Appendix CM (Field Notes And Location Maps)

C. M. MOLENAAR AND PARTY, U. S. GEOLOGICAL SURVEY, 1980, 1982, 1983, 1984, 1985 FIELD SEASONS

by C. M. Molenaar

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FIELD NOTES - NORTHEASTERN ALASKA

C.M. MOLENAAR AND PARTY

1980 '82, '83, '84, AND '85 FIELD SEASONS

Contents

		QUAD	
80AMK-1	Kemik Ss section - Sharrowk R.	Sag.	B-1
2	Base of deltaic sequence - Kavik R.	MM	C-5
3	Kemik Ss section - Echooka R.	Sag.	B-2
4	Sh overlying Kemik Ss " "		"
5	Albian (?) Turbidites " "		"
6	Lower Torok - Canning or Kps - Echooka R.		"
7	=80ACH Nonmarine Tert. - E. Sharrowk	Sag.	C-2
8	390' Kps syncline section - Kemik Cr.	"	B-1
9	1200' Kingak Sh (L.K part) "		"
10	Kingak - Kps section - Kavik - Canning R.	MM.	B-5
11	Albian (?) turbs - W of Kavik R.	"	"
12	147' Kingak Sh - Kemik sec. - W of Can. R.	"	B-4
13	Base of Killeak syncline section	Sag.	A-2
14	Turbs on ridge " "		"
15	" " "		"
16	Albian turbidites - Ivishak R.		"
17	Recurr of shal. mar. UK sec " "	Sag.	B-2
18	120' Kemik Ss sec. - W bank Can. R.	MM	B-4
19	Albian (?) turbs - Ridge W of " "	"	"
20	Albian (?) sh " "	"	"
21	Yellow vx tuff (Hue Sh) Juniper Cr.	MM	B-5
22	Sh etc in upper Canning Fm - Kavik R.		"
23	117' Kemik Ss section - Fin Creek		"
24	Mar - nonmar transition - N Sharrowk ant.	Sag.	C-1
25	Paleocene turbs - W bank Can. R.	MM	C-4
26	Brookian turbs, rubble etc - Ignek V.	MM	C-3
27, 28 & 34	with Ignek Valley section	MM	C-4
82-AMK-17, 18, 47	" " " "		

Contents

		QUAD	
80AMK-29	Paleocene slope turbs - W bank Can. R.	MM	C-4
30	Deltaic ss (Sag. Fm) E " "	"	"
31	" " E " "	"	"
32	Double Kemik Ss Ignek Creek	"	"
33	Pebble zone in Campanian Ignek Val	"	C-3
34	with Ignek Valley section		
35	" " "	"	C-4
36	Traverse of Cret section - Central Ignek V.	"	C-3
37	Repeated red zone " "		C-3
38	Kps/PKs contact - W fork Marsh Cr.		C-2
39	" " " E " "		C-2
40	Kps - Kemik above PKs - Trib of Kat. R.		C-3
41	Cret.-Paleoc. turb section - Kat. River		"
42	Shublik Fm - Fire Creek		"
43	Albian (?) turbs - W of Kekiktuk River		C-2
44	" " NE side " "		B-2
45	Kps (?) E " " "		"
46	Albian turbs - Headwaters of Arctic Cr.		B-1
47	" " E bank " "		C-1
48	" " " "		"
49	Kemik Ss section - Last Creek		"
50	Kps N side Sad. Mtns		C-3
51	Flow or turbs? ss - Nularvik - Kat. R.		D-3
52	Oil stained Tert. ss - NW flank Marsh Cr. ant		D-2
53-57	with Bathtub Ridge		
58-66	Sabbath Cr. section	D.P.	C-5
67	Inoc zone - E side Sad. R.	MM	C-1
68	Kemik Ss, W of Sad R., N of Sad Mtns		"

Contents

		QUAD	
80AMK-69	Kps, JK, & UK - Niguanak Bigh	DP	D-4
70	Jago River UK (Hue Sh)	"	"
71	Petroliferous sh - Jago R.	"	"
72	Albian(?) turbs Arctic Creek	MM	C-1
73	Kps " "	"	"
74	JK? " "	"	"
75	Kps " "	"	"
76	Bent. turbs " "	"	"
77	" " " "	"	"
78	" " - Kingak Hill	"	"
79-81	with Bathtub Ridge		
82	Kps E of Kekiktuk River	MM	C-2
83	Kps Jct of " & Sad. Rivers		"
84	Albian(?) turbs - Kingak Cliff		"
85	Bent sh & turbs below "		C-1
86	TK sh (Canning Fm) near Tam R.		C-3
87	Coc sh " " - lower Jago R.	DP	D-4
88	Kingak Sh	DP	C-3
80AMK-27, 28 & 34 82AMK-17, 18, 47 84AMK-8	Ignek Valley Section	MM	C-4
80AMK-53, 54, 55, 56, 57, 79, 80, 81 83AMK-27, 28, 29, 30 85AMK-28	Bathtub Ridge	DP	

Contents

		QUAD	
82AMK-1	Kps(?) Echooka River	Sag	B-2
2	Cret or TQ cgl - Echooka River " "	"	"
3	Albian turbs " "	"	"
4	Shalmar - nonmarn. " "	"	"
5		"	B-3
6		"	"
7	UK sec. - Toolik River	"	B-4
8	UK sec - 3 mi E of Sag. River	"	B-3
9	Tuff zone E of Sag. River	"	A-3
10	Turbs " " "	"	"
11	Coal & clinker - E side White Hills	"	C-4
12-14	LK? turbs - Lupine River section	"	A-3
15	Turbs 6 mi E of Sag. R.	"	"
16	Slope Sh " " "	"	"
17-18	with Ignek Valley Section		
19	Paleocene turbidites - Kat River	MM	C-3
20	" " - Canning R.	"	C-4
21	UK section (2600'±) Ivishak R.	Sag	B-2
22	UK turb section (440'±) " "	"	A-2
23	Lower Gilead Cr.	"	B-2
24	Dtcs along Gilead Cr.	"	A-2
25	Sag. Fm - Sagwon Bluff	"	B-3
26	" " Rd near " "	"	"
27	Fortress Mtn Fm near Elusive L.	PS	C-3
28	LK Sh below KFm " " "	"	"
29	Lisburne near " "	"	"
30	Karen Cr. Ss E side Canning R.	MM	C-4
31	Shublik Fm " " "	"	"
32	Hot Spring - west end Sad. Mtns	"	"

Contents

		QUAD	
82AMK-33	Albian turbs, 250' Gilead syn. sec.	Sag.	A-2
34	Sh below " " " "	"	"
35	" " " " "	"	"
36	Kingak Sh below " " "	"	"
37	" " " " " "	"	"
38	Kingak Sh - N side Gilead syn.	"	"
39	UK? turbs - lower Gilead Creek	"	"
40	Collecting oil - Umiat well #4	Umiat	B-4
41	KFm Atigun Gorge	PS	B-4
42	" " "	"	"
43	" " "	"	"
44	Shublik - LK " "	"	"
45	Saddlerocket Sp " "	"	"
46	LK sh below KFm " "	"	"
47-48	with Igneh Valley sec.		
49	Kingak Sh below Kingak Cliff	MM	C-2
50	Kingak - Kps " " "	"	"
51	" " " " "	"	"
52	" " " " "	"	"
53	Shublik S side Igneh Val.	"	C-3
54	Kemik Ss " " " "	"	"
55	Igneh Creek section Kemik Ss - Kps	"	C-4
56	Shublik - S side Sad. Mtns	"	"
57	610' albian turb sec. - Sag River	Sag.	A-4
58	Albian turb etc to S " "	"	"
59	Shal. mar UK ss - " "	"	A-3
60	Nonmar. " " "	"	B-3
61	Shal mar UK ss E of Sag River	"	A-3
62	2400' Shavirovik ant section	"	C-1

Contents

		QUAD	
82AMK-63	420' L. Shavirovik R sec (Tert.)	Sag.	C-2
64	Sh below lower Gilead Cr. sec.	"	B-2
65	Turbs " "	"	A-2
66	Kingak Sh, N side Gilead syncline	"	"
67	Shublik - Karen Cr. " " "	"	"
68	Albian(?) turbs - Echooka River	"	B-2
69	Shublik - Kemik Creek	"	B-1
70	Kingak Sh - " "	"	"
71	UK bent sh w/ pebbles Kavik R.	MM	B-5
72	Silty sh (Canning Fm) - "	"	C-5
73	Shublik - Kingak - Fire Cr.	"	C-2 C-3
74	Turbidites Hulahula R.	"	C-1
75	" Kingak Cliff	"	C-2
76	Kps(?) - lower Kekiktuk R.	"	"
77	" " "	"	"
78	Oil stained UK(?) turbs - W side Can R.	"	C-4
79	Albian(?) sh W of Canning R.	"	B-4
80	Kingak-Kemik between Can. & Kavik R	"	B-5
81	Kingak Sh - east of Juniper Cr.	"	"
82	Tertiary etc - Igneh Valley section	MM	C-4
83	590' lower Shavirovik R. section	Sag.	C-2

Contents

		QUAD	
B3AMK-1	Sag Fm – Tamaniah R.	MM	D-3
2	" " oil stained – E of Kavik	"	C-5
3	" " W side Canning R.	"	C-4
4	" " E " " "	"	"
5	Fluv. or turb – Kat – Nularvik R	"	D-3
6	Angun Pt oil seep	DP	D-3
7	U.K sh – Niguanak River	"	D-4
8	Hue Sh – " "	"	"
9	Sadlerochit Sp – E of Aichilik R	"	C-4
10	Kayak Sh " " "	"	B-4
11	Shublik Fm Aichilik R.	"	C-4
12	Karen Cr Ss "	"	"
13–15	Kingak Sh "	"	"
16	Arctic Cr. facies – Okerokovik R.	"	"
17	" " " "	"	"
18	Kpg "	"	"
19	Sabbath Cr. section sampling	"	C-5
20	Hue Sh Jago River	"	D-4
21–22	Eocene sh " "	"	"
23	Kpg Niguanak High	"	"
24	Hue Sh & Jur Sh " "	"	"
25	Eocene sh (Can. Fm) Marsh Cr. ant.	MM	D-2
26	Blue clay – Barter Island	BI	A-5
27–30	with Bathtub Ridge		
31	Kayak Sh – Lefflingwell Fork	DP	A-3
32	Arctic Cr. facies – Okerokovik trib	"	C-4
33	Eocene sh Marsh Cr. ant	MM	D-3
34	" " " " " axis	"	"
35	Eoc? sh – Kat. R. S of Marsh ant	"	"

Contents

		QUAD	
B3AMK-36	Eocene sh Tam River	MM	D-3
37	Kpg N side Sad. Mtns	"	C-3
38	" " " "	"	C-2
39	PRs – Kpg – E fork Marsh Cr.	"	"
40	Kemik Ss " "	"	"
41	Karen Cr. – Kpg E end Sad Mtns	"	C-1
42	Shublik – Kpg – East Creek	"	C-1
43	LK sh Hulahula R	"	"
44–46	Arctic Cr. facies – Hulahula R.	"	C-1
47	Kayak Sh " "	"	B-1
48	Shublik – Karen Cr. " "	"	"
49	Kingak Sh " "	"	"
50	" Okpilak River	DP	
51	Arctic Cr. facies E of Jago R.	"	C-5
52	Kingak Sh – Dodo Cr.	MM	C-2
53	Arctic Cr. facies – S of Sad. River	"	B-2
54	Kingak Sh " "	"	C-2
55	Manning Pt. oil seep	B.I.	A-5
56	Oil sand Sag Fm – Kat R bluff	MM	D-2
57	Shal mar Ss " – E side Can. R.	"	C-4
58	PRs – Ikiakpuk Valley	"	B-3
59	Kayak Sh Fourth Range	"	"
60	Lisburne " "	"	"
61	Kemik Ss E end Ignek Val.	"	C-3
62	Echooka Fm Fire Cr.	"	"
63	PRs/PMI W of " "	"	"
64	Karen Cr. Ss – Karen Cr.	"	B-2
65	Kingak Sh	DP	B-4
66	PRs samples – Okpirourak Cr.		B-5

Contents

			QUAD	
83AMK-67	PTs	Joe Creek	Table Mtn	
68	Kingak Sh	" "	"	"
69	LK sh	" "	"	"
84AMK-1	Shublik-Kingak	Lonely Cr.	Herschel Is	
2	Kingak Sh	" syncline	"	
3	PTs	W of Fish Cr, Canada	Demarcation Pt	
4	Nanookpuk	"	"	"
5	Echooka & PMI	"	"	"
6	Pre Mss	"	"	"
7	PTs	"	"	"
8	with Ignek Valley section			
9	Hue Sh & Coc sh -	Jago River	DP	D-4
10	Coc sh (Canning Fm)	Niguanak R.	BI.	A-4
11	Ss etc	" "	DP	D-4
12	Bent sh	" "	"	"
13	JK etc	" high	"	"
14	Hue Sh	" "	"	"
15	LK sh	Okerokovik Trib.	"	C-4
16	"	" "	"	"
17	Arctic Cr. facies	" "	"	"
18	Mio-Plio -	Carter Cr, Marsh Cr and	MM	D-2
19	Paleocene	Kat-Nularvik junction	"	D-3
20	"	" " "	"	"
21	Kemik & Shublik contact -	East Cr.	"	C-1
22	Kps	near East Creek	"	"
23	Lisburne/Kat Dolo -	E Sad Mtns	"	C-2
24	Footwall cutoff, Kemik Ss -	E Marsh Cr.	"	C-2

Contents

			QUAD	
84AMK-25	Kingak Sh -	N of Sad Mtns	MM	C-1
26	PTs thrust on JK -	NE Sad Mtns	"	"
27	Kemik Ss	" "	"	"
28	Paleoc Sh -	Marsh Creek	"	D-2
29	Paleoc sh & ss -	" "	"	"
30	Kat. Dolo smpls -	Kat. R canyon	"	C-3
31	" " thrust against PMI -	N side	"	"
32	Shublik & Kemik -	N side Sad Mtns	"	"
33	Kps beneath PMI	" " "	"	"
34	Kat Dolo over PTs -	" " "	"	"
35	" " on N side	Shublik Mtns	"	"
36	Nanookpuk -	N side Sad Mtns	"	C-2
85AMK-1	Near base Nanook Ls -	Shublik Mtns	MM	C-4
2	Burned out Hue Sh along	Ignek Cr.	"	"
3	Hue Sh	Jago River	DP	D-4
4	Jurassic sh	Niguanak high	"	"
5	" " solid HC	" "	"	"
6	Kps - JK -	E fork Marsh Cr.	MM	C-2
7	Hue Sh -	" " " Trib.	"	"
8	PMI faulted against Kps	N side Sad Mtns	"	"
9	Traverse down	W fork Marsh Cr.	"	"
10	Hue Sh along	Nularvik R.	"	"
11	Traverse down section,	Nanook-Kat Dolo	"	C-4
12	Arctic Cr. facies -	Okerokovik R. Trib	DP	C-4
13	Kemik Ss, TKs, PTs & PMI -	N of Sad Mtns	MM	C-3
14	PTs faulted against Kps -	" " "	"	"
15	Kat Dolo, PMI & Cret.	" " "	"	"

Contents

1983

Sagavanirktok Quad. (B-1) 6/23/80
Meas. south along Sagavanirktok R. (E. bank) CMM, ACH, ARK
SW NW Sec 24-15S-20E
80 AMK 1 N55E; 35 NW 69°20'35" N Lat
147°12'14" W Long

80AMK-1

			blk. - 50 cps
0-5'	5'	dark grayish black (N-2) silty shale, base covered (100')	100 cps
50 shale samp		80 AMK-1a Buchia Sublevis? frags. in float fr covered interval also horiz. burrows	
5-9'	4'	silty shale thin zones (<8" th.) of thin-v. thin bedded matrix and grain supported sandstones cont. gr. up to pebble size;	
7' lith. samp		80 AMK-1b	60 cps
9-49	40'	silty shale as at 1a	
fossil samp		Buchia Sublevis(?) fr. middle	
shale samp		80AMK-1c - 15' above base of unit	85 cps
shale samp		80 AMK-1d - at top of unit	90 cps
		N55E, 38 NW	
49-64'	15'	Siltstone — v. fine gr. ss. coarsens upward; v. thin bedded at base fr. thin bedded at top; non-calc; micaceous low ∠ fr. x-bd; coarse sands scarce horiz. burrows in sandstone	60 cps

6/23/80 pg 2

80AMK-1 (Cont'd)

64-72	8'	silty shale w/ thin-v. th. beds of med-coarse gr ss	60 cps
72-88	16'	silty shale w/ v. th. interbedded siltstone	25 cps
shale samp		80 AMK 1e at base	
shale samp		80 AMK 1f 4' below top	
		siltstone - low ∠ fr. x bdd N55E; 28 NW	
88-92½	4½'	transgressive(?) granule bed orange weath. (mod. br. 5YR 4/4) poorly sorted (silt-granule); fresh - 10YR 4/2 granules - mostly quartz; glauconite massive - v. poorly bedded	60 cps
lith samp		80 AMK 1g	
92½-95½	3'	clay shale grayish black - N2	
shale samp		80 AMK 1h	90 cps
95½-97½	2'	sandstone - clean, quartzose lower fine gr., v. poor porosity, non-calc. sharp base w/ load casts	60 cps
97½-104½	7'	Covered shale in lower part	
104½-118	13½'	sandstone low ∠ x bds.	
lith samp		80 AMK 1i white specks - tripolite yellow specks - weath. glauconite(?) clean qtzose ss., non-calc., v. poor porosity	50 cps

Pg 3

June 23, 1980 Molenaar Huffman & Kirk

80AMK-2 NW NE Sec 20 - 3N - 22E
Mt Michelson C-5 Quad

Otc along W bank of Kavik River about 100' of exposed (topo).
Fairly flat lying

Delta fringe buildup - mostly sh in lower part w/ a few thin VF ss beds, flat bd com carb, building up to thick bedded VF-F ss above (broken otc), com but scattered chert and qtz. pebbles throughout. This prob indicates narrow delta plain near fluvial influx

Looking back from below, there are three separate buildups or cycles

Sh smple Sh sample 80AMK-2 from near base.

This regressive sequence is about 300' below fluvial conglomeratic sequence that is exposed on hilltop in Sec 12 3 mile to NW.

6/24/80 pg 1

CMM, ACH, A.R.K

80AMK-3 NE NE SW Sec 36 - 1S - 18E
Sag B-2 Quad
Measuring Kemik Ss? section on SW side of Echooka River

6/23/80 N 40° E Dip 42° E

0'	0'		
sh sample		80 AMK 3a @ base at section	BK = CO
slt st sample		80 AMK 3b @ b + 28'	slt st. = 70 cps
slt st sample		80 AMK 3c @ b + 70'	limonite conc. = 90
slt st sample		80 AMK 3d @ b + 100'	
148'	0-148'	vg poorly bedded argil. siltstone, w/ concretionary sandstone beds up to 1' thick, dark worm burrows, med grey non calc.	
186'	148-223'		dip @ 38° E
foss sample 155'		80 AMK 3E bekemnite (fossil) @ b + 155'	
slt st samp		80 AMK 3F siltstone	@ b + 155' CPS = 92
		coarse siltst, belemnite in float from sandstone above @ 186' +	69° 18' 43.3" N Lat 147° 40' 22" W Long.
		@ 208' N 52° E 42°,	med. beds, ripple lam, w/ ft

Kemik Section 6/24/80 pg 2
Echooka River (Cont)

308 | 223-312' | lower vy fn grnd ss, qtzose, argil., vertical burrows, very light gray, slty. calc., low porosity,

fossil sample | @ 250' tb - 80 AMK 3F fossil ammonite
vertical burrow 69° 18' 43.8" N Lat.
147° 40' 22" W Long.

lower very fine, less. argil mat'l BK=50
w/ zones of slightly more argil ss. CPS=55

@ 295' grd slt. st. in 1-3' beds, non calc.
chg. to dip 45°.

top not exposed. @ 312 tb.
lower very fine grained, mod well sorted CPS=60
sub rounded, N4, sandstone

heavily burrowed zone above mx section along
strike w/ coarse siltstone interbeds
organics on laminations

ss samp. 80 AMK-6 ss. near top of section

sh. sample
shale unit above mx section, rubble outcrop
high gamma ray, N2, clayey shale bk=30
80-AMK-4 CPS=135
80-ACH-2 approx 30'
above last ss measured

(80AMK-4) C W/2 Sec 36-15-18E
Sag. B-2 Quad

CMM, ACH, ARK, 6/24/80
p.g 3

(80AMK-5) SWSW SE Sec 26-15-18E
Sag B-2 Quad

Grab sample of sh in turbidite sequence
Nanushuk equiv? VF ss beds up to 1' thick,
v. sli to no grading, com groove casts on
base, sharp basal contact, gradational upper
contact, Bouma a or b and minor c.
35 / 55 Att N55E 35NW
About 100' exposed 1/3 ss

& 80AMK-5 ~~C W/2 NE/4 Sec 35-15-18E~~
~~Sag B-2 Quad~~

(80AMK-6) C W/2 NE/4 Sec 35-15-18E
Sag B-2 Quad

Grab sample of black sh, thick section
partially exposed along hillside. No ss
in section - is this pebble sh or lower
Torok
& 80AMK-6

(80AMK-7) NWNW Sec 32 & SW SW Sec 29
T3N, R18E Sag C-2 Quad
= 80ACH-SR Measured nonmarine
section on Shaviovik R. w/ very thick
100'± coal section

C.M. Molenaar, A C Huffman 6/25/80
A.R. Kirk
pg1

(80AMK-8) SWSW Sec 8-15-21E
Sag. B-1 Quad

Syncline section (Kps-?) along Kemik Cr

Starting at base of continuous otc.
There are more sh-sltst otcs below, but discontinuously exposed and there could be structural complications

65
67

Att N65E 67S

0– sh. samp.	@ 5' 80 AMK-8A ⊗ greyish black, fissile silty claystone	BK=60 CPS=110
	@ 12' grayish black, fissile shale, N3, dis interbedded w/ discont. non calc., ironstone conc. wx limonitic stains	
sh. sample	@ 50' 80 AMK-8B ⊗, grayish black fissile shale w/ jarosite(?) yellow wx secondary along fractures secondary gypsum along laminations cannon ball concretions	BK=60 CPS=115
sh. sample	@ 95' 80 AMK-8C ⊗	BK=60 CPS=90

6/25/80 pg2

6/25/80 sheet 2 syncline section Kemik Cr.

sh. samp.	@ 125' 80 AMK-8D ⊗ blackish gray, fissile shale, out of concretionary zone ~~sd~~ ends @ about 100' and replaced by scattered round concretions	
sh samp.	@ 155' 80 AMK-8E ⊗, dark grayish black fissile shale good concretionary zones as discontinuous lenas... hematitic and yellow jarosite(?) wx zones	iK=60 CPS=160
	@ 175' pyrite cored conc. in yellow stained zone	
	N65°E 60°	
sh samp.	@ 200' 80-AMK-8F ⊗	
	@ 205 dark gray fissile shale interbedded w/ thin (6"-1') limey shale bed that wx y/limonite staining clayey shale,	
	@ 230' pyrite "pebbles" pyrite replacing something interbedded blk shale (N3) and ironstone concretions	
sh samp.	@ 235' 80 AMK-8G ⊗	
sh. samp	@ 250' 80 AMK-8H ⊗ fossil sample	
lith samp.	80 AMK-8H P lith ± quartzite cobble w/ pyrite along fractures, in shale dark gray fissile	BK=60 CPS=116

6/25/80 pg 3

6/25/80 page 3 Syncline section Kemik Cr.

@ 280' 80 AmK 8-I ○○
dark grayish black fissile shale, interbedded with buff 10YR 7/2, thin stringers may be gauge on rear bedding plane slip surfaces, another quarter w/ pyrite pebble included w/ log 80-AmK-H ±

@ 315', black fissile shale (N3), with scattered conc., thin 4" thick 5YR 4/4 bentonite bed(?)
BK = 80
OR sh = 150
CPS bent. 300

sh samp lith sample
80 AmK 8-J ○○
(80 AmK 8-J ± ptrag.)

@ 330' black fissile shale @ 330' non calc.
BK = 130
CPS = 180

@ 350' black fissile shale
sh. samp. 80-AmK-8-K 80

sh. samp. @ 385' 80-AmK-8-L 80, black fissile
BK = 150
CPS = 190
shale w/ jarosite staining along fracture, very tightly folded syncline, 15-20' additional section in core of syncline.

@ 390' CPS = 280

6/25/80 pg. 4

6/25/80 cmm, ACH, ARK

N 80° E
61° SE

80 AmK 9 C S/2 S/2 Sec 35-1N-20E & NW NW NE Sec 6-1S-21E
Kemik Cr. - Kingak Sh Sag B-1 Quad
No bottom on section structural complexities to N.W., max. thickness from map, sample A at base of section

sh. samp. 0' 80 AmK-9A 80
shale, dark grey, fissile, non calc., few floating qtz grains
BK = 60
limestone conc., secondary gypsum
CPS = 100

sh. samp. 80 AmK 9B 80
BK = 60
good fresh sample black, (N1) CPS = 90
non calcareous, clay shale, no fossiliferous, fissile

sh. samp. 80 AmK 9C 80 dark grey, non fissiliferous, shale w/ hematite staining along fractures, micro micaceous, non calc. very low porosity.

sh. samp. 80 AmK 9D 80 dark grey, clayey, shale
BK = 60
CPS = 90
interbedded with lenticular conc. beds.

sh. samp. 80 AmK 9E 80 dk grey (N2) non fissile, non calc. shale

6/25/80 pg 5

6/25/80 pg #2

sh. samp. 80 AMK 9E 80 dark gray fissile shale, local deformation structures adj. to shears
BK = 60
CPS = 80

fossil samp. 80 AMK 9G S fossil sample buchia in float almost complete shell second buchia found in float steal higher (?) (labled higher) 69° 23' 28" N Lat. 147° 8' 32" W Long

sh samp. 80 AMK 9H black shale, fissile (N 2), concretions BK = 60 CPS = 100

Along Creek several hundred feet to SE still in Black Shale, micro micaceous zones of different dip between here and last sample taken
1320' linear outcrop sample
approximate thickness 1235'

6/27/80

C. M. Molenaar, A. C. Huffman & A. R. Kirk

80AMK-10 W/2 W/2 Sec 35 to SE Sec 34 and SW Sec 35, T 1N, R 23E
Photo 7233 (M-35) Mt Michelson B-5

See 82AMK-80 for additional data

Measuring and collecting section of Kingak Sh - Kemik Ss - Pebble Sh

Between Kavik & Canning Rivers
att N 75-80 W 35-45 S

Kingak Sh measured by map & photo scaling method. SA - 10½°. Bearing N 30 E from resistant Kemik ridge to base.

900 Sh, dark gray, sli silty, fissile to sub-fissile, ferruginous (rusty) coating on ⅓ plate esp in lower part, minor or rare floating VF qtz grains in upper half

80 80AMK-10A thru I collected thru interval

G 10-G Buchia in float
69° 23' 59" N Lat; 146° 25' 59" W Long.
Top 10a is covered and holding up ridge (all covered) is thin Kemik Ss 5' dec in upper hillside, qtzose, L UVF, well sort, com blk chert grains and

± green glauconite ± 80AMK-10J

Continued traverse across shale valley to south. Several scattered rubble ots of black fissile shale - (pebble sh?) no pebbles seen.

B 80AMK 10K-N going up section no dips available - it looks like somewhat shallower dip. Thickness?

Next ridge to south is held up by Brookian ss rubble ots, Ss, VF w/ some LF, hard tight, lithic, no ots in place but scattered bottom ± marks noted - scours and some flutes ± 80AMK-10 Φ

These must be deep-water sands.

See next page for estimated strat position of samples in respect to Kemik Ss

11/15/84

Section between Canning and Kavik Rivers -- Approximate stratigraphic position of samples

Measured* down from base of Kemik Ss

80AMK-10	A	900	Ft
	B	800	
	C	700	
	D	600	
	E	500	
	F	400	
	G	300	
	H	200	
	I	100	
82AMK-80	A	750'	
	B	300'	

Measuring* up from top of Kemik Ss

80AMK-10	K	50	Ft
	L	100	
	M	150	
	N	200	

* Measurements are estimates; total section was map or photo scaled.

80AMK-11 SW NW Sec 3-1S-23E
Mt Michelson B-5 Quad
~~Photo M-35-7233~~

Checking rubble otcs of Brookian ss on hillside west of Kavik River
Ss, greenish gray, VF, w/ minor LF grains clayey, bottom markings - scours, crude flutes noted in float between ~~more~~ thicker ss otcs.
These are prob. deep-water sss

80AMK-12 C W/2 W/2 Sec 6-1N-24E
Photo M-35-7233 Mt Michelson 1/250,000

1/2 mile west of Canning River
Measuring and collecting shale below Kemik Ss

0-100 100' Sh, dark gray - blk, fissile to sub fiss. firm, minor ironstone concs, rare floating VF qtz grains
A = 0
B = 13'
C = 40'
D = 70'
E = 95'

~~&~~ 80AMK-12A to E

0-15 15' Covered

Ss, base not exposed, see next pg.

115-147' 17' Ss, med gray N4, LVF slty, non calc, tilt, flat bd 6"-2.4" thick θ at 6-8", some zones of small dark organic blebs
At 12' 1' bed w/ pebbles up to a cm, dk gray chert, matrix still LVF, N2
At 13-16 is non resistant zone of LVF more slty ss

17-23' still LVF, ripple lam, color N3, mod-well sort, v sli calc

23'-29' med bd UVF, ripple lam in part, vertical θ

29-32 LVF w/ some UVF, N4, v sli calc, well sort
At top is UVF

± 80AMK-12F at top

Total measured ss ≈ 32'. More is present but top is weathered back

June 28, 1980

D. M. Wolcrear, A. C. Huffman
A. R. Kirk

BOAMK-13 SE/4 Sec 28-3S-18E
Sag A-2 Quad

Gilead Cr. Area
Base of Gilead Cr. section
Lower 200'± of ss is greenish gray, VF w/ some LF, minor VF, hard, p bd, mica calc. Quite fractured. There is some bedding that may be med scale X bd and some scours, but this could all be due to fracturing. In upper part and in thinner bedded sequence above there are some bottom marks - scours etc trending N-S, N25W, N60E

also v sli grading noted

For 300'± above are some thinner bedded units w/ several 10-20' thicker bedded units. Some of the sands in the thicker (2-4') bedded units get up to LM and are v poorly sorted. Some appear med scale X bd, but could be fractures, some scouring and load features
Scours trending N15W
Another 300'± above is more of same
Some scours trending N45E
This is at base of thick mv otc zone. Maps scaling indicate 800 to 900 ft of section

6/28/80 pg 2.

BOAMK-14 NW NW Sec 28-3S-18E
Sag A-2 Quad.

Quick stop on ridge high up in section
Many bottom marks noted in float - scour marks, crude flutes.
These are still turbidites.

BOAMK-15 SW NE Sec 31-3S-18E
Sag A-2 Quad.

Another quick stop to examine ss ledges down lower, but possibly youngest sands in syncline.
Ss greenish gray VF-F w/ some med, v poor sorting, micaceous
Very few bedding structures, appears flat bd but poorly bedded. Some bottom markings in float below.
These are probably still deep-water sands.

BOAMK-16 = BOACH-14 C SW Sec 9-4S-17E
Sag A-2 Quad

River cuts along Arroyo River.
75'± exposed of well bedded sd on sd turbs some w/ thin sh between. Bed a few inches to 2' bd thick, VF-F w/ M & C some w/ grading. Bouma A B C. Some good bottom marks. Beds are overturned

6/28/80 pg 3

BOAMK-17 E/2 SW/4 Sec 35-15-16E
Baz B-2 Quad

Well exposed sections along Ivishak River. Both flanks of an anticline are well exposed. The north flank exposed more section, but the river against cutbanks precluded walking through section so we walked through part of south flank. attitudes are fairly consistant ranging from N65E 47S at base to N70E 52 at upper end. By map scaling, thickness calculates to be about 1750' to small(?) fault.

Section is made up of many cycles of lower shoreface delta front ss bruildups separated by offshore shale-siltst. Ss are VF, med gray, firm, flat bd, minor low angle X bd, com small carb debris, scattered nondescript pelecypods. Each cycle builds up to thicker bedded ss but still lower shoreface or distal, then overlain by 30 to 100' transgressive sh. Scat chert pebbles at base of some transgressions.
At upper end of section is small(?) fault, then at least another 600-700 of dominantly sh-siltst. - Didn't walk thru that.

(over)

6/29/80 pg 1

SESESE Sec 30
BOAMK-18 ~~SW SW SW Sec 29~~ 2N-24E
Mt Michelson 1/250,000 Quad

Kemik Ss section on west side Canning R.

att N60W 27SW

0-17' &	17'	Sh, blk soft broken clayey covered below a few more ft to river & BOAMK-18 A-C BK=50 CPS A = 120 B 140 C
17-20 ±	3'	Ss, dark gray-green (wet), 5GY 4/1, LF clay w/ VF-M qtz grains, minor blk chert pebbles up to 1/2" v glauc. v poor sort, more floating M-C grains in upper part non calc BK=5 CPS=80 ± BOAMK-D
20-22	1½'	Non calc orange wx conc bed iron-stone(?) glauconitic w/ floating qtz grains

Some bentonite is present in some of the SA tongues in the 1750' section. This whole section is undoubtedly post Seabee UK.

22-45' 23' Ss silty in lower part dark gray-blk, firm to hard, p bed, fractured w/ yellow hematitic coating
2-4" ironstone conc beds
At base is 2" yellow rust bent(?) zone.
& 80AMK-1B E-G
BK = 50 CPS E = 90
F = 120
G = 140

45-50 5' Base of resistant Kemik
In lower 3" 4" immediately overlying sh is pebble zone in sh matrix. Above is 3' of Sltst dark gray-blk, p bedded w/ scattered chert pebbles, nonsk
± 80AMK-1BH from basal cgl

BK = 50 CPS basal cgl = 100
CPS Sltst = 75

50-120' 70' Ss dark gray at base LLLVF-C sltst coarsening upward. Measured by dropping tape over cliff
At 15' horizontal bed w/ vertical and horizontal burrows LVF med gray
At 17' LVF-UVF ripple bed
60 / 28 at N60W 28SW

80AMK-1B Cont

Remainder of section could not be examined closely because of steepness of cliff, but most is all LVF w/ some UVF, flat bd in bed 2-6' thick, bding planes are not smooth, scattered burrows.

± 80AMK-1B I at 40

CPS is practically zero

No dks above - tundra flat

80AMK-19 E/2 Sec 2-1N-23E
Photo M-35-7233 Mt Michelson 1/25,000

35' otc near top of ridge. Interbedded Brookian Ss ± Sltst in irregular wavy beds 1-3" thick, Ss is dark greenish gray VF-LF, clay matrix dirty, no grading, ~~cut~~ apparent. Mina bottom marks (grooves) noted in rubble. This must be deep water Kin? or UK? Com carb frags
15 / 15 at N15E 15W (F)

80AMK-20 SESE Sec 1-1N-23E
Photo M35-7233 Mt Michelson 1/25,000
100'± Sltst, dk gray, hard, platy to pencil fracturing, com burrows (horiz), rare concs
40 / 39 Prob is lower Torok, at N40W 33SW

80AMK-20 Cont

Above this otc is Brookian VF ss rubble

80AMK-21 SWSWSW Sec 8-1N-22E
along Juniper Cr. ~~Sag~~ Mt. Mich, B-5 Quad

Otc of very bentonitic, porcellanitic, tuffaceous interbedded w/ thin blk paper sh. about 200' exposed
@ 80AMK-21 of paper shale

Overlying several hundred ft of sh-siltst w/ occasional thin V/F ss beds com bottom marks - grooves and some flutes

Whole section dips steeply to S w/ some contortions

Underlying couple hundred ft are contorted and probably faulted sh and siltst

80AMK-22 NENW Sec 7-3N-22E
Mt. Michelson B-5
Grab samples of marine siltst on W bank of Kavik River. 10' exposed, gentle dip
@ 80AMK-22-A & B

80AMK-23 C W/2 SW Sec 26-1N-21E
Mt. Michelson B-5 Quad

Measuring Kemik Ss along Fin Creek

STRIKE N85°E
DIP 50°N

0-19	19'	base not exposed but probably close; thin bedded at base medium bedded at top BK=35 CPS=50
sample 1ith		80 AMK 23 A ± sandstone sample lower very fine grained well sorted, quartose ss. chert, non calc. N4 BK=35 CPS=55
19-29	10'	sandstone very silty, lower very fine grained. coarsens upward into lower very fine grained sandstone
29-112	83'	vertical and horiz. burrows, lower very fine grained quartose ss in thin-med. beds thin interbeds of sl. calc. ss also lower very fine grained w/ abundant clam ship and limonitic staining, upper part of ss is silty and N3 (30') 80 AMK 23 B ± 15' below top of unit BK=35 CPS=50
sample 1ith		
112-117	5'	over lain by ss/siltst interbeds as at new transition zone, not outcrop well 5'

CMM, ACH, ARK 6/30/80 pg 2

(80AMK-24) NW/4 Sec 5-2N-19E
= 80ACH-17 Sag C-1 Quad

Walk thru section along Juniper Cr on north flank of Shaviovik anticline. About 1100 ft of discontinuously exposed section. Att at SE end: N78E 60N
Att at NW end: N85E 30± N

Section starts out in a couple 100 ft of poorly exposed shaley silt w/ some floating qtz grains. Above, there are 2"-6" ss beds (F) grading up to more ss. No good shoreface ss exposed - prob low energy shoreline - then nonmarine ss with interbedded thick zones of carb sh - coal. In upper few hundred feet are thicker conglomeratic fluvial ss units separated by carb sh - coal zones.

This whole sequence in regressive from prodelta mudstone to fluvial

ACH has marine sh samples, carb sh and lith ~~sand~~ samples

6/30/80 pg 3

(80AMK-25) SW SW Sec 29-3N-24E
Mt Michelson C-4

Long otc on west bank of Canning River opposite Nanook Cr.

This is 280' section measured by Palmer et al in OF 79-1634 Plate 8

Could not get to basal 50' ss, but section above is all marine and thin ss interbeds are turbidites - good grading (VF-VF) and many sole marks (mostly in float). Most in place trend N70E w/ ~~some~~ a few N20-30E.

CMM, ACH, ARR 7/1/80 pg1

(80AMK-26) Near C Sec 32-3N-26E
Mt Michelson C-3

Ignek Valley
Rubble otcs of Brookian ss on top of hill. Ss, LF-VF, greenish gray - lt med gray hard, some interbedded sltst (rubble) Sole marks rare but locally common - grooves. Some sl graded bedding, one chert pebble, one w/ zone of LM. ± 80AMK-26

One otc in place on S side of hill
att N80W 32 S (F)

CMM, ACH, ARK 7/2/80 pg1

(80AMK-29) SWNW Sec 4-3N-24E
Mt Michelson C-4

Otc on W bank of Canning R.
Sltst w/ interbedded Ss in beds a few inches to 1 ft or so. At least 100 ft exposed
Ss beds show small scale x bd, com scouring, some graded VF → VF, some w/ several thin VF - LM layers (multiple flows?), minor chert pebbles com carb frags. No sole marks seen.

Att: N80E, 30-70 N

This is not delta fringe - prob deep water or slope channel

B-29 BK 40 CPS 110

SE/4 Sec 33-4N-24E

7/2

80 AMK 30a E bank Canning R.
sltst samp

N60E; 10 NW

transition zone - upper 15'
thin bedded to med. bedded at top
ss. - sm. scale scour & fill & low ∆ x bedding at base, rippled at top; v.v.f. gr.; qtz. & cht., much organic debris on lams.; sl. calc; well sort, sbrd - lt. ol. gy (5Y 6/1); lg. plnt frags. interbedded sltst & mdst. - bk to 80cps

80 AMK 30b Shoreface ss. ~15'
ss samp. 5' abv. base
l.f. gr. w/ u.f.; qtzose, cht., brn. liths; well sort; lt. ol. gy. (5Y 6/1); lg. plnt frags. & carb. debris on lams.; v. sl. calc; poor porosity; clay clasts; th.-med. low ∆ & tr. X bd.

8. lower in Syncline (North) N80W, 30...

7/3 Move to Barter Island

7/2/80 pg. 2

(80AMK-31) NE Sec 33-4N-24E
Mt Michelson C-4

On east bank of Canning River. Good otcs but can't get around because of high water. About 20' of ss examined on N side of point.
Ss med gray, VF, well sort, abundant carb frags, clay chips, some scouring and clay drapes, scattered bimodal chert pebbles up to 2" in layers. Some med scale X bds.
This is prod dist channel system
Lineations on base = N60E
Float from upstream is VVF, ripple marks, com carb frags, burrows on bedding surfaces

att N45E 6N (F)

Ł 31

80 AMK-

80AMK-32 C E/2 E/2 Sec 24-3N-24E
Mt. Michelson C-4

Grab samples of shale between Tevo Kernik Sss along Janeke Cr where Gil Mull and Les Magoon measured their section
Shale is about 60' thick
One small qtz pebble or granule found

Ⓑ 32 A-D

Att: N85E 53S (G)

80AMK-33 C S/2 Sec 36-3N-26E
Mt. Michelson C-3

Stream cut of ~~very bentonite~~ sh interbedded w/ bentonite - about 75-100' exposed.
This is above red zone
Sh med gray N-3, p bedded, blocky, sl x, clay floating M-C qtz grains and scattered chert pebbles up to 1" ~~dia~~ - a couple ls (1 ±) lds
Ⓑ 33 A & B
± 33 of pebbles

Dip 20° S

This is same zone as at about 1200 ft on section yesterday (80AMK-27)

80AMK-36 E/2 Sec 1 - 2N - 26E
Mt Michelson C-3

Walking through Cret section 5 miles east of measured section to verify sequence

South flank of syncline is slightly overturned to vertical. Remick is exposed but is faulted off. Many small (?) faults but sequence look okay.

Att in Brookian Ss along E side of creek: N75E 85N (Bentonite interbedded)
Good sole marks on a few beds which when rotated out trend N60E (G)

Above this a couple hundred feet and prob in synclinal axis is another red wx zone. This is probably a thrust repeat of one red zone.

Brookian ss on N flank of syncline
Att: N70W 20S (F)

80AMK-37 NW NW NW Sec 1 - 2N - 26E
Mt Michelson C-3

Sta located on red zone (upper one)
This is on S dipping N flank of syncline
Underlying this red zone are several rubble patches of Brookian ss tuffs.
± Dipping 20° ± to S (est)

± 37A of ss

Red zone is surface weathering or staining
± of med light gray siliceous fine tuff.
± 37B
Interbedded is dark gray, brittle siliceous sh (like Mowry)

Above is another ss rubble bed.
This could be underlying red zone across tight syncline or it could actually be in overlying sequence.
Can't tell
± Ss is Brookian type as below - very hard ± 37C

Later: This red zone is probably a thrust repeat of one red zone. Underlying Brookian turbs are younger than red zone

80AMK-38 SWSWSE Sec 22-4N-29E
Mt Michelson C-2

North side of Sadlerochit Mtns
Examining K/ Sadlerochit contact
No Kemik Ss except for a 8-10' zone of Slty arg Ss & Sltst w/ scat small (<1") pebbles. At basal contact w/ Rs is a pebble zone

Kps section above is:

75'± v slty sh, p bed, v sli calc to non calc com chert and qtzite pebbles up to 2" floating
About every 10' is a 1' orange wx ironstone conc bed.
Att: N75E 30N (F)

38 A & B

50'+ Sh blk fissile, limonite wx on plates, yellow-jarosite stain com discontinuous ironstone concs
Few if any pebbles

38 C & D

80AMK-39 SESE Sec 19-4N-30E
Mt Michelson C-2

On east fork of Marsh Cr on N side of Sadlerochit Mtns.
On east side of creek and eastermost fork is good exposure of Echooka (not good base though), very good otcs of Kavik Sh and gradational outer fringe buildup into Ivishak Ss. There are several pebbly beds in Ivishak and ss increases from lVF at base to LF above.

Good contact w/ Cret Transgression
There is a pebble bed at contact and about 6' of arg slty VF ss w/ scattered pebbles. Above is about 50' or 75' of v slty sh, burrowed and com pebbles and 1' beds of ironstone concs
This is overlain by the more typical fissile pebble sh, but few or no pebbles. Didn't examine very much.
This sequence is very similar to that 3 miles west on west fork.

CMM, ACH, & ARK 7/7/80

80 AMK-40 SENE Sec 32-4N-28E
Mt Michelson C-3 Quad

On north side of Sadlerochit Mtns on tributary of Kat River
Cret - Sadlerochit sequence exposed along creek bank. Starting at base:

0-5	5+	Top (?) of Ivishak Ss, lt gray, yellow-orange wx. F w/ M-C ss in top few inches, well sort
15	10'	Broken otc 8' of which is Ss, med gray, LF-UF w/ minor M, ll bd. Is this still Ivishak? or basal transg ss of overlying sh section?
15-65	50'	~~Ss~~ Sh w/ 20-25% Sltst interbeds Sh, slty dk gray w/ 2 1' maroon sh beds at 19 & 35', p bd, soft-firm w/ a couple of soft recent sh beds. Sltst, tan, v sli calc, in beds a few inches to a couple ft thick. Rx Cret? at N50E 6SE
65-75	10'	Ss, blk to tan, F-M w/ C, arg, p sort some carb, soft wx. This may be basal transgressive unit of LK
75-77	1-3'	Cgl, p sort, ⊘, ss matrix, chert &

qtz pebbles & cobbles up to 4", one chert boulder 15". This cgl cuts down thru 5 or 6' in 30'. Underlying sltst bd is highly ⊘.

77-92	15'	Interbd Ss (Kemik) and Sltst (80-20) Ss, med-dk gray, LVF-C slt, ll bd 1-3' thick scat pbls in lower part. com H & V ⊘, com load features Sltst interbds 2"-6" thick, dk gray pebbles in uppermost part, prob base of overlying pebble sh transg

Above is eroded back soft section. But it appears to be sh-sltst section

7/7/80 pg 3

(80AMK-41) NENESW Sec 11-4N-27E
Mt Michelson C-3 Quad

Lower Tertiary [?] turbidites along Kaltak-Tusuk River N of Saddlerocket mtns
Walked through about 367' of section as measured by Lyle, Palmer, Bolm and Maxey OF 79-1637
Section consists of turbidites and slty sh

Ss, med gray VF-VF some in well graded lds but most is LF w/ no preceptual grading, hard, lds a few inches to 2' thick, good Bouma sequences of a b c d - mostly b c d, sharp bases w/ com sole marks, grooves trend N 70-80 E to S 80 E (F)
Com carb material on laminations within ss, com small scale X lds (Bouma c) at top of lds, com ripple marks on top surface.

Sh, slty p bd, firm, no bentonite

This is good deep water turbidite sequence in ss part. Ss sequences seem to be thinning upward, ie. channel sequence. Some scouring on a few ft noted. Section measured 7/20/80

CMM, ACH, ARK 7/20/80 pg 1

(80AMK-41) NENESW Sec 11-4N-27E
Mt Michelson C-3 Quad

Measuring section of turbidites exposed along W side Kaltaktusuk River
69° 43' 15" N Lat } near base of section
145° 26' 06" W Long }
alt E-W-30N

0-36 36' Turbidite sequence Ss F/ Sltst
Ss, pale yellowish brn 10YR6/2 graded to non graded beds up to 2' thick in lower part thinning upward to 2" at top, LF-VF Bouma a, b, c, d or b c
J, com carb material along bedding planes, sole marks (mostly in float) in place → N70E (grooves)
± 41A at 12'
Each bed separated by a parting or thin bed of Sltst - slty sh, dk gray.
Ss is at least 80%.

36-57 21' Sh, slty, dark gray, N3, broken otc non fissile non calc
80 Ss 41B & C near base and top
From 5 to 11' is a lense of somewhat contorted ss & sh - penecontemporaneous slump

± 7/19/84 Revisit. Found lightly oil stain ss in float in lower part - either in 36' or 12' interval. Has slight oil odor and gives cut. ± sample BO/84 AMK-41

57-69	12'	Thinning upward sequence of Ss & Sh Ss 50% in beds 1' → up 3", VVF graded Bouma b c d & c d
69-92	23'	Slightly thinning upward sequence Ss w/ Sltst partings or thin beds Ss 85% ± Ss in beds 2'± near base to 6"± in upper part, graded to nongraded turbs, bases about the same as described previously, some VF-LM, but fining up to VVF, com rippled top surfaces, some ss on ss graded beds, but mostly undivided sequences. ± 41 D at 15' Att E-W-31N Top bed is 8'-9" thick - maybe another thin sequence. Base of 23' sequence scours into un- derlying unit 1 or 2'. Sole marks → N80E, N85W, N85W
92-207	115'	Slty clyst, grayish brn, nonfissile p bedded except for some thin sltst-VFss interbeds 80 & 41 E at 5' 41 F at 45' sli calc 41 G at 80'
207-216	9'	Interbd sltst 65-70% and VVF Ss in beds up to 3", com Bouma c flutes trending → N85E

216-234	18'	Slty clyst as described 80 41 H from middle
234-44	10'	Thinning upward cycle Ss 50%± & sltst Ss Ss beds up to 6" thinning upward, sh cap Top 2 or 3' is slty sh
244-55	11'	Thinning upward cycle as above
255-71	16'	Thinning upward cycle. Ss beds at base up to 2' but thin to 5 or 6' to NE These whole sequences ± shingle out to NE (see photo) & sketch ± 41 I at base Att E-W 26-31° N
271-77	6'	Thinning upward cycle, 6"-4" ss beds 40% (all sltst-slty sh ripple bed)
277-92	15'	Cycle, lower 5' Ss & sltst thinning up. from 3" to 1" 50% Ss, upper 10' is all slty sh as described 80 41-J from near top sh
292-302	10'	Interbedded ss & sh 50-50 Ss beds 3" and less. There might be 2 cycles here
302-17	15'	Slty sh Back on hillside and glove is another 50'± of sh - no turbs

CMM, ACH, & ARK 7/8/80 pg 1

(80 AMK-42) NENENE Sec 15 to ~~SWSWSW Sec 11~~ NWNWNW Sec 14
T2N, R28E Mt Michelson C-3

Fire Creek - Examining ♄
At top Ivishak Ss - base of Fire Cr Mbr
is a 2"-4" pebble cgl (basal transg), mostly
blk chert pebble < ½"
Ivishak ss is v hard, siliceous & F ss.

Fire Cr Mbr is interbedded firm Sh and
thin ripple bedded sltst in beds a few
inches thick
Att: N60W 32N (G)

42 A & B for SR
A 20'± above base; B 35' above base

Shublik Fm Lower 40'± is C sltst - LLVF ss
w/ com blk phosphate? pebbles, abundant
at base. Some pebbles are irregularly
shaped - not round. A few thin slty sh
SR interbds 42 C from 20' above base
Com V shaped II

Above is more shaley section, largely covered. Then hard resistant calc sltst - ls
unit w/ coquinas of small pelec. a few
monotis in Ls.
42 D from below Ls
42 E sh-sltst interbd zone above Ls
SH is very calc, blk, sooty

7/8/80 pg 2

Ls beds 1-2' thick lensy, and up to
4 or 5'. Com monotes

Section above resistant thicker Ls beds
become thinner bedded

Upper Sh Mbr is largely covered, couldn't
get good sample

(80 AMK-43) S/2 SW/4 Sec 30-2N-30E
Mt Michelson C-2

Resistant ledges on hillside are Brookian
ss, some sole marks in float. these
are undoubtedly turbs
Att N80E 20±5
This is lowest bed on hillside. Checked
below to N - no otcs, some sh rubble
In creek bank exposures to NE is all
sh - prob Kingak

80AMK-44 NE NE SE Sec 26-2N-30E
Mt Michelson B-2

Hills on N side of Kekahtuk River
Highly folded turbs and bent sh,
& com bottom marks, some graded
VF-LVF
& 44 A & B

80AMK-45 SW SW Sec 25-2N-30E
Mt. Michelson B-2

On south side of fault (?) in non bent
sh, dark gray, indurated, silty some
& limonite coating on chips. Several
hundred ft exposed on upstream
& 45 A & B
alt N80E 45S (F)

80AMK-46 NW NW NW Sec 33-2N-31E
Mt Michelson B-1
On hilltop where Detterman et al reported
ammonite occurrence. All Brookian ss
rubble VF some sole marks
These are turbidites interbedded in sh.
Must be Albian.

80AMK-47 SE SE Sec 16-2N-31E
Mt Michelson C-1 Quad

100-150' otc along Arctic Cr.
Interbedded ss 80% and thin paper sh
20%. Ss are mostly VF Turbs, com
& small scale ripple bd, com sole marks
Trend on 3 or 4 N55-70E
alt N50E 42SE (G)

Sh dark gray-blk, fissile, poss bent
as indicated by surface mud
& 47 A & B

80AMK-48 W/2 NW/4 Sec 2-2N-31E
Mt Michelson C-1 Quad

100' otc along Arctic Cr.
Sh w/ thin interbd Sltst-VF ss, some
& thicker UVF ss bds, ripple bd Bouma C
in upper part, com sole marks trending
N40E, N55E
alt N75E 35SE

No bentonite

& 48 A & B

CMM, ACH, ARK 7/9/80 pg 1

(80 AMK-49) C E/2 E/2 Sec 11-3N-31E
Mt. Michelson C-1

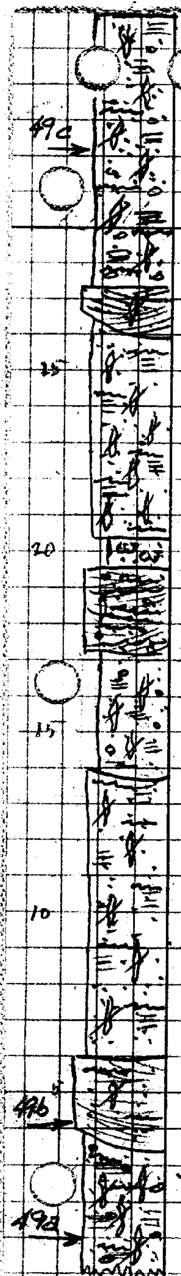
Measuring Kemik Ss section near Last Cr at E end Sadlerochit Mtns.
Measured and described by ACH & ARK
Kemik Ss unconformably overlies Shublik Fm at this location but contact is covered. Starting as low as possible in Kemik. (Possibly could get a little lower high up on slope or cliff face but couldn't get basal contact. Got within a few feet though)
Notes transcribed by C.MM.

Att: N10W 10N

35' Ss med dk gray (N-4), LVF slty throughout except UVF in upper 8', mostly ‖ bed, med bd w/ low ∡ x bds at 4'-6', 17-19½ and 26-27', scour base at 4' and 26', non calc, tight, abundant vert burrows throughout, scat qtz and chert pebbles at 0-4", 14-19', 27-35'
Ophiomorpha (?) in upper third

± 49A at 1'; 49B at 4'; 49C at 31'

(See 83AMK-42 for basal conact)



E end Sadlerochit Mtns. 7/9
N. bank of Sadler. R. pg 2
N10W; 10NE

med bedded; e ‖ lam.; heavily burrowed (vert, Ophiomorpha); Lv.f. gr. ss. (N4); qtz & dk. gy. cht. pbls scattered throughout at base of beds. 80 cps.

low ∡ tr. x bd. sparsely burrowed; th. to 4' lat. scours into mat. beneath

med bd; heavily burrowed (vert.); e ‖ lam.; N4; Lv.f. gr. silty; ophiomorpha?

bioturb (horiz. & vert. burrows)
weathers lt. br. (5YR 6/4)
med. bedded; mod. burrowed in lower 3' sparsely burrowed in upper 2' w/ low ∡ tr(?) x bed. & wavy ‖ lams at top of sets; lower 3 - ‖ lams; qtz & dk gy cht pbls scattered throughout

med bedded; even ‖ lam; heavily burrowed (vert burrows), N4; non-calc; v. poor poros.; Lv. fine gr. silty ss

90 cps.

low ∡ x bd.; sparse vert. burrows; non-calc, Lv.f. gr. silty s.s.; weathers lt. brown (5YR 6/4) 80 cps.
scour base
some ‖ lams.
heavily burrowed; scattered pebbles - qtz, dk gy cht; vert burrows; L.v.f. gr. s.s., n. calc., v. poor poros., silty; med dk. gy (N4), weathers med. gy (N4)
base not exp.
bk 80 80 cps
Shublik beneath

80AMK-49 Cont 7/9/80 pg 3

2' Ss-Sltst, arg, LVF v slty w/ scat chert and qtz pebbles up to 3/4"
This unit is eroded back from resistant ss below

4 Slty sh, dk gray-blk, non calc p bd

80-49 D

3' Sltst, dk gray, sli calc, p bd, concretionary (ironstone) orange wx, minor pbls

7' Slty sh BK 80 CPS 100

1' Ironstone conc zone

12' Slty sh BK 80 CPS 115
80 49 E

1' Conc bd

10 Slty sh
80 49 F BK 80 CPS 140

1' Conc bd.

7/9/80 pg 4

80AMK-50 N/2 N/2 Sec 27-4N-28E
Mt. Michelson C-3

Checking to see if we can measure thickness of Pebble Sh unit but upper contact with bentonitic section is not exposed. Base is not exposed either but probably close. Lower 50' ± is slty pebbly mudstone - LVF ss zone Att N70E 15S (F) N?
Above is at least 200' of fissile blk sh, scattered pebbles in float.

About 150' or more above base is a qtzose ss rubble zone. Appears to be in place. Prob not more than 5'. Ss LVF w/ some LF, qtzose, but badly wx
± 50

= 80ACH-22

80AMK-51 NENE SW Sec 26-5N-27E
Mt Michelson D-3

Otc near junction of Nularvik and Katakturuk Rivers. 15' otc of fluvial ss, LF, sli calc, thick bd w abundant carb and transported coal along bedding planes, ∥ to ripple bd, abandoned slt-filled scours, water expulsion structure at base
Nearly flat lying

7/9/80 pg. 5

80AMK-52 W/2 W/2 SW/4 Sec 16-6N-28E
Mt Michelson D-2 Quad

Otc of oil-stained Ss on E side of Katakturuk River. 6 or 8' exposed

Ss, gray, dark brown on fresh break (oil staining) VF-LM, generally || bed w/ some small scale ripples beds, minor med scale X bds, com carb debris, tasmanite (?) pebbles in float below, com qtz & chert granules and small pebbles ~~ss~~ scattered ~~in~~ along bedding plains.
This is ~~prob~~ a fluvial ss - Sagavanirktok Fm, Sagwon Mbr.

20 ∠ 55

Att N55E 20NW (?)

CMM, ACH & ARK 7/11/80 pg 1

80AMK-58 NE SE Sec. 8-3N-35E
Demarcation Pt C-5

Checking Sabbath Cr. section
41/85 ATP Sample of siltst just below 2-3" coal stringers Att: N80W 41S
at unit D 1/3 on section
⊗ ⊗-58
~~Down~~ Upstream at base of section is channel ss or dist mouth bar overlain by marine sh which goes upward into a regressive ss - a couple cycles, no burrows or other fauna

80AMK-59 NW NW Sec 4-3N-35E
Demarcation Pt C-5
200'+ exposure on W side of creek.
Fluvial ss w/ pebble cgl, one carb sh zone dug out; ⊗ 59

Lots of scouring in fluvial section, fractured, but some X bds → N and festoon crests → N30W. Mostly || poorly bd.
40 Att N85E 40N

80AMK-60 C N/2 SE Sec 33-4N-35E
Demarcation Pt C-5
Several 6"-20" coal bed separated by covered intervals that appear to be carb sh-sltst as indicated by squirrel diggings.
Cobs are massive-p bd, pebbles and cobbles to 3" of blk chert, qtzite, qtz & silicified Ls. Not many direction features. Possibles of N30E, N30W
& 60 of carb sltst

80AMK-61 SW NE Sec 33-4N-35E
Demarcation Pt C-5
& Same as above
& 61 of carb sltst

80AMK-62 NW NW Sec 34-4N-35E
Demarcation Pt C-5
& Same as above
& 62 of carb sh

80AMK-63 NW NW Sec 34-4N-35E
Demarcation Pt C-5
& Same as above
& 63 of carb sh

80AMK-64 NE SE Sec 22-4N-35E
Demarcation Pt C-5
Low energy fluvial ss, ll bd & sltst. Com leaf and stem fossils
↑8° One 6" carb coaly bed. Dip 8° north
& & 64 of carb sltst

80AMK-65 NW NW Sec 4-3N-35E
Demarcation Pt C-5
In lower part of section. Thick section of slabby fine grained ss. Com carb material on bedding planes
Marine or nonmarine?
& Down section is some sh.
& 65

80AMK-66 NE NE NE Sec 17-3N-35E
Demarcation Pt C-5
On south flank of small(?) roll over at southernmost otcp. Att: N75E 24S
15 24 Several fractured otcs of ss & sltst
& & 66A & B

(80AMK-58 to 64)

Summary of Sabbath Cr

Entire 11,000' section appears to be an overall regressive sequence ranging from shallow marine at the base to transitional delta plain to alluvial plain. In general the section becomes more conglomeratic in the upper part.

The basal marine part contains no fossils & no burrows but physically it looks like a regressive shoreface above neritic marine sltst. The sands are very argillaceous and not too well sorted - prob was a low marine energy river-dominated delta. The fluvial sands and cgl are poorly sorted and lithic in composition. Clasts in cgl are blk chert or argillite, white qtz and other chert. There is much channeling and scouring and some med scale trough cross bedding, but mostly p bedded to 11 bedded. Direction features are few and far between, but most seem to indicate north to possibly N 30 W transport directions.

CMM, ACH & ARK 7/13/80

(80AMK-67) C E/2 E/2 Sec 24-4N-31E
Mt Michelson C-1
69°41'15" N Lat. 144°23'19" W Long.

E bank of Sadlerochit River - Shale otcs Long hillside exposures - discontinuous - of bentonitic shale w/ abundant bentonite interbds, thin fissile shale and com discontinuous layers of prismatic calcite (Inoceramus prisms?) stacked up layer on layer or interbedded w/ shale. Inoc zone (2 otcs) is about 15' thick, base not exposed and 10' thick, base not exposed.

[B 67]

Structure is contorted but generally dipping steeply SE

(80AMK-68) SESE Sec 22-4N-31E
Mt. Michelson C-1

Two miles west of Sad. River

Otc of Kemik Ss, LVF, about 6' exposed, base covered and top or overlying pebble sh eroded. However pebble zone on top of Kemik indicates this is the top. Prob. not much thicker cause a short way below is blk sh rubble and squirrel diggings of Kingak Sh

B-68 Att: N10E 20 E (F)

1½ mi to N is another otc of Kemik dipping to NNW toward Red Sulbee rubble

CMM, ACH & ARK 7/15/80

(80AMK-69) SWSE Sec 3-6N-36E
Photo 7870 Demarcation Pt. D-4
69°53'57" N Lat, 143°06'46" W Long.

Jurassic sh otc on tributary of Niguanak River (This may be pebble sh - 1983)
Much snow covering much of creek banks and otcs.
ATP on east side of creek is a ~~base~~ shale rubble otc on small nose. If dip is steep prob 30-40' exposed.
& Sh, dk gray-blk N-2, uniform firm appears to be very clayey, but is mainly rubble, scat calc concs.
& -69 A & B

B Immediately across gully on south side 50'± is a very muddy, bentonitic?, side-hill goo in which a small gully draining it contains abundant belemnites and a few small ammonites
B 69C

± Also coming out of this same goo are chunks up to ½" of black, light weight, coal-like material. Is this a solid hydrocarbon, ie, gilsonite? ± 69D

From 1000' to 1400' upstream are some Seabee paper sh, bent otcs in and along stream.
Att: N85W 80S Some are contorted
0.5 to 0.6 mile upstream are more bentonitic shales, wet muddy contorted otcs (slumped?)
(over)

7/15/80 Pg. 2

NE NE Sec 4-6N-35E
(80AMK-70) ~~SE SE SE Sec 33-7N-35E~~
Demarcation Pt D-4
69°54'40" N Lat; 143°23'28' W Long

Bentonitic, organic Seabee Sh exposed along west side of Jago River
About 150-200' exposed, steeply dipping and somewhat contorted, dipping 60-75° to SSW.
B Interbedded Sh and bentonite with zones of prismatic calcite similar to Inoceramus prisms. They are separate stringers usually pinching out in about 12" but some are longer. But there are so many of them and they overlap so it appears as many long veins along bedding planes
B or ±? 70 Zone is ~~1-3'~~ 20'± thick

& Sh is dk gray-blk, fissile, very soft and papery, organic, oily smelling w/ yellow jarosite or sulfur specks
& 70 A-C

Bentonite beds up to 4" thick, soft, yellow to white, makes up 10-20% of otc.

Upstream a short way above JK outcrop, probably where side drainage comes in from east, found large Belemnite in creek bed (float)

B 80AMK-69E

7/15/80 pg. 3

(80 AMK-71) SESENW Sec 34 - 7N - 35E
Demarcation Pt D-4

Down river ½ mile from Seabee Sh otc
on W side Jago River
30 - 50' exposure of soft subdued sh
w/ orange-brn wx beds or conc layers

Sh or mudstone, slty, olive gray 5Y 3/2,
very soft, nonfissile, p bedded, contains
rare scattered chert (gray) pebbles up to 2",
& but most are < ½", smells petroliferous
& 71 A & B   No bentonite seen, ~~but soft wx and ...~~
Con layers of noncalc conc beds 1-4" thick,
some contain isolated or scattered pebbles and
⊥ granules. One looked like pebble had dropped
into soft mud

⊥ 71   Att: N40E 20NW (p-F)

This must be Tertiary

CMM, ACH & ARK   7/16/80 pg 1

(80 AMK-72) SENE Sec 28 - 2N - 31E
Mt Michelson C-1

Ridge where map shows Albian ammonite collection

Rubble otc, some close to in place of
Brookian ss w/ common sole marks
Ss VF-F w/ some VF-M
Otc seems to be dipping gently (10-25°)
to south. These are turbidites
Above and below (stratigraphically)
is shale rubble
Took soil and veg. sample

Prior to this stop we landed near
a rubble otc 9000' to west
which was quite slicked and sheared.
This may be large fault in which
Albian is thrust up to or over
Upper Cret.

(80AMK-73) NWSE Sec 22 - 2N - 31E
Mt Michelson C-1

75-100' sh exposed on hillside, mostly rubble
but enough in place, Sh dkgray-blk,

hard, subfissile, some manganese stain
B scat pebbles in float (chert & qtz) undoubt-
edly from sh. This is prob pebble sh
80-73 A-c no concs, non bent.

80AMK-74 NE SW Sec 22-2N-31E
Mt. Michelson C-1
About 100 strat ft below across covered
interval. Dip slope of hematite stained sh
rubble, . Below is 10-15' partly exposed
B sh, dk gray, non fissile, hard. No pebbles
in float, some small manganese?
pebbles or 1/8" nodules. Qtz crystals in
float
80 74 Att: N75E 305 (G)

80AMK-75 NE SW Sec 22-2N-31E
Mt Michelson C-1
A few hundred ft NW across covered
B zone is 50' of sh blk, fissile w
scattered ironstone concs, some pebbles
in float. Prob all pebble sh 80-75
80AMK-76 C W/2 Sec 22-2N-31E
Mt Michelson C-1
Large reddish wx otc on rounded ridge.
Looks like red zone from distance but
is ss and covered bent sh. Ss is VF-F,
rubble otc, sole marks, some is weathered
reddish or hematitic.
appears to be dipping to S or SE although

it is not consistent. Prob just south of
ridge is large fault that brings
pebble sh against upper Cret.

80AMK-77 NW Sec 21-2N-31E
Mt Michelson C-1
Checking outcrops on moving ridge.
Brookian ss interbedded w/ sh
Several units of ss or possibly
same unit offset by faulting
75 — 1B Att: N75E 1B S (F)

80AMK-78 C W/2 Sec 30-3N-32E
Mt Michelson C-1
Near top of Kingak Hill
Brookian ss, one unit about 30' thick
w/ thin shale interbeds, highly frac-
tured, mostly VF, well sort, fairly
E ortho for a Brookian ss bds 1-3'
thick, scat. sole marks (3) trending
N65E, N70E, N75E
Sole marks com in float. hard, tite
E 78

CMM, ACH, & ARH 7/19/80 pg. 1

80AMK-82 C S/2 Sec 23 to C SW/4 Sec 14
T 2 N, R 30 E
Mt Michelson C-2

Traversing down hill from 2535 knob to N 1½ miles.
From 2535 knob in C S/2 Sec 23 to head of gully in C NE/4 Sec 23 is puffy soil of bent sh and turbidite ss float.
At C ~~NE~~ NE/4 Sec 23 is rubble ots of pebble sh, manganiferous w/ scat pebbles
Just N of this to C N/2 N/2 NW/4 Sec 23 is soil and rubble of bentonitic sh.
From there to NW on east side of gully to C SW/4 Sec 14 are discontinuous rubble ots of pebble sh, some w/ ironstone concs and manganiferous and pebbles, some very fissile.
& 82 A-D from SE to NW

80AMK-83 C S/2 Sec 2 - 2N - 30E
Mt Michelson C-2

Quick stop to examine sh ots just east of junction of Kekektuk & Saddlerocket Rivers

Sh w/ ironstone concs, minor pebbles
This is pebble sh

7/19/80 pg. 2

80AMK-84 NW NW Sec 12 - 2N - 30E
Mt Michelson C-2 Quad

Two shattered ss ots separated by bentonitic sh. Ss beds are 10-20' thick, highly fractured, steeply dipping turbidites. Whether these are two separate ss units or are duplicated by folding or faulting was not determined. Sole mark trend: N 15 W

Between sta 84 and 83 is a lt gray weathering, bentonitic-looking sh w/ thin turbidites.

80AMK-85 NE/4 Sec 5 - 2N - 3 E
Mt Michelson C-1 Quad

Quick stop to try to get sh sample but too covered w/ float and weathered.
But is same as that between sta 84 and 83.
Lt gray sh, bent sh w/ thin VF turbidites, many sole marks.
Traces of bedding indicates uniform gentle dip to south all along here.

7/20/80

(80AMK-86) NW SE Sec 7 - 4N - 27E
Mt. Michelson C-3

Tributary of Tamayariak River. A couple hundred ft of slty sh, med dk gray N-3 p bd, v slty, bentonitic but no bentonite beds. Dipping 20° ± to N
⌀ 86A-C non calc to v sli calc.

CMM, ACH & ARK 7/21/80

(80AMK-87) NE/4 Sec 27 - 7N - 35E
Demarcation Pt. D-4

On W bank of Jago River
Otc of of soft gray brown mudstone w/ yellow brown sltst. Very soft, poorly
⌀ exposed, bentonitic (?). Dipping v slightly to N
⌀ 87
This is location where Cons. Div got Eocene paleo.

(80AMK-88) NW NW Sec 23 - 3N - 39E
Demarcation Pt. C-3

Isolated outcrop along small stream. About 200' of near vertical dipping
⌀ Hungak Sh (?) blk, fissile, clayey non calc ⌀-88

Igneek Sec.

7/1/80 pg 2

(80AMK-27) NE Sec 6-2N-26E
Mt. Michelson C-4

South side of Igneek Valley
Measuring up section from top of Kemik
Ss where Gil Mull measured Kemik
85/67 Att in Kemik: N85E 67SE (overturned)

Contact covered but base pebble shale within 10'. Pebble sh is largely covered with its own rubble and bedding dips are hard to see - probably some contorting and buggering. Measurements given are taped horizontal distances

0-210 210' Sh dk gray-blk (N-2), fissile, rare pebbles in float - qtzite, graywacke, one up to 3". Sh is iron stained on plates
& A-E or F. BK=80 CPS=130
Scattered ironstone concs
ATP dug out interbedded bentonitic blk sh w/ gray swelling clay, lt gray (altered ash)

& G BK 130 CPS = 200

-300 90' Fissile blk paper sh w/ bentonite
& H, I, J

H	BK= 150	CPS = 350
I	" 130	" 220
J	" 150	" 310

Some thin, hard, sli calc slty sh beds

300-400 100' Sh, blk, N-1, fissile, w/ about 15-20% ½-1" bent bds

& K & L K BK 150; CPS 300
L " 110 " 130

400-600 200' More of same
& M-P M BK 100; CPS 140
N " 100 " 140
O " 130 " 200
P " 120 " 150

600-800 200' Largely covered w/ sh rubble and red silicified tuff. Much more soft muddy bentonite in section

± Sample of red silicified tuff = Q at 725'

& R at 800'

800-950 150' Largely covered as above

& S & T S BK 120 CPS 150
T " 120 " 135

at 100'± is rubble of ½-1" Ls
± BOAMK-27 V of Ls.

950-1100 150' Sh dark gray N-2, splintery, slty limonite stained surfaces interbed-w/ bentonite
Bentonite percentage seems to be abruptly less than below 950'
Upper 50-100' is softer, med gray N4 slty sh w/ 10%± bent.
Scat pebbles

& V, W, X X-BK 100 CPS 150
V at 1000'
X at 1100'

1100-1250 150' Sh as below becoming less bent upward,
& Y & Z Y BK 60; CPS 100
Z " 90 " 170
Com chert pebbles in float up to 1½"
in lower and middle part

Platy VFss float w/ sole marks in upper 20'
& Z at 150'

1250-1328 78' Sh as below, bentonitic, com ss float as described, mostly covered
& BOAMK-28 A & B
BKA CPS
" B 100 " 150

1328-1339	11'	Ss, med gray, VF-LF, planar bedded fractured, largely rubble but some in place, plant frag com sole marks in rubble. Interbedded w/ bent sh
70 / 78		⊥ 2B C Att N70W 78S & 2B D overturned
1339-1416	77'	Broken otc Sh as below, bentonitic w/ thin < 1' ss interbeds
1416-1422	6'	Ss as in 11' interval above. No sh interbeds. Sole marks trending NE ±
1422-1512	90'	Broken otc or covered soft section Sh w/ thin ss interbeds BK 60 CPS 120 ✓
1512-17	5'	Ss as described, fractured, rubbly BK 50; CPS 50
1517-25	8'	Sltst-slty sh interbedded & 2B E BK 50 CPS 90 ✓
15[illegible]-30	5'	Ss as described
	~~200'~~	~~Mostly covered Sh w/ ss float~~

Cont on next page

Cont. 7/2/80

1530-1730	200'	Mostly covered bent sh w/ ss rubble, prob 10-15% SS UVF-LF, some sole marks
	~~50'~~	Blk Sh & bent. broken otc
1730-2005	275'	soft fissile blk Sh (N-1) & 2B F at 60' BK 70 CPS 210 & 2B G at 90' BK 80; CPS 200 & 2B H at 120' " 80 " 150 & 2B I at 183 " 80 " 170 & 2B J at 225' " 70 " 140 Last 75' ± is not fissile and is dk gray (N-3), slty
2005-20	15'	Rubble otc blocky Ss, lt gray LF-UF w/ M
2020-2140	120'	Mostly covered - broken otc Sltst - slty sh, 5YR 4/1 grayish brn, non fissile, non bentonitic apparently. & 2B K BK 40; CPS 80

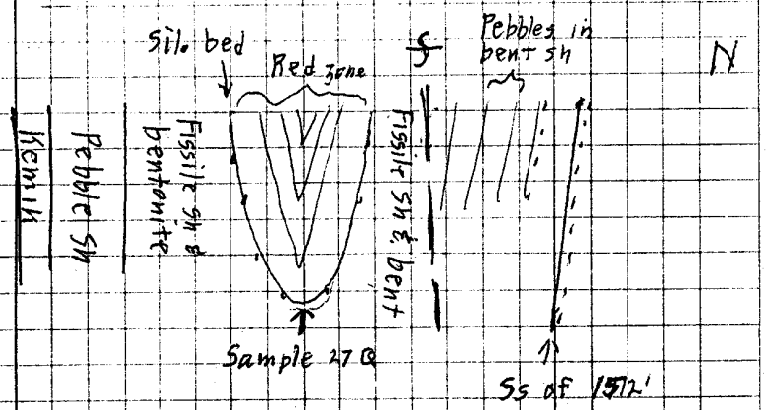
No otcs above

CMM & ARK 7/3/80 pg 7

Photographing and checking Lgnek Valley section - sta 27 & 28

Discovered there is a tight incompetent-sediment plunging synclinal fold that we missed below. At N end of fold is a fault and section continues on normally with an unknown amount (probably small) of section cut out.

Remeasured parts of section on ridge top to correct errors in duplication



Plan View

7/3/80 pg. 8

Lgnek Valley Section

Measurements (horizontal distance (chained) across strike - beds are near vertical):

From base bentonitic sh (top Kps) to resistant silicified tuff bed (porcellanite) which was where ± sample 27 Q was taken below = 400'

About 50' ± more section (estimate) is present from here to syncline axis.

From fault to where there is an abrupt lith change from fissile papery sh and much bentonite to splintery slty, limonite-stained sh and much less bentonite across fault. This was noted at 950' in section measured the other day. From this fault to resistant ss bed at 1512' on section below is 528'. Pebbles were noted in bentonitic sh at 200' and 300' in this interval.

Putting all this together section is approximately as follows: Refer to intervals measured on first day for details of lith.

