

Karl's

LEVEL BOOK

#101596

9/2/2014 - 8/9/16

 BEN MEADOWSSM

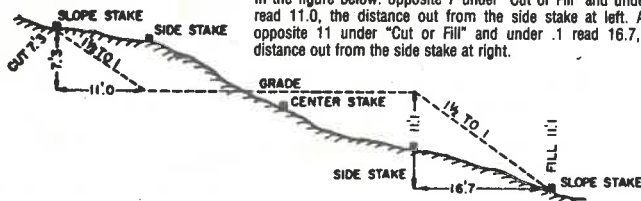
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When the
Outdoors
is Your
Office.

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING

Roadway of any Width. Side Slopes $1\frac{1}{2}$ to 1.

In the figure below: opposite 7 under "Cut or Fill" and under .3 read 11.0, the distance out from the side stake at left. Also, opposite 11 under "Cut or Fill" and under .1 read 16.7, the distance out from the side stake at right.



Cut or Fill	Distance out from Side or Shoulder Stake										Cut or Fill
	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0.0	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	0
1	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	1
2	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4	2
3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7	5.9	3
4	6.0	6.2	6.3	6.5	6.6	6.8	6.9	7.1	7.2	7.4	4
5	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.6	8.7	8.9	5
6	9.0	9.2	9.3	9.5	9.6	9.8	9.9	10.1	10.2	10.4	6
7	10.5	10.7	10.8	11.0	11.1	11.3	11.4	11.6	11.7	11.9	7
8	12.0	12.2	12.3	12.5	12.6	12.8	12.9	13.1	13.2	13.4	8
9	13.5	13.7	13.8	14.0	14.1	14.3	14.4	14.6	14.7	14.9	9
10	15.0	15.2	15.3	15.5	15.6	15.8	15.9	16.1	16.2	16.4	10
11	16.5	16.7	16.8	17.0	17.1	17.3	17.4	17.6	17.7	17.9	11
12	18.0	18.2	18.3	18.5	18.6	18.8	18.9	19.1	19.2	19.4	12
13	19.5	19.7	19.8	20.0	20.1	20.3	20.4	20.6	20.7	20.9	13
14	21.0	21.2	21.3	21.5	21.6	21.8	21.9	22.1	22.2	22.4	14
15	22.5	22.7	22.8	23.0	23.1	23.3	23.4	23.6	23.7	23.9	15
16	24.0	24.2	24.3	24.5	24.6	24.8	24.9	25.1	25.2	25.4	16
17	25.5	25.7	25.8	26.0	26.1	26.3	26.4	26.6	26.7	26.9	17
18	27.0	27.2	27.3	27.5	27.6	27.8	27.9	28.1	28.2	28.4	18
19	28.5	28.7	28.8	29.0	29.1	29.3	29.4	29.6	29.7	29.9	19
20	30.0	30.2	30.3	30.5	30.6	30.8	30.9	31.1	31.2	31.4	20
21	31.5	31.7	31.8	32.0	32.1	32.3	32.4	32.6	32.7	32.9	21
22	33.0	33.2	33.3	33.5	33.6	33.8	33.9	34.1	34.2	34.4	22
23	34.5	34.7	34.8	35.0	35.1	35.3	35.4	35.6	35.7	35.9	23
24	36.0	36.2	36.3	36.5	36.6	36.8	36.9	37.1	37.2	37.4	24
25	37.5	37.7	37.8	38.0	38.1	38.3	38.4	38.6	38.7	38.9	25
26	39.0	39.2	39.3	39.5	39.6	39.8	39.9	40.1	40.2	40.4	26
27	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6	41.7	41.9	27
28	42.0	42.2	42.3	42.5	42.6	42.8	42.9	43.1	43.2	43.4	28
29	43.5	43.7	43.8	44.0	44.1	44.3	44.4	44.6	44.7	44.9	29
30	45.0	45.2	45.3	45.5	45.6	45.8	45.9	46.1	46.2	46.4	30
31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.6	47.7	47.9	31
32	48.0	48.2	48.3	48.5	48.6	48.8	48.9	49.1	49.2	49.4	32
33	49.5	49.7	49.8	50.0	50.1	50.3	50.4	50.6	50.7	50.9	33
34	51.0	51.2	51.3	51.5	51.6	51.8	51.9	52.1	52.2	52.4	34
35	52.5	52.7	52.8	53.0	53.1	53.3	53.4	53.6	53.7	53.9	35
36	54.0	54.2	54.3	54.5	54.6	54.8	54.9	55.1	55.2	55.4	36
37	55.5	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9	37
38	57.0	57.2	57.3	57.5	57.6	57.8	57.9	58.1	58.2	58.4	38
39	58.5	58.7	58.8	59.0	59.1	59.3	59.4	59.6	59.7	59.9	39
40	60.0	60.2	60.3	60.5	60.6	60.8	60.9	61.1	61.2	61.4	40

IF FOUND, PLEASE SEND TO:
 KARLEE KVERSTEINER
 2991 SOUTH LAKE BRADFORD RD
 TALLAHASSEE FL 32310

OR CALL:
 (850) 225-0580

THANK YOU!!

The paper in this book is
 made of 50% high grade rag stock with
 a WATER RESISTING surface sizing.

[illegible]

TG/KW

1

Stopped for ice

6:30PM Arrived at SUN. STATE PARK

Ranger was in the field, got back

~ 6:45 PM

TG/KW

Time Run 10:05AM

- Set up ISCO #5 with BATT S1
- BATTERY CHARGE: 12.91V
- PHOTOS: 9-12

LIME SPRING (RANGERS KNOW IT AS
"LITTLE GEM") 10:35 AM

- ISCD #1 WITH BATT SB CHARGE: 12.57V
- PHOTOS 12-19

ELLAVILLE SPRING 11:00AM

- ISCD #2 WITH RATT S2 CHARGE 13.00V
- PHOTOS 10-26

SUWANNACOCHEE 11:40 AM

- IS CO # 4 WITH BATT 53 CHARGE 12.27V
- PHOTOS 27-33

RAN INTO A LOCAL, DAN, WHO OFFERED TO KEEP
 - AN EYE ON OUR ISCO SET UP WHEN
 - VISITING THE SPRING. HEADED BACK TO
 - THE RAMP, WHERE CLINT, SCOTT, AND
 - BEN MET US. CA. 1:00 PM

BACK TO THE CABIN FOR A QUICK LINK OF
 HAM SANDWICHES. THEN TG/L/S/BD
 HEADED BACK ON THE RIVER TO SET
 UP THE LAST 2 REMAINING ISCOS.

KATIE AND I HEADED TO TOWN TO PICK
 UP SUPPLIES SA WATER/GATORADE,
 BATTERIES FOR OUR VOLT METER AND
 UNDERWATER CAMERA HOUSING, AS
 WELL AS SILICONE GREASE FOR THE
 LATTER. ALSO A CABLE TO SECURE ISCO

5:30 PM KA AND I MET UP WITH THE GUYS
 AT THE FINAL ISCO SET UP AT
 ANDERSON SPRING WITH CABLE IN
 TOW TO LOCK ISCO/BATTERY.

4 SEP 2014 T/G/KW/LK/SP/BD

8:00 AM LOADED SUPPLIES FOR DYE TRACE
 - HEADING TO FALMOUTH TO INTRODUCE
 - DYE, RELEASE PLANNED FOR 9:00 AM

8:20 AM ARRIVE AT FALMOUTH, ABBY
 JOHNSON FROM SRUMD IS HERE TO
 PHOTOGRAPH THE DYE RELEASE
 TOM IS CALLING LOCAL AGENCIES SA
 THE SHERIFF TO ADVISE THEM OF
 THE PENDING DYE TRACE. SPOKE
 TO DEP. WATSON. SPOKE WITH
 FELICIA AT DOH, ALSO FWC, ROBIN
 MITCHELL

TARA, CARRIE, ABBY, AND MARK ARE HERE
 IN ADDITION TO TG/KW/SP/CK/BD
 BD IS OUR DYE LEADER.

8:55 AM ~10 lbs of RHODAMINE WT
 RELEASED BY BD. OBSERVED THE
 DYE TIL ~9:30 AM. DYE IS A DEEP
 BURNT ORANGE COLOR DUE TO THE
 TANNING.

RETURNED TO CABIN, LAUNCHED BOAT

TG/KW/SD WENT TO CAPECISCO'S

LINE EATER 10:43 AM R-1

STATION SECURE

BATT VOLTAGE 12.65

"BOTTLE 6 AT 12:00"

BOTTLE 1 WAS EMPTY

SAMPLE COLLECTED FOR BOTT 2

BOTT 3-5 DISCARDED

* BOTT 2 FROM 9/3/14 @ 8:00 PM

LIME SPRING 11:22 AM R-1

STATION SECURE

BATT VOLTAGE 12.40

"BOTTLE 5 AT 12:00"

SAMPLES 1-4 PRESENT

BOTTLE 4 SAMPLE COLLECTED

FROM 9/4/14 @ 8:00 AM

PROGRAMMED FOR R-2 BOTT 1 @ 12

SUWANNA COOCHIE 11:40 AM R-1

STATION SECURE

BATT VOLTAGE 12.72

MARK + WICKHAMS AT SITE

3:40 PM ANDERSON KCO/BATT INTACT

"SAMPLE 6 @ 1600" SAW STURGEON JUMP

3:57 PM KCO BEGINS SAMPLING BOTTLES
(6th SUWA)

"BOTTLE 5 AT 12:00"

SAMPLES 1-4 PRESENT

SAMPLE 4 COLLECTED (9/4 8AM)

1-3 DISCARDED

PROGRAMMED FOR R-2

"BOTT 1 AT 12:00"

LIME RUN 11:56 AM → WAIT FOR 12 PM
SAMPLE

STATION SECURE

BATT VOLTAGE 12.85

"BOTTLE 6 AT 16:00"

BOTTLES 1-5 PRESENT

1-3 DISCARDED, 4+5 COLLECTED
(9/4 AT 8 AM + 12 PM RESPECTIVELY)

PROGRAMMED FOR R-2

BOTTLE 1 AT 16:00

* ALL SAMPLES COLLECTED AT
4 HR INTERVALS.

5 SEP 2014 TL/BA

ANDERSON 8:00 AM ALL EQUIPMENT
PRESENT + FUNCTIONING,
CHECKED LINE RUN, NO VISIBLE SIGNS
OF DYE. BREAKFAST AT 9:00 AM.

FALMOUTH 10:00 AM STOPPED TO PICK UP
SIGN NOTIFYING OF DYE TRACE
ALL THE DYE APPEARS TO BE GONE,
MET A LOCAL WHO WAS PRESENT
YESTERDAY DURING THE DYE
DEPLOYMENT. ACCORDING TO HIS
ACCOUNT THE DYE WAS GONE
APPROXIMATELY 20 MINS AFTER WE
LEFT. 10:15 AM WERE HEADING TO
LIVE OAK FOR ICE, BATTERIES, ETC.
STOPPED AT PUBLIX + TRACTOR SUPPLY
THEY SELL BOLTS/NUTS/WASHERS BY THE
LB. SPENT \$10.14! ~~WALKED~~
BACK TO THE CABIN FOR LUNCH
~~WHERE~~ WHERE WE FOUND BA, THEN
TOOK A WALK DOWN LINE RUN.
FOUND AN AREA WHERE THE
WATER FLOWED BACKWARDS AND
FEELS BACK UNDERGROUND
PHOTOS: 93-100

ANDERSON 4:00 PM ISCO RUNNING,
SAW THE WICKHAMS AND THE ~~THE~~
DOG PEPPER. DAVID SWAM DOWN AND
CONFIRMED THAT THE VINYL TUBING
WAS STILL IN PLACE.

SAMPLE 13 AT 16:00 OBSERVED.
CHECKED THAT IT'S BEEN DRAWING THE
SAMPLES. SURGEON AROUND

LIME RUN 5:15 PM "BOTTLE 8 AT 20:00"

LIME 5:25 PM ISCO/BATT IN PLACE

6 SEP 2014 TG/BA

LIME RUN 9:30 AM SOME TURBIDITY
OBSERVED SEE PHOTOS 105-108

ELLAVILLE 10:00 AM SOME TURBIDITY
OBSERVED, UNSURE IF FROM RAW
OR POSSIBLY SMALL AMOUNTS OF DYE?

"BOTTLE 14 AT 12:00" STOPPED AT
AG-STATION TO CHECK RAINFALL.

THEY HAD ONE BUT IT HADN'T BEEN
EMPTIED IN MULTIPLE DAYS

→ SEE PHOTOS 109-113

SUWANNOOCHIEE 10:15 AM

TOOK A SMALL FOOT PATH SEVERAL
HUNDRED YARDS THROUGH THE
WOODS TO THE SPRING. ALL WELL.

