

Missouri  
Department of  
Natural Resources

Use Attainability Analysis

for

WBID 3490 Tributary to Little Muddy Creek

Submitted by

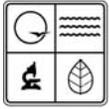
Pickett Ray and Silver

To

Missouri Department of Natural Resources

Water Protection Program

Date Received: October 31, 2007



Missouri  
 Department of Natural Resources  
 Permit 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): Trib. of L. Muddy Creek 2	
Missouri Water Body Identification (WBID) Number: 3490	
8-digit HUC: 20080724	County: Pettis
Upstream Legal Description (from Table H): 14, 46N, 22W	
Downstream Legal Description (from Table H): Mouth	
Number of sites evaluated: 3	
List all sites numbers, listed consequently upstream to downstream: 3490-01 Walnut Grove Rd, 3490-02 100m downstream of site 01, 3490-03 100m downstream of site 02	

**Site Locations Map(s):** Attach a map of the entire segment with assessment sites clearly labeled. Mark any other items that may be of interest.

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

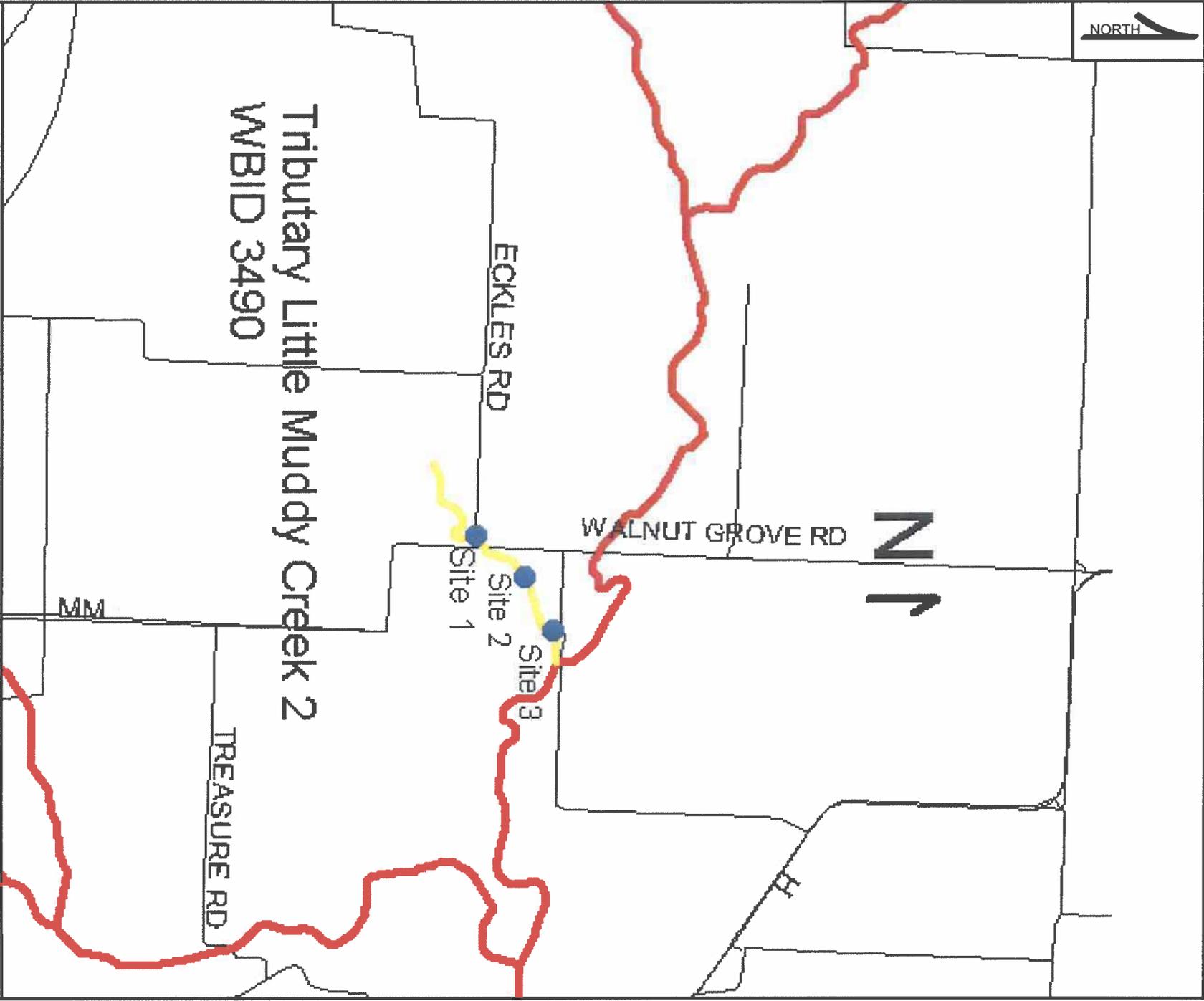
Facility Name(s) and Permit Number(s): Tyson Foods-Sedalia Proce – MO 0115061
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**III. UAA Surveyor** (please print legibly)