0-210	210'	Pebble Sh
210-610	400'	Blk fissile Sh and bentonite Samples 27 H - P going up section Samples B, S, T & U of this interval but reversed order Sample 27 Q at top of interval
610-60	50'	(Estimate) Red zone - red wx siliceous tuff (porcellanite) sh and bent.
		Fault Interval measured above 528' Same interval ± measured below 562' Average = ~~545~~ 545'
660-760	100'	Splintery wx/silty limonite-stain sh wx/bent (less) Smpls 27 V W
760-910	150'	Sh md gray soft wx/pebbles & bent Smpls 27 X & Y
910-60	50'	Sh becoming less bent wx/Ss float in upper 20'. Smple 27Z at top
-1032	72'	Refer to 78' interval
-1043	11'	Ss
-1115	72'	Refer to 77' interval
-1121	6'	Ss
-1205	84'	Refer to 90' interval

-1833	628'	Refer to interval ~~1228~~ 1512-2140
	1833'	Total section (Top covered)

All this is below or older than interval seen at sta 34

7/5/80

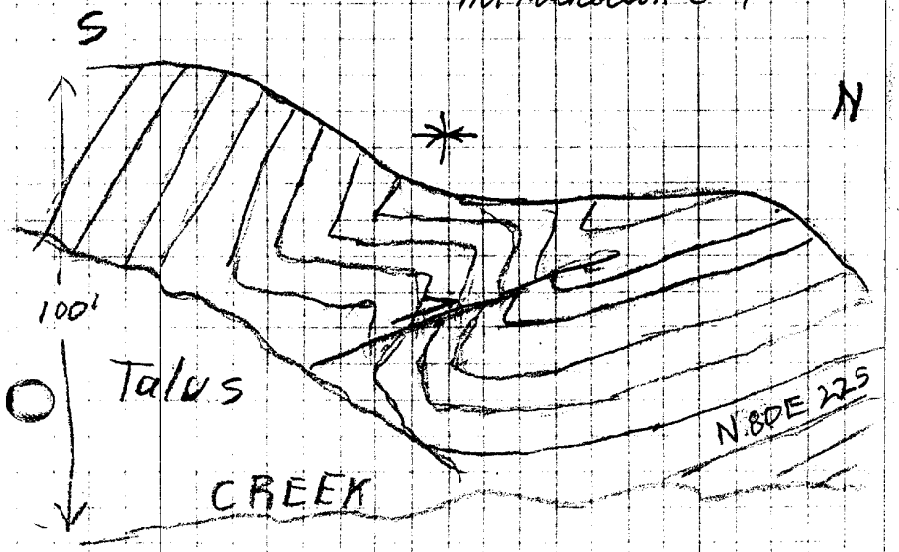
80AMK-28 (Cont) SWSWNE-6-2N-26E
Mt Michelson C-4

Collecting closely spaced sh samples across contact of non-bentonitic, ie, pebble sh, and bentonitic sh (Sealree?) on ridge-top exposures along section.

80 28 L at 0 Silty Sh non bent.
M " 12' " "
N " 24' " "
O " 40' " "
P " 50' " "

Contact - condensed zone?
Q at 60' Fissile blk sh w/ bent.
R " 70' " " "
S " 85' " " "
T " 105' " " "

BOAMK-34 NWNW Sec 5-2N-26E
Mt Michelson C-4



Axis of syncline in Igneck Valley

Interbedded Sltst-slty sh and Ss.
Ss med gray, LF-VF, in beds 2-5" thick sharp base, Bouma B, C, D, sole marks trend N 70° E ±, no grading apparent but prob are turbidites
BK 40 CPS 50 (1) BK 40 CPS 82 (7)
Sh-Sltst dk gray N-4 non fissile, firm, com floating sand grains
BO 34 A, B, C non bentonitic.
These look like Tertiary Att on N N80E 22S

BOAMK-34 (Cont)
None of this part of section is exposed in section measured 1/4 mile to west (Sta 27 & 28). There must be a fault in between. These sediments are non bentonitic and must be younger than section to west.

BOAMK-35 SW Sec 32-3N-26E
Mt Michelson C-4 Quad

Walked downstream 1/4-1/2 mile from sta 34 to look for underlying bentonitic section present in measured section to SW. This is on N side of syncline axis where section is mostly sh rubble w/some ss, but it doesn't appear to be bentonitic as far as bend in creek (extent of dz) There are some 1-2' ss beds, some well graded one w/ small pebbles in lower part, good sole marks trending N85E
Att at pt where station is plotted:
N75W 31S
Entire hillside appears to dip similarly

31 T

7/20/82 p1

Molenaar Kirk & Magoon

(82 AMK-17) = 80AMK-27,2B Mt. Michelson
NE/4 Sec 6-2N-26E C-4

Ignek Valley section
Measuring gamma-ray count starting in Pebble Sh - low in section and measuring every 20 ft. Starting low on hillside near creek.

	1.	BK 130	CPS	165	
	2	"	CPS	180	
Took 2 pics	3	"	CPS	185	
	4	135		190	
	5			180	
	6			200	
	7	150		170	wash?
	8			130	rusty
	9	150		210	rusty
	10	250		370	
		= ± top Kps on section			Bent
	11	200		430	+ sli
	12	200		350	slumped
	13	200		270	
	14	200		325 (350 in bent)	
	15	250		610	
		Smpl 17A			
	16	210		340	
	17	210		460	

7/20/82 p2

(82 AMK-17) Cont

Measuring gamma-ray count on top of ridge - Ignek Valley section Starting at top Kps or base Shale Wall - Sli slumped in first

		BK	CPS		
	1.	120	170		47A
	2	180	320		B
	3	190	380		C
	4	210	620		D
	5	200	310		E
	6	200	530		F
	7.	210	460		G
	8.	190	370		H
		Saddle - v bent above			
	9.	200	450		I
	10.	160	200		J
	11.	120	200		K
L	12	120	150	Rusty zone	L
M	13	150	210		M
N	14	180	230		N
O	15	180	230	Fissile blk sh	O
P	16	180	240	Smpl 17B + B & SR	
Q	17	175	200		
	18	180	230		
R	19	185	250		
	20	180	250		
S					

		BK	CPS	
S	21	180	210	
	22	190	260	Sample 17C SR & Bk Bk fissile Sh ↓
	23	190	250	
T	24	190	350	
U	25	230	330	Beginning of red zone
V	26	240	350	+ Sample 17D of red w/ tuff
	27	240	320	
W	28	220	340	
	29	220	330	
	30	210	290	↓
	31	200	290	
	32	190	250	↓
	33	190	280	
	34	190	280	
	35	190	270	↓
	36	130	230	

This is on ridge near synclinal reversal

82 AMK-17 Cont

Up section starting just above fault above red zone

		BK	CPS	
0'	1	140	160	
20	2	150	200	
40	3	150	180	
60	4	150	190	
80	5	160	180	} Start of pebbles
100	6	140	170	
120	7	140	200	
150	8	130	190	
175	9	140	180	
195	10	140	150	} ± sample of pebbles ± 17E
220	11	130	140	
240	12	130	130	

82 AMK-18 NE/4 Sec 6-2N-26E Mt. Michelson C-4

Sampled holes 1-17 at base of hill where first BR counts 1-17 of sta 17

82 AMK-18A-Q 17 samples for Q

18A-Q for SR

Sample 18R Q & SR from 30' below rusty zone BK 250 CPS 360

7/29/82

Molenaar, Kirk & Magoon p 4 (B)

(82 AMK-47)

Remeasuring and recollecting lower part of Iguik Valley section and plugging in previous samples.

Starting at base of pebble shale on top of Kemik Ss, which is covered, near creek level

Ft	Smpl No	BK	CPS	
10±	18A	130	165	
30	18B	130	180	
52	18C	130	185	
70	18D	135	190	
94	E		185	
115	F		200	
136	G	150	170	wash?
157	H		130	rusty wx
178	I	150	210	" "
200±	J	250	370	
				Beat from here on
212	K	200	430	
229	L	200	350	
238	M	200	270	
246	N	200	325	
267	O	250	610	Smpl 17A
268	P	210	340	
280'	Q	210	400	
340'±	R	250	360	

7/29/82 p 1

Notes on Iguik Valley section
Measuring on ridge starting at base of Bentonitic shale ±

Adjust		
172	0	
316	144'	saddle
370	195'	base rusty zone
391	219	top rusty zone
497	327'	2' first yellowish orange sil tuff
568	406'	base of red sil tuff float
610	443	yellow sil. tuff resistant bed 330-400' fissile blk sh w/ vent

Measuring below near base of hill starting in covered interval approx base Kps

	0		
200	200'±	first bent	200
280	285	17th sample (JBQ)	280
378	378	base of rusty zone	370

@ JBC 50'± above base

7/29/82 p2

Notes on Igrek Valley section remeasure (Cont)

	Ft	Smple	SR	BK	CPS	
	0	47A		120	150	slump?
	21	B		170	330	
	40	C	✓	175	350	
	56	D		200	620	
	74	E	✓	150	375	
	92	F		200	550	
	110	G	✓	170	430	
	129	H		220	430	slump?
	161	I		220	440	
	177	J	✓	140	200	
	190	K		125	200	
	200	L	✓	120	150	(195-217 rusty zone)
217	217	M		140	160	
234	233	N	✓	150	210	
247	250	O		150	210	
265	269	P	✓	190	210	
278	282	Q		130	160	← ~~skip hole~~
290	300	R	✓	150	250	← ~~skip 1 or 2~~
330	340	S	✓	166	240	~~skip?~~
365	380	T	✓	200	340	Paper sh
377	392	U		200	320	very bent
390	406	V	✓	200	370	" "
400	420			220	350	" "
413	433			220	320	" "
430	450	W	✓	240	340	

Rewrite 7/29/82 #2

Plugging in samples and GR readings into section - adjusted to 1980 section*

Ft*	Ft	Smpl No.	BK	CPS	2nd Time (9 days later) BK	CPS	
183		47 A	120	150	120	170	slump?
202		B	170	330	180	320	
220		C	175	350	190	380	
235		D	200	620	210	620	
252		E	150	375	200	310	257' 17A
270		F	200	550	200	530	
287		G	170	430	210	460	
306		H	220	430	190	370	slump?
337		I	220	440	200	450	— 18R
353		J	140	200	160	200	Rusty zone
365		K	125	200	160	200	370 - 392
375		L	120	150	120	150	
390		M	140	160	150	210	
406		N	150	240	180	230	
420		O	150	210	180	230	fissile sh
438		P	190	210	180	240	= 17B
450		Q	130	160	175	200	
					180	230	
462		R	150	250	185	250	
					180	250	
501		S	160	240	180	210	— 17C
536		T	200	340			Paper sh
548		U	200	320			Very bent
560		V	200	370			" "
							" "
							" "
600		W	210	340			" "

* Measurement from base of pebble shale

11/8/84

Ignek Valley Section - Approximate stratigraphic position of samples measuring up section from top of Kemik Ss

80 AMK-27	A	11 FT		BOAMK-28	A	985 FT	
	B	48			B	1015	
Pebble shale	C	78			C	1033	
	D	110			D	1038	
	E	139			E	1215	
	F				F	1470	
	G	219			G	1500	
GRZ	H	251			H	1530	
	I	290			I	1595	
	J	330			J	1636	
	K	370			K	1755	
	L	428			L	155	
	M	461		Pebble shale	M	167	
	N	505			N	179	
	O	544			O	195	
	P	583			P	205	
	Q	610			Q	215	
	R			GRZ	R	225	
	S				S	240	
	T				I	260	
	U				U		
	V	680			V		
	W	740			W		
	X	795			X		
	Y	885			Y		
Canning Fm	Z	960					

Hue Shale — Canning Fm — Hue Sh

80 AMK-34 A, B & C are at top of section. | from Tertiary (?) unit

11/8/84

Ignek Valley Section - Approximate stratigraphic position of samples measured up section from top of Kemik Ss

82 AMK-18	A	10 FT		82 AMK-47	A	183 FT	
	B	31		Pebble sh	B	202	
	C	52			C	220	
	D	73			D	235	
Pebble	E	94			E	252	
shale	F	115		GRZ	F	270	
	G	136			G	287	
	H	157			H	306	
	I	178			I	337	
	J	200			J	353	
	K	212			K	365	
	L	224			L	375	
	M	235			M	390	
GRZ	N	246			N	406	
	O	257			O	420	
	P	268			P	438	
	Q	280			Q	450	
	R	340			R	462	
					S	501	
					T	536	
82 AMK-17	A	257 FT			U	548	
	B	438			V	560	
Hue	C	510			W	600	
Sh	D	590 ±					
	E	880 ±					

Hue Sh

(over)

82AMK-82 NW NW Sec 5-2N-26E
≈ 80AMK-34 Mt Mich. C-4

Revisit to Tertiary (?) at top of Igneh Valley section for photographs.
Took shale sample 82A & B

84AMK-8 Igneh Valley section
near C Sec 6-2N-26E
Mt Mich C-4

Judy Parrish found ammonite in float near Kingak Shale outcrop below Igneh Valley section.

Also collected siliceous tuff sample from red zone
± 82AMK-17E

7/29/82 #2

Ignek V. sec-end

	Ft.		Smpl No.	BK	CPS			
	183	47	A	120	150	120	170	
202	204		B	170	330	130	320	
220	223		C	175	350	190	380	
235	239		D	200	620	210	620	
252	257		E	150	375	200	310	
270	275		F	200	550	200	530	
287	293		G	170	430	210	480	
306	312		H	220	430	190	370	
337	344		I	220	440	200	450	— 18K
353	360		J	140	200	160	200	
[illegible]5	373		K	125	200	160 170	200 150	~~370~~-392
375	383		L	120	150	rusty zone		378-400
390	400		M	140	160	150	210	
406	417		N	150	210	180	230	
420	430		O	150	210	180	230	fissile sh
438	448		P	190	210	190	240	= 17 B
450	461		Q	130	160	175	200	
						180	230	
462	473		R	150	250	185	250	
						180	250	
501	513		S	160	240	186	210	— 17 C
536	548		T	200	340	Paper sh		
548	560		U	200	320	Very bent		
[illegible]	573		V	200	370	"	"	
						"	"	
						"	"	
600	613		W	210	340	"	"	

CMM, ACH, & ARK   7/10/80 pg. 1

(80AMK-53) NE Sec 7 - 4S - 41E
Demarcation Pt. A-3 (SE) Photo #5453
69° 06' 46" N Lat, 142° 18' 10" W. Long
Examining Kongakut Fm type section at Bathtub Ridge
Lower part of section is poorly exposed to covered, but by walking around we could locate units. Landed on flat area on small hump made by lower Kemik type ss - att N80W 41 S ⊥ 53 E
Otc is largely rubble, but some is in place. LVF slty, dark, weathered, but looks like qtzose Ellesmerian type about 10' ± or less thick. Bear digging in otc indicates sh immediately below and above.

On hillside below are float or rubble otcs of hard mudstone - sh, dk gray, slty w/ com floating VF sand grains. lower half is pencil fracturing, some crops out - At least 300-400' of section or interval (calculated 850')
⊕ 53A-C going up

Below is covered - no Sadlerochit

About 30' below Kemik Ss is float of coquina-like slty Ls. Buchia ?
⊕ 53D

(80AMK-53) Cont   7/10/80 pg 2

Checked resistant bed on bench below large covered interval and found it to be Jurishak Ss. This is 280' in elev below base Kemik.

(80AMK-54) SW Sec 7 - 4S - 41E
Demarcation Pt A-3 (SE) Photo 5453

On ridge ½ mile to west at elev 3750' (chopper) which is 670' above base Kemik. This is in small saddle just above lower main saddle.
From here down is all slty sh, v hard platy dipping 35-40° S
This calculates to be about 2100 strat ft above base Kemik. Looking at adjacent ridges, section looks normal, dips are uniform and no folding.

Above is more sh but no hard ledges sticking out. Chert & qtz pebbles in float
⊕ 54A-C in 200' interval above chopper
above is all sh (distance view) to about 200' below 4700' ridge. First Ss appear about in upper 200'
⊥ 54D from float in gully (of Ss)

7/10/80

(80AMK-55) E/2 Sec 18-4S-41[illegible]
Demarcation Pt A-3 (SE) Pho[illegible]

High on ridge where section was probably measured. Chopper elev 4720'

Several thick ss otc separated by ss rubble-covered soft? section
Ss dk greenish gray, UVF lithic-graywacke, no good bedding features - too short a time to look - rained off.
Dip = 40-45° S.

(80AMK-56) N/2 SW Sec 16-2N-37E
Demarcation Pt C-4

Quick stop to look at Kingak Sh along Aichilik River.
Sh is dark gray fissile firm and contorted folded and faulted
80-56 A & B for SR

(80AMK-57) NW NW Sec 16-2N-37E
Demarcation Pt C-4

Kingak Sh as above w/ conc.
80-57 A & B for SR

CMM, ACH, & ARK 7/18/80 pg 1

(80AMK-79) Sec 18 & 19-4S-41E
Demarcation Pt Quad A-3 (SE)
Photo 5367

Walking down ridge to look at Bathtub Graywacke. Started on 5000' peak which is dipping N Att: E-W 40 N
This dips into a tight syncline
From peak to south of saddle where chopper landed (130 ft below peak) are structural wobbles and good south dip doesn't start until about at hump south of chopper.

Section consists of numerous resistant ss beds 15-50'+ thick separated by rubble and soft silty sh rubble.
Ss greenish gray, mostly UVF-LF w/ com scattered bimodal C grains floating, very hard, p bd or no discernable bedding in much of the highly fractured otcs, some trough X bd, but hard to tell w/ all the fracturing, no apparent grading although in upper part of section, granules are in lower part of bd, but matrix is same. Uppermost otc has some granule cgl, ^small trough X bd on upper surface → S. Tidal chan on shelf?

7/18/80 pg 2

∠ 79 D & E
⊗ 79 A, B, C & E

Sh is slty to sltst, dk gray, hard, had to dig to see - mostly rubble, some knobby patterns on some strata - sole marks?

Undecided on what to call environment for this mess - shallow marine shelf or deep water. No good criteria.
There is very little cgl in this section, just a couple thin granule beds i.e. 1" or so. But ss's have scattered bimodal M-C - granules in LF matrix

Attitudes and samples taken are approximately on Photo 5367

Traverse down ridge (up section) starts south of folded strata at about high point on ridge where 38° dip is plotted. Flew around folded zone later and estimate that lowest ss in section on N side of peak is about 100-200' below where we started our traverse. According to chopper altimeter, from high pt to low pt at 22° dip is about 1050' drop in elev.

7/18/80 pg 3

(80AMK-80) SE/4 Sec 7 - 4S - 41E
Photo 5453 Demarcation Pt Quad A-3 (SE)
Landed on break in slope at top of Detterman's Sltst member and at base of thick shale unit he doesn't show on his section.
This thick shale unit calculates to be about 1050 feet thick to base of first ss unit of Bathtub Graywacke. Calculated by map or photo scaling and using chopper elevations (and later 1:63360 topo).
Sh is dk gray, slty, hard, fissile to platy, com chert ~~[illegible]~~ pebbles up to 1-1½" in lower 200± ft - none above (this is based on float). In upper 100-200' there are some thin 1/8-1/4" Sltst interbeds. Contact with first Ss is rather abrupt except for thin Sltst interbeds. Ss is VFG, hard lithic fractured
Attitudes or dips are 30-35° fairly consistant.

Walked down ridge thru section to base of Kemik Ss sta 53
Sltst Member part of section is hard platy to fissile slty sh - more resistant beds are about the same lith - just a matter of more induration. There seems

	Chopper Elev.	Adjusted
AM		
Peak	4950	4830
Lowest ss on face to N	4450	4330
2nd " " "	4580	4460
1st landing in high saddle	4820	4700
Landing at 22° dip	3800	3680
PM		
Lowest ss on N slope	4400	4200
Saddle at base unreported sh	3910	3740
On lower Kenick ss 3080 ½	3260	3060
In creek at top Badlerocket	2850	2650

(30AMK-80) (Cont) 7/18/80 pg 4

to be no definite contact with underlying Pebble Sh Mbr just a gradual reduction in platyness and resistance to erosion and becoming more manganiferous. Chert and lithic ss pebbles in lower 50-100' only.

Sandstones of Kemik Mbr are very thin and mostly rubble ctcs. Uppermost ss is probably only a couple ft., LVF. The middle ss is no more than 15' including silst beds. The lower ss is 6 or 7' in one bed and another rubble ctc 5 or 6' above. Lower ss has sharp contacts with underlying and overlying fissile sh. some ⊘, and striations or grooves on base

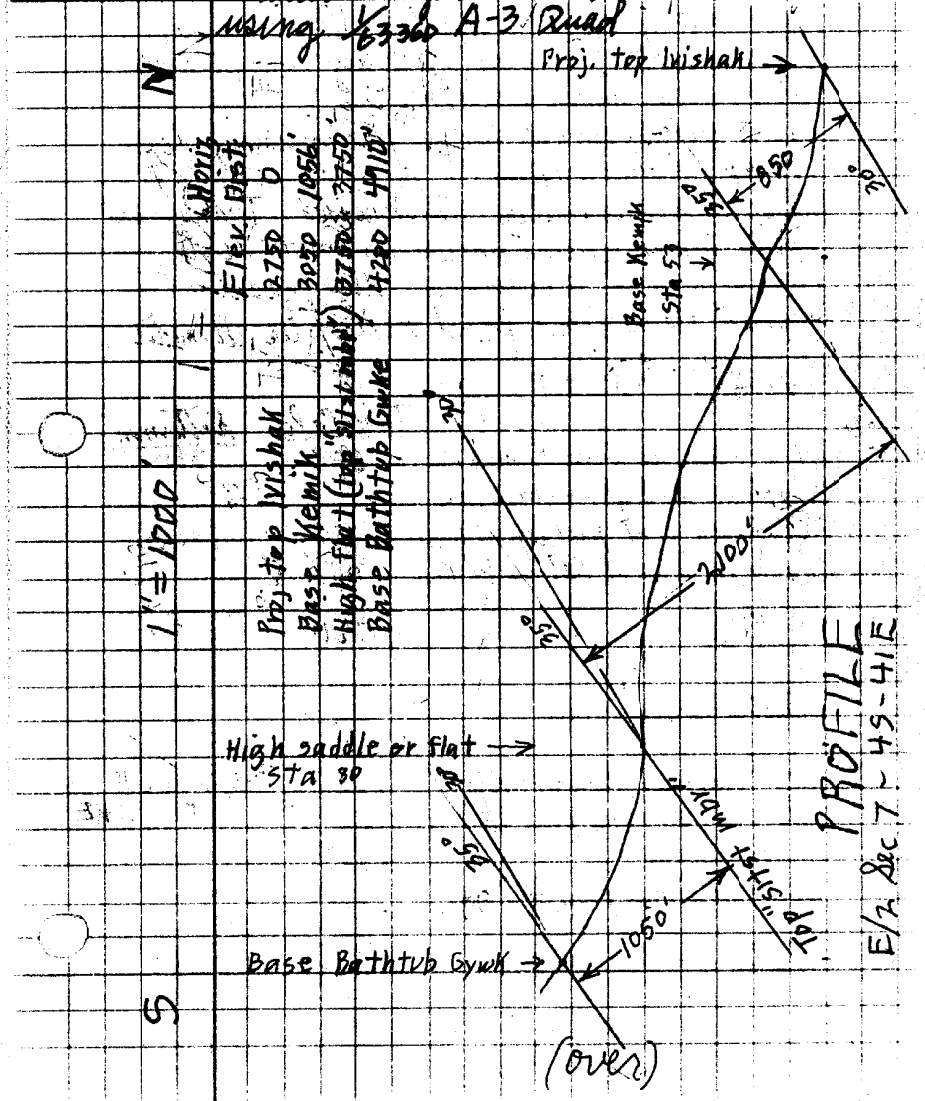
(30AMK-81) S/2 S/2 Sec 6 - 4 S - 41 E
Photo 5453 Demarcation Pt. Quad
A-3 (SE)

at top of Saddlerochit (Ivishak ss), VF.
Above is shale rubble and squirrel diggings, no exposures, no basal cgl or pebble bed noted in float
Sh silty v hard, platy, dark gray-blk

⊘ 81
Att on top Saddlerochit: N60W 25S (F)

10/81

Kongakut Fm Type section
Bathtub Ridge area Thickness calculations
using 1/6336 A-3 Quad



10/81

Summary of calculated thicknesses of Kongakut Fm. and Bathtub Graywacke at or near type section.
Used just-acquired 1:3360 preliminary topo map, Demarcation Pt. A-3, to calculate (descriptive geometry) thicknesses. Transferred points from aerial photos to map with fair degree of accuracy. Also, used adjusted elevations from helicopter altimeter

E/2 Sec 7 - 4S - 41E

	This Calc	Detterman
Top Ireshak to base Kemik ss	1850	350
Base Kemik to high bench white	[illegible]	
Detterman et al part top of Kkm.	2100	1740
Bench to base of 1st ss of Kbg	1050	
Total	4000	2090

Bathtub Graywacke

Part traversed down ridge	1360	SE/4 Sec 18 T4S, R41E
Calc. remaining part to syncline	1400	
Est. additional part at base	150	
Total Bathtub Gwke	2910'	2460'

83 AMK-27 Sec. 1 - 45 - 39E
Demarcation Pt A-3 (SW)
Battlefield Ridge in area of Dettermans West syncline section LVF
Top of Sadlerochit - Ss, - coarse Sltst, qtzose very hard blocky, abundant burrows in top 2 ft. Below top 5-10' is 15-20' soft covered section, then main Sadlerochit.
Σ smpl 27 of coarsest ss we could find
Att E-W 625 G
A few ft above is squirrel diggings of black sh hard, fissile-platy
⊕ smpl 27A
About 75-100' above is good rubble out of blk sh ⊕ & Geochem smpl 27B

Covered to base of hill, then discontinuous fissile shale bits w/ some Buchia coquina float

			Ft above base
⊕ smpl		27C	300'
"	& Geochem smpl	27D	600
"	"	27E	900
"	"	27F	1300
"	"	27G Kps	1800
		27H	2000

⊕ smple (Buchias) 21C, F & E

83 AMK-27 Cont

Buchias in 27F are in fissile platy sh and are fragile. Buchia and large pelecypod in 27E Buchia was found strat below other pelecypod
27G is prob pebble sh - contains rare small pebbles in some manganese nodules

27H is at base of hard platy shale - Dettermans Sltst member

Att at base (Top PRs) is E-W 625
Several attitudes going up section are about the same decreasing to 54° dip at 27H

83 AMK-28 C N/2 Sec 8 - 45 - 40E
Demarcation Pt A-3 (SW)
Battlefield Ridge Chopper elev 4660'
on high saddle above resistant "Sltst" mbr
Hiked up hill and collected samples over 500-1000 ft of section
Geochem samples 28 A, B, C, D
⊕ samples 28 B, C, D

7/24/83 p.3

83 AMK-29 C S/2 Sec 5-45-40E
Demarcation Pt A-3
Bathtub Ridge area
Collecting samples through upper half of "sltst" member

Geochem & ☒ smples 29 A, B, C, D

Att: Dip is about 40-45° S

83 AMK-30 NW/ Sec 5-45-39E
NW Demarcation Pt A-3
~~S~~W end Bathtub Ridge area
Landed chopper near top PKs
Hiked up to pebble sh, found a few pebbles and manganese nodules
Geochem and ☒ smpl 30A
Geochem smple ~~B~~ B " 30B
in lower part of Kps above 3-4' of ledgy quartzose coarse sltst, in beds 2" to 6", wavy bedding w/ shale interbeds, gradational bases
± 30-C Kemik Ss (?)
Below from Kemik to base is all shale, mostly covered in lower part. Scattered Buchias
☒ 30-D in upper part of this interval
Geochem smple D & E below Kemik

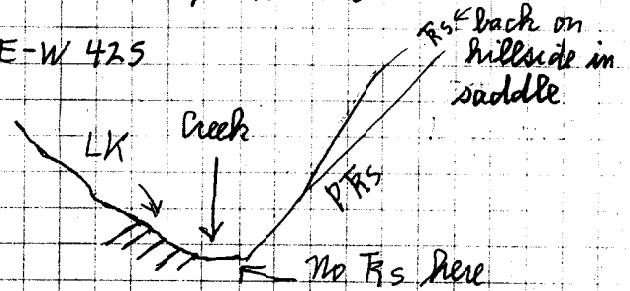
Att dip 45° ± to S

Molnaar and Kelley 7/18/85

Reconn trip to Bathtub Ridge on beautiful clear day.

85 AMK-28 Near C NW/4 Sec 5-45-39E
Demarcation Pt A-3
Revisit to Sta 83AMK-30 on south side of BR and to west:
68°07'41.3" N; 142°45'50.9" W in saddle at base of LK section here is prob. ☒ Shublik fossiliferous dark Ls.
☒ 85-28A on tundra covered dip slope to N.
Immediate west this bed appears to be about 15' thick and continues for quite a way. Down gully a few hundred ft to E, it is not present. There LK sh-sltst is within 15-20 strat ft of dip slope of PKs
± VF ss, dark gray, hard, sli calc ± 85-28B
± Basal LK is silty w/ 1-2 mm thin ~~ss~~ laminae ± 85-28C

Att: E-W 425



(85 AMK-28) (Cont.)

This does not seem to be a fault contact at base of LK -- no slicks no contortions etc. However, there is no basal transgressive ss or anything to indicate a normal transgressive sequence except for a thin laminae of ss.

Away from contact, PT_{3s} has concentric folding and faulting that does not carry into overlying LK. However at contact, PT_{3s} and LK appear structurally conformable. More work needs to be done on this problem.

Walked up through LK section as far as "siltstone" mbr. as described in 83-30. Scintalometer readings were 60-80 background and 60 to as much as 110 on otc. throughout sequence. No increase in pebble shale. Found some odd-looking
85-28A ~~fish~~ fossils or burrows (conduits?) just below "siltstone" member. 85-28D
John found 1/4" tan hard tuff layers in "siltstone" mbr, which may be why "siltstone" mbr is more resis-

(85 AMK-28) (Cont.)

tant to erosion. It certainly doesn't look any siltier than the other shales

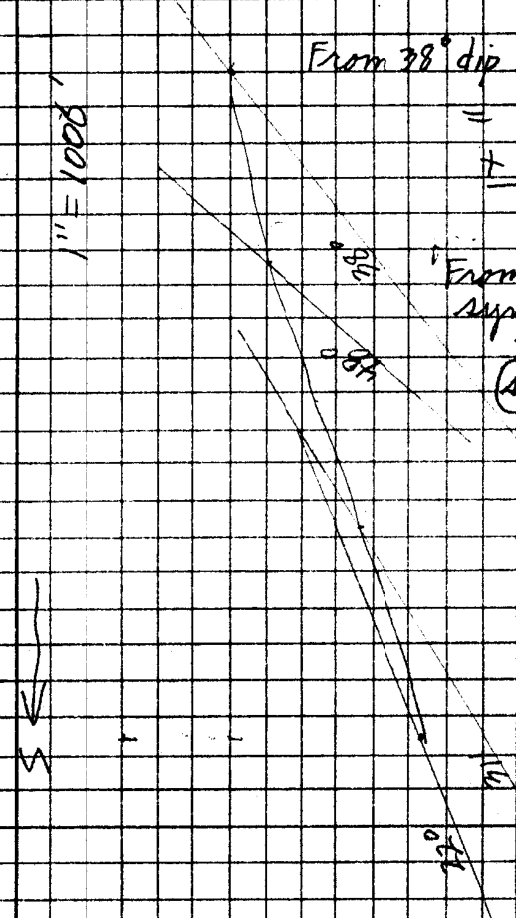
John took samples of tuff for thin sections and for rads.

Flew around west and south side of BR and took a lot of pictures. On south side, Lisburne is thrust over PT_{3s} in places. Seems to be more of an overthrust province like central Brooks Range.

10/81

Bathtub Ridge section
Calculations on partial thickness
of Bathtub Graywacke
@ Sta 80AMK-79

1" = 1000'



From 38° dip to 22° dip = 1360' ±
+ 1400
2760'

From 22° dip to syncline = 1400' ±
(see other side)

Bathtub R. – end

7/17/82 Molenaar & Kirk

(82AMK-1) Echooka River area
NE/4 Sec 35-1S-18E
Sag. B-2 Quad

Area of somewhat slumped Kps
black sh, fissile, no pebbles seen.
Fairly flat to gently south dip
50-100' exposed
At S end of oc are hard 2-3"
ls interbeds. Sh as usu w/
hematitic coating. Above ls
bed are v thin bedded Brookian
ss, f-vf w/ carb streaks.

L ± 80AMK-1 of Ls & ss

& 80AMK-1A of sh just above
ss interbeds. Should be
Albian?

In Kps (?) below BK is 250 cps

7/17

7/17/82

(82AMK-2) Echooka River
NW NE Sec 35-1S-18E
Sag B-2 Quad

Checking out badly wx cgl in upper part of bluff. About 30' thick, poorly sorted, sub ang. clasts up to 2', most 2"-5" w/ clasts of ss ls sh argillite
Abundant shale clasts & matrix.
Cgl has sharp irregular scouring contact into underlying sh.
Poorly bedded but some bedding traces fairly flat w/ some 5-10° W dipping and E dipping 10-15° ± accretion beds.
One 2-3' clay sh interbed w/ gouge or fracture white or orange clay
Sh appears concordant w/ cgl
& 82AMK-2A of interbed

Cgl has abrupt lateral contact w/ sh & 82AMK-2B from sh below cgl

Cgl is exposed as knobby protrusions or ribs on hillside.

7/17

(82AMK-2) Cont

Interpretation: This appears to be a debris flow. Question is whether its Holocene or Lower Cret.
Sh interbed suggests that it is L. Cret - a deep water channel (?)

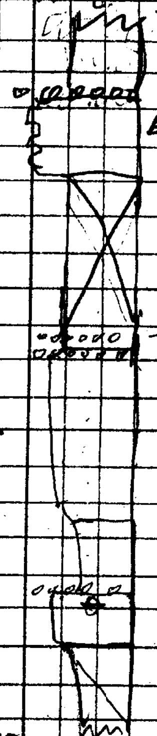
(82AMK-3) S/2 S/2 Sec 26-1S-18E
Sag B-2 Quad

SLP Ots along bluff of thin bedded turbidites & sh, generally dipping N 30-40° w/ some disturbed faulted areas.
ATP Turbs up to 3' thick, mostly 3"-4" 100' ± exposed F-VF, graded, com sole marks - grooves, flutes trending N 50-80 E (3), abundant carb - plant frags on some bedding planes.
Sh is sltst p. bedded
& 82AMK-3
Just downstream is several 100' of sltst dipping N.

7/17

(82 AMK-4) Echooka River
NE ~~SE~~ Sec 25-1N-16E Sag B-2

Shallow marine - nonmarine (?) sequence



More Ls - broken otc

L 82AMK-4(F)

Broken otc F-M ss w/ scat pbls com carb wood frags at base of some beds - fluvial

covered soft section

6" cgl

1 sq = 25'

Reg shoreface

- 82AMK-4(D)

~~burrows~~ small, curved gray mud-filled

65 45

Att: N 45E 65 NW G

7/17/82

(82 AMK-5)
NE Sec 9-1S-16E
Sag B-3 Quad
Soft section dipping steeply to S
500' ± section mostly covered but several black carb sh-coal otcs
some friable F-M ss between

Coal Smpl 82AMK-5 Coal sampl

(82 AMK-6) SE Sec 9-1S-16E
Sag. B-3
On N side of hill S of last station
Presumably up section from coaly sequence is orange wx rubble of qtz-jasper pebble cgl

L L 82AMK-6

This seems to continue to N

7/18/82

Molenaar & Kirk

82 AMK-7 E/2 NE/4 Sec 19-25-12E
Sag B-4

Measured Toolik River section on west bank. Plotted on section measuring forms

Measured 835' of cyclic regressive sequences. All neritic and lower shoreface. Upper Cret.

7/18/82

Molenaar & Kirk

82 AMK-8 C N/2 Sec 7-25-15E Sag B-3

Took measuring section for paleo context photo 3 miles E of Sag River

N75E 30S

350' Sltst, dark gray, soft (WX)
fair bedding

@ 8A at base
8B at 35'
C at 95'

Sltst as above but w/ hard beds
½-2" thick, sandy

@ 8D at 195'
8E at 245'

Sltst as above - soft
8E at 270'
8F at 350'

Above is 50-100' more. Section is somewhat folded and possibly faulted in upper half

7/18/82

82AMK-9 C E/2 Sec 17-3S-15E
Sag A-3 Quad

Took Photo 100'± Yellow-orange wx sil brent-Tuff zone w/ thin zones of fissil black organic sh, hard, brittle
Also thin VF ss beds

9A & B SR
9A & B ⊙

Dip is about 50° to S

82AMK-10 SE/4 Sec 17-3S-15E
Sag A-3 Quad.

Took Photo 6 mi east of Sag River

100'-150' Interbedded ss & silty sh.

Ss in sli graded beds (some) UF-LF mostly flats, sharp bases, beds up to 2' thick in mostly thickening upward cycles 5-10' thick, some load casts, groove straations, com ripple marks on top, abund
L carb on upper bedding planes.
⊙ One 2' chert pebble cgl
± 10A ⊙ 10A & B Att NBDE 455 G

7/19/82

Molenaar & Hurk

82AMK-11 SW SW Sec 1-2N-12E
Sag C-4

On east side of White Hills near Toolik River

Red clinker bed horizon is obvious on west side of Toolik River. Found one spot that was not burned. At least 15' of coal is exposed - probably is much thicker

Coal Smpl 82AMK-11 Coal sample

Fairly flat lying

This is most likely Tertiary.

7/19/82

Molenaar & Kirk

82 AMK-12 to 14 Sta 12 W/2 SW Sec 16-4S-14E
Sta 13 E 1/2 Sec 16-4S-14E
Sta 14 NW NE Sec 21-4S-14E
Seq. A-3 Quad

Examining Lupine River section

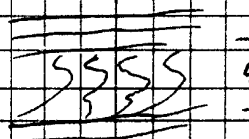
Entire section is deep water. Ss beds have sharp bases, abundant bottom marks - grooves, some flutes, musc. scours, grapevine structure; com small scale X bds and ripple beds (Bouma c), sli grading. LF-VF ss/mino scat M grains at base of some beds; com ripples and interference ripple marks at top of some beds. Some thick ss beds w/o distinct structures, fractured - looks like facies B. Direction features (scours) N 15E, 30E, 55E, 70E
One 20-30' slt exposed at 1270' on section, bentonitic, slty

Sta 12 A & B
@ 12 Roll over bottom mark or ammonite?
± 12 at 1780 on section
± 13 High in section (contained Inoc prism).
± 14 very high in section
@ 14 " " " Inoc frag. and possible bivalve

7/19/82

82 AMK-15 C N/2 Sec 17-3S-15E
Seq. A-3 Quad
Downstream from sta 9
Dip-slope exposure of turbidites and sh, about 25' strat ht.
Bottom marks E-W, N80E
alt N80E 55S
Up section is very bentonitic mud. One thin turb ss - groove trend N70E

Farther up section on N side of side canyon is blk sh - slst (from distance) w/ penecontemporaneous deformation.



82 AMK-16 SW SW Sec 36-3S-15E
Seq. A-3
100' slty mudstone well bedded w/ thin calc beds and a few very thin VF ss
@ 16A & 16B
At top is a zone of 2"-6" thick ss beds (turbs) sharp bases, load casts lam w/ ripple layers. alt: N80W 20N
Otc show penecontemp slumping.

This is prob slope deposit.

7/20/82
p. 5

~~82 AMK-18 Cont~~

~~Smples 5R to 18R from~~
~~30' below rusty zone~~
~~BK 250 CP 360~~

82 AMK-19 SW NW Sec 36-4N-26E
Mt. Michelson C-3
North side of Sadlerochit Mtns
Location #04 of Lyle et al
Took 2 pics 100-150' exposed of Paleocene prodelta turbs. 50% ± SS in beds up to 4" thick. Bouma C, D (small scale X bd)
Lineations at base are abundant — no relief on marks, but trends are
24 N 75E, 65E, 85E E-W att: N65E 24N

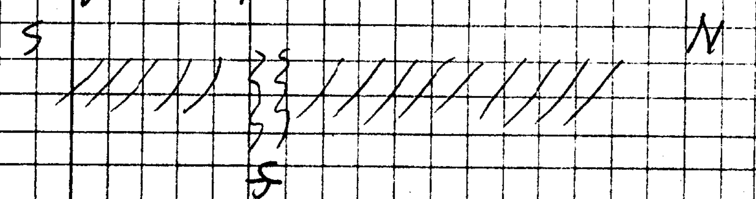
82 AMK-20 SW SW Sec 29-3N-24E
Mt Michelson C-4
On west bank Canning R. examining base of Lyle et als section #13 pl. 8
Looked at basal 25'. Bottom marks in float. Could only see lower part of thick 29' ss. Sharp basal contact; bottom marks (loads) 3' up. These are deep-water. Pebbles and cobbles are reworked iron-stone concs
L 20 of ss.

7/21/82
Molenaar, Kirk & Magoon

82 AMK-21 S/2 Sec 35-1S-16E
to NW NE Sec 2-2S-16E
Sag B-2

Measuring section on west bank of Ivishak River. Plotted on section measuring forms. Upper Cret.

Measure 2600 ft; 1900' below a fault and the remainder above. Drag(?) indicates fault is down on south; thereby section is cut out and younger on the south. However, this is not certain. If it is up on the south, the 1900' of section would be farther up section.



80E

7/22/82

Molenaar, Kirk & Magoon

82AMM-22 C S/2 S/2 Sec 5-3S-17E
Sag A-2 Quad

Measuring section of turbidites on east side of Itkillik River.
Starting at sharp anticlinal fold and going south
Att: N85E 45S

0-92	92'	80-90% Ss in beds 1" to 8" thick, graded VVF-LVF, some LF, comm bottom marks - grooves, ripple texture, Ss is hard, tight T- smpl 22A at 25' Grooves trend N10E, N15W (2 observations). Some wavy ripples on top of beds Thin sh-silst interbeds - mostly < 1", one 6-12" at 35' B smpl 22B
92-120	28'	Sh & Ss Ss 25% in beds 1-2" thick, grooves → N10E Sh, rusty wx, silty, bent. B smpl 22C
120-125	5'	Covered
125-163	38'	Ss and Sh: 80-90% ss as below
163-172	9'	Sh & Ss 30% Ss, 70% Sh B smpl 22D Groove → N10E
172-190	16'	Ss & Sh 60% - 40% Ss in beds up to 12" as described, comm ripple bedding at top of beds (Bouma C) Att N70E 54S B 22E
190-350	160	Sh w/ <10% thin ss beds Sh, rusty wx, dark gray B smpl 22F at 26' " " 22G at 58' H I J K L
350-380	30'	Ss
380-86	6'	Sh B 22M
386-436	50'	Ss 95% as below Inoceramus 22N Bottom mark → N60E

7/21/82

7/22/82

Molenaar, Kirk & Magoon

(82 AMK-23) SW SW ~~SE SE~~ Sec 10 - 25 - 17E
Sag. B-2

Measuring section on lower Gilead Creek. Plotted on section-measuring forms

Measured 810' of UK shallow marine lower shoreface & neritic; very cyclic

(82 AMK-24) S/2 S/2 S/2 Sec 27-25-17E
Sag A-2

Checking Fcs in rain along Gilead Cr. ~~and~~ south of section

ATP Shal w/ a few 1-2' turbs
att E-W 73N overturned.
Groove → N70W

Section to south is dipping steeply to south and appears to be deep water.
& 24 smpl from fissile sh 100' above turb

Section to north is dipping moderately to N and may be shallow water.
There is probably a large fault in between

7/23/82

Molenaar, Kirk & Magoon

(82 AMK-25) Sec 10 to 3 - 1S - 14E
Sag B-3

Sagwon Bluffs - looking for oil-stained ss for about 1½ mile opposite Sagwon. About 200' of fairly flat lying section exposed on bluffs. Thick coal beds, clay and siltstone and a few thick fluvial ss

82AMK-25A Coal sample from coal bed at least 18' thick

25B Coal sample from 12' coal bed 30' below 25A.

25C Flora sample from lower part of section

25D Dark gray claystone from lowest part of section

25E Coal sample from base of exposed section

Found some fine grained, sli pet. smell ss in float. Oil Sd smpl 25F

L smpl 82AMK-25G - Clean friable fluvial ss - Kogosukruk Fm?

7/23/82

(82 AMK-26) NE SE Sec 32-1N-14E
Along pipeline road in back of Saguaro Bluff Sag B-3

12' ± thick fluvial ss exposed along gully, lt gray, M w/ C & small pebbles, fining upward, trough X bds w/ small scale X bds at top, friable, well sort

± 82AMK-26

This is stratigraphically higher than outcrops on bluff - prob is close to ctc at top of hill. Fairly flat lying, sl dip to west or SW.

7/23/82

(82 AMK-27) NE/4 Sec 9-9S-15E
Philip Smith C-3
Walking through 1500 ft of Fortress Mtn turbidites near Elusive Lake

Ridge exposures of fractured rocks

Ss is in beds 1-4' thick, dark gray w/ greenish cast, very hard, p sorted in lower part of well graded sequence. Course w/ F-M some granules at base, fine grained at top, appears to be mostly Bouma a, some minor c, minor bottom marks,

± ± sample 27 Very lithic, clay galls

Shale interbeds are mostly covered, but is very dark gray, pencil fracture,

Smple Geochem sample 27

(82 AMK-28) C Sec 9-9S-15E PS C-3
At base of ridge in gully below above station. Dark gray very hard sh w/ minor 1-2' thick turb ss. A couple hundred ft exposed

Smpl Geochem sample 28

(82 AMK-29) NE Sec 26-8S-15E PS C-3
Grab sample (geochem) of Lisburne
Smple Group north of Elusive Lake
Black, arg, fct

7/24/82

Molenaar, Kirk & Magoon

(82 AMK-30) SW SW Sec 16-2N-24E
Mt. Michelson C-4

Otc along tributary on E side of Canning River.
15' VF ss, v hard, blocky, in beds 1 or 2' thick. At base is p sorted, dirty, silty zone 3' ± thick, con oysters, sub ang - rnded pebbles of Shublik ls.
G 30 Att: N20W 15W
This is probably a basal transgressive ss - Sag River Ss

(82 AMK-31) SW SW Sec 16-2N-24E
Mt. Mich. C-4

Upstream a couple hundred ft and below (strat) sta 30
15' exposure of Shublik v calc arg sh - lst w/ monotis, phosphate nodules, shark teeth ?,
G smpl 31
SR smpl 31

7/24/82

(82 AMK-32) SE/4 Sec 8-3N-25E
Mt. Michelson C-4

Hot spring at west end of Sadlerochit Mtns near saddle east of Red Hill.
Strong smell of H_2S, springs are bubbling and have high gamma-ray count - 12,000 CPS. Prob is radon gas.
Took sample of ooze and algal mat cover
82 AMK-32

Gilead Syn. Sec.

7/25/82

Molenaar & Magoon

82AMK-33 Sec 28-35-18E

Saag. A-7 Quad

Gilead syncline section

Measuring section in Gilead Creek area. Starting in shale below main ss package

Alt N80E 30% N

0-115 115' Silty claystone-mudstone, dark gray hard, non fissile, w/ hemicitic coating in fractures. One ¼" bentonite bed. Minor thin 1-4" vf-f ss-course silt interbeds (< 5%), sharp bottom contacts some bottom grooves, very slt grading, minor scouring noted of ss into ss.

GR count BK CPS 120-175

& 5 SR samples 33A at 15'

33B at 60' ±

Upper ¼ of interval is partially covered & rubble etc.

115-315 200' Covered - probably is soft section inasmuch as it is continuous.

Common bottom marks in creek float from above.

315-415	100'	Ss greenish gray, very well indurated VF-F, no sequence, poorly bedded irregular scallopy bedding (or fracturing), some scouring, p-mod sort, subarg This is prob Facies B turbidites Took 2 pics
415-432	17'	Partially covered Sltst-mudstone to LVF ss, platy
432-514 ±	82'	Ss greenish gray, hard, mostly UVF w/ LF & VF, mod sort, some UVF (± 330 at 15' ±), no sequence, irreg. scallopy bedding (took pic) w/ good bedding planes every 3-6" in upper half Att: N80E 2°N
514-522	8'	Inter bedded thin bedded mudstone & ss in beds 3-8" thick, graded UVF w/F → LVF, ripple beds at top of ss beds, bottom marks, grooves → N & N30E SR & ☒ smpls 33E

522-607	85'	Ss as described, mostly VF w/ LF, com scallopy ripple bedding, minor sltst partings
607-657	50'	Partially covered slty mudstone, platy - sub fissile ☒ 33 F & G at about 15' & 45' SR 33G at 45'
657-682	25'	Covered
682-707	5'	Sh-mudstone, dark gray, hard ☒ 33 H
707-777	90'	Ss dark greenish gray, hard, in sli graded beds (UVF w/F → LVF) 1-5' thick, separated by platy mudstone interbeds (10-20%) Att N70E 28S ± 33 ± of ss Com bottom marks → E-W, N70E
777-817	40'	Covered
817-907	90'	Broken etc Ss w/ mudstone interbeds - prob 75% Ss in beds up to 5' thick, sli graded UVF w/F → LVF, bottom marks Att N75E 26 N some channeling

Mudstone platy to p bedded in beds 1"–2'
Ss smpl 33 J

55' Ss 80% & Mudstone 20%
907–962 Ss as below, mostly VF in sli graded beds 1–5' thick, minor bottom marks (no directions noted)
Otc is rusty wx
Att N72E 29N
Mudstone as below
This is at drainage junction near middle of E boundary Sec 23

350' Mudstone w/ 15-20% (in lower 60') ripple bedded yellowish wx Sltst interbeds 1–3" thick, sharp base – turbidites
962–1312
SR & Ss 33K from near base
SR & Ss 33L at 100'
SR & Ss 33M 165
SR & Ss 33N 295'
2 – 1/4" bent beds at this point

Above basal 60' is all sub fissile mudstone, well exposed, rusty wx on bedding surfaces – may be tracks but no patterns seen

At upper end of sh section, strikes and dips become erratic. Possibly faulting in here or soft sediment squeezing in syncline

Offset in section 3/4 mile to SW

Shale section we just measured is in large covered (vegetation) area below thick resistant hill-forming ss

175' Covered
1487

Starting at base of lowest ss otc in resistant hill-forming ss
Att N50E 13-15 NW
95' Ss, somewhat broken otc, but most seems to be continuous, greenish gray hard lithic, mostly VF (VVF) w/some minor LF, poorly bedded to massive irregularly bedded - scalloped bedding, fractured, dish structures (?)
1582 Minor bottom marks in float
This is facies B turbidites

15' Covered slope-former some shale in float and thin bedded sltst in upper part
1597

45' Broken otc Ss VF w/ minor
1642 sltst interbeds, cm bottom marks
→ N75W

Top of knob - Elevation here is 450' above base of covered soft section below (presumably base of 350' sh we measured up other fork of creek. Strike and dip at base and top of this interval averages N50E 15 NW for map scaling purposes

Molnar, Kirk & Magoon
Continuing Gilead syncline section

Starting on knob where we left off yesterday. Will use chopper elevation and map scaling method to plug in thickness of covered intervals and Jake staff method for semi detailing ss ledges. Using 15° dip

222' Covered - float indicates shaly
1864 silty interval with some ss interbeds Ss is VF, bottom marks are common

25' Ss - somewhat broken, fractured
1889 otc. Below are some thick bedded ss blocks, but discontinuousness indicates they are probably slumped from above! This is first ss that has continuity
Ss, greenish gray, hard, mostly VF w/ some LF grains in sli graded beds 1-6' thick, Bouma A w/ C in sltly interval at top, abundant bottom marks (ropy, grapey) some → E-W
Ss is non calc, very lithic, musco-
± vite ± 33 ⊖

10' Covered slope - prob is shaley or thinner bedded interval — 1899

30' Broken otc Ss as described, mostly dislocated blocks of irregularly, scallopy bedded — 1929

30' Covered slope or flat - prob thin bedded or shaley — 1959

18' Ss (broken otc) as above w/ some VF-M ± smpl 33P — 1977
irreg ripple bedded, no grading sequence, bottom marks, grooves → N75E (17, 55)
att: N55E 17 NW

This is top of large resistant bench which is 120 ft (chopper altimeter) above bench below where we finished yesterday.

247' Covered (calculated thickness) flat area to base of first ss in place on upper slope above. Prob is sh and thinner bedded ss. One ss w/ pebbles noted in float — 2224

38' Ss greenish gray, hard, non calc, thick bedded, irreg poorly bedded, no silt breaks, dish structures? VF-LF, Facies B — 2262

Below is large talus-block covered and then flat area below

ATP Another large resistant knob. Chopper elevation is 90 ft above knob below

230' Covered flat as below — 2492

10' Broken otc Ss as described, top of hill and top of section. Chopper elevation above last ledge is 110 ft. Resistant ss is probably somewhat ~~higher~~ greater than 10', but is all rubble. One piece w/ wood frags, common marks. — 2502
att: Strike is probably swinging toward N - maybe N35E?

Gilead Sym Sec end

7/26/82

(82 AMK-34) NE NE Sec 33-35-18E
Sag A-2 Quad
Downstream from base of Gilead syncline section

156'± exposed of dark gray-black sh non-fissile, sub calc, flssl, com 4"-8" ls concs, limonite staining along fractures and platelets, scat qtz grains
& & SR smpl 34 A, B, & C (going down section)
& SR " " " "

Att is approx N65E 32 NW but at S end of ote structure goes to hell

Scat sand to granule size grains found throughout section, but more common in upper part this unit is probably pebble sh
Gamma-ray count is negligable
EK 105 CPS 120 DB 140

(82 AMK-35) NE Sec 33-35-18E Sag A-2

a few hundred yards downstream on ote of same sh w/ qtz grains
& & smpl 35 Gamma-ray count is negligable

Dip is to NW

7/16/82

(82 AMK-36) SW SE Sec 33-35-18E
Sag A-2
Downstream from last station
50'± otc of black claystone, non fissile w/ a few ironstone concs
No fossils found

& & & SR smpl 36
This is probably Kungak Sh

(82 AMK-37) SW SE Sec 33-35-18E
Sag A-2
On west side of creek ~ 20' otc of same as sta 36
& & smpl 37

(82 AMK-38) SE SE Sec 6-35-18E
Sag A-2
Along Gilead Cr. Side tributary gully, exposes several 100 ft of Kungak sh, dark gray-black, clayey, minor ironstone concs, no significant GR count

& & & SR samples 38

Dipping 45°± to S

7/16/82

(82AMK-39) Sec 27-2S-17E
Sag A-2

40' otc of Ss in beds 1-5' thick, sharp base, com bottom marks, → N65E, VF, some very slight grading. Prob VK turbs
att E-W 20N

Below and little to S is 8' otc of fissile sh, limonite on platelets
B B 39 smple

7/27/82

Molenaar, Kirk & Magoon

(82 AMK-40) SW NW NW Sec 2-1S-1W
Umiat B-4

Collecting oil sample from old Umiat well #4. Bailed about ½ gallon of light-colored waxy crude by using 5½ oz fruit juice can weighted with a large nut borrowed from O.J. Smith. Borrowed a large bolt of twine from GS1. Oil level was 299' below casing head. Collecting rate after method was established was about 3½ oz per 3 minutes. This calculates out to be 0.31 BOPD

7/28/82

Molenaar, Kirk & Magoon

(82 AMK-41) SW SW Sec 16 - 11S - 12E
Philip Smith Mtns B-4
at base of Kfm clastics - Atigun gorge

gradational contact from slty mud-stone below to VF ss - sltst to more resistant VVF ss in 50' of section. Ss is greenish gray, mod sorted, dirty, w/ minor sclt pebbles. Some thin mudstone breaks w/ com carb debris and horiz. B, some interference ripples. Some larger wood frags up to 6" diam and 2' long

Att: N80E 60N G

Found some cylindrical-shaped (belemnites?) objects that may be a fossil - prob not, but sampled B 41 very calc

(82 AMK-42) SE Sec 17 - 11S - 12E
Philip Smith B-4

Walking through Kfm section
Cyclic units of Ss and Cgl

Cgl in units 10 - 40' thick, in thick

7/28/82 p2

flat bedded units 1 - 5' thick generally fining up pebble to granule. Pebbles mostly < 1" w/ some up to 2", dominantly chert, dark gray to light gray, some silicified ls, minor but conspicuous lt green chert, very rare qtzite, subang to rounded, mod srt
t smpl 42A of cgl

Ss, in units up to 100' ± thick, greenish gray, med brown wx, mostly LF w/ some VVF, some isolated pebbles, flat bedded to low ∠ trough X bdg - esp just below cgl units. Com horizontal B noted in upper part of section, some carb. Most of Ss section is rubble ck

Cgl units are at top of cycle. Cycle begins with Ss possibly slightly coarsening up (VVF → LF). Base of cgl units is sharp - prob indicative of abrupt change in input - eg a river mouth bar or storm surge.

One carb sh coaly interval noted in squirrel diggings in soft covered
8 unit 150' ± (Topo) below top of hill. Coal - carb sh smpl 42B

Attitudes range from N80E 70N at base of section to N75E 50-55N above. Probably N75E 55N is good average.

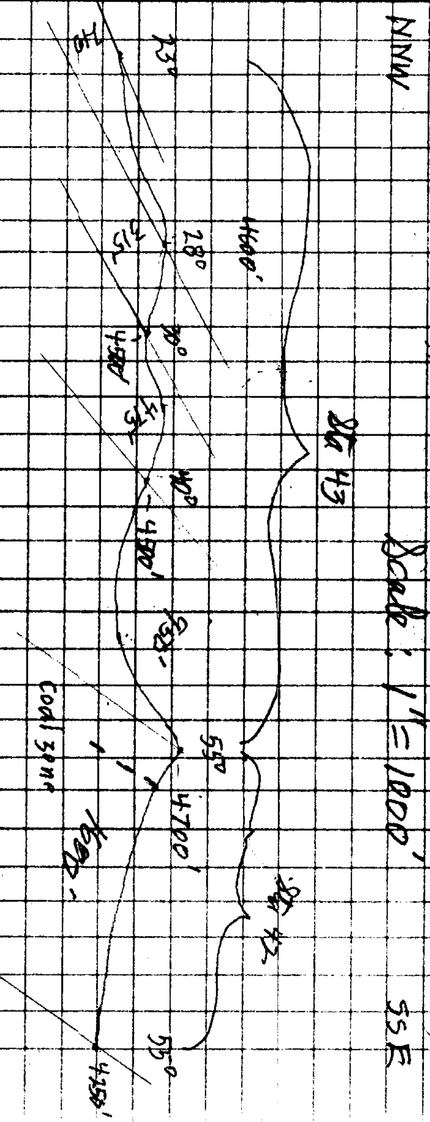
(82 AMK-43) N/2 Sec 17 to SE SW Sec 8-11S-12E
Philip Smith B-4

Continued N on ridge up section.
More of the same Ss & Cgl. In upper part of section there are a couple of thick cgl units with a few clasts up to 4"-8". No fossils found, no more burrows except for possibly some in uppermost part.

attitudes or dips decrease to 40° and at end of section is 21-25° (N80E)

Up section (down slope) is a few hundred more feet of covered ~~xx~~ ss rubble etc to syncline axis

Interpretation of sta 42 & 43
Depositional environment is shallow marine w/ a minor amount of nonmarine as indicated by the coal. The cgl units are interpreted to be river mouth bars and/or storm surge deposits due to episodic outpourings of rivers into narrow coastal zone. A fan delta.



Calculation for thickness of Fortress Mtn Fm Sta 42 & 43
Calculated from topo elevation and distance traversed, and attitudes taken along traverse. Topo: Philip Smith B-4 1/63360

Total Thickness: 3560'
Coal zone ≅ 1300-1350' above base

(82 AMK-44) NE/4 Sec 23-11S-12E
Philip Smith B-4

Landed on small knob of Sublik in Atigun gorge

At top is very fissile black sh over-lying bedded gray ls 1-2' beds w/ nodules and calc sh
SR smpl 44A from ls-sh-phosphate nodule section CPS 200 (phosphate 350)
SR 44B from fissile sh at top
BK 100 CPS 300
Above section is disturbed. Float from above has blocks of oyster(?) bed coquina, some frags w/ inoceramus ~~shell~~(?) prisms(?). One small belemnite.
(?) 44C

(82 AMK-45) NW/4 Sec 26 - SW/4 Sec 23-11S-12E

Walked thru upper part (strat) of overturned Sadlerochit Gp blk fissile clay sh.
Barite nodules in upper part (strat)
This is mapped as PRs, but looks like Kingak Sh - 1000' ± of solid blk sh
SR 45A-C from lower part (strat) of blk sh

(82 AMK-46) NW/4 Sec 13-11S-12E
Philip Smith Mtn B-4

Collecting samples and topo measuring of thick mudstone section below KFm.
Starting at top - abrupt contact with thick coarse-grained KFm ss
± smpl 46A Att N75E 55 N G

Although this is an abrupt contact, sh section below is coarsening upward in upper 200± ft from silty mudstone to sltst to silty VF ss w/ scattered granules. Most of section below is non fissile silty mudstone, dark gray, very hard, poorly bedded, scattered ls concretions up to 12"±, mudstone is non calc. Base not exposed
~~&~~ samples 46B to L through section going down hill and down section.
Attitudes or dips throughout section are steep 50 to 60° although in lower part it was down to 30°
At bend in gully 450 to 500 ft topographically below top (near sample 46H) are a couple ss intervals - slope channel ss. The upper one is about 25-30' thick and is conglomeratic at base and channels into somewhat ~~pre~~ contemporaneously

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slumped mudstone. Below a short distance (50'±) is about 75-100' of ss, LF-UVF, platy, thin bedded, no grading or bottom marks, which also channels into mudstone or has scouring channels within it.

Map scaling data:

Elev diff between top and base	850'
Angle from base to top	25°
Horizontal distance across strike	1900'

Calculated thickness =

1900 to 2000'

7/29/82

(82 AMK-48) NW NW SE Sec 6-2N-26E
Mt Michelson C-4

Kingak Sh - overturned section about 115' exposed and covered. Silty mudstone, dark gray, non-fissile. Found belemnites at 2 horizons

⊕ 48 A at 15' ±
48 B at 50' ±

SR 48 A B & C
C is 15' from top

85 65 Att at base Kemik Ss N85W 65N
overturned

(82 AMK-49) C N/2 S/2 Sec 2-2N-30E
Mt Michelson C-2

On S side Sadlerochit River below Kingak Cliff.
50'± otc of Sh, black, fissile, w/ ~~ov~~ a few ironstone concs. Found no fossils
Kingak Sh.

~~⊕~~ & SR 49

(82 AMK-50) C N/2 N/2 Sec 6-2N-31E
Mt. Michelson C-2

Looking for Kps & JK contact below Kingak Cliffs
Outcrops of shale along rounded sides of drainage - rubble otc

ATP (upper exposure) Dark gray-blk fissile shale, w/ pebbles up to 1" in float
Ps smple 50 A & B
SR " " "
Found some sh w rare course qtz grain. ↑ smple 50 of pebbles for D. Blanchard. Also odd rosettes collected

(82 AMK-51) C N/2 N/2 N/2 Sec 6-2N-31E
Mt. Michelson C-2

Down hillside ~ more rubble sh otc of fissile blk sh

Ps & SR smple 51 A & B

B may be in Kingak, but found a couple pebbles in float?

A is most likely in JK

(82 AMK-52) C south line Sec 2-2N-30E
Mt. Michelson C-2

Looking for pebble shale along bluffs above Sadlerochit River
Most of the shale is fissile black Kingak type. However, found a few pebbles and rosettes along and near the top of one or two rubble slopes

Ps 52 from that interval where it is plotted on map

(82 AMK-53) SW SE Sec 3-2N-26E
Mt Michelson C-3
S side of Ivagek Valley
SR samples from Shublik 53 A-D

(82 AMK-54) SW SE Sec 3-2N-26E
Mt Michelson C-3
S side of Ignek Valley
③ 54 from Kemik Ss
Nondescript pelecypods

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Molenaar Kirk & Magoon

(82 AMK-55) C N/2 N/2 SW/4 Sec 27-3N-25E
Mt Michelson C-4

Ignek Creek section plotted on section measuring forms 1" = 50'

Good section from Kemik Ss thru Pebble shale and into UK bentonitic shale (Shale Wall Mbr).

Kemik Ss	62'+	Base not exposed
Pebble Sh	290-313'	First bent at 290± Major bent at 313
UK Bent Sh	125'+	

7/30/82 p.2

(82 AMK-56) NE NE Sec 27-3N-25E
Mt Michelson C-4

Outcrop of Shublik Fm on S side of Sadlerochit Mtn
SR smpl 56A from fissile sh (blk)
56B Arg ls w/monotis

Very petroliferous odor
Att N75W 25S

Sag R. Albian Turb Sec.

7/31/82 p1

Molenaar, Kirk & Magoon

(82 AMK-57) C N/2 Sec 16-5S-14E
Sag A-4

Measuring strat section on E bank of Sagavanirktok River 10 miles south of Happy Valley.
Measuring using Jacob staff method

Base of section - covered below
att N75E 35S

21' Ss, med gray N4 or N5, hard, VF w/ some silty VF, p bedded, load cast under one bed, com carb frags & mud chips in slty ss, small scale X bd (ripple lam ~~Bouma~~ c) at top non calc. No grain size sequence. Top 2' is contorted slightly w/ water escapement flowage features

32' 11' Ss, med gray, hard, VVF-LF, no grading - possibly slightly coarser upward, non calc, blocky, p bd to thick bd, minor carb, no bedding features, except rippled or load cast at base
E smpl 57A from top

41'	9'	Silty mudstone, partly covered, mottled dark gray - brownish gray, ripple lam, some carbo debris @ smpl 57B SR smpl 57B
49'	8'	Interbedded ss & silty mudstone (80-20) Ss VF, in beds 8"-24", sharp scour base, ripple lam at top (Bouma c?) no good grading except at very top into mudstone Silty mudstone in beds 1-3" thick partially covered Att: N80E 35S
92'	33'	Covered - prob mudstone w/ thin bedded ss
94'	12'	Broken etc Interbedded mudstone and LVF ss (50-50) Ss in beds 2"-3" Bouma b-c going into d in mudstone sharp bases. Bottom marks in float @ @ simple 57C near top. Minor bent.
129	35'	Interbedded ss & mudstone (75-25%) Ss, VF, in beds 4-10", sharp base Bouma b-c, com groove casts → N50-60E (several) Att N70E 36S

209'	80'	Ss VVF-LF, thick bd, couldn't examine most of this because sharp deep river cut - had to climb up and around. Com bottom marks in lower part
217'	8'	Ss & Mudstone (50-50) w/ one 4' mdst in upper part Ss as described, beds 6"-2', graded LF-VF Bouma b, c, ? d, com casts One layer of 2-3" conca in ss Att N72E 36S
234	17'	Ss & mudstone 80-20 Ss as before in beds up to 4' thicker bedded upwards, ripple lam on top surfaces, common groove casts → N55-65 east (3 readings) Large grooves N75W & E-W
289	55'	Partly covered thinly bedded VF ss & mudstone (50-50) in beds up to 10", minor bent. Ss VF, ripple lam Bouma c @ @ 57D at 38'

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304 B	15'	Broken otc slty mudstone B 57E
344'	40'	Covered
392	48'	Ss med gray VF thick bedded w/ some med bed 2'± in lower part hard, non calc, no good grading but sharp bases and some ripple lam on top surface going into thin mudstone ~~toe~~ parting, com carb on top surf. Bottom marks, grooves → N65E (1)
		One thin bent sh at 20'
I		I smpl 57F at about 30'
399	7'	Covered soft section
419	20'	Ss as described, p bedded, fractured minor thin sltst partings, com carb and sh chips on top surfaces
437	18'	Covered soft section - prob interbd ss & sh

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467	30'	Ss as at last 20'
477	10'	Covered soft section
		Att N65E 36S
497	20'	Ss 90% in beds 1-3' w/ sltst partings, VF, some M grains at base of beds, some ripple lam at top of beds, com carb on tops, fractured, p bedded
532 B	35'	Covered soft section - slty mdst float, dug out B smpl 57G at 12'
553	21'	Ss LF w/ M-C grains scattered, med gray, hard, p bedded w/ some minor scouring, fractured minor small grading, no sltst interbeds. Is this a facies B unit? Scat carb and sh chips
I		I 57 H
563	10'	Partially covered ss as below

588 25' Covered

~~578~~

578 10' Partially covered mudstone
Ø 57 ±

~~603~~

603 5' Ss w/ flute casts at bottom

~~583~~

82 AMK-58 C E/2 Sec 16-5S-14E
Sag A-4

Next ote upstream from section; 40'± exposed. Thinly lam & ripple lam slst and VF ss, slo grading LF → VF in one 14" bed
Beds are slightly contorted but most are about N55E 37 SW

Sag. R. Sec. end.

82 AMK-59 SW Sec 34-2S-14E
Sag A-3

Ote on E side of Sag River
About 75' of shallow marine VF grained sandstone w/ 2 5-10' slty mudstone beds
Ss, lt gray, flat bd, com Ø, various kinds skolithos, diplocraterian

Scattered pelecypods, some large Inoceramus
Ø 59 ±
G 59 Att: N78E 12 N

82 AMK-60 C N/2 Sec 35-1S-14E
Sag B-3

E side Sad River
50'± nonmarine fluvial Ss w/ some interbeds of slty mudstone
Ss M conglomeratic, X bd, friable
± smpl bd, scouring base
BK 80 CPS 100
Slty mudstone in beds 5'± thick, dark gray-brown very carb, nonfissile
Ø (pollen) & SR (prt) smpl bd
BK 80 CPS 160

82 AMK-61 NW SW Sec 29-2S-15E Sag A-3

About 10-15' exposed shallow marine ss w/ abundant HCS com Ø, fossils (clams) Att: Fairly flat

8/2/82 p1

Molenaar Kirk & Magoon

(82AMK-62) C Sec 5-2N-19E Sag C-1

Measured section on N flank of Sharrock anticline. Used 100' tape and brunton compass.
Measured 2415' starting in shallow marine sltst, going through poorly exposed or developed shoreface to nonmarine coal and fluvial channel conglomeratic ss.

(82AMK-63) NW/4 Sec 32 - SW Sec 29 - 3N-18E
Sag C-2

Measuring thick coal beds above fluvial ss section we looked at in 1980 = 80ACH- This is Tertiary

Going up section:

42'	coal low-rank	Broken etc
40'	sand and clay, bentonitic	
29'	coal	
16'	sand and clay	
60'	clay and sand	
50'	coal	

covered above

R_o = 0.27 (M Bostick)

8/3/82 p.1

Molenaar, Kirk & Magoon

(82AMK-64) SESW Sec 10-2S-17E Sag B-2

Collecting silty mudstone, hard, nonfissile samples below lower Gilead Creek section about 300-400' of section collected

Ø Ø smpls 64A-E att: N75E 50N
SR SR " 64A, B & E

(82AMK-65) NWNE Sec 34-2S-17E
Sag A-2

Gilead Creek - about 50' of bentonitic sh w/ a few individual bentonites (1") overlying 40' of fractured, VF ss med bedded, p bedded, no grading, no bottom marks. Facies B turbs?
Ø att: N70E 70S
SR Ø & SR smpl 65
This is probably UK on basis of bent.

8/3/82 p. 2

(82 AMK-66) NE SE Sec 14 - 35 - 18E Sag. A2

Looking for fossil along open knob or ridge in Kingak Sh
Found belemnites lower down
B 66A
Found ammonite frag higher up
B 66B no attitude available, all rubble & float.

(82 AMK-67) NW NW Sec 24 - 35 - 18E Sag A-2

Resistant bed 5' ± thick that angles down hill. Sltst, c, gray, p bedded contains rounded to angular pebbles of phosphate?, com fossil frag - one gastropod, some pelecypods
B smpl 67
Dipping 5-10° to SW
This looks like Triassic - Shublik or Karen Cr. Float down section is not Shublik - p bedded sltst
Float above is Shublik calc sh - w/ monotis

8/3/82 p. 3

(82 AMK-68) C SW Sec 26 - 15 - 18E Sag B-2
Echooka River ~~Oe~~ downstream from Kps

200' Sh w/ thin bedded turbidites (80-20)
Sh is dark gray, fissile to non-fissile, non bent, but feels somewhat gummy in upper part. No bent seen

Turbs are coarse Sltst, hard, 1-4" thick, sharp base, Bouma b & c sequence. Grooves → N40E ///
Att N80E 50N

B B smpl 68 A & B

(82 AMK-69) SE SE Sec 19 - 15 - 21E
Sag B-1
Ts

Along upper Kemik Creek to sample for
SR SR 69 A & B , att N75E 25N
Going upward in section is blk, non-calcareous to sli calc sh, sltst and at the top is lst w/ abundant monotis. Higher still in float is fossiliferous, calc, sh.
A is from lower sh; B from ls.

8/3/82 p. 4

(82 AMK-70) SWSW NW Sec 35-1N-20E Sag B-1

First otc up side drainage of Kemik Cr.
40'± Sh dark gray, clayey, sub fissile
no att, one thin bentonite noted
~~Kingak~~ Kingak Sh
Found a Buchia
(B) 70

(82 AMK-71) C S/2 Sec 6-1N-23E
~~Jago~~ Kwoka R. Mt. Michelson B-5

UK bent sh - mudstone outcrop immediately S of yellow wx, v bent part of section. ATP ~~is~~ contains floating pebbles up to 2". This must be Campanian-Maestrichtian? part of section with pebbles at Ignek Valley
So smpl 71
± smpl 71 of pebbles
Structure is very contorted

(82 AMK-72) SE SE Sec 24-2N-22E
Mt Michelson C-5
Slty mudstone w/ thin 1"± VF ss interbds (15%) Shelf?
So smpl 72 Dipping very gentle to N

8/4/82 p.1

Molenaar, Kirk, and Magoon

(82 AMK-73) NWNWNW Sec 14-SWSW SW Sec 11
2N-28E Mt Michelson C-2 & C-3

Fire Creek area. Sampling Fire Creek Sltst Member, Shublik and lower part of Kingak Sh

SR smpl 73	A & B	Fire Creek Mbr
" "	C-L	Shublik
" "	M-O	Kingak Sh

(82 AMK-74) SWSW Sec 8-2N-32E
Mt Michelson C-1
Turbidite otcs on Hulahula River
50-50 ss & bent sh, Ss ~~dark~~ med grey, VF, Bouma b, c, & d, bottom marks
100'± exposed
att N75E 30S

(82 AMK-75) SW Sec 11-2N-30E
Mt Michelson C-2
Top of small knob at west end of Kingak Cliff - Rubble otc of VF sltst thin bedded turbs and bent sh (soil)

8/4/82 p 2

(82 AMK-76) SE Sec 10-2N-30E
Mt Michelson C-2

River cut along Kekiktuk River - S end

Dark gray-blk sandy sh, fissil w/ floating F-M grains and thin lenticular 1"-2" beds of M-C ss, very hard, non calc,
Att N80E 30S
± smpl 76
Ø & SR 76

(82 AMK-77) NE SE Sec 10-2N-30E
Mt Michelson C-2

200' downsection from sta 76 at N end of otc. Sh, dk gray-blk, fissile w/ minor ironstone concs - some being replaced in center by qtz → pyrite
One rounded coarse sand grain found in sh, some limonite stained zones
Found some "rosettes" in sh up to 1"
± smpl 77 of concs
Ø smpl 77 A & B
SR smpl 77A

This otc is ~~prop~~ prob. pebble sh

8/4/82 p. 3

(82 AMK-78) C Sec 8-2N-24E
Mt. Michelson C-4

On west bank of Canning River
15-20' exposed fairly flat lying, gentle west (?) dip. Exposure is for 300'+ along shoreline
2 pics Ss, lt gray, brn wx, F w/ m to stringers of 1/4" pebbles in graded beds 4" to 2', Bouma a, b and minor c, ripple marks at top of some beds. No shale interbeds, minor scouring, x bedded in part, abundant carb and wood trash on top surfaces, common clay galls, minor bottom marks (load casts)
Petroliferous (?) odor on fresh break
gives very very faint cut? and cut fluorescense (later)
± ± smpl 78

Interpretation: These are turbidites

8/5/82 p1

Molenaar, Kirk & Magoon

(82 AMK-79) SE Sec 1-1N-23E Mt Mich B-4
= 80 AMK-20

Elev: 1320

On west hillside west of Canning River well above Kemik Sandstone in west plunging syncline

410' Silty mudstone, dark gray, hard, non fissile, p bedded to platy, minor thin (1"±) graded sltst beds, v minor lineation scours, mostly no bottom marks, minor ripple lam (very small scale), small ¼-⅜" rnd blebs w/hematite staining - pyrite centered? One thin bentonite < ¾" and large calc conc about ⅓ way up. No other bentonite seen in well exposed section. A few small nondescript pelecypods found ③ 79

③ 8 smpl A-D through section
③ SR " A&C " "

Att: N10-50W - 38 SW

This section may be distal Torok bottomsets

8/5/82 p2

(82 AMK-80) SE NE Sec 34-1N-23E
Mt Michelson B-5

Revisit to 80AMK-10 - Kingak - Kemik - Kps - Brookian turbs to collect fossils in Kingak Sh

③ 80A - about 150'± above base in float but probably ~~didnt~~ came from shale bank - 1 Buchia

③ 80B - about same location as collection in '82. Many Buchias in shale - very fragile. In same zone are many "rosettes". Just above is a zone of 2-4" round cannonball concs calcareous.
Also, collected a Belemnite

In same zone, found 2 chert pebbles, ¼" and 1", subround and 1-7" silicified peletal grainstone (Lisburne?) sub angular but definitely in place
± 80B

8/5/82 p. 3

82 AMK-81 C W/2 Sec 34-1N-22E
Mt. Michelson B-5

Shale etc along small creek east of Juniper Creek
Shale dark gray, rubbly w/ scattered
G ironstone concs. Found a few Buchias
G 81
Estimated att N50E 35 ~~SE~~ SE

8/6/82

Molenaar & Kirk

82 AMK-82 ~~NW/4 Sec 16-2N-1BE~~ NW NW 5-2N-16E
= 80AMK-34 Mt. Mich. C-4

Revisit to Tertiary (?) at top of Ignek Valley section for photographs.

