M.D. HARVEY

TETRA TECH INC.

WEATHER

FIELD

No. 350

970-222-1710

SUSITNA 2014

BOOK #3

CONTENTS

PAGE	REFERENCE	DATE

"Rite in the Rain®"
ALL-WEATHER WRITING PAPER

ALL-WEATHER
FIELD BOOK

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Project SUSITNA 2014

BOOK # 3/3

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Columnar	1/4" Grid	Item No. 350	Item No. 350F

7/15/14 – TKA – Sold Crews
MOH, RV, BT, CB

P8199 – ~4in of recent (2014) sand deposition from ice-jam flooding – OFP surface.
WP01 – TLS, OFP, Hard, Uniform Strength – 2'-3' of fine sand over OFP surface.
FA104.

7/16/14 – Above DC.

PRM – 169.2 – Head of Island,
WP2 – head of marsh on Island.

P8200 – min d/s of HARDS TRANSECT SITE PRM 169.2

P8201 – ice scars on Poplars ~12' transect @ head of Island.
PRM 169.2
4-5' above ground surface.

P8202 – min d/s of head of Island w/ substantial sand deposition

P8203 – close up of ripples in sand overlay and cells.

P8204 – surface @ 50' mark on center transect

P8205 – excavated pit

P8206 – hole filled in – site before leaving

P8207 - Imbrication of > 330mm particles on R Transect
- Fluvial transport.

P8208 - - Ice rafted boulders on top of fluvial gravels on TLB of Island.

P8209 - photo backup
P8210 - photo backup
P8211 - photo backup

3 Pebble Counts + 1 Subsurface Bulk Sample @ site

SC - 27,800 cfs

PRM 174.4 - FA173.
- "Weir" at head of side channel that is flowing @ ~28,000 cfs
WP3.

P8212 - view u/s of head of bar
UNDISTURBED.

P8213 - view d/s across head of weir into side channel
@ WP 3.

P8214 - view d/s across the top of the lateral weir @ head of side channel @ WP3.

P8215 - Surface armor layer @ SO' Pt. on ℄ pebble count
- site of Bulk sample.

P8216 - Excavated pit @ ℄ PC line
- SO' mark - site of Bulk Sample

P8217 - view u/s of ℄ of C. Pebble Count + Bulk sample AFTER pit is filled.

P8218 - Helis @ Gold Creek

3 Pebble Counts + 1 Bulk Sample

Gold Crk - 24,900 cfs

7/17/14 - RM 173

P8219 - Photo Barcode for Sample PRM 174.4 - Bulk Sample Sieve.

Note: Weir @ head of Side Channel - PC site - boulder Count - coarser seds from weir

P8220 - view u/s across the head of lateral weir @ WP3. @ 24,900 cfs - almost dry.

P8221 - view d/s of lateral weir @ head of Side Channel - WP3. - 24,900 cfs @ Gold Crk.

P8222 - view d/s of Side Channel from lateral weir - v.c. bed + wide channel - Al hall. channel.

FA 173 — PRM 174.1

- 3 PC + Bulk Sample Site.
WP4 - TL side of bar -
TLB main channel.

P8223 UNDISTURBED — main d/s

P8224 — Sample among large @ 50 ft mark on ℄ Pebble Creek.

WP4 @ ℄ - 50 ft of ℄ PC PRM 174.1

Ht = Above W/S elev'n.

FA 173 - Geomorph Mapping.
WDG, RAN. - ℄ ~ 24,900 cfs

PT1 - ℄ bl. - Ht = 1 ft.

PT2 - MFP? - Ht = 5 ft.
Poplar + Spruce. - Spruce > 1 ft diameter.
- TLB of Island.
Poplars are smaller diameter than Spruce but have rough bark.
Note: Poplars may not grow as large @ higher elevation

CORES

Spruce - DBH = 1.6 ft
Age = 135 yrs

Poplar DBH = 1.4 ft
Rough bark - Robbe Center.

2. other rough bark Poplars ~ > 1 ft diameter near Robbe Center.

Pt 3 - TIB of MFP - Ht = 5.5 ft
- old Poplars & Spruce.

Pt 4 - VB surface towards head of MFP island - Ht = 2.3 ft
Alders & willows
May be ice - affected -

Pt 5 - Inner surface @ head of island - recent Sd. deposits - VB / MFP surface
Poplars < 6" in diameter & Smooth.
Some large Spruce ~ 1 ft diam
Ht = 4.2 ft.

P 8225 - min dlg of Abandoned channel - ie. Side Slough - filling w/ sand - Alders & willows

P 8226 - min u/s of filling Side Slough
Note Sand & alder, willow growth

Pt 6 - large sand bar @ dls end of vegetated island - large eddy @ high flows

P 8227 - Sand bar @ Pt. 6 - ~ 5 ft high - f-m. sd

P 8228 - min dls of high sand bar surface @ Pt 6
V. large bar & eddy at higher flows

Pt 7 - Top of Sand deposit on TL side of Side Channel on far right side of FA
Ht = 5.5 ft

P 8229 - min u/s of Side Channel @ Pt 7
Note large log boulders in channel

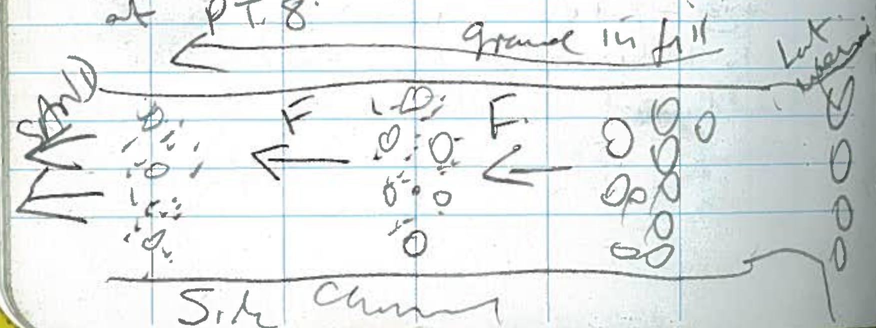
P8230 – view d/s of Side Channel
– Note gravel bar. that transitions to sand.

P8231 – view u/s of Side Channel towards Main Channel.
v. wide + shallow channel –
large relic boulders in gravel-cobble mix! – UNDISTURBED

P8232 – view u/s of Side Slough on North side of FA 173.
– clear water! probably trib source

S3
~~PT8~~ – PC line in Side Channel
– cobble bed infilled w/ small gravel.

P8233 – fine gravel infill of bar at PT. 8.



P8234 – view u/s of Side Slough towards N. side of FA + East of S.C. w/ PC's

P8235 – view u/s of Inlet in bottom of old Side Slough – Reactivation ??

CORE: – MFP – PT9
SPRUCE
– DBH = 1.6 ft.
Age – 130 yrs

Lot more Spruce Trees, than Poplars

PT9 – MFP surface – Island between 2 side channels.
– Ht = 5 ft
Spruce – Poplar w/ Spruce starting to dominate

P8236 – view d/s from lateral weir at
Main Channel of Side Channel.
That appears to be closing off w/
sand deposition & willow/alder growth

P8237 – view d/s along lateral weir
PC Site – UNDISTURBED
S6

P8238 – view d/s of spruce-dominated
MFP Island between 2 SC's.

PT 10 – YFP/VB – 20'–30' high
Poplars. – Ice ??
ht = 4 ft

P8239 – YFP/VB – PT 10
– 20–30' high Poplars

PT 11 – Lateral weir – boulders @ head
of Side Channel -> Side Slough
– sd deposition & alder/willow
encroachment

P8240 – view d/s of SC -> SS
@ PT 11. – note how coarse
the lateral weir is – boulders.
– sd. deposition & veg encroachment
in SC.

