2005 Field season
Anaktuvuk Pass

June 29

05 Mv 1 Lith — Desolation Ck Tributaries
Altered dk gn mafic igneous
68.58685° N
151.73376° W
1764' — Strike ~ E-W. Knob in tundra 200 yds E of 05Mv62

05Mv1-1 Lith — Shattered ft gr gn tuffaceous graywacke in prominent bluff,
68.58621° — withrs gn or orange rst wthrg,
151.7355° — app rarely surrounded by poorly
1672' — exposed bk-gy sh - Torok, mostly tundra

05Mv1-2 Micro, Geochem — Silty mudstone adjacent to tuffaceous graywacke, deeply weathered
68.58675
151.73773

05 Mv 1-3
Sheared bk sh & gn chloritic sh in creek cut (over)

In creek cut 50 yds downstream
from 05 Mv1-2

05 Mv 3-3 Intensely sheared bk mv ltstone,
Micro tuff (?), sheared green tuff ?,
Geochem mudstone & graywacke, forms
30' high bluff, prominent grey
band

General impression - south
dip of shattered beds -
possibly indicative of south dip of
regional fault zone. -
Desolation Creek Fault.

July 2 Saturday Overcast

Ahmaglit Creek

68° 30400', 151.66931

05 Mv 2 + 2-1 on SW side of creek
Micro
05 Mv 2-2 on E side of creek
Lith Black hard shale - silty shale
Micro with rst-br sheen, estimate
200'.
68.31458°
030° 20° SE 151.67285°

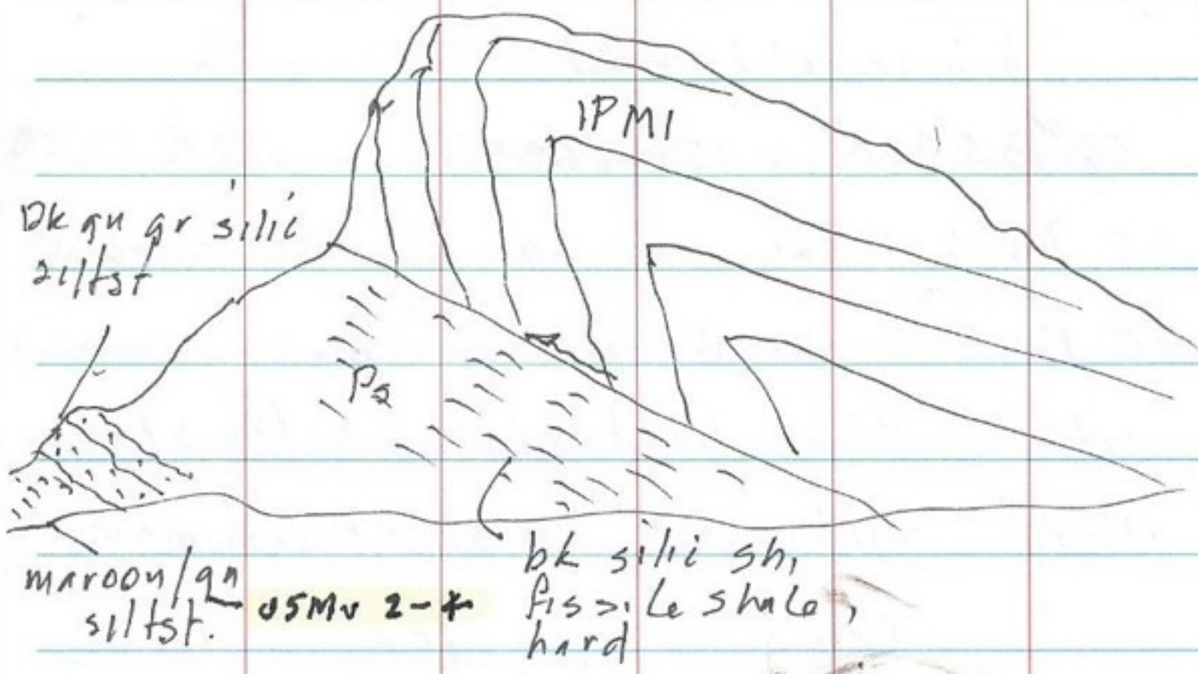
Dense siliceous siltst, even in bedded

05 Mv 2-3 1" - 5" beds w thin silic sh
Lith intbds, gr-gnish gr, w thrs
reddish br-orange, v evenly
bedded, forms more resistant
ledges downstream by 200' bk
silic sh (05 Mv 2+2-1) below
thrust of Lisburne

(over)

Downstream on E side of creek
into 15' thick interval of dk gn gr
siliceous siltstone, which overlies

NE SW



maroon - pale green siltstone

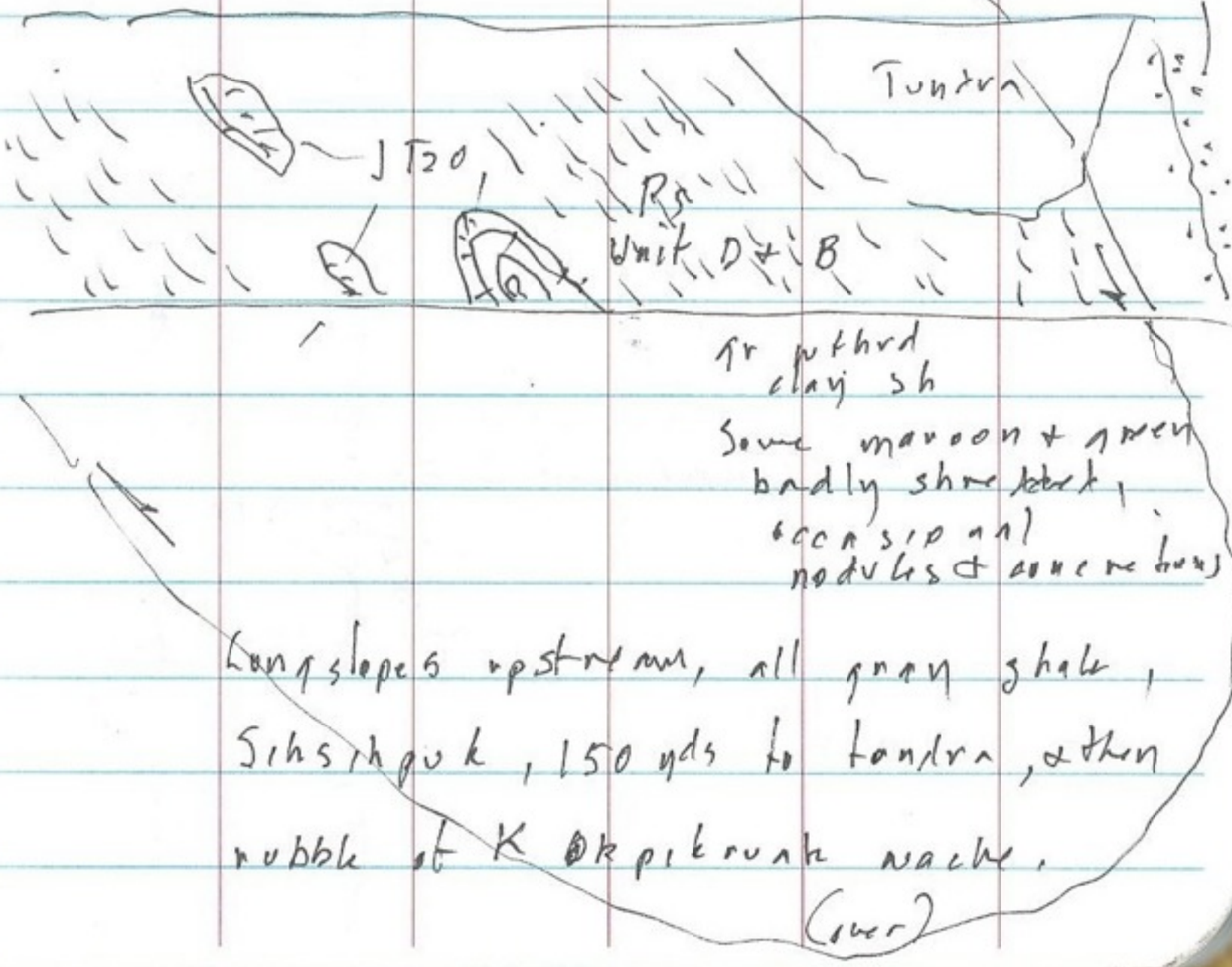
Clearly this section is Siksikpuk units B, C, & D, but unit D seems thicker and harder than normal, and is reminiscent of distal Ivishak Fm in the Lupine River area.