Took 2 smpl 82A & B

82 AMK-83 NW Sec 16-2N-18E
Sag C-2

Measured section on lower Sharrock River. Plotted on forms
Jacob staff - Brunton.

Measured 595 ft.

July 20, 1983 CMM, ARK, LBM

83 AMK-1 SW/4 Sec 5 5N-26E Mt Mich. D-3

E side of Tam. River, small otc along bank. 5'± exposed
Ss, gray, fine grain w sort, flat bd, com horiz. burrows, beds 6"-12" thick, hard well indurated lower 2' overlain by v soft well sort LF w/ thin streaks black grains — (detrital coal).

alt N65E 24 N
± 83 AMK-1
To ~~south~~ north 200' is small otc of soft silty sh, brownish, non fissil.
& 83 AMK-1
Interpretation:
These sands-ss are shallow marine.

Mt Mich C-5

83 AMK-2 S/2 S/2 S/2 Sec 34-4N-22E
Hilltop a few miles E of Kavik airstrip
Large blocks of med grained ss on S side of crest of hill - prob. not too far out of place since they are all similar - prob fluvial. Brown oil stained on fresh exposure.
Oil Ss smple 83 AMK-2
Gives good cut.

CMM, ARK, LBM 7/20/83 #2

83 AMK-3 SE SW Sec 33-4N-24E
Mt Mich E-4
Along W. bank of Canning River
Low river bank exposure - about 6 strat ft exposed
Ss lt brn, lt med-lt gray LF-UVF well sort, slabby wx in flat beds 1-3" thick, flat bed w some low angle swales - hummocky? bedding
photo #13 some woody frags at base, some vert. burrows (1/2 cm)
Shallow marine
alt N70E 23 N (F)
± and oil? Ss smples 83 AMK-3

83 AMK-4 SW SW Sec 10-4N-24E
Mt Mich C-4
On bluff on E side of Canning River
Sltst med gray to black, soft coarse, about 20 ft exposed dipping away from glacial-covered hill. Com large 3-8' concs, separated by soft sltst, some small siderite concs
Some of soft sltst is black - carb?
& Ss smples 83 AMK 4A & B

alt N45 E 12 NW (F)

83 AMK-5 SW/4 Sec 26-5N-27E
Mt. Mich. D-3
On east bank of Kat River
25 ± ft exposed ss & sand (20-80%)
Hard ss ledges 1-3 ft thick, VF, med gray, calc, sharp base w/ well developed groove lineations trending E-W, some load casts, some horizontal furrows on base of beds, mostly flat bd w/ some small scale ↗.
In between hard ss beds are softer sands, VF w/ common thin carb streaks.
Dip is 5 or 6° to south
± 83AMK-5
Vit. smpl 83AMK-5
~~This is prob nonmarine marginal marine~~

83 AMK-6 C E/2 E/2 Sec 33-7N-39E
Demarcation Pt D-3
Angun Pt Oil Saturated Sand
Q blow and beach sand aggutinated by oil making sand very firm or hard. Very petroliferous on fresh break.
Oil sand sample 83AMK-6

83 AMK-7 NW NE Sec 4-6N-37E
Demarcation Pt Quad D-4
Long muddy dtc[?] on E side Niguanak R. above snowbank.
Gooey bent sh and bent, badly wx, slumped, no attitude, prob contorted
Bo & SR samples 83AMK-7

83 AMK-8 SW NW Sec 9-6N-37E
Demarcation Pt D-4
280' of black fissile or paper shale and bentonite exposed in tight anticline with 80° ± dipping flanks. This prob Turonian-Coniacian - same as Jago R.
Geochem sample 8A-G mostly going down section. Bo samples 8A, C, E, F, G
Sample F(Bo) was from 10' ft thick, brownish zone w/ abundant Inoceramus frags.
Gamma Ray background = 50. Sample peaks = 150 ±; G was 240

83 AMK-9 Near center Sec 30-2N-38E
Demarcation Pt C-4 & B-4
In small saddle 2½ mi E of Aichilik R.
near Sadlerochit / Lisburne contact
Sample Sadlerochit (& Lisburne)

Upper Lisburne has a lot of oolitic ls and
fine grain med gray ls.
Geochem sample 9A
Att E-W 46 N

Overlying Echooka is very fossiliferous
calc & VF clastic ss and ls, com brach-
iopods, some corals, some pyrite cubes
± smpl B & D, from Echooka which
is about 200' thick - mostly rubble

Overlying Kavik is in saddle and about
300' thick - mostly covered.
Dug out some hard dark gray sh
Geochem samples C, E, & F

Above is mostly all talus of Sivulluk
to top of hill to south - about 400'
± smpl from base of talus
G (ss) and H (chert & mudstone pebble cgl)

± smpl I of fine grain wht ss from
rubble near top of hill (top of Sivulluk?)

83 AMK-10 SESE Sec 29-2N-38E
Demarc Pt B-4
Low hills of Kakak Sh near valley
bottom with 100' of good otcs along
E side of hill along creek

Sh black, hard platy to fissile
Smples 10 A, B, & C south to north
and smpl D about 300 farther
up creek. All samples for Geochem

Att N45E 45-60 SE
overturned?

83 AMK-11 SESE Sec 16-2N-37E
Demarc Pt C-4
photo 35 Shublik section on W bank of Aichilik R
Well exposed - about 300-400' thick
Geochem smples 11 A-E (5 smples)

Att N70E 60-70 N

83 AMK-12 same loc as sta 11

Karen Cr. Ss - dark gray very
hard siltst
± smpl 12

83 AMK-13 C 5½ Sec 16-2N-37E
Demarc. Pt. C-4
W side of Aichilik River sampling Kingak Sh along long bluff
Smples 13 A, B, C, D, E, F & G on lower part - first good otc prob several hundred feet above base
Sh is hard, black, small pencil fracturing
att N 50 E 60 N
all are Geochem smples in lower 1000' of section

83 AMK-14 ~~C SW/4~~ SW NW Sec 16-2N-37E
13 F&G Demarc Pt. C-4
Down river up-section from sta 13 and down section from 80AMK-56 Kingak
Geochem smples ~~14A & B~~ 13 F & G
Dip 10°± to N

83 AMK-15 SE SE SE Sec 8-2N-37E
Down river from 80AMK-56
Geochem smples 15 A & B (Kingak Sh)
Since sta 14, section flattens out, then is contorted

83 AMK-16 NE/4 Sec 17-2N-36E
Demarcation Pt E-4
Rubble covered hilltop with one 2-~~ft~~ thick fractured ss otc mostly all very fine w/ minor VF-LM. Bedding is flat to wavy, some small scale X beds → S or SE.
photo #4 A couple groove casts in float. This is prob. deep water brit no good turbidite features
att N-S dipping gently W
This otc is mapped as Manuschuk on Reiser's et al map.

83 AMK-17 W/2 NE/4 Sec 8-2N-36E
Demarcation Pt. E-4
Long otc on E bank of creek
Upper Cret brnt sh w/ 20% 1-4" v fine grained ss turbidites, com bottom marks in float. Sh has com iron oxide staining. Prob 500' exposed
att N 80 E 45 S
8 and Geochem samples A, B, & C

83 AMK-18 C W/2 Sec 4-2N-36E
Demarc. Pt E-4
About 300' exposed Sh, dark gray, p bd, rusty zones of wx some conc ledgers, non-
photo #5 brnt, micromica LK sh? K ps?
8 smples A-D; Geochem smples A-C
att E-W 50-60 S

7/22/83 p5

83 AMK-19 Sec 8-3N-35E to Sec 23-4N-35E
Demarcation Pt. C-5
Plotted on aerial photo #7599
Collecting sandstone samples throughout Salvation Creek section for thin sectioning and diagenesis studies.
± Samples 19A-M 13 samples
A at base; M at top.

7/23/83 p.1

83 AMK-20 NE/4 Sec 4-6N-35E
Demarcation Pt. D-4
Revisit to sta 80AMK-70 UK brnt sh on Jago River
Photos 7-17 Collected Geochem smpls 20A-F
& smples 20F-near top of exposure
Inoc frag smpl 20
Bentonite smpl 20
Att E-W 50° ± S
Gamma-ray readings with a background of about 100, are 150 to 250.
See photo #7847 for detailed locations

83 AMK-21 NW SW Sec 34-7N-35E
Demarcation Pt. D-4
West bluff of Jago River
Walked N from sta 20 looking for Tailleurs "pebble sh". Found sft w, brnt mudstone, non fissile, very sft w/ orange wx flat concs non to CO3, doesn't fizz, except slightly when scratched (dolomite?); scattered chert (wh & wht) pebble wx out, more than bentonite. This continues all the way to pt about ½ mile NNE to sta 80AMK-71. Petroliferous odor throughout
& smple 21A, B, & C going down river
Geochem 21C
± smpl 21 of conc

83 AMK-22 C w/2 Sec 34-7N-35E
Demarcation Pt D-4
Continuation of sta 21 down river to point or bulge at sta 80AMK-71

Φ smples 22 A & B
Geochem " 22A

83 AMK-23 SW SE Sec 3-6N-36E
Demarcation Pt D-4
Revisit to 80AMK-69, trib. of Nequanak River - Jurassic otc.
Too much snow filling gullies
Collected Φ and GeoChem smple from LK(?) sh (pebble sh?) on N side of gully from where we got Jurassic fossils. Rare chert pebbles in float
GeoChem smpl 23
Φ " 23

83 AMK-24 SW SW Sec 1-6N-36E
Demarcation Pt D-4
Checking gullies where USGS map shows Jurassic. Too much snow in gullies. Found VK bent sh to N and to S. One blk sh up gully to SSE
Φ smpl 24

83

83 AMK-25 SW/4 Sec 27-7N-30E
Mt Mickelson D-2
Subdued hills at E end Marsh Cr. Ant. Dug out brown bentonitic mudstone for sample.

Φ smple 25

Att. Dipping 35° to N (if it isn't slumped)

83 AMK-26 SW/4 Sec 18-9N-34E ?/?
Barter Island A-5
North shore of Barter Island
3'± exposure of blue-gray soft sticky clay. Pleistocene?

Φ smple 26

83 AMK-31 SW/4 Sec 15-3S-39E
Demarcation Pt. A-3
~~South of Bath~~ North of Bathtub Ridge on small tributary to Leffingwell Fork of Aichilik River
Sampling Kayak Sh for Geochem

Geochem smples 31 A, B, & C A at top

Kayak Sh is about 150-200' thick here

83 AMK-32 Sec 5 to Sec 8-2N-36E
Demarcation Pt. C-4

Measuring (map scaling) quick section

32A N55W 26S interbedded bentonitic shale w/ turbidites (Bouma B-C facies). Approx 50' exposed on creek bend. Sect 40% turb + 60% bentonitic shale. Paleo + Geochem spls 32A
Att N55W 26 S
C E line Sec 5-2N-36E (500'± above Kps)

32B SWSE Sec 5-2N-36E
E-W, 25 S s/ Lith as last stop paleo + geochem spl. Bottom marks trending ~~E-W,~~ N80W. 50 ft exposed.
Geochem & ~~fo~~ smple (1800' above Kps)

32C NWNE Sec 8-2N-36E
E-W, 25 S s/ Lith as first sta but 20% turb + 80% shale. Small fault at base. paleo + geochem spls.
Geochem and ~~fo~~ smple (2500' above Kps)

32D W/2 E/2 Sec 8-2N-36E
N70W, 50 S s/ Lith but thinner beds w/ 10% slst turb. paleo + geochem spls.
Geochem & ~~fo~~ smpl

(3700' above Kps)

estimate ↗

CMM, ARK, LBM 7/25 7/25/83 p. 1

83 AMK-33 SW NE Sec 24 - 6N - 27E
Mt Michelson D-3
Bluff on NW side of Kat. River
about 75' exposed
Sh - clay - mudstone, soft, bentonitic, med gray, com floating chert pebbles
att N70E 30 N (F)
& & Geochem smpls 33A & B

83 AMK-34 NE/4 Sec 34 - 6N - 27E
Mt Michelson D-3
W bank Kat River 100± exposed
Silty sh - mudstone, med gray, soft, com small chert pebbles & granules
& and Geochem smpl 34

att N 70E 50 S (F) but 50' to N is rollover to flat and gentle N dip. This is plot axis of Marsh Creek anticline
Photo

83 AMK-35 NE Sec 14 - 5N - 27E
Mt Michelson D-3
Bluff on E side Kat River
25' exposed in N gully silty sh - mudstone soft as above, pebbles in float
& & Geochem smpl 35 att N85E 30N
May be slumped - Found different atts in

7/25 7/25/83 p. 2

83 AMK-35 (Cont)
other gullies to S

83 AMK-36 NW Sec 11 - 5N - 26E
Mt Michelson D-3
W side Tam. River
Possible ote of conc bed w/x out of sh
att N 80E 45 S ?

83 AMK-37 N/2 N/2 NE/4 Sec 27 - 4N - 28E
Mt Michelson C-3
= 80AMK-50
Pebble shale ote
Geochem & & smpl 37A

83 AMK-38 SESW Sec 23 - 4N - 28E
Mt Michelson C-2
Quick stop to collect Geochem smpls from pebble sh Smpls 38A-D

83 AMK-39 SE Sec 19 - 4N - 30E
Mt Michelson C-2
E fork Marsh Cr. sampling PPs - Kps
Geochem smpl 39A Lisburne
& smpl 39B Echooka Ss

83 AMK-39 Cont

Geochem spls 39 C D E Kavik Sh
T smples 39 F, G, H, I Ivishak Ss

Geochem spls 39 J, K, L Pebble Sh

83 AMK-40 SESW Sec 18-4N-30E
Mt Michelson C-2
E Fork Marsh Cr.
Sampling Kemik Ss
T Smpls 40 A, B, C, D, E, F
See next page

83 AMK-41 W/2-W/2 W/2 Sec 31-4N-31E
Mt Michelson C-1
Outcrop on E bank of Sadlerochit River
E end of Sadlerochit Mtns
At S end of otc is about 40' of Ss, dark gray, LVF, very hard, qtzose non calc, blocky beds, 1-3' thick, abundant dark burrows. Is this Karen Cr - Sag R?
T 41 G? 41
Coming N is disturbed faulted zone and then about 25' of LVF-C sltst, minor or rare chert pebbles (Kemik Ss) grading up to pebble sh.
Geochem and T smple 41

83-AMK-40 Kemic Sandstone @ Marsh Creek section
SE SW Sec 18-4N-30E Mt Michelson C-2
45' of sandstone, upper 15' is repeated section along thrust fault
N 75°E
30° S

40A very thin bedded (1-2cm) darky gray silty sandstone at base with horizontal and vertical burrows thin pebble lag in lower most beds, whole unit about 2-3 ft thick.

40B overlying sandstone is 8-10' thick with medium beds of upper very fine grained - fine grained well sorted light gray sandstone

40C 12' above the base is 6-8" thick chert pebble conglomerate with chert pebbles > 3" in diam

40D overlying conglomerate is 10' thick sandstone with hematite stained zone 6-12" thick at the top, sandstone is upper very fine to fine grained and well sorted med scale trough x-beds near the top below FeOx stained zone, sandstone & FeOx zone overlain by 6-12" thick pebble conglomerate black & white chert

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(40E) 10' above second conglomerate
med scale trough x-bedded sandstone
fine to very fine grained, silty matrix
and light gray in color, horozontal
and vert. burrows

(40F) sample 2' below top of Kemik sandstone

CMM, ARK, LBM 7/26/83 p.1

(83 AMK-42) NE/4 Sec 11-3N-31E
Mt Michelson B-1 — C-1 ?

Last Creek area. Collecting samples
Kemik Ss on Shublik, sharp contact but
no pebble zone although on close inspection
there are rare small chert and qtz pebbles
in lower 3 ft.
Kemik is about 25' thick, LVF, dark gray
hard. At base of pebble shale are scatt-
ered pebbles and then scattered pebbles
throughout. About 100 ft Kps exposed.
Near top is a sltst
Geochem smples 42 A-E in upper 200'±
of Shublik
Geochem smpl 42 F, G, H, I in 100'± Kps

± smple 42 J from PKs (top)

(83 AMK-43) SW SW Sec 28-3N-32E
Mt Michelson C-1
On W side of Hulahula River
50' exposed in side gully
Hard dark gray Sh, p bedded, fractured
hackly, sub bentonite, prob LK
Geochem and ob smpl 43

Att: E-W to N65E 50-70 S

83 AMK-44 W/2 Sec 5-2N-32E
Mt Michelson C-1
W bank of Hulahula River — 200-300 ft
Highly folded turbidites, many overturned beds dipping 70-80° south.
Photos These show beautiful bottom marks, flutes & grooves → E
Ss mostly VF beds 6" to 2' thick, Ss is about 60-75% of section
Bouma a, b, & c
A few Inoceramids found at base of some bed, one about 12" across
Collected fragment and some others
83 44
Shale is hard to fissile, no bentonite noted
@ smple 44
LK or UK?

Dense fog rolls in

83 AMK-45 SENE Sec 18-2N-32E
Mt Michelson C-1
E bank of Hulahula River
Turbidites as at sta 44, no bentonite.
At S end of long otc com bottom marks @ & ± smpls 45 → ± E
Couldn't see remaining otc because of river cutting into otc
& Att N60E 50-60° overturned to S

83 AMK-46 SWSW Sec 8-2N-32E
Mt Michelson C-1
Revisit to 82AMK-74 to check bentonitic character, Yes, it is bent
Geochem & @ smpls 46

83 AMK-47 NWNE Sec 9-1N-32E
Mt Michelson B-1
W bank Hulahula River
Sampling Kekiak Sh
Geochem smpl 47A, B, C

About 150-200' exposed - sampled, lower 3/3 rds. Section is overturned

83 AMK-48 NWNW Sec 6-1N-32E to SWSW Sec 31-2N "
Mt Michelson B-1
Discontinuous otcs of Shublik
Geochem smpls 48 A-C
Overlying Ks is about 50' Karen Ck Ss
& mostly sltst w/some LL VF ss, very hard, dark gray, blocky beds 1-3' thick, burrowed, phosphate nodules (reworked?) in basal part
± 48

83 AMK-49 SW/4 Sec 31-2N-32E
Mt Michelson B-1
E bank of Hulahula River
Sampling Kingak Sh
Geochem and ☒ smpls 49 A, B C
Blk shale, contorted and faulted

83 AMK-50 S/2 NE/4 Sec 34-2N-33E
W bank of Okpilak River
Slumped? etc of Kingak Sh
Seems to bed dipping W
Geochem and ☒ Smpl 50

Outcrops are very sparse to nonexistent along river - mostly glacial

83 AMK-51 Sec 19? 2N-34E
Demarcation Pt ± C-5.
Hillside otc between Okpilak & Jago Rivers
Mostly rubble but one 3'± thin bedded otc dipping to S 15°±
VF ss, some groove casts and burrows on base of beds in float
☒ 51 smpl
Prob LK turbs

CMM, ARK, LBM 7/28/83 p1

(83 AMK-52) SW/4 Sec 2-2N-29E to NW/4 Sec 13 2N-30E Mt Michelson C-2

Dodo Creek on S flank Saddlerocket Mtns Walking down creek (up section) from Shublik through much of Kingak Sh

Kingak Sh is well exposed and apparently very thick. Shale is black, mostly fissile w/ subfissile, com marcasite and pyrite nodules, mostly in lower part w/ some in middle, com zones of iron stained shale

Dip varies from 50° to near zero, but mostly 25 to 45°, generally E-W strike, common contorted and folded and faulted zone but no large reversals in dip.

Collected Geochem, ☆ and fossils throughout section. Megafossils - small ammonites in lower part, pelecypods in lower part and less common above, some Inoceramus and rare ammonites in upper part (Middle Jurassic ?)

T/28/83 p.2

(83 AMK-52) (Cont)

Smpl No.	Geochem	☆	☆	Strike	Dip
A	X				
B	X				
C	X				
D	X	X	X	E-W	40 S
E	X	X			
F	X	X	X		48 S
G	X	X	X		
H			X		
I	X				15 S
J	X				45 S
K	X				35 S
L	X				40 S
M	X	X			
N	X	X			steep
O	X	X			20 S
P	X	X	X		
Q	X	X	X		
R	X		X		
S	X	X			
T	X	X	X		35-40 S
U		X			

Shublik

Kingak

7/28/83 p.3

(83 AMK-53) ~~SE~~/4 (SW NW) Sec ~~35~~ 3? - 2N - 29E
Mt Michelson B-2
Flying in fog up unnamed creek tributary south of Sadlerochit River. opposite Camp 263 Creek. Located sta by elevation on chopper
150 ft exposed on SE flank of creek
Interbedded VF Ss and sh. (turbidite)
Ss in beds as much as 1' thick, numerous bottom marks → N70E (G)

Sh is nonbentonitic to very slightly bentonitic
ꝺ and Geochem smpl 53
Prob is LK (Albian)

Structure: Dipping gently to east or SE

(83 AMK-54) C Sec 25 - 2N - 29E
Mt. Michelson C-2
Downstream from sta 53

Sh blk, firm, fissile - subfissile
Looks like Kingak
Geochem and ꝺ smpl 54

CMM, ARK, CMM 7/29/83 p.1

(83 AMK-55) NW/4 Sec 21 - 9N - 34E Barter Is. A-5
North side of Manning Pt.
Manning Pt. Collecting oil sample
Checked north end of island - found very oily smelling turf and surficial deposits - no actual oil seep.

Geochem smpl 55 (Give good cut)

(83 AMK-56) W/2 SW/4 Sec 16 - 6N - 28E
Mt Michelson D-2
Revisit to 80AMK-52 to recollect oil sand - SE bluff of Kat River

Geochem smpl 56

(83 AMK-57) SESE Sec 33 - 4N - 24E
Mt Michelson C-4
E bank Canning River - looking for oil sand
Shallow marine section - several small regressive buildup cycles from sltst to dist channel(?) ss - no good or big regressive shoreface buildups, com clasts

Geochem and ꝺ smpl 57
T smpl 57 (VF ss)

83 AMK-58 SW Sec 31-1N-27E
Mt Michelson B-3
N side of 4th range - Ikiakpuk Valley
Checking gully where Shell reported Cret turbidites.
Several hundred of overturned shale and thin bedded siltst & LVF ss, ripple bedded, com ripple marks on bses of beds some groove casts, some burrow trails.
~~Ss~~ Ss is quartzose Ellesmerian type w/ some altered (oxidized) pyrite
± 5B
Sh is fissile to slabby, brittle, hard non-calc slty. Axial plane cleavage developed.
Geochem 5B
Section is overturned 40 to 70° to S
Farther up gully, section is very contorted and faulted. Further up is Lisburne, but we didn't go that far.

This is probably distal Sadlerochit - prob still on shelf (?)

83 AMK-59 E/2 E/2 Sec 1-15-27E Mt Mich B-3
~~Fourth~~ Fourth Range grab sample of Kayak Sh. Geochem smple 59

83 AMK-60 NW NW Sec 6-15-28E Mt Mich. B-3
Fourth Range grab sample of Lisburne. Geochem smple 60

83 AMK-61 W/2 W/2 Sec 2-2N-27E
Mt Michelson C-3
Kemik Ss otc 3 mi W of Lupek Mesa
Photo about 100 ft thick (measured), base not exposed but probably close.
Ss, lt gray w/ rusty hor zones LVF to UVF, some pebbly zones in lower part, thin slty beds in lower 15', com burrows in lower 30' (vertical some ophiomorpha), beds 6-12" lower part, 5' ↑ above, some hummocky X bd at about 80' up.

± smples 61 A, B, C, D going up.

Att N40E 35 NW
This on W plunging syncline

83 AMK-62 NE/4 Sec 15-2N-28E
Mt Michelson C-3
Fire Cr. at Sadlerochit-Lisburne contact
Sampled upper 100' of Lisburne
Geochem smpl 62 A, B, C

Lower 20' of Echooka is conglomeratic, w/ chert pebbles. Ss is VF quartzose very hard, much iron oxide staining.
± 62 D

83 AMK-63 NW NW Sec 15-2N-28E
Mt Michelson C-3
On ridge west of Fire Cr. Checking apparent Sadlerochit channeling into Lisburne
Seems like about 30-40 ft of relief on channel. Fill is LVF qtzose ss w/ minor chert pebbles but at top are large blocks of Lisburne and larger chert clasts. Whole ob is poorly bedded and lichen covered so it is impossible to see bedding features or lithology without breaking fresh surface.
photo

83 AMK-64 ~~NW/4 Sec 29-11N-30E~~ C Sec 11-15-30E
Mt Michelson B-2
Karen Cr - Type section of Karen Cr Ss
Coarse sltst, dark gray, very hard, p bedded, laminated or bioturbated(?)
Sampled on crest of small anticline where it is less fractured 76 ft± thick
± samples 64 A, B, C (A at base)

83 AMK-65 SE NW Sec 34-21N-36E
Demarcation Pt B-4
Kingak Sh exposed on broad ridge below resistant Karen Creek Ss (sltst)
Steeply dipping to N or maybe S? overturned
Geochem smpls 65A-H (8 smpls)
thru 500 to 1000 of section of Kingak

83 AMK-66 Sec 32 & 29-T1N, R34E
Demarcation Pt. B-5
Upper Okpairowrak Creek W of Jago R.
Sampling Sadlerochit in folded exposures. Many concentric folds along traverse so it is not known exact stratigraphic position of samples.
± sample 66A SE/4 Sec 32
66B C N/2 N/2 Sec 32
66C near C Sec 29
Much of section is hard shale, very resistant, slaty
Ss is LVF or sltst.

CMM, ARK, LBM 7/31/83 p.1

13

(83 AMK-67) Sec 13 - 6S - 46E
Table Mtn 1/250000 Quad
Joe Creek area - looking for Shublik
Landed in high saddle (3750') in saddle -
rocket for a quick view
PTs is sltst to LLVF ss
t smpl 67
Section must be repeated by folding and/or faulting.

(83 AMK-68) Sec 33, 5S - 45E
Table Mtn 1/250,000 Quad
Joe Creek - outcrop of Kingak Sh on bank
of creek - about 75' exposed
Sh dark gray - blk fissile where clayey,
blocky and flaky where silty, com floating
F - C qtz grains in silty part, com concs
(ironstone), some belemnites replaced by
pyrite or marcasite
Geochem smpl 68 A - C
" smpl 68 A & B (not same as above)
att: Gentle dip to S

7/31/83 p.2

(83 AMK-69) C N/2 Sec 31 - 5S - 45E
Table Mtn 1/250,000 Quad
Joe Creek area
Lower Cret(?) part of Kingak Sh (mapped
as Kongakut Fm on map
On S trending broad ridge from large
flat above - chopper elev. 3580'. Several
hundred ft on rubble ridge
Sh dark gray - blk, rubble crop, w/ com
zones of small ironstone concs, fissile
clay shale in parts, other is flaky w/
some floating F - M sand grains, com
well preserved Buchias in float
B 69
Geochem & " smpl 69 A & B
att N70E 10 N

1984

July 6, 1984 McLennan, Parrish & Bader

(84AMK-1) Loney Creek in Canada
25 mi SW of Herschel Island
Herschel Island 1:250,000 quad.
69°20'18" N Lat. 139°46'46" W Long.

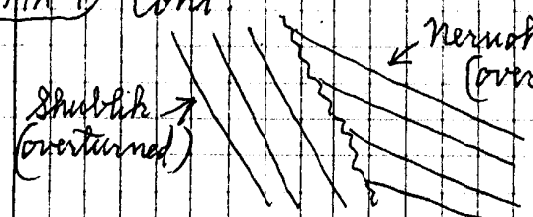
Kingak Sh exposed along complexly folded and faulted south flank of Loney Creek syncline. Just upstream from upfolded top of Shublik - about 75' of calc silst w/ lime grainstone below some conglomeratic lenses. At top of Shublik is 3-4" basal cgl under Kingak Sh. Cgl is apparently re-working of underlying lith.

Sh is firm, black, fissile - sub-fissile

Samples Geochem sample 84AMK-1a & b
a is about 30-40' above base.
b is 100-150' above base.

Examined Mountjoy Loney Cr. Shublik section about 1 + mile upstream from this point. Section is about as he described it, but section is overturned striking N 50-60 W overturned 75-80° to S. Section is unconformably overlying shaly phyllitic rocks of Neruokpuk. Angularity is apparent.

84AMK-1 Cont.



84AMK-2 Herschel Island 1/250,000 quad

Loney Creek syncline near axis as drawn on geologic map. Small tributary of, and 3 miles SW of junction with Malcolm River and 4½ miles NNW of Loney Cr. Shublik section
69° 23' 26" N Lat.; 139° 53' 18" W Long.

Sh Smpl. Small otc of Kingak Sh sampled for geochem. Smpl 84AMK-2

84AMK-3 Demarcation Pt 1:250,000 quad. Canadian part. N & W of Fish Cr and 10½ mi SW of Komakuk Beach.

Rubble otc near hill top. Dark brown weathering, med gray Ss, very fine, Sadlerochit Group ? Lisburne Ss

t t sample

84AMK-4 Demarcation Pt 1:250000 quad. Canadian part 2½ mi WSW of Sta 3

Rubble otc on valley sides are red w/ some green slaty shales — apparently Nerwokpuk underlying Lisburne ls above.

t t sample 84AMK-4

84AMK-5 Demarcation Pt. 1:250,000 quad Canadian part about 3 mi W of Sta 4 and on ridge just W of 1924' hill top w/ bench mark.

On south side of ridge near top is dark weathering Echooka cgl and ss patch on near-dip slope overlying light gray Lisburne. About 15-20 ft exposed cgl at base, angular to rounded clasts of white and gray chert up to 1" diam. in ss matrix. Above is hard VF-F ss w/ some cgl

t t sample of various types t 84AMK-5

(84AMK-6) Demarcation Pt. 1:250,000 quad. Canadian part. Across valley about 1 mi south of Sta #5

Rubble ctcs of strange granular limestone w/ dk grains, lt gray w/ rounded and elongate pebbles (clasts?) of dark granular limestone
± 1/8 - 1/4" diam ± simple

(84AMK-7) Demarcation Pt. 1:250,000 quad Canadian part. On hill about 1 mi north of Sta 4.

Checking dark weathering rocks overlying lt gray Lisburne

Rubble ctcs of Ss, F and M w/ some pebble cgl ! ± simple 84AMK-7
±

This must be Echooka again overlying Lisburne. If there are no structural complications, ie, thrusts, Lisburne, which apparently is underlain by Neruokpuk of Sta 4 and overlain by Echooka here, is only about 500 ft thick.

(84AMK-7) Cont

From here, we flew to NW over what is mapped as Kingak?

No ctcs seen and where there looked like there might be an ctc, it turned out to be gravel.

There may not be Kingak here.

7/8/84

CMM, Judy Parrish and Dudley Rice

Spent day on familiarization trip of Marsh Creek anticline and areas around Sadlerochit Mtns.

Judy found an ammonite in float near Kingak Shale outcrop at Ignek Valley section

⊕ 84 AMK-8

84AMK-8 Ignek Valley section near C Sec 6 - 2N - 26 E Mt Mich. C-4

Also collected siliceous tuff sample from red zone

⊥ 82 AMK - 17 E

7-9-84

Molenaar & Rice

Familiarization trip SE of Barter Island

Visited bentonite and shale (mid-Cretaceous outcrop on Jago River See sta 80 AMK-70 and 83AMK-20

Collected tuff sample ~~from~~ upsection from main outcrop

84AMK-9 = 83AMK-20

NENE Sec 4-6N-35E

Demarcation Pt D-4

⊥ sample of tuff - smpl 9 a

Down river on point where otc of Eocene mudstone w/ floating pebbles is

Collected sample of non calc hard concretion, - dolomitic ?

⊥ smpl 9 b = 83AMK-21 ⊥

Molenaar & Rice 7/10/84 p.1

(84AMK-10) S/2 S/2 Sec 25 8N-36E
Barter Is A-4 Quad

Outcrop along W bank of Niguanak River and up small gully
About 30'± exposed
Slty mudstone, grayish brown soft, slty in thin 1/4 - 1/2" platy beds, nonfissile abundant gray and black floating chert pebbles up to 1/2 - 3/4", some penecontemporaneous slumping and scour fills with same material. Some very thin wispy VF sand layers < 1/8"
Fairly flat lying. Upper slope - shelf break

Sh smpl — Sh smple 10a & b

(84AMK-11) NE NE Sec 20-7N-37E
Demarcation Pt D-4
Niguanak River - small otc on E bank
Rubble otc of Ss, dark gray lithic, VF w/ M, modsort hard calc, com clay chips, no bedding features on blocks
± — ± #11
Sh smple — Dug out calc sh nearby
Sh smple #11

7/10/84 p.2

(84AMK-12) C Sec 33-7N-37E
Demarcation Pt D-4
Small otc in side gully, partially covered by slump.
Sh smpl — Very bentonitic sh, soft, med gray possibly dipping 15°± to NW
Sh smpl #12

(84AMK-13) SW SW Sec 1-6N-36E
69°53'56" N 143°02'57" W
Revisit to 83AMK-24
Not so much snow in gully this year. Hiked up gully to SSE where Jk is mapped. Found a few shale otcs on side of gully
Sh smpl — Sh samples 84AMK-13 a & b

Sh is non bent. Smpl a is farther gully on E side - may be pebble sh, Smple b is on W side lower down.

Farther up gully is bent paper sh (Jk). On immediate SW and NE side of bend in drainage is Jk bent paper sh -, no pebble shale there

7/10/84 P. 3

(84AMK-14) SWSW Sec 1-6N-36E
Demarcation Pt D-4
Nguianak area near JK outcrop

Walked down main gully to NNE about 1000 ft and all is bent sh and bent. steeply dipping. Found bed w/ abundant Inoceramus prisms a short way down. No pebble shale

Sh smpl — Took sample 14 at N end of outcrop - soft bent. sh.

Returned to Barter Is to pick up Judy and try to go to Shublik section on Katak River, but still fogged in to west, so we returned to area SE of Barter Island

(84AMK-15) NW Sec 34-3N-36E
Demarcation Pt C-4

River cut on tributary to Okeroko-vik River. About 60' exposed. Sh, dark gray, nonfissile, firm-hard, common discontinuous calc-ironstone beds up to 2 ft thick.

7/10/84 P. 4

(84AMK-15) (Cont)

Found large ammonite or part of one (3" diam) and one Buchia? or Inoceramus (B) smple 15
Kingak? ↖ Pleuromya
Two shale samples 15 a and b
Some beds in shale have pyritized pelletal grains (M-C)

Att N50E 23SE

(84AMK-16) SWSW NW Sec 34-3N-36E
Demarcation Pt C-4

Stream cut on E side
Couldn't get to most of it because of high water
Sh w/ calc-ironstone beds as at Sta 15
Sh — Dipping 10 to 25° south
Sh smple 16

(84AMK-17) SESE Sec 33-3N-36E
Demarcation Pt C-4. 15' examined
Sh w/ thin 1-2" discontinuous sltst-LVF ss turbs, sli grading, no bottom marks noted. Non bent except for one thin 1/4" bent. Albian? or UK?
Sh smpl — Sh smple 17 Att E-W-35S

Molenaar & Kelley 7/12/84

(84AMK-18) W/2 W/2 Sec 27-7N-30E
Mt Michelson D-2
Carter Creek area - tributary of Carter Cr
on N flank Marsh Cr. anticline
Loosely consolidated sd, slt w/ cgl lenses
and scattered isolated pebbles.
2 pics 150'± exposed
Some small faults dipping steeply to SW
or W. Fault att. N 15 W 25 SW
Upper block offset 1'± to NW

Att of strata N 50-55 E 53 NW F
N 55-60 E 57 N G
Took two paleo samples from 40' section
of thinnly bedded brown slty mdst
Paleo w/<1/8" VF sd layers
smpl Sh smpl 18 a & B

(84AMK-19) SW SW Sec 26-5N-27E
Mt. Michelson D-3
Revisit to Sta 83AMK-5
Saw many more turbidite features
Good bottom marks - groovls, prods
brush, and some flutes → N80E
Some bed may be traction current deposits

Paleo smpl 19

7/12/84 p.2

(84AMK-20) NE SW Sec 26-5N-27E
Mt Michelson D-3
Revisit to 80AMK-51
Ripple bed ss bed 3-4' thick, LF, hard,
abundant carb frags and small
t carb throughout. Mb med scale cross
bedding. Ss beds are separated by
4-12" beds of very carb w/ trans-
ported coal ss-sltst beds
Paly Paly sample #20
t smpl of ss #20

Association of this otc with
nearby sta 19 where some
beds are turbidites suggests that
this may be distributary channel
well out on delta.

McLennan & Kelley 7/13/84

84AMK-21 NE Sec 11-3N-31E Mt. Mich C-1
Revisit to 83AMK-42
Re-examining Kemik-Shublik contact at East Creek

Very sharp contact. Shublik has veinal calcite veins in top 4" paralleling contact and is somewhat brecciated. Lower 4" of Kemik has fractures that parallel contact - above is fractures normal to bedding. No pebble zone at base as is normal.
This could be a thrust fault contact

84AMK-22 NE SE Sec 1-4N-31E
Mt Michelson C-1
On hillside 1 mi N of East Creek
Squirrel diggings indicate sh, some with pebbles and frosted granules
Paleo smpl Prob. is pebble sh.
Paleo smpl 22

7/13/84 p. 2

84AMK-23 NW NW NE Sec 12-3N-30E
Mt Michelson C-2

On ridge east of Itkilyariak Creek, north side eastern Sadlerochit Mtns
Elev. about 4000 ft
Contact of Lisburne on Kataktaruk Dol.
Dk dips much steeper to south - looks like good angular unconformity although Kelley thinks the contact may be a decollement thrust fault.
Dk is fine grained dolomite with scattered vugs.
± simple 23a Att: E-W 345

Contact is in covered bench - about 20' covered.
Lower part of exposed Lisburne is grainstone in lower 6-8 ft some cross bedding, common elongate chert lenses
± 1-2 ft long, 1-3" thick
± simple of Ls 23 b
Above this is 3-4 ft thick breccia with angular clasts up to 12" of chert somewhat foliated in non foliated lt. matrix although there are some calcite healed fractures. Is this a sedimentary or tectonic breccia?

7/13/84 p. 3

Spent most of day checking structural relations in eastern Sadlerochit Mtns. Concluded that thrust faulting is present.

One thrust moves Permo-Pak over Lisburne - thrust plane is marked by a color break in the saddle in N/2 Sec 1 - 3N - 30E and N/2 Sec 6 - 3N - 31E. Dip of fault is about 45° S.

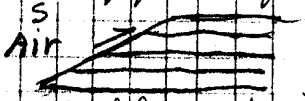
In N/2 of Sec 5 and near center Sec 4 - 3N - 31E is another thrust showing PMI over PMI and PRs. Thrusts seem to join to east and trends down East Creek and south of Kemik Ss outcrop on sharp ridge. Kemik - Shublik contact may be a thrust fault - see note at sta 21. Up hill from this outcrop (to west) is section overlying PRs of Shublik (dragged in upper part) Kingak Sh, Kemik Ss and Pebble sh. This sequence is in NE Sec 10 and NW Sec 11 - 3N - 31E and is on upper plate of thrust separating it from East Creek section.

Kelley is putting these on map.

Molenaar & Kelley 7/14/84 p. 1

84 AMN-24 C N/2 Sec 19 - 4N - 30E
Mt Mickelson C-6

Marsh Creek east fork near mtn front
Checking structural relationships.
ATF is thrust contact of Kingak (K) on Kemik Ss. This is first outcrop of Kemik going downstream from contact of pebble shale (and 6± of basal ss - Kemik) on Sadlerochit. Exposed surface of Kemik is footwall cut off plane of thrust fault. Common slickensides on surface. Att of fault surface: N75E 18S



A few hundred ft upstream is a shale outcrop dipping to south. Belemnite and pelecypod found in float below. Must be Kingak Sh sample #24. There is Kemik Ss cliff above on hill to west. From here south towards Sadlerochit is discontinuous outcrops of sh - prob mostly pebble shale. North dipping in southern part, but there are some sharp reversals and disturbed zones.

Paleo sample

[redacted]

p. 2

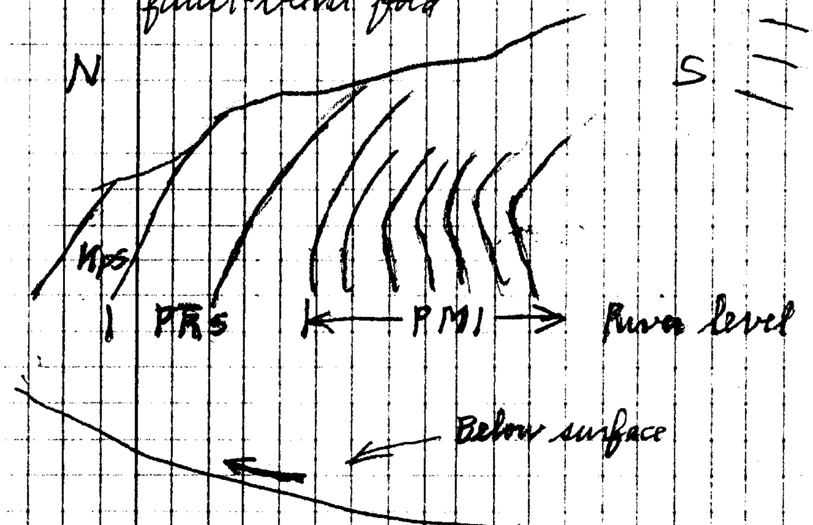
½ mile.

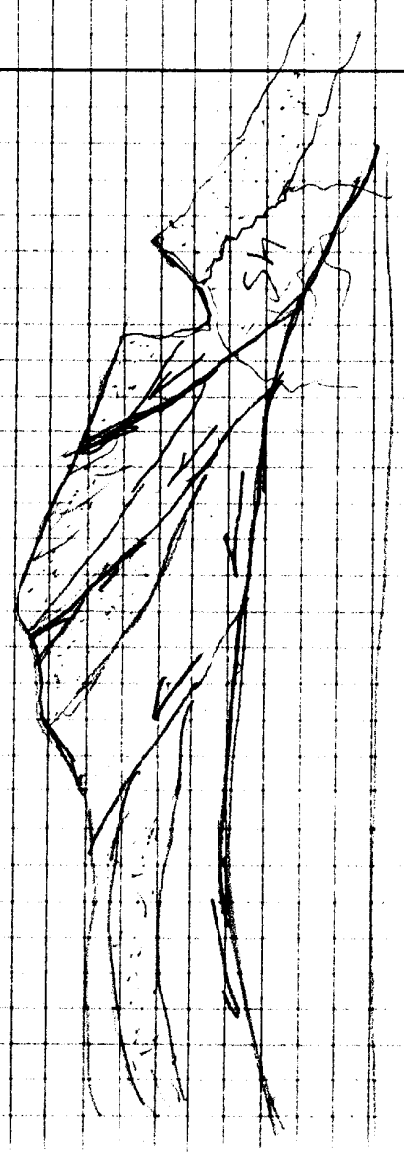
[redacted]

7/24/84 p. 3

(84AMK-24) (Cont)

Walked upstream through the Sadlerochit and upper part of Lisburne fault-bend fold





Molenaar & Kelley 7/15/84 p. 1

84AMK-25 SENW Sec 25 - 41N - 31E
Mt Michelson C-1
3½ miles W of Sad. River
100 ft ± exposed
Sh and Sltst
Sltst w/ sh interbeds. Sltst in beds
1-2 ft thick, separated by thinner
sh interbeds. Sltst irregularly
bedded, small ripple lam. cont
tubular burrows, some belemnites -
recrystallized filling, some wood
frags. Two or three 15-20 ft
units of this sequence - prob
shallow-marine shelf tongues from
north. Kingak Sh?
Below is dark gray-black sh,
Paleo non fossil, non calc
& Strat Paleo smpl 25 a & b
Geochem " 25

Whole otc is uniformly dipping
17° ± to north

69° 40' 30" N Lat
154° 32' 20" W Long

84AMK-26 NW Sec 33-4N-31E
MT Mich C-1 1 mi S of 25

Along front of Sadlerochit Mtns

Sdty Kingak Sh like at sta 25 overturned (E-W 60S ?) separated from Sadlerochit by covered interval (but not shaley) ~~from~~ All in Sadlerochit E-W 75-80 N

Possibly is thrust fault between. Upper part of Kingak beds are bent over to N. Drag under thrust fault or hillside creep?

Sadlerochit upper part is thin bedded w/ sltst. Is this shoreward Fire Creek Mbr?

84AMK-27 SW SE Sec 21-4N-31E
MT Mich C-1

Kemik Ss etc on NW side of creek valley and also on SE side of creek about 20 ft exposed, top and bottom not exposed. Dipping gently to NE

84AMK-28 NE NE NE Sec 3-5N-29E
MT Mich D-2

Squirrel diggings and shale chip soil etc on side of bluff on east bank of Marsh Creek

Paleo smpl Sh, med gray Smple 28

84AMK-29 NW SE Sec 14-5N-29E
MT Mich D-2

Several discontinuous lits of Ss & sh. Ss in beds up to 15", UF-VF, minor pebbles, some beds coarsen upward, plain bedded, minor small ripples, cm scale interference ripples, load casts (?) on top, some grooves and one flute (?) in float ± smpl 29

Attd: N75W to E-W 50-55 N assume is right side up, although some features suggest otherwise

Paleo smpl Paleo smpl 29a & b 300' strat apart

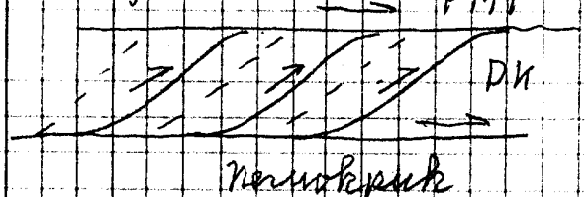
7/15/84 p. 4

84AMK-30 Sec 7, 18 & 19 - 31N - 27E
Mt. Michelson C-3

Collecting samples from Nataktaruk Dolomite along Kat. River where it cuts through Saddlerochit Mtns
Going down river and down section
A at top; J at the bottom
Ten samples; 30A through J

Several of the samples had irregular porosity and two or three were brecciated
Took attitudes and plotted them on map
Most were around N80W dipping 45 to 55° south

Section is about 10,000 ft thick if there are no fault repetitions.
Detailed work may show that section is duplexed i.e. repeated by bedding plane thrusts.

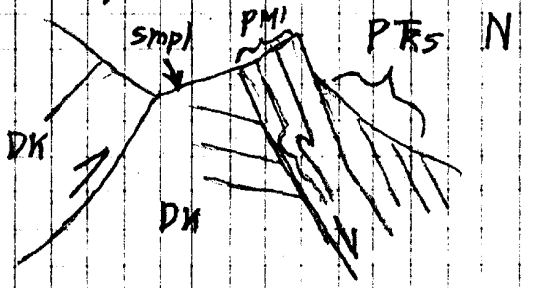


7/16/84 p. 1

Molenaar & Kelley

Checking structure on north flank of Saddlerochit Mtns

84AMK-31 C N/2 Sec 9 - 3N - 28E
Mt. Michelson C-3
In saddle where thrust fault is mapped. Nataktaruk Dolomite on both sides. ~~Sadlerochit~~ Lisburne on hilltop and ridge to north. Probably in decollement thrust fault contact with Nataktaruk. Lower part of exposed Lisburne has contorted folds. Took picture from opposite hill.



Took sample of Nataktaruk Dolomite on side hill just N of fault
Sample 31
Good vuggy porosity in dolomitized oolite.

7/17/84 p. 1

Molenaar & Kelley

Checking and mapping structure in Shublik Mtns. - on C-2 quad. Kelly mapped some of the structural features in all but the western part of the range. There seems to be a decollement at the base of the Lisburne although it can and has been mapped as a depositional contact. At the west part there is 100 ft plus of Kayak Shale at the base. This gets out to the east we think by thrust faulting along that layer. Where it is preserved it is somewhat sheared as seen from the air.

Thrust faults are distinguished by abrupt change in structure across fault, contorted or disturbed bedding near fault, and a light colored band of rubble (qtz veins, etc.) along fault zone

84AMK-35 SESE Sec 1 - 2N - 26E
Mt Michelson C-3
Random sample of Katakturuk Dolomite
t finely crystalline, vuggy porosity
Smpl # 35
Below DK is in apparent thrust contact with pebble shale

7/16/84 p. 2

84AMK-32 W/2 NE Sec 7 - 3N - 28E
Mt Michelson C-3

Outcrop of Shublik along W side of Creek - about 50-100 ft exposed
Att N75W 66 overturned to S
66

½ mile to NE on ridge east of creek are 3 or 4 outcrops of Kemik Ss and pebble sh and possibly Kingak repeated by small thrust faults. Kemik dips to south at low angle. Did not stop - just fly by geology

84AMK-33 C Sec 10-3N-28E Mt Mich. C-3
Dug out sltst on hillside beneath Lisburne and above Saddlerochit. Prob is pebble shale on footwall of thrust fault. Found a few pebbles
Paleo sample Paleo smpl 33

t smpl 34 - has secondary porosity

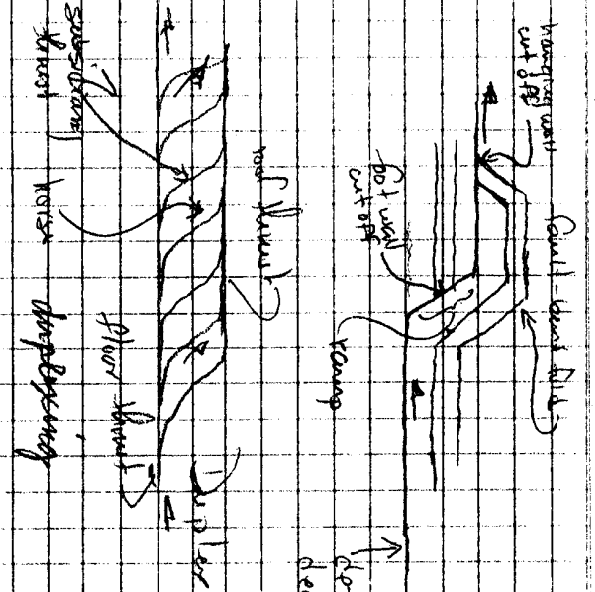
84AMK-34 SE NW Sec 10-3N-28E Mt Mich. C-3
Rubble of PTS on hillside. On footwall be neath thrust fault bringing DK over PTS exposed on opposite hillside. Took pic

7/19/84

McLennan, Bruns, and Fisher

Familiarization trip for Bruns and Fisher. Went to Porter Creek Pliocene locality, east bank of Marsh Creek to see KPs on Saddlerocket, walked up canyon onto Disturn, land of Paleocene turbidites on Kat River, went up Kat River through Saddlerocket Mtns, ran into Dave Taillieu and Peter setting up camp at south side canyon entrance, went to Igneh Valley section (cold and windy), flew through part of Shaviik Mtns to Fire Ck, looked at Shaviik from top, flew up Saddlerocket River to Fourth Range, back through Sunset Pass, looked at Nernorpuk on north side, and then examined mid Cretaceous and Eocene rocks on Jago River.

84AMK-36 near c W/2 Sec 6-3N-30E
Mt Michelson C-2
In Nernorpuk on N side Sad. Mtns in saddle between basic intrusive on N and white quartzite on S.
Smpl 36 a from basic igneous
36 b from quartzite
Between is platy phyllite



1985

Pt Thomson #1

9000 - 9050
9400 - 9450
9750 - 9790
10,200 - 250
10,550 - 600
11,300 - 330
11,600 - 640
11,900 - 950'

10950 - 980

Pt Thomson #2

9000 - 9030
9300 - 9400
9600 - 9700
9900 - 9960
10200 - 260
10500 - 560
10900 - 950
11310 - 370
11650 - 700
12100 - 140
12500 - 540
12700 - 750

#4 32-10N -22E

10630 - 700
11000 - 50
11300 - 340
11700 - 790
12100 - 130
12470 - 500
12850 - 900
13250 - 300
13700 - 760
14,100 - 140

July 3 1985 Molenaar & D. Bohn

85AMK-1 NE SW Sec 14-2N-25E Mt Mich. C-4
Shublik Mtns Nanook Cr. area
Reconnoitering for sections of Nanook and Katakturuk in Shublik Mtns
Nanook Creek area
Landed near base of Nanook Ls.
Lower couple hundred ft is well bedded lime mudstone, dolomitic. At base ca. 25-50' yellow wx zone of earthy dolo with some maroonish wx finer grained dolo. Is this a soil zone?
± sample 85AMK-1A earthy zone
1B is finely lam ls and some black arg ls below yellow zone

Below is thick bedded – massive Katakturuk Dolo, lt gray, good vuggy porosity, some interchrysalline porosity ± 85AMK-1C

Across valley to SW is complete section of Nanook Ls, fairly well exposed, about 1,500' thick (est)

85AMK-2 C Sec 24-3N-24E Mt Mich C-4
Along Igneck Cr. – Burned out organic sh, red w/ black clinker, prob in GRZ.
Downstream a short way is Inoc zone contorted.

7/4/85
Molenaar & Dede Bohn

85AMK-3 Revisit to Jago River otc
= Sta 83AMK-20 & 80AMK-70
NE/4 Sec 4-6N-35E Demarcation D-4

Checking black shale and bentonite otc below Inoc zone and exposed higher on hillside to see if it is GRZ this!
Background and count in Inoc zone is 50. Took several readings in GRZ which are as follows:

	Background	otc count
Inoc zone	50	50
GRZ	120	275
"	100	150
"	100	170

No doubt, this is GRZ.
Took 3 black soft paper shale samples
Sp1 85AMK-3A-C for geochem

Downstream on hillside is about 200 ft of steeply dipping shale and bentonite. One zone with some Inoceramus but not like main Inoc zone. This must be fault repetition of section above Inoc. zone upstream. This part of section was never exposed on previous visits – probably was covered by muck.
This year, river cuts into section above Inoc. zone. Hard to get much beyond Inoc zone.

(85AMK-4) Revisit to Jurassic shale otc area on Niguanak High = 83AMK-24 and 84AMK-13 & 14.
SW/4 Sec 1-6N-36E Demarc. Pt D-4
Plotted on photo # 7849
Located Inoc zone just south of small gully north of bend in main gully. Bed is dipping S (overturned) steeply. Immediately to south is gamma-ray zone. Counts are as follows:

	BK	Otc count
Inoc. zone	50	50
GRZ	120	225
"	120	180
"	140	280
" wash	150	180

At SE bend in gully is pebble sh-Kingak, but is pretty much covered. However, gamma-ray count drops. Much snow in gully to SE, but did get dug out shale on W side (Kingak?). Farther up gully is much ironstone conc rubble. Found one ammonite impression. Farther up on east side is bent sh otc with high gamma-ray count. Took sample 4B.

85AMK-4A

85AMK-4B

Traversed down gully to NE and found yellow wx siliceous tuff a couple hundred ft above Inoc zone, then more sh

and bentonite with high gamma-ray background count.
Farther down creek after last UK sh and bentonite otc is mud gray colored soil, one conc w/ pebble sh ft. Is this Eocene?
Upstream to SW from bend where Jurassic sh is is shale & bent for a short way - no sign of pebble shale.

(85AMK-5) Revisit to 80AMK-69 & 83AMK-23
Niguanak High
SW SE Sec 3 - 6N - 36E Demarc. Pt D-4

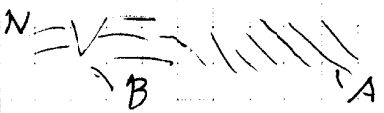
Collected black brittle substance - solid hydrocarbon(?) from poorly exposed Jurassic otc where we previously collected Jurassic ammonites and belemnites washing out of slope. This is just across gully to south of pebble sh(?) otc.

85AMK-5 solid hydrocarbon

7/5/85

Kelley and Molenaar

(85AMK-6) E Fork of Marsh Cr; Mt Mich C-2
C E/2 E/2 Sec 19-4N-30E
= 85AK-104
Took 2 sh samples from large otc of black sh on E side of creek
85AMK-6 A & B A above



Prob is pebble sh. Look for fossils or pebbles; found none, some pebble size marchasite nodules.
Farther east, found impression of nondescript clam about 1/2" long in sh.

7/6/85

Molenaar & Kelley

(85AMK-7) at junction of tributary with E Fork Marsh Cr. Mt Mich. C-2
NW SE Sec 6-4N-30E

Inoceramus zone crops out in last otc before junction on W side
150' upstream is otc of black fissile
Sh — sh w/ lent. GRZ?
Smpl — Sh sample 85AMK-7

Walked down tributary from about 3/4 upstream. Bubble clays and a few good ones of sh, bentonitic. It looks like all UK

Along main creek a couple hundred ft down stream is a good otc of a fault zone - prob part of a duplexed thrust. Much contortion in bentonitic sh w/ concretions - all UK; no Inoc. zone seen

(85AMK-8) SW SW Sec 24-4N-29E Mt. Mich C-2
Kps (?) sh rubble mixed with Lisbourne wash. Sadlerochit is missing across this area - fault out leg frontal Sadlerochit Mtn fault well up on hillside. PMI faulted against Kps (?)
Sh smple — Grab sample 85AMK-8

7/7/85

Molenaar & Kelley

85AMK-9 S/2 S/2 Sec 22 to stream junction in C W/2 W/2 Sec 15 - 4N-29E Mt Mich. C-2
Traverse down west fork of Marsh Creek starting in pebble sh below sta 80AMK-38

In upper part of Kps is 2' LVF ss bed, no bedding features, sharp base and top.
± 85AMK-9A ± of ss

about 50-100' downstream is 100' wide fault zone in bent sh. ~~Kob~~ UK

at S end of fault zone is 3-5' thick bed - Inoc? This may be higher than main Inoc zone
Next otc appears to be Kps, non bent found one polished 4" pebble, otc is rubble, however
Sh smpl Sh smpl 9B Kps?

Then we go back into bentonitic sh
Sh smpl prob GRS. No siliceous tuffs seen
Sh smpl Then more Kps Sh smple 9C

Farther downstream on E bank is long otc of generally S dipping Kps or JKK(?), petrographic wx, micro-micaceous, no fossils found
Sh smpl Sh smple 9D. 9E & 9G (collected later)
N/2 of otc is fault zone, Prob many repeats of Kps

85AMK-9 Cont.

Working downstream is sss bentonic sh and 2/3 or 3/4 toward E on W side is a lt gray-white weathering tuffs(bene) bed.

At E is 8-10' thick shattered VF ss otc, prob is Brookian, Overlain and
± underlain by sh and bentonite
± 9E
E is on W side just S of creek Jct.

85AMK-10 NW/4 Sec 20 - 4N-29E
Mt Michelson C-2
Walking along UK bent sh otcs along Nulavik River

Starting in red zone - red weathering fine tuffs, silicified, then discontinuous otcs and float of bentonitic sh, steep dipping to contorted. At end of traverse, but not last otc are some small tight north verging folds in interbedded bent sh and fine silicified tuffs (beds 2-4" thick). Took photos.

7/9/85

Molenaar, Kelley & Armstrong

(85 AMK-11) NW/4 Sec 7, SW/4 Sec 6-2N-26E
Mt Michelson C-4

Traverse down ridge and down section from lower part of Nanook Ls and about 400 ft of Katakturuk Dolo to fault contact at Hue Creek on N side of Shublik Mtns. Beautiful clear, calm to slight breeze
Kat dolo is fine crystalline dolo w/ abundant vugs. Took two P & P samples in upper part
85 AMK 11 A & B P & P
Upper part of Kat Dolo is shallow marine sub tidal - inner tidal, com zones of med scale X beds in pelletoidal packstone, burrowed, com mud (lime) clasts

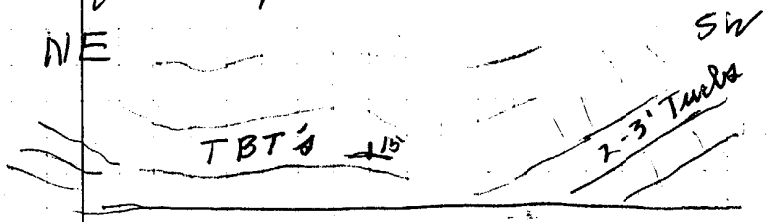
In middle is ~~algal~~ algal supra tidal facies w/ algal heads
Took several pictures

7/10/85

Molenaar & Kelley

(85AMK-12) SE NW Sec 4-2N-36E
Demarcation Pt C-4

Tributary of Okerokovik River, downstream from ~~the~~ pebble sh otc.



Several 2-3' thick turbs ss otcs at sw end with 2"-6" sh interbeds.

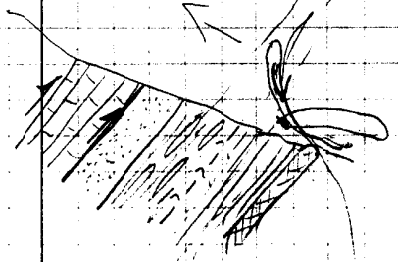
At NE and main part ss beds are 2"-6" thick w/ 3"-12" sh interbeds
Ss med-dark gray, VF, fairly uniform but graded in top inch or so, Bouma b-c, ripples → ~~DX~~, common bottom marks in float incl flutes. None seen in place

Sh may be slightly bentonitic but not certain.

Otc is somewhat fractured in SW end, probably is near a fault

Molenaar & Kelley 7/11/85

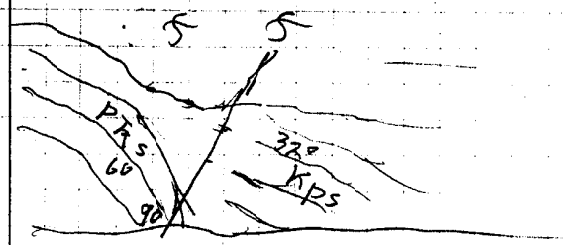
85 AMK-13 NE/4 Sec 7 SE/4 Sec 6 - 3N - 28E
Mt Michelson C-3



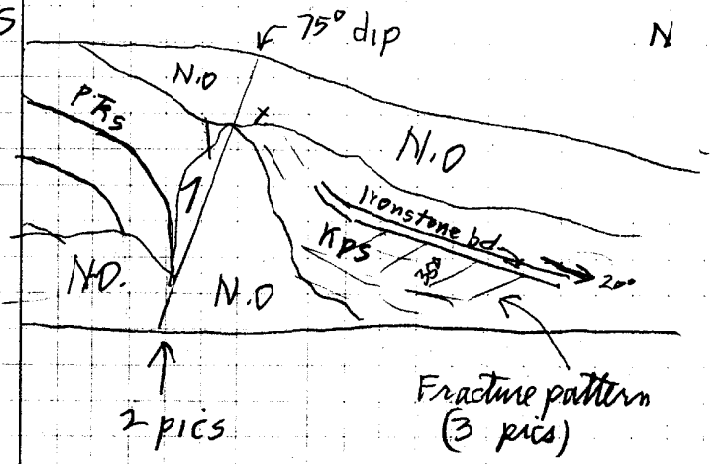
On N side Sad Mtns E of Kat River
Checking area where Kemik Ss is repeated by imbricate thrusting
Up gully and hillside is obtained Lisburne, Sadlerochit, Shublik, probable Kingak and Kemik Ss, all overturned and part of Sad Mtn block
Sh simple near base of Kingak from squirrel diggings
85AMK-13 NE/4 Sec 7
Sh simpl
Farther down hill are 2 or 3 repeats of Kemik on different block.
One is above above and toward mtn from in-place Kemik. Relationship questionable.

7/11/85 p. 2

85 AMK-14 C SW/4 Sec 3 - 3N - 28E
Mt Michelson C-3



Outcrop along small creek, PKs faulted against pebble shale (lower part of Kps ? the silty part w/ pebbles.



Molenaar & Kelley 7/12/85

(85 AMK-15) N/2 Sec 11, SW/4 Sec 2-3N-27E
Mt Michelson C-3

Traverse down and along tributary stream of Kalabtanuk River on N side Sad. Mtns

Starting at thrust fault contact of PM1 and Kat. Dolo. PM1 is N80W dipping to S (overturned) 45° at fault contact decreasing to 75° 100' N. Kat Dolo is shattered rubble near fault.

Several hundred ft downstream is otc of PTs., fractured, no attitude

Then all covered to just before Kemik Ss otc where there is pebble sh float w/ common pebbles
Kemik attitude is N75W 20NE F
Farther W along strike is

Just below in small gully is otc of silty mudstone dipping 45° S
sh smpl sh smple 15. Farther down slope is much more Kps rubble w/ pebbles, then bentonitic sh

Molenaar & Kelley 7/12/85 p. 2

(85 AMK-16) NE/4 Sec 2-3N-27E to S/2 Sec 35-4N-27E
Mt Michelson C-3

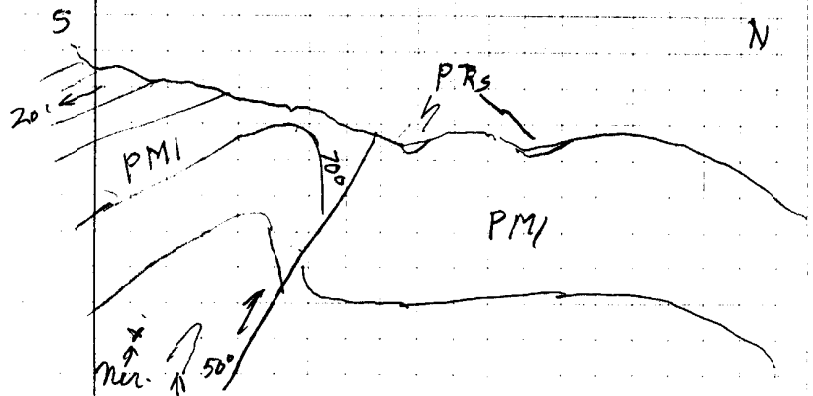
Traversing small creek with good exposures of shale
Most all is UK bentonitic sh with fair gamma-ray count - background of 100, count of 150-180 I. Prob is some of GKZ. ~~Some~~ Some is non- or little bentonitic, some pebbles,
sh one qtzite cobble 3" across.
smples Took sh smples 16A & 16B of probable pebble sh. Then shor bentonitic sh
~~Much~~ Most or all of section is dipping 30-45 to S w/some fault zones repeating section
Just beyond N end of outcrop is separate otc of pebble sh, fairly flat lying.

(85 AMK-17) C SE/4 Sec 35-4N-27E
Mt Michelson C-3

On west side of hill, a couple hundred ft of black bentonitic fissile shale w/ coal pebbles. One 8" quartzite cobble
sh smple t sh is dipping N about 35° ↑
T-17
This is Kps sh smple 17

Molenaar & Kelley 7/13/85

85AMK-18 Sec 4 & 5-3N-31E Mt Mich C-1
East end Sad Mtns

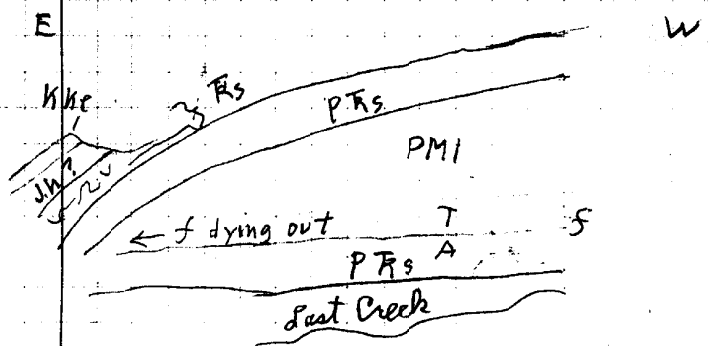


Nernokpuk qtzite & mangled sh-phyllite

Viewed structure from saddle near center of Sec 4 (View to W above). Then went into canyon near C SE/4 Sec 5 to check out Nernokpuk qtzite & phyllitic sh in core of tight fold. Also may be some qtzite dragged up along fault near saddle

7/13/85 p.2

85AMK-19 Sec 3 and vicinity 3N-31E
Mt Mich C-1



Landed on N side of Last Creek to view E plunge of Sad Mtns and dying out of fault. There are some complications, however with an up-to-the N fault paralleling lower part of Last Creek, probably south of Last Creek Kemik section

85 AMK-20 S/2 NW/4 Sec 11-3N-31E
Mt Michelson C-1
East Creek area - Walking around checking strat. and structural relations in area.

Shublik overlies PFs coming off ridge to W. Within Shublik there is folding and bedding contortions. Upper contact of Shublik with overlying Karen Cr and Kingak at this point is well up on hillside below Kemik Ss (above plotted point to E). There is a thin poorly exposed Karen Creek(?), probably only a few ft thick, but outcrops are poor. Karen Cr is coarse sltst - VF ss, noncalc, dark, wormy. Then fissile black shale - about 200-300 ft thick, rubble otcs, mostly covered. Saw grab a few pebbles in float - this may be Kps - but pebbles may be out of overlying Kemik Ss, which has a few coal zones.
SH smpls 20 A B & C C near base then A, and B above.

Above Kemik is some Kps and then more Kemik repeated by faulting.

Molenaar & Kelley 7/14/85

85 AMK-21 NE NW Sec 9-3N-27E
Mt Michelson C 3
Small tributary along Mtn front of Kal R otc of Kemik Ss, about 25' exposed Ss LVF grading up to C sltst, dark gray qt & chert, muddy, small qtz pebble noted, one coal block in float thin - med bedded
Att N85E 75S
overturned

A couple hundred yards upstream is Kal dolo N40W 57 & 30S

No otc in between, all covered by talus

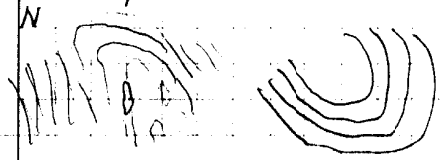
85 AMK-22 NE NW Sec 9-3N-27E
Mt Michelson C 3
otc on W side of creek up on hillside.
Fault contact of Inoc zone with GRZ.
Beds are contorted and silicified
Fault strikes NW, near vertical ~ N35W
Took photo
GRZ BK 100± otc 200±

SLP One squirrel digging - looks like pebble sh
Up hill to NW in next gully is otc of 15' Inoc zone (base not exp) overlain by sh & chert
Took photo BK 75 otc 125

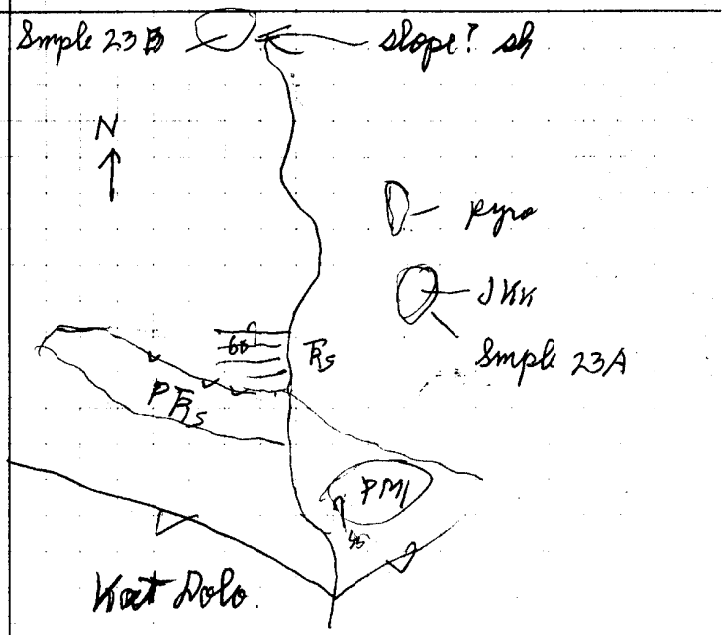
S/2 S/2 S/2 Sec 4

Next otc downstream on E bank. Tight anticlinal structure w/ bedding of 6° track Inoc beds. Inoc prisms replaced by Righes? Is this the main Inoc zone or
Also is concentric-like syncline in hard black tuff and sh beds

Took photos



85AMK-23 SW SW Sec 1-3N-26E
Mt Michelson ~~B-3~~ C-3
Tributary of Tam River just W of Kat Canyon
75' of Shublik exposed. Att NBOE 60S overturned
Just south is PTRs, fractured, mostly brush covered. Prob not complete section. Knob on E side of creek and a little farther S is PMI then fault contact with Kat Dolo. No PMI on W side of creek.



SH smpl Walked along hillside E of creek, Took sh sample 23A of squirrel diggings - Kingak?
a little farther north on hillside is yellow-w× VK tuff float - several patches

SH smpl Still farther N on W side is silty sh etc, non fissile, blocky, non bent (no distinct) bentonite beds slope facies? No att - - all rubble SH smpl 23B

7/14/85 p. 4

(85AMK-27) SE Sec 2-3N-26E
Mt Michelson C-3

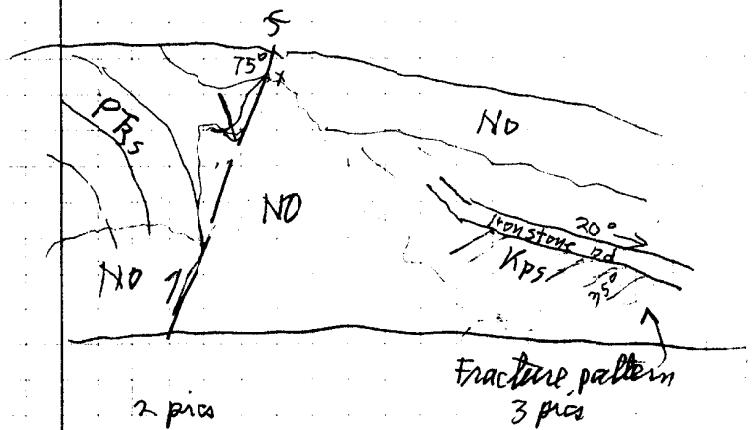
Knob otc on broad ridge -- mostly rubble but some in place
Att E-W 35 N (fair)

Ss, med gray, fine grain, blocky qtz and lith lithic grains, firm, looks like Brookian Ss, not Saddlerochit or Kemik
If Brookian, it must be deep water facies B. No bottom marks or bedding features, no grading

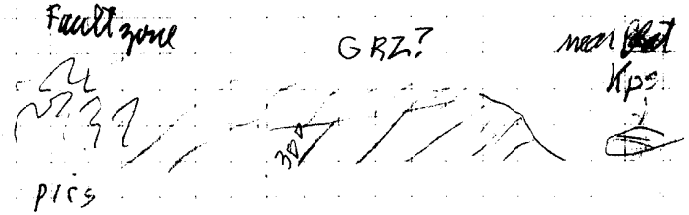
+ smple 24

7/14/85

Sta 85-14



Sta 85-16



Molenaar & Kelley 7/15/85

(85 AMK-25) SWSW Sec 10-4N-28E
Mt. Michelson C-3

Landed on hilltop. Brookian Ss rubble
Prob Paleocene turbs. Some in place
att: N70E 7-13 N
Otcs are slabby to blocky 2-12" thick,
Ss LF-VF, minor M, gray-brown, lithic,
tight, com black grains
Some bottom marks in finer grained float

(85 AMK-26) NW SW Sec 7-4N-28E
Mt Michelson C-3

Rounded hilltop knob of Brookian turbs -
Paleocene - UK? TK_2
att N75E 20S

Took ss sample for fission track work

Molenaar and Kelley 7/17/85

(85 AMK-27) NE NW Sec 11-1N-24E M-35
Mt Mich. B-4 eastern Photo 7232
Shublik Springs (~~southern~~ one)
Good flow of water abruptly comes
out of talus-covered hillside - PRs
~~fine~~ VF-~~Silt~~ facies, common
large bivalves

A few hundred ft to N on hillside are
otcs of PRs with well developed
fractures trending N15-25W dipping
82-85° E and 15° S plunge on
fenestrated slicks. Possible sense of
movement is right lateral.
A secondary set trends N15E dipping
87° S and 15-20° S plunge on
fenestrated slicks, apparent left
lateral slip based on rotated cleavage.

Another spring is 1200 ft to W in
NWNW Sec 11 - 1N-24E

Since sta 17 all outcrops dip ~~de~~ consistently to S.

83AMK-27 ~~through~~ 30 filed under Bathtub Ridge in 1980 & 1982 field notes book.