P8241 – view d/s of lateral weir @
PT 11. – v. coarse boulders
UNDISTURBED
– PC Site

P8242 – view d/s of SC -> SS
– note sand deposits & vegetation
– local scour around boulders

PT 12 – Large sand lobes – up to
3–4' high @ d/s end of
Side Channel along N side of
FA 173

P8243 – view u/s of large sand
lobes @ d/s end of Side Channel
– PT 12

P8β44 - main dls of Side Channel dls end of SC -> SS - lower portion open water - dls filled in w/ sand + veg pts

P8β45 - mid dls of lower end of Side Channel - major one dls part of site - lower area has filled in w/ sand + veg pts - then mid level down to cobble bed - not revegetated banks

P8β46 - mid dls of plugged + revegetated lower end of SC

P8β47 - mid dls of SC with less sediment deposition - more open channel -> SS

P8β48 - mid dls of plugged channel on TR + new outer channel formed on TR.

PT13 - Side Channel -> SS lower - plugged w/ sand + veg pts - v. coarse - gravel - boulder bed.

P8β49 - mid dls of SC -> SS - plugged + then re-opened.

P8β50 - mid dls of SC -> SS - looking towards MC - Sand conveyance pathway - Confluence w/ Upland Slough along N valley wall.

P8β51 - mid dls of SS -> SS - upper portion has more ponded open water - blockage dls is vegetated sand.

P8β52 - mid dls of upper end of SC -> SS - plugged - MC in background.

P8$53[2] – vi u/s of sedimentation
head of SC w/ MC in background.
– v. little bed material in transport
in SC – SAND

P8$54[2] – vi u/s of latest weir
@ S8 – bulk sample &
PC. on latest weir
UNDISTURBED

P8$55[2] – vi d/s of head of
island (MFP) – large woody
debris @ head of island

PI 14 – capture of SS/SC w/
small blocked off SS & the current
(u/s)

P8$56[2] – vi u/s of small channel
draining old SS @ PI 14

P8$57[2] – vi u/s of abandoned
channel segment – old SC →
SS → Abandoned → Road
outlets blocked.

P8$58[2] – vi u/s of top of open
water – old channel – filled
w/ black sprout

P8$59[2] – vi u/s of open water
section of old abandoned
channel.
– v. stable gravel / boulder bars
– No sign of recent sediment
deposition

PI 15 – TRB of MC – apparent
head of FA 173
– head of old abandoned channel
on TLB.

P8$60[2] – vi of ice-rafted boulders
on TRB of MC –
YFP or MFP ??

BK L4 U

PI16 - TRB of MC - map?
- Bk Ht = 5.5 ft -

2
P8Ø61 - Ice-pairing along TRB of MC

Q.4C - ~ 200 cfs

7/18/14 - FA 173 CONT.

2
P8Ø62 - main d/s of boulder concentration in u/s side of fan where Σ is >. BC site

PI 17 - u/s edge of fan @ d/s end of FA173.

NOTE: Fan sediments are v. < & are derived from largely mineralized zones in the w/shed. - landslides

2
P8Ø63 - fan surface sediments - note HWM where boulder transition to gravels etc

2
P8Ø64 - Surface sediments on top of fan/delta - PC + BS site

2
P8Ø65 - incision into fan surface sediments

2
P8Ø66 - main u/s of d/s portion of fan @ FA 173

PT18 - Dls side of Active fan-fed fan surface - mainly large pebbles > 1ft diameter - rock bank.
- Some Sponge
Ht = 7.5 ft

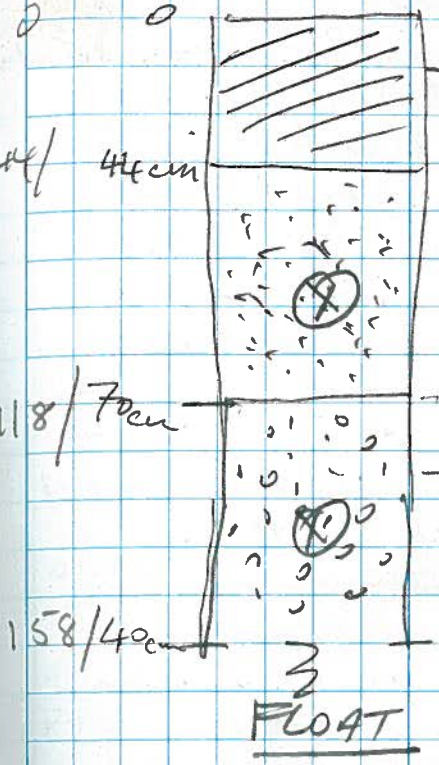
P8 #67 - PT18 - Inactive fan surface

PT19 - dls end of FP 173 site on TRB
- Terrace surface - compact rounded granules Vs & sds on ufs fan
- very thick > 1ft organic layer on top of bank.
- large Rock & Sponge in/ some algae

P8 #68 - wi of TRB of SR. @ PT19 - Terrace
Bk Ht - 13 ft

PRM 1 43.6 K

BANK SAMPLES @ PT19 S1A



P8 #69 - S1A & S1B. samples site @ PT19
. After Sampling.

PT20 - TRs of SC on N. side of FA 173 site
- Terrace/fan ~ 30' high bounds the v. narrow floodplain
- W/s of PT20 - floodplain ~ 100' wide to base of hillslope

NOTE: - Terrace/fan edge is steep - former TRs of SR, MC.

PSB70 - mid W/s of channel of SC on N. side of FA 173
- old MC??

S2 - Grab sample of v. large sand bar

PSB71 - Pre-Disturbance Photo

PSB72 - Post-Sampling - S2.

Sand transported + deposited in v. large eddy @ high flows

PT21 - Confluence of small SS/WS w. SC/SS on North side of FA 173
- most upstream one.

PSB73 - mid W/s of small channel @ PT21 - drains WS (?) on North side of valley + W/s end of FA 173

PSB74 - mid W/s of WS. - fed by hillside seeps + seeps

PSB75 - VAN DER MOOSE

PT22 - Lateral moraine on TCB of MC, SR - head of FA 173 site.

PSB76 - mid W/s of SC -> SS @ PT 22.

Lat. moraine - ht = 2ft

- Willow, Alders + S1. characteristic of raising water ht.

P8/77 - min dls of Side Slough channel : SC → SS - willow, alder encroachment + sed deposition PT 22

PT 23 - Beaver Dam on Upland slough channel.

P8/78 - min dls of pond + beaver dam @ PT23

P8/79 min wls of Upland Slough from TRs of beaver dam

P8/80 - Beaver Dam @ PT23 - 1ft = 2.5 ft.

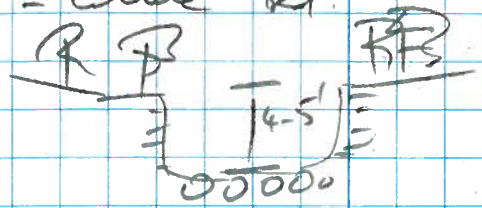
P8/81 - min dls - 2nd beaver dam in US dls of PT 23 ht = 1ft

PT24
P8/82 - min wls of 2nd beaver dam - ht = 1ft

PT25 - 3rd U. small beaver dam ht ~ 1ft.

P8/83 - min wls of beaver dam @ PT25

P8/84 - min wls of incising channel ~ 4'-5' ft deep in ~~valley~~ channel bottom deposited sds - Cattle trail



P8/85 - min dls of US in the former SC. that has subsequently infilled sand & then stabilized by willows & alders.