Name of Surveyor: Renee Martin	Telephone Number: 573-875-7844
Organization/Employer: Applied Environmental Solutions	

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

**Signed:** \_\_\_\_\_ **Date:** \_\_\_\_\_



# Tributary Little Muddy Creek 2

## WBID 3490

**PKCKET RAY & SILVER**

Civil Engineers Land Surveyors Natural Resources  
Address:  
333 Mid Rivers Mall Drive Phone: (636)997-1211  
St. Peters, Missouri 63376 Fax: (636)997-1104  
Website: www.prs3.com

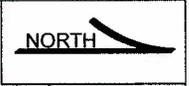
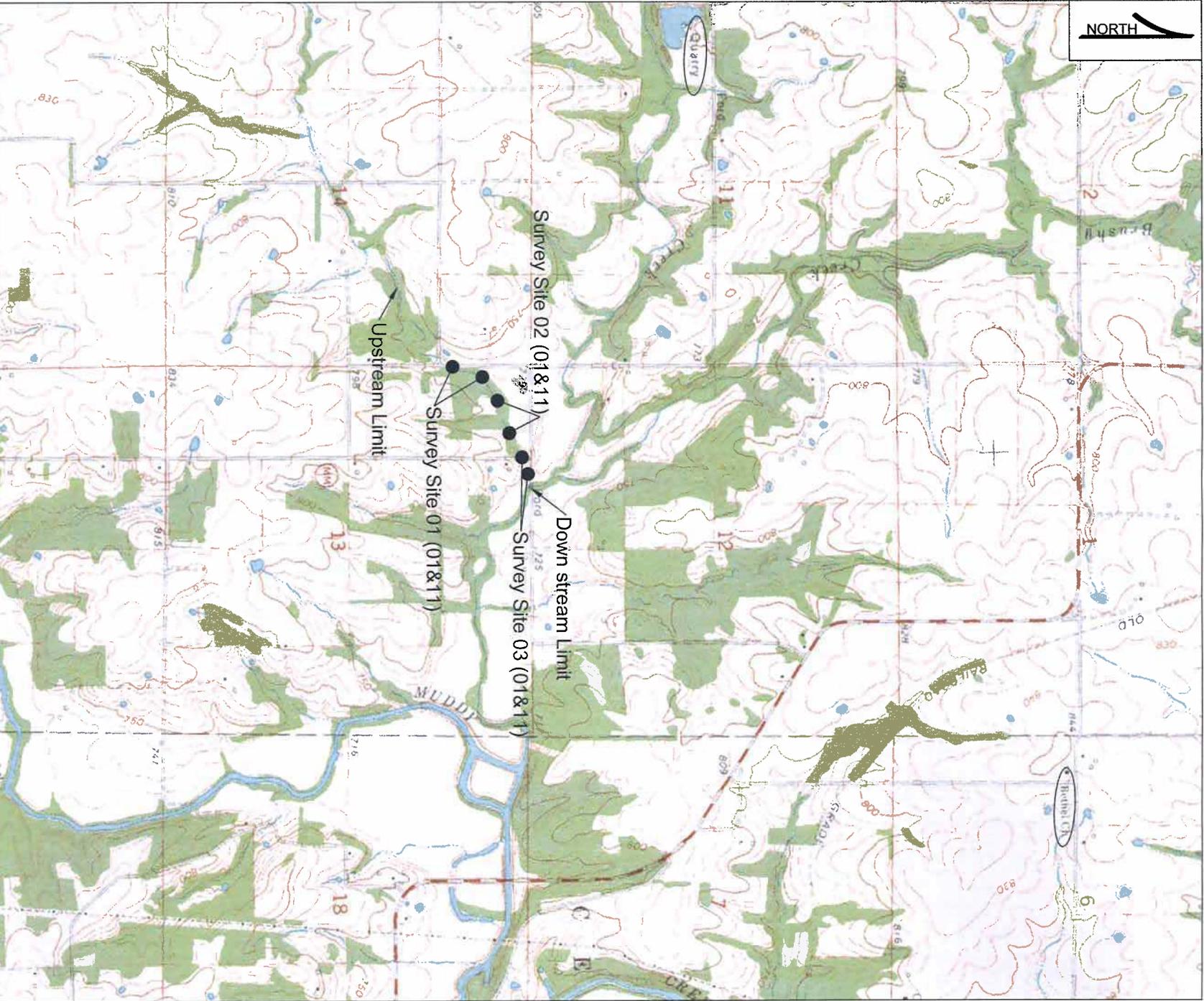
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WBID #: 3490  
Name: Tributary L Muddy  
Creek 2  
County: Pettis  
GIS Location Map  
Sheet 1 of 1



