

Enclosure 7: Field notes, in Sherwood, K.W., and Amoco Oil Co., 1977 geologic field investigations, Point Lay area, North Slope, Alaska

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Amoco Oil Co.

GMC DATA REPORT 445D

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State of Alaska
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Division of Geological & Geophysical Surveys
GEOLOGIC MATERIALS CENTER




Amoco Production Company
RECORD OF MAPS TRANSMITTED

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Date 1-4-83



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8/15/77	COLLECTING TUXID SAMPLES ALONG KOKOLIK RIVER	—	C.R. Williamson p. 69.
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8/18/77	DAY IN CAMP.	—	—
8/19/77	VISIT SECTIONS W-17B, W-17C, W-13 FOR EXTRA PHOTOGRAPHS. Also collected paleocurrent data from vicinity of S + W flanks OF COKE BASIN	196-197	SEE ALSO: DICK STEWART FIELD BOOK 2 p. 2-11. C.R. Williamson p. 71
8/20/77	CLEANED UP AND BROKE CAMP. IN ANCHORAGE AT 10 PM.	—	—

12 July 1977 Kw Sherwood
Pt. Lay area.

SECTION:
FT. DESCRIPTION & REMARKS

Helicopter reconnaissance north
along shore to mouth of
Kukpawruk R.; thence south
along river to Beaufort Basin.
Return directly to base camp.
Mapped outcrops along river.

Saw 20-30 white whales
("Beluga") along shore 10-12
miles N of Cape Beaufort.
Another group of 20-30 approx.
20 mi. NW of CBFT. Took 2
photos. R/14-15 of whales.

3

SECTION:

FT.

DESCRIPTION & REMARKS

DESCRIPTION & REMARKS

Flight south along Kukpawruk to Eagle drainage; proceed southeast to south drainage in $2\frac{1}{2}$ of T. 9 S., R. 46 W. to Tingmarkpuk Mt.,

R1/18¹⁹ view south of foothills of
Brooks Range.

RI/~~16~~²⁰ View east of Igloo Men.

STOP #1 T. 10 S, R. 45 W. Top
of mtn.

R1/~~2~~²¹: View south, foothills
Brooks Range, w/ helicopter.

R1/21: Squamiform sole markings
on base of Kfm ss bed.

Sndstn, dark gray - med. gray,
fin grained, in massive beds
5-15' thick, interbedded w/ flaggy
siltstone and sandstone (not
exposed). No rxn to HCl

4

[illegible]

SECTION:	READS FROM BOTTOM TO	9
DESCRIPTION & REMARKS	TOP OF PAGES	

FT.	DESCRIPTION & REMARKS
	TOP OF PAGES

SECTION Tingmerpuk Mt. - North Side
Map Location

7.6 ft. Sd st. vt. being settled
upward medgn-bm
massive, well cont'd.
weak horiz laminations
sharp lower contact, transition
upper contact
oxidation spots on upper 2-3
ft.

RLS-3 1ft above base of unit

5 ss v-f to lg. gray-brn, mod sorted
well cased, down horiz lam,
thin zones of ripples, local
convolutions, parting lineation

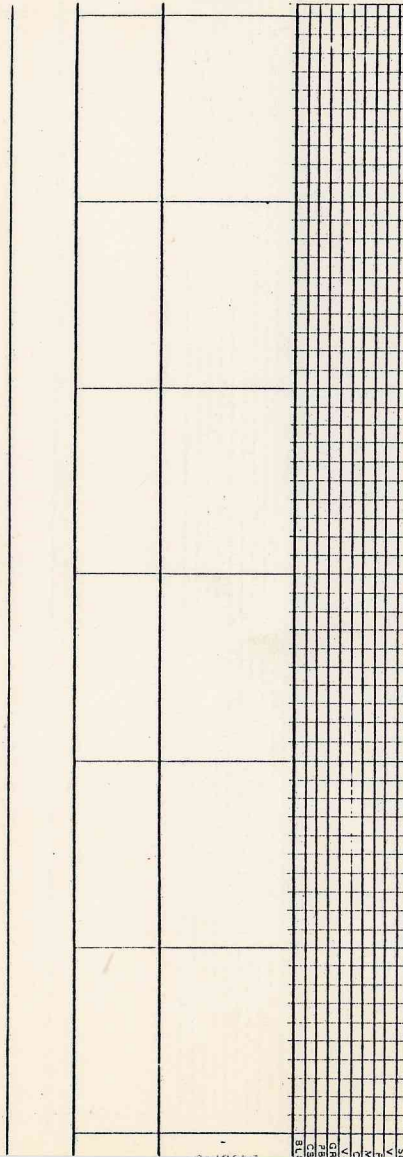
BASE → Shale lt gry, fissile, at

Base of Section N22W47SE

[illegible][illegible]

[illegible][illegible]

14



SECTION:

15

FT.

DESCRIPTION & REMARKS

0.9 Sdst. vfg. grnish gry ripple x-strat
lam. w/ contorted bdy., fines
upward to silty shale.
0.05" shale drape

8.9 Blk shale.

0.5 Sdst. sm sct x-lam.
vfg. dk grnish gry

2.3 Shale - as before

0.5 Ss. grn gry vfg. sm sct x-lam w/ contorted
bdy.
2.6 ft blk shale

1.3 Sdst. vt-fg at base, grad to
silty vt sdst. dk grn-gry
lower 0.8 contorted bdy. w/ sm sct
x-lam.
0.2 Sdst. dk gry vfg.
upper, horz

[illegible]

SECTION:	
FT.	DESCRIPTION & REMARKS
4.4	Slst, f-mg "cleaner" 1 ft ^{thin} gry well cont'd horiz lam near base; large scale contorted lam. at top 0.2' shale pt'g at top.
4.4	Blk shale.
1.3	Slst. lg. grn-gry; lower part wavy strat. w/ contorted laminae, upper horiz bema siltier upward.
1.4	dk gry shale.
0.5	Slst vt-fg grn gry slst. climbing, ripples @ base, horiz lam. upper.
1.0	dk gry shale
	Parting, lineation plgs 6° S 17 E Bedding attitude. N 15 W 32 E
2.8	Slst dk grn-gry vt-fg silty strat. dom. horiz w/ thin zones of contorted and climbing ripples. & parting lineation
1.0	Blk shale.
0.7	Slst bed vt-fg gold horiz laminae

SECTION:		GRAPHIC LITHOLOGY	GRAIN SIZE										SED. STRUCT. & BEDDING	PALEO-CURRENT		
FT.	SAMPLE		SH	VL	V	M	S	SL	CO	GR	CR	GR				
		RLST														
														CRW Picture of small dish structures		

23

SECTION:	
FT.	DESCRIPTION & REMARKS
0.8	Sdst slty. v. b. gm-dk gry contorted in base (D.G) parallel horiz w/cross lam (D.2)
4.3	Black shale.
5.0	Sdst. lt-med gry qtz. f. med ^{v. coarse} rip-up clasts dish structures lower part faint horiz laminae w/ med scale contorted laminations in upper part, poss. scars w/ 2.0 ft relief sharp base
0.3	shale.
0.2	silt
2.4	Shale
0.7	Sdst slty, contorted bdy. below parallel lam above med dish
5.0	Blk shale

This image shows a blank, aged, cream-colored page, likely a ledger or notebook page, numbered '24' in the top right corner. The page features a grid of squares, with a central column of smaller squares. The grid is composed of several vertical columns and horizontal rows. The central column is the narrowest, flanked by wider columns on either side. The page is marked with a vertical line on the left and right sides, and a horizontal line near the top. The page is numbered '24' in the top right corner. The page is blank, with no text or markings other than the grid and the number.

SECTION:		25
FT.	DESCRIPTION & REMARKS	
4.6	Sdst. fg. well sorted gtz are made lt gray - tan, lower 0.8' faint wavy horiz lam, upper prt lrg. scale contorted & overturned laminae w/ prob fluid escape structures Sharp base.	
0.3	shale	
1.0	Sdst horiz. laminae, ripples not top. desc. as 0.8 sdst below	
0.2	shale break	
0.8	Sdst vt-fg. dk gray w/ horiz rip-up clasts at base & horiz laminae - coarsely horiz. grading upward to shale	
0.4	shale	
0.2	Sdst.	
1.4	Black Shale.	

[illegible]

3 to 5 ft (Booming) Int. bldg. 1st
P. shade (1/2 each)

25,0
sdst. lt gray - tan f-mg
~~at base~~ uniform
lower has wavy horiz
lamination, ~~also~~ otherwise
~~intermediate~~ upper part, mainly
w/ some conchoidal frags.
upper most 3' thin
bedded w/ horiz lamination.
sharp ^{short} top contact.

1.0 ~~Black~~ Shale

5.8' Siltst. ~~med~~ med gry - lt grn-gry
f-g. mod silt, (note micaceous
flakes) lower 2/3 large scale
contorted laminations
- upper 1/3 gry iron-stained
vty ss. horiz laminae. w/ sm
scale cross strat.
Med gry. vty
base of ss scours underlying
shale ~~2~~ 2' ±

3 to 5' (varying) interbedded silt & shale

[illegible]

FT.	SECTION: DESCRIPTION & REMARKS
	29
	TOP OF SECTION
2+	^{feet} Shale.
3.1	sandstone fg & m-wl sorted med grey - well cnd'd. large scale convoluted laminae. sharp base upper 0.6 ft. horiz. lam up thin zone ripple lam.
3.30	
3'	shale
5.0	horiz lam sand ^{pass wispy lams} + 2" lams
4.0	shale

30

7/14/77

SECTION:

31

FT

[illegible]

Photos: RZ/1, 2, 3 TM section

Attitude at base of cliff:
N35E, 50NW

conglomerate, gray-brown, consisting of pebbles and cobbles (framework) resting in ~~ss~~ matrix of coarse sand, quite porous (absorbs fluid readily) and lightly cemented by carbonate. Pebbles consist of limestone (gray, fossiliferous locally), black chert, gray + black quartzite, metabasite, milky quartz, schist, argillite. rare stringers of pebbly sand 6-8" thick, ss horiz. laminated w/ parting lineations. Photo R2/4

Sample TC-12; 40' above base

[illegible]

FT.	<div style="text-align: right; font-size: 2em; font-weight: bold;">33</div> <div>SECTION: DESCRIPTION & REMARKS</div>
	RZ/5: Photo of reversed grading in conglomerate bed at vertical footage 152' (50-60° dip)
	RZ/6 7: Aerial view to SE of Tingsmuckpuk Creek locality and syncline.
	<u>STOP 2</u> Exposures of shale ~100' below conglomerate beds on northern flank of TC syncline.
	SAMPLE TC13 - shale.
	<u>STOP 3</u> In core region of syncline on south flank ~ at stratigraphic interval approx equiv. to 168'. Shale sample TC14 - shale Bedding: N50E, 74 N Flute east: N50W, TRANSPORT south to north Also: N45W

[illegible][illegible]

[illegible]

SECTION:

FT. DESCRIPTION & REMARKS

On crest of anticline north of Kukpowruk syncline at map location Sec. 14, T.3 S., R.45 W. Work south to core of AMATUSUK Hills (core Kukpowruk syncline). Recon examination of section.

Section of predominantly black shale with interbeds of sandstone 5-10' thick. Sandstones lenticular, with thicker bodies traceable for

Bedding: N10W, 10SW
N10E, 15W

Paleocurrent (aligned plant frags): N41E up to 100 yds along exposure. Individual beds often sand sections are 6-18" thick and exhibit horizontal plane or v. low angle cross-lamination. Sand is fine-medium grained, lithic, salt-pepper, abundant altered feldspar.

Paleocurrent: trough x-axis: N75E (transport)
Current Ripple marks: N60E (transport)
" " " N50E (transport)

SAMPLE KKS 17: SANDSTONE from bed approx 30' above creek bed.

SAMPLE KKS 18: SHALE from directly beneath bed.

Sands thicken upward with increase in thickness of beds.

Photo R2/8: Disturb(?) channel sand scouring thin by laminated and cross-laminated sands. (Tidal-flat; prodelta?) HAMMER FOR SCALE.

Paleocurrent ripple: → S 89 W.
mark —

STREAMING LINEATION: → S 56 W

Ripple mark → S 52 W

STREAM LINE: S 60 W

LINEAR BURROWS 2-3' long on backs of ripples. Random orientation.

CW notes basal part of sand grades downward into prodelta shales, siltstones. Lower laminated unit may be channel mouth bar. Shale drapes between sands dip to N 0 E, 27°. Massive sand above may represent channel & a dist. channel sand.

Channel-mouth bar sand generally more shaly and contains abundant shale chips up to 1/2" in diameter.

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R2/9: Prodelta shales sand grading upward into channel-mouth bar sand — truncated at top by channel sand.

R2/10: Accretionary structures (shaly drapes) on channel-mouth bar sand

CS
CMBS
CHANNEL SAND
CHANNEL-MOUTH BAR SAND

← KKS 25

← KKS 24

← KKS 23

← KKS 22

← KKS 21

← KKS 17

← KKS 18

← KKS 20

← KKS 19

ROOT STRUCTURES →

BASE NOT EXPOSED

stream

R2/13 Aerial-oblique view
R2/14 of section measured
today.

Sample of short-hole shale
chips collected in sec. 15, T9S, R44W.
Sample SH 26.

7/16/77

41

SECTION:
FT. DESCRIPTION & REMARKS

Return to Tingmerkpuk Mtn.
for brief sample collecting.
STOP 1

Sample TM27 (map loc. Z1/SE-NW
105, 45W) - red shale in
saddle.

Near top of section measured on
7/13/77... exposures of beds
of sand stone > 2' thick spaced
at 30' intervals. Sandstone is
dark greenish brown, fine-
grained, cross-laminated in sets
up to 1 cm thick; large amt. of
convolution of beds w/in ss.

R2/15: working on north ridge of
Tingmerkpuk Mtn.

attitude of bedding: N75E, 50° S
Flute casts on base of ss beds.

Sample TM28 - sandstone.

STOP 2 South east side of
TM. at map loc. SW, NW, Z8, 105,
45W.

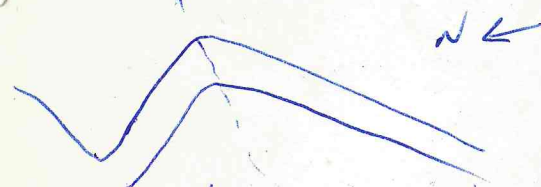
cherts & shale, chert in beds
6-12" thick with
alternating 1" white & black
beds. Interbeds of siliceous

42

"Chimney" fold w/ $\lambda > 30'$.
closely spaced cleavage
developed in core region of
fold.

B₅₀ : 40° 588E

S₁ + S_{1AP} : N82W, 68 S.



Folds slightly overturned to
north.

ENVELOPING SURFACE
very ~ N30E, 45E



Shale 6-10" thick

TM29 - chest

TM 30 - Siliceous shale

$B_{50} : 42, 580E$

$S_{AP} : N80W, 81N$

S₀ N80E, 74N

Light gray bedded chert containing
thin brachiopod shells wh/
react to HCL.

TM31 - BRACHIOPOD MEGA
FOSSILS IN CHERT

CHEVRON FOLDS WITH $\lambda = 10'$.

B₅₀ 58° 57SE

S1AP N75W, VERT.

Photo R2/16: CHEVRON FOLDS.

Bedded green (sandy) and black
chert in beds 3-12" thick.

In core of large fold, interbedded
shales and coal beds 2-3" thick
composed of coalified woody mat'l.
SAMPEE TM 32

[illegible]

SECTION:
DESCRIPTION & REMARKSFly Cast to Kokohik River,
proceed north~~TM33~~:

7/18/77

Visit type section of Kik
flank of Kasegaluk Syncline
(north flank Archimedes ridge
anticline).Samples designated "KA"
BASE OF SECTION (NE, NE, NW, Z6, T.2S, R4SW)
15 ft of covered interval
from AXIAL REGION of Archimedes Anticline
S: N40E, 32 NW1 ft. Sandstone, med. gray-brown,
abundant ~~for~~ calcified plant
fragments draped on bedding +
cross-lamination surfaces.
Fine to med. greenal. wavy
lamination lower 1/2;
cherting ripple lamination
upper 1/2.
SAMPLE KA41 (RLS41)

18 ft. covered interval.

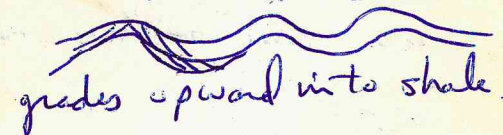
5.2 ft. Sandstone; lower 2'
fine to medium sand, lithic,
horizontally laminated, possibly
cross-lam. in 4 mm sets. Overlain by

stood down: Kukupuruk
flank of syncline
was measured and studied.

SECTION:		GRAPHIC LITHOLOGY	GRAIN SIZE										SED. STRUCT. & BEDDING	PALEO-CURRENT
FT.	SAMPLE		A	N	F	C	M	P	B	E				
													4' of massive sandstone with pebble lag (concretions + sh. pebbles) at base. Sandstone medium grained, locally coarse. Medium to light brown silty. Upper surface rippled. Ripples: $\overrightarrow{N72W}$. TO N61W	
													Trough cross lamination in sets 1-3 cm. thick.	
													Molds of clam shells locally.	
125'													covered siltstone, shale, thin beds of sandstone. Shale sample K1942	
13'													covered shale.	
60'													interbedded silty very fine sandstone (0.2' thick) and silty shale. Abundant burrowing, plant debris. Cross-lamination in sets 3-4 mm. thick.	

SECTION: 45	
FT.	DESCRIPTION & REMARKS
	Borrowing predominantly bedding-plane.
12'	covered shale + siltstone
5'	shale, dark gray. SAMPLE KA 43.
4.0'	Fine-grained med gray SS, thins to 0.5' on western edge of exposure. Low angle trough cross-lamination throughout in sets up to 0.2' thick. Clam molds, coalified plant debris on base of bed (sharp contact). Upper contact sharp. SAMPLE KA 44 - sandstone.
1.0'	shale, dk gray to black. S ₀ : N28E, 29 NW
0.3'	Sandstone as described ↑
0.3'	shale.
0.6'	Sandstone as described ↑
1.0'	shale.
0.5'	SS as described ↑ Thins to 0.1 ft in 10 yds. laterally.

and traceable for only 5-6' along exposure. Bedding 46 chaotic - possible slump structure. Overlain by 1.1' of rippled very fine grained sandstone with wavy bedding containing abundant plant mat'l (leaves) pressed along wavy bedding - $\lambda = 1.5'$



3.5' shale, dark gray.

0.2' sandstone, v.f.g., silty. Rippled cross-laminated.

0.5' shale.

0.2' sandstone, v. silty, shaly, abundant coalified plant debris.

0.2' shale, siltier at top.

0.2' sandstone, v.f.g., iron-stained, basal contact gradational w/ underlying shale.

upper surface w/ ripples $\lambda = 1 \text{ cm}$ —
giving sand a pinch & swell
aspect.

0.1' shale

0.1" sand as described ↑
← 5' → (RLS: RI/32)

0.3' sandstone, very fine-grained
at base, grading upward into
shale. Low-angle trough
cross-stratification in
lower part.

0.2' shale

2.8' ^(1.0-1.7') Sandstone, fine gravel at base,
very fine near top & becoming
quite shaly in upper 0.6'.
Lower part ripple cross-
laminated in sets up to 0.1'
thick. Basal contact shaly,
abundant load casts,
local shaly chips at base.
Bed from 1.0' to 1.7' above
base is very discontinuous.

SECTION:		GRAPHIC LITHOLOGY	GRAIN SIZE										SED. STRUCT. & BEDDING	PALEO- CURRENT
FT.	SAMPLE		A	P	F	C	M	S	L	V				
0.7'		silty shale, dark grayish brownish												
0.2'		sandstone v.f.g., v. silty												
0.1'		shale.												
0.2'		sandstone, v.f.g., silty,												
0.4'		shale, siltier toward top & near base overlying sand.												
0.5'		sandstone, v. f.g., silty, dark gray, cross-laminated w/ possible <u>root</u> structures.												
3.0'		Blk shale.												
0.2'		Sandstone, cross-laminated in sets up to 0.1 m thick. Local vertical carbonized structures 1 mm thick (roots) cross-cut cross-bedding. Sd: N24W (??), 19 NE? Ripple marks: → 60W												

TD
N55W

SECTION:
FT. DESCRIPTION & REMARKS

47

2.0' shale.

Attitude: N16E, 19NW

2.3' Sandstone, lt. brown, sharp base w/ clam molds, load structures, bedding - plane burrowing. Fine to medium-grained, subang to rnd, mod. well sorted; climbing ripple lamination throughout, minor carb. mat'l, sl. calc.

0.3' Siltstone, nodular frac.

0.8' Sandstn. ripple laminated, fine-grained.

18' Shale, dark gray.

0.5' Sandstone, mod. brown, altered & sp fragments; trough style (small scale) cross-lamination, very fine to fine-grained, subang, mod. well sorted; grades upward to siltstn then shale. Upper part of sand contains fine parallel laminations w/ abundant carbonaceous material.

48

2.5' Sandstone, v.f.g., x-lam, abund. carb conc. on x-lams, med. gray.

21.5' Shale, dark gray.

2.5' Sandstone, med. gray, f.g. to v.f.g., abund. coalified wood fragments; consists of 10-12 genetic units, each ~~grading~~ ~ 0.3' thick or thicker & grading up into a shale-siltstone parting. Basal contact of each unit is quite sharp & replete w/ load structures. medium sand at base of some units. Thins to <1.0' in 30 yards.

21.5' Shale, mostly covered.

12.0' : Very silty v.f.g. sandstone interbedded in 0.3'-0.9' beds with dark gray silty shale. Sandy intervals contain ripple cross-lamination locally.

6.0' Shale.

1.4' Sandstone, ($S_0 = \text{NOSE}, 29 \text{ NW}$).
very fine to fine grained,
ripple cross-laminated emphasized
by concn. of carbonaceous
material; fsp.; lithic frags;
climbing ripples in upper
 $\frac{1}{2}$. Grades upward into
siltstone (parallel laminated)
unit 0.4' thick; then sharp (?)
contact w/ overlying shale.

20.0' shale.

1.0': Sandstone, very fine to fine, trough cross lam, carb mat'l on lam. surfaces; fsp + lithic frags; mica plates on bedding surfaces. Sl. calc.

2.0
~~4.5~~¹ Shale, dark gray, silty.

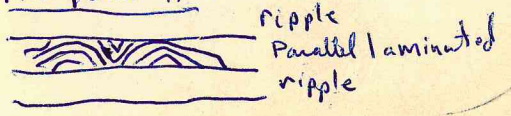
SECTION:		GRAPHIC LITHOLOGY	GRAIN SIZE								SED. STRUCT. & BEDDING	PALEO- CURRENT
FT.	SAMPLE		A	V	S	M	F	C	G	P		
											but other were appear structureless, perhaps suggesting bioturbation. Shale interbeds contain ironstone concretions. Very little carbonaceous debris, <i>carbonized</i> leaves along bedding surfaces locally.	
49.0'											Shale and siltstone - mostly covered. Sample KA 46. at 34'.	
4.0'											Abundant mica on bedding surfaces. Sandstone; very sharp basal contact. 2.5' of fine massive sand, locally ripple laminated in upper 1/3. Overlain w/ gradational contact g.z.' thick by wavy laminated v.f.g. sand 0.4' thick. Overlain by 0.4' of cross laminated sand w/ rippled upper surface.	

FT.	SECTION: DESCRIPTION & REMARKS
	ss Entire sand body pinches out laterally into shale in <40 yds.
12.8'	shale + siltstn, mostly covered.
4.0'	Sandstn, light to med. gray, massive to indistinct parallel laminations in lower 3.0'; upper 1.0' contains shale chips at base and is parallel laminated w/ local climbing ripples; parting lineation on bedding surfaces. Ripples on top surface. → Sample KA47 - sandstone (3' above base of ss body). Ripples: → S45W. Both lower & upper surface contain shale. S ₀ : <u>N35E, 23 NW</u> TD S59W
15.3'	Siltstone, shale, mostly covered.
20'	Sandstone, abnt. ripple lamination, fine to medium grained, light gray, carbonaceous mat'l along bedding surfaces;

50

climbing ripple lamination.
carbonate on fracture surfaces.
very little carbonaceous material.

- 5.7' shale + siltstone in 0.4' interbeds. ↑ siltstn in middle.
- 1.2' Sandstone. v.f.g. silty; both possible root structure pyrite base + top gradational into siltstn + shale. Abnt ripple-cross-lamination.
- 0.3' shale
- 1.2' Siltstone, dk gray, nodular fracture.
- 29.7' Interbedded shale + siltstone, mostly covered.
S₀: N20E, 29NW
- 1.0' Sandstone, fine to v.f.g. Lower 1/3 ripple laminated, middle 1/3 parallel laminated with food (?) structures (see sketch).



climbing ripples near top. Lower contact sharp w/ abut. load structures climbing ripples throughout.

~~0.5' siltstone~~
Ripple marks: \rightarrow S3SE
T.D. / S46E

0.3' Siltstone.

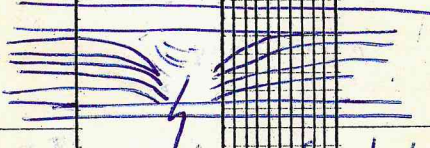
0.8' Sandstone, fine-grained, vague ripple cross-lamination.

3.8' siltstone + shaly siltstone

4.1' Interbedded (1'-0.2') shale and cross-laminated silty v.f.g. sandstone. Cross-laminated in sets up to 1.5 cm thick.

3.2' Shale + siltstn. sample KA48

2.1' Sandstone, f.g., mod. gray. Basal contact sharp w/ load structures, top grades into siltstn-sh over 0.4' interval. Lower 3' thorough cross-laminated in 1-3 cm sets. Abundant

SECTION:		GRAPHIC LITHOLOGY	GRAIN SIZE							SED. STRUCT. & BEDDING	PALEO-CURRENT
FT.	SAMPLE		CL	VL	ML	FL	FO	FI	FS		
7.8'										Shale, becoming silty through upper 2'. CONTACT with overlying sand gradational.	
1.5'										Sandstone, ripple laminated contains "dropstone" structures as sketched below:	
											
										Position of fossil log ??	
										SAND changes into siltstone laterally within 20-40'.	
9.0'										Sandstone, siltstone, shale. lower 2/3 shale, then 3' siltstone, topped by 0.3' sandstone. v.f.g.	

FT.	SECTION: DESCRIPTION & REMARKS
6.5'	Shale. ✓
5.0'	Interbedded v.f.g. sandstone (cross-laminated) and silty shale. Abnt coalified plant debris on bedding surfaces.
1.7'	Sandstone in 4 beds from 0.1 to 0.3' thick interbedded w/ shale. Basal contacts sharp w/ abnt load structures. Sands cross-laminated. Fine grained.
2.1'	Shale. Sample KA49
2.4'	sandstone (v.f.g.) + shale, as described above.
2.0'	Shale.
1.5'	Siltstone.
0.5'	Sandstone, v.f.g., grades upward into overlying shale; base sharp w/ load structures. Contains "dropstone" structures.

51

1.2' Sandstone - see last description.

52

2.0' Shale, ^{med.} ~~dark~~ gray, carbonaceous.

3.3' Fissile siltstone, fine-grained sand, fine parallel lamination, carbonaceous mat'l.

3.9' shale

0.9' Sandstone, sharp base
w/ bedding plane burrows
& load structures. Rippled
cross-laminated sand,
fine grained, current
rippled on sharp upper
surface.

10.3' Interbedded siltstone + shale
lower 2/3/upper 1/3 contains
0.1' interbeds of v.f.g. silty
sandstone.

2.1' Sandstone, sharp base
w/ load structures and
bedding-plane burrows.
Grades upward into siltstone
and shale. Fine-grained at
base.

1.2' Siltstone and shale.
Ironstone concretions
locally.

7/19/77 Kuknewok Fm. on north flank of Archimedes Ridge anticline (south flank of Kasegaluk syncline).	
SECTION: DESCRIPTION & REMARKS	53
FT.	
	Begin at base of thick sand unit.
	RLS R1/34 (Notes)
	R2/17 Progradational sequence in Kuk on N flank Archimedes Ridge.
	R2/18, 19, 20, 21, 22 Gry Falcon guarding fledgling young.
X	S ₀ , N30E, 30NW 17.7' Sandstone, fine-grained, mod. sorted @ base, becom. med. grained mod well sorted in upper part; dk gray to med gray, weath- tan. Upper part sl. calc, mod. porous (somewhat friable). Lower contact transitional upper contact grades into interbedded siltstn + sh. Dominant strat. is horiz lamination w/ some large

scale trough-stratification,
thick-bedded. several
large scours w/ 2" coaly
seams. Fossil log molds,
(photographed @ 2 1/2')
pebbles lining scours.
SAMPLE KASO

6.3' Interbedded sandstone,
siltstone and shale.
sandstone 2"-1.0' thick, v.f.g.,
brownish-gray, poorly sorted,
st. calc., horiz. lamination.

10.0' Sandstone, fine to med. grained,
well sorted, mod. calc.,
lt. brownish gray, mod.
porous; sedimentation units
are 1-3' thick; horiz. lam.
w/ lesser amts. low-angle
trough cross-bedding; ripples
at tops of units; thin (<0.5')
shale breaks between
sedimentation units.
top of entire unit transitional
RARE BEDDING PLANE BORROWS.

SAMPLE KA51

54

2.9' Shale w/ thin sandstone
intervals (<0.6').

6.4' Sandstone, med. grained, mod.
well sorted, ^{st. porous} at base; becomes
siltier v.f.g. sand, poorly
sorted at upper part of unit.
Horiz. lam. in lower 2 1/2';
overlain by 1.0' tabular
cross-stratified unit; upper
part of unit rippled w/
rare climbing ripples; abundant
organic mat'l, especially
near top; upper contact
transitional into overlying
shale; lower contact transitional.

SAMPLE KAS2

3.0'+ shale then covered.
SAMPLE KA53
Dip: N54E, 29NW.

15.0' covered - mainly shale
+ siltstone. FAULT AT TOP.
FAULT STRIKE ~ N36E. UPTG SOUTH??
29.0' covered - mainly shale +
siltstone.

SECTION:		GRAPHIC LITHOLOGY	GRAIN SIZE										SED. STRUCT. & BEDDING	PALEO-CURRENT
FT.	SAMPLE		1/16"	1/8"	1/4"	3/8"	1/2"	3/4"	1"	2"	4"	8"		
X		So: N25E, 29NW N15E, 35NW												
3.8'		Sandstone, fine-grained, mod. sorted @ base, becomes v.f.g. + poorly sorted at top. Contact sharp, upper contact transitional. Lower 2.5' broad (6.0') low-angle trough cross-stratification of clay pebbles near base. Upper part horizontal lamination, rippled at top.												
X		FROM DIP OF CROSS-BED: N50E, 32NW TO horizontal N34E T.D.												
0.6'		Shale + sandstone, thinly interbedded w/ incompletely formed ripple (flaser-bedded).												

SECTION:		FT.	DESCRIPTION & REMARKS
1.0'			Sandstone, v.f.g., mod.-sorted, dark gray, non-calcareous, upper surface rippled; base sharp; small-scale trough cross-stratification.
19.0'			Shale, black, fissile; thin siltstone beds 0.3' in middle of bed. SAMPLE KAS4 @ 10.0'
1.6'			Sandstone v.f.g., poorly sorted, dk gray, non-cal. Ball + pillow structure. Laterally thins + thickens. Abundant carbonaceous mat'l. heavily bioturbated.
2.6'			Interbedded sandstone + shale. ss beds thicken upwards. Sandstone contains carbonaceous vertical burrows or roots; v.f.g., dark gray, poorly sorted, small scale trough cross-lamination. Sequence contains abundant carbonaceous mat'l.
2.4'			Sandstone, gradational base, fine-med, mod. well sorted, at base, becoming v.f.g. + silty.

and poorly sorted at top.
 Upper contact transitional into
 shale, becomes thinner bedded
 and siltier in upper 0.8'.
 Small scale trough cross-
 stratif; thin silt-sand beds
 at top, rippled & contain
 vertical burrows or roots.
SAMPLE KA 55

8.1' Interbedded sandstone and shale,
 sandstone beds thin (<0.7')
 v.f.g., poorly sorted, dk gray.
 Laterally equivalent to
 sandstone-filled channel
 2.0' thick, 20-30' wide.

3.1' Same as 2.4' ss described
 above.

2.0' Shale.

1.6' Sandstone, fine-grained, dark
 gray, poorly sorted w/abundant
 clay, sl. calc.
 2 thin shale beds, each 0.2' thick

in center of bed. Small scale
 trough cross-lamination and
 abundant carbonaceous mat'l.
 Top of bed sharp.

89.0' shale and siltstone, mostly
 covered.

2.5' Sandstone, f.g., m. well sorted,
 med. gray, non-calcareous.
 Base covered; sharp upper
 contact; lower 1.5' thin
 horizontal lamination; upper
 part low angle trough x-
 stratification. Abundant
 clam molds, casts. Parting
 lineations in lower part.

7.1' Shale, partly covered.

~~2.7'~~ Sandstone, fine grained, med.
 2.7' Well sorted, ~~by~~ med. gray,
 non-calcareous; base
 covered ^{TRANSITIONAL} top; low angle
 trough x-stratif.; rippled upper
 surface; abundant plant
 material; convolution of laminae

30.0' COVERED.

1.0 sandstone, v.f.g., mod. sorted,
v. calc., small-scale trough
lamination. TOP + bottom
covered.

16.5' covered -

20.0' sandstone, med. grained at base,
mod. well sorted becoming very
fine grained, moderately to poorly
sorted at top. All but upper
2.0' trough cross-bedded
in sets 2-4' thick -
Upper 2' thin bedded
climbing & ripples, ripple
marks.

Sample KA56 - from
near base of ss.

83.3' covered interval.
(siltstone, shale?)

4.5' sandstone, fine grained, 58
mod. sorted, dk brn-gray,
non-calcareous. ~~Lower 3.0'~~
~~contains 4.5'~~ contains
Lower 3.0' contains
large-scale tabular
cross-stratification;
Upper 1.5' contains
undulating horizontal
stratification (hummocky
bedding). Abundant organic
material. Rippled on upper surface.
Ripples are linear, nearly
symmetric. Unit thins

X S₀: N42E, 38 NW
to < 1.0' ~~in~~ in 50 yds. to
NE.

2.2' Underbedded silt, shale,
v.f.g. sand, highly mottled,
organic rich, horizontal lam.

SECTION:		GRAPHIC LITHOLOGY	GRAIN SIZE								SED. STRUCT. & BEDDING	PALEO-CURRENT	
FT.	SAMPLE		1/16"	1/8"	1/4"	1/2"	3/8"	1"	2"	4"			
3.4'												Sandstone, v.f. to f.g., mod. sorted, brownish gray, non-calcareous, dominant horizontal bedding. truncates underlying units at base and thins to 1.5' in 50 feet to SW. Top transitional.	
0.9'												Shale.	
0.3'												Sandstone, lenticular.	
13.0'												Shale w/ interbedded siltstone. Sample <u>KA 57</u> .	
6.8'												Shale, siltstone.	
2.0'												Sandstone, v.f.g, silty, poorly sorted, dk. gray, ball & pillow structures heavily bioturbated. Interbedded sand and shale. Sand beds 0.3' thick to 0.7' thick.	

SAND BEDS THICKEN UPWARD. SECTION: PINCH AND SWELL -		59
FT.	DESCRIPTION & REMARKS	
4.5'	Shale	
2.3'	Similar to 2.0 sand interval, with some climbing ripples, locally.	
4.50'	covered - measured w/ assumed attitude of <u>N30E</u> , 30 39° NW	
	<u>So: N30E, 25NW</u>	
15'	Possible exposure conglomeratic rock w/ dioritic pebbles.	
20.5'	covered.	
2.5'	Siltstone, shaly, containing abundant coalified plant debris and root structures. (abundant). Plant debris resembles rushes. Swamp deposits.	
7.8'	Covered.	
1.0'	Sandstone, v.f.g., silty, poorly sorted; dark gray. Climbing ripples, abundant coalified plant debris. Crevasse splay sand?	

10.0' covered.

3.7' Gray shale. coal
splitting.

13.7' covered.

2.0' Sandstone, f.g., med. sorted,
dk gray, non calc.
Single sedimentation unit;
climbing ripples (type A)
(only lee side preserved -
rapid bed load sedimentation).
Abundant seeds & stems. Root
structures near base.

250' APPARENT THICKNESS OF
(TRUE TH. COVERED INTERVAL ALONG
(220')) ~~N 70 W~~ S 77 W line.

S₀: N 42 E, 31 NW.

11.6' covered interval.

~~Sr. ls. tone w/ shaly partings,
nodular fracture~~

R2/24 Chuck Wilson swimming.

60

SECTION:
FT. DESCRIPTION & REMARKS

R2/25, 26, 27, 28, 29, 30
photos of section measured
7/18 + 19/77.

7/20/77

61

FT.

SECTION:

DESCRIPTION & REMARKS

Return to Kulpowuk section
on North flank Archimedes
Ridge anticline; work
up-section (on west bank of
river) from top of section
measured on 7/19/77 (east bank
of river).

S₀: N33E, 22NW

3.7' Siltstone, poorly sorted,
non-calc. w/ ironstone
concretions, heavily
iron-stained, abundant
coalified plant debris.

2.9' Shale, partly covered.

0.8' Sandstone, v. fine, silty,
moderately sorted, dark
gray, non-calcareous. One
sedimentation unit,
climbing ripples with roots
at top.

10.0' covered.

27.5' Sample 5.0' from base of
interval (sample KA58).
Shale interbedded with
nodular siltstone.

62

SECTION:

FT.

DESCRIPTION & REMARKS

Whole sequence progradational;
beds thicken upward. Possible
clams; probable root.

8.7' Shale + siltstone, mostly covered.

Sample KA60 2.0' from top.

(Top 1.0' silty + transitional ^{into overlying} SANDS.)

R/Z/B1 Burrowing of clay
drapes ripple troughs
small scale
trough x-lamination on sand (next interval up).

~~14.7'~~
15.7' Sandstone,
lower 3.5'

Sandstone, fine grained
mod. sorted, non-calc,
med. gray, heavily
burrowed, vertical
non-branching, max. 4".
Abut. feeding traces on
bedding planes.
Abut. log molds on
bedding planes. Possible
root structures on
vertical stems.

Sample KA61 2.5' from

NEXT ~~8.5'~~ 7.5'

Sandstone, med. grained,
med. gray, non-calc.
med. scale trough cross-

3.6' Sandstone, f.g., med. well sorted at base, becomes med. grned, well sorted thru upper 2'; non-calc. lt. gray at top. Moderately porous. Bedding becomes thicker upward, climbing ripples ~~throughout~~; upper 2.0' small-scale trough x-lamination. Straight-crested flat-top ripples on bedding planes.
SAMPLE KAS9. 2.5' above base.

3.5' Shale.

4.0' Interbedded siltstone, sandstone, shale; sandstones 0.2'-1.2' thick, form 70% section, v. fig., poorly sorted, sl. calc., med. gray; small scale trough cross-lamination, and a few zones of climbing ripples. Good features on bases of ss beds; tops sharp, locally rippled.

lamination; upper 2' small-scale trough cross-lamination. Some rippling in lower part. Extensive bioturbation only along bedding planes. Ave. bed thickness 0.6' to 1.0'. Sand is moderately porous. Coalified plant debris.
SAMPLE KA62 ~~to~~ 6.5' above base
UPPER 4.7'; channel-mouth bar.

Sandstone, medium grained, well sorted, lt. gray, non-calc., porous; horiz. lam., beds 2.0'-3.0' thick,
SAMPLE KA63 13' above base.

0.4' Sandstone, f.g., med. sorted, med. gray, non-calc. thin bedded, large scale trough x-lamination in sets 2½-3.0' thick, 15' across (section expands to 4.5' within 25 yds to NW of this exposure). Scoured into top of underlying unit, Tidal channel?

SECTION:
FT. DESCRIPTION & REMARKS

63

- 0.5' Shale, interbedded sand, flasered.
- 0.5' Sandstone, low angle cross-stratification, rippled upper surface, interference ripples.
Ripple transport → N82W
So: N31E, 21 NW N80 W.T.D.
- 0.7' Unbedded shale, u.f.g. sandstone; sand in bed 5-10 mm thick, pinch and swell or flaser structure. Cross-lamination suggests bi-directional transport.
- 72.4 Sandstone, sharp lower contact w/ flute marks, current lineations ("streaming"), Fossil log imprints;
Sample KA 64 from 8' above base.
- 3.5' tightly cemented zone 10.0 above base.
- 2 fine-sands, thinly laminated at coaly partings in 0.4' beds within 3.0' of base.

SECTION:
FT. DESCRIPTION & REMARKS

64

- R2/32 Thick convoluted ~~thin~~ bedding in next sandstone above.
- R2/33 Trace fossils on ~~upper~~ lower ~~thin~~ surface of sandstone bed.
- 6.3 Sandstone, f.g., mod. sorted at base, well sorted at top; mod. calc., medium to light gray; lower 1.8' thin bedded w/ small scale trough cross-lamination and coaly partings; abundant organic mat'l.
- Middle 2.1' contain large ball + pillow structures.
- Upper part thin bedded, top rippled, and horizontally laminated. Sharp upper contact, with very abundant burrows.
So: N38E, 29 NW.
- Ripple marks: → N40W N42W
" → S00W S04E
" → S80W S84W
" → S70W S74W
" → N15E N12E

Sample KA65 from interval
50' above base.

DESCRIPTION: Fine to v.f. sand at base, moderately sorted, non-coaly ~~th~~ dark gray, w/ abundant coaly parting laminae; becomes medium grained, & well sorted upward. Poros. Thin-bedded throughout; all beds < 1.0' thick. Most of stratification thin rippled and trough x-laminated beds. Abund. carbonaceous mat'l along bedding surfaces. Few bedding plane burrows. Top of sand concealed.

17.5' ~~thick~~ Rare indistinct clam(?) imprints.
~~thick~~ Coarsel. Shale + siltstone, grading through upper 4-6' into v.f.g. sandstone, ripple laminated, w/ abnt coaly partings.

" 6 → 555W 557W
" 7 → 541W 540W
" 8 → NOSE NOZE
" 9 → 510W 506W
STREAMING Lamination¹⁰ ↔ N 65W N 64W
Ripple marks¹¹ → N 47W N 48W
Aligned plant frags¹² ↔ N 55W N 55W
Ripple marks¹³ → N 75E N 78E
" " 14 → 520W 518W

9.0' ~~thick~~ Shale + siltstone, partly covered. Shale nodular near top. A few 0.1 mm thick v.f.g. sand or silt interbeds in center.
10.2' Sandstone, sharp base w/ local load structures, trough-cross-bedded in sets 0.3' to 1.5' thick. Local convolutions resembling ball and pillow structures in 0.4' thick interval 0.5' above base - not laterally continuous for > 2 yds. Fine sand, reddish speckled black; abnt burrowing on bedding surface.
upper 8.0' of 10.2' sand (Horizontal lamination, thin-bedded; sl. coarser, well sorted at top. upper surfaces of ss beds rippled.

SECTION: N 40 E, 28 NW S 0: N 55 E, 26 NW		N 47 E, 27 NW	
65			
FT.	DESCRIPTION & REMARKS		
	Ripple mark: ¹ → N 05 E	N 02 E	
	trough axis ² → N 20 E	N 17 E	
	Ripple mark ³ → N 20 W	N 22 E	
	Ripple marks ⁴ → N 45 E	N 44 E	
	" " ⁵ → N 30 E	N 28 E	
	" " ⁶ → N 10 E	N 07 E	
	" " ⁷ → N 05 E	N 02 E	
	" " ⁸ → N 10 W	N 14 W	
	Sample KA 66 from sand 2.0' below top.		
24.5'	shale, nodular, becoming silty + sandy near top. Sample KA 67 - 1.0' below top.		
1.0'	Sandstone, v.f.g., silty, base transitional, ripple-marked, bedding indistinct, vertical stems or roots.		
3.5'	Shale, siltstone, picking up more silt and v.f.g. sand in upper 1.5'. Interdistributary bay deposits??		
1.9'	Sandstone, fine to very fine grained, med. sorted, med. gray, sl. calc. Base sharp, climbing ripples throughout, in sets 1-2 cm thick. crevasse splay deposit?		

Top of ss transitional into		66	
SECTION: OVERLYING SILTSTONES, shales.			
FT.	DESCRIPTION & REMARKS		
5.6'	Lower 1.5' siltstone, overlain by 4.1' shale (silty)		
0.5'	Sandstone, v.f.g., w/ prominent lobate (load?) structures along base of bed. Top transitional into overlying shale.		
8.2'	Shale. KA 70? 70A		
0.4'	Sandstone, v.f.g., silty.		
0.6'	Shale, silty, nodular.		
0.5'	Sandstone, v.f.g., ripple laminated. be upper surface rippled.		
	Ripple marks: → N 45 W N 45 W		
2.1'	Shale		
3.1'	siltstone		
15.0'	Covered. Float contains heavily burrowed sandstone.		

24.3' Shale; siltstone bed 4.0' thick at 13.0'
0.6' coal seam at 22.8'
Top 0.7 bentonite bed, weathered, with root structures (vertical).

SAMPLE KAGE - coal.
2.6' Sandstone, fine grained, moderately sorted, mod. brown, mod. calcareous, sharp base, abundant clams + oysters, wood frags; tabular cross-stratif., large scale; Top 1.0' nodular, heavily root mottled; coaly parting.

Sample KAG9 - sandstone
from middle of body.

Ripple marks: N10E NOTE

20.4' silty shale, becoming more silty upsection.
Top 1.0' very fine-grained sand, ripple cross-laminated.

14.8' Shale, dk gray, nodular.
Sample KATOB from 3.0' above base.

7.6' Interbedded shale, siltstone (sandy). Beds are 0.1 to 0.5 thick w/ thickest beds in middle. Low angle tabular foresets. Ripples on top.

Ripple mark: N40E N40E

~~4.7~~ 4.7' Nodular shale.

1.9' Sandstone, ripple cross-laminated, (trough) fine-grained, dark gray; base sharply transitional over 0.2'. Grades upward into siltstone.

Ripple marks: N60W N58W

16.5' Shale and siltstone, mostly covered.

SECTION: 67	
FT.	DESCRIPTION & REMARKS
8.7	Sandstone, f.g., lt-mod gray, well sorted, heavily burrowed w/ vertical burrows. Local <i>Ophiomorpha</i> , non-calcareous; thickens slightly to NW. Bedding not distinct due to burrowing; upper 1.0' trough cross-stratified and scours into burrowed sand. <u>SAMPLE KA71</u> 7' above base.
0.9'	Shale, vfg. siltstone. flaser bedding in 1/4" to 1/2" beds. 0.2' thick sand lenticular sand in middle, (mod flats-lagooal) →
0.7'	Sandstone, sharp lower contact w/ lead e burrow structures; var v.f.g. to f.g., mod. sorted, non-calc.
	<u>Flaser Ripples</u> → S15E S17E → S25E S37E
0.8'	Shale, flaser interbedded v.f.g. sands.

SHORE-FACE SAND

SECTION: 68	
FT.	DESCRIPTION & REMARKS
	<u>2.0-3.5'</u> (wedge-shaped) lower 0.4' conglomeratic, consisting of ss and sh pebbles. Upper part, horizontally laminated. thin bedded.
	<u>2.3'-11.8'</u> (channel w/ erosional base). Sandstone, f.g., mod. sorted at base becoming silty v.f.g. sand at top. Small-scale trough cross-lamination; silty drapes locally over ripples. Uppermost 3.5' mostly climbing ripples w/ abundant vertical root structures at tops of individual beds. <u>SAMPLE KA73</u> — Top of channel sand interval covered.
	R2/34 — strat. relations of three major parts of sand body.
	R2/35 — tent at camp.
	R2/36 — Destroilet

1.4' Sandstone, f.g., med. gray,
sl. calcareous,
low-angle tabular x-stratification;
Shale up-ups at base.
Wachover - fan sands ???

4.2' Shale, dark gray.

0.7' Sandstone, v.f.g., silty,
dk. gray, small-scale
rough cross-lamination.
Upper surface rippled.
Ripple marks: → N60E. N62E

5.1' Shale, dark gray.

11.8' Lower 5.5'

Sharp base sandstone, fine-
grained, med. well sorted,
light gray, thin-bedded.
from base up: stratification
types:

1. 2.0' horizontal lamination
 2. 1.5' climbing ripples.
 3. 2.0' large-scale tabular
cross-stratification
- SAMPLE KA 72

7/21/77

SECTION:

FT.

DESCRIPTION & REMARKS

5 Flank Kasegaluk Arch

69

Attitudes N50E 24° NW
N46E 21° NW
N48E, 23° NW

20.5' Shale being siltier upward.
[partly covered]

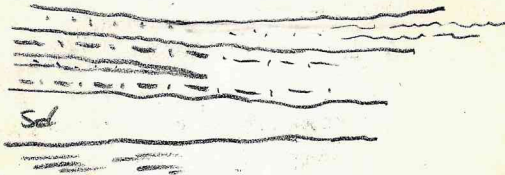
10.7' Sstst interbedded w/ siltst.
ss 80-85%
ss, v.f.g., silty, prly siltst
sh - calc. bds 0.3-
1.2 ft thick, thickening
upward. Unit transitional
w/ underlying silty sh.

indiv. bds climbing ripples
or sm silt. troughs
roots near top of
upper bed. Abund
plant material

1 bed ss exhibits
flow rolls and distorted
bdg.

Ripple near top N5E
N03E

RLS-74; PL77/KA74



70	
SECTION:	
FT.	DESCRIPTION & REMARKS
6.2	Shale
	RLS-74; KA-74
	abt 1 ft below top of unit.
8.4	Ss. w/ thin (<1ft) silty sh. bds. (90% sd)
	ss: fg-vtg med srted non-calc. dk gry bds. 0.8 - 5.0 ft.
	lowermost bd. truncated on top by low angle sd & sh filled chnl bds thicken & thin laterally
	base of unit sharp
	<u>Ripples: N 10W N12W</u>
	Indiv. bds mostly c/bg ripple w/ lesser horiz lams
	Abd vert roots & plat material

CRW picture

interpret as ^{small, thin} coarse splay
overlying marshy deposit



SECTION: 71	
FT.	DESCRIPTION & REMARKS
5.4	Covered probably shale
2.5	SHst dk gry, v. calc., base covered, sharp top. deformed clbg ripples (flow rolls) and other soft sed. deformation
5.4	shale grading upw. to stst marsh-type deposit abd root & pit frags nodular texture, no other strat
	upward coarsening marsh fill
3.3	Ss vfg., mod. srtld, dk gry, non-calc., beds thin & thicken laterally, progradational sequence, intbed silt & coaly ptgs, little visible strat within ss
	top transitional w/ next unit.

