



Missouri
Department of
Natural Resources

Use Attainability Analysis

for

WBID 1016 Kelley Branch

Submitted by

MEC Water Resources

To

Missouri Department of Natural Resources

Water Protection Program

On

October 17, 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): <i>Kelley Branch</i> |
| Missouri Water Body Identification (WBID) Number: <i>1016</i> |
| 8-digit HUC: <i>10300102</i> |
| County(ies), Listed Upstream to Downstream: <i>Boone, Boone</i> |
| Upstream Legal Description (from Table H): <i>24, 50N, 13W</i> |
| Downstream Legal Description (from Table H): <i>Mouth</i> |
| Number of sites evaluated: <i>3</i> |
| List all site numbers, <u>consecutively upstream to downstream</u> : <i>Site 1, Site 2, Site 3</i> |
| 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): <i>Mike's total. # MO 0114049, The Upper Deck. # MO 0126845</i> |
|--|

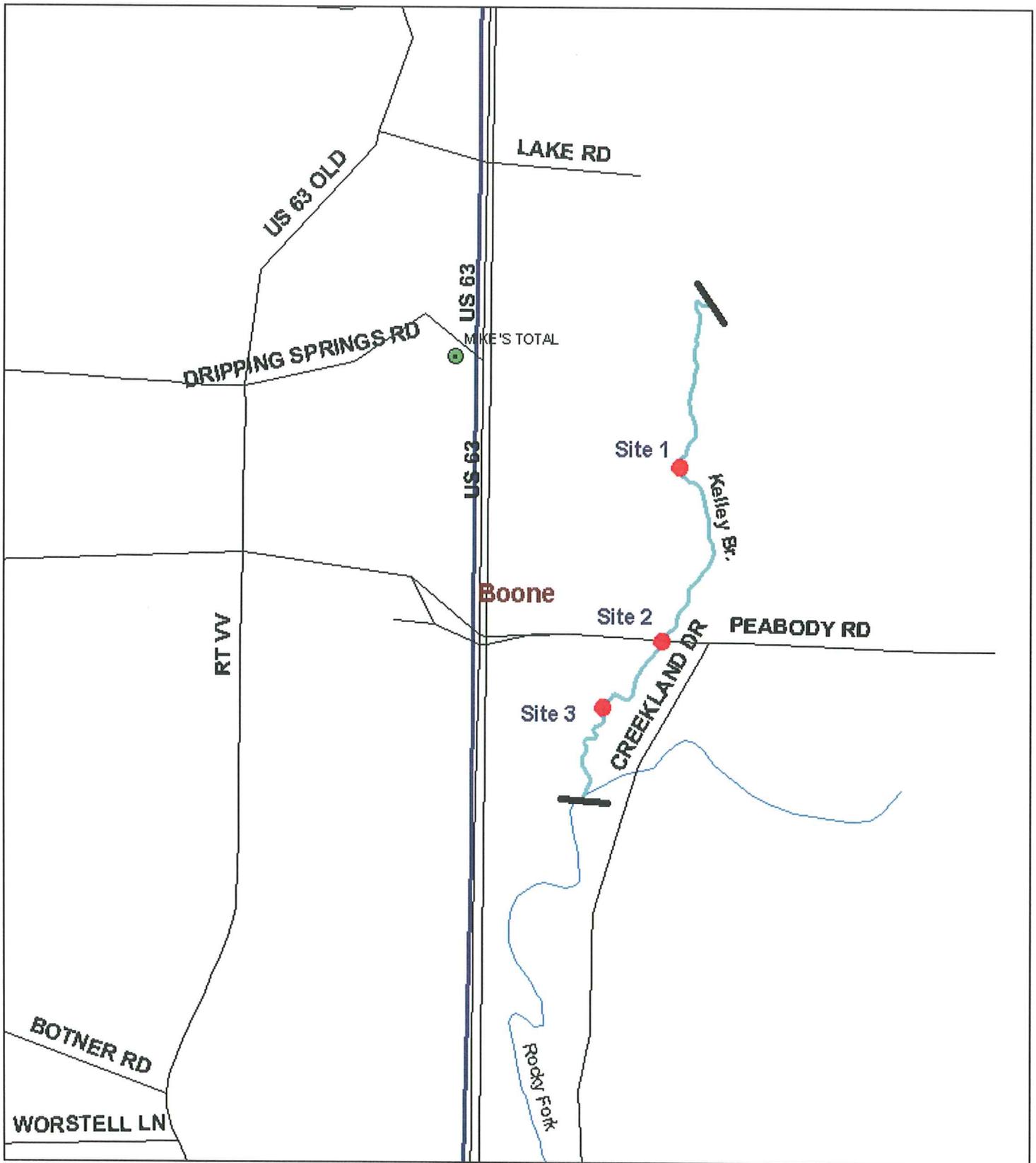
III. UAA Surveyor (please **PRINT** legibly)