July 9 overcast, cool north breeze, ~35°. Low ceiling & fog to north at AKP most of the last two days

68.31324°

05 Mv 3 Skino Creek 151.90379 2386'

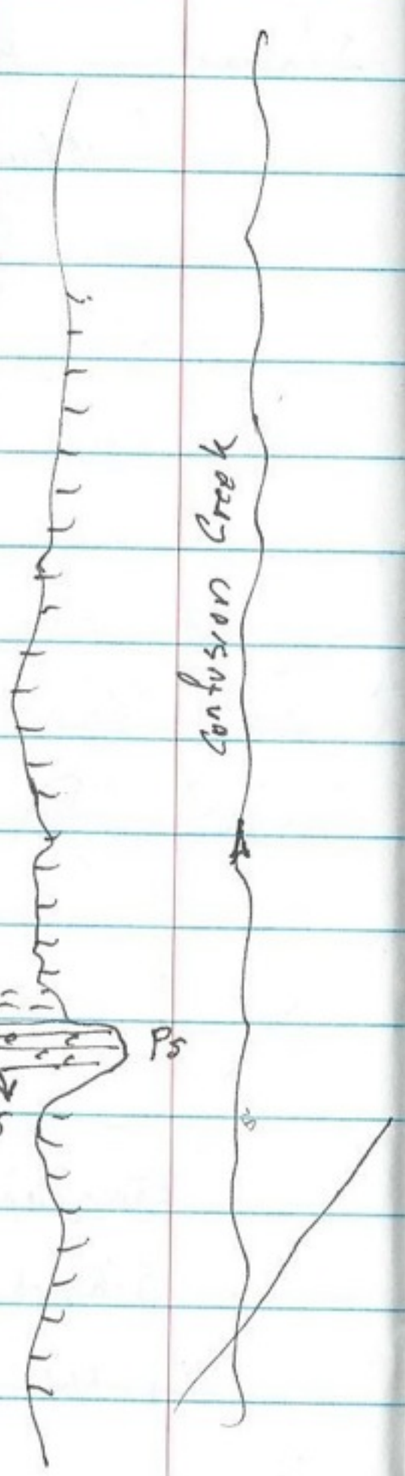
Station Balled up shredded ls mbr of Otuk in east bank of creek, in axis of tight syncline



Low slopes upstream, all gray shale, Siksikpuk, 150 yds to tundra, & then rubble of Kekpikruak rocks.

(over)

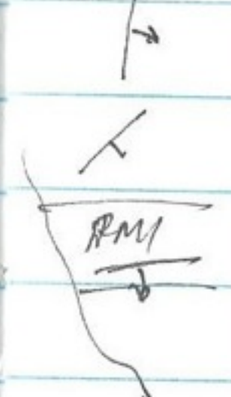
Appears to be an overturned syncline of Siksikpuk & Otuk thrust over Okpikruak,



05 MAR 68,36449, 152.00726 2441'

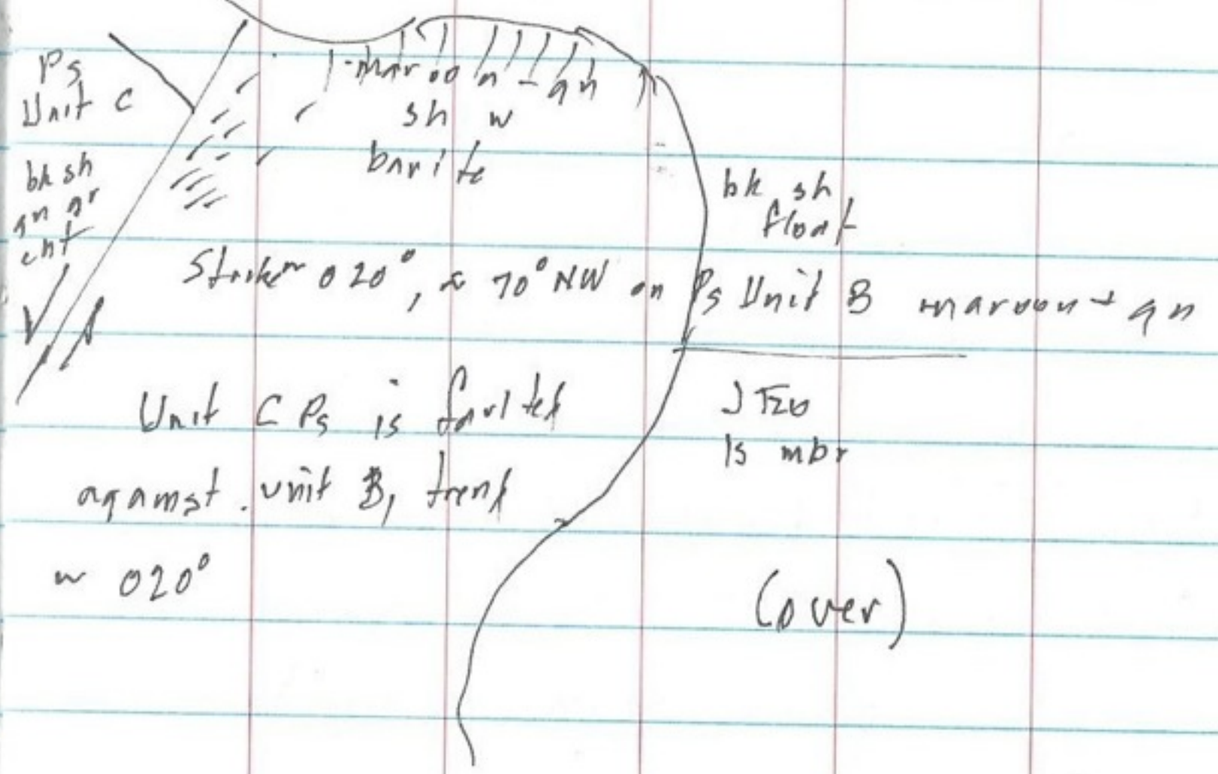
Station Confusion Ck on S side of Tiglukpuk anticline

Otuk Rubble, yel orange w/brg
Is member of Otuk capping ridge
Top. Traverse N around terrace
top to prominent bare shale slope
facing SW, with black shale in
float, probably lower Otuk unit
then onto maroon & green



Unit B of Siksikpuk

68.36743° 152.00989° W



(over)

Across creek to west is a prominent resistant point of siliceous shale/chert of Sihsihpuk unit e, 070°, dip ≈ 45°S. Clearly a small amount of left lateral offset across fault trend

05 Mv5 Desolation Ck
Geochem 68.61048 151.72409 1646'
Prominent white weathrg rubble covered hillside, thin bedded banded white chert + blk sh - thin bedded, poss tuff, and some thick beds of black smelly "marl. Same location as 00 Mv60.

