APPENDIX E

WATER RESOURCES AND FARMLAND SUPPORTING DOCUMENTATION

Missouri
Department
of Transportation

MoDOT

Pete K. Rahn, Director

105 West Capitol Avenue
P.O. Box 270
Jefferson City, MO 65102
(573) 751-2551
Fax (573) 751-6555
www.modot.org

September 18, 2007

Keith O. Davis, ARSS
USDA-NRCS
1911 Boggs Creek Road
Jefferson City, MO 65101

Dear Mr. Davis:

Subject: Environmental Studies
Route 63, Osage, Maries and Phelps Counties
Convert Route 63 to a Four-Lane Facility
Job No. J5P0950
Farmland Conversion Impact Rating

Enclosed, for the above referenced project, is one Farmland Conversion Impact Rating Form (CPA-106), and a map showing the project location. The project proposes to convert the Route 63 corridor to a four-lane facility from the Route 50/63 interchange north of Westphalia in Osage County to just north of Rolla in Phelps County. Included on the CPA-106 form are four acreage figures. One is for the proposed Alternate A, which is mostly west of Route 63. One is for Alternate B, which is primarily to the east. A third figure is for a series of connectors that may run from these alternates to existing Route 63 or to each other. A fourth figure is for new right of way that may be associated with widening along existing route 63. The project will cause the conversion of the recorded amount of acreage.

Please complete the applicable parts II, IV and V of the enclosed form and return it to me. You may make copies as needed. If you have any questions, please feel free to call me at 573-526-6683. Your assistance is greatly appreciated.

Sincerely,

K. McH

Kevin McHugh
Agricultural/Land Use Specialist

Enclosures

U.S. DEPARTMENT OF AGRICULTURE
Soil Conservation Service

SCS-CPA-106
01-91

FARMLAND CONVERSION IMPACT RATING
FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request 9/18/07	4. Sheet 1 of ___
1. Name of Project: Osage, Maries, Phelps Cos. J5P0950	5. Federal Agency Involved: Federal Highway Administration	
2. Proposed Land Use: Convert to 4-lane facility	6. County and State: Osage, Maries, Phelps County, Missouri	

PART II *(To be completed by SCS)*	1. Date Request Recieved by SCS	2. Person Completing Form
3. Does the corridor contain prime, unique, statewide or local important farmland? Yes ___ No ___ *(if no, the FPPA does not apply - do not complete additional parts of this form.)*	4. Acres Irrigated	Average Farm Size
5. Major Crop(s)	6. Farmable Land in Govt. Jurisdiction Acres: %	7. Amount of Farmland As Defined in FPPA Acres: %
8. Name of Land Evaluation System Used	9. Name of Local Site Assessment System	10. Date Land Evaluation Returned by SCS

