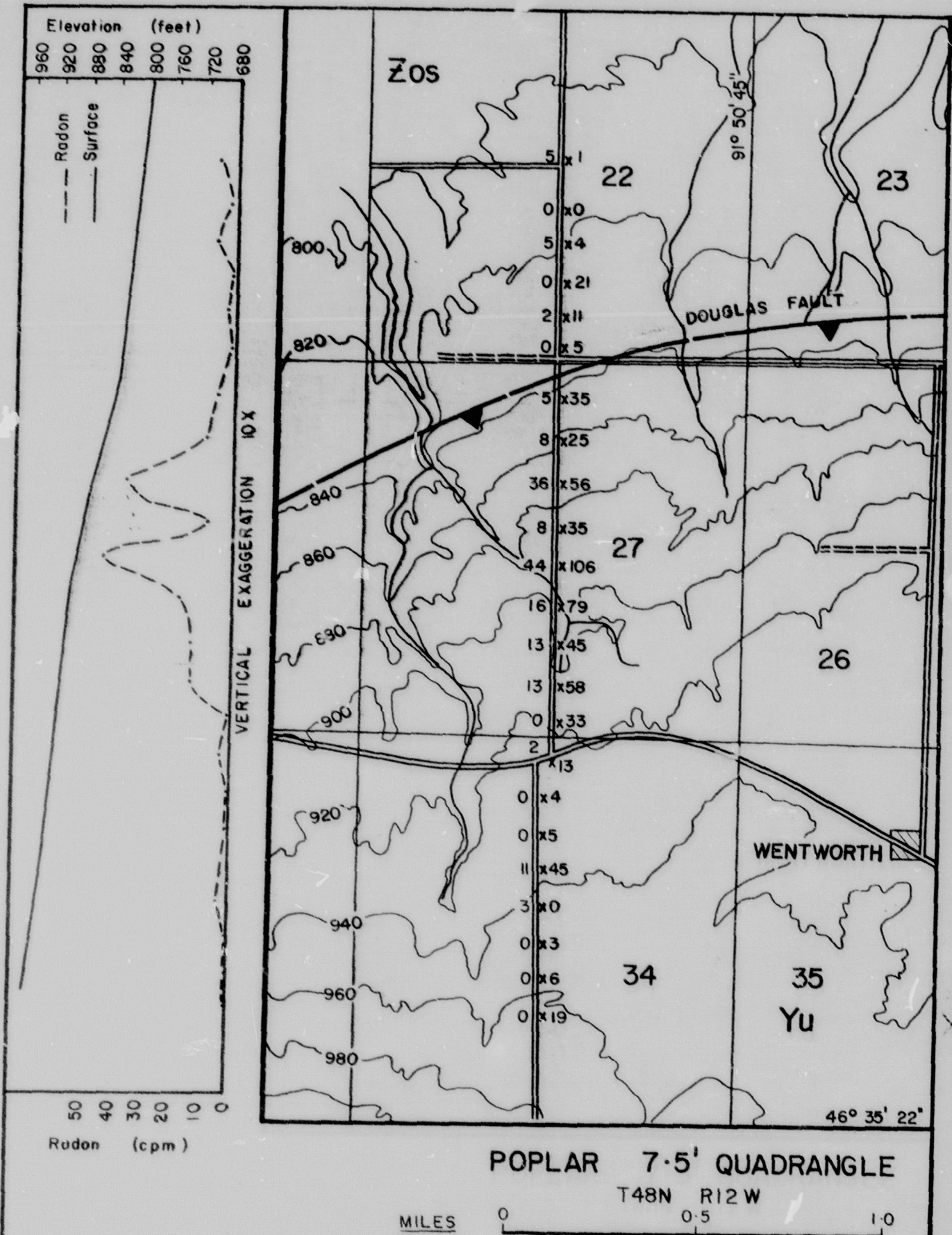
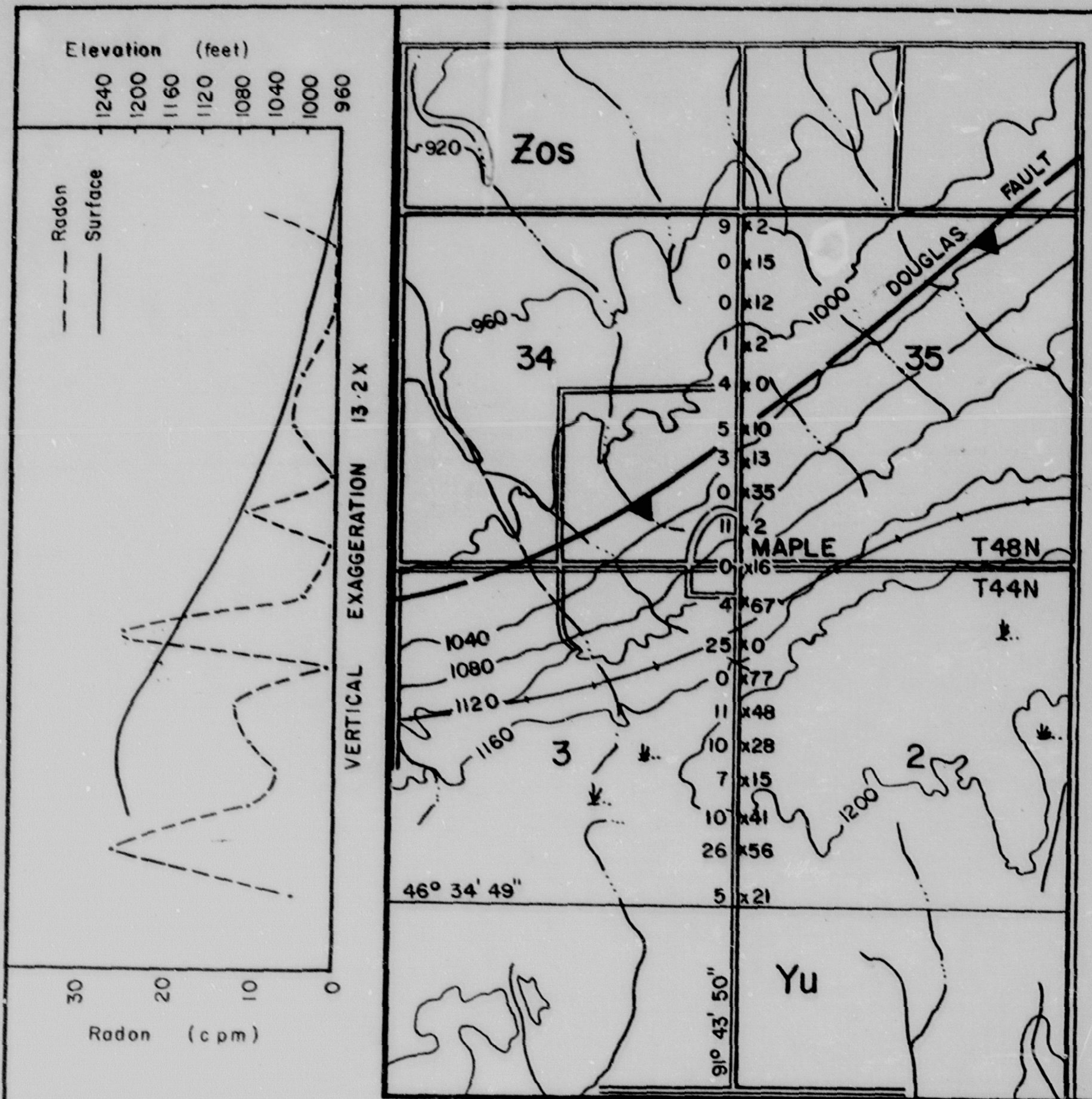


FIGURE 3 : Radon Soil Gas Survey Across Douglas Thrust Fault, Wentworth Area, Wisconsin