**GRAPHIC SCALE**  
1 inch = 2000ft.

PRS Job Number: 07031\_MODN\_01E  
Drawn By: BLS Date: 10/17/07  
Checked By: JCV Date: 10/18/07



**PICKETT RAY & SILVER**

Civil Engineers Land Surveyors Natural Resources

Address:  
333 Wild Rivers Mall Drive  
St. Peters, Missouri 63376

Phone: (636)397-1211  
Fax: (636)397-1704  
Website: www.prs3.com

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WBID #: 3490

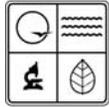
Name: Tributary L Muddy  
Creek 2

County: Pettis  
USGS Location Map  
Sheet 1 of 1



**GRAPHIC SCALE**  
1 Inch = 2000ft.

PRS Job Number: 07031MODN\_01E  
Drawn By: BLS Date: 10-17-07  
Checked By: JCV Date: 10-12-07



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization**

(must be completed for each site)

Date & Time: 9/14/07 10:50	Site Location Description (e.g., road crossing): Walnut Grove Rd
Personnel (Data Collectors): Tiffanie Hamilton, Justyn Foth	
Current Weather Conditions: sunny, breezy	Facility Name: Tyson Foods-Sedalia Proce
Weather Conditions for Past 10 days: clear/rain	Permit Number: MO 0115061
Drought Conditions?: 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:**

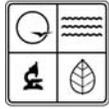
LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0474170	Northing (UTM Y): 4291311	Horizontal Accuracy: (EPE / FOM / PDOP) 20 feet
Site 11	Easting (UTM X): 0474223	Northing (UTM Y): 4291443	Horizontal Accuracy: (EPE / FOM / PDOP) 37 feet

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
101_0064	Upstream, livestock watering	101_0065	Downstream		
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 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.)				



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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 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 type="checkbox"/> Steep slopes	<input type="checkbox"/> Other:
Comments:				

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

<input checked="" 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 checked="" type="checkbox"/> Livestock Watering
Comments / Other:				

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

5% Cobble	15% Gravel	15% Sand	% Silt	% Mud/Clay	65% Bedrock
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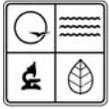
**Aquatic Vegetation\*:** (Note amount of vegetation or algal growth at the assessment site)

Duckweed
Filamentous algae

**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 type="checkbox"/> Green	<input type="checkbox"/> Gray	<input type="checkbox"/> Milky	<input checked="" type="checkbox"/> Other: tea brown (tannins)
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 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 effect another use.



Missouri **Field Data Sheets for Recreational Use Stream Surveys**  
Department of  
Natural Resources **Data Sheet B – Site Characterization (continued)**

**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.**

Surveyor's Signature: \_\_\_\_\_ Date of Survey: 09/14/07

Organization: Applied Environmental Solutions Position: Field Tech

## Field Data Sheets for Recreational Use Stream Surveys

### Data Sheet C - Field Survey Results

<div style="display: inline-block; vertical-align: top;"> <p><b>Missouri</b> <b>Department of</b> <b>Natural Resources</b></p> <p>Waterbody ID: <u>2490</u>      Site #: <u>1</u></p> <p>Estimated Channel Incision: <u>1.0</u> (m) (height between low bank width and water)</p> <p>GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM)</p> <p><b>01</b> UTM X: <u>0474170</u>      UTM Y: <u>4291311</u>      +/- <u>20</u> (feet)</p> <p><b>11</b> UTM X: <u>0474223</u>      UTM Y: <u>4291443</u>      +/- <u>37</u> (feet)</p> <p>Average Stream Width: <u>4.5</u> (meters)      Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach)      (20x average stream width)</p> <p>Field Staff: <u>Tiffanie Hamilton and Justyn Foth</u></p> </div>	<p style="text-align: center;"><b>Dissolved Oxygen</b></p> <p>Date: <u>9/14/2007</u>      Time: <u>10:50</u></p> <p>Dissolved Oxygen: <u>7.34</u> (mg/L)</p> <p>Dissolved Oxygen: <u>85.8</u> (% sat)</p> <p>Specific Cond: <u>1711.0</u> (µS/cm)</p> <p>Water Temperature: <u>22.8</u> (°C)</p>
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#### Transect Cross-Section