PT26 - small beaver dam #4 in US ht ~ 1ft

P8B86 [2] – view u/s of Beaver Dam #4. @ PT. 26.
– ht ~ 1 ft. in US

PT 27 – TRks of Island in TLS of MC. SR. – MFP

BR ht = 5.5 ft.
Dorrance + Parker

Ice-pumping of boulders onto surface – MFP

P8B87 [2] – Ice-pumped boulders w/ lichens on top of MFP surface @ PT 27.

P8B88 [2] – view u/s of lower portion of US where it exits old SC to MC.

P8B89 [2] – view d/s of lower part of SC – large, c. spaced s[illegible] ahead.

Run 173.8 – Boulder Count on Fan Margin – Largest Rocks
S3 – "B" axis
Mix, RAU

310, 280, 320, 270, 250, 410, 280, 280
370, 300, 280, 280, 330, 380, 420, 430
350, 300, 400, 350, 400, 280, 370,
330, 300, 450, 330, 320, 410, 320
300, 500, 380, 290, 250, 320, 270
400, 300, 310, 300, 350, 440, 300, 420
310, 420, 350, 410, 420, 320, 420, 370
320, 310, 300, 460, 300, 400, 390
300, 420, 260, 300, 330, 400, 300
280, 320, 400, 300, 380, 380
290, 350, 300, 420, 320, 350, 420
300, 320, 330, 340, 600, 300, 320
360, 340, 300, 330, 290, 300, 420,
510, 280, 320, 420, 350, 480

卌	卌	卌	卌	卌
卌	卌	卌	卌	卌
卌	卌	卌	卌	卌
卌	卌	卌	卌	卌

P8B90 [2] – view u/s of RC site

P8291 - Photo 1 BC Sheet

P8292 - Pit @ Sample SY UNT 173.8

UNAMED CREEK RM 173 (KRAMAI)

P8293 - P8304 .. Photos 1 Creek bed + sediment storage & sediment sources

P8293 - wide u/s 1 log-step in sediment storage zone.

P8294 - wide d/s 1 aggraded channel on mid fan region

P8295 - mid-upper fan channel - incised into recent flood deposits + former Boulder steps.

P8296 - wide d/s - Boulder-step bed u/s. Colour storage of Soils below Log).

P8297 - wide u/s near fan head - incised into fan - bedrock - Boulder steps bed.

P8298 - wide d/s 1 sediment storage zone near head of fan. channel has incised but there is lateral supply

P8299 Boulder-step in channel @ fan head.

P8300 - Highly jointed + fractured granite of core - source 1 to Soils

P8301 - wide u/s in canyon above fan - Boulder steps u/s. colluvial scar on TRS

P8302 Colluvial wedge that has been eroded + exposed soil to channel.

P8303 - head sediment storage zone in canyon section

P8304 – Steeply dipping + fractured granite → wide range of set sizes to check – Supply.

–

4w 7.C – 22, 900 cts

7/19/14 – PORTAGE CRK 14 FA 151

SR is bedrock confined on both banks as is the mouth of Portage Crk.

P8305 – Main stem SR. deposits @ mouth of Portage Crk.

P8306 – min w/s of SR @ Portage Crk – ofcomp. controlled

P8307 – min d/s of SR @ mouth of Portage Crk – outcrop controlled

P8308 – min u/s of Portage Crk from mouth – ofcomp. controlled

Note: Very coarse bedload lag on surface @ mouth

P8309 – v. coarse bedload lag on surface of fan @ Portage Crk.

P8310 - v. large boulders - d/s > 70 cm on surface of Portage Cr fan - ARMOR

NOTE: Very mixed lithologies

- Granite, Volc, Meta V., Kahiltna Conglomerates, Breccias

P8311 - view u/s of low elev. lateral bar on TRS of Portage Crk - 3 PC + BS.

P8312 - surface armor layer on lateral bar

P8313 - view d/s of lower part of Portage Crk - TR side is v. heavily armored - TLS - o/crop.

P8314 - view d/s of lower reach of Portage Crk - lateral bar along TR. Marsh on TL - Along TL is terrace / fan remnant.

P8315 - view d/s of v. heavily armored lower part of Portage Crk fan - TRB

P8316 - close up of v. heavily armored head of "delta" on Portage Crk.

S2

Portage Cr Fan

Boulder Count on TR side

Armored surface

Notes: most of the boulders are Imbricate — Portage Cr Transect

620	450	430	520	460	530
420	430	570	460	360	470
450	600	450	500	490	430
435	720	410	530	470	570
430	440	430	340	470	400
500	400	570	520	490	670
450	425	440	546	600	520
400	525	526	600	700	480
440	420	620	390	450	430
440	460	630	520	400	470
480	490	410	400	420	500
520	650	500	406	620	460
480	410	900	520	560	350
420	470	480	700	470	470
570	420	480	510	500	470
600	500	480	410	560	470
600	400	446	380		

S2

256	||	2
360	++++ ++++ ++++ ++++ ++++ ++++ ++++ ++++ ++++ ++++ ++++ ++++ ++++ ++++ ++++ ++++ ++++ ++++ ++++ ++++	
512	++++ ++++ ++++ ++++ ++++ |||	29 65
720	||	2

P8317 — Close up mix of large boulders — BC S2

Imbrication

S3

P8318 — Mid Point on PC line along face of Portage Creek fan — coarsened due to lack of flows in SR — S3

P8319 — mix of armored face of S3 — fan — Portage Creek

S4 – PC. along TC bank
of SR – near d/s end of
FA 151.

P8320 – u/s d/s of PC line @
S4 – PRM 151.8

P8321 – 50ft west on PC
line S4.

P8322 – u/s d/s of v. coarse
lobed bar – S4 PC – major
population – fluvial, ice, remnant

P8323 – u/s d/s of lower part
of FA 151

P8324 – u/s d/s below FA151
dcrop in TLS + Terrace on TRS

P8325 } u/s of Terrace on TRS
P8326 } d/s of FA151 – incised
below dcrop.

P8327 – TRS of SR @ d/s
end of FA151 – Red Rock
dcrop

P8328 – P8354
PRM 149.3L
– Ice effects photos

(1) Ice blocks in place in June 2014
& photographed by TT field crew

(2) Ice melted out & left a boulder-
cobble layer on top of lobed
weir of substantial sand

(3) ICE DEPOSITS INCREASE HT
OF LATERAL WEIR

* (4) Lateral weir is both fluvial &
ice driven accretion

(5) > ht of LW. TLS < frequent
is inundation → > veg encroachment
→ > sed Trapping (sds)
→ SC → SS.

@ ~c. 25,000 cfs

7/20/14 FA 184. WATANA SITE

P8355 - min dlls of head of island @ SI. - UNDISTURBED
- ice planing on exposed ground PRM 185.4

P8356 - 50ft marker on ℄ RC - B/S. site - SI PRM 185.4

P8357 - min dlls of RockEx - Spruce on TR3 @ ~ RM 185

P8358 - Landslide scarp on TR3 - Glacial till/alluvial TC - Spruce present

P8358 - min dlls of bedrock constriction @ PRM 185.5
- note gravel bar dlls, of constriction

P8359 - min dlls of head of island @ PRM 185.4
Spruce & Poplars (small diameter wl. much bark) + Birch
Note ice - scoured surface on TC - ice willows
MHP surface.
- No recent sd/cobble (ice) deposit on surface.

SITE 28.
MHP surface on TR. side of head of vegetated island
Bk ht = 6.5 ft.

