



Missouri
Department of
Natural Resources

Use Attainability Analysis

for

WBID 1172 Greasy Creek

Submitted by
Olsson Associates

To
Missouri Department of Natural Resources
Water Protection Program

On
October 14, 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): Greasy Cr.
Missouri Water Body Identification (WBID) Number: 1172
8-digit HUC: 10290110
County(ies), Listed Upstream to Downstream: Dallas
Upstream Legal Description (from Table H): 11, 32N, 20
Downstream Legal Description (from Table H): 31, 34N, 19
Number of sites evaluated: 7
List all site numbers, <u>consecutively upstream to downstream</u> : 1, 2, 3, 4, 5, 6, 7
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)

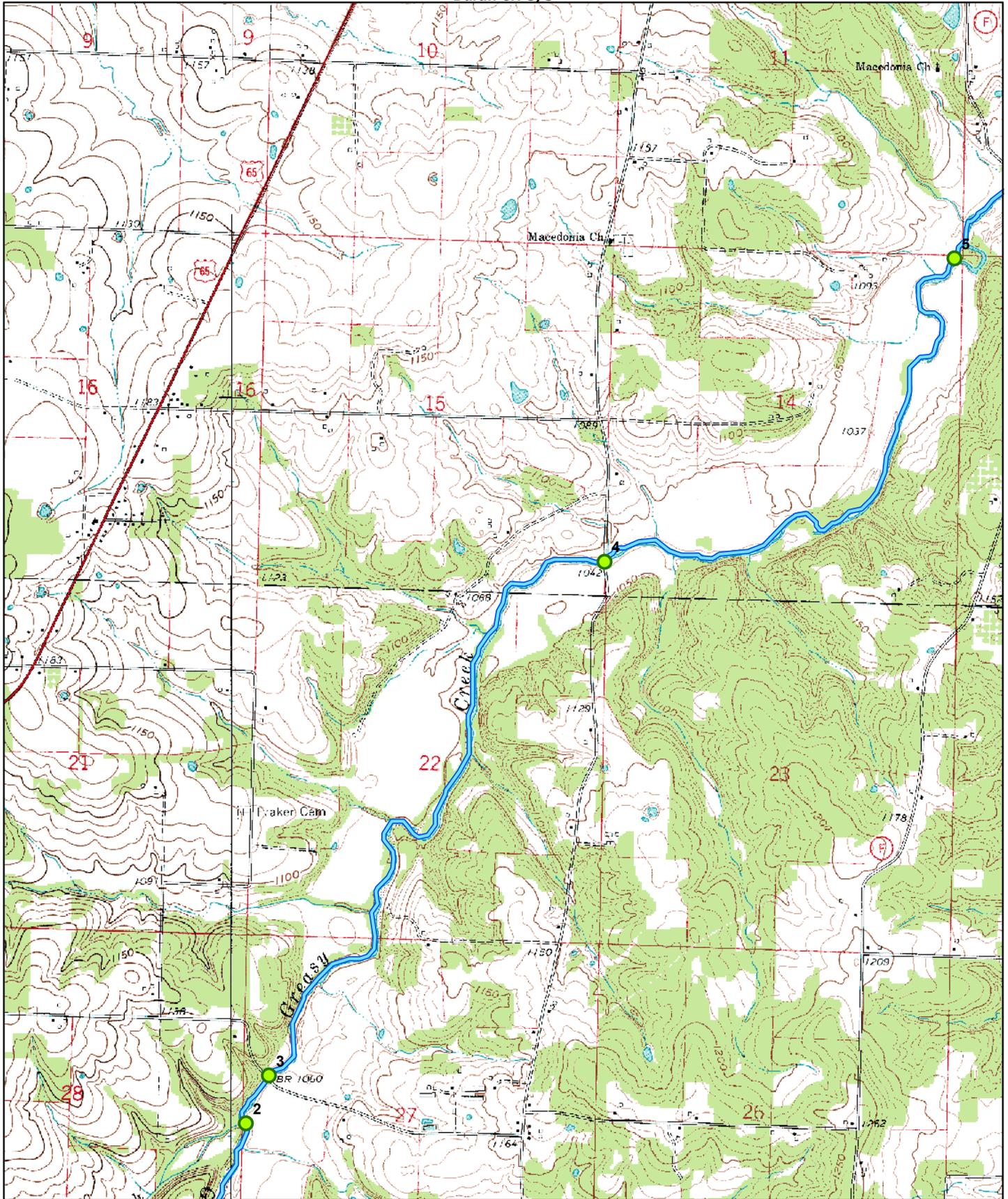
Facility Name(s) and Permit Number(s): Merritt's Campground WWTF MO 0125865

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

Name of Surveyor: Eric Hertzler	Telephone Number: 417-890-8802
Organization/Employer: Olsson Associates	

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.