		01		02		03		04		05		06		07		08		09		10		11	
Station		Distance (m)	Depth (m)																				
<b>Left Bank</b>		0	0	0	0	0	0	0	0	0	0	0.15	0	0	0	0	0	0	0	0	0	0	0
	<b>1</b>	0.45	0.01	0.45	0.03	0.30	0.06	0.61	0.13	0.28	0.10	0.27	0.25	0.52	0.35	0.54	0.20	0.51	0.54	0.60	0.22	0.47	0.18
	<b>2</b>	0.90	0.01	0.90	0.08	0.60	0.08	1.22	0.41	0.56	0.14	0.54	0.40	1.04	0.66	1.08	0.13	1.02	0.70	1.20	0.11	0.94	0.41
	<b>3</b>	1.35	0.17	1.35	0.17	0.90	0.10	1.83	0.56	0.84	0.10	0.81	0.43	1.56	0.64	1.62	0.14	1.53	0.70	1.80	0.11	1.41	0.40
	<b>4</b>	1.80	0.08	1.80	0.22	1.20	0.05	2.44	0.56	1.12	0.15	1.08	0.35	2.08	0.54	2.16	0.15	2.04	0.56	2.40	0.06	1.88	0.48
	<b>5</b>	2.25	0.10	2.25	0.30	1.50	0.11	3.05	0.55	1.40	0.08	1.35	0.30	2.60	0.54	2.70	0.12	2.55	0.45	3.00	0.10	2.35	0.50
	<b>6</b>	2.70	0.07	2.70	0.32	1.80	0.12	3.66	0.54	1.68	0.02	1.62	0.18	3.12	0.54	3.24	0.14	3.06	0.35	3.60	0.08	2.82	0.39
	<b>7</b>	3.15	0.06	3.15	0.40	2.10	0.18	4.27	0.51	1.96	0.05	1.89	0.12	3.64	0.45	3.78	0.17	3.57	0.34	4.20	0.08	3.29	0.23
	<b>8</b>	3.60	0.13	3.60	0.30	2.40	0.17	4.88	0.54	2.24	0.01	2.16	0.10	4.16	0.26	4.32	0.24	4.08	0.24	4.80	0.07	3.76	0.15
	<b>9</b>	4.05	0.12	4.05	0.30	2.70	0.22	5.49	0.24	2.52	0.01	2.43	0.07	4.68	0.18	4.86	0.31	4.59	0.10	5.40	0.04	4.23	0.05
<b>Right Bank</b>		4.50	0.00	4.50	0.00	3.05	0.00	6.12	0.00	2.80	0.00	2.70	0.00	5.21	0.00	5.41	0.00	5.13	0.00	6.00	0.00	4.72	0.00
<b>Feature Type</b>		Riffle		Run		Riffle		Pool		Riffle		Run		Run		Run		Run		Riffle		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

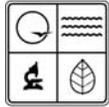
GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

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 0.01 meter unless depth is too deep to measure (then record as > 1)

All measurements to be taken to the nearest 0.01 meter.

Signed: \_\_\_\_\_ Date: \_\_\_\_\_



**Field Data Sheets for Recreational Use Stream Surveys**

**Missouri Department of Natural Resources**  
**Data Sheet D – Recreational Use Interview**  
(must be completed for each interview)

**I. Introduction**

**Date & Time** (include AM or PM): 9/14/07 10:50 am

**Interviewed:**  In person  By phone  By mail

(NOTE: If you are an Interviewee filling out this form to mail back to DNR, proceed to Question #1.)

**Interviewee selected because** (e.g., house next to stream; standing by stream, etc.) Drove up to us on  
ATV – Farmer’s son

**Interviewer introduction to Interviewee:** “My name is \_\_\_\_\_, I work for \_\_(*name of your employer*)\_\_\_\_, and I am collecting information on how people use \_\_(*name of the stream*)\_\_\_\_\_.”

**ASK:**

1.) Are you willing to respond to a survey about this stream? (It will just take a few minutes.)  
 Yes  No If yes, list contact information for the interviewee below:

Legal name: N/A  
Current mailing address: N/A  
Daytime phone number: (\_\_\_\_) N/A  
E-mail address (optional): N/A

2.a.) Do you live in this area?  Yes  No  
If yes, how many years? All his life

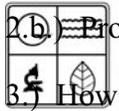
2.b.) If you don’t live in this area, are you still familiar with this stream?  Yes  No  
If yes, how many years? \_\_\_\_\_  
If no, thank the individual for taking the time to talk to you and conclude the interview.

3.) Are you familiar with this particular stretch of the stream? (show them the map, pointing out local landmarks such as roads, bridges, property lines)  Yes  No  
If yes, proceed to “II. Personal Use?”.  
If no, proceed to Section V.

**II. Personal Use?**

1.) Have you or your family personally used the stream for recreation since November 28, 1975?  
 Yes  No  
If yes, proceed to #3.  
If no, proceed to #2.