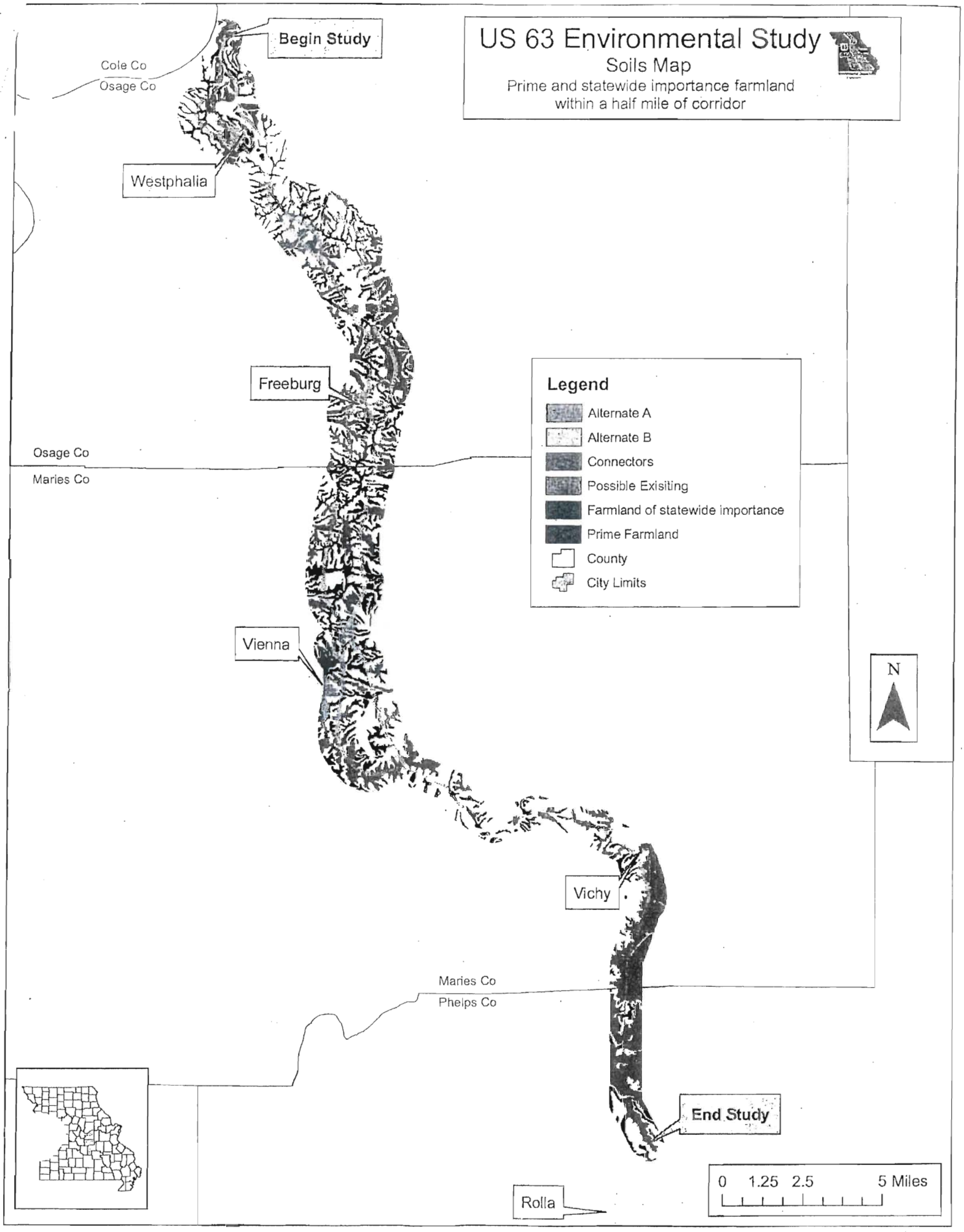
	Alternative Corridor for Segment ___			
PART III *(To be completed by Federal Agency)*	Corridor A	Corridor B	Connectors	Along Existing
A. Total Acres To Be Converted Directly	2609	2278	496	953
B. Total Acres To Be Converted Indirectly, Or To Receive Services				
C. Total Acres In Corridor	2609	2278	496	953
PART IV *(To be completed by SCS) Land Evaluation Information*				
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide And Local Important Farmland				
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value				
PART V *(To be completed by SCS) Land Evaluation Criterion Relative Value Of Farmland To Be Serviced Or Converted (Scale of 0 to 100 Points)*				
PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))*	Maximum Points			
ea In Nonurban Use	15.00			
erimeter In Nonurban Use	10.00			
3. Percent Of Corridor Being Farmed	20.00			
4. Protection Provided By State And Local Government	20.00			
5. Size Of Present Farm Unit Compared To Average	10.00			
6. Creation Of Nonfarmable Farmland	25.00			
7. Availability Of Farm Support Services	5.00			
8. On-farm Investments	20.00			
9. Effect Of Conversion On Farm Support Services	25.00			
10. Compatability With Existing Agricultural Use	10.00			
TOTAL CORRIDOR ASSESSMENT POINTS	160.00			
PART VII *(To be competed by Federal Agency)*				
Relative Value Of Farmland *(From Part V)*	100.00			
Total Corridor Assessment *(From Part VI above or a local site assessment)*	160.00			
TOTAL POINTS *(Total of above 2 lines)*	260.00			

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date of Selection	4. Was A Local Site Assessment Used?
			Yes ___ No ___

5. Reason For Selection

of Person Completing This Part:	DATE

NOTE: Complete a form for each segment with more than one Alternative Corridor.