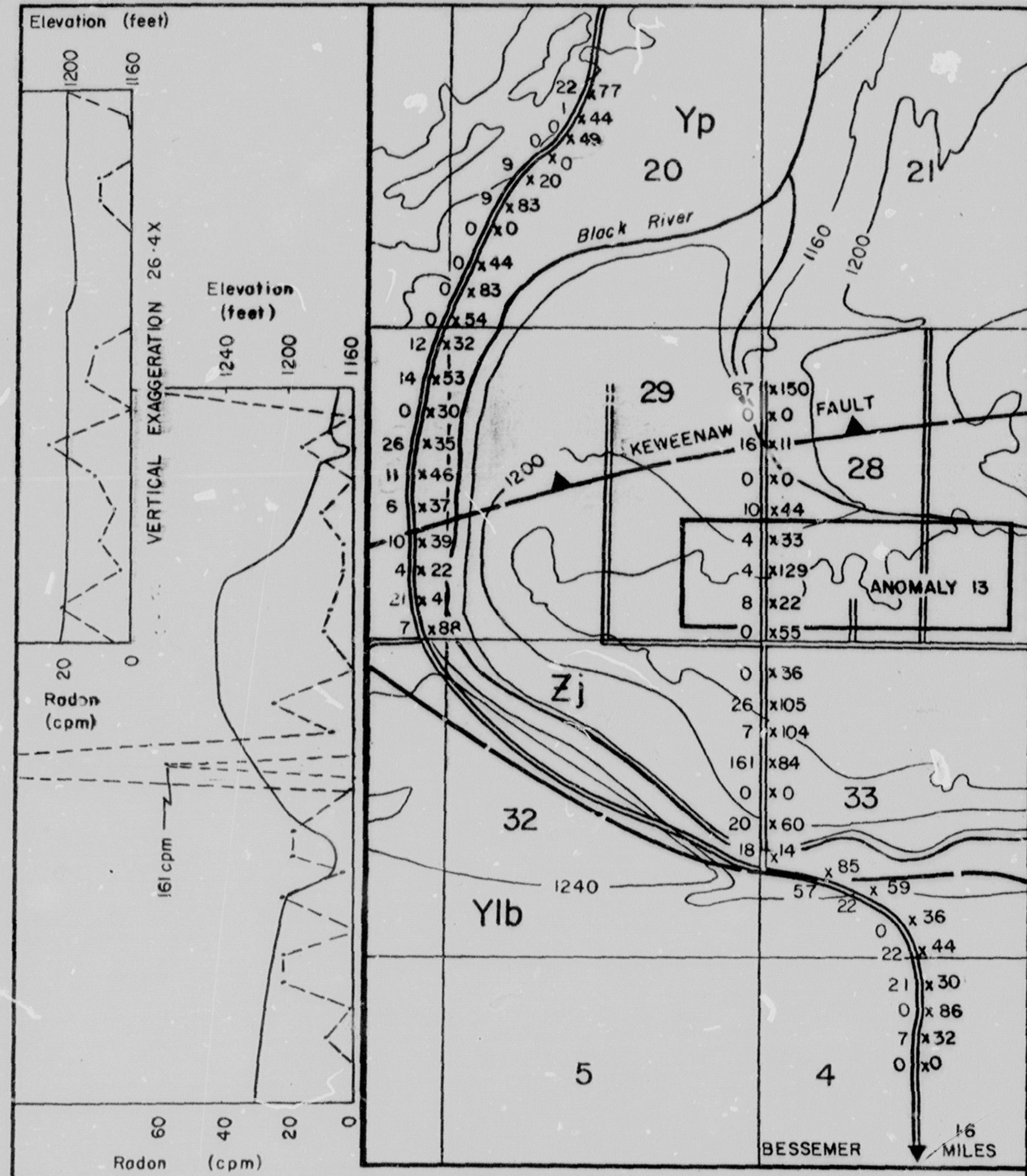
BRULE 15' QUADRANGLE

T47N, T48N, R10W

0 0·5 1·0 MILES

0 0·5 1·0 Km

FIGURE 4: Radon Soil Gas Survey Across Douglas Thrust Fault, Maple Area, Wisconsin



NORTH IRONWOOD 15' QUADRANGLE

T47N, T48N, R46W

MILES 0 0·5 1·0

Km 0 0·5 1·0 1·5 2·0

FIGURE 5 : Radon Soil Gas Survey Across Keweenaw Thrust Fault, North of Bessemer, Michigan

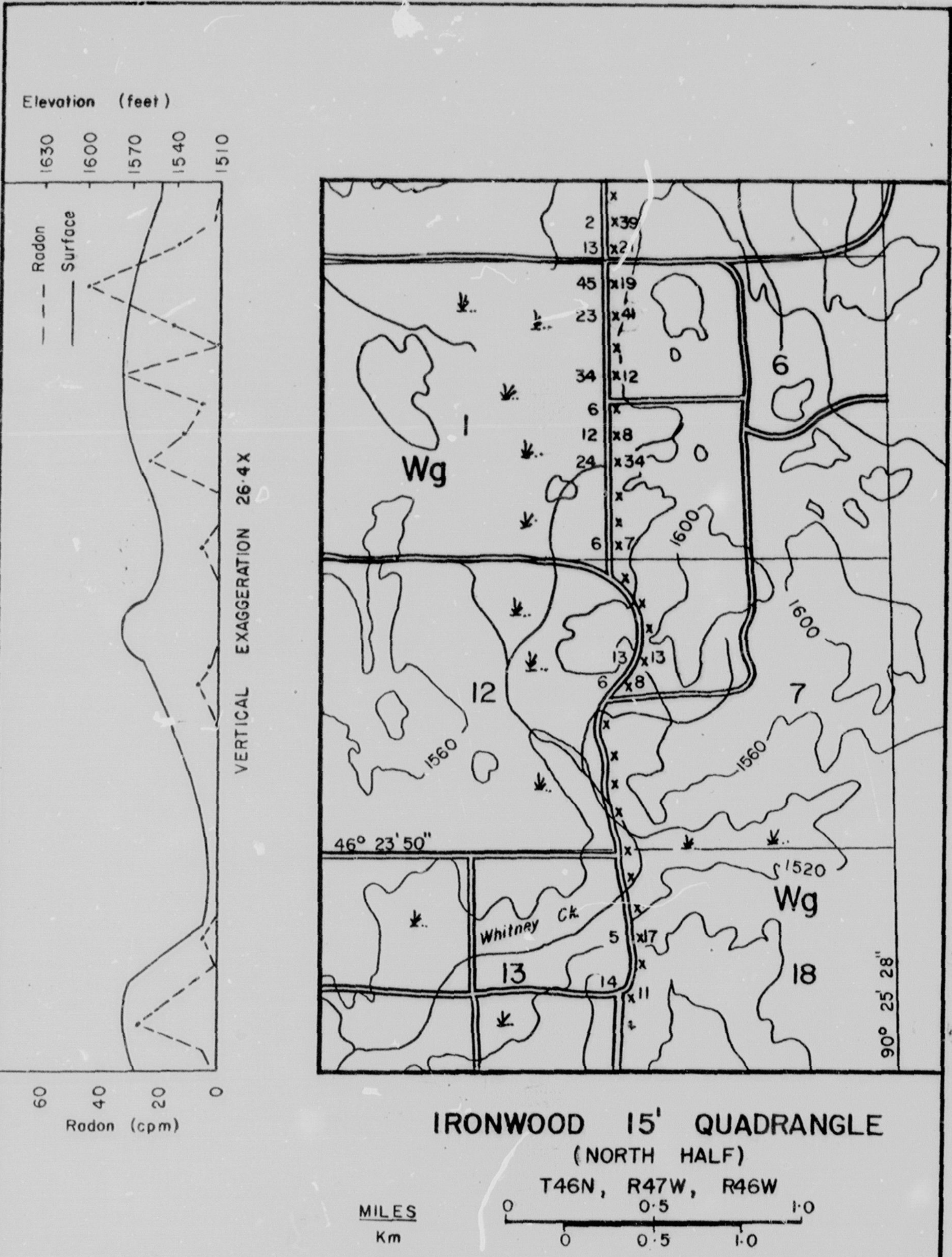


FIGURE 6a: Radon Soil Gas Survey Across Puritan Quartz Monzonite Intrusive. Michigan, Wisconsin. Border Area.

