



Missouri
Department of
Natural Resources

Use Attainability Analysis

for

WBID 0938 Little Walnut Creek

Submitted by
SES, Inc.

To
Missouri Department of Natural Resources
Water Protection Program

On
May 28, 2008

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet A – Water Body Identification

I. Water Body Information (for water body being surveyed)

| |
|---|
| Water Body Name (from USGS 7.5' quad): Little Walnut Creek |
| Missouri Water Body Identification (WBID) Number: 938 |
| 8-digit HUC: 10300104 |
| County(ies), Listed Upstream to Downstream: Johnson |
| Upstream Legal Description (from Table H): 47N 24W section26 |
| Downstream Legal Description (from Table H): 47N 24W section16 |
| Number of sites evaluated: 3 |
| List all site numbers, <u>consecutively upstream to downstream</u> : 1, 2, 3 |
| Include a Site Location Map(s). The map must include all requirements detailed in the <i>Missouri Recreational Use Attainability Analyses: Water Body Survey and Assessment Protocol</i> (Section IV.D.8.a). |

II. Facility Information (list all permitted discharges to this water body segment)

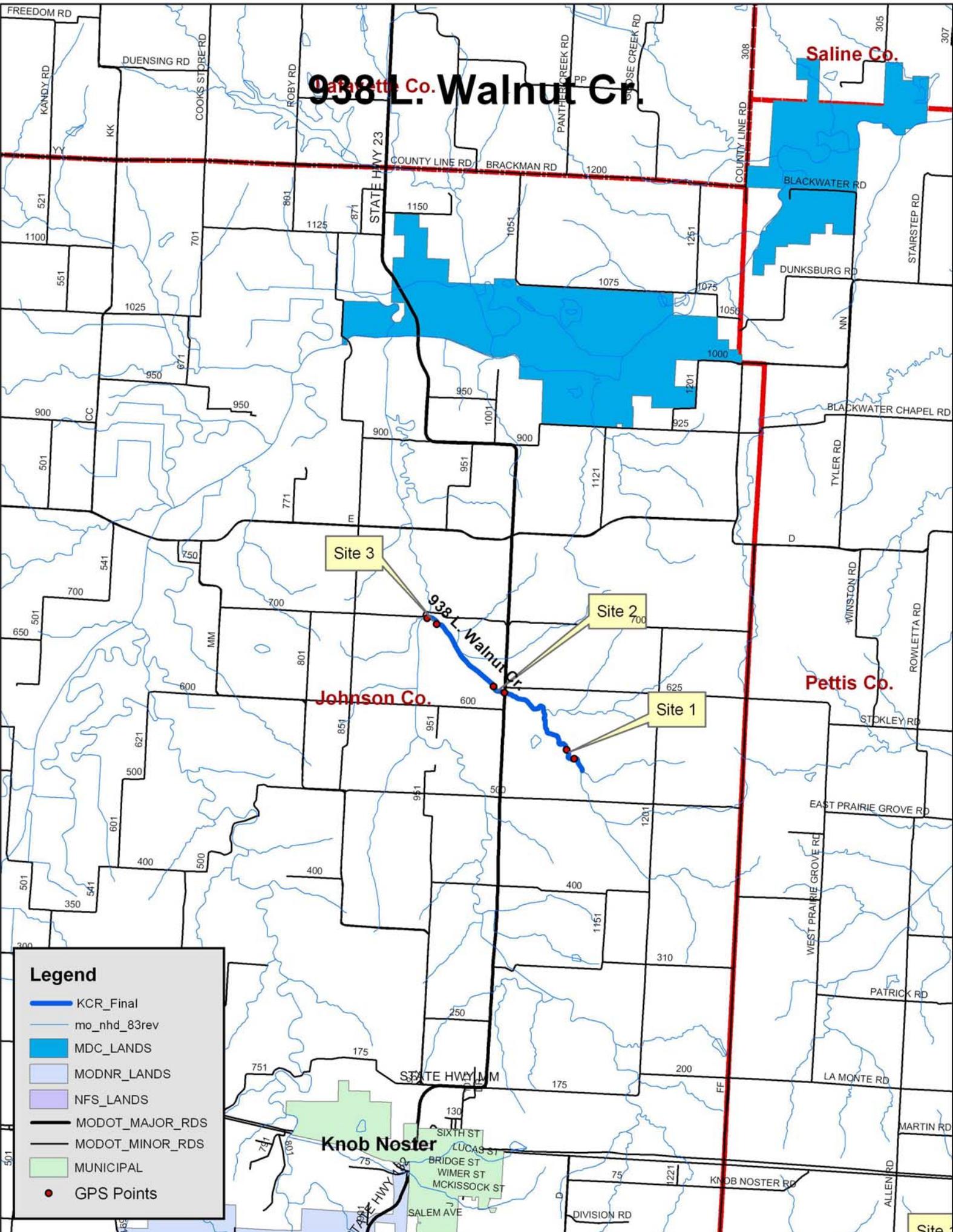
| |
|--|
| Facility Name(s) and Permit Number(s): Rolling Hills Subdivision MO0125202 |
|--|

III. UAA Surveyor (please **PRINT** legibly)

| | |
|----------------------------------|--|
| Name of Surveyor: Aaron Ball | Telephone Number: 9.13.307.0046 Ext.14 |
| Organization/Employer: SES, Inc. | |

Please verify that you have completed all sections of all data sheets, checked all applicable boxes, provided a map (that includes all requirements listed in the *Missouri Recreational Use Attainability Analyses: Water Body Survey and Assessment Protocol*) and that this form is complete.

