U. S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

GEOCHEMICAL DATA FROM COLOMBIA
Part A: General Discussion

by U.S. Geological Survey Center for Inter-American Mineral Resource Investigations and Instituto Nacional de Investigaciones Geológico - Mineras

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Open-File Report

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INTRODUCTION

This report contains geochemical data for Colombia from the files of the U.S. Geological Survey. The data are believed to be the result of U.S. Geological Survey (USGS) - U.S. AID cooperative projects in the 1960's and 1970's and subsequent regional studies by INGEOMINAS. Permission was granted in 1994 by Sr. Antonio Romero Hernandez, Director General of INGEOMINAS, to publish this information. Little documentation remains with the data, but the geochemical data in this report are probably a subset of those used for regional studies such as the geologic study of Planchas 167 and 187 by Humberto Gonzáles I. (1980). Much of the background information in this compilation is from that report.

CHEMICAL ANALYSIS

Samples of stream sediments and rock (10 mg in size) were analyzed for 37 chemical elements by a six-step semiquantitative method of emission spectrography (Grimes and Marranzino, 1968) in the laboratories of INGEOMINAS. In this method, the determinations are made by optical comparison and the concentrations are classed in terms of intervals whose limits increase logarithmically. Concentrations are reported as decimal multiples, or sub-multiples, of 1, 1.5, 2, 3, 5, or 7 which are the numbers representing midpoints of the six concentration intervals. Upper and lower limits of determination for each element are given in Table 1. Some elements for parts of some data sets were reported on the original laboratory report with detection limits other than those indicated in Table 1 (i.e. with a lower detection level for zinc of 100 ppm, not 200 ppm); the data in the tables are shown as originally reported.

GEOCHEMICAL DATA

Table 2 shows the number of samples for each of the thirty-two 1:100,000 quadrangles (planchas). A total of 7845 sample analyses are available in this report. The planchas occur partly or wholly within the Departments of Norte de Santander, Santander, Boyaca, Cundimarca, Huila, Tolima, Narino, Cauca Quindio, and Valle (figures 1, 2). The chemical analyses for each of the samples and their geographical coordinates are compiled in Tables 1 through 32 in part B of this report and are also available on diskette (Part C). Each table contains the data for a single plancha. The

Table 1. Limits of detection in parts per million (ppm) for the spectrographic analysis of rocks and stream sediments.

Element		Determination Limits Lower	Upper
Iron	Fe	500	200,000
Magnesium	Mg	200	100,000
Calcium	Ca	500	200,000
Titanium	Ti	20	50,000
Manganese	Mn	10	5,000
Silver	Ag	0.5	5,000
Aluminum	Al		
Gold	Au	10	500
Boron	B	10	2,000
Barium	Ba	20	20,000
Beryllium	Be	1	1,000
Bismuth	Bi	10	1,000
Cadmium	Cd	20	500
Cobalt	Co	10	2,000
Chromium	Cr	10	5,000
Copper	Cu	2	20,000
Galium	Ga	10	2,000
Lanthanum	La	20	1,000
Molybdenum	Mo	5	2,000
Niobium	Nb	20	2,000
Nickel	Ni	5	5,000
Lead	Pb	10	20,000
Antimony	Sb	100	10,000
Scandium	Sc	5	100
Tin	Sn	10	1,000
Strontium	Sr	100	10,000
Vanadium	V	10	10,000
Tungsten	W	20	10,000
Yttrium	Y	10	2,000
Zinc	Zn	100	10,000
Zirconium	Zr	10	1,000

data in this report are largely for the < 1.0 mm fraction of stream sediment samples, but some soil or rock samples may be present in the stream sediment datasets. Each table is recorded on the accompanying diskette (Part C) in data interchange format