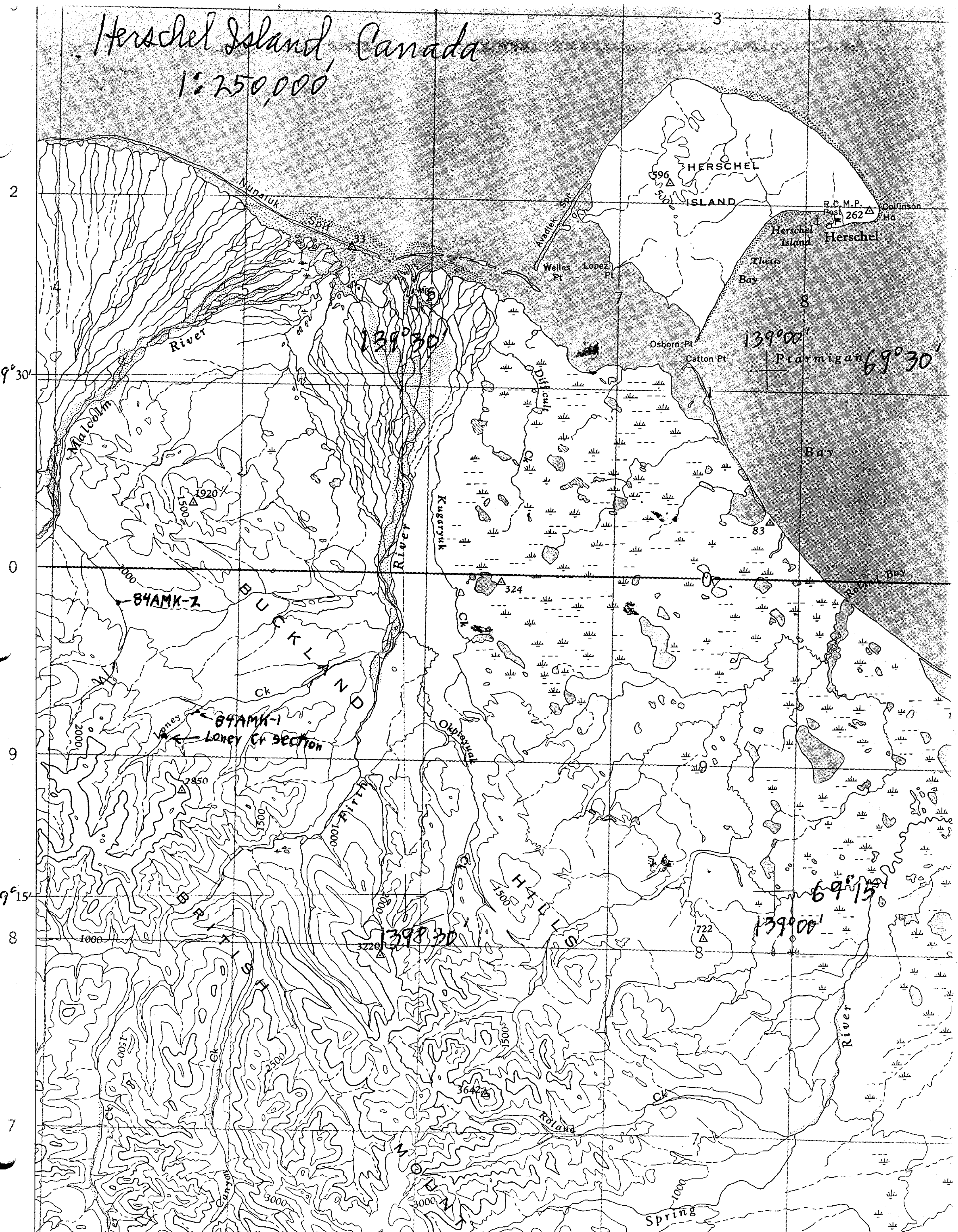
85AMH-2B filed under Bathtub Ridge in 1980 & 82 field notes books.

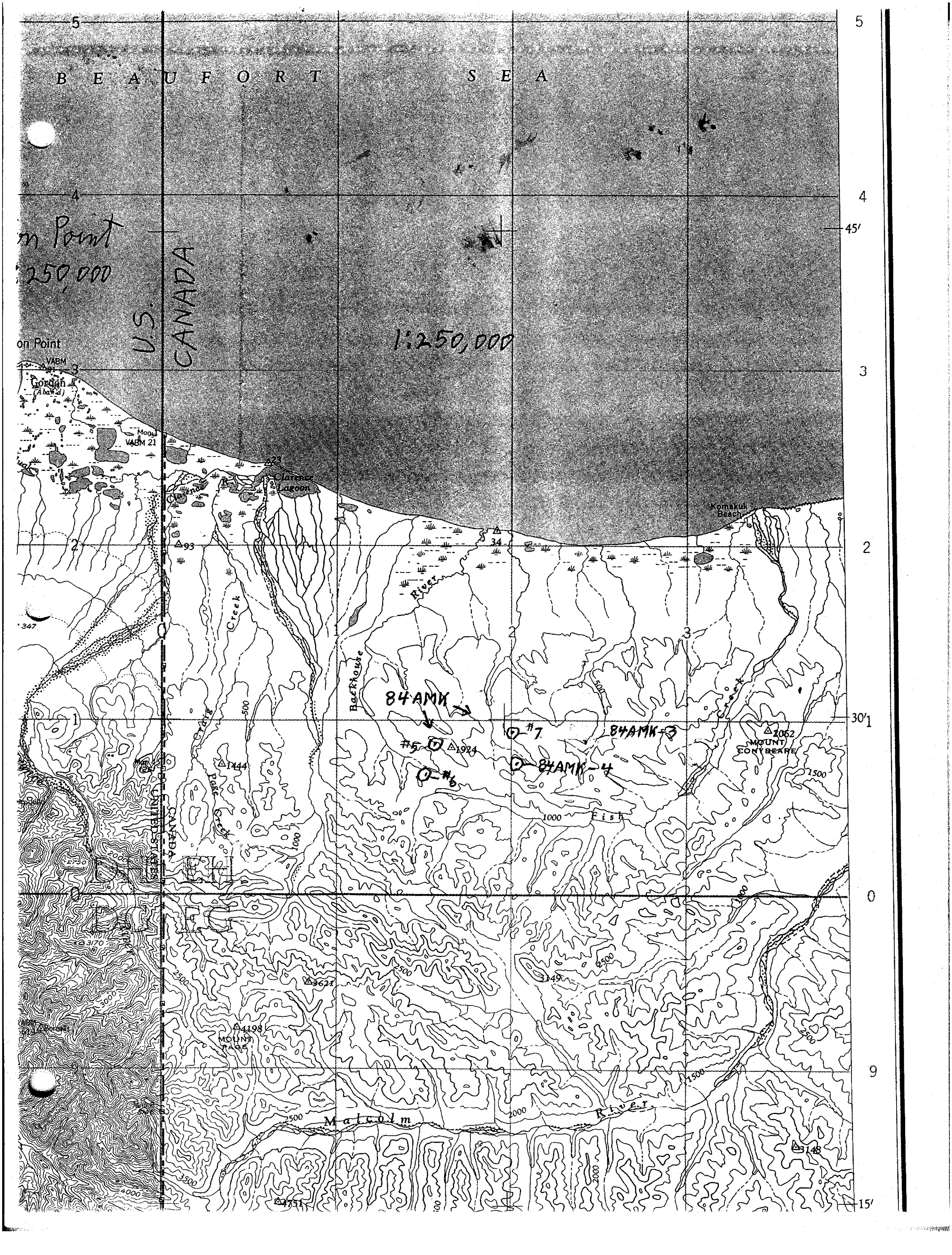
MAPS TO ACCOMPANY FIELD NOTES

C.M. MOLENAAR AND PARTY

NORTH SLOPE OF ALASKA

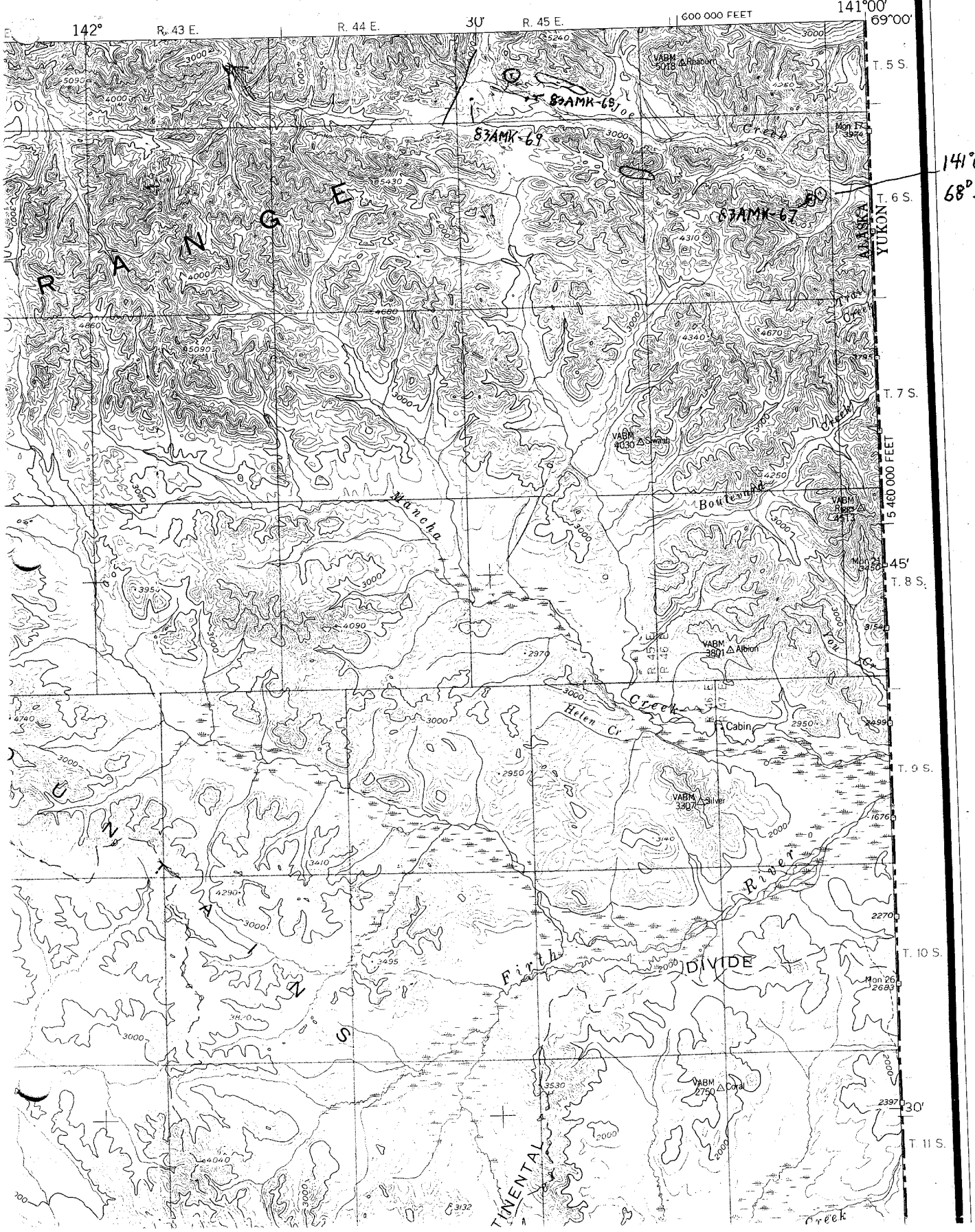
1980, '82, '83, '84, AND '85 FIELD SEASONS


Herschel Island, Canada
1:250,000
HERSCHEL
ISLAND
596
R.C.M.P. Post
262
Collinson Hd
Herschel Island
Herschel
Thetis Bay
Avadlek Spit
Welles Pt
Lopez Pt
Osborn Pt
Catton Pt
Ptarmigan
Bay
Nunaluk Spit
33
Malcolm River
139°30'
139°00'
69°30'
69°15'
1920
1500
1000
2000
Kugaryuk
River
Difficult Ck
83
324
Roland Bay
BUCKLAND
HILLS
BRITISH
MOUNTAINS
84AMK-2
84AMK-1
Loney Ck section
Loney
Ck
Okpioyuak
Firth
2850
3220
722
3642
Roland
Ck
River
Spring
Canyon
Glacier
2500
3000


B E A U F O R T S E A
on Point
1:250,000
U.S.
CANADA
1:250,000
on Point
VABM
Gordon
(Aband)
VABM 21
23
Clarence Lagoon
93
34
Komakuk Beach
River
Creek
Backhouse
Craig
Creek
84AMK
#5
1924
#6
#7
84AMK-3
84AMK-4
1444
Page Creek
2062
MOUNT CONYBEARE
1500
1000
Fish
500
1000
UNITED STATES
CANADA
3170
3621
3149
2500
3000
4198
MOUNT PAGE
Malcolm River
2500
2000
1500
3148
3500
4000
4751
2000
5
4
45′
3
2
1
30′
0
9
15′

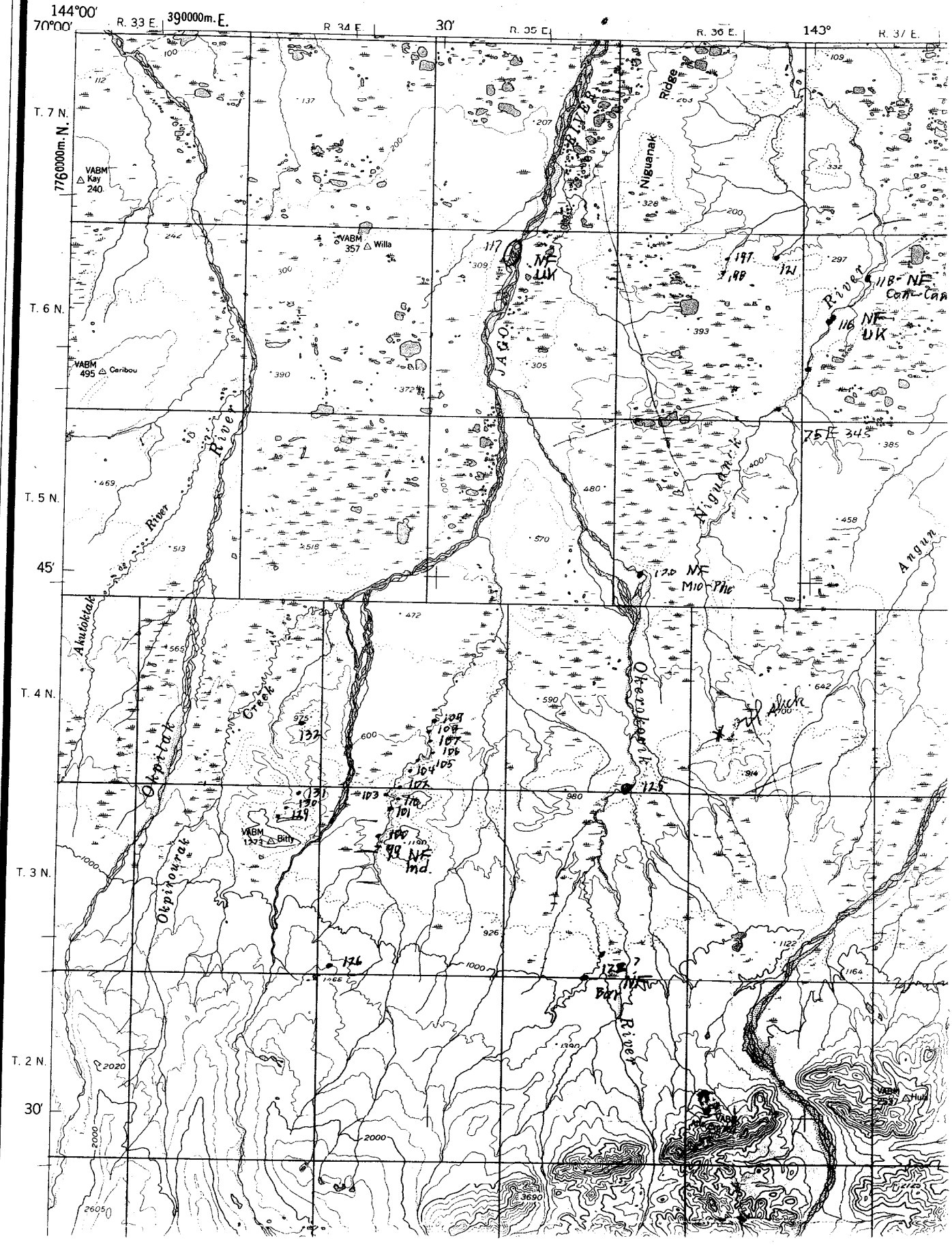
ALASKA
TOPOGRAPHIC SERIES

Table Mtn 1:250,000 NE



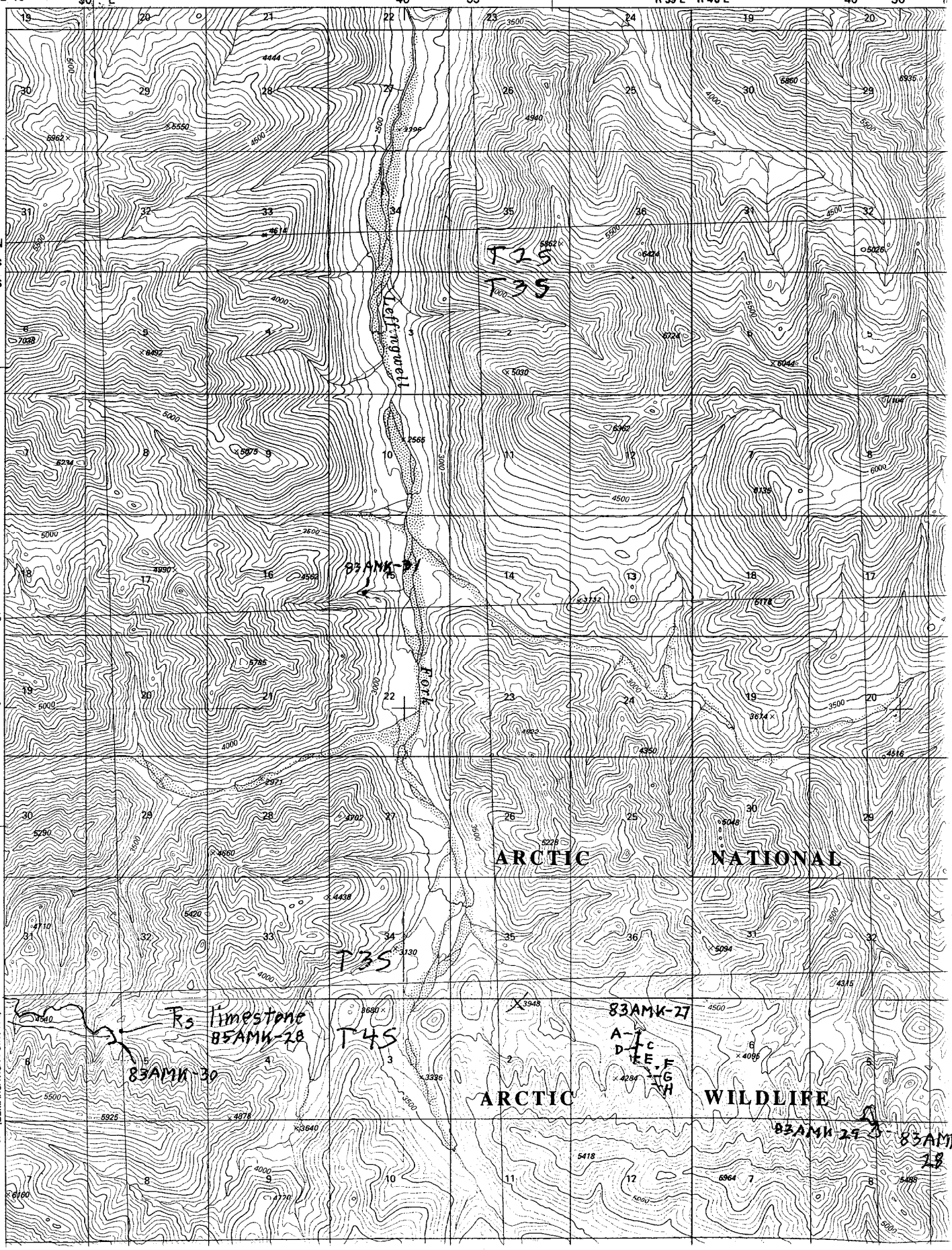
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

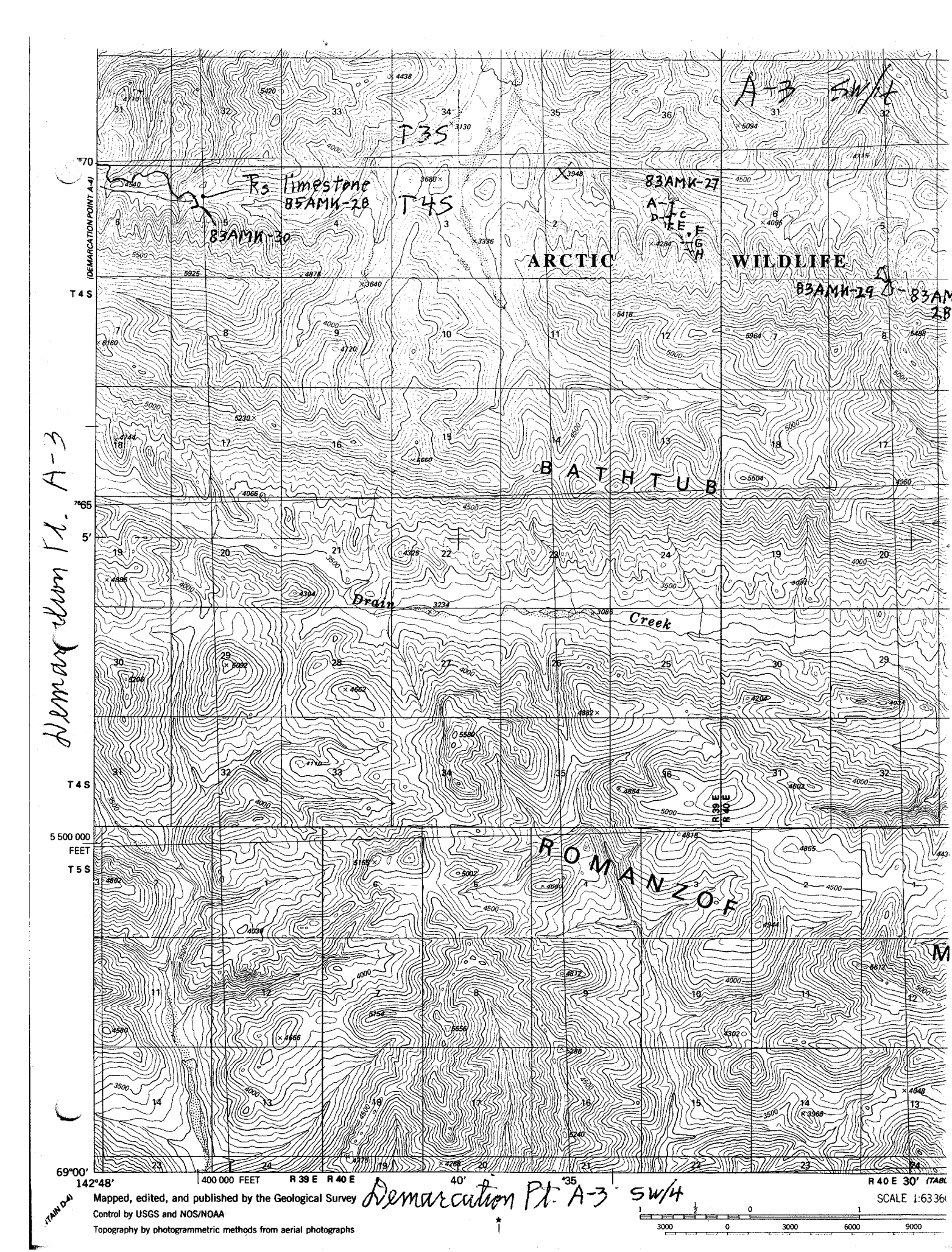
Demarcation Pt. 1/250000

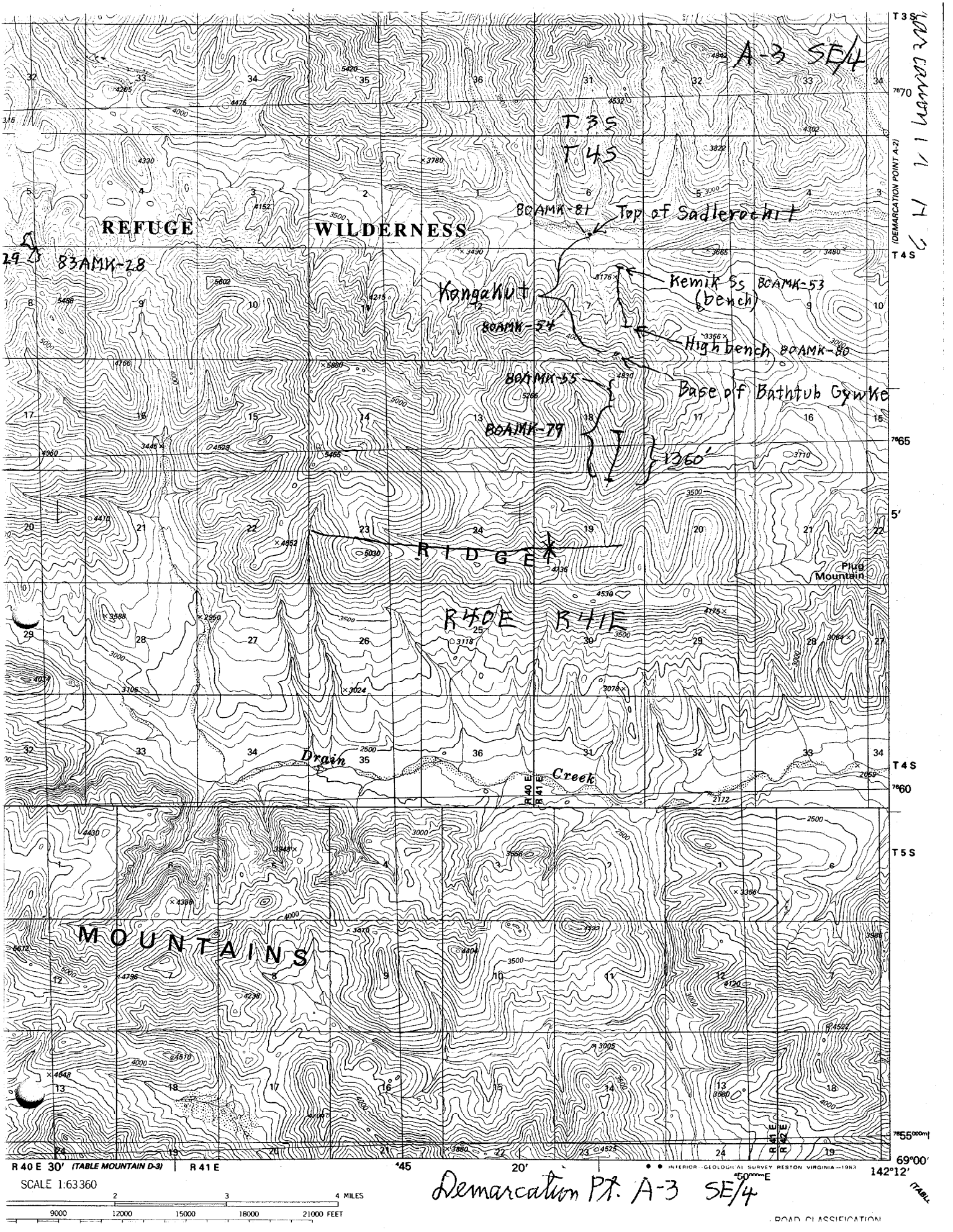


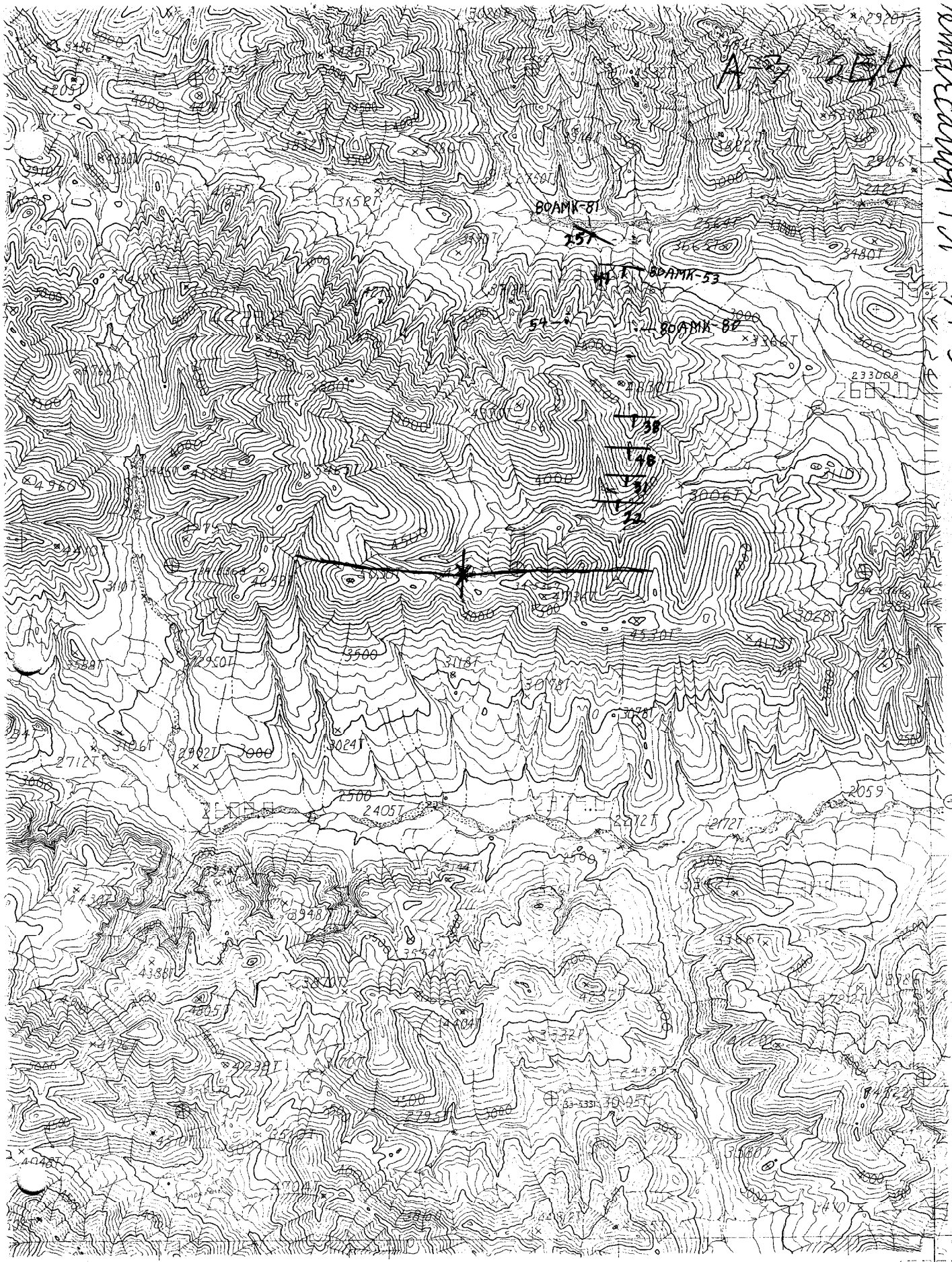
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Demarcation Pt A-3 NW/4




A-3 SW/4
T35
T45
R3 limestone
85AMK-28
83AMK-30
83AMK-27
A
B
C
D
E
F
G
H
ARCTIC
WILDLIFE
83AMK-29 - 83AMK 28
BATHTUB
Drain
Creek
ROMANZOF
R39E
R40E
Demarcation Pt. A-3
T4S
T5S
5 500 000 FEET
70°
65'
69°00'
142°48'
400 000 FEET
R 39 E
R 40 E
35
40'
30'
(DEMARCATION POINT A-4)
Demarcation Pt. A-3
Mapped, edited, and published by the Geological Survey
Control by USGS and NOS/NOAA
Topography by photogrammetric methods from aerial photographs
Demarcation Pt. A-3 SW/4
SCALE 1:63360
3000 0 3000 6000 9000


A-3 SE/4
T3S
T4S
REFUGE
WILDERNESS
29 83AMK-28
80AMK-81
Top of Sadlerochit
Kemik Gs 80AMK-53
(bench)
Kangakut
80AMK-54
High bench 80AMK-80
80AMK-55
Base of Bathtub Gywke
80AMK-79
1360'
RIDGE
Plug Mountain
R40E
R41E
Drain
Creek
MOUNTAINS
(DEMARCATION POINT A-2)
T3S
T4S
T5S
R40E 30' (TABLE MOUNTAIN D-3)
R41E
SCALE 1:63360
4 MILES
21000 FEET
INTERIOR-GEOLOGICAL SURVEY RESTON VIRGINIA-1983
142°12'
69°00'
Demarcation Pt. A-3 SE/4



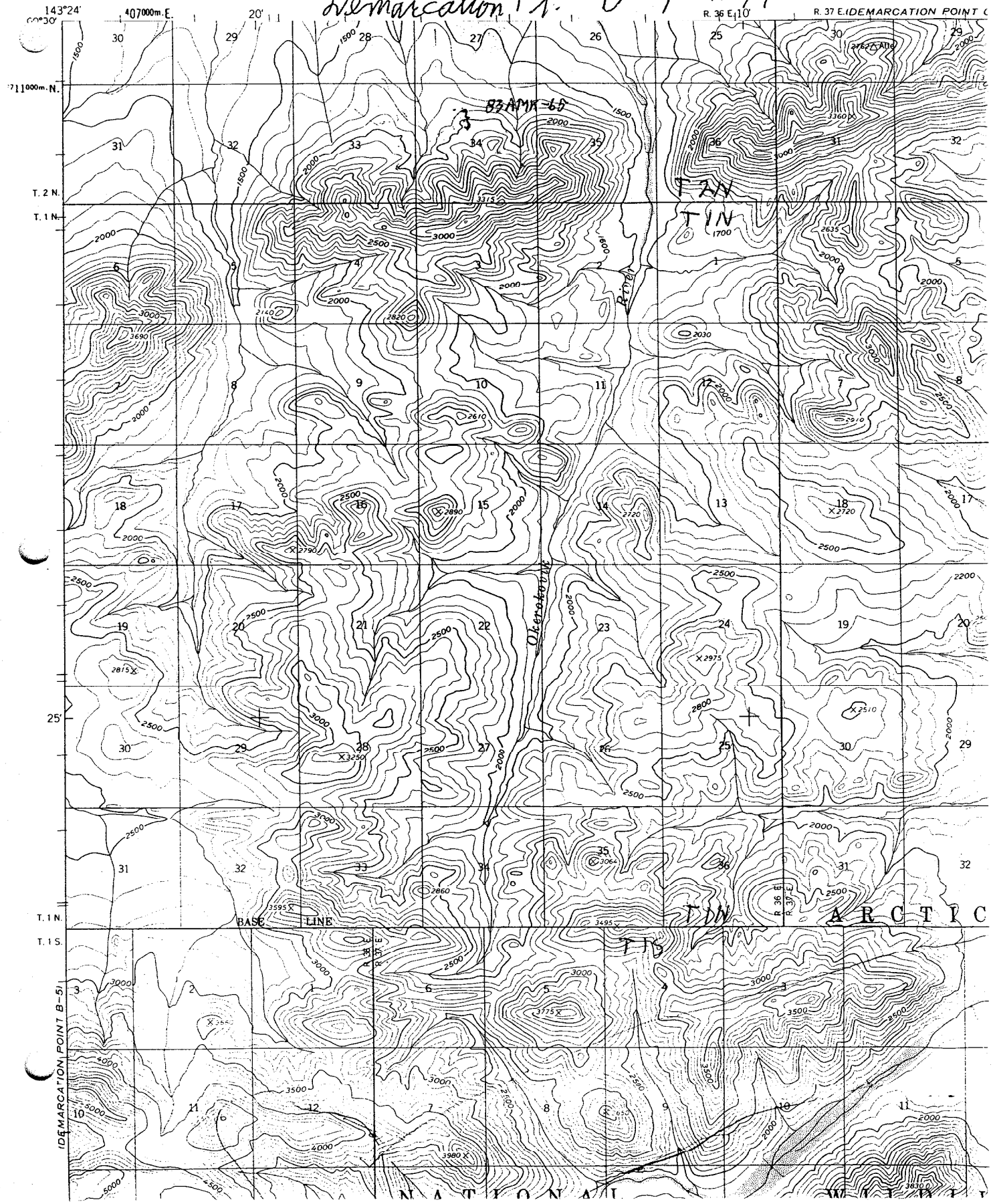
Demarcation Pt A-3 SE/4

Demarcation Pt A-3 SE/4

Pemarc B-4

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Demarcation PT. B-4 NW/4

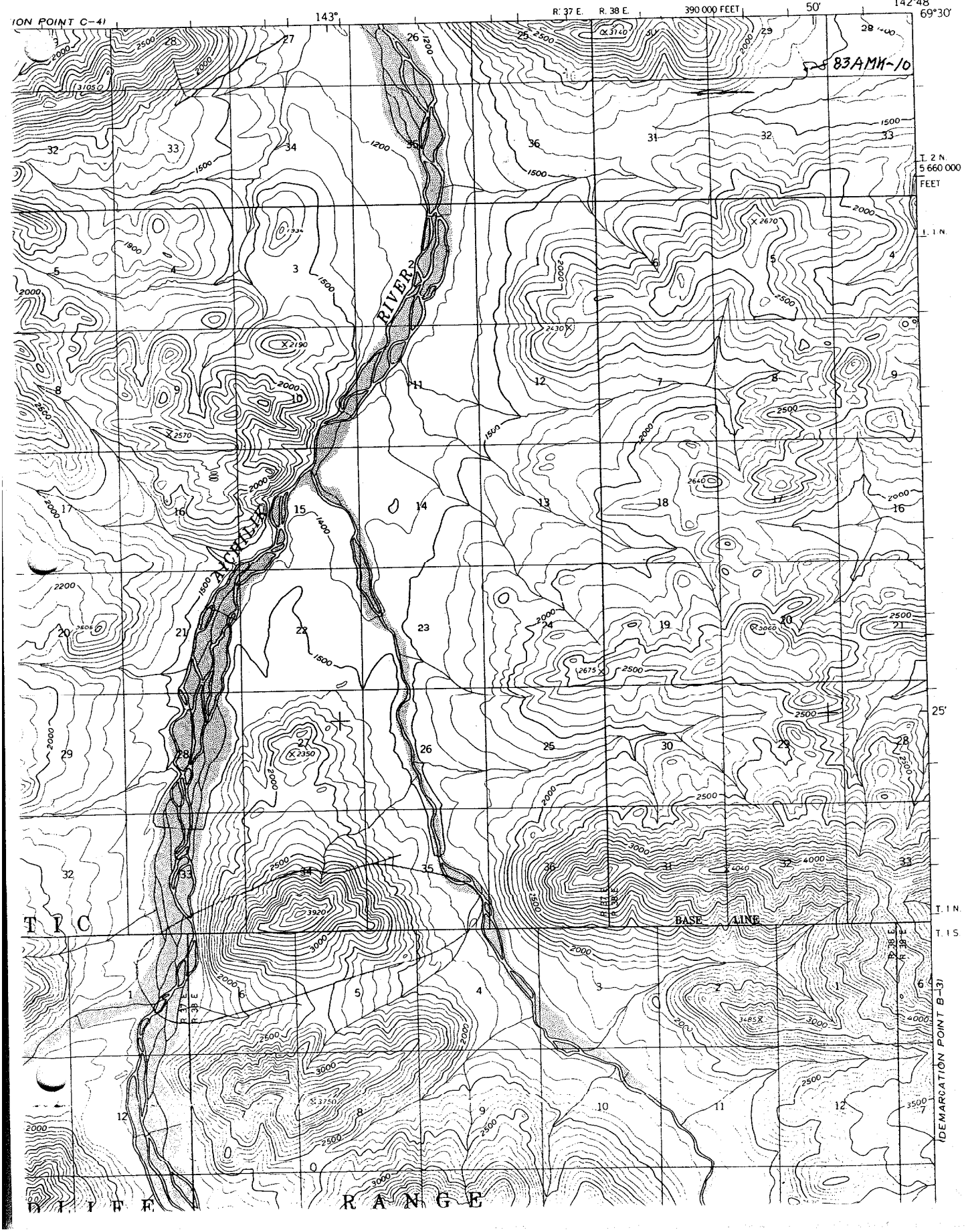


NE/4

DEMARCATION POINT (B-4) QUADRANGLE
ALASKA
1:63 360 SERIES (TOPOGRAPHIC)

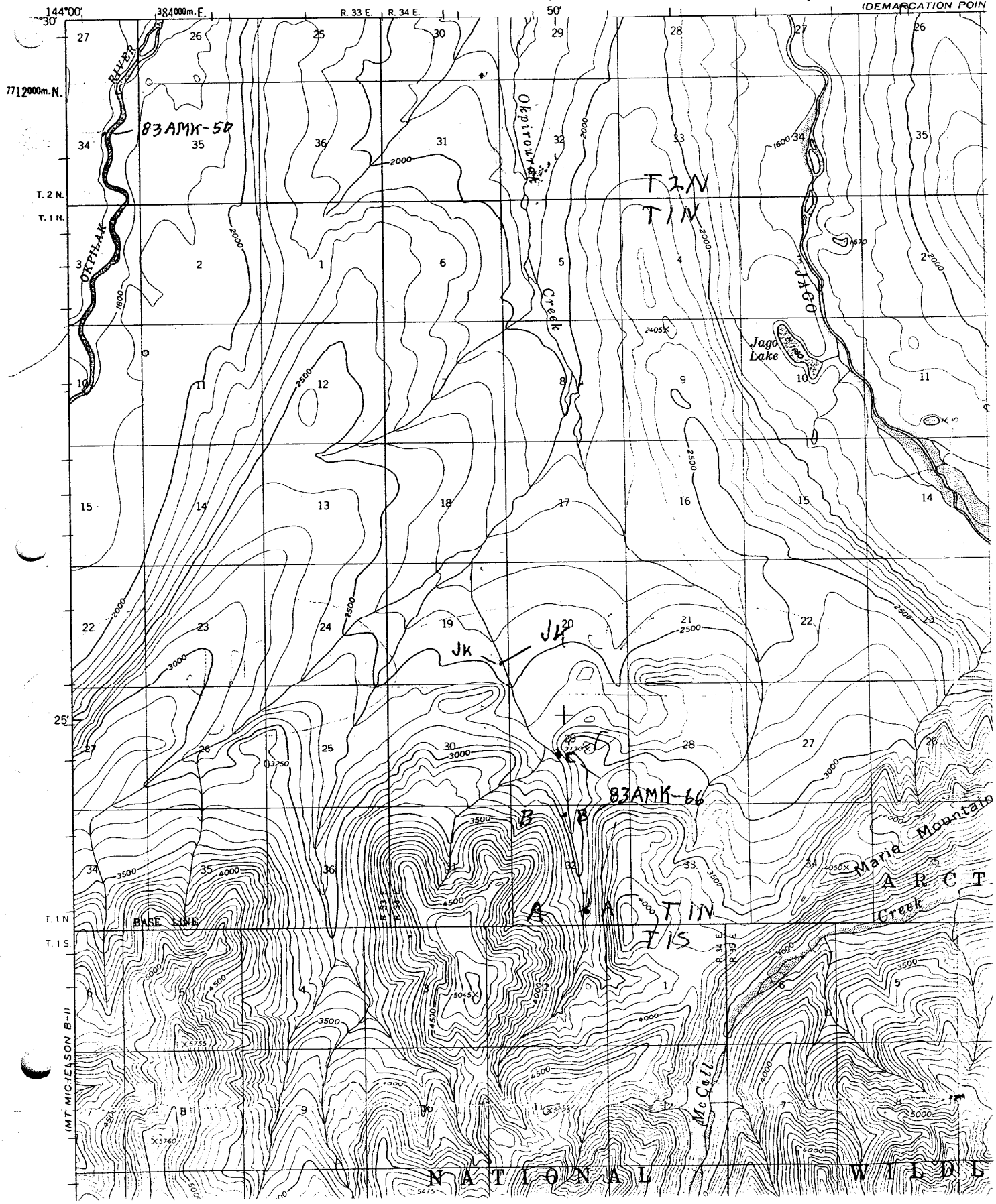
B-4

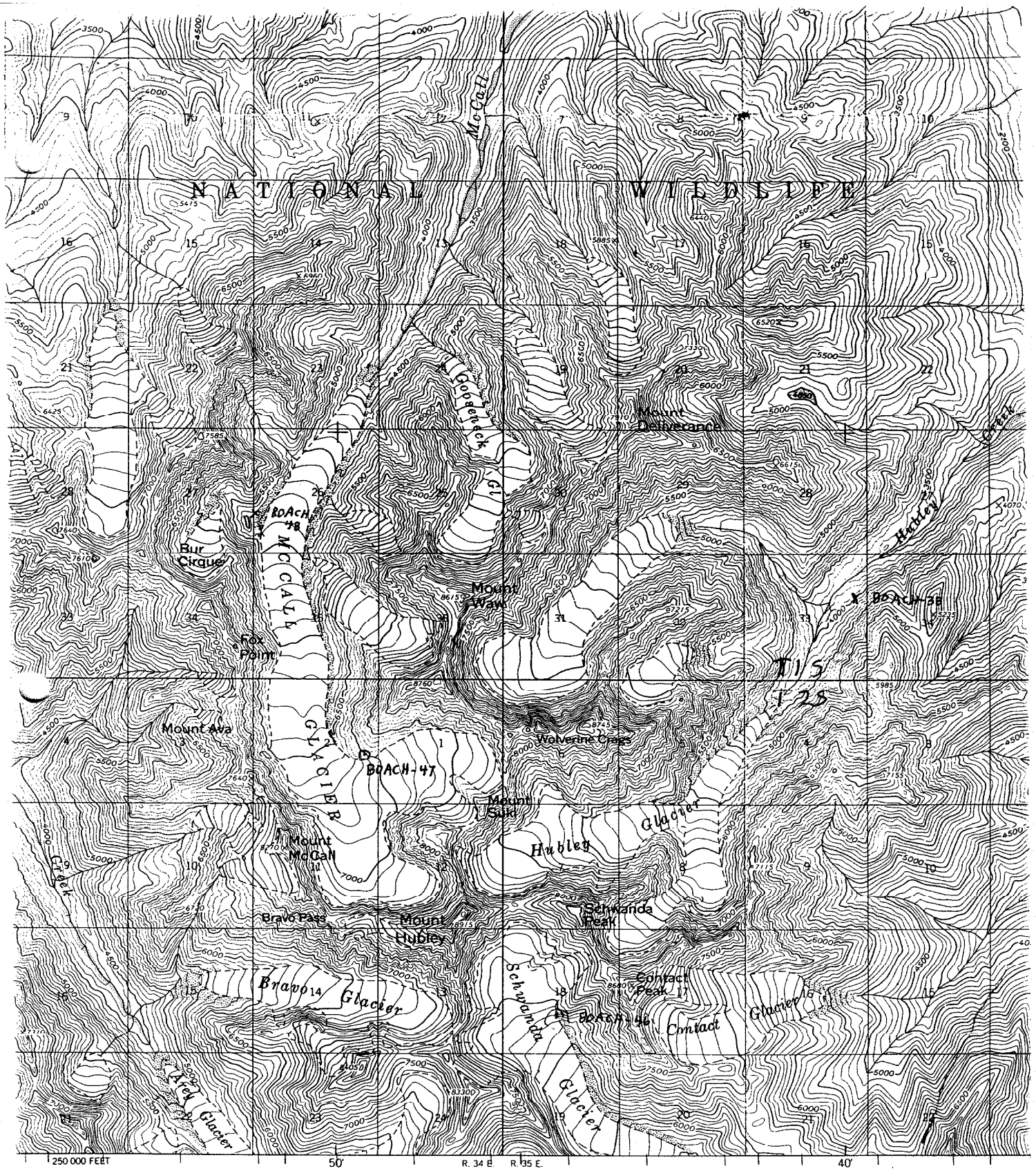
83AMH-10



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Demarcation Pt. B-5 NW/4





the Geological Survey

erial photographs
ld checked

1927 North American datum
nate system, zone 2
tor grid ticks,

marked locations
anagement

SCALE 1:63360

3000 0 3000 6000 9000 12000 15000 18000 2100

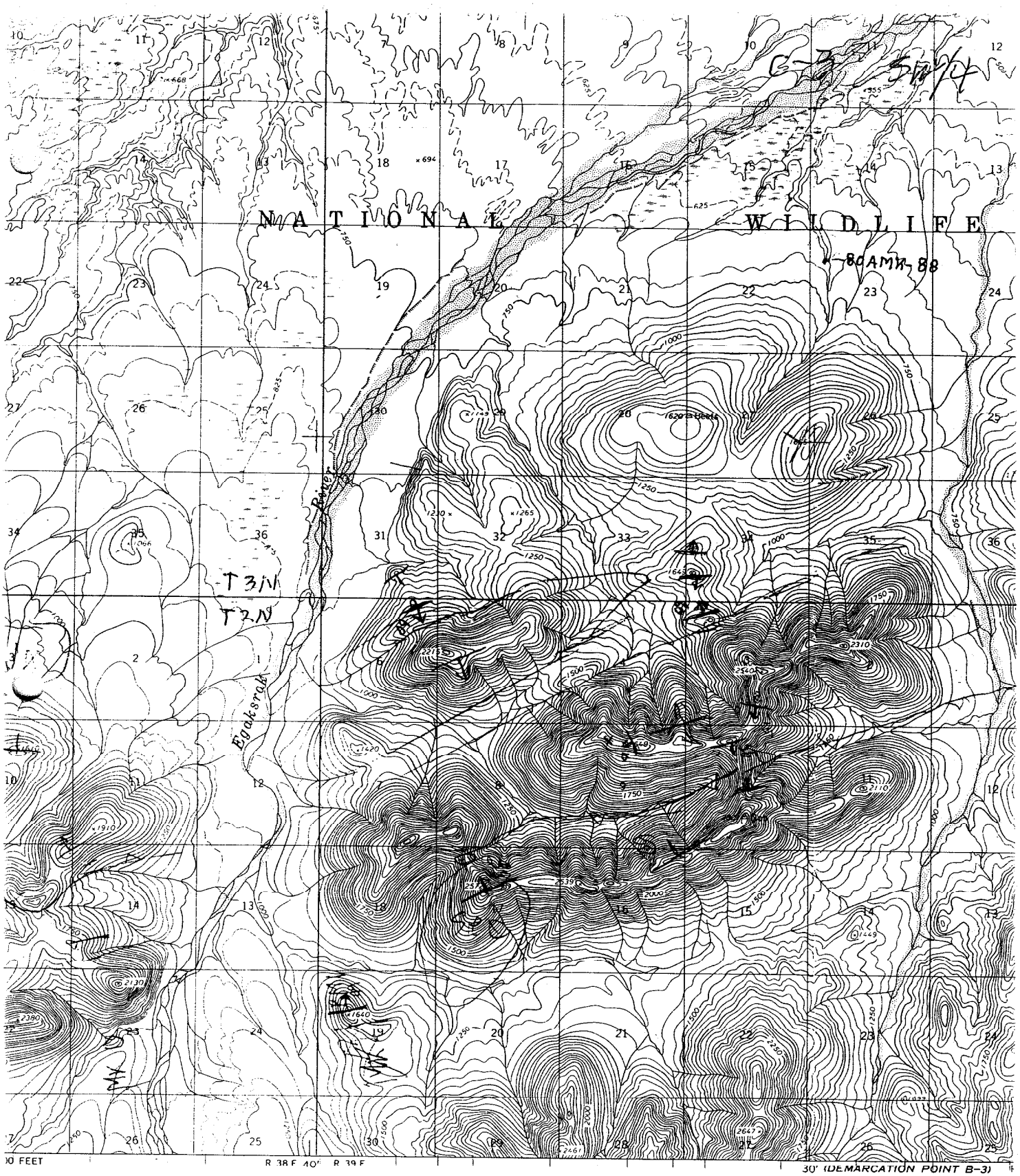
1 .5 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 100 FEET
DATUM IS MEAN SEA LEVEL

TRUE NORTH
MAGNETIC NORTH
34°
APPROXIMATE MEAN DECLINATION, 1956

Demarcation Pt B-5 SW/4 +

FOR SALE BY U.S. GEOLOGICAL SURVEY
FAIRBANKS, ALASKA 99701, DENVER, COLORADO 80225, OR WASHINGTON, D.C. 20242



rmy Map Service
shed by the Geological Survey

SCE

togrammetric methods from aerial photographs
nnotated 1955. Map not field checked

se Mercator projection. 1927 North American datum
ased on Alaska coordinate system, zone 2
sal Transverse Mercator grid ticks,
lue

nt unsurveyed and unmarked locations
he Bureau of Land Management

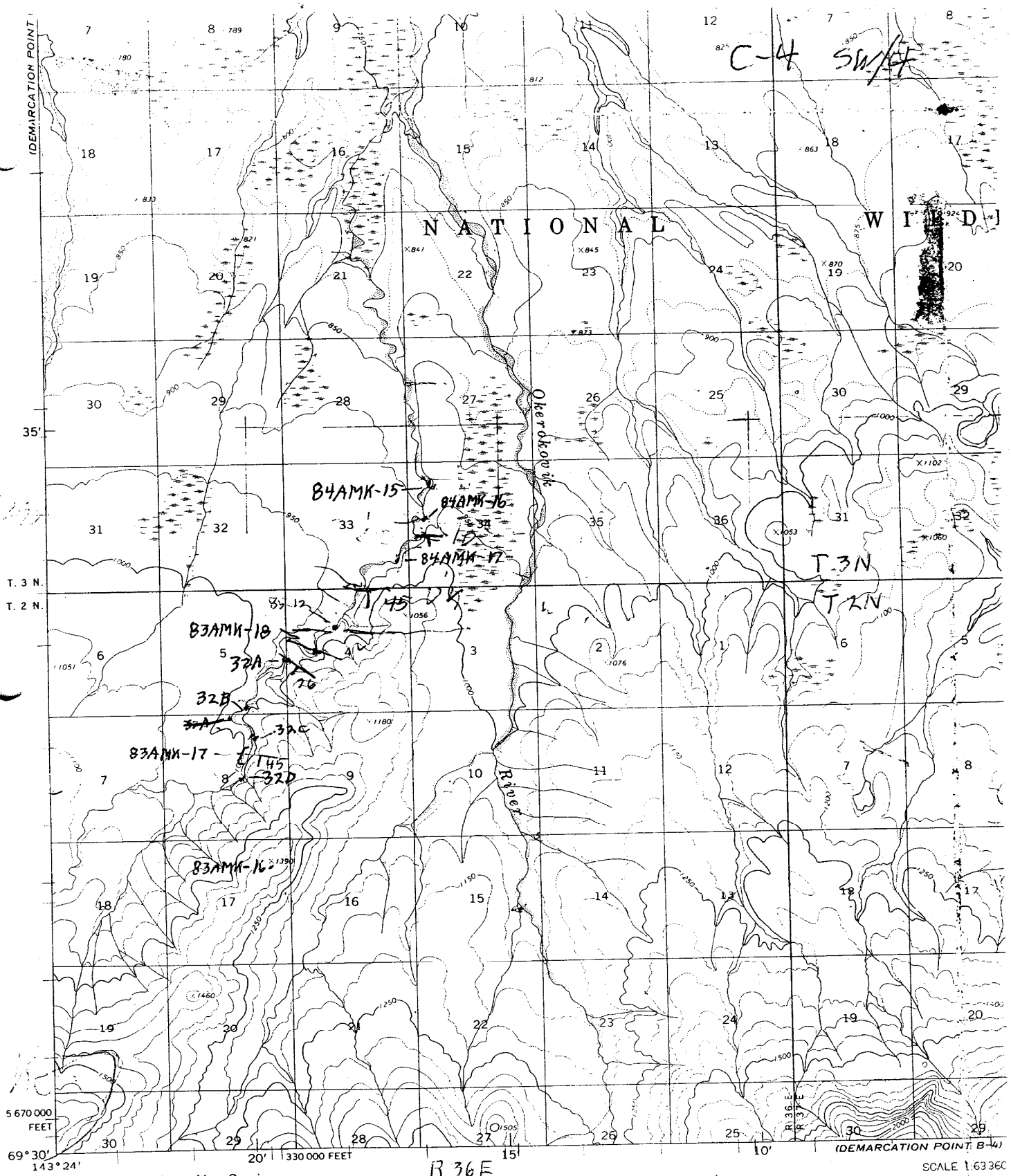
APPROXIMATE MEAN DECLINATION, 1955

SCALE 1:63360

CONTOUR INTERVAL 50 FEET
DASHED LINES REPRESENT 25-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

Demarcation Point C-3 SW/4

FOR SALE BY U. S. GEOLOGICAL SURVEY



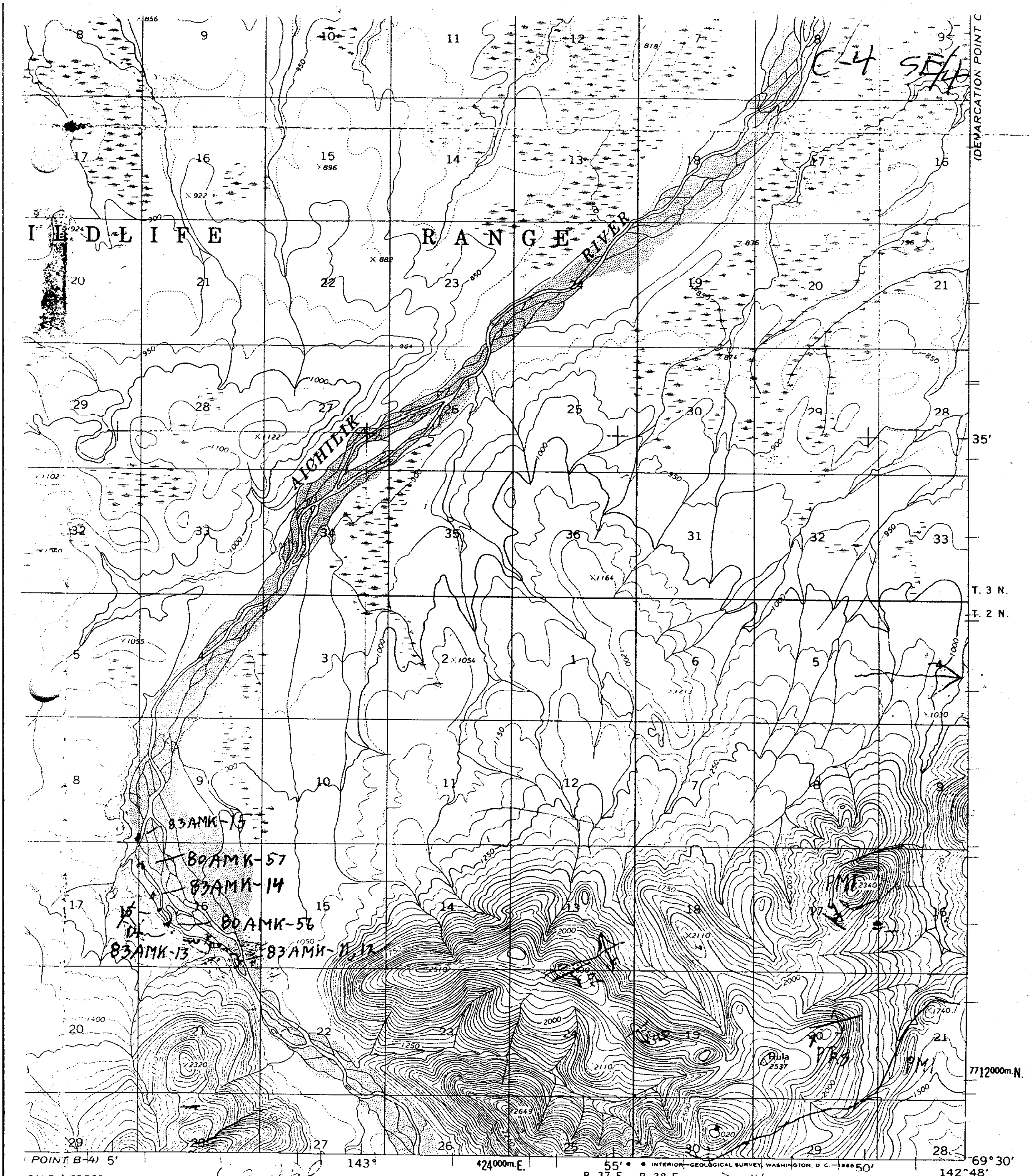
Mapped by the Army Map Service
Edited and published by the Geological Survey

Control by USC&GS and USCE

Topography by photogrammetric methods from aerial photographs taken 1955, field annotated 1955. Map not field checked

Universal Transverse Mercator projection. 1927 North American datum
10,000-foot grid based on Alaska coordinate system, zone 2
1000-meter Universal Transverse Mercator grid ticks,
zone 7, shown in blue

Land lines represent unsurveyed and unmarked locations
predetermined by the Bureau of Land Management



POINT B-4) 5′ 143° 424000m.E. 55′ R. 37 E. R. 38 E. INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1960 50′ 142°48′ 69°30′

CALE 1:63360

2 3 4 MILES

12000 15000 18000 21000 FEET

3 4 5 KILOMETERS

R INTERVAL 50 FEET
EPRESENT 25-FOOT CONTOURS
IS MEAN SEA LEVEL

(DEMARCA

C-4

ROAD CLASSIFICATION

No roads or trails in this area

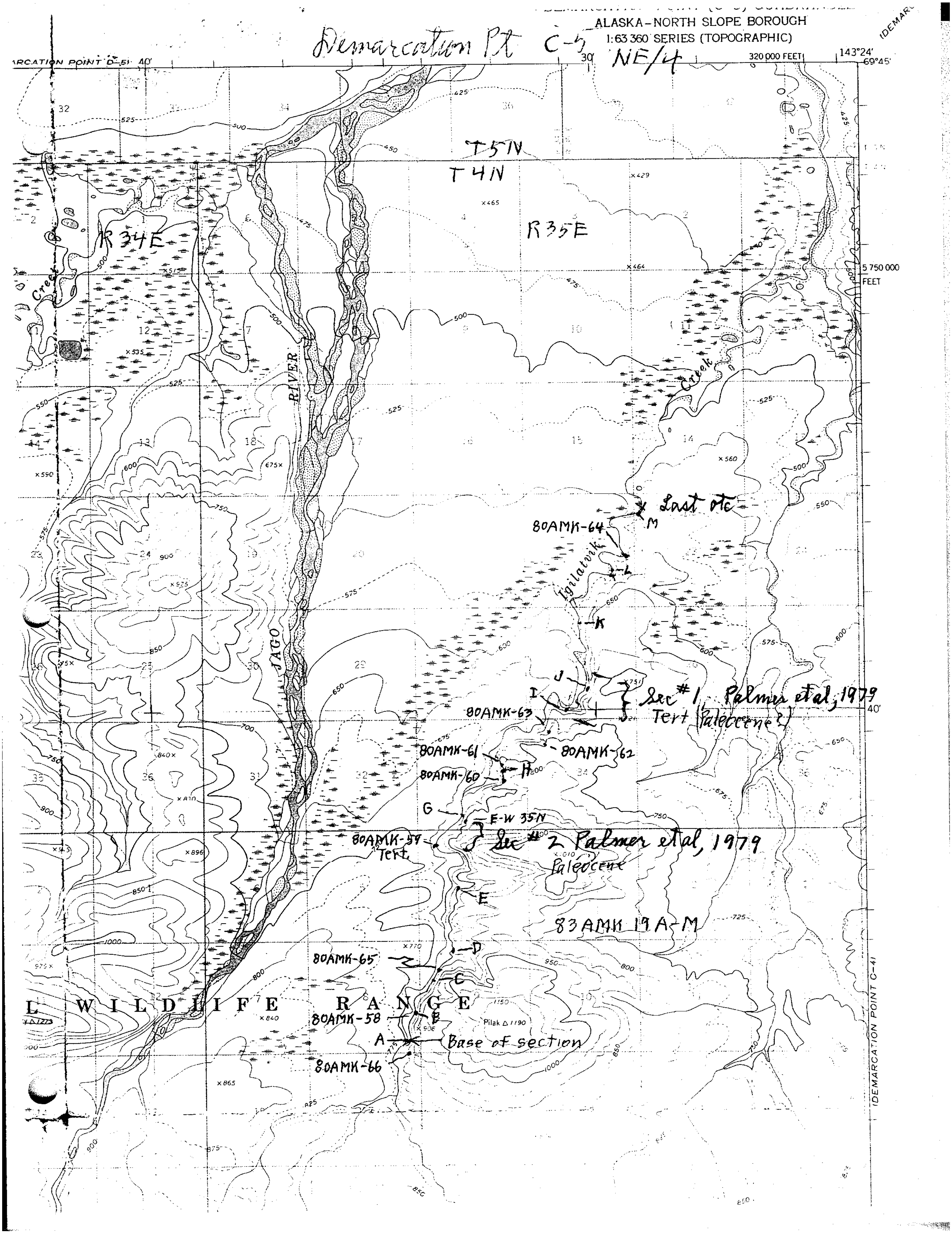
ALASKA

QUADRANGLE LOCATION

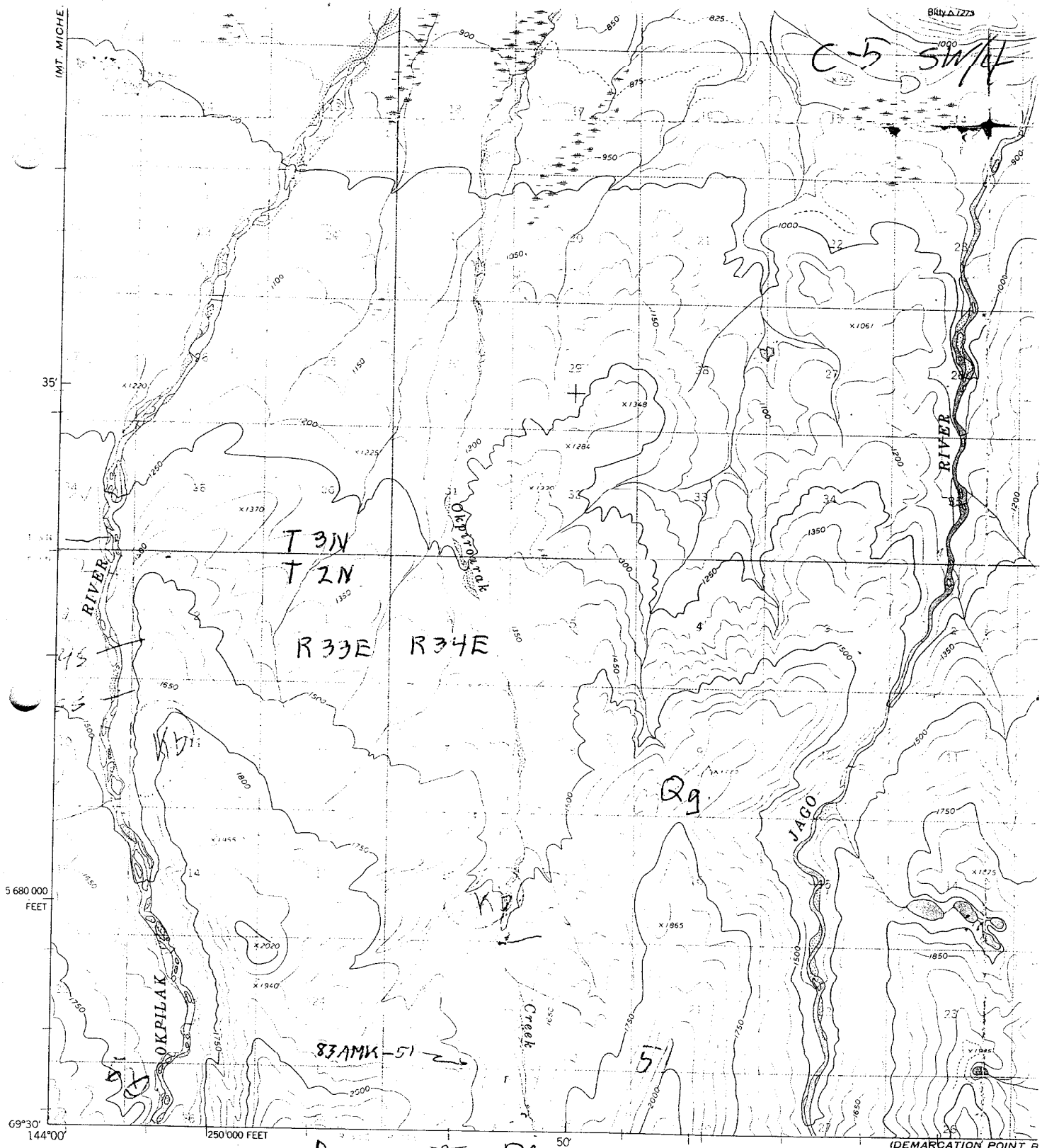
SE/4

U. S. GEOLOGICAL SURVEY
COLORADO 80225, OR WASHINGTON, D. C. 20242

DEMARCATION POINT (C-4), ALASKA
N6930—W14248/15X36



Demarcation Pt C-5
NE/4
ALASKA-NORTH SLOPE BOROUGH
1:63 360 SERIES (TOPOGRAPHIC)
320 000 FEET
143°24'
69°45'
5 750 000 FEET
40'
T5N
T4N
R34E
R35E
Creek
JAGO RIVER
Igilatvik
Last otc
80AMK-64
M
L
K
J
I
Sec #1 Palmer et al, 1979
Tert (Paleocene?)
80AMK-63
80AMK-62
80AMK-61
80AMK-60
H
G
E-W 35N
Sec #2 Palmer et al, 1979
Paleocene
80AMK-59
Tert
E
83AMK 19A-M
D
80AMK-65
C
L WILDLIFE RANGE
80AMK-58
B
Pilak △1190
A
Base of section
80AMK-66
DEMARCATION POINT C-4



Demarcation Pt. C-5

Mapped by the Army Map Service
Edited and published by the Geological Survey

Control by USC&GS and USCE

Topography by photogrammetric methods from aerial photographs taken 1955, field annotated 1955. Map not field checked

Universal Transverse Mercator projection 1927 North American datum
10,000-foot grid based on Alaska coordinate system, zone 2
1000-metre Universal Transverse Mercator grid ticks, zone 7, shown in blue

Land lines represent unsurveyed and unmarked locations predetermined by the Bureau of Land Management
Folio U-1, Umiat Meridian

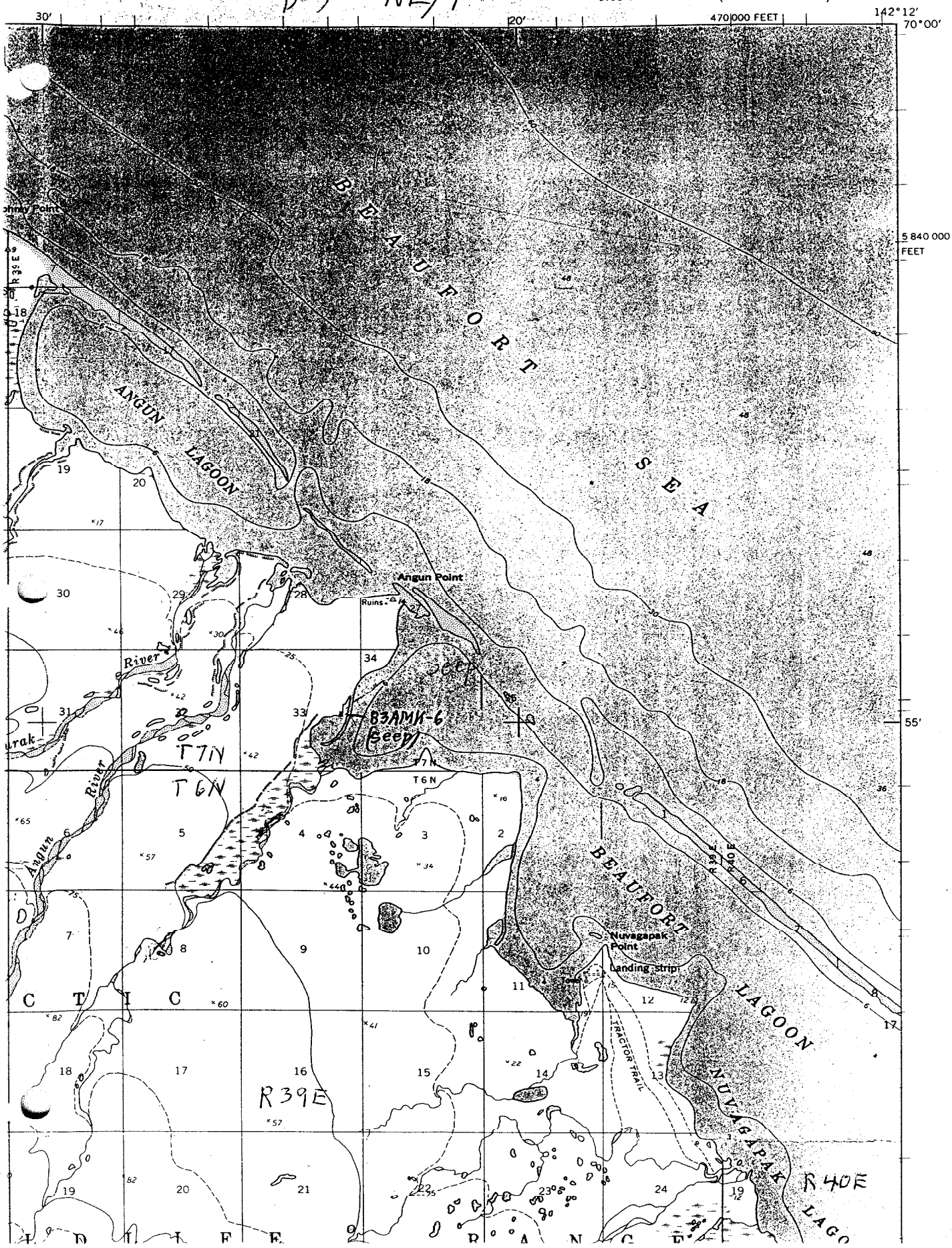
APPROXIMATE MEAN DECLINATION, 1955

TRUE NORTH
MAGNETIC NORTH
35°

SCALE 1:63 360

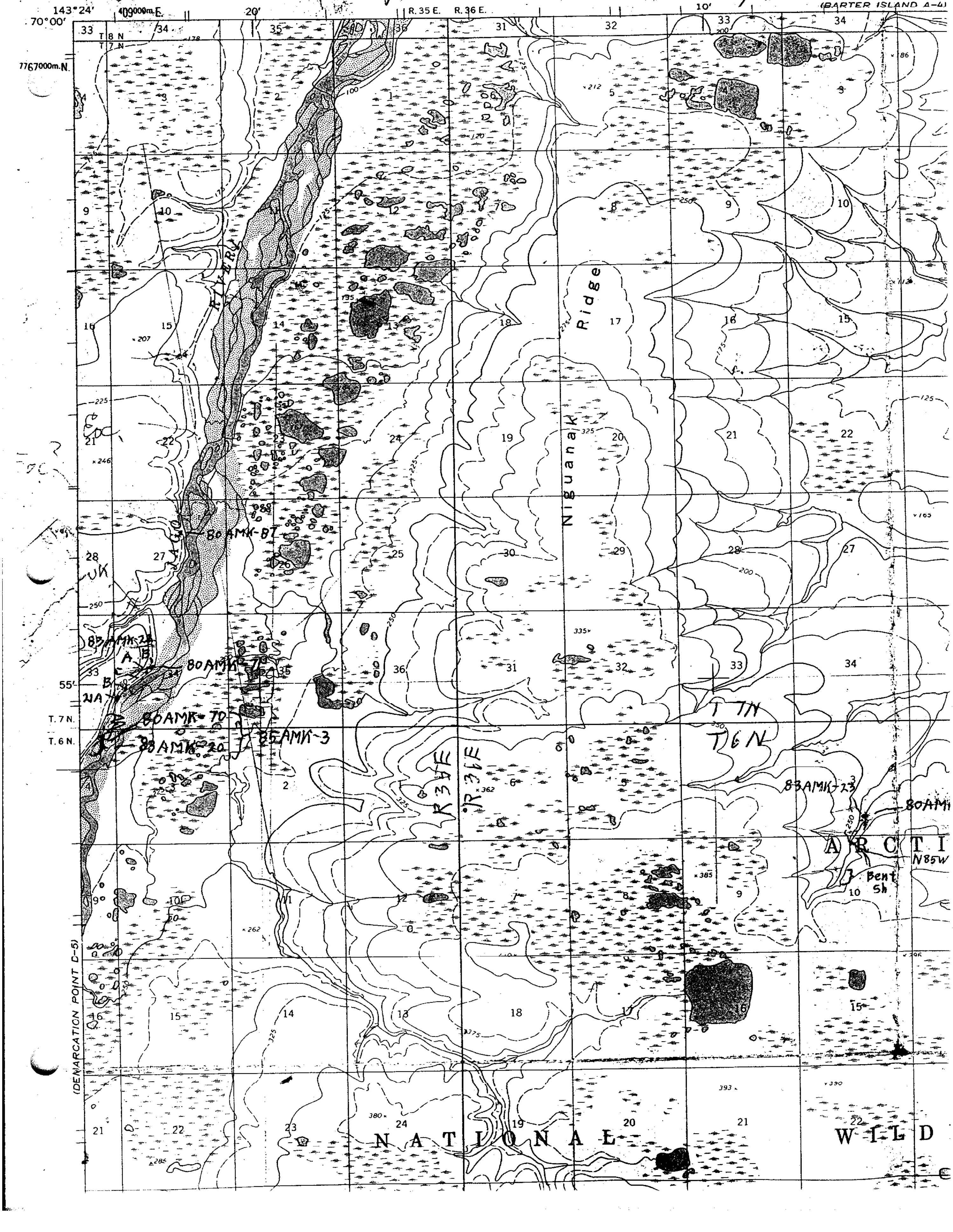
CONTOUR INTERVAL 50
DOTTED LINES REPRESENT 25-FOO
NATIONAL GEODETIC VERTICAL DATU

FOR SALE BY U. S. GEOLOGICAL
FAIRBANKS, ALASKA 99701, DENVER, COLORADO 8022
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBO


DEMARCATION POINT (D-3) QUADRANGLE
ALASKA
1:63 360 SERIES (TOPOGRAPHIC)
D-3 NE/4
30'
20'
470 000 FEET
142°12'
70°00'
5 840 000 FEET
55'
BEAUFORT SEA
ANGUN LAGOON
Angun Point
Ruins
River
B3AMK-6 (Seep)
T7N
T6N
R39E
R40E
Nuvagapak Point
Landing Strip
TRACTOR TRAIL
NUVAGAPAK LAGOON
Angun River

