STRAIT

HAGEMEISTER ~~STRAIGHT~~ FIELD REPORT

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* July 18, 1988

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Donald Paul Hodel, Director

BUREAU OF MINES
T.S. Ary, Director

INTRODUCTION

In conjunction with the Bureau's strategic and critical mineral studies, a reconnaissance investigation was conducted along the northern shore of Hagemeister Straight, southwest Alaska. Pyritic gossans were observed in intermediate to mafic volcanic rocks and samples were collected for geochemical analyses. Also, manganese oxide and ferricrete cemented gravels were observed in bluffs along the coastline.

Location and Access

The area investigated is located in the Bristol Bay region of southwest Alaska. Field work was performed from July 10-15, 1988, along the north side of Hagemeister Straight, between the mouths of the Osviak and Matogak Rivers (Hagemeister Island D-3 and D-4 quadrangles). Rock exposure is good along sea cliffs and limited in the hills immediately inland which comprise mostly rubble.

Access to the area was provided by a wheel-equipped Cessna 207 airplane chartered out of Dillingham, Alaska. Landing was made at low tide along the hard-packed beach 1 mile west of the Matogak River. Data was obtained by foot traverse along the beach and in the hills a few miles inland. High winds, frequent storms, and large tidal fluctuations could provide hazards in working in the area.

The area is within the boundaries of the Togiak National Wildlife Refuge which is under the administration of the U.S. Fish and Wildlife Service.

Previous Work

Previous work in the area includes 1:250,000 geologic mapping by Hoare and Coonrad (1961) and more recent geologic studies by Box (1984). Berryhill (1963) performed reconnaissance studies of beach sands in the Bristol Bay region, including the area of investigation. Berryhill reported traces of chromite in 2 pan concentrated beach sand samples near the mouth of the Osviak River. Aeromagnetic coverage of the study area, at 1:63,360 scale, is also available through the Alaska Division of Geologic and Geophysical Surveys (ADGGS-Aeromagnetic Series).

REGIONAL GEOLOGY

The geology of the region is structurally complex and consists of Mesozoic mafic to intermediate volcanic and volcanoclastic rocks intercalated with siltstone, chert and graywacke, collectively mapped as the Gemuk Group (Hoare and Coonrad, 1961). The layered rocks have all been intruded by Tertiary dikes and sills.

Box (1984) performed terrane analysis on the region and includes the rocks in the Togiak tectonstratigraphic terrane which is interpreted to depict Mesozoic subduction and related volcanic activity and associated sedimentation.

BURBAU INVBSTIGATION

The oldest rock in the study area is composed of green to black, aphanitic, mafic to intermediate volcanic flows intercalated with minor chert and graywacke of the Mesozoic Gemuk Group. These rocks have been intricately intruded by numerous Tertiary(?) subvertical, hypabyssal, light to dark green, very fine-grained to fine-grained diabase dikes and sills. The diabase bodies range in thickness from 6" to 30' in width and span the height of many of the sea cliffs (up to 150'). The diabase is the dominant rock type in the area and the presence of high angle shear zones, mylonitic margins, slickenside surfaces, open to closed folds, and complex cross-cutting relationships suggest many episodes of injection and significant, post or synintrusive structural movement.

The volcanic rock and diabase appear to have undergone intense propylitic alteration evidenced by abundant pods, veins, veinlets, and disseminations of pyrite + epidote + calcite + quartz. In some areas the alteration has created a mottled texture, expressed by pods of epidote several feet across, and in some cases has completely converted large volumes of rock to massive epidote.

Unconsolidated glacial gravels, colluvium, and beach deposits overlie the bedrock in the area.

Mineral Occurrences

Numerous gossans were found to occur at lithologic contacts, especially at the margin of the diabase bodies. The gossans are generally barren in ore minerals except for clots and disseminations of pyrite and pyrrhotite. Two gossans (KW24763 & KW24768) were found to contain veinlets to 3" wide veins containing galena, sphalerite, pyrite, chalcopyrite and other copper sulfides(?). Gangue accompanying the ore minerals include epidote, calcite, quartz, malachite, azurite, turquoise, and fibrous amphibole. All the rocks in the study area contain variable amounts of manganese coatings and fracture stained surfaces.