"BOTTLE 13 AT 12:00"

PHOTOS: 114-118

ANDERSON 10:25 AM

"BOTTLE 17 AT 12:00"

RAIN!!! TRIED PEPE'S FOR EARLY DINNER, AT

FALMOUTH STOPPED AFTER DINNER, ~7:00 PM
SAW A TINY CORNSNAKE BABY.

7 SEP 2014

TG/BA

BOTTLE ABBREVIATIONS

ANDERSON: ANDS

ELLAVILLE: ELLA

SUWANNACOOCHIEE: SUWA

LIME RUN: LRUN

LIME SPRING: LSPR

LINE EATER: LEAT

7:30 UP AND PREPPING SAMPLE BOTTLES
TO COLLECT FROM ALL 6 ISCO'S THIS AM

LINE EATER 9:05 AM SITE LOOKS GOOD

TUBING IN PLAKE RIVER HAS RISEN ~8"

"BOTTLE 19 AT 12:00"

COLLECTED R-2 SAMPLES 1-18

REPROGRAMMED ISCO FOR R-3

"BOTTLE 1 AT 12:00 PM" 7-9-14

DID NOT TEST BATT THIS RUN.

WILL CHECK NEXT VISIT

SAW A LITTLE SKIFF HALF SUNK

BY RAIN, STOPPED TO NOTIFY THE OWNERS.

LIME SPRING 9:50 AM ALL APPEARS

WELL. "BOTTLE 19 AT 12:00"

DID NOT TEST BATT. COLLECTED

R-2 SAMPLES 1-18. RESET ISCO

TO "BOTTLE 1 AT 12:00"

SUWANNACOOCHIEE 10:05 AM ALL'S

WELL, "BOTTLE 19 AT 12:00" DID

NOT TEST BATT. ~~18M~~ 15+18 appear

R-2 SAMPLES 1-18 to be brownish

TOP OF ISCO FELL, PULLING WIRES

FROM BATT. TOM REPLACED CONN-

ECTORS. RE-PROGRAMMED ISCO'S

"BOTTLE 1 AT 12:00"

LIME RUN 10:30 AM ALL IS WELL

"BOTTLE 18 AT 12:00" COLLECTED

R-2 SAMPLES 1-17, 14+17

HAVE A SLIGHT BROWN CAST, DYE?

TURBIDITY?

REPROGRAMMED "BOTTLE 1 AT 12:00"

ELLAVILLE 11:15 AM ALL IN PLACE

"BOTTLE 20 AT 12:00"

COLLECTED R-1 SAMPLES 1-19

REPROGRAMMED "BOT. 1 AT 12:00"

ANDERSON 11:35 AM "BOT. 23 AT 12:00"
 COLLECTED R-1 SAMPLES 1-22
 SET ISCO FOR R2, BOTTLE 1 AT 12:00
 SAMPLE BOTTLE 18 HAD <200 ML.
 ENOUGH TO FILL THE VIAL THOUGH.
 WAITED FOR BOTTLE 1 AT 12:00
 SAW THE SAMPLE DRAWN, LOOKS GOOD

CHECKED ON LIME RUN AT 2:45 PM
 LOTS OF TURBIDITY. PULSES
 AFTER RAIN. VERY TURBID NOW

ANDERSON 3:05 PM "BOTTLE 2 AT 16:00"
 HEADED BACK TO PEPE'S FOR
 LATE LUNCH.

LIME RUN: 7:25 PM. RIVER APPEARS
 TO HAVE RISEN ABOUT A FOOT, AS
 WELL AS LIME RUN. THAT COMBINED
 WITH THE RIVER WASHING BACK
 INTO THE MOUTH OF LIME RUN
 PROMPTED US TO MOVE ISCO + BATT
 TO HIGHER GROUND FURTHER
 "UP RUN" "BOTTLE 3 AT 20:00"
 ALSO CHECKED LIME SPRING.
 BOTTLE 3 AT 20:00

8 SEP 2014

WALKED INTO THE DRAW BEHIND OUR
 CABIN TO SEE A FAMILY OF DEER.
 MAMA, 2 YEARLINGS, AND A TAG ALONG
 YOUNG. BVCK. TOM SAID L RUN IS
 RUN IS MUCH CLEARER THIS AM.
 THE RIVER HAS CONTINUED TO RISE

ANDERSON 9:20 AM THE RIVER IS UP.
 DRAMATIC COLOR CHANGE TO MUDDY
 RED/BROWN TURBIDITY. THE SPRING
 ITSELF IS COVERED IN DARK RIVER
 WATER, AND ONLY IDENTIFIABLE
 BY THE BOILING WATER. HOPEFULLY
 THE HOISING IS STILL PULLING UP
 SPRING WATER. "BOTT 7 AT 12:00"
 MET A LOCAL NAMED LENNY WHOSE
 SISTER AND MOTHER WITNESSED A
 "BLACK PANTHER" NOT FAR FROM
 ANDERSON. POSSIBLY A JAGUAR?
 DROVE DOWN TO THE WITHALACOOZEE
 WHICH IS STILL QUITE CLEAR. FLOWING
 SLOWER THAN LAST WEEK (PROB.
 DUE TO THE JUANNEE RISING)

MET KATIE + KIRSTYN AT ONEALS
IN MADISON. ~1:00 PM

TARA + ROBBIE FROM GRNMD CALLED,
THEIR GO

LIME SPRING 6:00 PM "9 AT 20:00"
OVER A FOOT ABOVE WATER LEVEL

ANDERSON 7:30 PM "9 AT 2000"

9 SEP 2014

RIVER STILL RISING.

LIME SPRING 9:00 AM
"BOTTLE 13 AT 12:00" MOVED
ISCO + BATT TO HIGHER GROUND
REPLACED TUBING WITH LONGER
PIECE. RECONFIGURED ISCO FOR
6 FT OF HEAD. BATT V: 12.40

LIME RUN 9:15 AM TUBING CAME OFF
OF THE ROCK, SAMPLE 12 AT 8:00
MAY NOT HAVE COLLECTED.

LIME RUN 5:45 PM

- BATT VOLTAGE: 12.75
- "BOTTLE 15 AT 20:00"
- TOM COLLECTED A HAND SAMPLE
AT 17:45 HRS.
- L RUN GRAB 01

LIME SPRING 5:55 PM

- BATT VOLTAGE 12.40
- "BOTTLE 15 AT 20:00"

ELLAVILLE 6:20 PM

- BATT VOLTAGE 12.83
- "BOTTLE 15 AT 20:00"

SUWANNOOCHIEE 6:40 AM

- BATT VOLTAGE 12.85
- "BOTTLE 15 AT 20:00"

10 SEP 2014 TG/KW

LIME RUN 7:45 AM

RIVER WATER IS CREEPING UP
LEFT BANK.

LIME RUN 9:20 AM "BOTTLE 19 AT 12:00"

COLLECTED R-3 SAMPLES 1-11

12/13/14 NO SAMPLE HOSE OUT 15-18

BATT VOLTAGE: 12.74

RESET ISCO FOR R-4 "BOTTLE 1 AT 12:00"

LIME SPRING 9:45 AM "BOTTLE 19 AT 12:00"

COLLECTED R-3 SAMPLES 1-18

SAMPLE 13 DO NOT HAVE A FULL 200ML

COLLECTED ABOUT 1/4 OF VIAL 13.

BATT VOLTAGE: 12.38

RESET ISCO FOR R-4 "BOTT 1 AT 12:00"

ANDERSON 10:35 AM "BOTTLE 19 AT 12:00"

COLLECTED R-2 SAMPLES 1-18

SAMPLE 10 WAS ALMOST EMPTY. WAS
ABLE TO COLLECT ~ 1/4 VIAL

BATT VOLTAGE: 12.80

RESET ISCO FOR R-3 "BOTT 1 AT 12:00"

ELLAVILLE 10:55 AM "BOTTLE 19 AT 12:00"

COLLECTED R-2 SAMPLES 1-18

ALL SAMPLES APPEAR NORMAL

BATTERY VOLTAGE 12.89

RESET ISCO FOR R-3 "BOTT 1 AT 12:00"

SUWANNACOCHEE 11:25 AM

"BOTTLE 19 AT 12:00"

COLLECTED R-3 SAMPLES 1-18

BATTERY VOLTAGE 12.83

RESET ISCO FOR R-4 "BOTT 1 AT 12:00"

LINE EATER 12:35 PM

"BOTTLE 20 AT 16:00"

COLLECTED R-3 SAMPLES 1-19

1-10 CLEAR, 11-19 COLORED, SPRING
IS POSSIBLY BACK SIFTING

BATTERY VOLTAGE 12.54

LSPR 12:05 PM

RAN INTO AIR + WATER RESEARCH
TEAM, TAKING FLOW MEASUREMENTS
17.7 CFSCHARCOAL PACK RETRIEVED
DEPLOYED

LIME RUN

DYE PACK RETRIEVED
DEPLOYED

ELLAVILLE

DYE PACK RETRIEVED
DEPLOYED

SUWANALOOCHIEE

DYE PACK RETRIEVED
DEPLOYED

STOPPED AT WALMART ON WAY TO
LAKE CITY. PICKED UP SMALL COOLER,
ICE, BAGGIES. ON THE WAY TO
SHIP DYE PACKS TO OZARK.
OVERNIGHTED DYE PACKS FROM
THE FOUR CLEAR SPRINGS (LRUN, LSPP,
ELLA, SUWA) TO OZARK AT 3:50 PM.

11 SEP 2014

ELLAVILLE 12:55 PM

BATT V: 12.81

"BOTTLE 8 AT 16:00"

SUWANALOOCHIEE 1:15 PM

BATT V: 12.82

"BOTTLE 8 AT 16:00"

ANDERSON 3:10 PM

BATT V: 12.81

"BOTTLE 8 AT 16:00"

LIME RUN 4:15 PM

BATT V: 12.73

"BOTTLE 9 AT 20:00"

LIME SPRING 4:30 PM

BATT V: 12.38

"BOTT 9 AT 20:00"

SPRING WATER IS TINGED W/ TANNING

12 SEP 2014 TG/KW/CN

ELLAVILLE 11:55 AM

"BOTTLE 13 AT 12:00 PM"

WAITED FOR SAMPLE 13.

COLLECTED R-3 1-13

BATT VOLTAGE: 12.72

RESET ISCO FOR R-4

"BOTTLE 1 AT 16:00"

ANDERSON 12:20 PM

"BOTTLE 14 AT 16:00"

COLLECTED R-3 1-13

BATT VOLTAGE 12.77

RESET ISCO FOR R-4

"BOTTLE 1 AT 16:00"

SWANNACOCHEE 12:45

"BOTTLE 14 AT 16:00"

COLLECTED R-4 1-13

BATT VOLTAGE 12.81

RESET ISCO FOR R-5

"BOTTLE 1 AT 16:00"

THE WATER IN THE SPRING IS

DARK BROWNISH COLOR!

15 SEP 2014 TG/KW

LEFT FGS AROUND 5:00 PM

- DROVE TO SUW COUNTY, STOPPED

AT PUBLIX FOR SUPPLIES

- SUW STATE PARK AT 8, CABIN 5

16 SEP 2014 TG/KW

LINEATER 10:30 AM

- BATT VOLTAGE 12.50

- SPRING IS DISCHARGING. WATER
IS COLORED WITH TANNINS

- "24 SAMPLES DONE"

- ALL 24 SAMPLES PRESENT

1 IS DARKEST 1-23 GRADUALLY
GET CLEARER AND 24 IS
SOMEWHAT DARKER THAN 23

LINE SPRING

~~ELLAVILLE~~ 11:11 AM

"DONE SAMPLING 24 BOTTLES"

- WARNING: REPLACE TUBING

- ELLA IS VERY CLEAR NOW

BATT VOLTAGE: 12.34

- SAMPLE 2 WAS DRY SAMPLE

14 SMALL AMOUNT COLLECTED.

1/4 VIAL

15 SEP 1

SUWANNA COOCHIE 11:30 AM

"SAMPLE 24 AT 12:00"

BATT VOLTAGE: 12.76

SAMPLES 1-23 COLLECTED R-5

"SAMPLE WAS DARK, THEY
GRADED INTO CLEARER WATER
WITH THE EXCEPTION OF
10, 12, 14, 18 = ALL DARK
RAINING, LIGHTNING, SO MUCH
WE LOADED UP AND BOTTLED
SAMPLES ON PORCH. ISCO #4

LIME RUN: 11:45 AM

"DONE SAMPLING"

ALL 24 SAMPLES R-5 COLLECTED

BATT VOLTAGE: 12.76 ISCO #5

ANDERSON 4:15 PM

"DONE SAMPLING, BOAT 24"

BATT VOLTAGE: 12.75

TAKING BACK TO CABINS TO
REMOVE SAMPLES OUTSIDE OF
RAIN & LIGHTNING.