RLS-75; PL77/KA75
near top of shale unit

SECTION: 72	
FT.	DESCRIPTION & REMARKS
3.9	thinly intbed vfg ss & siltst (50-50) root mottled, poss trace of ripples, largely obliterated abd. plant material
19.4	Shale pth cov near base w/ several \neq 0.4' thick vfg ss bds. abt 1/4 of way up, sds horiz lam.
4.0	Sdst, fg, mod-wl srt'd at base, bcng vfg, mod srt'd at top Thick bdd (1 ft) at base, bcng thin bdd ($< 0.4'$) upward Mod calc. Heavily bioturb, vert burrow lower part, no vis shat. iron concretions around burrow

SECTION:
FT. DESCRIPTION & REMARKS

73

upper part thin bed.
ripples, & sm. scl troughs.
w/ abd sh. bds interbedded
at top.

Sharp base: gradational
top

Abd plant material,
increasingly so upward.

20.5 Shale

lower part covered

6-8' thinly interbedded sh. &
siltst. w/ siltst 0.1 to 0.3'

upper 1.5' fissile clay shale

SECTION:
FT. DESCRIPTION & REMARKS

74

5.0 Ss. f-ing, med gr, v. calc

lower 0.6 ft thinly interbedded
siltst, top sharp

Bds 1.2 to 0.5 ft thick
w/ shale drapes

indiv. bed: (equiv to lowest bed)
lwr 0.6' med gr
sm scl trough x-lam
upper 0.6' clgy ripples
& sm. scl troughs,
fg, w/ abd vert
burrows.

Most other beds, small-scl
troughs.

1 Bed: 0.6' has concav. bedg,
flow rolls, ripple clasts
at base, ripples at base.

6.6 Shale being siltier upward

RLS-76; PL77/KA76
abt 3.5' from base

Interp chul fill - point bar
sequence

RLS-77; PL77 KA77
abt 2' above base

SECTION:
FT. DESCRIPTION & REMARKS

75

1.0 Siltst fg, med. w. srt'd,
calc, brn-gry,

Sequence:

1) Soft sed folding, flow
rolls

2) Small scale trough.

Sharp base & top

laterally thickens
1 foot to 1.8' in
4 feet laterally

3.3 Siltst

7.6 Ss., mgr med srt'd, porous
at base, being fg mod w/ srt'd
at top, lt grey,

Sharp base, transit. top
thinner bed at top than
base

lwr. 5 ft lge scale tabular
X-strat; upper prt c/bg
ripples.
up to 4'

SECTION:
FT. DESCRIPTION & REMARKS

76

lower 1 foot has large
plant frags up to 2' long

8.0 Covered

6.6 Ss. med gr at base, to
vfg at top. Mod w/ to
mod srt'd, med gr
w/ thin orange,

Bdg thickness dec upward

upper beds 0.6 to 0.8 ft
lower beds 3-4 ft

Sharp lower contact
transitional upper contact

lge scl tabular X-beds
in lower third,
climbing ripples in
upper part

root mottling & bsd
plant material in
upper 2 feet
upper 2 1/2 ft int bed w/
shale

927
 8.7
 6489
 7416
 80649

typical point bar
 sequence.

SECTION: 77	
FT.	DESCRIPTION & REMARKS
5.9	Shale,
1.3	ss, vlg, silty, prly sorted, roots, no vis strat. transitional base w/ thin sh. interbed.
30.4	Shale, w/ coaly seams ~ 1/4" thick
3.5	intbed ss & sl. (50-50) sd bds 0.4 to 1 ft thick silty vlg sd to siltst. root mottled, no vis strat. irreg. thickness of bds. thin laterally
4.9	Shale.
4.0	ss & sl at base to vlg at top. lt gray. low angle lge scl roots lower part. upper part ripple and sm. scale tang. sharp base, eroded into underlying shale 2'±

SECTION:
FT. DESCRIPTION & REMARKS

78

soft sed folding at base
channel-like form

{ straight-crested ripples
dir of flow: ¹N10W N13W
²N20W N22W
³N45W N45W
⁴N55W N54W
⁵N10W N13W
⁶N20E N18E

20.0 Shale

w/ 1 1/2 ft fg ss, w/ clbg
ripples, roots, 3 bds sep by thin sh
abt 10 ft from top

6.3

Ss. fg, mod srt'd, med gry,
v. calc.,
lower 3 1/2' thick bdd, ^{3" pebbly ss} at base
upper part thin bdd,
(0.4 - 0.6' thick)
uppermost 1 1/2' thin
shale interbeds

climbing ripples throughout
w/ lesser amt sm scale
trif x-lam. vert
plant stems in growth pos.

SECTION:
FT. DESCRIPTION & REMARKS

79

Ripples - sed. directions:

¹N45W N45W
²N35W N36W
³N20E N17E
⁴N50W N50W
⁵N20W N22W
⁶N15W N17W
⁷N25E N23E

6.9 Shale partly covered

1.2 Ss vfg, dk gry, abd
plant frags, no vis strat

3.4 Shale - dk gry.

12.5 Ss. mgr. mod w/ srt'd
non-calc. lt gry, porous

Sharp base w/ undulatory
surface

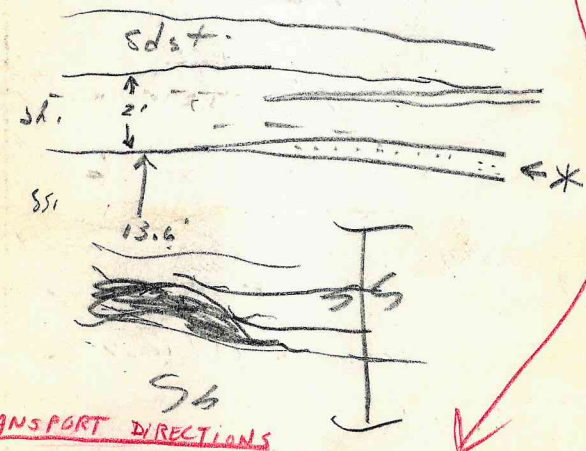
abd veg. matter, coalified
near bottom
Bdg 0.8 - 1.5 ft

well devel. horiz lam
and lg scale trough (?)

RLS-78; PL77 KA78
paleo sample 1 ft
below top of shale
unit

RLS 79; PL77 KA79
LEP 4 ft above base

RLS 80; PL77 KA80
LEP



TRANSPORT DIRECTIONS

- 1 ELIMINATE
- 2 N83W
- 3 N03E
- 4 N10E
- 5 N39E
- 6 N12E
- 7 ELIMINATE

SECTION:
FT. DESCRIPTION & REMARKS

	prob. mostly tabular X-lam, 3ft thick set. Top of unit eroded by overlying unit. 4 N65E 32NW 5 N62E 17SE; 5 N68E 25NW 6 N35E 33NW 6 N75E 37NW 7 N65E 34NW 7 N54E 22NW SEE OPPOSITE PAGE FOR RESTORED ATTITUDES.
13.6	Ss as before Another channel unit marked at base by erosional surface, by pebbly silt & clay Pebbles, ss frags sh & iron stone Upper surface eroded see X Large scale top of X-strat sets 2-5' thick lesser horiz lamination
	Strike of X-beds TRANS. DIR. 1 N45E 38NW N43W 2 N47E 30NW N29W 3 N30E 38NW N83W 4 N45E 13°SE S48E 5 N36E 29NW N72W 6 N35E 27°NW S88W 7 N50E 36NW N31W

SECTION:
FT. DESCRIPTION & REMARKS

9.4	as before med. grained erosional base & top fantastic tabs. 1-3' thick all lge side tabular w/ agl at top, ironstone pebs non calc. abt carb mat'l on bdy. porosity 17% (Kent tongue method) set of X-beds 1 N55E 38°NW 4 N55E 32°NW 2 N68E 40NW 5 N40SE 31NW 3 N68E 13 SW
5.3	Another channel unit lithas before large scale tab sets abt 2-3 ft erosional base & top set of X-beds 1 N89E 33NW 3 N73E 48NW 4 due E 36W
10.0	lithas before erosional base, sd on sd lge scale lo-angle troughs at base: horiz lams in upper 2/3
5.0	1 set of lge scale tabular cross beds. Sd. med gr (RLS 81) poss grds to ag. X-bed 1 N53E 43NW 3 N75E 28NW Sdip 2 N60E 39NW 4 N72E 25NW



Pictures
Roll 2 #15, 6

TRANSPORT DIRECTIONS

- 1 N10W
- 2 N06E
- 3 S78E
- 4 N02E
- 5 N42W

X-BED: N68E 46° NW

- | | |
|--------|---------------------------|
| 1 N03W | } TRANSPORT
DIRECTIONS |
| 2 N34E | |
| 3 N03E | |
| 4 N37E | |

TRANSPORT DIRECTIONS

- 1 N27W
- 2 N07W
- 3 N44E
- 4 N52E

Roll 2 #8 25 at 1/60
RLS 81 5 PL 77 KA 81
LBP

RLS-82; PL 77 KA 82
LBP 12.5' below
top

Levee - flood basin

82

SECTION:
FT. DESCRIPTION & REMARKS

24.3 Sd. f-mgr, sli calc.
dom. horiz lam. w/ low angle
lge scale, tabular X-strat,
sets < 2.0 ft. thick

Upper contact. transitional
ooid plant frag

attitude N42E 24NW

Strike & dip of X-beds
low angle tabulars

N60E 26 NW
T.D. N35E

hi angle lge scale tabular

N80E 44° NW
T.D. N15E

25' Mostly shale partly covered.
Transition to interbedded siltst-sh.

Siltst bds max 0.6' thick

5' Siltst w/ roots in top

83

SECTION:
FT. DESCRIPTION & REMARKS

6.4 Coal black

4.6 Ss. fg / lgry, mod w/ siltst, broad, (20')
low angle, wavy X-strat
lower 2', 2 ft set,
upper 2' nodular, non-
strat. fine ss., w/
roots & plant mottling
& heavy iron stain

uppermost 0.6'
is cross stratified
fine siltst.

Entire siltst filling
low angle broad
channel, sharp base.

TOP OF SECTION

RLS-83; PL77 KA83
SR

SECTION: 7/22/77 Measure section 84 ①	
FT.	DESCRIPTION & REMARKS
	along Kukpowruk River on north flank of Snowbank Anticline at map location: (east bank of Kukpowruk River).
	R3/1 Stacked channels in section
	R3/2 measured 7/21/77.
	R3/3 Norm Kent on snowbank
	R3/4, 5 Contorted diapiric shales in axial regions of Snowbank Anticline. Folds plunge 34 to N80E. B ₅₀ 74, N45W
	R3/6 Steeply plunging fold; Jake along axial trend.
22' 8"	DESCRIBED BY RLS
	SHALE, SLTY M. GRAY FAINT LAMINATIONS CARBONACEOUS TOWARD TOP
	SANDSTONE, Vfg, SLTY M. GRAY IN PART FINE LAMINATIONS ELSEWHERE INDISTINCT SOME ZONES SHOW SIGNS OF DEFORMATION, CALCITE VEINS SOME PARALLEL TO BEDDING OCC.
	SHALE PARTINGS, CALCARIDDS COALY PARTINGS. IRONSTONE NODULES
40' 5"	SANDSTONE, M. GRAY, F & M G. LOWER ? 1.5' MASSIVE, UPPER

From Foot 0

85 (2)

FT.	SECTION: DESCRIPTION & REMARKS
	3' RIPPLE X-LAM. NON-CALCAREOUS
	SHALE
50 7.5	SANDSTONE, L TO M GRAY, fg. SOME HINT OF LAMINATION 1/2 TO 2", EXPOSURE CLEARLY DISTORTED W/ SHALE INJECTED ALONG BEDDING PLANES, FRACTURES.
24	SILTSTONE TO SHALE, M. GRAY
5	SANDSTONE, L TO M GRAY, fg HINT OF RIPPLE LAMINATIONS NOT MUCH OF LAMINATIONS INDISTINCT APPEAR STRUCTURALLY DEFORMED GRADES UPWARD INTO SLTY SHALE. APPEARS OVERTURNED
17	SANDSTONE, L TO M. GRAY ufg SLTY. APPEARS TO BE OVERTURNED
27	SANDSTONE, M. GRAY, WEATHERS BROWN, fg, SLIGHTLY CALCAREOUS RIPPLE LAMINATED, BRECCIATED W/ CALCITE VEINS, COARSER AT TOP, POSSIBLY UP TO SOUTH. (DESC. KWS)
18	SHALE & INTERBEDDED SILTSTONE
0.3	SANDSTONE, M. GRAY, ufg AXIS OF DRAG FOLD
3.0	SHALE & SILTSTONE
6.7	SANDSTONE, M. GRAY, ufg, CALCAREOUS

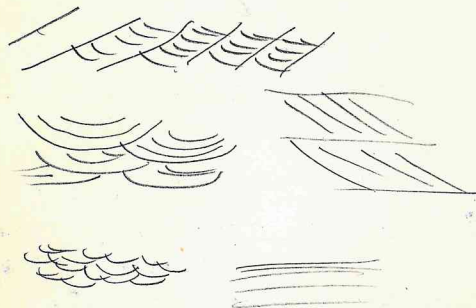
86 (3)

FT.	SECTION: DESCRIPTION & REMARKS
	CALCITE IN VEINS, LAMINATIONS HORIZONTAL TO INDISTINCT,
5.0	SHALE & SILTSTONE
1.4	SANDSTONE, M. GRAY, ufg, CALCAREOUS, SILTY, BEDDING INDISTINCT TO POSSIBLY FINE LAMINATED ON NORTH
8.0	INTERBEDDED SILTSTONE & SHALE SANDSTONE, L TO M GRAY, fg SLIGHTLY CALCAREOUS, CLIMBING RIPPLES, VERTICAL BURROWS BED FACES NORTH NTSW SWN
	HIGHLY CONTORTED - FAULT
4.0	SILTSTONE & SHALE INTERBEDDED
2.6	SANDSTONE, L TO M. GRAY, fg Mg, CALCAREOUS, SLIGHTLY, COALIFIED PLANT MATERIAL ON BEDDING SURFACE, BEDDING INDISTINCT TO CROSS LAMINATED.
2.2	SHALE & SILTSTONE INTERBEDDED
0.7	SANDSTONE, M. GRAY, fg. CALCAREOUS, CLIMBING RIPPLES POSSIBLY FACES TO NORTH
10	SHALE & SILTSTONE INTERBEDDED
	R3/7 Subvertical folds in siltstone and shale axial region snowbank anticline

SAMPLE ^{SA} 84 @ 28' above
base of shale unit.

SECTION: 87 (4)	
FT.	DESCRIPTION & REMARKS
30	SILT STONE & SHALE INTERBEDDED
12	SANDSTONE, D. GRAY, fg, ABUND. FRACTURES FILLED W/ CALCITE POSSIBLY FACES TO SOUTH
15	SILTSTONE & SANDSTONE, vfg INTERBEDDED, HIGHLY FRACTURED
12	SANDSTONE, M. GRAY, #1. MG WEATHERS BROWN, INDICATION OF RIPPLING, CARBONACEOUS MATERIAL ON BEDDING PLANES COVERED AT TOP
10	COVERED
5	SANDSTONE, L TO M GRAY, fg RIPPLED CARB. MATERIAL ON BEDDING PLANES.
5	SHALE PARTLY COVERED
5	SANDSTONE, M. GRAY, fg, NON CALC., X-LAM. IN SETS UP TO 1/2" THICK (TROUGH) TOP COVER
10	CONTORTED ZONE, PART COVER SUBVERTICAL FOLDS
7	SANDSTONE, M. GRAY, WEATHERS BROWN, fg, X-LAM. IN SETS UP TO 3", SH. CLASTS, OUTCROP PART. COVERED
25	COVERED
10	SANDSTONE, M. GRAY WEATHERS BRN. fg, v. SLT CALC., SLT CARB. TROUGH LAM., SH. CLASTS.
10	GRDS INTO HORIZONTALLY LAM SCTY vfg SS AT BASE & TOP

SAMPLE SA85A -
shale -



88 (5)

FT.	SECTION:
	DESCRIPTION & REMARKS
4'	SHALE & SILTSTONE, INTERBED.
7'	SANDSTONE, L. GRY, fg, CAM. VAUGE, POSS. RIPPLE X-LAM, VERT. ROOT STRUCTURES; POSS FACES TO NORTH. TOP COVERED
7'	COVERED
7.5'	SANDSTONE, M GRY, WEATHER BRN, fg, CARB. CLIMBING RIPPLES - SETS 2-3", ROOT & VEG. MAT, OBLIQUE OR NORMAL TO BEDDING
12'	SHALE, MOSTLY COVERED
20'	CONTORTED ZONE
6'	SHALE & SLTST INTERBEDDED
31'	SANDSTONE & INTERBEDDED FINE CAM SCTSTONE. INDIVIDUAL SS & 0.2-0.3' THICK. M. BRN, fg, BASE CONTACT SHARP W/ LOAD STRUCTURES (BEDS FACE SOUTH) CONVOLUTE LAMINATION, UPPER SURFACE LOCALLY RIPPLED
7.5'	SHALE (DOWN SECTION) FLASER STRUCTURE INTERBD Vfg SS & SLTST. 0.1-0.2' THICK AT BASE. (TOP) N86E S1 NW OVERTURNED MEASURED ON SS ABOVE. (3.1)
40'	SANDSTONE, M GRY WEATHERS BRN, fg, DEPOSITIONALLY LOWER 2.5' BEDDING MASSIVE TO INDIS- TINCT. UPPER 1.5' X-LAM, VER.

89 (6)

FT.	SECTION: DESCRIPTION & REMARKS
	ROOT STRUCTURES THRU OUT, ABUND. PLANT MAT.
118	SHALE & INTERBEDDED SILTST 0.1' THICK 2 TO 3 OF 0.3' SS, vfg, M. GR.
170	MOSTLY COVERED, PROB. INTER- BEDDED SILTST & SH
60	SANDSTONE, L GR, vfg, LOWER 25' LAM 1/2 TO 2" THICK, BEDD CARB. MAT. NEXT 1' RIPPLED, 1.2' HORIZ. LAM, LOCALLY WAVY, 0.4' TROUGH X-LAM, 0.2' PARA HORIZ. LAM. vfg SCTY SANDSTONE. QZ UPPER PART - RIPPLE X- LAM. W/ VERT BORROWS RIPPLE DIRECTION OF TRANSPORT S85E. FACES NORTH.
60	SANDSTONE, M. GR WEATHERS BRN, fg ^{SCTY} BEDDING INDISTINCT LOCALLY CLIMBING RIPPLES ABUND. VERT BORROWS, ABUND COALIFIED PLANT DEBRIS ON BED SURFACES. SHALE PARTINGS UP TO 1/2" THICK AT 2" TO 6" INTERVALS POSS. ROOT STRUCTURES, SLIGHTLY CALC., UPPER SURFACE SHARP

7/23/77 Continue measuring
section (Kukpowuk - 90

FT.	SECTION: DESCRIPTION & REMARKS
	Corwin) on north flank of Snowbank Anticline West bank of Kukpowuk River.
	NGOE 68NW
193	SHALE, M. GR PARTLY COVERED AT BASE
26	SANDSTONE, M. GR WEATHERS GRY, fg, SCTY, BOTTOM CONTACT SHARP, TOP CONT. SHARP, NON- CAL, CARB MAT ON BEDDING, CLIMBING RIPPLES THRU OUT VERT. BORROWS? THRU OUT
108	SHALE, M GR
06	SANDSTONE, M. GR , M. GRN BRN, WTHRS BRN, CALC. BASE SHARP, THIN BEDDED, RIPPLE X-LAM, THINNER BEDDED NEAR TOP, TOP GRADATIONAL
46	SHALE & SILTSTONE MOST. COV.
05	SANDSTONE, M GR, WTHRS BRN
03	GRY, CALC, BASE SHARP, X- LAM. TOP GRADATIONAL INTO SH.
45	SHALE, PART COVERED
45	SANDSTONE, M. GR, WTHRS GR fg, SCTLY CALC. BASE & TOP COVERED, SMALL SCALE TROUGH X-LAM AT BASE, NO STRUCT @ TOP, ROOT STRUCT.

RIPPLE X-LAM = SMALL SCALE
TROUGH

SAMPLE SA 85B

91 ②

FT.	SECTION:	DESCRIPTION & REMARKS
23		SHALE, D. GRAY, PART. COV.
22		SANDSTONE, M. GRAY WEATHERS BRN, fq, MOD. CALC. BASE GRADATIONAL W/ SH. & SLT., LOAD STRUCT, LENTICULAR, CARB. BEDS 0.05 TO 0.3', THIN BEDS RIPPLED, LARGER MASSIVE.
14		SHALE, D. GRAY
38		SANDSTONE, LT GRAY, WTHRS LT BRN, fq (CLEAN), NON- CALC., V. LITTLE CARB, BASE COV. SHARP, LARGE SCALE TROUGH X-BEDDING, SETS 2 TO 3' THICK, 10' ACROSS, RIPPLED TOP SURFACE, PARTING LIN. ON BEDDING PLANES, TOP SHARP
44		SHALE, M. GRAY, PART. COV. LITTLE SLT.
06		SANDSTONE, M. GRAY, WTHRS GRAY, fq, NON-CALC. HORIZ LAM BASE COV. CLAMS ON BED BOTTOM TOP SHARP
16		SHALE, L. TO M. GRAY
17		SANDSTONE M. GRAY, M. GRAY, ufq, INTERBEDDED W/ SHALE
105		SHALE, M. GRAY SAMPLE 5' FROM BASE JA 85B
33		SANDSTONE, M TO L. GRAY, L. GRAY fq, NON CALC, SLTLY POROUS COVERED BASE & TOP, MOD TO HEAV.

92 ③

FT.	SECTION:	DESCRIPTION & REMARKS
		BIOTURBATED W/ VERT BURROWS NO VISIBLE STRAT, RIPPLED AT TOP.
151		COVERED PROB. SHALE SAMPLE SA 86 @ 105' @ 120' SANDSTONE 4' THICK M. BRN GRAY, fq NON-CALC. BASE & TOP COV. APPEARS TO GRADE UPWARD INTO SLTST & SH, SMALL SCALE TROUGH X- LAM THRU OUT.
345		SANDSTONE, LT GRAY, M. GRAY, ^{STLY} SAND CALC. SHARP BASE, LARGE SCALE ^{& MODULAR} TROUGH X-BEDDING, SETS 2 TO 5' THICK, ABUND PLANT & CARB MAT ALONG BEDDING PLANES SHALE CLASTS TO 1", SANDS LOCALLY PBLY. PBLs: BLK CHT, RED STAIN, FE NODULES & SAND STONE, SAMPLE 4' FROM BASE
68		SHALE W/ A FEW INTERBED SLTSTONES
21		SANDSTONE, M. GRAY, fq, M. SORT STLY CALC. SHARP BASE, NO VLS. STRAT. TOP COV.
20		COVERED PROB. SH.
86		SANDSTONE, M. GRAY, LT GRAY, ufq, NON-CALC, THIN BEDDED FINELY LAM, LOW ANGLE LARGE SCALE TROUGH X-BEDS, SHARP TOP W/ LONG CRESTED RIPPLES

SAMPLE SA 86

SAMPLE SA 87

SAMPLE SA 88

3' FROM BASE OF OVERLYING
SANDSTONE.

SAMPLE SA 89

3' ABOVE BASE

SAMPLE SA 90

8' FROM BASE.

FT.	SECTION: DESCRIPTION & REMARKS
	PALED CURRENT ON RIPPLES N7SE.
186	SHALE, M. GR. - @ 3.3' A
188	0.8' SS BED. SPL 3' FROM BASE OF SS ABOVE SANDSTONE, LT. GR. WEATHERS
	LT. BRN., MG @ BASE fg AT TOP NON-CALC. ABUND CARB MAT. HORIZ. LAM, THIN BEDDED. PEBBLY ZONES: PBLs: SS, FE ST & SH TO 0.4', LARGEST PBLs AT BASE. BASE SHARP, TOP GRAD. UPPER 1.5' SMALL SCALE TROUGH X-BEDS
29	SHALE, M. GR. w/ CLIMBING RIPPLES
12	SANDSTONE, M TO LT GR, LT BRN GR, MG, HORIZ LAM. GRADATION AC UPPER CONTACT
29	SANDSTONE, M. GR., MGRY, fg, PART COV.
65	SANDSTONE, M. GR., WEATHERS LT GR TO LT BRN, NON-C MG NON-CALC. @ 16' PEBBLY SS COBBLES TO 0.6' ON LONG AXIS PBLs: SS & FE ST, BED ~1' THICK @ 34' - 2.2' COVERED (WHOLE UNIT) → SHARP BASE - EROSIONAL, MG AT BASE BECOMES UFG GRADING INTO SHALE DUE TO ^{LAMINATED SANDSTONE} ZONE @ TOP LARGE SCALE TROUGH & TAB ULAR CROSS STRATIFICATION. SETS 3 1.5 TO 6.0' THICK ABUNDANT SCOUR & LATERALLY

FT.	SECTION: DESCRIPTION & REMARKS
	DISCONTINUOUS UNITS
	STRIKE & DIP OF LARGE SCALE X-BD NBSW SS NE MASTER BEDDING TRANSMIT DIRECTION
	1. N90E, 64 N N34W
	2. N85E, 76 N N25W
	3. N85W, 79 N N06E
	4. N85E, 74 N N27W
	5. N80E, 60 N N86W
	6. N89W, 70 N N14W
	7. N84W, 69 N N13E
	8. N88W, 68 N N08W
	9. N83E, 74 N N13E
	10. N90E, 74 N N09W
	11. N80E, 66 N N64W
	12. N86E, 70 N N32W
	13. N50W, 74 N 586E
	14. N86E, 53 N 558W
	15. N80E, 71 N N47W
	16. N85W, 68 N N02E
	17. N76E, 66 N N68W
	18. N80W, 72 N N18W
	19. N84E, 78 N N25W
	20. N88E, 54 N 562W
62	SHALE, PARTLY COVERED
24	SANDSTONE, BRN GR, MG, NON-CALC. CARB. MAT - WOODY FRAG, RIPUP CLASTS, MOSTLY COVERED
35	COVERED, PROB. SHALE

SAMPLE SA 91

17' FROM BASE OF SHALE

SAMPLE SA 92

FROM MIDDLE OF SANDSTONE

95

6

FT.	SECTION: DESCRIPTION & REMARKS
	SANDSTONE, LT. GRAY, WEATHERS LT. BRN GRAY, vfg. NON -CALC. SHARP BASE w/ LOAD CASTS SHARP TOP. LARGE SCALE X- LAMINATED, SETS < 2' THICK. HORIZ. LAM IN UPPER 0.2'
25'	SHALE, D. GRAY, SAMPLE 17' FROM BASE SA 91 SOIL ZONE @ TOP
31'	SANDSTONE, M. GRAY, WEATHERS LT. GRAY, fg, NON-CALC, SHARP BASE, BEDS UPWARD FINE, BEDS < 0.4', WAVY IRREG. BEDS SEPERATED BY ORGANIC RICH SILTSTONES, CLIMBING RIPPLES THRU OUT TRANSITIONAL UPPER SURFACE.
1'	SHALE, SILTY M. GRAY
26'	SANDSTONE, M. GRAY, fg, M. SORTED, NON-CALC. SHARP BASE (EROSIONAL) SHARP TOP, BEDS 0.4' TO 0.6' THICK, SEPERATED BY SILTSTONE BEDS, SMALL SCALE TROUGH X-STRAT & CLIMBING RIPPLES, BURROLED AT BASE.
75'	SHALE, M. GRAY
43'	SANDSTONE, M TO LT GRAY WEATHERS LT. BRN GRAY, NON Mq, NON CALC, BASE SHARP w/ ^{VERT} BURROWS. NO VIS. STRAT. LARGE PLANT FRAGS 0.5' UPPER SURFACE SHARP w/ RIPPLES PALED CURRENTS

SAMPLE SA 93
FROM TOP OF SHALE

SAMPLE SA 94
FROM 1' BELOW TOP OF BIO-
TURBATED ZONE. (FOSSILS FROM HERE)

SAMPLE SA 95
10' FROM TOP OF SHALE

SECTION: 96 (7)	
FT.	DESCRIPTION & REMARKS
	NLSW. TD: N50W
56	SHALE, D. GRAY SAMPLE SA 93 TAKEN AT TOP OF SHALE.
27	SANDSTONE, LT BRN, WEATHERS LT BRN, m to fg, v. STLY CALC. SHARP BASE, TOP COVERED (LOCAL) LARGE SCALE TABULAR X-BEDDED IN LOWER 5' 3' THINNER BEDDED NON STRAT. 1' COVERED, 5' BIODTURBATED, VERT BURROWS W/ FOSSILS; CLAMS INOCERIMUS(?) LK, UPPER PART LARGE SCALE TROUGH CROSS STRATIFIED. SA 94 1' BELOW ^{TOP} BIODTURBATED - PEBBLY SANDSTONE W/ CHERT TBS IN BIODTURBATED ZONE.
24	SHALE D. GRAY, M GRAY, SAMPLE 94 5 10' FROM TOP
32	SANDSTONE, M GRAY WEATHERS LT GRAY AT BASE D. GRAY AT TOP fg AT BASE TO vfg AT TOP. SHARP BASE GRADATIONAL TOP FINES UPWARD BEDS THIN UPWARD TO LARGE SCALE TROUGHS FILLING CHANNEL. BED THINS TO WEST.
42	SHALE D. GRAY, M GRAY, v. THIN INTERBEDDED vfg SS & SLTST.
32	SANDSTONE, M. TO LT GRAY, fg.

SAMPLE SA 96
4' FROM TOP OF SHALE

97 (8)	
FT.	SECTION: DESCRIPTION & REMARKS
	W/ INTERBEDDED SLTST, NON-CALC. CARB MAT ON BEDDING PLANES, CLIMBING RIPPLES THROUGHOUT, BASE CON. TOP SHARP
26.4	SHALE M. GRAY
3.5	SANDSTONE M. BRN GRAY
	WEATHERS LT BRN GRAY NON CALC. CARB MAT ON BEDDING PLANES GRADATIONAL BASE TO TOP. SHARP TOP, TROUGH X-LAM, THIN BEDDED W/ SILTSTONE PARTINGS SPACED FROM 1" TO 3"
82.7	SHALE M. TO D. GRAY W/ INTERBEDDED vfg SS & SLTST IN THIN BEDS < 0.5', BECOMING SILTYER AT TOP
9.5	SANDSTONE D. GRAY, LT GRAY fgy & SILTY, BASE TRANSITIONAL NON-CALC. HORIZ. LAM < 1/2" NO BURROWING, TOP SHARP
6.5	SANDSTONE LT GRAY, MG, SILTY, MOD SORTED, GRAINS ANGULAR, NON-CALC. BASE SHARP (EROSIONAL), BIOTURBATED W/ VERTICAL BURROWS NO APPARENT STRAT. NUMEROUS RIPUP CLASTS AT TOP. TOP COVERED, FOSSED WOODY
37.6	SHALE, D. GRAY, MOD GRAY SAMPLE SA 96 4' FROM BASE TOP

SAMPLE SA 97
FROM 5' FROM TOP OF SAND

SECTION: 98 (9)	
FT.	DESCRIPTION & REMARKS
42	SANDSTONE, M. GRAY WTH LT GRAY fg, NON-CALC. TRANSITIONAL UPPER & LOWER CONT. MAX. BED THICKNESS 2' AT BASE, 0.4' AT TOP, THEN SHALE INTERBEDS SMALL SCALE TROUGH & CLIMB- ING RIPPLES.
18	SHALE, M GRAY
22	SANDSTONE, M. GRAY WTHRS LT GRAY fg, MOD WELL SORTED, NON-CALC TRANSITIONAL BASE, LOW ANGLE TABULAR FORE SETS, ROOTS & ABUND. PLANT MAT. TOP THIN NER BEDDED & TRANSITIONAL.
38	SHALE M. GRAY W/ THIN SS ^{INTER} BEDS, @ 2.5' from BASE 40.5' & @ 8.0' from BASE 1.5' THICK
16	SANDSTONE, M. GRAY WEATHERS LT. GRAY, vfg to fg FINES UPWARD MOD CALC. SHARP BASE. TRAN SITIONAL TOP, LITTLE VISIBLE STRAT SOME SMALL SCALE TROUGH X-LAM., RIPPLE CLASTS. AT BOTTOM, LOCALLY HORIZ BURROWS, SAMPLE 97 @ 5' FROM TOP.
10	SHALE, D. GRAY
16	SANDSTONE, LT. GRAY WEATHERS V LT GRAY, fg AT BASE & TOP NON-CALC., BASE TRANSITIONAL OVER 6', BEDS THICKEN UPWARD

FT.	SECTION:	DESCRIPTION & REMARKS

COWDER C' HAS LOW ANGLE
TROUGH X-STRAT, SETS < 2'.
THIN BEDDED, UPPER PART
HEAVILY BIOTURBATED, VERT
BURROWS, NO STRAT, SHALE
CLASTS AT TOP.

7³
6² COVERED, PROB SHALE
SANDSTONE, LT GRAY WEATHERS
D TO M. GRAY, fg, M. TO V. CALC.
BASE COVERED TOP COVERED.
LARGE SCALE TROUGH, LOW
ANGLE X-STRAT, BEDS 28' TO
1.6' THICK, ROOTS $\frac{1}{2}$ CARB MAT

FT.	DESCRIPTION & REMARKS
	1. 1000 YARDS
	2. 1000 YARDS
	3. 1000 YARDS
	4. 1000 YARDS
	5. 1000 YARDS
	6. 1000 YARDS
	7. 1000 YARDS
	8. 1000 YARDS
	9. 1000 YARDS
	10. 1000 YARDS
	11. 1000 YARDS
	12. 1000 YARDS
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	16. 1000 YARDS
	17. 1000 YARDS
	18. 1000 YARDS
	19. 1000 YARDS
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	21. 1000 YARDS
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	39. 1000 YARDS
	40. 1000 YARDS
	41. 1000 YARDS
	42. 1000 YARDS
	43. 1000 YARDS
	44. 1000 YARDS
	45. 1000 YARDS
	46. 1000 YARDS
	47. 1000 YARDS
	48. 1000 YARDS
	49. 1000 YARDS
	50. 1000 YARDS
	51. 1000 YARDS
	52. 1000 YARDS
	53. 1000 YARDS
	54. 1000 YARDS
	55. 1000 YARDS
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	57. 1000 YARDS
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	62. 1000 YARDS
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	70. 1000 YARDS
	71. 1000 YARDS
	72. 1000 YARDS
	73. 1000 YARDS
	74. 1000 YARDS
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	76. 1000 YARDS
	77. 1000 YARDS
	78. 1000 YARDS
	79. 1000 YARDS
	80. 1000 YARDS
	81. 1000 YARDS
	82. 1000 YARDS
	83. 1000 YARDS
	84. 1000 YARDS
	85. 1000 YARDS
	86. 1000 YARDS
	87. 1000 YARDS
	88. 1000 YARDS
	89. 1000 YARDS
	90. 1000 YARDS
	91. 1000 YARDS
	92. 1000 YARDS
	93. 1000 YARDS
	94. 1000 YARDS
	95. 1000 YARDS
	96. 1000 YARDS
	97. 1000 YARDS
	98. 1000 YARDS
	99. 1000 YARDS
	100. 1000 YARDS

DESCRIPTION & REMARKS

Cape Lisburne.
R3/9-25 Ivigik Mtn (E-K?)
3 mi. N of Cape Lewis (Lishb)
Photos of refaulted cleavage,
thrust faults + associated
folds and fractured limestone,
coral (favosites-type) heads,
sponging.

95

7/25/77: measure section 101	
SECTION:	
FT.	DESCRIPTION & REMARKS
	along west bank of Kukpawuk R., north flank of Snowbank Anticline.
23.1	S ₀ : N85E, 55N
	shale + siltstone, mostly covered.
2.5' 3.3'	sandstn, fine-grained, mod. gray, ripple laminated. Root structures concentrated on bedding surfaces. Sandstn interbedded with shale + siltstone beds 0.5' thick. Sand beds thicken toward top from 0.4' at base to 0.9' at top.
15.6	shale + siltstone
2.0	Snd, v.f.g., silty, thin- bedded w/ silty interbeds; root structures.
30.0	interbedded shale + siltstone.
1.0	SANDSTONE 15' below
1.0	Snd, v.f.g., silty.
4.9	shale, SAMPLE SA98 from 32' above base.

102

SECTION:	
FT.	DESCRIPTION & REMARKS
4.0	Identical to sandstone below (3.5).
3.3	Shale, siltstone.
2.1	Sandstn, f.g., m. brn, at horiz. lam., vert. roots. Sply?
1.6	Shale
4.4	Same as 2'- sand below. Sply?
8.4	Shale
0.5	Sandstn, f.g., silty, no strat, root mottled.
10.2	Shale.
4.6	Interbedded sandstone, shale. Sandstone v.f.g. to f.g., mod. gray. Beds thicken upward from 0.2' to 1.0' near top. Climbing ripple lamination. Vert. burrows or roots?

42 Interbedded sandstone + shale, in 0.2' to 0.6' interbeds wh/thicken toward top. Sandstone, v.f.g., silty, small-scale trough cross-lamination - Splay sand.

347 Untubedded shale + siltstone, mod-pk gray. Partly covered

35 Sandstone, fine-grained, mod. sorted, sharp base, top transitional into overlying sh + siltstn. Low angle large-scale trough cross-bedding, w/ small scale cross-lamination, fines upward. Small channel.

18 shale, siltstone,

126 Shale.

18 Sandstone; v.f.g., silty, abund. carb. mat'l. Interbed with shale in 0.2' - 1.0' interbeds wh/thicken at top. Abundant root structures at top. Splay?

29 Shale.

31 ~~S~~ Sandstone, f.g., mod. gray, Sharp base, trough ripple laminated at base; climbing ripples at top. 2.5' at base to 0.2' at top. Channel?

31 Untubedded ss + sh. Two ss beds 0.8' thick. Fine-grained. channels?

50 shale

103	
FT.	SECTION: DESCRIPTION & REMARKS
0.6	Sandstone.
53.4	Shale.
5.1	Sandstone, f.g., m. gray, sharp base, horiz. lamination throughout w/ local rippled zones 0.1'-0.2' thick. Mod. sorted. thin-bedded. Abut. parting lineations; non-calc.
7.7	Shale
0.7	Sandstone, f.g., m. gray, mod. sorted, small-scale trough cross-laminated, sharp base w/ lower load structures; upper surface rippled.
8.3	Shale.
13.2	Sandstone. Base transitional into underlying shale. Lower 2.5 ft. fine grained, mod. well sorted, mod. gray, with climbing ripples. Sands lenticular w/ erosional base locally. Sample SA99. From 2 nd ft above base.

104	
FT.	SECTION: DESCRIPTION & REMARKS
7.3	Shale, mostly covered.
3.4	Sandstone 2.2' thick Shale 0.7' Sand 0.5'
	Lower sand - large scale trough, medium-grained, clean. Upper sand - climbing ripples. fine-grained.
48.2	Shale. Sample SA101 @ 35' above base.
1.3	Sandstone, f.g., med-lt. gray, clean, ripp trough cross-laminated.
11.2	Shale + siltstone.
8.1	Very thinly interbedded sandstone (v.f.g., silty) and shale. Carbonaceous mat'l on bedding surfaces. Sandstone laminae contain very fine trough cross-laminations.
2.2	Sandstone Sandstone, f.g., m. brn., base laminated (none) and transitional w/ underlying sand-shale interval. Middle part contains climbing ripples. Upper part trough cross-laminated.

Upper 10⁵ feet consists of
nodular-bedded sands
approx. 0.2' thick interbedded
w/ shale. Abundant root
structures. m.f.-fg, silty.

R3/34 channel structure
overlain by levee
deposits?

21⁹ shale, siltstone.

~~5⁶~~ Sandstone, med. grained w/
13⁶ pebbles (shale) at base,
fining upward to fine-grained
at top. Well sorted.
Horizontal lamination - possibly
foresets of large tabular
cross-beds. SAMPLE SA100 -
3⁶ above base
5⁶ covered interval, possibly
sandstone.

14³ Sandstone, same as 13⁶
interval below. Abund. parting
lineations

in sets up to 0.8' thick in
small scours. 2'-8' in lateral
extent.

8² Shale.

5⁴ Sandstone, fine-grained, m. gray,
clean, well sorted, lower
3⁵ ~~is~~ small scale trough
cross lamination w/ abundant vert.
root structures up to 0.8' long.
Upper 12 v.fg. w/ horiz. lamination and
grades upward into shale.
12² Shale

18⁵ Sandstone, f.g., m. gray,
well sorted. ~~4~~ progradational
packages 4.5' thick, within
packages bedding thickens
upward from 0.1' at base
to 1.0' at top. Lower
part trough cross-laminated,
upper parts ~~wavy~~ wavy horiz
lamination. Abund. coaly partings.

105	
FT.	SECTION: DESCRIPTION & REMARKS
	Rocks up-section from here weather reddish orange - brown?
15'	Shale.
3'	Uninterbedded v.f.g. sands in shale. ss beds 0.3' thick or less w/ trough x-lam sets approx equal to bed thickness. Flaser structure.
13'	Shale
3'	Sandstone, f.g., lt. mod. gray, lenticular; large scale tabular cross-bedding; trough cross-lamination, ripples on cross-beds? Poorly sorted. Base sharp w/ shale pebbles. Lower part tabular x-bed; upper one-half small-scale trough x-lam.
7'	Shale
0.5'	Sandstone f.g., horiz. lam. abund. carb. mat. on bedding surfaces.

106	
FT.	SECTION: DESCRIPTION & REMARKS
3'	Shale
1'	Sandstone, f.g., ^{horizontally} rippled cross laminated, middle interval contains centriclinal cross-lamination.
1'	Shale
2'	Sandstone, f.g., massive, ball and pillow structures.
3'	Flaser interbedded shale + v.f.g. silty sandstone.
1'	Shale
1'	Sandstone, f.g., sharp erosional base, lenticular, no vis strat, ripples at top, burrowed on upper surface.
30'	Shale, partly covered.
6'	Sandstone, f.g., rippled small-scale trough cross-laminated, interbedded with shale interbedded. ss in 1.0' - 0.3' beds w/ thickening upward. Base and top transitional.
3'	Shale

10⁸ Shale, flaser bedding
in top 0.5'.

4⁹ Sandstone, f.g., med. gray,
weathers orange-brown; trough
cross-bedded in sets 0.5' thick.
~~the~~ BI-directional foresets.
Individual sands 10' max. and
traceable laterally for 12' or less.
Two main sands at top + base
of interval, separated by
shaly interval w/ flaser
bedded thin sand beds.
Tracks and trails on upper
surfaces of sands.

Heavily burrowed - silt marks
when pooping his way out.
Tidal channels? Upper ss
bed fines upward.

13⁸ Shale

3³ Sandstone, v.f.g., argill.,
reddish brown, trough cross-
laminated.

0⁹ Sandstone, v.f.g., horiz. lam.,
poorly exposed.

2⁰ Shale.

1⁰ Sandstone, f.g., med. sorted,
convoluted bedding; bed thickness
irregular.

14⁸ Shale.

11⁰ Sandstone, fine to med. grained,
lower 4.0' progradational unit
of interbedded sand + sh. w/
ss beds thickening upward.

Next 3.0' same.

Upper 4.0' contains v. thin bedded
siltstone, v.f.g. sand w/ coaly ~~sand~~-shaly
partings. Upper surface rippled.

18⁶ Shale - v.f.g.

2⁹ Sandstone, ~~interbedded~~ w/
shale and siltstone at base,
coarsening upward; beds thicken
upward from 1/2' at base
to 0.8' at top.

75⁰ Shale. Sample SA 102 at 35'
above base. Thin interbeds of ss

FT.	SECTION: DESCRIPTION & REMARKS
	w/ climbing ripples 8" from top, flow rolls (ss balls w/ convolute lamination)
28	Sandstone, f.g., small-scale trough cross-lamination; top, bottom covered. (107)
6'	Shale
02	Sandstone, v.f.g., small scale trough; splay sand?
6'	Shale
20'	Interbedded sandstone, shale. SS beds comprise 30% of interval and are 0.4' - 1.5' thick; local small-scale troughs but mainly horizontally laminated.
732	Sandstone; body composed of 5-6 genetic units ranging from 3' to 15' thick. Each genetic unit consists of a basal member of medium-grained pebbly sandstone grading up through medium-grained sand with shale parting at top. Upper genetic units contain fine-grained sand. Shales may represent channel- abandonment fill. Sand body as a whole becomes very thin bedded at top. Abundant carbonaceous mat on

FT.	SECTION: DESCRIPTION & REMARKS
6'	Sandstone, fine grained, lower 4.0' small scale trough x-lam. upper 2.0' horizontally laminated.
6.2'	Sandstone, siltstone, thin interbedded, grading down into sandstone, upward into shale.
20'	Shale
	Sandstone, medium grained, med. gray, moderately well sorted, lithic; beds thin upward and upper part is interbedded with shale beds 0.3' thick. 2-3' beds at base, 0.3' beds at top. Upper beds horizontally laminated and contain root structures.
40'	Shale.
36.5'	Sandstone, ^{locally pebbly} medium to fine- grained tabular cross-bedded in sets up to 3' thick. Base sharp w/ lag of coarse carbonaceous material.

bedding surfaces. Upper genetic units abundantly ~~rippled~~ trough cross-laminated. Large scale tabular cross-sets in lower units.

Sample SA 103 - 10° above base

Sample SA 104 - 40° above base

25° Shale; lower 15° interbedded w/ v.f.g. ss w/ climbing ripples.

22 Sandstone, f.g., sharp base, interbedded shale near top. Low angle large scale trough x-bedding and small scale trough x-lam.

18° Shale. ss 0.3' thick at 12°.

Top 15.0' thin bedded (0.4') v.f.g. ss interbedded with 0.2' shaly intervals. ss contains small scale trough cross-lamination and climbing ripples in uppermost 2°.

SAMPLE SA 105 - 2° above base

SAMPLE SA 106 - 30° " "

~~32°~~ Shale, siltstone and interbedded thin sands up to 0.3' thick. Sand contains 15% of internal. Siltstns contain roots.

SAMPLE SA 107 - coaly

Shale 12° below top -

SAMPLE SA 108 - 30° above base of 52° shale section.

7' Sandstone, f.g., at base - v.f.g. at top; lower 2° horiz. lam., upper ~~4°~~ 4° small-scale troughy uppermost part climbing ripples, thinner bedded.

SECTION:
FT. DESCRIPTION & REMARKS

109

72.5 Shale, w/ interbedded progradational ss intervals • 3" thick at 10, 20, 30 ft above base. Prograd. bed sequences ~~thicken upward from~~ contain beds w/ thicken upward from 0.2' at base to 0.8' at top.

7.3 Interbedded ss + sh. ss silty, v.f.g., beds 0.2' to 0.6' thick. beds thicken upward thru lower 1/3, then thin to middle. Beds thicken from middle to top. Sands comprise ~60% of interval. Bedding plane burrows.

7.4 shale.

7.5 Sandstone, fine grained ~~dark~~, argill. ~~fining upward to~~ beds thin upward from 1.5' at base to 0.4' at top. top grades into overlying shale. Trough cross-lam.

SECTION:
FT. DESCRIPTION & REMARKS

110

5.8 Shale

2.1 Sandstone, f.g., in thin lenticular beds w/ erosive bases, climbing ripples.

8.8 Shale w/ 0.8 ss bed at top.

0.6 Shale.

3.5 Sandstone, nodular, f.g., in 0.4' beds interbedded w/ siltstone. Sands locally trough x-lam, but mostly indistinct.

3.9 Shale.

3.1 Sandstone, v.f.g., sharp base, lenticular, trough x-lam upper 1/2; climbing ripples lower 1/2. Laminar defined by concentrations organic mat'l.

2.7 Shale, silty.

40[±] Shale

3[±] sandstone, fine grained,
med gray, beds + base
transitional; interbedded
with shale w/ max bed
thickness 0.8'. Interval
consists of 85% sand.

4[±] shale, 1.0' coaly bed in
center.

3[±] Sandstone, f.g., mostly covered.

~~5[±]~~ shale, silty.

2[±] Sandstone, f.g., well-sorted,
small-scale trough w/
contorted laminations.

7[±] shale, grading upward into
ss beds interbedded w/ sh in beds
0.2' thick. ss beds thicken
upward to 1.5' on top.
through cross-laminated.

1[±] Sandstone, v.f.g., silty,
climbing ripples.

3[±] shale

1[±] Sandstone, v.f.g., silty,
climbing ripples, abut.
organic content.

4[±] shale, interbedded
Sandstone (50%) 1.0'
sand at top w/ fossil logs;

6[±] shale

4[±] Sandstone, base sharply (3")
transitional, grading upward
into fine-grained sand;
horiz. lam - vague. Internal
scour surfaces.

SECTION: 111	
FT.	DESCRIPTION & REMARKS
5.0	Shale
1.5	Sandstone, f.g., no str.
3.7	Shale
8.1	Interbedded ss, sh, siltstn. ss beds from 0.4 to 1.5' thick. Sand ~50% fine-grained, coalified plant, wood fragments; no conspicuous STRATIFICATION.
5.5	Shale.
3.3	Sandstone interbedded w/ siltstone partings. ss beds thicken upward from 0.8' at base to 0.1' at top. Base transitional.
2.8	Shale.
2.5	Sandstone + interbedded shale. 80% ss. f.g. thin, irreg. beds; no conspic. strat.

SECTION: 112	
FT.	DESCRIPTION & REMARKS
2.0	Sandstone, large (2") climbing ripples, current deformed, fine-grained.
7.1	Shale
4.3	Sandstone, f.g. to v.f.g., trough x-lam., abut. root structures.
4.5	Shale
1.2	Sandstone, f.g., trough? x-bedded.
3.4	Shale.
3.5	Sandstone, f.g. to med. g., trough x-lam throughout. Poor exposure.
39.6	Siltstone sh./comprised of 10" thick small progradational intervals topped by siltstone. Partly covered.
6.2	Sandstone, base and top transitional. Base sharply transitional over 0.3' interval; top over a 3' interval. Fine grained.

3⁴ shale
1⁶ ss, same as below,
4⁰ shale.

14⁷ shale w/ 3 ss beds,
ea. 0.8' ~~thick~~ 2.0'
thick; upper surfaces
rippled, horiz. lam.,
middle bed contains
small scale troughs w/
abundant roots.