Signed: _____ **Date:** _____



938 L. Walnut Cr.

Saline Co.

Johnson Co.

Pettis Co.

Knob Noster

Legend

- KCR_Final
- mo_nhd_83rev
- MDC_LANDS
- MODNR_LANDS
- NFS_LANDS
- MODOT_MAJOR_RDS
- MODOT_MINOR_RDS
- MUNICIPAL
- GPS Points

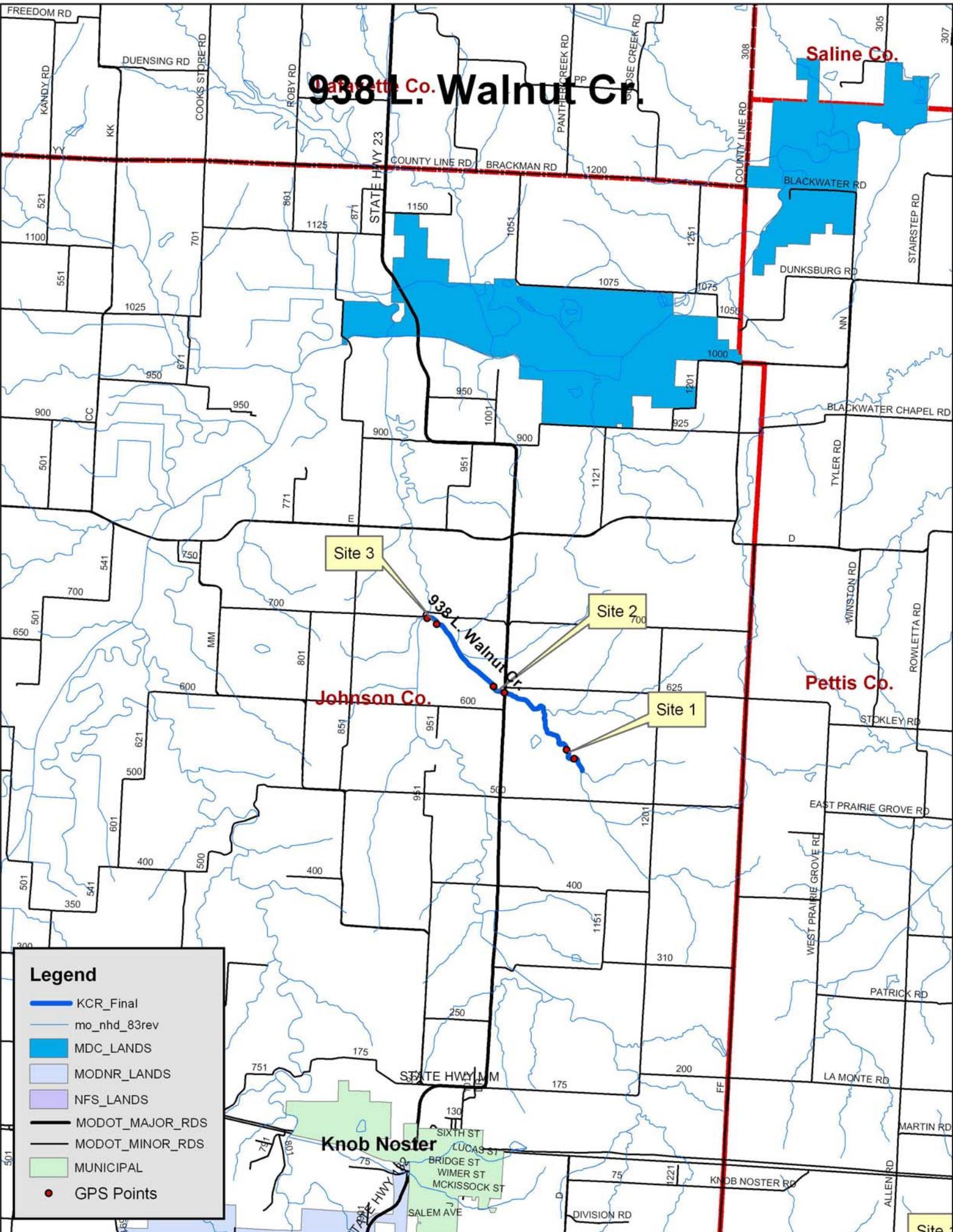
Site 3

Site 2

Site 1

Site 4

938 L. Walnut Cr.



Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 1 of 3)
(must be completed for each site)

| | |
|---|---|
| Date & Time: 4.28.08 14:17 | Location Description (e.g., road crossing): |
| Stream Name: Little Walnut Creek | 500 Road |
| Current Weather Conditions: clear | Facility Name(s): Rolling Hills Subdivision |
| Weather Conditions for Past 10 days: 3.50 inches | Permit Number(s): MO0125202 |
| Official Drought Conditions at time of this survey (search DNR home page for “drought”): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/> | |