ALL 24 SAMPLES CLEAR & COLLECTED

SAW WICKHAM'S. NO PEPPER

SOME WATER IN BOTTOM OF ISCO #7

ELLAVILLE 4:45

"DONE SAMPLING BOAT 24"

BATT VOLTAGE: 12.84

ALL 24 SAMPLES CLEAR &
COLLECTED

5:30 PM ALL SAMPLES SECURE
IN FRIDGE.

ALL SIX ISCO'S & BATTERIES
ACCOUNTED FOR!

17 SEP 2014 MILEAGE 149

UP AT 8:00 AM 7:30 AM, PACKED, LEFT
BOAT A SRSP AND HEADED FOR
A 10:00 AM MEETING AT SPWMD
WITH ERIC MARZOLF

BACK AT FGS AT 3:00 PM

UNLOADED, BROUGHT BOAT
TO WAREHOUSE

SUWANNACOOCHEE 11:30 AM

"SAMPLE 24 AT 12:00"

BATT VOLTAGE: 12.76

SAMPLES 1-23 COLLECTED R-5

"SAMPLE WAS DARK, THEY
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10, 12, 14, 18 = ALL DARK
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WE LOADED UP AND BOTTLED
SAMPLES ON PORCH. ISCO#4

LIME RUN: 11:45 AM

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BATT VOLTAGE: 12.76 ISCO#5

ANDERSON 4:15 PM

"DONE SAMPLING, BOAT 24"

BATT VOLTAGE: 12.75

TAKING BACK TO CABINS TO
REMOVE SAMPLES OUTSIDE OF
RAIN & LIGHTNING.

ALL 24 SAMPLES CLEAR & COLLECTED

SAW WICKHAM'S. NO PEPPER

SOME WATER IN BOTTOM OF ISCO#7

ELLAVILLE 4:45

"DONE SAMPLING BOAT 24"

BATT VOLTAGE: 12.84

ALL 24 SAMPLES CLEAR &
COLLECTED

5:30 PM ALL SAMPLES SECURE
IN FRIDGE.

ALL SIX ISCO'S & BATTERIES
ACCOUNTED FOR!

17 SEP 2014 MILEAGE 149

UP AT 8:00 7:30 AM, PACKED, LEFT
BOAT A SRSP AND HEADED FOR
A 10:00 AM MEETING AT SRWMD
WITH ERIC MARZOLF

BACK AT FGS AT 3:00 PM
UNLOADED, BROUGHT BOAT
TO WAREHOUSE

SEP 30th 2014 TG/KW

11:08 AM DEPART FGS FOR SUWA BASIN

3:36 PM FANNING SPRINGS

4:30 PM MANATEE SPRINGS

DEPART 5:45

9:45 AM ARRIVED AT SUWA ST PARK

SRSP: 3101

~~SEP~~ OCT 1 2014 TG/KW

UP AT 8:30 AM, TRIED SPAM FOR THE FIRST TIME ~~GO~~

9:30 AM HEADING TO O'BRIEN ~~FOR~~ TO

MEET MS. MARY DANIELS

TO GET SITE ACCESS

11:00 AM REGISTERED SINK, HAS SLOW

VORTEX IN CENTER. WATER

HAS TANNINS, ~~WATER~~ STILL CLEAR

* POTENTIAL RELEASE SITE

RHODAMINE

MET VICTOR BRADOW, DALE'S OLDER

BROTHER. HE BELIEVES DYE

WILL COME THROUGH LITTLE

RIVER BASED ON OLD

ANECDOTES AND PERSONAL

EXPERIENCE

Brian Thomas 386 397 9187

BRADOW, DALE

WENT TO SEVERAL CS ON

PROPERTY. MOST DRY. 1 WITH

STAGNANT TURBID WATER

1 V SMALL (DIAMETER) SINK WITH

A PUMP IN IT MAY HAVE ACTIVE

FLOW.

MEET WITH WILL & AMANDA JOHNSON

- CALL # WILL (386) 697-8099

- RD 200, PICS ON TOM'S PHONE

- FLOWING AT ~ 10 CFS

* WINNING RELEASE SITE!

- VERY TANNED WATER, FLOURACNE

Stopped at Little River, water is up
about 2'. Green Cast to it.

Stopped at Karst Env. met Pete Butt
and Tom Morris. Picked up
about 30 charcoal packs
* inventory at office!!

Headed on to High Springs
for dinner at Outdoor Cafe

2nd Oct 2014 TG/KW

10:30 AM STOPPED AT WALMART
FOR SUPPLIES

11:15 AM Johnson Place

Cleaned trash out of sink
photographed it.
Walked up run to giant
spring (dry) hole in the ground
about 60-70 feet deep.
Break for a lunch on the
road. Driving to Hancock's

2:35 PM Hancock Place Judy & Lee

The electric pole in their
yard is stained from water
about 17 feet up...

Judy says the water
rose that quickly in a span
of 2 hours.

She said Swan on 252 also
flooded.

Water cleared/draind in
4 days

Jason at Jason's Welding
has a large sinkhole

on his property, saw white
(presumably sediment)
bubble to the surface and
then the sink "flushed"

* Find FWK contact for
Mrs. Hancock to get aerial
photos of their land during
flood (Debbie, 2012)

During the flood, the
water went from shin deep
to chest deep in 4 mins.

* scorpionairboats@windstream.net
youtube ↑ + airboat africa

MONDAY OCT 6th 2014 TG/KW/LH

LEAVE FGS AT 4:30 PM HAGESETH
FOR LAFAYETTE BLUE PARK
ARRIVE AT 9:00 PM, LOCKED OUT;
TOM GOT KEYS FROM PARK MGR
JEN MILLER.
IN HOUSE AT 9:30 PM

TUES OCT ~~6~~ 7th 2014 TG/KW/LH

UP AT 8 AM.
HIT UP THE LBSP SHOP TO
RETROFIT A GARBAGE CAN
AS CAMO/PROTECTION FOR
OUR ISCO AT LITTLE RIVER
SUCCESS! →



TROY 2:25 PM

ISCO #4

BATTERY VOLTAGE: 12.77

START SAMPLING 10/8/14 AT 12:00

DEPLOYED NEW CHARCOAL
PACK, OLD PACK WAS NOT LOCATED

MEARSON SPRINGS 3306 1st GATE

1127 2nd GATE

(CONTACT LANA MORGAN PROVIDED)

ABOVE INFO, GAVE SITE ACCESS

LIVES AT SUN ROAD NEAR 4
HARDENBERG KEY

WAYNE REGISTER 935-0279 (863)

LITTLE RIVER 6:00

SET UP ISCO #5

BATT

START 10/8/14 AT 12:00

SAW 3 SCUBA DIVERS ENTER
LR CAVE.

AS WE FINISHED THEY CAME
INTO THE MOUTH OF THE
VENT WITH THEIR LIGHTS.

V COOL. FINISHED AT 7:45 PM

8 OCT 2014 TG/KW/CH

UP BY 8AM

MEARSON SPRING 9:30 AM

DEPLOYED ISCO # 2

BATT S1

SET FOR SAMPLE 1 AT 12:00 PM 10/8/14

LOCK 1 3306 CARBON R-1 DEPLOYED

LOCK 2 1727 ADDL CARBON AT
END OF HOSE "R-TUBE"

LITTLE RIVER 11:00 AM

ISCO STILL INTACT,

SECURED HOSEING

LOOKED FOR CARBON PACK,

NOT FOUND

DEPLOYED FRESH CARBON PACK

12:30 PM MEET WITH REGISTERS

IN TALKING WE REALIZED

THE SINK WE LOOKED AT ON

THEIR SITE IS A SMALLER ONE

WILL CHECK LARGER ONE THIS

AFTERNOON

386 965 7585

2:52 PM REGISTER SINK

57 lbs of Rhodamine WT

DEPLOYED.

SENT THROUGH PVC,

NEVER SAW DME UNTIL

RINSING PIPE + FUNNEL

APPEARS TO HAVE SIPHONED

IMMEDIATELY

JOHNSON SITE ACCESS OBTAINED

FROM WILL JOHNSON

30 lbs FIDORESCEIN

DEPLOYED AT 4:55 PM

SINK WATER LEVEL HAS

DROPPED 3-4 FT IN LAST

COUPLE OF WEEKS.

CLEANED UP SITE

NOTE * DRILL DID NOT PERFORM

UP TO PAR. TEST BATTS WHEN

HOME.

NOTE 2 * CAMERA BATT WAS

FULLY CHARGED YET DIED

WITHIN 5 MINS. TEST!!

BACK TO CABIN 11:30 PM

9 OCT 2014

TROY 11:00 AM

"BOTTLE 3 AT 12:00 PM"
FOUND A TINY BABY TURTLE
ROUGHLY NICKEL SIZED!

LITTLE RIVER 12:30 PM

ALL APPEARS TO BE IN
WORKING ORDER

SAW TARA FROM SRWMD
SETTING UP TO TAKE
A FLOW MEASUREMENT
WITH ADCP (ACOUSTIC DOPPLER
CURRENT PROFILER).

WE RAN THE COMP FOR
HER WHILE SHE RAN THE
EQUIPMENT

STEP 1 MOVING BED TEST.

TEST IN AREA WITH GREATEST
FLOW V (USUALLY DEEPEST SPOT)

TEST FOR 5 MINS.

STEP 2 ENTER BANKSIDE, L OR R

DISTANCE FROM WATER'S

EDGE NEED 2 GOOD BINS

AND 10 ENSAMBLE BEFORE

MOVING. TAKE MIN. OF 3 MINS TO
REACH OTHER BANK. REPEAT 4X



WHILE WE HELPED WITH ADCP.
CAROL + TOM PICKED UP THE
BOAT + TAHOE AND CHECKED
OUR INTRODUCTION SITES.

NO TRACE OF DYE VISIBLE.
LR FLOW MEASUREMENT
AVG. 81.447 CFS.

LEFT PICKED UP GAS +
HEADED FOR MEARSON.

MEARSON 4:00 PM.

"BOTTLE 4 AT 8:00"

ALL'S WELL.

FORGOT TO NOTE, WE
HAD COPIES OF MEARSON
GATE KEYS MADE THIS
MORNING.

HEADED HOME.

FGS: 6:30 PM. UNPACKED
LEFT AT 7:00 PM

15th OCT 2014 TH/KW

LEFT FGS AT 8:00 AM

11:07 AM MEARSON

"BOTTLE 15 AT 12:00"

BATT: 12.64 V

RIVER LEVEL HAS DROPPED
IS NOW BELOW BOTTOM STEP
BY ~ 6"

R-1 SAMPLES 1-14 COLLECTED
ISCO REPROGRAMMED FOR

"BOTTLE 01 AT 12:00"

COLLECTED CARBON R-1 AT 11:20 AM
R-2 DEPLOYED

12:00 PM TROY

"BOTTLE 16 AT 0:00"

BATT:

RIVER LEVEL HAS DROPPED

R-1 SAMPLES 1-15 COLLECTED
ISCO REPROGRAMMED FOR

"BOTTLE 01 AT 0:00"

COLLECTED CARBON R-1 AT 12:

R-2 DEPLOYED

MET JEN MILLER + AMY

SAMPLE 15 WAS A FULL
BOTTLE, ALL OTHERS NORMAL

OVERSTREET
ED 1 or 2

3:30 LITTLE RIVER

"FATAL ERROR! DISTRIBUTOR
JAMMED!"

ISCO MALFUNCTIONED SAMPLES

1-13 COLLECTED BUT ALL BOTTLES
WERE OVERFILLED, FLOODING.

R1 1-13 COLLECTED

GARBAGE CAN DRAINED,

BATTERY CLEANED AND DRY.

ISCO REPROGRAMMED FOR

"BOTTLE 01 AT 0:00"

COLLECTED CARBON PACK

PULLED UP ROCK, TAPE HAD

BEEN BUSTED, CARBON PACK

HAD BEEN PULLED OFF.

TOM WENT BACK DOWN AND

FOUND CARBON PACK. WOOT!!!

R-2 DEPLOYED

BACK AT FGS 7:00 PM

10/29/14 KK/KW

DEPART FGS AT 8:15 AM

STOP FOR ICE 8:45 AM

11:00 AM TROY

"FATAL ERROR DISTRIBUTOR JAMMED"

Bottle 1: ~300 mL

Bottle 2: ~500 mL R-3 1-13 COLLECTED

Bottle 3-10 = FULL

Bottle 11: ~200 mL BATT: 12.67 V

Bottle 12: ~FULL

Bottle 13: ~200 mL

Tested a manual sample

RESET ISCO FOR R-4 AT 12:00 PM

SET SAMPLE SIZE TO 100 mL

CARBON PACK RETRIEVED / DEPLOYED

12:30 PM MEARSON

BATT 12.54 V

"BOTT 17 AT 0:00"

R-3 1-16 COLLECTED

CARBON PACK COLLECTED /

DEPLOYED

RESET ISCO TO R-4 AT 0:00

SAMPLE 1 AT 0:00

SAW AN ARMADILLO!