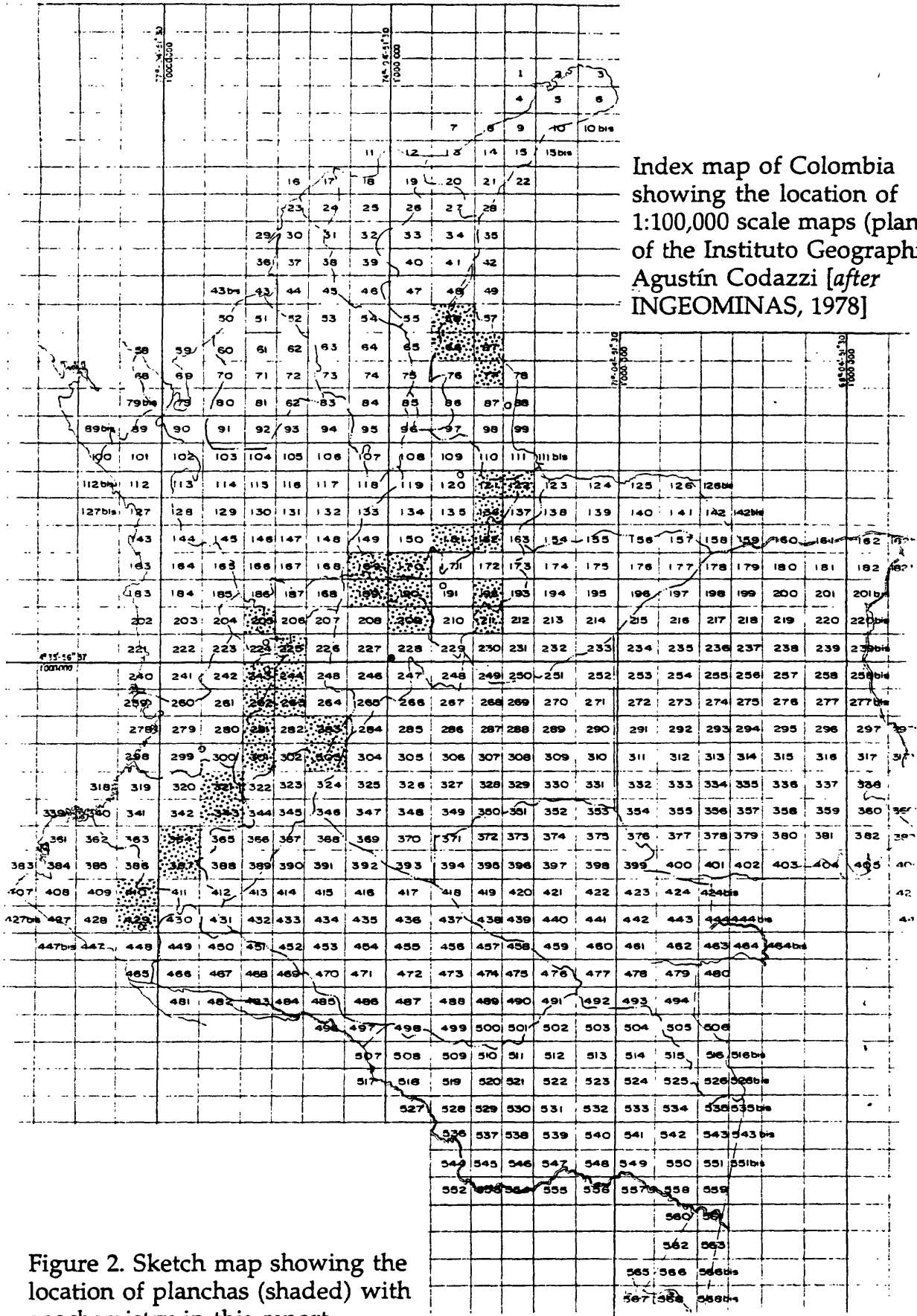
Table 2. Numbers of analyzed samples in this report.

Plancha	No. Samples	Plancha	No. Samples
56	86	211	4
66	166	225	4
67	29	243	24
77	20	244	561
121	59	262	24
122	135	263	200
136	119	281	538
151	32	283	4
152	33	301	552
169	6	303	49
170	24	321	487
189	71	343	533
190	54	364	1447
192	2	387	977
205	263	410	725
209	4	429	613

(DIF) and can be imported into most spreadsheet and database application software. Data files are identified by their plancha number followed by the suffix ".DIF".

The first column of the data tables lists the laboratory number of the sample. The second and third columns contain he latitude and longitude in decimal degrees. The remaining 37 columns list the concentrations of elements. The symbols ">" (greater than), "<" (less than), and "N" (not detected) may occur with, or instead of, numerical values. In addition, in some datasets not all elements were reported, in these cases the fields were left blank. Table 3 lists the maximum, minimum, and median values of the 37 elements analysis of stream sediments for each plancha.