| |
|--|
| Name of Surveyor: <i>Sonathan Witte, Cody Laebbering</i> Telephone Number: <i>(573) 443-4100</i> |
| Organization/Employer: <i>MEC Water Resources</i> |

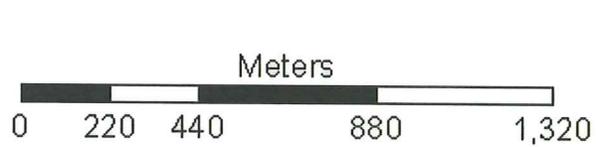
Please verify that you have completed all sections of **all** data sheets, checked all applicable boxes, provided a map (that includes all requirements listed in the *Missouri Recreational Use Attainability Analyses: Water Body Survey and Assessment Protocol*) and that this form is complete.

Signed: *Cody Laebbering* Date: *9-16-08*

AME 9-16-08



**Kelley Branch
WBID 1016
Boone County**



WBID # 1016

Site # 01

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: <u>8-12-08</u> <u>14:20</u> | Location Description (e.g., road crossing): <u>0558646 Easting (UTM)</u> <u>4326118 Northing (UTM)</u> |
| Stream Name: <u>Kelley Branch</u> | Facility Name(s): <u>Mikes Total</u> <u>The Upper Deck</u> |
| Current Weather Conditions: <u>80° Mostly Sunny</u> | Permit Number(s): <u>MO 0114049</u> <u>MO 0126845</u> |
| Weather Conditions for Past 10 days: <u>1 in. rainfall</u> | 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): <u>558647</u> | Northing (UTM Y): <u>4326131</u> | Horizontal Accuracy: (EPE / FOM / PDOP) <u>6.0</u> Meters |
| Site 11 | Easting (UTM X): <u>558731</u> | Northing (UTM Y): <u>4325999</u> | Horizontal Accuracy: (EPE / FOM / PDOP) <u>5.1</u> Meters |

Photos:

| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
|--------------------|------------------|--------------------|-----------------|-----------|---------------|
| <u>1016-01-065</u> | <u>DN Stream</u> | <u>1016-01-006</u> | <u>UpStream</u> | | |
| | | | | | |
| | | | | | |
| | | | | | |

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 Data Sheet D- Recreational Use Interview when conducting interviews.)

N/A

Stream Name & WBID # Kelley Branch 1016

Date of Survey 8-12-08

Site # 01

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 type="checkbox"/> Rural Residential |
| <input type="checkbox"/> Campgrounds | <input checked="" 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 checked="" type="checkbox"/> Steep slopes | <input type="checkbox"/> Other: |
| Comments: <p style="text-align: center;"><u>Riparian zone 7100m</u></p> | | | | |

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: <p style="text-align: center;"><u>N/A</u></p> | | | |

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

| | | | | | |
|-------------------|--------------------|------------------|------------------|----------------------|--------------------|
| <u>0</u> % Cobble | <u>15</u> % Gravel | <u>55</u> % Sand | <u>20</u> % Silt | <u>10</u> % Mud/Clay | <u>0</u> % Bedrock |
|-------------------|--------------------|------------------|------------------|----------------------|--------------------|

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

| |
|---|
| <u>Aq. Grasses, uncommon algal growth</u> |
|---|

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 type="checkbox"/> Clear | <input type="checkbox"/> Green | <input checked="" type="checkbox"/> Gray | <input checked="" type="checkbox"/> Milky | <input type="checkbox"/> Other: |
| Bottom Deposit: | <input type="checkbox"/> Sludge | <input type="checkbox"/> Solids | <input checked="" type="checkbox"/> Fine sediments | <input 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.