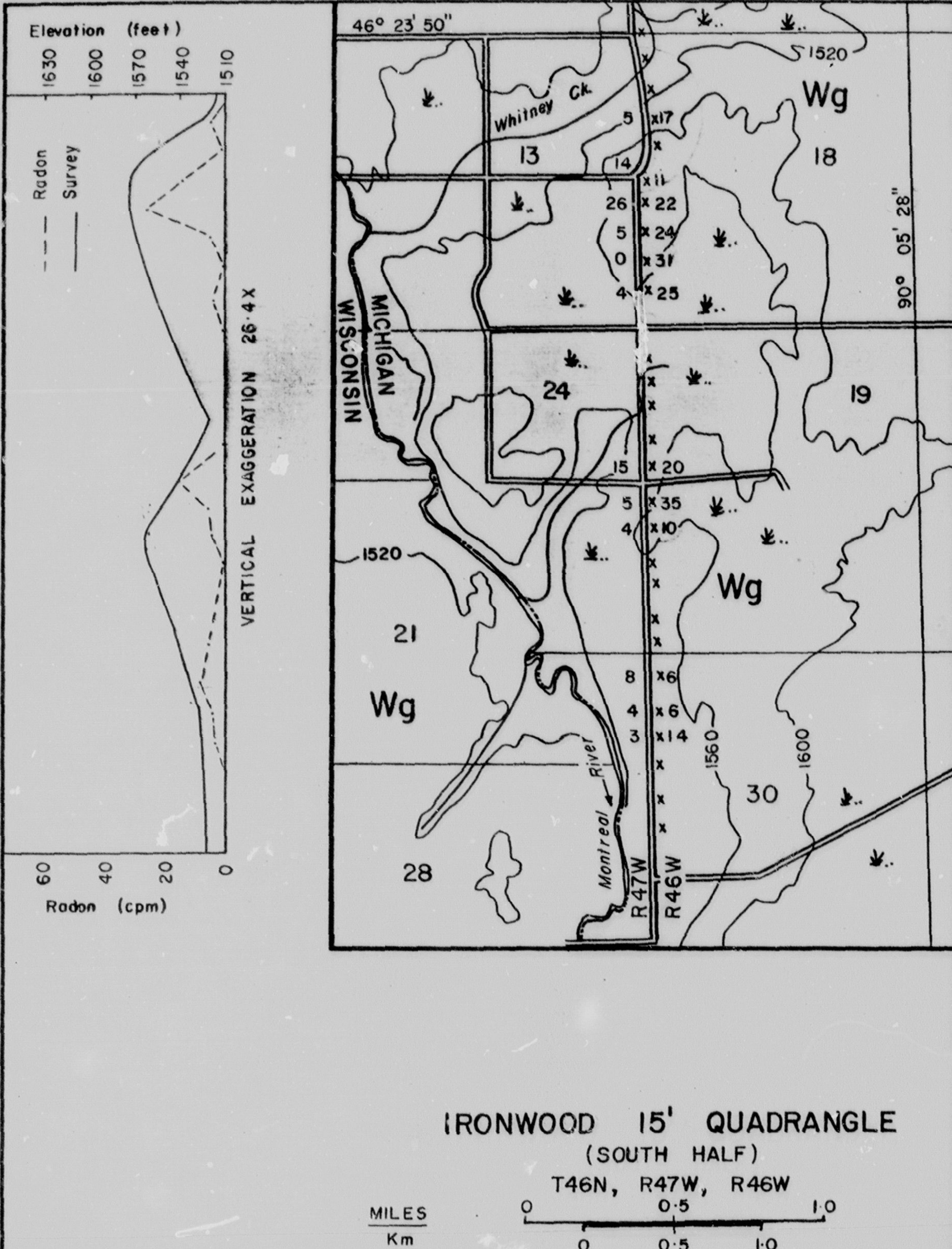


FIGURE 6b : Radon Soil Gas Survey Across Puritan Quartz Monzonite Intrusive. Michigan - Wisconsin. Border Area.

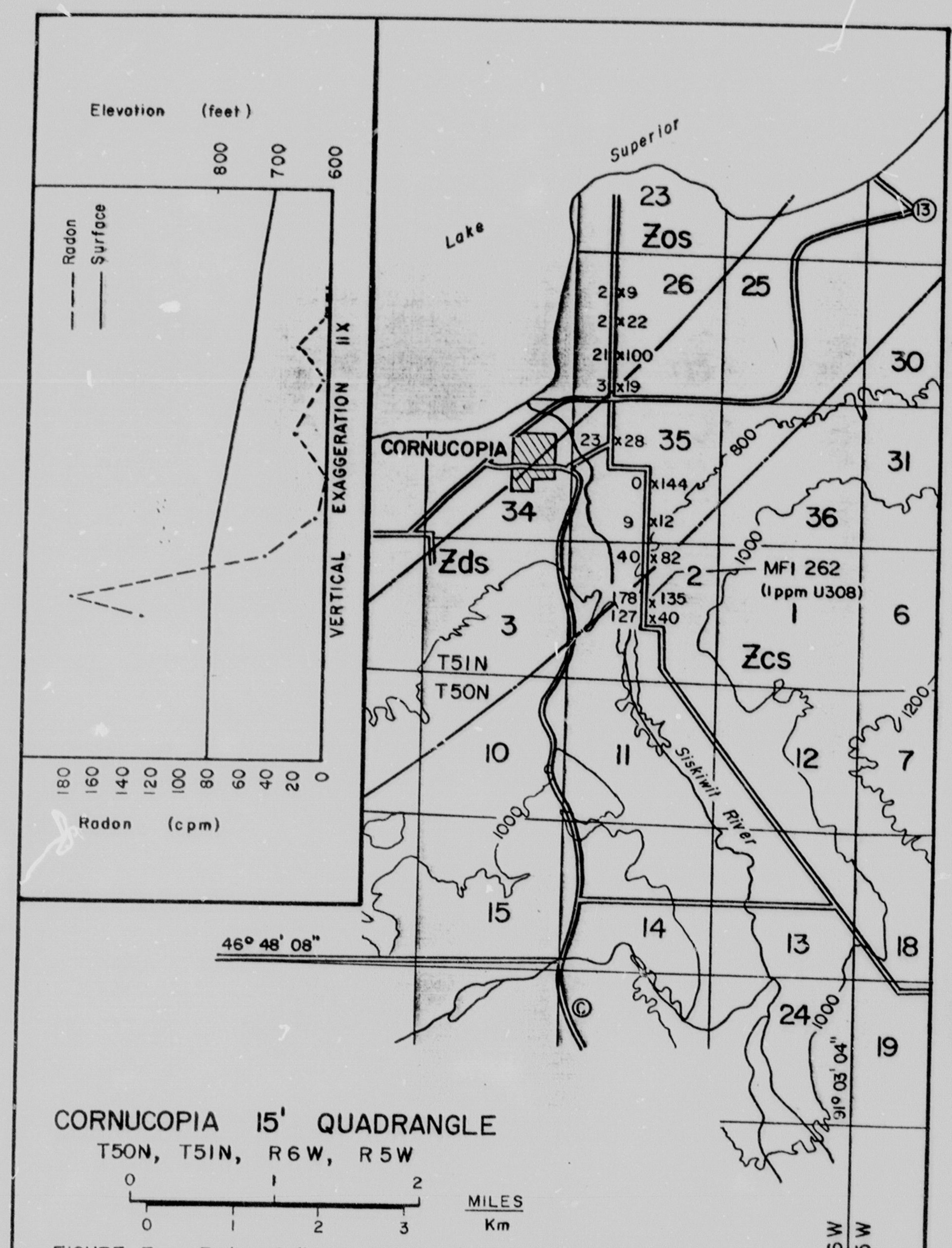
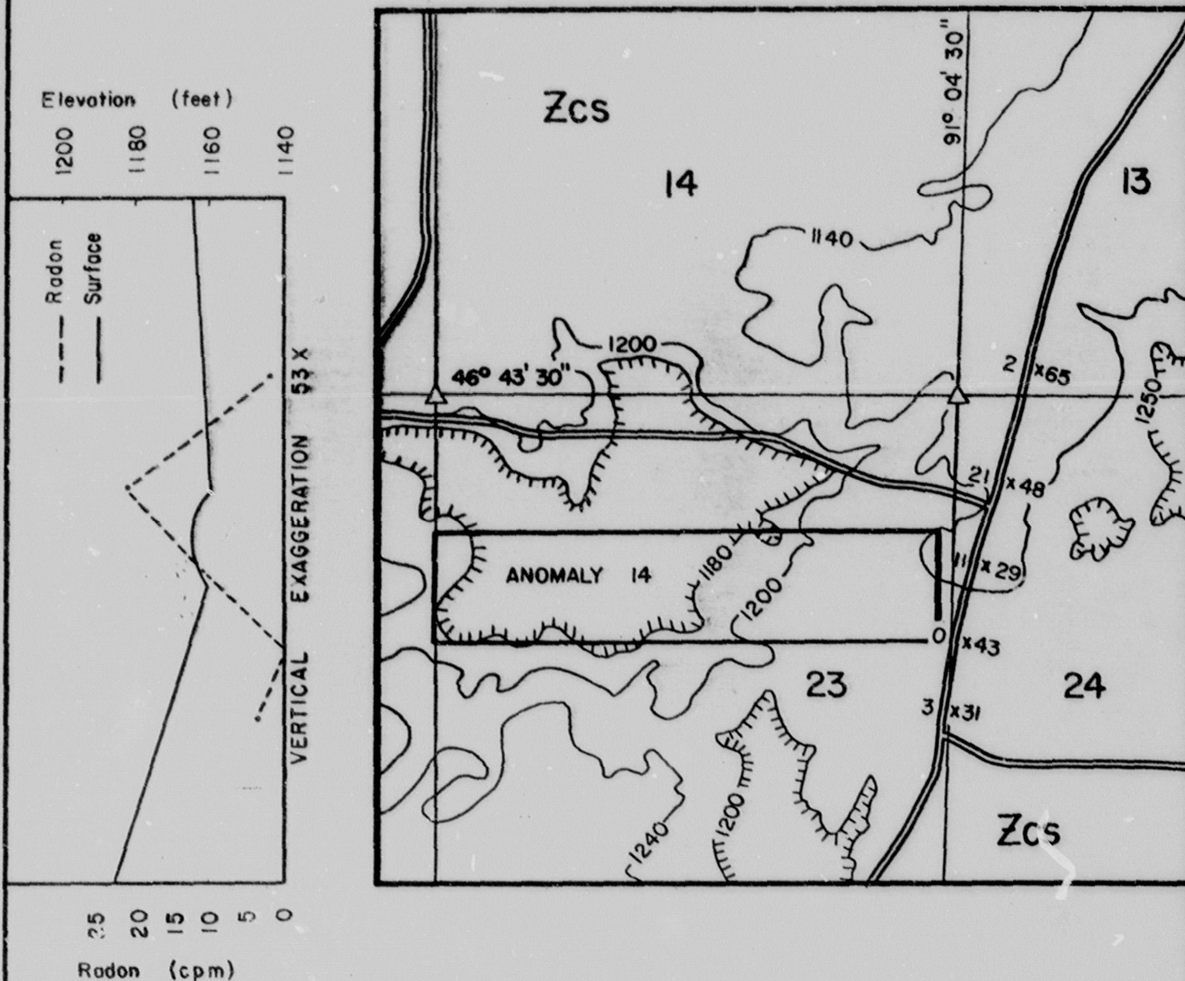


