

**Muddy Creek
Recreational Use Attainability Analysis**

July 2005

Prepared for:

UAA Review Committee
Water Quality Monitoring & Assessment Section
Water Protection Program
MISSOURI DEPARTMENT OF NATURAL RESOURCES
1101 Jefferson
Jefferson City, MO 65102-0176

Prepared by:

MEC WATER RESOURCES, INC.
1000 North College Avenue, Suite 4
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Field Data Sheets for Recreational Use Stream Surveys

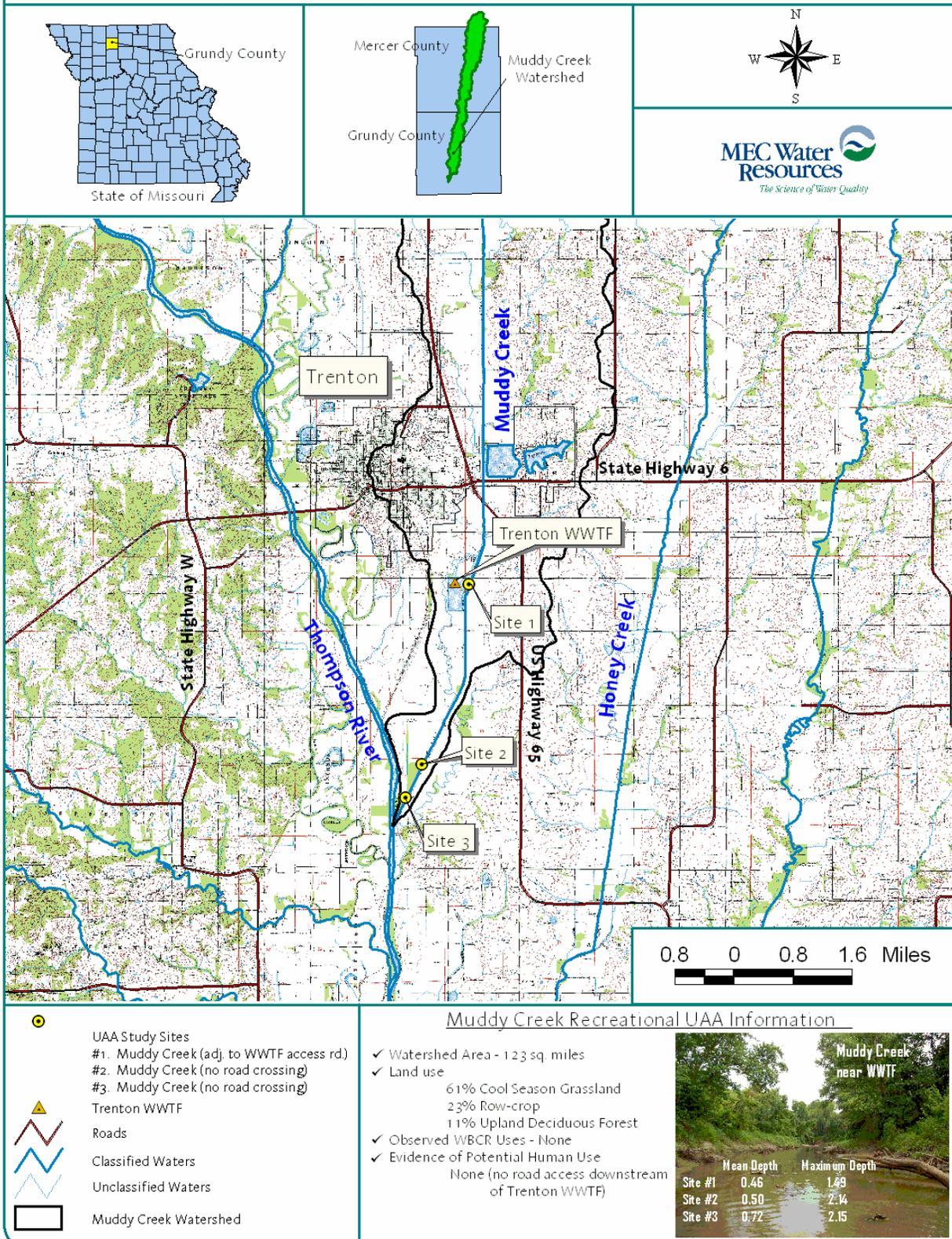
Data Sheet A – Water Body Identification