Stream Name & WBID # Kelley Branch 1016

Date of Survey 8-12-08

Site # 01

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) |
|-----------------|-----------------------------------|------------|------------|------------------|---------------|
| | | | | | |
| | | | | | |
| | | <u>N/A</u> | | | |
| | | | | | |
| | | | | | |

Comments: (Please record any additional comments here.)

~~###~~ Within Finger Lakes SP

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

Printed Names of Personnel Collecting Data: Sonathan Witte, Cody Luebbering

Surveyor's Signature: Cody Luebbering Date of Survey: 8-12-08

Organization: MEC Water Resources Position: Water Quality Scientist I

ALC 9-16-08

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

| | |
|---|---|
| Stream Name: <u>Kelley Branch</u> Waterbody ID: <u>1016</u> Site #: <u>1</u> Estimated Channel Incision: <u>0</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>558647</u> UTM Y: <u>4326131</u> +/- <u>6</u> (meters) 11 UTM X: <u>558731</u> UTM Y: <u>4325999</u> +/- <u>5.1</u> (meters) Average Stream Width: <u>5</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>JW, CL</u> | <h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u>8/12/2008</u> Time: <u>14:20</u> Dissolved Oxygen: <u>6.65</u> (mg/L) Dissolved Oxygen: <u>77.3</u> (% sat) Specific Cond: <u>717</u> (µS/cm) Water Temperature: <u>23.7</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 | 0.43 | 0.07 | 0.45 | 0.20 | 0.53 | 0.11 | 0.57 | 0.22 | 0.57 | 0.26 | 0.46 | 0.04 | 0.74 | 0.19 | 0.35 | 0.20 | 0.35 | 0.05 | 0.33 | 0.10 | 0.62 | 0.10 |
| | 2 | 0.86 | 0.10 | 0.90 | 0.36 | 1.06 | 0.25 | 1.14 | 0.23 | 1.14 | 0.26 | 0.92 | 0.09 | 1.48 | 0.31 | 0.70 | 0.19 | 0.70 | 0.06 | 0.66 | 0.16 | 1.24 | 0.08 |
| | 3 | 1.29 | 0.10 | 1.35 | 0.38 | 1.59 | 0.46 | 1.71 | 0.20 | 1.71 | 0.29 | 1.38 | 0.19 | 2.22 | 0.10 | 1.05 | 0.20 | 1.05 | 0.10 | 0.99 | 0.15 | 1.86 | 0.05 |
| | 4 | 1.72 | 0.10 | 1.80 | 0.70 | 2.12 | 0.55 | 2.28 | 0.17 | 2.28 | 0.33 | 1.84 | 0.28 | 2.96 | 0.20 | 1.40 | 0.21 | 1.40 | 0.10 | 1.32 | 0.14 | 2.48 | 0.01 |
| | 5 | 2.15 | 0.13 | 2.25 | 0.83 | 2.65 | 0.56 | 2.85 | 0.11 | 2.85 | 0.38 | 2.30 | 0.31 | 3.70 | 0.16 | 1.75 | 0.21 | 1.75 | 0.09 | 1.65 | 0.14 | 3.10 | 0.02 |
| | 6 | 2.58 | 0.18 | 2.70 | 0.79 | 3.18 | 0.34 | 3.42 | 0.04 | 3.42 | 0.42 | 2.76 | 0.35 | 4.44 | 0.00 | 2.10 | 0.16 | 2.10 | 0.06 | 1.98 | 0.10 | 3.72 | 0.00 |
| | 7 | 3.01 | 0.19 | 3.15 | 0.50 | 3.71 | 0.21 | 3.99 | 0.01 | 3.99 | 0.26 | 3.22 | 0.29 | 5.18 | 0.13 | 2.45 | 0.11 | 2.45 | 0.10 | 2.31 | 0.08 | 4.34 | 0.01 |
| | 8 | 3.44 | 0.19 | 3.60 | 0.31 | 4.24 | 0.14 | 4.56 | 0.00 | 4.56 | 0.18 | 3.68 | 0.14 | 5.92 | 0.24 | 2.80 | 0.10 | 2.80 | 0.04 | 2.64 | 0.06 | 4.96 | 0.02 |
| | 9 | 3.87 | 0.07 | 4.05 | 0.13 | 4.77 | 0.07 | 5.13 | 0.05 | 5.13 | 0.10 | 4.14 | 0.08 | 6.66 | 0.15 | 3.15 | 0.04 | 3.15 | 0.07 | 2.97 | 0.07 | 5.58 | 0.01 |
| Right Bank | | 4.30 | 0.00 | 4.50 | 0.00 | 5.30 | 0.00 | 5.70 | 0.00 | 5.70 | 0.00 | 4.60 | 0.00 | 7.40 | 0.00 | 3.50 | 0.00 | 3.50 | 0.00 | 3.30 | 0.00 | 6.20 | 0.00 |
| Feature Type | | Fiffle | | Pool | | 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: _____ Date: 8/12/2008