2.a.) List reasons stream not used. Used only to water livestock  
\_\_\_\_\_  
\_\_\_\_\_



Missouri Department of Natural Resources  
2.d.) Proceed to III. Witnessed Use??.  
3.) How

**Whole Body Contact Recreation (WBCR)**

Swimming     Tubing     Snorkeling/Skin Diving     Water Skiing

**If Interviewee (or family) used the stream for WBCR since Nov. 28, 1975, ask:**

4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

4.b.) Where, exactly? Describe specific location *and mark on the map* (See map requirements in the protocol). \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

**Secondary Contact Recreation (SCR)**

Fishing     Wading     Boating     Trapping     Other:

**If Interviewee (or family) used the stream for SCR since Nov. 28, 1975, ask:**

4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

4.d.) Where, exactly? Describe specific location *and mark on the map* (See map requirements in the protocol). \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

**III. Witnessed Use?**

1.) Have you observed others using this stream for recreation since Nov. 28, 1975?

Yes **X** No

If yes, proceed to #2.

If no, proceed to, "IV. Anecdotal Use?".

2.) What kinds of uses have you witnessed?

**Whole Body Contact Recreation (WBCR)**

Swimming     Tubing     Snorkeling/Skin Diving     Water Skiing



**Missouri Department of Natural Resources**

**If Interviewee witnessed WBCR use since Nov. 28, 1975, ask the following questions:**

2.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2.b.) Where, exactly? Describe specific location *and mark on the map* (See map requirements in the protocol). \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Secondary Contact Recreation (SCR)**

Fishing     Wading     Boating     Trapping     Other:

**If Interviewee witnessed SCR use since Nov. 28, 1975, ask the following questions:**

2.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2.d.) Where, exactly? Describe specific location *and mark on the map* (See map requirements in the protocol). \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**IV. Anecdotal Use?**

1.) Have you heard about anyone using this stream since Nov. 28, 1975 for recreation – not seen or done yourself, but just heard about it?     Yes     No

    If yes, proceed to #2.

    If no, thank the individual for taking the time to talk to you and conclude the interview.

2.) What kind of uses have you heard about?

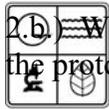
**Whole Body Contact Recreation (WBCR)**

Swimming     Tubing     Snorkeling/Skin Diving     Water Skiing

**If Interviewee heard of WBCR use since Nov. 28, 1975, ask the following questions:**

2.a.) When did these uses take place (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



2.d.) Where, exactly? Describe specific location *and mark on the map* (See map requirements in the protocol) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Secondary Contact Recreation (SCR)**

<input type="checkbox"/> Fishing	<input type="checkbox"/> Wading	<input type="checkbox"/> Boating	<input type="checkbox"/> Trapping	<input type="checkbox"/> Other:
----------------------------------	---------------------------------	----------------------------------	-----------------------------------	---------------------------------

**If Interviewee heard of SCR use since Nov. 28, 1975, ask the following questions:**

2.c.) When did these uses take place (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2.d.) Where, exactly? Describe specific location *and mark on the map* (See map requirements in the protocol). \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**V. Others to Contact?**

Can you recommend someone else we could contact that knows the stream?  Yes  No  
If yes, that person's contact info (name, address, phone, directions?) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

If no, thank the individual for taking the time to talk to you and conclude the interview.

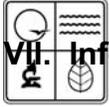
**VI. Additional Comments**

From the Interviewee: He felt the only reason the stream flowed in the summer was because Tyson pumped into the stream. The stream use to be stream fed, but the streams and springs dried up when Tyson came. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

From the Interviewer: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

WBID # 3490

Site # 1



**Missouri  
Department of  
Natural Resources**

**VII. Information on Interviewer**  
Has interviewer been trained by Missouri DNR to conduct UAA Interviews?

Yes  No If yes, how (check all that apply):

Workshop? (if so, enter date): \_\_\_\_\_

On-line training seminar? \_\_\_\_\_

Followed Interview Instruction Sheets? \_\_\_\_\_

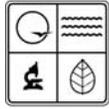
Other \_\_\_\_\_

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Employer (where applicable): \_\_\_\_\_

Interviewer's phone #: \_\_\_\_\_ E-mail: \_\_\_\_\_



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization**

(must be completed for each site)

Date & Time: 9/14/07 11:18 am	Site Location Description (e.g., road crossing): 100m downstream of site 01, transect 11
Personnel (Data Collectors): Tiffanie Hamilton, Justyn Foth	
Current Weather Conditions: sunny, breezy	Facility Name: Tyson Foods-Sedalia Proce
Weather Conditions for Past 10 days: clear/rain	Permit Number: MO 0115061
Drought Conditions?: 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:**

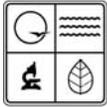
LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)					
Site 01	Easting (UTM X): 0474316	Northing (UTM Y): 4291510	Horizontal Accuracy: (EPE / FOM / PDOP)	30 feet	
Site 11	Easting (UTM X): 0474472	Northing (UTM Y): 4291560	Horizontal Accuracy: (EPE / FOM / PDOP)	27 feet	

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
101_0066	downstream, livestock watering	101_0067	upstream		
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 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.)				