Water Body Name: Muddy Creek (from USGS 7.5' quad)
8-digit HUC: 10280102
Missouri WBID # 0557
County: Grundy
Upstream Legal Description: NW ¼ of SW ¼ of Section 28, Township 61N, Range 24W
Downstream Legal Description: SW ¼ of SW ¼ of Section 16, Township 60N, Range 24W
Upstream Coordinates: 40.05594 latitude, -93.59447 longitude (USG 84, ddd,dddd)
Downstream Coordinates: 40.01327 latitude, -93.60840 longitude (USG 84, ddd,dddd)
Discharger Facility Name(s): Trenton Municipal Util. WWTF
Discharger Permit Number(s): MO0039748
Number of Sites Evaluated: 3
Name of Surveyor and Telephone Number: John Christiansen/573-443-4140
Organization: MEC Water Resources
Position: Water Quality Specialist

I, the undersigned, hereby affirm to the best of my knowledge, that all information reported on this UAA datasheet is true and accurate.

Signed: John Christiansen Date: 7/12/05

Figure 1. Muddy Creek Study Area and Sites



Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (A separate data sheet must be completed for each site)

Missouri WBID #: <u>0557</u>	Site Location Description:	
Site Lat/Long: <u>40°03.349'/93°35.603'</u>	<u>Muddy Creek Site 1 @ WWTF</u>	
Date & Time: <u>6/30/05 12:30</u>	Facility Name: <u>Trenton Munic. Util. WWTF</u>	
Personnel: <u>KK/X</u>	Permit Number: <u>MO 0039748</u>	
Current Weather Conditions: <u>cloudy/cool</u>	Weather Conditions for Past 7 days: <u>hot, dry - rain in morning</u>	
Photo Ids: Upstream: <u>107</u>	Downstream: <u>108</u>	Other: <u>109 (upstream looking downstream) 110 (downstream looking upstream)</u>

Used Observed*:

<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, frequency of use, photo-documentation of evidence of recreational uses, etc.)

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"/> Campgrounds
<input type="checkbox"/> Boating accesses	<input type="checkbox"/> State parks	<input type="checkbox"/> National forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkway
<input type="checkbox"/> No trespass sign	<input checked="" type="checkbox"/> Fence	<input checked="" type="checkbox"/> Steep slopes	<input checked="" type="checkbox"/> Other: <u>site access within WWTF locked gate</u>	

Evidence of Human Use*:

<input checked="" type="checkbox"/> Roads	<input type="checkbox"/> Foot paths/prints	<input type="checkbox"/> Dock/platform	<input type="checkbox"/> Livestock Watering	<input type="checkbox"/> RV/ATV Tracks
<input type="checkbox"/> Rope swings	<input type="checkbox"/> Camping Sites	<input type="checkbox"/> Fire pit/ring	<input checked="" type="checkbox"/> NPDES Discharge	<input type="checkbox"/> Fishing Tackle
<input type="checkbox"/> Other:				

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

*Some of this information is not intended to directly influence a decision on any one particular recreational use analysis but may point to conditions that need further analysis or that effect another use.