1:40 PM LITTLE RIVER

"FATAL ERROR DST. JAMMED"

9 SAMPLES TAKEN, ALL OVER
FILLED. MANUAL SAMPLE RUN, OVERFILL
LOWERED HEAD TO 8 FEET

REDUCED TUBE LENGTH TO 25 FEET

MANUAL SAMPLE #2: STILL OVERFILLED

BATT: 11.66 V

COLLECTED R-3 1-9

CARBON PACK RETRIEVED /

DEPLOYED

HEADED BACK AROUND 3:00 PM

STOPPED FOR SUBWAY IN MAYO

BACK AT FGS 6:00 PM

3rd NOV 2014

LEFT FGS AT 10:00 AM

STOPPED AT WINNIKIE

FOR SUPPLIES;

GATORADE WATER

& BAGGIES.

* NEED A VOLT METER !!

ATE SNACKS FOR LUNCH ON
THE ROAD.

MET TARA AT LITTLE RIVER
AT 2:00 PM

FIRST STOPPED AT LAF.

BLUE, GOT CABIN KEYS,

UNLOADED, THEN PICKED

UP ISCO AND BATT. FROM
WORKSHOP

LITTLE RIVER 2:00 PM

"BOTTLE 11 A 0.00"

PRaise THE LAND: NO

"FATAL ERRORS.

ALL BOTTLES OVERFILLED,

ISCO OVERFLOWING

R-4 SAMPLES 1-10 COLLECTED

REPLACED ISCO # WITH

SCO #

RESET FOR R-5

BATT: 12.54 V

(READING MUST HAVE BEEN
OFF LAST WEEK DUE TO WATER?)

DID NOT CHANGE BATT AS
UNNECESSARY

TOOK FLOW MEASUREMENT
WITH TARA USING A
PRIME METER

KATHIE WALKED THE POLE
ACROSS IN WADERS.

MEASUREMENTS ARE TAKEN
AT 0.6 FROM SURFACE

IF 0.5-3.0 FT DEEP AND
0.2 + 0.8 IF 3 ft +.

20 MIN MEASUREMENTS MIN.

FINISHED AND GOT DINNER.

HEADED HOME

BACK TO CABIN AT 8:00 PM
40 SECS. PER POINT.

4th NOV 2014

JP AT 9:00 AM

MET TARA AT TROY AT 10:30 AM

TROY 11:00 AM

"FATAL ERROR DIST. JAMMED"

SAMPLES 1-3 NORMAL

H-11 OVERFILLED

R-4 1-11 COLLECTED

RESET ISCO

FOR SAMPLE 1 AT 13:00

LOWERED HEAD TO 6'

TOOK MANUAL SAMPLE: NORMAL

ROYAL: 12:45

FOLLOWED TARA TO
ROYAL TO TAKE A FLOW
MEASUREMENT. RUN WAS
AT ~1.3 FT DEPTH.

USED PYGMY PRICE METER.

I TOOK MEASUREMENTS

WHILE KATE RECORDED THEM

MUCK BOOTS KEPT MY

TEE DRY!

AFTER TROY (BEFORE ROYAL)

WE ATTEMPTED TO ACCESS
MEARSON FROM THE RD.

THE SECOND GATE LOCK

WAS EITHER JAMMED OR

LOCK CODE HAS BEEN

CHANGED IN LIEU OF

SEEING PICKUP TRUCK &

4 WHEELER (SUSPECTED

TO BE LANDOWNER KELLY

MORGAN'S BUT NOT

MAKING CONTACT WITH

HIM, WE FELT WALKING

IN MIGHT BE BRAZEN

FORTUNATELY TARA

HAS A FRIEND WITH

A PLACE DIRECTLY

ACROSS FROM MEARSON

ON THE RIVER. ALSO TARA

CONVENIENTLY HAD HER

KAYAK...

2:30 MEARSON

LAUNCHED KAYAK FROM
ACROSS RIVER

ALL SEEMS WELL.

SAMPLES 1-12 TAKEN

"BOTTLE 13 AT 000"

SAMPLES 7 + 9 ARE

ABOUT 3/4 FULL

ALL OTHERS NORMAL.

R-4 1-12 COLLECTED

ISCO RESET FOR R-5

"SAMPLE 1- AT 0.00"

KAYAKED BACK, SUCCESS!!

LEFT ~3:30 PM.

STOPPED IN OBRIEN

FOR COFFEE.

STOPPED IN PERRY

FOR GAS

BACK AT FGS 6:15 PM

NOV 12TH TG/KW

4:00 LEFT FGS

STOPPED AT JAMES TO PICK
UP AMC STAND PROTOTYPE

NOV 13TH TG/KN

6:00 AM WAKEUP

7:00 AM LEAVE FOR SI XVI

STOPPED FOR B. FAST SAMMIES
IN LURAVILLE

8:00 AM ARRIVE AT CAMP WOOD
FOR STURGEON IMMERSION XVI

JOHN PINGES - SRWMD

ASST EX. DIRECTOR

WMD GOVERNED BY A BOARD
OF "VOLUNTEERS" APPOINTED BY
THE GOVERNOR

MEGAN WEATHERINGTON - SRWMD

41 RAIN GAGES

200+ GROUNDWATER WELLS

~80 SURFACE WATER SITES

~60 " " QUALITY SITES

~30 GROUND " " "

MY SUWANNEE RIVER. COM

BOB KNIGHT - FL SPRINGS INST.

HEALTHY SPRINGS DOMINATED BY
MACROPHITES

ABOUT 200/10/ACRE NITROGEN APPLIED
C&W CARRIES ABOUT 3.4/10/ACRE WTD
AQUIFER

~1 TONNE N: IN FLOWS OUT OF WAKULLA
3-4X IN SUWANNEE DAILY DAILY

KEN SULAK - USGS

STURGEON NEED HIGH DO
3.5 mg/L

KATIE GLODZIK - PHD UF

1:00 PM LUNCH WITH JILL HEINRICH
OUTDOOR CAFE

2:45 PM MET WITH PETE AT KES

HE RECOMMENDED A LONGER
PIECE FOR THE ACM TO

ATTACH TO IN CASE OF SILT
ALSO 2+ SETS OF SHORT
LEGS. (18" - 24")

MAKE 2 MED EXTENSIONS
AND 1 TALL EX.

REPLACE PINS HOLDING ACM
WITH BOLTS

FOR EXTENSIONS DRILL
SIMI MULTIPLE SETS OF HOLES (6" APART)
SO HEIGHT IS HIGHLY
CUSTOMIZABLE

* 3/8" SS BOLTS ARE IDEAL
ADD NUTS OR WASHERS TO MAKE
ACM SNUG IN FITTING
NOTCH GEAR UNDER LEGS
FOR A GREATER RANGE OF
MOVEMENT UNDER LEGS.
SPRINKLER DONUTS + ZIPTIES
TO RUN CABLES.

* CHECK HOW FALMOUTH
METERS TAKE FLOW
POINT VELOCITY? OR CROSS SECTION

* BRING A 120 GENERATOR
FOR INSTALLATION OF ACMS

LRV, CANT RUN CABLES
CALL KEVIN LOCKWOOD AND
ASK FOR DETAILS ON ACM IN
GINNIE, MAINLY BATT PACK

ITENARARY

- 1 PEACK + LAFAYETTE BLUE
- 2 FALMOUTH + CONVICT
- 3 LRV

DO NOT DISTURB ^{OR PLACE}
SIGNAGE: PLEASE DON'T TIE OFF LINE
RESPONSIBLE AGENCIES
* DO NOT PLACE OR TIE OFF LINES
ON THIS DEVICE

3/8" BOLTS FOR THE LEGS.

BLACK WIERTIES (LONG)

RUSTOLEUM 95% GALVANIZED
BLACK, GREEN, DARK PRIMER

NOV 14TH TG/KW

MEARSON 10:25AM

"BOTTLE 20 AT 12:00" R-5 1-20
RESET FOR R-6 COLLECTED

"BOTTLE 1 AT 12:00"
CARBON R-4 COLLECTED
R-5 DEPLOYED.

F

E TROY	2.16	R	4.28
MEAR	3.77	R	-
LRV	3.07	R	20.0

ERICH: (386) 688-0866
CELL

TROY 11:30 AM BATT: 12.46 V
"FATAL ERROR DIST. JAMMED"
R-5 1-8 COLLECTED
3 + 5 WERE 100 ML
ALL OTHERS OVERFILLED
CARBON R-4 DEPLOYED
COLLECTED R-5 DEPLOYED
RESET ISCO FOR R-6
BOTTLE 1 AT 0:00

LRV: 12:00 PM

"BOTTLE 23 AT 0:00"

B SAMPLE 6 DRY
8 SMALL AMT
VIAL 1/4 FULL
9+10 DRY
11 SMALL AMT
VIAL 3/4 FULL
12 SMALL AMT
BUT FULL VIAL
14 SMALL AMT
ONLY FEW DROPS
15 SMALL AMT
A DROP
16-21 DRY
22 SMALL AMT
1/4 VIAL

BACK AT 5:00 PM FGS

17 NOV 2014

6:30 PM LEAVE FGS

STOPPED FOR DINNER AT
A MEXICAN RESTAURANT
IN MONTICELLO
NEW BEST! BEATS PEPE'S!

MADE IT TO DAN SWANNEE
AT 10:00 PM

18TH NOV 2014

PAUL

1.5"
x 3/8" x 12' 12.63/ft 100' ~~\$186.67~~
\$1,364.04

1.5"
3/16" x 12' 4.60/ft 60' \$276

4" x 1/4" x 12' 12.30/ft 12' \$147.6

1.25"² tubing x 20' 6.90/ft 40' \$1276

1"² tubing x 20' 5.47/ft 40' 218.8

\$2,282.80

MEARSON 11:20AM

"BOTTLE 10 AT 0:00"

BATT: 12.30 V S1

COLLECTED CARBON PACK

R-TUBE (10/08-11/18)

R-6 SAMPLES 1-9 COLLECTED

SAMPLES 02 & 09

ABOUT 2/3 FULL (~600ML)

ALL OTHERS NORMAL

BROKE DOWN ISCO TO BRING

BACK TO FGS

TROY 12:30 PM

"FATAL ERROR DIST. JAMMED"

BATT: 12.45 V

R-6 SAMPLES 1-6

COLLECTED 1-5 OVERFILLED

SAMPLE 6 ~ 200 mL

BROKE DOWN/COLLECTED BCO

LEFT TUBE & CARBON.

MEARSON 1:00 PM

MET TARA TO TAKE FLOW MGMT
USING ADXP.

70.910

72.545

72.937

70.250

AVG:

71.66

LITTLE RIVER: 4:00 PM

"SAMPLE 09 AT 0:00"

R-6 SAMPLES 1-8 COLLECTED

BROKE DOWN BCO TO BRING

BACK TO FGS

19TH NOV 2014 TG

9:00 AM GIBSON PARK

MET CHUCK BARNETT WHO
WORKS FOR PARKS AND
IS OVERSEEING RAMP
CONSTRUCTION

12:30 PM SRWMD

MET WITH ERIC, TARA
AND EDWIN

FLORIDA WILDLIFE CORRIDOR
MEETING / PADDLE TRIP
AT STEINWATCHEE FALLS (A)

1/31/15

GOT SRWMD LAND MAPS FROM
EDWIN

MET WITH ERIC

HEADED TO PEACOCK WITH
TARA

1:00 PM STOPPED AT P1 P2 P3

P3 IS SITE FOR ACM INSTALL
OLSEN & ORANGE GROVE

5:00 PM STOPPED AT ROYAL

THEN HEADED TO PUBUX

AT 6:00 PM

20TH NOV 2014

UP AT 7:00 AM BREAKFAST
THEN CLEANED UP CABIN
HEADED TO ANDERSON

9:30AM ANDERSON

BACK TO CLEAR. WATER
LEVEL HAS DROPPED FRESH
WITH FLAT ROCK.
TUBING IS GOOD.
SAW A BIG BUCK BY THE
INTERSTATE.

11:00AM SUWANNEE SPRINGS

BATHHOUSE WALLS ARE DRY
SOME WATER FLOWING IN
SPRING

12:30PM STOPPED FOR LUNCH IN
JASPER
STOPPED AND SPOKE TO
COTTON FARMERS

1:45 PM CALLED KELLY SHEETMETAL
TOM SPOKE WITH RICK

FANNING GATE: #5545

CABIN #

2:00 PM DEAD RIVER DR GATE: 1006

ALAPAHA IS IN POOLS NOT
FLOWING. DEAD RIVER IS
VERY LOW.