US 63 Environmental Study
Soils Map
Prime and statewide importance farmland
within a half mile of corridor
Begin Study
Cole Co
Osage Co
Westphalia
Freeburg
Osage Co
Maries Co
Vienna
Vichy
Maries Co
Phelps Co
End Study
Rolla
Legend
Alternate A
Alternate B
Connectors
Possible Exisiting
Farmland of statewide importance
Prime Farmland
County
City Limits
N
0 1.25 2.5 5 Miles

MEMORANDUM FILE CL

Missouri Department of Transportation
Environmental Section
P.O. Box 270, Jefferson City, MO 65101

	Init	Copy	Assigned
DIST ENGINEER	KM		
ASST DIST ENG			
OE - MAIN			
OE - CONST/MTLS			
AE - COLUMBIA			
AE - JEFF CITY			
AE - CAMDENTON			
PROJECT MGRS			✓
DESIGN		✓	
PLANNING			
RIGHT OF WAY			
TRAFFIC			
LEGAL			
PUBLIC AFFAIRS			
GEN SERVICES			
SUPPORT SERV			
HUMAN RES			
BUS & BENEFITS			
INFORMATION SYS			
RISK MANAGEMENT			
CIRCULATE			
COPY ALL			

OCT 23 2007
DISTRICT 5
MISSOURI HIGHWAY & TRANSPORTATION COMMISSION

TO: Memorandum to File

CC: Roger Schwartze - 5

FROM: Kevin McHugh KM
Agricultural/Land Use Specialist-de

DATE: October 23, 2007

SUBJECT: Environmental Studies
Route 63, Osage, Maries and Phelps Counties
Just South of Route 50 to North of Rolla
Conversion to a Four Lane Facility
Job No. ~~J5S0929~~ JSP0950
Farmland Conversion Impact Rating

The project referenced above has been rated for farmland conversion impact. The recorded Part V Relative Value of Farmland to be converted totaled 63.1 points for Alternate A, 129.3 points for Alternate B, 113.2 points for the connecting segments, and 109.4 points for widening along existing right of way. The site assessment rating scored 64 points out of a possible 160 for Alternates A and B, 51 points for the connectors, and 52 points for widening along existing. The total conversion impact rating was 127.1 points for Alternate A, 129.3 points for Alternate B, 113.2 points for the connecting segments, and 109.4 points for those portions of the proposed project that propose to widen along existing right of way. These totals are well below the 160-point threshold established for consideration of farmland protection. The completed form is on file for review.

The following relates to the Part VI Site Assessment Criteria. The alignments are not known to be protected from conversion by any State, local government, or private non-profit policy or program. Impacts to on-farm investments will be minimized to the extent possible. After project completion, any remnants of the remaining land of the affected farms that becomes nonfarmable will be dealt with according to the provisions of the law. All farm support services are available to the area and will not be negatively impacted by the project. The project will be fully compatible with existing agriculture.

Attachment

United States Department of Agriculture

USDA

NRCS Natural Resources Conservation Service

Area Office, 1911 Boggs Creek Road, Jefferson City, Missouri 65101 Phone: 573 761-3105 Ext. 5

RECEIVED

OCT 23 2007

ENV/HP SECTION
MO DEPARTMENT OF TRANSPORTATION

October 22, 2007

Mr. Kevin McHugh
Agricultural/Land Use Specialist
Missouri Department of Transportation
105 West Capitol Avenue
P.O. Box 270
Jefferson City, MO 65102

Dear Mr. McHugh,

Attached is the completed CPA-106 form per your request for a Farmland Conversion Impact Rating for road improvements along Highway 63 in Osage, Maries, and Phelps Counties. (Job No. J5P0950).

After you complete the form, please return one copy for our records.