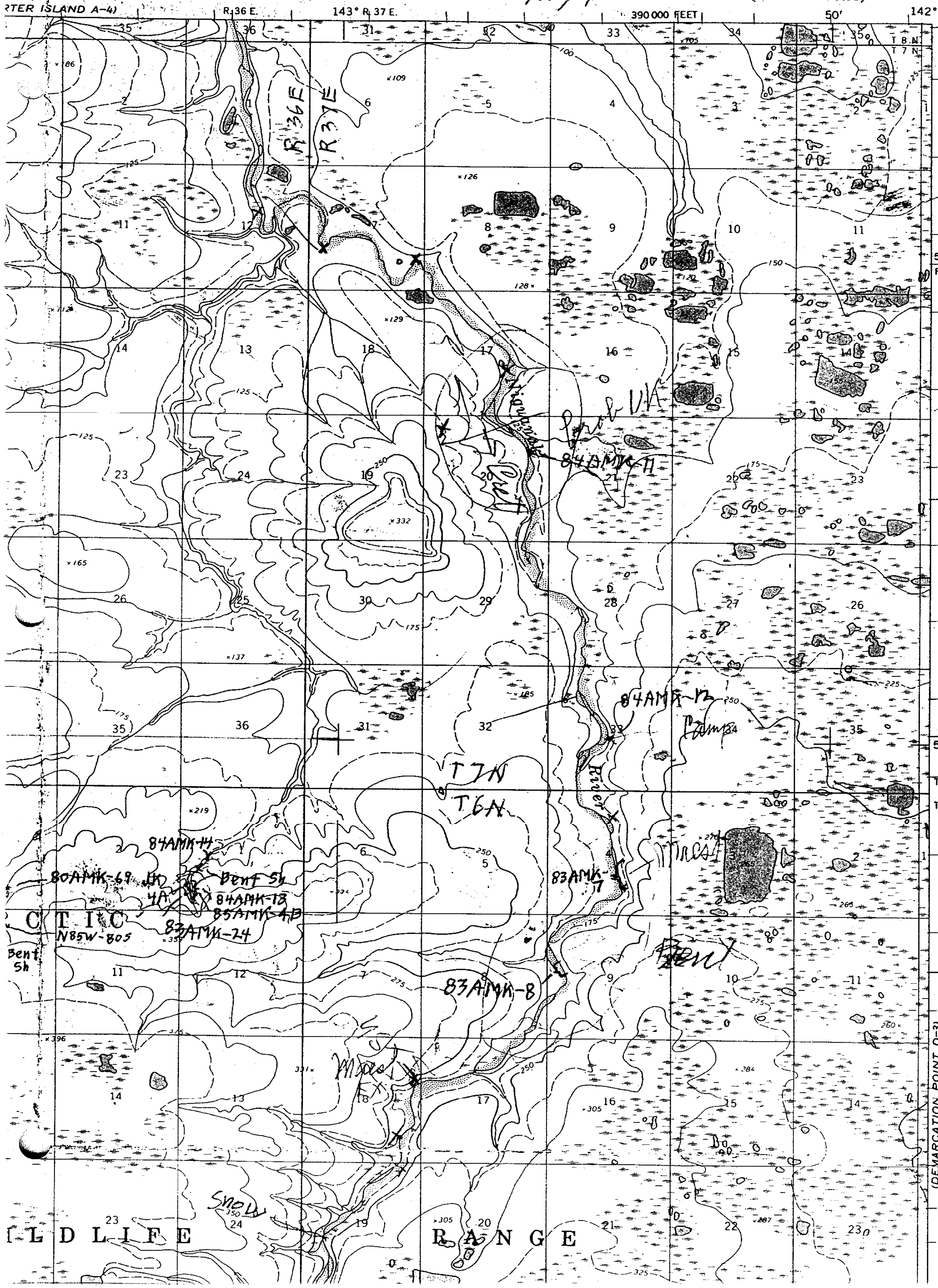
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

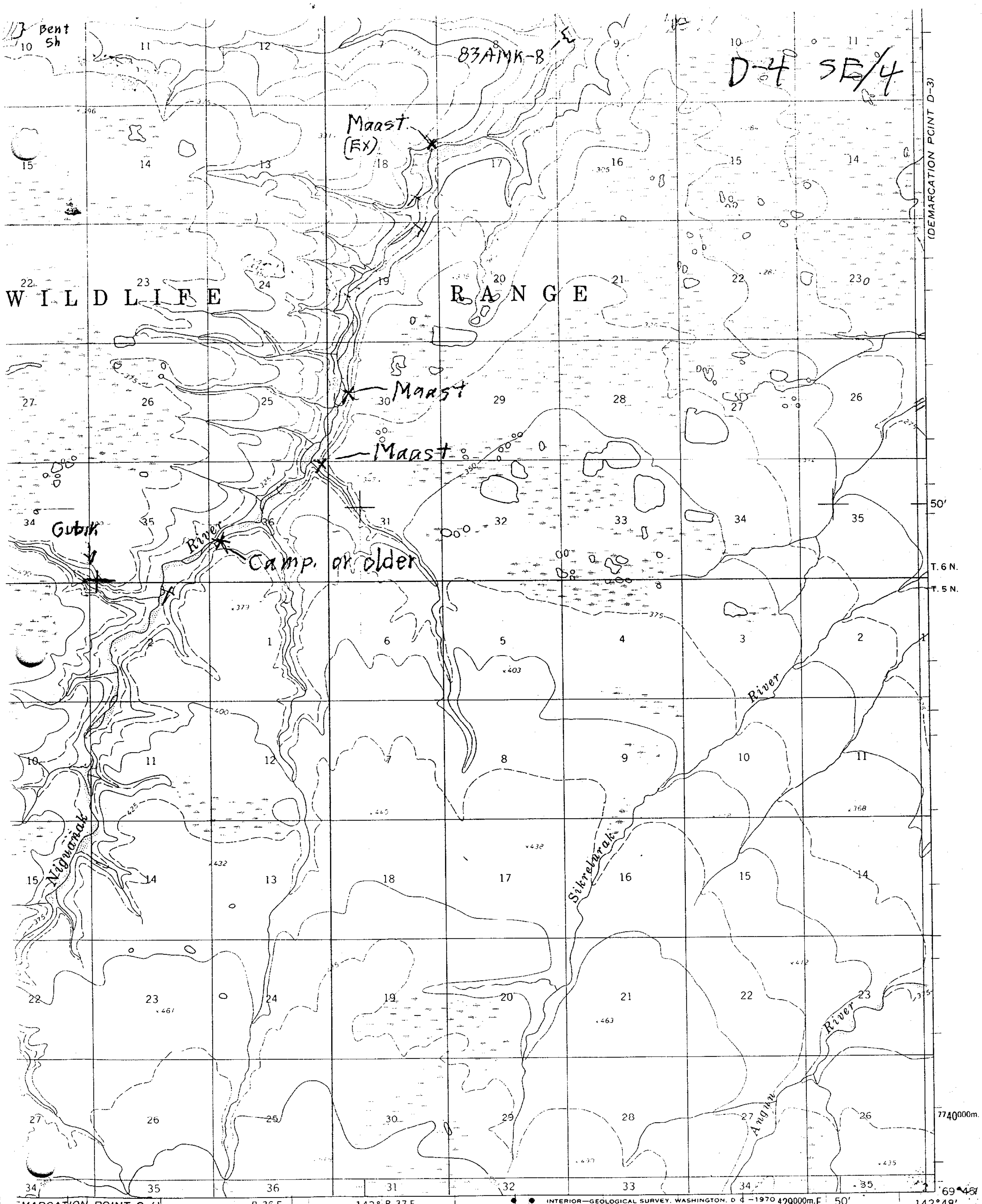
Demarcation Pt. D-4 NW/4



143° 5' 38"

DEMARCATION POINT (D-4) QUADRANGLE
ALASKA
NE/4
1:63 360 SERIES (TOPOGRAPHIC)





Demarcation Point D-4 SE/4

SCALE 1:63 360

1 2 3 4 MILES

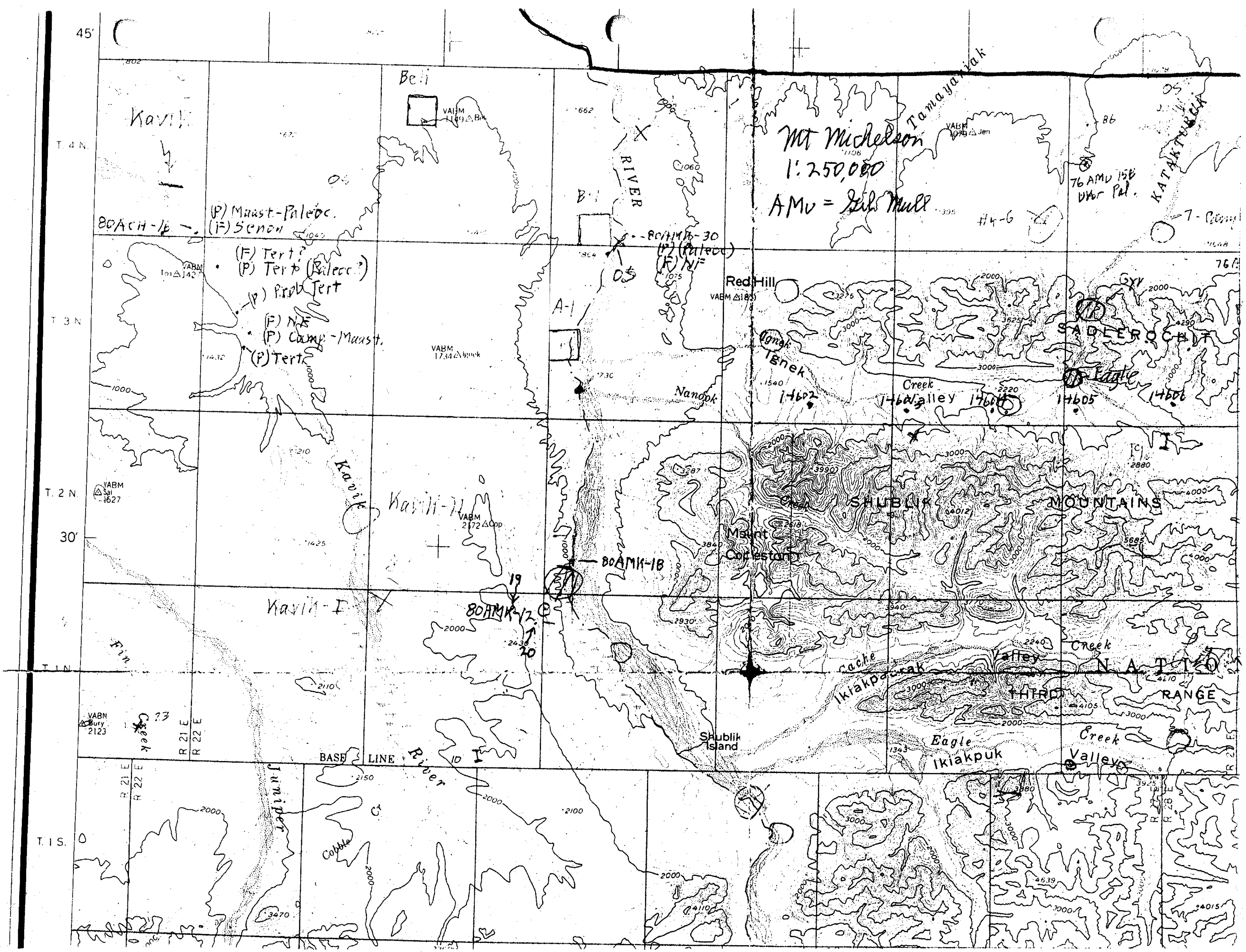
0 9000 12000 15000 18000 21000 FEET

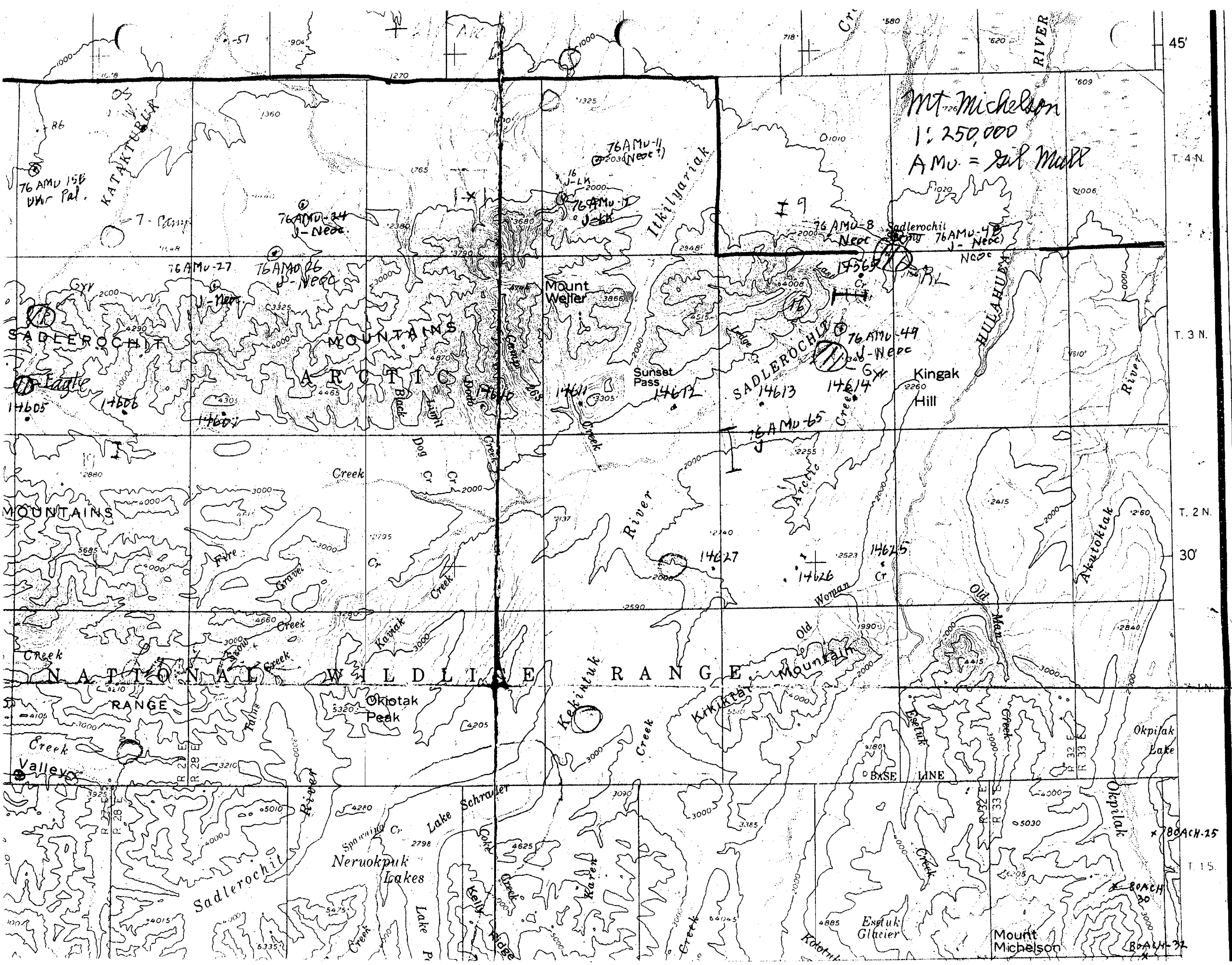
2 3 4 5 KILOMETERS

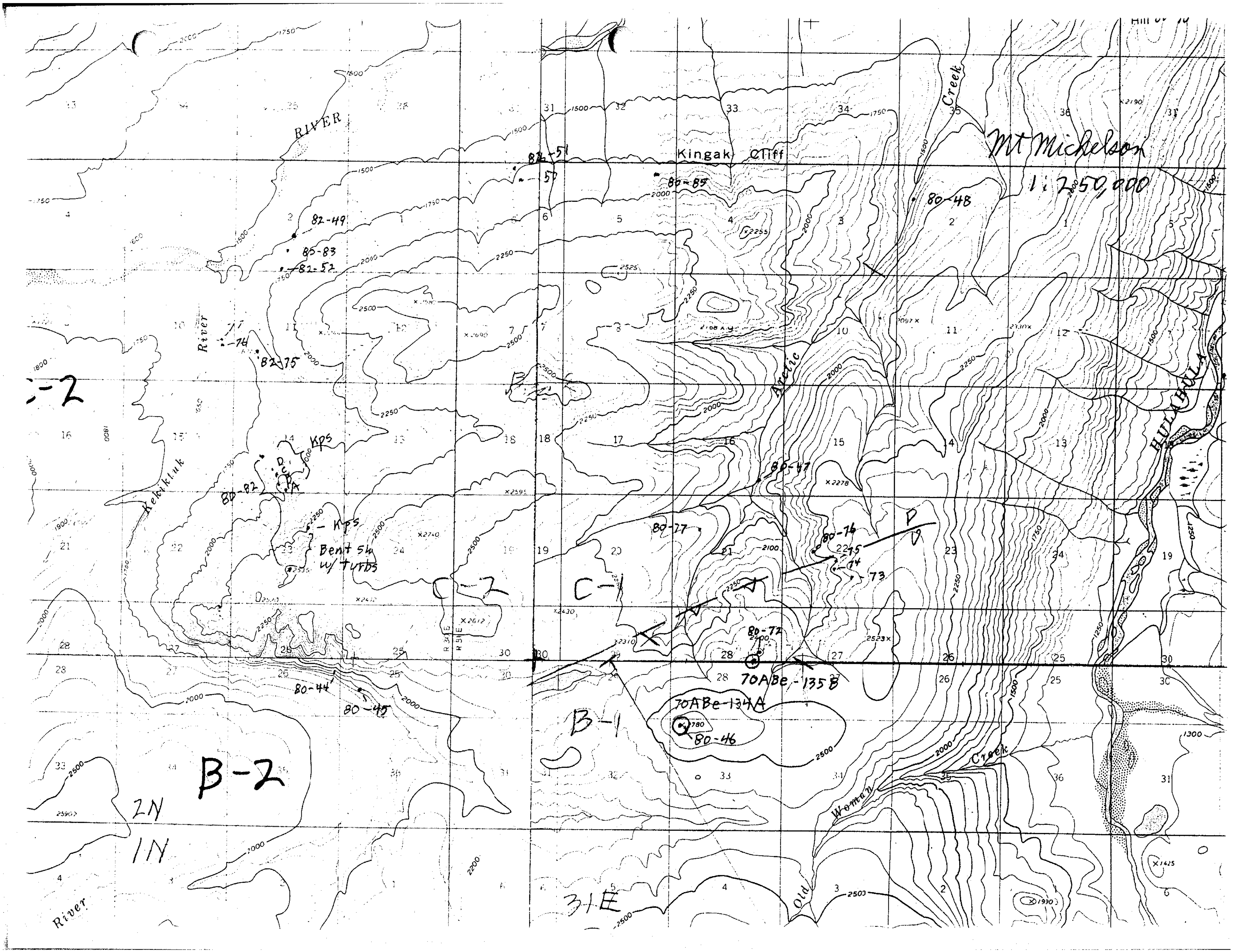
TOUR INTERVAL 50 FEET

ROAD CLASSIFICATION

No roads or trails in this area


Mt Michelson
1:250,000
AMU = Bill Mull
Bell
Kavik
Kavik-II
Kavik-I
Kavik
RIVER
Tamayariak
KATAKTURUK
80ACH-1b
(P) Maast-Paleoc.
(F) Senon
(F) Tert?
(P) Tert? (Paleoc?)
(P) Prob Tert
(F) NF
(P) Camp-Maast.
(P) Tert.
80AMK-30
(P) (Paleoc)
(F) NF
80AMK-1B
80AMK-12
19
20
A-1
B-1
76 AMU 15B
U. Pal.
7-Camp
Red Hill
Ignek
Nanook
Creek
Valley
14602
14603
14604
14605
14606
SADLEROCHIT
Eagle
SHUBLIK
MOUNTAINS
Mount
Copleston
Cache
Ikiakpaurak
Valley
Creek
THIRD
RANGE
Eagle
Ikiakpuk
Creek
Valley
Shublik
Island
BASE LINE
River
Juniper
Fin
Creek
Cobble
T. 4 N.
T. 3 N.
T. 2 N.
T. 1 N.
T. 1 S.
R 21 E
R 22 E
45'
30'

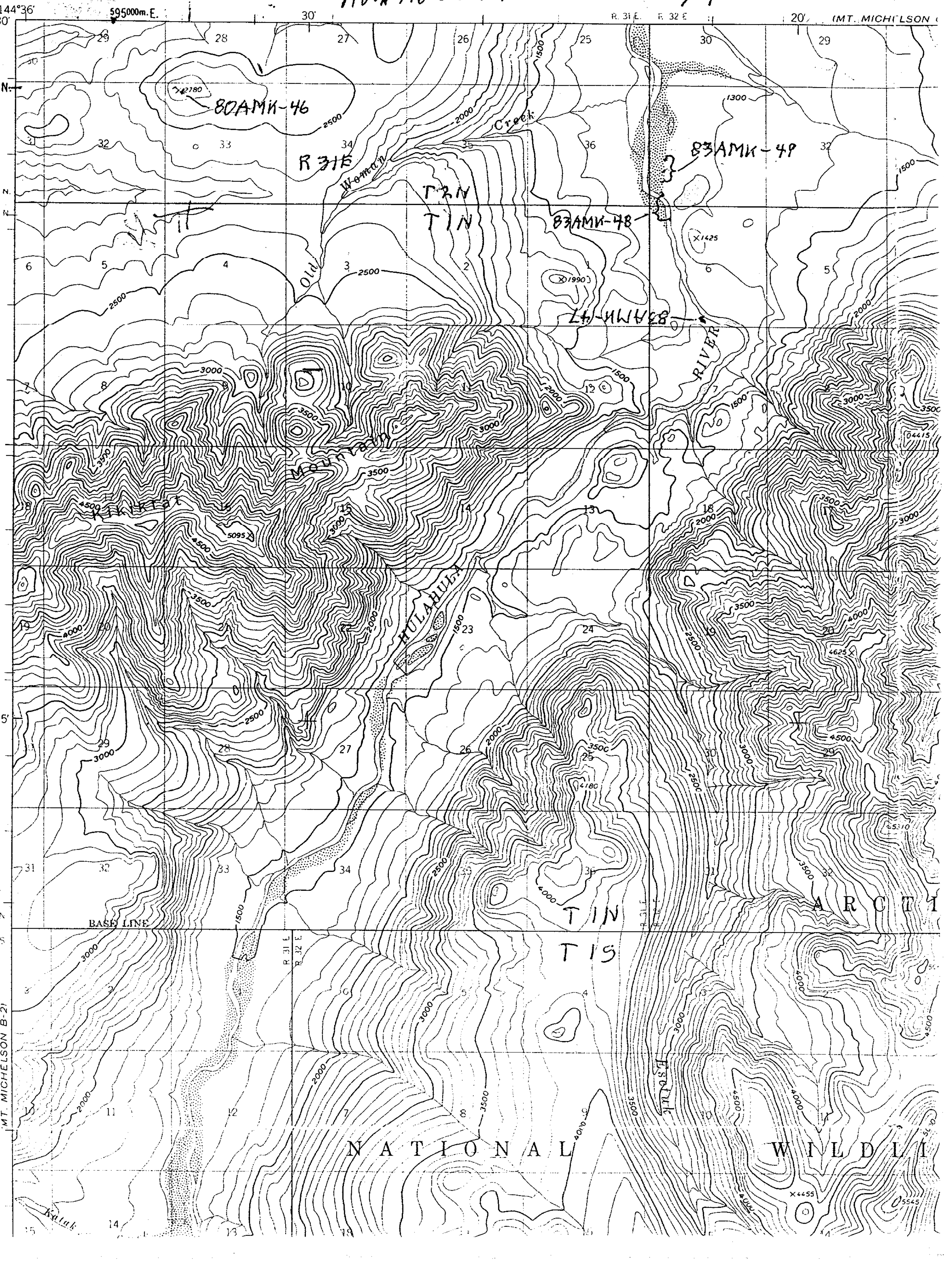

Mt Michelson
1:250,000
AMu = Gil Mull
SADLEROCHIT
MOUNTAINS
ARCTIC
NATIONAL WILDLIFE RANGE
Mount Weller
Sunset Pass
Kingak Hill
Okiotak Peak
Neruokpuk Lakes
Mount Michelson
Esetuk Glacier
Sadlerochit
Katakturuk
Itkilyariak
Hulahula
Old Man
Old Woman
Okpilak
Akutoktak
River
BASE LINE
T. 4 N.
T. 3 N.
T. 2 N.
T. 1 S.
45'
30'
76AMU-8
76AMU-11
76AMU-27
76AMU-49
76AMU-65
14605
14613
14614
14625
14626
14627

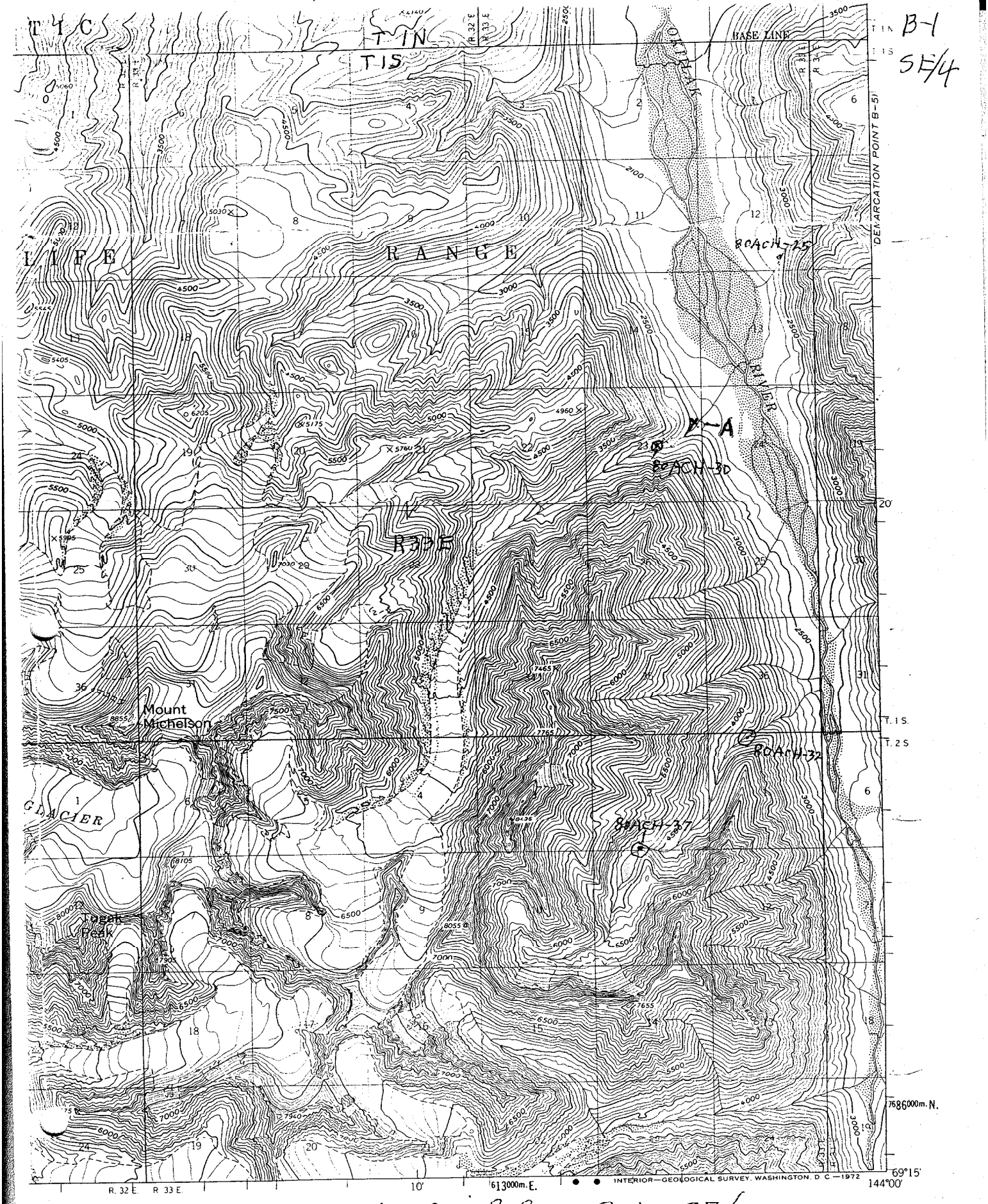


Mt Michelson
1:250,000
Kingak Cliff
RIVER
River
Arctic
Creek
HULAHULA
Kekiktuk
Woman Creek
Old
River
80-48
80-85
82-51
57
82-49
85-83
82-52
-74
82-75
Kps
80-82
- Kps
Bent Sh
w/ Turbs
80-47
80-77
80-76
75
74
73
80-72
70ABe-135B
70ABe-134A
80-46
80-44
80-45
D
C-1
C-2
B-1
B-2
2N
1N
31E

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Mt. Michelson B-1 NW/4



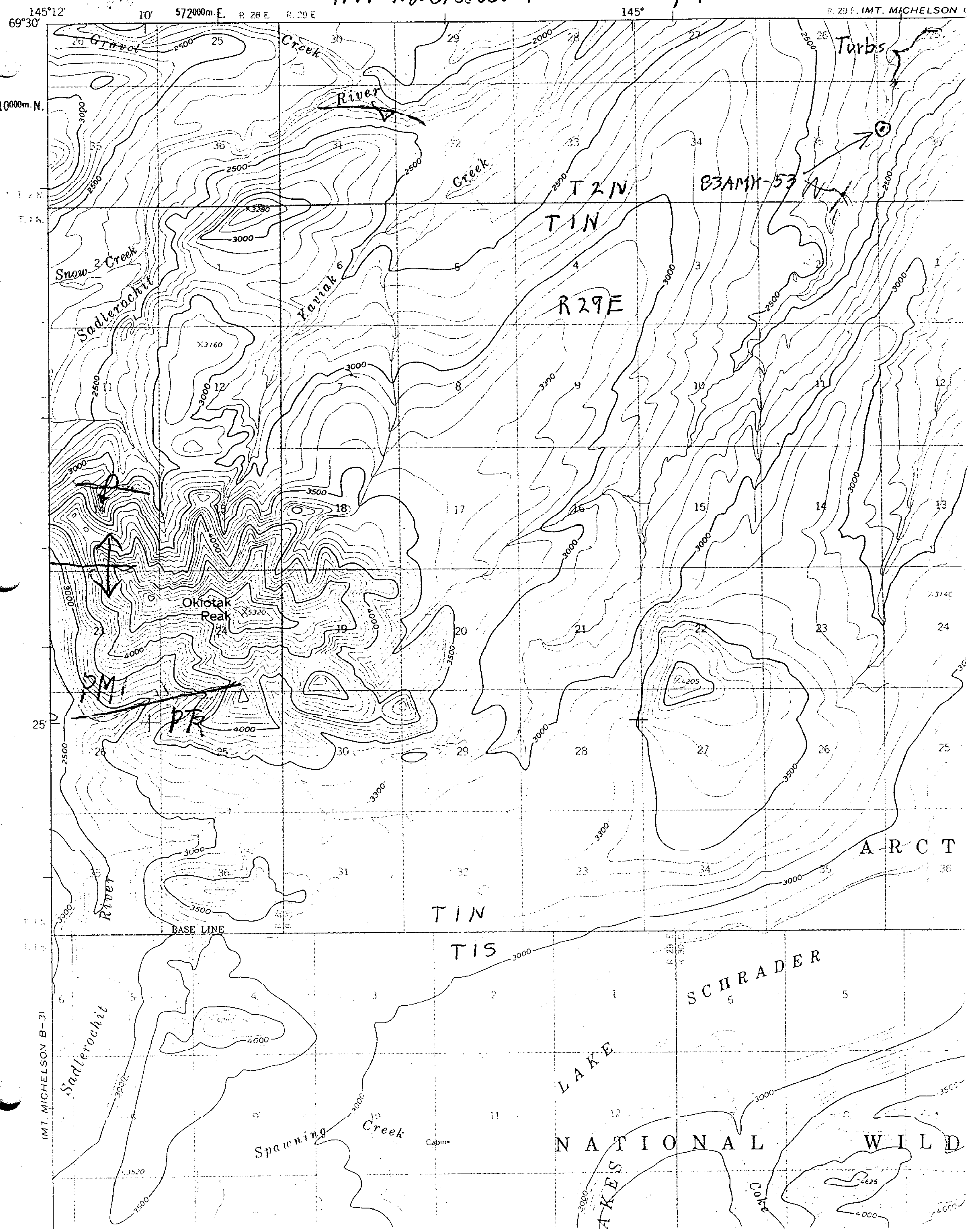


B-1
SE/4

Mt Michelson B-1 SE/4

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

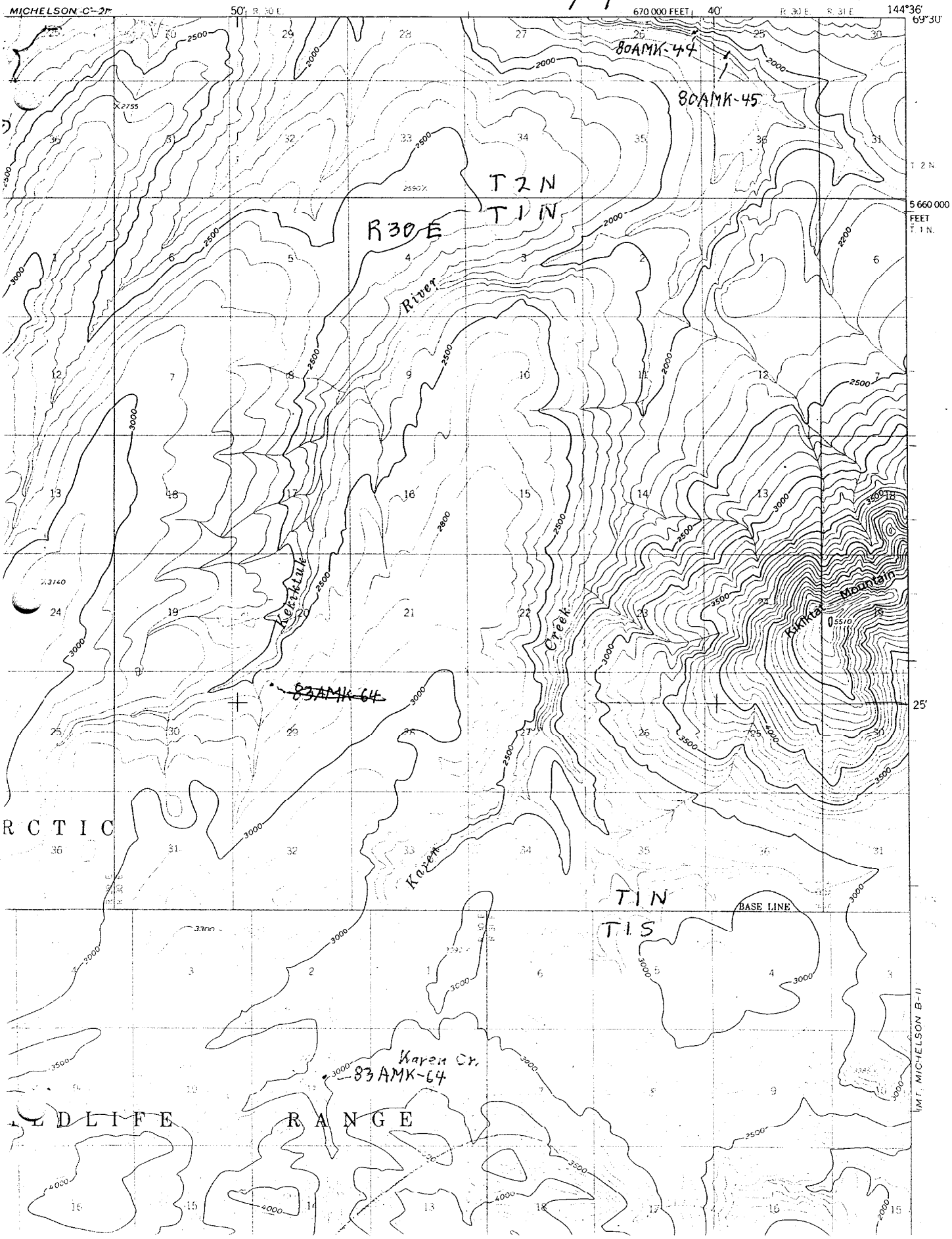
Mt Michelson B-2 NW/4

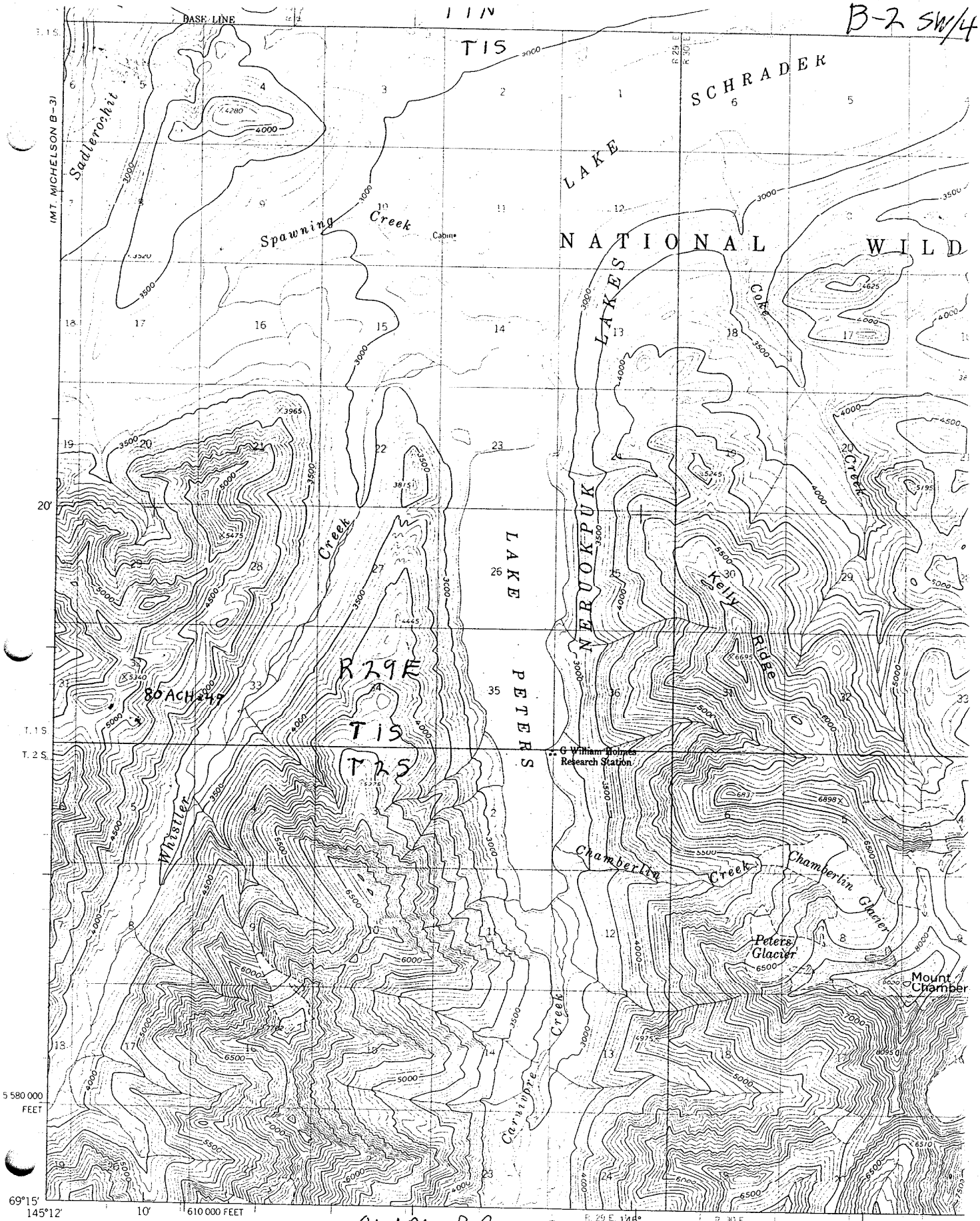


Mt Michelson B-2 NE/4

ALASKA

1:63 360 SERIES (TOPOGRAPHIC)





B-2 SW/4

Mapped, edited, and published by the Geological Survey

Mt Michelson B-2 SW

Control by USC&GS and USCE

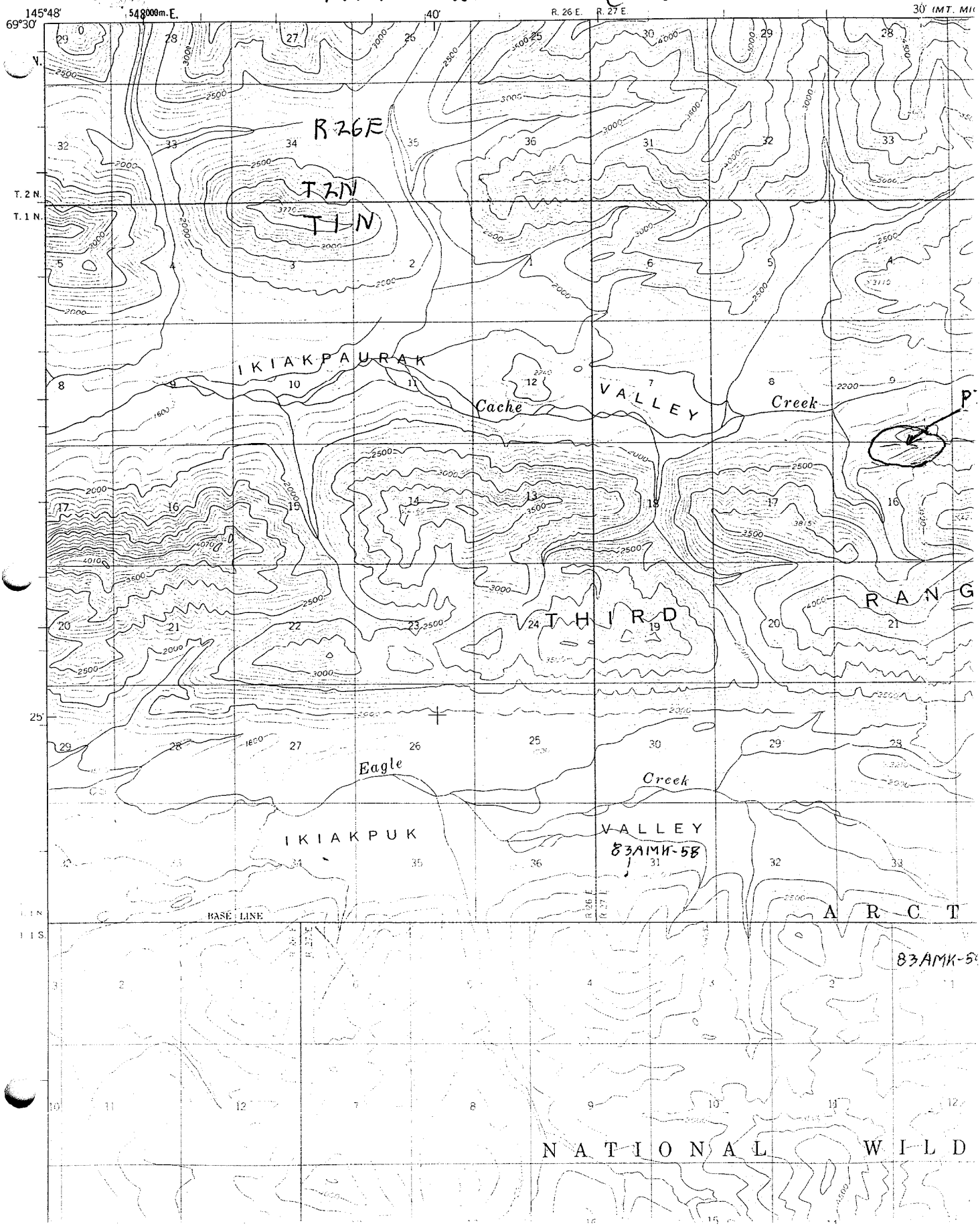
Topography by photogrammetric methods from aerial photographs taken 1956, field annotated 1956. Map not field checked

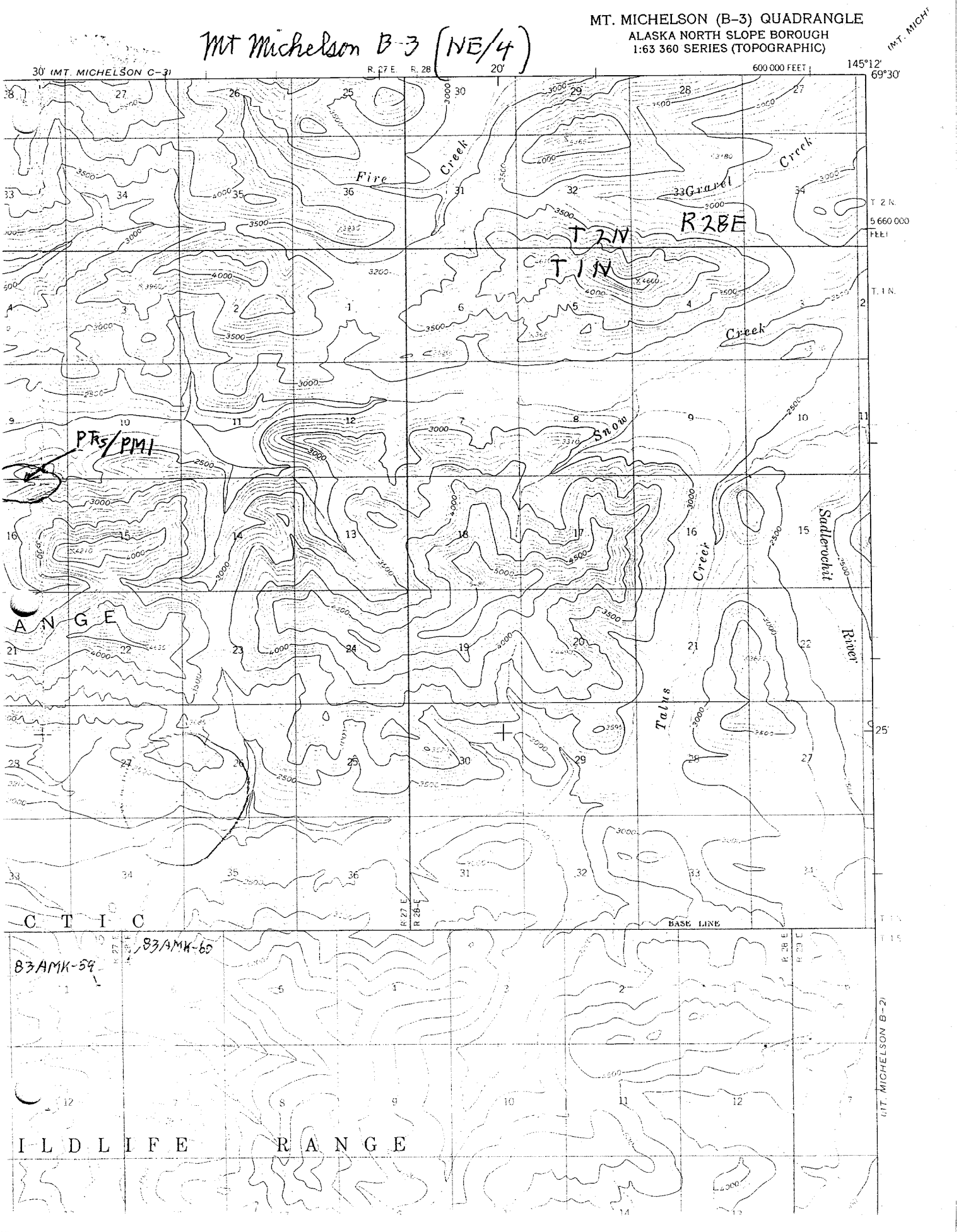
SCALE 1:63360

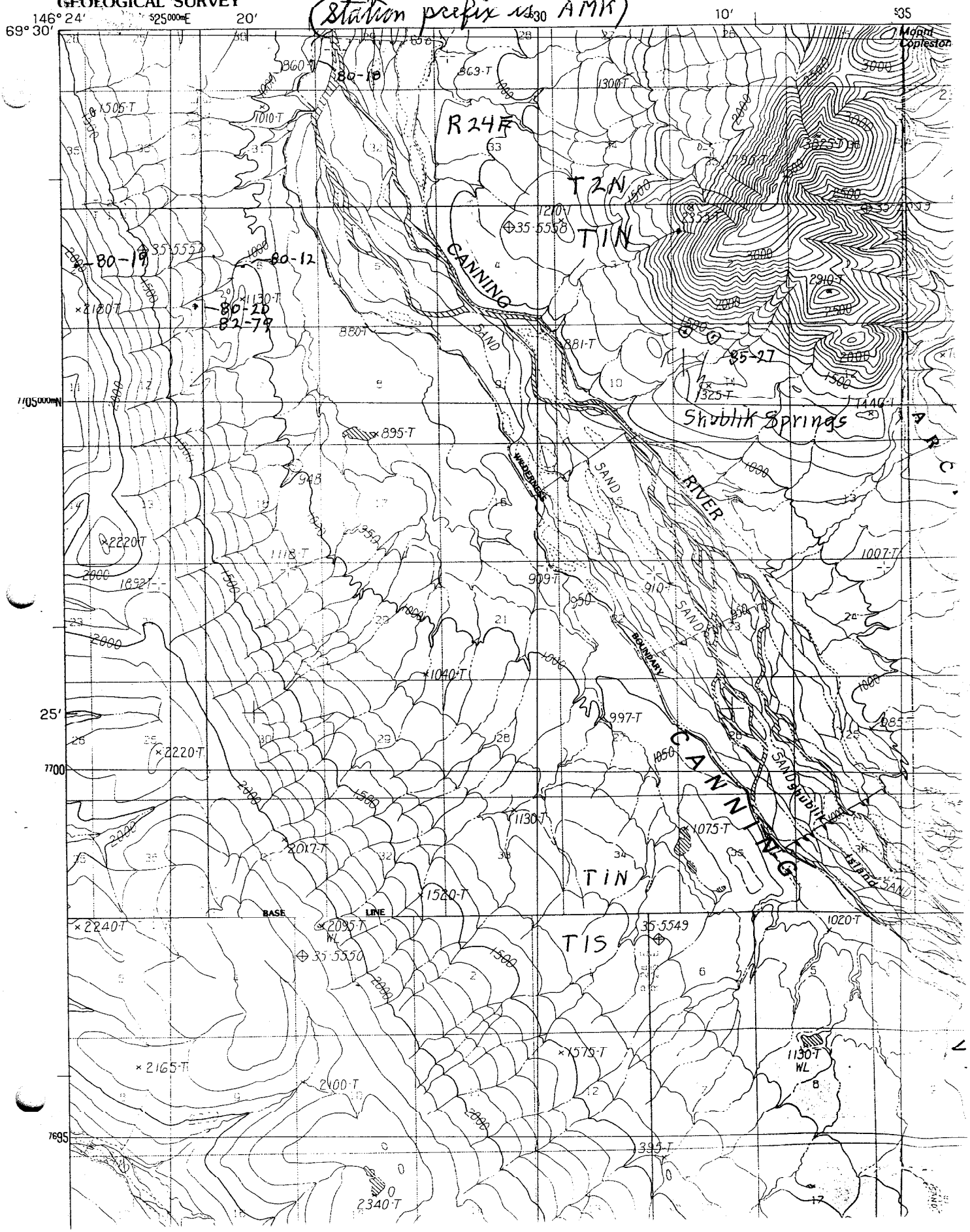
1 0 1

3000 0 3000 6000 9000

1 .5 0 1 2

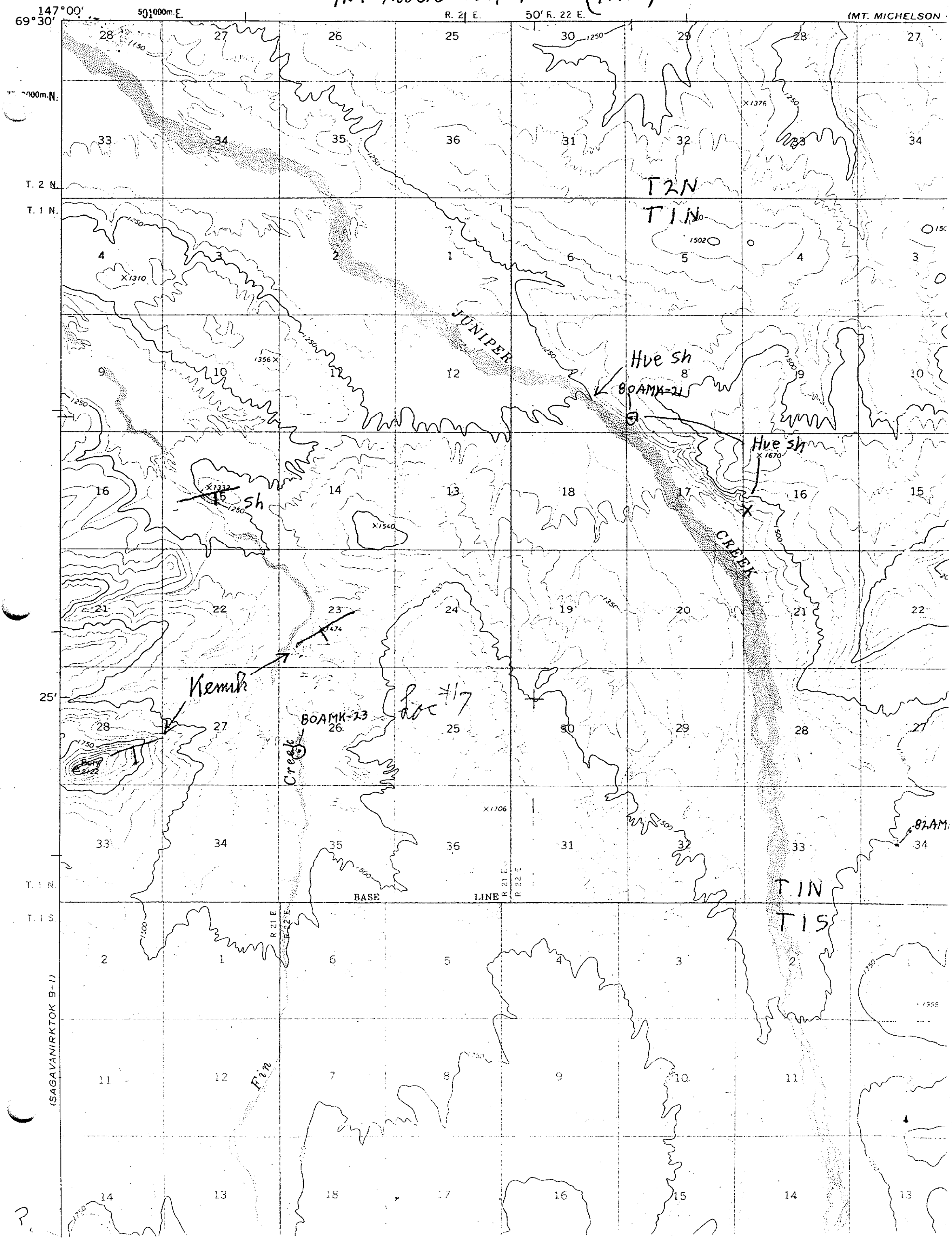

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Mt Michelson B-3 (NW)
145°48'
69°30'
548000m.E.
40'
R. 26 E.
R. 27 E.
30' (MT. MI
R26E
T2N
T1N
T. 2 N.
T. 1 N.
IKIAKPAURAK
Cache
VALLEY
Creek
RANG
THIRD
Eagle
Creek
IKIAKPUK
VALLEY
83AMK-58
BASE LINE
ARCT
83AMK-5
NATIONAL
WILD

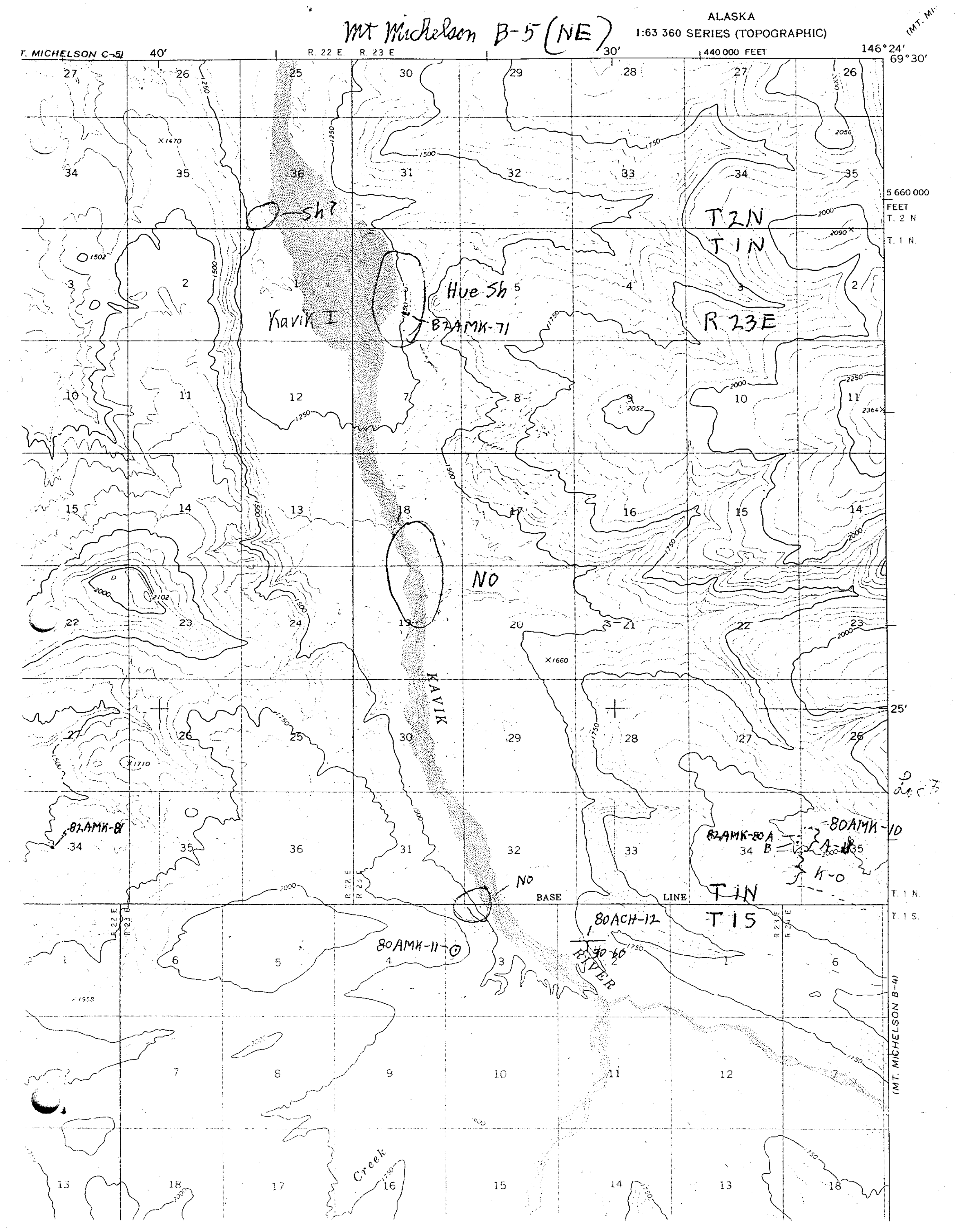

MT. MICHELSON (B-3) QUADRANGLE
ALASKA NORTH SLOPE BOROUGH
1:63 360 SERIES (TOPOGRAPHIC)
Mt Michelson B-3 (NE/4)
30' (MT. MICHELSON C-3)
R. 27 E.
R. 28
20'
600 000 FEET
145°12'
69°30'
T 2 N.
5 660 000 FEET
T. 1 N.
T 2N
R28E
T 1N
Fire Creek
Gravel Creek
Creek
Snow
Sadlerochit River
Creer
Talus
PTS/PM1
A N G E
C T I C
I L D L I F E R A N G E
83AMK-59
83AMK-60
BASE LINE
R. 27 E.
R. 28 E.
MT. MICHELSON B-2


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Mt Michelson B-4 NW
(Station prefix is AMK)
146° 24'
525000mE
20'
10'
69° 30'
Mount Copleston
80-18
80-19
80-12
80-20
82-74
85-27
Shublik Springs
CANNING
RIVER
SAND
WILDERNESS
BOUNDARY
BASE LINE
R24E
T2N
T1N
T1S
7705000mN
7700
7695
25'

DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

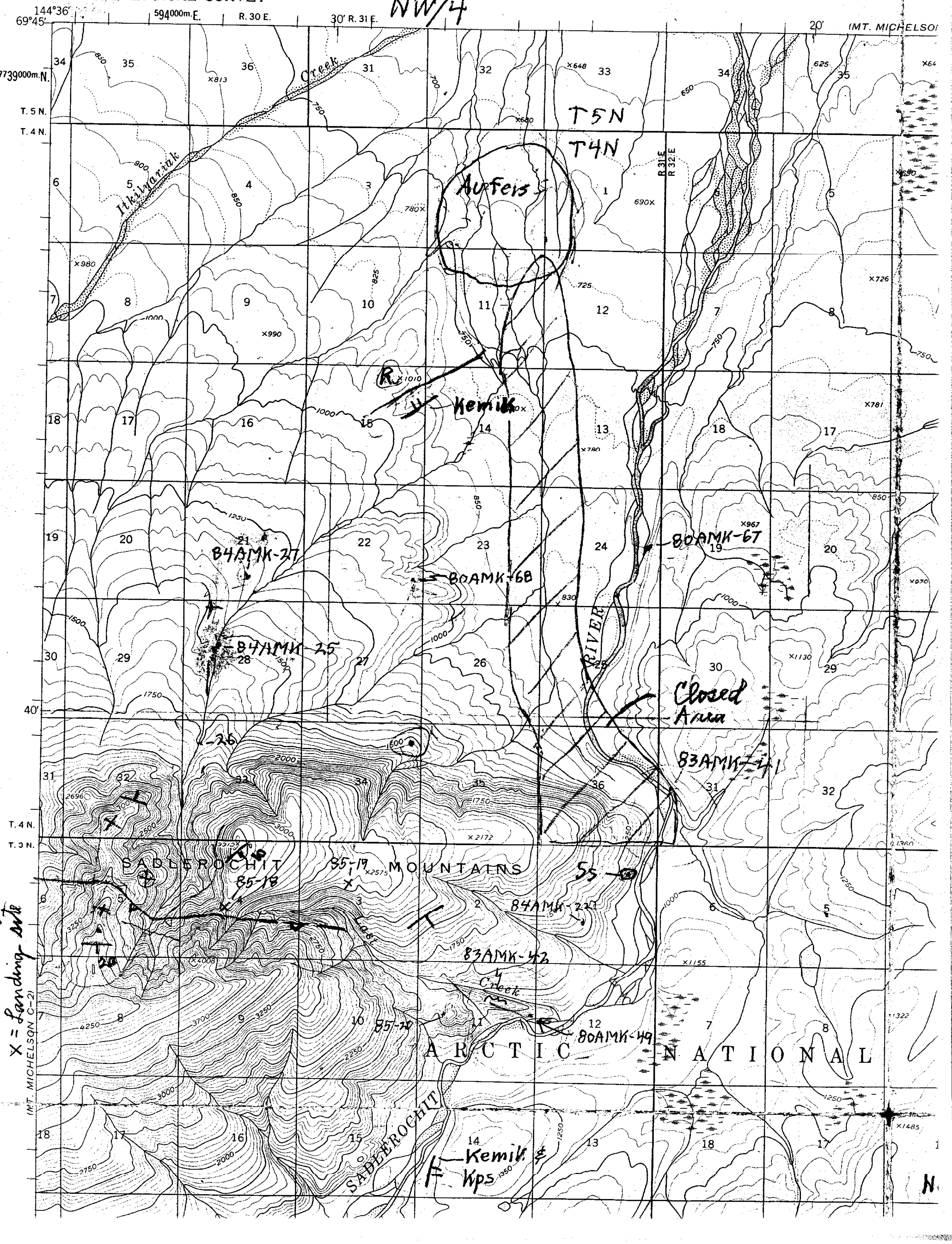
Mt Michelson B-5 (NW)

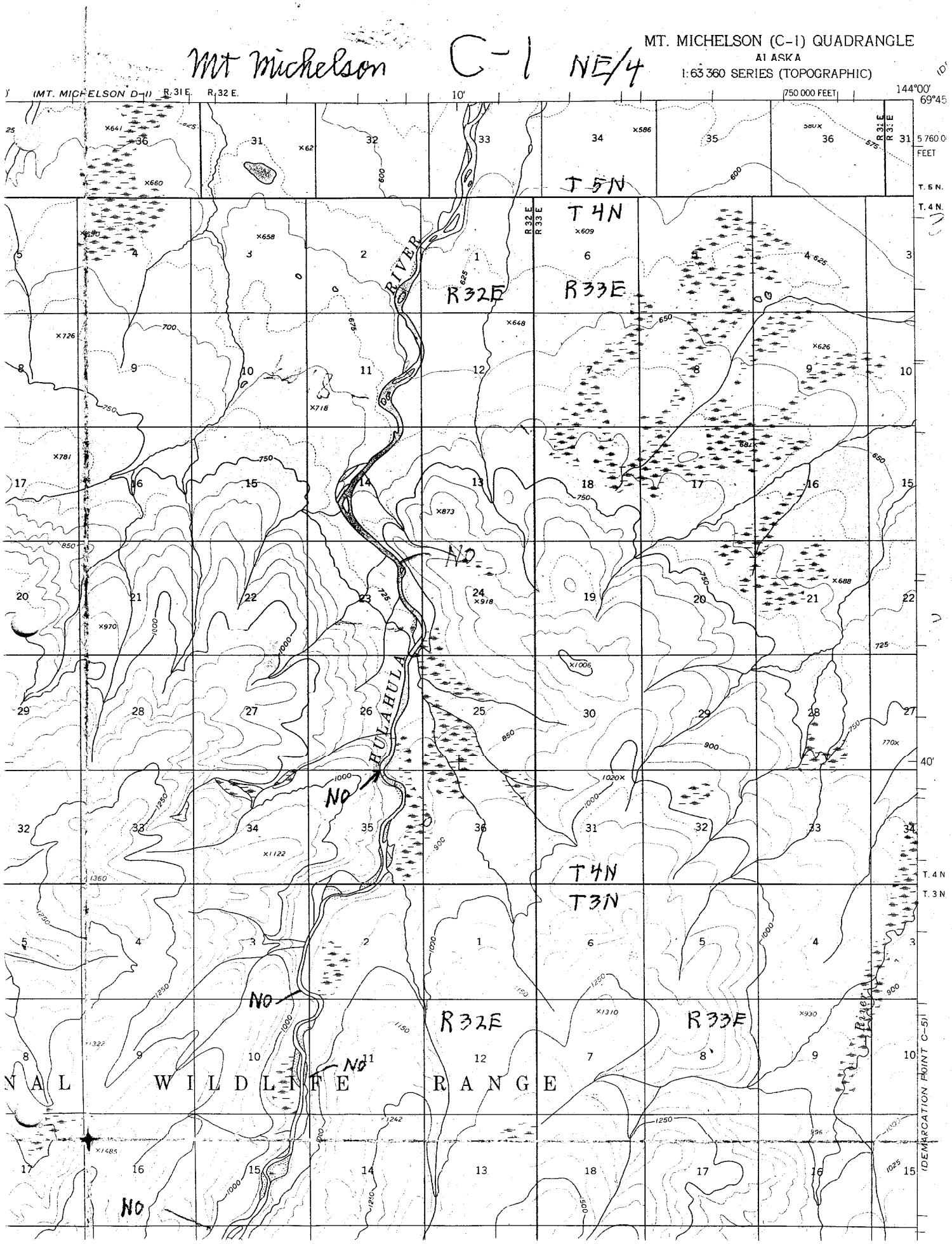


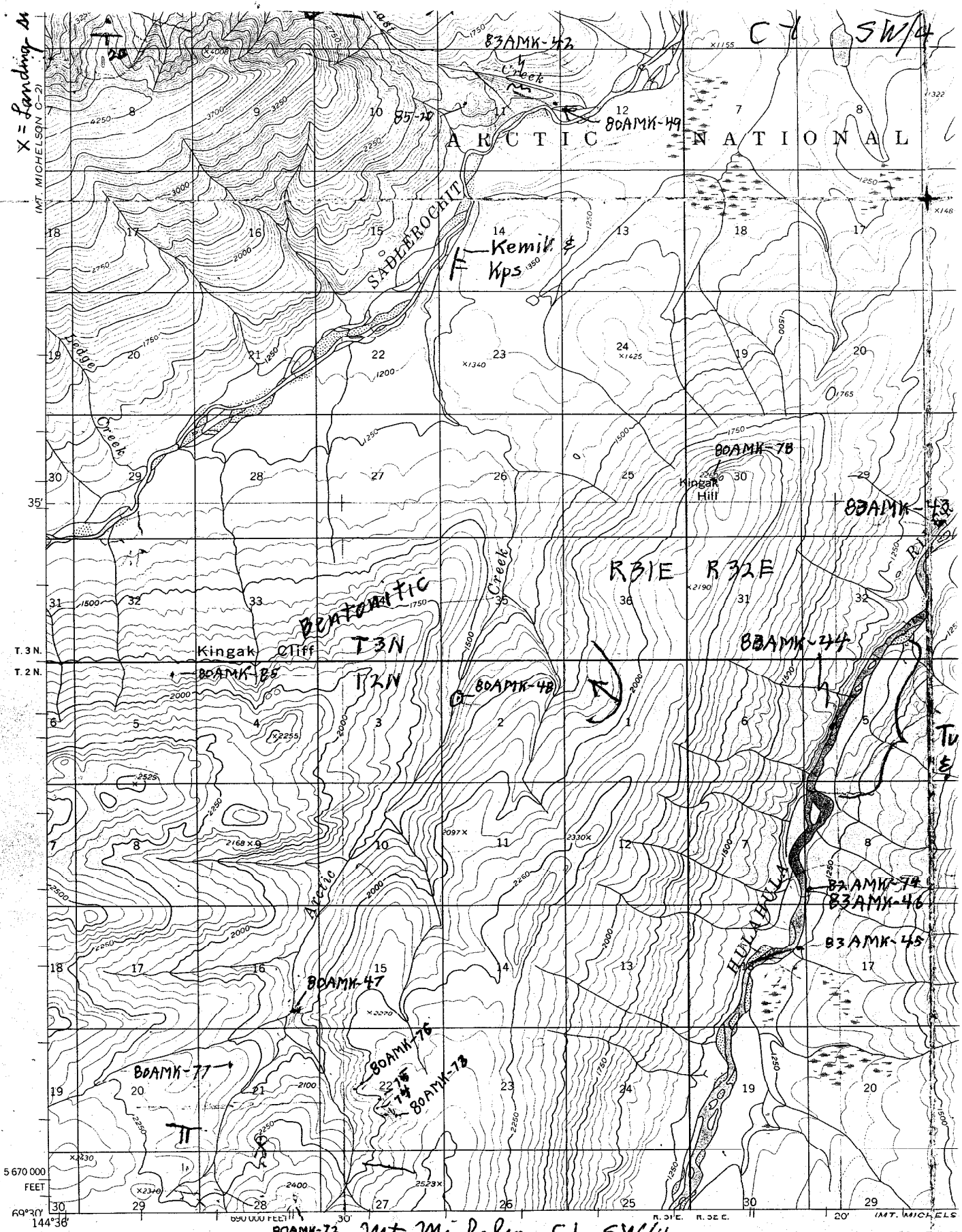

Mt Michelson B-5 (NE)
ALASKA
1:63 360 SERIES (TOPOGRAPHIC)
MT. MICHELSON C-5
40'
R. 22 E. R. 23 E.
30'
440 000 FEET
146°24'
69°30'
5 660 000 FEET
T. 2 N.
T. 1 N.
Sh?
T2N
T1N
R23E
Hue Sh
Kavik I
82AMK-71
NO
KAVIK
RIVER
25'
82AMK-81
82AMK-80 A
B
80AMK-10
K-O
NO
BASE LINE
T1N
T1S
80ACH-12
80AMK-11-0
Creek
(MT. MICHELSON B-4)

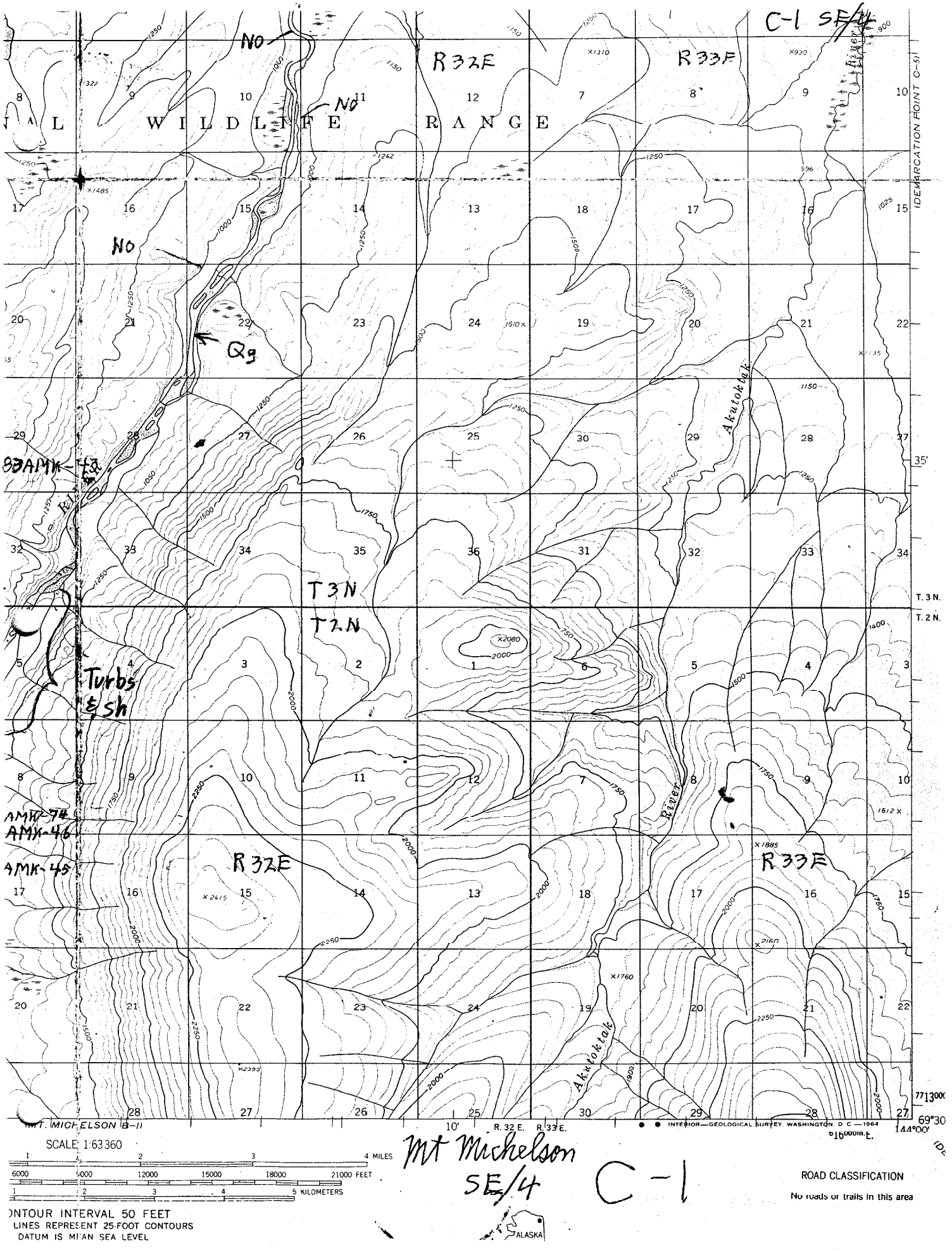
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

C-1 Mt Michelson
NW/4




Mt Michelson C-1 NE/4
MT. MICHELSON (C-1) QUADRANGLE
ALASKA
1:63 360 SERIES (TOPOGRAPHIC)
(MT. MICHELSON D-1)
R. 31 E.
R. 32 E.
144°00'
69°45'
750 000 FEET
T. 5 N.
T. 4 N.
T. 3 N.
T 5N
T 4N
T4N
T3N
R32E
R33E
R 32 E
R 33 E
RIVER
HULAHULA
NO
NATIONAL WILDLIFE RANGE
DEMARCATION POINT C-5


X = Landing St
(MT. MICHELSON C-2)
C-1 SW/4
83AMK-43
Creek
85-77
80AMK-49
ARCTIC NATIONAL
SADLEROCHIT
Kemik Kps
Ridge
Creek
80AMK-78
Kingak Hill
83AMK-43
R31E R32E
Creek
BEAUFORTIC
Kingak Cliff
80AMK-85
T3N
T2N
80AMK-48
83AMK-74
Arctic
HULAHULA
83AMK-74
83AMK-46
83AMK-45
80AMK-47
80AMK-76
80AMK-77
80AMK-73
80AMK-72
T. 3 N.
T. 2 N.
5 670 000 FEET
69°30'
144°30'
MICHELSON B-2
Mt. Michelson C1 SW/4
C-1
Mapped by the Army Map Service
Edited and published by the Geological Survey
Control by USC&GS and USCE
Topography by photogrammetric methods from aerial photographs taken 1955, field annotated 1955. Map not field checked
Universal Transverse Mercator projection. 1927 North American datum
SCALE 1:63
CONTOUR INTERV
DOTTED LINES REPRESENT