Stream Morphology:

Upstream View Physical Dimensions: *See Appendix B in report*

<input type="checkbox"/> Riffle	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
<input type="checkbox"/> Run	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
<input type="checkbox"/> Pool	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
<input type="checkbox"/> Flow	Present?	<input checked="" type="checkbox"/> Yes	No	Estimated (ft ³ /sec): <i>17</i>

Downstream View Physical Dimensions: *See Appendix B in report*

<input type="checkbox"/> Riffle	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
<input type="checkbox"/> Run	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
<input type="checkbox"/> Pool	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
<input type="checkbox"/> Flow	Present?	<input checked="" type="checkbox"/> Yes	No	Estimated (ft ³ /sec): <i>same as above</i>

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

%Cobble	%Gravel	<i>90</i> %Sand	%Silt	<i>10</i> %Mud/Clay	%Bedrock
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Aquatic Vegetation*: (note amount of vegetation or algal growth at the assessment site)

<i>none</i>

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 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

Comments: Please attach additional comments (including information from interviews) to this form.

*This information is not to be used solely for removal of whole body contact recreation 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.

I, the undersigned, hereby affirm to the best of my knowledge, that all information reported on this UAA datasheet is true and accurate.

Signed: *John Christensen* Date: *6/30/05*

Organization: *MEC Water Resources Inc.* Position: *Water Quality Specialist*

Figure 3. Muddy Creek Site 1 Upstream View



Mean depth along a 1,000 ft. assessment reach was 0.46 ft. as determined from 10 transects (Appendix B). The maximum depth observed at this location was 1.49 ft. MEC staff measured streamflow as 17.15 cfs.

MEC staff did not observe any direct or indirect evidence of WBCR at Site 1. MEC staff concludes that WBCR is neither an existing nor an attainable use at this site based on no public access due to fencing, steep slopes, absence of observed WBCR uses, and shallow conditions.

Site 2. Muddy Creek (40.02030, -93.60390) 2.95 Miles from WWTF

The stream banks at Site 2 are steeply sloping and are covered with low-growing brush (Figures 4 and 5). Riparian areas are vegetated by the upland deciduous forest complex and row crop agriculture. The stream channel was observed to be mostly sand with some mud.

Mean depth along a 1,350 ft. assessment reach was 0.50 ft. as determined from 10 transects (Appendix B). The maximum depth observed at this location was 2.14 ft. Flow was measured as 15.89 cfs.

MEC staff did not observe any direct or indirect evidence of WBCR at Site 2. MEC staff concludes that WBCR is neither an existing nor an attainable use at this site based on limited access to the stream imposed by no roads, steep slopes, absence of observed WBCR uses, and shallow conditions.

MEC Water Resources, Inc.

Muddy Creek
Recreational Use Attainability Analysis

Site Characterization

No sites surveyed as part of this study are publicly accessible nor are any segments of Muddy Creek publicly accessible downstream of the Trenton WWTF to the confluence of Thompson River. There were no road crossings on Muddy Creek downstream of the Trenton WWTF at the time of the survey. Site 1 was located within the gated Trenton WWTF and was accessed by permission. Sites 2 and 3 were located downstream of the Trenton WWTF and were accessed via an overgrown unmaintained road (presumably 50th Street) by foot. Study results are discussed for each site to provide a description of differences between assessment reaches.

*Site 1. Adjacent to Trenton WWTF Access Road Downstream of Outfall
(40.05582, -93.59338)*

The landscape near the Trenton WWTF is mostly row crop with some lightly forested areas. The banks are steeply sloping and are mostly covered with sand and some grass and small shrubs (Figures 2 and 3). Riparian areas are narrow and are composed of trees and shrubs. Channel substrate is predominately sand.

Figure 2. Muddy Creek Site 1 Downstream View



Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization
(A separate data sheet must be completed for each site)

Missouri WBID #: 0557	Site Location Description: Muddy Creek Site 2	
Site Lat/Long: 40° 01.218' / 93° 36.234'	2.95 miles downstream of WWTF	
Date & Time: 6/30/05 14:15	Facility Name: Trenton Munic. Util. WWTF	
Personnel: KK/JC	Permit Number: MO 0039748	
Current Weather Conditions: cloudy	Weather Conditions for Past 7 days: hot, dry - rain in morning	
Photo Ids: Upstream: 112	Downstream: 113	Other:

Used Observed*:

<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, frequency of use, photo-documentation of evidence of recreational uses, etc.)				