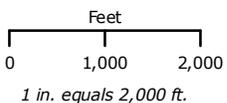
Signed:  _____ **Date:** 08-15-08



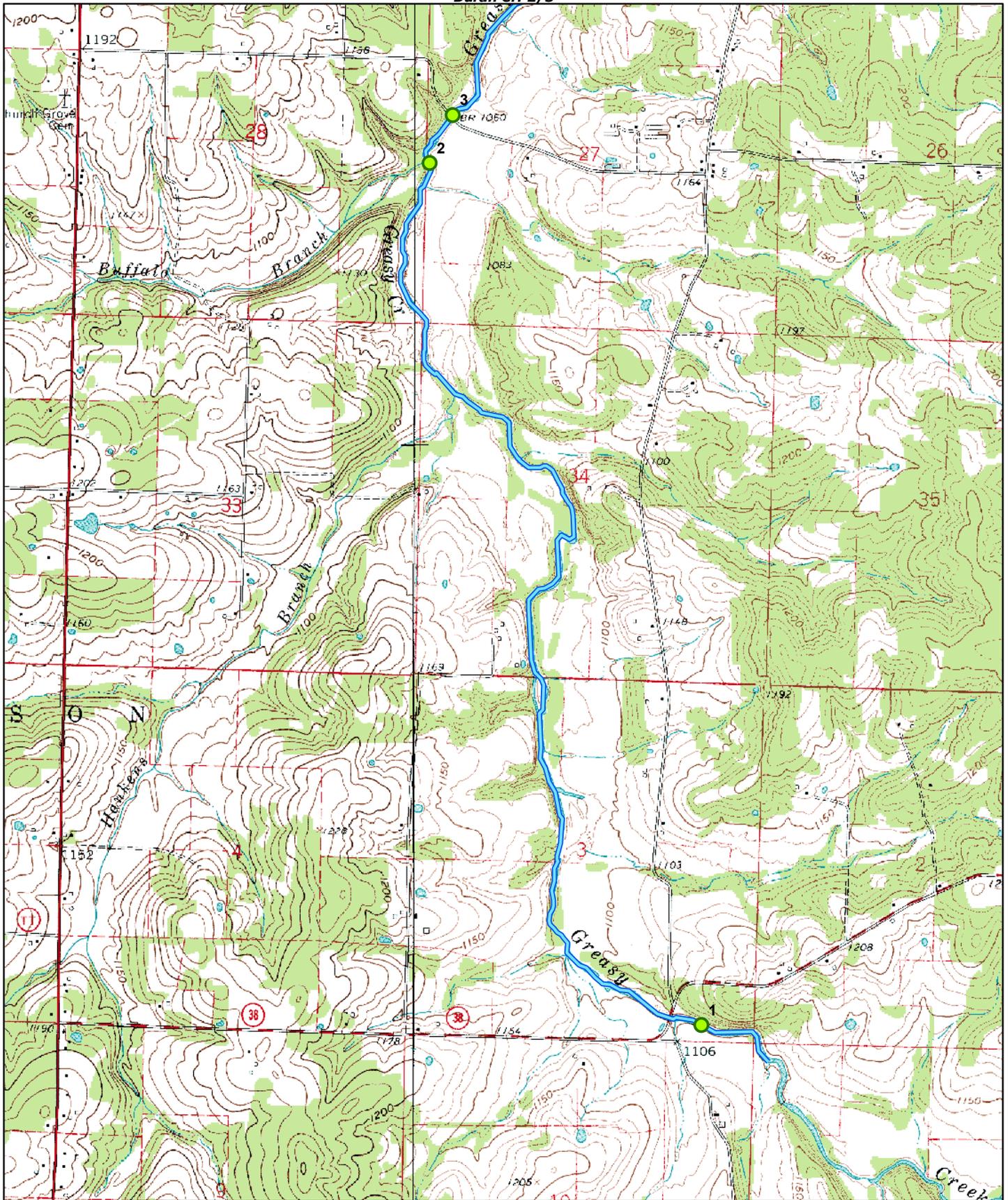
**MISSOURI RECREATIONAL
USE ATTAINABILITY ANALYSIS**

Stream: Greasy Cr.
WBID: 1172

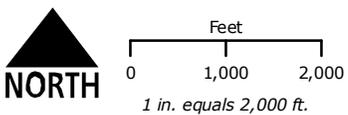
Map Sheet: 2/3
County: Dallas



Project No. 008-1298



**MISSOURI RECREATIONAL
USE ATTAINABILITY ANALYSIS**



Stream: Greasy Cr.
WBID: 1172

Map Sheet: 1/3
County: Dallas

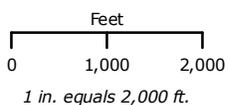


Duran Cr. 2/3

**MISSOURI RECREATIONAL
USE ATTAINABILITY ANALYSIS**

Stream: Greasy Cr.
WBID: 1172

Map Sheet: 3/3
County: Dallas



Project No. 008-1298

WBID # 1172

Site # 1

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: 08-12-08	Location Description (e.g., road crossing):
Stream Name: Greasy Cr.	Hwy M Bridge
Current Weather Conditions: sunny	Facility Name(s): Merritt’s Campground
Weather Conditions for Past 10 days:0.30” @ Springfield	Permit Number(s):MO:0125865
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): 490116	Northing (UTM Y): 4152338	Horizontal Accuracy: (EPE / FOM / PDOP) 41 ft. Meters
Site 11	Easting (UTM X): 489987	Northing (UTM Y): 4152434	Horizontal Accuracy: (EPE / FOM / PDOP) 59 ft. Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1172-1-A	Upstream looking down				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1172—1-B	Pool under bridge (caused by Beaver Dam)				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1172-1-C	Downstream looking up				

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 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 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 type="checkbox"/> Livestock Watering
<input type="checkbox"/> None of the above	Comments / Other: Bridge @ upstream end of transect			

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

% Cobble	5% Gravel	5% Sand	% Silt	% Mud/Clay	90% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Moss and algae covering bottom of stream
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Water Characteristics*: (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input checked="" type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input 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 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.

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)
Pool under bridge	50m	12	150	.40	+1

Comments: (Please record any additional comments here.)