July 5 68.61325°N
05 Mv 6 152.55650°W 1655'
Lith N of Castle Mtn
Rubble patches of wh-cream weathrg on air photos, or ground abundant Fe stained tuff (?) and minor chert. Two small knobs of gn gr dense mafic igneous

rock, resistant. Southern knob appears to dip ~S, 45° Remainder of knobs all fine rubble. This locality should be on hanging wall of Desolation Ck thrust

Traverse with Bob Swenson 05 BS — Torok Ck traverse for maturity samples, from N to S

#1 05 BS 08 68 65858 152.4294
Ro On west bank, steep meander, Torok Shale, mostly bk sh minor siltst.

05 BS 09 Upstream, east bank
Ro Nicely S dipping ~30° section of silty mudstone & minor turbiditic siltstone 114°32°S
68°.38.46 N
152° 26.48'

05 BS 10 68.61811 N, 152.48450' W
Fissile track Upstream, east bank at bend to east, prominent sands form point, into creek
Turbidites 114°32°S
same as previous stop
low ridges to east are probably held up by some turbiditic section

05 BS 11 68.58923
Fissile Track 152.45246
Forok Creek - low rubble mid gps upstream from BS 10

Sivugak Bluff

68°.59537

152.35794 1864'

05BS 12 Blowing like hell. From
Fission track the NW.
Micro Good turbidite section
intbA ss, fissile clay
shales.
Reoccupy of MV47

68°.62284 152.38004

05BS 14 Chandler River Bluff on west
Fission track side downstream from
Sivugak Bluff
Prominent Stripping ss turbidite,
dip ∑ 60° ±. Ass abundant
white chert grains — reminds
me of Cobblestone ss
086° 64°S

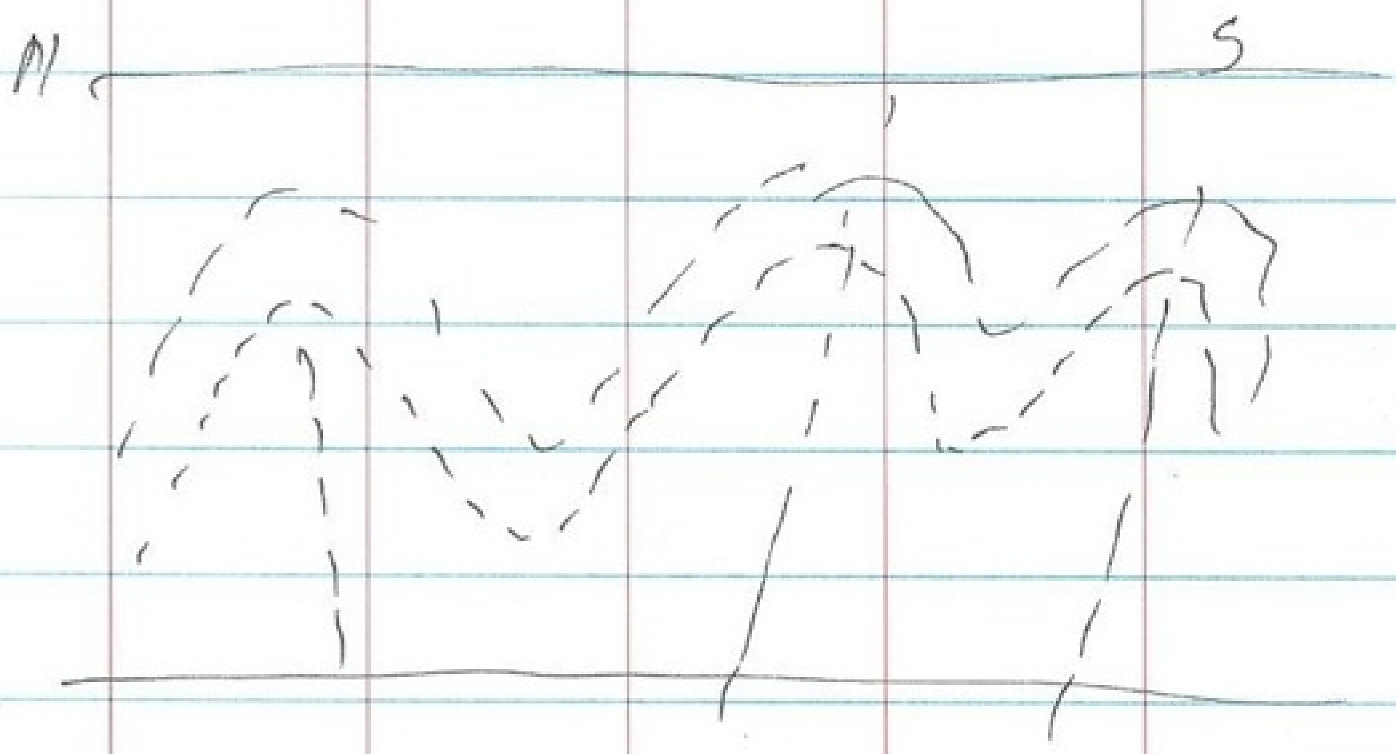
05BS 13 N. of Sivugak Bluff
68.61686 152.23407
Rubble ridge to NE,
strike appears to swing
to NE. Prob Torok
ss.
056° 46°N

05 BS 15 Chandler River

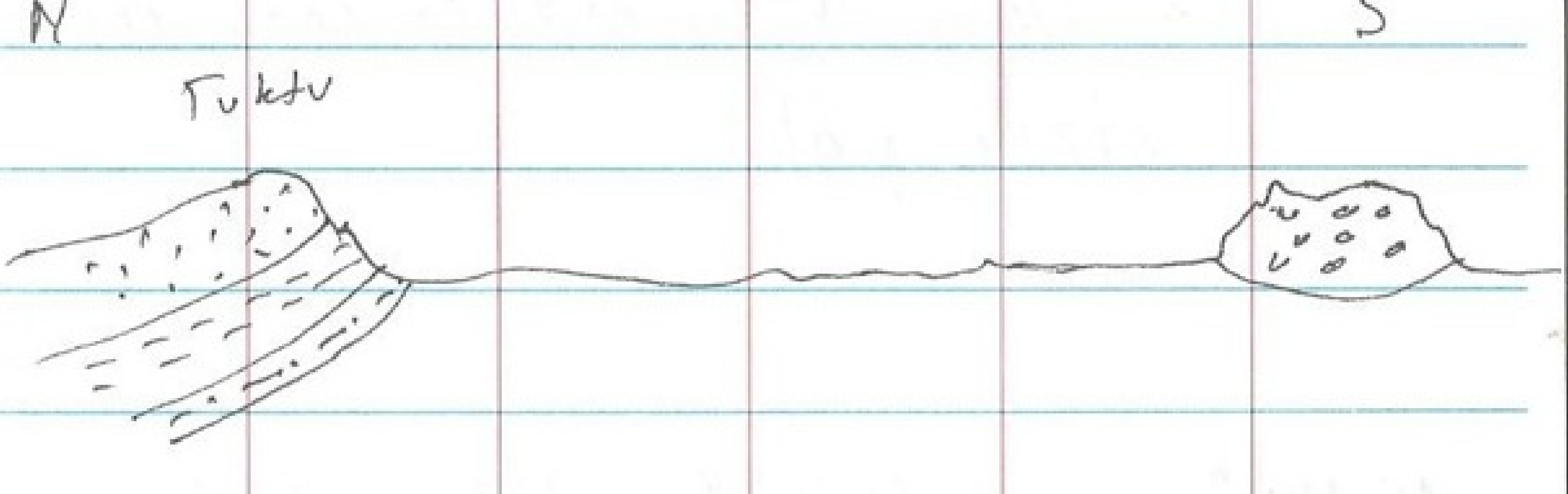
05 Mv 7 Same location as 89 Mv 6

E side, 2 miles upstream from junction with Torok Creek

Beautiful section of rhythmic ss - sh, thin bedded, fissile clay shales, nice Torok pelagic shales. Tight chevron folding some steep N dipping axial planes at south end of bluff, one prominent 80° S dipping axial plane on N end