Figure 1. Sketch map of Colombia showing its Departments.



Index map of Colombia showing the location of 1:100,000 scale maps (planchas) of the Instituto Geographico Agustín Codazzi [*after* INGEOMINAS, 1978]

Figure 2. Sketch map showing the location of planchas (shaded) with geochemistry in this report.

REFERENCES CITED

Gonzáles I., Humberto, 1980, Geología de las planchas 157 (Sonson) and 187 (Salamina): Colombia Instituto Nacional de Investigaciones Geológico - Mineras Boletín Geológico, v. 23, no. 1, p. 1-174.

Grimes, D.J., and Marranzino, A.P., 1968, Direct-current arc emission spectrographic field methods for semiquantitative analysis of geologic materials: U.S. Geological Survey Circular 591, 6 p.

	FE (ppm)	MG (ppm)	CA (ppm)	TI (ppm)	MN (ppm)	AG (ppm)	AL (ppm)	AS (ppm)	AU (ppm)	B (ppm)	BA (ppm)	BE (ppm)	BI (ppm)	CD (ppm)	CO (ppm)	CR (ppm)
56																
min	10000	1500	500	1500	100	1	20000	0	0	< 10	200	< 1	0	0	< 5	10
max	70000	15000	20000	7000	2000	1	70000	0	0	100	1500	3	0	0	20	100
median	30000	5000	2000	3000	500	1	40000	0	0	15	700	1.5	0	0	7	30
66																
min	5000	500	< 500	500	10	1	5000	0	0	< 10	50	< 1	0	0	< 5	< 10
max	70000	30000	20000	15000	3000	1.5	100000	0	0	70	5000	15	0	0	20	1500
median	20000	5000	1500	3000	500	1.25	50000	0	0	17.5	500	2	0	0	10	30
67																
min	10000	1000	700	1500	100	0	0	0	0	< 10	300	< 1	< 5	0	< 5	20
max	150000	15000	10000	> 10000	> 5000	0	0	0	0	300	1000	5	< 5	0	30	150
median	30000	7000	5000	3000	500	0	0	0	0	17.5	700	2	< 5	0	15	70
77																
min	20000	3000	1500	3000	500	0	0	0	0	< 10	500	2	0	0	10	< 10
max	100000	20000	15000	7000	2000	0	0	0	0	70	1000	7	0	0	20	150
median	30000	15000	10000	5000	700	0	0	0	0	50	700	3	0	0	15	50
121																
min	7000	500	< 500	1500	100	0.5	0	0	0	< 10	70	< 1	< 10	0	< 5	10
max	70000	7000	20000	30000	1500	0.5	0	0	0	50	700	3	< 10	0	30	100
median	15000	2000	3000	3000	300	0.5	0	0	0	20	200	1.5	< 10	0	10	30
122																
min	500	500	< 500	2000	100	2	2500	0	0	10	20	1	0	20	< 5	10
max	100000	20000	70000	70000	5000	2	100000	0	0	100	10000	15	0	300	20	300
median	20000	4000	1000	5000	700	2	50000	0	0	20	200	2	0	50	10	30
136																
min	1000	200	< 500	100	20	< 0.5	0	0	0	< 10	< 20	< 1	0	200	5	10
max	100000	20000	> 200000	10000	> 5000	20	0	0	0	100	7000	7	0	200	50	500
median	20000	2000	2000	2000	200	2.5	0	0	0	15	150	1.5	0	200	20	50
151																
min	500	200	< 500	200	50	< 0.5	< 10	0	0	0	< 20	< 1	0	70	5	10
max	100000	15000	> 200000	> 5000	5000	20	100	0	0	0	300	2	0	70	30	700
median	15000	2000	7500	1000	250	1	10	0	0	0	100	1.5	0	70	15	100
152																
min	500	200	< 500	100	50	< 0.5	0	0	0	< 10	< 20	< 1	0	0	5	15
max	70000	5000	200000	3000	2000	< 0.5	0	0	0	100	500	7	0	0	50	700
median	15000	1500	2000	2000	300	< 0.5	0	0	0	10	150	1.75	0	0	15	100
166																
min	10000	700	500	1000	100	< 0.5	0	0	0	10	150	1.5	0	0	10	50
max	20000	3000	10000	2000	200	1	0	0	0	15	500	2	0	0	20	150
median	15000	2000	1000	1500	125	1	0	0	0	15	500	2	0	0	20	85
170																
min	500	200	500	1000	20	< 0.5	0	0	0	< 10	20	1	0	< 20	5	10
max	20000	2000	10000	3000	1000	0.5	0	0	0	20	200	1.5	0	< 20	10	150
median	15000	1000	1250	1500	100	0.5	0	0	0	15	100	1.5	0	< 20	7	20
169																
min	15000	700	< 500	1000	50	< 0.5	0	0	0	15	50	< 1	0	< 20	< 5	30
max	150000	50000	> 200000	20000	> 5000	7	0	0	0	150	1500	70	0	< 20	70	300
median	30000	3000	2000	3000	200	1	0	0	0	50	300	2	0	< 20	15	150
190																
min	5000	200	< 500	200	20	0.5	0	0	0	< 10	< 20	< 1	0	20	< 5	10
max	100000	10000	7000	7000	5000	0.5	0	0	0	50	700	50	0	50	20	150
median	10000	700	500	1500	70	0.5	0	0	0	15	70	1.5	0	35	7	20
192																
min	50000	7000	5000	10000	500	0	0	0	0	15	150	1.5	0	0	20	70
max	50000	7000	7000	10000	700	0	0	0	0	15	150	1.5	0	0	30	150
median	50000	7000	6000	10000	600	0	0	0	0	15	150	1.5	0	0	25	110
205																
min	30000	5000	2000	1500	100	0.5	0	0	0	< 10	100	< 1	0	0	10	20
max	200000	30000	70000	50000	2000	0.5	0	0	0	70	3000	3	0	0	50	3000
median	50000	15000	15000	5000	700	0.5	0	0	0	20	500	1	0	0	20	200
209																
min	5000	200	1000	150	700	0.7	0	0	0	50	150	1	0	0	10	10
max	150000	1500	100000	7000	5000	1.5	0	0	0	50	150	1	0	0	10	10
median	37500	1500	65000	450	1750	1.1	0	0	0	50	150	1	0	0	10	10
211																