Site Location:

| LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS) | | | |
|--|--------------------------|---------------------------|--|
| Site 01 | Easting (UTM X): 0453762 | Northing (UTM Y): 4298464 | Horizontal Accuracy: (EPE / FOM / PDOP) 7 Meters |
| Site 11 | Easting (UTM X): 0453622 | Northing (UTM Y): 4298615 | Horizontal Accuracy: (EPE / FOM / PDOP) 7 Meters |

Photos:

| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
|-----------|----------------|-----------|---------------|-----------|---------------|
| 19 | downstream, T1 | 20 | upstream, T11 | | |
| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
| | | | | | |
| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
| | | | | | |

Uses Observed*: (Uses actually observed at the time of survey.)

| | | | | |
|--|--------------------------------------|---------------------------------------|---|---------------------------------------|
| <input type="checkbox"/> Swimming | <input type="checkbox"/> Skin diving | <input type="checkbox"/> SCUBA diving | <input type="checkbox"/> Tubing | <input type="checkbox"/> Water skiing |
| <input type="checkbox"/> Wind surfing | <input type="checkbox"/> Kayaking | <input type="checkbox"/> Boating | <input type="checkbox"/> Wading | <input type="checkbox"/> Rafting |
| <input type="checkbox"/> Hunting | <input type="checkbox"/> Trapping | <input type="checkbox"/> Fishing | <input checked="" type="checkbox"/> None of the above | <input type="checkbox"/> Other: |
| Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.) | | | | |

Site #1

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 2 of 3)

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

| | | | | |
|--|--------------------------------------|---|--|---|
| <input type="checkbox"/> City/county parks | <input type="checkbox"/> Playgrounds | <input type="checkbox"/> MDC conservation lands | <input type="checkbox"/> Urban areas | <input checked="" type="checkbox"/> Rural Residential |
| <input type="checkbox"/> Campgrounds | <input type="checkbox"/> State parks | <input type="checkbox"/> National forests | <input type="checkbox"/> Nature trails | <input type="checkbox"/> Stairs/walkway |
| <input type="checkbox"/> Boating accesses | <input type="checkbox"/> Fence | <input type="checkbox"/> No trespass sign | <input type="checkbox"/> Steep slopes | <input type="checkbox"/> Other: |
| Comments: | | | | |

Evidence of Human Use*: (Attach photos and reference in “Photos” section.)

| | | | | |
|---|--|--|---|---|
| <input type="checkbox"/> Roads | <input type="checkbox"/> Foot paths/prints | <input type="checkbox"/> Dock/platform | <input type="checkbox"/> Camping Sites | <input type="checkbox"/> Rope swings |
| <input type="checkbox"/> RV / ATV Tracks | <input type="checkbox"/> Fire pit/ring | <input type="checkbox"/> NPDES Discharge | <input type="checkbox"/> Fishing Tackle | <input type="checkbox"/> Livestock Watering |
| <input checked="" type="checkbox"/> None of the above | Comments / Other: | | | |
| | | | | |

Substrate*: (These values should add up to 100%.)

| | | | | | |
|------------|------------|----------|--------|------------|-----------|
| 30% Cobble | 30% Gravel | 40% Sand | % Silt | % Mud/Clay | % Bedrock |
|------------|------------|----------|--------|------------|-----------|

Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

| |
|------------------------------------|
| none in water; banks are vegetated |
|------------------------------------|

Water Characteristics*: (Mark all that apply.)

| | | | | | |
|------------------|---|---|---|---|---------------------------------|
| Odor: | <input type="checkbox"/> Sewage | <input type="checkbox"/> Musky | <input type="checkbox"/> Chemical | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Other: |
| Color: | <input checked="" type="checkbox"/> Clear | <input checked="" type="checkbox"/> Green | <input type="checkbox"/> Gray | <input checked="" type="checkbox"/> Milky | <input type="checkbox"/> Other: |
| Bottom Deposit: | <input type="checkbox"/> Sludge | <input type="checkbox"/> Solids | <input type="checkbox"/> Fine sediments | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Other: |
| Surface Deposit: | <input type="checkbox"/> Oil | <input type="checkbox"/> Scum | <input type="checkbox"/> Foam | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Other: |

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Site #1

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 3 of 3)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

| Channel Feature | Distance from access location (m) | Width (m) | Length (m) | Median Depth (m) | Max Depth (m) |
|-----------------|-----------------------------------|-----------|------------|------------------|---------------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Comments: (Please record any additional comments here.)

Please verify that you have completed all sections, checked all applicable boxes, and that the form is complete.