FIGURE 7 : Radon Soil Gas Survey Across Bayfield Group, Cornucopia Area, Wisconsin. Bayfield Peninsula.



MOQUAH 15' QUADRANGLE
T49N, R6W

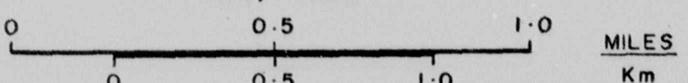


FIGURE 8 : Radon Soil Gas Survey, Area of Anomaly 14, Bayfield Peninsula

APPENDIX C.

Table of chemical analyses: rock sample analyses (in ppm)

Sample Number (MFI)	Geol. Code	U_3O_8 (Fl)
001	Yu	1
002	Xbt	4
003	Wg	<1
004	Xmi/Xbt	1
005	Yf	2
006	Wg	2
007	Ygp	1
013	Xmp	<1
014	Xmp	<1
015	Xmp	2
016	Xmp	1
017	Xmp	<1
018	Xmp	<1
019	Yc	<1
020	Yn	1
021	Yf	<1
022	Yf	1
023	Wgn	4
024	Xmi	1
025	Ybq	<1
026	Ymr	1
027	Ymr	2
028	Ygp	2
029	Yf	<1
030	Yf	2
031	Yf	3
032	Ybq	<1
033	Xmp	<1
034	Xml	1
035	Xmp	2
036	Xmp	1
037	Yu	1
038	Zos	<1
039	Zos	<1
040	Wg	8
041	Wg	2
042	Ybq	<1
043	Zds	1
044	Zds	<1
076	Yc	2
077	Xbt	2
078	Xbt	4
079	Xbt	5
080	Xbt	2
081	Ybq	1
082	Ybq	1
083	Wg	4
084	Wg	2
085	Zcs	<1
086	Wg	1
087	Wg	2
088	Wg	1
089	Wg	2
090	Zcs	<1
091	Zcs	<1
092	Zcs	<1
093	Zcs	<1
094	Zcs	1
095	Zcs	1
096	Zos	<1
097	Zos	<1
098	Zos	<1
099	Zos	1
100	Zos	<1
101	Xbt	1
102	Xbt	4
103	Yf	5
104	Yf	2
105	Yf	1
106	Ybq	1
107	Ybq	1
108	Xmp	<1
109	Yfp	2
110	Yfp	1
111	Wg	3
112	Xmp	<1
113	Yc	1
114	Ygp	1
115	Xbt	2
116	Ygp	1
117	Xbm	1
118	Xbm	2
119	Xbt	8
120	Yc	1
121	Yfp	1
122	Wgn	36
123	Wgn	11
124	Wgn	4
125	Wgn	107
127	Xmi	107
128	Yu	1

Sample Number (MFI)	Geol. Code	$U_3{}^8{}_8$ (Fl)
129	Yu	2
130	Yu	2
131	Zos	<1
132	Yu	1
133	Yu	1
134	Zos	1
135	Yu	<1
136	Zos	2
137	Xbm	2
138	Xg	1
139	Wgn	9
140	Wgn	2
141	Wgn	252
176	Xbm	1

Sample Number (MFI)	Geol. Code	U_3O_8 (Fl)
177	Xbm	1
178	Xbm	1
179	Xbm	<1
180	Xbm	<1
181	Wxv	<1
182	Wxv	<1
183	Wxv	<1
184	Wxv	<1
185	Wxv	<1
186	Yf	3
187	Yf	1
188	Yf	2
189	Yf	3
191	Wgn	4
192	Yc	2

APPENDIX C.

Table of chemical analyses: stream-sediment analyses (in ppm)

Sample Number (MFI)	Geol. Code	U_3O_8 (Fl)	LOI %
058	Yf	3	8
059	Yf	<1	4
201	Yc	1	2
202	Wgn	1	4
203	Xbm	2	4
204	Xbm	1	4
205	Xbis	2	3
226	Є	4	14
227	Yrg	<1	1
228	Wgn	11	78
229	Wgn	3	19
230	Wgn	1	9
231	Wgn	6	1
232	Wgn	<1	26
233	Wgn	6	83
234	Wgn	6	62
235	Wgn	1	2
236	Ylb	1	12
237	Ylb	2	4
238	Ylb	2	19
239	Ylb	1	2
240	Ylb	1	1
241	Xbt	<1	2
242	Xbt	4	7
243	Ylb	3	6
244	Ylb	5	35
245	Xbt	2	7
246	Ylb	1	4
247	Ylb	6	37
248	Ylb	1	3
249	Ylb	2	3
250	Ylb	1	4
251	Ylb	5	13
252	Ylb	6	16
253	Ylb	1	2
254	Yfp	1	3
255	Yu	1	4
256	Zcs	<1	1
257	Zcs	<1	1
258	Zcs	<1	1
259	Zcs	1	3
260	Zcs	<1	5
262	Zcs	1	4
301	Ylb	<1	6
302	Ybq	3	12
303	Xmp	2	8

Number (MFI)	Geol. Code	U_3O_8 (Fl)	LOI %
304	Wg	1	8
305	Wg	1	6
306	Wxv	2	1
307	Wg	<1	1
308	Wgn	<1	0
309	Xbt	1	11
310	Xbt	<1	1
311	Ygp	2	5
312	Ygp	1	6
313	Yuv	<1	1
314	Yuv	1	5
315	Yuv	<1	1
316	Xbt	<1	19
317	Xbt	<1	4
318	Xbt	<1	3
319	Wg	1	6
495	Yf	1	2
496	Yf	1	1
497	Yf	1	3
498	Yf	2	6
499	Yf	2	7
500	Yf	3	1
501	Wg	11	17
502	Wg	7	10
503	Wg	9	13
504	Wg	27	66
505	Wg	4	38
506	Wg	6	36
507	Wg	<1	3
508	Wg	3	3
509	Ylb	<1	2
510	Ylb	<1	3
511	Ylb	<1	4
512	Ybq	<1	3
513	Ybq	<1	5
514	Wg	<1	3
515	Wg	9	21
516	Wg	4	17
517	Wg	1	2
518	Wg	1	6
519	Wg	1	3
520	Wg	<1	2
522	Wg	<1	2
523	Wg	<1	2