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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 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 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 checked="" type="checkbox"/> Livestock Watering
Comments / Other:				

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

10% Cobble	5% Gravel	5% Sand	5% Silt	5% Mud/Clay	70% Bedrock
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**Aquatic Vegetation\*:** (Note amount of vegetation or algal growth at the assessment site)

Duckweed
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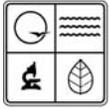
**Water Characteristics\*:** (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input type="checkbox"/> None	<input checked="" type="checkbox"/> Other: metallic
Color:	<input checked="" type="checkbox"/> Clear	<input type="checkbox"/> Green	<input type="checkbox"/> Gray	<input type="checkbox"/> Milky	<input type="checkbox"/> Other:
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 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 effect another use.

WBID # 3490

Site # 2



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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.**

Surveyor's Signature: \_\_\_\_\_ Date of Survey: 9/14/07

Organization: Applied Environmental Solutions Position: Field Tech

## Field Data Sheets for Recreational Use Stream Surveys

### Data Sheet C - Field Survey Results

Missouri Department of Natural Resources Waterbody ID: <u>3499</u> Site #: <u>2</u> Estimated Channel Incision: <u>1.0</u> (m) (height between low bank width and water)  GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) <b>01</b> UTM X: <u>474316</u> UTM Y: <u>4291510</u> +/- <u>30</u> (feet) <b>11</b> UTM X: <u>474472</u> UTM Y: <u>4291560</u> +/- <u>27</u> (feet)  Average Stream Width: <u>5.0</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width)  Field Staff: <u>Tiffanie Hamilton and Justyn Foth</u>	<b>Dissolved Oxygen</b> Date: <u>9/14/2007</u> Time: <u>11:18 am</u>  Dissolved Oxygen: <u>5.69</u> (mg/L) Dissolved Oxygen: <u>65.5</u> (% sat)  Specific Cond: <u>1687.0</u> (µS/cm) Water Temperature: <u>22.1</u> (°C)
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#### Transect Cross-Section

Station		01		02		03		04		05		06		07		08		09		10		11	
		Distance (m)	Depth (m)																				
<b>Left Bank</b>		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	<b>1</b>	0.20	0.06	0.45	0.06	0.48	0.14	0.30	0.02	0.43	0.04	0.75	0.09	0.71	0.02	0.27	0.04	0.81	0.20	0.71	0.29	0.45	0.34
	<b>2</b>	0.40	0.18	0.90	0.23	0.96	0.19	0.60	0.04	0.86	0.13	1.50	0.01	1.42	0.01	0.54	0.09	1.62	0.42	1.42	0.25	0.90	0.50
	<b>3</b>	0.60	0.26	1.35	0.36	1.44	0.27	0.90	0.07	1.29	0.21	2.25	0	2.13	0.01	0.81	0.16	2.43	0.61	2.13	0.13	1.35	0.56
	<b>4</b>	0.80	0.29	1.80	0.37	1.92	0.30	1.20	0.07	1.72	0.27	3.00	0	2.84	0	1.08	0.19	3.24	0.90	2.84	0.04	1.80	0.49
	<b>5</b>	1.00	0.27	2.25	0.42	2.40	0.31	1.50	0.11	2.15	0.45	3.75	0	3.55	0	1.35	0.20	4.05	0.99	3.55	0.05	2.25	0.34
	<b>6</b>	1.20	0.22	2.70	0.30	2.88	0.25	1.80	0.15	2.58	0.44	4.50	0.06	4.26	0.08	1.62	0.20	4.86	0.93	4.26	0.15	2.70	0.31
	<b>7</b>	1.40	0.15	3.15	0.20	3.36	0.24	2.10	0.13	3.01	0.48	5.25	0.13	4.97	0.19	1.89	0.11	5.67	0.94	4.97	0.15	3.15	0.22
	<b>8</b>	1.60	0.13	3.60	0.14	3.84	0.11	2.40	0.04	3.44	0.45	6.00	0.11	5.68	0.30	2.16	0.09	6.48	0.94	5.68	0.26	3.60	0.16
	<b>9</b>	1.80	0.09	4.05	0.09	4.32	0.17	2.70	0.02	3.87	0.40	6.75	0.05	6.39	0.28	2.43	0.04	7.29	0.95	6.39	0.31	4.05	0.13
<b>Right Bank</b>		2.00	0.00	4.51	0.00	4.80	0.00	3.00	0.00	4.30	0.35	7.50	0	7.10	0.00	2.70	0.00	8.12	0.90	7.10	0.00	4.50	0.00
<b>Feature Type</b> <small>(riffle, run, or pool)</small>		Run	Run	Run	Riffle	Run	Riffle	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

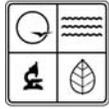
GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

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 0.01 meter unless depth is too deep to measure (then record as > 1)

All measurements to be taken to the nearest 0.01 meter.