WBID # 1016

Site # 02

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: <u>8-12-08 12:45</u> | Location Description (e.g., road crossing): <u>at Penbody Rd. Crossing</u> |
| Stream Name: <u>Kelley Branch</u> | |
| Current Weather Conditions: <u>80° F, Clear</u> | Facility Name(s): <u>Mikes Total, The Upper Deck</u> |
| Weather Conditions for Past 10 days: <u>lin. rainfall</u> | Permit Number(s): <u>MO 0114049 MO 0126845</u> |
| 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): <u>558504</u> | Northing (UTM Y): <u>4325390</u> | Horizontal Accuracy: (EPE / FOM / PDOP) <u>6.0</u> Meters |
| Site 11 | Easting (UTM X): <u>558399</u> | Northing (UTM Y): <u>4325296</u> | Horizontal Accuracy: (EPE / FOM / PDOP) <u>9.0</u> Meters |

Photos:

| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
|--------------------|------------------|--------------------|------------------|-----------|---------------|
| <u>1016-02-001</u> | <u>Dn Stream</u> | <u>1016-02-002</u> | <u>Up Stream</u> | | |
| | | | | | |
| | | | | | |
| | | | | | |

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 *Data Sheet D- Recreational Use Interview* when conducting interviews.)

N/A

Stream Name & WBID # Kelley Branch 1016

Date of Survey 8-12-08

Site # 02

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 type="checkbox"/> Rural Residential |
| <input type="checkbox"/> Campgrounds | <input checked="" 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 checked="" type="checkbox"/> Fence | <input type="checkbox"/> No trespass sign | <input checked="" type="checkbox"/> Steep slopes | <input checked="" type="checkbox"/> Other: <u>row crop</u> |
| Comments: <p style="text-align: center;">N/A</p> | | | | |

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

| | | | | |
|---|--|--|---|---|
| <input checked="" type="checkbox"/> Roads | <input checked="" type="checkbox"/> Foot paths/prints | <input type="checkbox"/> Dock/platform | <input type="checkbox"/> Camping Sites | <input type="checkbox"/> Rope swings |
| <input checked="" 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 type="checkbox"/> None of the above | Comments / Other: <p style="text-align: center;">Roads Borders Finger Lakes SP</p> | | | |

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

| | | | | | |
|-------------------|--------------------|------------------|------------------|----------------------|--------------------|
| <u>5</u> % Cobble | <u>10</u> % Gravel | <u>10</u> % Sand | <u>15</u> % Silt | <u>60</u> % Mud/Clay | <u>0</u> % Bedrock |
|-------------------|--------------------|------------------|------------------|----------------------|--------------------|

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

| |
|--|
| <u>Aq. Grasses , Algal growth uncommon</u> |
|--|

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 type="checkbox"/> Clear | <input checked="" type="checkbox"/> Green | <input checked="" type="checkbox"/> Gray | <input checked="" type="checkbox"/> Milky | <input type="checkbox"/> Other: |
| Bottom Deposit: | <input type="checkbox"/> Sludge | <input type="checkbox"/> Solids | <input checked="" type="checkbox"/> Fine sediments | <input 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.

Stream Name & WBID # Kelley Branch 1016

Date of Survey 8-12-08

Site # 02

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) |
|-----------------|-----------------------------------|-----------|------------|------------------|---------------|
| | | | | | |
| | | | | | |
| | | N/A | | | |
| | | | | | |
| | | | | | |

Comments: (Please record any additional comments here.)