Sample Number (MFI)	Geol. Code	U_3O_8 (Fl)	LOI %	Sample Number (MFI)	Geol. Code	U_3O_8 (Fl)	LOI %
524	Wg	<1	2	572	Wg	<1	1
525	Wg	1	5	573	Wg	1	1
526	Wg	<1	4	574	Wg	<1	1
527	Wg	1	2	575	Wg	1	1
528	Wg	<1	2	576	Zcs	<1	1
529	Wg	<1	2	577	Zcs	<1	1
530	Wg	1	3	578	Zcs	<1	1
531	Wg	1	2	579	Zcs	<1	1
532	Wg	<1	2	581	Zcs	<1	1
533	Wg	<1	2	582	Zcs	<1	1
534	Wg	1	2	583	Yf	1	1
535	Wg	<1	6	584	Yf	1	1
536	Wg	<1	2	585	Yf	1	1
537	Wg	<1	2	586	Yf	1	6
538	Wg	<1	3	587	Yf	1	1
539	Wg	<1	5	588	Yf	1	1
540	Wg	<1	6	589	Yf	<1	1
541	Wg	2	38	590	Yu	1	1
542	Wg	1	5	591	Ygp	1	2
543	Wg	1	4	592	Yu	1	5
544	Wg	<1	3	593	Yu	1	4
545	Wv	1	24	595	Yu	1	14
546	Wv	5	62	596	Yc	1	2
547	Wv	7	67	597	Yn	<1	1
548	Wv	1	10	598	Yf	1	2
549	Wv	<1	3	599	Yc	1	1
550	Wv	<1	11	600	Wg	<1	1
551	Wv	<1	3	601	Wg	4	2
552	Wv	<1	5	602	Wg	2	1
553	Wv	<1	2	603	Wg	6	7
554	Yf	<1	5	604	Wg	1	1
555	Yf	1	15	605	Wg	6	11
556	Yf	1	9	606	Xmi	3	5
557	Yf	1	13	607	Xmi	10	31
558	Yf	1	4	608	Xmi	6	8
559	Yf	1	5	609	Wg	9	16
560	Yf	<1	1	610	Wg	4	8
561	Yf	<1	2	611	Wg	14	11
562	Yf	<1	5	512	Wg	42	54
563	Yf	2	18	613	Wg	7	71
564	Yf	<1	2	614	Wg	8	3
565	Yf	2	38	615	Wg	1	21
567	Yf	1	17	616	Wg	3	5
568	Yf	2	11	617	Yu	<1	11
569	Yf	2	15	618	Zds	<1	1
570	Yf	1	2	619	Zds	1	1
571	Wg	<1	1	620	Zos	1	2

Sample Number (MFI)	Geol. Code	U_3O_8 (Fl)	LOI %
621	Zos	1	5
622	Zos	<1	1
623	Zos	<1	1
624	Zos	1	4
625	Zos	1	9
626	Zos	1	1
627	Zos	1	1
628	Zos	1	5
629	Zos	1	1
630	Zds	1	13
631	Yu	1	1
632	Yf	<1	1
633	Yn	1	4
634	Yn	1	1
735	Yn	<1	1
636	Yu	2	7
637	Yu	1	5
638	Yf	17	54
639	Xmp	1	11
640	Xmp	1	16
641	Xbt	2	52
642	Yml	2	20
643	Yml	2	14
644	Zj	2	10
645	Zj	3	13
646	Zj	<1	2
647	Yn	2	15
648	Yn	1	4
649	Yn	2	3
650	Yp	1	5
651	Yf	1	4
652	Yf	2	3
653	Yf	1	2
654	Yf	<1	1
655	Yf	1	5
656	Yf	1	5
657	Zos	1	4
658	Zos	1	1
659	Zos	1	3
660	Zos	<1	6
661	Zos	2	12
662	Zos	1	10
663	Wgn	2	7
664	Wgn	1	9
665	Wgn	2	8
666	Xmp	2	4
667	Zos	2	7
668	Zos	1	9

Sample Number (MFI)	Geol. Code	U_3O_8 (Fl)	LOI %
669	Zos	1	11
670	Zos	1	2
671	Zos	3	7
672	Zos	1	8
673	Zos	1	5
674	Zos	1	7
675	Zos	2	9
676	Zcs	<1	1
677	Zcs	<1	2
678	Zcs	<1	1
679	Zcs	<1	0
680	Zcs	<1	0
681	Zcs	1	8
682	Zcs	<1	1
683	Zcs	<1	1
684	Zcs	1	4
685	Yf	<1	1
686	Wg	1	5
687	Wv	1	4
688	Wxv	2	8
689	Wxv	<1	5
690	Yu	1	9
691	Yu	<1	2
692	Yuv	<1	2
693	Yuv	1	6
694	Yuv	<1	7
695	Yuv	10	44
696	Yuv	1	6
697	Wgn	1	3
698	Wgn	7	87
699	Wgn	<1	17
700	Wgn	<1	6
701	Zos	1	4
702	Zos	1	4
703	Zos	1	13
704	Zos	1	4
705	Zos	2	5
706	Zos	1	2
707	Zos	2	7
708	Zos	3	12
709	Zos	1	2
710	Zos	1	15
711	Zos	1	1
712	Zos	1	2
713	Zos	2	7
714	Yu	2	1
715	Yu	2	3
716	Zos	1	5

Sample Number (MFI)	Geol. Code	U_3O_8 (Fl)	LOI %
717	Zos	1	2
718	Zos	1	7
719	Wgn	1	4
720	Wgn	1	7
721	Wgn	1	6
722	Xbt	2	10
723	Xbt	1	2
724	Xbt	<1	1
725	Xbt	6	64
726	Xbm	<1	2
727	Xbm	<1	2
728	Xbm	<1	5
730	Yf	1	1
731	Yf	1	3
732	Yf	<1	4
733	Wg	1	4
734	Wg	<1	1
735	Wg	<1	7
736	Wg	1	12
737	Wg	1	5
738	Yf	<1	4
740	Yf	<1	14
741	Yf	1	2
742	Yf	<1	1
743	Yf	<1	1
744	Yf	<1	3
745	Yf	3	22
747	Yf	<1	1
748	Yf	<1	2
749	Yf	<1	3
750	Yf	2	15
751	Yvs	1	7
752	Yvs	1	2
753	Yvs	1	2
754	Yc	1	4
755	Yvs	4	18
756	Yf	<1	3
757	Yf	<1	6
758	Yf	1	8
759	Yf	1	1
760	Yf	1	2
761	Yf	1	2
762	Yf	1	1
763	Yf	1	1
764	Yf	3	8
765	Yvs	<1	6
766	Wg	1	3
767	Wg	3	6

Sample Number (MFI)	Geol. Code	U_3O_8 (Fl)	LOI %
768	Xmp	1	4
769	Xbt	<1	3
770	Yf	1	1
771	Yf	1	2
772	Yf	2	4
773	Yf	1	1
774	Yf	<1	1
775	Yuv	1	5
776	Wgn	1	11
777	Wgn	2	7
778	Wgn	1	5
779	Yf	1	1
780	Yf	<1	1
781	Yfp	<1	2
782	Yfp	1	2
783	Yf	1	1
784	Yf	1	6
785	Yf	1	2
786	Yf	1	13
787	Yf	<1	3
788	Yf	1	2
789	Yf	1	1
790	Zcs	1	2
791	Yf	2	6
792	Yf	2	21
793	Yf	5	25
794	Yu	3	83
795	Yu	19	53
796	Yu	1	12
797	Yu	1	14
798	Zos	2	12
799	Zos	1	5
800	Zos	2	6

APPENDIX C.