Printed Names of Personnel Collecting Data: Gilisa Gould and Aaron Ball

Surveyor’s Signature: Aaron Ball Date of Survey: 4.28.08

Organization: SES, Inc. Position: Field Team Leader

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

| | |
|---|---|
| Stream Name: <u>Little Walnut Creek</u> Waterbody ID: <u>938</u> Site #: <u>1</u> Estimated Channel Incision: <u>2</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>0453762</u> UTM Y: <u>4298464</u> +/- <u>7</u> (meters) 11 UTM X: <u>0453622</u> UTM Y: <u>4298615</u> +/- <u>7</u> (meters) Average Stream Width: <u>3</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>Gilisa Gould and Aaron Ball</u> | Dissolved Oxygen Date: <u>4.28.08</u> Time: <u>14:17</u> Dissolved Oxygen: <u>7.9</u> (mg/L) Dissolved Oxygen: _____ (% sat) Specific Cond: _____ (µS/cm) Water Temperature: <u>16.3</u> (°C) |
|---|---|

Transect Cross-Section

| | | 01 | | 02 | | 03 | | 04 | | 05 | | 06 | | 07 | | 08 | | 09 | | 10 | | 11 | |
|--|---|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|
| Station | | Distance (m) | Depth (m) |
| Left Bank | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1 | 0.40 | 0.15 | 0.30 | 0.10 | 0.30 | 0.05 | 0.40 | 0.15 | 0.20 | 0.10 | 0.20 | 0.01 | 0.60 | 0.20 | 0.30 | 0.10 | 0.40 | 0.10 | 0.50 | 0.15 | 0.40 | 0.15 |
| | 2 | 0.80 | 0.25 | 0.60 | 0.15 | 0.60 | 0.10 | 0.80 | 0.30 | 0.40 | 0.10 | 0.40 | 0.05 | 1.20 | 0.20 | 0.60 | 0.10 | 0.80 | 0.20 | 1.00 | 0.10 | 0.80 | 0.20 |
| | 3 | 1.20 | 0.30 | 0.90 | 0.20 | 0.90 | 0.15 | 1.20 | 0.35 | 0.60 | 0.10 | 0.60 | 0.10 | 1.80 | 0.30 | 0.90 | 0.10 | 1.20 | 0.20 | 1.50 | 0.25 | 1.20 | 0.25 |
| | 4 | 1.60 | 0.40 | 1.20 | 0.25 | 1.20 | 0.20 | 1.60 | 0.35 | 0.80 | 0.25 | 0.80 | 0.15 | 2.40 | 0.20 | 1.20 | 0.10 | 1.60 | 0.30 | 2.00 | 0.30 | 1.60 | 0.25 |
| | 5 | 2.00 | 0.30 | 1.50 | 0.50 | 1.50 | 0.20 | 2.00 | 0.35 | 1.00 | 0.35 | 1.00 | 0.15 | 3.00 | 0.01 | 1.50 | 0.10 | 2.00 | 0.30 | 2.50 | 0.50 | 2.00 | 0.20 |
| | 6 | 2.40 | 0.90 | 1.80 | 0.60 | 1.80 | 0.20 | 2.40 | 0.30 | 1.20 | 0.30 | 1.20 | 0.10 | 3.60 | 0.01 | 1.80 | 0.10 | 2.40 | 0.30 | 3.00 | 0.70 | 2.40 | 0.15 |
| | 7 | 2.80 | 0.70 | 2.10 | 0.60 | 2.10 | 0.15 | 2.80 | 0.30 | 1.40 | 0.20 | 1.40 | 0.10 | 4.20 | 0.01 | 2.10 | 0.10 | 2.80 | 0.30 | 3.50 | 0.60 | 2.80 | 0.10 |
| | 8 | 3.20 | 0.50 | 2.40 | 0.50 | 2.40 | 0.10 | 3.20 | 0.20 | 1.60 | 0.10 | 1.60 | 0.10 | 4.80 | 0.05 | 2.40 | 0.10 | 3.20 | 0.25 | 4.00 | 0.30 | 3.20 | 0.10 |
| | 9 | 3.60 | 0.20 | 2.70 | 0.40 | 2.70 | 0.10 | 3.60 | 0.10 | 1.80 | 0.10 | 1.80 | 0.10 | 5.40 | 0.10 | 2.70 | 0.10 | 3.60 | 0.05 | 4.50 | 0.25 | 3.60 | 0.05 |
| Right Bank | | 4.00 | 0.00 | 3.00 | 0.00 | 3.00 | 0.00 | 4.00 | 0.00 | 2.00 | 0.00 | 2.00 | 0.00 | 6.00 | 0.00 | 3.00 | 0.00 | 4.00 | 0.00 | 5.00 | 0.00 | 4.00 | 0.00 |
| Feature Type <small>(riffle, run, or pool)</small> | | pool | | pool | | run | | riffle | | pool | | pool | | run | |

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width

GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)

Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)

All measurements to be taken to the nearest 0.01 meter.