87⁰ shale
SAMPLE SA109 - 50' above
base.

2² sandstone, f.g., small-scale
trough x-lam, rippled upper
surface.

9⁴ shale

trough cross-laminated
throughout; abundant root
structures at top.

21³ shale, 50% interbedded
sltstn. coaly interval ~~thick~~
at 20' above base, 1.3' thick,
v. fissile, platy.

2² sandstone, fine-grained, med.
gray, small scale trough
cross-laminations, horiz. lam. in
lower 1/4.

5³ shale.

4⁸ sandstone, f.g., climbing
ripples.

5² shale.

0⁸ sand

1.0 shale

1.0 sandstone.

10⁴ shale, top 4⁰ is
sandstone, f.g., climbing
ripples in poorly exposed.

SECTION: 113	
FT.	DESCRIPTION & REMARKS
4.5	Coal - SAMPLE SA 110.
2.0	Covered - from center of bed.
	Filling abandoned channel?
10.2	Sandstone, f.g., large scale tabular x-bedding in sets up to 3.0' thick. Becomes thinner bedded upward in silty v.f.g. sand w/ a bit carbonaceous material. Top transitional. Point-bar sequence.
20.0	Shale.
5.0	Interbedded sh, siltstn, v.f.g. sandstone in 2 progradational sequences capped by 0.5' sandstone beds, containing climbing ripples. Lower interval 3.5' thick, upper 1.5'.
18.0	Shale
4'	Coal, platy.
12.3	Covered interval.
2.3	Siltstone, nodular
2.3	Shale

SECTION: 114	
FT.	DESCRIPTION & REMARKS
13.0	Shale + siltstn.
0.2	Siltstone, v. calcareous, horiz. laminate. (almost varved), vertical root structures.
22.0	Shale
4.1	Coal - Sample SA 112 from center of bed.
10.5	Shale
11.2	
1.8	Sandstone, v.f.g., silty, small scale trough x-lam., root structures at top.
16.1	Shale
0.2	Coal, gerasite staining.
8.2	Shale, w/ interbedded sandstones. ss. beds 0.4' thick, in center of interval.

23 Siltstone. Root structures at top.

54^a Shale, siltstone.

SAMPLE SA 111 at 18' above base.

Siltstone beds (2) 0.4' thick at 15' and 19' above base.

Shale w/ thin (<1.0")

siltstone beds.

Coaly shales 2'-4' thick at 25', 40' above base.

3^a Siltstone, root mottled, no STRAT.

20^a Shale

5^c V.F.G. silty sandstone, calcareous.

6^z Shale, coaly in lower 1/2.

0⁶ Sandstone, v.f.g., horiz. lam. at base, small to scale troughs in upper part.

23^z Sandstone, medium grained, orangish brown. Probable tabular x-bedding in sets up to 6" thick. Abundant coalified plant fragments. Top covered.

SAMPLE SA 113 - from 15' from base of interval.

7/27

SECTION: Examine Exposures of Kukpowruk
FT. DESCRIPTION & REMARKS

Fm. along ~~the~~ south flank of **115**
Tupikchak syncline along Kotolik
River. Party: Sherwood, Stewart
and Kent. Weather overcast,
~60°F. **SECTION 17C**

STOP #1

Located the measured section
(stop #2, 7/26) in USGS section
21.

STOP #2

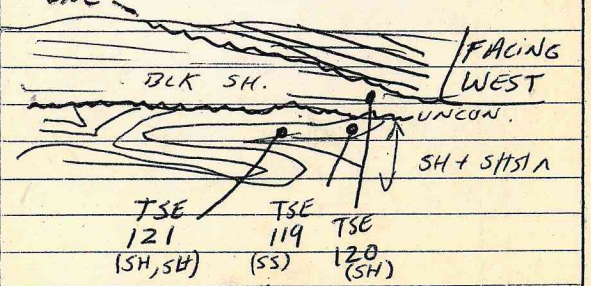
SAMPLE TSE 118 - shale from
~30' above basal Kukpowruk
sand, on east bank of Kotolik R.

STOP #3

Fly south to exposures of Torok
shale

Sunset photo at point
taken before

5+6
Photo R4/12, 3, 4 Deformation
and angular unconformity (s)
in Torok Fm.



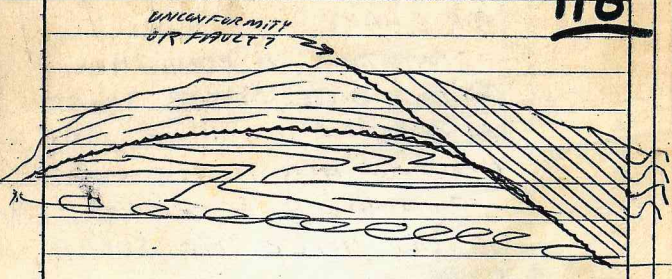
LOCATION: SEC 14, T7S, R43N, WEST
BANK KOTOLIK RIVER

SECTION:

FT. DESCRIPTION & REMARKS

SKETCH OF ENTIRE EXPOSURE:

116



STOP #4: EXAMINE section
~~was~~ laterally equivalent (but 3/8 mi.
to east) to section measured **(17A, 17B)**
at stop #2 on 7/26/77.

SAND #1 CORR. w/ USGS SECT.

42 SANDSTONE, LT, GRAY, LT, BRN,
f to mg, WELL SORTED, STLY FRIABLE
STLY CALC. TROUGH X-LAM.
~~SMALL SCALE TROUGH LAM. IN SHALE~~
3 ABOVE BASE OF EXPOSURE BOTTOM
COVERED, TOP SHARP.

09 SANDSTONE, LT TONED GRAY, TAN,
f to mg, MOD. CALC., TROUGH
X-LAM INSETS UP TO 0.1' THICK

06 SANDSTONE, M. GRAY BRN, MOD
BRN, f, STLY CALC., HORIZ. LAM
THIN BEDDED w/ ABNT COALIFIED
PLANT MAT. ALONG LAM. SURFACES
TRACE OF RIPPLES AT TOP, BASE
GRADES DOWNWARD INTO 1/2" SHALE

②

~~Below~~

Above upper unconformity (or thrust)
interbedded shale and v.f.g. sandstone;
ss comprises ~ 50% of sequence
and occurs in beds from 0.1' to
0.2' thick. Sole marks on bases
of beds include flute casts and
bedding-plane burrows. Sands
contain small-scale trough
cross-laminations and upper
surfaces are locally rippled.
Flaser structure locally. Shale sample
TSE 120.

angular unconformity

Beneath, highly deformed
sequence dominated by v.f.g.
silty sandstone. Stratification
indistinct. ss sample TSE 119
sh sample TSE 121

~~SH 600/4~~

~~Return north to exposures of
ridge-forming sands along
Kokolik River. Sands between
1200 and 2149 on 1565 section
#12.~~

④

TOP SHARP.

01 SANDSTONE, M. BRN, TAN, f to mg,
CALC., BASE SHARP, TROUGH X-LAM
IN SETS UP TO 1" THICK, TOP GRADED
UPWARD INTO HORIZ LAM SS.

11 SANDSTONE, M. BRN GRY, TAN, fg
SILY CALC., UPPER CONT. SHARP, HORIZ
LAM.

20 SANDSTONE, M. BRN, TAN, fg, CALC
BASE SHARP, TROUGH X-LAM IN SETS
TO 1/2" THICK, UPPER CONTACT TRANS
ITIONAL.

19 SANDSTONE, TAN, TAN, fg, CALC.
TROUGH X-LAM. IN SETS TO 6" THICK.
INDIVIDUAL TROUGHS LOW ANGLE
& TRACEABLE MORE THAN 6', TOP
COVERED.

58 COVERED

36 SANDSTONE, LT GRAY, TAN, f to m
g, v. CALC., TROUGH X-LAM IN
SETS UP TO 0.1' THICK, TOP & BASE
COVERED.

83 COVERED PROB. ARGILL. SS
& SHALE.

63 SANDSTONE, LT GRAY, TAN, fg, v. SILY
CALC., MINOR CARB. MAT. ALONG BED-
DING, INDIST. HORIZ. LAM., BASE
COVERED & TOP COVERED.

20-68 COVERED w/ FOSSILS (?) REC.

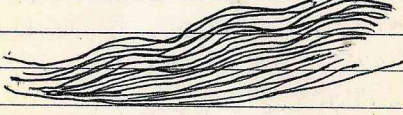
47 SANDSTONE, TAN, M. BRN, fg, CALC.

SECTION: 117 (S)

FT. DESCRIPTION & REMARKS

TROUGH X-LAM. 1 IN SETS UP TO 0.4', (LOW ANGLE). INDIVIDUAL TROUGHS 3 TO 4' WIDED, BASE COVERED TOP TRANSITIONAL

4' SANDSTONE, LT. GRAY, TAN, fg MOD. CALC., WAVY (LOCALLY) ✓ HORIZ LAM., POSS. V. LOW ANGLE TABULAR X-BEDS, TOP ~~SS~~ & BOTTOM TRANSITIONAL, BECOMES V. THINLY BEDDED AT TOP.



10' SANDSTONE, M. GRAY, TAN, fmg CALC., LOW ANGLE LARGE SCALE TROUGH X-BEDS, RIPPLED UPPER SURFACE, PARTING LINEATIONS BASE TRAN. TOP TOP OF RIDGE. STRIKE & DIP OF TROUGHS

1. N 65 W	14 NE	S 82 W
2. N 23 W	29 NE	S 59 E
3. N 30 W	23 NE	S 13 E
4. N 40 W	21 NE	S 18 W
5. N 25 W	27 NE	S 18 E

RIPPLE DIRECTION N 70 E. SAND INCOMPLETE, CORRELATES W/ LAST (TOP) SAND OF 27 & 28 SECTION.

SAND #2 CORRELATES W/ USGS SECT. SOUTH FLANK TUPIKCHAK SYNCLINE.

SECTION: 118 (F)

FT. DESCRIPTION & REMARKS

~~SAND #3~~ COVERED.

SS SANDSTONE & SHALE INTERBEDDED SANDSTONE BEDS FROM 0.1' TO 1.5' AT TOP. SANDSTONE COMPOSES ~50% OF THE INTERVAL SS: M GRAY, BRN, fg MOD. CALC - WELL CEMENTED. SS BEDS CONTAIN SMALL SCALE TROUGH X-BEDS, UPPER SURFACE ARE RIPPLED. SS FORMS FLASER STRUCTURES IN SOME SHALE BEDS. BEDDING N 40 W, 24 NE. RIPPLE TRANSPORT TO N 72 E. SH: DK GRAY TO BLK SA 123 FROM 4' ABOVE BASE OF INTERVAL, BASE COVERED SHARP TOP.

1' SANDSTONE, M GRAY, BRN, ffg MOD. CALC. BASE SHARP SHALE PEBBLE CAG AT BASE. SMALL SCALE TROUGH X-LAM INDISTINCT. TOP SHARP. VERY LIKELY SHALE, DK GRAY SINGLE SS BED 0.3' THICK IN CENTER AS FOLLOW

→ SANDSTONE, MED GRAY, BRN, ffg STLY CALC., TROUGH X-LAM.

22' SANDSTONE, AS 1.7 SS BEFORE

35' COVERED, PARTLY, PROB. SH

14' SANDSTONE, M. GRAY, BRN, vfg MOD. CALC - WELL CEMENT, HORIZ

TUBULAR TRANS TO 0.4' LATEROALLY W/N 30M

6

SAND#2

SA-122 4.5' ABOVE BASE

2 SANDSTONE, LT BRN GRY, GRY f to mg, MOD. CALC., BASE SHARP OVERLIES SHALE, HORIZ BEDDED TOP SHARP.

06 SILTSTONE, M. BRN, CHALKY NON-CALC., TRACE CARB., HORIZ LAM TO INDIST. TOP SHARP

2f SANDSTONE, M. GRY, BRN, mg, STLY CALC., BASE SHARP, WAVY HORIZ. BEDDING, BEDS 0.4' TO 0.4' THICK, TOP SHARP.

03 SHALE, DK GRY.

03 SANDSTONE, M. GRY, BRN, v f to fg, STLY CALC., BASE SHARP, SMALL SCALE, LOW ANGLE TROUGH X-LAM IN SETS TO 0.1' THICK TOP COVERED

3 COVERED, POSS SHALE

08 SHALE, BLK.

73 SANDSTONE, LT BRN GRY, RDISH BRN, fg, MOD. CALC., GOOD SORT. BASE SHARP, BEDS THICKEN UPWARD FROM 1/2" TO 6" AT TOP. LARGE SCALE, TROUGH X-BEDDING, IN SETS TO 2.0' THICK INDIVIDUAL TROUGH ~~FF~~ > 10' WIDE. TOP COVERED. SHARP

09 SHALE, BLK.

26 SANDSTONE, A.A. W/ TOP COU.

8

LAM., BASE 1/2 TOP (?) SHARP, TOP PARTLY COU.

32 SHALE, DISCORDANT BEDDING UP TO 40% SANDSTONE BALLS W/ DISTORTED LAMINATION, ~~AT~~ CONCAVE UPWARD, RESEMBLES BALL & PILLOW IN PLACES, LOCALLY MORE COMPLEX. BED ~~2~~ LENTICULAR W/ REGULAR TOP THINS TO 1.0' IN PLACES. ZONE IS CAPPED BY 0.1' THICK UNDISTURBED SH SS: M. GRY, BRN, vfg, MOD CALC STLY CARB - ON BED SURFACE. APPEARS ORIGINALLY HORIZ LAM.

Photos: view east of R4/F7, 8 R4/5, 6: Terraces created by resistant sandstone beds in Kukpowruk and Corwin Formations exposed in Tupichak syncline along Kokolik River.

7/28/77 - EVERYONE SPENT DAY IN CAMP PLOTTING.

FT.	SECTION: 7/29/77 Section TSE. (9)
DESCRIPTION & REMARKS	
	Return to section exposed on south flank of Tupichak syncline along Kokolik River. Continue measurement + description of sand #3 (as designated on USGS section #12). N40W 21NE
18	SANDSTONE, M. GRV, WTARS BRN fg, STLY CALC, WELL CEMTD. LARGE SCALE BROAD LOW ANGLE TROUGH X-BEDS, SHARP BASE & TOP, TOP HUMMOCKY, SET = TO BED THICKNESS, BALL & PILLOW LENTICULAR
15	SHALE & SANDSTONE, BALL & PILLOW. AS 3' BED BEFORE LENTICULAR, THINS TO SHALE TO < 0.5' IN 30 YDS.
54	SANDSTONE, M. GRV, GRN. f to vfg, STLY CALC. WELL CEMTD. SHARP BASE, STLY DEFORMED IN PLACES, LOWER 2 3' HORIZ. LAM 1' SMALL SCALE TROUGH X-LAM 2' HORIZ LAM. TOP INDIST.
15	SANDSTONE, M GRV, BRN, f to mg. MOD. SORTED, STLY CALC. WELL CEMTD. HORIZ LAM TOP COV.
130	COVERED PROP SS.
115	SANDSTONE, M. GRV, BRN, fg
SA 124	STLY CALC. THICK BEDDED DO U.S. STRAT SAMPLE SA 124, 5' from TOP 124

HORIZ BEDDING PLANE BARROS NEAR BASE

FT.	SECTION: 120 (71)
DESCRIPTION & REMARKS	
	CALC. BASE COV. LS TAB X-BED. IN SETS TO 6' THICK, UPPER CONT. SHARP & EROSIONAL, SCoured BY CHANNELS. SANDSTONE, LT GRV, TAN, MG LOCALY PBLV (FESTONE), WELL SORTED SUB-ANG STLY CALC. V. WELL CEMTD. LENTICULAR, CONTAINS BLOCK OF ^(6") SANDSTONE UNIT. PALED-CURRENTS. FOR 8° + 45°
1.	N15W 23NE N48E
2.	N24W 29NE N67E
3.	N32W 26NE N47E
4.	N35W 28NE N46E
5.	N40E 12SE S12W
6.	N38W 27NE N39E
7.	N30W 19NE N59E
8.	N25W 48NE N65E
9.	N36W 26NE N45E
10.	N25E 06SE S38W
11.	N28W 37NE N62E
12.	N28W 21NE N57E
13.	N22E 21SE S16E
45	SANDSTONE, M. GRV, LT BRN, MG STLY CALC, CARB AT BASE, SHARP EROSIONAL BASE. WHOLE UNIT CHANNELLED LOW & STEEP TAB. X-BEDS < 1' THICK STEEP TABS FILL EROSIONAL SCOURS MIDDLE PART OF BED BROAD UNDULATING HORIZ LAM, TOP ERODED BY OVERLYING UNIT W/ 2' EROSIONAL RELIEF. ZONES OF CLASTS PBLV! SANDSTONE, SHALE & COAL. TO TO 0.5' MAX DEM.

70

TOP COVERED

COVERED SEE USGS SECT.
SAND #4, N25W, 14NE

11² SANDSTONE, LT BRN, TAN, M_g
STLY CALC. BASE, COU., SMALL
TO LARGE TROUGH X-STRAT

11⁸ SANDSTONE, LT BRN GRY, TAN, f to m_g
STLY CALC, BASE GRAD., THIN BEDDED
HORIZ LAM W/ THIN BEDS OF S. CALC
ESTABULAR CROSS-STRAT (<10') MOD. fri
~2.0' from BASE LARGE SCALE (1.5')
TROUGH X-STRAT. SAMPLE
SA 125 @ 10' FROM BASE

SA 125

16² SANDSTONE, LT. BRN GRY, TAN, f_g
V. CALC. BASE SHARP. THIN BEDDED
PAPERY THIN NEAR TOP, SMALL SCALE
TROUGH X-CAM. THEN OUT, CLIMB-
ING RIPPLES.

R4/F9,10

~~R4/F7,8~~ CLIMBING TROUGHS
NOTE: ALONG WEST BANK OF
STREAM BED 2 TO 3' OF CONGLOM-
ERATE OVERLAIN BY THIN ~~PAPERY~~
PAPERY SANDSTONE, CONG: MAY
BE LOOSE CORRELATIVE W/ BREAK
BETWEEN 11² HORIZ. CAM SS &
16⁸ SS. CONGLOMERATE HAS
BRN GRY FE STONE CLASTS

SAND #5

8² SANDSTONE, LT. GRY, BANDED TAN
& GRY, M_g, WELL SORTED, SUB. ANG, STLY

66

SANDSTONE, D. GRY, M. GRY
PBLY, M_g, MOD. CALC, FEW CARB
FRAGS, DRAPES UNDERLYING EROSION
AL SURFACE MARKS BASE OF OVER-
LYING CHANNELS, NO VIS STRAT.

4² SANDSTONE, LT GRY BRN GRY, M_g
MOD. FEI., MED. BEDDED, OVER STEEP
TAB X-BDS, TROUGH SHAPE SCOURS
& TROUGH X-STRAT., WAVY SUB
HORIZ LAM, TOP BURROWED W/ WOOD
FRAGS. TAB X-BED DIR:

N41W 34NE & N32W 37SW,
STEEP
OVER ~~TROUGH~~ N57E

5² SANDSTONE, LT BRN GRY, TAN, M_g
STLY CALC., MOD SORT., THICK
BEDDED LARGE SCALE TROUGH-
STRAT w/ SETS 1', LOWER PART NO
VIS STRAT.

19² SANDSTONE, LT BRN GRY, TAN,
M_g AT BASE, f_g @ TOP. MOD CALC.
MINOR CARB ON BED SURF., THIN
BEDDED, HORIZ-LAM W/ RIPPLED
BEDS.

13² SANDSTONE, TAN, BRN, M_g, MOD
SORTED, MOD. CALC., SUB-ANG.
THICK BEDDED, LARGE SCALE ^{LOW}
TROUGH STRAT. w/ SETS 1' TO
3' THICK, TOP OF HILL COVERED
GENERAL TREND OF CHANNELS OF
OUTCROP N20W

SECTION: 121	
FT.	DESCRIPTION & REMARKS
	R4/9" channel truncating large-scale lcs.
	R4/# ¹² , # ¹³ , # ¹⁴ PANORAMIC view of outcrop of channel complex.
	STOP #6
	BASE OF SECTION EQUALS RIVER BOTTOM
	13 SILTSTONE, M RED BRN, MAROON TO LT BRN, SILY CALC. BEDDING 0.2 TO 0.5' THICK W/ SHALE INTER BEDS NODULAR UNEVEN BEDDING HEAVILY BIO TURBATED, ABUNDANT PLANT MAT.
SA 126	06 SILTSTONE, DK GRY, ORGANIC RICH (SAMPLE SA 126)
97	SANDSTONE, M ufg SILTY POOR/LY SORTED, V. CALC. WELL CEMENTED W/ SILTSTONE INTERBEDS ~90% SS., BEDS 0.2 TO 0.4' THICK, NODULAR & UNEVEN HEAVY BIO. TURB., RIPPLED ON UPPER SURFACE, ABNDT PLANT MAT.
EST 8	COVERED (EST) W/ EST. 20' OF SAME FACIES TO TOP OF HILL
	SAND #6 STOP #7
+36	SANDSTONE, LT GRY, LT BRN, mg NON CALC., BASE COU., BEDS 0.2-0.5' THICK, UNEVEN BEDDING

SECTION: 122	
FT.	DESCRIPTION & REMARKS
	SUB HORIZ. FORESET ACCRETION.
	26 TO 56 FROM BASE SMALL SCALE TROUGH X-LAM.
	56 TO 61 HORIZ LAM.
	61 TO 70 CLIMBING RIPPLES EROSIONAL TOP.
48	SANDSTONE, BRN, TAN, FROM THIN BEDDED SHARP BASE ERODED INTO UNDERLYING UNIT, LARGE SCALE, WEDGE SETS OF TABULAR X-STRAT DIPPING TO SE, SHARP TOP, SH. PBLEGGL @ TOP.
16	SANDSTONE M BRN, TAN, FROM NON-CALC., ONE BED, X-STRAT
23	SANDSTONE, AS BEFORE, LARGE SCALE TROUGH X-LAM., BED THICKNESS EQUALS SET THICKNESS TRUNCATED ON TOP BY EVEN SURFACE
SA 128	SAMPLE SA 128, 1' FROM TOP BRN GRY
40	SANDSTONE, LT GRY, TAN, FROM MOD. SORT, V. CALC. SHARP EROSIONAL BASE, SMALL SCALE TROUGH X-BEDDING IN SETS 0.2' THICK, TOP IS TOP OF RIDGE.

LSLATX-LAM = LARGE SCALE LOW
ANGLE TROUGH X-LAM.

NO VIS STRAT., INTERBEDS OF
fg SS. (PLATY) ABNT. WOOD
* PLANT MAT. ALONG BEDDING.
TOP SHARP PASS. OUTCROP 8' BELOW
TO SANDSTONE, LT GRAY, TAN
fg, NON-CALC, THICK BEDDED
SHARP BASE, LOWER 1.5' TROUGH
X-LAMINATED W/ SETS 0.8'
UPPER PART LSLATX-LAM
SETS 2' THICK SHARP TOP
~~SAMPLE~~

+ 10' SANDSTONE, LT GRAY, TAN mg
NON-CALC, HORIZ LAM, THIN
BEDDED, SAMPLE SA 127 FROM
1' ABOVE BASE.

OUTCROP FORMS RIDGE WHICH
EXTENDS 2-4 MI TO HORIZON.

SAND 7

14 SANDSTONE, LT GRAY, TAN, fg
SHARP BASE, SOFT SED. DER
OF PROB. TROUGH X-STRAT,
TOP GRAD.

7-5' SANDSTONE, M, GRAY, TAN, fm
U. CALC. MOD SORT.
~~2' - 2 1/2' SS TX-LAM 0.1 to~~
~~0.2' THICK~~
2' - 2 1/2' FROM BASE LOW ANGLE

SECTION: N Flank Flintchip Syncline
DESCRIPTION & REMARKS
30 July Section W-18 123
Began at position on photo
GS-TAL Roll 27 # 96 R
Putukok Rm A-5 quad. NE/4 S17 T55 R42W
Approx altitude N 65 E ~ 35 SE

25.0 Ss, m-g, lt-gr, mod
srt, mostly covered,
trough X-strat, 0.8 ft set

43.5' Covered, silty shale
n shaly from float
pass gr, to sd near
top

12.7 Ss, fg, brnsh-gr, in
bed w/ shale. exposure
partly covered,

top heavily burrowed // to
big pls, - many double burrows
poss. gastropod(?) ← see

100'	lower 65' mostly covered, remainder clearly shale, dark grey - brown
RLS 129	Sample at 95' in unit
67'	Shale - med gry. silty, ^{very} thin siltst beds
3.7	Sandstone lg, mod calc, med-brn-grey, sharp bar sharp top, large scale trough x-strat in sets ~ 2' thick rippled on top, none measurable.
40'	Shale, partly covered, prob silty
2' ±	Ss., vfg, dk gry, v. calc, well contd, horiz lam., w/ interference ripples, polygonal shaped at top.

FT.	SECTION: DESCRIPTION & REMARKS
	top 5' base mostly covered,
13.5	Shale largely covered.
4.5'	Thin vfg silty sd, intbdd w/ shale.
	<u>Sand tops extensively burrowed,</u>
8.5	Covered, mostly shale.
↑	
10.7 ft	Ss. fg., lt gry, non calc, mod. wt srt'd, well contd w/ g + 3;
RLS 130	lower 2.2 ft lge scale trough x-strat, rippled top w/ 0.1 ft sh interbed.
	0.9 ft sm sd trough x-strat w/ ^{non} burrows at base. rippled on top.
↓	

Upper 7.6 ft
 lge scl strat x-strat:
 lwr 5 ft lge scl strat
 upper 2.6 ft. rippled.
 abd. horiz bioturb in
 upper 2 ft.
 top covered, indistinct
 35 ft mostly covered prob sh.
 2'± Sst-med-gr, horiz lam,
 mostly
 53.5' Shale, poss being
 silty upward.
 largely covered.
 (Above are ball & pillow
 structure
 - CPW picture)

SECTION:
FT. DESCRIPTION & REMARKS

125

5.5 ft. Ss, fg, ^{slightly} poorly sorted
 non calc dk gry,
 giant ball & pillow & soft
 sed. deformation structures
 with sh. squeezed up
 between.
 Sharp top contact.
 1.3 ft Ss, fg, dk gry,
 well sorted,
 Sharp base and top,
 incipient balls at base
 no structure exc.
 ripples at top 6 in.
 2.4 Ss. mg, extremely well
 cemented. Sand sized
 shale rip-up clasts
 thruout
 v. calc.
 Base - incipient ball & pillow
 top - rippled.
 Basal contact sharp
 Top partially covered.

4.7 ft. shale, silty.
poorly exposed.

3.2 ft ss. fg. dk gray, med w/ sorted, some med grs. very calcareous.

sharp base & top.

in upper foot several discontinuous sh. laminae. uppermost 6 in. of X-bed.

rippled on top.

Ripple sed transport direction

1) S 00 E 4) N 12 E

2) N 12 W

3) N 14 W

Strike of X-bed:

1 N 75 E 32° SE S 34 E

2 N 80 E 48° SE S 35 E

Bedding attitude:

N 55 E 39° SE

SECTION:
FT. DESCRIPTION & REMARKS

126

5.4 Int bed siltst & silty sh. becomes silty upward. Thicker siltst bds. uppermost 1 ft. has soft sed deformation, loading, extensively vertical burrowing.

1 thin rippled bed.

within siltstone interval

ss fg. horz lam.

thickens from 1-2 in to at least 2.2 ft

over 40 ft. little pebbles & coarser at top. overlain by remainder of ss. interval ex. ball & pillow

5.6 ft ss

lower 3.5 ft. fg, med grs, v calc, well sorted, sharp base

low angle, large scale, not X-bedded, 2 ft abt 1-2 ft thick w/ pebbles ironstone pebbles &

CRW
pictures →

6.

9.1

RLS
132

2' from top

0.3 ft

ss clasts lining scours.

of remaining, 1.3 ft is
gradational w/ underlying
sds, flaser bed

last 0.8 ft contorted
bedding, silty - vfg sd.

Ss. mgr., H. gr., v calc,
abd coaly mat'd at base
large scale tabular
X-strat. sets 2-3 ft.
Forsets appear bimodal
Uppermost 1 ft.
sm scale trough X-
lam, with ripples
on top

Tabular X-bed attitudes

1	N70 E	5°	SE	N74 W
2	N62 E	3°	SE	N23 W
3	N63 E	39°		S47 E

Silty shale.

SECTION:
DESCRIPTION & REMARKS

127

7.0 ft Ss mgr, lge sd
tabular, X-strat,
abd coalified plant debris
at base; sharp base.

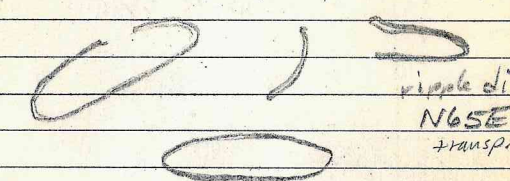
2.9 vfg
SS & siltst thinly interbed
clg ripple, trans dir'n
to SOUTH.

17.5' Silt, med gr, sharp
base, large scale trough
& tabular X-strat, thin
bedded, sets 2-4 ft.
top rounded,

tabular X-beds:

3	N55W	42°	SW	S81W
4	N74W	33	SW	S89W
5	N80E	24	SE	N62W
high	N27E	67	SE	S05E
x-bed	N67E	42	SE	N41E
0	N74E	40	SE	N61E

25.0	Covered, prob shale
5'±	Ss. mg. med gr., sm scale trough x-lam mostly covered.
24'	Covered
9'	Ss. fg, med gr., mod wl srt'd. v. calc., top & base covered lge ^{too small} tabular x-bed sets ~ 2 ft thick horiz lam near top
16'	Covered, prob shale.
7'	Ss mostly covered
41.5	Covered. —

SECTION: 128	
FT.	DESCRIPTION & REMARKS
4.00	ss fg, med wl srt'd, v. calc., lge scale trough x-strat, thin bdd. upper str. rippled, extensive horiz. burrows. w/ distinctive kidney bean shape
	 ripple dir. N65E transp.
9.0'	covered prob ss.
6.0 ft	ss, as prev. unit. trough x-strat.
17'	Covered, prob shale.
5.0	Sdst, fg, med gr., trough x-lam., sets 0.8 ft thick
44'	Covered - prob in bdd ss & sh.

9.4 Ss., fg., mod
sld., mod calc. well
contd.

lower 3 ft horiz lam.
then ripped surface

S70W

upper 2 ft low angle
trough cross
strat.

transitional top w/
ripples, & sm sld
trough X-strat.

poss sh. intbeds.

124

(+ Covered prob

sh - poss ss intbeds

5.5

ssd. for
m. gry. tough
cross lam.

poorly exposed

103

mostly covered; suggestion
of intbed sld sh. mang sh

SECTION:

FT. DESCRIPTION & REMARKS

129

9.0 ss fg. lt gm - brn

lge scale trough X-bed.
top & bottom covered.
poorly exposed.

25 ft. Covered - suggestion
of sh & thin intbed
ssd.

to base of "O" (=orange)
sand. Poorly exposed
on west ridge

Stop 2 - down strike of
NW 1/4 Sec 16 "O" sand on ridge to
SS R 42W east. due to loss of
exposure on west ridge.
Bedding attitude:

N75E 26° SE

4.0 ft ss.
vfg. silty, dk gry.
w/ abd carb. grunge
sli calc.
thin bed, base covered
horiz. bdg, & sm sld trough
X-lam.

3.2 ft

RLS
133

5.1

0.5 ft

0.3 ft clayey
shale at top of unit.
also shaley interbeds
in unit

SS., fg., + gry.
mod srted.,
thick bdd., sharp
base. wispy V. low
angle X-strat.
prob trough.

trough x-bed:
N88E 30° NW
N09W

SS. vf-fg. a/a.

thin bdd., lge sel
to angle trough X-lam
sets ~ 1 ft thick
w/ minor horiz lam
top rippled, sharp

rippled forsets in
X-beds.

ripple transport direction:
N 80 W

shale 0.1 to 0.3, sh 0.1
in interbeds

SECTION:

FT. DESCRIPTION & REMARKS

130

SS is silty, platy, v. horz
lam.

3.8 ft. SS., fg., w/ cmtd.
upper 0.3 ft bcms silty sh.

horizontal lam, rippled
at top. Trough X-lam
more prevalent laterally
laterally erosive bases
erosive siltstone.

10.6 SS. f-mg. mod srted., mod
calc. thick bdd., erosive
base, w/ sh pebb rip-up
clasts, & holly bioturb'd
lower part, incl vert
burrows.

Transitional upward into
thin bdd. mat'l.

22.0 ft SS fg. + gry, v calc,
thin bdd throughout.

37 ft lower 15 ft dom sin sel
trough X-lam. w/ wedge sets
1-2 ft thick

RLS

134

LP

20 ft

from

base

upper part lge sel trough
sets 1 ft thick E tabular X-lam

N 70 W 28° SW 581W
N 84 E 24 SE 171W

	cont'd. N87W N55W 28 SW
	upper 15 ft of unit mostly covered.
5.0	Intbed sh & ss. v. h mostly covered sds in that highly bioturbated
53 ft	mostly covered prob mostly shale w/ a few intbed sds.
16 ft.	ss. fg. (upper range) med lt gray, v calc. thin bed, lge sel trif x-strat, filling scours. Lower 4 ft. horiz to sh inclined strat. [scours assoc w/ migrating bed forms]
261	It mostly covered prob shale & thin intbed ss's.

FT.	SECTION: DESCRIPTION & REMARKS	131
5.0	Ss, mg, lt gr, v calc, tightly ind. base covered, top sharp. abd. coaly material. Upper 1 1/2 ft horiz lam. no vis strat in lower part.	
2.0	Ss mgr., erosional base truncated on top by eros, poorly dev sm sel trif x-lam thruout.	
3.5	Ss, mgr., eros base sm sel trif x-lam thruout. Capped by 0.1 ft wavy horiz lam. ss.	
4.7 ft.	Ss. med-gr, erosional base lge sel tabular x-strat sets 2-3 ft thick Many trough shaped scours 1 1/2 ft thick & lge sel trif x-strat tabular x-bed: N45W 33° SW N90W	

4.5

Ss m-gi.
small-scale trough x-lam

8.5

Ss, f-mg, thin bdd,
(“paper thin”)
sm sct trough x-lam
woody ^{imprints} frags at top

27 ft

covered - probably largely
shale

5.0 ft

ss “paper thin” bedded
fg ss, horiz lam
w/ low angle truncation
base covered.
top sharp, 4 bedding
plane burrows

6.5 ft

Ss fg, med wt srted,
sli calcareous.

RLS
135

large scale trough
x-lam. sets 1 ft thick
erosive base.

SECTION:
FT. DESCRIPTION & REMARKS

132

67 ft covered

7.5 Ss fmg.

thick bedded
(base covered)

thin zones of ss ssk ripup
clasts

RLS
136

upper str truncated by outlying
unit.

large scale tabular x-bdg.
attitudes on tabs:

- | | | | |
|---|------|--------|------|
| 1 | N42W | 10° NE | N03E |
| 2 | N85W | 9 NE | N09W |
| 3 | N65E | 13 NW | N18W |
| 4 | N65W | 37° NE | |
| 5 | N40W | 34 NE | |
| 6 | N58W | 29 NE | |
| 7 | N25E | 24 NW | N41W |

Too high
dips

22.0 Ss mg., erosional

bars, cgl ss pebb lag.
lge sct grad x-strat.
thick bdd, sets 1-3 1/2 ft

top covered.
 top of ledge end of
 section. end
 of day.
 Bye.

SECTION: 8/11/77 Recon flight to **133**
 DESCRIPTION & REMARKS
 area in vicinity of
 Pitmegea River, south and
 southwest of Cape Beaufort.
 STOP # 1: NORTH FLANK PITMEGEA SYNCLINE.
~~8: N56E, 31 SE~~
 A. 215 SANDSTONE, LT. BRN, TAN, fg, SILY
 A. CALC. CARB. MAT. ON BED SURFACE
 BASE COV, THIN BEDDED, (PAPERY)
 HORIZ BEDDING W/ SMALL SCALE
 TROUGH X-LAM. BASE LARGE SCALE
 V. LOW ANGLE TROUGH X-BEDS, IN
 SETS 6-10' THICK $\frac{1}{2}$ 100' WIDE
 UPPER 65' SMALL SCALE TROUGH
 X-BEDS UPTO 1' THICK. CHANNELLED
 2-4' THICK W/ EROSIONAL BASES.
 VAGUE RIPPLED AT TOP MOSTLY
 OBLITERATED. LOCAL SHALE PBL
 LAGS THRU OUT.
 B. 185 SANDSTONE, LT. BRN GRAY, BRN, fg,
 MOD. CALC., MOD. CARB. ON BEDDING,
 BASE COV. LARGE & SMALL SCALE
 TROUGH X-BEDS, LOW, ANGLE,
 IN SETS UPTO 2' THICK, BURROW
 ING, HEAVY LOCALLY IN LOWER
 PART, PBL LAGS & SCATTERED
 PBLs (CHT & SH), WOOD FRAGS
 LOCALLY, TOP COV.
 TROUGH X-BEDS
 1. N75E, 14 SE POOR N51W
 2. N52E, 19 SE POOR N28W

C

6' SANDSTONE, M. GRAY, GRAY, vfg-fg, NON-CALC, CARB ON LAM & BEDDING, BASE COV. SMALL SCALE TROUGH X-LAM IN SETS UP TO 8' THICK, TOP SHARP, X-LAM BECOMES MORE PLANAR & LOW @ TOP.

0' SILTSTONE, HORIZ LAM. CARB. SANDSTONE, LT GRAY, BRN GRAY, f w/ PBL LAG @ BASE, BASE SHARP, PBL SH, FST, BLK CHT, NON-CALC, LOWER 25' LARGE SCALE LOW ANGLE TROUGH X-BED UPPER 25', TROUGH X BEDDED 0.5' TO 3.0' THICK, LOCALLY HEAVY BURROWED IN TOP 3'.

VERT BURROWING
TOP COV. mg @ TOP
SAMPLE SA 141 2' FROM TOP

SANDSTONE, LT. TAN, BRN, f mg NON-CALC, BASE COV.; TROUGH X-BEDDED IN SETS 1' OR > IN THICKNESS, TOP COV. LOCAL SH PBL LAGS ON SCOUR SURF. 15' COV BETWEEN C & D

E. 8' SANDSTONE, M. BRN, LT GRAY C TO UCG, LOCALLY PBL, PBL: GRAY CHT, BLK CHT, COAL, PALE GN CHT, OLV GN CHT, NON-CALC, POROUS, MOD WELL TO

SA 141

MIN 3
NOT > 10'

POORLY SORTED, FRI, BASE COV. BEDDING INDIST. POSS. LARGE SCALE TROUGH X-BED IN SETS UP TO 2' THICK, POORLY DEFINED. SAMPLE SA 142 FROM ~~RE~~ FLOAT, TOP COV., N145E, 22SE STRIKE & DIP, N55E, 27SE.

SA 142

F 19' SANDSTONE, LT GRAY: S & P, BRN, CO TO MG @ BASE, MG @ TOP LOCALLY PBL, NON-CALC, CARB MAT LOCALLY ABNDT ON BEDDING SURF. BASE COV., TROUGH X-BEDS, 4' THICK & 40' LONG, SCoured BASAL SHEETS. BEDS & THICKNESS OF X-STRAT THINS TOWARD TOP. MAX, PBL DIA 1", TOP COV. SAMPLE SA 143 FROM FLOAT @ BASE OF SLOPE N59E, 27SE

SA 143

1. N 80E, 24SE " X-BED N88W
2. N 60E, 34SE " S29E
3. N 85E, 26SE " S73W
4. N 80E, 37SE " S58E
5. N 40E, 38SE " S81E
6. N 86W, 23SW " S82W
7. N 75E, 32SE " S33W
8. N 72E, 37SE " S11W
9. N 30W, 18NE " N04E
10. N 40E, 04NW " N34W
11. N 75E, 29SE " S50W
12. N 35E, 32SE " N70E

13 N60E, 45 SE **529E**
 14 N46E, 40 SE **566E**
 15. UPPER MOST 3' HORIZ. LAM
 W/ PARTING ~~LINE~~ LINEATIONS

G 12 SANDSTONE, LT TAN GRAY, LT BRN.
 fq. STLY CALC. TRACE CARB MAT
 ON BEDDING. BASE COV. 85.
 CAN BE DIVIDED INTO THE
 FOLLOWING FOUR INTERVALS:
 (1) 2" SMALL SCALE TROUGH
 X-LAM.
 (2) 3' TAB X-LAM IN SETS
 3' THICK
 (3) 4' CLIMBING RIPPLES
 IN SETS UP TO 1" THICK
 (4) 3' VERY PLANAR LARGE
 SCALE LOW ANGLE X-LAM
 IN SETS UP TO 2' THICK
 (#4 ON TOP)

TDP COV

RIPPLE TRANSPORT DIRECTION

1. N24W	N26W
2. S32E	S22E
3. N80W	N49W

18, 19, 20

Photo R4/16, 17, 18: view to east
 along N flank of Pitegea
 syncline, showing lenticularity of
 SANDS.

SECTION:
 DESCRIPTION & REMARKS

135

H 11 SANDSTONE, LT GRAY, BRN, fq,
 STLY CALC. BASE COV. HORIZ LAM
 TOP TRANSITIONAL

32 SANDSTONE, LT TAN GRAY, BRN
 fq, NON-CALC, CARB MAT ON
 BEDDING, POROUS, TROUGH X-
 BEDDED (LARGE SCALE) IN SETS
 > 5' THICK, PBL LAG PBL: BLK
 CHT, FST & SH, MAX DIA 1 1/2".
 TOP COV.

I 15 SANDSTONE, LT GRAY BRN, BRN, fq to mg
 NON-CALC., TRACE CARB MAT, LARGE
 SCALE LOW ANGLE TROUGH X-BED.
 SETS TO 3' THICK, WOOD MOLDS
 SHALE PBLs

28 SANDSTONE, M. GRAY, BRN, fq
 NON-CALC. CARB ON BEDDING
 BASE SHARP, TOP ~~SHARP~~
 SHARP & RIPPLED, SMALL SCALE
 TROUGH X-LAM. IN SETS TO 1"
 THICK TRANSPORT DIRECTION:
 S40W.

25 SANDSTONE, LT TAN GRAY, BRN, fq
 MOD WELL SORTED, NON CALC. CARB
 MAT DISPURSED W/N, BASE
 SHARP, LARGE SCALE V. LOW
 ANGLE TROUGH X-BEDS. IN SETS
 TO 25' THICK, TOP COV.

J 11- SANDSTONE, LT GRAY, BRN, fq, NON
 CALC. CARB MAT ALONG X-LAM

SMALL SCALE TROUGH X-LAM
IN SETS TO 1" THICK
2 SANDSTONE, M. BEN, BRN. MDCG
LARGE SCALE TROUGH X-BEDDING
IN SETS TO 3' THICK
3. SANDSTONE, LT BRN GRAY BRN, fg.
MOD. SORTED, MOD CALC. SMALL
SCALE TROUGH X-LAM IN SETS
UP TO 2" THICK. TOP TRANSIT
IONAL INTO CLIMBING RIPPLES
3. SANDSTONE AA. EXCEPT FOR
CLIMBING X-STRAT IN SETS
UP TO 1" THICK, TOP COV.

K - 5 SANDSTONE, M. BEN, BRN, fg, NON
CALC., LOCALLY PBLY, LARGE
SCALE TABULAR &/OR TROUGH
X-BEDS (LOW-ANGLE) IN SETS
TO 3' THICK. NUMEROUS SCAR
SURFACES; BASE COV, TOP COV.
WOOD IMPRINTS @ TOP

R4/F21 ~~R4/F21~~ TROUGH X-LAM IN
UPPER KUKPOWOK BRUNTON
FOR SCALE. In Pitmegea
syncline, near base of
Corwin.

L - 5 SANDSTONE, TAN, TAN, f, TONG
STLY CALC. CARB MAT ON BEDS
LARGE SCALE TROUGH & TAB

X-STRAT IN SETS 2 TO 3' THICK
CLIMBING RIPPLES TOP & BASE
COV.
M - 3 SANDSTONE, TAN, BRN, mg
LOW ANGLE TROUGH X-LAM
IN SETS 0-8" THICK BASE COV
TOP COV
2 COVERED
5 SANDSTONE AA
15 SANDSTONE LT GRAY, BRN, mg
MOD WELL SORTED, MOD CALC. BASE
SHARP (EROSIONAL) CLIMBING
RIPPLES IN SETS UP TO 1" THICK
6 SANDSTONE, LT. GRAY, M BEN, fg,
MOD CALC, CARB MAT ALONG LAM
LARGE SCALE LOW ANGLE TROUGH
& TAB X-STRAT IN SETS UP TO
25' BASE SHARP TOP SHARP, SCAR
BY BED ABOVE SA 144 1' BELOW TOP
25 SANDSTONE, LT BRN GRAY, ORNG,
fmg, LOCALLY PBLY w/ FESS
CGL INTERVAL UP TO 0.5' THICK
@ BASE, MOD CALC, LOW ANGLE
LARGE SCALE TROUGH STRAT
IN SETS UP TO 25' THICK BASE
& TOP SHARP
08 SANDSTONE, LT BRN, ORNG, fg,
SLTY, CALC. FRI OCCURS
IN HORIZ LAM UP TO 15" THICK
INTERBEDDED W/ SILTSTONE
TOP SHARP

RLS
N4
SAAS
14A
7

15 SANDSTONE, LT GRAY, GRAY
BRN, mg, CALC. SMALL SCALE
LOW ANGLE TROUGH X-BEDDING
IN SETS 0.5' THICK TOP &
BASE SHARP (BASE EROSIONAL)

02 SANDSTONE & SILTSTONE
INTERBEDDED AS 0.8 SS ABOVE

3 SANDSTONE, LT GRAY, BRN, fg
MOD WELL SORT. w/ 1 ABNDT
& FE OXIDE SPOTS BED THICK
NESS DECREASES UPWARD FROM
6" AT BASE TO 1 1/2" AT TOP
SMALL SCALE TROUGH BEDDING
& LAMINATION IN SETS THINNER
NEAR TOP OF SECTION. TOP
COV

RLS: PS
SAMPLE SA 145 IN STREAM @
"N" ON AIR PHOTO. SHALE
STRATIGRAPHICALLY BELOW "M"
SAND.

SECTION: 8/2/77 Mebom section 137
FT. DESCRIPTION & REMARKS
on south flank of
Meat Men; corresponds to
USGS section #23.
W-21

SAND A ~~SS: N40E, 09NW~~

50 Sandstn, v.f.g., lt. gray,
v. calc., mostly COVERED.

150 COVERED, PROBABLY SANDSTONE

350 Sandstone f.g., lt. gray, v. calc.,
mostly lg. scale tab. x-strat.,
poorly exposed, & set
thickness 1'-3'. Ripples near
top w/ moderate bioturbation;
parting lineations, shale-
pebble lags; possible clams,
snail trails.

SAND B

112 Sandstone, m.f.g., m. calc., lt. gray,
m.w. sorted, thin-bedded
horiz. lamination; top has
tracks & trails; base covered,
top sharp, top ~~is~~ transitional.

10 Sandstone, f.g., v. thin bedded (3/8"),

5°

Sandstone, med-g., sharp
erosional base. large-scale
low angle trough cross-
bedding in sets up to 3'
thick.

SAND # C.

10°

^{H. gray}
Sandstone, m. brown, f.g.;
tr. carb, m. calcareous;
~~THE~~ LARGE SCALE TROUGH

CROSS-BEDDED in sets up to
3.0' thick. Base and
top covered. Scour at bases of
individual troughs; snail trails,
clam molds on bedding surfaces
near top. Upper surface rippled.

SAMPLE
MM 1462' above
base.N19E
N51W
N48E

~~Trough axis N85W, 21° to~~
TROUGH AXIS p. 21° to NOSE N85W
" " 13° to N20W N70E
" " 18 to N25E N65W
MASTER BEDDING. N80E 10N.

SAND # D.

5°

Sandstone, H. grayish
brown, weath. brown, fine-
grained; m. calc.; base
covered; large SCALE SCOUR-FILL

SECTION:

138

FT. DESCRIPTION & REMARKS

BEDDING AND ^{thin} TROUGH CROSS-BEDDING

in sets up to 1.5' thick.
Also small channels near top filled
with tabular x-beds in sets 0.8' thick.
Upper surface eroded.

5°

SAMPLE
MM 147in talus
at base of exposure.

Sandstone, f.g., H. brn, w. tan,
very calcareous; Trough cross-
bedding filling scours up to
1.0' thick. Top covered.

TABULAR X-BED / N73E, 12NW N19W
" " " N86W, 06NE S52E

SAND "E"

65

SAMPLE
MM 148.5' above
base.

Sandstone, f.g. at base, vt-f.g. at
top, lt. gray, weath. tan, m. calc., tr. carb,
base covered, eroded top. Becomes
thinner bedded in upper 1.0'. Large-
scale tab. x-strat in sets up to 3.0'
thick (most range between 2.0'-3.0');
ripples on foresets; upper 1.0'
small scale trough x-lam.;

Tabular x-bed: ^{S40E} N28W, 10NE
" " " : NOSE 14 SE ^{S40E}
" " " N85E, 26N N21W
" " " N45W, 18NE N71E
" " " N67W, 21NE N40E

FILLING CHANNELS
10-20 yards
wide

TABULAR X-BED!

N25W, 27 NE N82E
 N17W, 29 NE N88E
 N52W, 14 NE N79E
 N38W, 17 NE N90E

142 Sandstone, m-fs, s/calc,
 medium bedded; large scale
 trough and tab x-bedding in
 sets from 1'-3' thick.
 Multiple scour surfaces. Base
 of unit erosional; top
 transitional.

78 Sandstone, f.g.,
 thin-bedded, horiz. lam., w/
 small-scale trough x-lam in
 sets up to 0.8' thick. Upper
 surfaces rippled near top.

+ 150 Sandstone, v.f.g. - f.g.,
 v. thin-bedded, rippled, v.
 similar to 78 sand beneath.
 mostly covered

SECTION:

139

FT. DESCRIPTION & REMARKS

SAND "F"

115 Sandstone, f.g., lt. gray, weath.
 H. brn, mod. calc. becomes
 v.f.g. at top. Lower 8.8' low-angle

SAMPLE
 MM149

35 above
 base

Trough + tabular x-beds

N40W, 17 NE N31 E
 N04E, 14 SE N61 E
 N06E, 15 NW N48W

trough x-strat in sets up to
 3' thick. Upper 2.7' horiz. lam..
 and small-scale troughs ~ base
 transitional into lower unit. Top
 sharp; minor carb, mat'l along
 bedding surfaces; ripples between
 x-bed sets in lower unit.