Table of chemical analyses: ground and spring-water samples

Sample Number (MFI)	Geol. Code	U_3O_8 (ppb)	Cond. umhos	Eh (mv)	pH	M.Alk. mg/l	Temp. (°C.)
801	Yu	0.287	361	-12.0	7.5	280.4	15.1
802	Yu	0.573	198	-44.0	8.1	157.3	16.7
803	Yu	0.287	274	-18.0	7.6	218.9	17.8
804	Yu	0.287	433	-45.0	8.1	348.8	15.9
805	Yu	22.283	730	5.0	7.1	581.4	10.8
806	Yu	11.174	690	-39.0	8.0	164.2	11.3
807	Yu	33.308	670	0.0	7.5	643.0	16.2
808	Yu	31.794	700	5.0	7.2	506.2	13.7
809	Zos	0.287	850	-12.0	7.3	109.4	13.9
810	Zos	1.715	212	- 5.0	7.1	177.8	14.5
811	Yf	17.329	510	15.0	6.9	451.4	11.3
812	Zos	<0.257	495	10.0	6.9	164.2	16.9
813	Zos	<0.257	143	22.0	6.7	143.6	13.5
814	Zos	<0.287	220	42.0	7.2	130.0	13.0
815	Zds	0.860	263	-15.0	7.5	215.5	13.0
816	Zcs	<0.287	173	-15.0	7.1	143.6	14.5
817	Yu	<0.287	143	22.0	6.8	106.0	13.0
818	Yu	21.328	780	7.0	7.1	499.3	14.6
819	Zos	8.730	515	-32.0	7.7	328.3	12.6
820	Zos	20.662	930	-7.0	7.2	280.4	13.3
821	Zos	28.766	740	-15.0	7.4	581.4	12.8
822	Yu	9.757	930	35.0	7.8	157.3	15.9
823	Zos	2.311	239	-30.0	7.8	109.4	16.7
824	Yu	1.130	510	-5.0	7.3	362.5	13.1
825	Yu	17.157	630	0.0	7.2	478.8	10.9
826	Yu	1.939	176	-20.0	7.5	130.0	16.4
827	Yu	2.663	465	-39.0	7.6	123.1	14.9
828	Zos	0.799	120	-100.0	8.8	102.6	-
829	Zos	6.390	144	-30.0	7.6	109.4	-
830	Zos	1.331	25	150.0	5.2	34.2	15.5
831	Zds	3.062	168	8.0	6.7	109.4	14.0
832	Zos	7.189	155	10.0	6.9	102.6	14.8
833	Zds	2.929	272	-5.0	7.1	88.9	-
834	Zos	2.929	250	10.0	7.3	106.0	11.2
835	Zos	2.464	181	27.0	6.7	136.8	-
836	Zos	1.095	148	20.0	6.8	123.1	13.5
837	Zos	0.274	435	17.0	6.9	376.2	9.8
838	Zos	2.327	410	30.0	6.7	328.3	14.0
839	Zos	15.330	580	50.0	6.3	321.5	15.5
840	Zos	19.159	605	40.0	6.7	567.7	17.5
841	Zos	10.950	580	15.0	6.9	540.4	16.7
842	Zos	1.369	422	-9.0	7.4	95.8	14.7
843	Zos	2.464	820	1.0	7.2	670.3	13.5
844	Yu	1.643	163	-40.0	7.9	150.5	13.2
845	Yu	0.821	370	-80.0	8.7	150.5	14.5
846	Yu	2.190	97	85.0	6.1	34.2	21.8

Sample Number (MFI)	Geol. Code	U_3O_8 (ppb)	Cond. umhos	Eh (mv)	pH	M.Alk. mg/1	Temp. (°C.)
847	Zos	7.665	240	-36.0	7.8	123.1	16.9
848	Zos	11.771	850	-18.0	7.4	177.8	12.0
849	Wg	2.824	225	29.0	6.7	143.6	17.5
850	Xbt	0.287	190	9.0	7.0	116.3	19.0
851	Yu	0.263	134	28.0	6.9	126.5	-
852	Yu	<0.263	122	-42.0	8.1	88.9	15.0
853	Zcs	<0.263	172	-31.0	7.6	143.6	-
854	Zcs	4.212	215	15.0	6.9	157.3	12.2
855	Xbt	<0.287	270	18.0	6.8	184.7	13.5
856	Wg	<0.287	248	30.0	6.6	150.5	17.0
857	Wg	5.012	230	26.0	6.6	160.7	13.2
858	Wg	8.771	221	25.0	7.1	174.4	12.7
859	Wg	0.940	140	48.0	6.6	109.4	17.3
860	Xmp	0.940	72	60.0	6.5	34.2	20.5
861	Wg	<0.313	221	-70.0	8.4	116.3	18.0
862	Wg	0.313	210	-50.0	8.0	106.0	13.5
863	Wg	0.940	182	15.0	6.9	150.5	12.5
864	Wg	1.880	195	23.0	7.3	140.2	13.0
865	Wg	2.192	282	-10.0	7.3	174.4	16.0
866	Wg	1.566	210	-15.0	6.9	164.2	12.3
867	Wg	0.313	210	29.0	7.1	123.1	12.7
868	Wg	0.940	146	55.0	6.1	123.1	11.0
869	Wg	1.880	100	60.0	6.2	80.4	18.5
870	Wg	6.625	235	10.0	7.3	171.0	14.0
871	Wg	2.464	65	73.0	6.0	47.9	16.0
872	Wg	0.224	70	91.0	5.6	61.6	16.5
873	Wg	1.120	78	70.0	6.0	51.3	16.0
874	Ylb	1.120	312	20.0	6.8	208.6	16.0
875	Ylb	0.672	234	30.0	6.6	157.3	17.0
876	Yfp	4.032	173	-35.0	7.9	116.3	14.2
877	Ylb	7.392	690	-63.0	8.3	102.6	13.0
878	Ylb	1.568	245	-3.0	7.2	1 1.5	13.0
879	Wg	0.515	118	130.0	5.0	41.0	17.0
880	Wg	1.545	140	60.0	6.2	95.8	13.0
881	Wg	1.545	120	-5.0	7.1	88.9	9.0
882	Ylb	0.515	115	52.0	6.5	88.9	12.0
883	Zj	1.803	242	-10.0	7.6	167.6	16.0
884	Zj	1.734	195	28.0	6.6	171.0	14.0
885	Ylb	1.084	190	85.0	5.6	119.7	16.0
886	Ylb	1.734	110	48.0	6.2	102.6	11.0
887	Zj	5.202	260	5.0	6.9	198.4	18.5
888	Ylb	1.300	100	40.0	6.3	34.2	13.5
889	Ylb	1.521	205	-7.0	7.2	130.0	18.0
890	Yf	1.951	113	-19.0	7.3	88.9	15.0
891	Yvs	3.035	235	-7.0	7.3	157.3	16.0
892	Yvs	3.092	680	8.0	7.0	389.9	17.0
893	Yvs	2.168	148	-31.0	7.8	109.4	15.0
894	Yvs	5.852	232	-10.0	7.4	130.0	14.0
895	Yf	8.887	880	8.0	7.1	383.0	14.5

Sample Number (MFI)	Geol. Code	U_3O_8 (ppb)	Cond. umhos	Eh (mv)	pH	M.Alk. mg/l	Temp. (°C.)
896	Yf	16.530	805	-33.0	7.8	150.5	14.0
897	Yf	1.734	182	59.0	6.1	116.3	15.5
898	Yf	5.202	145	-41.0	7.9	102.6	10.0
899	Yf	4.584	232	30.0	6.6	109.4	15.2
900	Yf	5.444	254	-30.0	7.7	123.1	15.1
901	Yf	<0.255	135	211.4	9.5	171.0	9.8
902	Yf	4.327	167	214.7	8.8	198.4	8.8
903	Yf	5.344	216	192.3	8.3	191.5	9.2
904	Yf	20.097	189	206.2	8.9	198.4	13.5
905	Yf	5.676	192	197.2	8.8	136.8	15.0
906	Yf	0.764	157	202.0	8.5	171.0	13.5
907	Ygp	<0.255	148	204.0	7.8	150.5	14.2
908	Yf	<0.255	162	216.3	8.3	140.2	13.7
909	Ygp	<0.255	87	152.6	7.2	95.8	-
910	Yf	6.966	156	150.9	8.3	102.6	17.6
911	Yf	1.018	124	139.4	8.8	116.3	13.3
912	Yf	0.255	127	67.3	5.5	119.7	10.8
913	Yf	<0.255	133	104.0	7.5	157.3	-
914	Ygp	0.509	107	179.5	-	123.1	-
915	Zos	8.293	428	10.0	6.6	130.0	16.2
916	Zos	<0.263	110	8.0	7.1	75.2	15.2
917	Zos	<0.263	135	22.0	7.8	126.5	14.6
918	Zos	<0.263	126	35.0	6.9	88.9	14.8
919	Zos	<0.263	122	12.0	-	116.3	14.2
920	Zos	0.790	293	93.0	6.4	205.2	11.0
92a	Zos	<0.263	165	35.0	6.6	88.9	13.2
922	Yu	1.792	155	42.0	6.8	116.3	-
923	Yu	1.568	145	25.0	6.7	119.7	13.5
924	Yu	1.568	720	37.0	6.5	601.9	12.0
925	Yu	1.120	251	-40.0	8.0	198.4	15.2
926	Yf	<0.266	273	32.0	6.5	95.8	12.5
927	Yf	9.053	330	-29.0	7.6	88.9	15.8
928	Yf	5.858	188	10.0	7.0	88.9	14.0
929	Yf	<0.266	600	-37.0	7.8	54.7	11.8
930	Yf	0.725	260	-38.0	7.8	68.4	12.1
931	Yf	<0.242	220	-31.0	7.7	68.4	14.2
932	Yf	8.424	155	-10.0	8.2	95.8	17.5
933	Yf	3.344	185	-35.0	7.6	116.3	14.8
934	Yf	6.713	200	-20.0	7.3	88.9	14.0
935	Yf	7.433	242	-50.0	8.0	82.1	17.0
936	Yf	3.942	152	30.0	7.6	130.0	14.5
937	Yf	1.126	185	-25.0	7.5	130.0	9.8
938	Yf	4.280	228	-12.0	7.3	150.5	10.5
939	Yf	2.816	580	11.0	7.2	424.1	10.5
940	Yf	0.451	153	-11.0	7.7	116.3	11.0
94a	Yf	<0.225	220	-69.0	8.8	95.8	12.6
942	Yf	14.416	385	7.0	7.5	294.1	11.6
943	Yf	4.055	198	-21.0	8.0	82.1	14.7