Surveyor's Signature: Aaron Ball Date: 5.09.08

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 1 of 3)
(must be completed for each site)

| | |
|---|---|
| Date & Time: 4.28.08 15:40 | Location Description (e.g., road crossing): |
| Stream Name: Little Walnut Creek | Highway 23 |
| Current Weather Conditions: clear | Facility Name(s): Rolling Hills Subdivision |
| Weather Conditions for Past 10 days: 3.50 inches | Permit Number(s): MO0125202 |
| Official Drought Conditions at time of this survey (search DNR home page for “drought”): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/> | |

Site Location:

| LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS) | | | |
|--|--------------------------|---------------------------|--|
| Site 01 | Easting (UTM X): 0452295 | Northing (UTM Y): 4299791 | Horizontal Accuracy: (EPE / FOM / PDOP) 6 Meters |
| Site 11 | Easting (UTM X): 0452484 | Northing (UTM Y): 4299677 | Horizontal Accuracy: (EPE / FOM / PDOP) 5 Meters |

Photos:

| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
|-----------|----------------|-----------|---------------|-----------|---------------|
| 16 | downstream, T1 | 17 | upstream, T11 | | |
| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
| | | | | | |
| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
| | | | | | |

Uses Observed*: (Uses actually observed at the time of survey.)

| | | | | |
|--|--------------------------------------|---------------------------------------|---|---------------------------------------|
| <input type="checkbox"/> Swimming | <input type="checkbox"/> Skin diving | <input type="checkbox"/> SCUBA diving | <input type="checkbox"/> Tubing | <input type="checkbox"/> Water skiing |
| <input type="checkbox"/> Wind surfing | <input type="checkbox"/> Kayaking | <input type="checkbox"/> Boating | <input type="checkbox"/> Wading | <input type="checkbox"/> Rafting |
| <input type="checkbox"/> Hunting | <input type="checkbox"/> Trapping | <input type="checkbox"/> Fishing | <input checked="" type="checkbox"/> None of the above | <input type="checkbox"/> Other: |
| Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.) | | | | |

Site #2

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 2 of 3)

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

| | | | | |
|--|--------------------------------------|---|--|---|
| <input type="checkbox"/> City/county parks | <input type="checkbox"/> Playgrounds | <input type="checkbox"/> MDC conservation lands | <input type="checkbox"/> Urban areas | <input checked="" type="checkbox"/> Rural Residential |
| <input type="checkbox"/> Campgrounds | <input type="checkbox"/> State parks | <input type="checkbox"/> National forests | <input type="checkbox"/> Nature trails | <input type="checkbox"/> Stairs/walkway |
| <input type="checkbox"/> Boating accesses | <input type="checkbox"/> Fence | <input type="checkbox"/> No trespass sign | <input type="checkbox"/> Steep slopes | <input type="checkbox"/> Other: |
| Comments: | | | | |

Evidence of Human Use*: (Attach photos and reference in "Photos" section.)

| | | | | |
|---|--|--|---|---|
| <input type="checkbox"/> Roads | <input type="checkbox"/> Foot paths/prints | <input type="checkbox"/> Dock/platform | <input type="checkbox"/> Camping Sites | <input type="checkbox"/> Rope swings |
| <input type="checkbox"/> RV / ATV Tracks | <input type="checkbox"/> Fire pit/ring | <input type="checkbox"/> NPDES Discharge | <input type="checkbox"/> Fishing Tackle | <input type="checkbox"/> Livestock Watering |
| <input checked="" type="checkbox"/> None of the above | Comments / Other: | | | |
| | | | | |

Substrate*: (These values should add up to 100%.)

| | | | | | |
|----------|------------|--------|--------|--------------|-------------|
| % Cobble | 70% Gravel | % Sand | % Silt | 20% Mud/Clay | 10% Bedrock |
|----------|------------|--------|--------|--------------|-------------|

Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

| |
|---------------|
| none in water |
| |

Water Characteristics*: (Mark all that apply.)

| | | | | | |
|------------------|---|---|---|---|---------------------------------|
| Odor: | <input type="checkbox"/> Sewage | <input type="checkbox"/> Musky | <input type="checkbox"/> Chemical | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Other: |
| Color: | <input checked="" type="checkbox"/> Clear | <input checked="" type="checkbox"/> Green | <input type="checkbox"/> Gray | <input checked="" type="checkbox"/> Milky | <input type="checkbox"/> Other: |
| Bottom Deposit: | <input type="checkbox"/> Sludge | <input type="checkbox"/> Solids | <input type="checkbox"/> Fine sediments | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Other: |
| Surface Deposit: | <input type="checkbox"/> Oil | <input type="checkbox"/> Scum | <input type="checkbox"/> Foam | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Other: |

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Site #2

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 3 of 3)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

| Channel Feature | Distance from access location (m) | Width (m) | Length (m) | Median Depth (m) | Max Depth (m) |
|-----------------|-----------------------------------|-----------|------------|------------------|---------------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Comments: (Please record any additional comments here.)

Please verify that you have completed all sections, checked all applicable boxes, and that the form is complete.