	CU (ppm)	GA (ppm)	LA (ppm)	MO (ppm)	NA (ppm)	NB (ppm)	NI (ppm)	P (ppm)	PB (ppm)	PD (ppm)	PT (ppm)	SB (ppm)	SC (ppm)	SI (ppm)	SN (ppm)	SR (ppm)
56																
min	5	10	< 20	< 5	1000	< 10	5	< 1000	10	0	0	0	< 5	> 200000	0	100
max	70	50	100	10	50000	20	50	1500	70	0	0	0	15	> 200000	0	500
median	25	30	30	5	15000	17.5	10	1000	20	0	0	0	7	> 200000	0	100
66																
min	2	10	< 20	< 5	1000	< 10	5	< 1000	10	0	0	0	< 5	150000	0	100
max	70	50	150	15	50000	10	70	2000	70	0	0	0	20	> 200000	0	500
median	20	20	30	6	10000	10	15	1000	20	0	0	0	7	200000	0	100
67																
min	7	< 10	20	0	0	0	7	0	< 10	0	0	0	5	0	0	100
max	150	50	500	0	0	0	70	0	30	0	0	0	20	0	0	300
median	30	30	50	0	0	0	30	0	20	0	0	0	15	0	0	200
77																
min	10	20	30	0	0	10	< 5	0	10	0	0	0	7	0	0	100
max	70	30	200	0	0	15	50	0	30	0	0	0	20	0	0	500
median	50	20	70	0	0	12.5	20	0	20	0	0	0	10	0	0	200
121																
min	5	< 10	20	< 5	0	< 10	< 5	0	< 10	0	0	0	< 5	0	0	100
max	70	30	200	10	0	< 10	50	0	100	0	0	0	50	0	0	200
median	10	15	30	5	0	< 10	15	0	15	0	0	0	7	0	0	100
122																
min	3	10	< 20	< 5	< 1000	< 10	< 5	1000	< 10	0	0	0	< 5	100000	50	< 100
max	100	70	100	20	10000	20	50	2000	100	0	0	0	50	> 200000	100	1000
median	20	20	50	5	1500	10	20	1000	10	0	0	0	10	200000	50	150
136																
min	< 10	< 10	20	5	0	0	5	0	10	0	0	0	5	0	0	100
max	20000	50	150	30	0	0	2000	0	> 20000	0	0	0	70	0	0	1000
median	20	20	50	5	0	0	20	0	30	0	0	0	10	0	0	200
151																
min	< 10	10	20	< 5	0	0	5	0	10	0	0	0	5	0	0	100
max	5000	50	200	30	0	0	3000	0	20000	0	0	0	20	0	0	300
median	20	20	50	7.5	0	0	125	0	70	0	0	0	10	0	0	200
152																
min	< 10	10	20	< 5	0	0	7	0	10	0	0	0	5	0	0	100
max	200	100	500	10	0	0	2000	0	500	0	0	0	20	0	0	1000
median	15	30	50	5	0	0	20	0	50	0	0	0	10	0	0	100
169																
min	< 10	< 10	20	< 5	0	0	15	0	< 10	0	0	0	5	0	0	200
max	20	10	50	< 5	0	0	70	0	10	0	0	0	10	0	0	300
median	10	10	35	< 5	0	0	30	0	10	0	0	0	10	0	0	200
170																
min	5	< 10	30	< 5	0	0	< 5	0	< 10	0	0	0	< 5	0	0	100
max	50	15	200	30	0	0	50	0	200	0	0	0	15	0	0	100
median	10	12.5	30	15	0	0	10	0	15	0	0	0	7	0	0	100
189																
min	7	< 5	20	< 5	0	0	10	0	10	0	0	0	5	0	0	100
max	5000	50	300	300	0	0	200	0	300	0	0	0	100	0	0	300
median	30	30	50	30	0	0	100	0	20	0	0	0	15	0	0	200
190																
min	< 10	< 10	20	< 5	0	0	< 5	0	< 10	0	0	0	< 5	0	0	100
max	50	20	70	30	0	0	70	0	150	0	0	0	15	0	0	200
median	7	10	30	10	0	0	10	0	20	0	0	0	7	0	0	100
192																
min	15	30	20	< 5	0	0	30	0	20	0	0	0	20	0	0	0
max	100	30	50	< 5	0	0	30	0	30	0	0	0	20	0	0	0
median	57.5	30	35	< 5	0	0	30	0	25	0	0	0	20	0	0	0
205																
min	10	10	< 20	< 5	0	0	10	0	10	0	0	0	7	0	30	100
max	300	50	50	10	0	0	700	0	100	0	0	0	50	0	30	500
median	30	20	20	7	0	0	50	0	15	0	0	0	20	0	30	200
209																
min	7	10	20	5	0	0	5	0	50	0	0	0	5	0	0	100
max	30	10	20	10	0	0	15	0	15000	0	0	0	5	0	0	200
median	22.5	10	20	5	0	0	5	0	1600	0	0	0	5	0	0	150
211																