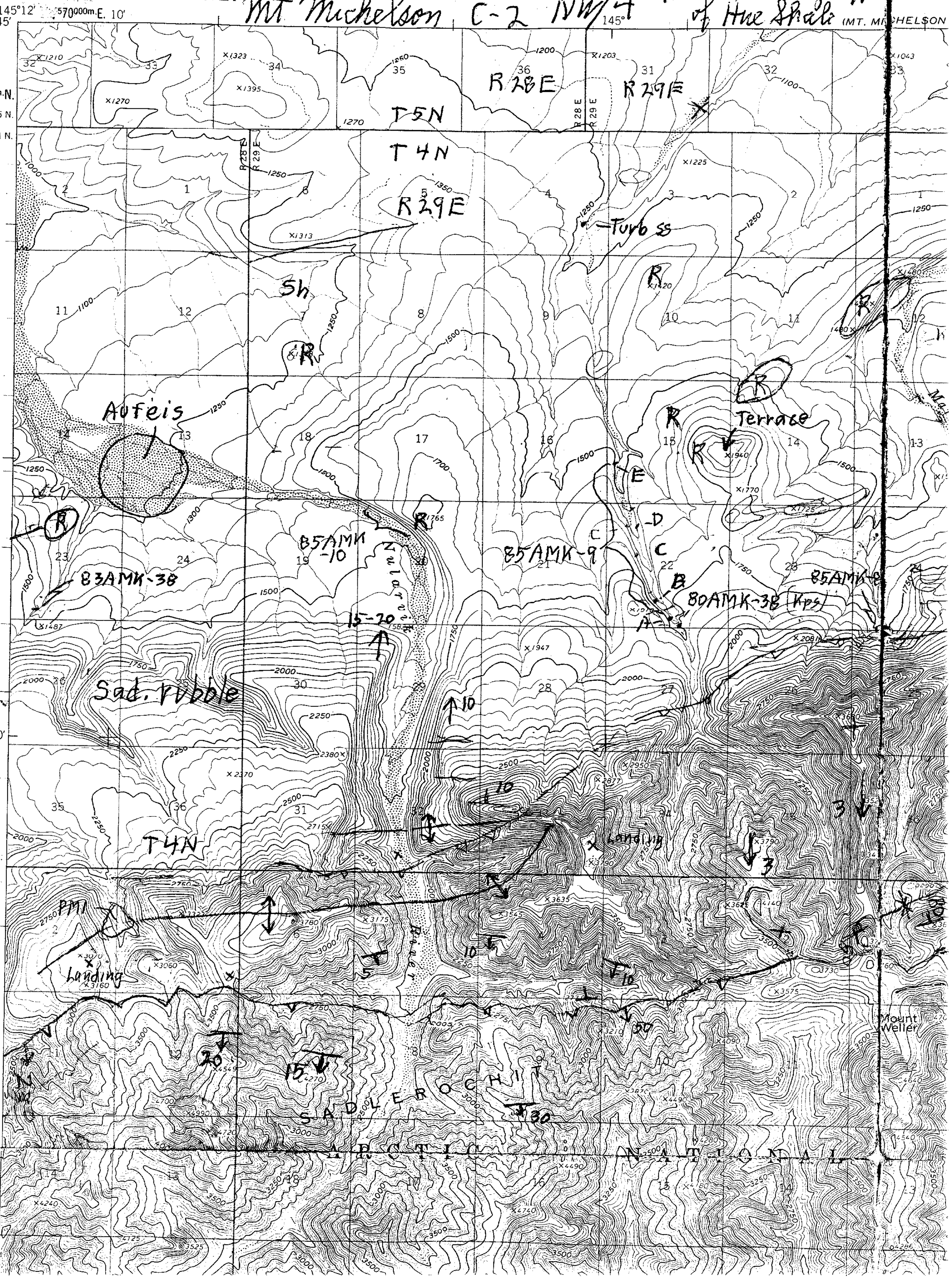
Mt Michelson
SE/4
C-1

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

C-2

Mt Michelson C-2 NW/4

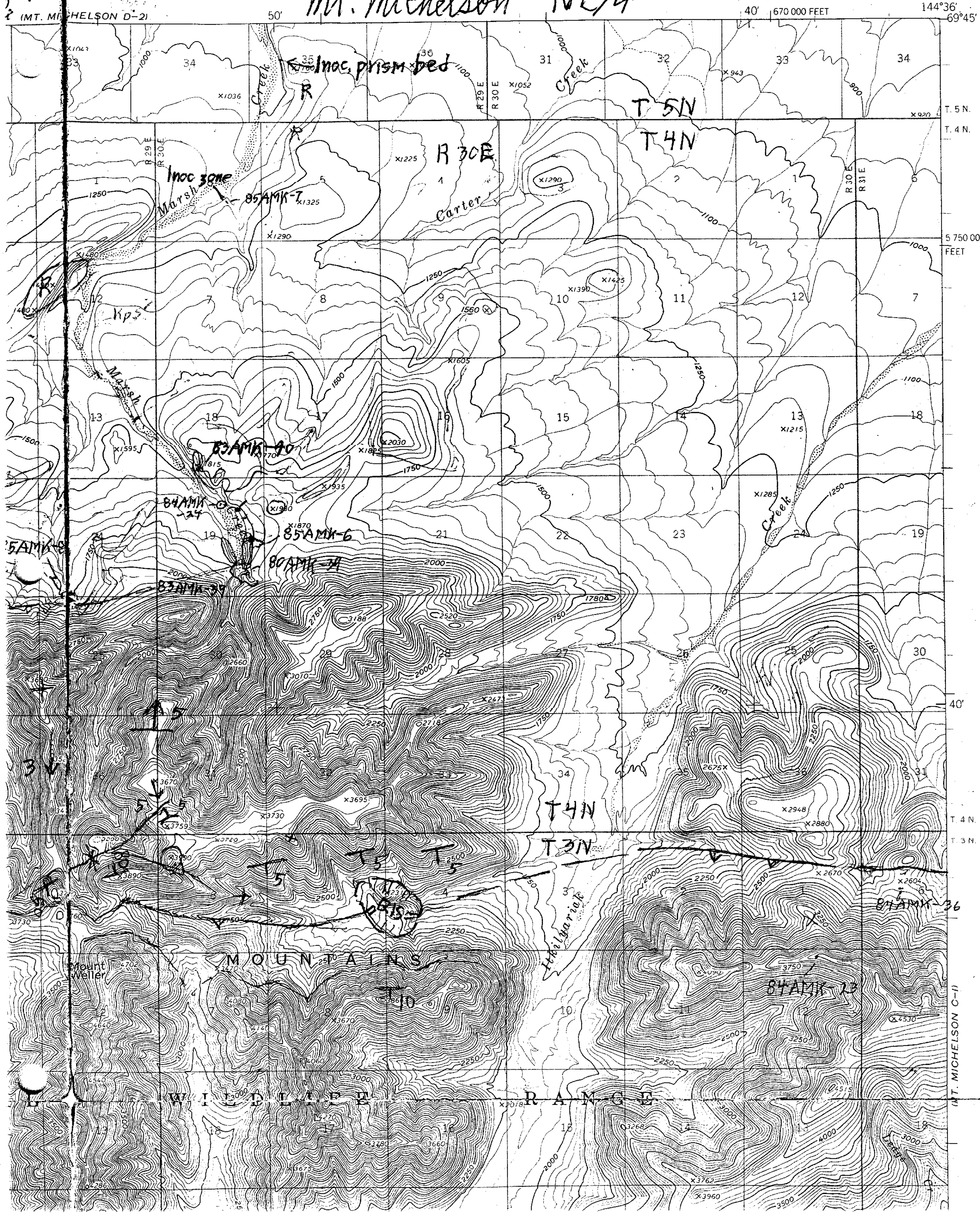
R = Red weathering tuff of Hue Shale

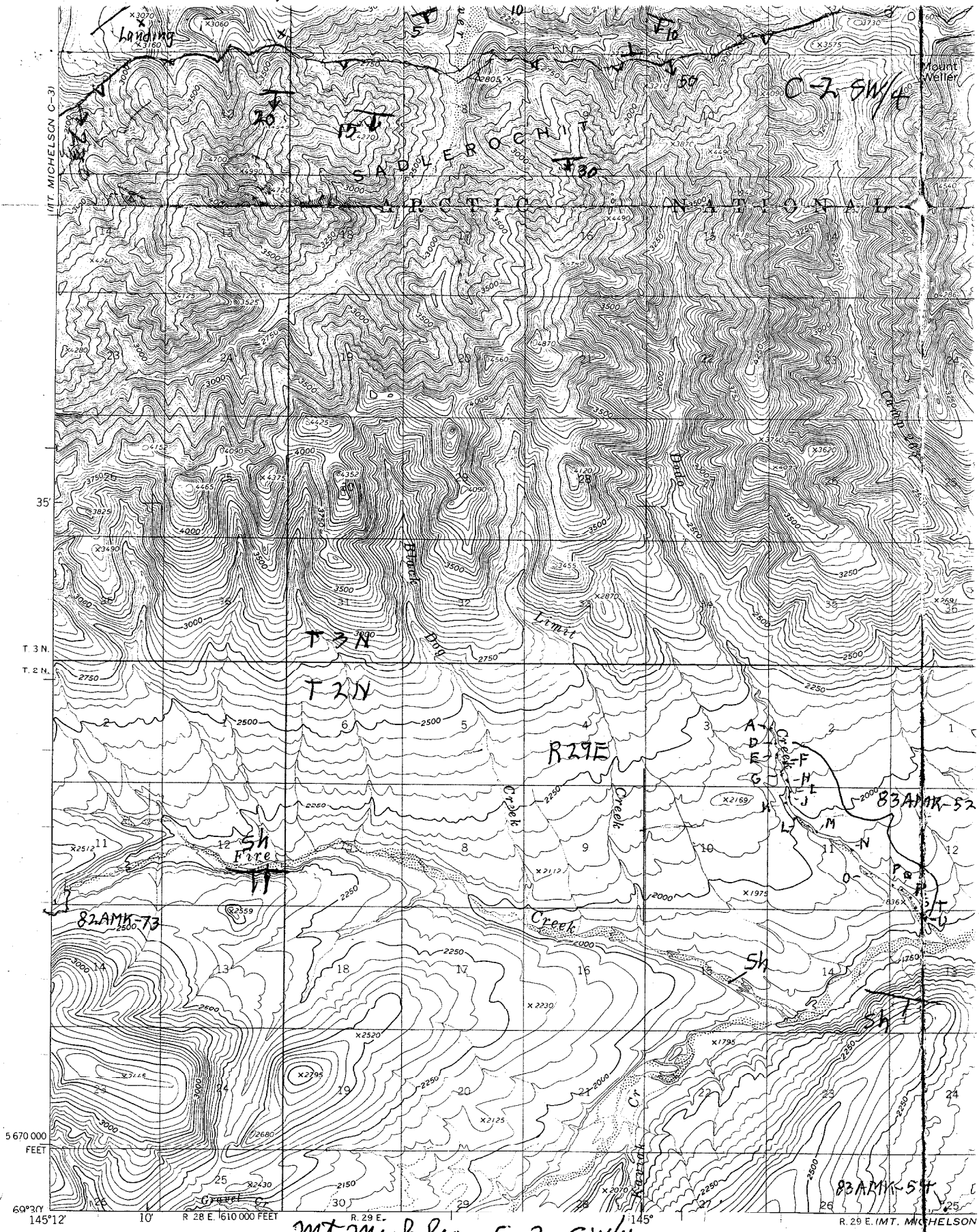


C-2

Mt. Michelson NE/4

MT. MICHELSON (C-2) QUADRANGLE
ALASKA
1:63 360 SERIES (TOPOGRAPHIC)





Mt Michelson C-2 SW/4

Mapped by the Army Map Service
Edited and published by the Geological Survey

Control by USC&GS and USCE

Topography by photogrammetric methods from aerial photographs taken 1955, field annotated 1955. Map not field checked

Universal Transverse Mercator projection. 1927 North American datum

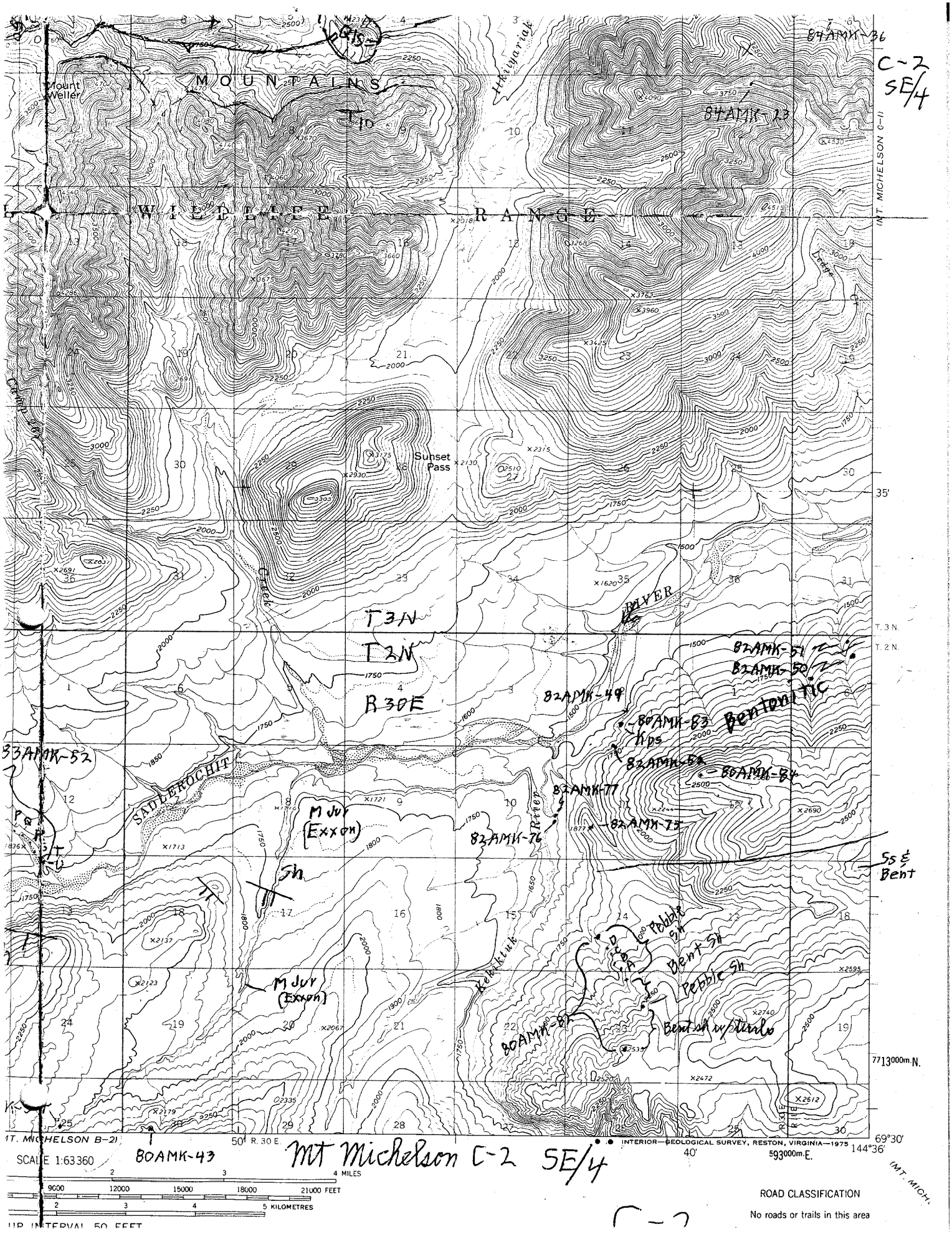
34°

TRUE NORTH

MAGNETIC NORTH

SCALE 1:63360

CONTOUR INTERVAL
DOTTED LINES REPRESENT 25



C-2 SE/4

SCALE 1:63360

2 3 4 MILES

9000 12000 15000 18000 21000 FEET

2 3 4 5 KILOMETRES

UP INTERVAL 50 FEET

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1975

ROAD CLASSIFICATION

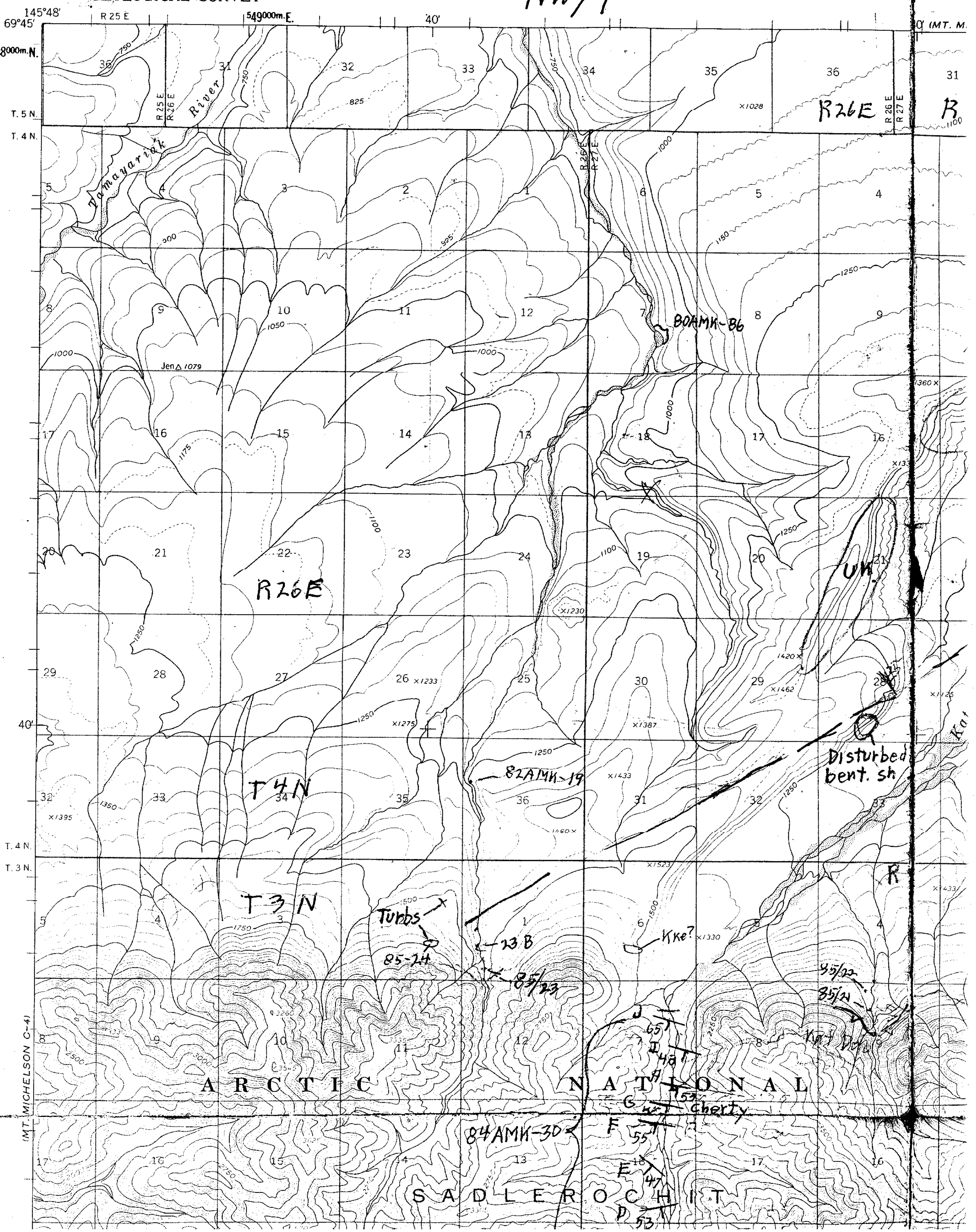
No roads or trails in this area

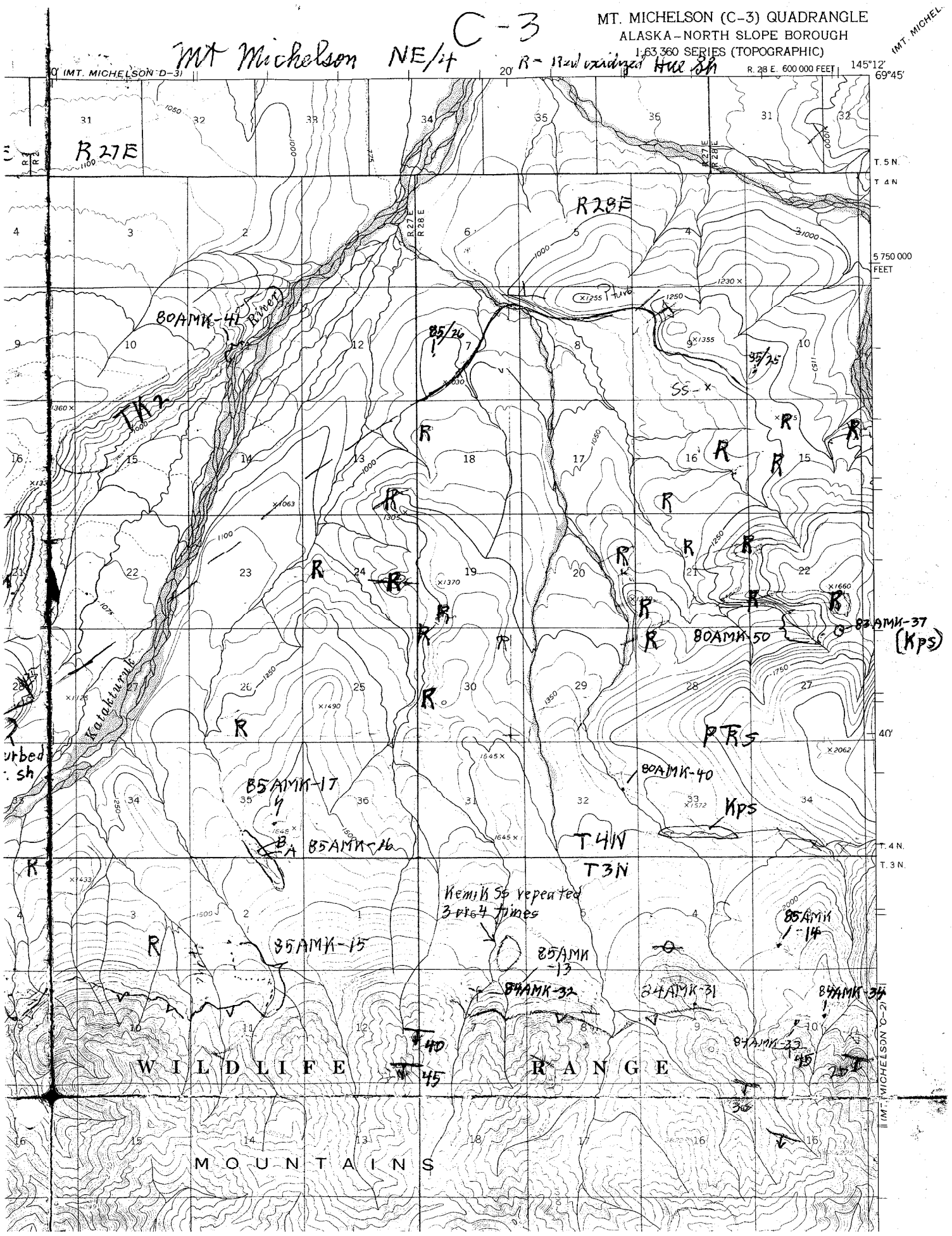
Mt Michelson C-2 SE/4

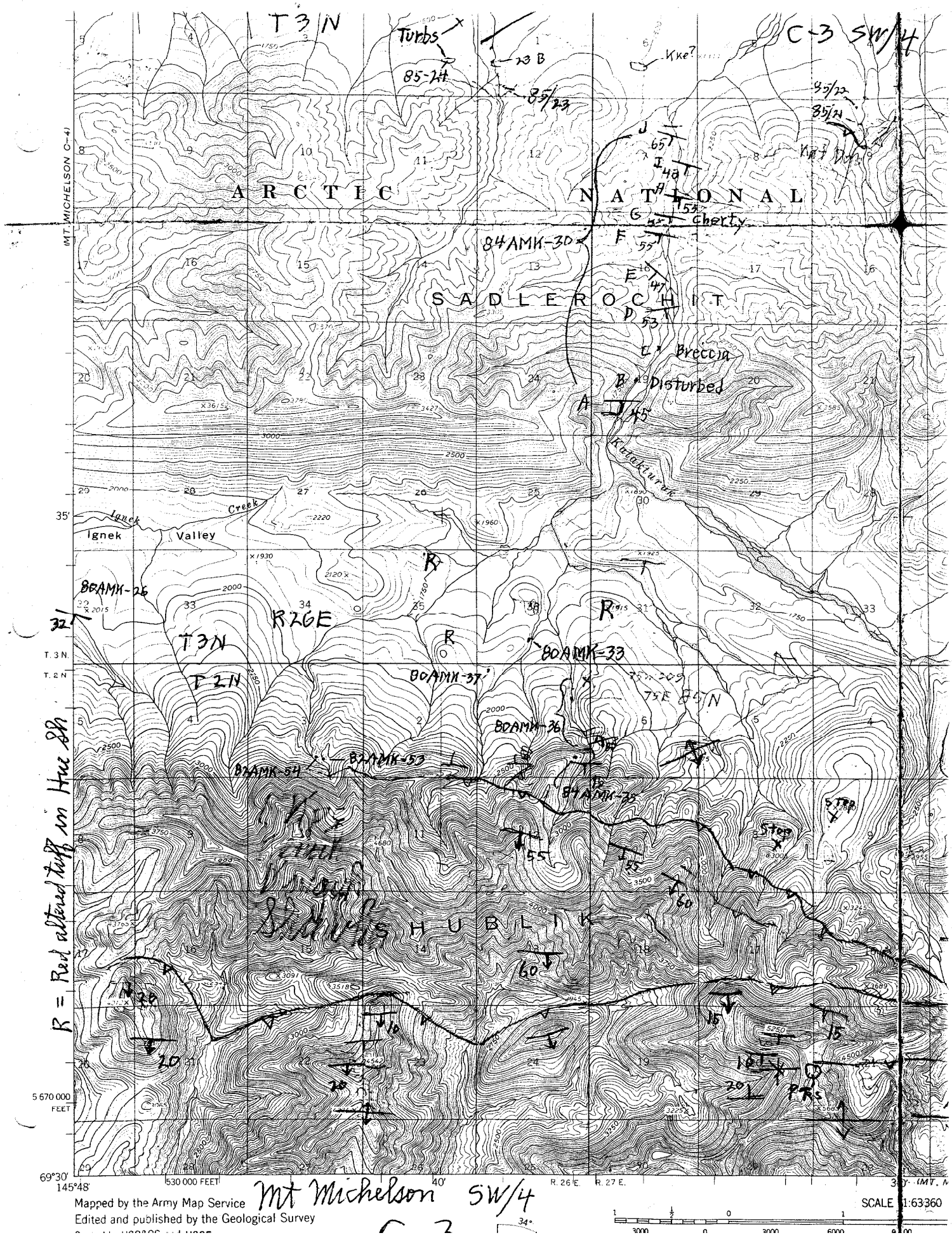
C-2

Mt Michelson C-3
NW/4

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY




C-3
MT. MICHELSON (C-3) QUADRANGLE
ALASKA – NORTH SLOPE BOROUGH
1:63 360 SERIES (TOPOGRAPHIC)
Mt Michelson NE/4
R - Raw unedged Hue 5R
(MT. MICHEL
(MT. MICHELSON D-3)
R. 28 E. 600 000 FEET
145°12'
69°45'
R 27 E
R 28 E
T. 5 N.
T 4 N
5 750 000 FEET
80AMK-41 River
85/26
85/25
80AMK-50
83AMK-37
(Kps)
Kps
80AMK-40
85AMK-17
85AMK-16
T4N
T3N
T. 4 N.
T. 3 N.
Kemik Ss repeated 3 or 4 times
85AMK-15
85AMK-13
84AMK-32
84AMK-31
84AMK-34
85AMK-14
87AMK-33
WILDLIFE RANGE
MOUNTAINS
(MT. MICHELSON C-2)

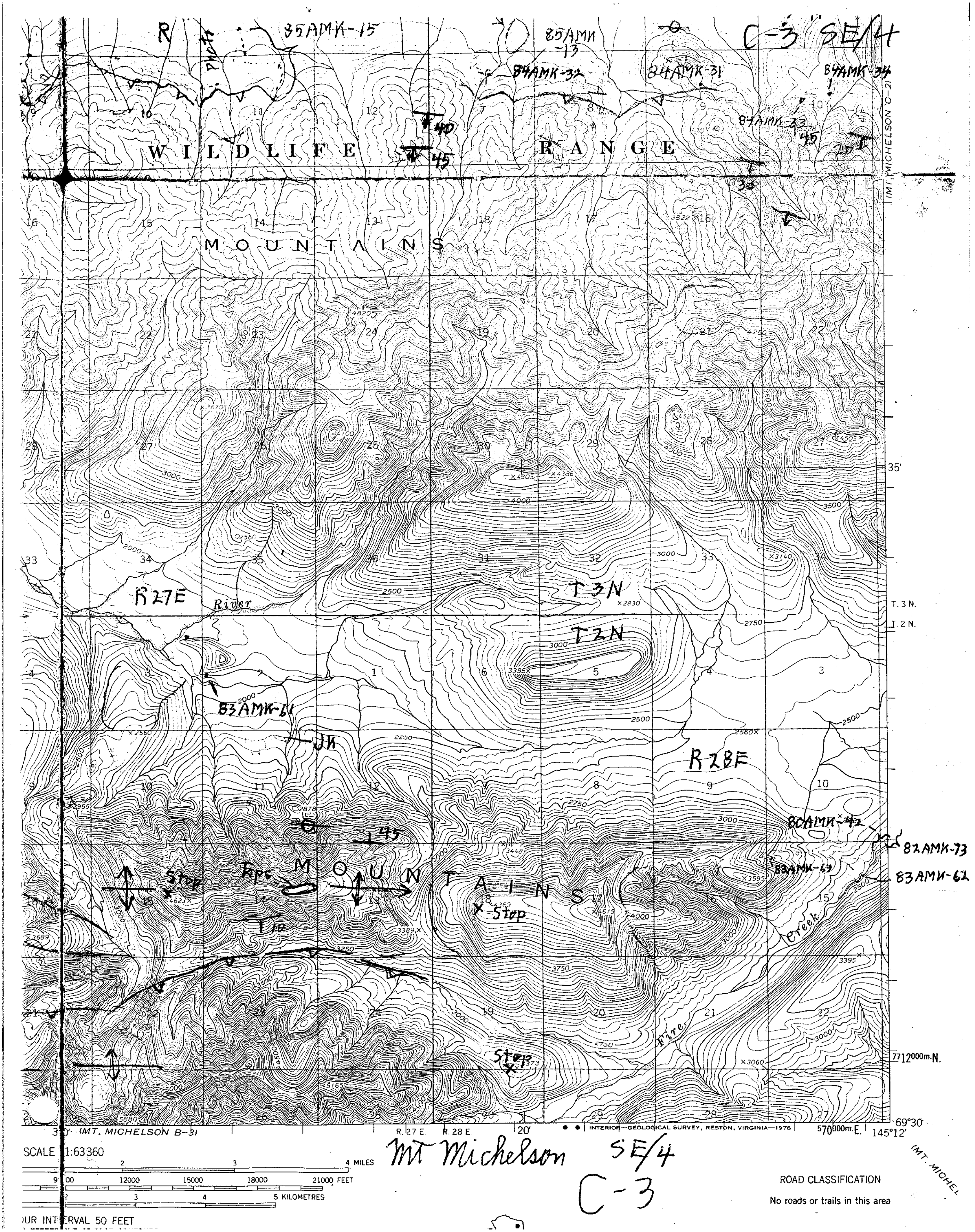


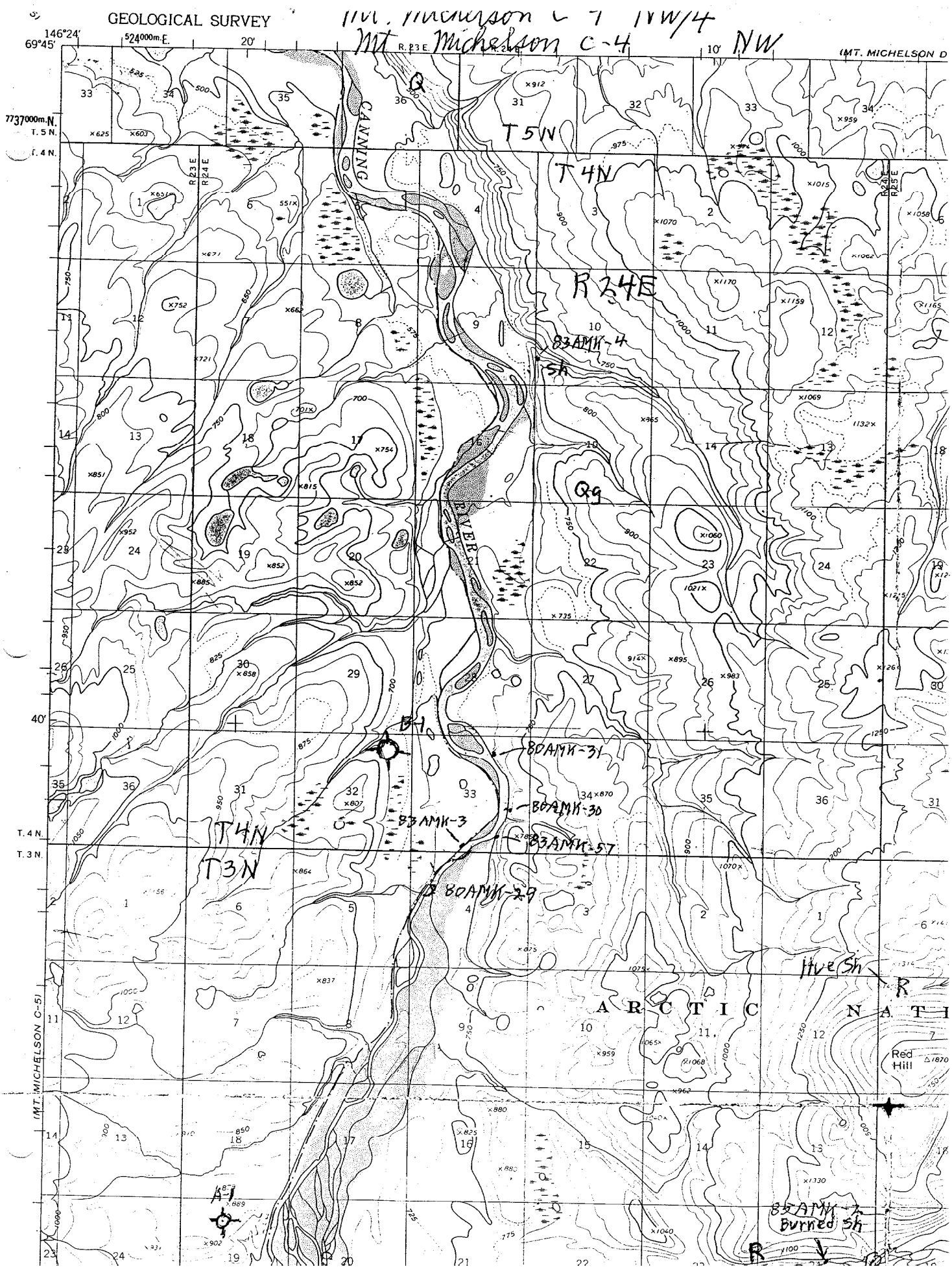
R = Red altered tuff in Hue 8R

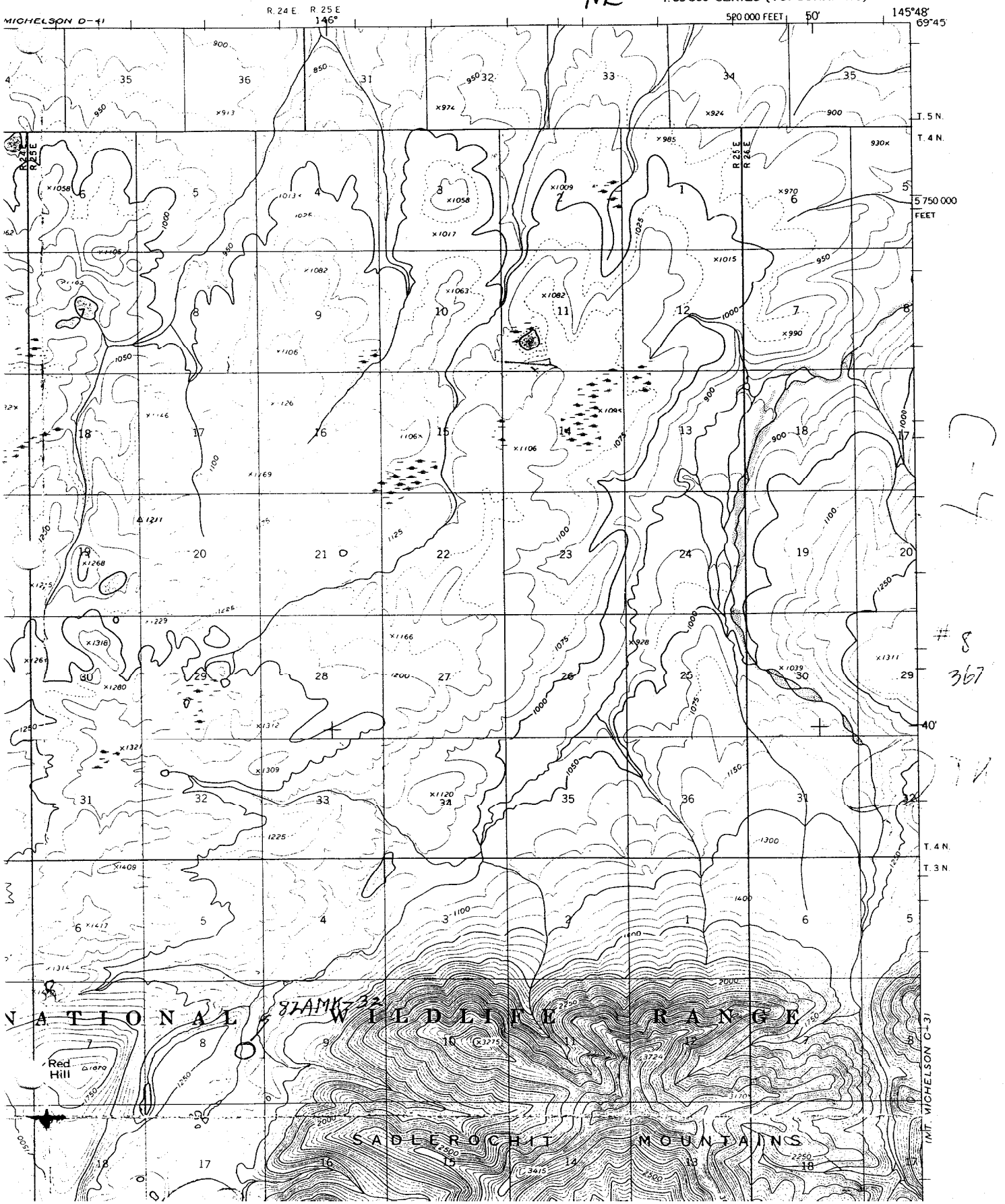
Mt Michelson SW/4

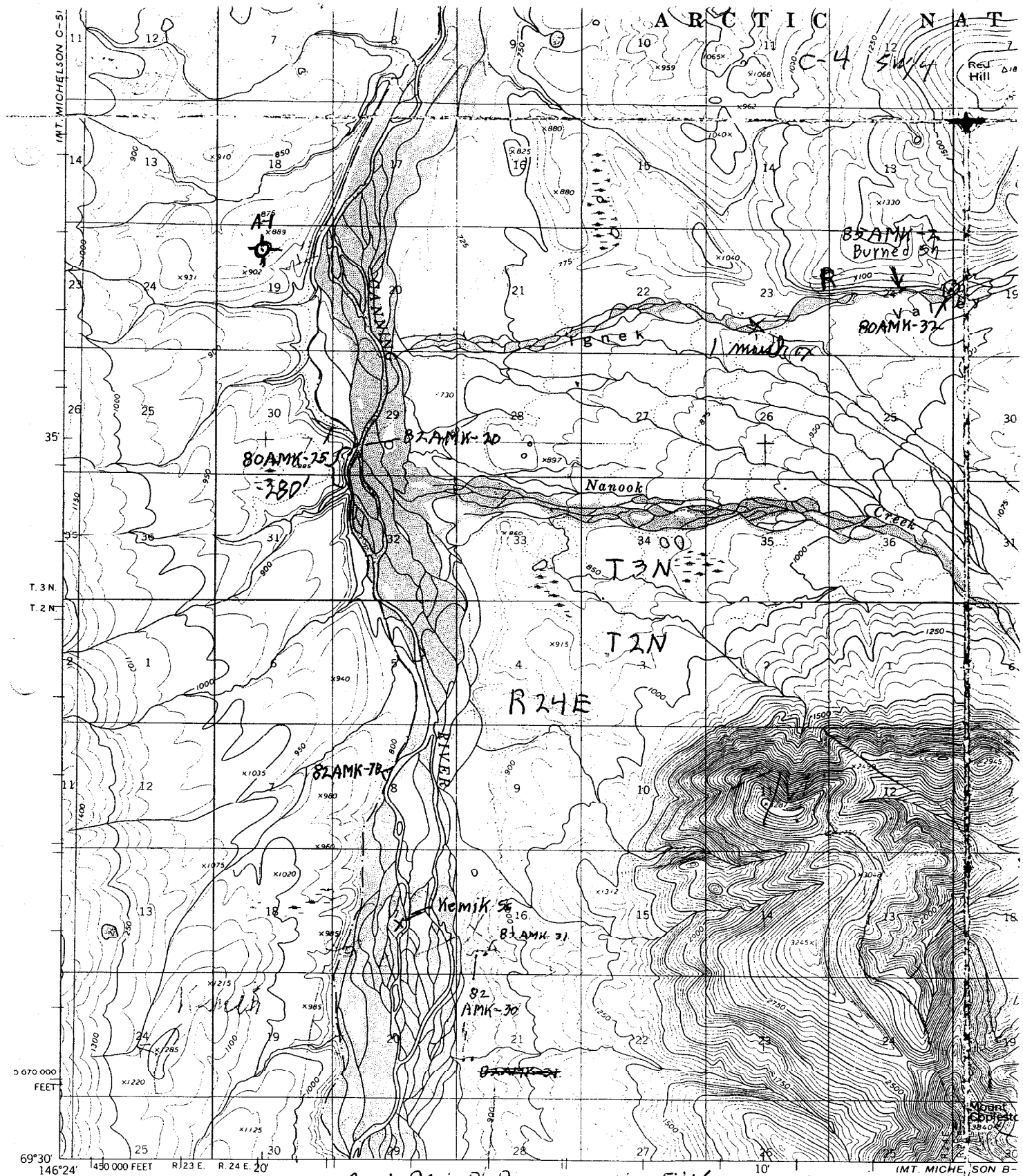
C-3

Mapped by the Army Map Service
Edited and published by the Geological Survey


C-3 SE/4
85AMK-15
85AMK-13
84AMK-32
84AMK-31
84AMK-34
84AMK-33
Photo
WILDLIFE RANGE
MOUNTAINS
R27E
River
T3N
T2N
T. 3 N.
T. 2 N.
83AMK-61
R28E
82AMK-42
82AMK-73
83AMK-62
83AMK-63
Stop
Creek
Fire
MT. MICHELSON C-2
35'
7712000m.N.
69°30'
145°12'
570000m.E.
(MT. MICHELSON B-3)
R. 27 E.
R. 28 E.
20'
INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1976
SCALE 1:63360
4 MILES
12000
15000
18000
21000 FEET
5 KILOMETRES
CONTOUR INTERVAL 50 FEET
Mt Michelson SE/4
C-3
ROAD CLASSIFICATION
No roads or trails in this area
(MT. MICHEL


GEOLOGICAL SURVEY
Mt. Michelson C-7 NW/4
Mt Michelson C-4 NW
146°24'
69°45'
524000m.E.
20'
10'
(MT. MICHELSON D
7737000m.N.
T. 5 N.
T. 4 N.
R23E
R24E
R25E
CANNING
RIVER
T5N
T4N
T3N
R24E
Qg
83AMK-4
Sh
B-1
80AMK-31
80AMK-30
83AMK-3
83AMK-57
80AMK-29
Hive Sh
ARCTIC
Red Hill
A-1
83AMK-2
Burned Sh
(MT. MICHELSON C-5)


C-4
NE
MT. MICHELSON (C-4) QUADRANGLE
ALASKA
1:63 360 SERIES (TOPOGRAPHIC)
MT. MICHELSON C-4
MICHELSON D-4
R. 24 E
R 25 E
146°
520 000 FEET
50'
145°48'
69°45'
T. 5 N.
T. 4 N.
T. 3 N.
5 750 000 FEET
40'
NATIONAL WILDLIFE RANGE
Red Hill
SADLEROCHIT MOUNTAINS
MT. MICHELSON C-3



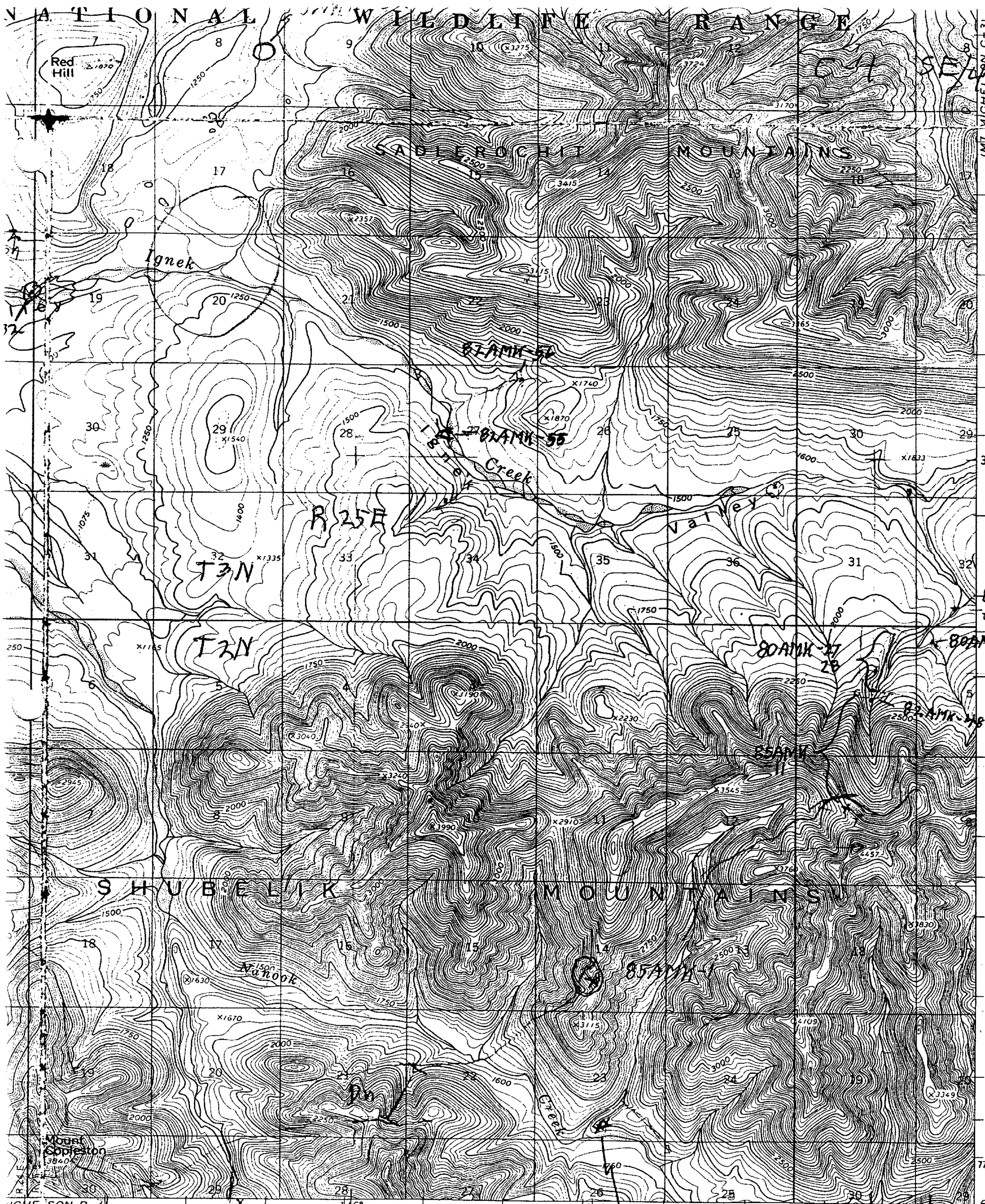
Mapped by the Army Map Service
Edited and published by the Geological Survey

Control by USC&GS and USCE

Topography by photogrammetric methods from aerial photographs taken 1955, field annotated 1955. Map not field checked

Universal Transverse Mercator projection. 1927 North American datum
10,000-foot grid based on Alaska coordinate system, zone 3
1000-meter Universal Transverse Mercator grid ticks, zone 6, shown in blue

Land lines represent unsurveyed and unmarked locations



INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1984

Trilobite loc

ALE 1:63 360

4 MILES

12000 15000 18000 21000 FEET

5 KILOMETERS

INTERVAL 50 FEET
PRESENT 25-FOOT CONTOURS
S MEAN SEA LEVEL

Mt Michelson C-4
SE

ROAD CLASSIFICATION

No roads or trails in this area

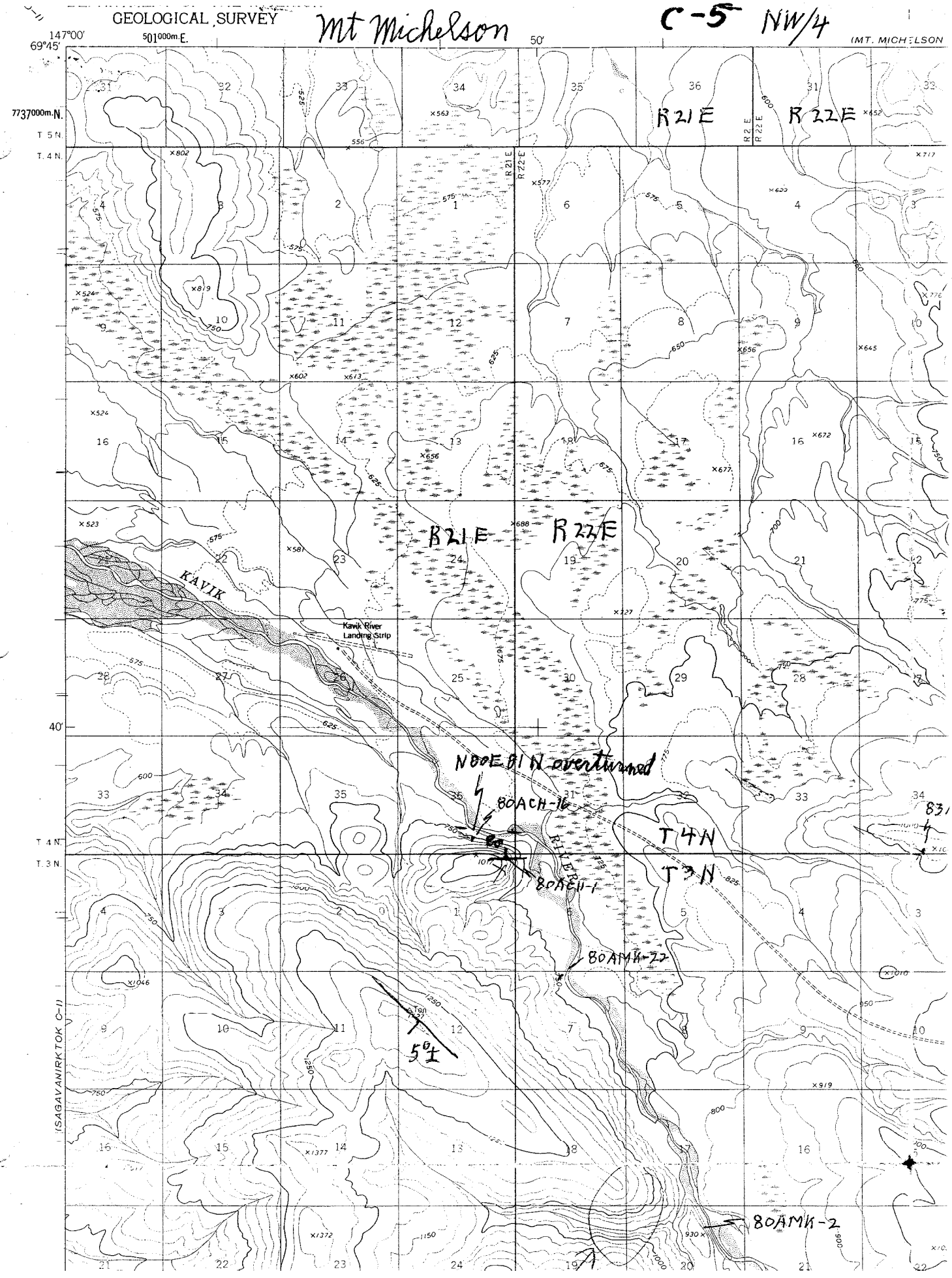
(MT. MICHELS

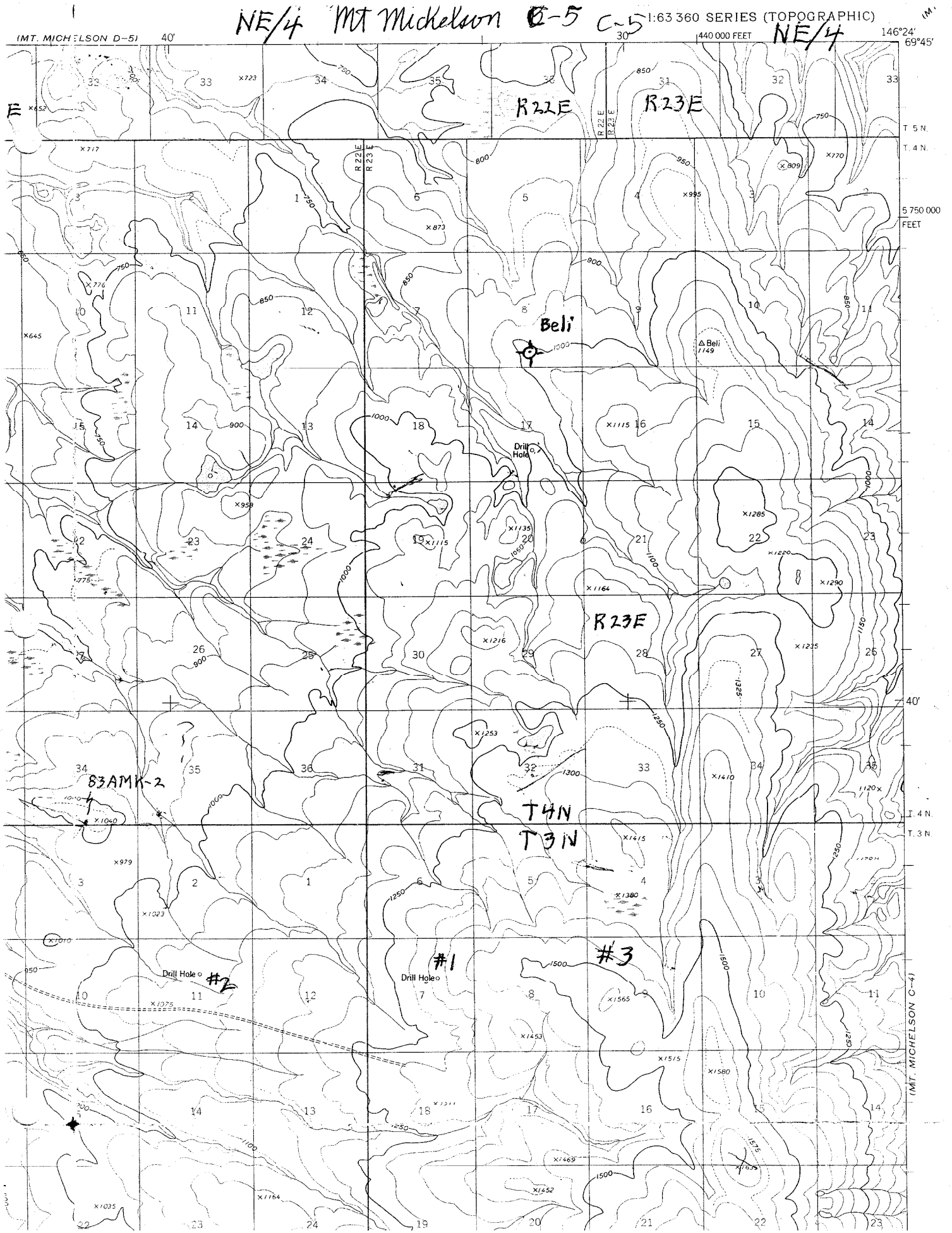
ALASKA

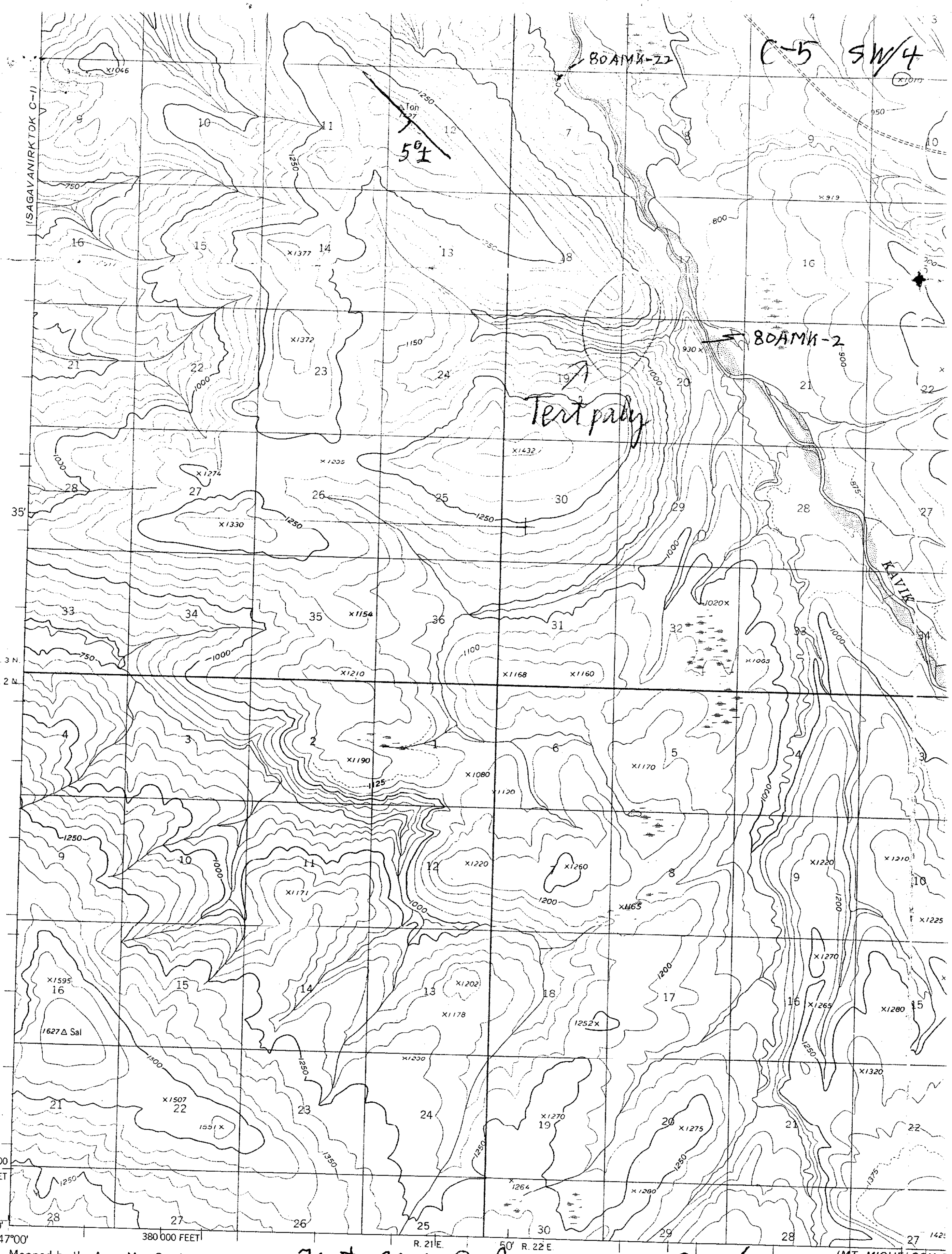
QUADRANGLE LOCATION

S. GEOLOGICAL SURVEY

MT. MICHELSON (C-4), ALASKA SE


GEOLOGICAL SURVEY
Mt Michelson
C-5 NW/4
147°00'
69°45'
501 000m.E.
50'
(MT. MICHELSON
7737000m.N.
T 5 N.
T. 4 N.
R21E
R22E
KAVIK
Kavik River
Landing Strip
N00E81N overturned
80ACH-16
80ACH-1
80AMK-22
80AMK-2
T4N
T3N
T. 3 N.
ISAGAVANIRKTOK C-II
40'


NE/4 Mt Michelson D-5 C-5
1:63 360 SERIES (TOPOGRAPHIC)
(MT. MICHELSON D-5)
440 000 FEET
NE/4
146°24'
69°45'
R22E
R23E
T. 5 N.
T. 4 N.
5 750 000 FEET
Beli
Δ Beli 1149
Drill Hole
R23E
83AMK-2
T4N
T3N
T. 4 N.
T. 3 N.
Drill Hole #2
Drill Hole #1
#3
(MT. MICHELSON C-4)



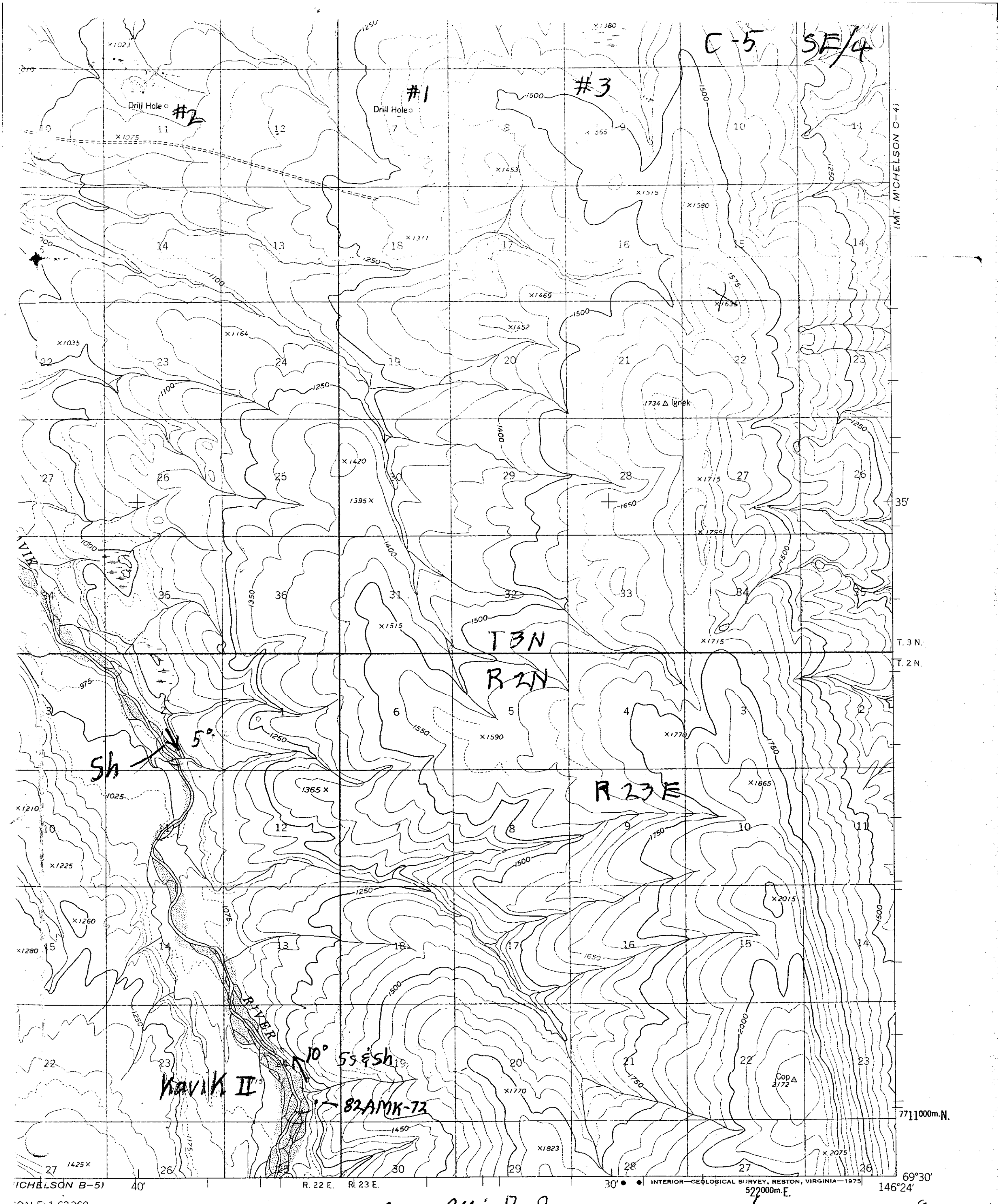
Mapped by the Army Map Service
Edited and published by the Geological Survey

Control by NOS/NOAA and USCE

Topography by photogrammetric methods from aerial photographs taken 1955, field annotated 1955. Map not field checked

Mt. Michelson C-5 SW/4

SCALE 1:63360



SCALE 1:63 360

2 3 4 MILES

6000 12000 15000 18000 21000 FEET

2 3 4 5 KILOMETRES

Mt Michelson C-5 SE/4

ROAD CLASSIFICATION

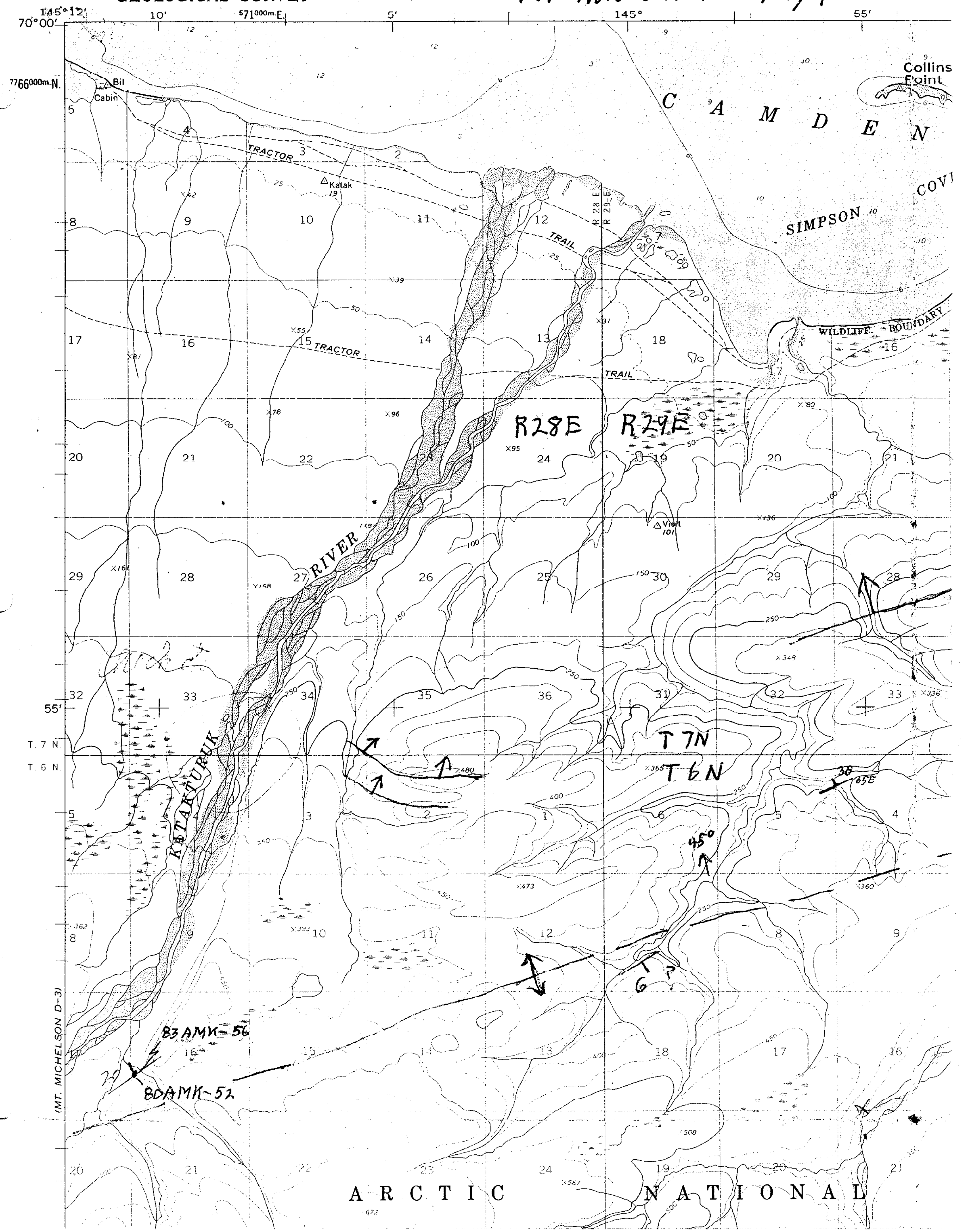
Unimproved dirt

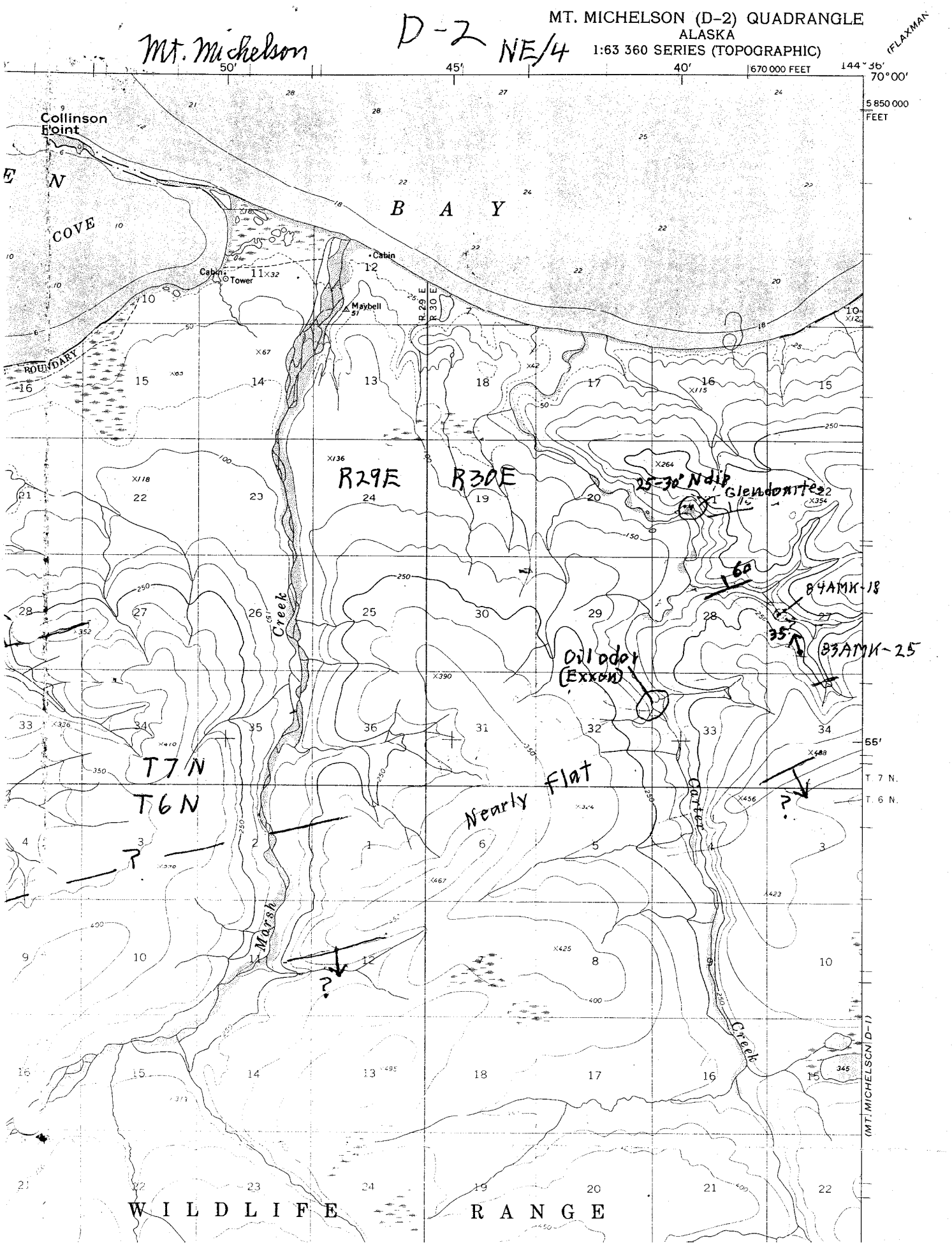
(MT. MICHELS

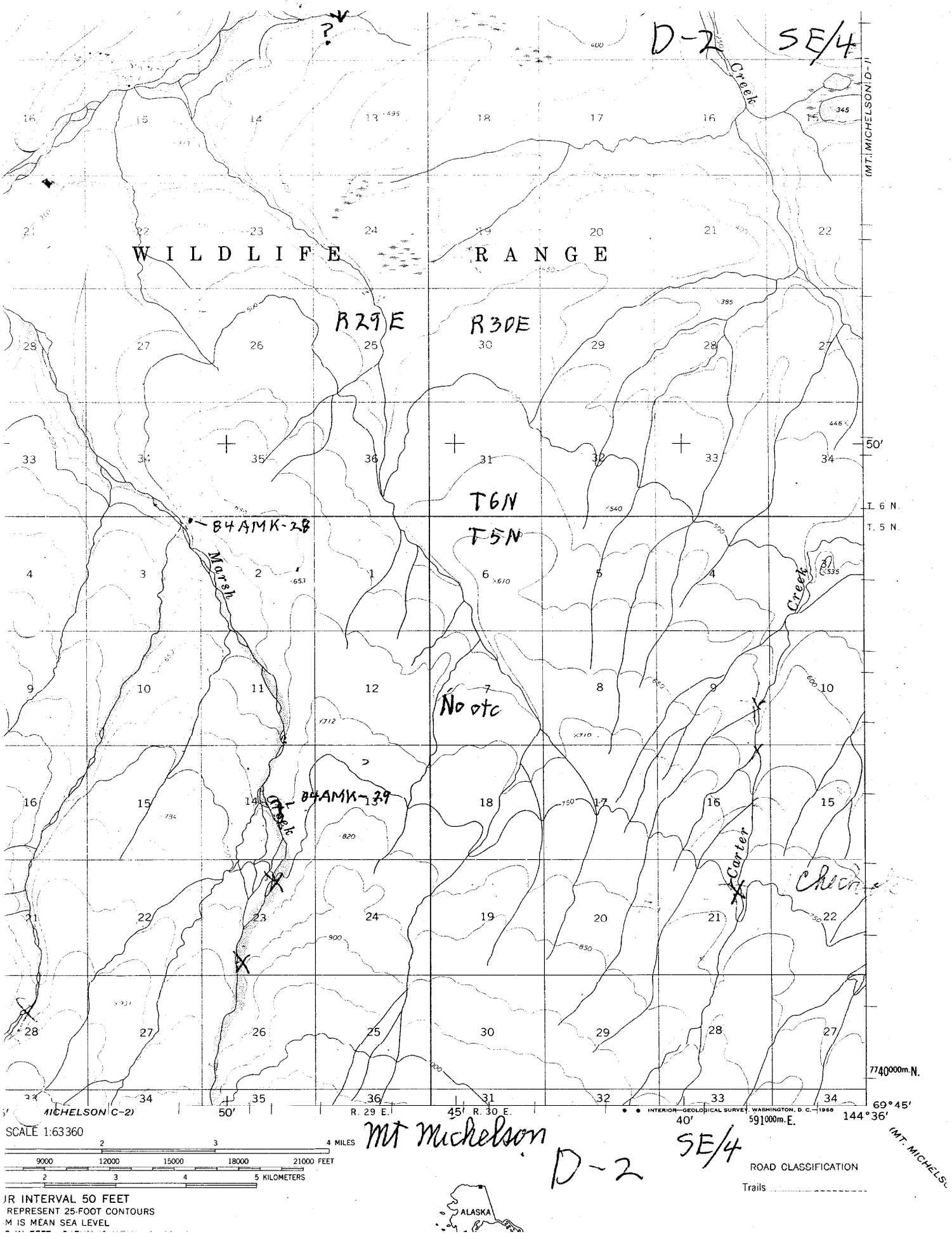
AND A-3)