Please feel free to contact me if I can be of further assistance.

Keith Davis
Area Resource Soil Scientist

DEPARTMENT OF AGRICULTURE
Conservation Service

SCS-CPA-106
01-91

FARMLAND CONVERSION IMPACT RATING
FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*

3. Date of Land Evaluation Request: 9/18/07

4. Sheet 1 of ___

1. Name of Project: Osage, Maries, Phelps Cos. J5P0950

5. Federal Agency Involved: Federal Highway Administration

2. Proposed Land Use: Convert to 4-lane facility

6. County and State: Osage, Maries, Phelps County, Missouri

PART II *(To be completed by SCS)*

1. Date Request Recieved by SCS: 9/22/07

2. Person Completing Form: Keith Davis

3. Does the corridor contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form.)* Yes: X No: ___

4. Acres Irrigated

Average Farm Size: 768

5. Major Crop(s): Corn (For index)

6. Farmable Land in Govt. Jurisdiction Acres: 1,152,702 % 99.3

7. Amount of Farmland As Defined in FPPA Acres: 607,364 % 52.3

8. Name of Land Evaluation System Used: Osage, Maries, Phelps

9. Name of Local Site Assessment System: none

10. Date Land Evaluation Returned by SCS: 10/23/07

PART III *(To be completed by Federal Agency)*	Alternative Corridor for Segment ___ Corridor A	Corridor B	Connectors	Along Existing
A. Total Acres To Be Converted Directly	2609	2278	496	953
B. Total Acres To Be Converted Indirectly, Or To Receive Services				
C. Total Acres In Corridor	2609	2278	496	953
PART IV *(To be completed by SCS) Land Evaluation Information*				
A. Total Acres Prime And Unique Farmland	182.5	116.4	14	234
B. Total Acres Statewide And Local Important Farmland	964.2	876.5	219	436
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted	.19	.16	.04	.11
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value	40	40	40	41
PART V *(To be completed by SCS) Land Evaluation Criterion Relative Value Of Farmland To Be Serviced Or Converted (Scale of 0 to 100 Points)*	63.1	65.3	62.2	58.4
PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))* — Maximum Points				
1. Area In Nonurban Use — 15.00	12	12	12	12
2. Perimeter In Nonurban Use — 10.00	9	9	9	9
3. Percent Of Corridor Being Farmed — 20.00	15	15	15	15
4. Protection Provided By State And Local Government — 20.00	0	0	0	0
5. Size Of Present Farm Unit Compared To Average — 10.00	10	10	10	10
6. Creation Of Nonfarmable Farmland — 25.00	8	8	0	2
7. Availability Of Farm Support Services — 5.00	5	5	5	5
8. On-farm Investments — 20.00	5	5	0	1
9. Effect Of Conversion On Farm Support Services — 25.00	0	0	0	0
10. Compatability With Existing Agricultural Use — 10.00	6	6	6	0
TOTAL CORRIDOR ASSESSMENT POINTS — 160.00	64	64	51	52
PART VII *(To be competed by Federal Agency)*				
Relative Value Of Farmland *(From Part V)* — 100.00	63.1	65.3	62.2	58.4
Total Corridor Assessment *(From Part VI above or a local site assessment)* — 160.00	64	64	51	51
TOTAL POINTS *(Total of above 2 lines)* — 260.00	127.1	129.3	113.2	109.4

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date of Selection	4. Was A Local Site Assessment Used?
			Yes ___ No ___

5. Reason For Selection

Signature of Person Completing This Part: DATE

NOTE: Complete a form for each segment with more than one Alternative Corridor.