In "triangle zone" between Tuktu escarpment and Desolation Creek fault. Swenson argues for no significant back thrust beneath Nanushuk, and infers that North dip on Tuktu escarpment is entirely due to drag by the overriding Desolation Creek fault



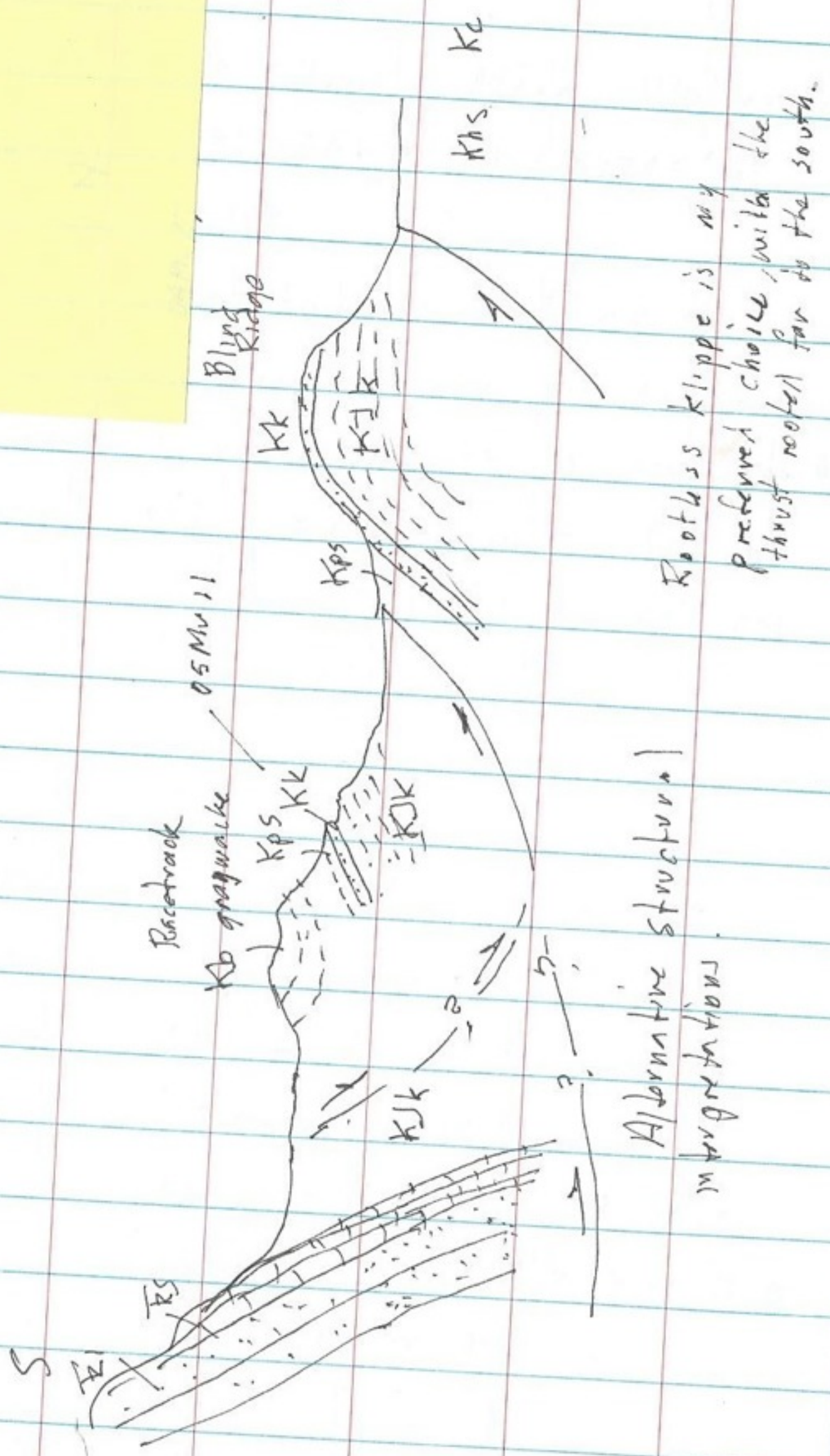
05 Mv 8 N Hatbox Mesa - Wolverine Ck
Lith 68.82653 152.31705° W
1971

Nanushuk ss-cgl, abunf
wh qtz, bk cht on gently
S flank of small compl; dwk
fold. ~ 090° 5-10° S. Bds to
~ 3/4". atz, bk gr cht, sm
qtzite pbl

05 Mv 9 68.85798° 152.33369
Lith E of Wolverine Ck
080° 15° N, on N flank of
Wolverine Ck fold
Mgy thick cgl, ~ 50' thick,
pinches out laterally in ~ 1/2 mi
prob local channel

2005 Camp log

KAVIK AREA



July 12 Overcast, misty. West side Kavik River Southern Kemik ridge

05MV11-A 69.39491 mafic

146.60446 Thin Kavik - 5' resistant, v f grnd, gray, some abundant orange weathg slabs, overlies silty Kingak

05MV 11 Kavik tributary

69.39748, Kavik w 1 thick,

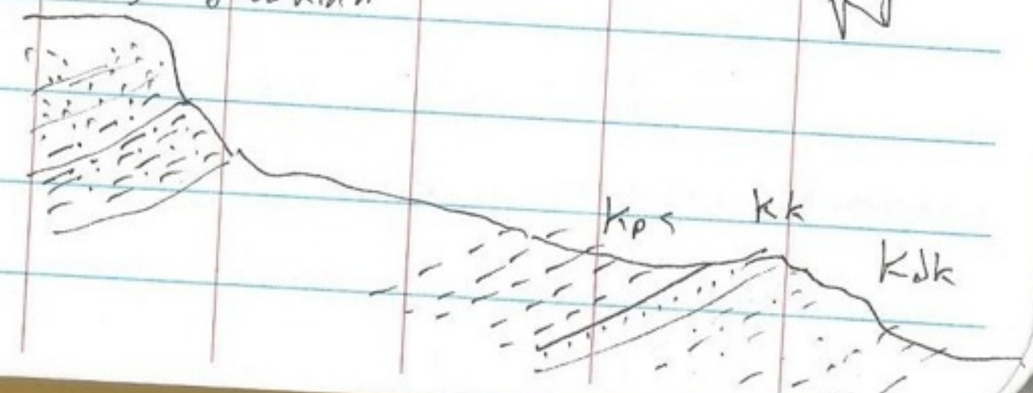
146.41522 overlying Kingak

See 91 MV

Upslope to south to Brookian ss, dk gr to bk, msv, forms bench, poss 30' thick, apparently overlies Pebble Shale at a relatively sharp contact.