Deep pool under Hwy M bridge. See photo 1172-1-B
(Pool created by Beaver Dam)

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

Printed Names of Personnel Collecting Data: Eric Hertzler

Surveyor's Signature:  Date of Survey: 08-12-08

Organization: Olsson Associates Position: Field Service

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u>Greasy Cr.</u> Waterbody ID: <u>1172</u> Site #: <u>1</u> Estimated Channel Incision: <u>0.19</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>490116</u> UTM Y: <u>4152363</u> +/- <u>44 ft.</u> (meters) 11 UTM X: <u>489987</u> UTM Y: <u>4152434</u> +/- <u>59 ft.</u> (meters) Average Stream Width: <u>9.5</u> (meters) Length of Survey Segment: <u>190</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>Eric Hertzler / Austin Lohkamp</u>	<h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u>08-12-08</u> Time: <u>2:51 p.m.</u> Dissolved Oxygen: <u>92.1</u> (mg/L) Dissolved Oxygen: <u>8.53</u> (% sat) Specific Cond: <u>370</u> (µS/cm) Water Temperature: <u>29.4</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)																				
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	0.76	0.13	0.37	0.05	0.73	0.17	0.81	0.24	0.66	0.13	0.68	0.14	0.93	0.12	1.25	0.11	1.46	0.32	1.32	0.29	1.36	0.17
2	1.52	0.23	0.74	0.05	1.46	0.22	1.62	0.35	1.32	0.18	1.36	0.17	1.86	0.21	2.50	0.19	2.92	0.37	2.64	0.36	2.72	0.26
3	2.28	0.21	1.11	0.05	2.19	0.24	2.43	0.34	1.98	0.20	2.04	0.19	2.79	0.33	3.75	0.30	4.38	0.38	3.96	0.35	4.08	0.36
4	3.04	0.18	1.48	0.05	2.92	0.24	3.24	0.33	2.64	0.29	2.72	0.19	3.72	0.31	5.00	0.29	5.84	0.47	5.28	0.37	5.44	0.33
5	3.80	0.16	1.85	0.14	3.65	0.23	4.05	0.34	3.30	0.31	3.40	0.17	4.65	0.32	6.25	0.28	7.30	0.29	6.60	0.19	6.80	0.31
6	4.56	0.17	2.22	0.17	4.38	0.28	4.86	0.29	3.96	0.31	4.08	0.21	5.58	0.28	7.50	0.32	8.76	0.19	7.92	0.24	8.16	0.32
7	5.32	0.12	2.59	0.19	5.11	0.17	5.67	0.33	4.62	0.42	4.76	0.29	6.51	0.27	8.75	0.30	10.22	0.07	9.24	0.33	9.52	0.29
8	6.08	0.10	2.96	0.05	5.84	0.16	6.48	0.26	5.28	0.42	5.44	0.25	7.44	0.26	10.00	0.26	11.68	0.16	10.56	0.27	10.88	0.24
9	6.84	0.05	3.33	0.05	6.57	0.13	7.29	0.19	5.94	0.35	6.12	0.19	8.37	0.23	11.25	0.27	13.14	0.21	11.88	0.18	12.24	0.11
Right Bank	7.60	0.00	3.70	0.00	7.30	0.00	8.10	0.00	6.60	0.00	6.80	0.00	9.30	0.00	12.50	0.00	14.60	0.00	13.20	0.00	13.60	0.00
Feature Type <small>(riffle, run, or pool)</small>	Pool		Riffle		Pool		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.

MAXIMUM 0.47
 MEDIAN 0.24

Surveyor's Signature:



WBID # 1172

Site # 2

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: 08-13-08 9:57 a.m.	Location Description (e.g., road crossing):
Stream Name: Greasy Cr.	1/8 mile upstream of County Rd. 222 Bridge crossing
Current Weather Conditions: cloudy	Facility Name(s): Merritt’s Campground WWTF
Weather Conditions for Past 10 days:0.30” @ Springfield	Permit Number(s): MO 0125865
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): 489023	Northing (UTM Y): 4156262	Horizontal Accuracy: (EPE / FOM / PDOP)	55 ft.	Meters
Site 11	Easting (UTM X): 489113	Northing (UTM Y): 4156469	Horizontal Accuracy: (EPE / FOM / PDOP)	71 ft.	Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1172-2-A	Upstream looking down				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1172-2-B	Downstream looking up				
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 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: Private property with gate				

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 type="checkbox"/> Livestock Watering
<input type="checkbox"/> None of the above	Comments / Other:			

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

% Cobble	50% Gravel	10% Sand	10% Silt	10% Mud/Clay	20% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Moss (some floating) and algae

Water Characteristics*: (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input checked="" type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input 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 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 checked="" type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input type="checkbox"/> None	<input type="checkbox"/> Other: some oil (possibly)

*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)
Pool	3	25	10	.50	+1

Comments: (Please record any additional comments here.)

Pool and bridge are at the downstream end of site #2 and at the upstream end of site#3 – see photo 1172-3-B

