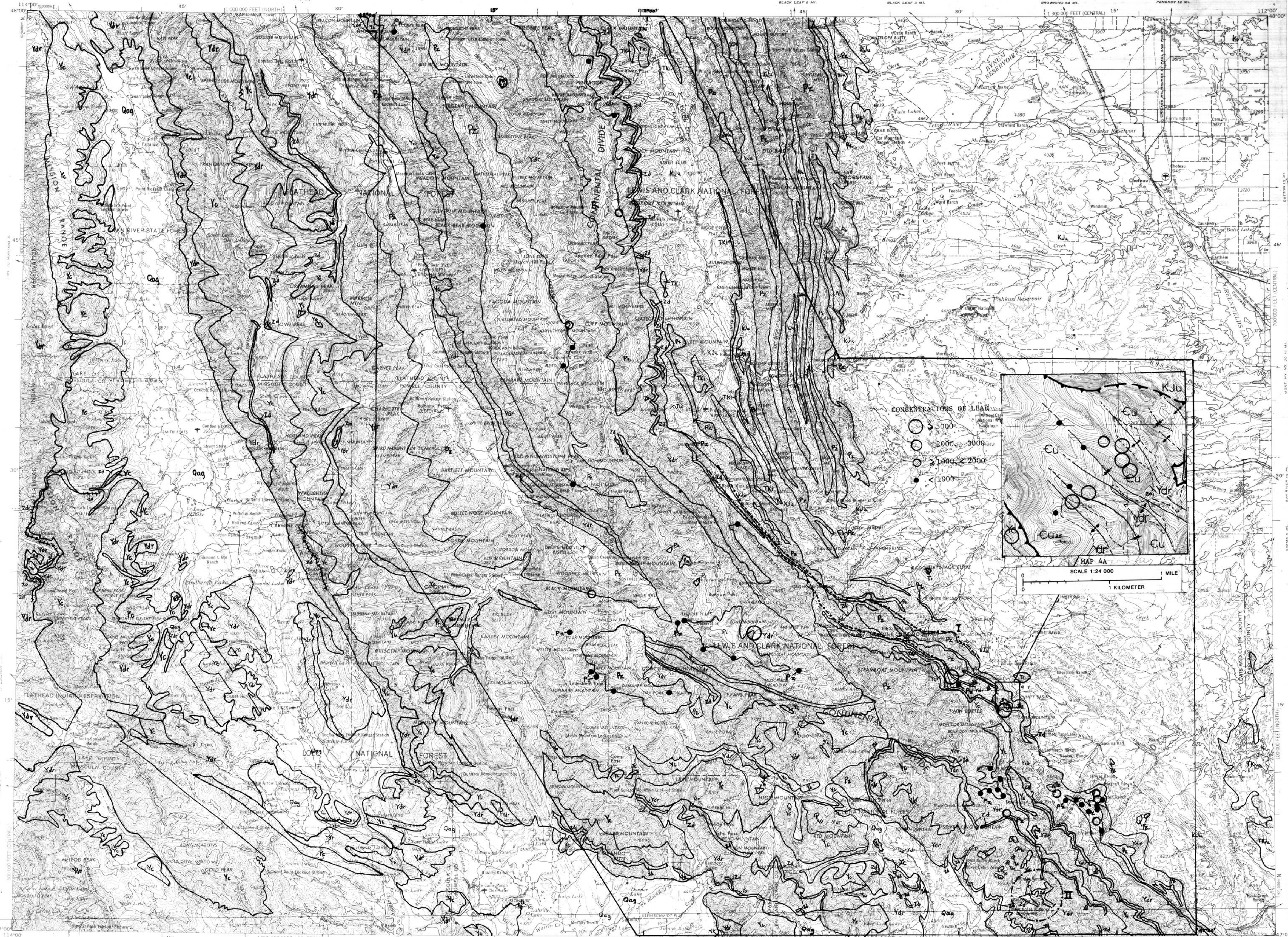