Signed: \_\_\_\_\_ Date: \_\_\_\_\_



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization**

(must be completed for each site)

Date & Time: 9/14/07 11:40am	Site Location Description (e.g., road crossing): 100m downstream of site 02, transect 11
Personnel (Data Collectors): Tiffanie Hamilton, Justyn Foth	
Current Weather Conditions: sunny, breezy	Facility Name: Tyson Foods-Sedalia Proce
Weather Conditions for Past 10 days: clear/rain	Permit Number: MO 0115061
Drought Conditions?: 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:**

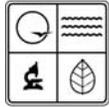
LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0474561	Northing (UTM Y): 4291579	Horizontal Accuracy: (EPE / FOM / PDOP) 27 feet
Site 11	Easting (UTM X): 0474691	Northing (UTM Y): 4291657	Horizontal Accuracy: (EPE / FOM / PDOP) 21 feet

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
101_0068	upstream	101_0069	downstream		
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 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.)				



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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 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:				

**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
Comments / Other: none				

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

25% Cobble	35% Gravel	% Sand	10% Silt	25% Mud/Clay	5% Bedrock
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**Aquatic Vegetation\*:** (Note amount of vegetation or algal growth at the assessment site)

Duckweed
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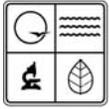
**Water Characteristics\*:** (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input type="checkbox"/> None	<input checked="" type="checkbox"/> Other: metallic
Color:	<input checked="" type="checkbox"/> Clear	<input type="checkbox"/> Green	<input type="checkbox"/> Gray	<input type="checkbox"/> Milky	<input checked="" type="checkbox"/> Other: tea brown (tannins)
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 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 effect another use.

WBID # 3490

Site # 3



**Missouri Field Data Sheets for Recreational Use Stream Surveys**  
**Department of Natural Resources**  
**Data Sheet B – Site Characterization (continued)**

**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.**

Surveyor's Signature: \_\_\_\_\_ Date of Survey: 9/14/07

Organization: Applied Environmental Solutions Position: Field Tech

## Field Data Sheets for Recreational Use Stream Surveys

### Data Sheet C - Field Survey Results

Missouri Department of Natural Resources Waterbody ID: <u>3480</u> Site #: <u>3</u> Estimated Channel Incision: <u>1.0</u> (m) (height between low bank width and water)  GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) <b>01</b> UTM X: <u>474561</u> UTM Y: <u>4291579</u> +/- <u>27</u> (feet) <b>11</b> UTM X: <u>474691</u> UTM Y: <u>4291657</u> +/- <u>21</u> (feet)  Average Stream Width: <u>3.5</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width)  Field Staff: <u>Tiffanie Hamilton and Justyn Foth</u>	<b>Dissolved Oxygen</b>
	Date: <u>9/14/2007</u> Time: <u>11:40</u>
	Dissolved Oxygen: <u>6.65</u> (mg/L)
	Dissolved Oxygen: <u>75.5</u> (% sat)
	Specific Cond: <u>1667.0</u> (µS/cm)
	Water Temperature: <u>21.4</u> (°C)

#### Transect Cross-Section

		01		02		03		04		05		06		07		08		09		10		11	
Station		Distance (m)	Depth (m)																				
	<b>Left Bank</b>	0	0.12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1		0.29	0.14	0.48	0.06	0.48	0.11	0.22	0.06	0.16	0.15	0.45	0.24	0.46	0.11	0.40	0.31	0.44	0.15	0.16	0.31	0.45	0.13
2		0.58	0.14	0.96	0.16	0.96	0.21	0.44	0.06	0.32	0.14	0.90	0.45	0.92	0.14	0.80	0.29	0.88	0.23	0.32	0.26	0.90	0.12
3		0.87	0.16	1.44	0.20	1.44	0.33	0.66	0.07	0.48	0.05	1.35	0.39	1.38	0.18	1.20	0.34	1.32	0.15	0.48	0.30	1.35	0.15
4		1.16	0.13	1.92	0.07	1.92	0.45	0.88	0.07	0.64	0.15	1.80	0.44	1.84	0.17	1.60	0.40	1.76	0.13	0.64	0.24	1.80	0.09
5		1.45	0.09	2.40	0.07	2.40	0.54	1.10	0.10	0.80	0.01	2.25	0.40	2.30	0.16	2.00	0.45	2.20	0.22	0.80	0.21	2.25	0.09
6		1.74	0.09	2.88	0.08	2.88	0.46	1.32	0.12	0.96	0.04	2.70	0.31	2.76	0.20	2.40	0.45	2.64	0.17	0.96	0.19	2.70	0.05
7		2.03	0.07	3.36	0.06	3.36	0.40	1.54	0.13	1.12	0.07	3.15	0.25	3.22	0.22	2.80	0.31	3.08	0.16	1.12	0.18	3.15	0.09
8		2.32	0.09	3.84	0.04	3.84	0.38	1.76	0.13	1.28	0.11	3.60	0.22	3.68	0.24	3.20	0.24	3.52	0.15	1.28	0.10	3.60	0.07
9		2.61	0.05	4.32	0.01	4.32	0.07	1.98	0.07	1.44	0.06	4.05	0.01	4.14	0.25	3.60	0.22	3.96	0.19	1.44	0.10	4.05	0.15
	<b>Right Bank</b>	2.90	0.00	4.80	0.00	4.80	0.00	2.25	0.00	1.60	0.00	4.50	0.00	4.60	0.00	4.01	0.00	4.40	0.00	1.60	0.00	4.50	0.00
	<b>Feature Type</b> (riffle, run, or pool)	Riffle		Riffle		Run		Riffle		Riffle		Pool		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 0.01 meter unless depth is too deep to measure (then record as > 1)