(over)

S. Kb Brookian N



Significance of location is the contrast in stratigraphic sequence to the sequence to the north, at Blind Ridge & Kavik River, in which the tuffs and bentonites, in the Hue Shale and Canning Fm are abundant. this sequence has no Hue Shale and has thick Brookian sandstone

July 13 Partly cloudy, winds variable NW to NE, warm, bit windy

05 MV12 Last Ck 69.63212

144.44501 1440 ft

~~Karen Ck~~ Upper Ivishak

Strike ~~0° dip 20°~~ E, N120°, 35°N

Fault(?), joint surface 110°, 60°S

faint slickensides on surface, normal to strike of surface

Probable fault in saddle

Shublik on ridge crest

115° ~ 35°N 69.63168

144.44086 1420'

Joint / fault surface on Ivishak probably parallel Hillard fault, may be indication of dip on fault

05MV12 115° 35-40° N Trg

Geochem/Ro S' - 105° 65° S

Slicks plunge ~ 65° E

Collected black sooty calc shale ~~shale~~ for Ro analysis

05 Mu 12-1 LCU, contact of burrowed
Geochem/Ro pebbly siltst + Shublik
69.63155° N, 144.44836° W, 1447'

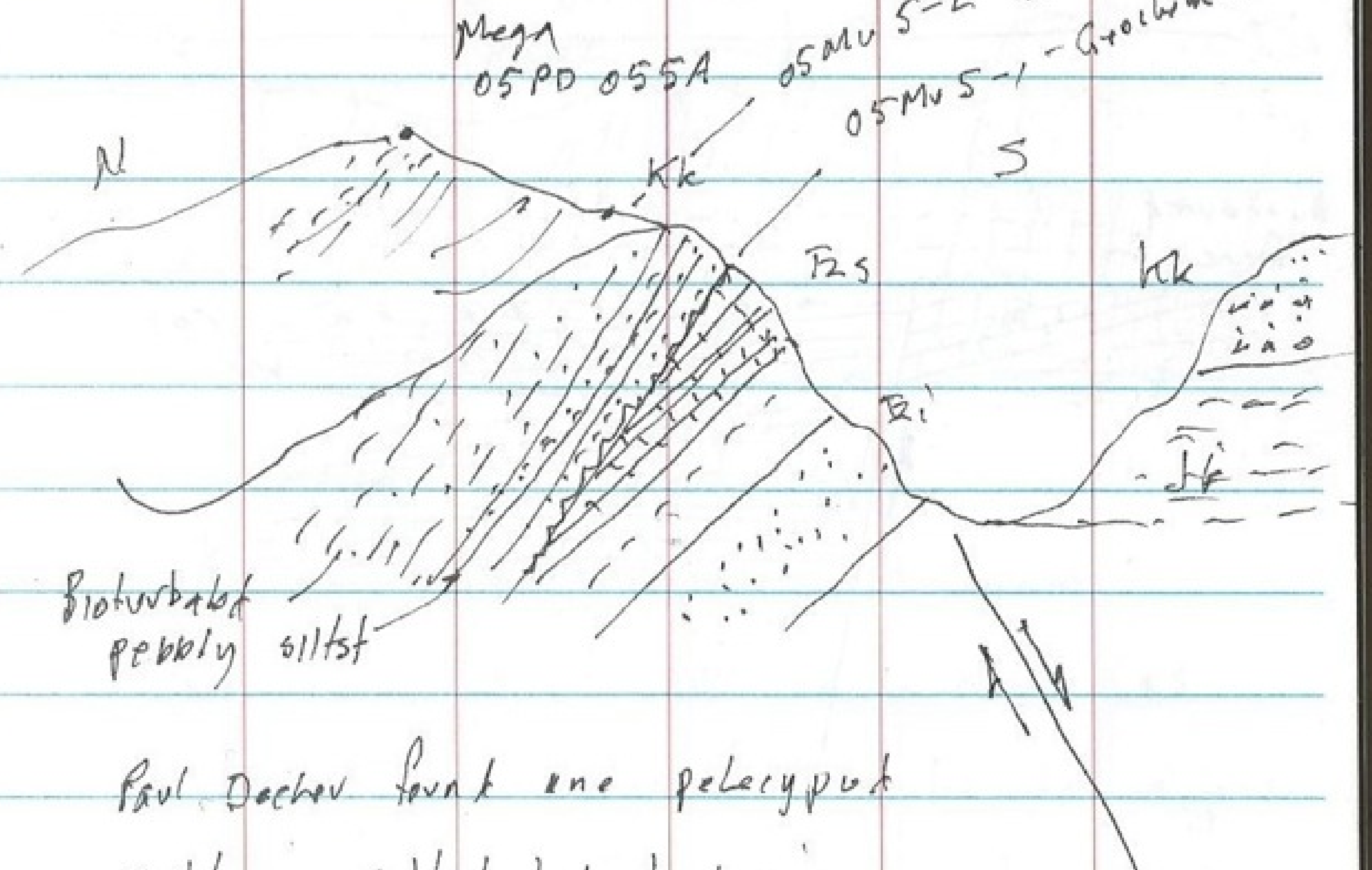
Top Shublik Ls contains abunt orange limonitic/hematitic clay? on fractures, down work into black calc shale, sooty. Sample taken 1' below base Kemik.

Basal Kemik - vf grnd blk gr coarse qtzitic ss - siltst, w scolithos burrows (vertical) and occasional floating chert pebbles. No visible lamination, crude bedding 1-2' thick poorly defined beds on weathering. Abund orange lichens. Occas surface with conspicuous wh cht grains but mostly qtz + some limonitic spots.