	V (ppm)	W (ppm)	Y (ppm)	ZR (ppm)	ZN (ppm)
56					
min	30	0	< 10	100	0
max	300	0	50	1500	0
median	70	0	15	200	0
66					
min	10	0	< 10	50	0
max	300	0	70	1000	0
median	70	0	15	200	0
67					
min	50	0	10	150	0
max	300	0	200	1500	0
median	150	0	30	500	0
77					
min	70	0	15	150	0
max	200	0	70	> 1000	0
median	150	0	20	200	0
121					
min	20	< 50	< 10	100	300
max	200	< 50	> 200	1500	300
median	70	< 50	20	300	300
122					
min	5	50	< 10	10	< 100
max	200	50	50	1500	200
median	70	50	30	200	200
136					
min	10	0	< 10	30	20
max	500	0	70	2000	2000
median	50	0	25	200	200
151					
min	20	0	10	15	< 200
max	200	0	70	500	5000
median	50	0	20	150	200
152					
min	20	0	10	20	20
max	200	0	200	700	3000
median	50	0	20	150	200
169					
min	50	0	10	30	< 200
max	100	0	15	150	200
median	70	0	12.5	125	200
170					
min	10	0	10	30	< 200
max	700	0	70	1000	500
median	60	0	15	150	200
189					
min	20	< 30	10	20	20
max	2000	70	200	300	5000
median	500	70	20	100	500
190					
min	10	0	< 10	30	< 200
max	300	0	70	1000	5000
median	50	0	15	150	250
192					
min	200	0	30	300	0
max	300	0	30	300	0
median	250	0	30	300	0
205					
min	15	0	< 10	< 10	< 100
max	1000	0	20	700	300
median	200	0	10	70	100
209					
min	20	0	10	200	200
max	50	0	50	2000	3000
median	35	0	10	1100	600
211					