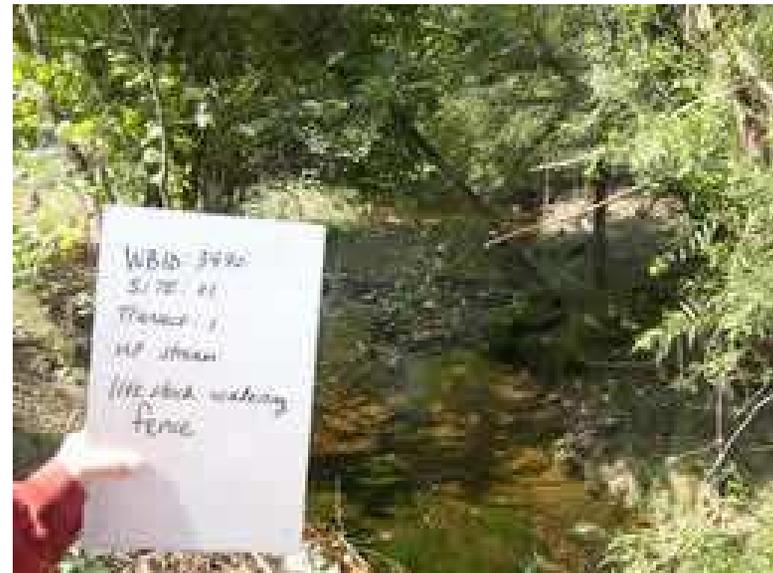
All measurements to be taken to the nearest 0.01 meter.

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

**WBID# 3490 Tributary to Little Muddy Creek**



**Site# 1 Photo ID# 65, Downstream**



**Site# 1 Photo ID# 64, Upstream, Livestock watering**



**Site# 2 Photo ID# 66, Downstream**

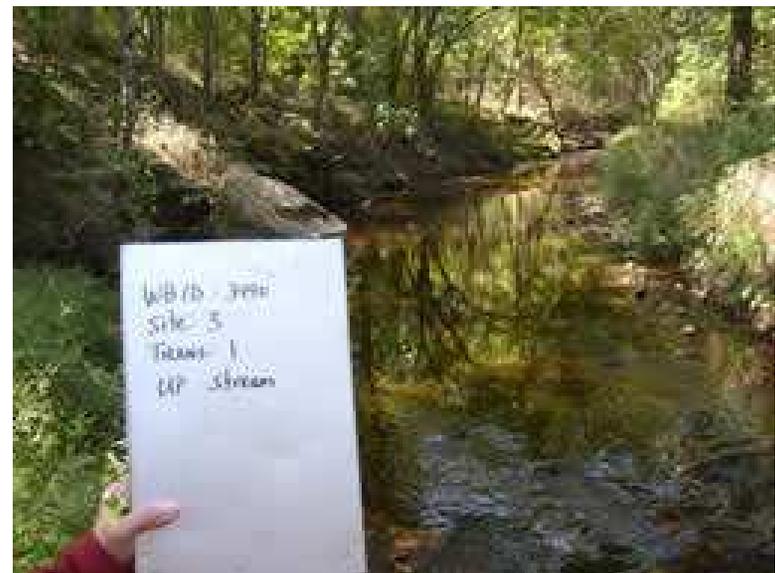


**Site# 2 Photo ID# 67, Upstream**

**WBID# 3490 Tributary to Little Muddy Creek**



**Site# 3 Photo ID# 69, Downstream**



**Site# 3 Photo ID# 68, Upstream**