~~143~~ Sandstone, lower part fine-grained,
 to medium grained, H. gray, w. brn,
 lg scale trough x-strat; base
 erosional; Upper 5' of unit
 horiz. lam. Top sharp, truncated
 by upper unit.

SAMPLE

MM 150

10' above
 base

102 Sandstone, f.g., sm. scale
 trough x-strat. thin-bedded, local
 lenses of silty v.f.g. sand up to 2"
 thick. Vertical and inclined
 burrow, back-fill type, up to
 2 1/2" long, 3/4" wide. Burrowing light

to moderate. Top covered.

Kukpowruk section on north
flank of Foggy Syncline.

S₀: N87E, 11S

SECTION: 8/3/77 Examine section

FT. DESCRIPTION & REMARKS

of Kukpowruk exposed on 140
Utukok River on south
Flank OF FOLSOM POINT
SYNCLINE. W-22
A' SE/4 Sec 5 T4S R37W
2.0' Shale, mostly covered.

SAMPLE
FP 151

1.0'
below top
of shale.

135 Sandstone dark gray fresh &
SAMPLE FP 152 weathered, base f.m.g.; top vf-f.g.
3' above base v. slightly calcareous; poorly sorted,
argillaceous; sharp base;
top covered. Lower 12' feet
thick-bedded, large scale trough
cross-strat in sets ~~up to~~ from
1' to 25 ft. thick. Shale - pebbles
legs at bases of sets. Upper 15 ft
thin-bedded, small-scale troughs;
Sand body pinches out 200 yds to
east; thickens to 200 ft. to west.

23, 24, 25, 26, 27

Photos R4/~~20-25~~ west to east
panorama of exposures at
land in River on S. Flank Folsom
pt. syncline.

MEASURE EXPOSURES ON EAST SIDE OF RIVER.
WEST

Sand 58
B
NE/4
T4S
R37W

SAMPLE
FP153,
1.0' from
base.

sandstone, dk gray, f.g.,
v. poorly sorted + argillaceous;
non-calc, indistinctly
bedded; horiz. lam. upper
0.4'. PARTLY covered

235 Sandstone; dark gray, f.g.,
poorly sorted, argillaceous,
non-calcareous; base sharp
erosional. horizontally bedded
with shale pebbles
scattered throughout lower
8.0 FEET. Abundant coalified
Plant frags.

To east, unit is truncated
by scour + fill structures
~~up to~~ from 5' to 15'
thick and traceable for
10's of yards along exposure.
Sands in basal parts
of structures are medium-
grained, and ~~are~~ contain
~~small-scale~~ low angle
large scale trough or
tabular cross-beds in
sets from 1.0 to 1.5' thick.
Upper parts are fine-
grained and contain
small-scale trough
cross-lam.
Clam molds in a few talus blocks.

SECTION:
DESCRIPTION & REMARKS

141

270
~~270~~

~~5~~

SAMPLE
FP154
at 18.0'

UPPER SURFACES
rippled.

Shale, mostly covered, with
sandstone beds at 16.0,
19.0, 21.0 and 25.0. All
~~sandstone~~
sand beds 0.5' thick with
uppermost 0.9' thick

Sands v.f.g., silty, well
cemented, dark gray,
slightly calcareous;
bases sharp with local
structures and burrows;
Some beds texturally
graded, massive to
horiz. lam in lower part.
climbing ripples in upper
part. Shales very
silty with abundant
bioturbation. Abundant
clam molds in sand beds.

Ripple transport direction: N64E,
N54E,

52

SAMPLE
FP155,
at 0.5'
above
base of
upper 1.7 unit.

Sandstone: lower 3.5'
interbedded siltstone + v.f.g.
sandstone in uneven rippled
beds from 0.1' to 0.4' thick.
Bioturbated on top; load
casts on bases of beds.
Upper 1.7 is v.f. to f.g.
sandstone, sharp base, load casts,

R4/28

low angle trough x-lam w/
rip-up clasts at base.

~~R4/26~~ DELTA FRONT SANDS
(interval measured below ↑)
in Kukupawuk Fm.

Bedding: N35W, 07NE

Photo
R4/29

10' Interbedded siltstone and
rippled flaser interbeds of
v.f.g. sandstone up to 0.2'
thick. Siltstones exhibit closely-
(SPACED FRAC. CLV. N30W, 60S., WAVY.

Ripple transport, to:
N38E
N43E
N77E
N66E
N72E

09' Sandstone, med. gray, weathers
brown, v.f.g., v. calcareous,
sharp erosional base w/
burrow casts; horiz. lam
in lower part, small-scale
troughs upper part. Upper
surface sharp, rippled.

293' Interbedded siltstone and
shale w/ 0.5' sand at 16° feet
above base. Siltstones
exhibit subvertical cleavage.

2' Sandstone, med. gray, weath. brn,
fine-grained, v. calc., well cemented,
sharp base w/ load ~~casts~~
casts. Horiz. lam + v. low-angle
trough x-lam. Lenticular,
thickens & thins laterally.

4' Shale.

2' Sandstone, v.f.g., calc., sharp
base, med. dk gray, low-angle
trough cross-lam.

3' Silty shale w/ 0.4' ss
interbed.

28' Sandstone, lt. gray, m.g., mod. calc.
large scale tabs in lower 2.0' w/
climbing ripples in upper part. Base +
top erosional scours. Roots throughout upper 1.0'.
TROUGH X-BED: N35W 19NE N69E
Ripple transport: N28E.

118' Sandstone, lt. gray, med. grained,
non-calc., erosional base with shale
3' above base.

pebble lag; thick bedded. large
scale low angle trough
x-beds in sets 1.0'-2.0' thick.
Abundant plant mat'l. Top
truncated at scour surface.

15 Conglomeratic med. g. sandstone
with 30-40% shale clasts;
fills lenticular SCOUR.

Attitude lg scale tab. ~~N05W~~ ^{S01E} 27NE
N08W, 28NE ^{S06E}

20°-11° LENTICULAR ACTIVE ~~CHANNEL~~
CHANNEL FILL, at thickness
of 20° it cut through
underlying sand section
into shale. Chert boulders lag
at base.

30° Sandstone, m.g., non-calc.,
lt. gray, well cemented,
thick-bedded. Lower 10'
contains large-scale trough
and tabular x-strat. sets 2'-5'.
Next 6.0' contains horiz.
lamination. Abund. plant
material. erosional base
w/ shale-pebble lag
conglomerate.

SAMPLE
FP158
from 5'
above base.

SECTION:
FT. DESCRIPTION & REMARKS

143

STOP #3 D, E
SW/4 T4S R37W

SANDSTONE:

9.0' Sandstone, fmg. lt. base, fg at
top, dk gray, poorly sorted, v.
calcareous; lower 8.0' large
scale tabular x-STRAT. w/ TANGENTIAL
FORSETS IN SETS FROM 1 to 5 FEET.
UPPER 1.0' Rippled.

So: N48W, 16NE ^{N09E}

TABULAR X-BEDS: 1 N30W, 22NE } SAME BED

It. STRIKE N18W, 90

RAKE 20° NW

It. STRIKE N86E 74SE

RAKE 21° ~~SW~~ SW

2 N14E, 18SE ^{S62E}

3 N55W, 30NE ^{N62E}

4 N41W, 32NE ^{N72E}

5 N32W, 15NE ^{S86E}

6 N74W, 20NE ^{N61E}

7 N38W, 28NE ^{N70E}

8 N33W, 19NE ^{N09E}

121° shale.

SAMPLE 159
1' below top.

24° Sandstone, lt. gray, f.g. - m.g.,
thick-bedded, sharp erosional
base; top curved. large scale
low trough x-strat in sets from

SAMPLE
FP160,
8' from top.

1 to 4 feet thick. Cross-bedding
sets less thick near top
generally less than 2.0'.
Abundant plant material.

~~TOP SAND EQUIV. TO~~

LOWER SAND EQUIV. TO
TOP SAND MEASURED AT

STOP #2. UPPER SAND

AT STOP #3 EQUIV. TO

10-20' SAND ~150' above

UPPERMOST SAND EXAMINED

AT STOP #2.

SAND BELOW 2 MEASURED

AT STOP #3 is equivalent

to lowermost SAND MEASURED

AT STOP #2.

F30

PHOTO R4/28 LENTICULAR

SANDS AT BEND IN UTUKOK

R. ON S FLANK FOLSOM

PT. SYNCLINE.

SECTION:

DESCRIPTION & REMARKS

144

STOP #4 Sand F SW/4 Sec 33, T3S

R37W

9.5' Sandstone, lt. gray, medium to
coarse grained, non-calc.,
porous, top sharp, base
covered.

Lower 3.0' contains large-
scale tabular to cross-lam
in sets up to 3.0' thick.

Upper part of sand contains
small-scale trough x-
laminations in sets up to 0.5'
thick.

SAMPLE
FP#61

from 2'
below pebble
lag.

20' Sandstone, greenish brown,

WEATHERS BROWN, FINE TO MEDIUM

GRAINED. Base sharp erosional

scour with pebble lag

interval from 0.3' to 1.0' thick,

containing pebbles of blk

fossiliferous chert (containing

fenestrate bryozoa + crinoid ossicles),

green chert, meta-gabbro, ironstone,

and shale. Remainder of

unit contains small scale

trough cross-laminations in sets

up to 1.0 ft. thick, thin-bedded.

MAXIMUM PEBBLE DIAMETER
= 0.9'

PARTIAL-ABANDONMENT
CHANNEL FILL??

STOP #5 Sand 'C' E/2 Sec 3 T4S
R37W

9' shale, mostly covered

24' sandy siltstone. w/ climbing
ripples throughout; vertical
roots.

7' shale, mostly covered

4' Sandstone and siltstone - interbedded
~ 85% sandstone, beds 0.1 - 1.5'
thick, dark gray, very fine grained,
moderately calcareous. Beds
thin upward. Rippled and
climbing ripples. Roots near tops
of beds. Abundant plant material.

36' Silty shale with a few (c. 10%)
thin siltstone interbeds

SECTION:
FT. DESCRIPTION & REMARKS 145

6' - Siltstone, v. calcareous,
abundant plant material.
Thin-bedded. Upper part
truncated by overlying unit.

FP-162
from upper 10' →

6.9' Sandstone with siltstone
interbeds. About 80% sandstone.
Beds 0.3 to 3.0' thick.
Sandstone is v. fine, poorly
sorted dk. gray, calcareous, well
cemented. Sharp erosional bases
with bottom marks, load structures
and walled slanted burrows.
Whole unit channelized, cuts
into underlying siltstone ~ 2.5'.
Sandstone is massive or
horizontal laminated. One horizon
of trachoidal ripples - to SW-
upcurrent, + peculiar form suggests
intidunes? Extensive tracks +
trails on S.S. tops - grades
into overlying unit.

30% Interbedded sandstone, siltstone
and silty shale. About 15-20%
sandstone, v.f., thin beds - 0.1 to
0.8' thick, sharp bases with bottom
marks - tool marks, groove casts,
load features. Tops of beds rippled,
most horizontal lam. Extensive

back into
good section
long profile

FP-163
20.0 above
base of
unit

bioturbation on tops of
beds. Lenticular (thicken
over laterally 0.3 to 1.0') sandstones near
top.

2.5' - Sandstone, v.f. grained,
mod. sorted, sl. calcareous,
dk gray weathers tan.
Sharp base with flute
casts rather bottom marks.
Low-angle, hummocky tabular
cross-stratification. Rippled
top. S.S. laterally thins to
0.3 to 2.5' over 50'.
~~18.4/29~~ - hummocky
tabular cross-beds

19' Silty shale w/ thin bedded
v.f.g. sandstone rippled
(beds 1/2" thick to 1'). S.S. =
25% of section

3.5' Interbedded sandstone
and silty shale.
50/50. ~~Two~~ beds
(1' - bell + pillow), (0.7'
Lox tabular) Both have
sharp bases + tops, v.f.g.

2' - Sandstone, well cemented,
v.f.g., med. gray, highly
calcareous. Large scale
rough cross lamination (2.0' x 2.0')

R4/31

FR 164
0.5' from
base

SECTION:
FT. DESCRIPTION & REMARKS

146

1' rippled on top
12' Silty shale w/ thin sandstone
bed in center.

8.2' Sandstone, v.f. fine grained,
well cemented, med. gray, moderately
sorted. Little visible strat,
but ripple and horizontal
lam. near top. Thick bedded,
gradational base. Top covered

8.0' covered - probably s.s.
4' poorly exposed, heavily bioturbated
fine s.s. dark gray - completely
burrowed, vertical burrows
top + base covered

5.0' Thick bedded, fine grained s.s.
w/ long plant stems, vertical
stems 8" long - top + base covered
(only v.f. s.s. exposed).

4.0' Covered ~~by shale~~
Thin bedded nodular silty
v.f. s.s. w/ sh. in interbeds
Uneven 0.2 - 0.8 beds,
roots. top of hill -
shale at base covered. About 80% s.s.



SECTION: 8-4-77 W-23 147	
FT.	DESCRIPTION & REMARKS
	Stop 1 NW 1/4 Sec. 1, T5S 1237W note
	Base of intul covered, ✓ prob intbdd siltstone, shale & minor sds.
	Attitude at base of measure - intul N 84 E 12 SE
	NOTE Sec extends to SW 1/4 Sec 6 T5S 1236W
27.7	Unit A made up of following:
	4.8' Ss. vfg. med-dk gray abd carb mat'l sli calc. coaly ptop. top & base covered
	3.7 Covered intul prob shale.
RLS 168	3.3 Ss fgy, med gray, tr. carb mat'l dispersed thruout sli calc. 6.8" med bdd, horiz bdd base & top covered. ripples on upper sfc's
	7.0 Covered - evdy shale.
	8.9 Ss fmg, med w/ silt. lt gray v. calc covered base, sharp top med bdd, bds lge scale flow

SECTION: 148	
FT.	DESCRIPTION & REMARKS
	S12E; S4E trans di. tabular x-bed. SITE TRANS MB
N 88 E	S44E 18 NE N62W 27 SW S44E
86	N62W 17 SW N74W 28 SW N8E S16W
	See photo - scuminess at A - mostly channel fac thin upper units at A, altimeter 1900
67 ft	covered, - prob shale
18 ft.	mostly covered. Ss. vfg., silty, dk gray, v. calc., well cont'd. roots & other carb mat'l tracks & trails in float. poorly exposed,
42	Covered, prob intbdd silt & sh.
8'	Ss fgy, lt gray, med silt w/ cont'd, med calc. rip-up clasts, pebble sized poorly exposed.
45'	Covered
6'	low ridge, prob ss vfg., calc. med gray, thin bdd,

6.1

RLS
169
near top

angle trough cross beds
Ripples on foresets
Sets: 1 1/2 - 3 1/2 ft thick

Ss. fgy, lt med gry,
mod calc, thick bdd,
sharp erosional bars
w/ groove casts
aligned N 10W,
shale pebble chert lag
at base; transitional
top.
large scale low angle
trough cross lam.
sets 1-2 1/2 ft thick
Abd. plant mat'l
(whole unit is a channel)

2.7

RLS
170

Ss, vfg, lt brn gry,
slt calc, v. thin bdd,
sm scale trough cross lam
abd carb mat'l
on bdy planes.
top is covered.

Laterally at same
exposure
climbing ripples S 14 E

130
cm

194

RLS
171
alt
3' h
top

ripples, trace & traler.
top, base covered

Covered-

64' Talus. Mostly sand
w/ shale washing over.

21' Ss fgy, med gry, v calc.
top base covered
thin bdd.
large scale trough
cross lam sets
1-3' thick

18' Covered prob shale

1' Outcrop Ss.

10' Covered

11.2' Ss. fgy, at base, fmg
near top. lt gry,
non-calcareous. mod silt
top, base covered.
Large scale low angle trough
cross strat. sets 0.8-1.5' thick
meas on slightly disoriented bed
Block N 23 W 7° SW

FT.	SECTION: DESCRIPTION & REMARKS
	<p> <u>149</u> Cross bed attitudes: str dip 1) N 14W 17° SW N23W 9SW 2) N 18W 15° SW N38W 8SW Dip dir 1) S67W ; 2) S52W Minor rippled zones 0.2-0.5 ft beds sm scale trough x. strat. vfg, org rich ss. vertical burrows, in ripples lightly bioturbated. Altimeter 2145 Stopⁿ flew to top of canyon SE 1/4 Sec 6 T55R36W Altimeter 2353 Altitude N 78° E 14° SE Note talus below 6.0' Ss. fg., mod crtd. dk orangish gry, silic. calc well crtd. horiz lam. in lower 5' upper 0.8 ft. sml sil tabular x-strat set 0.8' 70.0' Covered, prob shaled in bed Sd. </p>

FT.	SECTION: DESCRIPTION & REMARKS
	<p> <u>150</u> Stop 3 - small mesa NW 1/4 Sec 9 T55R36W Altimeter 2220 At base, talus overlying shale and coal 11.3 Ss., fg at base, being vfg, silty at top. med gry, mod. calc - lowermost 1 ft is trough cross-strat, and shale pebble zone. w/ large (2' length) wood frags. Erosional base (at top coal) - upper part chg ripples becomes thinner, bedded upward; Eroded on top. 11.5' Ss., mg., mod crtd mod calc. lt gry. large scale trough and tabular cross-strat sets 2-4' thick Top covered, base erosional </p>

3.0'

Ss, v. fg., med. gry
v. calc., wh. contd.,
top, base covered,

beds 0.8-1.4 thick
low angle trough X-strat
upper beds rippled on top.
Top of beds on upper surface

Ripple trough dr.

S35W

thickens considerably on shore
Covered.

3.9'

17.0'

Ss fg., lt gry,
v. calc., top E
base covered

thin bed, low angle
trough X-strat
0.2 to 1.8 ft thick

Broad (20-40') troughs

No ripples, fossils,
burrows, trace of trails

RLS

172

Stop 4

at confluence of
Utukok R. & stream
flowing west from
Teggy Syncline.

Grab Sample in Torok Sh.

in SE/4 Sec 31

T4S R37W

at confluence of small creek
flowing W from the W end
of Teggy Syncline w/
Utukok R. - N end of bluff

W 24 (73)	SECTION: 151 (1)	
	FT.	DESCRIPTION & REMARKS
		SAUGFF SECTION W-24
		NORTH FLANK SNOWBANK ANTI-CLINE ON KOKOLIK R.
		PHOTO GS-TAL 37-33-L; UTUKOK RIVER
		B-5 QUAD Secs: NW/4 Sec 24 & S/2 Sec 13
		T1S, R40W.
	~5	SANDSTONE, mg, LT BRN, LT BRN NON-CALC, HORIZ. LAM (?) POSS. ATTITUDE N55W 30NE, BASE & TOP COV.
	75'	COVERED @ 45' FROM BASE INDISTINCT EXPOSURE OF f TO mg SANDSTONE W/ SMALL SCALE TROUGH X-LAM
	5-10	SANDSTONE, f TO mg, LT BRN, DISPURSED FLECKS OF CARB MAT NON-CALC. INDISTINCT EXP. TOP & BASE COV.
	20	COVERED
	185	SANDSTONE, f TO mg, LT BRN, STLY CALC. BASE COV. THIN TO MED BEDDED, (0.1-0.7) LOW ANGLE, LARGE SCALE TROUGH X-BEDDED TOP TRANSITIONAL.
	135	SANDSTONE, fg, LT GR4 BRN, THIN TO MED BEDDED (1/2" TO 0.5') LARGE SCALE LOW ANGLE TROUGH X-BEDS, W/ RIPPLES INCLUDES CLIMBING RIPPLES ON SLIPE FACE OF X-BEDS, NON-CALC, MINOR CARB MAT. LATERAL SUGGESTION OF CHAN

	SECTION: 152 (3)	
	FT.	DESCRIPTION & REMARKS
		BEDS UP TO 0.2' THICK, BEDS THIN UPWARD INTO 0.5' THICK INTERVAL OF INTER BEDDED, THINLY BEDDED SS & COALY SH. TOP SHARP, EROSIONAL
	95	Cg @ BASE, f TO mg @ TOP, LT BRN, M BRN, CALC. NUMEROUS SCOUR SURFACES
	SAE 173	W/ FLOATING VCg SAND & PEBBLES OF WHT QTZ, BLK CHT & SHALE, THIN BEDDED, LARGE SCALE TROUGH BEDDING W/ CLIMBING RIPPLES W/IN FORESET BEDS, SETS UP TO 4' THICK. WOOD CASTS SAMPLE SAE 173 FROM 1 1/2' FROM BASE.
		1E, f TO fmg, M. BRN GR4, BRN ORN. SMALL SCALE TROUGH X-LAM IN SETS UP TO 0.05' THICK TOP & BASE COV
	12	COVERED PROB INTERBED SS & SH
	35	SANDSTONE, fg, DK GR4, GR4 NON-CALC, TRACE CARB, SMALL SCALE TROUGH X-BEDDING, BASE & TOP COV. OUTCROP V. RUBBLEY
	135	COVERED BREAK IN SCOPE W/ ABUNDANT COAL FROM ANIMAL BURROWS
	45	COVERED
	~1	SANDSTONE fg, M. TO DK GR4, BRN ORN V. CALC. CARB. MAT ON BEDDING SMALL SCALE TROUGH X-LAM
	100	COVERED
	~5	SANDSTONE, fg, LT GR4, RED ORN

(2)

109' COVERED

68' SANDSTONE, f to mg, LT BRN, MOD SORTED, THIN BEDDED, HORIZ (?) LAM. TROUGH & TAB. X-LAM IN SET UP TO 0.5' THICK, V. CALC, BASE & TOP COV.

63' COVERED

15' SANDSTONE, v to f at base BE-COMING f to mg UPWARD, LT BRN TO GRAY, CALC. LOWER 3' CONTAINS CLIMBING RIPPLES IN SETS UP TO 0.2' THICK, 3' LARGE SCALE LOW ANGLE TROUGH X-BEDS IN SETS UP TO 1.5' THICK, 1.5' CLIMBING RIPPLES THIN BEDDED, 7' LARGE SCALE LOW ANGLE TROUGH X-BEDS IN SETS 2' THICK W/ BEDS OF TAB X LAM IN SETS UP TO 0.4' THICK, ABUND WOOD & CARB MAT. (LEAVES, LIMBS & STEMS) 6' CLIMBING RIPPLES UP TO Fg, ROOTS, BASE & TOP COV.

40' COVERED

20' SANDSTONE

6' mg, M. GRAY, GRAY, BASE COV. LARGE SCALE TAB. X-BED IN SETS UP TO 4' THICK, LOCAL CLIMBING RIPPLES W/ N FORESET BEDS, TOP TRANSITIONAL

35' fg, TAN, BRN ORN, CALC, CLIMBING RIPPLES IN PINCH & SWELL FORESET

(4)

WELL SORTED, QTZ RICH, NON-CALC (DOLO, CMT ?) BEDDING INDISTINCT, BASE & TOP COV LOG MOLDS

224' COVERED, COAL BED OF UNKNOWN THICKNESS 185' FROM BASE (≤ 5')

7' SANDSTONE, mg, MOD SORTED M. BRN, RED ORN, THIN BEDDED LARGE SCALE TROUGH X BEDDED IN SETS 1 TO 3' THICK TOP & BASE COVERED, V. CALC

515' COVERED 430' FROM BASE

INTERBEDDED COAL & SHALE

440' SANDSTONE, v to f, LT TO M. GRAY ABUNDANT CARB MAT. ROOTS, THIN BEDDED, INDISTINCT WAVY LAM BASE & TOP COV.

410' SANDSTONE M TO CG, V. FRI LT GRAY POOR SORTED NO DISTINCT OUTCROP.

9' SANDSTONE v to mg, POOR SORTED LT GRAY, V. LT GRAY, SLY CALC, V. THIN TO THIN BEDDED LARGE SCALE LOW ANGLE TABULAR X-BEDS IN SETS 2' TO 8' THICK, LOG MOLDS, FLOATING PEBBLES TO 3" LONG OF SH & FST, BASE COV. TOP SHARP, SAMPLE FROM 2' BELOW TOP

SANDSTONE, v to fg, LT GRAY, MOD.

SAE
174 →
95

FT.	SECTION: 153 (5)	DESCRIPTION & REMARKS
		SORTED, LT GRAY, VLT GRAY, V. THIN BEDDED, HORIZ. LAM. BEDS THICKEN UPWARD FROM 1/2" TO 0.2'. SILTY CALC. COALY PARTINGS, TOP COU. FE STONE BED NEAR TOP 0.3'
218		COVERED
13		SANDSTONE, f to mg, LT GRAY, BRN BRN SILTY CALC. ABUNDANT CARB MAT RANGING FROM SILT SIZE TO STEMS & BRANCHES (1' LONG) THIN BEDDED TABULAR X-BEDS IN SETS 0.2' TO 3' THICK W/ RIPPLES LOCALLY FLOATING PEBBLES (FE STONE) TO 4" LONG. FE STONE BED 1" FROM TOP 0.5' THICK, TOP & BASE COU.
82		COVERED, COAL AT TOP
3		SANDSTONE, vf, LT BRN, LT GRAY SILTY CALC, BEDDING INDISTINCT WISPY LAM IN PLACES APPEARING TABULAR. EROSIONAL TOP, BASE SHARP OVERLYING COAL.
35		SANDSTONE, fg, LT GRAY, LT BRN LOCALLY PEBBLY, FE STONE UP TO 3" IN MAX DIMENSION, THIN PARALLEL LAM NEAR BASE GRADING UPWARD INTO TABULAR X-BEDS IN SETS FROM 0.5 TO 1.5' THICK TOP SHARP
10		SANDSTONE, fg, LT GRAY, BRN, MDN CALC. SILTY CARB SHARP EROSIONAL BASE W/ LAG OF FE STONE PEBBLES

FT.	SECTION: KOKOLIK RIV. (7) SINOUBANIC ANT. 154	DESCRIPTION & REMARKS
		THICKNESS AT TOP OF TAB SETS (PALEOSOLS ?) STRIKE & DIP OF TABS. E-W 41N TOP SHARP
04		SANDSTONE, vf, ARGIL., DK GRAY, LT GRAY ABUNDANT CARB MAT. SMALL SCALE TROUGH X-LAM
18		SANDSTONE, mg @ BASE, fg @ TOP LT GRAY, BRN, BASE SHARP, SMALL SCALE TROUGH X-LAM UPPER SURFACE RIPPLED
02		SANDSTONE AS 0.4' BED ABOVE
152		SANDSTONE & INTERBEDDED SANDY SILTSTONE, SS-BEDS 1 TO 2' THICK INTERBEDDED W/ SILTST IN BEDS 0.3' TO 1.0' W/ SANDSTONE 70% OF UNIT. SANDSTONE, fg, LT GRAY, TAN, SILTY CALC, CONTAIN SMALL SCALE TROUGH CLIMBING RIPPLES THRU OUT, BASES & TOPS SHARP, SILTSTONES, CONTAIN ABUNDANT vf, SAND. NEAR TOPS CONTAIN IRONSTONE BEDS 1/2" TO 2" THICK, SMALL SCALE CLIMBING RIPPLES & SMALL SCALE TROUGH X-LAMS WAY ARE V. THIN & PAPERY TOP COVERED
SAE 176		SAMPLE SAE 176 FROM BASE OF 152 UNIT

LOWER 45' CONTAINS CLIMB-
ING RIPPLES IN SETS UP TO 0.2
THICK
UPPER 55' INTERBEDDED SLTST
SS, CONTAINS SMALL SCALE
TROUGH X-LAMS, TOP COU
TABULAR X-BEDS
S: N89E 27NW - BEDDING
N80E 43NW - TAB N22W
N42W 5NE - " SIDE
155 COVERED COAL OF UNKNOWN
THICKNESS 40' FROM BASE
COAL AT TOP
95 SANDSTONE, f to mg, LT GRAY, YEL
BRN, SLT CALC, ABUNDANT CARB
MAT ON BEDDING, THIN TO MED BEDD
[SAMPLE 175 4' FROM BASE]
R4/33 IRON STONE PALEOSOL
(KWS) TRUNCATING FORESETS
IN CORWIN SS ALONG
KOKULI K RIVER
K6/1 SAME AS ABOVE.
(R45)
TABULAR X-BEDS W/ TANGENTIAL
BOTTOM SETS, CARB MAT. MORE
ABUNDANT ON BOTTOM SET THAN
ON EQUIVALENT FORESET
FEST LAYERS 1" TO 1' THICK, 1 REG,

SAE
175
7

Aug 6 AUGUST 1977

N82E 34N - MASTER BED
1 N40W, 10NE TAB X-BED
2 N45W, 26NE " 558E
3 N60W, 21NE " 547E
4 N64W, 27NE " 563E
5 N85E, 12SE " 507E
6 N82E, 48NW " N25W
7 N72E, 44NW " N50W
8 N61W, 15NE " 533E
9 N77E, 47NW " N35W
10 N86E, 49NW " N04E
11 N84E, 41NW " N01E
12 N68W, 40NE " N77E
13 N86E, 35NW " N45E
14 N81W, 49NE " N12W
BASE OF SAND SET EXPOSED, SHARP, REST-
ING ON COAL
230 COVERED, COAL IN GROUND
SQUIRREL BURROWS @ 75'
14.5 SANDSTONE, mg @ BASE, fg @ TOP
BRN GRAY, BRN, NON-CALC, ABUNDANT
CARB, BASE & TOP COU, MIDDLE 5'
LARGE SCALE TROUGH STRAT IN BEDS
2' THICK, SCATTERED PEBBLES
OF FEST & SS, NO OTHER VIS STRAT
SAMPLE SAE 177 FROM BASE
COVERED
SANDSTONE, f to vfg, GRAY, BRN
MOD TO POOR SORTED, VERY POORLY
EXPOSED BASE & TOP COU, SMALL
SCALE TROUGH X-LAM

SAE
177
40

FT.	SECTION: DESCRIPTION & REMARKS
60	COVERED
38	SHALE PARTLY COU., SILTY
21	SANDSTONE, fg @ BASE, SILTY vfg @ TOP, M. GRAY, BRN, NON-CALC. ABUNDANT CARB ON BEDDING, BASE COU. TOP GRAD., CLIMBING RIPPLES UPPER 1' HAS NO VIS STRAT.
35	COVERED
15	SANDSTONE, vfg, LT GRAY, BRN NON-CALC., ABUNDANT PLANT MAT SOFT SED. DEFORMATION @ BASE CLIMBING RIPPLES ABOVE W/ ROOTS AT TOP., TOP & BASE COU.
35	COVERED
55	SANDSTONE mg to fg, LT TO M. GRAY GRAY, NON-CALC., ABUND. CARB MAT BASE COU. TOP SHARP, THIN BEDS (0.4 TO 0.1') BEDS SHOW FAINT RIPPLES & LITTLE STRATIFICATION, UPPER MOST 1' THINLY LAM. W/ ORGANIC RICH (COALY) LAM FILLING LOW ANGLE TROUGH.
13	CLAYSTONE, ^{DRUM.} GRAY WEATHERS ORN
SAE 178	MASSIVE, NON-CALC. (EQUIVALENT) TO FINEST BEDS BELOW) SAMPLE
7	SAE 178 FROM MIDDLE
	NTSW 30N
13	SANDSTONE, mg BECOMES SILTY FINER UPWARD, LT BRN GRAY, SILTY CALC., ABUND PLANT FRAGS, BASE PARTLY COU. PROB SHARP, ERODED INTO

155 (9)

FT.	SECTION: DESCRIPTION & REMARKS
	LYING CHANNEL, 7 1 TO 2' CLAYSTONE BED, MED GRAY WTHRS ORN, SHARP TOP, ERODED,
193	SANDSTONE, mg, LT GRAY, YELL ORN NON-CALC., MOD SORTED, ERODIVE BASE W/ ABUNDANT PLANT MAT. LOWER 4', CLIMBING RIPPLES 14' LARGE SCALE TAB. X-BEDS SET THICKNESS = BED THICKNESS
SAE 180	NEXT 4', SMALL SCALE TROUGH X-LAM SAMPLE SAE FROM 14' BED
7	SE TABS, TOP 7', EROSIONAL BASE, mg, RIPPLED AT BASE UPPER 3' LARGE SCALE TAB X-BEDS
0.3	CONGLOMERATE, mg SAND & PBLS UP TO 0.3' IN DIAM. PBLS, SS, CHT, GREEN STONE AND LOGS
15	SANDSTONE, M TO CG, M. GRAY, BRN GRAY V. TO MOD. CALC. ABUND PLANT DEBRIS. BASE GRAD W/ CONGLOMERATE TOP COU., THIN BEDDED, NO VIS STRAT.
	COVERED STOP #2
10	SANDSTONE v/ to mg, DK RED M. ORN RED, TOP & BASE COU. FAINT RIPPLE & PROB. HORIZ LAM. OXIDIZED PLANT DEBRIS. - KLINKER.
SAE 181	STOP #3 SANDSTONE CORWIN CHANNEL SAMPLE SAE 181 FROM MIDDLE

156 (11)

	UNDERLYING UNIT, TOP COU. LARGE SCALE TAB. X-STRAT. IN SETS 15 TO 2' THICK, UPPER MOST 2' HORIZ. LAM., RIPPLED AT TOP.
125	COVERED
70	SANDSTONE, fg, LT TO M GRAY YELL BRN, WELL CMTD, ABUND LEAVES & STEMS, BEDS < 1' THICK. RIPPLES COMMON, RIP UP CLASTS. TOP OF BED AT 60' FROM ^{BASE} HEAVILY BURROWED HAS HEAVY WALLED BURROWS, COU ON RIDGE EXPOSED ONLY IN NARROW ZONE NEAR RIV AT TOP LARGE LOGS TO 3'x1' & GINGKO LEAVES
	³⁴ R4/32 SMALL SHALE
	DIAPIR IN CURWIN.
SAE ¹⁴	SLTY SHALE, DK GRAY, SAMPLE SAE
179	179. FROM 8' ABOVE BASE CONTAINS SILT & COAL BEDS (< 1') TOP HAS ROOT STRUCT
25	SILTSTONE, GRAY, ORN BRN. ABUND. PLANT DEBRIS (LEAVES ETC), THIN 1/2 S' Vfg SAND BED AT TOP
25	SILTSTONE & INTERBEDDED SS
15	Vfg, ABUND PLANT DEBRIS
	COAL No. 9
26	SILTSTONE & SHALE, DK GRAY AT TOP OF UNIT, AT BASE OF OVER

SECTION:	7/AUG/77	157
FT.	DESCRIPTION & REMARKS	
	SOUTH FLANK OF SNOWBANK ANTICLINE ON THE KOKOLIK RIVER, MIDDLE OF KUKPOWUK FM. BY KWS, CRW, & WNK NBOW 185	
175	SANDSTONE fg LT GRAY, LT GRAY NON-CALC MOD WELL SORTED, MINOR CARB MAT. BASE & TOP COU. LOWER 7' HORIZ. LAM. UPPER PART MOD TO HEAVILY BIOTURD. NO VIS. STRAT.	
65	COVERED	
48	SANDSTONE, vfg SLTY @ BASE, mfg @ TOP, LT GRAY, SORTING INCREASES UPWARD, NON-CALC., TRANSITIONAL BASE, SHARP TOP, LARGE (< 1') PLANT FRAG. & ABUND COALY PARTINGS. RIPPLED ON TOP, NO VIS STRAT, M. BEDDING	
50?	SANDSTONE, vfg, LT BRN GRAY NON-CALC. & ABUND CARB MAT. BASE SHARP, TOP EROSIONAL, SMALL SCALE TROUGH LAM.	
50?	SANDSTONE, vfg, LT BRN GRAY NON-CALC., MOD CARB MAT. EROSION BASE, TOP COU., BEDS 0.5 TO 2' THICK SEVERAL SCOUR SURF. W/N UNIT DRAPED BY LAMINATED SILTY Vfg SS., MASSIVE BEDS RIPPLED ON TOP WELL CMTD.	
70	COVERED	

10' SANDSTONE: mg @ BASE fg @ TOP
LT GRY, NON-CALC. TRACE CARB
MAT., BASE & TOP COV. MED BEDDED
LARGE SCALE TAB. X-BEDS, SETS
0.8 TO 1.5' THICK, MINOR HORIZ
LAM. GRADES UPWARD IN UPPER
2' TO THIN BEDDED SMALL SCALE
TROUGH X-LAM., PEBBLELY SS NEAR
BASE. PBLs TO 3/4" OF SH, SS, CHT
IN MG MATRIX ~0.8' THICK. THICK
ENS LATERALLY INTO 3' ZONE
W/ MOSTLY FINE COBBLES

1' COVERED

175' SANDSTONE, fg, M. BRN GRY, NON-
CALC, ABUND. CARB MAT, BASE
COV., THIN BEDDED, CLIMBING RIP-
PLES, A FEW THIN BEDS (0.8') OF
HORIZ LAM & RIPPLE LAM. (2 BEDS
IN UPPER 6') TOP TRANSITIONAL
INTO SILTY SHALE OVER 0.5'

48' SHALE & SANDSTONE, INTER
BEDDED, SANDSTONE: fg, M. GRY, NON
CALC, CARB. PARTING, BEDS (< 0.8')
CLIMBING RIPPLES, BASE SHARP
W/ SHALE PEBBLE LAGS, TOP TRANS.
~25% SS.

18' SANDSTONE, fg M. BRN GRY, SILY
CALC., MINOR CARB, BASE SHARP.
TOP GRADES INTO SILTSTONE, LOWER
7' HORIZ. LAM UPPER 11' CLIMBING
RIPPLES, BEDS 0.6 TO 2' THICK IN

SECTION: 158	
FT.	DESCRIPTION & REMARKS
	OVER ALL UNIT. (UNIT THINS NE TO TWO SS. (LOWER 4, UPPER 2 SET BY 2'SH)
34	SAS 182 FROM 10 SHALE & SILTSTONE (NODULAR) ABOVE BASE
25	LIGNITE
8	SILTSTONE & SHALE
3	SANDSTONE vfg, SILTY, DK GRY CALC, ABUND. PLANT MAT. NO VIS STRAT. FAINT CLIMBING RIPPLES BEDS 0.2 TO 0.5' THICK, TRANSITION AL BASE & TOP.
35	SILTSTONE & SHALE, SH HAS ABUNDANT COALY PARTINGS, SCLST IS SANDY BEDS 0.4 TO 0.8 THICK & PINCH OUT LATERALLY
5	LIGNITE
8	COVERED, PROB SHALE
2	SANDSTONE vfg, M. GRY, CALC BASE & TOP COV. BEDDING PLANE BURROWS CLIMBING RIPPLES THEN OUT.
4	COALY SHALE
0.4	SANDSTONE AS 2' BED BELOW COVERED STOP # 2
135	SILTSTONE & SHALE INTERBEDDED MOSTLY COV. INTERBEDDED SAND STONES 0.3' THICK AT TOP 4' TOP SHARP. BURROWED

0.6	SANDSTONE, Vfg, DK GR, NON-CALC. ABUNDANT CARB. MAT SHARP BASE, TRANS. TOP, TRUNCATES UNDERLYING UNIT 0.8' RELIEF RIPPLED W/ MOD BURROWING
33	SILTY SHALE & SILTSTONE, SICTER AT TOP
32	SANDSTONE & SILTY SHALE INTER-BEDDED, SS BEDS 0.4 TO 0.8' THICK THREE BEDS, Vfg, SHARP BASE ERODED INTO UNDERLYING UNIT MOD. BIOTURB. ABUND. CARB. MAT STRAIGHT CRESTED RIPPLES - SMALL CHANNEL FILL.
15	SHALE & SILTSTONE MOSTLY COV.
18	SILTSTONE, NODULAR, DK GR, NO VIS STRAT. LOGS & ROOTS. POSS BURROWS, COAL 1' THICK, 12' ABOVE BASE, UPPER 5' INTER BEDDED SANDS & SHALE 0.5 TO 0.8' THICK SS, Mq, LT GR, STLY CALC. COALY & SILICIFIED LOGS & LIMBS, SHARP BASE, TOP SHARP ECOATING PCLS, SS & SH UP TO 1"
11	SANDSTONE Mq, MOD SORTING, LT GR, NON-CALC. SHARP BASE THICK BEDDED, NO VIS STRAT. LARGE LOGS & PCLS NEAR BASE

SAS
183
5' FROM
BASE

FT.	SECTION: DESCRIPTION & REMARKS
158	Vfg @ TOP 159 SANDSTONE, Cg, LT GR, STLY CALC, MOD. SORTING, BASE COV. LARGE SCALE TROUGH X-BEDS IN SETS 2' TO 5' THICK, UPPER 3' R/L CLIMBING RIPPLES, TOP TRANSITIONAL, SAMPLE SAS #184 - 4' FROM BASE.
15	SILTSTONE, LAMINATED
46	SANDSTONE, Mq @ BASE TO Vfg @ TOP, LT GR, SHARP BASE w/ FEST Cgl @ BASE PCLS UP TO 0.5 IN DIAM. LOWER 2' TABULAR X-STRAT IN SETS ~2' THICK UPPER PART RIPPLED & THIN BEDDED, TOP TRANS
9	SANDSTONE Mq @ BASE fg @ TOP LT GR, MINOR CARB. MAT. SHARP BASE, LOWER 5' LARGE SCALE TABS IN SETS 1.5 TO 5' THICK RIPPLES AT TOP OF SETS, TWO THIN (0.3') Vfg SS LAM. BEDS UPPER 4' CLIMBING RIPPLES TOP COV.

SECTION: 8/8/77 Kukupuruk - Corwin	
FT.	DESCRIPTION & REMARKS
	section on NE Flank of Coke Basin
	So: N24W, S516SW 160
220	Shale, w/ interbedded siltstone. Partly covered.
48	Sandstone, interbedded with siltstone, 85% sand. ss v.f.g., beds 0.4' to 1.1' thick, laterally thickens to east (merge into 1 sand). Abnt roots + plant mat'l. Strat indistinct, locally wavy(?). Ironstone concretions in siltstn beds. SPLAY SAND? PHOTO R4/33 - SPLAY SAND. 35
	SAMPLE CB186 6' above base }
310	Silty shale; upper 2.0' FLASER BEDDED. ABNT BURROWS ON BOTTOMS OF SAND BEDS.
38	Sandstn, f.g., lt. brn, non-calc., ERODED BASE, TOP TRANSITIONAL large-scale low-angle trough x-beds in sets 1.5-2.0' thick. Small-scale troughs at top.

SECTION: 161	
FT.	DESCRIPTION & REMARKS
	AND PLANT MATERIAL, INCLUDING GINGKO LEAVES. BASE TRANSITIONAL, TOP COVERED. SAMPLE CB 187 - 5HSTN - 6.0' FROM TOP.
210	COVERED.
40	SILTSTONE, SANDY, ARGILL; in 0.3'-1.5' beds interbedded with shale. ABNT CARB MAT'L; ROOT STRUCTURES.
30	COVERED.
53	SAME AS 4.0' UNIT DESCRIBED ABOVE ↗
1380	COVERED; BLK SHALE CUTTINGS IN PARKY SQUIRREL TAILINGS. SS BED 1.8' THICK @ 130'.
73	Siltstone, dk. brn, ABUND. PLANT MATERIAL; POSSIBLE ROOT STRUCTURES.
210	COVERED.
30	Sandstn, v.f.g, silty, RIPPLES (DEFORMED) AND CONVOLUTED LAMINATION. ABNT PLANT MAT'L, POSSIBLE ROOTS.

~~205~~
255

INTERBEDDED SILTSTONE +
SHALE w/ INTERBEDDED
THIN SANDSTN BEDS 0.2'-0.4'
~~CONSIDERABLE~~ THICK (RIPPLED,
HEAVILY BIOTURBATED
ON UPPER SURFACES).
SS FORMS <10% of
sequence.

RIAPLE TRANS

S30W

N25E

S37W

49

Sandstone, v.f.g., med. gray,
mod. calc., base ~~eroded~~;
top ~~eroded~~; medium-
bedded (0.5'-1.0');
ABNT SOFT-SED DEFORMATION;
ABNT ROOTS AT TOP.

93

SILTSTONE, SHALE; SILT
MORE ABUNDANT IN UPPER
4.0'.

395

SILTSTONE SANDY
SANDSTONE; v.f.g., silty,
med-dk gray, sl. calc.,
INTERBEDDED IN 0.2' TO
1.5' BEDS WITH ~~SILTSTONE~~ SILTY
PARTINGS 0.2' THICK.
BEDDING UNEVEN - NODULAR;
ABUNDANT ROOT STRUCTURES

75

BLK SHALE, SLTY.
SAMPLE CB188 2' above
base

148

SANDSTONE, m.g., H. gray,
NON-calc., mod. SORTED;
FROM BOTTOM -
2.8' EROSIONAL BASE, LG. WOODY
PLANT FRAGS UP TO 1.0'
LONG. UPPER 0.8'
CONTAINS CLIMBING
RIPPLES.
4.0' LARGE SCALE TABS,
LOWER 3.0'; CLIMBING
RIPPLES UPPER PART.
6.0' LARGE SCALE TROUGHS IN
SETS 1.5-2.0' THICK
2.0' SMALL-SCALE TROUGHS

Each sequence fines
UPWARD

1979

COVERED.

162	
FT.	SECTION: DESCRIPTION & REMARKS
80	SANDSTONE, M.-C.G., LOCALLY CONTAINS PEBBLE OF BLK CRT UP TO 1.5" IN DIAMETER; TABULAR CROSS-BEDDING IN SETS FROM 0.4' TO 0.7'. LARGE-SCALE LOW ANGLES TROUGH IN SETS FROM 2.5 - 3.5' THICK. LABB MAT'L CONC. ALONG TROUGH FORESET SURFACES.
85	PEBBLY SANDSTONE; EROSIONAL BASE.
85	SANDSTONE, M.G., BECOMES THINNER BEDDED TOWARD TOP; SMALL-SCALE TROUGH X-BEDDING IN SET ~ 0.6' THICK. TOP COVERED; BASE TRANSITIONAL INTO UNDERLYING PEBBLY SANDSTN. COVERED.
166	
52	Sandstone, v.f.g., at base to fine at top; v. THIN HORIZ. LAMINATION IN LOWER 3 1/2 FEET UPPER PART CONTAINS THICKER BEDS. SPLAYS ENCROACHING INTO LAKE ?? ABNT CARB MAT'L ON BEDDING; HORIZ LAM. WAVE NEAR TOP PHOTO R4/2936 TOP OF STAFF AT BASE OF CHANNEL SEQUENCE.

163	
FT.	SECTION: DESCRIPTION & REMARKS
	TROUGH X-LAM IN SETS UP TO 0.3' THICK.
113	SANDSTONE, M.-C.G. AT BASE; F.G. AT TOP; NON-CALC. LT. GRAY; LOWER 3.0' - NO VIS STRAT; NEXT 4.5' CONTAINS LOW ANGLE TABS IN SETS 0.5' - 1.0' THICK. UPPER 3.8' HORIZ. LAMINATED; TOP TRUNCATED AT SLOUR. CONTAINS PEBBLES + PLANT DEBRIS.
CB190 1' above base.	
CB191 2.0' below TOP.	SANDSTONE, M.G., LT. BRN, CONTAINS LG SCALE X-BEDS IN SETS 1.5' - 5.0' THICK. UPPER 0.5' CLIMBING RIPPLES. BASE IS SLOUR SURFACE.
CB192 2.0' below TOP.	
35	SANDSTN, M.G., LOW-ANGLE TROUGH X-STRAT IN SETS 1.0' THICK. BASE EROSIONAL; UNIT THICKENS Laterally.
CB193 1.0' below TOP.	
51	SNDSTN, M.-C.G., EROS. BASE, LG-SCALE X-STRAT IN SETS 1.0 - 2.5' THICK. TOP COVERED. ALSO TABS IN SETS < 1.0' THICK. MASTER BEDDING N38W 17SW TAB ATTITUDES: TRANSPORT DIRECT.
1	N64W, 26 SW 505E
2	N74E, 19 SE 561E
3	N27E, 35 SE 579E
4	N70E, 31 S 546E

3' SS, medium-grained w/
CB189
2.0' ABOVE
BASE
PEBBLE LAG AT BASE; BASE
+ TOP SHARP EROSIONAL
SCOURS; STRAT. INDISTINCT
LOCAL TAB X-LAM.

9' Sandstone, m.g., LT. GRAY,
NON-CALC., SHARP BASE (SCOUR);
PEBBLE LAG AT BASE.
LARGE SCALE TROUGH
X-LAM IN SETS 1.5' - 3.5'
THICK. BECOMES THINNER
BEDDED AT TOP + CONTAINS
TROUGH X-LAM IN SETS
FROM 1.0' - 1.5' THICK
(UPPER 5.0' of unit). TOP
COVERED.

37
R4/35 CW JAKING ACROSS
COVERED INTERVAL

445' COVERED INTERVAL SAND RIDGES
IN LOWER 1/3.

2' SANDSTONE, c.g., LT. GRAY,
NON-CALCAREOUS, MINOR
CARB. MAT'L.

SANDSTONE, m.g., horz.
laminated w/ local low-angle

TAB ATTITUDES:

TRANSPORT DIRECTION

5	N35W, 245W	S69W
6	N74W, 30S	S14E
7	N47W, 21S	S18W
8	N71W, 41S	S03W
9	N59W, 22S	S10E
10	N68W, 26S	S12E
11	N78W, 22S	S37E
12	N58W, 24S	S08W
13	N66W, 29S	S04E
14	N64W, 39S	S11W

STOP # 2 NEXT BEND IN
RIVER TO NORTHEAST; SECTION
BELOW THAT MEASURED IN
KUKPOWRUK AT STOP #1

9' SANDSTONE, M.G., DK BRN,
LT GRAY FRESH; NON-CALC.
BASE COVERED; PEBBLE
LAG NEAR BASE; LARGE
SCALE TABS + TROUGHS
IN SETS FROM 1.0 TO 2.0
FEET THICK.

2' SANDSTONE, c.g., LT. GRAY, conglomeratic
AT BASE, w/ PEBBLES UP TO
8" IN DIAMETER. TABS IN
SETS 1-3' THICK.