WALKED RIVERBED TO ITS
TERMINATION IN A SWALLET.
VERY DRAMATIC!

STRANGE GEOLOGY UP
HERE. LOTS OF HAWTHORNE.
HEADED TO FANNING.
ARRIVE AT 7:45 PM.
DINNER WITH MARK & ANNETTE.

21ST NOV UP AT 6:00AM

HEAD TO HOMASSASSA FOR
SPRINGS QUARTERLY
AFTER LUNCH. KATIE & I
WERE ABLE TO LOOK AROUND
THE PARK. ITS AWESOME!
HEADED HOME AROUND 4
BACK AT FGS 7:00 PM.

3rd DEC

9:30 AM LEFT FGS FOR SWW

11:00 AM STOPPED AT FNC IN

PERRY. TOM SPOKE WITH

RANDY ON THE PHONE.

HAYES

- SPRING CREEK IS PILOT AREA FOR SPRINGS MAPPING

PROJECT (TAYLOR COUNTY)

- AVAILABLE LIDAR, THERMOGRAPHY

AND A BUDGET PROPOSAL

POUNCEY'S FOR LUNCH

STOPPED AT LAF BLUE

1:45 PM NEARSON

COLLECTED CARBON PACK

TOOK UNDERWATER PHOTOS

3:00 PM TROY

MET TARA + ROBBY DOING A

FLOW MEASUREMENT WITH

THE ADLP. — RIVER

COLD DARK WATER HAS

CREPT UNDER GROUNDWATER

TOTALLY OBSCURING THE

CRACK. COLLECTED TUBING.

CARBON PACK WAS NOT ACCESSIBLE

LAF: 4856

DEC 17

DEPART FGS AT 5:45 PM

ARRIVE LAF BLUE 11:00 PM

18 DEC

3rd 1"

AM

ATE BREAKFAST

THEN SET UP

1ST TREESTAND

AT LAFAYETTE

BATTERY BOX FITS PERFECTLY!

2 bolts washers

locks + nuts.

18" board for UNDER

LADDER

NEED ↑

3:00 PM PEACOCK

SET UP NEXT STAND

AT PEACOCK

SAW CATFISH FROM

TROY.

→ WENT TO THE

LAF BLUE WORKSHOP

AND MODIFIED THE

MIDDLE LADDER PIECE

TO FIT AT THE TOP SO

WE CAN BRACE IT

AT LAF BLUE WHERE

WE ONLY NEED 1 LADDER.

19 DEC 2014 TG/KW/PB/ML

8:30 AM PETE & MARK ARRIVE.

9:00 AM LAFBLUE

DEPLOYED BATT #1

12/17 12.76V

ACM 1184

10:30 AM MARK & PETE IN THE WATER

MOORING DEVICE IN

THEN INSTRUMENT

THEN CABLE

12 DONUTS USED

MARK SAID INSTRUMENT

IS AT APP. 38 FT DEPTH

FINISHED AROUND 1:30 PM

TREE STAND UP!

WITH BATT

DEPLOYED ACM 1184

NO LEGS NEEDED

NUTS/BOLTS/WASHERS

NUTS IIII IIII IIII

BOLTS IIII IIII IIII

WASHERS

2:30 PM PEACOCK 3

BATT #2 12.86V

ACM 1187

No legs necessary

~250' CABLE USED

TREESTAND UP WITH

BOX SECURED AND

BATT INSTALLED

CABLE IS TIED A FEW

FEET ABOVE GROUND

IN CASE OF BEAVERS.

RAN OUT OF LIGHT TO

TRENCH CABLE

BACK AT FGS AT 9:30 PM

12/22/14

TG/KW

LEFT FGS AROUND 12:00

BOUGHT SUPPLIES TO

TRENCH + SECURE CABLE

AT PEACOCK.

STRUNG CABLE THROUGH

FLEXIBLE TUBING WHICH

WE THEN BURIED.

RAINED THE WHOLE TIME

BACK AT FGS AT 9:00 PM

05 JAN 2015 KW/TG

4:40 PM LEFT FGS FOR SRSP

9:00 PM ARRIVE AT SUWANNEE

06 JAN KW/TG

9:00 AM WIA UP FOR BREAKFAST,
CLEAN CABIN AND PACK

10:30 AM FALMOUTH

BROWN, TURBID, & REVERSED

* LOOK AT HISTORIC RIVER FLOOD
DATA TO COMPARE

TURBIDITY WOULD SUGGEST
ITS TAKING WATER FROM
WITHLACOOCHEE (PROB VIA
SUWANALOOCHIE + ELLAVILLE)

11:45 AM PEACOCK

ORANGE GROVE IS SAME
BROWN TURBID WATER
AS FALMOUTH (COINCIDENCE,
OR ??)

OLSEN IS ALSO BLACKED
OUT. P 1, 2, 3 ALL BROWN

TRIED TO CONNECT LAPTOP
TO ACM IN ORDER TO BOOT IT
UP. "NOT COMMUNICATING,"

TALKED TO SCOTT BARETT
AND FALMOUTH - NEITHER
OF WHICH WERE ABLE TO
DIAGNOS THE PROBLEM
WITHOUT REMOVING THE ACM
AND/OR CABLE FROM THE
SPRING. SPRING IS BLACKED
OUT & REVERSING, SO THIS
IS NOT CURRENTLY POSSIBLE
PICKED UP LUNCH FROM
LURAVILLE AND ATE AT
PEACOCK. RAN INTO A RANGER
NAMED RICHARD WHO OFFERED
TO LOOK INTO POSSIBLY
REMOVING A DEAD TREE
WITHIN CLOSE PROXIMITY TO
OUR SET UP.

BATT V.

3:30 PM LAFAYETTE BLUE

"YANA"

WATER IS UP SEVERAL
FEET. DUE TO BEING

UNABLE TO ENTRENCH
CABLE BELOW WATERLINE
WE DECIDED TO WAIT FOR A
LOWER STAGE TO BURY CABLE.
INSTEAD JUST RAN IT THROUGH
CONDUIT AND SECURED IT.

KATIE TESTED THE ACM
WITH THE COM CABLES
FROM PEACOCK, EVERYTHING
WORKED FLAWLESSLY.

THUS THE ISSUE AT P3
IS EITHER A PROBLEM
WITH THE ACM WHICH WE
BENCH TESTED JUST A
FEW DAYS PRIOR TO
INSTALLING OR THE
EXTENSION CABLE WHICH
WAS RECENTLY REFURBISHED
AND ALLEGEDLY TESTED BY
FALMOUTH.

WERE ABLE TO GET ACM
IN VANA SET TO RUN
HOURLY FOR 5 MINS
STARTING AT 6:00 PM.
MACHINE MADE US START
AT 1900 AS ITS PRDP ON DST.

P3 COORDINATES WERE
PROGRAMMED AS "PEACOCK
SPRINGS AT SUWANNEE"
VANA AS "LAFAYETTE SPRINGS"
IN THE SPRINGS OVERLAY
ARRIVED BACK AT FGS
AT 9:30 PM

13 JAN 2015

TG/KW

LEFT FGS 5:30 PM

STOPPED FOR DINNER

ARRIVED AT LAF BLUE

AT 11:00 PM

14 JAN 2015

7:30 AM WAKE UP

PACKED CAR & HEADED
TO SRWMD FOR MEETING
WITH ERIC, TARA, & TOM M.

WENT WITH TARA & INTERN
NAMED IRENE TO LAF
TO TAKE FLOW MSMT.

TOOK MSMT IN SNAKE

SINK = ~110.5 CES

ATE PB ON THE FLY

BACK AT DOWNLOADED DATA
FROM YANA ACM

27 JAN 2014

2

KW/KE

TR

8:00 AM LEFT FGS WITH KATIE
TO MEET TARA AT LAF
BLUE.

10:00 ARRIVE AT LAF BLUE
TOOK MEASUREMENT IN
SPRING RUN VIA KAYAK
MEASUREMENTS RANGED
FROM -50 TO -135 SPRING
STILL SIPHONING. ERRATIC
READINGS DUE TO EDDIES.
WENT TO CONVICT FOR
SITE ACCESS BUT SUSIE
WAS NOT IN.
HEADED BACK AROUND
3:30 PM

5:30 PM ARRIVED AT FGS

* TARA SAID PEACOCK IS OPEN
FOR DIVING AS OF FRI!!

31 JAN 2015

TG/KW

8:00AM LEFT FGS FOR SUWANNEE

10:15AM ARNE PEACOCK SPRINGS

MET TOM, TARA, AND MARK
AT P3.

TARA AND MARK DOVE
UP OLD CABLE WHILE
TOM KATIE AND I DUG
UP THE PORTION ON LAND.
WHY THEY THEN BROUGHT
THE NEW CABLE TO
PLUG INTO ACM WHILE WE
BURIED/SECURED IT.

TESTED, ALL GOOD
DEPLOYED FOR 1400 HR
EVERY 30 MINS AVG 5 MINS.
STOPPED FOR LUNCH IN
MAYE

BACK AT 7:00PM

5 FEB 2015 TG/KW

10:00AM

FGS LOADED SUPPLIES, DEPART
FOR SUWANNEE

12:45PM LAF BLUE

BATT 12.56 V

WAITED FOR 1PM MSMT,
THEN DID DATA DOWNLOAD.
SECURED CONDUIT WITH
DONUTS.

REDEPLOYED FALMOUTH
AT 1:15PM FOR
1:30PM MSMT

PEACOCK WALKED IN DUE TO
FLOODED RD.

CHECKED BATT, DATA DOWNLOAD,
REDEPLOYED FALMOUTH FOR
3PM MSMT.

CONVICT SITE ACCESS FORMS
SIGNED BY SUSIE.

SPRING IS ~10 FT UNDER
2014 FLOOD STAGE, STILL DARK

8PM RETURN FGS.

11 FEB 2015 TG/UC

6:00 PM LEAVE FGS (WH)
AFTER MOVING ALL DAY.
HEADING TO SUWANNEE
FOR FIELD TRIP FOR
AGS SECTION TO MORROW
ON OFFICIAL MOVING DAY.

9:00 PM ARRIVE SRSP.
GATE 0716 CABIN 5

7:00 AM WAKE UP, FRANK RUPERT,
TOM MIRTH + AMY
MET US AT SRSP 8:00 AM
WALKED TO LRUN THEN
HEADED TO FALMOUTH.
LRUN REVERSING BARELY,
STILL DARK. FALMOUTH IS
STAGNANT, DARK + TURBID
DEAD TURKEY IN FALMOUTH

10:30 AM PEACOCK

11:00 AM TREESTAND

BATT: 12.72 V

MARCH 4TH

TG/KW

3:30 PM DEPART FGS

DINNER IN MAYO. ARRIVE
CONVICT SPRINGS ~~11:30~~ 9:19 PM

MARCH 5TH

TG/KV/TR

7:30 WAKE UP MEET TARA
AT LAF BLUE AT 10:00 AM

TOOK DISCHARGE MSMT AT LAF
~178 CFS. BATT 12.46 V
DIO TOOK DATA DOWNLOAD

HEADED TO PEACOCK FOR DATA DOWNLOAD
BATT 12.69 V

STOPPED AT CONVICT TO DISCUSS
INSTALL WITH SUSIE.

8:45 PM RETURN FGS
UNLOAD 9:00 PM

MARCH 16TH

TG/KW

9:30 AM LEAVE FGS FOR WACISSA
MEETING WITH CONTRACTORS
& ARCHEOLOGISTS TO DISCUSS
HEADSPRINGS "RESTORATION".
TURBIDITY CONTROLS GO
IN TODAY. DREDGING
BEGINS NEXT MONDAY.

DREDGING FOR CANOE
LAUNCH TO BE 3.5-4.0'
FROM AVG WATER LEVEL.

* WILL FIND & COMPILE DATA
ON WATER LEVEL FOR THEM.
ESTIMATING 5-6 WEEKS FOR
BANK & DREDGING WORK.
AN EXTRA COUPLE OF WEEKS
FOR FENCING ETC.

"7-8 WEEKS IS AGGRESSIVE"

19 MARCH 2015 KW/SB

9:15 AM LEAVE FGS FOR SUN.

11:00 AM STOPPED AT FALMOUTH
STILL BROWN, BUT CLEAR!
OUTFLOWING!

RAN OVER TO SRSP
AND CHECKED LIME RUN,
ALSO "CLEAR" BROWN AND
FLOWING OUT.

LIME SPRING IS COVERED
BY RIVER AND LOOKED TO
BE STAGNANT OR TAKING
IN SOME WATER. TINY
VORTEX.