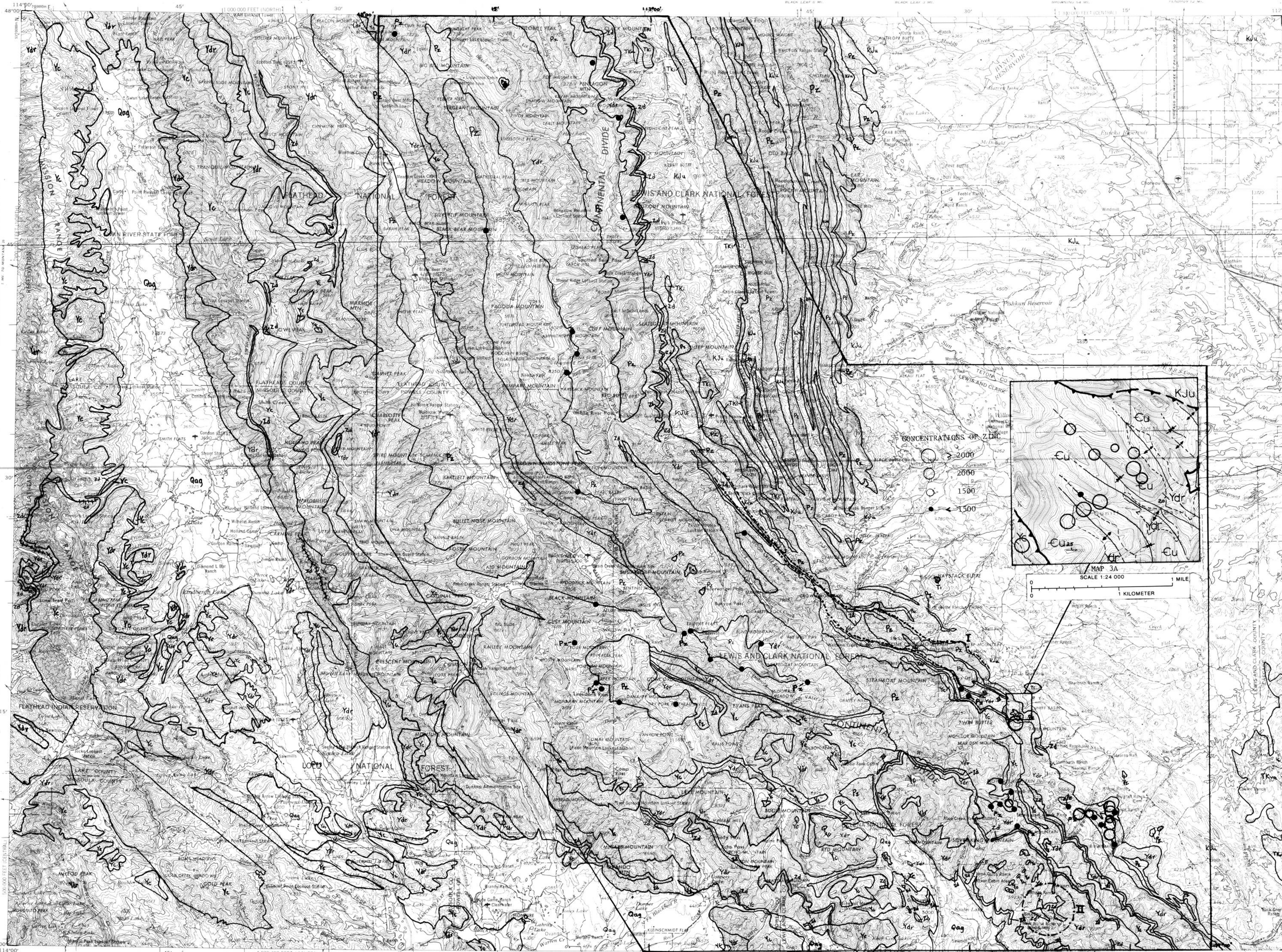