SECTION: 164	
FT.	DESCRIPTION & REMARKS
3 ⁵ CB 194 Do. 5' below TOP	SANDSTONE, FINE-MEDIUM GRAINED w/ EROSION BASE, ALTERNATING COARSE (MEDIUM) AND FINE SANDS IN LAMINAE.
3 ⁴	SANDSTONE, M.G., w/ conglom. (pebbles to cobbles) lag at base AND FINE-GRAINED AT TOP! LOW-ANGLE FORESETS IN LOWER 2.5'; UPPER 2.0 0.9' CONTAINS CLIMBING RIPPLES, IRONSTONE BED 0.05 0.05' THICK AT TOP.
5 ²	SANDSTONE, M.G., PEBBLY AT BASE, v.f.g. at top; ALTERN. LAM. AT BASE; NO STRAT VIS IN UPPER INTERVAL FROM 1.0 - 4.7' ABOVE BASE; UPPER MOST 1.0' CONTAINS CLIMBING RIPPLES.
	50° N40W, 26 SW
6 ³	SANDSTONE, F.G., SCOUR BASE, LG SCALE TROUGH X-STRAT IN SETS 2.0 - 3.0' THICK.
115 ⁴	COVERED. EXPOSURE OF V.F.G. SS 40' below top. SS CONTAINS ROOT STRUCTURES.

SECTION: 165	
FT.	DESCRIPTION & REMARKS
4 ⁵	Siltstone, interbedded with shale; BED THICKNESS VARIES FROM 0.1' to 1.0'; HEAVILY BURROWED.
19 ⁰ SAMPLE CB 197 8' above base.	Shale, black
8 ⁵	Siltstone, in 0.2' interbeds with shale; heavily bioturbated! Abundant coalified plant fragments.
14 ⁰ SAMPLE CB 198 10' above base.	SHALE
8 ⁵	SANDSTONE, v.f.g., silty at BASE, BECOMING F.G. AND MORE WELL-SORTED UPWARD. Lt. GRAY, v. calcareous, BASE TRANSITIONAL, TOP TRANSITIONAL. THINLY BEDDED, RIPPLED, MODERATELY BIOTURBATED. WAVE RIPPLES.
CB 200 2' above base.	

2° Siltstone, dk gray,
ABUNDANT ROOT STRUCTURES,
IRREGULARLY BEDDED;
BASE COVERED; TOP SHARP.

2° Conglomeratic sandstone,
coarse-grained, with large
coalified plant fragments.
SOFT-SED DEFORMATION;
PLANT FRAGS UP TO 0.8',
chert pebbles. V. POORLY
SORTED; CHAOTIC,
BANK-COLLAPSE CHANNEL
LAG DEPOSITS?? DEPOSITS
POD-SHAPED.

29.5° SANDSTONE, MED. GRAY, FINE
AND MEDIUM-GRAINED, V.F.G. AT TOP,
VERY THINLY LAMINATED;
HORIZONTAL CLIMBING, AND
TROUGH AND WAVY LAMINATIONS.
INTERFERENCE RIPPLES
AT TOP;

70° Shale, blk, nodular.

SAMPLE
CB 195
7.0' above
base

SAMPLE
CB 196
60' above
base

PROGRADING LOW-E SHORE LINE?

3° Siltstone, w/ THIN (< 0.2')
v.f.g. ss beds.

14° SHALE, BLK.

SAMPLE
CB 199
@ 4' above
base.

4° SANDSTONE INTERBEDDED
w/ SILTSTONE; 80% SS;
BEDS 0.2' - 0.8' THICK;
CLIMBING RIPPLES THRU-OUT.

18 ~~1.8~~° SILTY SHALE

32° INTERBEDDED SS + SILTSTN;
60% SS; Lower bed 7.4',
UPPER 0.5' THICK.
SS V.F.G., SHARP BASE,
CLIMBING RIPPLES THROUGHOUT,
w/ MINOR SOFT-SED
DEFORMATION.

24° Silty shale, dk gray.

29° SS, v.f.g., dk gray,
SHARP BASE w/ LOAD
STRUCTURES. CLIMBING
RIPPLES THROUGHOUT.

166	
FT.	SECTION: DESCRIPTION & REMARKS
334	silty shale, dk-gray - blk.
2.7	SANDSTONE F.G., silty; SHARP BASE w/ LOAD STRUCTURES - CLIMBING RIPPLES.
0.3	SHALE
1.6	SANDSTONE, SAME AS 2.7' BED DESCRIBED ABOVE.
15.5	SHALE.
5.1	SANDSTONE, F.-V.F.G., DK GRAY, SL. CALCAREOUS - UNEVENLY BEDDED IN 0.2' - 0.6' 1.0' THICK BEDS w/ 0.1' silty shale breaks. CLIMBING RIPPLES; ROOT STRUCTURES, BIOTURBATION OF ORGANIC-RICH SHALE DRAPE.
29.5	BLK SILTY SHALE, PARTLY COVERED.
8.8	SANDSTONE; m.G. DARK BROWN; FETID ODOR WHEN BROKEN. WAVE LAMINATION AND SMALL-SCALE TROUGHS IN LOWER 5.0'. UPPER 3.8' CONTAINS climbing ripples.

167	
FT.	SECTION: DESCRIPTION & REMARKS
	8/9/77
	Coke Basin N limb, continued Stop 1. see photo GS-TAL 26-52L Channel roughly equivalent to stoping place 8/8/77 am Altitude N53W 23°SW
4.5	Ss. fg, becoming finer upward 1" brn-gr, v. calc, well contd. base covered, top sharp med bdd, clbg ripples 0.2' horizon. at top
12.5	Ss mg, 1" brn gry eroded base, with pebbles & cobbles lining scour surfaces
RLS 202 4 ft from top	chest, vein qtz, ironstone, thin-med bdd. large sole trough strat, sets 2 1/2 - 4 ft thick troughs are 15-30 ft wide abd plant debris up to 1 1/2' long.
7.7	Ss. mg at base, fg at top 1" brn gry thin bdd, eroded base lowermost 2 ft rippled

7⁵ Silty shale.

8² SANDSTONE; F.G., LT. GRAY,
NON-CALC. MOD. ABUND.
CB201
5' above
base.
CONDENSED PLANT MAT'L.
VERTICAL STEMS NEAR
BASE, SHARP EROSION
BASE; LOW ANGLE
TABS IN SETS 1.0-2.0'
THICK; TRANSITIONAL TOP;

14 THINLY INTERBEDDED V.F.G.
SS AND SH; BEDS <0.1'
THICK, uppermost SS
is 0.5' THICK. EACH
SS BED IS RIPPLED.
BEDDING PLANE BURROWS
ON TOP.

61⁶ Silty shale, partly
COVERED.

6⁰ SANDSTONE, V.F.G., DK.
GRAY, SL. CALC., TOP
AND BASE COVERED;
CLIMBING RIPPLES;
POORLY EXPOSED.

60² + SHALE, COVERED IN PART.

→
TRANS. DIR.
S87E
N90E
N24W
N46E

upper part lge silt
tabular x-lams
sets: 2-3 ft.

top transitional
attitudes of tab. x-bds
N65E 21SE N78W 21SW
N52E 22SE NO
N31W 20SW S87E
N74W 8SW
troughs: AXIS? BED? RESTORED AS
INCLINED BED (KWS)
N3E 18NE?
N05E 16SE → N61E

4.4 SS lg, thin bdd, low
angle through x-lam
top covered
troughs 0.6-1 ft thick
near horiz.

111-9 Covered

6.8' Ss. mg., lt gray, v. calc,
top, base covered, thin bdd,
lge silt low angle trough
x-shat sets 1-2 ft thick
v. broad (20-30' across)

168	
FT.	SECTION: DESCRIPTION & REMARKS
	unit appears to the west.
	Stop 2 - small channel on west bank of river
6.1 RLS 203 pal	Intbdd siltst & vfg. ss. mod brngray [est 25% ss.] - mod. calc. abd plant frags, heavily rooted no vis strat. poss. burrows.
	attitude of channel base N52W 18° SW
15.5	Ss, f-vfg, mod gray, mod calc. minor carb matly thin bdd, erosive base, top covered.
	climbing ripples: type 'A' near base, type 'B' near center, generally S40±E in orientation (see below)
	note of "Butte" exposure at Folsom Pt. - sand. exposure cgl lag at base of thick rippled zone.

169	
FT.	SECTION: DESCRIPTION & REMARKS
0.6	clayst silty, dk gray v. calc., weathers ochre.
12.2	Intbdd ss & siltst sh. est. 20% ss. ss bds 0.6 to 1.2' thick ss fgy, v. calc, clay rippled w/ minor soft sed. defn. slickensides noted on float blocks
18.9	Covered - partly shale
5.8	Intbdd ss & siltst ("Bay splash") ss: 75% bds 0.3-1.2 ft vt-fgy, lt gray ss thins laterally ripples on ste. Soft sed. defn in sd - folds etc within beds penetrating burrows ripples with truncated tops noted.

looks like partially
abd. distrib channel
fill. Not a major
distrib

Note this channel
little more than 1-200gds
wide -

Ripple directions: S05W
S28E

41.5' ~~partly~~ Covered, shale floor

5.9

Ss vfg, dk gray, poly sorted,
v. calc, abd carb
matl.

top base covered
silty shale with bds 0.3'
thick

85% ss.

Climbing ripples, heavily
burrowed upper surfaces

29

Covered

35'

Covered.

1.5'

Ss., fg., med gray, med
calc., no vis strat,
rippled on top, heavy
bioturbation, ind.



33'

Covered

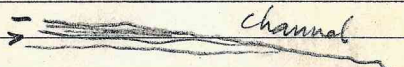
14.1

Ss. fg., med gray,
v. calc., minor carb matl/
* progradational base,
covered top
bedding 0.3-4 or 5' thick
thin sh. with bds 0.2'
thick

Rip up clasts locally.
no visible stratification

* transitional from less sdy
& thinner beds.

SECTION: 170	
FT.	DESCRIPTION & REMARKS
18.6	Lignite interbedded w/ siltst at base, being cleaner at top
0.4	Siltstone w/ iron concretions
3.2	Ss., vfg., med gry, sli calc, sharp base, covered top beaucoup climbing ripple w/ contorted lamination at top. Abd. woody material at base of bed.
15' ±	Coaly shale.
Stop 3 - lowermost reaches of Turbid Creek	
25	Ss. fg., med gry, calc, ab carb mat'l, no vis strat base covered
5.0	Covered - Shaly

SECTION: 171	
FT.	DESCRIPTION & REMARKS
1.0	Ss., fg., med gry, sli calc, w/ contd. abd carb material, lge fronds etc sharp base, tapered by channel. clog ripples thruout 0.3 ft shale at top sh -  1.0 ->
2.8	Ss., fg., med-dk gry, med calc, abd carb. mat'l. within this we get erosive base w/ 3' relief at base gradational top Conglomeratic w/ plant & woody traps up to 3' pebbles w/ chert, blk chert 3/4" max diam, fairly spheric, floating

6.1

Ss, fg, med gray,
v. calc., abd plant
material
beds; 0.2 to 1.2' thick
unconform. bdd.
no vis. strat.
abd roots
tops of some beds rippled

base transitional
top covered

AT BASE
OR TOP OF
UNIT?
(IMPORTANT)

21

15

2.2 ft top soil
tundra grass,
small br. warts
scrub, sm red
worms ~2 mm
diam seeds,
var. fecal deposits

attitude: N40W
25° SW

15'

Covered

RLS

12.5

Interbedded ss & siltst
ss beds < 1 ft thick
vtg, med gray,
abd roots

204

LP

1.2'

Ss vtg, silty, med calc.
reddish gray, heavily
iron-stained abd
carb. material
sharp upper contact

ripples -
slightly deformed.
thin layers of convolute
bedding

7.9

Ss fg, lt gray, v. calc,
abd plant material
up to 12' long.
thick bdd, erosional
base, eroded top

RLS
205

2' above
base of
unit

large scale trough x-beds
in sets 3-5' thick

15.7

Ss, as above,
lge scale trough x-beds
scour-fill
(islets ~15 ft)
eroded base top covered
abd logs, thruout.

FT.	SECTION: DESCRIPTION & REMARKS
	172
	climbing ripples near base (lowermost 5 ft)
35	Covered
6.9	Ss. vfg., dk gray, v calc. abd carb mottled, base covered. top eroded by overlying unit
RLS 206 3' below top.	lower 2 1/2' contorted beds. remainder fine ripples slightly deformed iron concretions
15 ft	Ss. f-vfg., med gray med calc. abd carb debris, erosional base. (channel w/ 5' relief visible, top transitional. bedding thin - med 0.4 - 1.0' thick irregular beds; clbg ripples in most beds Minor soft sed detm Thin shale interbeds w/ 1/2 - 1 in. thick

FT.	SECTION: DESCRIPTION & REMARKS
	173
5.3'	Ss. mgr. pebbles at base erosional base, truncated top.
RLS 207 LP 3' above base.	thin bdd. down horiz lam w/ intbed sm. silt trough X-lam.
	upper 1 foot trough X-lam. sets 1 foot
3.1	Ss mgr. erosional base. lge silt tabular X-sets bed = set thickness
11.6	Ss. f-mgr. thick bdd. w/ lge silt trough. X-strat multiple scum & fill w/ scatt. pebs. & wood fragments. erosional base
19.4	Ss f-mgr. m. gray, med bdd w/ v.f. sd and siltst interbeds, more common near top. lge silt tabular X-beds 1 1/2 - 3 ft thick; in lower

5'

comprise less than 5%
of rock.

Silty shale, w/ coaly
partings, top covered,

21.6'

Ss. as above

Stop 4, Tall cliff
of ss. upstream a
Rukpawrak

5'

Ss. f-mg, med gr, v. calc

base covered, med bdd,
top truncated by overlying
unit.

At lower 2 ft. soft
sed detm.

Upper part cbbg ripple
with thin shale
interbeds, loading
features

altitude: N 65 W
12 SW

part uppermost 6'
has. cbbg ripple w/
contorted laminae

Pebbles common near
top. (rods & rollers)

Ss, chert, shale & metam. var.
Abd carb. mat'l throughout
incl logs.

33'

Ss. m.g.

med bdd near base
being v. thin bdd at
top.

erosional base, top
covered.

pebble lag at base

lower part 1 gr

scale rough etab

X-siltst. sets

— 2-5' thick

Some sets separated
by siltst. drape.

RLS
208
10' below
top

Upper 15' v. thin bdd
low angle 1 gr scale
trif X-lam. sets
1-2' thick

thin bds of clbg ripples
70' Covered.

16.8' Ss., v-fg., dk gry.
poorly sorted, v. calc.
extremely carbonaceous.
top & base covered.
thin bdd., dem. horiz
lam. w/ several small
scours < 1 ft thick

logs up to 1.35 ft long
x .25' wide

33 1/2' Covered

8' Ss. m-gr., lt gry.
v. calc., v. carb.
med. bdd.
base top covered.
clbg ripples somewhat being
type B above

RLS
209
41'
above
base

thickens to 20' to N
So: N65W, 12S
Strike lge scale tabulars: TRANS. DIR.
1' N50W 15SW → 576W
2' N12W 14SW → N45W
3' N50E 11°SE → N86E

20. Ss. m-cg. lt gry,
v. calc., abd carb mat'l
eroded base,
PLS
211
3'
above
base

large scale tab X-strat
w/ tangential faceted
ripples clasts near bases
of sets.
Sbt sediment deformation

So: N65W, 12S
TRANSPORT DIRECTION
1' N88E 22 SE 525E
2' N87W 26 SW 514E
3' N85E 21 SE 530E
4' N72E 24 SE 542E

17.1 ft Ss. cg at base (lower 3')
fg at top.
PLS
212

eroded base, w/
2' above deformed (convolute) bds
lower 3 ft
base

1' unit
upper part thin bdd
clbg ripples & sm scl
through X-lam.
Ironstone concretions at top

13'

Covered.

4 1/2'

Sandstone mgn,
lt gray. v. calc.
base covered, top sharp
low angle lge scale trough
X-beds, sets 2 1/2'
thick

?

pebbly sandstone cg,
shale ripup clasts.
in 0.5-foot lens.
PART OF 4.5' UNIT?

28.5

RLS

210
LP

4' above
base

Ss, m-cg, lt gray,
v. calc, abd cgl
mat'l. med bdd
for most part,
dgm lge scale trough
tabular X-beds
sets, 1-3 ft.
eroded base,
0.4' thick ironstone
concretions at top
multiple scours.

22.7

RLS

213

10'

from

top

Ss, mgn,
med bdd, lge scale trough X-beds
eroded base, sets 1-2'
upper 8' sm scale tabs.
.6-.8' thick sets

50' N65W, 125W

TRANS. DIRECTION		
Sm scale tabular		
1 N75E	25° SE	540E
2 N80E	26° SE	531E
3 N74E	19 NW	555E
4 N66E	36 SE	542E

8.7

RLS

214

3' above
base.

Ss, m-g w/ c. gns
present, eroded base
w/ soft sed deformation
abd lge plane
material

Ss pebs & nodules
at base - lower
1-2 ft.

lge scale trough X-bed
sets 2-4 ft

SECTION: 176	
FT.	DESCRIPTION & REMARKS
7.3	Sandstone. mgr, medgy thin bdd., eroded base, top covered large scale low angle, rough x-lam. sets 0.8 - 1.5 ft thick
10/AUG/77 NORTH FLANK COKE BASIN ON KUKPOURUK R. PHOTO 26-52-L, MAP D-2 RLS, KWS, & WNK SECTION STARTS AT TOP OF SECTION MEASURED 9 AUG 77 238' COVERED	
38	SANDSTONE vfg SILTY LT. M. GRAY MOD CALC., CARB. MAT. ON BEDDING THIN BEDDED, CLIMBING RIPPLES TOP & BASE COV.
5	COVERED
3	SANDSTONE vft to fg, M. DK GRAY, V. CALC. MOD CARB. MAT. THIN BEDDED RIPPLE IN PART CONTORTED, BASE COV. TOP SHARP, ERODED
5	SANDSTONE, vfg SILTY, MOSTLY COV. THIN BEDDED, RIPPLED, BASE & TOP SHARP.
5	SANDSTONE, f to mg, LT GRAY, LOGS & ABUNDANT CARB. MAT., THIN TO MED

SECTION: STOP # 2 177	
FT.	DESCRIPTION & REMARKS
202	COVERED
11	SANDSTONE fg @ BASE, GRADES INTO SILTSTONE AT TOP, M. GRAY, MOD CALC., V. ABUND. CARB. MAT., U. THIN BEDDED, BASE COV. TOP SHARP
62	SANDSTONE f to c g, ^{LT TO} M. GRAY SILTY CALC., BEDDING INDISTINCT & CONTORTED CONSISTING OF IRREG. BODIES WHICH EXHIBIT DISTORTED RIPPLES, ABUNDANT WOOD FRAGS LENSES & LOGS, LOGS 2' x 3', LOWER 2' TO 3' SCOURS INTO 2' TAB. ULAR X-BEDDED SAND & UNDERLYING SLTST. UPPER 0.5' M. BRN fg RIPPLE LAMINATED SAND W/ INTER. LAM. COAL. BASE & TOP SHARP W/ INTERNAL SCOURS.
4	SANDSTONE, M TO Cg @ BASE, M @ TOP, LT GRAY, NON CALC., CARB. MAT. ON SOME BEDDING SURFACES TRACE THRUOUT, PEBBLE LAG @ BASE OVERLYING SCOUR SURFACE, LOWER 3' CONTAINS LARGE SCALE TAB X- BEDS IN SETS UP TO 25' THICK, BASE OF UNIT HAS CONTORTED BEDDING IMPLYING SLUMPING(?), UPPER 1'. NODULAR BEDDED & CONTAINS ABUND. COALIFIED WOOD FRAGS. POSS. WEATH- ERING HORIZON. SAMPLE 215 X FROM 2' BELOW TOP OF UNIT, BASE & TOP SHARP

BEDDED, CHAOTIC BEDDING w/ PODS
OF MED SAND. FROM 3" TO 5" WIDE
IN MATRIX OF INDISTINCTLY BEDDED
SILT & f TO f SAND. BASE & TOP
SHARP w/ 2" RIPPLED CHANNEL @
TOP.

125 SANDSTONE, f to mg, DK BRN, MOD.
CALC. CARB MAT ON BEDDING,
LOWER 8' CONTAINS LARGE SCALE
TABULAR & LOW ANGLE TROUGH
X-BEDS IN SETS 1 TO 1.5' THICK
OVERLAIN BY 4 SMALL SCALE
TROUGH X-BEDS IN SETS UP TO 0.5'
BASE & TOP SHARP.

245 SANDSTONE M TO Cg, BELOWING
Mg @ TOP. M. GRAY, BRN, M. CALC
THIN BEDDED - PAPERY. LARGE
SCALE LOW ANGLE TROUGH X-
BEDS IN SETS 0.6 TO 2' THICK
BASE SHARP TOP CONV.

R5/3: SANDS AND SHALES
AT TOP OF SECTION
MEASURED IN KAK ON
8/8/77.

4, 5, 6, 7
R5/2, 3, 4, 5 LENTILULAR THICK
(120") channel sands
measured in Cornin Fm
in KAK RIVER 8/9/77.

16' SANDSTONE, M & Cg, LT GRAY, NON-CALC
CONTAINS SCATTERED COALIFIED WOOD FRAGS.
SCOUR AT BASE, INTERNAL SCOURS AT 3 TO
6' INTERVALS, THIN TO MED. BEDDED. LARGE
SCALE TROUGH & TAB X BEDS IN SETS TO
3' THICK, TOP CONV. POSS. PALEOSOLS
PRESERVED UNDER SCOUR SURFACES LOCALLY
MAROON TO DK BRN.

CB STOP #3 TRAVERSE #1

216 50' SHALE & SILTSTONE INTERBEDDED
ABUNDANT GINGKO LEAVES AT BASE
+ SAMPLE, CB 216-25' FROM BASE

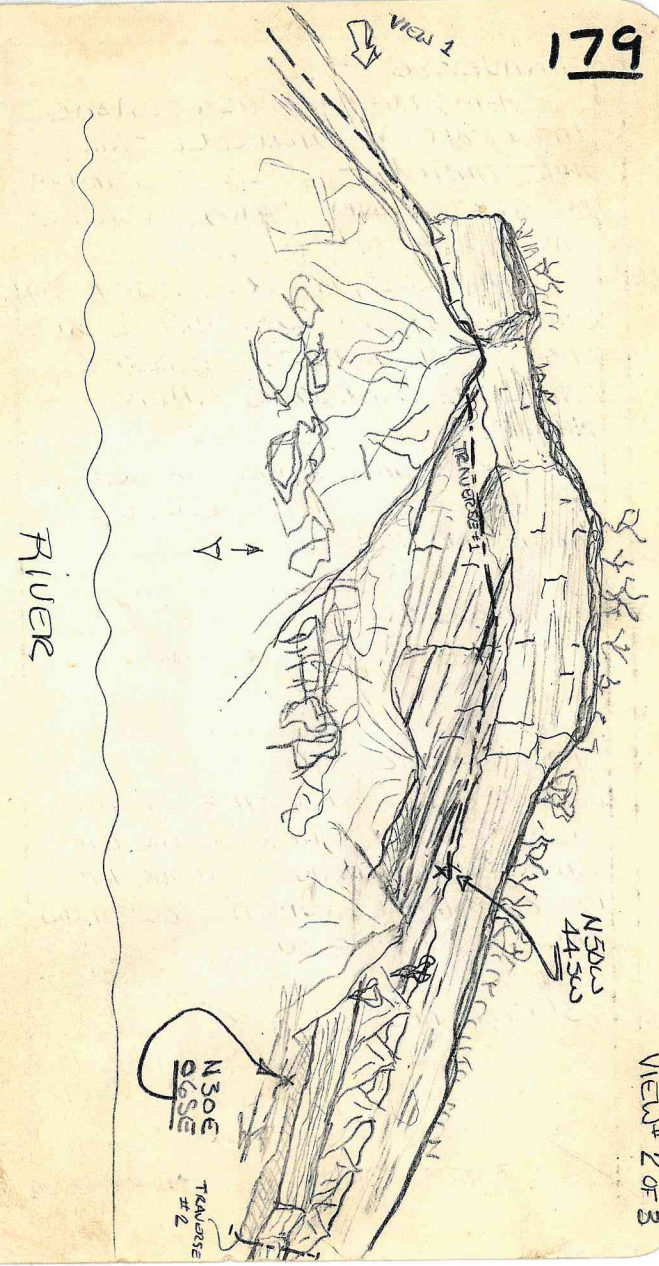
30' SILTSTONE & SHALE, INTERBEDDED

CB
217 SILTSTONE, V. INDURATED, OCCURS IN
LENSES @ BASE, [SAMPLE CB 217 @ X
BASE] SILTSTONES; DK GRAY, BRN, NON-CALC
OCCUR IN BEDS 0.3 TO 5' THICK, BEDDING
PLANE BURROWS ON BASES OF SOME
BEDS

13 SANDSTONE f to mg @ BASE, 1' TO 10' f to mg
0.2' SHALE BREAK AT 10', UPPER 3' f to mg.
DK BRN, REDDISH BRN, MICACEOUS
STY-CALC, MINOR COALIFIED PLANT
MAT, MED. BEDDED, SMALL SCALE
TROUGH & WAVY LAM IN SETS 0.2 TO
0.4' THICK, MOD BURROWED, VERT,
SLANT & Y-SHAPED, UP TO 4" LONG
TOP TRANS.

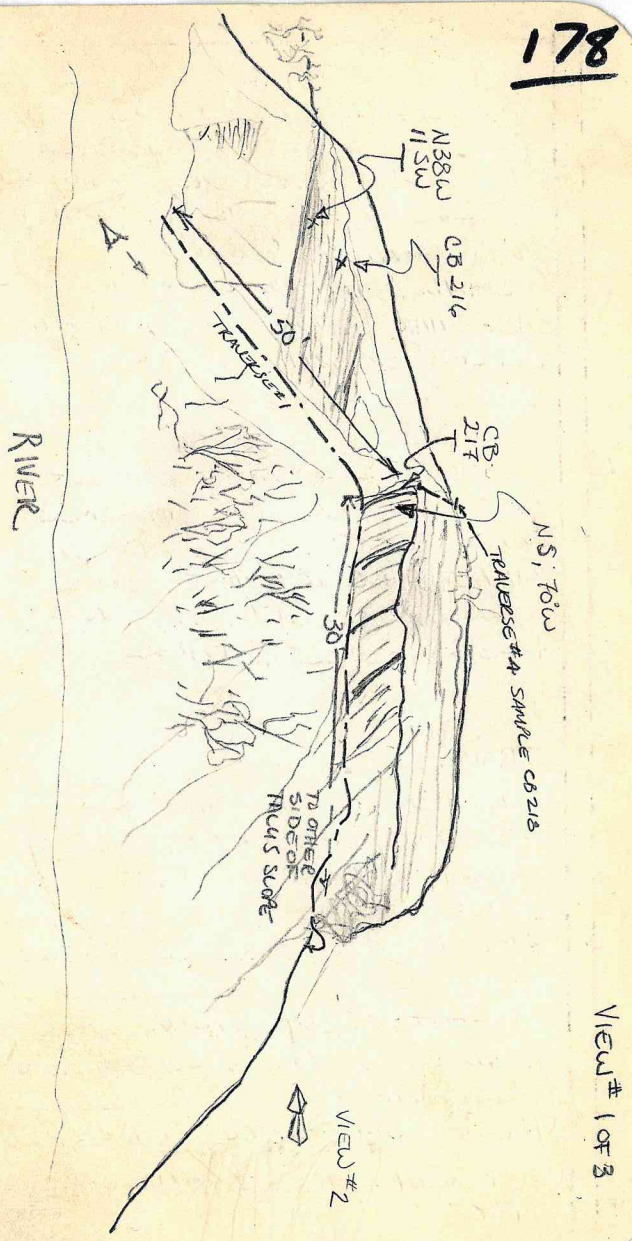
0.9 SILTSTONE, SANDY, DK GRAY, GRAY OR
RED, NON-CALC. ABUND. COALIFIED
PLANT DEBRIS INCLUDING GINGKO

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VIEW # 2 OF 3

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VIEW # 1 OF 3

7 SANDSTONE, fg, SILTY, MICA,
DK BRN, TAN, NON-CALC. ABUND
CARB. MAT, INCLUDING GINGKO
BASE SHARP, EROSION, CLIMBING
RIPPLES & WAVY LAM, LOCALLY
CONTORTED, TOP SHARP

25 SANDSTONE, fg, MICA, M. BRN, TAN
BASE SHARP, TOP CON. CLIMBING
RIPPLES OR INDISTINCT STRAT.
CARB. MAT INCLUDING GINGKO
LEAVES

19 SHALE & SILTSTONE, SH. BLK.
SLTST: DK BRN, MICA, NON-CALC
ABUND, COALIFIED PLANT DEBRIS
IN BEDS 0.5' THICK & COMPOSES ~60%
OF INTERVAL, ATTITUDE N50W
45SW, BASE & TOP CON.

30 SILTSTONE, IRONSTAINED, $\frac{1}{8}$ vfg
SANDSTONE MED. DK GRY IRREG
CONTORTED BEDDING, DEFORMED
AT TOP, SMALL SCALE LOW ANGLE
THRUST, 2 OR 3' EXPOSED IN VOL.

65 SANDSTONE, vfg, SILTY, CALC.
ABUND CARB MAT & EVIDENCE OF
ROOTS WITHIN TO THIN BEDDED
RIPPLE LAN. RIPPLES DISTORTED.

VERT ROOTS MORE ABUNDANT @ TOP

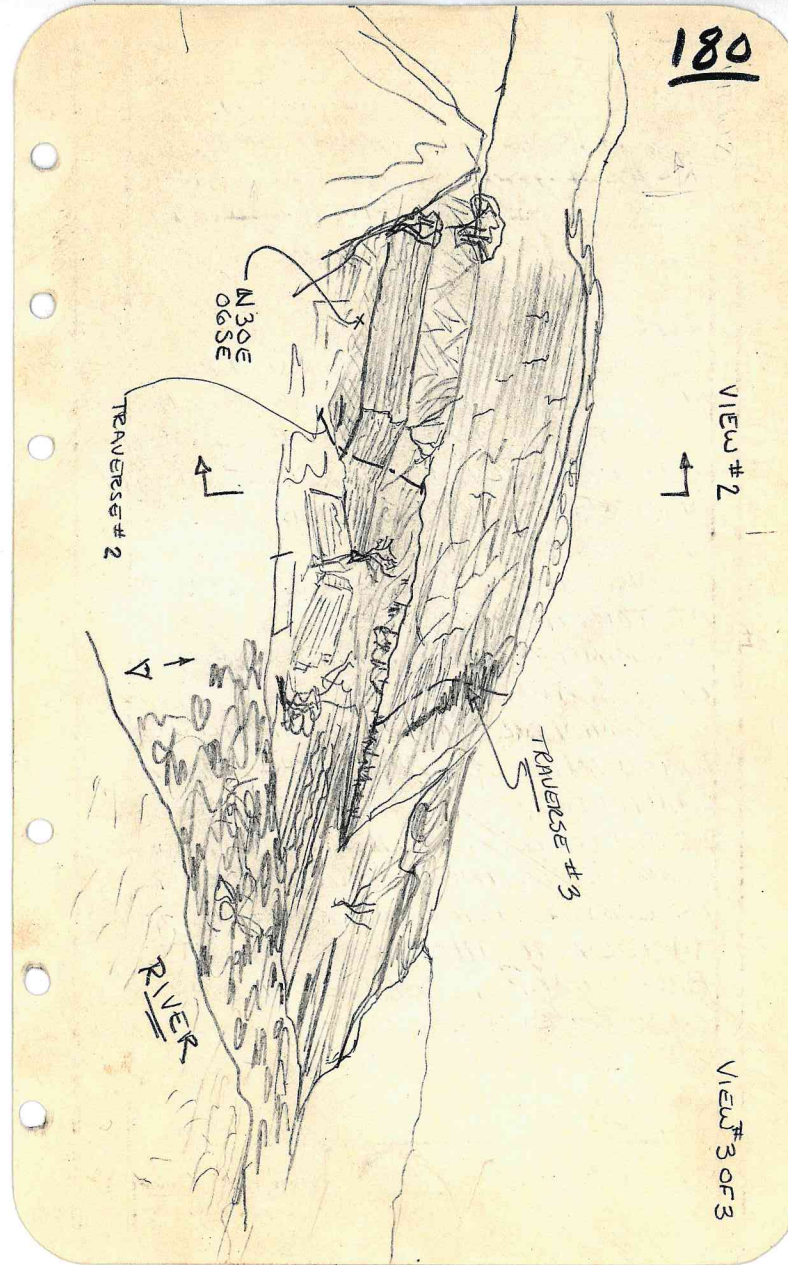
24
SANDSTONE M TO VCg, Cg, LT
LT BRN GR, NON CALC. CARB
MAT THRU OUT, PBLs TO 3" INDIA.
OF QTE, SH, CHT, INDIST, WAVY LAM
BASE $\frac{1}{2}$ TOP SHARP

20
SANDSTONE, M TO Cg, LTGRY, NON
CALC. ABUND CARB ^{BASE} MAT $\frac{1}{2}$ SILICIFIED
LOGS, THIN TO THICK BEDDED, RIPPLE
LAMINATED IN PART $\frac{1}{2}$ INDIST LAM,
NUMEROUS SCOUR SURFACES $\frac{1}{2}$ LARGE
SCALE TROUGH X-BEDS IN SETS UP TO
4', EXPOSURE PARTLY COV, BASE
SHARP, TOP COV.

56 SANDSTONE, vf to c_g, DOMINANTLY
mg, LT BROWN TO BLACK, ALON-CALL
D. ABUND. CARB. MAT & LOG MOLDS > 10'
IN LENGTH, MICA, MED TO THIN BEDDED
LARGE SCALE TROUGH X-BEDDING
IN SETS TO 1' THICK NEAR BASE
RIPPLE (CLIMBING ?) NEAR TOP.
PREDOMINANTLY CHAOTIC BEDDING
BASE SHARP, TOP CON. - CARB MAT
ALONG RIPPLES. SAMPLE CB 218 X
~ 3' FROM BASE.

CB
218
3

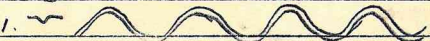

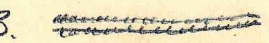
SECTION:	DESCRIPTION & REMARKS	FT.



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DISTANCE FROM 1' SS GIVEN
FOR COALS & SS ALL OTHER

SECTION:	DESCRIPTION & REMARKS
CB 219	1' COAL, SAMPLE CB 219 DISC'D
148	INTERBEDDED SHALE & SILTSTONE
52	COAL
165	COAL
23	
TO 28	6 COAL SEAMS MAX THICKNESS 4"
31	BASE SANDSTONE w/ 5" COAL BELOW
	SANDSTONE (4' THICK) v/f SILTY, MICA, DK BRN, TAN, STLY CALC, NOVIS STRAT ABUND
37	COALIFIED PLANT FRAGS
37	COAL (0.7' THICK)
43	COAL IN 5 BEDS ~ 5" THICK
CB 220	48 SAMPLE CB 220 X SUBTRACT 47.5
52	COAL (1' THICK)
54	" (8" ")
65	" (25' ")
75	" (3" ")
85	" (5' ") w/ TREE IN PLACE
CB 221	90 1' IN DIA.
94	COAL (3" THICK)
111	" (")
115	" (0.7' ")
145	" (")
	TOTAL w/ CN TOP
	SAMPLE CB 221 X @ 98'

	8,9	RS 4,4: CLOSE-UP - ANG.
		UNCINFORMITY AT N
		END OF EXPOSURE.
	10, 11, 12	RS 8, 9, 10 PANORAMA OF
		FAULTED FAULTED ROCKS
		AND UNCONFORMITY IN
		CORWIN FM.
		STOP #4
1-		SANDSTONE, f.g., M. BRN, BRN,
		MOD CALC. CORALIFIED PLANT FRAG.
		& ROOTS(?), BASE SHARP ERODED
		INTO UNDERLYING MUDSTONE, WAVY
		HORIZ. LAM., TOP SHARP
		COVERED
42		MUDSTONE, FEW CONCRETIONS
19		AT TOP ABUND CARB MAT
38		LIGNITE, IRREG. MUDSTONE
		LENSES AT TOP
48		SANDY SILTSTONE, GRAPING UP-
		WARD INTO Vfg SANDSTONE. HORIZ
		LAMINATED. SS: Vfg, DR GRAY, MOD CALC.
		V. THIN BEDDED, PREDOM. WAVY HORIZ
		LAM., CLIMBING RIPPLES LOCALLY
		IN LOWER PORTION. UNIT THINS
		RAPIDLY TO THE EAST & WEST
		BASE SHARP - CHANNEL ~100' WIDE
		OVER BANK(?) EQUIV. TO THE WEST
		HAS NUMEROUS BEDDING PLANE
		TRACKS
		1.  0.2"
		2.  0.3
		3. 
		SECTION DESCRIPTION & REMARKS

	SECTION: 8/12/77	Bogal Kut-powru
FT.	DESCRIPTION & REMARKS	
		FM. ON NE FLANK COKE BASIN.
		Bedding: N56W, 53SW 182
		PLOT BENEATH BASE OF
		SECTION MEASURED ON 8/8/77
CB222		Shales at ~ 1/2 gully in north corner
		base of Berlin River.
		sequence.
610°		Interbedded (thinly)
		siltstone and shale.
335		Sandstone, m. brown, f.g.,
		st calc., minor carb frags;
		becoming medium-grained upward.
		Heavily burrowed. BASE
CB223		COVERED; TOP COVERED.
at 28°		THIN-BEDDED. irregular -
		wavy bedding. lower 1/3 has
		thin shale drapes between
		beds; lower 2/3 - contains
		little vis. STRAT - wavy bedding
		upper 1/3 small-scale troughs
		(low-angle) in sets from 0.8 to
		1.5' THICK. UPPER SURFACES
		RIPPLED. WALLED BURROWS
		ABUNDANT, UP TO 3/4" IN DIAM.
		MOSTLY SLANTED OR HORIZONTAL.
		Locally contains shale pebbles
		less than 1" in diameter.
		NO OBVIOUS SCOUR SURFACES.
		Sd: N36W, 35SW

260°	COVERED INTERVAL
5°	SANDSTONE, f.g., calc., well-cemented; lt. gray, weathering tan; APPEARS TO CONTAIN TROUGH LG SCALE TABULAR X-STRAT BUT EXPOSURES ARE VERY POOR. BASE AND TOP COVERED.
185°	COVERED.
50°?	SS in subcrop forming ridge; small slumped exposures of horiz. lam (large tabs?) f.g. SS w/ parting lineations on bedding surfaces.
385°	Sandstone COVERED INTERVAL
5°	Sandstone, f.g., m. gray, v. calc., well cemented; mostly COVERED; ABUNDANT BURROWS IN FLOAT.
55°	COVERED INTERVAL

SECTION: 183	
FT.	DESCRIPTION & REMARKS
22°	Sandstone, f.g., med. grayish brown, weathering tan; mod. calc., well cemented. Base + top covered; internal scour surfaces with veneer of shale pebbles. Large scale trough cross-STRATIFICATION.
289°	COVERED INTERVAL
13°	SANDSTONE, M.-C.G. ^{AND PEBBLY} at base; fine-grained at top; sl. calc., sl. friable; pelecypods; horiz. lam. at base (basal contact covered); large-scale troughs in sets up to 3.0' thick in upper 4.0 feet. Small scale troughs in uppermost 1.0'.
19°	SANDSTONE, m.-c.g. at base, f.g. upward. Basal 5.0' indistinctly bedded w/ abundant pebbles, coalified plant mat'l and log imprints up to 2.0' in max dimension. Upper 14.0' contains large scale trough x-strat in sets up to 2.5' THICK. Sharp SCOUR AT BASE; TOP TRANSITIONAL.
31°	SS, f.g., H. gray, weathers brn.

very calcareous, middle
1/3 covered. Thin-bedded,
lg. ~~small~~ scale trough
X-STRAT in sets from 1.0
to 2.0 feet thick. Top
covered, base transitional.

374° COVERED INTERVAL.

18.5 SANDSTONE, interbedded
with siltstone. 70% of
interval is SANDSTONE;
SAND BEDS RANGE FROM
0.4' TO 2.0' THICK;
SS v. f.g. at base, f.g.
at top; poorly sorted,
calcareous; beds thicken
toward top of sequence.
ABUNDANT PLANT MAT'L.
SPARSE ROOTS; CLIMBING
RIPPLES IN UPPER BEDS;
BASE COVERED; TOP
SHARP, SCoured.

14° SANDSTONE, fine to m.g. at base
LT. GRAY; f.g. + lt. brownish
gray at top; sl. calc.,
SHARP SCOUR AT BASE;
SHARP TOP; lower 9.0'
CONTAINS lg. scale trough
X-STRAT in sets from 1.5'

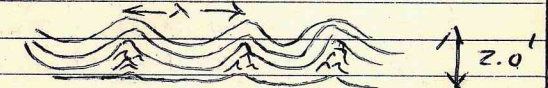
SECTION:
FT. DESCRIPTION & REMARKS

184

(5)

TO 3.5 FEET THICK; OVERLYING
4.0' contains trough X-STRAT
in sets from 0.5' to 1.0'
THICK; UPPER MOST 1.0' contains
soft-sediment deformation
(photographed by CW)
R5/26 photo. of linear structures

27 diapiric folds in
sandstone.



"FOLD" AXES TREND N75E.

FOLDS MAY BE DIAPYRS LOCALIZED
BY RIPPLED BED-FORMS.

30° Sandstone, f.g. at base; f. - v.f.g.
at top, LT. GRAY, SL. CALC;
SHARP SCOUR AT BASE WITH
PEBBLE LAG; TOP COVERED;
THIN-BEDDED; LG SCALE
TROUGH X-STRAT IN SETS 1.5 TO
3.0' THICK.

395° Covered interval; SAND
SUBCROP (feather edge of
channel?) in middle of
interval.

- ✓ 22' SANDSTONE; f.g., silty,
med. brn, sl. calc.; BASE
COVERED, TOP COVERED;
LG SCALE TROUGHS IN
SETS ~ 2.0' THICK.
- 120' COVERED.
- 4' Sandstone, v.f.g., lt. brn-
gray, non-calc. top +
base covered; thin-bedded;
lg SCALE TROUGH X-STRAT
IN SETS ~ 2.0' THICK.
PINCHES OUT Laterally.
- 129' COVERED INTERVAL.
- 4' Sandstone, fine grained,
med. brown, mod. calc.,
ca 1 to 3 inch cross-laminated
beds separated by siltstone
breaks 1/2 to 1 inch thick.
Abundantly burrowed.
Base covered, Top covered.
- 55' CONGLOMERATE, SANDY; coarse
SAND w/ PEBBLES comprising
30% of volume; pebbles
range from granules to cobbles.
Clast types include, quartzite,

SECTION: 185 (F)	
FT.	DESCRIPTION & REMARKS
	vein quartz, sandstone ironstone, gray chert, green chert, black chert, greenstone. Large coalified plant + wood FRAGMENTS UP TO 2.0' in LENGTH. BASE COVERED (basal SCOUR into underlying burrowed SS?); TOP SHARP.
75	SANDSTONE, V.F.G., LT BRN, WEATHERS TAN; VERY CALC., SHARP, IRREGULAR, SCoured BASE WITH PEBBLE LAG; SHARP TOP; THIN-BEDDED; STEEPLY CLIMBING RIPPLES IN UPPER LOWER 3.5'; UPPER 4.0' CONTAINS HORIZONTAL LAMINATIONS. CARBONACEOUS MATERIAL ALONG BEDDING SURFACES.
69	SANDSTONE, M.G. AT BASE, F.G. AT TOP; LT. GRAY, NON-CALC; SHARP EROSIONAL(?) BASE; LOWER 2.5' CONTAINS SMALL-SCALE TABS IN SETS 0.6' TO 1.0' THICK. UPPER 4.4' is is THIN BEDDED AND CONTAINS SMALL- SCALE TROUGH X-STRAT; SHARP TOP.

12 ⁸	SANDSTONE, M.G. AT BASE, F.G. AT TOP; LT GRAY, NON-CALC; ERODED BASE; LOWER 4.0' THICK BEDDED; UPPER PART THIN-BEDDED; LOWER PART LG SCALE TROUGH X-STRAT IN SETS 1.5' TO 2.0' THICK; UPPER PART AB TROUGH X-STRAT IN SETS FROM 0.7' TO 1.5' THICK. TOP COVERED.
25 ⁰	COVERED
1 ⁰	SANDSTONE; RUBBLY EXPOSURE.
60 ⁴	COVERED
3 ⁰	SANDSTONE; RUBBLY EXPOSURE.
61 ⁰	COVERED.
11 ⁰	SANDSTONE, V.F.G., DK-MED BRN, LG SCALE TROUGH X-LAMINATED IN SETS ~ 1.0' THICK.

CB 224
from 1.5'
ABOVE
BASE.

FT.	SECTION: DESCRIPTION & REMARKS
13 ⁰	COVERED
7 ⁰	SANDSTONE; RUBBLY EXPOSURE.
85 ⁰	COVERED
10 ⁰	SANDSTONE, RUBBLY EXPOSURE.
332 ⁰	COVERED.
3 ⁰	SANDSTONE, V.F.G., dk brn., LG SCALE TROUGH X-STRAT IN SETS ~ 1.0' THICK. Rubbly EXPOSURE.
35 ⁰	Covered, probably sandstone. A few rubbly scattered v.f.g. sandstone outcrops.
582 ⁰	Covered, definite shale upper 8' ① ~ 200' from base of covered interval is sandstone outcrop on stream bank (lateral to measured section). Sandstone, very fine grained to fine grained, dark gray, very calcareous. Transitional base, top covered. Lower 6' interbedded siltstone and v.f.s.s., even beds, bioturbated. Grain size coarsens upward, siltstone beds not present. Horizontal lamination, a few beds with wave ripples. Progradational sequence (low energy surface) thin-bedded.

Es + thin bedded interbeds =

205 Sandstone, medium grained to fine grained, light gray, moderately sorted, non-calcareous. Erosional base top covered. Ironstone pebbles at base and scours w/ th pebbles at 7.5 and 19 ft. Large-scale trough cross stratification (sets 1-4' thick) thin-bedded near top, upper 2' trough cross stratification in sets (.8-1.5' thick).

335² COVERED INTERVAL
10 SHALE, BLACK
10² SANDSTONE, MEDIUM-GRAINED AT BASE. FINE-GRAINED AT TOP; MED. GRAY, MOD. CALC. SHARP BASE WITH PEBBLE LAG. TROUGH X-STRAT IN SETS 1.0'-2.0' THICK. GRADES UPWARD INTO VERY THIN LOW-ANGLE TROUGH X-LAMINATIONS ("PAPER SAND").

383² COVERED INTERVAL
95 SANDSTONE, M.G. W/
CB 225 scattered coarse grains;
6' ABOVE BASE LT GRAY, NON-CALC, THICK-

SECTION: 187 (11)
FT. DESCRIPTION & REMARKS
BEDDED; BASE COVERED;
TOP TRUNCATED; conglomerate at near base containing pebbles (3" max) of BLK CHERT; GREEN CHERT, SANDSTONE, IRONSTONE, AND SHALE LG SCALE TAB X-STRAT IN SETS 2.0'-5.0' THICK;
69 SANDSTONE; M.G. AT BASE, F.G. AT TOP; LT BRN-GRAY, NON-CALC. MEDIUM BEDDED AT BASE; THIN-BEDDED AT TOP; SCOUR AT BASE; TOP TRUNCATED; LG-SCALE TAB X-STRAT IN SETS 2.5' to 4.0' THICK IN LOWER 5.6'. IN LOWER 5.6' TWO CGL ZONES, PEBBLES UP TO COBBLE SIZE IN BEDS 0.5' THICK 2.0' AND 4.0' ABOVE BASE. UPPER 1.3' CONTAINS CLIMBING RIPPLES WITH 0.2' THICK IRONSTONE BED AT TOP.
108 SANDSTONE, M.-F.G., LT GRAY, NON-CALC. ~~FULL SEQUENCES~~;
8.
LOWER 5.0' LG SCALE ~~THIN~~ TROUGH X-STRAT IN SETS 1.0' TO 3.0' THICK. 0.9' ZONE

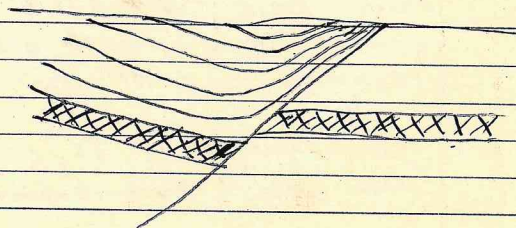
SMALL-SCALE TROUGHS AT
TOP.

UPPER 5.8' - LG SCALE TROUGH/
CROSS-LAMINATION IN SETS
UP TO 4.0 FEET THICK.

125° COVERED INTERVAL —
TOP IS AT BASE OF SAND
WHICH IS LOWERMOST PART
OF KNT MEASURED ON 8/8/77.

EXPOSURE OF DEFORMED (?)
ROCKS IN CORWIN FM. ON
SOUTHWEST FLANK OF
COKE BASIN.

R5/²⁸~~28~~: MARGIN (SLUMPED)
of channel



R5/29: Photo of levee
deposits, showing thinning
(to right) of sands from
massive (to left) to thinly

SECTION:

188 (13)

FT.

DESCRIPTION & REMARKS

interbedded with shale.
~~Soft~~ Soft-sediment deformation
in sands near left side of
photo.

SECTION: 8/13/77 Measure section 189	
FT.	DESCRIPTION & REMARKS
	in Corwin on north flank of Snowbank Anticline at top of section measured previously.
54'	COVERED, PROBABLY SHALE
3.8'	SANDSTONE, V.F.G., lt. gray, abundant coalified plant mat'l, mod. calc., vert stems & roots. Climbing ripples. Weath. brn.
29'	COVERED INTERVAL, 6" coal at 10.0'.
1'	Sandstone, same as described above.
52.5'	shale, lignite bed at 39.0' 1.0' THICK.
JA 234 1' BELOW TOP 11'	Sandstone v.f.g., dk brn, non-calc. Base sharp. Climbing ripples. Top transitional into overlying shale.
58'	Shale, silty, mostly COVERED 6" coal at 143.0'. 50° N 82E, 47 N
18'	SANDSTONE, V.F.G. med. gray, weathers reddish brn, sl. calc. Climbing ripples.