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

Printed Names of Personnel Collecting Data: Eric Hertzler

Surveyor's Signature:  Date of Survey: 08-13-08

Organization: Olsson Associates Position: Field Service

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u>Greasy Cr.</u> Waterbody ID: <u>1172</u> Site #: <u>2</u> Estimated Channel Incision: <u>0.3</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>489023</u> UTM Y: <u>4156262</u> +/- <u>55</u> ft. (meters) 11 UTM X: <u>489113</u> UTM Y: <u>4156469</u> +/- <u>71</u> ft. (meters) Average Stream Width: <u>18</u> (meters) Length of Survey Segment: <u>300</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>Eric Hertzler / Austin Lohkamp</u>	<h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u>08-13-08</u> Time: <u>10:01 a.m.</u> Dissolved Oxygen: <u>5.74</u> (mg/L) Dissolved Oxygen: <u>63.8</u> (% sat) Specific Cond: <u>366</u> (µS/cm) Water Temperature: <u>21.9</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)																				
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	1.11	0.45	0.99	0.05	1.66	0.36	2.70	0.35	2.47	0.46	1.70	0.45	1.88	0.13	1.94	0.63	1.81	0.49	1.84	0.10	1.69	0.55
2	2.22	0.56	1.98	0.21	3.32	0.52	5.40	0.78	4.94	0.67	3.40	0.68	3.76	0.14	3.88	0.63	3.62	0.63	3.68	0.20	3.38	0.53
3	3.33	0.66	2.97	0.42	4.98	0.68	8.10	1.00	7.41	0.87	5.10	0.78	5.64	0.15	5.82	0.71	5.43	0.39	5.52	0.33	5.07	0.54
4	4.44	0.62	3.96	0.51	6.64	0.64	10.80	1.00	9.88	1.00	6.80	0.79	7.52	0.69	7.76	0.76	7.24	0.29	7.36	0.46	6.76	0.63
5	5.55	0.60	4.95	0.65	8.30	0.74	13.50	1.00	12.35	1.00	8.50	0.81	9.40	0.68	9.70	0.71	9.05	0.24	9.20	0.53	8.45	0.71
6	6.66	0.56	5.94	0.62	9.96	0.62	16.20	1.00	14.82	1.00	10.20	0.75	11.28	0.85	11.64	0.64	10.86	0.31	11.04	0.53	10.14	0.71
7	7.77	0.59	6.93	0.63	11.62	0.61	18.90	1.00	17.29	1.00	11.90	0.64	13.16	0.83	13.58	0.49	12.67	0.28	12.88	0.57	11.83	0.70
8	8.88	0.59	7.92	0.62	13.28	0.64	21.60	1.00	19.76	1.00	13.60	0.29	15.04	0.75	15.52	0.39	14.48	0.25	14.72	0.61	13.52	1.00
9	9.99	0.55	8.91	0.61	14.94	0.63	24.30	1.00	22.23	1.00	15.30	0.24	16.92	0.40	17.46	0.13	16.29	0.14	16.56	0.59	15.21	1.00
Right Bank	11.10	0.00	9.90	0.00	16.60	0.00	27.00	0.00	24.70	0.00	17.00	0.00	18.80	0.00	19.40	0.00	18.10	0.00	18.40	0.00	16.90	0.00
Feature Type <small>(riffle, run, or pool)</small>	Run		Run		Pool																	

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.

MAXIMUM 1.00
 MEDIAN 0.62

Surveyor's Signature: _____



Date: 08-13-08

WBID # 1172

Site # 3

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: 08-13-08 11:00 a.m.	Location Description (e.g., road crossing):
Stream Name: Greasy Cr.	30m downstream of County Rd. 222 bridge
Current Weather Conditions: sunny	Facility Name(s): Merritt’s Campground WWTF
Weather Conditions for Past 10 days:0.30” @ Springfield	Permit Number(s): MO 0125865
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): 489126	Northing (UTM Y): 4156482	Horizontal Accuracy: (EPE / FOM / PDOP)	129 ft. Meters
Site 11	Easting (UTM X): 489251	Northing (UTM Y): 4156558	Horizontal Accuracy: (EPE / FOM / PDOP)	173 ft. Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1172-3-A	Upstream looking down	1172-3-D	Pool adjacent to transect		
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1172-3-B	Pool w/bridge				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1172-3-C	Downstream looking up				

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 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: NONE				

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 type="checkbox"/> Livestock Watering
<input type="checkbox"/> None of the above	Comments / Other: Bridge @ upstream end of transect			

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

% Cobble	60% Gravel	10% Sand	10% Silt	20% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Moss and some algae

Water Characteristics*: (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input checked="" type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input 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 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 checked="" type="checkbox"/> Oil	<input checked="" type="checkbox"/> Scum	<input checked="" type="checkbox"/> Foam	<input type="checkbox"/> None	<input checked="" type="checkbox"/> Other: some oil

*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)
Pool	3	25	10	.50	+1
Pool	22	13	60	.30	+1

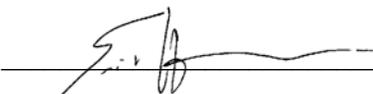
Comments: (Please record any additional comments here.)

-Pool and bridge are at the downstream portion of site #2 and at the upstream end of site #3 See photo 1172-3-B

-Pool adjacent to transect area – over 1 meter deep see photo 1172-3-D (Upstream looking down)