MAPS 2 AND 2A-ABUNDANCE AND DISTRIBUTION OF COPPER IN THE OXALIC ACID-SOLUBLE IRON AND MANGANESE OXIDE FRACTION OF SAMPLES OF FLATHEAD SANDSTONE



MAPS 4 AND 4A-ABUNDANCE AND DISTRIBUTION OF LEAD IN THE OXALIC ACID-SOLUBLE IRON AND MANGANESE OXIDE FRACTION OF SAMPLES OF FLATHEAD SANDSTONE



MAPS 3 AND 3A-ABUNDANCE AND DISTRIBUTION OF ZINC IN THE OXALIC ACID-SOLUBLE IRON AND MANGANESE OXIDE FRACTION OF SAMPLES OF FLATHEAD SANDSTONE

CORRELATION OF MAP UNITS

SEDIMENTARY ROCKS		IGNEOUS ROCKS	
SURFICIAL DEPOSITS		TERTIARY	
Qag		Tl	
Kju		Tn	
Pe		Tn	
Ydr		Tn	
Yc		Tn	

DESCRIPTION OF MAP UNITS

Qag SURFICIAL DEPOSITS (QUATERNARY)—Chiefly of alluvial origin. Locally includes sedimentary and pyroclastic rocks of Tertiary age in southern part of map area.

Kju SEDIMENTARY ROCKS (CRETACEOUS AND JURASSIC)—Chiefly mudstone and sandstone.

Pe UNDIFFERENTIATED, MISSISSIPPIAN, DEVONIAN, CAMBRIAN SANDSTONE, LIMESTONE, AND DOLOMITE (PALEOZOIC)—Locally includes shale, siltstone, and quartzite; basal formation is Flathead Sandstone.

Ydr DEARBORN LIMESTONE, DANMATION LIMESTONE, GORDON SHALE, AND FLATHEAD SANDSTONE (CAMBRIAN)—Fine- to coarse-grained sandstone and quartzite, shale, and limestone.

Yc ANGLITE, SILTITE, AND QUARTZITE (PROTEROZOIC Y)—Includes dolomite and dolomitic limestone in easternmost exposures.

Tl INTRUSIVE ROCKS (TERTIARY)—Chiefly quartz monzonite stocks and dike plugs, locally porphyritic.

Tn TRACHYANDESITE SILL (TERTIARY OR CRETACEOUS).

Zd DIORITE AND GABBRO SILLS (PROTEROZOIC Z).

MAP SYMBOLS

CONTACT—Dashed where approximately located

THrust FAULT—BARS ON UPPER PLATE

SYNCLINAL AND ANTICLINAL FOLDS

STRIKE AND DIP OF BEDS

AREA OF LEAD-ZINC MINERALIZATION

REDLESTON DISTRICT

RP/R SAMPLE LOCATION

Table 1.—Concentrations of selected elements in 82 untreated samples of Flathead Sandstone, and their concentrations in the oxalic acid-soluble iron and manganese oxide fractions of the samples, Choteau quadrangle, Montana.

(All values reported in parts per million except Pb for sample 79-128 which is greater than 21. Lower limits of determination given in parentheses (5) at the top of table. N, not detected at lower limit; L, detected but less than lower limit; R, concentrations in the untreated rock samples; Oa, concentrations in oxide fractions. Samples analyzed spectrographically by R. J. Grimes.)