Mn-rich ferricrete was observed in Quaternary gravels in a 200' long portion of wave-cut bluffs along the west side of a small cove, located 1 mile southwest of the mouth of the Matogak River. In the gravels, manganese oxide coats pebbles and is found as a cementing agent along with iron oxide and silica. Several beds of these manganese bearing gravels, ranging from 3" to 10" thick, occur in a 10' vertical section. Sample KW24795 was collected from one of the thicker manganese bearing beds.

Sampling Procedures

Random chip and grab samples were taken of the mineralized gossans along with representative sampling of the igneous rocks for major oxide analysis. One pan concentrate sample (KW27488p) was taken from a creek to determine the presence of any heavy minerals. Random ground magnetometer readings were also taken during the foot traverses. Results of the magnetometer study show reasonable agreement with the ADGGS-Aeromagnetic Series

Descriptions of samples are included in the attached table.

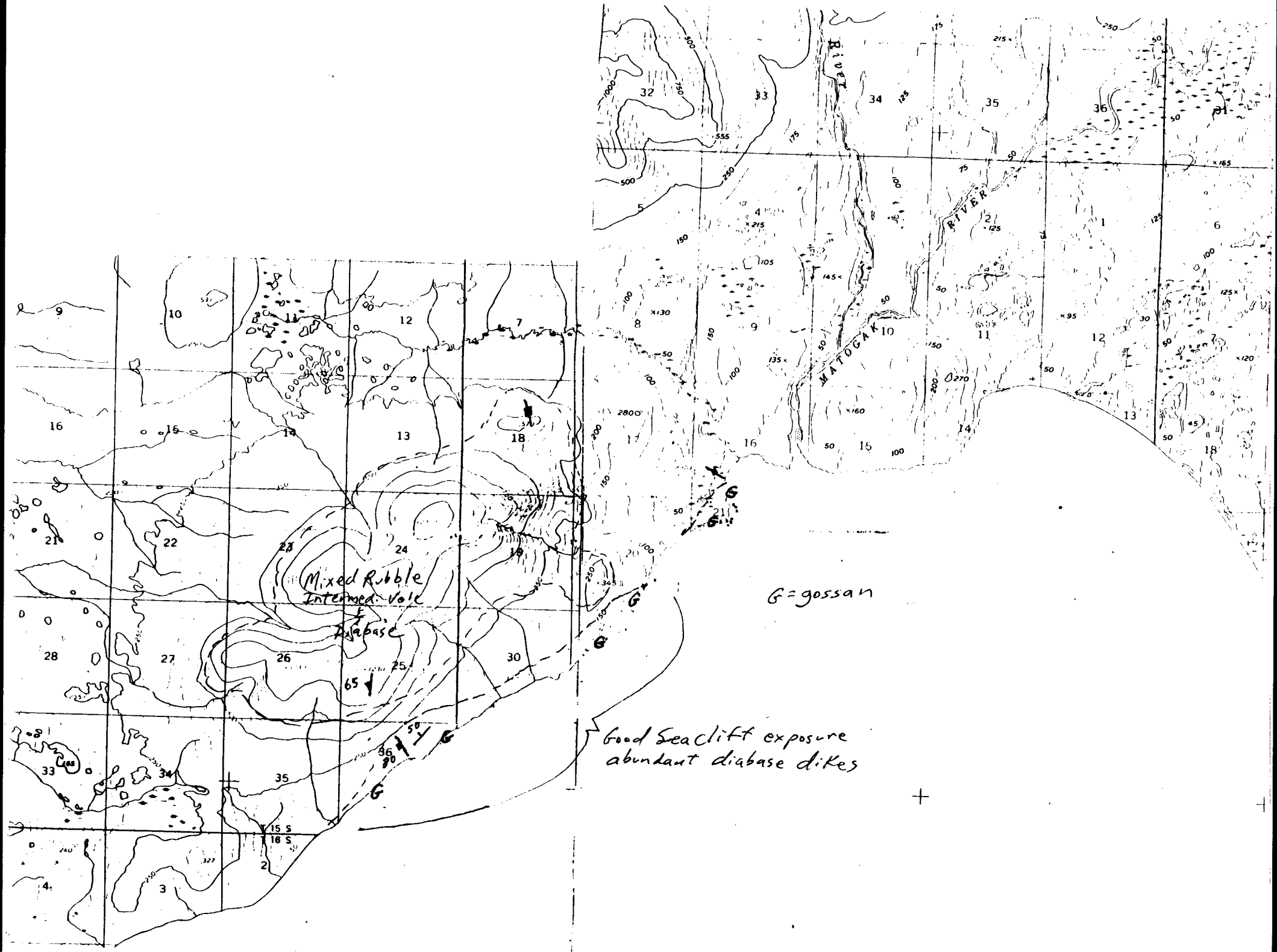
Sample #	Description
KW24763	cp, py, gl, spl, ep vein at diabase dike margin
KW24764	epidotite
KW24765	diabase
KW24766	py, gl, spl, cp, cc, qtz 3"wide vein, diabase dike margin
KW24767	altered diabase (py + ep + cc + qtz)
KW24768	py, cp, amph, cc, qtz 2"-4" vein cross-cutting diabase
KW24769	altered diabase, py disseminations and veinlets
KW24784	py in altered intermediate volcanic rock
KW24785	intermediate volcanic with hornblende phenocrysts
KW24786	Fe-Mn stained intermediate volcanic
KW24787	py in altered intermediate volcanic rock
KW24788p	pan concentrate, very little heavies (MT)
KW24789	po in intermediate volcanic rock
KW24790	MnO seam in andesite(?)
KW24791	cp, po in altered intermediate volcanic rock
KW24792	py, spl, MnO in silicified altered intermediate volcanic rock
KW24793	py, ep in altered intermediate volcanic rock
KW24794	py, hm, ep, qtz in altered intermediate volcanic rock
KW24795	Fe-Mn coated pebble horizon in glacial gravels