Sample Number (MFI)	Geol. Code	U_3O_8 (ppb)	Cond. umhos	Eh (mv)	pH	M.Alk. mg/1	Temp. (°C.)
944	Yf	1.352	185	-35.0	8.3	136.8	12.0
945	Yf	9.461	490	1.0	7.6	437.8	14.2
946	Yf	6.983	318	-20.0	8.0	239.4	13.2
947	Yf	3.379	258	-9.0	7.8	212.0	11.1
948	Yf	5.068	178	-24.0	8.0	130.0	15.0
949	Yf	1.858	220	-10.0	7.6	164.2	13.0
950	Yf	0.697	148	-20.0	7.6	44.5	13.2
951	Yf	0.929	159	0.0	7.2	136.8	15.0
952	Yf	0.232	170	-5.0	7.2	143.6	9.9
953	Yf	<0.232	105	15.0	6.9	116.3	9.8
954	Yf	1.394	253	0.0	7.1	157.3	14.8
955	Zcs	0.929	390	5.0	7.1	157.3	12.0
956	Zcs	2.323	202	98.0	6.5	130.0	14.5
957	Zcs	6.503	151	0.0	7.1	123.1	12.3
958	Zcs	3.019	265	2.0	7.0	130.0	12.5
959	Zcs	2.207	412	30.0	6.7	253.1	11.9
960	Zcs	11.032	391	8.0	7.0	287.3	14.2
961	Zcs	2.323	169	9.0	7.0	143.6	10.0
962	Zcs	0.697	205	-15.0	7.3	157.3	15.0
963	Zcs	1.662	139	2.0	7.1	102.6	10.0
964	Zcs	2.770	439	22.0	6.8	239.4	17.0
965	Yf	3.270	131	-20.0	7.6	109.4	-
966	Yf	1.363	134	-15.0	7.4	102.6	16.0
967	Yf	1.635	189	-5.0	7.3	136.8	-
968	Yf	0.273	122	-3.0	7.4	102.6	12.7
969	Yf	1.908	268	-20.0	7.5	191.5	19.0
970	Yf	5.995	230	-15.0	7.5	181.5	17.5
971	Yf	2.725	131	-100.0	8.1	116.3	12.5
972	Yf	0.545	173	-5.0	7.3	123.1	10.2
973	Ygp	0.545	49	49.0	6.6	27.4	15.5
974	Yu	5.178	412	95.0	6.6	136.8	18.0
975	Xg	0.273	91	90.0	5.8	47.9	15.5
976	Xg	0.818	150	90.0	5.9	54.7	12.0
977	Xg	2.180	160	50.0	6.2	143.6	14.0
978	Xg	<0.246	159	90.0	6.4	123.1	16.0
979	Xg	0.246	39	70.0	6.2	27.4	13.0
980	Xg	5.407	136	30.0	6.6	123.1	18.0
981	Yf	0.246	160	-80.0	8.6	68.4	10.8
982	Yf	3.195	160	-3.0	7.3	116.3	12.8
983	Yf	1.475	380	50.0	6.4	273.6	15.0
984	Yf	<0.246	110	95.0	5.6	47.9	10.0
985	Yf	<0.246	91	45.0	6.4	47.9	14.6

APPENDIX C.

Table of chemical analyses: stream-water samples

Sample Number (MFI)	Geol. Code	U_3O_8 (ppb)	Cond. umhos	Eh (mv)	pH	M.Alk. mg/l	Temp. (°C.)
206	Zos	.253	140	89	6.1	88.9	7.0
207	Zos	.253	98	75	5.9	130.0	7.5
208	Yu	.253	70	50	6.2	54.7	8.1
209	Yu	.253	59	60	6.0	41.0	8.3
210	Yu	.253	60	75	5.7	41.0	8.5
211	Yu	.253	106	65	5.9	68.4	8.3
212	Zos	.253	148	60	6.0	88.9	7.6
213	Zos	.253	90	60	6.0	34.2	8.6
214	Zos	.253	81	50	6.3	61.6	8.8
215	Zos	.253	99	35	6.5	68.4	8.3
216	Zos	.253	170	35	6.5	82.1	8.6
217	Zos	.253	102	35	6.5	61.6	9.4
218	Zos	.253	100	30	6.5	68.4	8.9
219	Zos	.253	150	15	6.8	75.2	9.1
220	Zos	.253	165	5	7.0	88.9	9.9
221	*	.253	62	-	-	41.0	9.0

* Lake Superior water sample.

APPENDIX C.

Table of chemical analyses: lake-sediment analyses (in ppm)

Sample Number (MFI)	Geol. Code	U_3O_8 (F1)	LOI %	AS	CU	MO	NI	PB	SE	V	ZN
051	Є	2	46	-	40	2	40	35	-	-	150
052	Є	3	72	-	75	7	35	15	-	-	125
053	Wgn	5	71	-	30	3	25	15	-	-	155
054	Wgn	5	55	-	35	4	25	30	-	-	130
055	Wgn	5	52	-	40	4	25	15	-	-	140
056	Wgn	2	70	-	30	3	25	15	-	-	245
057	Wgn	3	69	-	35	3	25	10	-	-	105
060	Є	4	54	15	25	2	25	10	<1	130	150
061	Yu	2	83	-	15	1	10	105	-	-	50
062	Yu	2	7	-	25	1	45	25	-	-	215
063	Є	3	42	35	35	1	25	15	<1	190	230
064	Є	2	26	10	20	5	15	5	<1	60	45
065	Wgn	2	64	-	30	3	30	20	-	-	155
066	Wgn	4	34	-	15	1	15	10	-	-	135
067	Wgn	3	20	-	10	1	10	10	-	-	125
068	Є	5	42	-	45	3	30	20	-	-	145
069	Yu	3	45	-	25	3	30	5	-	-	160
070	Yu	2	60	-	30	4	25	15	-	-	115
071	Yu	5	52	-	40	2	35	20	-	-	125
072	Yu	1	15	-	15	1	15	5	-	-	45
073	Yu	3	50	<5	35	3	30	15	1	130	95
074	Xbt	5	32	-	20	2	25	15	-	-	115
320	Yf	2	72	<5	40	13	35	55	<1	210	215
321	Є	5	62	<5	65	34	170	25	2	500	210
322	Yu	3	61	<5	60	25	170	30	-	-	175
323	Yf	1	50	15	35	23	140	25	16	250	205
324	Yf	1	55	20	65	54	285	75	15	370	180
325	Yf	4	42	10	60	5	30	25	8	460	85
326	Yf	9	47	20	55	4	30	65	1	640	100
327	Yf	2	62	<5	50	8	10	40	11	320	65
328	Yf	1	15	<5	20	2	5	5	1	370	20
329	Yf	2	53	10	35	6	10	10	<1	280	60
330	Yf	1	31	<5	35	2	10	5	<1	320	25
331	Yf	1	[illegible]7	20	20	2	15	15	<1	460	40
332	Yf	7	74	15	35	11	25	75	<1	460	150
333	Yf	1	7	<5	10	1	5	10	<1	230	15
334	Yf	2	63	<5	40	7	10	80	<1	210	50
335	Yf	2	62	<5	45	10	15	10	<1	200	50
336	Yf	4	53	5	25	6	10	45	<1	460	30