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

Printed Names of Personnel Collecting Data: Eric Hertzler

Surveyor's Signature:  Date of Survey: 08-13-08

Organization: Olsson Associates Position: Field Service

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u>Greasy Cr.</u> Waterbody ID: <u>1172</u> Site #: <u>3</u> Estimated Channel Incision: <u>0.12</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>489126</u> UTM Y: <u>4156482</u> +/- <u>129</u> ft. (meters) 11 UTM X: <u>489251</u> UTM Y: <u>4156558</u> +/- <u>173</u> ft. (meters) Average Stream Width: <u>7</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>Eric Hertzler / Austin Lohkamp</u>	Dissolved Oxygen Date: <u>8/13/2008</u> Time: <u>11:06 a.m.</u> Dissolved Oxygen: <u>3.62</u> (mg/L) Dissolved Oxygen: <u>43.3</u> (% sat) Specific Cond: <u>373</u> (µS/cm) Water Temperature: <u>24</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)																				
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	0.44	0.05	0.35	0.05	0.71	0.13	0.61	0.23	0.70	0.19	0.40	0.05	0.41	0.05	0.67	0.05	0.89	0.21	1.26	0.11	1.08	0.05
2	0.88	0.06	0.70	0.08	1.42	0.21	1.22	0.31	1.40	0.32	0.80	0.05	0.82	0.05	1.34	0.05	1.78	0.18	2.52	0.21	2.16	0.14
3	1.32	0.13	1.05	0.17	2.13	0.29	1.83	0.33	2.10	0.36	1.20	0.05	1.23	0.05	2.01	0.05	2.67	0.15	3.78	0.11	3.24	0.12
4	1.76	0.14	1.40	0.21	2.84	0.38	2.44	0.32	2.80	0.39	1.60	0.07	1.64	0.05	2.68	0.05	3.56	0.18	5.04	0.05	4.32	0.11
5	2.20	0.09	1.75	0.23	3.55	0.39	3.05	0.37	3.50	0.40	2.00	0.05	2.05	0.08	3.35	0.05	4.45	0.05	6.30	0.12	5.40	0.05
6	2.64	0.21	2.10	0.19	4.26	0.36	3.66	0.34	4.20	0.41	2.40	0.08	2.46	0.09	4.02	0.05	5.34	0.05	7.56	0.13	6.48	0.07
7	3.08	0.28	2.45	0.18	4.97	0.37	4.27	0.29	4.90	0.27	2.80	0.09	2.87	0.10	4.69	0.07	6.23	0.10	8.82	0.12	7.56	0.14
8	3.52	0.14	2.80	0.13	5.68	0.31	4.88	0.16	5.60	0.24	3.20	0.05	3.28	0.07	5.36	0.06	7.12	0.14	10.08	0.21	8.64	0.05
9	3.96	0.07	3.15	0.09	6.39	0.19	5.49	0.12	6.30	0.17	3.60	0.05	3.69	0.06	6.03	0.05	8.01	0.12	11.34	0.00	9.72	0.05
Right Bank	4.40	0.00	3.50	0.00	7.10	0.00	6.10	0.00	7.00	0.00	4.00	0.00	4.10	0.00	6.70	0.00	8.90	0.00	12.60	0.00	10.80	0.00
Feature Type <small>(riffle, run, or pool)</small>	Run		Riffle		Riffle		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
 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.

MAXIMUM 0.41

MEDIAN 0.11

Surveyor's Signature: _____



Date: 8/13/2008

WBID # 1172

Site # 4

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: 08-15-08	Location Description (e.g., road crossing):
Stream Name: Greasy Cr.	County Rd. 38-48 Bridge crossing
Current Weather Conditions: cloudy	Facility Name(s): Merritt’s Campground
Weather Conditions for Past 10 days:0.30” @ Springfield	Permit Number(s): MO 125865
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): 490658	Northing (UTM Y): 4158845	Horizontal Accuracy: (EPE / FOM / PDOP)	56 ft. Meters
Site 11	Easting (UTM X): 490049	Northing (UTM Y): 4158858	Horizontal Accuracy: (EPE / FOM / PDOP)	46 ft. Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1172-4-A	Upstream looking down	1172-4-D	Fishing bobber		
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1172-4-B	Bridge w/pool and rope swing				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1172-4-C	Downstream looking up				

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.)				

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 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: NONE				

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 checked="" type="checkbox"/> Rope swings
<input type="checkbox"/> RV / ATV Tracks	<input type="checkbox"/> Fire pit/ring	<input type="checkbox"/> NPDES Discharge	<input checked="" type="checkbox"/> Fishing Tackle	<input type="checkbox"/> Livestock Watering
<input type="checkbox"/> None of the above	Comments / Other:			
Rope swing hanging off of bridge – see photo 1172-4-B Fishing tackle found see photo 1172-4-D				

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

% Cobble	80% Gravel	20% Sand	% Silt	% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Algae and moss on rocks

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 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 checked="" type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input type="checkbox"/> None	<input checked="" type="checkbox"/> Other: some oil slick

*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.

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)
Pool under bridge	5m	40	18	.45	+1

Comments: (Please record any additional comments here.)

Pool under bridge at upstream end of transect. Pool over 1 meter in depth. Note rope swing hanging off of bridge. See photo 1171-4-B