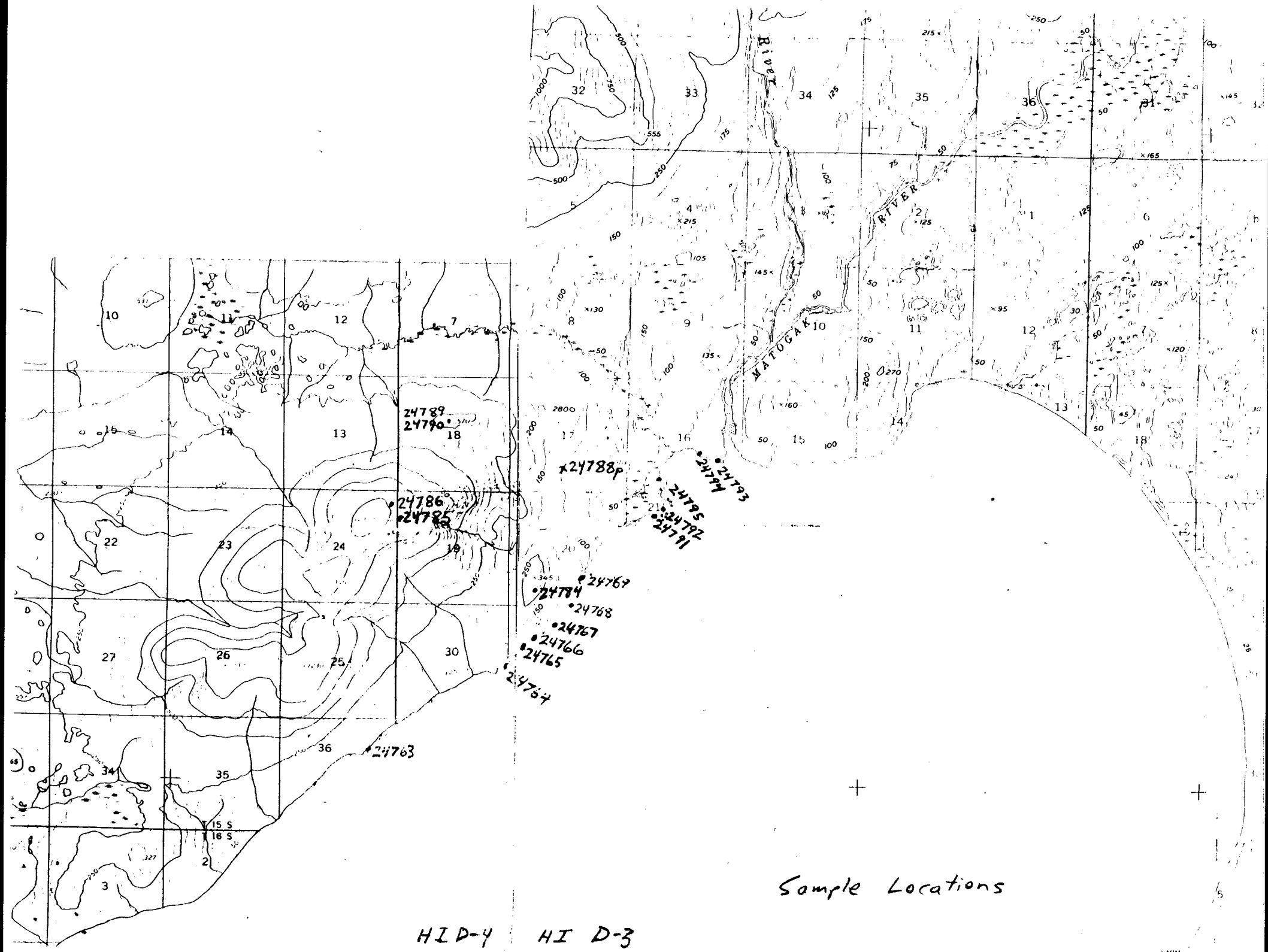
REFERENCES

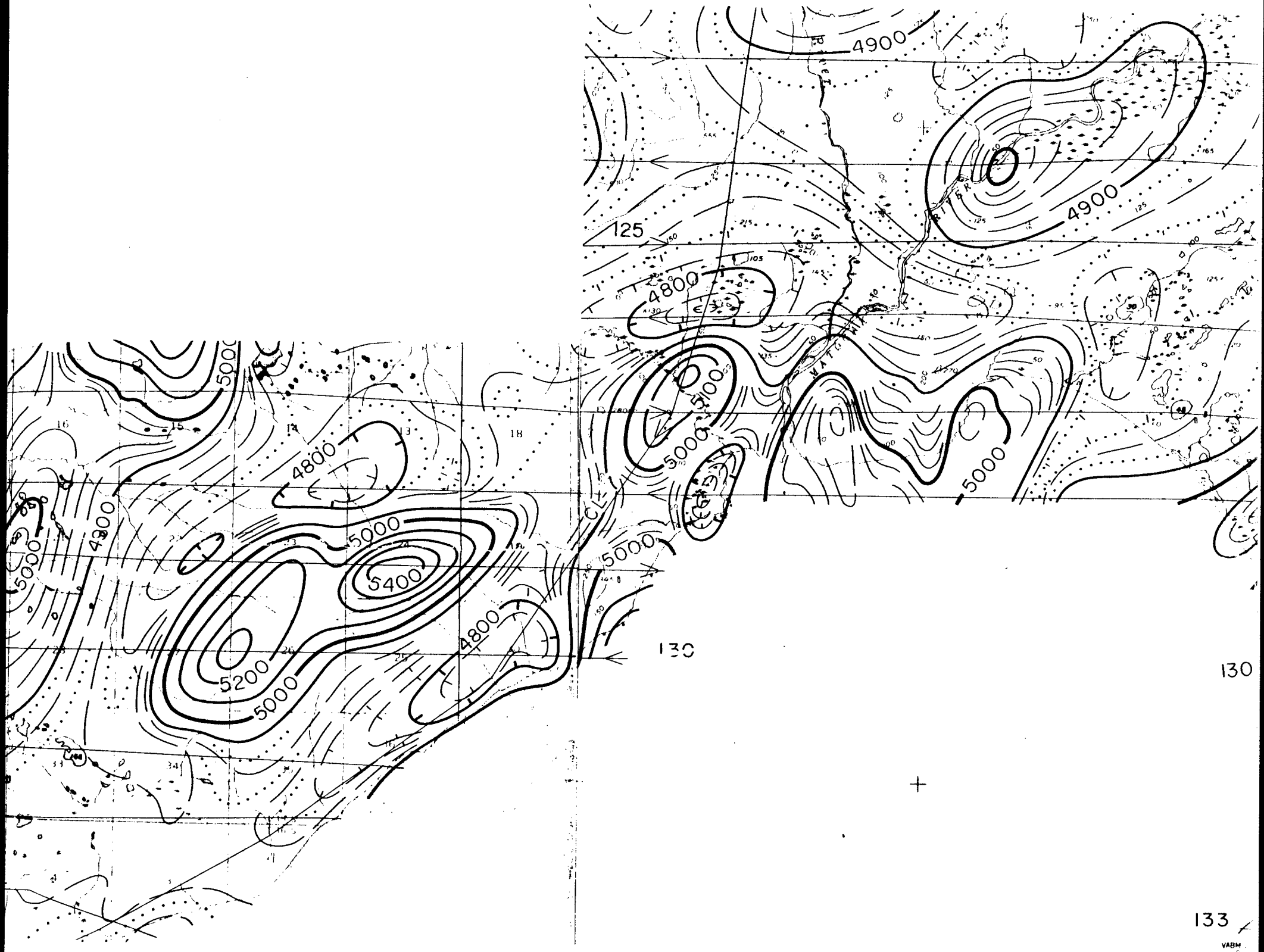
Berryhill, R.V., 1963, Reconnaissance of beach sands, Bristol Bay, Alaska: U.S. Bureau of Mines RI 6214, 48p.