Printed Names of Personnel Collecting Data: Gilisa Gould and Aaron Ball

Surveyor’s Signature: Aaron Ball Date of Survey: 4.28.08

Organization: SES, Inc. Position: Field Team Leader

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

| | |
|---|---|
| Stream Name: <u>Little Walnut Creek</u> Waterbody ID: <u>938</u> Site #: <u>2</u> Estimated Channel Incision: <u>2.5</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>0452295</u> UTM Y: <u>4299791</u> +/- <u>6</u> (meters) 11 UTM X: <u>0452484</u> UTM Y: <u>4299677</u> +/- <u>5</u> (meters) Average Stream Width: <u>6</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>Gilisa Gould and Aaron Ball</u> | Dissolved Oxygen |
| | Date: <u>4.28.08</u> Time: <u>15:40</u> |
| | Dissolved Oxygen: <u>9.1</u> (mg/L) |
| | Dissolved Oxygen: _____ (% sat) |
| | Specific Cond: _____ (µS/cm) |
| | Water Temperature: <u>15.4</u> (°C) |

Transect Cross-Section

| Station | 01 | | 02 | | 03 | | 04 | | 05 | | 06 | | 07 | | 08 | | 09 | | 10 | | 11 | |
|--|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|
| | Distance (m) | Depth (m) |
| Left Bank | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0.60 | 0.15 | 0.40 | 0.05 | 0.80 | 0.35 | 0.50 | 0.25 | 0.60 | 0.10 | 0.60 | 0.30 | 0.80 | 0.40 | 0.80 | 0.25 | 0.50 | 0.10 | 0.40 | 0.10 | 0.70 | 0.05 |
| 2 | 1.20 | 0.30 | 0.80 | 0.10 | 1.60 | 0.35 | 1.00 | 0.50 | 1.20 | 0.20 | 1.20 | 0.50 | 1.60 | 0.50 | 1.60 | 0.50 | 1.00 | 0.20 | 0.80 | 0.10 | 1.40 | 0.10 |
| 3 | 1.80 | 0.30 | 1.20 | 0.20 | 2.40 | 0.20 | 1.50 | 0.60 | 1.80 | 0.20 | 1.80 | 0.50 | 2.40 | 0.40 | 2.40 | 0.60 | 1.50 | 0.10 | 1.20 | 0.30 | 2.10 | 0.05 |
| 4 | 2.40 | 0.30 | 1.60 | 0.25 | 3.20 | 0.10 | 2.00 | 0.90 | 2.40 | 0.30 | 2.40 | 0.50 | 3.20 | 0.30 | 3.20 | 0.60 | 2.00 | 0.20 | 1.60 | 0.30 | 2.80 | 0.10 |
| 5 | 3.00 | 0.35 | 2.00 | 0.40 | 4.00 | 0.05 | 2.50 | 0.50 | 3.00 | 0.50 | 3.00 | 0.45 | 4.00 | 0.30 | 4.00 | 0.60 | 2.50 | 0.20 | 2.00 | 0.30 | 3.50 | 0.00 |
| 6 | 3.60 | 0.30 | 2.40 | 0.45 | 4.80 | 0.00 | 3.00 | 0.30 | 3.60 | 0.60 | 3.60 | 0.30 | 4.80 | 0.20 | 4.80 | 0.45 | 3.00 | 0.20 | 2.40 | 0.20 | 4.20 | 0.05 |
| 7 | 4.20 | 0.30 | 2.80 | 0.50 | 5.60 | 0.00 | 3.50 | 0.20 | 4.20 | 0.50 | 4.20 | 0.20 | 5.60 | 0.15 | 5.60 | 0.25 | 3.50 | 0.15 | 2.80 | 0.10 | 4.90 | 0.05 |
| 8 | 4.80 | 0.20 | 3.20 | 0.40 | 6.40 | 0.05 | 4.00 | 0.15 | 4.80 | 0.30 | 4.80 | 0.10 | 6.40 | 0.20 | 6.40 | 0.20 | 4.00 | 0.10 | 3.20 | 0.05 | 5.60 | 0.10 |
| 9 | 5.40 | 0.15 | 3.60 | 0.35 | 7.20 | 0.10 | 4.50 | 0.05 | 5.40 | 0.20 | 5.40 | 0.10 | 7.20 | 0.20 | 7.20 | 0.05 | 4.50 | 0.05 | 3.60 | 0.10 | 6.30 | 0.05 |
| Right Bank | 6.00 | 0.00 | 4.00 | 0.00 | 8.00 | 0.00 | 5.00 | 0.00 | 6.00 | 0.00 | 6.00 | 0.00 | 8.00 | 0.00 | 8.00 | 0.00 | 5.00 | 0.00 | 4.00 | 0.00 | 7.00 | 0.00 |
| Feature Type <small>(riffle, run, or pool)</small> | pool | | pool | | riffle | | pool | | pool | | run | | run | | pool | | riffle | | run | | riffle | |

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width
 GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.
 Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)
 Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)
 All measurements to be taken to the nearest 0.01 meter.