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

Printed Names of Personnel Collecting Data: Eric Hertzler

Surveyor's Signature:  Date of Survey: 08-15-08

Organization: Olsson Associates Position: Field Service

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u>Greasy Cr.</u> Waterbody ID: <u>1172</u> Site #: <u>4</u> Estimated Channel Incision: <u>0.65</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>490675</u> UTM Y: <u>4158853</u> +/- <u>56</u> ft. (meters) 11 UTM X: <u>490829</u> UTM Y: <u>4158937</u> +/- <u>46</u> ft. (meters) Average Stream Width: <u>8</u> (meters) Length of Survey Segment: <u>160</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>Eric Hertzler / Austin Lohkamp</u>	<h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u>08-15-08</u> Time: <u>9:29 a.m.</u> Dissolved Oxygen: <u>5.43</u> (mg/L) Dissolved Oxygen: <u>53.4</u> (% sat) Specific Cond: <u>388</u> (µS/cm) Water Temperature: <u>21.8</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)																				
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	0.81	0.11	0.26	0.05	0.47	0.14	0.73	0.55	0.92	0.23	0.54	0.12	0.33	0.05	0.78	0.29	1.38	0.39	1.67	0.45	0.95	0.61
2	1.62	0.21	0.52	0.05	0.94	0.23	1.46	0.67	1.84	0.34	1.08	0.16	0.66	0.07	1.56	0.31	2.76	0.43	3.34	0.51	1.90	0.71
3	2.43	0.34	0.78	0.05	1.41	0.19	2.19	0.81	2.76	0.49	1.62	0.18	0.99	0.14	2.34	0.39	4.14	0.39	5.01	0.58	2.85	0.77
4	3.24	0.31	1.04	0.05	1.88	0.09	2.92	0.85	3.68	0.71	2.16	0.14	1.32	0.16	3.12	0.45	5.52	0.38	6.68	0.65	3.80	0.72
5	4.05	0.33	1.30	0.05	2.35	0.05	3.65	1.00	4.60	0.85	2.70	0.15	1.65	0.19	3.90	0.87	6.90	0.37	8.35	0.70	4.75	0.68
6	4.86	0.30	1.56	0.05	2.82	0.05	4.38	1.00	5.52	1.00	3.24	0.17	1.98	0.15	4.68	1.00	8.28	0.17	10.02	0.56	5.70	0.67
7	5.67	0.22	1.82	0.05	3.29	0.05	5.11	1.00	6.44	1.00	3.78	0.05	2.31	0.07	5.46	1.00	9.66	0.14	11.69	0.45	6.65	0.58
8	6.48	0.21	2.08	0.05	3.76	0.07	5.84	1.00	7.36	1.00	4.32	0.05	2.64	0.05	6.24	1.00	11.04	0.17	13.36	0.19	7.60	0.39
9	7.29	0.15	2.34	0.05	4.23	0.24	6.57	1.00	8.28	1.00	4.86	0.05	2.97	0.05	7.02	1.00	12.42	0.19	15.03	0.11	8.55	0.24
Right Bank	8.10	0.00	2.60	0.00	4.70	0.00	7.30	0.00	9.20	0.00	5.40	0.00	3.30	0.00	7.80	0.00	13.80	0.00	16.70	0.00	9.50	0.00
Feature Type <small>(riffle, run, or pool)</small>	Pool		Riffle		Riffle		Pool		Pool		Pool		Riffle		Pool		Pool		Pool		Pool	

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.

MAXIMUM 1.00

MEDIAN 0.19

Surveyor's Signature: _____



Date: 8/15/2008

WBID # 1172

Site # 5

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: 08-13-08 2:30 p.m.	Location Description (e.g., road crossing): Springfield Rd. Bridge (300m upstream)
Stream Name: Greasy Cr.	
Current Weather Conditions: Sunny	Facility Name(s): Merritt’s Campground WWTF
Weather Conditions for Past 10 days: 0.30” @ Springfield	Permit Number(s): MO 0125865
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): 492393	Northing (UTM Y): 4160479	Horizontal Accuracy: (EPE / FOM / PDOP) 92 ft. Meters
Site 11	Easting (UTM X): 492532	Northing (UTM Y): 4140584	Horizontal Accuracy: (EPE / FOM / PDOP) 49 ft. Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1172-5-A	Upstream looking down				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1172-5-B	Downstream looking up				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1172-5-C	Bridge @downstream end of transect				

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.)				

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 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: NONE				

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 checked="" type="checkbox"/> Fishing Tackle	<input type="checkbox"/> Livestock Watering
<input type="checkbox"/> None of the above	Comments / Other: Fishing line in tree. Bridge @ downstream end of transect			

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

% Cobble	60% Gravel	10% Sand	% Silt	% Mud/Clay	30% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Algae and moss on rocks

Water Characteristics*: (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input checked="" type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input 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 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.

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.)

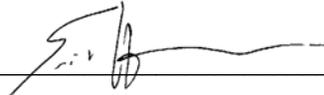
Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)

Comments: (Please record any additional comments here.)

Bridge @ downstream end of survey (water .30 meters deep)
 See photo 1172-5-C

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

Printed Names of Personnel Collecting Data: Eric Hertzler

Surveyor's Signature:  Date of Survey: 08-13-08

Organization: Olsson Associates Position: Field Service

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u>Greasy Cr.</u> Waterbody ID: <u>1172</u> Site #: <u>5</u> Estimated Channel Incision: <u>0.16</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>492393</u> UTM Y: <u>4160479</u> +/- <u>92</u> ft. (meters) 11 UTM X: <u>492532</u> UTM Y: <u>4160584</u> +/- <u>49</u> ft. (meters) Average Stream Width: <u>13</u> (meters) Length of Survey Segment: <u>260</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>Eric Hertzler / Austin Lohkamp</u>	<h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u>8/13/2008</u> Time: <u>2:32 p.m.</u> Dissolved Oxygen: <u>9.76</u> (mg/L) Dissolved Oxygen: <u>126.1</u> (% sat) Specific Cond: <u>462</u> (µS/cm) Water Temperature: <u>28</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)																				
Left Bank		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1	1.03	0.19	1.12	0.20	1.39	0.05	0.93	0.20	1.11	0.21	1.24	0.33	1.32	0.51	1.64	0.44	1.68	0.45	1.45	0.59	1.26	0.42
	2	2.06	0.21	2.24	0.13	2.78	0.05	1.86	0.20	2.22	0.20	2.48	0.41	2.64	0.54	3.28	0.49	3.36	0.50	2.90	0.54	2.52	0.52
	3	3.09	0.26	3.36	0.19	4.17	0.05	2.79	0.19	3.33	0.22	3.72	0.51	3.96	0.47	4.92	0.54	5.04	0.51	4.35	0.49	3.78	0.29
	4	4.12	0.13	4.48	0.31	5.56	0.15	3.72	0.23	4.44	0.39	4.96	0.41	5.28	0.50	6.56	0.61	6.72	0.44	5.80	0.39	5.04	0.66
	5	5.15	0.25	5.60	0.34	6.95	0.09	4.65	0.18	5.55	0.45	6.20	0.38	6.60	0.57	8.20	0.54	8.40	0.56	7.25	0.29	6.30	0.80
	6	6.18	0.32	6.72	0.33	8.34	0.19	5.58	0.29	6.66	0.28	7.44	0.45	7.92	0.50	9.84	0.39	10.08	0.42	8.70	0.27	7.56	0.73
	7	7.21	0.31	7.84	0.26	9.73	0.11	6.51	0.37	7.77	0.26	8.68	0.41	9.24	0.47	11.48	0.41	11.76	0.31	10.15	0.23	8.82	0.62
	8	8.24	0.21	8.96	0.21	11.12	0.09	7.44	0.34	8.88	0.17	9.92	0.41	10.56	0.43	13.12	0.49	13.44	0.19	11.60	0.12	10.08	0.34
9	9.27	0.15	10.08	0.09	12.51	0.11	8.37	0.32	9.99	0.11	11.16	0.31	11.88	0.36	14.76	0.31	15.12	0.24	13.05	0.11	11.34	0.19	
Right Bank		10.30	0.00	11.20	0.00	13.90	0.00	9.30	0.00	11.10	0.00	12.40	0.00	13.20	0.00	16.40	0.00	16.80	0.00	14.50	0.00	12.60	0.00
Feature Type <small>(riffle, run, or pool)</small>		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.