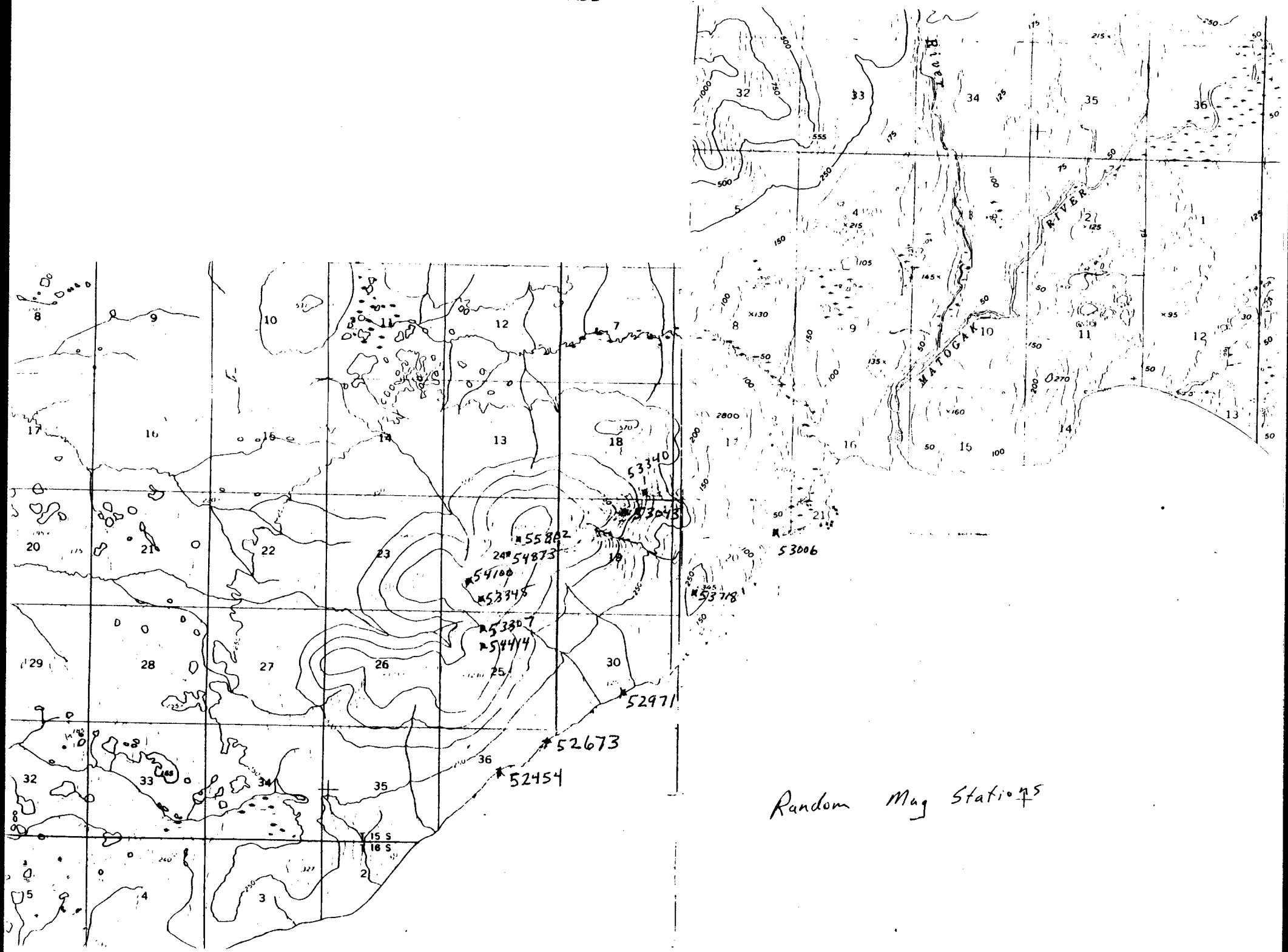
Box, S.E., 1984, Terrane analysis of the northern Bristol Bay region, southwestern Alaska: USGS Accomplishments during 1984, U.S. Geological Survey Circ. 967, p. 32-37.

Hoare, J.M., and Coonrad, W.L., 1961, Geologic map of the Hagemeister Island quadrangle, Alaska: U.S. Geological Survey Misc. geol. Inv. Map I-339, scale 1:250,000.


Mixed Rubble
Intermed. Volc
+
Diabase
G = gossan
Good Seacliff exposure
abundant diabase dikes
MATOGAK RIVER
15 S
16 S


MATOGAK RIVER
River
24789
24790
24788p
24786
24785
24793
24794
24795
24792
24791
24769
24784
24768
24767
24766
24765
24764
24763
T 15 S
T 16 S
Sample Locations
HID-4
HI D-3


4900
4900
125
4800
5100
5000
5000
5000
4800
4800
5000
5400
5200
5000
130
130
133
VABM


River
RIVER
MATDGAK
53340
53043
55882
54873
54100
53345
53307
54414
53006
53718
52971
52673
52454
Random Mag Stations