Surveyor's Signature: Aaron Ball Date: 5.09.08

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 1 of 3)
(must be completed for each site)

| | |
|---|---|
| Date & Time: 4.28.08 14:50 | Location Description (e.g., road crossing): |
| Stream Name: Little Walnut Creek | 700 Road |
| Current Weather Conditions: clear | Facility Name(s): Rolling Hills Subdivision |
| Weather Conditions for Past 10 days: 3.50 inches | Permit Number(s): MO0125202 |
| Official Drought Conditions at time of this survey (search DNR home page for “drought”): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/> | |

Site Location:

| LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS) | | | | |
|--|--------------------------|---------------------------|--|----------|
| Site 01 | Easting (UTM X): 0451247 | Northing (UTM Y): 4300929 | Horizontal Accuracy: (EPE / FOM / PDOP) | 5 Meters |
| Site 11 | Easting (UTM X): 0451077 | Northing (UTM Y): 4301038 | Horizontal Accuracy: (EPE / FOM / PDOP) | 3 Meters |

Photos:

| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
|-----------|---------------|-----------|----------------|-----------|---------------|
| 14 | upstream, T11 | 15 | downstream, T1 | | |
| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
| | | | | | |
| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
| | | | | | |

Uses Observed*: (Uses actually observed at the time of survey.)

| | | | | |
|--|--------------------------------------|---------------------------------------|---|---------------------------------------|
| <input type="checkbox"/> Swimming | <input type="checkbox"/> Skin diving | <input type="checkbox"/> SCUBA diving | <input type="checkbox"/> Tubing | <input type="checkbox"/> Water skiing |
| <input type="checkbox"/> Wind surfing | <input type="checkbox"/> Kayaking | <input type="checkbox"/> Boating | <input type="checkbox"/> Wading | <input type="checkbox"/> Rafting |
| <input type="checkbox"/> Hunting | <input type="checkbox"/> Trapping | <input type="checkbox"/> Fishing | <input checked="" type="checkbox"/> None of the above | <input type="checkbox"/> Other: |
| Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.) | | | | |

Site #3

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 2 of 3)

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

| | | | | |
|--|--------------------------------------|---|--|---|
| <input type="checkbox"/> City/county parks | <input type="checkbox"/> Playgrounds | <input type="checkbox"/> MDC conservation lands | <input type="checkbox"/> Urban areas | <input checked="" type="checkbox"/> Rural Residential |
| <input type="checkbox"/> Campgrounds | <input type="checkbox"/> State parks | <input type="checkbox"/> National forests | <input type="checkbox"/> Nature trails | <input type="checkbox"/> Stairs/walkway |
| <input type="checkbox"/> Boating accesses | <input type="checkbox"/> Fence | <input type="checkbox"/> No trespass sign | <input type="checkbox"/> Steep slopes | <input type="checkbox"/> Other: |
| Comments: | | | | |

Evidence of Human Use*: (Attach photos and reference in “Photos” section.)

| | | | | |
|---|--|--|---|---|
| <input type="checkbox"/> Roads | <input type="checkbox"/> Foot paths/prints | <input type="checkbox"/> Dock/platform | <input type="checkbox"/> Camping Sites | <input type="checkbox"/> Rope swings |
| <input type="checkbox"/> RV / ATV Tracks | <input type="checkbox"/> Fire pit/ring | <input type="checkbox"/> NPDES Discharge | <input type="checkbox"/> Fishing Tackle | <input type="checkbox"/> Livestock Watering |
| <input checked="" type="checkbox"/> None of the above | Comments / Other: | | | |
| | | | | |

Substrate*: (These values should add up to 100%.)

| | | | | | |
|----------|------------|----------|----------|------------|-----------|
| % Cobble | 60% Gravel | 30% Sand | 10% Silt | % Mud/Clay | % Bedrock |
|----------|------------|----------|----------|------------|-----------|

Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

| |
|------|
| none |
| |

Water Characteristics*: (Mark all that apply.)

| | | | | | |
|------------------|---|---|---|--|---------------------------------|
| Odor: | <input type="checkbox"/> Sewage | <input type="checkbox"/> Musky | <input type="checkbox"/> Chemical | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Other: |
| Color: | <input checked="" type="checkbox"/> Clear | <input checked="" type="checkbox"/> Green | <input type="checkbox"/> Gray | <input type="checkbox"/> Milky | <input type="checkbox"/> Other: |
| Bottom Deposit: | <input type="checkbox"/> Sludge | <input type="checkbox"/> Solids | <input type="checkbox"/> Fine sediments | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Other: |
| Surface Deposit: | <input type="checkbox"/> Oil | <input type="checkbox"/> Scum | <input type="checkbox"/> Foam | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Other: |

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Site #3

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 3 of 3)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

| Channel Feature | Distance from access location (m) | Width (m) | Length (m) | Median Depth (m) | Max Depth (m) |
|-----------------|-----------------------------------|-----------|------------|------------------|---------------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Comments: (Please record any additional comments here.)

Please verify that you have completed all sections, checked all applicable boxes, and that the form is complete.