SECTION: 190	
FT.	DESCRIPTION & REMARKS
88.5'	SHALE + SILTSTONE, MOSTLY COVERED, LIGNITE BED 1.0' THICK AT 79.0'
35'	SANDSTONE, FINE-GRAINED, M. GRAY, WEATH. ORANGE; SL. CALC., BASE + TOP COVERED; ROOT STRUCTURES SMALL-SCALE TROUGH X-STRAT.
	50° N 88W, 62 N
43.5'	SHALE, SILTSTN, MOSTLY COVERED; COAL (4") 10' above base
25'	SANDSTONE, V.F.G., SILTY, MED. GRAY, WEATH. BRN; SL. CALC. ABUNDANT COALIFIED PLANT FRAGS; VERT STEMS OR ROOTS. CLIMBING RIPPLES. BASE + TOP COVERED.
42'	SHALE AND SILTSTONE, MOSTLY COVERED. 3.0' COAL BED AT 37.0'.
just 4 ft	SANDSTONE, F.-M.G., MED. GRAY, WEATH. ORANGE, ABUNDANT LARGE COALIFIED PLANT FRAGS. OUTCROP RUBBLY.

Bedding-plane slicks plunge
(in S₀) to N16E. BASE
SHARP, TOP RIPPLED.

48³ Shale + siltstone, mostly
covered.

2² SANDSTONE, v.f.g., med. gray,
non-calc., weath. orange.
BASE + TOP SHARP;
TOP RIPPLED; CLIMBING
RIPPLES THROUGHOUT.

73⁵ SHALE + SILTSTONE, MOSTLY
COVERED. 1.0' LIGNITE
AT 15.0' ABOVE BASE.

5⁰ SANDSTONE, F.G., med. gray,
weath. ORANGE; CLIMBING
RIPPLES THROUGHOUT. BASE
AND TOP COVERED.

54⁰ COVERED.

5⁰ SANDSTONE, F.-M.G.
LT. GRAY, WEATH GRAY.
COALIFIED PLANT FRAGS;
STRAT INDISTINCT TO
HORIZON. LAMINATED. BASE
AND TOP COVERED.

60⁰ ~~SA~~ SHALE AND SILTSTONE,
SANDSTONE BEDS 6" THICK
in 4.0' INTERVAL @ 30' above
BASE. COAL 0.9' THICK @
35.0'.

12⁹ SANDSTONE, ~~F.~~ M.G. AT
BASE, F.G. AT TOP. LT.
GRAY, NON-CALC.; THINLY
BEDDED; SMALL SCALE
TROUGH X-STRAT in
SETS WHICH THIN UPWARD
FROM 0.8' near base to
0.2' AT TOP. ABUNDANT
CARB. MAT'L ALONG BEDDING
SURFACE.

61⁰ Shale + siltstone, mostly
covered.

29⁹ SANDSTONE, INTERBEDDED WITH
(38' N80E, 54N) SILTSTONE
in BEDS FROM 0.5' TO 6.0'
THICK. OUTCROP QUITE

BA 235
FROM
4.0'
ABOVE
BASE.

RUBBLY. SANDSTONE M.G.
AND MASSIVE (?) AT BASE,
F.G. GRAINED AND CONTAINS
SMALL-SCALE TROUGH X-LAM-
in SETS FROM 0.2' TO 0.8'
THICK (FROM 18' TO 29' above
base).

FT.	SECTION: DESCRIPTION & REMARKS
5 ⁰	COVERED.
12 ⁰	LIGNITE.
22 ^E	SHALE + SILTSTONE, PARTLY COVERED.
SA236 1.0' BELOW TOP	
1.5 ^E	SANDSTONE, V.F.G., LT. GRAY, WEATH. ORANGE, medium NON-CALC., V. LENTICULAR, CLIMBING RIPPLES IN LOWER HALF; SMALL SCALE TROUGHS IN UPPER HALF; SHARP SCOUR AT BASE; TOP COVERED.
7 ^E	LIGNITE.
104 ^E	SHALE + SILTSTONE, MOSTLY COVERED. 6" SAND @ 450'.
SA237 @ 43' above base	1.0' SAND (F.G., CLIMBING RIPPLES) AT 53' ABOVE BASE. COALY STREAKS AT 65'.
4 ⁰	SANDSTONE, M.B., PEBBY, with lag of shale pebbles up to 2" in diameter. Clasts of green & black chert, greenstone. SHARP SCOUR AT BASE, TOP

FT.	SECTION: DESCRIPTION & REMARKS
91	Coal bed 9 ft thk.
45 ⁰	Covered but float suggests ss dom lith. Weathered platy & in irreg. chips up to 1-ft in largest dimen.
2 ⁰	Ss., lt. brn, w/ orange, f. gr. sli calc. Covered both @ base & @ top. Parallel lamin. domin. w/ platy w/ express parallel to lamin. Minor carb. debris defining laminae.
38 ⁵	Covered. Prob. Ss w/ interbdd sh.
5 ⁰	Ss. brownish gray, w/ orange, fin. gr, sli calc., base & top covered. Small scale trough x-lam. dom. struct. Seifs < 1" thk & 4" wide
34 ^E	Covered. Prob sh w/ interbdd ss (?)

COVERED, ~~LARGE~~ COMPLICATED
PLANT + WOODY FRAGMENTS.
STRAT. INDISTINCT.

83⁰ SHALE AND SILTSTONE;
COALY STREAKS AT 60.0'
ABOVE BASE.

202 SANDSTONE IN 0.5' TO
3.0' INTERBEDS WITH
0.2' TO 0.9' BEDS OF SHALE
AND SILTSTONE. SS IS
F.G., med. brn., sl. calc.,
silty, argill., BASES AND TOPS
OF BEDS ARE SHARP. SS BEDS
CONTAIN CLIMBING RIPPLES
THROUGHOUT.

~~TOP OF SECT~~

- BASE OF SECTION

MEASURED BY RLS + CW

on 8/13/77 -

Note: The following is the upper-most part of snowbank Anticline Section. Meas. by KWS & RBS. Next lower part meas by RLS & CRW. (13 Aug 77)

1st p. 193

193

[illegible]

SS. brush-grey, mod calc.
f. gr. silty, carb debris
mod abundant. No visible
stratification.

Covered w/ coal streak
@ 22 ft. Prob. dom.
sh. w/ minor ss

1ST SAMPLE
IS #246
FT.

SECTION: 8/14/77 Fly to exposures
DESCRIPTION & REMARKS

OF KUKPOWRUK Fm. TO TRACE
LATERAL EXTENT OF SAND
BODIES.

1 VISIT KUKPOWRUK TYPE SECTION
ON Kukpowruk River.

SAND EXTENT

31 32

R5/29, 30 Kk type section, ~~east~~,
then west of Kuk River

2 SOUTH FLANK OF ~~BLIZZARD~~ BLIZZARD
ANTICLINE - BASAL SAND, Kk.

RIPPLE TRANSPORT TO N15W -

SAMPLE 246 on ridge west of
Kukpowruk R.

R5/33 HELICOPTER.

R5/34 Kk SANDS ON SOUTH
FLANK OF BLIZZARD
ANTICLINE. VIEW TO
WEST FROM KUK RIVER

R5/35 Kk SANDS IN CENTRAL
PART OF COKE BASIN.
VIEW TO SW. MASSIVE
SANDS MEASURED BY
CW, RLS AND NK.

193

2nd P.
193

SECTION:
DESCRIPTION & REMARKS

194

4

SOUTH FLANK OF TOPICHAH
BASIN ON KOKOLIK RIVER.

26 27

R6/34, 25 HORIZONTALLY

LAMINATED SHORFALO (?)

SANDS IN KUKPOWRUK
Fm.

SAMPLES 247, 248

5

NORTH FLANK OF KOKOLIK
ANTICLINE

SHALE SAMPLES 249

(TOPOK)

250

251

MIDDLE KUK POWRUK

252

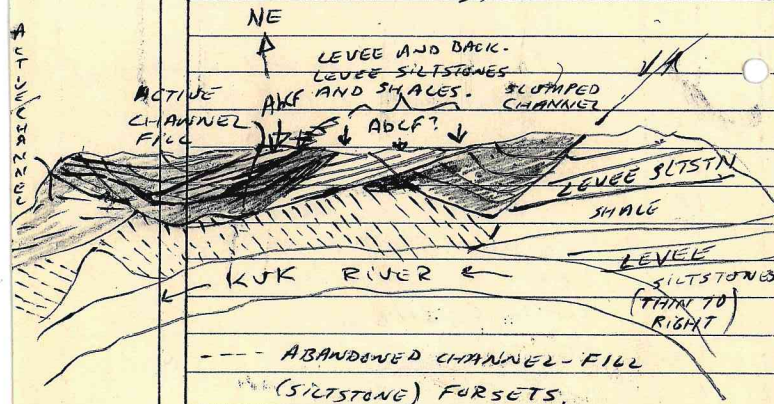
253

3

SUN FLANK OF COKE
BASIN - SCURED ~~EA~~ +
FOUNDERED CHANNEL FILL.

R/5/36, 37, 38 } PHOTO MOSAIC OF
R6/2-12 } OUTEROP FROM NW
TO SE (FACING NE)

13-18
(PHOTOS ~~8-17~~ (APPROX) DUPLICATE PHOTOS
1-7 (OUT OF FOCUS?))



ABANDONED CHANNEL-FILL
(SILTSTONE) FURSETS.

UPPER SCUR SURFACE RUNS
ALONG TOP OF TALUS.

19-25

PHOTOS ~~18-23~~ (R/6) -

MOSAIC FROM SINGLE POINT ON
BANK ABOVE RIVER.

Photo mosaic
STARTS AT
THIS END

195

SECTION:
FT. DESCRIPTION & REMARKS

8/17/77

STOP #1

VISIT NORTH FLANK OF
SNOWBANK ANTICLINE ON
KUKPOWUK RIVER.

R6/24, 32 ROOTS IN
TIDAL FLAT (?)

DEPOSITS ? OR
LEVEE DEPOSITS(?) - R_x

33 HAVE CLIMBING RIPPLES.
R6/34, 32.

33 31: BIPOLAR CURRENT

X-BEDS IN TIDAL
CHANNEL SAND (BURROWS
in MUD VENEER ON TOP).

34 32: SAME SAND FROM
DISTANCE.

35
R6/33 - RIPPLES ON UPPER
SURFACES OF BEDS.
RIPPLES FLAT-TOPPED.
TOP TIDAL-FLAT
SEQUENCE?

8/19/77 FLY-AROUND TO
VARIOUS LOCALITIES
IN SOUTHERN PART OF
STUDY AREA.

STOP #1

R7/9 - channel mouth BASAL
PROGRADATIONAL SANDS
~~ET~~ (LOWER) overlain
BY CROSS-BEDDED
TIDAL CHANNEL
SAND.
SEC. W-13 ON
KUK POWDER RIVER

R7/10 - CHANNEL (TIDAL)
SANDS. PROGRAD.
IN FRONT OF CW +
FLASER BEDDED ABOVE.

R7/11, 12: VIEW SE INTO
TUPICHAK BASIN ~~ET~~
EAST OF KOKOLIK RIVER.

STOP #2

S. FLANK TOPICHAK BASIN,
KOKOLIK R.

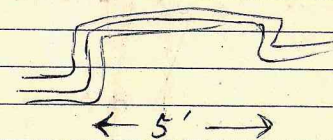
R7/13: HUMPY THING
IN BASE OF SS
TROUGH

SECTION:

FT. DESCRIPTION & REMARKS

196

~~MANUR~~ HUMPY THING:



R7/14, 15: LARGE-SCALE
TROUGH-~~SS~~ - 2 SETS
TRANSPORT TO SOUTH.

STOP #3

R7/16: TROUGH - X-BEDDING
IN ~~CR~~ BASAL CORWIN
SAND IN CENTER OF
TUPICHAK BASIN ALONG
KOKOLIK RIVER.

STOP #4

SOUTH FLANK OF
COKE BASIN.

TABS NOSE, 31 NW
N52E, 50 NW

MASTER BEDDING: N25W, 25E
STOP #6 WEST FLANK COKE BASIN

TAB
ATTITUDES

N13W, 38E

N54W, 30NE

N30W, 38NE

N02E, 32E

N00E, 37E

N15E, 28E

N12W, 35E

N55W, 28NE

N20E, 26E

N15W, 29E

N48W, 34NE

N32W, 40NE

N54E, 11SE

N16E, 12SE

N22E, 39SE

N26E, 34SE

SECTION:

FT. DESCRIPTION & REMARKS

DOGOUT SYNCLINE

197

TAB ATTITUDES:

N36E 32NW

SAMPLES 278 + 279

KUKPOWRUK SANDS ON

NE END (SOUTH FLANK)

OF DOGOUT SYNC.

SHERWOOD
OUTCROP
SAMPLE
LISTING

Pt. Lay 1977



CURVE TABLES Published by KEUFFEL & ESSER CO.

Table I. contains Tangents and External angles to a 1° curve. Tan. and Ex. to any other radius may be found nearly enough, by dividing the Tan. or Ex. opposite the given Central Angle by the given degree of curve. To find Deg. of Curve, having the Central Angle and Tangent: Divide Tan. opposite the given Central Angle by the given Tangent. To find Deg. of Curve, having the Central Angle and External: Divide Ex. opposite the given Central Angle by the given External. To find Nat. Tan. and Nat. Ex. Sec. for any angle by Table I.: Tan. or Ex. of twice the given angle divided by the radius of a 1° curve will be the Nat. Tan. or Nat. Ex. Sec.

EXAMPLE

Wanted a Curve with an Ex. of about 12 ft. Angle of Intersection or I. P. = 23° 20' to the R. at Station 542+72.

Ex. in Tab. I opposite 23° 20' = 120.87
120.87 ÷ 12 = 10.07. Say a 10° Curve.

Tan. in Tab. I opp. 23° 20' = 1183.1

1183.1 ÷ 10 = 118.31.

Correction for A. 23° 20' for a 10° Cur. = 0.16

118.31 + 0.16 = 118.47 = corrected Tangent.

(If corrected Ex. is required find in same way)

Ang. 23° 20' = 23.33° ÷ 10 = 2.3333 = L. C.

2° 19½' = def. for sta. 542

4° 49½' = " " + 50

7° 19½' = " " + 50

9° 49½' = " " + 50

11° 40' = " " + 50

543 + L. C. =

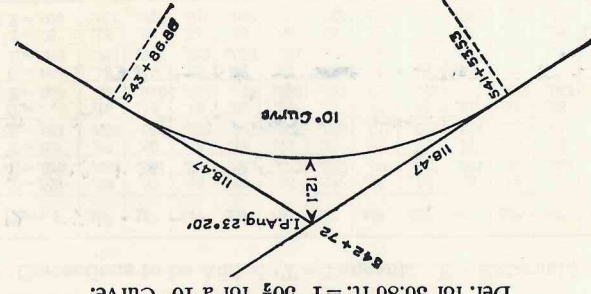
543 + 86.86 E. C. = Sta. 543+86.86

100 - 53.53 = 46.47 × 3' (def. for 1 ft. of 10° Cur.) = 139.41' =

2° 19½' = def. for sta. 542.

Def. for 50 ft. = 2° 30' for a 10° Curve.

Def. for 36.86 ft. = 1° 50½' for a 10° Curve.



SAMPLE LISTING PL 77

- ✓ TM1 - sandstone - from top of Tingmerkpuke Mtn. Forties Mtn. (Kfm). 2-300' above top of ^{measured} section
- ✓ TM2 - Kfm - sandstone - see section
- ✓ TM3 - " " " "
- ✓ TM4 - Kfm - shale - " "
- ✓ TM5 - " - sandstone - " "
- ✓ TM6 - " - " - " "
- ✓ TM7 - " - " - " "
- ✓ TM8 - " - " - " "
- ✓ TM9 - " - " - " "
- ✓ TM10 - " - shale - " "
- ✓ TM11 - " - sandstone - " "

TC (Tingmerkpuke creek section).

- ✓ TC12 - Kfm - sandstone - see section
- ✓ TC13 - Kfm - shale - approximately 100' below basal conglomerate in TC section.
- ✓ TC14 - Kfm - shale - see section
- ✓ TC15 - Kfm - sandstone - see section.
- ✓ TC16 - Kfm - sandstone - see section

Kks (section measured on crest of anticline north of Kukpowuk syndine).

- ✓ KKS 17 - Knk - sandstone - see section
- ✓ KKS 18 - Knk - shale - " "
- ✓ KKS 19 - Knk - " " "
- ✓ KKS 20 - Knk - " " "
- ✓ KKS 21 - Knk - " " "
- ✓ KKS 22 - " - sandstone " "
- ✓ KKS 23 - " - " " "
- ✓ KKS 24 - " - " " "
- ✓ KKS 25 - " - " " "

✓ SH 26 - - shale - short hole
chips collected in sec. 15, T9S,
R44W.

✓ TM 27 - Kfm - shale - approx 600'
above top of section measured on
7/13/77; map location SE/NW/sec. 21/
T10S/45W.

✓ TM 28 - Kfm - sandstone - approximately
200'-400' above top of section
measured on 7/13/77; ~~map location~~

✓ TM 29 - J-Neoc? - chert - southeast
side of Tingmepuk Mtn. at
map location SW, NW, NW, Sect.
28, 10S, 45W.

✓ TM 30 - J/Neoc. - siliceous shale -
same location as #29.

✓ TM 31 - J/Neoc? - chert containing
brachiopod megafossils.
~~TM~~ Same location as 29.

✓ TM 32 - J/Neoc? - shale w/
coaly seams - 400 yds.
SSW of #29.

✓ TM 33 - Kfm? - shale - approx.
500'-1500' (?) below base of
section measured on 7/13/77.
on NW flank of Tingmepuk
Mtn at map location SW, SE,
NE, Sec. 20, T10S, R45W.

TS sequence - section measured on
south flank of Tupichak Syncline,
Kukporuk River, Air photo road
#6-51R, bluff on west bank.
Dalong Mts. Quad. - T.6S R47W
Sec. 10 SW 1/4 of SE 1/4.

- ✓ TS 34 - Knk - sandstone - see section
- ✓ TS 35 - Knk - sandstone - " "
- ✓ TS 36 - Knk - shale - see section
- ✓ TS 37 - Knk - shale - see section.

~~1st Shipment 6? 8? boxes~~

SHIPMENT A : 6 BOXES

- ✓ TS 38 - Knk - sandstone - see section
- ✓ TS 39 - Knk - shale - see section
- ✓ TS 40 - Knk - sandstone - see section

KA series - section measured 7/18, 19, 20
21/77 on Kukupowuk exposures
on north flank of Archimedes Ridge

Anticline and south flank of
Kasegaluk Syncline - base dist
top of Torok at map loc.

NE/4, NE/4, NW/4, sec. 26, T. 2 S.
R 45 W, Pt. Lay AZ quad, and
tapping at map loc: NE/4, NW/4, SW/4,
sec. 22, T. 2 S., R 45 W, Pt. Lay
B-2 quad.

- ✓ KA 41 - Knk - sandstone - see section
- ✓ KA 42 - Knk - shale - " "
- ✓ KA 43 - Knk - shale - " "
- ✓ KA 44 - Knk - sandstone - " "
- ✓ KA 45 - Knk - " - " "
- ✓ KA 46 - Knk - shale - " "
- ✓ KA 47 - Knk - sandstone - " "
- ✓ KA 48 - Knk - shale - " "
- ✓ KA 49 - Knk - shale - " "

- ✓ KA 50 - Knk - sandstone - see section
- ✓ KA 51 - Knk - " - " "
- ✓ KA 52 - Knk - " - " "
- ✓ KA 53 - Knk - shale - " "
- ✓ KA 54 - Knk - shale - " "
- ✓ KA 55 - Knk - sandstone - " "
- ✓ KA 56 - Knk? - " - " "
- ✓ KA 57 - Knk? - shale - " "
- ✓ KA 58 - Knc? - shale - " "
- ✓ KA 59 - " ? - sandstone - " "
- ✓ KA 60 - " - shale - " "
- ✓ KA 61 - " - sandstone - " "
- ✓ KA 62 - " - " - " "
- ✓ KA 63 - " - " - " "
- ✓ KA 64 - " - " - " "
- ✓ KA 65 - " - " - " "
- ✓ KA 66 - " - " - " "
- KA 67 - " - ? - SEE SECTION MISSING
- ✓ KA 68 - " - shale - " "
- ✓ KA 69 - " - sandstone - " "
- ✓ KA 70 - " - SHALE SHALE - " "
- ✓ KA 71 - " - sandstone - " "
- ✓ KA 72 - " - " - " "
- ✓ KA 73 - " - " - " "
- ✓ KA 74 - " - shale - " "

✓KA 75	- Knc	- shale	- see section
✓KA 76	- Knc	- sandstone	- " "
✓KA 77	- "	- "	- " "
✓KA 78	- "	- shale	- " "
✓KA 79	- "	- sandstone	- " "
✓KA 80	- "	- "	- " "
✓KA 81	- "	- "	- " "
✓KA 82	- "	- "	- " "
✓KA 83	- "	- "	- " "

SA series - samples from section
measured on north flank of
Snowbank Anticline - south flank
of Barbara syncline. Measuring
dates 7/22, 23, 25

Map location: NW, SE, Sec. 27, T1N, R44W
to SW/4, SE/4, NW/4, Sec. 27, T1N, R44W,
and SW/4, SW/4, NW/4, Sec. 27
to SW/4, SE/4, SE/4, Sec. 21, T1N,
R44W.

✓SA 84	- Knc	- shale	- see section
✓SA 85A	- Knc	- "	- " "
✓SA 85B	- "	- "	- " "

✓SA 86	- Knc	- shale	- see section
✓SA 87	- "	- sandstone	- " "
✓SA 88	- "	- shale	- " "
✓SA 89	- "	- sandstone	- " "
✓SA 90	- "	- "	- " "
✓SA 91	- " 7	- shale	- " "
✓SA 92	- Knc?	- sandstone	- " "
✓SA 93	- "	- shale	- " "
✓SA 94	- "	- sandstone	- " "
✓SA 95	- "	- shale	- " "
✓SA 96	- "	- "	- " "
✓SA 97	- "	- sandstone	- " "
✓SA 98	- "	- shale	- " "
✓SA 99	- "	- sandstone	- " "
✓SA 100	- "	- sandstone	- " "
✓SA 101	- "	- shale	- " "
✓SA 102	- Knc	- "	- " "
✓SA 103	- "	- sandstone	- " "
✓SA 104	- "	- sandstone	- " "
✓SA 105	- "	- sandstone	- " "
✓SA 106	- "	- sandstone	- " "
✓SA 107	- "	- shale	- " "
✓SA 108	- "	- "	- " "
✓SA 109	- "	- "	- " "
✓SA 110	- "	- COAL	- " "
✓SA 111	- "	- "	- " "

✓ SH 112 - Knc - coal - see section
 ✓ SH 113 - Knc - sandstone - " "

~~SH~~ TSE series - section measured
 on south flank of Tupikchak
 syncline along Kokolik River, from
 NW 1/4, sec. 1, T7S, R43W; to
 NW 1/4, sec. 32, T6S, R42W.

VTSE 114 - Knc - sandstone - see section
 VTSE 115 - Knc - silty shale - " "
 VTSE 116 - Knc - sandstone - " "
 VTSE 117 - Knc - sandstone - " "

SHIPMENT B - 12 boxes.

VTSE 118 - Knc - shale - see section
 - The following were obtained from Torok shales
 beneath the Kukpowruk near the axis of
 southern Anticline along the Kokolik River.

✓ TSE 119 - Kt - sandstone - see note + section
 ✓ TSE 120 - Kt - shale - "
 VTSE 121 - Kt - " - "

above from map location sec 14, T7S, R43W,
 on west bank of Kokolik River.

VTSE 122 - Knc - sandstone - see section
 VTSE 123 - Knc - shale - see section.
 VTSE 124 - Knc - sandstone - " "
 VTSE 125 - Knc? - sandstone - " "
 VTSE 126 - Knc? - shale - " "
 VTSE 127 - Knc? - sandstone - " "
 VTSE 128 - Knc? - sandstone - " "

FS series - samples collected during
 measurement of Kukpowruk Fm. on
 NW flank of Flintchip Syncline,
 on east bank of Kokolik River, at
 map location: sections 16, 17-21, T. 5 S.,
 R. 42W.

✓ FS 129 - Knc - shale - see section
 ✓ FS 130 - " - sandstone - " "
 ✓ FS 131 - " - shale - " "
 ✓ FS 132 - " - sandstone - " "
 ✓ FS 133 - " - " - " "
 ✓ FS 134 - " - " - " "
 ✓ FS 135 - " - " - " "
 ✓ FS 136 - " - " - " "

DS series - collected from Kukpowruk
exposed on south flank of Dugout
Syncline. Samples 137-139 collected
in sec. 25, T7S, R51W; sample
140 in sec. 27, T7S, R50W on
small knob (Kent's Butte).

✓ DS 137 -	Knk -	shale	-	see section
✓ DS 138 -	" -	sandstone	-	" "
✓ DS 139 -	" -	"	-	" "
✓ DS 140 -	" -	"	-	" "

PS series - collected from Kukpowruk and
Carwin exposed on northern flank and core
of Pitmegea Syncline. Samples 141-143
collected at scattered locations in T8S, R50,
S1 W. Sample 144 is from sec. 29, T8S, R50W
and 145 is from sec. 20, T8S, R50W.

✓ PS 141 -	Knk -	sandstone	-	see section
✓ PS 142 -	" -	"	-	" "
✓ PS 143 -	" -	"	-	" "
✓ PS 144 -	Knc -	"	-	" "
✓ PS 145 -	Knc? -	shale	-	" "

MM series collected from
Kukpowruk Fm. exposed on south
flank of Meat Mtn. in sec. 17+20,
T6S, R37W, Mt. Misheguk Quad.

✓ MM 146 -	Knk -	sandstone	-	see section
✓ MM 147 -	" -	"	-	" "
✓ MM 148 -	" -	"	-	" "
✓ MM 149 -	" -	"	-	" "
✓ MM 150 -	" -	"	-	" "

PP series collected from Kukpowruk Fm.
exposed along Utukok River on south
flank of Folsom Point syncline, in
sec. 32, T3S, R37W and sec. 3 and
5, T4S, R37W, Utukok River quad.

✓ PP 151 -	Knk -	shale	-	see section
✓ PP 152 -	" -	SANDSTONE	-	" "
✓ PP 153 -	" -	"	-	" "
✓ PP 154 -	" -	SHALE	-	" "
✓ PP 155 -	" -	SANDSTONE	-	" "
✓ PP 156 -	" -	SHALE	-	" "
✓ PP 157 -	" -	SANDSTONE	-	" "
✓ PP 158 -	" -	"	-	" "

~~CB series~~

SAMPLE 185 - OILSAND FROM CORWIN
ON SOUTH FLANK OF NORSEMAN
ANTICLINE, ALONG KOKOLIK RIVER
AT NE/4, SE/4, SW/4, SEC. 7,
T2N, R39W, UTUKOK C-5 QUAD.

CB series - collected from
Kukpowruk and Corwin on
NE margin of Coke
Basin, along Kukpowruk River.

✓ SAMPLES 186-193 were taken on
a section extending from SE/4, NE/4,
SE/4, SEC. 33, T.6S., R47W, DELONE
MTS. D-2 TO NE/4, NW/4, NW/4,
SEC. 4, T.7S., R47W. Samples

✓ 194-201 were taken at a lower
STRATIGRAPHIC INTERVAL IN A
SECTION EXTENDING FROM NE/4, NE/4,
NE/4, SEC. 29, T.6S., R47W. TO
NE/4, SW/4, NE/4 of the same section.

✓ 202: SW, SE, SEC. 29, T.6S., R47W

✓ 203: SE, SE, SEC. 30, " "

✓ 204-206: SW, SW, SEC. 32, " "

✓ 207-214: N 1/2, NE, SEC. 6, T.7S., R47W.

✓ CB 186 -	Kok -	shale	-	see section
✓ CB 187 -	"	SANDSTONE	-	"
✓ CB 188 -	"	shale	-	"
✓ CB 189 -	"	SANDSTONE	-	"
✓ CB 190 -	"	"	-	"
✓ CB 191 -	"	"	-	"
✓ CB 192 -	"	"	-	"
✓ CB 193 -	"	"	-	"
✓ CB 194 -	"	"	-	"
✓ CB 195 -	"	"	-	"
✓ CB 196 -	"	SHALE	-	"
✓ CB 197 -	"	"	-	"
✓ CB 198 -	"	"	-	"
✓ CB 199 -	"	"	-	"
✓ CB 200 -	"	SANDSTONE	-	"
✓ CB 201 -	"	"	-	"
✓ CB 202 -	"	SANDSTONE	-	"
✓ CB 203 -	"	SHALE SILTSTONE	-	"
✓ CB 204 -	Kok -	SANDSTONE	-	"
✓ CB 205 -	"	"	-	"
✓ CB 206 -	"	"	-	"
✓ CB 207 -	"	"	-	"
✓ CB 208 -	"	"	-	"
✓ CB 209 -	"	"	-	"

✓ CB 210 - Knc - SANDSTONE - see section
 ✓ CB 211 - " - " - " "
 ✓ CB 212 - " - " - " "
 ✓ CB 213 - " - " - " "
 ✓ CB 214 - " - " - " "

SAMPLE 215 FROM SECTION MEASURED IN
 SW/4, SW/4, SE/4, SEC. 6, T7S,
 R47W. SAMPLES 216-218 FROM
 SECTION MEASURED IN SE/4, SE/4,
 NW/4, SEC. 7, T7S, R47W;
 samples 219-221 from section measured
 in ~~NE/4~~, NW/4, NE/4, NE/4,
 SEC. 12, T7S, R48W. All in
 Delong MTS. D-Z quad.

✓ CB 215 - Knc - sandstone - see section
 ✓ CB 216 - Knc - shale - " "
 ✓ CB 217 - " - shale - " "
 ✓ CB 218 - " - siltstone - " "
 ✓ CB 219 - " - coal - " "
 ✓ CB 220 - " - shale - " "
 ✓ CB 221 - " - siltstone - " "

~~##~~

SAMPLES 222-230 collected from
 Torok and Kukpowruk Fm. exposed on
 northeast flank of Coke Basin. Samples
 222-225 from basal Kukpowruk exposed
 in section extending from (SW/4, SW/4, SW/4,
 section 15) to (NE/4, NE/4, NE/4, section 29),
 T6S, R47W. SAMPLES CB 226-CB 230
 (numbered 1 to 5 consecutively in field notes
 (NORM + ROGER) of 8/12/77) are from
 vicinity of Torok-Kukpowruk contact
 on NE flank of Coke Basin, in
 SW/4, NW/4, SW/4, sec. 23, T6S,
 R47W.

✓ CB 222 - Kt - shale - see section
 ✓ CB 223 - Knc - sandstone - " "
 ✓ CB 224 - Knc - " - " "
 ✓ CB 225 - Knc - " - " "
 ✓ CB 226 - Kt - shale - " "
 ✓ CB 227 - Kt - " - " "
 ✓ CB 228 - Kt - " - " "
 ✓ CB 229 - Kt - " - " "
 ✓ CB 230 - Kt - " - " "

BA SERIES - FROM KUKPOWRUK - TOROK

contact on north flank of Blizzard
Anticline. Section along east
bank of Kokpowruk River in NE 1/4
of section 6, T55, R46W,
PT. LAY A-Z QUAD. Numbered 6, 7 and
8 in field notes of 8/12/77.

✓ TSA 231 - Kt - shale - see map

✓ TSA 232 - Kk - siltstone - see map

✓ TSA 233 - Kk - " - see map.

SA (series) - second visit - extension
of section on north flank of

Sambank Anticline along
Kukpowruk River. ^{SECTION EXTENDS} FROM NW 1/4,

SE 1/4, SE 1/4, SEC. 21 TO SW 1/4, SE 1/4, SE 1/4, SEC. 16,
PT. LAY B-2, B-3 QUAD.

✓ TSA 234 - Knc - ~~SHALE~~ - see section

✓ TSA 235 - " - SANDSTONE - " "

✓ TSA 236 - " - SHALE - " "

✓ TSA 237 - " - " - " "

✓ TSA 238 - " - " - " "

✓ TSA 239 - " - " - " "

✓ TSA 240 - " - SANDSTONE - " "

✓ TSA 241 - " - " - " "

✓ TSA 242 - " - " - " "

✓ TSA 243 - " - SHALE - " "

✓ SA 244 - Knc - SANDSTONE - see section

✓ SA 245 - " - " - " "

SAMPLE 246 - FROM KUKPOWRUK FM WEST OF
KUKPOWRUK RIVER ON SOUTH FLANK OF
BLIZZARD ANTICLINE AT MAP LOCATION: NW 1/4,
SE 1/4, SEC. 29, T55, R47W, DE LONG MTS. D-2 QUAD.

✓ 246 - Kk - SANDSTONE - see ~~section~~
map

TSE SERIES (second visit):

SAMPLES COLLECTED ON SOUTH FLANK OF

TUPICHAK BASIN EAST OF ~~KUK~~ KOKOLIK RIVER,
AT MAP LOCATION: NW 1/4, SE 1/4, SEC. 16,
T65, R42W, MISHEGUK Mtn.

should read T55

TSE 247 - Kk - SANDSTONE - see map & section

TSE 248 - Kk - " - " "

SAMPLES 249-253 - collected from Torok and

Kukpowruk Fms. near their mutual contact

along the Kokolik River on the north flank of

Kolik Anticline, samples 249-251 collected. AT

MAP LOCATION: NE 1/4, NW 1/4, SEC. 9 AND SW 1/4, SEC. 4,

T65, R42W, MISHEGUK Mtn. QUAD.

SAMPLES 252 AND 253 collected at map location:

NW 1/4, NW 1/4, NW 1/4, SEC. 4, T65, R42W, MISHEGUK
Mtn. QUAD.

✓ 249	- Kt -	SHALE	- SEC MAP
✓ 250	- Kt -	"	- " "
✓ 251	- Kt -	"	- " "
✓ 252	- Ktk -	"	- " "
✓ 253	- Ktk -	"	- " "

SAMPLES 254 TO 261 FROM ~~SECTION~~ SECTION
(NOT MEASURED) IN CORE OF BLIZZARD
ANTICLINE ALONG KOKOLIK RIVER, AT
MAP LOCATION SW/4, SW/4, NW/4,
SEC. 5, T55, R42W. TO SE/4, NE/4, SE/4,
SEC. 6, T55, R42W, UTUKOK RIVER
A-5 QUAD.

SAMPLES 262 TO 266 FROM SECTION
OF TOROK ON WEST BANK OF KOKOLIK
RIVER ON SOUTH FLANK OF BLIZZARD
ANTICLINE IN SW/4, NW/4, SEC. 8;
T55, R42W, UTUKOK RIVER A-5
QUAD.

SAMPLES 267 AND 268 FROM ~~QUAD~~
Kokpowruk Fm. on north flank
of BLIZZARD ANTICLINE along west
bank of Kokolik River in SW/4,
SW/4, SEC. 25, T45, R42W,
UTUKOK RIVER A-5 QUAD.

SAMPLES 269 + 270 FROM TOROK IN CORE
OF ARCHIMEDES RIDGE ANTICLINE ALONG
WEST BANK OF KOKOLIK RIVER AT MAP
LOCATION: NE/4, SE/4, SEC. 2, T35,
R42W, UTUKOK R. A-5.

SAMPLES 271-274 FROM TOROK
ON NORTH FLANK OF ARCHIMEDES
RIDGE ANTICLINE ON WEST BANK OF
KOKOLIK RIVER IN SE/4, SE/4,
SEC. 36, T25, R42W, UT. R. A-5.

SAMPLES 275-277 FROM UPPERMOST
TOROK EXPOSED ON WEST BANK OF
KOKOLIK RIVER ON NORTH FLANK OF
ARCHIMEDES RIDGE ANTICLINE IN
NE/4, SW/4 AND NE/4, SE/4 OF SECTION
29, T25, R41W, UT. R. A-5.

✓ 254	- Kt -	SHALE	- SEC MAP
✓ 255	- " -	"	- " "
✓ 256	- " -	"	- " "
✓ 257	- " -	"	- " "
✓ 258	- " -	"	- " "
✓ 259	- " -	"	- " "
✓ 260	- " -	"	- " "
✓ 261	- " -	"	- " "
✓ 262	- " -	"	- " "

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800101

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8/20/77	CLEANED UP AND BROKE CAMP. IN ANCHORAGE AT 10 PM.	—	—

1

21 Jul

WNK Boda 1

ON OUT CROP 8:00 N. FLANK ARCHIMIDES

ANTICLINE NEAR CONT. KNE & KNC

N30E 24NW & N46E 21NW

FRACTURE N22E 28NW

N30E 36NW

N85W 57NE

N42W 39SW (?)

N49W 55SW

N43W 53SW

N48W 53SW

N46W 47SW

1438 cov.

12 AUG 77

THIN OVERCAST

TEROK. EXPOSURE ALONG MUKPOW R. R.
NE. FLANK OF COKE BASIN, RBS & WNK

2' EMMISTONE, MTOF, M. GRAY, STLY CALC
CARB MAT ON BEDDING, BASE COV, HEAVILY
BURROWED, TOP SHARP W/ RIPPLES,
TRACKS & TRAILS

21' SHALE & SILTSTONE, INTERBEDDED
SAMPLE #1 @ 10' FROM BASE.

2" SILTSTONE, SANDY, M. GRAY, STLY CALC
BASE COV. BOTTOM HAS SOFT SED. DEFORMATION
TOP 1" HORIZ LAM @ BASE TOP CLIMBING
RIPPLED

29' SHALE & SILTSTONE INTERBEDDED
SAMPLE #2 @ 16' FROM BASE

8' SANDSTONE, LT M. GRAY, M. BRN, STLY
CALC., TR. CARB MAT ON BEDDING, BASE
GRADATIONAL, AROUND BURROWS & LOAD
CASTS (?) ON BASE OF BEDS, VERT & IN-
CLINED BURROWS, NUMEROUS CLAMS,
BEDDING INDIST, BEDDING SURFACES RIP-
PLED, TOP SHARP

18' SHALE

8' SANDSTONE, MTOF @ BASE, MTOF @ TOP
LT GRAY, BRN GRAY, STLY CALC, TR. CARB.

BASE GRAY, SOFT SAND DET. AROUND BUR-
ROWS, CLAUSE, SAND CLUSTS, UPPER 2'
V. FRI. Fg. LUMBY LAM. TOP GRADES INTO
C" FISSILE SILTSTONE, MICA.

32^S SANDSTONE & SHALE, INTERBEDDED
SANDSTONE BEDS UP TO 1' THICK OF: Ufg
LT TO M. GRAY, SET TO MOD CALC.; BASES
SINEP W/ AROUND BURROWS, LAMINAE
INDIST TO RIPPLED, TOPS SHARP W/ RIPPLES
TRACKS, TRAILS & BURROWS; ABUND CLAMS
LOCALLY. EXPOSURE, MOSTLY COV. TOP
5' COV PROB. SANDSTONE Ufg, LT GR
THIN BEDDED, BURROWED W/ RIPPLE
CLUSTS (XCL) WHICH CROPS OUT TO
EAST. WEST OF LINE OF SECTION
INTERVAL IS FOLDED & FAULTED W/

APARENT DISRUPTION OF UNDERLYING
2ND OVERLYING BEDS: SAMPLE IT FROM MIDDLE

8⁻ SANDSTONE U/ TO M. SUB ANGULAR
MOD SORTED, MOD BULK, LT GRAY TO BROWN
BASE COV. SMALL. SCALE TROUGH
AND HORIZ LAM., BURROWS & RIPPLE
CLUSTS UPPER BED SURFACES RIPPLE
W/ TRACKS, CLAMS, IP CIV.

DET SET WEST TO TOP OF EQUIVALENT (?)
SAND

15' SANDSTONE, $\frac{1}{4}$ to $\frac{1}{2}$ in, LT GRY, STLY CALC.
ABUND CARB MNT ON BEDDING LOCALLY
THIN TO MED BEDDED, BASE COV. SMALL
SCALE TROUGH (3), HORIZ, $\frac{1}{2}$ CONTOUR
ET LAM, ABUND BURROWS, TRACKS
 $\frac{1}{2}$ TRACES, CLAMS, LOAD-CASTS. MOST
LY COV. TOP COV.

13' COVERED PROB SHALE, SHALE AT TOP

(229) 3' SANDSTONE, STUF, LT GRY, MOD CALC.
ABUND CARB MNT ON BEDDING, BASE
SHARP, EROSIONAL, BEDDING THIN TO
MED, BASE OF BEDS HAVE LOAD CASTS.
CURRENT LINEATION, $\frac{1}{2}$ BURROWS, THIN
HORIZ LAM W/ SOME TROUGH X-LAM,
TOPS OF BEDS RIPPLED, CLAMS, TOP
COV. SAMPLE #1 FROM UNDER -
LYING ^{TOP OF} SHALE

128' COVERED

3(3) SANDSTONE, $\frac{1}{4}$ to $\frac{1}{2}$ in, LT GRY, STLY CALC.
BASE COV. THIN TO MED BEDDED
NO VIS STRAT OCC BARROW, TOP SHARP
W/ RIPPLES

(230) 5' SHALE W/ THIN SANDSTONE INTERBEDS
TO 03' THICK, TOP COV. SAMPLE #5
FROM BASE

DICK STEWART
FIELD BOOK #2

RLS

~~Field Bk 2~~
Field Bk 2

SEALED COPY
OF BOOK

1

Own Camera

Roll 7 # 5

W. Bank, near bank

low tide - 1000

small tidal channel

#16 Same

sm. tidal channel

#17

tidal flat underlain by

tidal channel

Co Camera

Roll 8 # 12, 13, 14 first land

on S side (2nd b.

sand in section)

19 August

CRW photos

12/ #35 Small sand con. baffle-13

12/ #36 Coarse sand con. W-13

13/ 1 Tidal creek at W-13

at low tide

Own camera #2 interference with

W-17B #9 down slope of main face
note change in texture

? for the 1st time since the
beginning

10 Etched face small
scale low angle rough
x beds "porey" to core

11 Another more typical
exposure

17 W-17B

18, 19 W-17C tidal

19 looks in tide

20, 21 Big boulders in probable lag

19 August

Stop 1 W-13 location

Accretion faces mapped several
meters to east by channel near
top. Channel had usual sequence
of large-scale rough below
with "porey" facies above

Stop 2 Trench 1 & 2
on ridge W-17 to 10

Stop 3 Trench 3 on Crest
W-17C

Stop 4 1st channel in
Crest, Trench 4
Brim

Sec 30, T7S, R47W

S41W rippled

S47W

N 64 W

S78W

Large scale tabular cross-bedding.

N20E 37 NW

N46E 34 NW

N47E 37 NW

N64E 35 NW

N36E 20 NW

N20E 28 NW

N34E 28 NW

N53E 22 NW

N48E 36 NW

N45E 27 NW

N50E 33 NW

N40E 42 NW

N46E 35 NW

N38E 34 NW

N12E 32 NW

N36E 36 NW

N34E 42 NW

N38E 34 NW

N48E 33 NW

N56E 34 NW

N61E 29 NW

Trough axis

N25W large unbedding

S12W 6°

N58E 26 NW

N40E 40 NW

N31E 30 NW

N58E 28 NW

N51E 37 NW

N30E 28 NW

N70W 22 NE

Slighted strike

N55E 17 NW

Pos. S. a ? no 3 bedding

N58E 29 NW

Stop 5. S. Hank (aka) P. Hank

Sec 29, T7S, R47W

Small scale trawler

N15W 22.5W

N70E 27 NW

N55E 23 NW

N10W 22.5W

N34E 26 NW

N75E 19 NW

N40W 37 NE

N67E 36 NW

N77E 44 NW

N78W 42 NE

N85E 48 NE

N65W 41 NE

N42W 59 NE

N53W 21 NE

N88W 41 NE

N12W 15 SW

N38E 25 NW

N89W 36 NE

N62W 44 NE

N26E 27 NW

N75E 22 NW

N36E 27 NW

N50W 26 NE

N55W 30 NE

N54W 46 NE

[Small scale trawler]

N42W 39 NW; N82W 29° N

Small scale trawler

N85W 34 NE

N61E 32 NW

N70W 34 NE

N75W 24 NE

S. Hank up

N52E 24° NW

Stop 6. West S. Hank (aka) P. Hank

Sec 20, T7S, R48W

Channel A (western) 33° NE

N25W 32° NE

N10W 21 NE

N48W 22 NE

N85W 35 NE

N27W 32 NE

N23E 24 NW

(direction?)

Channel B. - 1 Kirk has some value

back.

N04E 44° NW

N35W 32 NE

N08E 35 NW

N5W 27 NE

N2W 29 NE

N2W 33 NE

N27E 38 SE

N40E 12 SE

N20W 8 NE

N09E 45 SE

N58W 23 NE

N11W 25 NE

N18E 23 SW

N28W 15 NE

N03W 16 NW

N04E 39 SE

N46W 30 NE

N14W 18 NE

Stag 7 E end of Vaguet

Supra Sec 25 T7S, R50W

Large scale low 2 bed cross bed. Sets

N44W 9 NE

210'

N30E 21 NW

N60E 23 NW

N47W 25 SW

N09W 14 SW

N32E 31 NW

N63E 24 NW

pass S. N54E 24 NW

pass. 10' NW

N61E 21 NW

N32E 21 NW

N75E 24 NW

N50W 11 SW

Spindle:

R/S 278. m. Sandstone

279. m. Sandstone

279. m. Sandstone

279. m. Sandstone

highly cemented.

Stop 8

1714 West 4th Ave. Fairmont

1714 West 4th Ave. in 2nd. (X)

N5W 25NE

N7W 24NE

N49W 23NE

N40E 24SE

N9E 34NW

N56W 11NE

N7W 30NE

N35E 6SE

N55E 27SE

N39E 20SE

N2E 36SE

N36E 46SE

N29W 28NE

X Corrugated to Sand "1.1" in

measured section

Sec 19 T8S, R50W

DICK STEWART
FIELD BOOK #1

R. L. S.

1977 Bl. L.

Wheat Creek
WHEAT CREEK
FIELD BOOK
1977

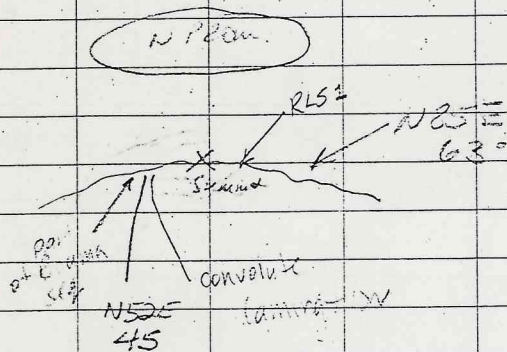
Stop 1 Tingmarok Mt
S.W. Side Wd on flat
ridge. Took walk up S.W.
side. Dips SE steep - mostly
blocky flaggy rubble
Synclinal load cast.

Rock - overcompacted, tight -
fairly lge amt matrix
ss, vfg, silty, lt tannish brn to
lt grey, r. glauc. lt lime green.
no eff.

Summit seems to be assoc w/
a single horizon or two

Near summit Ting. Mtn. just east

Convolute laminations - not
in place tho estimate
is prob rite side up but no
clear cut diagnostic sed structure



Sample RLS1 LEP

apparent portion of Barrow sequence
 (evidence of shale) E
 upper (?) parallel line basin,
 small scale undulate
 over massive

trough cross strat seen w/



Summit

Ripple trough marks
 N57W

bed S 64° E 35

4

Roll 1 Pic #5

Roll #6, 7 8 9 10

5

Stop 2. NE side of
lower summit W of top
Tingmorkpuk. Sand in
rubble d-mg, g/30se.

Evidence of parting lineation
(Pic #5) shows fill

Measured Tingmorkpuk Mtn
section (see next page)

Pic #6 - cratered body

Pics 7 8 9 of outcrop

Pic 10 view down Kukprokt R
from Coler Basin

6

RLS-2 L&P

RLS-3 L&P
1.5 ft above base
of unit

Tingmark, Ark Mtn Strat Sec

W-11

Base of Section

N 22° E 47° SE

Shale, lt gr, fossils at base

5' ss. v. lg. lt gr, - brn, med
srd, well cont'd, dom. horiz
lam., thin zones of ripple
local convolutions, prt'y lins

7.6 ft. ss. v. lg. brng siltic
upward, med gr - brn
msl, well cont'd, weak horiz
lams, sharp tur cont, transitional
upper cont. Oxidation spots
on upper 2/3

2' Siltst, lam., flaggy,
iron stnd, transitional tur
contact

RLS-4 alt 6' above base
paleogrey

28.8' Shale, sli bentonitic
med-dk grey, partly covered

0.2 Ss, dk grey vfg

0.2 shale

1.3 Ss vfg at base, grds to
city vfg ss, dk grn-grey
lower 0.8' contorted bdg.
w/ sm sel X-lam; upper
horiz bdg.

2.6' blk sh.

0.5 Ss grn-grey vfg, sm sel
X-lam w/ contorted bdg.

2.3 Shale as above

0.5 Sst vfg, dk grn-grey
sm sel X-lam

8.9 blk shale

0.9 Sst vfg grn-grey ripple
X-strat lam w/ convol
bdg, fines upward to silty
shale. 0.05' shale ripple

1.8 As previous unit &
grades upward into blk
shale.

8.5 Blk shale incl. two
0.3' Sst beds near
middle of unit

2.6 ss. fg, grad upward to
silty vfg ss, grn-grey
msw at base (0.7');
convolute (0.4');
climbing ripples (0.4')
horiz laminae grad into
shale (1.1')

2.0 blk shale

2.2 2 or 3 flow units; ss fg,
gn-gry, lower unit contorted
lam., upper unit horiz lam
w/ climbing ripples, gradg
into sh., sharp erosive
base

2.3 blk shale

0.7 ss bed vt-fg, gold'd horiz
lams.

1.4 blk sh.

2.8 slst, blk gn-gry, vt-fg,
stx, strct is dom. horiz
w/ thin zones of contorted
& climbing ripples & parting
lineation

- prtg lin pgs 6° N17E

- b-g altitude N15W 32E

RLS-5 LPP

1.7 dk grey sh.

0.5 ss. vt-fg, grn-gr, clmbs
ripples at base, horiz lam
upper

1.4 dk grey sh.

1.3 ss fg grn-gr; lower part
wavy strat w/ cont'd lam
upper is horiz being siltier
upward

1.4 blk sh

1.4 ss, f-mg, "cleared" vt-lam
grn well cont'd, horiz lam
near base, lge sl cont'd
lam at top; 0.2' shl ply
at top

1.5 ss, glaze vt-gr, fg, near base
trans up to grn-gr silt
vt-gr sl; lower part cont'd
lam, being more horiz, w/ thin
ripple zone upward

1.5 blk sh, shi base, incl 0.8' silt
vt-gr, dk grn-gr; cont'd at base
parallel above

RLS-6 LEP

RLS-7 LEP

Chuck has picture of disk structure

2.3 ss, vfg, contorted below, parallel abv,
ends upward to blk sh.