MAXIMUM 0.80

MEDIAN 0.29

Surveyor's Signature: _____

Date: 8/13/2008

WBID # 1172

Site # 6

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: 08-13-08 3:19 p.m.	Location Description (e.g., road crossing): Downstream of Springfield Rd. Bridge (15m)
Stream Name: Greasy Cr.	
Current Weather Conditions: Sunny	Facility Name(s): Merritt’s Campground WWTF
Weather Conditions for Past 10 days:0.30” @ Springfield	Permit Number(s): MO 0125865
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): 492568	Northing (UTM Y): 4160601	Horizontal Accuracy: (EPE / FOM / PDOP) 57 ft. Meters
Site 11	Easting (UTM X): 492708	Northing (UTM Y): 4160663	Horizontal Accuracy: (EPE / FOM / PDOP) 35 ft. Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1172-6-A	Upstream looking down				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1172-6-B	Downstream looking up				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1172-5-C	Bridge				

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 # 6

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 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: NONE				

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 type="checkbox"/> Livestock Watering
<input type="checkbox"/> None of the above	Comments / Other: Bridge See photo 1171-5-C			

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

% Cobble	60% Gravel	10% Sand	10% Silt	% Mud/Clay	20% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Moss and algae on rocks

Water Characteristics*: (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input checked="" type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input 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 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.

Site # 6

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.)

Bridge @ upstream end of transect. See photo 1172-5-C

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

Printed Names of Personnel Collecting Data: Eric Hertzler

Surveyor's Signature:  Date of Survey: 08-13-08

Organization: Olsson Associates Position: Field Service

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u>Greasy Cr.</u> Waterbody ID: <u>1172</u> Site #: <u>6</u> Estimated Channel Incision: <u>0.15</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>492568</u> UTM Y: <u>4160601</u> +/- <u>57 ft.</u> (meters) 11 UTM X: <u>492708</u> UTM Y: <u>4160663</u> +/- <u>35 ft.</u> (meters) Average Stream Width: <u>9</u> (meters) Length of Survey Segment: <u>180</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>Eric Hertzler / Austin Lohkamp</u>	<h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u>8/13/2008</u> Time: <u>3:21 p.m.</u> Dissolved Oxygen: <u>3.54</u> (mg/L) Dissolved Oxygen: <u>44.2</u> (% sat) Specific Cond: <u>440</u> (µS/cm) Water Temperature: <u>25.8</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)																				
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	1.41	0.17	1.17	0.28	1.43	0.27	0.44	0.06	0.73	0.08	0.55	0.12	0.94	0.15	0.84	0.24	0.90	0.16	0.87	0.31	0.51	0.18
2	2.82	0.21	2.34	0.37	2.86	0.26	0.88	0.12	1.46	0.18	1.10	0.25	1.88	0.21	1.68	0.31	1.80	0.22	1.74	0.29	1.02	0.32
3	4.23	0.22	3.51	0.23	4.29	0.23	1.32	0.17	2.19	0.09	1.65	0.29	2.82	0.19	2.52	0.22	2.70	0.31	2.61	0.31	1.53	0.31
4	5.64	0.21	4.68	0.37	5.72	0.19	1.76	0.21	2.92	0.13	2.20	0.24	3.76	0.17	3.36	0.31	3.60	0.32	3.48	0.26	2.04	0.44
5	7.05	0.28	5.85	0.29	7.15	0.28	2.20	0.16	3.65	0.13	2.75	0.22	4.70	0.16	4.20	0.32	4.50	0.39	4.35	0.25	2.55	0.41
6	8.46	0.29	7.02	0.29	8.58	0.21	2.64	0.09	4.38	0.11	3.30	0.14	5.64	0.20	5.04	0.29	5.40	0.41	5.22	0.24	3.06	0.30
7	9.87	0.31	8.19	0.21	10.01	0.22	3.08	0.05	5.11	0.07	3.85	0.07	6.58	0.18	5.88	0.28	6.30	0.40	6.09	0.28	3.57	0.29
8	11.28	0.24	9.36	0.27	11.44	0.21	3.52	0.05	5.84	0.05	4.40	0.05	7.52	0.14	6.72	0.19	7.20	0.22	6.96	0.32	4.08	0.06
9	12.69	0.21	10.53	0.13	12.87	0.14	3.96	0.05	6.57	0.05	4.95	0.05	8.46	0.06	7.56	0.13	8.10	0.21	7.83	0.24	4.59	0.07
Right Bank	14.10	0.00	11.70	0.00	14.30	0.00	4.40	0.00	7.30	0.00	5.50	0.00	9.40	0.00	8.40	0.00	9.00	0.00	8.70	0.00	5.10	0.00
Feature Type <small>(riffle, run, or pool)</small>	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.