12:00 PM STOPPED AT SRWMD
PICKED UP CLIPPINGS FROM
WARREN. HEADED TO
PEACOCK.

12:45 PM PEACOCK. BATT 12.61V

7 APRIL 2015 → KATIE W.

9:00 AM MEET TARA AT LAF
BLUE

ADCP · COMPUTER SETTING
CONNECT GPS & RIV COM PORTS
USING PARAMIN
NEW MEASUREMENT
COMPASS CALIBRATION
ERROR = 0.8°

FIND MAX DEPTH = 9.5 FT
CHANGE IN CONFIG WIZ
START PINNING
SELECT MOVING BED TEST
AT LEAST FIVE MINUTES
NO ERRORS - CLOSE
START TRANSECT
AT LEAST 3 MINS

DATA DOWNLOAD AT
LAFAYETTE

VOLT: 12.29

CHANGED OUT BATT
REPLACED #1 FOR #3

7 MAY 2015

TG/KW

8:00AM LEAVE FGS FOR SUN.
STATE PARK.
GIVE PRESENTATION TO
PARK STAFF.

2:15 PM PEACOCK
ORANGE IS CLEAR
DATA DOWNLOAD
BATT 12.41 V

4:30PM LAF BLUE
DATA DOWNLOAD
BATT 12.57 V

8 MAY TG/KW/PB/ML

CONVICT SPRINGS
MEET PETE BUTT & MARK
LONG AT 9AM.

10:30 INSTALL ACM #1185
HAD TO PULL ACM TO
INSTALL CAPILLARY KIT.
REPLACED ACM.

8 MAY 2015

* NOTES ON CAVE, VIA
PETE.

FLOOR 21 FT

CEILING 17 FT

VNH AT 19 FT

BASED ON STAGE OF 6.88 FT

RETURNED TO FGS 8 PM

19 MAY 2015 TG/KW

9 AM LEAVE FGS FOR CONVICT

11 AM CONVICT.

TEST ACM WITH NEW
SET COMM CABLES.

HALLUWAH... IT
WORKED!

DEPLOYED INSTRUMENT
FOR 12:00:00 - EVERY
30 MINS 5 MIN INTERVAL

TOOK 1 READING
DOWNLOADED

ALL OK.

REDEPLOYED

1:30 PM MEET PETE AT KES.

DISCUSSED FUTURE
DEPLOYMENTS.

RETRIEVED HISTORICAL
DYE TRAKE REPORTS.

ALSO MET WITH TARA.

3:30 PM MET WAYNE REGISTER
AT HIS HOME. GAVE HIM
SITE ACCESS/LIABILITY FORMS

FOR FUTURE DIVES IN
REGISTER SNK.

5 PM VISITED SINK ON REGISTER'S
NIECE'S PROPERTY

7:30 PM RETURN FGS
UNLOAD 8 PM

Dye Trace: Potential Site Information

NAME	ADDR	CITY	STATE	ZIP	PHONE	SLEGAL
BRADOW WALLACE DALE & TAMMY L	8585 216TH STREET	O'BRIEN	FL	32071	JESSIE BRADOW (386)935-2553	80.00 ACRES
BRYANT JOHNNIE	21682 89TH RD	OBRIEN	FL	32071	HOME (386)935-6762	5.00 ACRES
HANCOCK RAYMOND L & JUDY A	P O BOX 126	OBRIEN	FL	32071	HOME (386)935-1388	10.00 ACRES
JOHNSON WILLIAM I JR &	7791 200TH STREET	MCALPIN	FL	32062		120.00 ACRES
MORRIS ROBERT D & MICHELLE M	21233 81ST PLACE B	MCALPIN	FL	32062		10.00 ACRES
THOMAS HERBERT C	P O BOX 1507	LAKE CITY	FL	32056	BRIAN THOMAS (386)752-6646	150.00 ACRES

3 JUNE 2015

MET WITH TREY TO DISCUSS
PROPOSAL. 9:30 AM

1:30 PM LEFT FGS

STOPPED FOR LUNCH
AND THEN HEADED FOR
OCALA. MET FRIENDS OF
TOM'S FOR SUPPER IN OCALA
AT 6:00 PM.

4 JUNE 2015

7:30 AM WAKE UP

9:15 AM ARRIVE SILVER SPRING
FOR SPRINGS MEETING.
DARLEAVE PRESENTED 1ST
ON SUWA SUNA INSTALLS

15 JUNE 2015 KW

2:00 PM

11:00 AM HEAD TO LAF BLUE
DATA DOWNLOAD
BATT 12.59 V
REDEPLOYED
USGS HERE BUILDING STATION

3:10 PM PEACOCK
DATA DOWNLOAD
BATT 12.56 V
REDEPLOYED.

4:05 PM CONVIKT
DATA DOWNLOAD
BATT 12.62 V
REDEPLOYED

16 JUNE 2015

10:45 AM MEET WITH PETE
AT KES TO DISCUSS
ACM INSTALL AT HORNSBY

2:00 PM MEET WITH PHIL
YOUNTS AT KULAQUA.
RETRIEVED SIGNED SITE
ACCESS FORM.
LOOKED AT INSTALL SITE

7:15 PM FOGS

29 JUNE 2015

1:55 PM LEAVE FGS

30 JUNE 2015

07/13/2015 TG/KW/JC

4:45 Depart FGS for Suwa.
STOP IN MADISON FOR
DINNER
ARRIVE AT SRSP ~ 8:30PM

07/14/2015 TG/KW/JC

8:00AM BREAKFAST THEN HEAD
TO SRWMD TO MEET
UP WITH SONTEK REKS.
THEY SENT 2;
KEVIN: FIELD SET UP +
APPLICATION
ERIC: DATA PROCESSING.
TARA MET US THERE.
WE DID SETUP/ASSEMBLY
OF RIVERSURVEYOR M9 ALL
MORNING. BROKE FOR LUNCH
AND THEN HEADED TO LRV
TO TAKE MSMT. GPS
WORKED BUT OUR VNT'S
TRANSDUCER DID NOT.

5 OCT 2015 TG/KW/CF

1245 LEAVE FGS

STOP AT WALMART FOR SUPPLIES
STOPPED AT SRSP FOR KEYS
HEAD TO ALAPAHARISE + HOLTON
CREEK TO CHECK POTENTIAL
DEPLOYMENT SITES.

615 ARRIVE SRSP

6 OCT 2015 TG/KW/CF/SB/GP

9:30AM

SETH AND GEOFF MET US AT FALMOUTH
LEFT FROM THERE FOR ALAPAHARISE.

10:30AM DEPLOYED X2 CARBON
PACKS. ONE OFF USGS STATION
THE OTHER OFF THEIR STAGE
GAGE AT SIPHONING END.

HOLTON CREEK: DEPLOYED
X2 CARBON PACKS. ONE
OFF USGS STATION OTHER
SLIGHTLY UPSTREAM
OFF TREE. →

21 SEP TG/KW

10:20 AM LEFT FGS

12:45 PM LAF BLUE
TOOK DOWNLOAD AT 1:00 PM
REDEPLOYED FOR 1:30
TONS OF ROACHES
KILL ME NOW

BATTERY CHANGE
OLD: 12.10 V
NEW: 12.57 V BATT#3

LUNCH

3:30 PM PEACOCK
TOOK DOWNLOAD AT 4:00
CHANGED OUT BATT #5
FOR BATT #1
#5 12.06 V
#1 12.79 V

22 SEP 2015

10:45 AM HORNSBY
SRWMD HAS CHANGED
THE LOCK DIFFERENT
KEY NOW, A SMALLER
MASTER LOCK.

TOOK 11:30 DOWNLOAD
1/30 BATT 12.49 V
DID NOT CHANGE OUT

1:30 PM CONVICT
TOOK DOWNLOAD, REDEPLOYED
FOR 2:00 PM
BATT 12.31 V DID NOT
SWITCH OUT!! #8

6 OCT 10TD

~~ALL~~ ALL CARBON PACKS WIRED
TO ROCKS WHICH ARE TIED
WITH PARACORD TO AN
ANCHOR PT

1:45 PM DEAD RIVER LOOKED AROUND
FOR A FEW MINUTES. WATER
IS WAY UP FROM WHEN I
SAW IT LAST YEAR.
JENNINGS IS ~500 CFS.

LUNCH AT MYRA'S IN JASPER
* JENNINGS HAS NO RESTAURANT

3:00 PM TIGER CREEK. DEPLOYED
SINGLE CARBON PACK.
AMAZING TERRAIN!

4:00 PM BACK TO DEAD RIVER TO
DEPLOY CARBON PACK
NEAR CONFLUENCE OFF
SMALL MAPLE TREE.

28 OCT 2015 TG/KW

12:40 PM LAF BLUE -

12.29 V

TOOK DOWNLOAD REDEPLOYED
FOR 1:30 PM.

12:00 PM PEACOCK

12.5 V

TOOK DOWNLOAD AFTER 1:30
REDEPLOYED FOR 2:00 PM

2:15 PM 12.22 V

WAITING FOR 2:30 DOWNLOAD
THEN TAKE DOWNLOAD
REDEPLOY FOR 3:00 PM

1. OPEN ACM PRO PLUS

- COMMUNICATIONS

- ICMPRO PLUS

- RUN INSTRUMENT DATA DL

2. DOWNLOAD CSV AND DAT FILES

- HIT DOWNLOAD

*CHANGED CONVICT BAT
NEW BATT 12.75

TO REDEPLOY.

- COMMUNICATIONS

- CLOSE PORTS IF CHANGING
BATS.

- OPEN PORTS

CONFIGURE & DEPLOY

✓ SYNC DATE +

SET TIME

ALL BOXES LIKE EXCEPT
AUXILIARY INPUTS
& RAW PATH.

WILL AUTO SAVE IN
DOCUMENTS.

7738 SWANNE RSP CODE

30 29 OCT 2015

8:30 AM MEETING WITH TREY,
TOM, TARA AT SRWMD

Q MIDDLE SWANNEE PROJECT

- LITTLE RIVER ACM??

- WELL COST = 12-14K

DEAD RIVER / ALAPANA RISE

* LEVIN WRIGHT

229-560-8083

UPSTREAM OF HOLTON?

* RIVER CAMP...

BACKGROUND AT RIVER SITES

* ANY ADD'L SAMPLE SITES

TOM +

* SEND TARA JESSUP DATA...
AND AMY BROWNS

LUNCH AT PEPES

HEADED UP TO JASPER
TO MEET WITH DAVID
GOOLSBY REGARDING
TIGER CREEK ACCESS
- ALL GOOD

3:00 PM ALAPAH RKE
WATER LEVEL LEVEL HAS
DROPPED, CLARITY IS
BETTER THAN LAST VISIT.
CARBON PACK STILL IN PLACE

4:00 PM HOLTON CREEK

TG/UF

GATE CODE 1066

10:40 AM HOLTON CREEK

ADT R-1

HCP-01 COLLECTED

HCU-02 COLLECTED

DEPLOYED:

ADT R-2

HCP-02

} BIN#123

HCU-02

LOT# HB125AW-1

HOLTON STAGE: 36.40

MORE TURBID THAN PREVIOUSLY.

STILL SOMEWHAT CLEAR.

11:15 AM ADT R-1

ARP-07 COLLECTED

ARD-01 COLLECTED

ARP-02 DEPLOYED

ARD-02 DEPLOYED

ALSO MORE TURBID THAN PREVIOUSLY
OBSERVED.

12:00 DEAD RIVER
DRR-01 RECOVERED
DRR-02 DEPLOYED

1:05 TIGER CREEK
TIG-01
TIG-02

8 DEC 2015 TG/KW SRSP GATE
7/44

LAFAYETTE
2:00PM SWITCHED BATT#3 12.09 V
FOR BATT#4 12.29 V
TOOK DOWNLOAD, REDEPLOYED
FOR ~~STOP~~ 2:30 PM

3:00PM PEACOCK OLSEN LOOKS
GOOD. BAIT 12.29 V
~~SWITCHED BATT#~~
~~FOR BATT#~~
TOOK DOWNLOAD REDEPLOYED
FOR

4:45PM TIGER CREEK
COLLECTED CARBON SAMPLE
R-1 TIG

5:30PM DEAD RIVER
COLLECTED CARBON SAMPLE
R-2 DRR

STOPPED FOR DINNER IN
LIVE OAK

9 DEC 2015 TG/KW

8:30 AM LINEEATER
COLLECTED R-1 LEAT

MET LOCAL FARMER LEE
TOWNSEND. HE HAS GPS
FOR 5 KARST FEATURES IN
LINEEATER SYSTEM

386-590.

leetownsend@windstream.net

10:00 AM MEETING AT SRWMD WITH
TOM MIRTl + TARA

SAT IN ON MEETING WITH
RICK COPELAND REGARDING
SALINITY IN GROUNDWATER
FL RESOURCE WATER MON.
COUNCIL

1:15 ALAPAH/ SUWA CONFLUENCE
CARBON PACK NOT RECOVERED
ATE LUNCH

2:15 HOLTON CREEK RIVER CAM
R-1 HCL COLLECTED

2:35 HOLTON CREEK
R-2 HCP COLLECTED
R-2 HCU COLLECTED

MET 2 USGS STAFF
CLINT + SCOTT
ALAPAH DISCHARGE: 588 CFS
HOLTON CREEK " : 133 CFS

3:15 PM ALAPAH RISE
R-2 ARP COLLECTED
R-2 ARD COLLECTED

4:40 PM HORNSBY SPRING
BATT 12.27 V

14 DEC 2015 TG/SD

7:00 PM MET TOM AT WH
LOADED VEHICLE.
PICKED UP SCOTT OTW
TO SUWANNEE.