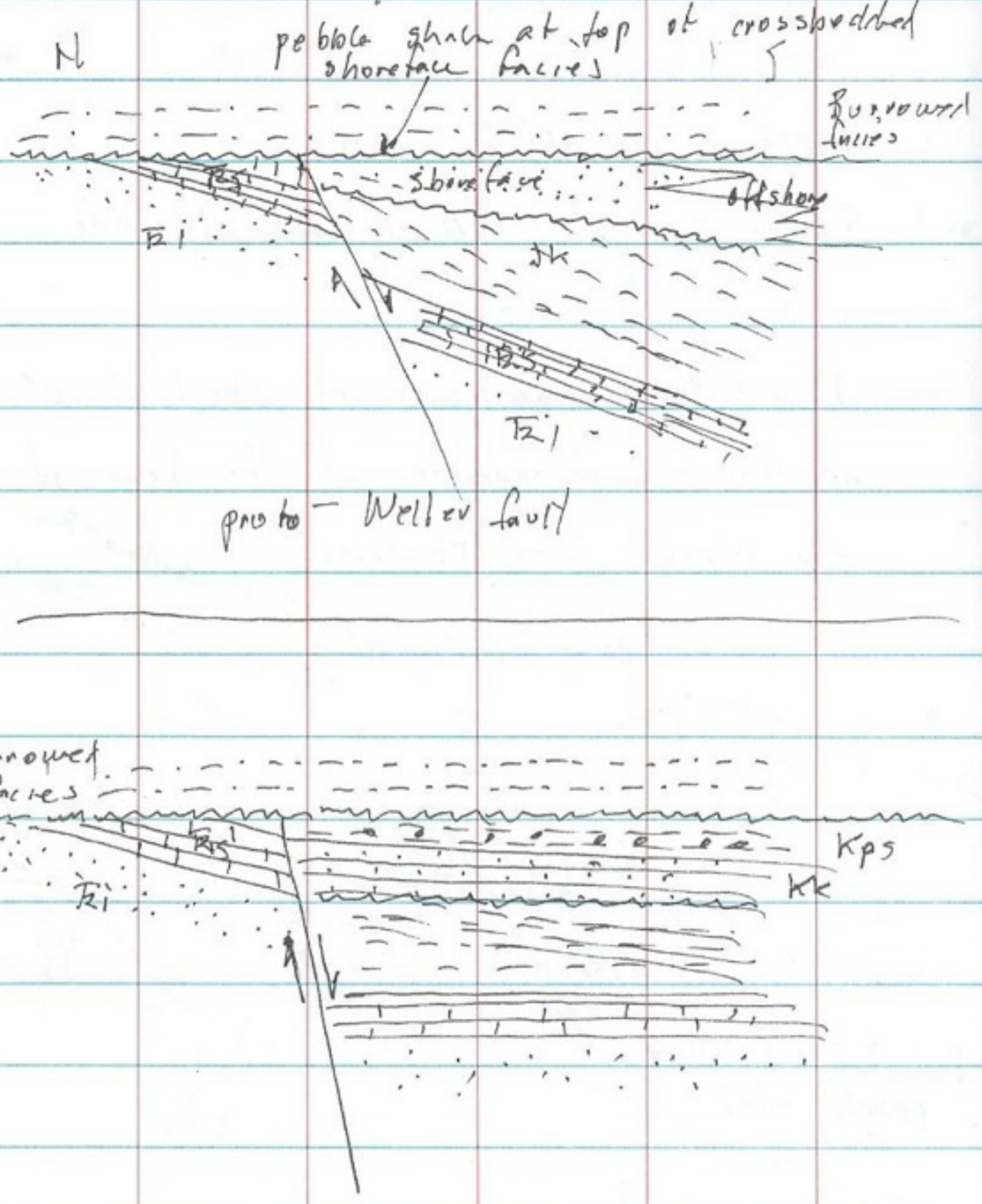
Forms prominent ledgy cliff above TRS, w conspicuous orange-black bands

Kemik - 120° 45° N, good.
Shublik - 115° 35° N, v good attitude

I get the impression of about a 10° angular unconformity at the base of the Marsh Creek Member



Paul Decker found one pelecypod mold in siltst bed higher in Marsh Ck Member.

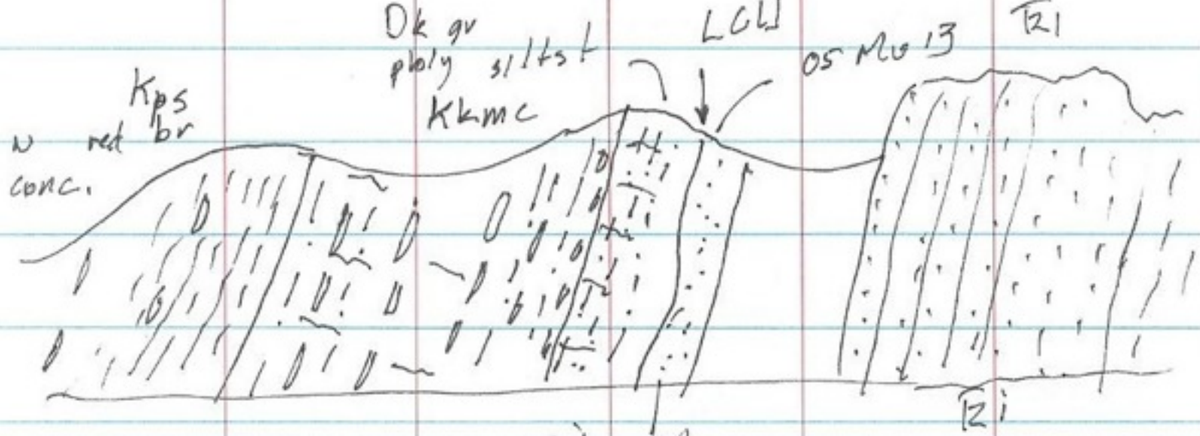


Marsh Creek at mountain front

05 Mv 13 69.38317

Lith 144.04381 1538'

Basal contact of burrowed siltst facies of Kemik and white nthny qtzitic ss bed that we have always considered to be Ivishak



Looked at the white nthny qtzitic ss again, wondering if it could be a Kemik ss from Ignek valley facies. It has a pale grey wispy mottling & some burrowing, in contrast to the white overall color - unlike any Kemik I've seen. Decided

(over)

that it is still Ivishak, v similar to qtzitic ss in beds downsection.

Same as 04MU30

July 14 Kotahtuvuk R. tributary

69.66045°N 145.29443°W #12'

Measuring section of basal Kemik to ?? ss.

05MU 14 Certain Ivishak downstream - lt gr,

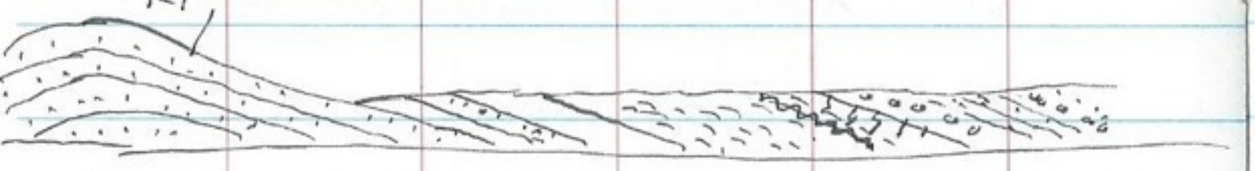
Lith v f grnd, qtzose, 10-20% to white tripolitic chert, to some reddish-brown banding. Abundant brown limonitic specks, well bedded, black lichen covered, uniform grain size

See notes from 1980

Questioned ss: ltgy to white, with abundant limonitic weathering along fractures, thus yellow to orange-gray, dominantly quartz but significant percentage of f to medium well rounded grains, including transluscent rose quartz, gr qtz, blk chrt, occas glauconite.

Close examination of what I had interpreted as rooted horizons by Paul + Marwan convinced me that they are not roots but burrows. No carbonaceous material, all red w/ thru oxidized. I'm curious as to why this horizon is the only bioturbated horizon that is oxidized. I'm also intrigued at the oxidation + leaching in the "mystery sandstone - which is different than the for sure Ivishak.

N. 5°



My interpretation - LCU at base of oxidized sandstone, overlying paleosol. Section of siltstone w bentonite + red beds - lacustrine according to

Katakturuk tributary - Pebble Shale

05 Mv is Collection of large clasts with in base shale exposure

69.67940°N, 145.22314°W 1451'

Most outsized clasts are v f grnd dk gr qtzite, but one 18" elongate rounded clast of bk coarser grained tuffaceous qtzite.;

8" elongate clast of chloritic mica schist w bull quartz vein

20" elongate clast of silicified black limestone with horn coral + bryozoans and poss crinoid columnals etched out on surface. Groundmass micritic (on fresh surface little hint of fossil material). This is the largest clast I've seen ever at this locality

~6" lt gr dolomite, w thin mud gr, has many laminae + birds eye structures, some porosity lined with tol + thombs. Could be Katakturuk. Clear qtz xtl in

(over)

specks, thin wthng rind, sl schistose appearance, irregular weathering.