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"/> Campgrounds
<input type="checkbox"/> Boating accesses	<input type="checkbox"/> State parks	<input type="checkbox"/> National forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkway
<input type="checkbox"/> No trespass sign	<input type="checkbox"/> Fence	<input checked="" type="checkbox"/> Steep slopes	<input type="checkbox"/> Other:	

Evidence of Human Use*:

<input type="checkbox"/> Roads	<input type="checkbox"/> Foot paths/prints	<input type="checkbox"/> Dock/platform	<input type="checkbox"/> Livestock Watering	<input type="checkbox"/> RV/ATV Tracks
<input type="checkbox"/> Rope swings	<input type="checkbox"/> Camping Sites	<input type="checkbox"/> Fire pit/ring	<input type="checkbox"/> NPDES Discharge	<input type="checkbox"/> Fishing Tackle
<input type="checkbox"/> Other: none observed				

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

*Some of this information is not intended to directly influence a decision on any one particular recreational use analysis but may point to conditions that need further analysis or that effect another use.

Stream Morphology:

Upstream View Physical Dimensions: *See Appendix B in Report*

<input type="checkbox"/> Riffle	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
<input type="checkbox"/> Run	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
<input type="checkbox"/> Pool	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
<input type="checkbox"/> Flow	Present?	<input checked="" type="checkbox"/> Yes	No	Estimated (ft ³ /sec): <i>16</i>

Downstream View Physical Dimensions: *See Appendix B in Report*

<input type="checkbox"/> Riffle	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
<input type="checkbox"/> Run	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
<input type="checkbox"/> Pool	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
<input type="checkbox"/> Flow	Present?	<input checked="" type="checkbox"/> Yes	No	Estimated (ft ³ /sec): <i>Same as above</i>

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

%Cobble	%Gravel	<i>95</i> %Sand	<i>5</i> %Silt	%Mud/Clay	%Bedrock
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Aquatic Vegetation*: (note amount of vegetation or algal growth at the assessment site)

<i>none</i>

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 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

Comments: Please attach additional comments (including information from interviews) to this form.

*This information is not to be used solely for removal of whole body contact recreation 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.

I, the undersigned, hereby affirm to the best of my knowledge, that all information reported on this UAA datasheet is true and accurate.

Signed: *John Christensen* Date: *6/30/05*

Organization: *MCC Water Resources Inc* Position: *Water Quality Specialist*

Figure 4. Muddy Creek Site 2 Downstream View



Figure 5. Muddy Creek Site 2 Upstream View



Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization

(A separate data sheet must be completed for each site)

Missouri WBID #: <u>0557</u>	Site Location Description:		
Site Lat/Long: <u>40° 00.796' / 93° 36.504'</u>	<u>Muddy Creek Site 3 3.47 miles downstream of WWTF</u>		
Date & Time: <u>6/30/05 18:00</u>	Facility Name: <u>Trenton Munic Util WWTF</u>		
Personnel: <u>KK/JL</u>	Permit Number: <u>MD 0039748</u>		
Current Weather Conditions: <u>cloudy</u>	Weather Conditions for Past 7 days: <u>hot, dry - rain in morning</u>		
Photo Ids: Upstream: <u>114</u>	Downstream: <u>115</u>	Other:	

Used Observed*:

<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, frequency of use, photo-documentation of evidence of recreational uses, etc.)				