Spruce Cored.
DBH = 1.3 ft.
Age = 105 yrs

Spruce Cored
DBH = 1.5 ft
Age = 130 yrs

P8360 - view u/s of d/s part of vegetated island PRM 185.4
- Note large bubbles - ice deposition

P8361 - view u/s of SC on TCS of PA 184. - u/s end.

P8362 - view across stream of hanging pointed granitic o/crop on TRB

P8363 - view across ~~stream~~ mouth of Till/o/wash + outcrop TR o/crop on TRB.

P8364 - view d/s of lower + mid part of PA 184

P8365 - close up of ice - rafted boulders in MC on TR side of Veg Island.

P8366 } Pit S1 Sample loc'n
P8367 } @ PRM 185.4.

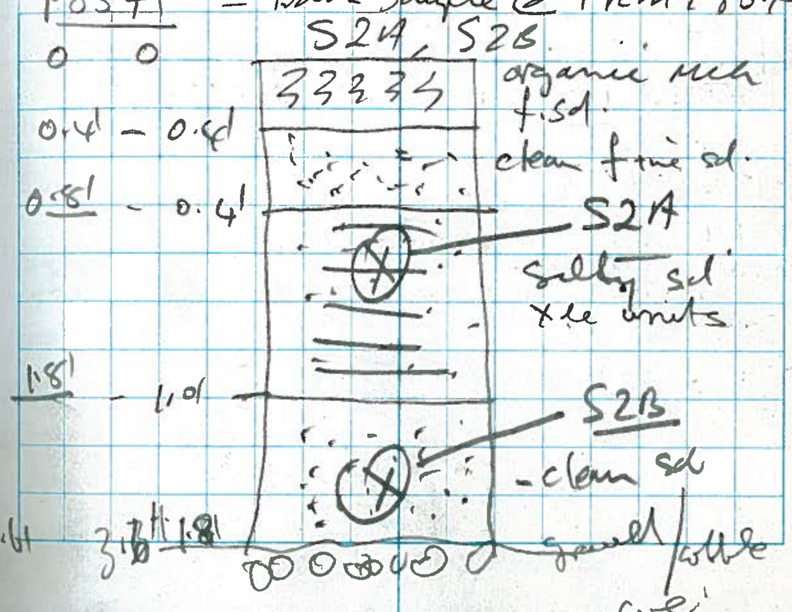
P8368 - view d/s of site after Sampling - DISTURBED

Pt. S2 - Bank Samples @ head of Veg. Island @ PRM 185.4

P8370 - UNDISTURBED BANK

P8369 - ~~Soil profile @ S2 @~~ PRM 185.4

P8371 - Bank sample @ PRM 185.4



P8372 - Core & Data Sheet
- Bulk Sample S2A, S2B.

PRM 185.2L - Grave Section on TR
& SC
P.C - S3.

P8373 - wide Mth of S3 line - Section
on TRs & SC @ PRM 185.2.

P8374 - 80-M- width on PC line
S3

PRM 185.9 W/S & FA184

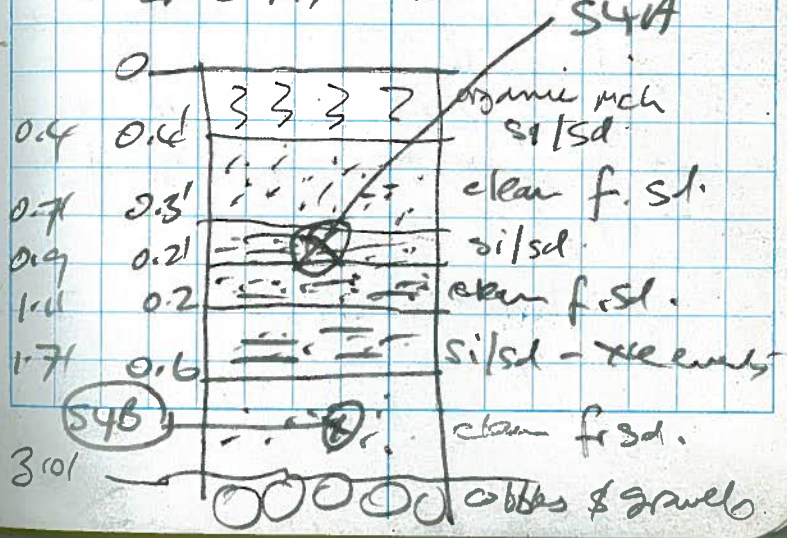
Head & Valley Island W/S & FA184
1st Island N/S & Dune Face
- ICE TRANSPORT & DEPOSITION
3 PC's - ~~S4~~
S5

P8375
P8376
P8377
Head & Barrier PRM 185.9
Ice deposits - very
coarse - cobble - boulder
S4S

4
S3 - Bulk Sample on Tidal
& Valley Island @ PRM 185.9

P8378 - Bulk sample S3 S4.
UNDISTURBED - MEP

P8379 - Cleaved bank - PRM 185.9
- ~~S4~~ S4A, S4B



P8380 photo backup bank
profile datasheet - S4A & S4B

NOTE: NEW SD Deposit from
ICE deposition on top
of Veg Island @ PRM 185.9
MFP
- U/S of Belair Contracted
CONSTRICTION → ICE JAMS

Spruce Core: - MFP Surface
DBH = 1.5 ft
Age = 120 yrs

P8381
P8382
P8383

TRB of SC - finely jointed granite
- columnar & colluvial wedges - source of SC seds to river.

- WEATHERING

NOTE: Veg Island - towards d/s end nearest d/s constriction the lateral sand bar is as high as MFP surface.

P8384 - view d/s from MFP - veg Island @ PRM 185.9.
- Belair contraction that is likely a site of preferential ICE JAM formation
→ u/s shoulder + vegetation of MFP Island.

P8385 - view d/s of lower part of PRM 185.9. veg bar at d/s contraction.

Tsusena Creek

FAN - v. coarse - lag deposit
- mainly granite boulders
- Load = sd + gravel -
throughput load

S

P8386 - view d/s of lag deposit near mouth of Tsusena Crk - PC line.

P8387 - view u/s of lower reach of Tsusena Crk & main channel of coarse - [illegible] channel

P8388 - view u/s of 2° channel of Tsusena Crk - note v. large >1m granite boulders

P8389 - view d/s of Tsusena Crk sediment load - sd/gravel - throughput load

P8390 - view u/s of bar composed of Tsusena Crk sed load.

P8391 - gravel - sd. deposits in bed of Tsusena Crk near v. coarse lag deposits

P8392 - view u/s across lower reach of Tsusena Crk from 1 PC - wet/sandier

P8393 - view d/s of v. coarse boulder lag along lower part of T. Crk fan

Z

FA 184

P8393 (4) - Landslide scar in Till / outwash on TRB ~ middle of FA.

P8394 (5) - view d/s of Till / outwash surface turned into TR side of valley between R / ...

P8395 (6) / P8396 (7) TRB of SR. - hummocky textured meta seds

PI 29 - TRB of veg Island in FA 184 - - MFP
bf ht - 7 ft.
Spruce, Poplar.

NOTE Veg Is. is u/s of Bedrock constriction

P8397 (8) - view d/s of sand bar @ d/s end of veg Island.

P8398 (9) - view u/s of d/s end of veg Island (PI 29).