	FE (ppm)	MG (ppm)	CA (ppm)	TI (ppm)	MN (ppm)	AG (ppm)	AL (ppm)	AS (ppm)	AU (ppm)	B (ppm)	BA (ppm)	BE (ppm)	BI (ppm)	CD (ppm)	CO (ppm)	CR (ppm)
min	50000	7000	700	7000	300	0	0	0	0	10	150	1.5	0	0	15	70
max	70000	10000	5000	10000	1000	0	0	0	0	15	300	3	0	0	30	150
median	50000	7000	2250	8500	500	0	0	0	0	15	200	1.5	0	0	17.5	110
225																
min	100000	70000	50000	10000	1500	0	0	0	0	0	1500	1.5	0	0	20	300
max	150000	100000	70000	15000	1500	0	0	0	0	0	3000	1.5	0	0	30	700
median	125000	100000	60000	12500	1500	0	0	0	0	0	2000	1.5	0	0	20	400
243																
min	15000	5000	3000	2000	300	0.5	0	0	0	0	150	< 1	0	< 20	10	50
max	70000	30000	15000	15000	1000	1	0	0	0	0	1000	< 1	0	< 20	70	700
median	30000	10000	7000	3000	500	0.7	0	0	0	0	300	< 1	0	< 20	20	100
244																
min	2000	1500	1000	1500	150	0.5	0	200	0	< 10	50	< 1	0	20	5	15
max	150000	100000	200000	15000	2000	30	0	1000	0	30	2000	3	0	20	200	1000
median	30000	10000	15000	3000	700	1	0	300	0	10	300	1	0	20	15	100
262																
min	20000	5000	3000	2000	500	0	0	0	0	20	100	< 1	0	0	10	30
max	70000	20000	50000	15000	1500	0	0	0	0	20	500	1	0	0	50	500
median	30000	12500	7000	5000	700	0	0	0	0	20	250	1	0	0	20	150
263																
min	10000	1000	700	1000	200	0	0	0	0	< 10	30	< 1	0	0	5	10
max	100000	30000	30000	15000	1500	0	0	0	0	100	1000	3	0	0	50	500
median	30000	7000	10000	5000	700	0	0	0	0	10	300	1	0	0	15	50
281																
min	2000	1000	700	200	70	< 0.5	0	0	10	< 10	20	< 1	0	< 20	10	10
max	200000	70000	> 200000	15000	7000	50	0	0	10	150	1500	2	0	50	70	1500
median	30000	10000	10000	3000	700	1.5	0	0	10	10	300	1.5	0	50	20	100
283																
min	20000	1500	1500	1000	300	< 0.5	0	0	0	15	70	< 1	0	0	< 5	20
max	50000	7000	20000	2000	1500	2	0	0	0	50	1000	2	0	0	5	500
median	25000	5000	8500	1750	850	1.35	0	0	0	20	500	2	0	0	5	225
301																
min	1000	500	< 500	500	40	< 0.5	20000	< 200	10	< 10	50	1	0	100	< 5	< 10
max	200000	50000	150000	15000	5000	3	150000	1000	10	30	1200	3	0	300	70	2000
median	30000	7000	15000	3000	500	0.5	50000	200	10	10	300	1.5	0	150	15	50
303																
min	10000	1000	500	2000	50	< 0.5	0	0	0	< 10	150	< 1	0	0	10	10
max	100000	10000	20000	10000	1000	5	0	0	0	15	1500	3	0	0	50	500
median	30000	5000	3000	3000	500	1.5	0	0	0	10	700	1.75	0	0	20	50
321																
min	700	200	500	100	30	0.5	0	0	0	10	20	1	0	0	5	10
max	70000	30000	30000	10000	1500	1	0	0	0	70	700	2	0	0	70	500
median	15000	3000	2000	3000	300	0.5	0	0	0	10	150	1	0	0	15	70
343																
min	1000	200	500	500	30	0.5	0	0	0	10	20	1	0	0	5	10
max	150000	70000	20000	30000	5000	1.5	0	0	0	300	2000	1.5	0	0	100	700
median	20000	5000	3000	3000	500	0.5	0	0	0	10	150	1	0	0	10	70
364																
min	3000	700	500	300	50	0.5	0	0	0	< 10	20	1	0	0	5	10
max	150000	70000	50000	30000	5000	15	0	0	0	100	1500	15	0	0	70	2000
median	30000	7000	5000	3000	500	0.5	0	0	0	10	150	1	0	0	20	70
367																
min	2000	200	< 500	200	30	< 0.5	0	< 200	0	< 10	20	< 1	10	< 20	5	10
max	150000	100000	70000	30000	2000	15	0	1500	0	150	2000	3	30	30	100	5000
median	20000	3000	2000	2000	300	1	0	300	0	15	200	1	20	30	15	70
410																
min	7000	500	1000	500	100	0.2	0	0	0	10	20	1	0	0	5	10
max	200000	100000	200000	20000	5000	5	0	0	0	50	5000	3	0	0	100	3000
median	50000	7000	10000	5000	700	0.5	0	0	0	10	300	1	0	0	20	150
429																
min	10000	1000	1000	1000	100	0.5	0	0	0	10	30	1	0	0	7	10
max	200000	70000	70000	20000	5000	10	0	0	0	700	1500	20	0	0	70	700
median	50000	10000	10000	5000	700	0.7	0	0	0	10	500	1	0	0	30	100