2.4 blk sh

2.5 ss, qdd, lt grey at base, becoming
grey at top, siltier upwards
horiz lam, w/ thin zone contorted
sharp base, qtzose at base

2.6 blk sh w/ ironstn. concretions

2.7 ss, qtz arenite, fg at base
med-ill sorted, ends upward to
grey-gr, silt, silt vfg, clean
ss more med than horiz lam
upward sdy, sharp base

2.8 blk sh

2.9 siltst sdy contorted only below
parallel lam abv, med dk grey

2.10 shale

2.11 silt

2.12 shale

2.13 ss - fg - mg - vfg, rip-up clsts
lt-med grey, qtzose, disk
structures in lower part, faint
horiz laminae w/ med scale
contorted lam, in upper part
pass scour w/ relief, sharp
base

- 4.3 blk sh.
 0.8 ss, slty vfg gm-dk grey
 cont'd in base (0.6')
 parallel horiz w/ X-lam (0.2)
 1.4 blk sh.
 0.2 siltst
 0.4 shale
 0.8 ss, vfg dk grey w/ rip-up
 clsts at base, horiz lam then
 convolute, then horiz, grad up to
 to shale.
 0.2 shale
 1.0 ss, horiz lam ripples at top
 down as 0.8' unit above
 0.3 shale
 4.6 Siltst fg, w/ srt'd, qtz arenite
 lt grey-tan; lower 0.8' faint
 wavy horiz lam, upper part lge
 scale convoluted & unconfined laminae
 & prob fluid escape structures
 (lighter colored, wavy patches
 1/4 - 1/2" wide & to bedg.)
 sharp base.
 3 to 5' (varying) intbed siltst & sh

- 5.8' Siltst med grey to lt grey - tan
 mod srt'd (microscopic flinty) lower
 1/3 lge scale convoluted lam. upper
 2/3 grey iron stnd. vfg ss, horiz lam,
 w/ thin silt X-siltst med grey.
 base scours into underlying
 shale 2-3' thick
 (Roll #1 fig #6 of manual, lam)
 10' dk grey shale
 25.0 ss lt grey-tan, f-mg, qtz arenite
 w/ srt'd, uniform, lower part
 has wavy horiz laminations
 upper part mod w/ some vertical
 lam. Uppermost 3' thinner bedd
 w/ horiz lam, sharp upper base
 (in bed)
 RLS-8 near base
 RLS-9 near top
 11.5 shale
 5.0 siltst wavy lam. RLS-11
 3.0 shale
 3.1 ss fg mod w/ srt'd med
 grey, well cut/d, lge scale
 convoluted lam, sharp base
 upper 0.6' horiz w/ thin zone ripple lam.

18

2+ feet shale

TOP of Section

Returned to camp 6:25
END OF DAY

14 July 19

Left strip 7:45

Plans are to return to Tugan mtn
and check surrounding outcrops.
Possibly fly down Kokilik R
if time permits.

Pictures 11-12-13, 14^{SW}-11
section location

Stop 1 At east end of crescent
shaped ridge view of Tugan Mtn
in Sec 17.

Altitude N 22-30 W ~17°

on questionable bed plane

Conglomerate pebbles to 1/2 in.

Aug. 32-50 mm cobbles w/ sandy matrix

med- co. poorly sorted, grayish
abd. little fine

probably not in gr to gr
contact

Sd st bed (lenses) 0.6 ft

mgr. poorly sorted no vis

about N 35 E 50 NW

altitude.

mafic rock fragments, ls pebbles
 calcareous w/ chert, a few
 sdst pebbles of var. shales.
 low-med modern pebbles.

avg. pb. size 30-50 mm
 range: granules \rightarrow 1 ft.
 pebbles poorly sorted.

Base of section

23' (14') Cal as above above ^{wt. 20% B} _{metals}
 1' sd. gray-gm sand sea above

22 0.5' sd.

Cgl

25

Sd gray-gm med. cgl.

Cal

30 1.0'

Sd

Cgl

37 30.37

Sds

2 38

Sa

RHS-12

69 42 0.5 SdSt - beds now more
continuous

94 52 SdSt most bases horiz laminated
rare sm s.l X-slat at
tops.

99 61 SdSt a very few have isolated
pebbles in s.l.

100 63 SdSt

104 65 SdSt

109 67 SdSt

113 70 SdSt

115 71 SdSt

120 73 SdSt

131 81 SdSt

Roll 1 #15 Reverse gradient
in conglomerate, below
"154" sand

#16 view of K. and L
(gl and "154" sd)

6" scale on pic

17 WF

27 142 Sd

95 154 Sd

185 vertical foot = 114' short at
top of first part of sec.
altitude N40E 54 NW

at top.

Rot'd to slope. others vertical

and top to continue sec

marked hole, etc. to other side

26

27

Section 40 miles by 40 miles K's

RLS-13

Pic #18 view of N Side of Syncline

19 Sole markings in silt
above shale sampled
RLS-14

RLS-14

Shale at top of
"168" point in
CRW back

Stop 2. Shale sampling
Stop

Sample RLS-13 taken
45' vertical ft below base
of cgl. -
attitude at base cgl.
N67E 73 SE

Stop 3 Shale in center of Syncl.
Silt 168 ft in CRW block
mass shale upward in
section.

attitude N50E 74 NW

Poleo current meas. of
silt casts (Pic 19)

N50W S to N trend.
(horiz. proj of dir)

T.D. N44W

I measured the same

Shale 34.5 feet

RLS 14 24' above base

RLS15 in sand at
top of shale unit.
near flute casts
measured.

Roll 1 #20 of flute casts
measured.

↓
14'
in
section

2' pebbly silt, c.g.
poor silt w/ pebbles &
cobbles up to 3" near
base, silt pebbles thrust
flute casts at base,
scour marks behind
pebbles.

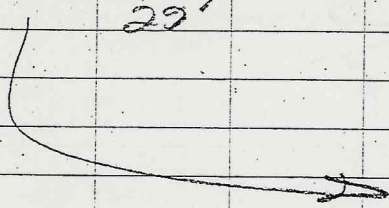
7½ ft of shale

suggestion of channel-like
lenticularity in cgl's.

13' Cgl (hint of channel)
pebble cobbles.

coarse sand, greenish gray,
max pebbles 5"
mostly in contact.

RLS - 16 pale pink in siltstone above
last cgl. - exact
distance uncertain as
in slumped area. est.
29'



29' Shale and ^{silt}stone above
cgl. partly covered
disturbed due to slumping
hence no exact measurement
est 29' -

6' Siltst. Horiz lam w/
thin sand ripples.
Sample RLS-16

29' + Shale above siltst

Ret'd to camp early
am.

34

RLS-26

15 July

35

Ferned George, Harry and Jack
around. Stopped on Tinguicula
Mtn in saddle. Found chevron
folded rock specimen suggesting
considerable structural complication.

Scouted Chevron well site
Received shot hole cuttings in
Sec 15, T9S, R43W. Supd RLS-26

Flew to river at Coto Basin,
stopped at Squeeze antline
and at Kulpowick synd.
N Flank (S14 T3S R25W) NW
corner where Chuck, Rick & Roger
were. Flew on to Archimedes
Ridge Anticline. ERK'd home
2:30.

RLS-27 paly paleo

RLS-28 LEP (ha)

RLS-29 - Litz, paly paleo
chert

RLS 30 paly paleo

16 July

Departed camp 7:30 for
Tingmunkpuk. Stop 1 in saddle
between main summit & NW
summit

RLS-27 in shale - mottled
red black in spring ~~on~~
slope of main summit
Sec 21, T.10S R45W

RLS-28 sdst soft sed deform
ation - a few flute casts
fg ss, clayey med dk gray
light, hard.

Stop 2 - tight folds on
ridge s of Tingmunkpuk

sampled chert, block RLS 29
some bedding in part
unit of sole marking,
(concretion) some in late
fractured weathering

RLS-31 paleo, only

RLS-32 SR / Palypalae

Roll #22 of stop where
RLS-31 collected

#23, 24 of Chevron fold
on S side of Tugay Mtn

Down gully: old 100 yds W. crest
not gen. fossil palypods found
in big places.

Further down - asynclinal
horizon fold. Black sandy material
in west of fold suggests
for ER and Divide in
camp for Pale-pale

Stop 3: West of Tugay Mtn
walked west from horizon fold
down E. will be looking
for suitable shales for paleo

stop fine ⁱⁿ sh. also w/ climbing
ripples, mod Sdd - old
beds

- old near vertical - appears
disturbed - strike N60E

Vertical $\pm 10^\circ$

- burrows noted.

RLS-33

34.4.4.6 on r. side, block
 11-22 87°N OT

Collected on 1st P/L
 map on ridge NW of
 T. 10. 11. 12.

N 30 W to 2nd 10 line
 through 1st

N 78 E to top of river
 summit of T. 10. 11. 12.

Flow east to mountain
 in T 10 S R 43 W Note
 similar appearance to T. 10. 11. 12.
 The river flows into a
 lake near Kokolk River
 to the west of the lake
 not to Camp

RLS-34. L & P. 2 ft. above base
of unit.

17 July

Stop 1 S flank Tuptchal
Syncline

[N40W 22 NE]
marginal

N30W 27 NE

Section W-14

Photo 26-57R Roll 26 of
DeLong Mtns index map.
Notes by RBS, described by CRW.

Base of section covered.

0-33 ft covered -- prob. sh

33-36.3 (3.3 ft) Ss. F. gr., mod well-
srt'd, feldspathic, base covered,
small-scale trough x-lam., top
transitional to siltstn.

36.3-49.9 (13.6 ft) Ss. m-f. gr.,
well srt'd, lt. brownish gray, v.
calcareous, thin bed, horiz. lam.
w/ small scale trough x-lam.,
abund. parting lentic, poorly exposed.

49.9 - 55.9 (6 ft) Covered

55.9 - 59.7 (3.8 ft) Ss, med gr.,
well srted, tan, v. calc, abun
fldspr & lithic frags, low δ
trough x-lam, horiz. burrows
on bedding surfaces

59.7 - 66.7 (7 ft.) Covered.

66.7 - 83.7 (17 ft). Ss, f-m gr., mod
wt srted, tan - lt gray, low
 δ trough cross-strat, poorly
exposed. Linear current ripples
on one bedding plane.

83.7 - 84.1 (0.4 ft) Silty sh., dk
gray.

84.1 - 84.4 (0.3 ft) Ss, v f. gr., mod
srted, med. gray. Small scale
trough x-lam.

84.4 - 84.9 (0.5 ft) Silty sh., dk gray
w/ horiz burrows, Fe concret.

RLS-35 L & P 1 ft below
top of unit.

RLS-37 L & P Taken 4 ft
below top of unit.

84.9 - 109.0 (24.1 ft) Ss, f. gr, mod.
wt. srted, lt. gray, large-scale
trough x-lam (< 4 ft). Tops
of beds rippled (linear rounded
current ripples) & bioturbated
(randomly wandering trails $\frac{3}{8}$ "
wide). V. calc. Pelocypod molds.

109.0 - 139 (30 ft) Covered.

139 - 167 (28 ft) Sh, dk gray, fissile,
clay-rich, w/ thin (< 10 ft) slty
v. fin ss beds. Entire interval
mostly covered. Ss. beds more common up
ward.

167 - 169 (2 ft) Ss & sh interbedd.
Ss v. f. gr slty, mod srted,
med gray. Beds 1" - 7" thk.
Small-scale trough cross-lam w/
rippled upper surfaces.

169 - 173.4 (3.4 ft) Ss, v. f. gr @ base
becoming shi coarser & better
srt toward top. F. gr. &
mod well srted @ top. lt. to
med gray, fsh. dk gray.
Abund. aligned plant frags.
Mod. calc.

along bedding surf. Thin bedd.
 Horiz. lamin. w/ zones of
 ripples & small-scale trough
 x-lam. Base of ss transitional
 top sharp & eroded by overlying
 unit. Parting lineat. present.
 Parting lineation ¹ S 32 W SS1W
 Ripple foresets ² N 35 E (unidirect) ³ N 36 E
 Current lineations (?) ³ S 51 W SS1W
 Aligned plant debris: ⁴ S 38 W SS1W
 - Ripple foresets ⁵ N 50 E N 40 E?
⁶ N 52 E N 41 E

173.4-175.9 (22.5 ft) Ss. f gr. med
 srted, brownish med gr.
 abund muscov. Massive thick
 beds, large-scale trough x-strat.
 thruout. (sets 2-4 ft wide).
 Sharp eros. base w/ < 2 ft
 relief. Conglomeratic lag of
 mud rip-up clasts (max dimens.
 8") Ripples @ top of unit.
 Plant debris abund. Ripple
 most (bidirectional) ⁷ S 15 W
S17W

RLS-36 Paleo. 3 ft below top

RLS-38 L & P 10 ft below
top of unit.

195.9 - 240.4 (44.5 ft) Sh. Partly
covered, siltstone or ss. beds (26"±).

240.4 - 243.6 (3.2 ft) Intrabdd ss &
silty sh. Ss v. f. gr., poor-
med sorted, brownish med gray.
Occurs in beds 1 - 5" thick.
Small-scale trough x-lam,
ripples, thin bdd. Transit.
underlying sh. Upper
surf. is scoured & eroded
by overlying ss. Abund.
plant debris. Weakly calc.


243.6 - 267.0 (23.4 ft) Ss. F - m gr.
Med well-sorted v. calc. Lt.
gray - tan Wx orangish tan.
Sharp eros. base truncates
underlying thin ss & sh. Clay
pebble lg zone @ base
(lower 1 ft) Largest dimens.
~ 5". Domin. large-scale
trough x-lam. Current
linear, S-40W. Discont. < 1 ft
thk organic-rich silt layers

ATTITUDE X-BEDS

- 1 N08W, 34NE
- 2 N15E, 25NW
- 3 N35E, 19NW
- 4 N25W, 36NE
- 5 N45W, 27NE
- 6 N10W, 34NE

Restored T.D.

556E
 580W
 580W
~~589E~~
 N08W
 556E

T.D. 
 N41E

(or 2 to 3 near middle of 55). Abund plant debris
 through x-strat (fresets axis)
 1 N8W 34NE, 2 N15E 25NW, 3 N35E 19NW
 4 N25W 36NE, 5 N45W 27NE
 Ripples (N41E) on bedding plane (top)
 of burrowing. 6 34NE 27E TEP
 of large-scale x-beds.

281.7 - 281.7 (14.7 ft) Sh partly covered.

281.7 - 285.1 (3.4 ft) Ss. Lwr 2 ft
 have 3 thin sh interbeds
 (< 6"). F. gr., med well
 sorted, med gray, w/ tan,
 shi calc. down horiz laminar
 rippled @ top. Ripple
 fresets N15W, N14W, N22E
 N10W (transport directions)
 Abundant plant debris.

285.1 - 286.4 (1.3 ft) Sh. w/ 8" ss
 bed 1/3 of dist. above base.

286.4 - 301.6 (5.2 ft) Ss. f - med
gr. mod ul srt'd, lt gray fresh,
tan wx, mod calc. large
scale ^{trough + minor tabular} cross-strat. (2-3 ft
sets), upper 2 ft show
minor soft sedi. folding,
rippled upper surf. ^{ripples}
x-strat. N15E & N25E ^{N27E}
N18E (transport directions)
^{N19E}

286.4 - 289.5 (3.1 ft) Sh. covered.

289.5 - 290.1 (0.6 ft) Ss. f gr.
mod ul srt'd, brownish
gray fresh, tan wx v. well
cemented w/ CaCO₃. Low &
x-strat. ripples in uppermost
6". Trace fossils & abund.
plant debris. Ripple marks
(transport direction) N10E. ^{N11E}

290.1 - 325.3 (35.2 ft) Sh. partly covered

325.3 - 325.9 (0.6 ft) Interbedded
s & sst/sln. Ss (3 beds -

RLS-39 Paled. from top of
unit-

0.4 ft, 0.4 ft & 1 ft) v. f. gr.
med srted, calc. med gray
fash. Dom. horiz. lam. w/
small-scale trough x-lam.
Sltstn interbeds -- poorly
srted, heavily bioturb. abund
plant matter. Ss has ripples
on topmost units

325.9-330.5 (4.6 ft) Sh. partly
covered. Thin (< 6") sandy
sltstn bed in upper part
of unit.

330.5-342.2 (11.7 ft) Interbedd ss,
sltstn & sh. Ss: 2" to 1.2 ft.
(topmost 1.2), v. f. gr. med
srted, drk gray w/abund
plant debris. Dom. horiz.
strat. w/ bur & trough
x-strat. tops of beds
gen have straight crested
wave modif ripples & also
abund. trace fossil burrows.
Sh ptngs w/ ss beds.

N53E-
S53W

Sh. & siltstn heavily bioturb,
sli calc.

372.2-365.8 (23.6 ft) Sh. partly cov.

365.8-366.5 (0.7 ft) Ss v.f. gr
qtz & lithics sli calc., med.
gray fresh brown wx.

Horiz. lam. upper 6"

heavily bioturb w/ ripples on
upper surf. Burrows on
base. Thin wispy sh prtngs.

S53W current lineat.

366.5-373.9 (7.4 ft) Sh partly cov

373.9-374.7 (0.8 ft) Ss Same
as underlying ss.

374.7-379.2 (4.5 ft) Sh.

379.2-384.2 (5.0 ft) Ss w/ 2
sh interbeds 0.3 ft ea for the
sh. Ss. f. gr med well
scrch, med gray, wx tan,
s calc. Low & x-stret.

RLS - 40 L & P @ base
of unit.

(trough) w/ horiz lam in
uppermost 8". Bioturb upper
& lower surf. Ripples (weakly
devel.).

384.2 - 414.2 (30ft) Sh partly cov.

414.2 - 420.2 (6.2ft) Ss. f. m gr.
poor - mod srt'd. v. calc.
thin bed. wispy stratifi
w/ sli penecontemp. deform.
that has affected trough
& stratifi. abund. plant
frags.

420.2 - 431.8 (11.8ft) Sh
partly covered.

431.8 - 475.3 (43ft) Ss. f. m gr
mod well srt'd. v. calc.
lowermost 15ft ± massive
large scale trough & strat
w/ abund mudst ripples lining
surfs. Uppermost thin bed
horiz. & ripple lam. & small

62

Roll 1 #29-30
of outcrop

63

slope trough lam. Wenge
channel cut near top of
3rd. Relations unclear
in low part of sand.

TOP of 1st Major
BREAK IN SLOPE
(LOC. A see polaroid
photo)

18 July

Field work resumed
in camp for plotting of
section.

Drew to S. block of
Kasegaluk supaluc mts.
lower part of Kasegaluk
there.

19 July

• Stood down
troops went back to S. block
Kasegaluk to continue
measuring.

66

RLS-58 paleosol
 dip source rock

RLS-59 LSP

RLS-60 paleo-paly

RLS-61

~~RLS-62~~

~~RLS-63~~

67

20 July -

Depart camp 7:40

back to S Fork Kawagata
 Sykes west bank to continue
 measuring

in shale at beginning of section
 mess on W bank

3.6 Sandstone, fg med w/soltd.
 at base being med. w/soltd
 then upper 2' fine calc

shale at base of next unit

Heavily burrowed lower part

68

RLS-62

Roll 1 #36 Ball and pillow structure

Roll 2 #1

69

Silt w/ silt w/ silt
 med silt + rough x-lam
 med silt + rough x-lam
 (Silt (RLS-62))
 extensive bioturbation along
 bedding planes.

70

Roll 2 #1, 2, 3

Roll 2 #4, 5

21 July

71

Left camp 2:40 & flew to
N. base of Kluane Ridge

Views of helicopter &
Kluane Ridge & Kluane
Pass.

Large scale ~~tabular~~
x-beds in ^{dist} channel
fill sequences in river
S. W. Kluane Lake
section
1/4 at 60

Roll #2 #9-13

#14, channel incision

#15 upper part of river
near coal bed.

#16 shale channel fault
2-300 yd N of crest of S. Bank

#17 - continuation of shale
near #16.

F/2.8 at 250

20, 22 dry and the
structures N flank
snowbank. snowline

22 July

left camp 7:30 flow to S.S.

Kasegalula syncline. Photographed
upper part of anticline

Flow to crest of snowbank
Anticline. Remained

plan

found numerous shale
contorted sections
also N flank. one (Pic #17)
plg.

74

75

23 July

24 July

Roll 2

34 Cape Deger

35 Killisnoak Pt

36 J-K Country Map

Roll 3

~~Roll 3~~

25 July 1977

Flow to N flank Snowbank

Anticline to continue seen there

Roll 3 #19

pass channel overlain by
beed(?) deposits. Up to
right

20 WF

21 Current drag 15

in place. Barometer
to flank

Completed Snowbank Anticline
Section. Flow up Epizotka
river to examine exposures.
They are very poor — nothing
worthy of a section, though
a few strata were
seen and a few samples
could be taken.



26 July

Left camp 7:40, flew toward
Tupikchak Mtn. Plans are to
leave fuel caches near there
then scout Tupikchak Syncline
and Flintchip Syncline exposures.

Ret'd to S. Flank Tupikchak
Syncline

- ① Examined lower broad hogback
generally fine gr. large scale
low angle trough x-section
w/ abd. sm. set. (2-4 ft)
channels thruout.

Thin < 1 ft shale (P. & H. in
bld zones. in mid to lower
part.

Extensive bioturb. (Unit 5)
horiz. less organic matter than
usual. But mica present.

Unit 105 ± 45' ±
Unit 106 ± 50' ± 45' ±

local zones of conglute bldg. cusps

bed concave upward at top

? base of zone

me 3' to 10' from top

Sands RLS 114 ①

abt 1/2 way thru int'l

Small ledge just on edge, thin
X-lam, abdt. tracks & trails
mostly 11 to bed

sds. fg. med. gray.

clam fossils in thin above int'l

③ Thin bed sm. sd. lot, X-lam.

④ High hogback Set W-17A

base altitude

dip dr N62E

Strike N28W 18°NE

base of measured interval
not necessarily base of sand
is latter and former are
both probably same?

Unit 1 9.7 ft

Ss, mg, mod. sld., sh. calc.
thick bed, (1-3 ft); abd. sh.

chip cgl. zone, discontinuous,
abt 4" thick, Low angle

lg. sd. through X-beds,

partly covered at base.

Unit 2 2.6 ft.

Ss, mg., lt gry; thin bed
 (≤ 0.6 ft); dom horiz bed,
 w/ low angl lge sel troughs
 near top. X-lam.

Unit 3 12.4 ft.

Ss, mg., lt gry, thick bed,

Lower part dom. horiz lam.,

Upper part low angle lge sel
 troughs, 2-ft ss.

Sm sel troughs in thin
 2" thick in lower part.

Unit 4 8.1 ft

Ss, fg. *, v. thin bedded,
 carb, mica, horiz lam. lower
 $\frac{2}{3}$, sm sel + int X-lam upper $\frac{1}{3}$
 upper stc truncated by overlying
 unit.

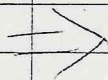
* with roots

pics #27, 28 of log scale
low angle x-works.

#29

TRANSPORT DIRECTIONS FROM CROSS-SETS

- 1 N53E
- 2 N06E
- 3 N58E
- 4 N32E
- 5 N45E
- 6 N06E
- 7 N82W
- 8 N40E
- 9 N09E
- 10 N37W
- 11 N20W
- 12 N58E
- 13 N40E
- 14 N70E



Unit 5 30.2 ft

incises lower unit by up to
2 ft. ss, lg, clay. Lwr 11' horiz
lamin w/ thin rippled zones; upper 4 ft
+15' thin bedd. lg scale 2' thick 3' wide low
angle - through cross laminations (lg scale
M.A.M. (th.) - upper ~~10~~ ¹⁰ ~~trifid~~ ^{trifid}
along bedding

N36W 26NE	N70E	12 NW?
N60W 35NE	N35W	25 NE
N30W 35NE	N60W	36 NE
N41W 36NE	N47W	18 NE
N36W 37NE	N55W	21 NE
N80W 35NE	N30W	35 NE
N40W	N40W	34 NE
N24W	N24W	32 NE

NOTE: uppermost 15 ft. most
at top distance 1/4
unit in top of section

NOTE:
Next section - ledge on skyline = 60' ± 15'
from base of last unit, last section

Sample RLS ② 115 in
sh. ss / silt

Sample RLS ② 116
6 ft over base

Section W-17B

To east along same hogback. (See sketch)
4.0 ft. Top 2' phase covered
ss. fg. v. calc.
sd med brn-grey, lenticular
orange
Sm sd. 1' red X-lam.

25' Covered. prob. mottled ss &
ss.

last 3' mottled silt & siltst.
Sm. ② ind. silt. mottled

15.8 ss. fg. silt calc., tan grey
thin bdd., platy, wavy
sharp base w/ local
features.
lower 2/3 lge sd. 1' red X-lam
upper 1/3 ripple & sand
through X-lam.
upper 1' of 1' covered by
overlying unit.

(pass contact w/ Unit 3, above)
15.2 ft

thin bed.
Ss - lg. lge. scale trough K-lam
thin bed. 20% base
w/2'± relief, irregular
upper contact gradational

N74E

Ripples N75E = N74E

12.9 Ss vfg., v. calc.

lower 6' sm sel. flat X-lam.

upper part horiz lam. w/
thin zones (<1') tabular
X-striae to sm. scale
flat X-lam.

Note: channel in upper 6.5'
of unit, ss. 14' brn, fg. v. calc.
part of bed is ss. thin bed,
base occasional
to sharp.

Sample ⁽³⁾ RLS 117
 6' x 6' at top

more x-beds →

1 N15W 20NE; 4 N25E 18NW
 2 N75E 24NW; 5 N43W 13NE
 3 N85W 30NE

→ RESTORED TRANSPORT DIRECTIONS

1. S38E	6. N62W
2. N56W	7. S32W
3. N30W	8. N05W
4. S33W	9. N17W
5. N20W	10. N13E
	11. N42W

Pics 30-31

large scale 20m
 x-bed
 where
 said to be 60-100m
 get lots of ss!

20-9 Ss. fg. lgc scale not x-bed.
 Ss 1' 1/2 - 3 1/2 ft thick
 fully burrowed upper surface
 of unit;

gradational base

top is probably transitional

placement near "N54W 18NE; 10 N40W 22NE
 2 N70E 22NW; 7 N15E 15NW; 5 N65W 31NE; 9 N55W 22NE

10' Ss. fg., maculae, 14 brn.
 lgc scale tough x-bed - to
 top of exposure, acts 1-3 ft.

Bi-polar paleocurrents

Notes top of section is 60' ± 15'
 above base of unit #5

RESTORED TRANSPORT DIRECTIONS

1 N80E	10 SE	S36W
2 N50E	11 SE	S20W
3 N88E	6 SE	S46W
4 N87E	11 SE	S35W
5 N70E	8 SE	S39W
6 N62E	11 SE	S60W
7 N85E	14 SE	S31W

Roll 4 #3

View of Stations on west
Shank Biquifort Spindle

RLS 118. ^{pt}/SR Torok stop
F. glass 1000 & 500
1000 stops

27 July

Left camp @ 8:05⁺
12th to S. Fork Turpichak
Spindle. weather cloudy, breeze
New hills for 3 days.

Carried 2 more loads (to
cave at S. Fork Turpichak Mtn
(Sec 1, T7S R43W)'

Revised yesterday's stop.
Tied in w/ USGS near sec.

Stop 2.

Moved to a new position.
Sampled "Torok" sh w/ 10' beds
Left marked lam above, and
x. bed below. in one bed 6-8' sh.
At 12 ft above a 7' sh w/
pitted lam & some specimens
Possibly true Torok.

all N32W 23° NE

Roll it #34 of an inclined
sandstone Torok also
showing different units
generated by unroofing.

Sample RLS 119 in sandy unit
channel-like, below

Loc 3 Torok exposure up
Kokalle River from Stop 2.
exposure mid. 10' high x 30' wide.

Predominantly sandy unit overlain
by predominantly shaly unit. Evidence
of erosion at contact between
the two.

Whole outcrop appears to be
unroofed but much unroofed
and small scale deformation.

Below clayey siltstone, unroofed
and unroofed, unroofed
Sagittations of fine scale (1' long
by 3-5" wide) channels.

Upper unit well sorted - dls. may be
with thin interbeds of shaly shale.
1/2 - 1/4" thick.

Pictures

Roll 5 #3, 4, 5 ladder type
rigs at SW corner
Dugout machine

28 July

Continued measurements
5 Blank Tephelak syncline
Notes in Kirk's book

29 July

Stood down - Grand
Unstaked 5 Blank Tephelak
Din Martin arrived. Was shown
around

30 July Kirk showed Dan

Martin around. Chuck &
I measured section on
14 strike of Olenokup syncline
on Kokalle.

31 July

Din mentioned in Noon
Chuck & I went to Dugout machine
to measure Kukupuk exposure
there. Notes in Chuck's book.

Roll 5#10 Corona outcrop "M"
at Rio Paulo Pitanga
Antioquia

#11 Large acid tubular
x-lens

1 August

R. N 5 13, 14, 15

pan view of dip 2
atop

16-17 view of ^{dip} delta front
at 8.50.

3 August

Section W-22

4 August

N 65 W

12 SW

bed dip

S 84 W

12 SE

Roll 6 #3 Tabular X-bedded sand
accretion surface (?) in pt.
W. Sequence in Cole basin
section

#4, 5 trough wave-bed

#6 wave beds.
at 19360

7, 8, 9 pan views of N flank
Cole basin

10 View of 8/9 Stop 1 of 3

11 Where the weathering of
bedding first appears
tabular dipping left &
weathering dipping right

13 Stop 3 1/4 of coal
Turbidite fac.

14. View of Tabular the channels -

17, 18, 19 Aerial of Corwin distributary
channels

26 View of irregular wavy
8/10 Stop 3

12 August Continuation of Snowbank
Lithology Section

Concave to portion nearly, EWS EKS
NE-1W 47°N

Base of measured segment

36.4 mostly covered, undulating
shale & 1 ft undulating
lt. ss, ripple w/ rest impression

19 ft ss, lt. gray, dk gray,
non calc., well cont'd.
sharp base, & top
clay ripples

20.8 mostly covered
near top - subtle step

41.9 ss, lt. gray, med dk gray,
non calc., well cont'd.
covered base, sharp
top
clay ripples throughout, rare
roots

7.3 mostly covered

1 cm. 12' sand, also shale
& coal in float.

2.7 SS, v-fg, med-gry, non calc
abd carb mudst

prob transit base, sharp top
0.3 - 1.0 ft thick beds.

beds thicken upward
Siltstone interbeds 0.3 ft

Tops of beds heavily burrowed
root traces abundant
burrows 11 to 16, predominantly.

0.4 mostly shale or lignite

1.4 covered

1.1 SS, v-fg, med-dk gry, non calc
abd carb mudst

covered base, top. clay ripple
abd roots.

9.5 Covered, partly mudstone
P. shale.

6.9 Siltstone being sandstone
upward, dk grey,
thin calc.
horizontal layers, top,
iron concretions abd carb
mott. a few roots at
top

10.2 Covered

1.9 Siltstone dk grey, brn.
sl. calc., base sharp(?)
top horizontal,
heavily rooted.

1.2 Lignite

25.8 Mostly covered, only shale at
top

3.6 Ss. vfg, silty med grey
v slt calc. sharp base
trans. top

into Siltstone, nodular.
upper 0.5' clbg ripples,
heavily rooted.

3.3 Covered.
shale bed.

2.6 ss vly nodular,
non calc. abd. 1' carb. matter
in laminae.
fin scale rough & tubular
~~to 1/2 inch~~
base & top transition.

3.4 shale.

3.8' Interbedded vly ss & siltst.
60% ss.
termit base. top.
abd carb matter.
noticeable strat.

10.3 silt shale

2.5 siltst. clayey med gray, non calc.
nothing visible - like proto ironstone.

RLS 239 (#5-1) 10' above base

10.5

SI-239

29.4 Silty shale, blk.

10.5 Intbed siltst & ss vfg ss.
30% ss. beds, up to 0.6
ft. Transitional top of base
heavily rooted, no vis strat
bed plant material

looks like base

9.8 Intbed siltst & ss.
20% ss. beds up to 1.3'
thick. no vis strat
bed plant material

transitional top of base

9.5 Coal.

9.3 Silty stone

3.2' Sandstone vfg-fg.
dk gray, no calc.

Sharp base, trace for

beds 0.6 to 1 ft thick
syz. gy. siltst.

clby ripples

24.6 Siltstone (interbedded silty shale)
(2 1/2' coal at 15' in interval)

24.6
9.1 to 10'

Interbedded siltstone & ss.

40% sand. Ss. vt-fg.

med. gray, non-calc. transitional
base, sharp top.

ss. in beds less than 0.4' thick

abd plant material & clby

ripples in a few beds.

a few ironstone concretions

13 ft Ss vt-fg, lt-med. gray
non-calc., sharp erosional
base, transitional top

Beds 0.4 to 1.5' thick

w/ many siltst interbeds.

clby ripples in most beds
concreted lenses minor

215 240 S-2 9' above base
240

Levee - CRW produce

RLS 241 (S-3) 10' above base

abd roots, fine weather
Scars less than 1 ft

31' Mostly covered prob shale
clay

9.4 Ss, vfg, med-lt gry, non calc
3 siltstone inter beds 0.4' thick
covered by
vertical stems faint clay ripples.

24.5 Mostly covered - shale

31.4 Ss, v-f-g, lt gry.
non calc.

siltst inter beds in 10%
ss beds less than 1' thick
irregular. most have clay
ripples. red pit mott
& vert stems

Sharp bases & tops so
in thin beds.

Iron stone concretions

36.5 Covered. mostly shale

2.1 Ss fg lt gry, med calc

sharp base, covered top roots, 119
no vis strat

5.5 Covered,

4.3 ft Ss. vfg, int bdd w/
silty shale. Ss bds 1.1' thick,
0.4 & 0.6 thick, sharp bases
to bds, clyg ripples throughout.

4.2 Covered shale w/ lignite

4.5 Ss. vfg, med gray, cly calc.
covered base, gradual top
into siltst
bds 0.3 to 1.1' thick
clyg ripples, old roots.

4.5

silty sh w/ siltst sandier beds

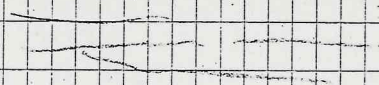
4.8 Ss vfg med gray, non-calc.
int bdd

base is covered. but get on
no ms 's tent was there,

13.1 Siltstone.

RLS 242 (S-4)

7.6 Ss. vfg., med gr, weak
org-tan non-calc, well
cmtd.
Sharp base - trans-top
med bdd. cont'd lam
in lower $\frac{1}{2}$, r/bg ripples upper
 $\frac{1}{2}$; med rooting in upper
 $\frac{1}{2}$. 2 over-lapping channels



8.2 Silt shale w/ siltst interbeds
up to 2' thick & thin
clay shales less than 0.4'
thin ind. bedded limestone
interstrata

2.5' Ss fgy, med gr, med
calc., trans. base, sharp
top. Hauly burrowed upper
surface. well bedded burrows
mostly slanted & horiz.
no calc. smt.

44 ft Shale cool
top covered.

45.5 mostly covered w/
thin lentic shale layers in
lower part.

21.7 SS. vt-fg, lt-med gray micaceous
beds less than 1 ft thick.
interbedded with sandy shale
& ironstone layers.

transitional to ss & top
medium red beds have sharp
bases

lt gray micaceous small scale rough
gray lense.
old red metal.

55.5 Mostly covered w/ 1
more ss beds. less than 1' thick
15' further only shales, etc

RLS-243

~~SS~~ above basal sand.

6.1 ft. Ss., vfg., silty, dk
gry, poorly sorted. non-calc.
sharp base, grad top.
becomes siltier upward.
lower 1 foot faint wavy
X-bedding.

0.6' shaley coal

2.9 Covered

2' Coal

35.6 Covered, upper part prob ss

2.2' Ss., vfg, dk gry, silty calc
weathers orange.
base covered, top gradational
mostly coarsulate (concretion
abd plant mat'l.

4.3 Ss., fgy, (near ang.) lt gry,
silty calc, fine base, sharp
top. Thin bedded, w/ siltst.
separating beds. clgy ripples
abd plant material.

graded beds (less than 1" thick)

0.8' Sandstone vfg., as 2.2' above.

15.6 Ss. same as 4.3' unit above.

25.4 covered, prob silt, sh

1.5 Ss vfg., med gray, 1 calc.
fluvial/lake
no vis strat.

0.3 lathy shale

10.0 Bentonite shale, more stone
lme. & lathy shale.

20' covered

1.3 Ss vfg c/bx ripple

2.3' mostly covered
Bentonite slope wash in
upper part of this volume
Ss strags at top

4.1 Ss. vfg. med gray nodule
abd carb nodule, roots &
faint clay ripples
sharp base, top covered.

weathers orang.

65.4 Covered bent. Sape unmet.
upper 10' Silt w/ ironst.
lamin.

0.9' Ss. fg, med gray nodule
well cemented
sharp base, shale pos. ripple
dists in lower, clay ripple

6.8 Siltstone, nodular

2.1 Ss. vfg. med gray silt. nodule
sharp irregular base, fine sand
through it - siltstone.

15.3 Siltstone w/ ironst. concretions
layers heavily rooted

2.3 Coaly shale

~~56~~ RLS 244 →

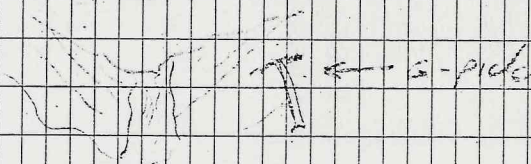
25

26.5 Covered shale & sand.

3.2' ss, vfg, med-dk grey
noncalc.

Sharp base, gradal top.
ripples in upper portion

vertical wood frag (stump?)
0.4 ft diam, inclined hdg
toward center



66.3 Covered, includes shale &
some coal in float

5.4 ss vfg, dk med grey, moderate
ripples, clay ripples in upper part
attitude N80W 28°

9.2 Covered

2.1 ss to

10' Ss. partly covered

3.8 Shale Coal

26.5 Covered prob shale

1.8 Ss, vfg. med gray, vertical
muscle

covered base & top
abd plant material
heavily burrowed, especially
med. vertical burrow
up to 6' long

17.00' Covered

4.3 Ss fg. med gray, horizontal
base covered, top thin
clay ripple (covered)
silty at top.

8.8 Coal.

30' covered

6' Sandstone - med grey etc.

9.9 Covered

2.2 Ss v-fg, med grey, non calc.

abd calc med / ~~beds~~
top transitional
- base covered.
mod. silt.
roots at top.

5.3 Partly covered; local

24.1 Covered, prob with shale

0.9 vfg ss.

mostly covered

34.6 Covered.

9.8 Ss. vfg, med grey non calc.

becom finer at top
mod bld at base long thin
at top 1.2' m/s

clayst bld (proto Festone)

RLS-245 -

top covered.

8.5 Covered

2.6 Shalestone vfg, red gray
non-calc.
rippled (conspicuous) silt. ripple
top & base covered.

10.5 Covered, show minor sand
& bituminous

9.5 Ss. vfg, light gray, calc.
calc. mud being shed
near top
no significant beds
except "mud" beds near
top, partially
covered

20.5 Covered

3.8 Ss. vfg. light gray non-calc.
top & base covered.
silt. ripple.

roots

My Number 475. Blizzards A-line

N Flank Tugitchook Dyadline in
Kilepivuk

III 132

Sand I

24:40

Stop 1 S Flank Blizzards
underline on sand
just measured.

Pipe down the A-line

RLS 245 from low angle to
parallel low unit

On surface 16 17 of S Fl.

Blizzards A-line 18 same
not drawn, also a base
Kilepivuk quad.

On surface 17 = 1. same as
Kilepivuk on S Flank Lake Bay
2 views of lower part of Cape B. in
section

181

Sand I

24

47

200

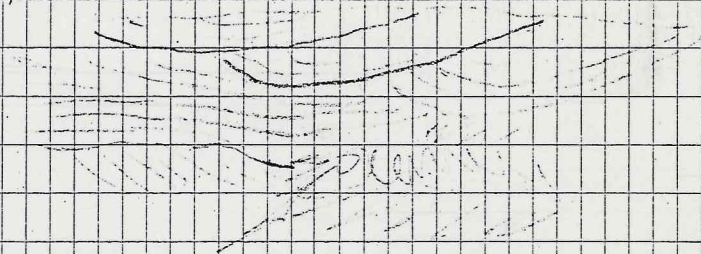
Stop II

continued & photographed with
pictures Co camera 2-3
my camera 2-7

R



M



Flow to S Flank Tugitchook in
Kilepivuk R.
Sand I (w 17 R, 18)

Stop 3. Along S side of
Tupelo Creek NW 1/4 Sec 21
Shelburne Creek Sand T
RLS 247 & 248 of strand-like
ss 247 appears more
weathered; 248 harder &
crusher - from same outcrop
Abt 15 - 18 ft exposed.

Lower part for 1/2 mile to right
displays more part mostly
parallel lines, w/ minor ripples
and a shallow trough x-lens
in "paving facies"

o Part of picture #10

Stop 4 north flank Kokolik
Anticline on Kok. River

RLS 249, 250, 251 for poles
collected, mostly upon section

Stop 5 N flank Kokolik
anticline looking
Kok. for poles central

RLS 252, 253 looking

CHUCK WILLIAMSON
FIELD NOTES.

EXCERPTS FROM CHUCK WILLIAMSON'S
FIELD NOTES FOR UNION-AMOCO, CRETACEOUS FIELD PARTY
WEST OF NPR-4, CHUKCHI BASIN. CAMP AT CAPE BEAUFORT

Geologists: Kirk W. Sherwood (Amoco)
Richard L. Stewart, Chuck R. Williamson,
Roger B. Stickney, Norm Kent (Union)

p. 6 Continuation of Section W-12 (measured along dip - actual thickness). This section is upper part of W-12 to be added to RLS' notes.

MEASURING UP FROM TOP OF RLS' NOTES:

0-20' Cgl. All is cgl except Ss lens.
@ 20' 2' - S.S., F-g., w/horiz lam discontinuous laterally
@ 30' 1' - Ss.
@ 35' 1' - Ss.
@ 39' 1' - Ss.
@ 42' 2' - Ss, w/abdn't plant frags, med. gr., small scour laterally
disappears 20' - small scale x-lam. + contorted beds -
abdn't coal frags. Top is scoured by cgl. Pebbles at
base of Ss. Sliding along top of ridge to the N.

N 7° W 36° SW

@ 85' 111'-26' covered interval
111'-114' = 3' cgl.
114-115' = 1' Ss
115-136' = 21' cgl - partly covered
136-136.5 0.5 Ss.
136.5-150 13.5 cgl. 2' inverse graded unit at base (partly covered)
150-160 = 10' cgl - exposed
160-162 = 2' Ss. small scale trough x-strat., dk gry, fg, lithic arenite
N 37° W 23° SW
162-165 - 3' covered
165-168 - 3' - cobbly pebbly Ss med. g., contorted bed.
N 70° W 42° SW

p. 8 Lower ridge is 78' from top. Walking to West along ridge to check lateral continuity and possibly measure another section.

2-30 Wildflowers
*2-31 Kfm cgl. E to Tim M

Stop 2 Shale outcrop just N of Tfm? cgl outcrop. Samples from stream cut bank. Stratigraphically just below cgl.

45' ELEVATION (= 151') from Top of shale cut in stream to base of cgl exposure.
Interval is covered N67 E 73° SE/RLS-13 Sh

Stop 3 Shale in center of syncline - Kfm? cgl ridge-sampled shales, measured section from top of 168' cgl. & collected shale samples & flute casts, paleocurrents in pebbly Ss.

* * *

p.13 MEASURED SECTION -Knk Kukpowruk Creek, W Wall from bottom up. Section W-13 covered - starts @ stream bed.

1'± Ss, f., trough x-sets 8" thick, interference ripples, upper part, S40° W trend.

47.7' Shale, gray-black, fissile, partly covered.

4.4' Ss, silty, v.f., dk. gray, covered base, becomes thinner-bedded and grades into silt & silty shale upward. Contorted lamination & small scale trough.

8.5' Shale, clay dk gray KKS-19; RLS-19

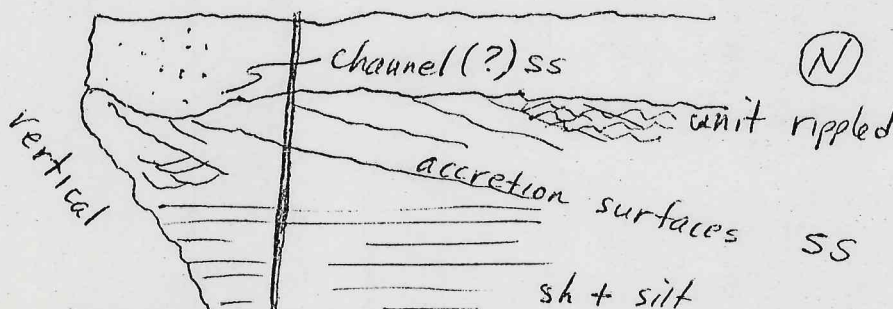
3.3' Silty v.f. Ss., dk gray, thin-bedded w/siltstone partings, poorly developed ripples and small scale trough x-strat. KKS-20 RLS-20
Base exposed = interbedded, beds thicken upward. Abdn't plant frags.

p.14 32.8' Shale, partly covered clay, black

12.4' Ss, F-m grained, dk-med gray, sharp basal contact w/shale, erosional. Logs in Ss up to 1' concentrated near base, remainder trough x-strat, lg. scale. Top contact not exposed.

5.7' Interbedded vfg, poorly sorted, Ss & siltstone, Ss beds & % increases upward. Coaly seams. Low angle troughs - small scale and horiz. lam. common (KKS-21 RLS-21)

p.15 8.5' Ss, massive, f.g., mod.sorted, mostly lg.scale trough in lower 2/3rd - becomes thin-bedded, & rippled w/small scale trough near top and in wedge shaped unit thickening to North.



100% Ss. HORIZ OUTCROP (POLAROID)

This unit has probable accretion surfaces dipping roughly 20-25° to N separated by thin (< 1') silty shale discontinuous units. These are probable channel mouth bar splay surfaces. Upper part is truncated by overlying Ss.

9.5' Ss, f g., mod. sorted, w/abdn't wood frags at base - dominantly lg scale trough x-strat.

- p.16 Sharp, erosional lower contact, Upper contact not accessible.
- 17.4' Shale, clay, dk black organic - rich w/probable 1' thick silty ss. in center partly covered.
- 2.2' Ss, fg-m, mod-well sorted, thin-bedded, rippled & s-c x-lam., & small scour & fills upper ss eroded into top. Base of unit transitional into silts & sh. Identical to lower part of next older major(?) ss.
- 6.1' Ss. f-g, mod. sorted, sharp base, erosional, excellent large scale trough x-strat w/wood frags 8" cgl. lag at base. Also 6" rounded Ss pebbles at base (sharp top to channel Ss.)
- p.17 6'+ Shale, black, clay, organic rich - near top of hill into float; remainder of section covered. END.
- * * *
- p.18 Bottom of Measured Section at STOP #1 - Added onto Above section.
- 1.5' Ss, clean ss, low angle x-beds 8" sets, linear, rounded current ripples at top 1", load struc @ base - erosional base.
- 1.0' Sh.
- 3.0' Ss, silty coarsening & beds thicken upwards, abdn't coalified debris & climbing ripples, thin-bedded.
- 0.5' Sh
- 2.0' Ss, rusty, Fe-rich, good root casts at top 8". Rippled thin-bedded, coarsens & thickens upward.
- 2.0' Sh & stream bed covered. PALEOCURRENTS Ripple marx:
N55E N35E S75E N70E N15W N65E S65E N60E
- p.19 Overall Impression - probably Channel Mouth Bar - shoreface Ss out by Dist. Channel (trough x-strat facies), CMB is rippled, thin-bedded prograd. sequence. Dist. channel = sharp base, lg. scale troughs. CMB-wave ripples & current, some bidirectional paleocurrents, troughs in Channels = unimodal to N. Lowermost Ss = thin <3'; silty & clayey w/climbing ripples, roots, etc. = cravesse splay? One clean Ss w/troughs & is discontinuous just above splay sands is of uncertain origin - transgressive Ss? - sharp base, good trough, low angle x-beds.
- * * *
- P.20 July 16 - Sl overcast, 60's, generally sunny. RLS, KWS & CRW work around Ting Mt. Feister, Lee, & Merryman leave in A.M., stop #1 Ting Mt., ridge N of summit ridge: N50E, 22° SE; farther N into saddle N70E 45° SE
- Ss beds are extremely well indurated, clayey v f-g ss, dk gray, poorly sorted. Abndt soft-sed-folding - 1-2' amplitude.
- RLS - 28 - Ss. Flute casts & load features - sole marks on bases of Ss.
- .21 Stop #2 - Low Ridge S of Ting. Mt. Summit w/Chevron folds, chert, shale between cherts.
RLS - 29, 30
42° to S80E = Axis of tight chevron fold, axial plane N80W, 81° NE; SW of NW Sec. 28 T10S, R45W

Sampled green chert w/abndt shell frags - thin-walled pelecypods, brachiopods - chertified carbonate rock-wacke-stone to packstone. Thin-bedded - 5" beds in 2' thick beds.

*3-6 Beekeepers, Tm Mt.

*3-7 Tite Chevron fold stop 2, chert

*3-8 " " " "

58° S75E fold axis axial surface N75W, vertical

p.22 Sample at core of tight fold coaly sh. RLS-32
Picture 3-8 of sample site (man)

Light-colored, qtz arenite abndt float on ridge to N probably lite-colored Ss.

Ridge N of TM Mt. - Stop #3

Ss, w/horiz lam, abndt climbing ripples, graded bed thin-bedded, f-g, mod.sorted biotite-rich, abndt plant fragments nonbranching bedding plane burrows on base of same beds.

N62E 87 NW

p.23 *3-11 Chevron folds & scenic, of Kokolik River. Spart - RECON Kokolik for exposures.

RECON FLIGHT - Tupichak Mt-Knc. Flew persistent "sheet" ss. - many channels approx. ½ lam across evident in sheet ss. Excellent outcrops of Corwin.

*3-12 Camp.

P.38,39 Section 19 S. Flank Dugout Syncline Stop #1

S₀: N45W 16° NE, N45W 17° NE

RLS-137 Shale sample
1.0' below sandstone

About 100.0' covered, slope to Torok Valley on SW
Upper 30-40' shale

Sand-A

About 2.0' - Ss, v.f, mostly covered
15.0' Covered.
6.5' Ss, v.f. - f, light gray, weathers tan, well cemented, noncalcareous. Base & top covered. Large-scale trough cross-strat (sets 1.5-3.0'). Tops of beds moderately bioturbated (tracks & trails). Abundant plant fragments. Clam molds.
55' - Covered.

p.40,41 RLS-138 Ss-5' from top

20.0' - Ss, f-g, lt brn, gray, mod.sorted.
Thin-bedded horizontal lamination.