Printed Names of Personnel Collecting Data: Gilisa Gould and Aaron Ball

Surveyor’s Signature: Aaron Ball Date of Survey: 4.28.08

Organization: SES, Inc. Position: Field Team Leader

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

| | |
|---|---|
| Stream Name: <u>Little Walnut Creek</u> Waterbody ID: <u>938</u> Site #: <u>3</u> Estimated Channel Incision: <u>5</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>0451247</u> UTM Y: <u>4300929</u> +/- <u>5</u> (meters) 11 UTM X: <u>0451077</u> UTM Y: <u>4301038</u> +/- <u>3</u> (meters) Average Stream Width: <u>3</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>Gilisa Gould and Aaron Ball</u> | Dissolved Oxygen Date: <u>4.28.08</u> Time: <u>14:50</u> Dissolved Oxygen: <u>9.8</u> (mg/L) Dissolved Oxygen: _____ (% sat) Specific Cond: _____ (µS/cm) Water Temperature: <u>14.7</u> (°C) |
|---|---|

Transect Cross-Section

| | | 01 | | 02 | | 03 | | 04 | | 05 | | 06 | | 07 | | 08 | | 09 | | 10 | | 11 | |
|-------------------|----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|
| Station | | Distance (m) | Depth (m) |
| Left Bank | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1 | 0.20 | 0.10 | 0.40 | 0.20 | 0.20 | 0.10 | 0.50 | 0.10 | 0.60 | 0.15 | 0.20 | 0.25 | 0.40 | 0.10 | 0.20 | 0.01 | 0.30 | 0.20 | 0.30 | 0.05 | 0.40 | 0.05 |
| | 2 | 0.40 | 0.10 | 0.80 | 0.20 | 0.40 | 0.20 | 1.00 | 0.15 | 1.20 | 0.30 | 0.40 | 0.20 | 0.80 | 0.10 | 0.40 | 0.01 | 0.60 | 0.40 | 0.60 | 0.10 | 0.80 | 0.05 |
| | 3 | 0.60 | 0.15 | 1.20 | 0.30 | 0.60 | 0.25 | 1.50 | 0.25 | 1.80 | 0.45 | 0.60 | 0.25 | 1.20 | 0.15 | 0.60 | 0.05 | 0.90 | 0.60 | 0.90 | 0.20 | 1.20 | 0.10 |
| | 4 | 0.80 | 0.20 | 1.60 | 0.35 | 0.80 | 0.35 | 2.00 | 0.25 | 2.40 | 0.40 | 0.80 | 0.20 | 1.60 | 0.15 | 0.80 | 0.05 | 1.20 | 0.65 | 1.20 | 0.20 | 1.60 | 0.01 |
| | 5 | 1.00 | 0.25 | 2.00 | 0.30 | 1.00 | 0.40 | 2.50 | 0.25 | 3.00 | 0.70 | 1.00 | 0.20 | 2.00 | 0.15 | 1.00 | 0.10 | 1.50 | 0.75 | 1.50 | 0.25 | 2.00 | 0.01 |
| | 6 | 1.20 | 0.30 | 2.40 | 0.25 | 1.20 | 0.40 | 3.00 | 0.25 | 3.60 | 1.00 | 1.20 | 0.20 | 2.40 | 0.10 | 1.20 | 0.20 | 1.80 | 0.75 | 1.80 | 0.30 | 2.40 | 0.05 |
| | 7 | 1.40 | 0.35 | 2.80 | 0.10 | 1.40 | 0.25 | 3.50 | 0.25 | 4.20 | 1.00 | 1.40 | 0.15 | 2.80 | 0.10 | 1.40 | 0.20 | 2.10 | 0.70 | 2.10 | 0.20 | 2.80 | 0.00 |
| | 8 | 1.60 | 0.30 | 3.20 | 0.05 | 1.60 | 0.20 | 4.00 | 0.25 | 4.80 | 1.00 | 1.60 | 0.10 | 3.20 | 0.10 | 1.60 | 0.20 | 2.40 | 0.25 | 2.40 | 0.15 | 3.20 | 0.10 |
| | 9 | 1.80 | 0.30 | 3.60 | 0.01 | 1.80 | 0.10 | 4.50 | 0.20 | 5.40 | 0.80 | 1.80 | 0.15 | 3.60 | 0.10 | 1.80 | 0.10 | 2.70 | 0.20 | 2.70 | 0.10 | 3.60 | 0.05 |
| Right Bank | | 2.00 | 0.00 | 4.00 | 0.00 | 2.00 | 0.00 | 5.00 | 0.00 | 6.00 | 0.00 | 2.00 | 0.00 | 4.00 | 0.00 | 2.00 | 0.00 | 3.00 | 0.00 | 3.00 | 0.00 | 4.00 | 0.00 |
| Feature Type | | run | | run | | run | | pool | | pool | | run | | riffle | | run | | pool | | run | | riffle | |

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width
 GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.
 Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)
 Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)
 All measurements to be taken to the nearest 0.01 meter.

Surveyor's Signature: Aaron Ball Date: 5.09.08

WBID# 0938 Little Walnut Creek



Site# 1 Photo ID# 19, Downstream, T01



Site# 1 Photo ID# 20, Upstream, T11



Site#2 Photo ID# 16, Downstream, T01



Site# 2 Photo ID# 17 Upstream, T11

WBID# 0938 Little Walnut Creek



Site# 3 Photo ID# 14 Upstream, T11



Site# 3 Photo ID# 15, Downstream, T01