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"/> Campgrounds
<input type="checkbox"/> Boating accesses	<input type="checkbox"/> State parks	<input type="checkbox"/> National forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkway
<input type="checkbox"/> No trespass sign	<input type="checkbox"/> Fence	<input checked="" type="checkbox"/> Steep slopes	<input type="checkbox"/> Other:	

Evidence of Human Use*:

<input type="checkbox"/> Roads	<input type="checkbox"/> Foot paths/prints	<input type="checkbox"/> Dock/platform	<input type="checkbox"/> Livestock Watering	<input type="checkbox"/> RV/ATV Tracks
<input type="checkbox"/> Rope swings	<input type="checkbox"/> Camping Sites	<input type="checkbox"/> Fire pit/ring	<input type="checkbox"/> NPDES Discharge	<input type="checkbox"/> Fishing Tackle
<input type="checkbox"/> Other: <u>none observed</u>				

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

*Some of this information is not intended to directly influence a decision on any one particular recreational use analysis but may point to conditions that need further analysis or that effect another use.

Stream Morphology:

Upstream View Physical Dimensions:

See Appendix B in Report

<input type="checkbox"/> Riffle	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
<input type="checkbox"/> Run	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
<input type="checkbox"/> Pool	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
<input type="checkbox"/> Flow	Present?	<input checked="" type="radio"/> Yes	No	Estimated (ft ³ /sec): 16

Downstream View Physical Dimensions:

See Appendix B in Report

<input type="checkbox"/> Riffle	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
<input type="checkbox"/> Run	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
<input type="checkbox"/> Pool	Width(ft)	Length(ft)	Ave. Depth(ft)	Max. Depth(ft)
<input type="checkbox"/> Flow	Present?	<input checked="" type="radio"/> Yes	No	Estimated (ft ³ /sec): same as above

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

%Cobble	%Gravel	95	%Sand	5	%Silt	%Mud/Clay	%Bedrock
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Aquatic Vegetation*: (note amount of vegetation or algal growth at the assessment site)

none

Water Characteristics*: (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other
Color:	<input checked="" type="checkbox"/> Clear	<input 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

Comments: Please attach additional comments (including information from interviews) to this form.

*This information is not to be used solely for removal of whole body contact recreation 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.

I, the undersigned, hereby affirm to the best of my knowledge, that all information reported on this UAA datasheet is true and accurate.

Signed: John Christensen Date: 6/30/05

Organization: McClure Research, Inc. Position: Water Quality Specialist

Figure 7. Muddy Creek Site 3 Upstream View



MEC staff did not observe any direct or indirect evidence of WBCR at Site 2. MEC staff concludes that WBCR is neither an existing nor an attainable use at this site based on limited access to the stream imposed by no roads, steep slopes, absence of observed WBCR uses, and low flow shallow conditions.

V. WHOLE BODY CONTACT USE ATTAINABILITY RECOMMENDATION

MEC Staff conclude that the surveyed reaches of Muddy Creek do not currently support WBCR uses due to lack of public access, the absence of observed WBCR uses or evidence of WBCR uses, and the presence of steep bank slopes. Furthermore, WBCR uses in Muddy Creek are not attainable according to depth criteria associated with ephemeral, intermittent, or low flow conditions set forth in MDNR UAA guidance.

VI. REFERENCES

Blunt, R. 2004. Code of State Regulations; Missouri Water Quality Standards, Title 10, Division 20, Chapter 7.

Missouri Department of Natural Resources. 2004. Recreational Use Attainability Analysis Protocol. Water Protection Program, Jefferson City, MO.

MEC Water Resources, Inc.

Muddy Creek

Recreational Use Attainability Analysis

Site 3. Muddy Creek (40.01327, -93.60840) 3.47 Miles from WWTF

The riparian area consists of larger trees, thick brush, and some grassy areas (Figures 6 and 7). The stream banks at Site 3 are steep and covered with brush and downed trees (Figure 7). Stream substrate consisted of mostly sand with some mud and clay.

Mean depth along a 1,200 ft. assessment reach was 0.72 feet as determined from 11 transects (Appendix B). The maximum depth observed at this location was 2.15. Measured streamflow was 15.93 cfs at this site.

Figure 6. Muddy Creek Site 3 Downstream View