It is hard to envision how a 20" boulder could become attached to seasonal shore ice that melted it offshore, but I can think of no other mechanism by which such transportation could occur

See 91 Mv 83

July 16 Overcast, north breeze

Canning River, "Emerald Isle" section. Located on west bank of Canning River about 3 miles upstream from mouth of Nanook Creek.

05 Mv 16 Station 69.53039° 146.25968°

Discontinuously exposed in lower part, with significant covered intervals. Found a few red bn concretions that appear to have been Inoceramus

West side Canning River, on middle of the 3 Kremik "dup4x" points

05 Mv 17 69°, 49395° 146.31345 807'

Lith

Same locality as 80 Mv 3 in Kremik paper, and 91 Mv 81

Fascinating exposures of etched surfaces that absolutely proves Paul Decker's suggestion that the etching must be due, in part to pressure phenomena akin to stylolites and are not entirely due to weathering. Unquestionably bedding laminae are etched out in low relief, but superimposed on that in places is are pressure points akin to stylolite points. On several surfaces it is possible to project the etched surface back into the outcrop, where etching occurs on both sides of a fracture

(over)

In an intensely bioturbated section, the pressure imprinting seemed to be even more accentuated, clearly showing preferential etching in surfaces ~~oriented~~ striking ~300 to 330°, and no etching on surfaces at right angles that show some slickensides.

Structure in the 3 Kemik repeats that project into the river is much more complicated than a reverse duplex as other interpreted.

05MV18 Kemik horseshoe, west side ~~Station~~ of Canning River.

Micro-Poly Same as 80MV2 and area of 91MV37

69.47188' N, 146.33711° W 1012'

Kemik - Kingak contact not exposed

Collected sample from small gully 50yds downstream from resistant ridge of Kemik-Ignek Valley facies

Estimate 30-50' below Kemik.

Black silty shale, gray fissile shale in float, also apparently a thin bentonite

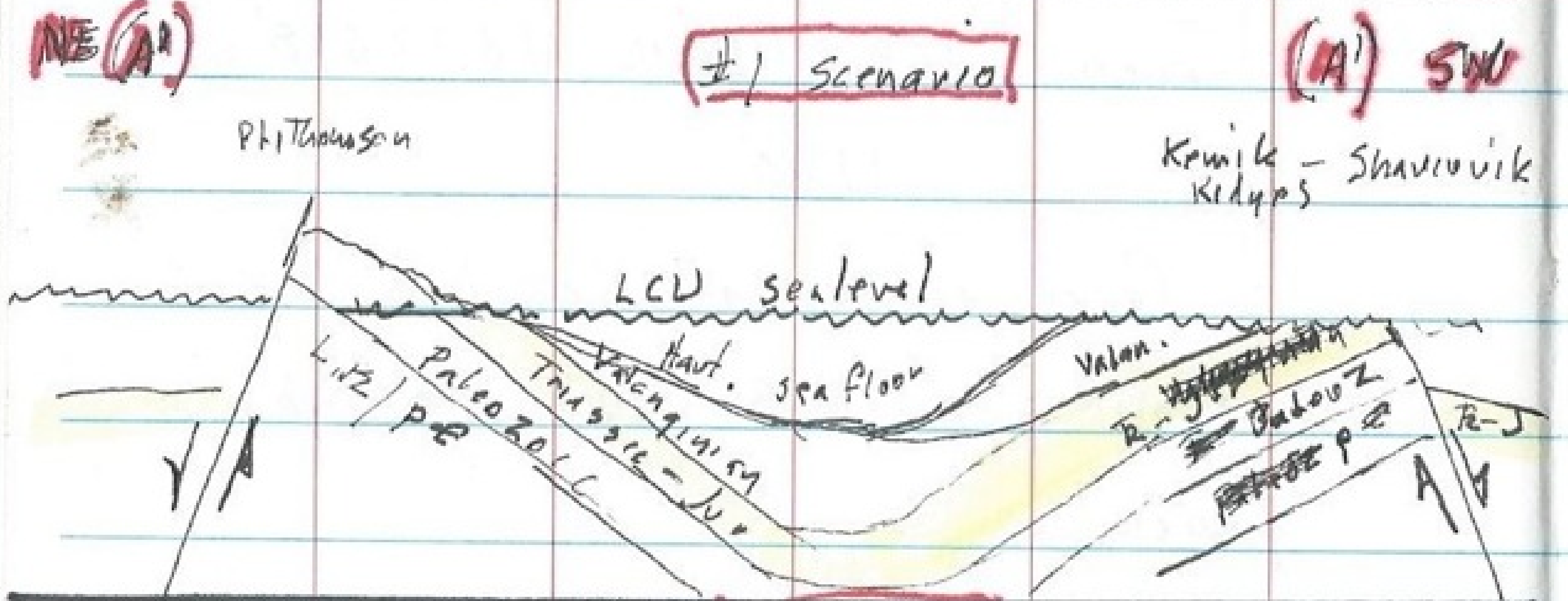
WP (A) Cairn 69.47108°N 146.33618°W (A) 1170'