Sample Number (MFI)	Geol. Code	U_3O_8 (Fl)	LOI %	AS	CU	MO	NI	PB	SE	V	ZN
337	Yf	2	72	25	25	7	10	25	<1	300	50
338	Yf	3	43	40	30	8	20	115	1	230	35
339	Yf	10	48	20	30	18	10	65	<1	340	30
340	Yf	3	69	10	45	8	15	30	2	750	110
341	Yu	2	58	10	45	28	130	25	16	210	180
342	Yf	6	35	5	60	3	30	30	2	430	80
343	Yf	14	46	15	40	4	25	50	<1	460	75
344	Yf	-	43	30	30	19	15	55	<1	320	35
345	Yf	4	18	30	45	4	30	65	1	110	20
346	Yf	3	49	10	40	5	20	30	3	320	80
347	Yf	<1	42	<5	35	4	15	15	9	250	40
348	Yf	11	47	10	55	3	20	35	<1	620	75
349	Yf	3	48	10	45	4	15	55	<1	270	75
350	Yf	4	31	<5	20	2	5	15	<1	230	15
351	Yf	1	22	<5	10	2	5	45	<1	110	15
352	Yu	4	32	10	30	1	30	25	11	290	265
353	Yu	4	57	5	30	3	35	25	18	230	190
354	Yu	2	4	5	35	1	40	15	3	230	80
355	Yu	12	30	5	30	2	10	20	1	270	45
356	Yf	2	54	5	90	3	5	10	1	480	20
357	Yf	4	50	15	20	1	5	10	1	140	5
358	Yf	1	45	10	30	2	5	55	2	210	15
359	Yf	1	86	5	20	13	35	395	2	270	110
360	Yf	12	33	15	20	3	10	70	2	290	45
361	Yf	2	44	10	45	2	5	5	<1	320	10
362	Yf	5	38	<5	30	2	5	10	<1	210	5
363	Zcs	3	44	10	40	1	5	10	<1	300	5
364	Yf	2	46	10	30	2	5	10	<1	250	10
365	Yf	2	62	<5	25	8	10	110	<1	320	40
366	Yf	3	45	<5	45	1	5	10	<1	320	5
367	Yf	4	47	5	30	3	10	35	<1	340	35
368	Yf	9	56	5	65	3	20	35	<1	540	75
369	Yf	28	70	40	50	7	15	95	<1	290	35
370	Yf	5	53	30	35	8	20	115	<1	460	70
371	Yf	3	80	<5	65	14	15	115	1	860	35
372	Yf	3	63	10	40	7	10	40	8	230	35
373	Yf	2	62	<5	40	3	5	5	2	290	10
374	Yf	1	28	<5	30	1	5	5	4	290	5
375	Yf	3	5	<5	20	1	5	5	3	160	5
376	Yu	7	54	<5	40	2	35	20	16	360	125
377	Yu	2	55	<5	180	4	45	45	8	250	185

Sample Number (MFI)	Geol. Code	U_3O_8 (Fl)	LOI %	AS	CU	MO	NI	PB	SE	V	ZN
378	Yu	3	45	10	65	2	55	40	-	320	355
379	Yu	3	62	5	50	4	50	45	-	180	440
380	Yu	3	39	10	30	5	35	20	-	-	110
381	Yu	2	33	5	20	2	35	20	-	-	130
382	Wgn	6	38	25	30	3	35	20	-	-	190
383	Xbt	2	48	15	25	2	35	50	-	-	175
384	Xbt	2	7	5	10	<1	20	10	-	-	90
385	Xbt	3	29	10	20	1	30	20	-	-	190
386	Xbt	2	5	<5	5	<1	10	10	-	-	45
387	Yu	3	56	5	40	2	35	40	6	-	185
388	Wg	4	39	<5	25	2	35	20	-	-	120
389	Wg	2	41	10	15	2	25	20	-	-	165
390	Wgn	2	61	10	40	4	35	25	-	-	180
391	Wgn	4	31	5	15	2	25	20	-	-	115
392	Wgn	2	59	10	25	2	25	30	-	-	215
393	Wgn	2	24	<5	10	<1	20	20	-	-	120
394	Wgn	2	54	5	30	3	35	15	-	-	175
395	Wgn	2	59	5	75	3	55	25	-	-	320
396	Wgn	1	4	5	5	1	15	10	-	-	65
397	Wgn	1	54	5	30	3	25	20	-	-	235
398	Wgn	3	49	<5	25	3	35	25	-	-	205
399	Wgn	2	59	10	35	3	25	45	-	-	185
400	Wgn	8	37	<5	70	2	25	25	-	-	75
401	Ybq	3	39	<5	25	3	40	15	-	-	130
402	Yu	2	30	10	45	2	35	30	-	-	150
403	Yvs	2	5	<5	20	1	25	30	10	-	100
404	Wv	5	63	<5	200	8	-	-	-	-	120
405	Wv	2	13	10	35	5	20	15	-	-	65
406	Wg	1	4	<5	35	1	15	10	-	-	60
407	Wg	4	16	<5	30	1	20	10	-	-	85
408	Wg	3	18	<5	20	<1	580	60	-	-	65
409	Wg	1	37	<5	30	1	30	20	-	-	180
410	Wg	<1	7	<5	15	<1	10	5	-	-	90
411	Wg	<1	57	<5	45	4	-	-	-	-	180
412	Wxv	1	40	10	30	2	30	20	-	-	185
413	Wgn	2	12	5	15	<1	30	10	-	-	75
414	Wxv	5	40	5	50	2	40	15	-	-	220
415	Wv	1	30	10	25	1	145	30	-	-	180
416	Wxv	3	40	20	35	2	60	30	-	-	155
417	Wxv	4	40	5	30	2	-	-	-	-	170
418	Wg	8	61	25	60	8	-	-	-	-	145
419	Xg	3	60	10	60	3	-	-	-	-	220

Sample Number (MFI)	Geol. Code	U_3O_8 (Fl)	LOI %	AS	CU	MO	NI	PB	SE	V	ZN
420	Xg	3	57	15	40	2	-	-	-	-	245
421	Xbm	2	53	10	25	1	50	70	-	-	240
422	Xbm	1	9	45	10	<1	30	10	-	-	45
423	Xbm	3	36	<5	35	<1	35	45	-	-	200
424	Xbm	2	27	5	25	<1	40	25	-	-	160
425	Wgn	2	68	5	55	3	155	60	-	-	235
426	Wgn	2	58	<5	55	1	320	40	-	-	440
427	Wgn	3	38	15	35	<1	35	25	-	-	135
428	Wgn	1	7	15	5	<1	300	15	-	-	65
451	Yf	5	59	15	35	3	25	40	15	170	125
452	Yf	4	53	35	45	3	20	45	19	200	70
454	Yf	8	43	40	40	2	30	55	10	240	165
455	Yf	1	49	30	35	5	40	30	7	240	145
456	Yf	9	47	30	35	1	30	30	12	220	125
458	Yf	1	33	10	25	1	15	30	15	70	90
462	Yf	3	61	20	65	3	45	60	17	180	320
463	Yf	1	64	15	60	3	50	70	16	190	260
464	Yf	9	40	35	45	4	20	25	14	130	150
466	Yf	6	51	20	45	2	35	40	19	230	195
469	Yf	1	2	15	10	<1	10	10	5	140	25
470	Zos	3	8	15	40	<1	50	30	2	140	120
471	Zcs	1	34	10	35	<1	45	20	11	120	130
472	Zcs	2	63	10	45	2	40	30	14	140	250
473	Zcs	2	51	15	30	<1	35	30	16	160	180
474	Zcs	4	46	15	55	2	45	45	7	140	285
476	Zcs	2	58	10	50	3	40	45	14	190	315
478	Yf	3	52	25	85	2	50	30	12	200	395
479	Yf	2	63	10	40	3	40	55	28	160	345
480	Yf	1	12	10	20	1	25	15	3	190	75
481	Yu	1	32	-	35	<1	45	50	19	-	195
483	Yf	1	32	10	35	<1	45	15	13	110	250
484	Yu	2	34	-	40	1	45	25	-	-	245
485	Wgn	1	57	-	85	3	100	100	-	-	540
486	Yu	1	28	-	120	<1	35	205	-	-	5
487	Wg	3	61	-	495	2	175	70	-	-	220
488	Wg	<1	66	-	30	1	175	45	-	-	170
489	Wg	1	63	-	50	1	60	5	-	-	225
490	Wg	3	51	-	45	2	45	5	-	-	205
491	Wxv	6	35	-	20	2	55	5	-	-	5
493	Xg	2	63	-	55	3	75	10	-	-	245
494	Xg	1	64	-	50	6	90	15	-	-	245
739	Yf	3	52	-	-	-	-	-	-	-	-
746	Yf	9	55	-	-	-	-	-	-	-	-