Sample no.	Cu (5)		Pb (10)		Zn (200)		Ag (5)		Al (200)		Sb (100)		Cd (20)		Co (5)		U (50)		Th (100)	
	R	Oa	R	Oa	R	Oa	R	Oa	R	Oa	R	Oa	R	Oa	R	Oa	R	Oa	R	Oa
RP 12	7	1000	L	300	N	500	N	5	N	N	N	N	N	N	N	N	N	N	N	N
RP 13	15	700	L	300	N	500	N	5	N	N	N	N	N	N	N	N	N	N	N	N
RP 14	15	10000	20	15000	N	1000	N	15	N	N	N	N	N	N	N	N	N	N	N	N
RP 15	10	7000	70	20000	N	5000	N	2	N	1000	N	1500	N	100	N	20	N	50	N	100
RP 16	L	300	L	200	N	500	N	N	N	N	N	N	N	N	N	N	N	N	N	N
RP 17	L	300	L	500	N	2000	N	N	N	N	N	N	N	N	N	N	N	N	N	N
RP 18	7	1500	L	2000	N	1500	N	2	N	2000	N	N	N	N	N	N	N	N	N	N
RP 19	20	5000	100	15000	N	2000	N	7	N	2000	N	N	N	N	N	N	N	N	N	N
RP 20	10	700	200	20000	N	5000	N	1	N	300	N	N	N	N	N	N	N	N	N	N
RP 21	7	500	150	1000	N	2000	N	5	N	300	N	N	N	N	N	N	N	N	N	N
RP 22	5	2000	L	1000	N	700	N	5	N	300	N	N	N	N	N	N	N	N	N	N
RP 23	7	300	L	500	N	1500	N	N	N	N	N	N	N	N	N	N	N	N	N	N
RP 24	5	1500	N	1000	N	1000	N	2	N	N	N	N	N	N	N	N	N	N	N	N
RP 25	7	1000	L	700	N	1500	N	2	N	N	N	N	N	N	N	N	N	N	N	N
RP 26	10	1500	L	700	N	1500	N	2	N	N	N	N	N	N	N	N	N	N	N	N
RP 27	10	3000	L	500	N	700	N	5	N	1000	N	N	N	N	N	N	N	N	N	N
RP 28	L	300	N	150	N	1500	N	N	N	N	N	N	N	N	N	N	N	N	N	N
RP 29	10	1000	L	1000	N	2000	N	1	N	N	N	N	N	N	N	N	N	N	N	N
RP 30	10	1500	N	1000	N	2000	N	1	N	200	N	N	N	N	N	N	N	N	N	N
RP 31	10	1500	N	1000	N	2000	N	1	N	200	N	N	N	N	N	N	N	N	N	N
RP 32	10	1500	N	1000	N	2000	N	1	N	200	N	N	N	N	N	N	N	N	N	N
RP 33	10	1500	N	1000	N	2000	N	1	N	200	N	N	N	N	N	N	N	N	N	N
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RP 35	10	1500	N	1000	N	2000	N	1	N	200	N	N	N	N	N	N	N	N	N	N
RP 36	10	1500	N	1000	N	2000	N	1	N	200	N	N	N	N	N	N	N	N	N	N
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RP 40	10	1500	N	1000	N	2000	N	1	N	200	N	N	N	N	N	N	N	N	N	N
RP 41	10	1500	N	1000	N	2000	N	1	N	200	N	N	N	N	N	N	N	N	N	N
RP 42	10	1500	N	1000	N	2000	N	1	N	200	N	N	N	N	N	N	N	N	N	N
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RP 63	10	1500	N	1000	N	2000	N	1	N	200	N	N	N	N	N	N	N	N	N	N
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RP 66	10	1500	N	1000	N	2000	N	1	N	200	N	N	N	N	N	N	N	N	N	N
RP 67	10	1500	N	1000	N	2000	N	1	N	200	N	N	N	N	N	N	N	N	N	N
RP 68	10	1500	N	1000	N	2000	N	1	N	200	N	N	N	N	N	N	N	N	N	N
RP 69	10	1500	N	1000	N	2000	N	1	N	200	N	N	N	N	N	N	N	N	N	N
RP 70	10	1500	N	1000	N	2000	N	1	N	200	N	N	N	N	N	N	N	N	N	N
RP 71	10	1500	N	1000	N	2000	N	1	N	200	N	N	N	N	N	N	N	N	N	N
RP 72	10	1500	N	1000	N	2000	N	1	N	200	N	N	N	N	N	N	N	N	N	N
RP 73	10	1500	N	1000	N	2000	N	1	N	200	N	N	N	N	N	N	N	N	N	N
RP 74	10	1500	N	1000	N	2000	N	1	N	200	N	N	N	N	N	N	N	N	N	N
RP 75	10	1500	N	1000	N	2000	N	1	N	200	N	N	N	N	N	N	N	N	N	N
RP 76	10	1500	N	1000	N	2000	N	1	N	200	N	N	N	N	N	N	N	N	N	N
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RP 82	10	1500	N	1000	N	2000	N	1	N	200	N	N	N	N	N	N	N	N	N	N

OXALIC ACID-SOLUBLE IRON AND MANGANESE OXIDES IN THE CAMBRIAN FLATHEAD SANDSTONE, CHOTEAU QUADRANGLE, MONTANA—A SAMPLE MEDIUM FOR MINERAL EXPLORATION

By  
Reinhard W. Leinz and James W. Whipple  
1981