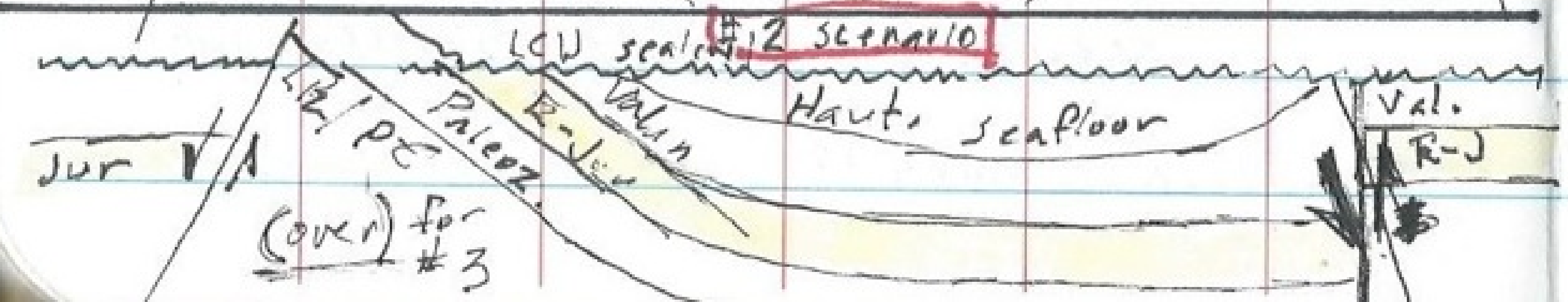
Cairn on top of Kemik Ridge

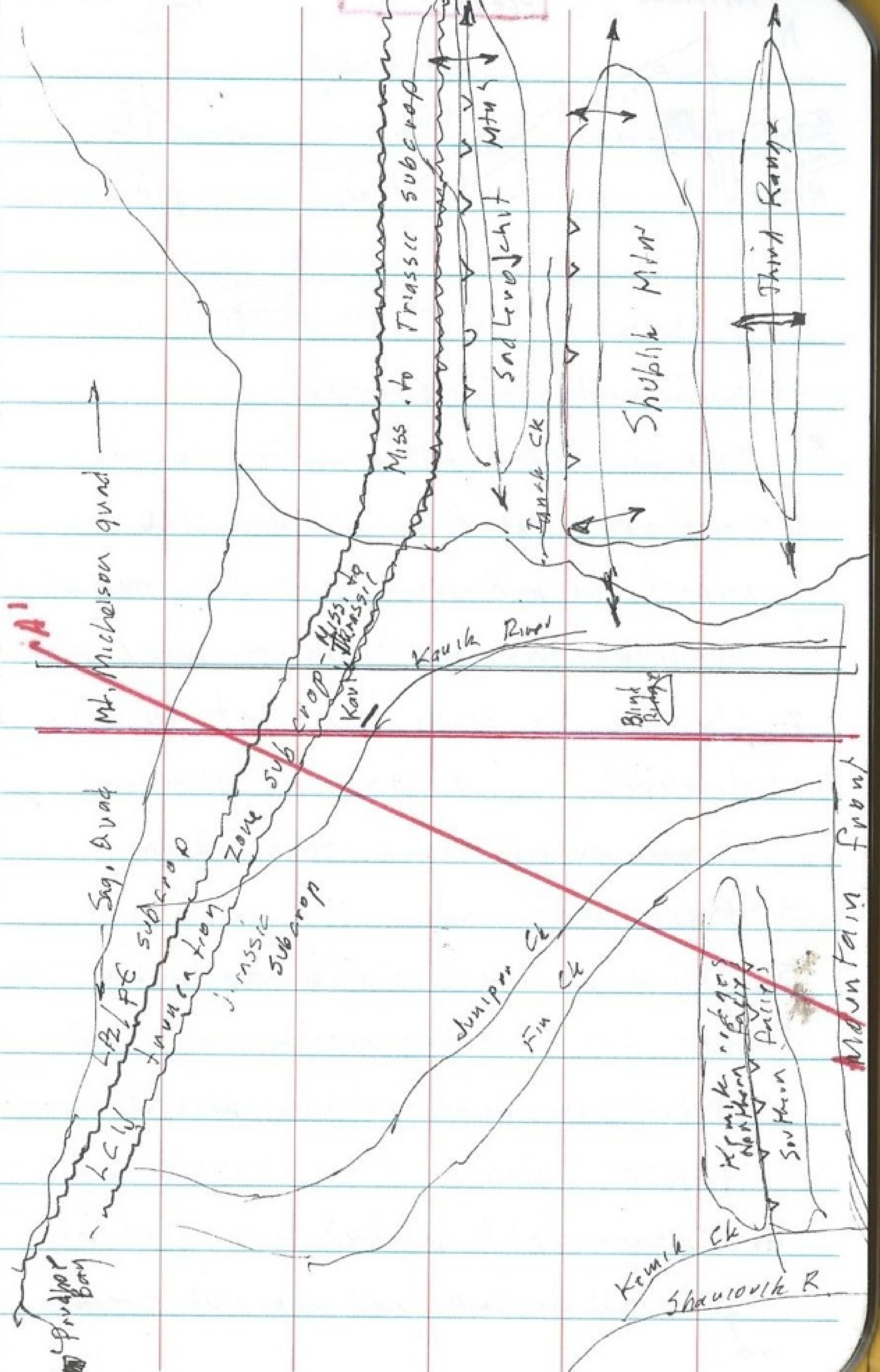
Kemik - See 1980 notes & Kemik paper

Retrieved a 1960's 5 gallon gas can — ours??

Mt. Michelson B 5 quad, west edge.
VABM Bury 2122' with Marwan + Paul
05Mv19 69.40773 146.99405
Exposure of bioturbated facies on lower slopes, weather grayish brown. Capped by thin slabby black weathering qtzose sandstone
Rubbly irreg lt gr ss below cap appears to have abundant rootlet material, marked by black carbonaceous films, Ss v f grnd, lt br gr, tripolitic cht + qtz, glauconite in some

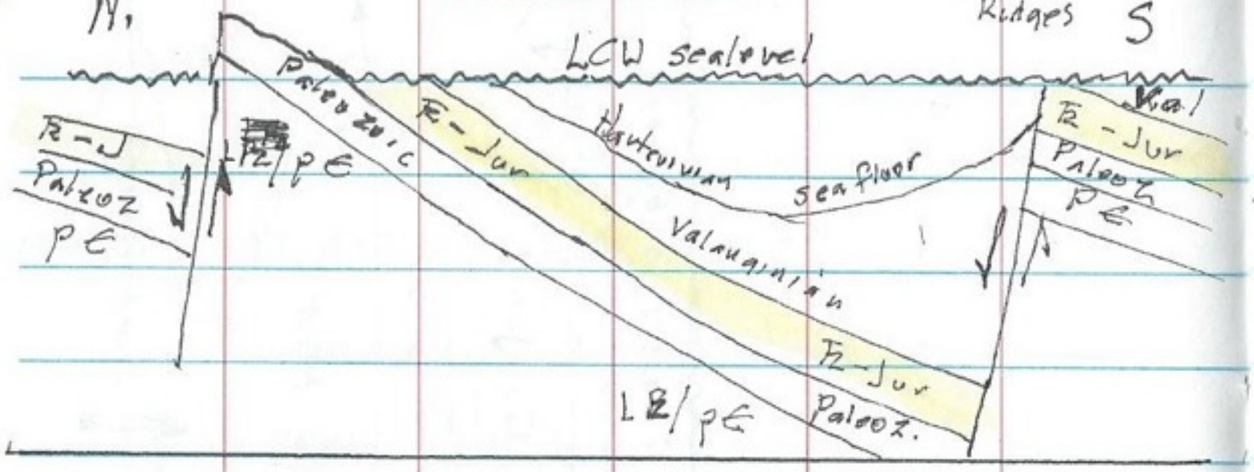






Scenario 3

Kemik - Shaviovik Ridges 5



Comments on scenarios

1. Extreme vertical exaggeration on all
2. Topographic relief on north to take into account the relationships at Pt. Thomson subsurface, in which high went into Albian.
2. Uplift on the south to account for well developed LCW at Shaviovik River and longer section on northern Kemik Ridges
3. Inferred uplift at Ivishak or south, but may not be necessary because Ivishak in that area does not have much, if any tripolitic chert.
4. Southern uplift inferred to account for good LCW on South and expanded section to the north.
5. Fault block options on south inferred to account for thickness changes in Kemik and also to control locality of thrust that juxtaposes southern and northern facies, by either reactivation of older fault, with same throw, or inversion (ie thrusting along trace of previous normal fault.)
6. Dip of southern fault at time of LCW - unknown.
7. Comment on structure in Kemik in Sag B1 grid map — intensity of shortening seems to increase toward the eastern end of the map.
8. Faults probably should be nearly vertical rather that steeply dipping as shown.
9. Reasonable scenario should account for difference between Marsh Creek Mbr facies and the bioturbated facies of

(Cover)

the Kamik anticline ridges, northern
faces, which seems much more
homogeneous than Marsh Ck Range.
10. At this point (7/20/05) I guess I
favor some version of Scenario #2

Emerald Isle

Camp log - 2005
June 26 Flew Alaska Airlines
Anchorage, from Albuquerque
Phoenix on America West
Alaska to Seattle to Anch
Flight to ~~Anch~~ Seattle with
class upgrade. Flight to
cancel/LA, transferred to
that was 4 hours late. Ar
Anchorage with no bagg
which didnt show up unti
What has happened to A
Airlines. Stayed in Puff
June 27 Flew to Fairbanks, flig
minutes late. Rented car,
motel room, ran errand
day. Got Levis, water b
talked with Mike Tolbert
Taiga. Dinner at Pump
Heavy smoke over Interi
fires near Ft. Yukon