P8399 (Zero) - Shallow Slide on Till / gravels on TRS of site

CORED SPRUCE
DBH = 1.1 ft
Age = 80 yrs

CORED SPRUCE
DBH = 0.9 ft
Age = 60 yrs

NOTE dense, but not very large diameter spruce trees on veg bar.
- wide range of sizes / ages
- recent sedimentation

P8400 (1) - Ice scar on spruce tree @ head of veg Island - MFP ~ 7 ft high

P8401 ~~1~~ 2 – S8 – PC. on TR side of Veg Island. – PRM – lateral bar – fluvial sed's PRM 185.3

P8402 ~~2~~ 3 – SD-ft mark on P.C. line – S8 PRM 185.3

~~P8403 – Photo of Data Sheet S8~~ 4 delete

P8404 ~~4~~ 7 – Backup of S8 Data Sheet

P8408 – Backup of S3 Data Sheet

P8409 – mis gross SR from TRB – Terrace

P8410 Ms end of veg Island – PRM 185.3

P8411 – d/s end of Veg Is – v. Sandy spit

P8412 – mis u/s of Veg Is @ PRM 185.3

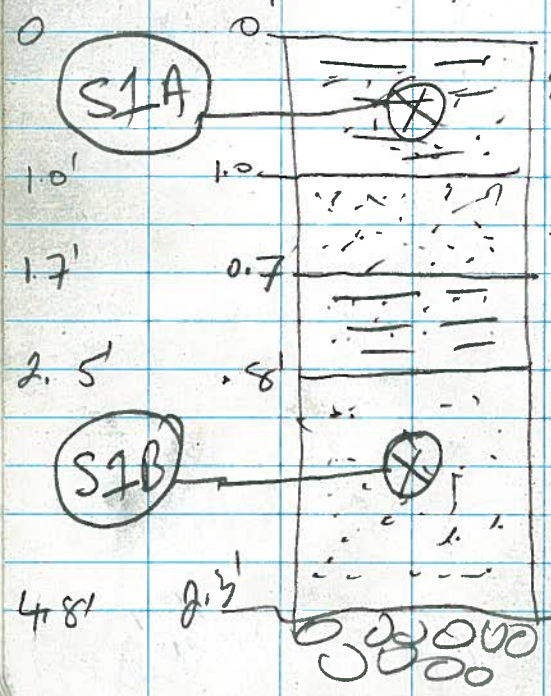
P8413 – H500

Z

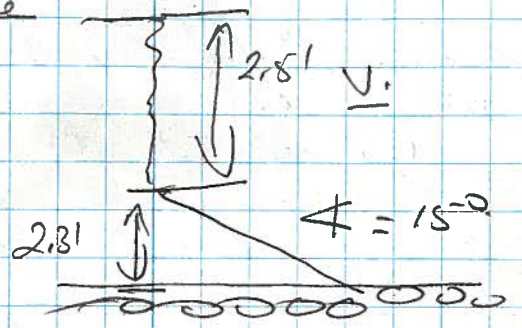
7/21/14 – Tsusegwa Creek Area

P8414 – Bank on TRS 7 SK ~401
d/s 7 2014, PRM 184.7R Pin
– undisturbed.
RTK # 30016

P8415 – Soil Profile S1
PRM 184.7R. TRS SR
Bank Samples S1A & S1B
Root Depth = 2.5ft



Bank Profile



PRM 184.7 R LEVEL LOOP

RTK # 30016
BM = PRM 184.7R cap & pin

	BS(+)	FS(-)	(SS-)	Comments
BM	3.34			
REW		7.34		@ 1100 hours
ICE SCAR 1		1.32		6.7' to top of scar
ICE SCAR 2		1.59		7.0' to top of scar
BM	3.34 ✓ OK			

PRM 18410R. LITTLE TSUSONA CK

- Coarse gravel + cobbles many granitic material to SR.
- large mouth bar in tributary sampled for load.

P8416 - view u/s of mouth of Little Tsusena River. - note mid-channel bar - large clay deposits.

P8417 - view u/s of mouth of Little Tsusena Creek.
- note deposits + lag boulders

P8418 - view u/s of S2 site
- mouth of Little Tsusena R
UNDISTURBED

P8419 - surface armored layer on high flow deposits - 180 mm - Sd.

P8420 - view across stream of granitic lag boulders
Diam > 1m

P8421 - view d/s of mouth of Little Tsusena Ck

P8422 - view u/s of lower reach of Little Tsusena Ck u/s of mouth

P8423 - view d/s of lower part of Little Tsusena Ck fan - channel has incised into high flow deposits. → cobble deposit over lag boulders — PC line. S3

P8424 - 50' mark on PC. line
S3

P8425 - Hole @ S2 - armor layer removed - Bulk Sample.

P8426 - S2 site after pit is filled

Boulder Count — S4

Lower Portion of Little Tsuga Crk fan — LHG deposit.

PS428 — unit w/s of lag deposit for BC — S4

840	750	580	620	580	490
570	500	760	400	510	570
520	600	420	570	400	640
500	430	480	600	620	440
750	480	420	630	440	400
800	580	380	420	540	540
550	530	480	510	480	490
440	480	440	480	870	440
420	470	350	440	450	580
480	500	470	600	480	400
630	590	730	480	440	620
510	760	480	440	520	400
580	420	530	540	500	400
720	390	600	380	460	670
590	920	880	520	640	500
500	480	520	480	440	610
600	570	700	820		

BINS

256	I	1
360	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 I	51
512	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 I	36
720	𝍸 𝍸 II	12
1024		
		100

PS428 — unit w/s of Ice-Pressed boulder bar on TRS w/s of Little Tsuga Crk — infill between boulders of finer gravels, eddies probably from Little Tsuga Crk.

P8429 - mi u/s of Little Tsuseum
Cth - plane bed + confined by stable farm surface - Tees

P8430 - mi d/s of Little Tsuseum
Cth - large, coarse gravel bar in expansion zone
- eroding banks
- Incised channel - evidence of recent of banking

P8431 - Scat ??

P8432 - mi u/s of Little Tsuseum
Cth - plane bed - low sed yield (?) - Terrace confined

P8433 - mi d/s of Little Tsuseum
Cth - lower floodplain surface has been ice-affected - scars on trees + alders mowed down

P8434 - mi d/s of Little Tsuseum
Cth - PB → B/s locally
- confined by eroding banks but there is enough of bk capacity to prevent full B/S development

P8435 - mi u/s of Little Tsuseum
Cth - PB - well confined on Ters but lower floodplain surface on TSB.

NOT A HEAVY SEDIMENT PRODUCER ON ANNUAL BASIS - EPISODIC

7/22/14 - MOUTH OF CHINOOK CRK

PC + Bulk Sample - mult CB

P8436 - mini u/s of hist flow deposits on Chinook Crk fan "UNDISTURBED"

P8437 - 45-ft mark on S1 PC line on Chinook Crk fan

P8438 mini u/s of congested part of Chinook Ck fan - Armored

P8439 - mini u/s of deposition line on Chinook Crk fan - hist flood stg.

P8440 - mini d/s of v. coarse, armored fan face @ Chinook Crk

P8441 - mini u/s of SR in DC from mouth of Chinook Crk

P8442 - mini d/s of SR in DC from mouth of Chinook Crk }
P8443 - SAME

NOTE: Rocks are Primarily f.gr. granite + some Gneiss

P8444 - Pit @ S1 - Sampled w/ 6 Buckets + PC

BUCKET WEIGHTS FOR TRANSPORT

50.6
63.1
66.6
70.6
57.0
66.2
___
374.1

P8445 - view upper face of fan face
[illegible] @ Clement Cr
dmax > 1m.