MAXIMUM 0.44

MEDIAN 0.21

Surveyor's Signature: _____



Date: 8/13/2008

WBID # 1172

Site # 7

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: 08-13-08 1:00 p.m.	Location Description (e.g., road crossing): Hayes Rd. Bridge crossing
Stream Name: Greasy Cr.	
Current Weather Conditions: Sunny	Facility Name(s): Merritt’s Campground
Weather Conditions for Past 10 days: 0.30” @ Springfield	Permit Number(s): MO 0125865
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): 494062	Northing (UTM Y): 4162793	Horizontal Accuracy: (EPE / FOM / PDOP) 39 ft. Meters
Site 11	Easting (UTM X): 494093	Northing (UTM Y): 4162966	Horizontal Accuracy: (EPE / FOM / PDOP) 35 ft. Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1172-7-A	Upstream looking down				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1172-7-B	Downstream looking up				
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1172-7-C	Bridge Max pool depth .45				

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 # 7

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 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: NONE				

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 type="checkbox"/> Livestock Watering
<input type="checkbox"/> None of the above	Comments / Other: Bridge @ upstream end of transect			

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

% Cobble	30% Gravel	20% Sand	% Silt	% Mud/Clay	50% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Moss and algae

Water Characteristics*: (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input checked="" type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input 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 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 checked="" type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input type="checkbox"/> None	<input checked="" type="checkbox"/> Other: some oil slick floating on surface

*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 # 7

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.)

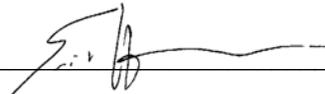
Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)

Comments: (Please record any additional comments here.)

Hayes Rd. Bridge @ upstream end of transect. See photo 1172-7-C (max pool depth .45m)

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

Printed Names of Personnel Collecting Data: Eric Hertzler

Surveyor's Signature:  Date of Survey: 08-13-08

Organization: Olsson Associates Position: Field Service

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u>Greasy Cr.</u> Waterbody ID: <u>1172</u> Site #: <u>7</u> Estimated Channel Incision: <u>0.2</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>494062</u> UTM Y: <u>4162793</u> +/- <u>39</u> ft. (meters) 11 UTM X: <u>494093</u> UTM Y: <u>4162966</u> +/- <u>35</u> ft. (meters) Average Stream Width: <u>8</u> (meters) Length of Survey Segment: <u>160</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>Eric Hertzler / Austin Lohkamp</u>	<h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u>08-13-08</u> Time: <u>1:15 p.m.</u> Dissolved Oxygen: <u>7.49</u> (mg/L) Dissolved Oxygen: <u>94.2</u> (% sat) Specific Cond: <u>414</u> (µS/cm) Water Temperature: <u>27.1</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)																				
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	0.73	0.24	0.81	0.16	0.52	0.14	0.96	0.34	1.31	0.51	1.34	0.35	1.02	1.00	0.99	1.00	0.16	0.05	0.32	0.05	0.33	0.22
2	1.46	0.27	1.62	0.11	1.04	0.21	1.92	0.21	2.62	0.57	2.68	0.42	2.04	1.00	1.98	0.89	0.32	0.08	0.64	0.07	0.66	0.26
3	2.19	0.12	2.43	0.14	1.56	0.19	2.88	0.32	3.93	0.50	4.02	0.59	3.06	1.00	2.97	0.70	0.48	0.10	0.96	0.05	0.99	0.21
4	2.92	0.13	3.24	0.08	2.08	0.14	3.84	0.29	5.24	0.61	5.36	0.68	4.08	1.00	3.96	0.60	0.64	0.08	1.28	0.08	1.32	0.23
5	3.65	0.07	4.05	0.05	2.60	0.12	4.80	0.45	6.55	0.52	6.70	0.69	5.10	0.70	4.95	0.49	0.80	0.06	1.60	0.06	1.65	0.24
6	4.38	0.09	4.86	0.08	3.12	0.18	5.76	0.39	7.86	0.67	8.04	0.71	6.12	0.56	5.94	0.40	0.96	0.05	1.92	0.09	1.98	0.19
7	5.11	0.05	5.67	0.05	3.64	0.21	6.72	0.24	9.17	0.74	9.38	0.45	7.14	0.45	6.93	0.35	1.12	0.05	2.24	0.05	2.31	0.13
8	5.84	0.11	6.48	0.11	4.16	0.18	7.68	0.25	10.48	0.72	10.72	0.29	8.16	0.22	7.92	0.19	1.28	0.05	2.56	0.05	2.64	0.05
9	6.57	0.05	7.29	0.05	4.68	0.11	8.64	0.18	11.79	0.49	12.06	0.17	9.18	0.13	8.91	0.14	1.44	0.05	2.88	0.05	2.97	0.05
Right Bank	7.30	0.00	8.10	0.00	5.20	0.00	9.60	0.00	13.10	0.00	13.40	0.00	10.20	0.00	9.90	0.00	1.60	0.00	3.20	0.00	3.30	0.00
Feature Type	Riffle		Riffle		Riffle		Pool		Riffle		Riffle		Riffle									

(rifle, run, or pool)

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.

MAXIMUM 1.00

MEDIAN 0.14

Surveyor's Signature: _____



Date: 8/13/2008