Hagemeister Straight

			KW24748	KW24749	KW24750	KW24751	KW24752	KW24763	KW24765	KW24766	KW24767	KW24768	KW24769	KW24784	KW24785	KW24786	KW24787	KW24789	KW24790	KW24791	KW24792	KW24793	KW24794	KW24795
Au	PPB	FA-AA	11	34	11	12	8	170	9	762	9	9	12	12	5	9	7	13	13	13	22	11	14	13
Ag	PPM	PBS	0.8	0.6	0.6	<0.5	<0.5	15.0	<0.5	3.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5
As	PPM	PBS	9	8	7	<5	<5	<5	<5	<5	5	<5	<5	17	<5	8	<5	<5	<5	10	<5	<5	<5	<5
Bi	PPM	PBS	<2	3	<2	3	<2	16	<2	5	5	<2	<2	<2	4	<2	<2	2	<2	<2	7	<2	<2	6
Co	PPM	PBS	13	15	8	10	6	18	23	39	23	5	27	26	28	10	25	29	32	6	34	15	36	14
Cr	PPM	PBS	101	94	60	86	56	50	76	116	7	221	10	36	102	40	17	75	51	153	12	95	32	54
Cu	PPM	PBS	46	163	61	48	52	>20000	121	356	37	17	57	27	142	15	72	91	83	17	117	277	22	48
Mn	PPM	PBS	1687	755	570	515	331	382	668	259	1083	247	1000	663	1047	664	738	589	723	337	1253	561	1106	6808
Mo	PPM	PBS	<1	<1	<1	<1	1	29	<1	2	<1	9	<1	<1	<1	<1	<1	<1	<1	2	<1	<1	<1	<1
Ni	PPM	PBS	23	14	5	8	5	13	32	3	5	6	24	9	56	5	10	60	46	7	20	17	17	23
Pb	PPM	PBS	<5	<5	<5	<5	<5	238	<5	3175	10	20	<5	<5	<5	<5	<5	<5	<5	<5	81	<5	<5	<5
Sb	PPM	PBS	<5	<5	<5	<5	7	<5	<5	<5	<5	7	11	<5	10	14	<5	6	6	<5	<5	<5	7	<5
Se	PPM	PBS	6	<5	<5	<5	<5	24	<5	<5	6	<5	9	<5	<5	<5	<5	<5	10	<5	<5	18	<5	<5
W	PPM	PBS	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Zn	PPM	PBS	73	82	44	44	24	>20000	187	18111	174	92	69	82	75	74	88	55	71	52	553	40	127	77
Hg	PPB	CV AA	15	10	<5	<5	30	>5000	55	1600	20	20	20	10	5	5	5	5	5	5	100	<5	5	40
Ba	PPM	XRF	1100	710	720	760	390	4500=	<20	100=	<20	<20	<20	<20	30	190	<20	<20	<20	30	<20	<20	<20	410
Al2O3	PCT	PBS	13.63	15.68	16.18	15.59	17.39	-9	14.17	-9	13.34	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
CaO	PCT	PBS	1.44	6.13	7.48	8.38	3.38	-9	8.29	-9	5.18	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
Fe2O3	PCT	PBS	5.35	8.85	9.01	9.42	5.03	-9	12.71	-9	14.71	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
K2O	PCT	PBS	1.74	5.20	5.00	4.69	5.97	-9	0.14	-9	0.07	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
LOI	PCT	GRAV	1.82	0.79	0.31	0.70	0.35	-9	2.94	-9	2.97	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
MgO	PCT	PBS	1.31	3.48	3.03	3.68	1.41	-9	6.61	-9	4.82	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
MnO	PCT	PBS	0.35	0.16	0.17	0.17	0.11	-9	0.20	-9	0.21	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
Na2O	PCT	PBS	3.54	3.60	3.45	3.28	4.90	-9	3.87	-9	5.02	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
P2O5	PCT	PBS	0.15	0.52	0.49	0.48	0.23	-9	0.14	-9	0.18	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SiO2	PCT	PBS	69.33	53.59	52.90	52.17	59.79	-9	48.62	-9	50.87	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
TiO2	PCT	PBS	0.69	0.85	0.91	0.98	0.58	-9	1.65	-9	2.15	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
Total	PCTs		99.35	98.85	98.93	99.54	99.14	-9	99.34	-9	99.52	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
S	PCT	LECO	0.10	0.02	0.02	0.02	0.01	-9	0.14	-9	0.21	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
Ba	PCT	PBS	0.10	0.07	0.07	0.07	0.04	-9	0.01	-9	0.01	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
Cr	PCT	PBS	0.02	0.02	0.02	0.02	0.01	-9	0.03	-9	0.01	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9