	CU (ppm)	GA (ppm)	LA (ppm)	MO (ppm)	NA (ppm)	NB (ppm)	NI (ppm)	P (ppm)	PB (ppm)	PD (ppm)	PT (ppm)	SB (ppm)	SC (ppm)	SI (ppm)	SN (ppm)	SR (ppm)
min	15	30	20	< 5	0	0	20	0	15	0	0	0	15	0	0	0
max	30	50	50	10	0	0	30	0	50	0	0	0	20	0	0	0
median	17.5	30	50	10	0	0	25	0	32.5	0	0	0	20	0	0	0
225																
min	15	15	0	< 5	0	0	70	0	10	0	0	0	30	0	0	1000
max	50	15	0	7	0	0	100	0	10	0	0	0	30	0	0	1500
median	15	15	0	7	0	0	70	0	10	0	0	0	30	0	0	1000
243																
min	< 10	10	30	< 5	0	0	5	0	< 10	0	0	0	7	0	0	100
max	150	30	50	15	0	0	150	0	15	0	0	0	30	0	0	500
median	30	15	40	10	0	0	30	0	15	0	0	0	15	0	0	250
244																
min	5	< 10	< 20	< 5	0	50	< 5	0	< 10	0	0	0	5	0	0	100
max	3000	115	200	30	0	50	200	0	300	0	0	0	50	0	0	1500
median	20	15	30	7	0	50	30	0	15	0	0	0	15	0	0	500
262																
min	< 10	< 10	50	< 5	0	0	< 5	0	< 10	0	0	0	10	0	0	100
max	100	30	50	5	0	0	50	0	15	0	0	0	20	0	0	500
median	20	20	50	5	0	0	25	0	10	0	0	0	20	0	0	200
253																
min	< 10	< 10	20	< 5	0	0	< 5	0	< 10	0	0	0	5	0	0	100
max	300	50	300	50	0	0	100	0	70	0	0	0	50	0	0	700
median	20	15	20	5	0	0	15	0	15	0	0	0	15	0	0	200
281																
min	< 10	10	< 20	< 5	0	0	< 5	0	< 10	0	0	0	5	0	10	100
max	500	70	300	100	0	0	500	0	50	0	0	0	100	0	20	1000
median	15	20	20	7	0	0	20	0	15	0	0	0	20	0	10	300
283																
min	20	15	20	5	0	0	10	0	20	0	0	0	5	0	0	100
max	300	20	100	7	0	0	700	0	100	0	0	0	7	0	0	500
median	20	20	65	6	0	0	600	0	75	0	0	0	5	0	0	200
301																
min	< 5	< 10	15	< 5	1000	< 10	5	0	10	0	0	100	< 5	50000	< 10	< 100
max	200	200	200	20	50000	10	100	0	52	0	0	100	70	200000	20	1000
median	15	20	20	5	20000	10	15	0	10	0	0	100	15	200000	10	300
303																
min	< 10	20	< 20	0	0	0	5	0	< 10	0	0	0	5	0	0	100
max	500	100	100	0	0	0	50	0	150	0	0	0	50	0	0	500
median	20	30	50	0	0	0	17.5	0	30	0	0	0	10	0	0	200
321																
min	5	10	20	5	0	0	5	0	10	0	0	0	5	0	0	100
max	100	20	150	10	0	0	700	0	110	0	0	0	70	0	0	300
median	20	10	20	5	0	0	20	0	10	0	0	0	15	0	0	100
343																
min	5	10	20	5	0	0	5	0	10	0	0	0	5	0	0	70
max	100	70	50	10	0	0	150	0	30	0	0	0	30	0	0	1000
median	20	10	20	5	0	0	15	0	10	0	0	0	10	0	0	100
364																
min	5	10	10	5	0	0	5	0	10	0	0	0	5	0	0	100
max	500	70	150	15	0	0	700	0	70	0	0	0	70	0	0	1000
median	30	10	20	5	0	0	15	0	10	0	0	0	15	0	0	200
387																
min	< 10	< 10	20	< 5	0	0	< 5	0	< 10	70	0	150	< 5	0	70	50
max	1000	70	100	30	0	0	1000	0	300	200	0	3000	50	0	70	700
median	30	15	20	7	0	0	20	0	15	150	0	300	10	0	70	100
410																
min	10	10	20	5	0	0	5	0	10	0	0	0	5	0	0	100
max	500	100	100	30	0	0	500	0	70	0	0	0	70	0	0	2000
median	30	20	20	5	0	0	30	0	10	0	0	0	15	0	0	250
428																
min	10	10	20	1.5	0	0	5	0	10	0	0	0	5	0	0	100
max	500	70	150	20	0	0	200	0	200	0	0	0	50	0	0	1500
median	20	20	20	5	0	0	30	0	10	0	0	0	15	0	0	300