P8446 - view d/s of PC - S2
line - reworked Clem... Cr
seds on bar @ base of fan

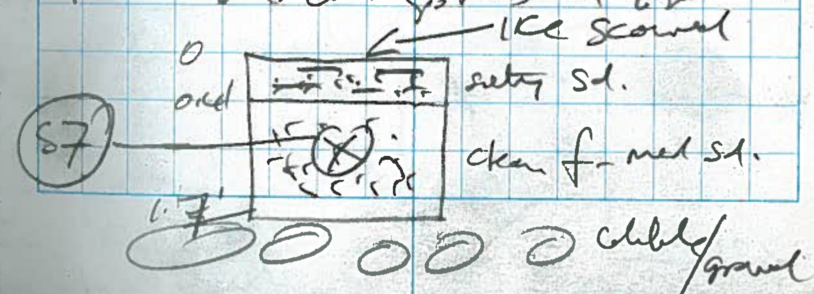
FA 173 - TLB - Skew bar @
head of FA - MC ~~FA~~
PC count. S6 PRM 175.1

P8447 - view d/s of Skew bar
+ PC line S6 PRM 175.1

P8448 - SOFA mark on PC
line S6 PRM 175.1

Bank Sample - ~~S7~~ S7 on TRB
of Vey Trend @ PRM 175.2
- TLB, MC

P8448 - view of undisturbed bank
sample location.
- bank has been scoured by
ice - boulder deposits on top.

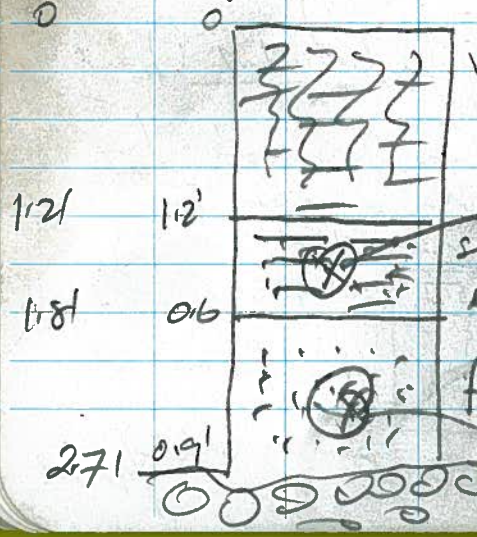


P8449 – Soil Sample S7 Profile – S1 over alluvium – terrace scarp.

Bank Sample S8 – TLB of Veg Island, TLB of MC Swale R.

P8450 – Undisturbed bank of S8 TLB of vegetated Island, TLB of MC Shoreline

P8451 – Bank Samples S8A & S8B on TLB of veg Island – PRM 174.8 – TLB of MC SR



Egg Creek PRM 179.5 L.

P8451 – min 1lb of lower part of Egg Creek fan. – 3 PC's on 7/22/14

P8452 – min 1lb of f. grained lobe on Egg Creek fan

NOTE: Many Granitic rocks

P8453 – min 1lb from bulk sample site on Egg Cr

P8454 min 1lb of Egg Creek – Multiple channels – between stable vegetated Islands

P8455 min 1lb of Egg Creek bed of modern fan – single channel

P84656 - min d/s of deposition @ head of [illegible] - occurs contact [illegible] d/s.

Q@QC = 22,400 cfs

7/23/14 - Erosion, occurs, LOTS [illegible] - ~~[illegible]~~ Above DC.

P84457 - 85449 - Bank conditions between PRM 166.2 - MR 3/4 to PRM PRM 187.6 (MR 6)

—

Z

LITTLE TSUSENA SURVEY REACH

P85530 - min d/s of surveyed reach. - 5 XS
XS 5 just d/s of fallen tree
XS 1 - at d/s end of steep riffle.

P8551 - min u/s through the surveyed reach
XS 1 - [illegible] w/ Tape
XS 5 - just d/s of logs

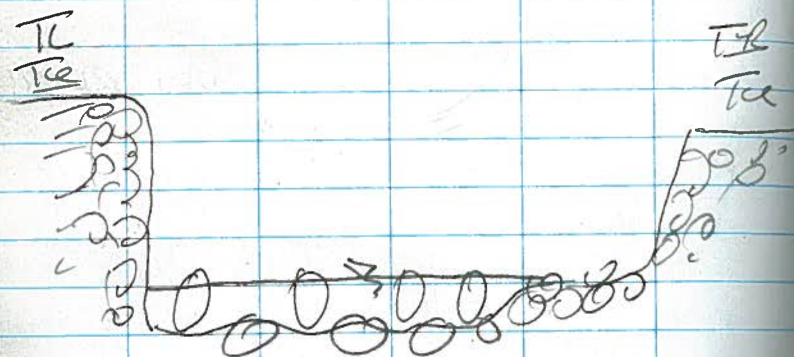
P8552 – TR -> TL – XS1 (d/s)

P8553 – TR -> TL – XS2

P8554 – TR -> TL – XS3

P8555 – TR -> TL – XS4

P8556 – TR -> TL – XS5 (u/s)

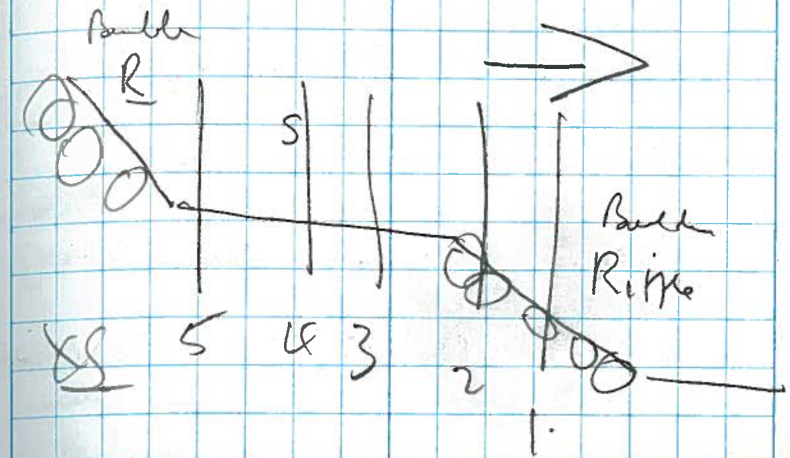


Plane Bed – B/Step channel – minimal
mixe from 6'–7'

Boulder toe armour – v. stable

P8557 – view d/s of TRB – note
boulder armour along TRB

damage in channel ≥ 1m.



P8558 – view of TRB – Tce
– finer sed's of erosion
– probably prevent formation
of B/Step bed morphology.

P8559 – view d/s of lower
reach of Little Rock
– Profile section

P8560 – view u/s of Little
Tsunami Ck – profile

Middle River - Seeboom

Pattaya Cliff - FA -

151 -	153.5	KJs	Kahuitara MR5
153.5 -	~154	Tpgr	- Granite Paleocene (intr
154 -	156.5	KJs	Kahuitara
156.5 -	170	Tpgr	- Granite - Paleocene.
170 -	174	TKgg	- Gneiss [FA 173]
174 -	180	KJs	- Kahuitara.
180 -	183	TVk	- Tertiary Volc. KJs Cuvier Valley
183 -	185	Tpgr	- Granite Paleocene
185 -	187	TKgg	Gneiss Dawn Falls

REACH BOUNDARIES

UR 6 | MR-1	187	-	184.6
MR1 / MR-2	184.6	-	170
MR2 | MR 3	170	-	166
MR3 | MR 4	166	-	154 DC.
MR5 | MR 6	154	-	148.5

- Turbidite / Flysch - Cretaceous (Jurassic)
- Granite rock of Paleocene Age.
- Turbidite / Flysch.
- Granite rock of Paleocene Age
- Melange of Metamorphic
- Turbidite / Flysch -
- Volcanic / Hypabyssal. rocks - Mafic
- Granite rock of Paleocene Age.
- Melange of Metamorphic