12:00 PM ARRIVE LAF BLUE

15 DEC 2015 TG/SD

6:30 AM WAKE UP, PACK VEHICLE
STOPPED FOR BREAKFAST
IN MAYO

8:30 AM CONVICT

RAN CABLE THROUGH
CONDUIT, SECURED CONDUIT
RAN BEHIND WALL + MOVED
BOX TO BALCONY. BATT 8/26V

COM CABLE ERROR, COULD
NOT REDEPLOY.
NEED NEW COM CABLE...

2:30 PM DROPPED TOM + SCOTT
OFF AT LAF BLUE TO
TRENCH ACM CABLE

DROVE TO LIVE OAK TO
BUY NEW USB-SERIAL
CABLE.

NEITHER WALMART OR
2 COMP STORES HAD IN STOCK
DROVE BACK TO LAF BLUE
PICKED UP SCOTT + TOM.

~5:30 PM
STOPPED FOR DINNER W PERRY
DROPPED SCOTT OFF.
BACK AT WH 9:00 PM

6 JAN 2016 TG/SD

11:00 AM MET KELLY @ WAK.
TO UPGRADE + TAKE DOWN-
LOADS FROM SCOTT'S STATION.
COM CABLE ERROR MESSAGE...

9 MARCH 2016 TG

LEAVE FGS ~10:30
STOP FOR LUNCH IN FERRY

12:45 PM LAF BLUE
CHANGED BATT TO #7 12.61V
#4 11.71V
TOOK DOWNLOAD, REDEPLOYED
FOR 2:00 PM

2:45 PM PEACOCK
CHANGED BATT TO #2 12.64V
#1 11.92V
TOOK DOWNLOAD REDEPLOYED
FOR 4:00 PM

4:00 PM CONVICT
BATT 12.29 V DO NOT REPLACE
TOOK DOWNLOAD REDEPLOYED

RETURN FGS ~8:10 PM

10 MARCH 2016 KW/TG

8:30AM LEAVE FGS W/KW
MEET TG IN WAUKEENAH

10:30AM STOP IN MAYO AT
LANA'S MOTHER'S HOME TO
GIVE REPORT TO MEARSON
LANDOWNER LANA MORGAN
OSTEN

11:00AM STOP AT GARY REGISTER'S
TO GIVE REGISTER LANDOWNER
REPORT. LEFT WITH GARY'S
BROTHER

11:30AM STOPPED AT A DIFFERENT
SINK ON REGISTER PROPERTY
THAT GARY'S BROTHER TOLD
US ABOUT. STEEP ROCKY, WITH
LAND BRIDGE ACROSS THE TOP.
CLEAR WATER. SAID TO
OPEN INTO A LARGE CAVERN
THAT IS ACCESSIBLE AT LOW
WATER..

11:15AM STOPPED AT MARY
DANIELS TO GIVE HER A
REPORT

11:45AM STOPPED AT WILL JOHNSON'S
TO GIVE HIM A REPORT.
NO ONE HOME. LEFT ON
BACK PORCH.

2:00 PM LUNCH IN HIGH SPRINGS.

3:30 PM HORNSBY SPRING
BATT #3 11.91 V REPLACED
WITH BATT #6 12.49
LEFT REPORT WITH OFFICE
TOOK DOWNLOAD & REDEPLOYED

5:00 PM STOPPED AT KES.
MET PETE BUTT AND GAVE
HIM COPY OF REPORT.

15 MARCH 16 TG

18 MAY 2016 TG/BA

10:00 AM LEAVE FGS

11:00 AM TOM SPOKE WITH TREY
ON CELL FOR 13 mins

LUNCH AT ONEALS

DEAD RIVER 1:00 PM

* CHECK FLOW *

SWALLET WAS UNDERWHELMING.
NEED TO LOOK UP FLOW
AND COMPARE TO PREVIOUS DATES
POSSIBLY SOME OBSTRUCTION IN
THE CONDUIT?

1:45 PM ALAPAH RSE

2:15 PM SRSP

LIME RUNSINK IS FLOWING,
LOW AND SLIGHTLY TANNIC
SAME WITH LIME

2:45 FALMOUTH
ALSO TANNIC

3:45 PEACOCK 12.26 V #2
REPLACED #2 WITH #5
#5 12.73 V

WAITED FOR 4:00 PM DOWNLOAD
TO CHANGE BATT.

SOMEONE HAS TAMPERED
WITH THE BATT BOX, THE
HASP AND LOCK WERE BROKEN
OFF. FORTUNATELY BATT &
CABLE APPEAR UNDISTURBED

* NEED SCREW DRIVER & SMALL
WRENCH TO FIX BOX.

FGS AT 7:15 PM

19 MAY 2016 TG/BA

9:00 AM LEAVE FGS

STOP FOR LUNCH IN HIGH SPRINGS

12:50 PM HORNSBY

INSTALLED DRIVER FOR USB-
SERIAL

BATT BOX HAS ANTS &
ROACHES.

* BRING EXPANDABLE FOAM
SAW A SNAKE SWIMMING
IN THE SPRING

BATT #3 12.19 V

~~EXCHANGED FOR BATT #5~~

~~12.69 V~~ REDEPLOYED
AT 2:00 PM

2:45 PM

12.23 V #8 EXCHANGE FOR

#5 12.69 V

WAITED AFTER 3:00 PM
DOWNLOAD.

* NEW COM CABLES FOR CONVICT
HAVING ISSUES COMMUNICATING
WITH INSTRUMENT...

GETTING ERROR MESSAGES....

"PARAMETER FETCHING PROBLEM"

"UNHANDLED EXCEPTION"

"FIRMWARE VERSION FETCH RETURNS
ERROR CODE -5!"

"CHECK COM CABLES"

IT DOES SEEM TO RECOGNIZE

ACM. ISSUE MAY BE WITH
COM CABLE...

ACM DOWNLOADS

5-26-16

ZACK ZARRANZ, TG

11:10 CONDUIT SPRING. SPOKE W/
SUSIE. BATT NO. 8 12.21 V

Unable to Parse Serial Number
Response [Bad Command [CATE]]

11:57 UNABLE TO ESTABLISH
COMMUNICATION W/ UNIT.

12:30 PEACOCK II BATT 12:21 V
BATTERY #2 OUT
RS-232 Interface ACM - Plus
BATTERY # 12.17 V IN

1:45 CONDUIT USING
KICK START FROM PEACOCK
WORKS FINE.

X ACM TEST CABLE P/N D240-468
ORDER NEW ONE

2:55 P LAF BLUE
BATT #7 12.16 V OUT
BATT #6 12.65 V IN

2 JUNE 2016
LEAVE FGS 9:45 AM

TG/BA

12:00 PM DEAD RIVER

12:15 PM DEPLOY R-B DRIV
OFF MAPLE TREE ~ 300 CFS
NO LONGER BLOCKED

12:45 PM DAVID GOOLSBY CALLED
GAVE VERBAL GO AHEAD TO
ACCESS TIGER CREEK

1:05 PM TIGER CREEK NO FLOW!!

1:15 PM DEPLOY R-B TIGR

2:00 PM ALAPAH / SUWA CONFLUENCE

2:15 PM DEPLOY R-B ALSU

2:30 PM RIVER CAMP
3:10 PM DEPLOY R-B RCAM

3:30 PM HOLTAN CREEK RISE
3:45 PM DEPLOY R-B HOLT
HOLTAN IS FLOWING
E

11:05 PM ALAPAMA RISE

4:15 PM DEPLOYED R-B ALAU

4:25 PM DEPLOYED R-B ALAD

4:40 PM COILE SPRING

TOM ALMOST STEPPED ON A
LARGE TIMBER RATTLESNAKE

STARTED POURING RAIN

WAITED FOR RAIN TO SLOW

AND UPDATED CAROLINE ON
PROJECT STATUS

~~5:30~~ DEPLOYED R-B COIL

5:15 OLD CARBON PACK WAS IN PLACE
WIRED NEW ON TOP OF AD.

7:30 FGS

9/6 9 JUNE 2016 TCKK

9: LEAVE FGS

11:30 AM DEAD RIVER

COLLECT DRR-R1

DEPLOY DRR-R2

12:20 PM TIGER CREEK

NO FLOW

LEFT TIG R-1

DID NOT DEPLOY R-2

1:10 PM SUWANNEE RIVER CAMP

COLLECT SRC R-1

DEPLOY SRC R-2

1:25 PM HOLTON CREEK RISE

3-4 FT VIS, PRETTY CLEAR

SOME TANNIC, NO TURBIDITY

2
3
4
5

HCP R-1 COLLECTED 1:25 PM

HCP R-2 DEPLOYED

2:00 PM ALAPAMA RISE "CLEAR" W/AD

ARP R-1 COLLECTED HCP

ARP R-2 DEPLOYED

2:05 PM ARD R-1 COLLECTED
ARD R-2 DEPLOYED

2:30 PM COILE
CCS R-1 COLLECTED
CCS R-2 DEPLOYED

3:50 PM SRWMD MEET WITH TH/TG
USGS WILL TAKE ALAPAH
+ HOLTON FLOWS

STEVENSON

COILE

DEAD RIVER

* 5-HOLE??

DEAD RIVER

AIM FOR WED JUNE 22nd

* DEPLOY CARBON PACK JUST DS
OF FIVE HOLE?? AT BOAT
RAMP A SRSP??

CHECK ALAPAH FIRE TOWER
GAGE + WATER PLANT

5:25 PM PEACOCK SPRINGS

BATT 12.15 V

SWITCHED COMM CABLES

WORKED!!

SUCCESSFUL DL +

REDEPLOYED FOR 18:30P

* WHILE DOWNLOADING WITH
NEW COMM CABLES, TOOK DL
VERY SLOWLY, AFTER EACH
BLOCK BRIEFLY WAS "UNABLE
TO COMMUNICATE" BEFORE

7-19-16

1:15P C. Fischer T. Greenhalgh

3:19P LAF BLUE / DOWNLOAD

ACM

Battery #6 recovered 12.28

Battery #12 replace 12.75

set up at 3:56pm

Leaving site 4:10pm

Handle broken on Battery #6

8 AUG 2016

TG/CF/JC
T J M

700 AM LEAVE FGS

130 PM MEET AT SRWMD
WITH TREY G + TOM M

TIGER CREEK IS FLOWING
POSSIBLY DO QUALITATIVE DT?
1 ROUND X 5 SITES DETECT
+ NON DETECT
50-75 lbs??

3X AT { HOLT
ALAP
COILE
~~US COILE~~

9 AUG

7:30AM UP

1225 PM DYE INTRO TIGER
SINK. JESSE POURED 50LBS
RH. TIGER CREEK IS VERY
TURBID. ~15-20 CFS?
DYE WAS NO LONGER VISIBLE
IN ~15 MINS

1/19

KFNC

845AM LEAVE FGS

1100 HORNSBY BATT 12.21V

"UNABLE TO CONFIG...
UNHANDLED EXCEPTION IN
APPLICATION...