Riparian zone <10m

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

Printed Names of Personnel Collecting Data: Jonathan Witte Cody Luebbering

Surveyor's Signature: Cody Luebbering Date of Survey: 8-12-08

Organization: MEC Water Resources Position: Water Quality Scientist I

RWC 9-16-08

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

| | |
|--|---|
| Stream Name: <u>Kelley Brach</u> Waterbody ID: <u>1016</u> Site #: <u>2</u> Estimated Channel Incision: <u>0</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>558504</u> UTM Y: <u>4325390</u> +/- <u>6</u> (meters) 11 UTM X: <u>558399</u> UTM Y: <u>4325296</u> +/- <u>9</u> (meters) Average Stream Width: <u>5</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>JW, CL</u> | <h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u>8/12/2008</u> Time: <u>12:45</u> Dissolved Oxygen: <u>6.02</u> (mg/L) Dissolved Oxygen: <u>68.5</u> (% sat) Specific Cond: <u>790</u> (µS/cm) Water Temperature: <u>23.5</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 | 0.29 | 0.08 | 0.47 | 0.08 | 0.51 | >1 | 0.28 | 0.09 | 0.53 | 0.02 | 0.63 | 0.20 | 0.53 | >1 | 0.55 | 0.15 | 0.72 | 0.16 | 0.63 | 0.19 | 0.31 | 0.30 |
| 2 | 0.58 | 0.11 | 0.94 | 0.11 | 1.02 | >1 | 0.56 | 0.11 | 1.06 | 0.04 | 1.26 | 0.14 | 1.06 | 0.98 | 1.10 | 0.28 | 1.44 | 0.12 | 1.26 | 0.32 | 0.62 | 0.30 |
| 3 | 0.87 | 0.11 | 1.41 | 0.20 | 1.53 | >1 | 0.84 | 0.08 | 1.59 | 0.12 | 1.89 | 0.22 | 1.59 | 0.83 | 1.65 | 0.40 | 2.16 | 0.09 | 1.89 | 0.30 | 0.93 | 0.20 |
| 4 | 1.16 | 0.10 | 1.88 | 0.25 | 2.04 | >1 | 1.12 | 0.15 | 2.12 | 0.17 | 2.52 | 0.22 | 2.12 | 0.64 | 2.20 | 0.58 | 2.88 | 0.08 | 2.52 | 0.21 | 1.24 | 0.16 |
| 5 | 1.45 | 0.10 | 2.35 | 0.14 | 2.55 | >1 | 1.40 | 0.16 | 2.65 | 0.19 | 3.15 | 0.32 | 2.65 | 0.44 | 2.75 | 0.66 | 3.60 | 0.04 | 3.15 | 0.18 | 1.55 | 0.08 |
| 6 | 1.74 | 0.04 | 2.82 | 0.10 | 3.06 | >1 | 1.68 | 0.14 | 3.18 | 0.25 | 3.78 | 0.30 | 3.18 | 0.30 | 3.30 | 0.73 | 4.32 | 0.07 | 3.78 | 0.16 | 1.86 | 0.08 |
| 7 | 2.03 | 0.07 | 3.29 | 0.10 | 3.57 | >1 | 1.96 | 0.10 | 3.71 | 0.26 | 4.41 | 0.21 | 3.71 | 0.21 | 3.85 | 0.70 | 5.04 | 0.06 | 4.41 | 0.17 | 2.17 | 0.07 |
| 8 | 2.32 | 0.09 | 3.76 | 0.10 | 4.08 | >1 | 2.24 | 0.04 | 4.24 | 0.23 | 5.04 | 0.17 | 4.24 | 0.21 | 4.40 | 0.52 | 5.76 | 0.10 | 5.04 | 0.13 | 2.48 | 0.05 |
| 9 | 2.61 | 0.03 | 4.23 | 0.07 | 4.59 | >1 | 2.52 | 0.03 | 4.77 | 0.12 | 5.67 | 0.10 | 4.77 | 0.15 | 4.95 | 0.19 | 6.48 | 0.07 | 5.67 | 0.10 | 2.79 | 0.03 |
| Right Bank | 2.90 | 0.00 | 4.70 | 0.00 | 5.10 | 0.00 | 2.80 | 0.00 | 5.30 | 0.00 | 6.30 | 0.00 | 5.30 | 0.00 | 5.50 | 0.00 | 7.20 | 0.00 | 6.30 | 0.00 | 3.10 | 0.00 |
| Feature Type <small>(riffle, run, or pool)</small> | Riffle | | Run | | Pool | | Run | | Run | | Run | | Pool | | 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: _____ Date: 8/12/2008