7/24/14 CHINOOK CRK SURVEY
MDH, RU, CB

P8561 - view u/s of Swamped reach of Chinook Crk
- Boulder step channel confined by Terraces - V. coarse gravel d's 0.5 - >1m.
5 XS's
XS 1 - d/s : XS 5 - u/s. (Step)

P8562 - XS 1. - TL -> TR (step)

P8563 - XS 2 - TL -> TR (step)

P8564 - XS 3 - TL -> TR (step)

P8565 - XS 4 - TL -> RR (pool)

P8566 - XS 5 - TL -> TR (step)

P8567 - view d/s of swamped reach of Chinook Crk from u/s of XS 5

QUESTIMATE: 75 - 100 cfs

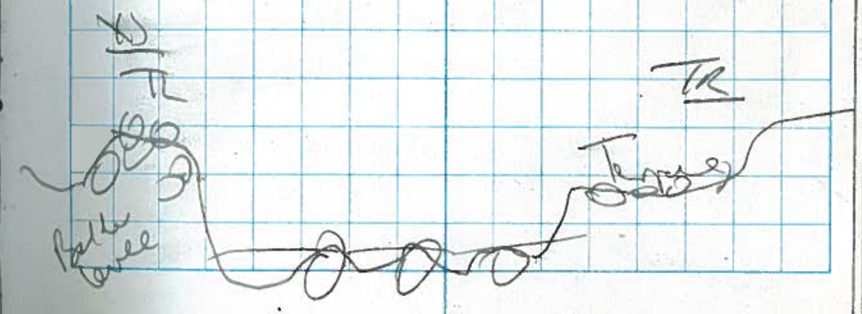
P8568 view d/s of swamped reach from TR side of XS 5

P8569 - view u/s of flood deposits just u/s of swamped reach d's 0.5 - 1m.

P8570 - view d/s of B/step structure between XS 3 + XS 4

P8571 - view u/s of B/step structure between XS 3 + XS 4

P8572 - view d/s boulder jam @ XS 2 - not organized into B/s but v. stable.



NOTE: 8 Large Rel Salmon observed in lower reaches of Chinook Crk on 7/24/14

P8573 – P8585 – Chinook Crk transect upstream from the mouth

P8586 – P8590 – Data Sheets for Chinook Crk survey backup.

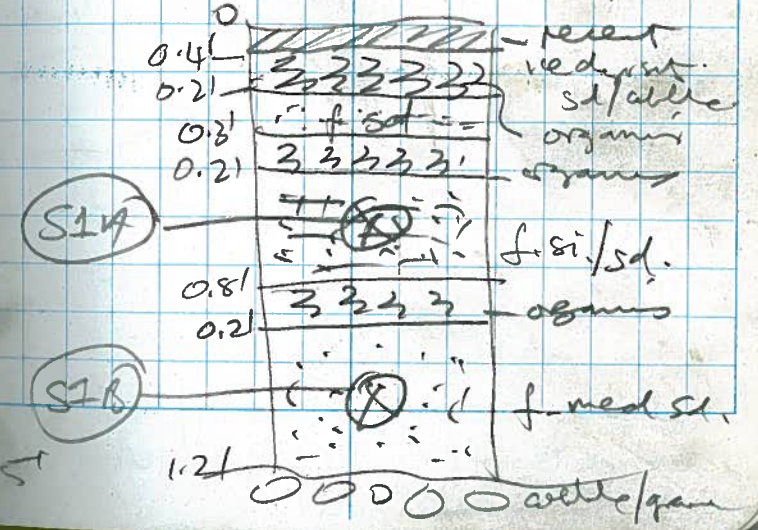
7/25/14 – MRB

Bank Samples, Erosion, Spool Measurements, RM, KT, CB

RKm 147.5 – TLS + MTP/DTP.
– Bank samples 14 & 16

P8591 – Bank profile RKm 147.5 TLS + MTP/DTP – undistorted ice deposits on top of bank – Sand + cobbles

P8592 – Profile – S14 + S15 @ RKm 147.5 – recent ice deposits sedimented on top of profile



1. Root depth - 2.5ft

n values - 0.06 - 0.12

PRM 147.9 R

8593 view d/s @ XSEC PIN
8594 view of overbank
8595 pin

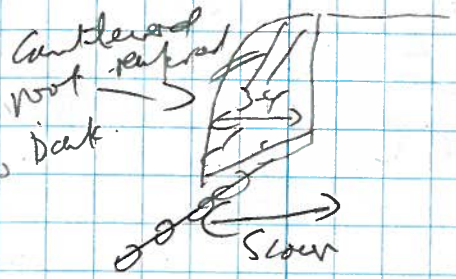
P8596 - Ice - cable - small bank
tree on top of bank RU antag

P8597 - min of TLB of OFF surface @ PRM 147.9 - ice deposits + scars on Poplars

PRM 148.8 L
- LWC edge
- Bank samples S2A & S2B } MTP surface.

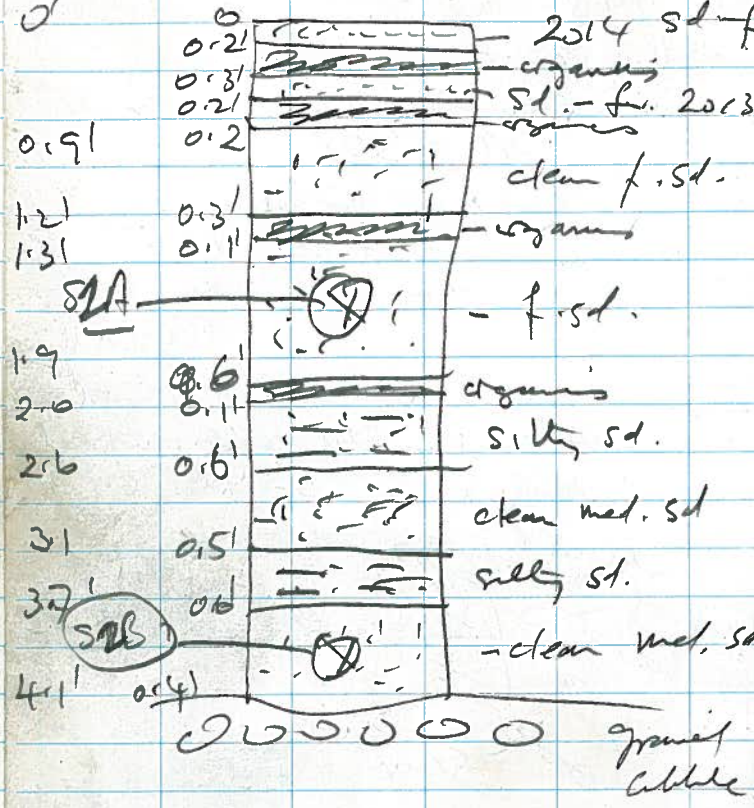
Note - Significant ice deposition of sand, gravel & cobbles in 2014. - Recent

P8598 - Bank site undercut root-reinforced
- Cantilever undercut bank is ~ 3-4'



P8599 - Cantilevered depth @ bank sample site ~2.5ft

P8600 - Bank shot @ PRM 148 & - MTP surface - ice deposits on top of point



P8601 - wls of Pit @ PRM 148.8L
+ floodplain - MHP

P8602 - Pit @ PRM 148.6L
- wls elev of sed.

P8602 - 2014 deposits on lower portion of old SC dls end.
- Sd ~ 8' + cobble existing elev of weir dls end.