Sand B

10.1 - Sandstone, lt gr, weathers brn, f-to m- slightly calcareous, wood fragments, carbonaceous material on bedding surfaces. Base erosional-shale drape. Thick-medium bedded, large scale trough x-strat (1-2')
8.6 - Sandstone, fine, thin-bedded horizontal lam. Sharp base, top covered. Uppermost bed rippled with abundant tracks & trails (gastropod?) Shale pebble clasts near top

STOP #2

About 225' EST. Covered, w/2 intervening benches then move to next spur to west & begin Ss section.
 Attitude $S_0 = N19W, 8^\circ NE$

p. 42-43

24.8' Ss, f. g, light to med. gray. Alternating beds (1-2' thick), thin-bedded horizontally lam., eroded by more thick bedded, (3-5.5'), trough x-stratified units. Base covered.

Sand C

2.6 - Sandstone, v. calcareous, v. f. grained (finer than below). Thin-bedded small-scale trough cross-strat. Gradational w/underlying unit.

p. 44-45

2.4' - Ss, lower 2.0' lower med-grained, upper part f-grained. Thick-bedded, massive at base, v. thin-bedded platy at top. Erosional base w/pebble molds. Horizontal lam. in base, top horizontal w/ripples & sm. scale troughs Shell (Pelecypod) fragments at base.

3.7 - Ss, lt brn, upper f-grained, sl. calc. Thick-bedded, becomes thinner-bedded at top. Large-scale trough x-strat (1-2' sets). Common plant fragments & mica; top covered.

40' est. - Covered, some definite silty shale.

Sand D

4.8' - Ss, fine-grained, med. brn, very calcareous. Base covered, top sharp. Lower 3' horizontal lam. then erosive surface, upper part small-scale trough x-strat with low-angle inclined beds. Rippled upper surface-interference ripples. A few tracks & trails on top. Definite pelecypods in lower part. Shale clasts w/pelecypods.

p. 46-47

40' est - covered.

Sand E

15.5' Ss, f-g, mod. sorted, noncalc. - med-gray. Lower 4' lge scale tabular x-beds. Base covered. From 4-6' (near center), heavily bioturbated, abundant organic material - no stratification. From 6' to 14' - large scale troughs? and tabular x-strat. Upper 1.5' f-to v-fine, sl-calc., thin-bedded platy, with ripples. Tracks & trails on top - v. abundant burrows
 Ripples: N24E N15E T.D.
 Trough x-bed N30W
 Ripples N28E T.D.
 Ripples N20E T.D.
 53' est - covered.

Sand F

16.5' - Ss, f-g, thin-bedded, lower 10.0' poorly exposed, but excellent interference ripples (ladderback ?)
Upper part low-angle troughs (1.5').

RLS - 139 TSE - 139
Sand F

5.9' - Ss, v-f to f, abundant plant material, thin-bedded.
Top covered. Sm scale trough x-lam.
*8-3, *8-4 - interference ripples
200'-220' Est. (check photo) Covered=photo est. is 180'
*8-5 - Crevasse Splay facies w/thin progradational cycles bay? rooted, clams.

Sand G

p. 50-51

12.4' - Interbedded Ss & sandy Siltstone.
40% sdst beds. 3-1.2' thick of Ss - Ss, v. f. silty, poorly sorted, dark gray, v. abundant plant material. Vertical stems-roots? - Nodular, uneven bedding, trace of sm-scale troughs, but little strat. S_o : N12 W 8° NE
Uppermost 1.0', f-to-m., mod. well sorted sdst w/low-angle, lge scale troughs & rippled upper surface w/tracks & trails. Cgl zone near top of shale clasts. Ripple & Paleocurrents transport directions N25E, N15E, N01E, N06E, N09E, N08E, N12E
TOP OF HILL

Moved about 3/4 mi NE along ridge-same Ss & made more ripple paleocurrent measurements S_o =N72°E, 15° SE

Ripple TD's	Lg. Scale Tabular Cross Beds	
N10E	N30E	19° SE
N20E		
N23E	N85W	10° SE
N11E	N75E	21° SE
N21E	N85W	19° SE
N09E		

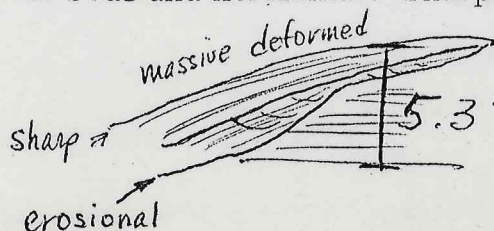
STOP #2 - Butte - Upper Knk

Sandstone - resistant butte in Dugout Syncline - Air Photo location

p. 52-53

Sand H

Base Covered. 5.3' - Ss, f-g, lt brn, mod. calc., upper 1. becomes v. f-grained. Abundant carbonaceous material. Thin-bedded horizontal strat outlined by carbonaceous material. Marked erosion surface (*8-6) 2.5' from top to 4' from top. Draped by finer-grained, low angle x-beds and horizontal. Sharp upper contact-Polaroid.



p 54-55

Sample 3' frm base

RLS 140

TSE 140

*8-7 Caribou

19' - Ss, f-to-m. grained, mod sorted, v. calc.
f-grained at top. Large scale cross-stratification
throughout; mixed troughs & tabulars (sets 1-6' thick)
near base-lower 10.0' locally large scale soft-sediment
deformation. Thick-bedded lower part, thin-bedded
near top.

TOP OF BUTTE - Top Ss covered

August 1-70-75°, sunny - STP CRW, WNK, RLS, KWS
Measure sections Pitmega Syncline area.

* * *

p. 64

Aug. 14 - Sunday - 60-70° Sunny.

A.M. Jack Merryman departs

RLS, KWS, CRW flying - sandstones Kukpowruk & Kokolik Rivers to check lateral
continuity.

p. 65

1st area - Knk type section - northern Kukpowruk River

Ss-"A" Knk type section - thick (about 70') Ss lowerpart of section - 1st thick
Ss on W bank of river.

@ 60 mph Ss "A"

2 min. to river - East end: Rubble - Ss - covered to river

1 min. - River to west. Photo measurement ~2.2 mi. [ss at 2067, W-15]

54 sec: Ss "B" - upper 70' - dist. channel going east from River - covered at
E end. Photo measured: ~.44 mi. [ss. at 2620, W-15)

Lowermost Knk Ss-N flank Tupikchak

5 mins: Kukpowruk River - Ss "C" on photo M-56 -13433-13432 flying from E
to W from Kuk. River. - Ss is covered - only rubble mostly a bench probably only
max. of 35' exposed at various locations. Exposures get better to W. Ss is
thickening to W? Sample RLS-246. (6.7 mi Photo measurement; first 2 min.
covered.) Ss, med-f. g., fires upward. Several stacked sequences. Top &
base covered. Lge-scale low angle tabs into rippled & rooted? or burrowed?
zone. 10-35 & 10-36 S flank Tupichuk Syncl. first Ss above Torok.

p. 66

Coke Basin N flank - Ss "D" 6730' on W-26)

Stop #1 on Photo 26-52-L following E from river cut - uppermost Ss in cut:

0-24 sec - outcrop

24.47 sec. covered

} 1.2 mi photo measurement

47-131 sec. outcrop

Ss "E" - Ss 130' & Ss - marked by flying W to E from ridge across drainage. Starts w/15-30' outcrop, then drainage crossing 2:00 minutes. (Photo measured: 1.8 mi.)

[ss at 9340, W-26]

Ss "F" below "E" = 130' on sec. flying W to E, 47 sec. Fl - (.45 mi photo measurement)
97-60 sec. - covered (1 mile measured on photo)
165 sec. - outcrop to river (2 miles - Not certain in photo, poss. diff. Ss.)
4 min 14 sec. river to covered

STOP #2 LUNCH - Channels in Corwin Coke basin Kukpouruk River (pictures 11-1 - 11-21)

Ss "G" - S flank of Tupichak syncline. Measured sec. 17A & 17B sandstone start at outcrop W bank Kokolik River flying west:

0-86 secs good outcrop

86-180 secs. covered ledge Ss "G"

flying from river to E, 0-45 good outcrop; 45-115 covered but definitely traceable

115 secs. - 160 - good outcrop

160-270 - rubble but patchy outcrop

270-450 - rubble with only a little outcrop

450-480 - rubble - probably still Ss thin

7.0 mi photo measurement

Ss "H" immediately above G: from river to E

0-480: good, outcrop - a few partly covered outcrops 7.0 mi photo.

Ss "I"-plateaus as on photo:

0-170 secs. Good outcrop - 25' thick 170-230 secs. Covered, photo trace

230-300 secs. rubbly outcrop

300-330 possible rubble? (5.2 mi photo measured)

CRW

1

757

LEAF 700K

2000/0

CONTENTS

Field notes for 1964 - Arrive, Ordovician
of ... work of NPP-4

Chukchi Basin. Camp at Camp

Recon. trip, Kuybyshev Kf. ...

Geologists: Kirk W. Sherwood

(Ames), Robert L. ...

John R. H. ... Roger B. ...

Norman K. ...

Fig. #

12 JULY - Arrive From Anchorage

Recon. Kuybyshev River

13 JULY - ...
Section W-11 Kf. ... Tinmenek Mt.

14 JULY - N. of Tinmenek Mt.

Section W-12, Cgl. Kf. ...

Camp Vis. ...

15 JULY - Kuybyshev Syncline

Kuybyshev River, S. of W-12

Detail of Knt Fm.

Camp Vis. ...

16 JULY - Tin Mt., mapping ...

Chert, ... Tolds, Kf. ... Recon

Kokotik River - S. part

(23) 17 JULY - Kukpauruk River
N. Flank of Snowbank
7 miles N. Kukpauruk

18 JULY -

(25) 18 JULY - 2nd day of
inc. PCS, NK, KWS. Marked
at Kukpauruk River, W-15 - N. Flank

(25) 19 JULY - Clear, sunny, 50-60°
Continue on snowbank W-15 N. Flank
Archived at Kukpauruk River - K.

(27) 20 JULY - Clear, sunny, 50-60°
Continue W-15 N. Flank, N. Flank Archival

21 JULY - Clear, sunny, 50-60°
W-15, N. Flank, N. Flank Archival
22 JULY - Clear, sunny, 50-60°
W-15, N. Flank, N. Flank Archival
- AM. Visit Frank Noble

(30) 23 JULY - Clear, sunny, 50-60°
Snowbank $\frac{1}{2}$ mile, Kukpauruk River

30 JULY - Clear, sunny, 50-60°
60-60°, River, Camp, Snowbank
Limbore Ls.

(31) 25 JULY - Snowbank anticline, W-15
Kukpauruk River - completed W-15

(31) 26 JULY - Clear, sunny, 50-60°
Snowbank anticline, Kukpauruk River - W-15A

27 JULY - Clear, sunny, 50-60°
Snowbank anticline, Kukpauruk River - W-15C

28 JULY - Clear, sunny, 50-60°
29 JULY - Clear, sunny, 70° S. Flank

30 JULY - Clear, sunny, 70° S. Flank
Snowbank anticline, Kukpauruk River - W-15D

(31) 30 JULY - Clear, sunny, 70° S. Flank
Snowbank anticline, Kukpauruk River - W-15E

31 JULY - Clear, sunny, 70° S. Flank

55) 11 AUG - 40-50° - Heavy fog - Weathered in
morning. Windy. W-26. Heavy rain.

56) 12 AUG - Smoky, 60-75° - Clear
morning. Windy. W-26. Heavy rain.

57) 13 AUG - Smoky, 60-75° - Clear
morning. Windy. W-26. Heavy rain.

58) 14 AUG - Smoky, 60-75° - Clear
morning. Windy. W-26. Heavy rain.

59) 15 AUG - 50-60° - Clear - Heavy rain.
Section 24 - East Snowbank wetland, Kokolik Pk.

60) 16 AUG - 40-50° - Heavy fog - Weathered in
morning. Windy. W-26. Heavy rain.

61) 17 AUG - 45-55° - Clear - Heavy rain.
Section 24 - East Snowbank wetland, Kokolik Pk.

62) 18 AUG - 40-50° - Heavy fog - Weathered in
morning. Windy. W-26. Heavy rain.

63) 19 AUG - 50-60° - Clear - Heavy rain.
Section 24 - East Snowbank wetland, Kokolik Pk.

64) 20 AUG - 50-60° - Clear - Heavy rain.
Section 24 - East Snowbank wetland, Kokolik Pk.

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morning. Windy. W-26. Heavy rain.

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21 AUG - 50-60° - Clear - Heavy rain.
Section 24 - East Snowbank wetland, Kokolik Pk.

22 AUG - 50-60° - Clear - Heavy rain.
Section 24 - East Snowbank wetland, Kokolik Pk.

(1)

12 JULY 1977 - R. Stewart, K.

Shervood (Amoco) + I leave Anchorage
to Kotzebue, then Maxons charter
to Cape Pe. Tent camp. M. Kent + R.
Stickney set up camp prior to our arrival.

Arrived 7:00 pm. - A. D. ...

We flew up coast to mouth Kikpauruk
river, followed river south to Brewster
Basin noting good outcrops along the
route.

13 JULY - R.S., K.S., C.W.

* 2-1, 2-2 Corwin Coal Sequence
Coke Basin

* 2-3, 2-4 Torok - Lower Tills
Igloo Mt. - Sandstone outcrop

* 2-5 Bad picture - Typical Torok
Kikpauruk Creek, w. of Igloo
Mt.

#2

13 JULY (Sat) - A.M. R.S. K.S.

C.W. Helicopter Recon south

Kul-pu-wuk Creek From Butte 1 East

to Jolo Mt. Excellent ^{K.K.} S.S. - A Part

outcrops Topika-hak Simulka Ariz.

P.M. - Topika-hak Mt. Recon.

First strike - ^{50°} crest of Mt.

* 7-6 Lead - Plate rocks - some random

top, Timi Mt. K. T. V.

- Top of Topika-hak Mt.

Coastal Ridge is ^{med.} grey-brown,

silty v.f. s.s., well cemented, glauconitic.

Little ^{med.} s.s. Loc. Sake marked

(lead rocks) road abnd. No recon. of

Δ's in texture or strat. Poorly

exposed. N 85° E 63° S

SAMPLE - RS-1-L+P, S.S. bed

several m ± thickness

#3

Minor contorted bedding (1 ft.

thick zones) and traces of

horiz. laminations in S.S.

Difficult to see definition of vertical

trunks - but small-scale x-strat +

convolute lam. in some horizon

+ underlain by horizontal, then massive

beds.

< 2' thick. Amalgamated s.s. bed

or flow units separated by thin

clays.

* 2-7 Pointing lamination - Tim

Mt. North Side in ^{K.F. Mt.} ~~Tim~~ Fm.

* 2-8 Flow unit w/ convolute lam.

horiz. - Timi. - ~~Fortress~~ Mt.

* 2-9 - Dish structures - clear

str. minute - ~~thick~~ picture

* 2-10 - S.S. w/ massive beds

+ wispy separation surfaces

#4

* 2-11 - Same as 2-10, different ss

* 2-12 - Contacted lam - TM Mt

* 2-13 - ? ? KFn

* 2-14 - Kinty lineation TM Mt. - KFn

* 2-15 - Sample from TM Mt. - Brooks Reef

* 2-16 - 2-18 - Measured Section

P.M. - Measured Section N side

of Tingo Mt. in Trenches Mt.

Fm. Thick ss - probably

turbidite & hi-density sediment

gravity flows (sandflow - slurry flow

etc) V. well sorted gtz - subarkose

gtz coarse in upper part of section.

* 2-19 helicopter view west

line of Tropicak Signline

Common

1. thin bedded ss - have 1 sharp top
 2. thin bedded ss - have 1 sharp top
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 97. thin bedded ss - have 1 sharp top
 98. thin bedded ss - have 1 sharp top
 99. thin bedded ss - have 1 sharp top
 100. thin bedded ss - have 1 sharp top

14 JULY RLS K. & I -

Good weather again, sunny 60s.

A.M. - K. by helicopter of

Tingo Mt. area looking for good KFn

#5

* 2-20

Measurements in

K. point of view of

* 2-21

"

Tingo Mt. area

* 2-22

- Outcrop of KFn? level No. 1

* 2-23

- Spring W-11 Tingo Mt.

N Tingo Mt. - KFn

TOP #1 - East rose of KFn?

col. ridge (2-22) of Tingo Mt.

N 35°E 65°N - taken

- bedded ss

* 2-24

Col. KFn? level TM

* 2-25

close up of

* 2-26

- SS. bed in col.

* 2-27

- Reverse reading in col.

* 2-28

- Reverse reading in col.

* 2-29

- SS. bed in reverse reading

col.

#6 Transcribed

Continuation of Section W-12
 (Measured along dip - locked to base)
 This section is 1/4 of
 W-12 to be added to PLS
 notes.

M. S. C. 1/4 P. 1/4 (M)

TOP OF PLS Notes

0-20' cgl. - all cgl.

@ 20' 2' - S.S. to ...

@ 30' 1' - S.S.

@ 35' 1' - S.S.

@ 39' 1' - S.S.

@ 42' - 2' ss, w/ distinct plant frags.

med. gr. small - coarse, sandy

fine, coarse - small - coarse

x-bed + coarsened beds - distinct

coal frags. Top is covered

by cgl. probably base of

ss

#7

Sliding along base of ...

to N

N 7° W 36° SW

135' - 111' - 115' covered in sand

111' - 115' = 3' cgl.

111' - 115' = 1' ss

115' - 135' 21' cgl. - partially covered

135' - 136.5 0.5 ss -

136.5 - 150 13.5 cgl. (2' in sand bed)
 partially covered

150 - 160 10' cgl. - covered

160 - 167' - 7' ss, med. coarse, sandy

partially covered by ...

med. coarse, sandy

N 37° W 22° SW

7' 15' - 3' covered

115' - 3' - cgl. (partially covered)

med. g. coarse, sandy

N 70° W 42° SW

#8
Transcribed

Lower ridge - 78' from top

W. side of W. side ridge

to about 1/2 mile from top

W. side of W. side ridge

TO BE

*2-31 K-2 - 200 E of Tim N

TRANSCRIBED

022

Stop 1. Shale outcrop just N

03 of Tim N. side ridge

03 from center of ridge. Shale outcrop

03 from center of ridge. Shale outcrop

03 45' ELEVATION from

Tim N. side ridge

Tim N. side ridge

Tim N. side ridge

Tim N. side ridge

Tim N. side ridge

Tim N. side ridge

Tim N. side ridge

#9

STOP#3 - Shale in creek

syncline - Tfr. 7' from top

Sandstone shales, max. 100' thick

From top of 148' cor.

1' thick shale samples +

fine calc. concretions in

fine calc. s.s.

(Visit by F. J. Lee

15 JULY - 70° Sunny, K.S.

KBS, + CRW. Traveler along

Kukpawuk River, starting

at anticline crest N of

Kukpawuk Syncline + working

S along River in N. flank of

Kukpawuk Syncline. Will

attempt recon of S.S. structure

+ character of this sand-pon

dial facies of Kukpawuk

Fm. STOP#1

(10) N 25° W 8° SW

N 10° W 10° SW

shale

ripples

plant frags abndt
massive ss truncational

2.5'

(B) base, w/ large scale trough

2.5'

(A) small scale
low AX strat + thin wave ripples

covered

shale

possibly C.M. Bar
cut by Dist channel
or frontal splay channel

S 60° W ✓ streaming lineation

S 41° W ✓ flow to currents aligned

N 25° W 8° SW strike slip

N 75° E ✓ - Small scale troughs

transport direction

N 50° E - ripples - current, linear type

N 60° E T.D. - ripple marks

Linear wave ripples

S 78° W Lo x trough - short

S 110° W flow from west - lg scale

trough (B)

S 89° W - ripple mark trends

T.D. direction

(11)

(A) Lower part of ss has many small scale ($< .7m$) cut & fill w/ multiple thin 10-70 cm ripple zones, linear current ripples + small-scale trough formed by ripple migration. S.S. is silty, well-laminated w/ thin clay-rich layers.

(B) Upper ss is vt-f grained mod sorted, w/ large trough sets 1-2 m thick, 10-20° dips, erosional base no well-defined g-size trend vertically, burrowed at top.

Picture

2-32

Beach on outcrop

2-33

2-34

Close-up of (A)

2-35

Trough sets (B)

12

S 60 W

current direction, ? direction

S 52 W

excellent linear

ripple marks

N 1° E Wood frag. - 26° dip

N dipping accretion surfaces

As move S along outcrop get into beautiful ss section.

Lower part is clearly transitional upward into massive CM bar ss cut by dist. channel?

erosional D.S.

N dipping accretion surfaces
CM B

silty sh

lower distal

sh

bar

SEE TRANSCRIPTION

MEASURED

SECTION 1 - KhK

Kukpowruk Creek, Wall from bottom up

Covered - Starts @ stream bed

1' + - SS. f., trough x-sets B. thick,

ripples, upper part,

S 10° W trend.

47.7 Shale, clay, dk gray, partly covered.

4.4' S.S. silty v.f., dk gray, covered base, becomes thinner bedded and grades into silty + silty shale upward. Correlated lamination + small scale trough.

3.5' Shale, clay dk gray KKS-19 PLS-19

3.3' Silty v.f. ss, dk gray, thin bedded w/ silty shale, bedding.

Poorly developed cross-bedding - KKS-20 PLS-20

Base exposed = interbedded, beds thicken upward. Abt 1' part from

transcribed

SEE

TRANSCRIPTION

415

37.91	- Shale	partly covered		
	Very dark			

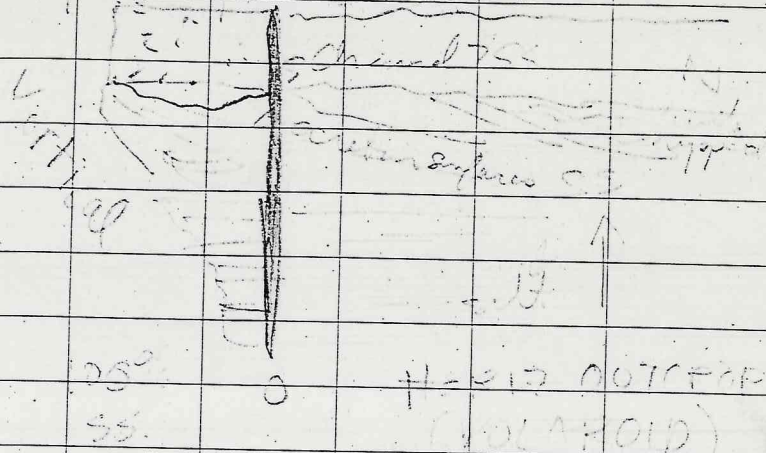
12. A - S.S. from grainy, dk
red gray sharp brecciation
in scale, occasional. Low
in ss. up to 1" concentrated
near base, remainder
brownish - shd. to scale.
top bed not exposed

5.7' Jittered. 44.4 ± 5.7 Hz. $100 \pm 10\%$ increase in speed

cooly	108	fringe	chickadee	
seems	hatch	100	common	(KKS-21)
				(RLS-21)

8.5 - 5.5 mass in f.g. mod.
sorted, mostly lg. scale troughs
with lower 3' - becomes
thin bedded, + rippled.
Small scale trough near
top + in med. of channel.

Anderson to North



This unit has probable 2 or 3
places of origin, 2000
to N separated by the $\angle 10^\circ$

silts shale discontinuous units.
There are probable channel mouth
bar & clay surfaces. Upper
part is truncated by underlying
S.S.

9.5'-S.S., Fg. mod. sand
w/ sh. dent. wood frags. & limonite
Rim. scale. Tough x-thatch.

16
transcribed

SEE TRANSCRIPTION

Shrimp in sandstone

base, Upper contact
not available.

17.4 - Shale clay like

rich w/ nodules

1' thick w/ s.s. in

richly colored

2.2' - S.S., f.g. med. salt

septa, thin bedded, med. salt

septa, small, med. salt

septa, med. salt

septa, med. salt

septa, med. salt

septa, med. salt

septa, med. salt

6.1' - S.S., f.g., med. salt

sharp base, expansion, Excellent

large scale, f.g. med. salt

w/ wood fragments, f.g. med. salt

at base. Also 6' marked

17

Group top of bed

S.S. pebbles, f.g. med. salt

6' - Shale black, f.g. med. salt

+ rich - near top of bed

to top of bed

rich - near top of bed

rich - near top of bed

rich - near top of bed

rich - near top of bed

rich - near top of bed

rich - near top of bed

rich - near top of bed

rich - near top of bed

rich - near top of bed

rich - near top of bed

rich - near top of bed

rich - near top of bed

rich - near top of bed

rich - near top of bed

rich - near top of bed

rich - near top of bed

rich - near top of bed

(20)

transcribed

8 JULY - Sl. overcast, light
 drizzly sun. RLS, KWS +
 CWN work around Ting Mt.

Forster, Lee + Mangum work on

TP Tr. N + ridge. No T. work

#1 ridge N 50° E 22' SE

Forster N in saddle

N 70° E 40° SE

26. lat. work on ridge. No T. work

abundant Forster. No T. work

to top. Add. T. work on ridge.

Col. 1 - 1-2' sun. beds.

Pl. 5 - 2-3' sun. beds.

2. 1-2' sun. beds.

3. 1-2' sun. beds.

4. 1-2' sun. beds.

5. 1-2' sun. beds.

6. 1-2' sun. beds.

7. 1-2' sun. beds.

8. 1-2' sun. beds.

(21)

chart, charted from data

RLS-29' = 0

42° = 30° = Axis of

to the horizon 311

311/310 N 80° W 31° NE

311/310 NW 50° SE

T 10° S R 45° W

TRANSCRIBED

311/310 NW 50° SE

311/310 NW 50° SE

311/310 NW 50° SE

311/310 NW 50° SE

311/310 NW 50° SE

311/310 NW 50° SE

311/310 NW 50° SE

311/310 NW 50° SE

311/310 NW 50° SE

311/310 NW 50° SE

311/310 NW 50° SE

311/310 NW 50° SE

22

SAN

TRANSCRIBED

N. of TA. 11 - STIP

11 - STIP

23

K-3-11 - Chino. 11/11/11
K-3-11 - Chino. 11/11/11
K-3-11 - Chino. 11/11/11

RE - CN - 11/11/11 - Timp. 11/11/11

11 - K-3-11 - Chino. 11/11/11

11 - K-3-11 - Chino. 11/11/11

11 - K-3-11 - Chino. 11/11/11

11 - K-3-11 - Chino. 11/11/11

11 - K-3-11 - Chino. 11/11/11

11 - K-3-11 - Chino. 11/11/11

17 JULY - Forest coast. 11/11/11

11 - 505 - R.L.S. R.R.S.

CRW - Data on K-3-11 - Chino. 11/11/11

11 - K-3-11 - Chino. 11/11/11

11 - K-3-11 - Chino. 11/11/11

11 - K-3-11 - Chino. 11/11/11

11 - K-3-11 - Chino. 11/11/11

11 - K-3-11 - Chino. 11/11/11

24

N40 W. 25° NE

N33 W. 27° NE

M. H. S. P. SECTION - W-4

IN. RLS notes

* 3-13 - Translated. Bar

1/2 pt. 1/2 - 1/2 well

darker. 1/2 bar of

rock

3-14 Holocapton

3-15 Pappas in Road

Barca. Hec. in. in. in.

modified in. in. in.

3-16 La. scale troughs

5.

2-18

2-19

2-20

25

All notes 1/2 in. in. in.

in RLS bar - 1/2 in. in.

21 - S. H. in. in. in.

M. H. S. P. in. in. in.

1/2 in. in. in.

1/2 in. in. in.

10 JULY - 1/2 in. in. in.

stand down day for in.

PLS, WNIK, KWS in. in. in.

VI-15, N. H. K. in. in. in.

Kubersok River - 1/2 in. in. in.

Kok

Vga 23 24 25 26 27 CAMP M.

10 JULY - Continuation of

VI-15, WNIK, CRW, WLS.

(26)

3-30 3-31 - Prograde Land

Sediment 11-15

3-32 - Low 2.2' base of mound

4-1 - Grey Falcins

4-2 - Red 1. Pillorus - sand ss

4-3 Tidal flat - sand
fine sand, silt, clay

4-4 Root stumps - sand

4-5 - Fluvial sand - sand
takes 1' sand - sand

4-7 Sand - ss - bedded

sand - ss - bedded

4-8 - 1' sand - sand - sand

4-9, 4-10, 4-11, 4-12 Phytosoma

11-15

4-13 Tidal flat - bedded

4-14 Ice floor

(27)

All notes for 1974 KWS
book.20 JULYRLS, KWS, RWI - continue
working Kirk-type section, 13
JULY - Holbrook River. Sand
west bank of river. Kirk wood
interior

4-15 RLS - collected

11-15 E 7.1

4-16 Alms - sand

4-17 - transverse

4-18 thin bedded C.B.

bed of flat - sand

4-19 small - sand

4-20 - sand - sand

4-21 - sand - sand

4-22 - bedded - sand - sand

4-23 - sand - sand

(28)

4-23 W-15

W-15

W-15

4-24 W-15

W-15

~~Crematogaster~~

4-25 W-15

4-26 W-15

4-27 W-15

4-28 W-15

(29)

21 JULY - N-Hank-1

Archimedes

July 20 - cretaceous

N-Hank-1

Start at

N50E 24° NW

45-1 W-15

W-15

53

N-Hank-1

55

56

57

58

59

60

(30)

22 JULY - Standard

Sun. CRW, RLS, KWS

WNK work Knk - Spindale

5-12 - 5-12 - 5-12 - 5-12

5-12 - 5-12 - 5-12 - 5-12

23 JULY - CRW, KWS, WNK

work Spindale

Knk - 5-12 - 5-12 - 5-12

5-12 - 5-12 - 5-12 - 5-12

5-12 - 5-12 - 5-12 - 5-12

5-12 - 5-12 - 5-12 - 5-12

5-12 - 5-12 - 5-12 - 5-12

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5-12 - 5-12 - 5-12 - 5-12

5-12 - 5-12 - 5-12 - 5-12

5-12 - 5-12 - 5-12 - 5-12

5-12 - 5-12 - 5-12 - 5-12

(31)

and 6-1 - 6-1 - 6-1 - 6-1

Sun. CRW, RLS, KWS

WNK work Knk - Spindale

5-12 - 5-12 - 5-12 - 5-12

5-12 - 5-12 - 5-12 - 5-12

5-12 - 5-12 - 5-12 - 5-12

5-12 - 5-12 - 5-12 - 5-12

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5-12 - 5-12 - 5-12 - 5-12

5-12 - 5-12 - 5-12 - 5-12

5-12 - 5-12 - 5-12 - 5-12

5-12 - 5-12 - 5-12 - 5-12

5-12 - 5-12 - 5-12 - 5-12

26 July - WNK, CRW, RLS. Recon

Tupelo back Syncline, Flintship area.
Sunny 60°6-22 - Brooks Range - early A.M.
+ dephoto 2000 hr6-23 - Corwin channel - ^{Typical} ~~lake~~
~~Syncline~~ west flank

(32)

6-24 - Seismic Art - Telephoto
Tupichak Syncline, S flank

6-25 Bears + 3 cuts

6-26 Fork - Blizzards Anticline - Koldik River

6-27 - Kink - ripple lam - S flank
Tupichak

6-28 Section through A point -
Kink S flank Tupichak

6-29 - Crestal delta point thinly
bedded ss.

6-30 A point crest - structures
trough beds

6-31 - " "

6-32 - " "

6-33 S. flank Tupichak
Syncline looking NE

6-34, 35 - Ridge - stop 1 A point
ss.

7-1 - Cgl. zones lower A point

(33)

Changes - fluvial?
7-2 Fidal channels (corwin?)

7-3

7-4 > top view (9 scale tough)

7-5

hemibane

7-6 - "

7-7

7-11 - Mosaic of section

7-12

Corwin channels -

Made 1 stop today,
measured 2 sections ~ 3/8 mile
apart - RLS notes through
delta point sandstones - Tupichak,
Syncline, S flank. Traced S.S.
beds 3-4 miles laterally.

JULY-27 - Stand down in Fair CPW

1. S. WINK, Kink, S. flank, etc.

2. S. WINK, Kink, S. flank, etc.

3. S. WINK, Kink, S. flank, etc.

4. S. WINK, Kink, S. flank, etc.

5. S. WINK, Kink, S. flank, etc.

6. S. WINK, Kink, S. flank, etc.

JUL 28 - Day 1 - 1st day

2nd day

3rd day

4th day

5th day

6th day

7th day

8th day

9th day

10th day

11th day

12th day

13th day

14th day

15th day

16th day

17th day

18th day

19th day

20th day

21st day

22nd day

7-22 7-23 7-24 Manned

7-25 7-26 7-27

7-28 7-29 7-30

7-31 8-1 8-2

8-3 8-4 8-5

8-6 8-7 8-8

8-9 8-10 8-11

8-12 8-13 8-14

8-15 8-16 8-17

8-18 8-19 8-20

8-21 8-22 8-23

8-24 8-25 8-26

8-27 8-28 8-29

8-30 8-31 9-1

9-2 9-3 9-4

9-5 9-6 9-7

9-8 9-9 9-10

9-11 9-12 9-13

9-14 9-15 9-16

9-17 9-18 9-19

9-20 9-21 9-22

9-23 9-24 9-25

9-26 9-27 9-28

(36)

30 JULY - 1975 - 1st Day

1st Day - 1st Day - 1st Day

1st Day - 1st Day - 1st Day

1st Day - 1st Day - 1st Day

1st Day - 1st Day - 1st Day

1st Day - 1st Day - 1st Day

1st Day - 1st Day - 1st Day

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1st Day - 1st Day - 1st Day

1st Day - 1st Day - 1st Day

1st Day - 1st Day - 1st Day

1st Day - 1st Day - 1st Day

21 JULY - 1975

1st Day - 1st Day - 1st Day

1st Day - 1st Day - 1st Day

1st Day - 1st Day - 1st Day

1st Day - 1st Day - 1st Day

1st Day - 1st Day - 1st Day

1st Day - 1st Day - 1st Day

37

~~7/31/75~~

38

transcribed

ALS-137

SS-A

SS-B

ALS-138

E from 19

TRANSCRIBE

S. Flank District, S. 100 #

S. 100 #

1145W 16°NE, 1145W 17°NE

100,000,000, slope 17°NE

1145W 16°NE, 1145W 17°NE

S. 100 #, v. E. 100 #

15,000 - 100,000

E. 100 #, 100 #

100,000,000, slope 17°NE

1145W 16°NE, 1145W 17°NE

100,000,000, slope 17°NE

1145W 16°NE, 1145W 17°NE

100,000,000, slope 17°NE

1145W 16°NE, 1145W 17°NE

100,000,000, slope 17°NE

1145W 16°NE, 1145W 17°NE

100,000,000, slope 17°NE

1145W 16°NE, 1145W 17°NE

transcribed

10.4 - Sandstone, 10' thick

Thin, fine, 10' thick

Thin, fine, 10' thick

Thin, fine, 10' thick

Thin, fine, 10' thick

Thin, fine, 10' thick

Thin, fine, 10' thick

Thin, fine, 10' thick

Thin, fine, 10' thick

Thin, fine, 10' thick

Thin, fine, 10' thick

Thin, fine, 10' thick

Thin, fine, 10' thick

Thin, fine, 10' thick

Thin, fine, 10' thick

Thin, fine, 10' thick

Thin, fine, 10' thick

Thin, fine, 10' thick

Thin, fine, 10' thick

Thin, fine, 10' thick

Thin, fine, 10' thick

transcribed

242 2/1

TRANSCRIBE

[illegible][illegible]

observed. This is what we are
looking for in the field. It is
the most essential principle.

[illegible]

transcribed

SS-D

TR

45 - 5' - 10' - 15' - 20' - 25' - 30' - 35' - 40' - 45' - 50' - 55' - 60' - 65' - 70' - 75' - 80' - 85' - 90' - 95' - 100' - 105' - 110' - 115' - 120' - 125' - 130' - 135' - 140' - 145' - 150' - 155' - 160' - 165' - 170' - 175' - 180' - 185' - 190' - 195' - 200' - 205' - 210' - 215' - 220' - 225' - 230' - 235' - 240' - 245' - 250' - 255' - 260' - 265' - 270' - 275' - 280' - 285' - 290' - 295' - 300' - 305' - 310' - 315' - 320' - 325' - 330' - 335' - 340' - 345' - 350' - 355' - 360' - 365' - 370' - 375' - 380' - 385' - 390' - 395' - 400' - 405' - 410' - 415' - 420' - 425' - 430' - 435' - 440' - 445' - 450' - 455' - 460' - 465' - 470' - 475' - 480' - 485' - 490' - 495' - 500' - 505' - 510' - 515' - 520' - 525' - 530' - 535' - 540' - 545' - 550' - 555' - 560' - 565' - 570' - 575' - 580' - 585' - 590' - 595' - 600' - 605' - 610' - 615' - 620' - 625' - 630' - 635' - 640' - 645' - 650' - 655' - 660' - 665' - 670' - 675' - 680' - 685' - 690' - 695' - 700' - 705' - 710' - 715' - 720' - 725' - 730' - 735' - 740' - 745' - 750' - 755' - 760' - 765' - 770' - 775' - 780' - 785' - 790' - 795' - 800' - 805' - 810' - 815' - 820' - 825' - 830' - 835' - 840' - 845' - 850' - 855' - 860' - 865' - 870' - 875' - 880' - 885' - 890' - 895' - 900' - 905' - 910' - 915' - 920' - 925' - 930' - 935' - 940' - 945' - 950' - 955' - 960' - 965' - 970' - 975' - 980' - 985' - 990' - 995' - 1000'

Thick bedded, brownish
reddish clay, fine grained,
horizontal, (thin bedded).
Faintly bedded, brownish
reddish clay, fine grained,
horizontal, (thin bedded).

Thin bedded, brownish
reddish clay, fine grained,
horizontal, (thin bedded).
Faintly bedded, brownish
reddish clay, fine grained,
horizontal, (thin bedded).

Thin bedded, brownish
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horizontal, (thin bedded).
Faintly bedded, brownish
reddish clay, fine grained,
horizontal, (thin bedded).

Thin bedded, brownish
reddish clay, fine grained,
horizontal, (thin bedded).
Faintly bedded, brownish
reddish clay, fine grained,
horizontal, (thin bedded).

Thin bedded, brownish
reddish clay, fine grained,
horizontal, (thin bedded).
Faintly bedded, brownish
reddish clay, fine grained,
horizontal, (thin bedded).

Thin bedded, brownish
reddish clay, fine grained,
horizontal, (thin bedded).
Faintly bedded, brownish
reddish clay, fine grained,
horizontal, (thin bedded).

Thin bedded, brownish
reddish clay, fine grained,
horizontal, (thin bedded).
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reddish clay, fine grained,
horizontal, (thin bedded).

Thin bedded, brownish
reddish clay, fine grained,
horizontal, (thin bedded).
Faintly bedded, brownish
reddish clay, fine grained,
horizontal, (thin bedded).

transcribed

SS E

R

N 24 E

Roughly N 13 E T.D.

Thinly bedded N 30 W

Dark N 30 E T.D.

N 40 E T.D.

S F

407 at - covered

15.5 Sandstone fine grained, slightly
coarse, somewhat indurated.

Lower 4' thin bedded, fine grained, T.D. 6'

fine grained, slightly indurated, T.D. 6'

at base of T.D. 6' to 14'

and above T.D. 14' to 15.5'

fine grained, slightly indurated, T.D. 15.5'

plastic, wavy rippled, T.D. 15.5'

11.5 - Sandstone, fine grained, thin bedded, T.D. 11.5'

exp. cont. T.D. 11.5'

part low and thin bedded, T.D. 11.5'

transcribed

TR

57 - Sandstone, variegated, light
dark, thin bedded. Top covered. 11.10.10

37 - 10.4.10. 10.10.10. 10.10.10.

1 - 2.10.10. 10.10.10. 10.10.10.

1 - 10.10.10. 10.10.10. 10.10.10.

1 - 10.10.10. 10.10.10. 10.10.10.

1 - 10.10.10. 10.10.10. 10.10.10.

1 - 10.10.10. 10.10.10. 10.10.10.

1 - 10.10.10. 10.10.10. 10.10.10.

1 - 10.10.10. 10.10.10. 10.10.10.

1 - 10.10.10. 10.10.10. 10.10.10.

Transcribed

Upper Pk

N 100 E

N 100 E

N 100 E

N 100 E

N 100 E

N 100 E

N 100 E

N 100 E

N 100 E

N 100 E

N 100 E

N 100 E

N 100 E

lg. conc. 700' det.

N 100 E

19° SE

N 85 W

19° SE

N 75 E

19° SE

N 35 W

19° SE

Upper Pk 1.0' fine sanding

Wind - strong - calm - 100'

100' - 100' - 100' - 100'

100' - 100' - 100' - 100'

100' - 100' - 100' - 100'

100' - 100' - 100' - 100'

100' - 100' - 100' - 100'

100' - 100' - 100' - 100'

100' - 100' - 100' - 100'

100' - 100' - 100' - 100'

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100' - 100' - 100' - 100'

100' - 100' - 100' - 100'

100' - 100' - 100' - 100'

100' - 100' - 100' - 100'

100' - 100' - 100' - 100'

Transcribed

Sandstone

Sample K65-form

TR

Base Contact

Sandstone, fine grained

1.5' to 2' thick, medium bedded

1.5' to 2' thick, medium bedded

1.5' to 2' thick, medium bedded

Thin, fine grained

Thin, fine grained

Thin, fine grained

Thin, fine grained

Thin, fine grained

Thin, fine grained

Thin, fine grained

Thin, fine grained

Thin, fine grained

Thin, fine grained

Thin, fine grained

Thin, fine grained

Thin, fine grained

Thin, fine grained

Thin, fine grained

Thin, fine grained

transcribed

Sample 3' from base RLS-140

TSE -140'

IR

19.

Sample 3' from base

TSE -140'

Sample 3' from base

TSE -140'

Sample 3' from base

TSE -140'

Sample 3' from base

TSE -140'

Sample 3' from base

TSE -140'

Sample 3' from base

TSE -140'

Sample 3' from base

TSE -140'

Sample 3' from base

TSE -140'

Sample 3' from base

TSE -140'

Sample 3' from base

TSE -140'

Sample 3' from base

TSE -140'

56

2 AUG ST - Sunday, windy - 20 knots

GO - WNK, KUS, & CREW recon

Southern Hokok P. area. Draftwood

area. Check USSC sections in area

for water quality - Calm inland

8-8 - SMOKE 11

STOP 1 - Meat Mountain, ST

8-9 S Section - Mountain W-21

8-9 700 m x 100 m at Mt. Island

8-10 This bedded area was small

channel - 100 m x 100 m

8-10

8-11 - Small channel on 8-10

8-11

8-12 Halcyon

8-13 This bedded area was small

STOP 2 - Foggy Mountain area

N. side - small stream in distance

57

ridges - covered in between. 8-14

bedded to 1500 feet in distance

This bedded area was small

Flow S. Flank. This area was small

This bedded area was small

This bedded area was small

This bedded area was small

3 AUG ST - Very strong, 15 knots

and as far as 1000 feet in distance

8-14 - This bedded area was small

S. S. Flank. This area was small

8-15 - This bedded area was small

8-16 This bedded area was small

L. P. This bedded area was small

8-17 This bedded area was small

8-18 This bedded area was small

8-19 This bedded area was small

58

8-19 - Wide & of outcrop
 8-20 - 8-27 - Mosaic of ~~beds~~
 8-21 - Faintly bedded silty shale
 8-22 - Faintly bedded silty shale
 8-23 - Faintly bedded silty shale
 8-24 - Bottom member - ~~beds~~
 8-25 - Thin rocky beds
 8-26 - ~~beds~~
 8-27 - ~~beds~~
 8-28 - ~~beds~~
 8-29 - ~~beds~~
 8-30 - ~~beds~~

4 AUG

T - PLS, WNK, WNK
 at Folsom ~~site~~ ~~site~~

59

Proceeded to Folsom, Mt. Summit -
 9-1 - ~~beds~~
 9-2 - ~~beds~~
 9-3 - ~~beds~~
 9-4 - ~~beds~~
 9-5 - ~~beds~~
 9-6 - ~~beds~~
 9-7 - ~~beds~~
 End of day - A.M. - ~~beds~~
 Mt. Summit ~~site~~
 Folsom ~~site~~ N. Folsom ~~site~~

5 AUGUST

6 AUGUST

Low visibility, unable to fly until 3:00
 Office day in camp.

60

7 AUGUST - C. J. MOORE & WNK

Ch. W. K. W. S. Sprinkler and Co.					
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Kalahiki River

7-8	9-9	10-10	11-11	12-12
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[illegible]

Q. No.	1	2	3	4
Ans.	1-10	11-20	21-30	31-40

9-10-911 - Gunko W-7A

9-10	417	Kv 1	5-10	-
------	-----	------	------	---

[illegible]

9-19	Feb	Thurs	W-25
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9-17	Covered	11/10/18
------	---------	----------

8 AUGUST - Cold 42°, heavy wind 70

[illegible]

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9-16: Sp. in the middle

--	--	--	--	--

4. 1. 1941			
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[illegible]

66

7-17 Ditto clump of above

1-13-9-79	55	climatic	atmosphere
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Page	Bill	No.	...
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[illegible][illegible]

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7	1	1	7	1	1
---	---	---	---	---	---

[illegible]

9-11/10-2004

7-22	land cell -			
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[illegible]

12.1	1-	C.L.P
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[illegible]

51	510	510	510
51	510	510	510

[illegible][illegible]

Wds. A.				

7.27.	(a)	suppl. 1941	1941	1941
-------	-----	-------------	------	------

		177	178	179	180
2	3	4	5	6	7

1-28	Black	1	1	1	1
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(63)

9 AUG

1000 - WNK

R.L.S., CRW - N. Fork

Piney Point W-26

STOP 1 -

STOP 2 - 9-27

W-26

STOP 3 - 9-28

W-26

9-29 - SP. of

STOP 4 - 10-1 10-2

W-26

W-26

10-3, 10-4

W-26

10-5 WNK

10-6, 7, 8, 9 - Corn in S.S.

W-26

10 AUGSTP for Corn Basin
section continued.

(63)

11 AUG - Fishing Dam at

Killer Creek 40°-50°

12 AUG

KWS - CRW

W-26

W-26

10-19, 20 -

10-19, 20 -

10-21 -

10-21 -

10-22, 23

10-22, 23

10-24

10-25

10-26

10-27

10-28

10-29

10-30

13

AUG

Stops 1 - N. Flank

Flank of Kalamazoo River

10-20 ft. ss A

10-20 ft. ss A

10-20 ft. ss A

10-20 ft. ss A

10-20 ft. ss A

10-20 ft. ss A

10-20 ft. ss A

P.M. - Jack Morgan tour - 10-11

14 AUG Sunday - 60° Sunny -

M. Jack Morgan tour - 10-11

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

(15)

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

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10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

W-15

2600 ft. ss A

2600 ft. ss A

2600 ft. ss A

2600 ft. ss A

2600 ft. ss A

2600 ft. ss A

2600 ft. ss A

2600 ft. ss A

2600 ft. ss A

2600 ft. ss A

2600 ft. ss A

2600 ft. ss A

2600 ft. ss A

2600 ft. ss A

2600 ft. ss A

2600 ft. ss A

2600 ft. ss A

2600 ft. ss A

2600 ft. ss A

2600 ft. ss A

2600 ft. ss A

2600 ft. ss A

2600 ft. ss A

Photo measured
v2.2 mi.

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

10-11 Kalamazoo River

Photo measured
N. 44 mi

v 6.7 mi

Photo measured

35' ss A

35' ss A

35' ss A

35' ss A

35' ss A

35' ss A

246

transcribed

made F. a. ...
 several stacked ...
 ...

...
 ...

Col. ...
 ...
 ...
 ...
 ...

TR

0-24 sec. - outcrop
 24-47 sec. ...
 47-136 sec. ...

1.2 mi.
 photo measurement

SS "L" - ...
 ...
 ...

13 30' outcrop, then distance ...
 2" ... Photo measurement: ~ 1.8 mi

SS "F" ...
 ...

SS "F" - ~ .45 mile Photo Measurement
 ... ~ 1 mile

...
 ...
 ...

2 LUNCH - ...

SS "G" - S. Flank of Tropic ...
 ...

17-A + 17B sandstone
 ...
 River ...

... SS "G"

...
 ...

... covered ...

68
transcribed

11.50 - 1.00

1.00 - 2.00

2.00 - 4.50

4.50 - 6.00

6.00 - 7.00

7.00 - 8.00

8.00 - 9.00

9.00 - 10.00

10.00 - 11.00

11.00 - 12.00

12.00 - 13.00

13.00 - 14.00

14.00 - 15.00

15.00 - 16.00

16.00 - 17.00

17.00 - 18.00

18.00 - 19.00

19.00 - 20.00

20.00 - 21.00

21.00 - 22.00

22.00 - 23.00

TR

~ 7.0 miles
Photo manuscript

~ 7.0 miles
Photo

~ 5.2
mi photo
manuscript

11-22 - Typo

11-23 - Typo

11-24 - Typo

11-25 - Typo

11-26 - Typo

11-27 - Typo

69

11.50 - 1.00 - 5.00

Flintship

River - No. 1

Flint - 2.52-2.53

Afternoon - 5.00

Flintship

Flintship

15 AUG - 5.00 - 5.00

RPS, CPU, 5.00

Kahala - 5.00

Sample - 5.00

Kahala - 5.00

16 AUG - 5.00

5.00

5.00

5.00

5.00

5.00

5.00

5.00

(70)

and W-13 continue along

Kuloumuk 1-sec.

11-27 (continued) 6-sec.

11-28 11-29 Mock

11-31 - Looking N at W-16

Simultaneous Section

11-30 (continued)

11-23 Receptor

34 Photos

11-24 (continued)

11-1 - (continued)

11-25 (continued)

11-26 (continued)

11-27 (continued)

11-28 (continued)

(71)

18 AUG - J. Packard + R. Hickman

took helicopter. Office day for

field party - 55 minutes

19 AUG - Revisit - key sections

+ collected Polacanthus - at

Calaopsis ^{DLW + P. 11/27/78} ~~DLW + P. 11/27/78~~ section.

PLS, CRW, KWS.

20 AUG - (continued)

Make camp - arrived in Anchorage

P.M.

END OF SEASON