WBID # 1016
 Site # 03

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: <u>8-12-08</u> | Location Description (e.g., road crossing): <u>0558377 d/w 0558320</u> <u>4325258 4325150 From Peabody Rd.</u> |
| Stream Name: <u>Kelley Branch</u> | |
| Current Weather Conditions: <u>80° Mostly Sunny</u> | Facility Name(s): <u>Mirco Total, The Upper Deck</u> |
| Weather Conditions for Past 10 days: <u>lin/rainfall</u> | Permit Number(s): <u>MO 0114049 MO 0126845</u> |
| 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): <u>0558377</u> | Northing (UTM Y): <u>4325258</u> | Horizontal Accuracy: (EPE / FOM / PDOP) <u>5.9</u> Meters |
| Site 11 | Easting (UTM X): <u>0558320</u> | Northing (UTM Y): <u>4325150</u> | Horizontal Accuracy: (EPE / FOM / PDOP) <u>4.7</u> Meters |

Photos:

| Photo ID# | Photo Purpose | Photo ID# | Photo Purpose | Photo ID# | Photo Purpose |
|--------------------|-----------------|--------------------|-----------------|-----------|---------------|
| <u>1016-03-003</u> | <u>UPStream</u> | <u>1016-03-004</u> | <u>DNStream</u> | | |
| | | | | | |
| | | | | | |
| | | | | | |

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 *Data Sheet D- Recreational Use Interview* when conducting interviews.)

N/A

Stream Name & WBID # Kelley Branch 1016

Date of Survey 8-12-08

Site # 03

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 checked="" type="checkbox"/> Other: row crop |

Comments:
Row Crops on both sides of riparian.
Corn

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: <u>N/A</u> | | | |

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

| | | | | | |
|--------------------|--------------------|------------------|------------------|----------------------|--------------------|
| <u>10</u> % Cobble | <u>30</u> % Gravel | <u>30</u> % Sand | <u>20</u> % Silt | <u>10</u> % Mud/Clay | <u>0</u> % Bedrock |
|--------------------|--------------------|------------------|------------------|----------------------|--------------------|

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

Uncommon algal growth.
Aquatic grasses are abundant.

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 type="checkbox"/> Clear | <input checked="" type="checkbox"/> Green | <input type="checkbox"/> Gray | <input type="checkbox"/> Milky | <input checked="" type="checkbox"/> Other: <u>Brown</u> |
| Bottom Deposit: | <input type="checkbox"/> Sludge | <input checked="" type="checkbox"/> Solids | <input checked="" type="checkbox"/> Fine sediments | <input type="checkbox"/> None | <input type="checkbox"/> Other: |
| Surface Deposit: | <input type="checkbox"/> Oil | <input checked="" type="checkbox"/> Scum | <input checked="" type="checkbox"/> Foam | <input 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.

Stream Name & WBID # Xelley Branch 1016

Date of Survey 8-12-08

Site # 03

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) |
|-----------------|-----------------------------------|-----------|------------|------------------|---------------|
| | | | | | |
| | | | | | |
| | N/A | | | | |
| | | | | | |
| | | | | | |

Comments: (Please record any additional comments here.)

Run, Riffle, Pool stream system.