P8604 - PRM 150.1R Pit

PRM 150.6 - wls elev @ Pit

P8605 - Pit @ PRM 150.6

P8606 - MHP surface - no evidence of recent ice deposits but there are older ones

NOTE: Recent ice deposits @ head of island - Canoe Isl

PRM 151.1 R – X Section
u/s alluvial shot.
Terrace upstream of Bedrock Canyon

P8607 – Cany @ PRM 151.1 R

Terrace ht ≈ 9 ft.

—

PRM 151.5 R – X Section
w/s alluvial shot
Terrace ~ 20 ft high
P8608 – Pic Cany @ 151.5 R

P8609 – Sand & small boulder deposited on top of alluvium on TRB of SR. — base of Terrace

—

PRM 152.9 R – X Section
– w/s alluvial shot.

Above Portage Crk

P8610 – view d/s of SR above Portage Crk from PRM 152.9
– Bedrock constriction w/ backwater bar.

P8611 – Weathered Kahiltna Flysch seds

P8612 – view d/s of backwater bar u/s of bedrock constriction

P8613 – Pic top @ XS 152.9 R
Base of hillslope – alluvium

P8614 – 20 Qtz veins in meta seds u/s of Portage Creek
TRB

Z

P8615 – P8645 – Erosion, Sed bars, Log mapping – Gold Creek to Above Portage Crk
PRM 140 – PRM 154

FA 128 (Slough SH) - 7/26/14

mod, RV, CB

Typical Q's from Parkins 2-D model

	~ Cs	RT
Ground Bars -	27 - 31,000	1.0 1.0 yr.
Veg. Bars -	46,000	2.3.
YFP -	60,000	7
mFP -	76,000	22
OFP -	87,000	49.

FA 128 (SH Slough)

PT1

- YFP - Heading veg. island
  - sl. depth = 0.6 ft
  - f.-med. sd.

PT2

- YFP - interior island
  - sd depth = 0.2 ft
  - f-med sd.

PT3

- YFP - Heading island
  - sd depth = 0.6 ft
  + alders + grass
  - f. med sd.

PT4

- YFP - interior island
  - sd depth = 0.2 ft
  - f-med sd.

PT5 -
YFP - TR side of island
- sd depth = 0.5ft
(some gravels & debris)
- f. ms. sd

PT6 -
MFP - interior from TR side of island
- very little sd deposition over last years organics

PT7
- MFP - interior - large spruce & Poplars.
- ϕ sd. deposition.

PT8 -
YFP surface - Poplars ~ 1ft.
- sd depth = 0.3ft
f. sd. w/ silt.
- flow depth ~ 0.5ft

PT9 - Interior ~ 40ft from TL side of island. - YFP
- ft - Sd depth = 0.35ft.
- f-med sd.
- flow depth ~ 2ft.
NOTE - large # of young spruce

PT10 - ~ 15ft from TL side of island
- YFP
- sd depth = 0.7ft.
- f. med. sd
Veg - alders & small poplars w/ small spruce.

PT11 - TL side of island
- YFP
- sd. depth = 0.4ft
- f. sd
Young Poplars & alders

49
PS6/15 - ~ 0.4ft of sand deposition on YFP surface @ PT11.

PT12 – Center of Island – YFP
– Poplars + alders
– Sd depth = 0.1 ft
– f. Sd.

PT13 – TRB of Island. YFP
– Poplars + alders
– Sd depth = 0.5 ft
– f-med. Sd.

PT14 – Center of Island near
Rt end. – YFP
– Sd f. sandy Sd.
Sd depth = 0.1 ft.

49
P86K6 – P8653 – SWIMMING BEAR

RA 128 (8A Slough) – MFP Island

IT15 – YFP surface @ head of
Island.
Sed Depth = 0.35 ft
f-med Sd.
Alders + young Poplars

PT16 – MFP surface. – Poplars
>1 ft-diameter.
Sed Depth = ϕ

PT17 – TRB of MFP Island –
V. large Poplars >1 ft-diameter
Sed Depth = ϕ

PT18 – TRB of MFP Island.
near head of Side Channel
on TR.
Sed Depth = 0.3 ft
f sd, silt
Large (>1 ft) Poplars.

PT19 - MFP surface - slightly lower elev^{n} - near head of Side channel
Sed Depth = 0.5ft
f. med Sd.

PT20 - MFP surface - may be an old channel that is filling in - Large poplars but some side have large ice scars
Sd depth = 0.3ft
f. med. Sd.

PT21 - MFP Surface - v. large Poplars.
- Sed Depth = 0
- slightly lower surface to the left of the channel @ PT20

PT22 - MFP surface - transect onto margin on TC.
- old channel
Sd Depth = 0.35ft
f. sd. silt
- Alders, Poplars

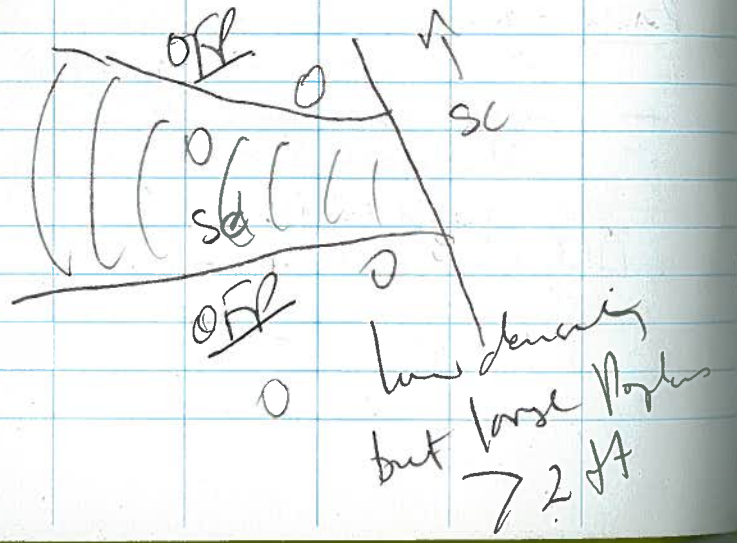
PT23 - MFP/YFP surface along TC side of island
Poplars < 1ft diameter
Sed Depth = 0.5ft
f. m. Sd.

PT24 - TC side of island.
YFP surface
- 20ft from edge of SC
Sd Depth = 1.2ft
f. med Sd
Alders + small Poplars

PT25

MFP/OFP Surface – TL side of SC – OFP Ridges > 2'
Outside ferns, alders.
Sed Depth = 0.1 ft.
f-md. sd.

PT26 – TL side of OFP surface – There has been continuous sand + shell deposition along here since PT25
Sed Depth = 0.6 ft
f. md. Sd.
Outside ferns,



P8654 – large sand deposit in interior of OFP surface – PT27

PT 27
Depth = 0.9 ft
f-md sd

P8655 – mix towards SC on TR side of island. – OFP side w/ significant sand deposits under the ferns

PT28 – OFP surface – Center lower tree density, smaller trees only a trace of sand deposition
Sd. Depth = 0.1 ft
f. Sd.

PT29 – MFP surface – lower elev^n – ferns + alders
Sd Depth – 0.4 ft
f.-md. sd.
(Around 2.)

n PT30 – MFP surface – poplars
>1ft, some Spruce
Sand Depth = 0.3 ft
f. med. S1

PT31 – MFP surface on TC side
of island.
~ 40' from SC.
Sand Depth = 0.7 ft
f. md. S1

SPRUCE CORE

DBH = 1.3 ft
Age = 145 yrs

Note: from PT31 → Bost – Contains
sand deposits

NOTE: Terrace surface on n/s
end of FFARS was not
overtopped – no evidence
of deposition