UNEXPECTED END OF FILE
FOLLOWING ELEMENTS NOT
CLOSED. LAST COM PORT
USED

HAD TROUBLE CONNECTING...
REDEPLOYED 1230

130 CONNICT BATT#3 12.06V
TOOK DOWNLOAD SWITCHED
BATT WITH #7 12.54
REDEPLOYED 2:00PM

215 PEACOCK BATT#8 11.98V
REPLACED WITH 12.76V

TOM EDWARDS GATE: 1014

DAVID GOOLSBY (CELL):

386 397 3515

BOB HEEKE ^{SRWM} (DISTRICT NUMBER)

~~386 362 1001~~

TOM EDWARDS

904 399 1609

PA: KIM

CLAY GOOLSBY:

386-303-1252

GARY GABRIEL 828 337 2188

HOLTON CREEK HOST

WILL MCPHA: 352 538 5270

DANIEL BRONLEY: 386-570

4107

TOM EDWARDS: 904-219-4547

CAROLYN COLE ~~503V~~

386 842 5003

PETE: (352) 339-3380
(CELL)

JIM 386-209-0176

TIM 386-208-2739

KEVIN WRIGHT: 386 560-8083

KENNETH NEWSOME: 386-855-1950

6374

GARY + TERESA REGISTER

561-308-9568

SRWMD LOCK COMBOS

HOLTON CREEK 1606

OSTEEN 1106 REDBAND 1001

SRSP

1125

FGS MAIN:

TOM:

KATIE:

SUN RIVER STATE PARK 386-362 2746

TARA RODGERS: 800 226 1066

386 647 3134 (6)

208 5461 (6)

PETE BUTT 386 454 2147 (H)

386 454 3556 (6) KARST ENV SERV

LAFAYETTE BLUE STATE PARK 386-294 3667

ERICH MARZOFF 386-688-0866

(CELL)

SRSP 1963
3101

CRAIG CELL 386-365-2501

CHUCK BARNETT 386 303 1145
386 855 0078

CLIFF ADAMS

WILL JOHNSON 386 697-8709

CURVE TABLES

HOW TO USE CURVE TABLES

Table I. contains Tangents and Externals to a 1° curve. Tan. and Ext. to any other radius may be found nearly enough, by dividing the Tan. or Ext. 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 Ext. 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 Ext. 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 Ext. of about 12 ft. Angle of Intersection or I. P. = 23° 20' to the R. at Station 542 + 72.

Ext. in Tab. I opposite 23° 20' = 120.87
 $120.87 \div 12 = 10.07$. Say a 10° Curve.

Tan. in Tab. I opp. 23° 20' = 1183.1
 $1183.1 \div 10 = 118.31$.

Correction for A. 23° 20' for a 10° Cur. = 0.16
 $118.31 + 0.16 = 118.47 = \text{corrected Tangent}$.

(If corrected Ext. is required find in same way)
 Ang. 23° 20' = 23.33° $\div 10 = 2.3333 = \text{L. C.}$

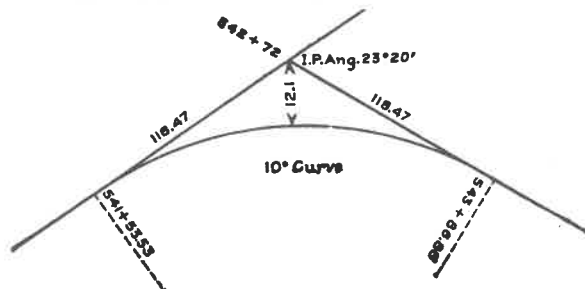
2° 19½' = def. for sta.	542	I. P. = sta.	542 + 72
4° 49½' = " " "	+ 50	Tan. =	1 18.47
7° 19½' = " " "	543	B. C. = sta.	541 + 53.53
9° 49½' = " " "	+ 50	L. C. =	2 .33.33
11° 40' = " " "	543 +	E. C. = Sta.	543 + 86.86
	86.86		

$100 - 53.53 = 46.47 \times 3' (\text{def. for 1 ft. of } 10^\circ \text{ Cur.}) = 139.41' =$

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.



Angle	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	Angle	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.
32	.5299	.6249	1.1792	1.887	1.600	.84805	39	.6293	.8098	1.2868	1.589	1.235	.77715
10	.5324	.6289	1.1813	1.878	1.590	.84650	10	.6316	.8146	1.2898	1.583	1.228	.77531
20	.5348	.6330	1.1835	1.870	1.580	.84495	20	.6338	.8195	1.2929	1.578	1.220	.77347
30	.5373	.6371	1.1857	1.861	1.570	.84339	30	.6361	.8243	1.2959	1.572	1.213	.77162
40	.5398	.6412	1.1879	1.853	1.560	.84182	40	.6383	.8292	1.2991	1.567	1.206	.76977
50	.5422	.6453	1.1901	1.844	1.550	.84025	10	.6406	.8342	1.3022	1.561	1.199	.76791
33	.5446	.6494	1.1924	1.836	1.540	.83867	57	.6428	.8391	1.3054	1.556	1.192	.76604
10	.5471	.6536	1.1946	1.828	1.530	.83708	50	.6450	.8441	1.3086	1.550	1.185	.76417
20	.5495	.6577	1.1969	1.820	1.520	.83549	40	.6472	.8491	1.3118	1.545	1.178	.76229
30	.5519	.6619	1.1992	1.812	1.511	.83389	30	.6494	.8541	1.3151	1.540	1.171	.76041
40	.5544	.6661	1.2015	1.804	1.501	.83228	20	.6517	.8591	1.3184	1.535	1.164	.75851
50	.5568	.6703	1.2039	1.796	1.492	.83066	10	.6539	.8642	1.3217	1.529	1.157	.75661
34	.5592	.6745	1.2062	1.788	1.483	.82904	56	.6561	.8693	1.3251	1.524	1.150	.75471
10	.5616	.6787	1.2086	1.781	1.473	.82741	50	.6583	.8744	1.3284	1.519	1.144	.75280
20	.5640	.6830	1.2110	1.773	1.464	.82577	40	.6604	.8796	1.3318	1.514	1.137	.75088
30	.5664	.6873	1.2134	1.766	1.455	.82413	30	.6626	.8847	1.3352	1.509	1.130	.74896
40	.5688	.6916	1.2158	1.758	1.446	.82248	20	.6648	.8899	1.3386	1.504	1.124	.74703
50	.5712	.6959	1.2183	1.751	1.437	.82082	10	.6670	.8952	1.3421	1.499	1.117	.74509
35	.5736	.7002	1.2208	1.743	1.428	.81915	55	.6691	.9004	1.3456	1.494	1.111	.74314
10	.5760	.7046	1.2233	1.736	1.419	.81748	50	.6713	.9057	1.3492	1.490	1.104	.74120
20	.5783	.7089	1.2258	1.729	1.411	.81580	40	.6734	.9110	1.3527	1.485	1.098	.73924
30	.5807	.7133	1.2283	1.722	1.402	.81412	30	.6756	.9163	1.3563	1.480	1.091	.73728
40	.5831	.7177	1.2309	1.715	1.393	.81242	20	.6777	.9217	1.3600	1.476	1.085	.73531
50	.5854	.7221	1.2335	1.708	1.385	.81072	10	.6799	.9271	1.3636	1.471	1.079	.73333
36	.5878	.7265	1.2361	1.701	1.376	.80902	54	.6820	.9325	1.3673	1.466	1.072	.73135
10	.5901	.7310	1.2387	1.695	1.368	.80730	50	.6841	.9380	1.3711	1.462	1.066	.72937
20	.5925	.7355	1.2413	1.688	1.360	.80558	40	.6862	.9435	1.3748	1.457	1.060	.72737
30	.5948	.7400	1.2440	1.681	1.351	.80386	30	.6884	.9490	1.3786	1.453	1.054	.72537
40	.5972	.7445	1.2466	1.675	1.343	.80212	20	.6905	.9545	1.3824	1.448	1.048	.72337
50	.5995	.7490	1.2494	1.668	1.335	.80038	10	.6926	.9601	1.3863	1.444	1.042	.72136
37	.6018	.7536	1.2521	1.662	1.327	.79864	53	.6947	.9657	1.3902	1.440	1.036	.71934
10	.6041	.7581	1.2549	1.655	1.319	.79688	50	.6967	.9713	1.3941	1.435	1.030	.71732
20	.6065	.7627	1.2577	1.649	1.311	.79512	40	.6988	.9770	1.3980	1.431	1.024	.71529
30	.6088	.7673	1.2605	1.643	1.303	.79335	30	.7009	.9827	1.4020	1.427	1.018	.71325
40	.6111	.7720	1.2633	1.636	1.295	.79158	20	.7030	.9884	1.4061	1.422	1.012	.71121
50	.6134	.7766	1.2661	1.630	1.288	.78980	10	.7050	.9942	1.4101	1.418	1.006	.70916
38	.6157	.7813	1.2690	1.624	1.280	.78801	52	.7071	1.	1.414	1.414	1.	.70711
10	.6180	.7860	1.2719	1.618	1.272	.78622	50						
20	.6202	.7907	1.2748	1.612	1.265	.78442	40						
30	.6225	.7954	1.2778	1.606	1.257	.78261	30						
40	.6248	.8002	1.2808	1.601	1.250	.78079	20						
50	.6271	.8050	1.2838	1.595	1.242	.77897	10						
Cosin. Cotg. Cosec. Sec. Tan. Sin. Angle							Cosin. Cotg. Cosec. Sec. Tan. Sin. Angle						

#0812663530

6374

JIM KELLY 386-546-2364

GATE CODE ALAPAH RISE

MASTER LOCK @ HORNSBY #2640

TREY GRUBBS CELL

WALTER SMITH

850 832 2260?

Alapaha Rise

David Kelley Lot 4

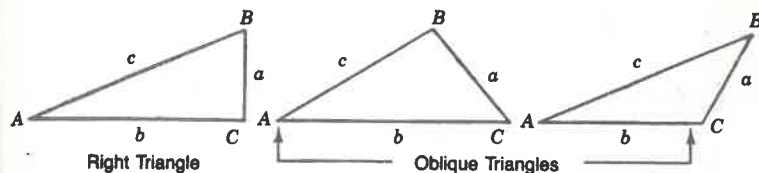
Gainesville

2744 NW 63rd St.

DAVID GOOLSBY

386 397 3515

TRIGONOMETRIC FORMULÆ



Solution of Right Triangles

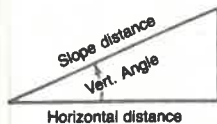
For Angle A. $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{a}$, $\csc = \frac{c}{b}$

Given a, b	Required A, B, c	$\tan A = \frac{a}{b} = \cot B$, $c = \sqrt{a^2 + b^2} = a \sqrt{1 + \frac{b^2}{a^2}}$
a, c	A, B, b	$\sin A = \frac{a}{c} = \cos B$, $b = \sqrt{(c+a)(c-a)} = c \sqrt{1 - \frac{a^2}{c^2}}$
A, a	B, b, c	$B = 90^\circ - A$, $b = a \cot A$, $c = \frac{a}{\sin A}$
A, b	B, a, c	$B = 90^\circ - A$, $a = b \tan A$, $c = \frac{b}{\cos A}$
A, c	B, a, b	$B = 90^\circ - A$, $a = c \sin A$, $b = c \cos A$

Solution of Oblique Triangles

Given A, B, a	Required b, c, C	$b = \frac{a \sin B}{\sin A}$, $C = 180^\circ - (A + B)$, $c = \frac{a \sin C}{\sin A}$
A, a, b	B, c, C	$\sin B = \frac{b \sin A}{a}$, $C = 180^\circ - (A + B)$, $c = \frac{a \sin C}{\sin A}$
a, b, C	A, B, c	$A + B = 180^\circ - C$, $\tan \frac{1}{2}(A - B) = \frac{(a - b) \tan \frac{1}{2}(A + B)}{a + b}$, $c = \frac{a \sin C}{\sin A}$
a, b, c	A, B, C	$s = \frac{a + b + c}{2}$, $\sin \frac{1}{2}A = \sqrt{\frac{(s - b)(s - c)}{b c}}$, $\sin \frac{1}{2}B = \sqrt{\frac{(s - a)(s - c)}{a c}}$, $C = 180^\circ - (A + B)$
a, b, c	Area	$s = \frac{a + b + c}{2}$, $\text{area} = \sqrt{s(s - a)(s - b)(s - c)}$
A, b, c	Area	$\text{area} = \frac{b c \sin A}{2}$
A, B, C, a	Area	$\text{area} = \frac{a^2 \sin B \sin C}{2 \sin A}$

REDUCTION TO HORIZONTAL



Horizontal distance = Slope distance multiplied by the cosine of the vertical angle. Thus: slope distance = 319.4 ft. Vert. angle = $5^\circ 10'$. From Table, Page IX. $\cos 5^\circ 10' = .9959$. Horizontal distance = $319.4 \times .9959 = 318.09$ ft.

Horizontal distance also = Slope distance minus slope distance times $(1 - \cos \text{ of vertical angle})$. With the same figures as in the preceding example, the following result is obtained. $\cos 5^\circ 10' = .9959$. $1 - .9959 = .0041$. $319.4 \times .0041 = 1.31$. $319.4 - 1.31 = 318.09$ ft.

When the rise is known, the horizontal distance is approximately: - the slope distance less the square of the rise divided by twice the slope distance. Thus: rise = 14 ft., slope distance = 302.6 ft. Horizontal distance = $302.6 - \frac{14 \times 14}{2 \times 302.6} = 302.6 - 0.32 = 302.28$ ft.