	V (ppm)	W (ppm)	Y (ppm)	ZR (ppm)	ZN (ppm)
min	150	0	30	150	0
max	300	0	30	300	0
median	175	0	30	175	0
225					
min	200	0	20	150	0
max	700	0	20	300	0
median	300	0	20	200	0
243					
min	100	0	< 10	50	< 200
max	500	0	20	200	500
median	200	0	15	100	500
244					
min	50	0	< 10	15	< 200
max	1000	0	70	7000	1000
median	150	0	15	100	300
262					
min	100	0	< 10	50	0
max	500	0	20	500	0
median	200	0	15	150	0
263					
min	20	0	< 10	20	200
max	700	0	100	3000	500
median	150	0	20	300	300
281					
min	20	0	< 10	15	20
max	1500	0	100	7000	3000
median	150	0	20	200	200
283					
min	20	0	10	50	< 200
max	70	0	20	300	< 200
median	40	0	15	250	< 200
301					
min	20	0	< 10	20	< 100
max	1000	0	200	5000	1000
median	150	0	20	200	200
303					
min	20	0	10	100	< 200
max	500	0	150	5000	< 200
median	150	0	20	200	< 200
321					
min	20	0	10	15	20
max	700	0	200	1500	20
median	100	0	15	150	20
343					
min	20	0	10	15	20
max	50000	0	30	700	100
median	100	0	10	100	20
364					
min	10	0	10	15	200
max	2000	0	200	2000	500
median	150	0	10	100	200
367					
min	10	70	< 10	< 10	< 200
max	1000	70	50	1000	3000
median	100	70	15	100	300
410					
min	20	0	5	15	20
max	2000	0	70	1000	70
median	200	0	10	100	20
429					
min	20	0	10	15	20
max	2000	0	100	5000	100
median	200	0	10	150	20