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

Printed Names of Personnel Collecting Data: Jonathan Witte, Cody Luebbering

Surveyor's Signature: Cody Luebbering Date of Survey: 8-12-08

Organization: MEC Water Resources Position: Water Quality Scientist I

AUC 9-16-08

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

| | |
|---|---|
| Stream Name: <u>Kelley Branch</u> Waterbody ID: <u>1016</u> Site #: <u>3</u> Estimated Channel Incision: <u>0</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>558377</u> UTM Y: <u>4325258</u> +/- <u>5.9</u> (meters) 11 UTM X: <u>558320</u> UTM Y: <u>4325150</u> +/- <u>4.7</u> (meters) Average Stream Width: <u>5</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>JW, CL</u> | <h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u>8/12/2008</u> Time: <u>13:10</u> Dissolved Oxygen: <u>6.23</u> (mg/L) Dissolved Oxygen: <u>76.4</u> (% sat) Specific Cond: <u>787</u> (µS/cm) Water Temperature: <u>23.4</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 | 0.33 | 0.07 | 0.55 | 0.12 | 0.72 | 0.22 | 0.70 | 0.25 | 0.94 | 0.16 | 0.52 | 0.20 | 0.79 | 0.76 | 0.12 | 0.10 | 0.34 | 0.07 | 0.37 | 0.18 | 0.56 | 0.13 |
| 2 | 0.66 | 0.07 | 1.10 | 0.32 | 1.44 | 0.52 | 1.40 | 0.61 | 1.88 | 0.08 | 1.04 | 0.39 | 1.58 | 0.90 | 0.24 | 0.17 | 0.68 | 0.19 | 0.74 | 0.21 | 1.12 | 0.16 |
| 3 | 0.99 | 0.08 | 1.65 | 0.57 | 2.16 | 0.63 | 2.10 | 0.46 | 2.82 | 0.10 | 1.56 | 0.70 | 2.37 | 0.97 | 0.36 | 0.19 | 1.02 | 0.29 | 1.11 | 0.22 | 1.68 | 0.23 |
| 4 | 1.32 | 0.07 | 2.20 | 0.72 | 2.88 | 0.69 | 2.80 | 0.58 | 3.76 | 0.11 | 2.08 | 0.90 | 3.16 | 0.90 | 0.48 | 0.19 | 1.36 | 0.33 | 1.48 | 0.24 | 2.24 | 0.33 |
| 5 | 1.65 | 0.08 | 2.75 | 0.79 | 3.60 | 0.65 | 3.50 | 0.63 | 4.70 | 0.00 | 2.60 | 0.91 | 3.95 | 0.68 | 0.60 | 0.20 | 1.70 | 0.31 | 1.85 | 0.28 | 2.80 | 0.41 |
| 6 | 1.98 | 0.08 | 3.30 | 0.80 | 4.32 | 0.59 | 4.20 | 0.58 | 5.64 | 0.00 | 3.12 | 0.92 | 4.74 | 0.51 | 0.72 | 0.19 | 2.04 | 0.30 | 2.22 | 0.28 | 3.36 | 0.47 |
| 7 | 2.31 | 0.05 | 3.85 | 0.77 | 5.04 | 0.54 | 4.90 | 0.52 | 6.58 | 0.00 | 3.64 | 0.90 | 5.53 | 0.38 | 0.84 | 0.18 | 2.38 | 0.22 | 2.59 | 0.21 | 3.92 | 0.47 |
| 8 | 2.64 | 0.07 | 4.40 | 0.71 | 5.76 | 0.45 | 5.60 | 0.39 | 7.52 | 0.29 | 4.16 | 0.79 | 6.32 | 0.23 | 0.96 | 0.17 | 2.72 | 0.13 | 2.96 | 0.02 | 4.48 | 0.28 |
| 9 | 2.97 | 0.11 | 4.95 | 0.68 | 6.48 | 0.30 | 6.30 | 0.34 | 8.46 | 0.26 | 4.68 | 0.70 | 7.11 | 0.11 | 1.08 | 0.14 | 3.06 | 0.04 | 3.33 | 0.08 | 5.04 | 0.21 |
| Right Bank | 3.30 | 0.00 | 5.50 | 0.00 | 7.20 | 0.00 | 7.00 | 0.00 | 9.40 | 0.00 | 5.20 | 0.00 | 7.90 | 0.00 | 1.20 | 0.00 | 3.40 | 0.00 | 3.70 | 0.00 | 5.60 | 0.00 |
| Feature Type <small>(riffle, run, or pool)</small> | Riffle | | Pool | | Pool | | Run | | Riffle | | Pool | | Pool | | Riffle | | Run | | Run | | 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
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 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: _____ Date: 8/12/2008