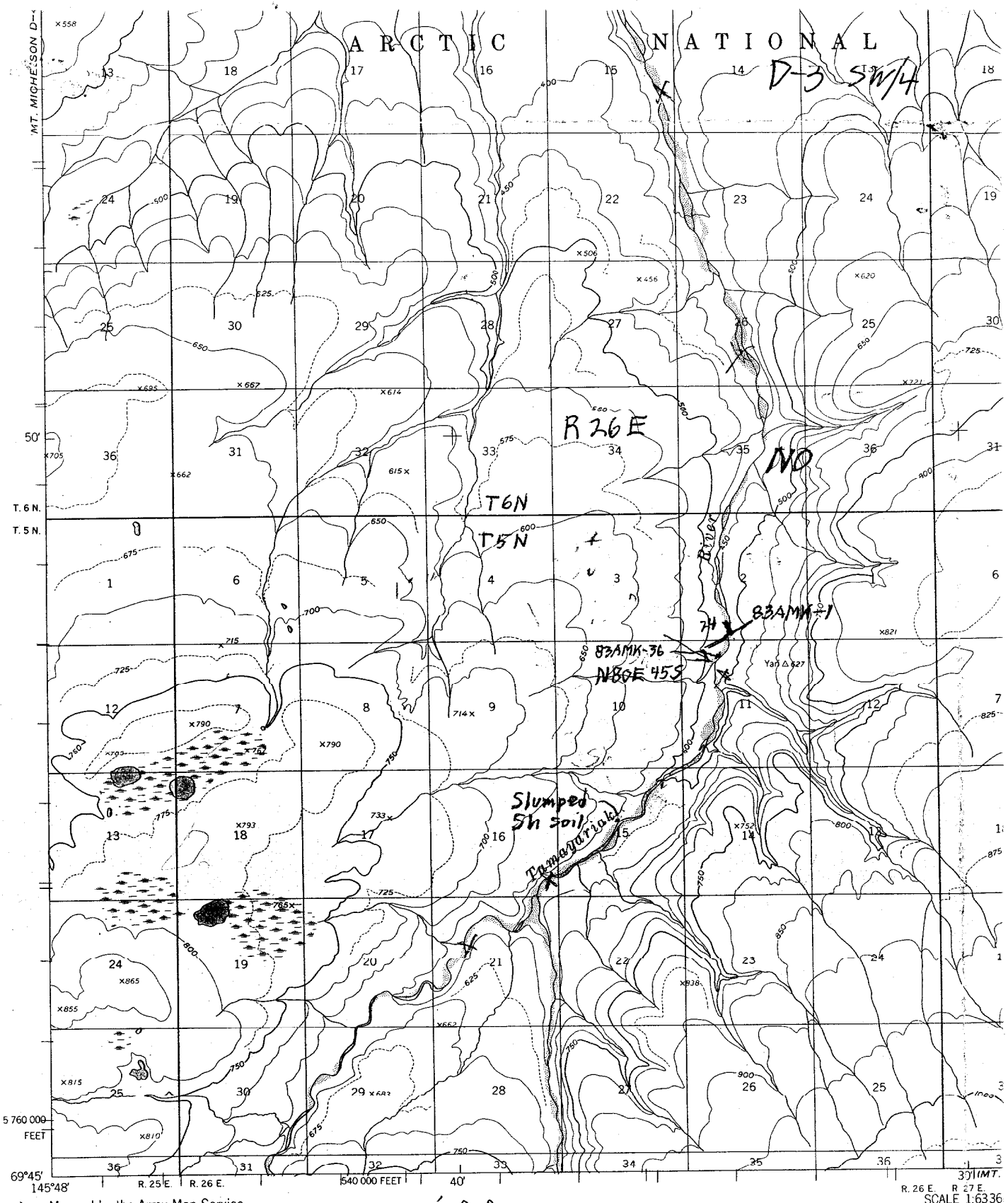
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

D-2 Mt. Michelson NW/4




Mt. Michelson
D-2 NE/4
MT. MICHELSON (D-2) QUADRANGLE
ALASKA
1:63 360 SERIES (TOPOGRAPHIC)
(FLAXMAN)
50'
45'
40'
670 000 FEET
144° 36'
70° 00'
5 850 000 FEET
Collinson Point
B A Y
COVE
Cabin
Tower
Maybell
R 29 E
R 30 E
BOUNDARY
R29E
R30E
25-30° N dip
Glendonites
Oil odor (Exxon)
84AMK-18
83AMK-25
Creek
Marsh
Nearly Flat
T 7 N
T 6 N
T. 7 N.
T. 6 N.
55'
(MT. MICHELSON D-1)
WILDLIFE RANGE


D-2 SE/4
WILDLIFE RANGE
R29E
R30E
T6N
T5N
84AMK-28
84AMK-29
Marsh Creek
Carter Creek
No otc
(MT. MICHELSON D-1)
(MT. MICHELSON C-2)
50'
45'
40'
R. 29 E.
R. 30 E.
7740000m.N.
591000m.E.
69°45'
144°36'
SCALE 1:63360
4 MILES
21000 FEET
5 KILOMETERS
JR INTERVAL 50 FEET
REPRESENT 25-FOOT CONTOURS
M IS MEAN SEA LEVEL
ROAD CLASSIFICATION
Trails
ALASKA
Mt Michelson
D-2
SE/4



Mapped by the Army Map Service

Edited and published by the Geological Survey

Control by USC&GS and USCE

Topography by photogrammetric methods from aerial photographs taken 1955, field annotated 1955. Map not field checked

Selected hydrographic data compiled from USC&GS Chart 9475 (1956). This information is not intended for navigational purposes

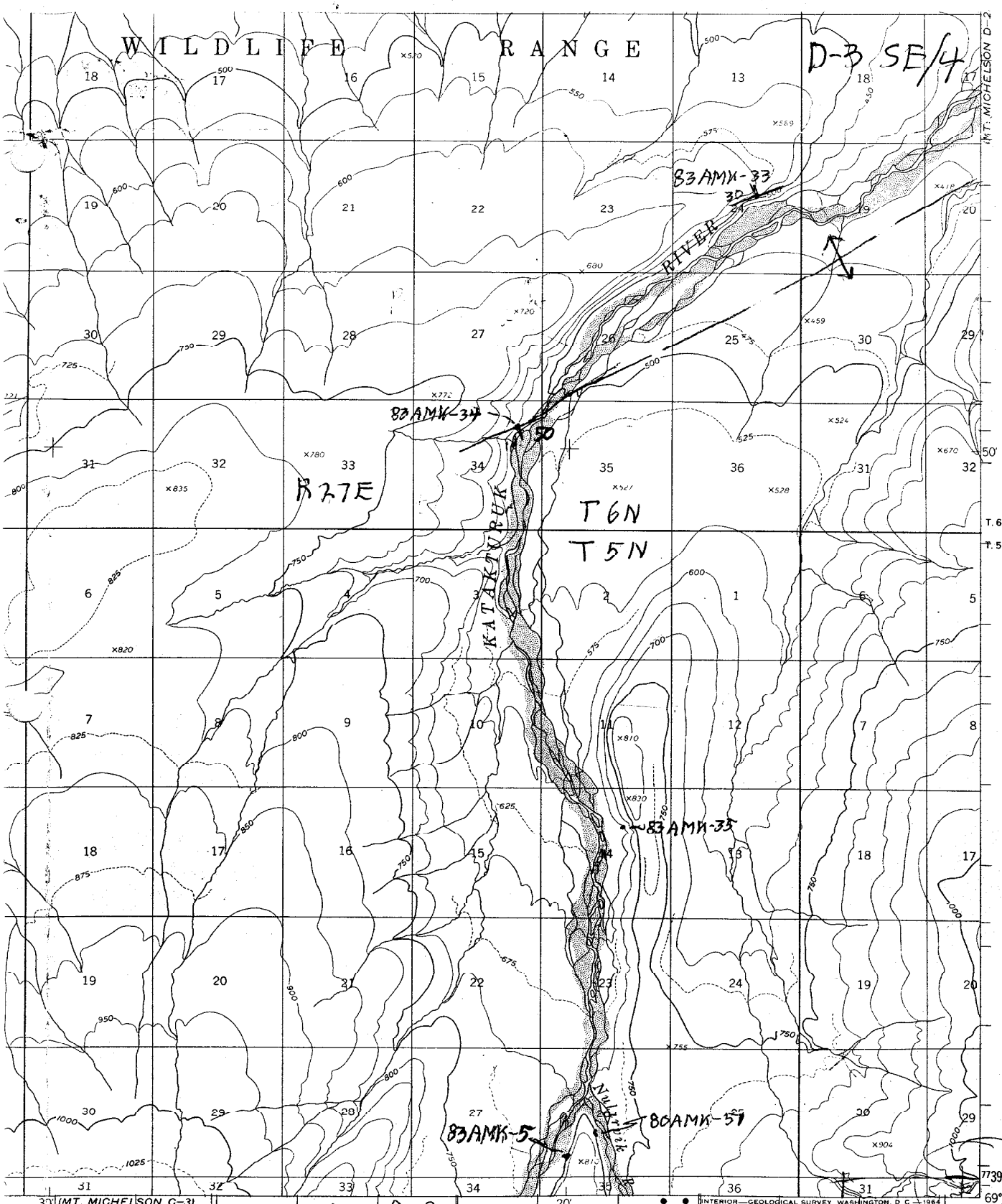
Universal Transverse Mercator projection. 1927 North American datum
10,000-foot grid based on Alaska coordinate system, zone 3
1000-meter Universal Transverse Mercator grid ticks,

Mt Michelson
D-3
SW/4

APPROXIMATE MEAN DECLINATION, 1955

CONTOUR INTERVAL
DOTTED LINES REPRESENT 25
DATUM IS MEAN SEA
SOUNDINGS IN FEET-DATUM IS MEAN
SHORELINE SHOWN REPRESENTS THE APPROXIMA
THE MEAN RANGE OF TIDE IS APPR

FOR SALE BY U. S. GEOLOG
FAIRBANKS, ALASKA DENVER 25, COLOR



Mt Michelson

D-3 SE/4

SCALE 1:63360

2 3 4 MILES

:00 12000 15000 18000 21000 FEET

2 3 4 5 KILOMETERS

R INTERVAL 50 FEET
REPRESENT 25-FOOT CONTOURS
I IS MEAN SEA LEVEL
DATUM IS MEAN LOWER LOW WATER
NTS THE APPROXIMATE LINE OF MEAN HIGH WATER
E OF TIDE IS APPROXIMATELY 5 FEET

U. S. GEOLOGICAL SURVEY

ROAD CLASSIFICATION

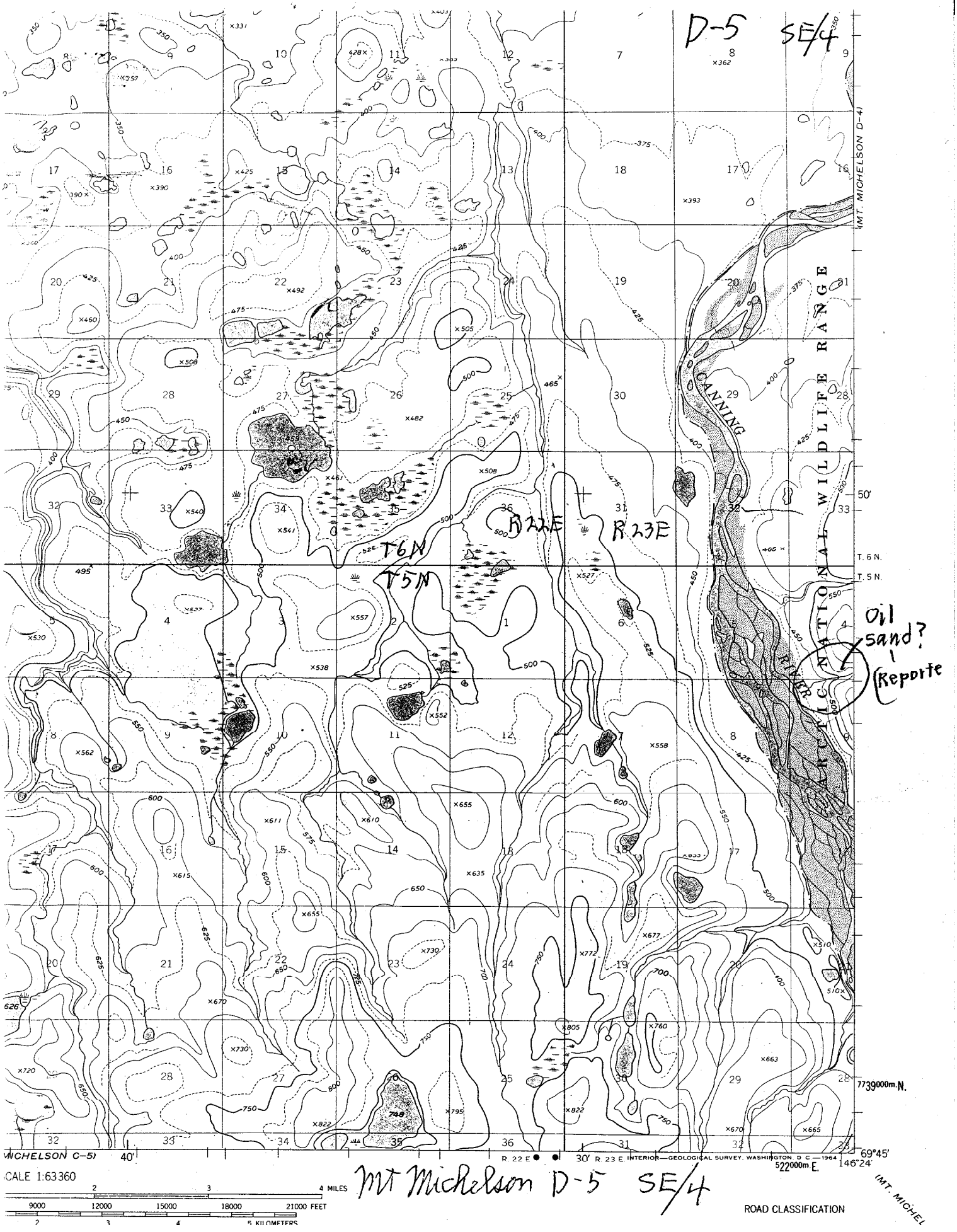
Trails .....

QUADRANGLE LOCATION

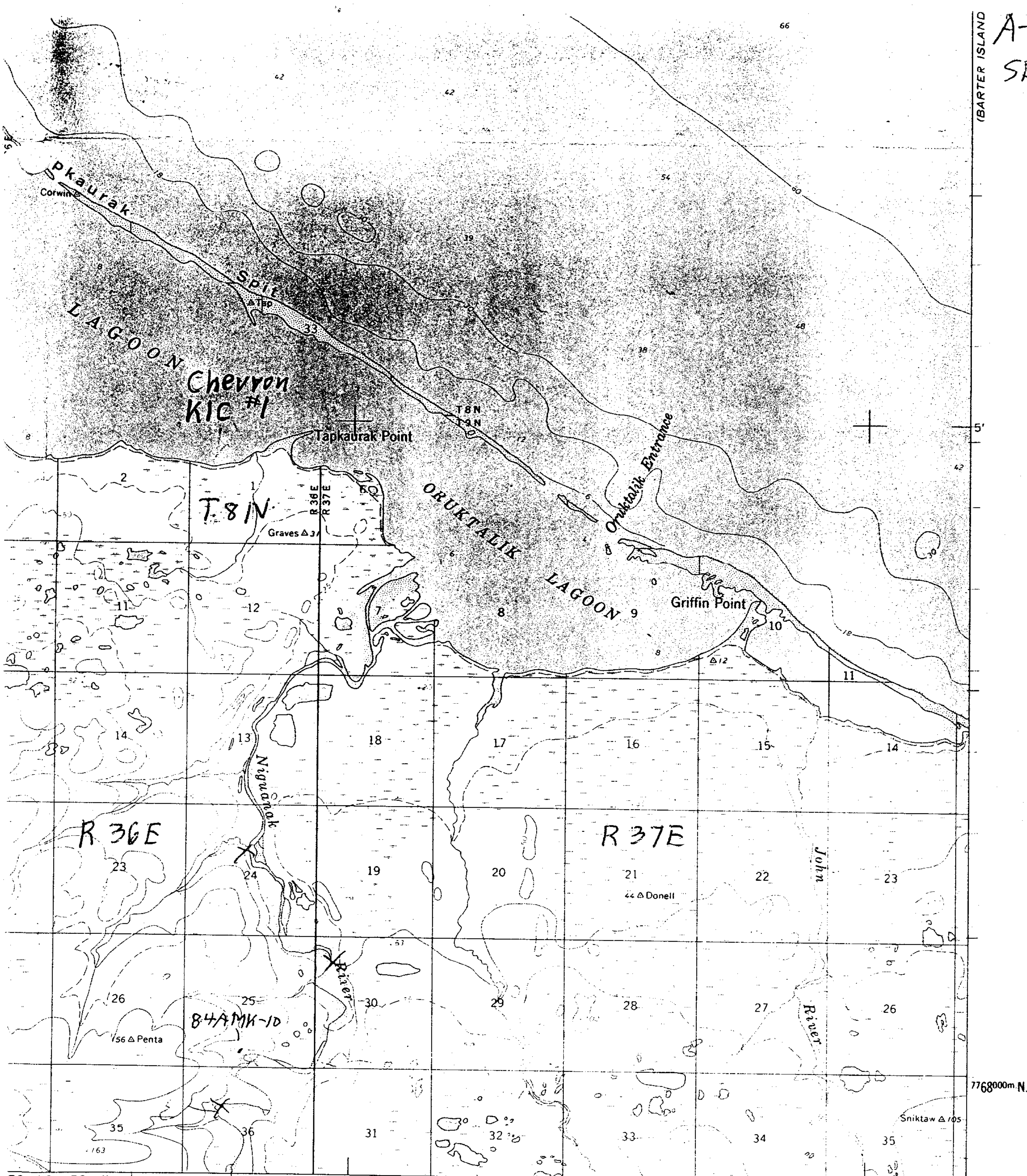
MT. MICHELSON (D-3), ALASKA

N6945—W14512/15X36

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1964


D-5 SE/4
T6N
T5N
R22E
R23E
CANNING
RIVER
ARCTIC NATIONAL WILDLIFE RANGE
Oil sand? (Reporte
T. 6 N.
T. 5 N.
50'
40'
30'
69°45'
146°24'
7739000m.N.
522000m.E.
R. 22 E.
R. 23 E.
INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1964
MICHELSON C-5)
(MT. MICHELSON D-4)
(MT. MICHEL
CALE 1:63360
4 MILES
9000 12000 15000 18000 21000 FEET
5 KILOMETERS
ROAD CLASSIFICATION
Mt Michelson D-5 SE/4

A-4
SE/4



Barter Island A-4 SE/4

(DEMARCATION P.

ALE 1:63 360

2 3 4 MILES

9000 12000 15000 18000 21000 FEET

3 4 5 KILOMETERS

ROAD CLASSIFICATION

No roads or trails in this area

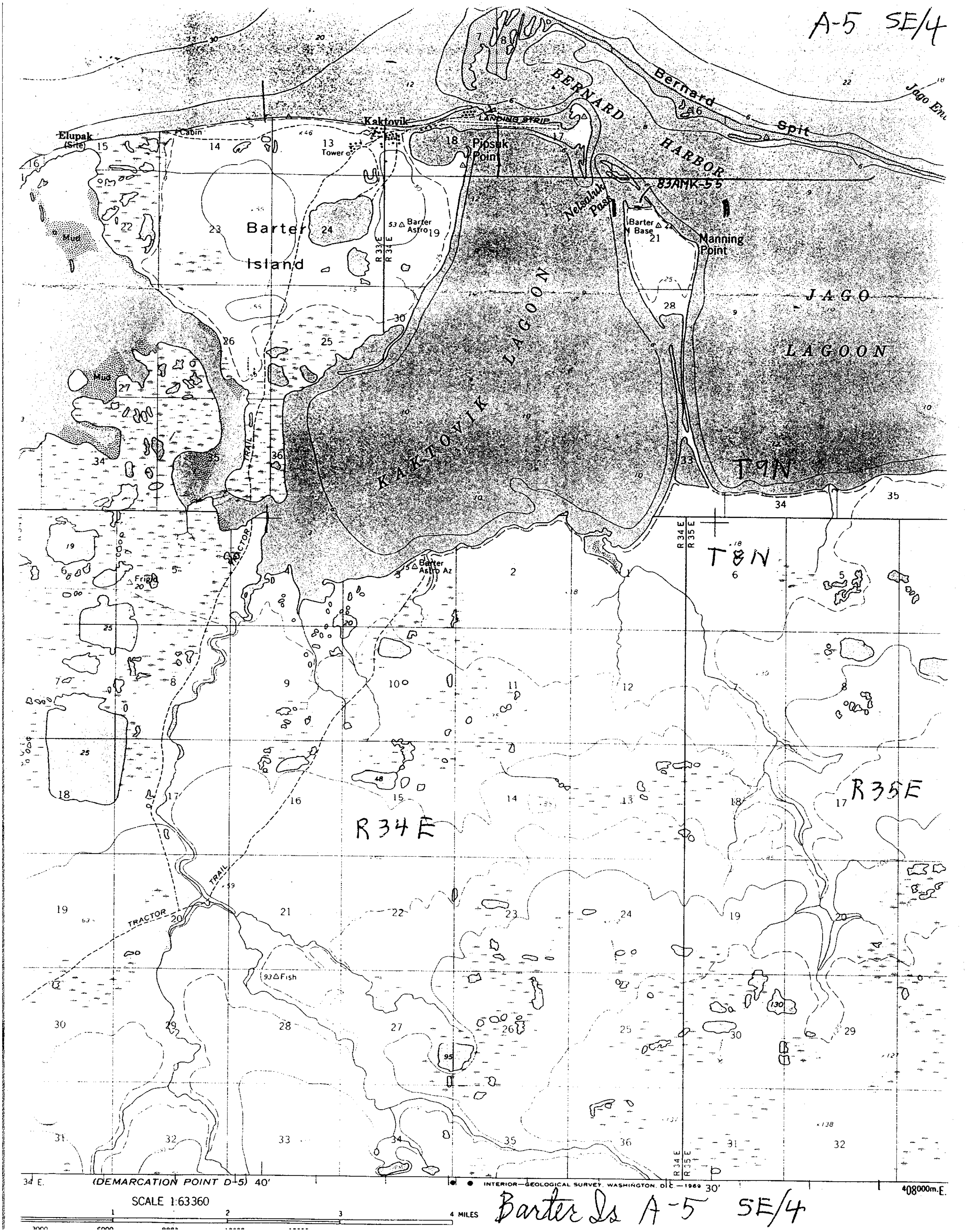
. AL 50 FEET
'RESENT 25-FOOT CONTOURS
. MEAN SEA LEVEL
.S IN FEET—DATUM IS MEAN LOW WATER
THE APPROXIMATE LINE OF MEAN HIGH WATER
DE IS APPROXIMATELY 0.5 OF A FOOT

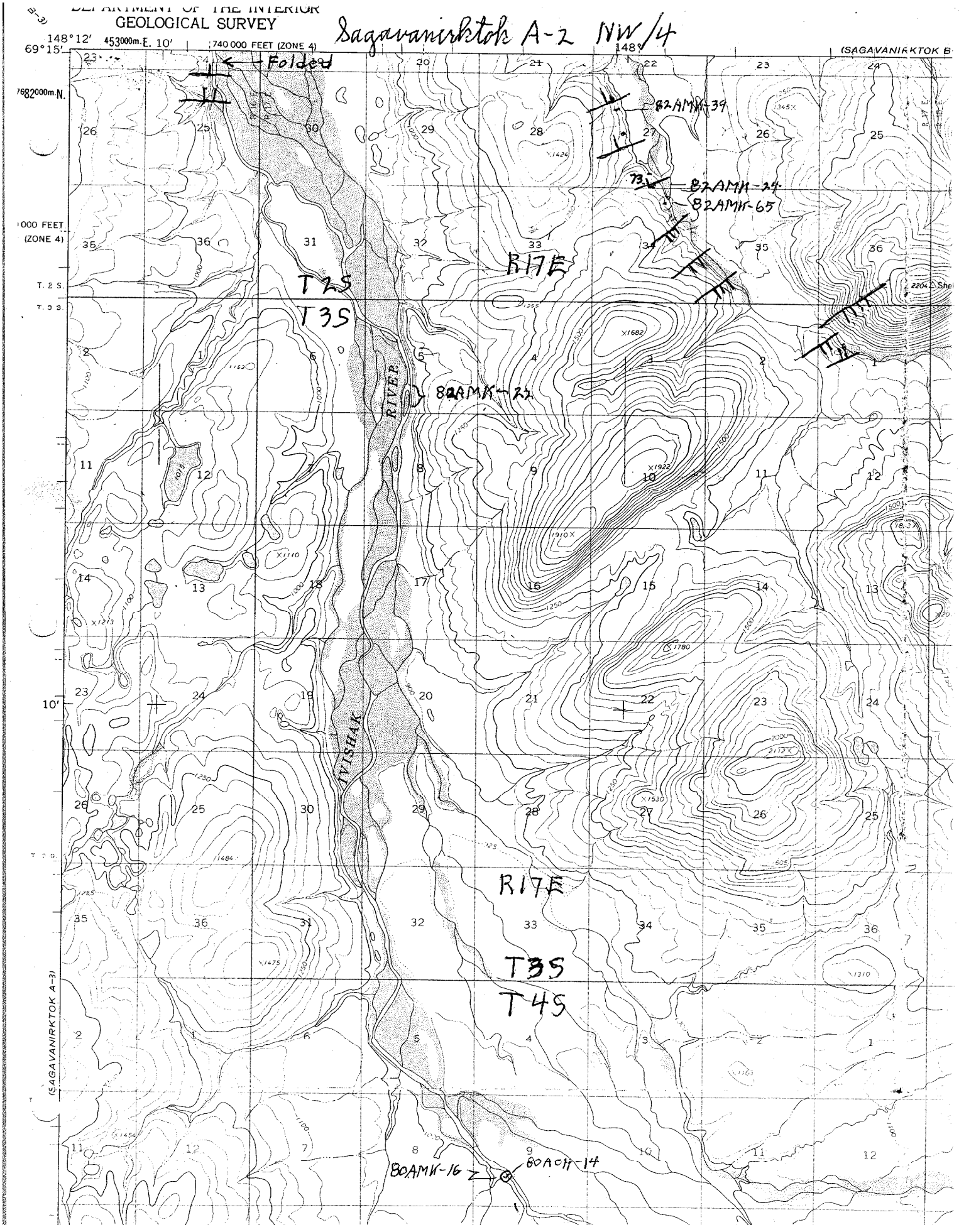
QUADRANGLE LOCATION

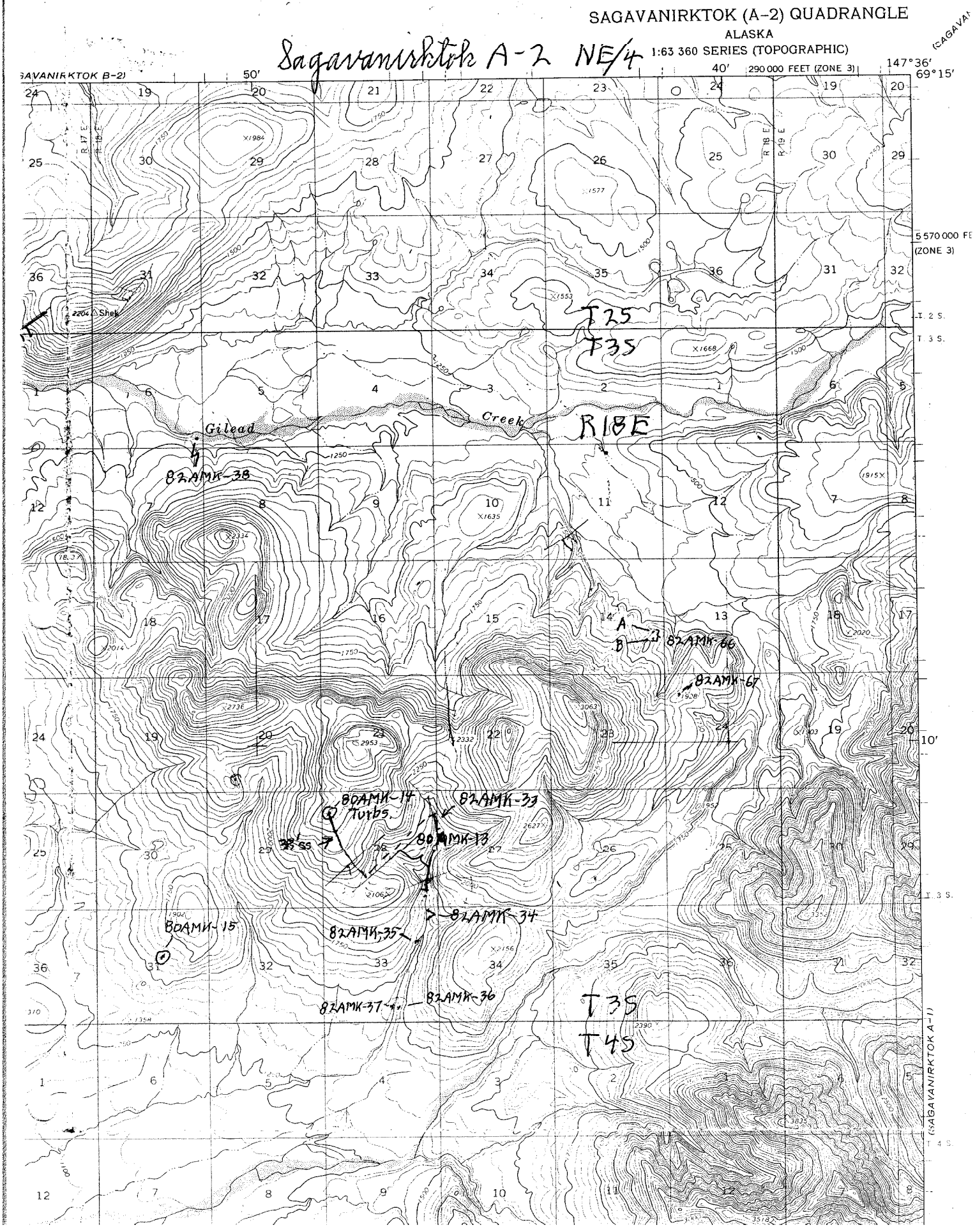
. S. GEOLOGICAL SURVEY
COLORADO 80225, OR WASHINGTON, D.C. 20242
MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

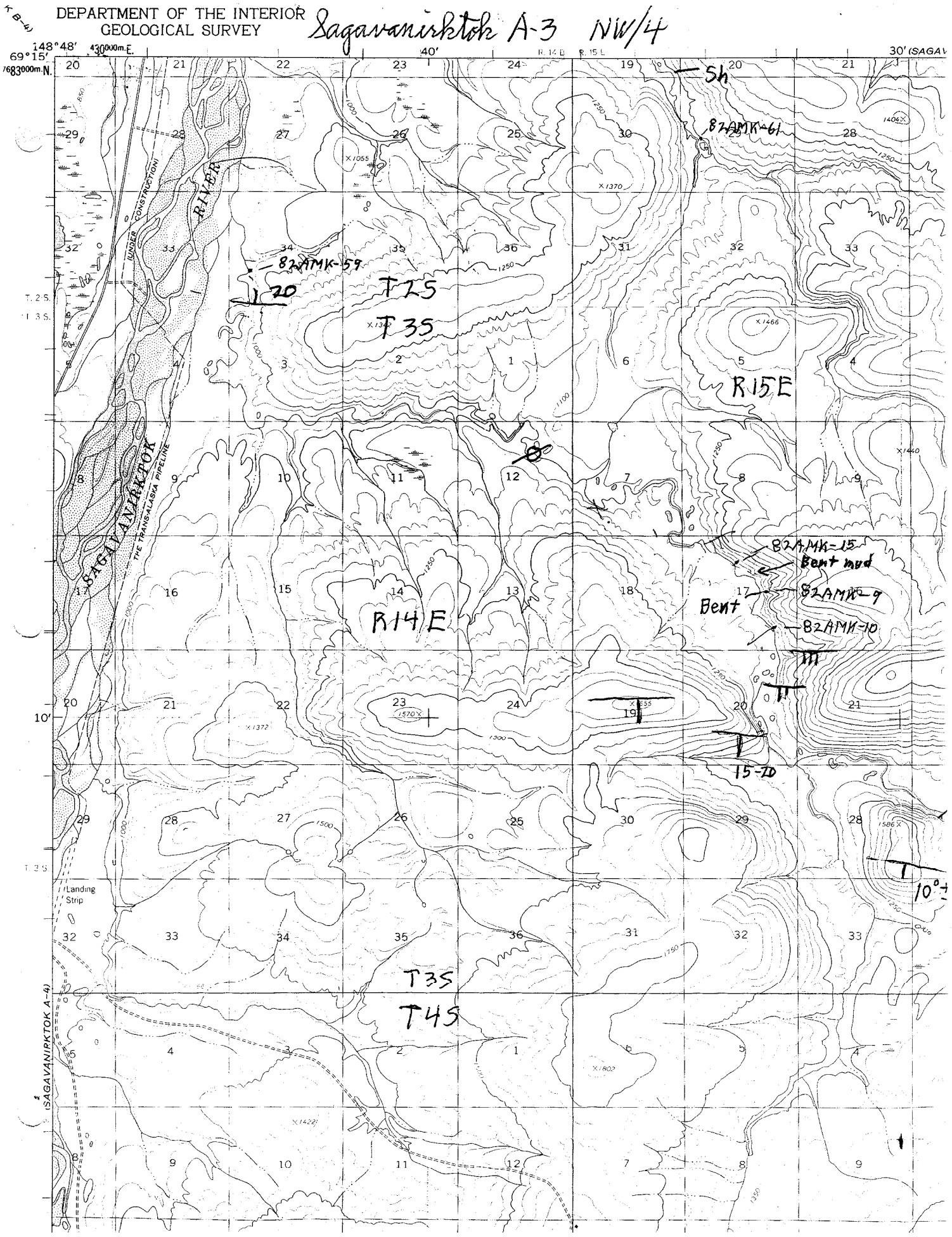
BARTER ISLAND (A-4), ALASKA
N7000—W14248/15 X 36

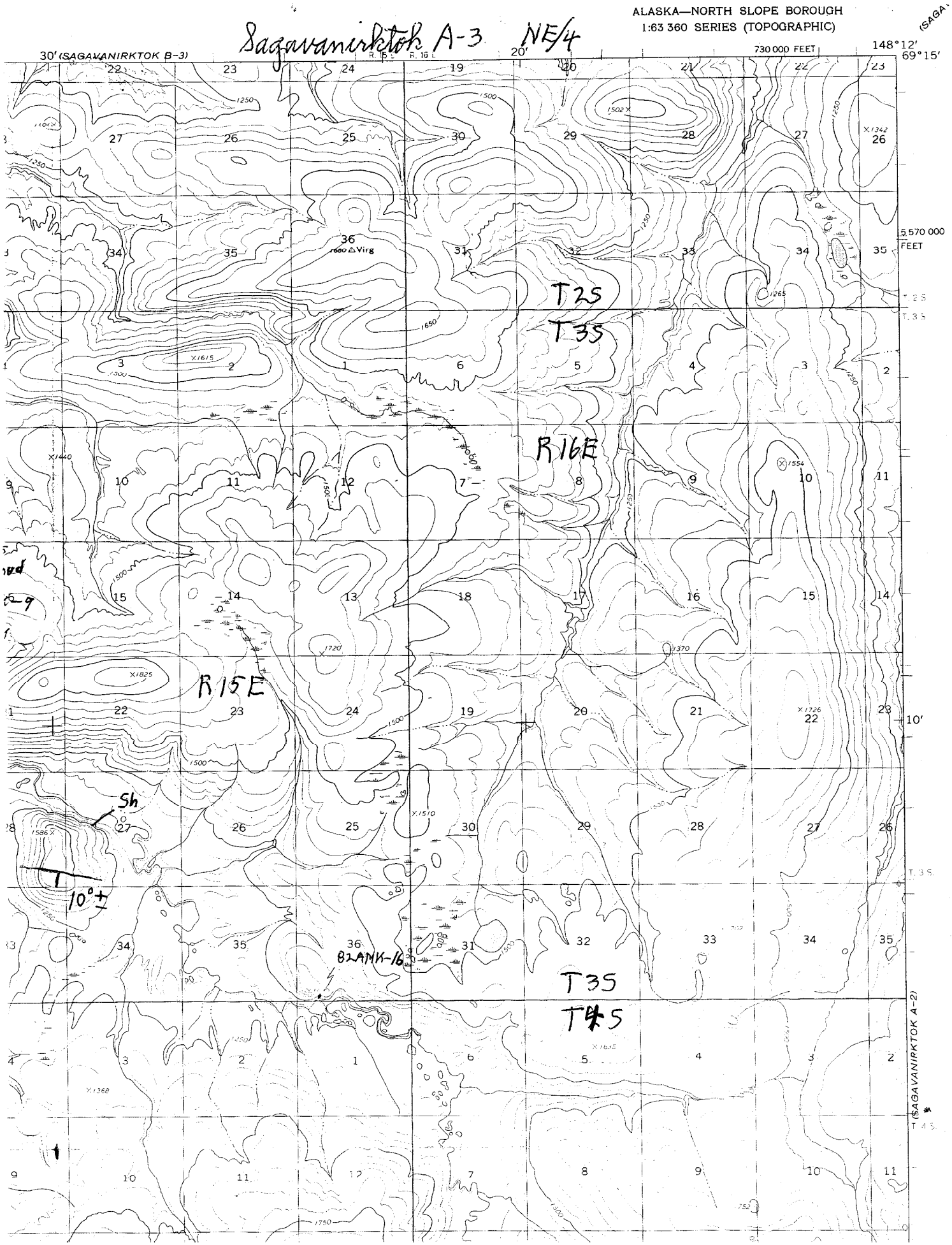
1955

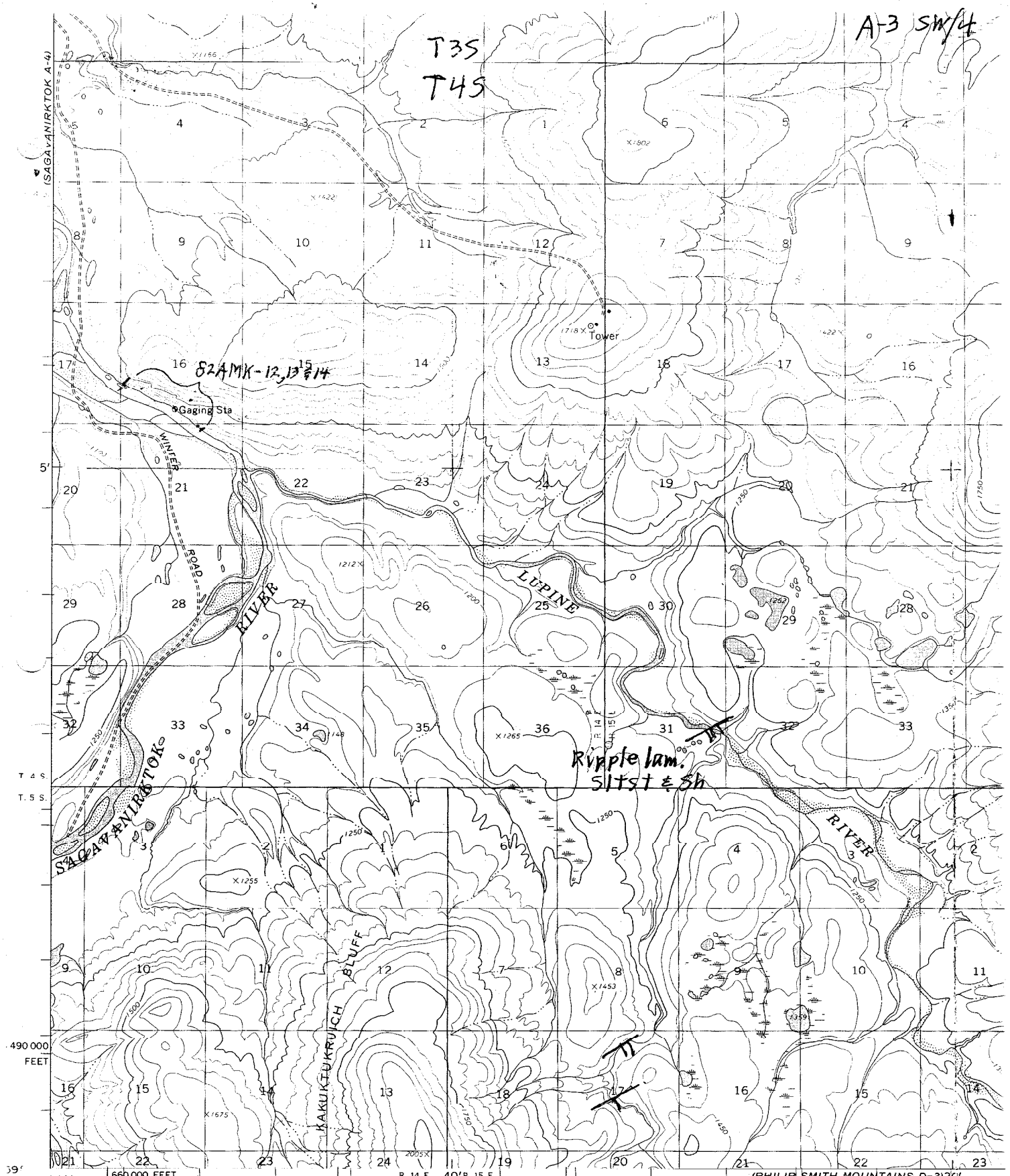

A-5 SE/4
Bernard Spit
BERNARD HARBOR
Jago Ent
Kaktovik
LANDING STRIP
Cabin
Elupak (Site)
Tower
Pipsuk Point
83AMK-55
Nelsaluk Pass
Barter Base
Manning Point
Barter Island
Barter Astro
Mud
JAGO LAGOON
KAKTOVIK LAGOON
T9N
T8N
R 33 E
R 34 E
R 35 E
R34E
R35E
TRACTOR TRAIL
Barter Astro Az
Frigid
Fish
(DEMARCATION POINT D-5) 40'
30'
INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D.C.—1969
408000m.E.
SCALE 1:63360
4 MILES
Barter Is A-5 SE/4


DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Sagavanirktok A-2 NW/4
148°12'
69°15'
453000m.E.
740 000 FEET (ZONE 4)
7682000m.N.
(SAGAVANIRKTOK B
Folded
82AMK-39
82AMK-24
82AMK-65
82AMK-22
R17E
T2S
T3S
T3S
T4S
R17E
IVISHAK RIVER
80AMK-16
80ACH-14
(SAGAVANIRKTOK A-3)


SAGAVANIRKTOK (A-2) QUADRANGLE
ALASKA
1:63 360 SERIES (TOPOGRAPHIC)
Sagavanirktok A-2 NE/4
147°36'
69°15'
40'
290 000 FEET (ZONE 3)
5 570 000 FE
(ZONE 3)
T 25
T 35
R 18 E
Gilead
Creek
82AMK-38
82AMK-66
82AMK-67
80AMK-14
Turbs.
82AMK-33
80AMK-13
82AMK-34
82AMK-35
80AMK-15
82AMK-37
82AMK-36
T 35
T 45
T 2 S.
T 3 S.
T 4 S.
SAGAVANIRKTOK A-1


DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Sagavanirktok A-3 NW/4
148°48'
69°15'
430000m.E.
7683000m.N.
40'
30' (SAGAV
R.14E.
R.15E.
T.2S.
T.3S.
T.4S.
T25
T35
T45
R14E
R15E
SAGAVANIRKTOK RIVER
UNDER CONSTRUCTION
THE TRANS-ALASKA PIPELINE
Landing Strip
(SAGAVANIRKTOK A-4)
82AMK-59
82AMK-61
82AMK-15
Bent mud
82AMK-9
Bent
82AMK-10
15-20
10°+
Sh


Sagavanirktok A-3 NE/4
ALASKA—NORTH SLOPE BOROUGH
1:63 360 SERIES (TOPOGRAPHIC)
730 000 FEET
148°12'
69°15'
30' (SAGAVANIRKTOK B-3)
20'
10'
5 570 000 FEET
R. 15 E.
R. 16 E.
T 2 S.
T 3 S.
T 4 S.
T25
T35
R16E
R15E
T35
T45
Sh
10°±
B2AMK-16
(SAGAVANIRKTOK A-2)



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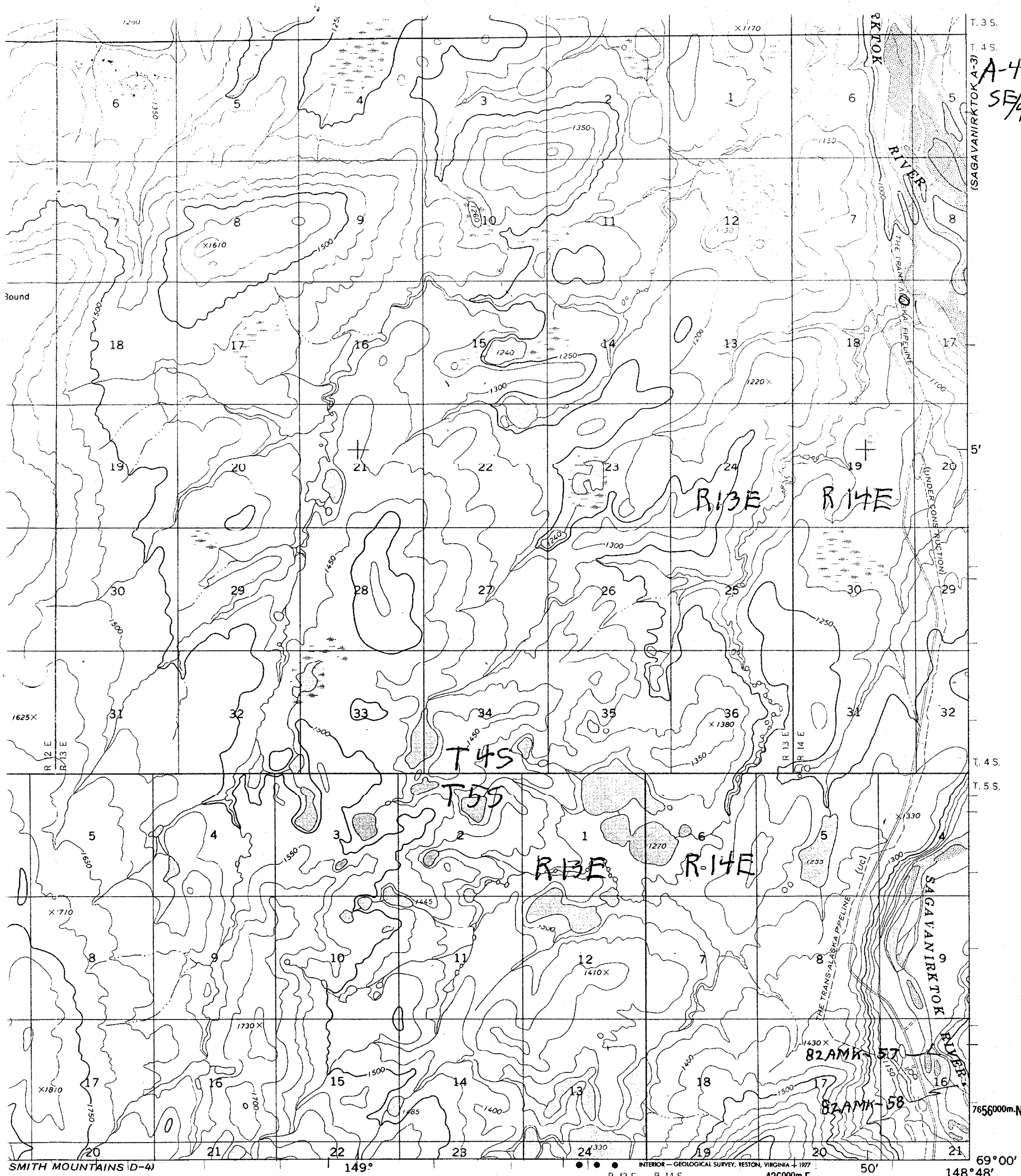
Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1970, field annotated 1971. Map not field checked

Universal Transverse Mercator projection. 1927 North American datum
10,000-foot grid based on Alaska coordinate system, zone 4
1000-meter Universal Transverse Mercator grid ticks.



Sagavanirktok A-4 SE/4

SCALE 1:63360

2 3 4 MILES

9000 12000 15000 18000 21000 FEET

2 3 4 5 KILOMETERS

CONTOUR INTERVAL 50 FEET

DATUM IS MEAN SEA LEVEL / NATIONAL GEODETIC VERTICAL DATUM OF 1929

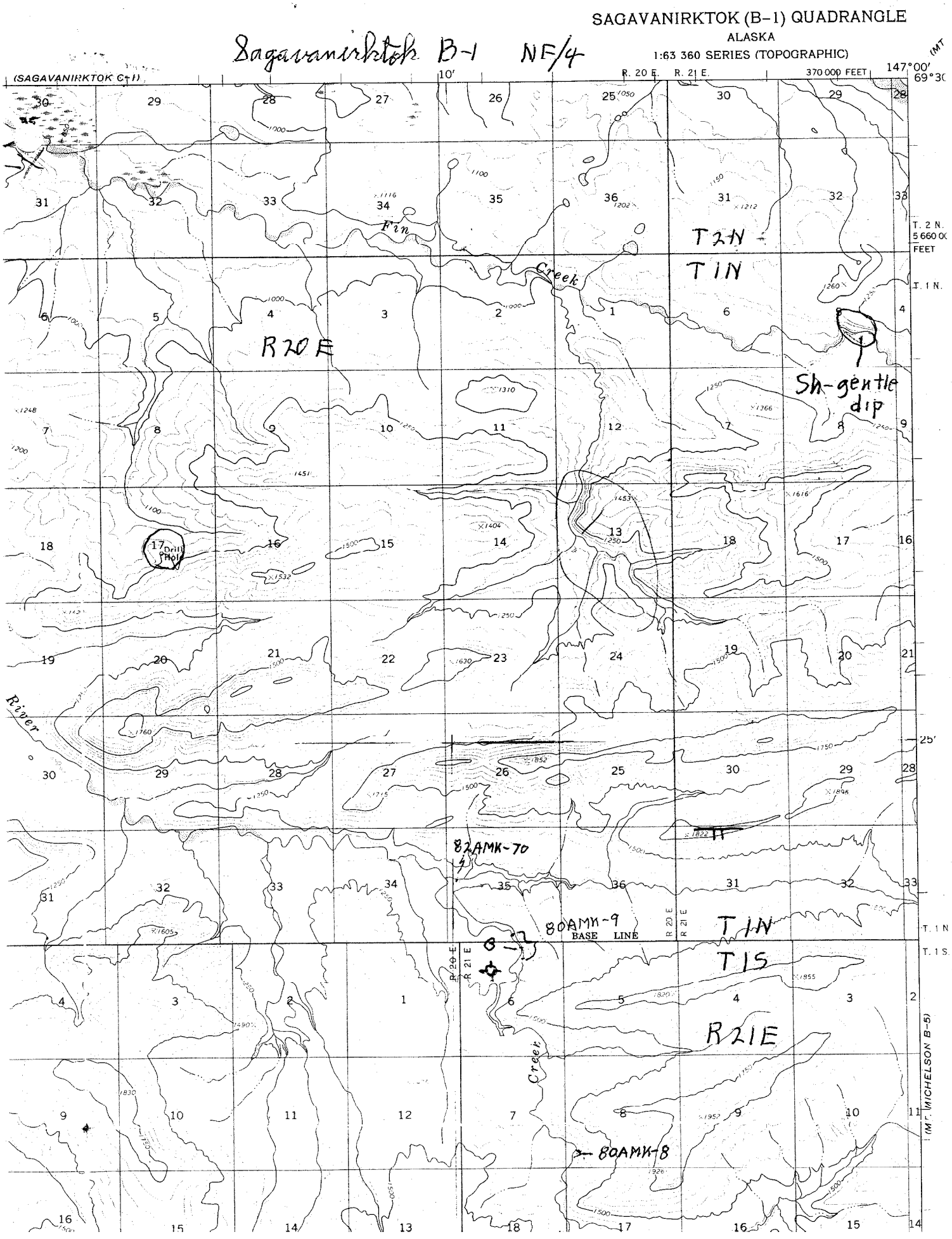
ROAD CLASSIFICATION

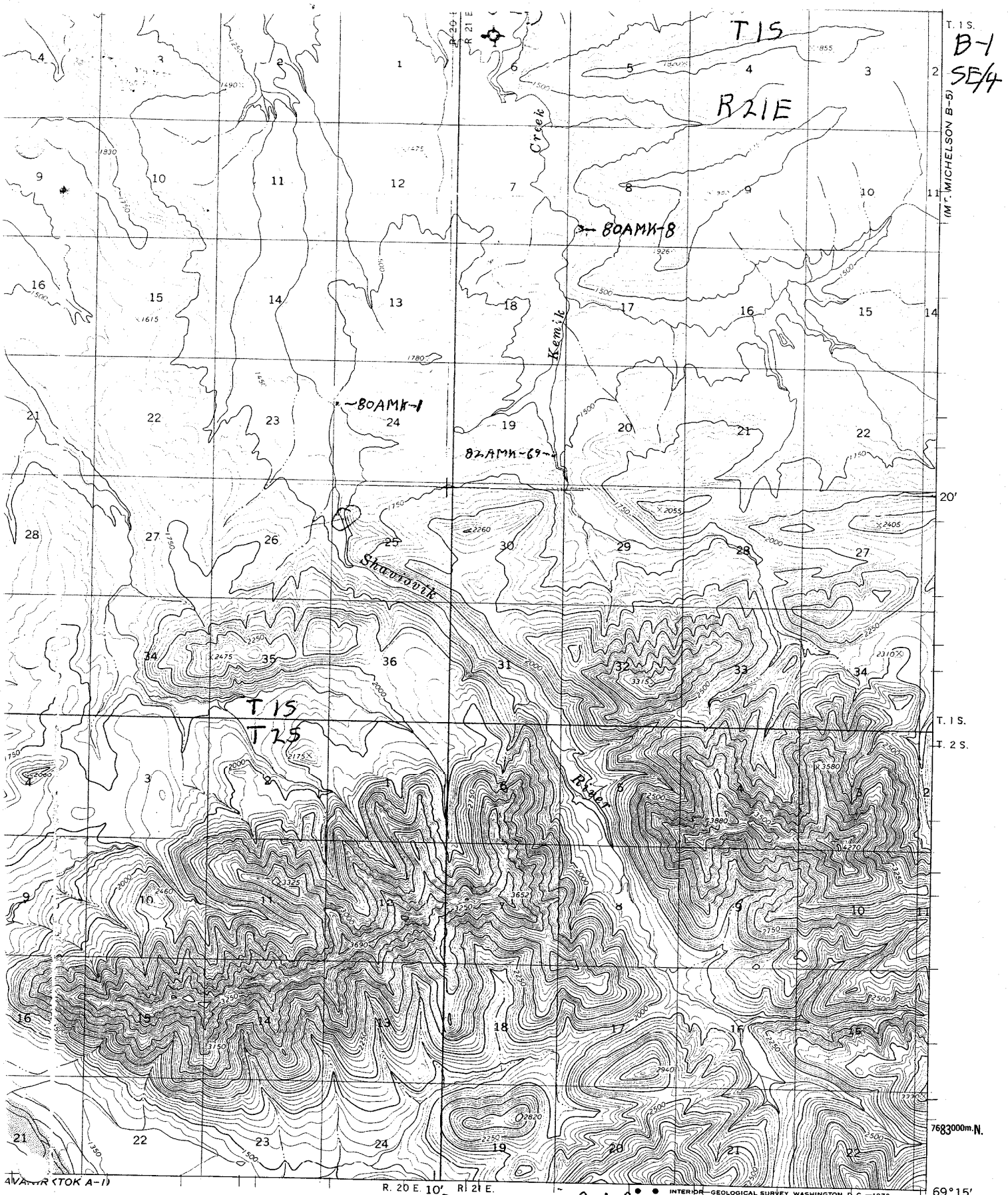
Light-duty ________ Unimproved dirt = = = = = =

ALASKA

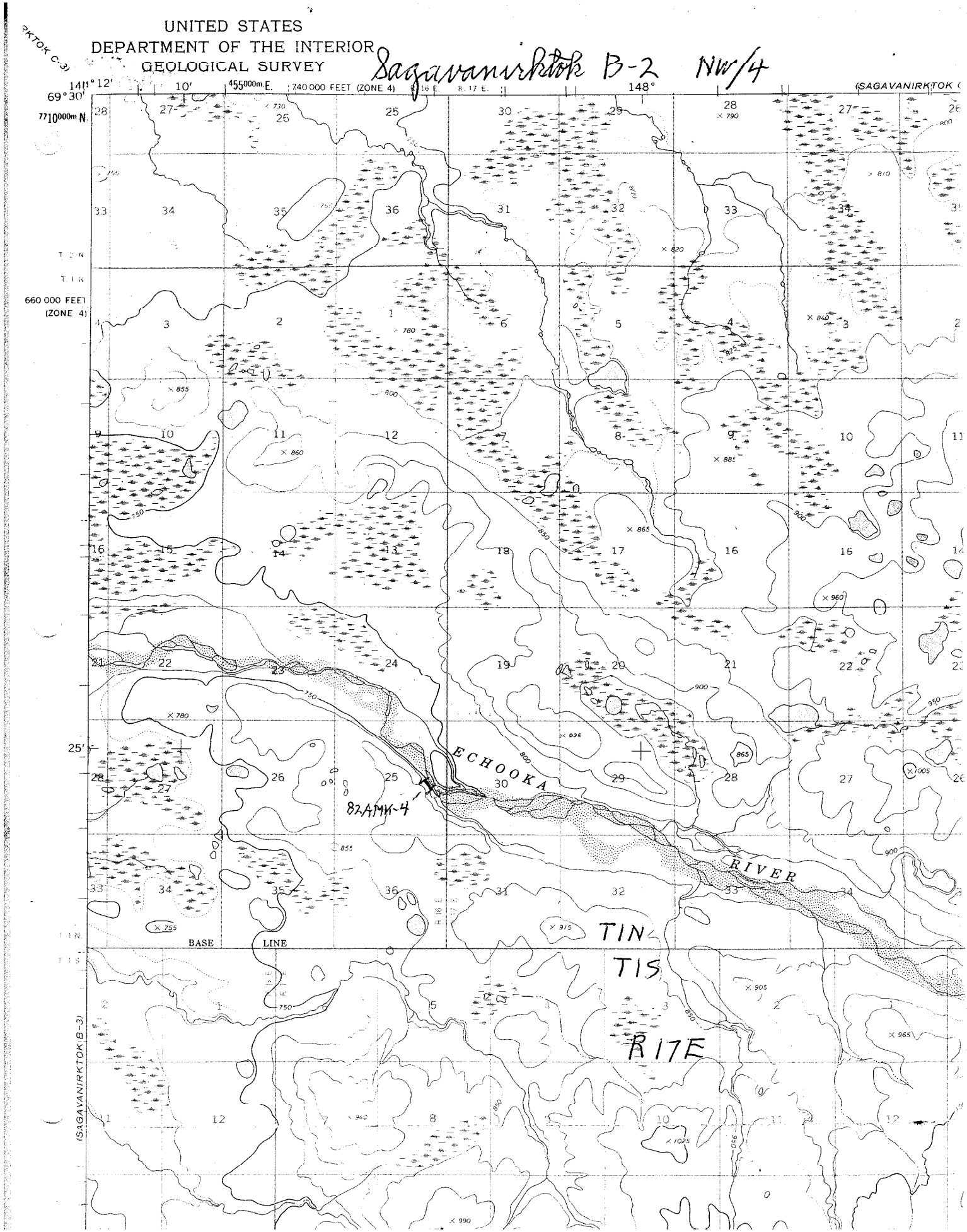
(PHIL. MOUNTA

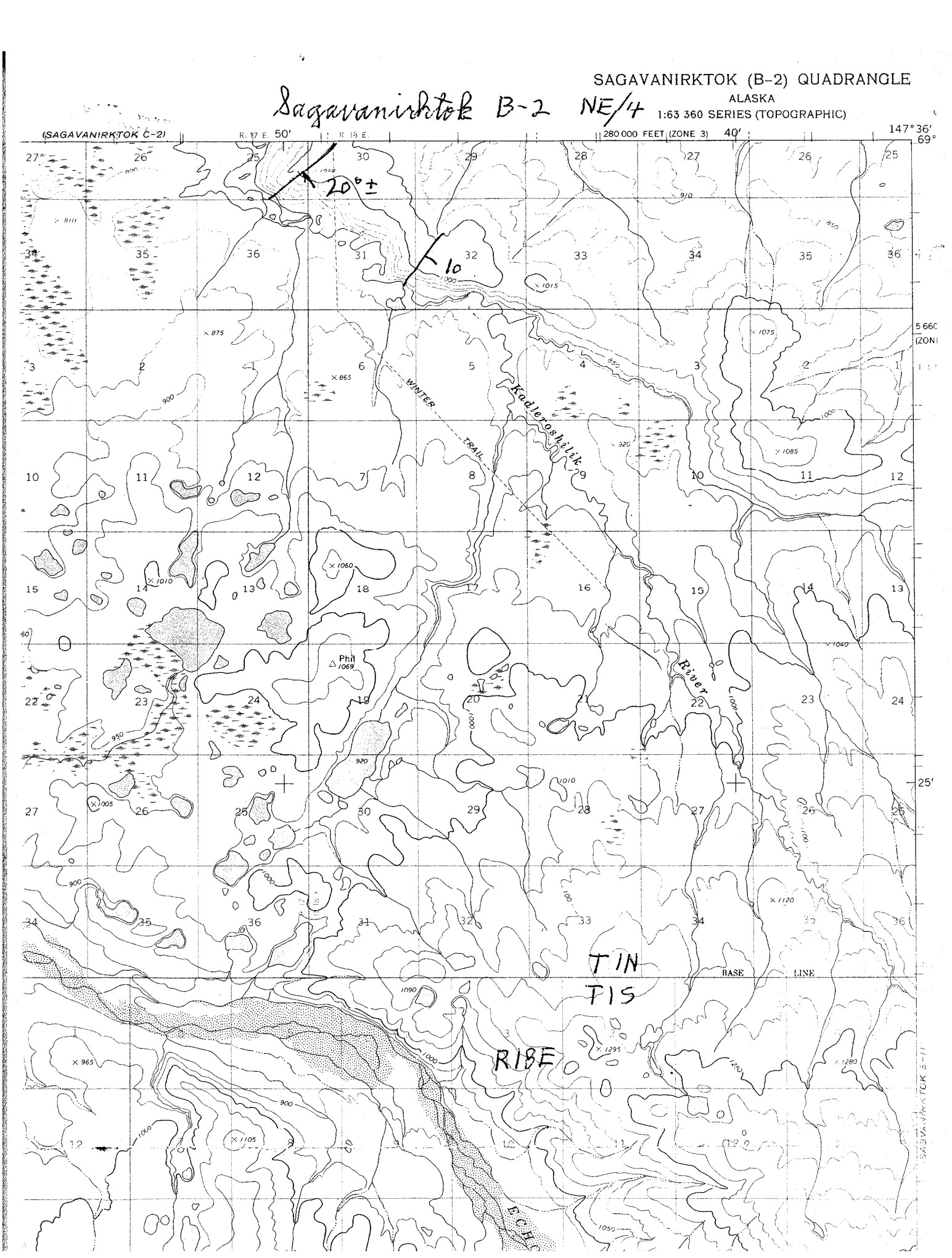
SAGAVANIRKTOK (A-4), ALASKA

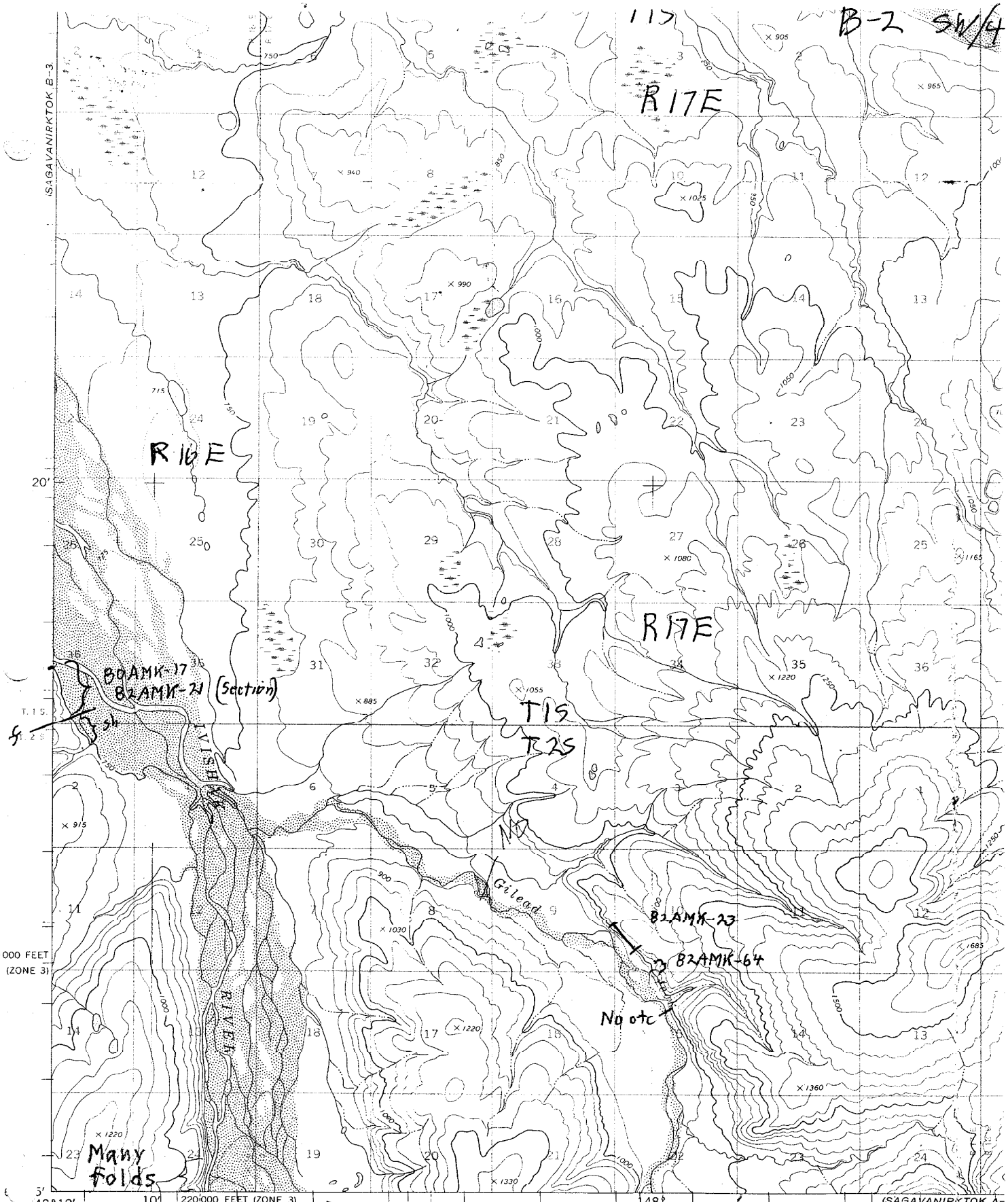

SAGAVANIRKTOK (B-1) QUADRANGLE
ALASKA
1:63 360 SERIES (TOPOGRAPHIC)
Sagavanirktok B-1 NE/4
(SAGAVANIRKTOK C-1)
R. 20 E.
R. 21 E.
370 000 FEET
147°00'
69°30'
T. 2 N.
5 660 000 FEET
T. 1 N.
T. 1 S.
T2N
T1N
R20E
R21E
Fin Creek
Sh-gentle dip
Drill Hole
River
82AMK-70
80AMK-9
BASE LINE
80AMK-8
Creek
(MT. MICHELSON B-5)



Sagavanirktok B-1 SE/4


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Sagavanirktok B-2 NW/4
(SAGAVANIRKTOK C-3)
69°30'
7710000m N.
455000m.E.
740 000 FEET (ZONE 4)
660 000 FEET (ZONE 4)
R. 16 E.
R. 17 E.
148°
(SAGAVANIRKTOK
ECHOOKA
RIVER
82AMK-4
BASE LINE
TIN
TIS
R17E
(SAGAVANIRKTOK B-3)


SAGAVANIRKTOK (B-2) QUADRANGLE
ALASKA
1:63 360 SERIES (TOPOGRAPHIC)
Sagavanirktok B-2 NE/4
(SAGAVANIRKTOK C-2)
R. 17 E.
R. 18 E.
280 000 FEET (ZONE 3)
147°36'
69°
50'
40'
25'
20 ± 10
WINTER TRAIL
Kadleroshilik River
Phil
1069
TIN
TIS
RIBE
BASE LINE
E.C.F.



Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

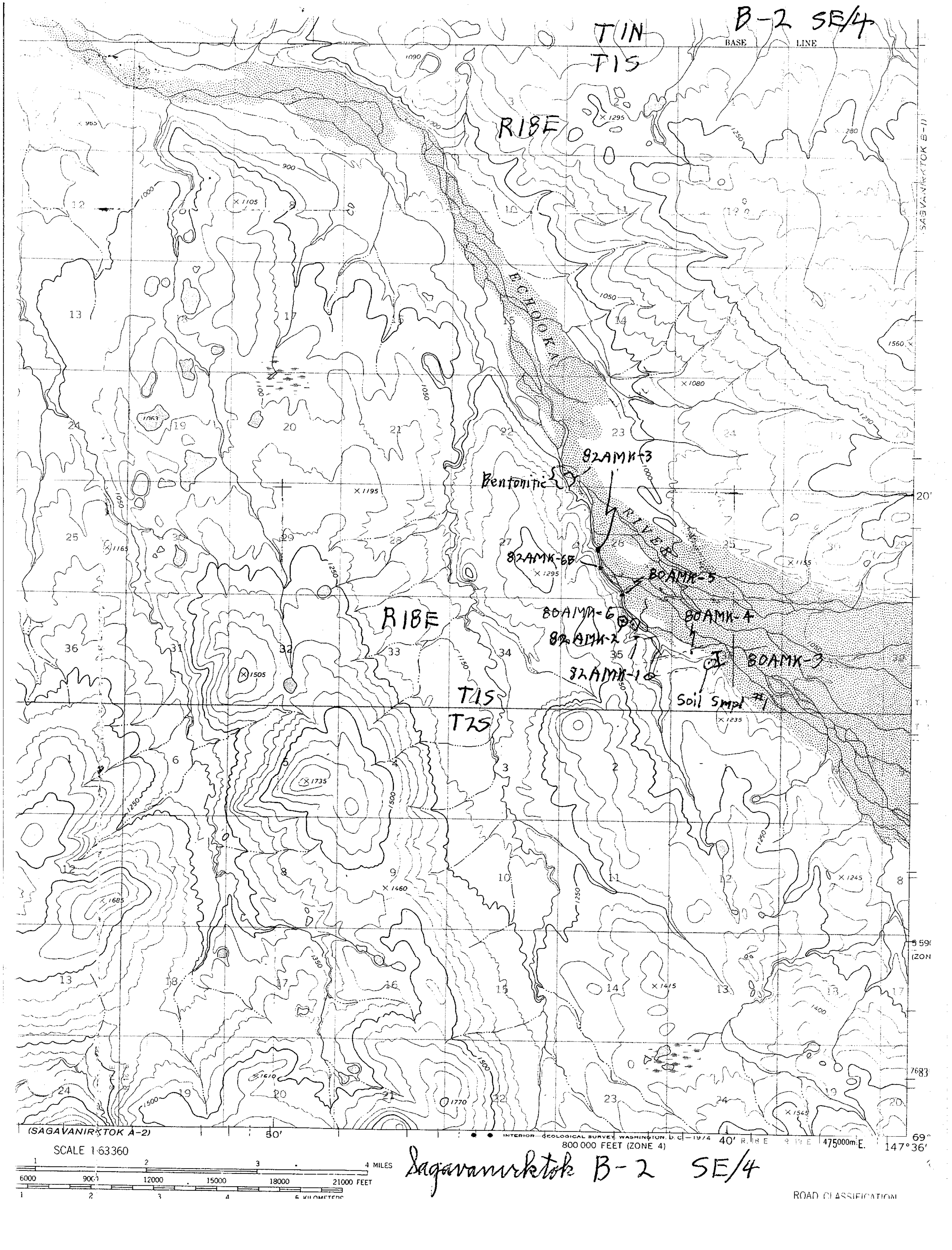
Topography by photogrammetric methods from aerial photographs taken 1970, field annotated 1971. Map not field checked

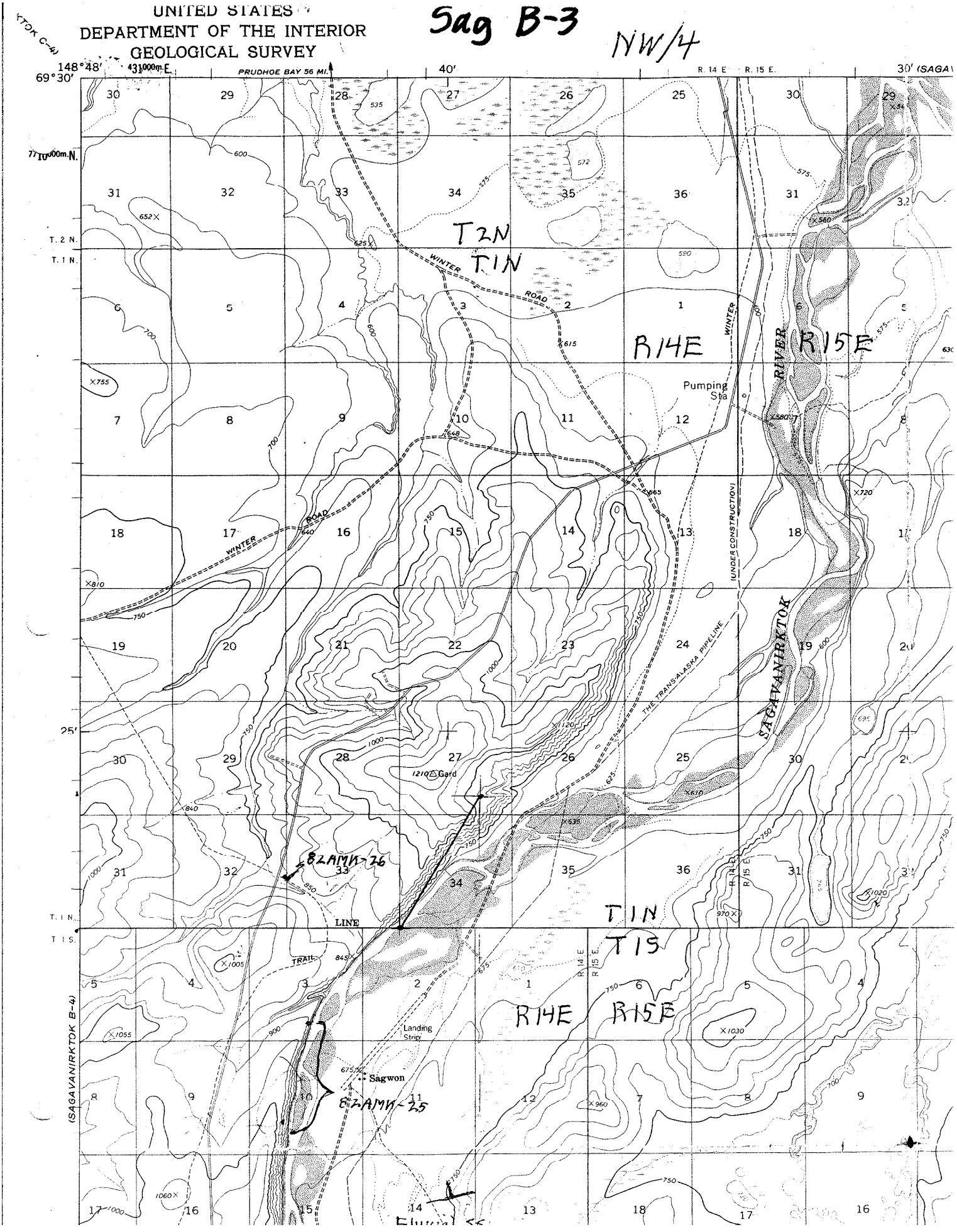
Projection and 1000-meter grid ticks: Universal Transverse Mercator, zone 6

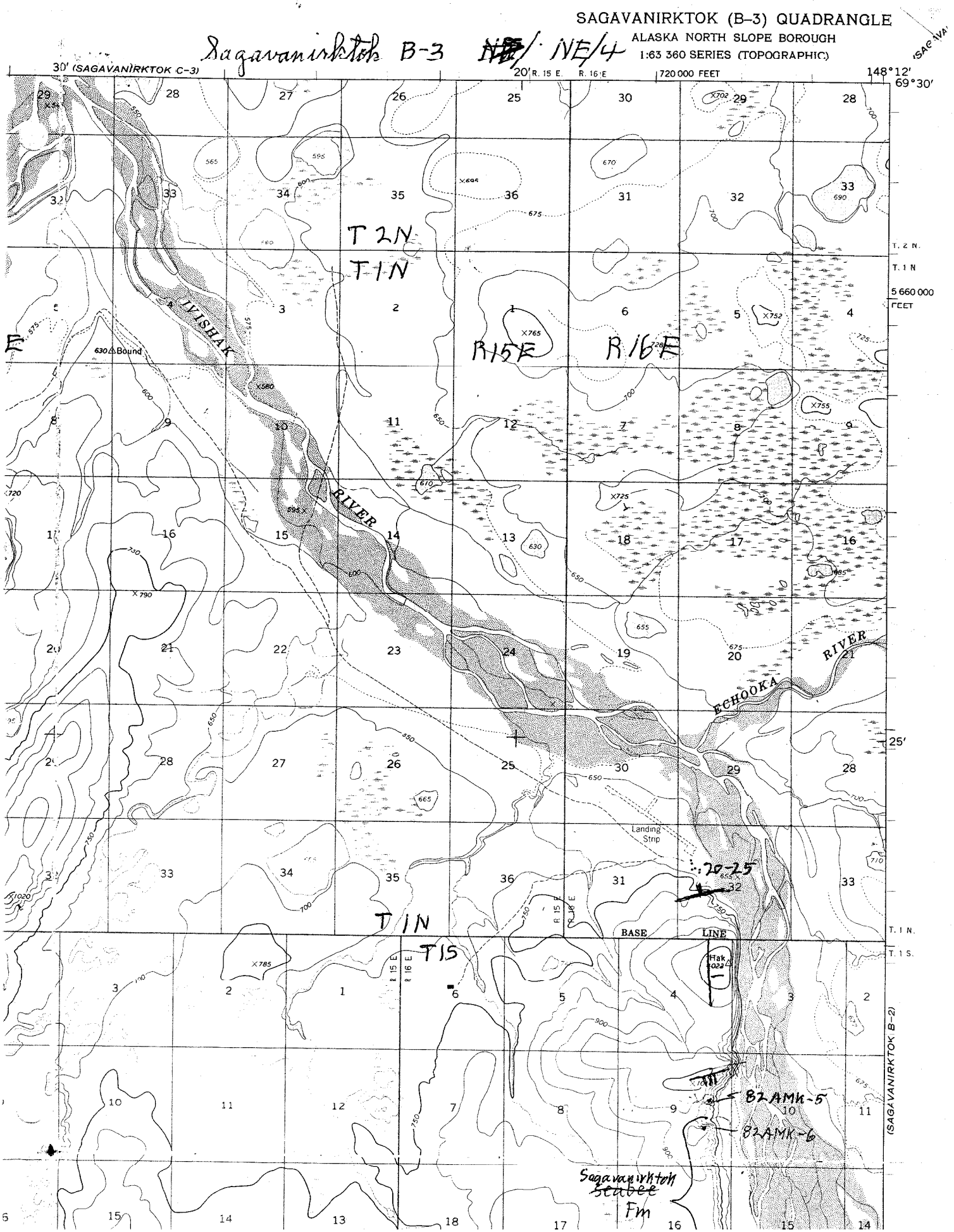
SCALE 1:63360

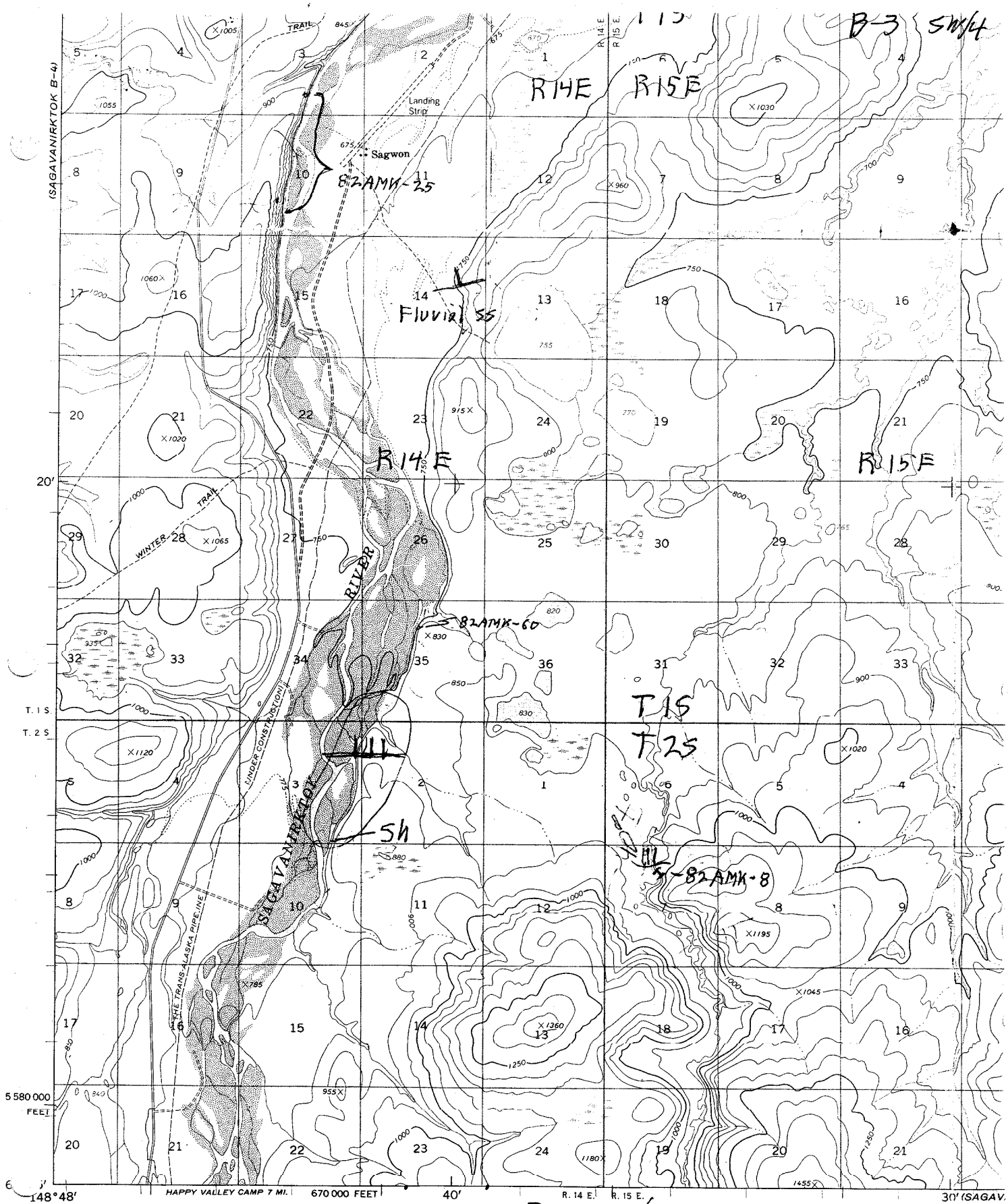
CONTOUR INTERVAL 50

DOTTED LINES REPRESENT 25-FOO


B-2 SE/4
T1N
T1S
R18E
ECHOOKA RIVER
Bentonitic
82AMK-3
82AMK-6B
80AMK-5
80AMK-6
80AMK-4
82AMK-2
80AMK-3
82AMK-1
Soil Smpl #1
R18E
T1S
T2S
(SAGAVANIRKTOK A-2)
SAGAVANIRKTOK B-1
INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D.C.—1974
800 000 FEET (ZONE 4)
475000m E.
147°36'
SCALE 1:63360
4 MILES
21000 FEET
5 KILOMETERS
Sagavanirktok B-2 SE/4
ROAD CLASSIFICATION


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Sag B-3
NW/4
148°48'
69°30'
7710000m.N.
431000m.E.
PRUDHOE BAY 56 MI.
40'
R. 14 E.
R. 15 E.
30' (SAGA
T. 2 N.
T. 1 N.
T2N
T1N
R14E
R15E
WINTER ROAD
WINTER ROAD
RIVER
Pumping Sta
(UNDER CONSTRUCTION)
THE TRANS-ALASKA PIPELINE
SAGAVANIRKTOK
1210 Gard
LINE
T. 1 N.
T. 1 S.
T1N
T1S
R14E
R15E
TRAIL
Landing Strip
Sagwon
(SAGAVANIRKTOK B-4)


SAGAVANIRKTOK (B-3) QUADRANGLE
ALASKA NORTH SLOPE BOROUGH
1:63 360 SERIES (TOPOGRAPHIC)
Sagavanirktok B-3 NE/4
30' (SAGAVANIRKTOK C-3)
20'
R. 15 E.
R. 16 E.
720 000 FEET
148°12'
69°30'
T. 2 N.
T. 1 N
5 660 000 FEET
T 2N
T 1N
R15E
R16E
IVISHAK
RIVER
ECHOOKA
RIVER
Landing Strip
BASE LINE
Hak
T 1N
T 1S
82AMK-5
82AMK-6
Sagavanirktok Seabee Fm
(SAGAVANIRKTOK B-2)



Mapped, edited, and published by the Geological Survey

Control by USGS, USC&GS, and USCE

Topography by photogrammetric methods from aerial photographs taken 1970, field annotated 1971. Map not field checked

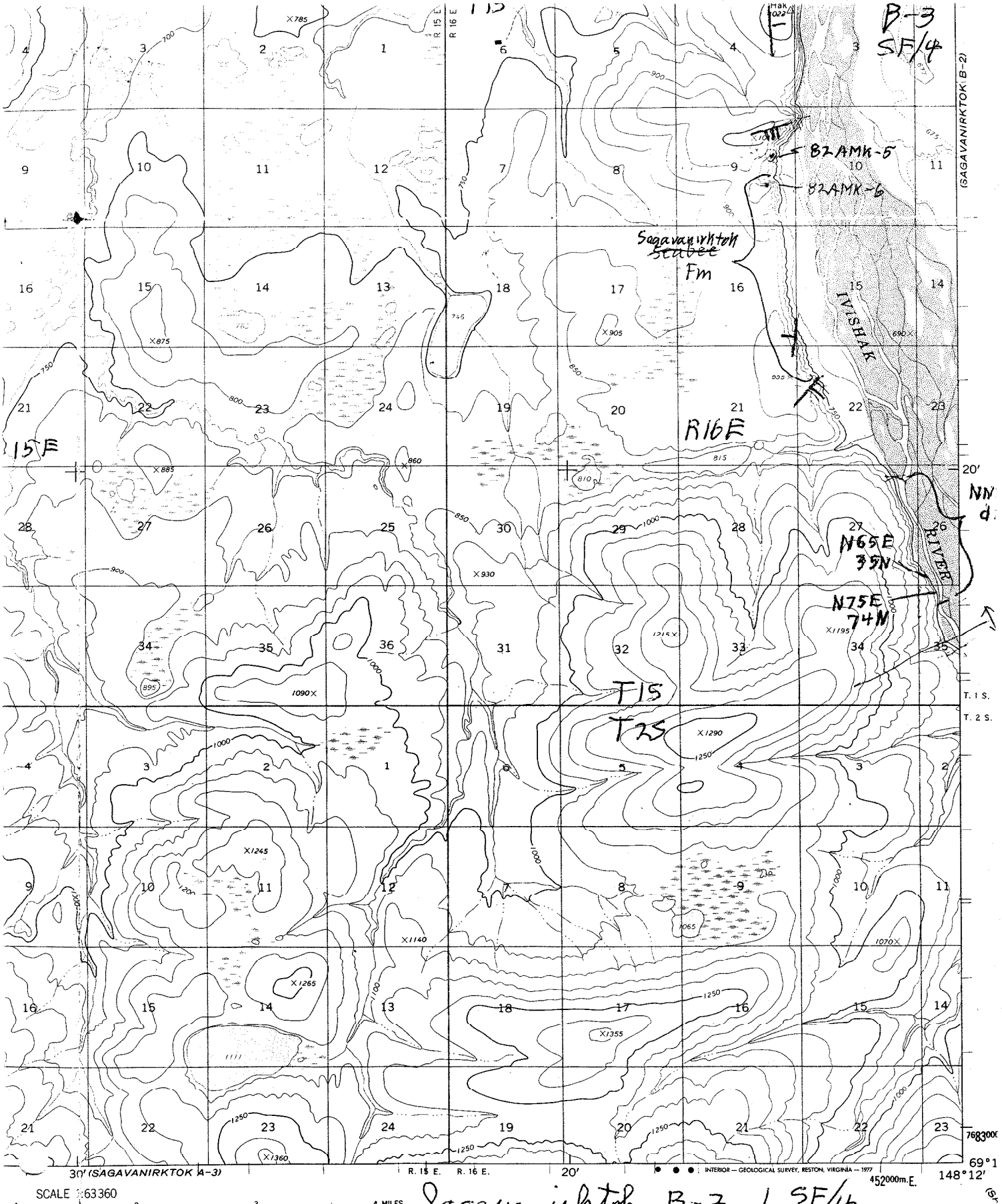
Projection and 1000-meter grid ticks: Universal Transverse Mercator, zone 6

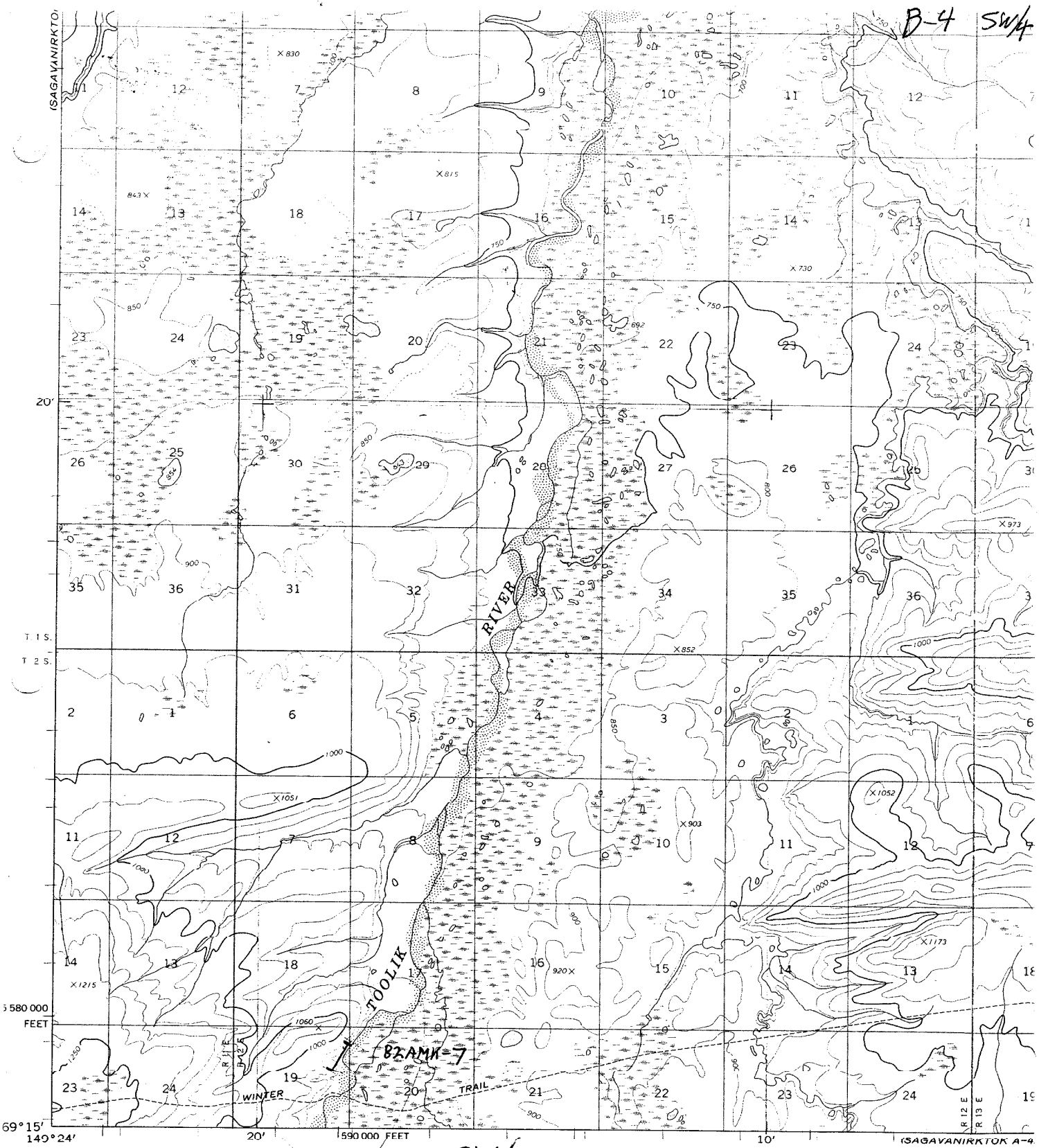
Sagavanirktok B-3 SW/4

SCALE 1:63360

CONTOUR INTERVAL 50

DOTTED LINES REPRESENT 25-FOO


B-3
SE/4
82AMK-5
82AMK-6
Sagavanirktok
Seabee
Fm
IVISHAK
R16E
15E
T15
T25
N65E
35M
N75E
74M
RIVER
(SAGAVANIRKTOK B-2)
(SAGAVANIRKTOK A-3)
R. 15 E.
R. 16 E.
20'
30'
T. 1 S.
T. 2 S.
INTERIOR — GEOLOGICAL SURVEY, RESTON, VIRGINIA — 1977
452000m.E.
7683000
69°1
148°12'
SCALE 1:63360
4 MILES
21000 FEET
5 KILOMETERS
Sagavanirktok B-3 1 SE/4
ROAD CLASSIFICATION
Light-duty
Unimproved dirt
NTOUR INTERVAL 50 FEET
LINES REPRESENT 25-FOOT CONTOURS



A-5)

Mapped, edited, and published by the Geological Survey

SW/4

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1970, field annotated 1971. Map not field checked

Projection and 1,000-meter grid ticks: Universal Transverse Mercator, zone 6

10,000-foot grid ticks based on Alaska coordinate system, zone 4. 1927 North American datum

Land lines represent unsurveyed and unmarked locations predetermined by the Bureau of Land Management Folios U-3 and U-11, Umiat Meridian

Swamps as portrayed, indicate only the wetter areas

Sag

B-4

30°

TRUE NORTH

MAGNETIC NORTH

APPROXIMATE MEAN DECLINATION, 1971

SCALE 1:63360

1 0 1 2

3000 0 3000 6000 9000

1 .5 0 1 2

CONTOUR INTERVAL 50 F

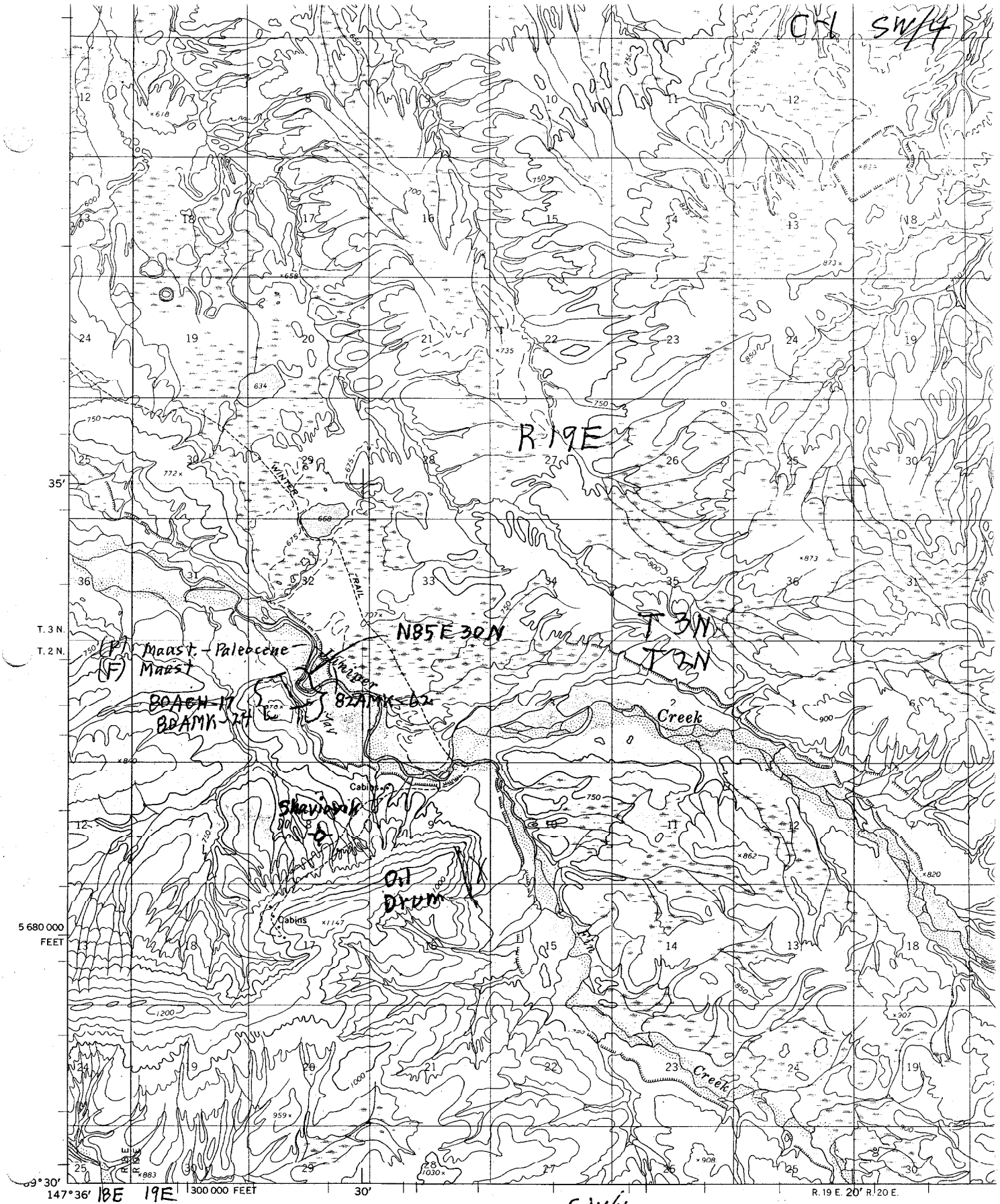
DOTTED LINES REPRESENT 25-FOOT

DATUM IS MEAN SEA LEVEL

FOR SALE BY U. S. GEOLOGICA

FAIRBANKS, ALASKA 99701, DENVER, COLORADO 802

A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND



Mapped by the Army Map Service
Edited and published by the Geological Survey

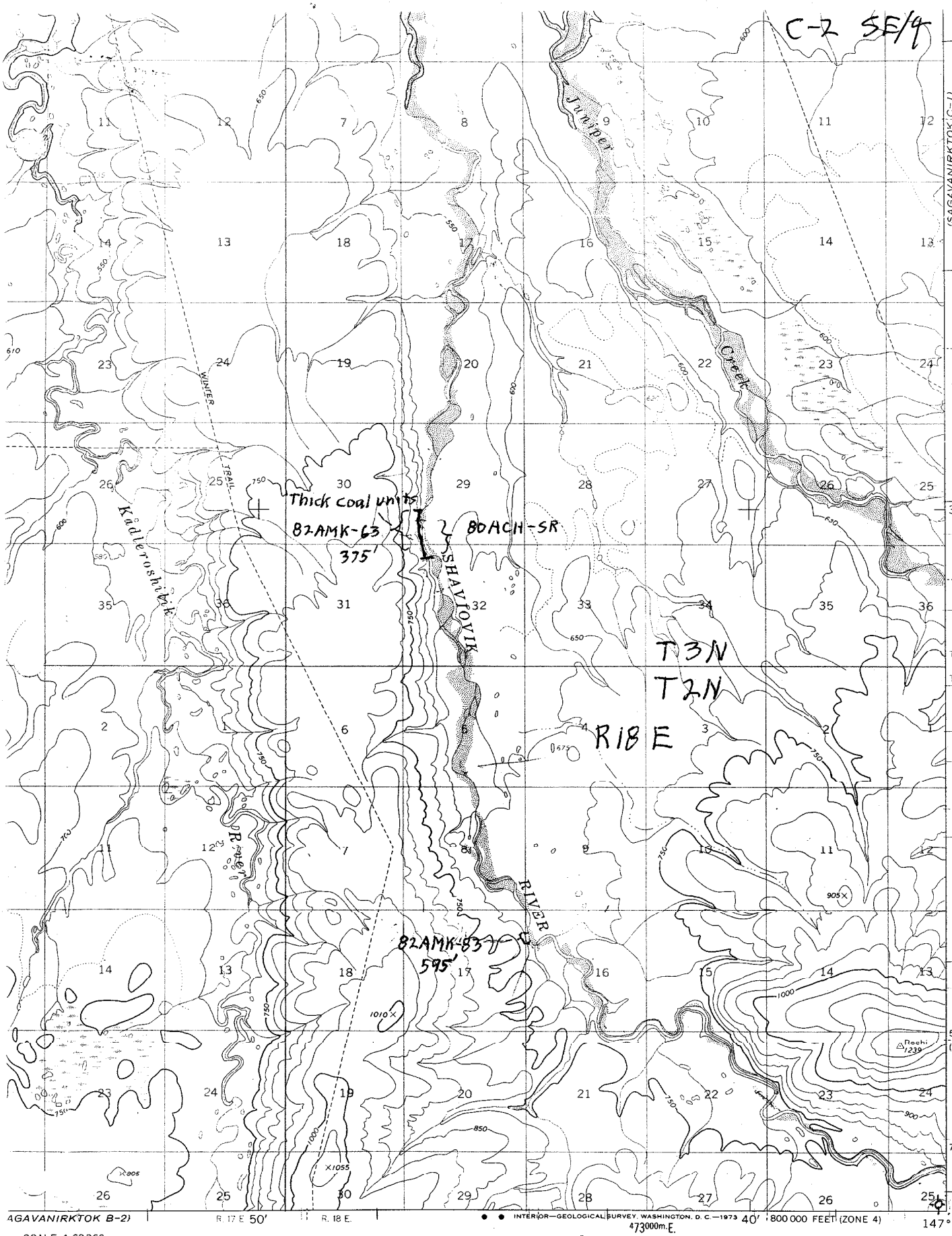
Control by USC&GS and USCE

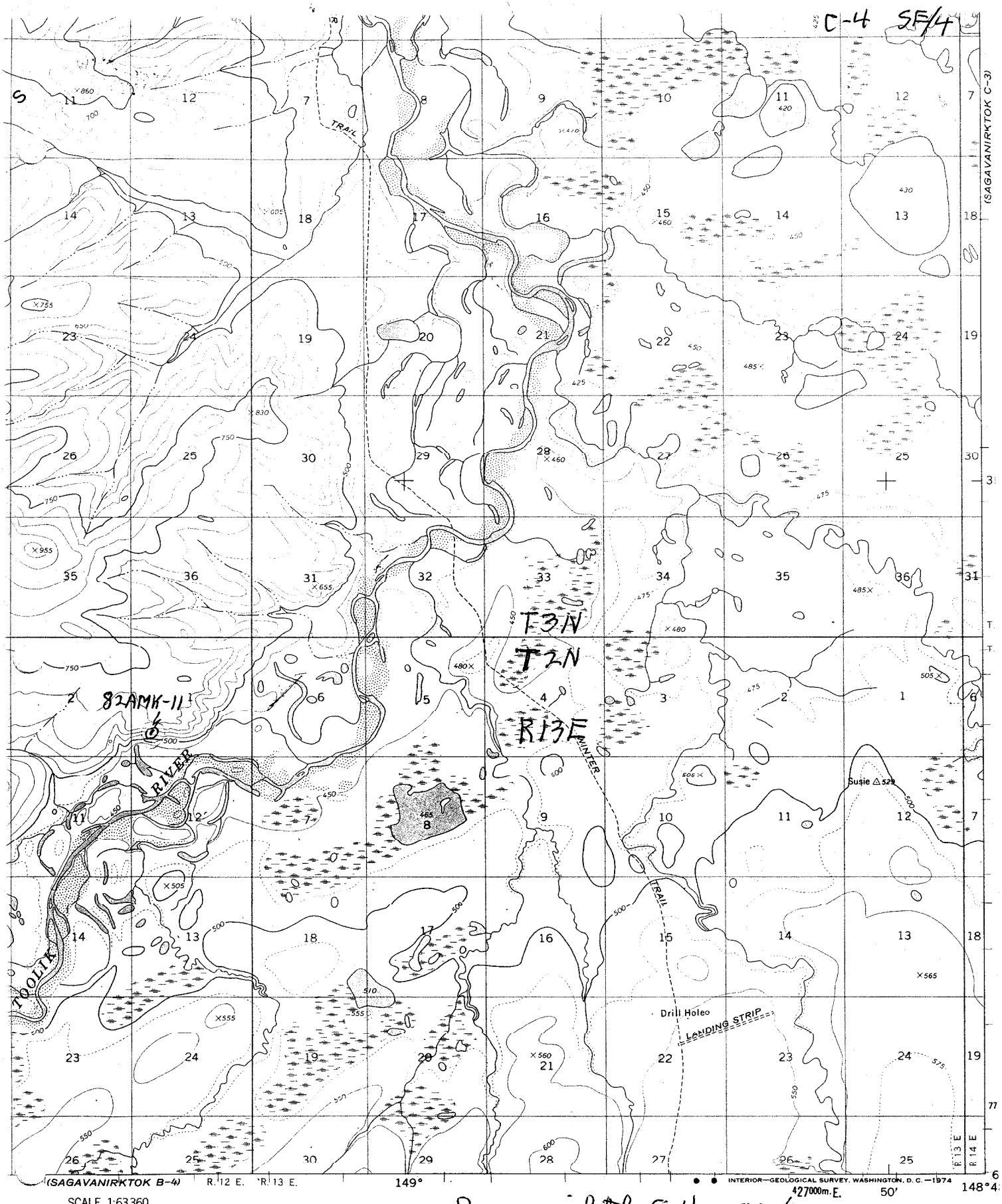
Topography by photogrammetric methods from aerial photographs taken 1955, field annotated 1955. Map not field checked

Universal Transverse Mercator projection. 1927 North American datum

SCALE 1:63360

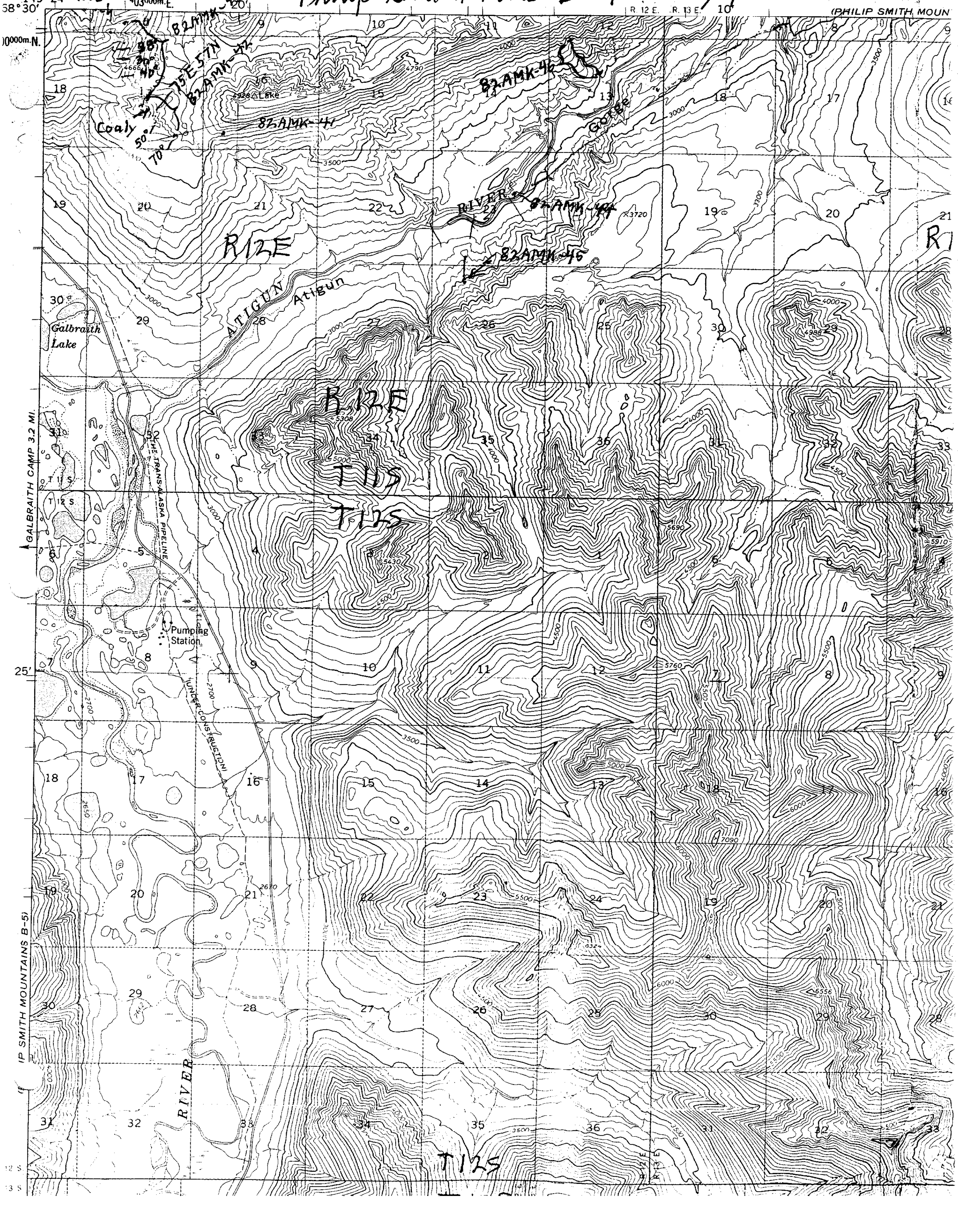
CONTOUR INTERVAL 50


C-2 SE/4
Juniper
Creek
WINTER TRAIL
Kadleroshiak
SHAVIOVIK
RIVER
Thick Coal units
82AMK-63
375'
80ACH-SR
82AMK-83
595'
T3N
T2N
R18E
(SAGAVANIRKTOK C-1)
T. 3 N.
T. 2 N.
5 680 000 FE
(ZONE 4)
7711000m N.
69°30'
147°36'
473000m E.
(SAGAVANIRKTOK B-2)
R. 17 E.
50'
R. 18 E.
40'
800 000 FEET (ZONE 4)
INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1973
SCALE 1:63360
4 MILES
21000 FEET
5 KILOMETERS
Sagavanirktok C-2 SE/4
ROAD CLASSIFICATION
Trails


C-4 SE/4
(SAGAVANIRKTOK C-3)
T3N
T2N
R13E
82AMK-111
RIVER
TOOLIK
WINTER
TRAIL
Susie △529
Drill Holeo
LANDING STRIP
(SAGAVANIRKTOK B-4)
R.12 E.
R.13 E.
149°
148°4
427000m.E.
50'
R13 E
R14 E
INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1974
SCALE 1:63360
1 2 3 4 MILES
6000 9000 12000 15000 18000 21000 FEET
1 2 3 4 5 KILOMETERS
CONTOUR INTERVAL 50 FEET
OTTED LINES REPRESENT 25-FOOT CONTOURS
Sagavanirktok C-4 SE/4
ROAD CLASSIFICATION
Trails

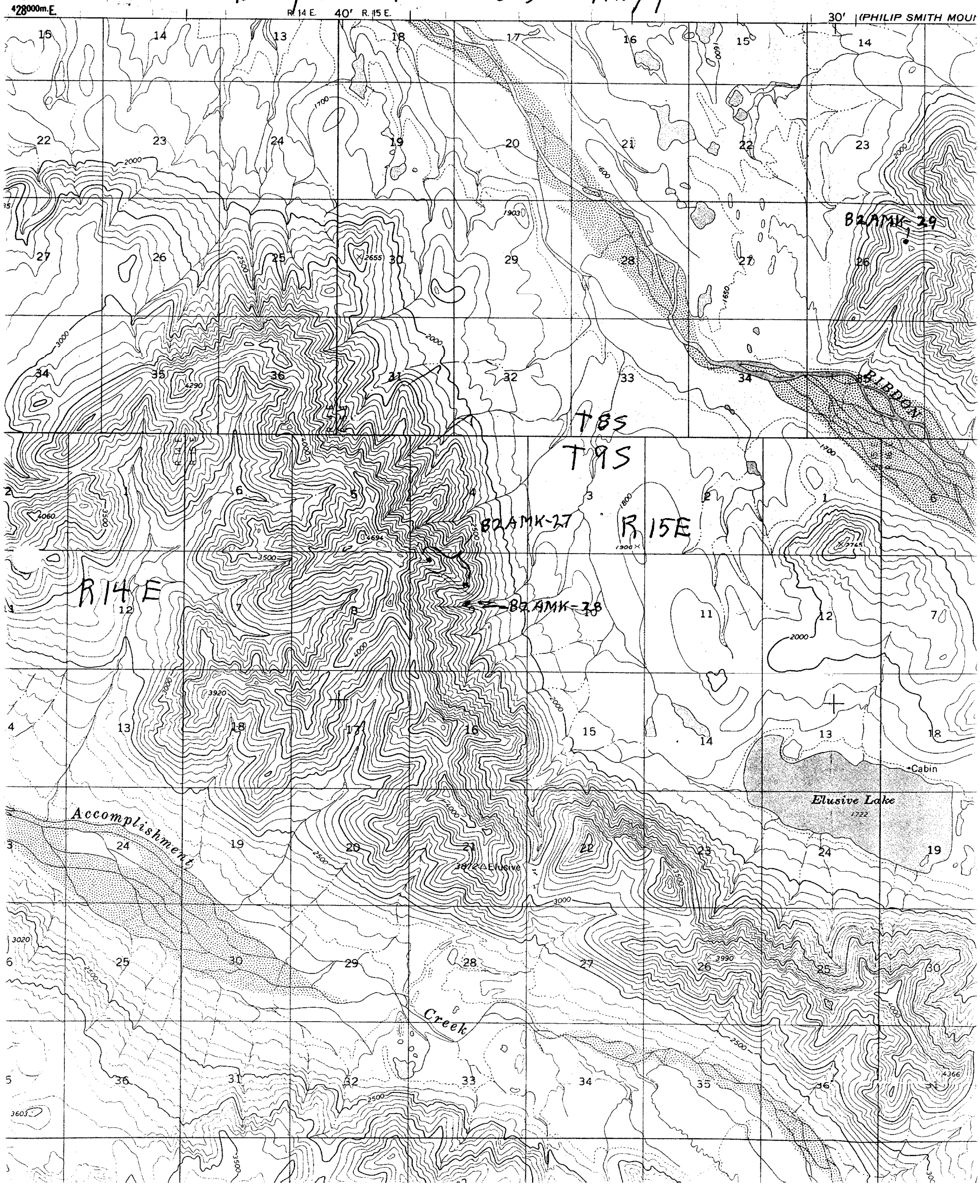
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

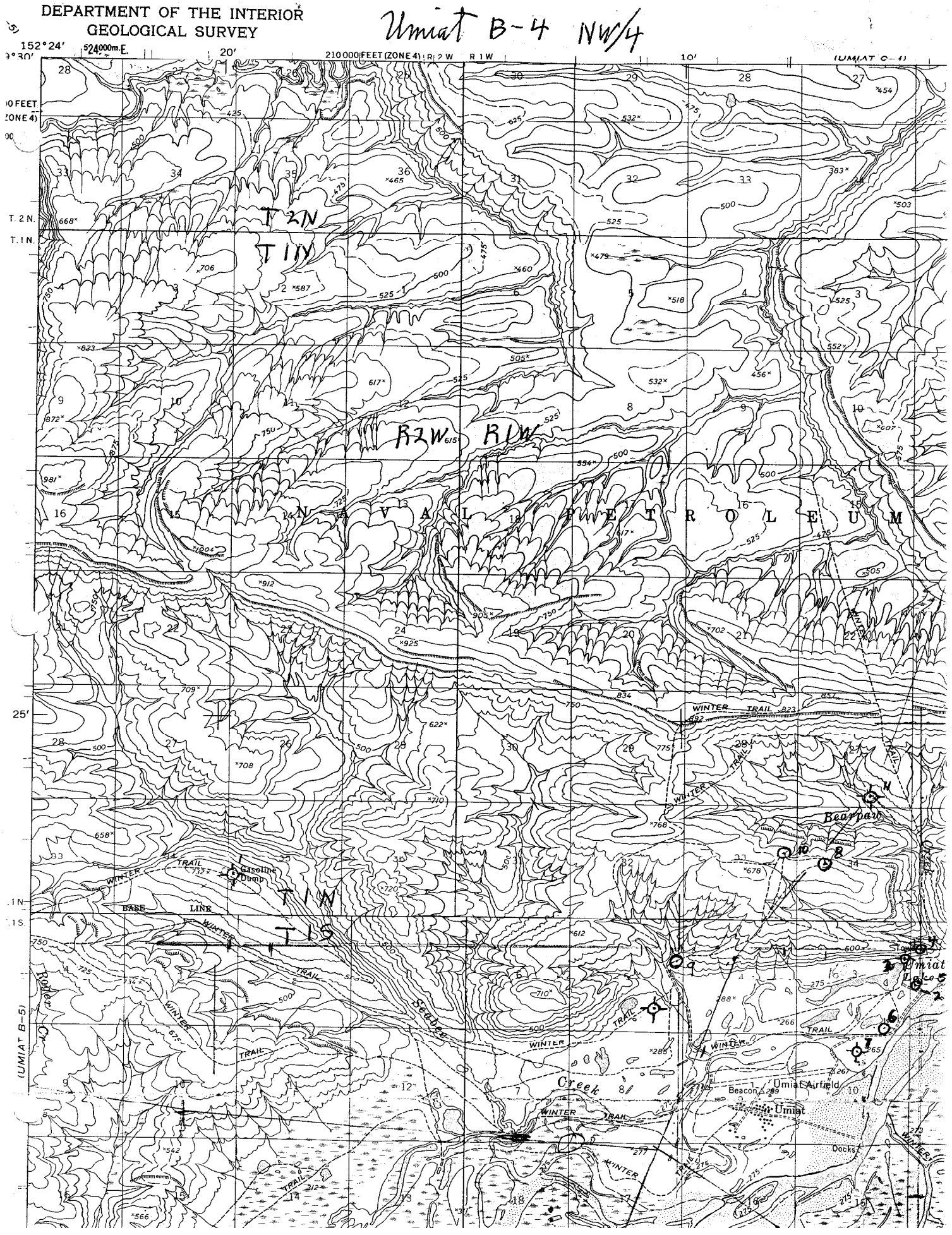
Philip Smith Mtns B-4 NW/4



UNITED STATES
TMENT OF THE INTERIOR
EOLOGICAL SURVEY

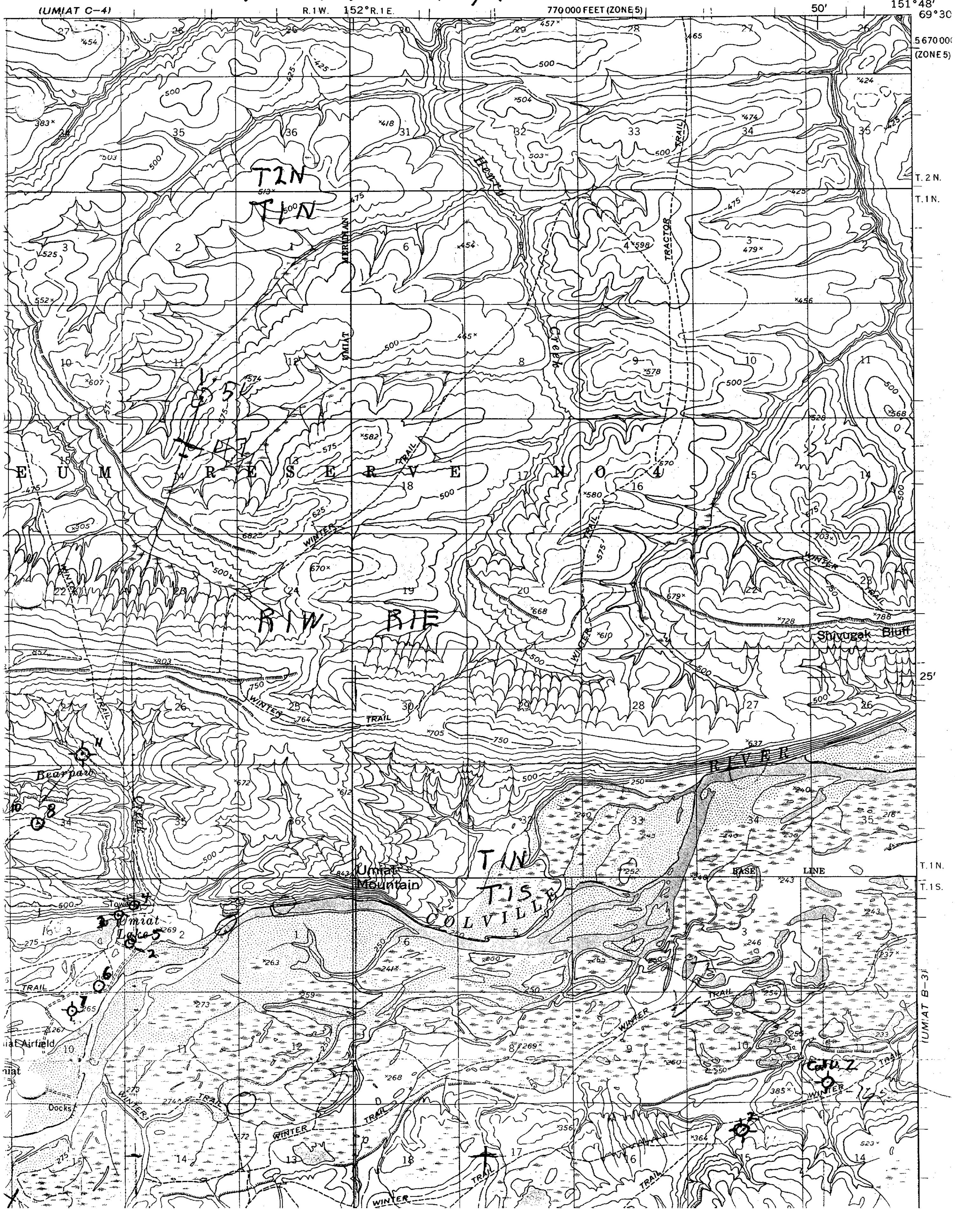
Philip Smith Mtns C-3 NW/4




DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Umiat B-4 NW/4
152°24'
524000m.E.
20'
210000 FEET (ZONE 4)
R 2 W
R 1 W
10'
(UMIAT C-4)
T. 2 N.
T. 1 N.
T 2N
T 1N
R2W
R1W
AVALON PETROLEUM
T 1N
T 1S
25'
WINTER TRAIL
Gasoline Dump
BASE LINE
Seabee Creek
Roller Creek
Bearpaw
Umiat Airfield
Beacon △289
Umiat
Docks
(UMIAT B-5)

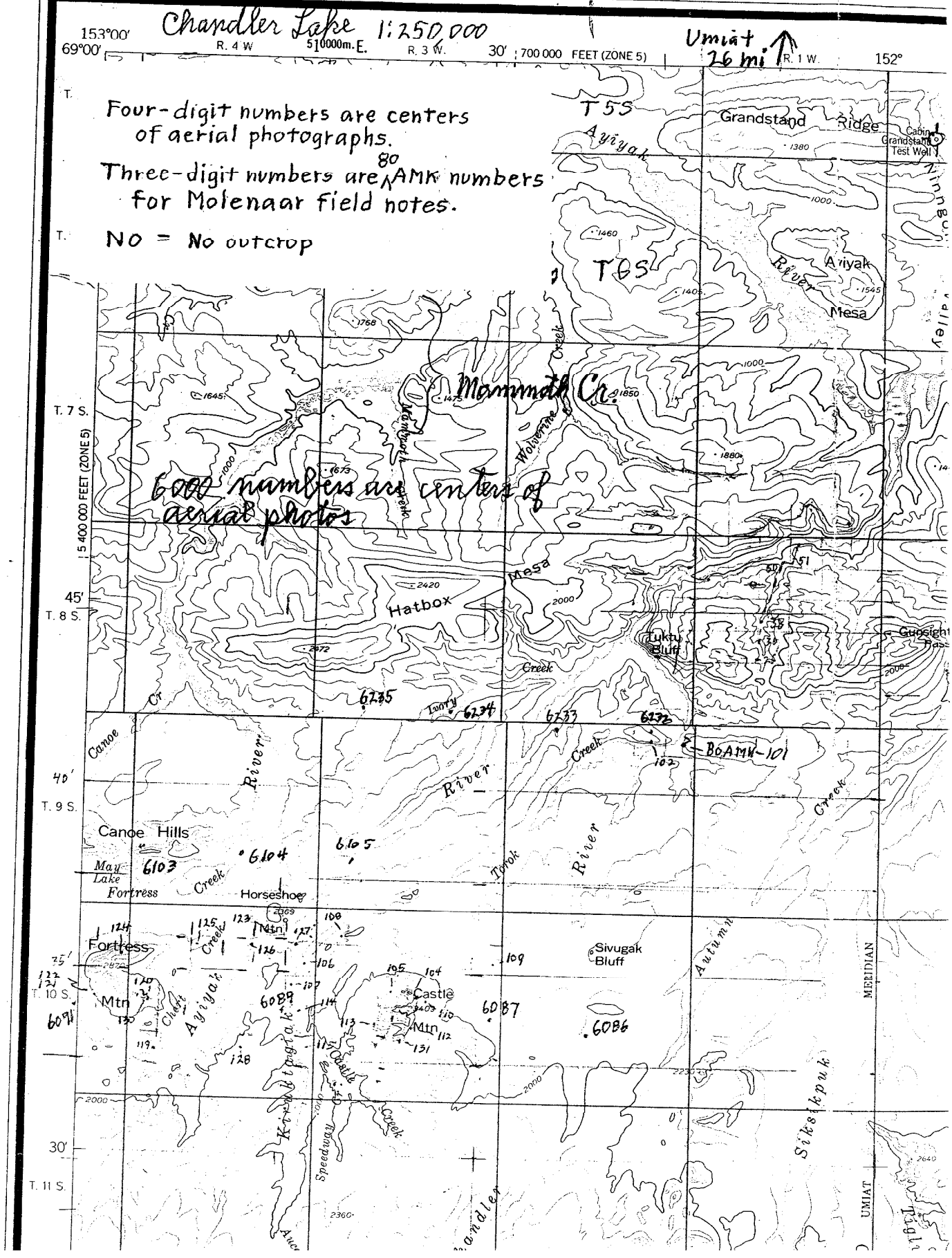
Umiat B-4 NE/4

ALASKA
1:63 360 SERIES (TOPOGRAPHIC)



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

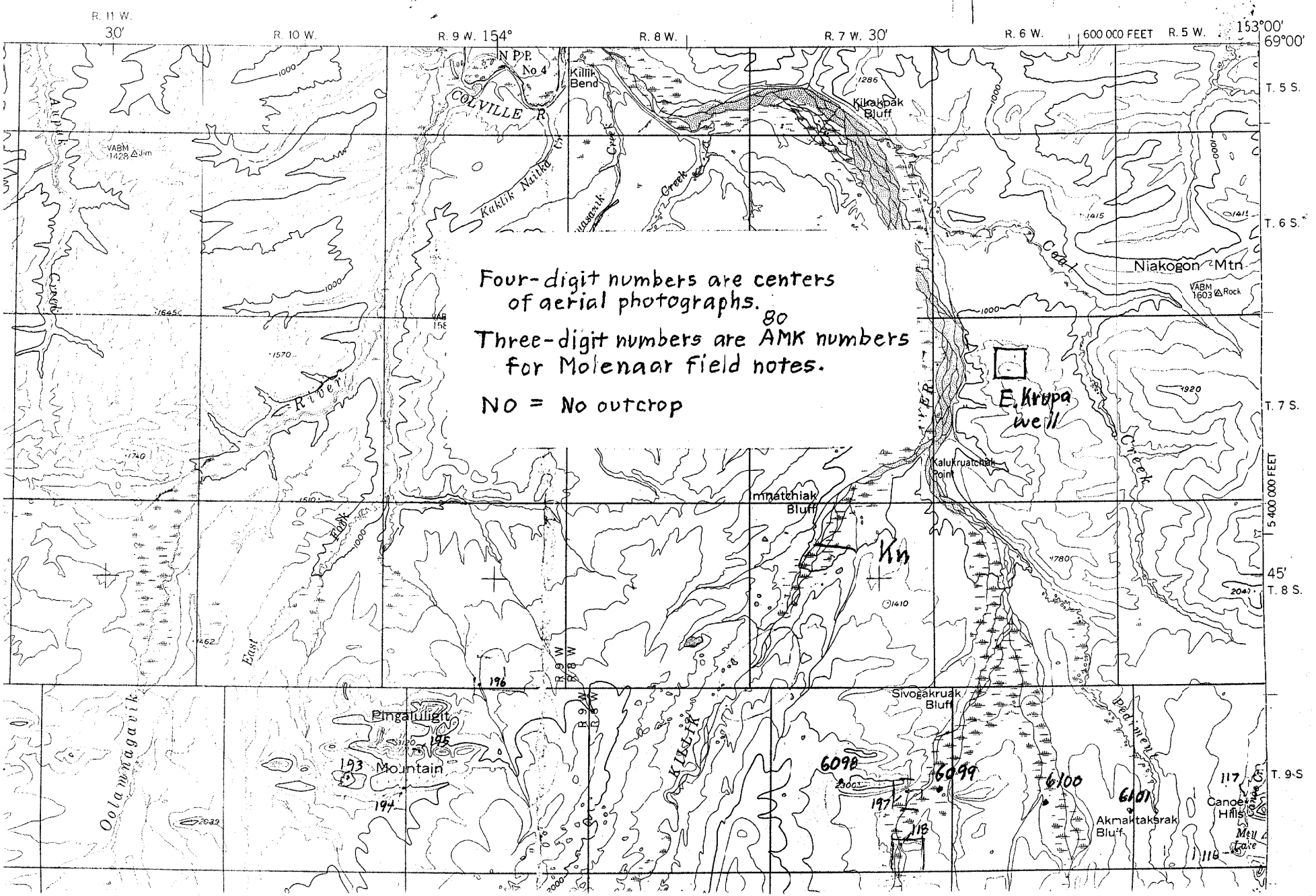
UMIAT
26 mi



KILLIK RIVER

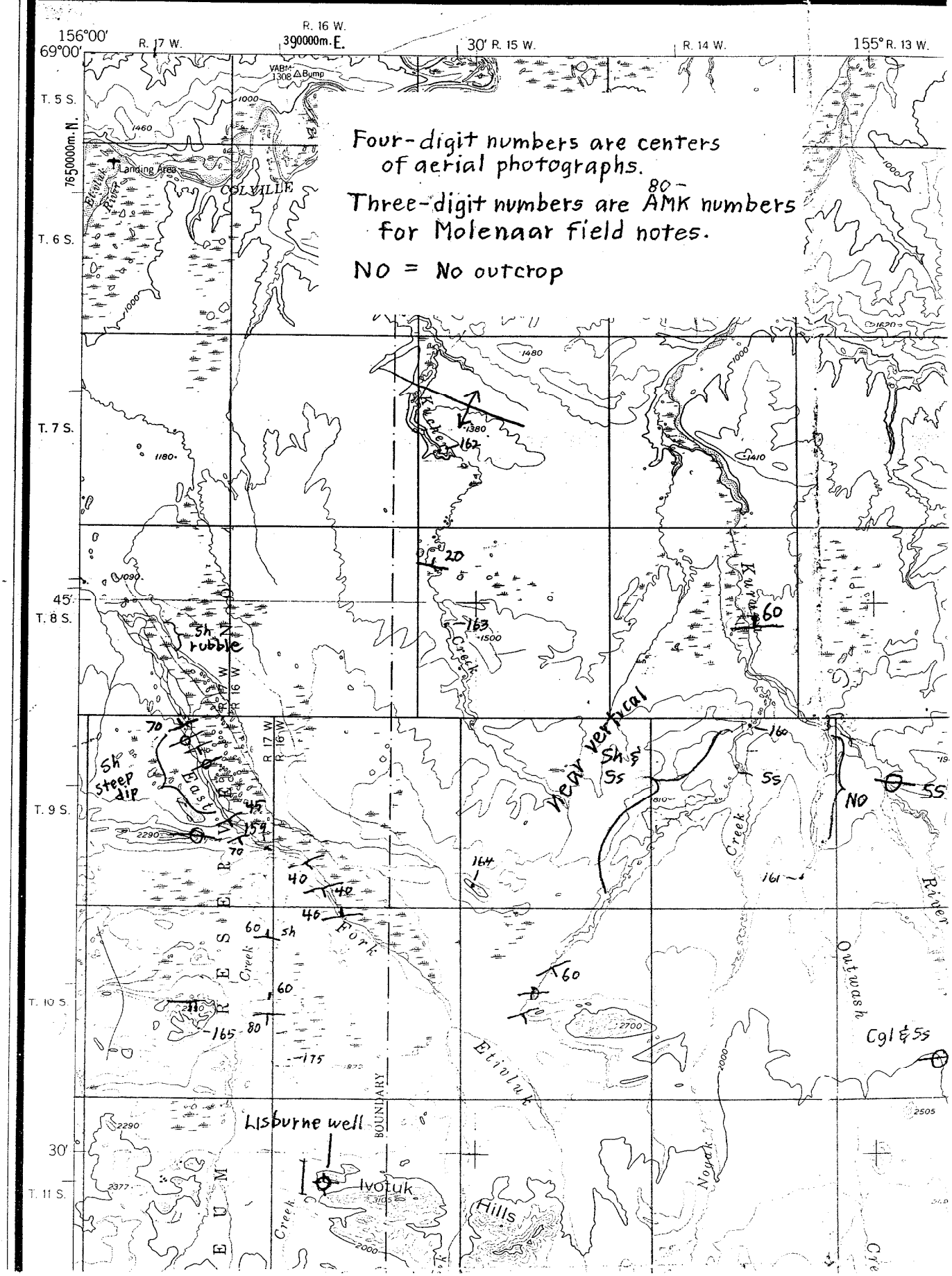
Killik River 1:250,000 NE

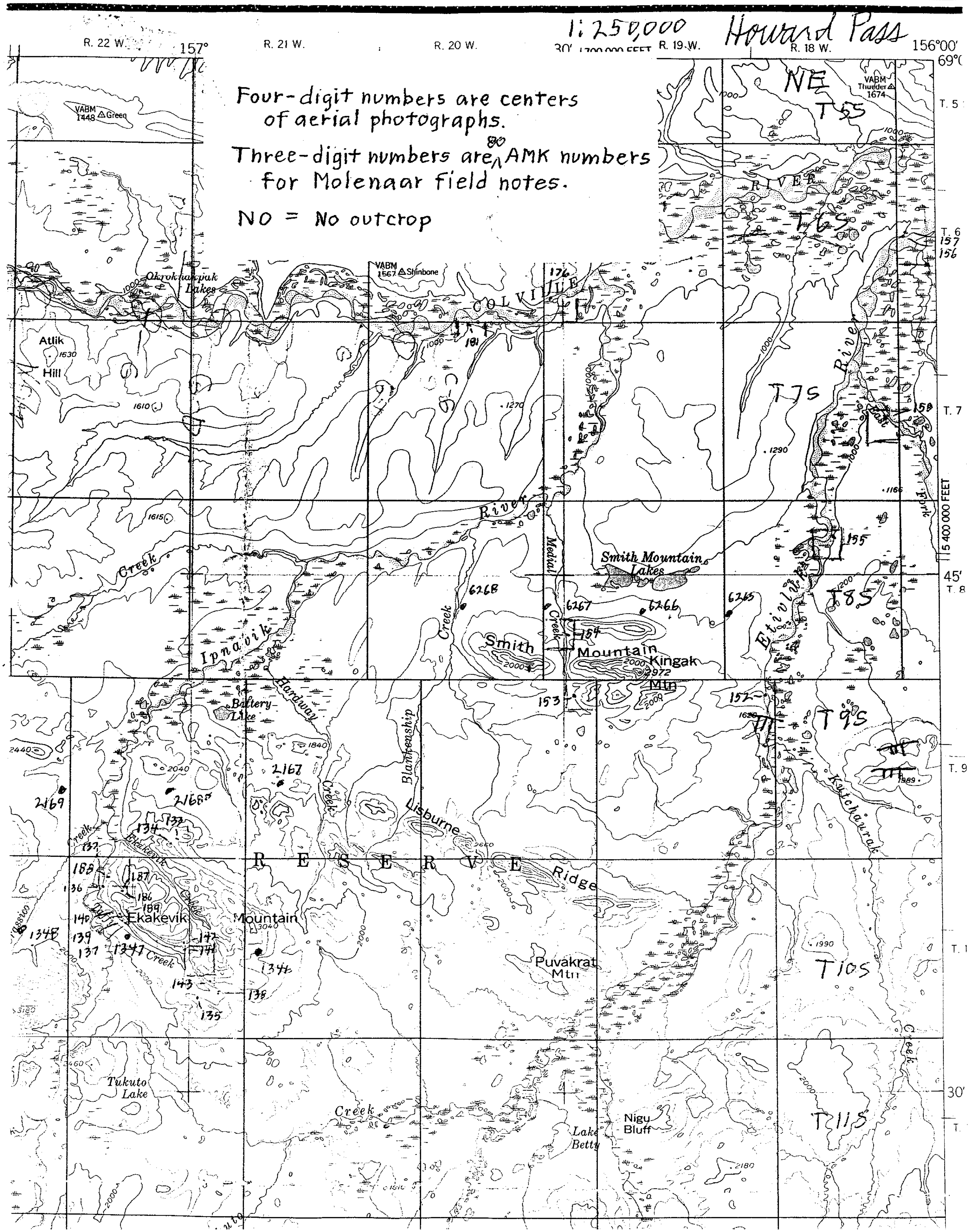
ALASKA
TOPOGRAPHIC SERIES



DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

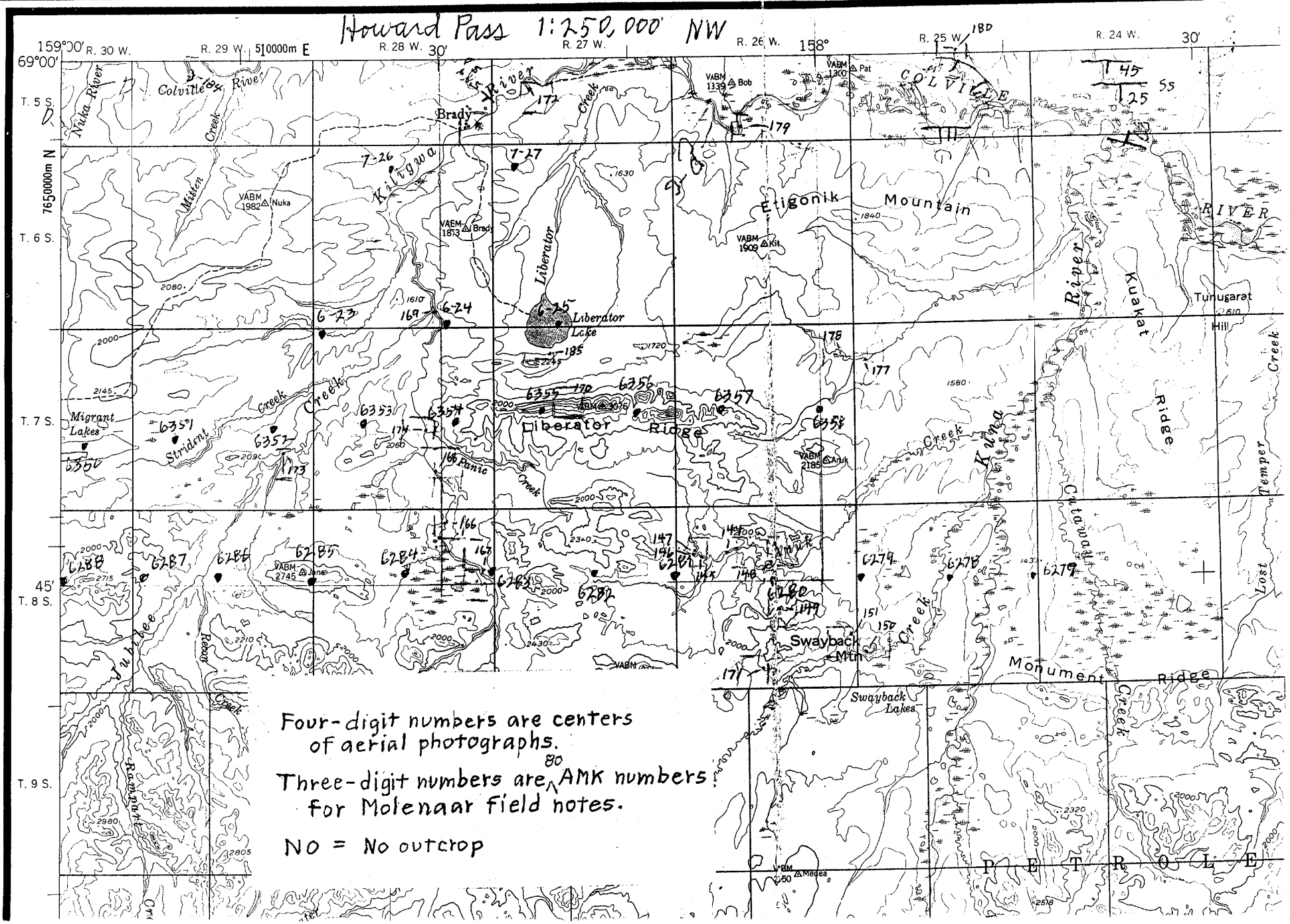
Killik River 1:250,000 NW

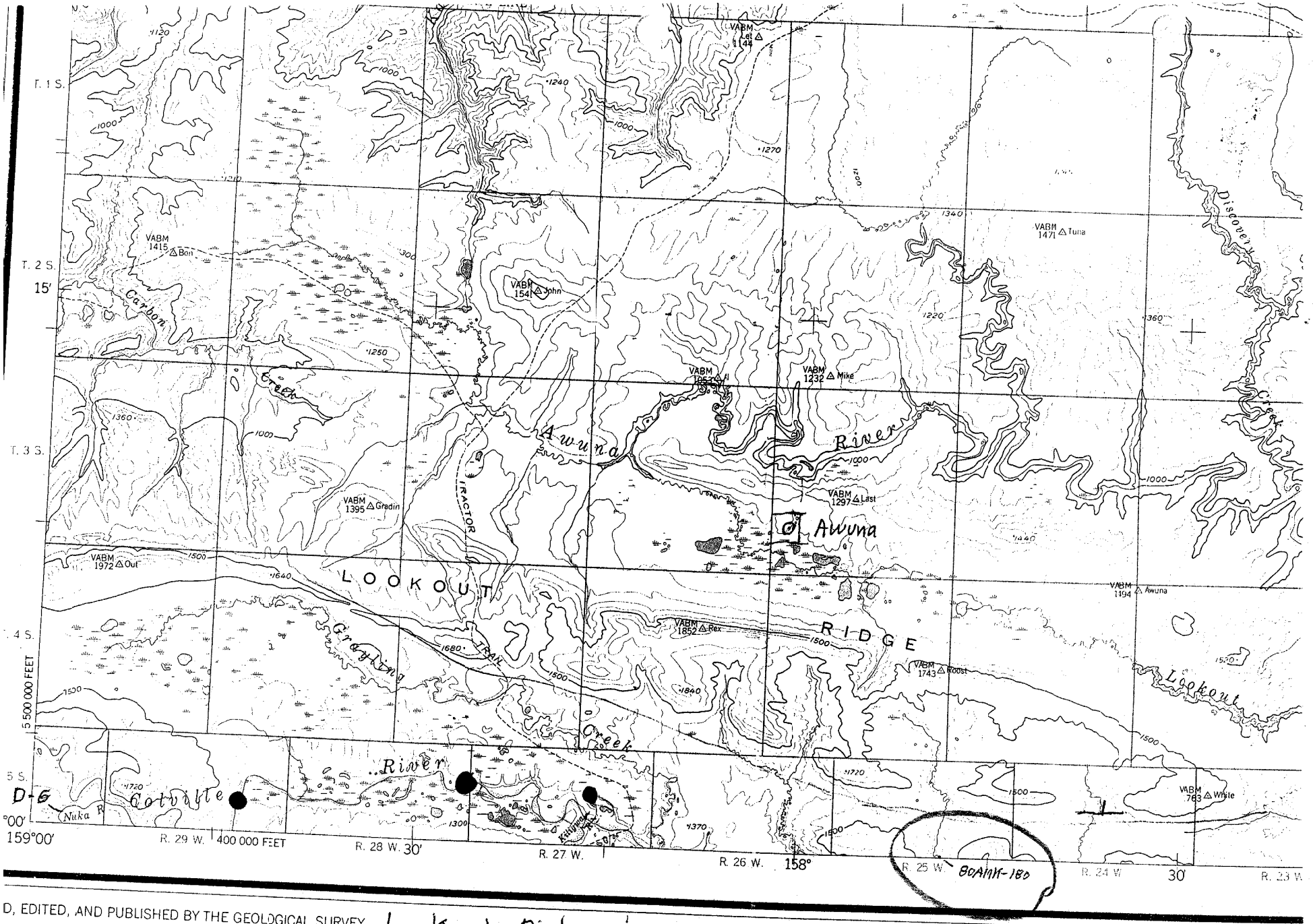



1:250,000
Howard Pass
R. 22 W.
157°
R. 21 W.
R. 20 W.
30'
R. 19 W.
R. 18 W.
156°00'
69°
Four-digit numbers are centers of aerial photographs.
Three-digit numbers are 80 AMK numbers for Molenaar field notes.
NO = No outcrop
NE
T 5S
T 6S
T 7S
T 8S
T 9S
T 10S
T 11S
VABM 1448 Green
VABM 1567 Shinbone
VABM Thunder 1674
Okrokhakpak Lakes
COLVILLE
RIVER
Atlik Hill
River
Creek
Ipnavik
Smith Mountain Lakes
Smith Mountain
Kingak Mtn
Medial Creek
Etivluk River
East Fork
Battery Lake
Hardway Creek
Blankenship Creek
Lisburne Ridge
RESERVE
Ekakevik Mountain
Ekakevik Creek
Puvakrat Mtn
Kutchaurak Creek
Tukuto Lake
Lake Betty
Nigu Bluff
6268
6267
6266
6265
2167
2168
2169
1348
1347
1346
5 400 000 FEET

DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

HOWARD PA





D, EDITED, AND PUBLISHED BY THE GEOLOGICAL SURVEY

BY USGS, USC&GS, AND USCE

PHY BY PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHS
55, AND 1956. FIELD ANNOTATED 1956. MAP NOT FIELD CHECKED

L TRANSVERSE MERCATOR

Lookout Ridge 1:250,000
(SW)

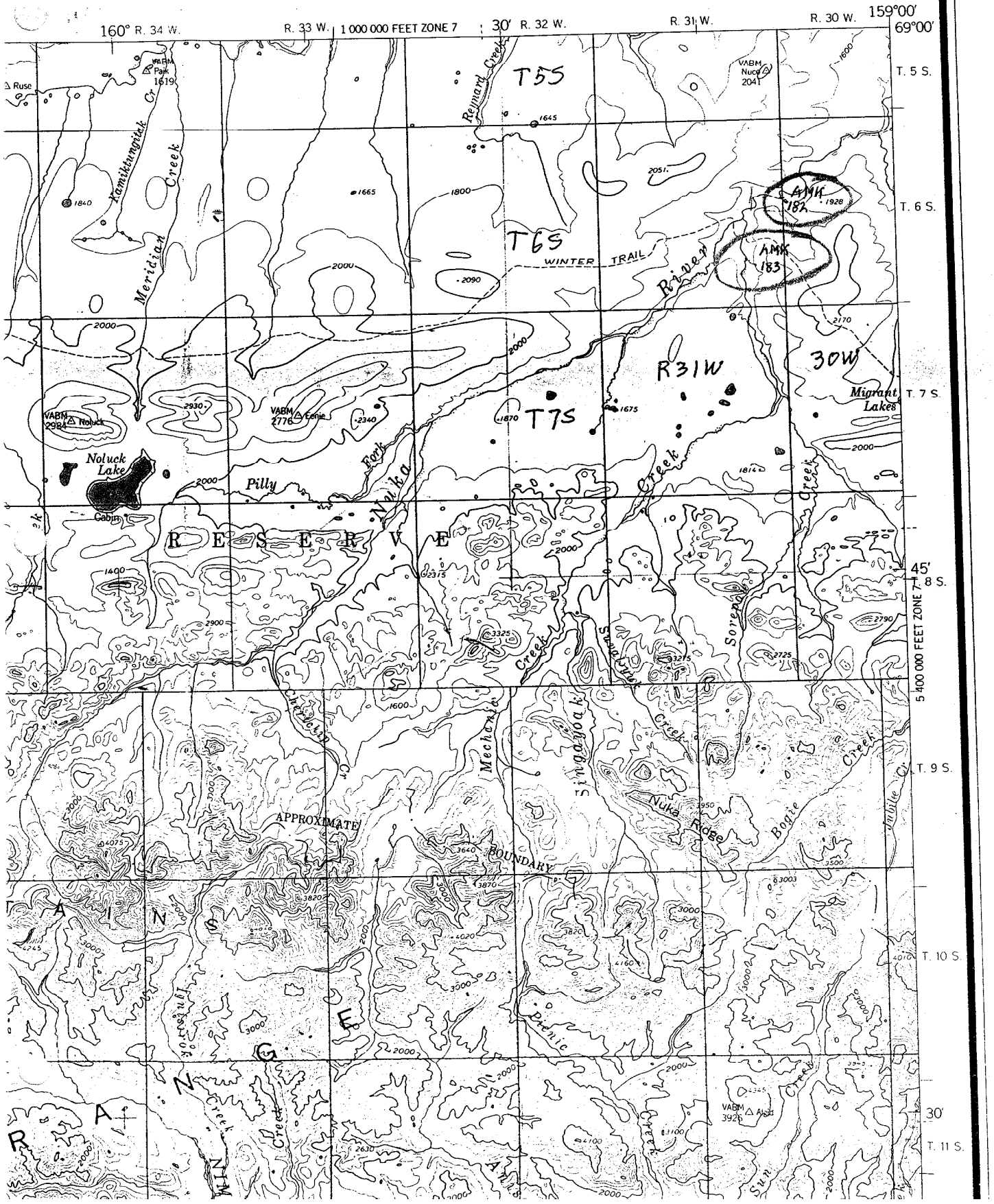
SCALE 1:250000

5 0 5

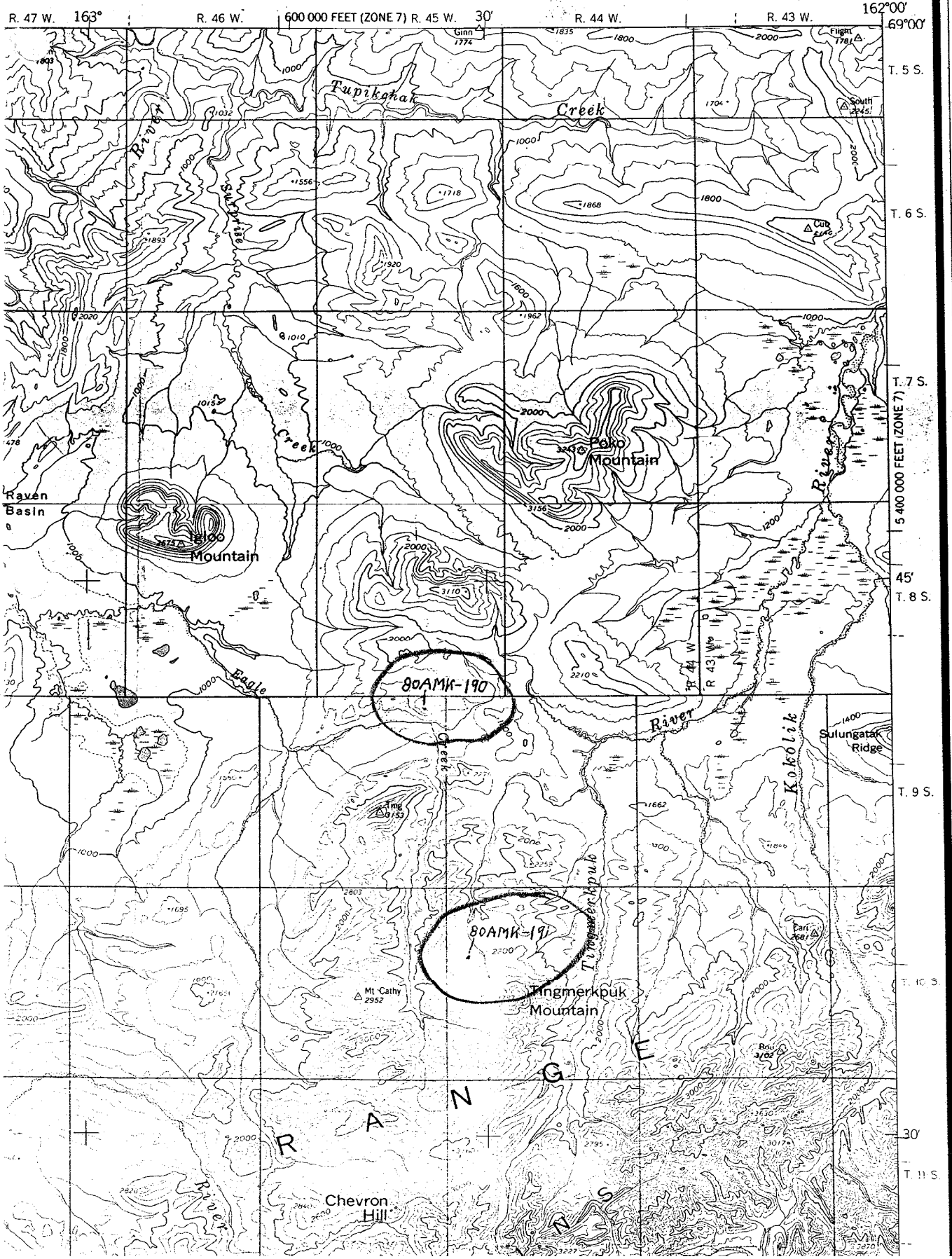
10

ALASKA
TOPOGRAPHIC SERIES

Misheguk Mtn. 1:250,000 NE



De Long Mtns 1:250,000 NE



DE LONG MOUNTAINS

1:250,000 N-Central part