DEPARTMENT OF AGRICULTURE
Conservation Service

SCS-CPA-106
01-91

FARMLAND CONVERSION IMPACT RATING
FOR CORRIDOR TYPE PROJECTS

I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request 9/18/07	4. Sheet 1 of ___
1. Name of Project: Osage, Maries, Phelps Cos. J5P0950	5. Federal Agency Involved: Federal Highway Administration	
2. Proposed Land Use: Convert to 4-lane facility	6. County and State: Osage, Maries, Phelps County, Missouri	

PART II *(To be completed by SCS)*	1. Date Request Recieved by SCS: 9/22/07	2. Person Completing Form: Keith Davis	
3. Does the corridor contain prime, unique, statewide or local important farmland? *(if no, the FPPA does not apply - do not complete additional parts of this form.)* Yes: X No: ___		4. Acres Irrigated	Average Farm Size: 268
5. Major Crop(s): Corn (For index)	6. Farmable Land in Govt. Jurisdiction Acres: 1,152,702 % 99.3	7. Amount of Farmland As Defined in FPPA Acres: 607,364 % 52.3	
8. Name of Land Evaluation System Used: Osage, Maries, Phelps	9. Name of Local Site Assessment System: none	10. Date Land Evaluation Returned by SCS: 10/23/07	

PART III *(To be completed by Federal Agency)*	Alternative Corridor for Segment ___ Corridor A	Corridor B	Connectors	Along Existing
A. Total Acres To Be Converted Directly	2609	2278	496	953
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D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value	40	40	40	41
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1. In Nonurban Use — 15.00	12	12	12	12
2. Perimeter In Nonurban Use — 10.00	9	9	9	9
3. Percent Of Corridor Being Farmed — 20.00	15	15	15	15
4. Protection Provided By State And Local Government — 20.00	0	0	0	0
5. Size Of Present Farm Unit Compared To Average — 10.00	10	10	10	10
6. Creation Of Nonfarmable Farmland — 25.00	8	8	0	0
7. Availability Of Farm Support Services — 5.00	5	5	5	5
8. On-farm Investments — 20.00	5	5	0	1
9. Effect Of Conversion On Farm Support Services — 25.00	0	0	0	0
10. Compatability With Existing Agricultural Use — 10.00	6	0	6	0
TOTAL CORRIDOR ASSESSMENT POINTS — 160.00	64	64	51	52
PART VII *(To be competed by Federal Agency)*				
Relative Value Of Farmland *(From Part V)* — 100.00	63.1	65.3	62.2	58.4
Total Corridor Assessment *(From Part VI above or a local site assessment)* — 160.00	64	64	51	51
TOTAL POINTS *(Total of above 2 lines)* — 260.00	127.1	129.3	113.2	109.4

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date of Selection	4. Was A Local Site Assessment Used?
			Yes ___ No ___

5. Reason For Selection

Signature of Person Completing This Part: | DATE

NOTE: Complete a form for each segment with more than one Alternative Corridor.

List of Abbreviations and Acronyms

Ac	acre
COA	Conservation Opportunity Area
CWA	Clean Water Act
FHWA	Federal Highway Administration
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
HUC	Hydrologic Unit Code
MSMM	State of Missouri Stream Mitigation Method
MDNR	Missouri Department of Natural Resources
NWI	National Wetland Inventory
NRCS	Natural Resource Conservation Service
NEPA	National Environmental Policy Act
OHWM	Ordinary High Water Mark
PEM	Palustrine Emergent
PFO	Palustrine Forested
PSS	Palustrine Scrub-Shrub
PUB	Palustrine Unconsolidated Bottom
SWPPP	Soil and Water Pollution Prevention Plan
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WQC	Water Quality Certification

LAWS AND REGULATIONS

- On January 9, 2001, the U.S. Supreme Court issued a decision, Solid Waste Agency of Northern Cook County (SWANCC) v. United States Army Corps of Engineers. The decision reduces the protection of isolated wetlands under Section 404 of the CWA. Prior to the SWANCC decision, the USACE had adopted a regulatory designation of "waters of the U.S." that afforded federal protection for almost all of the nations's wetlands. The Supreme Court also concluded that the use of migratory birds to assert jurisdiction over the site exceeded the authority that Congress had granted the USACE under the CWA. The Court interpreted that USACE jurisdiction is restricted to navigable waters, their tributaties, and wetlands that are adjacent to these navigable waterways and tributaries. The decision leaves "isolated" waters/wetlands unprotected by the CWA.

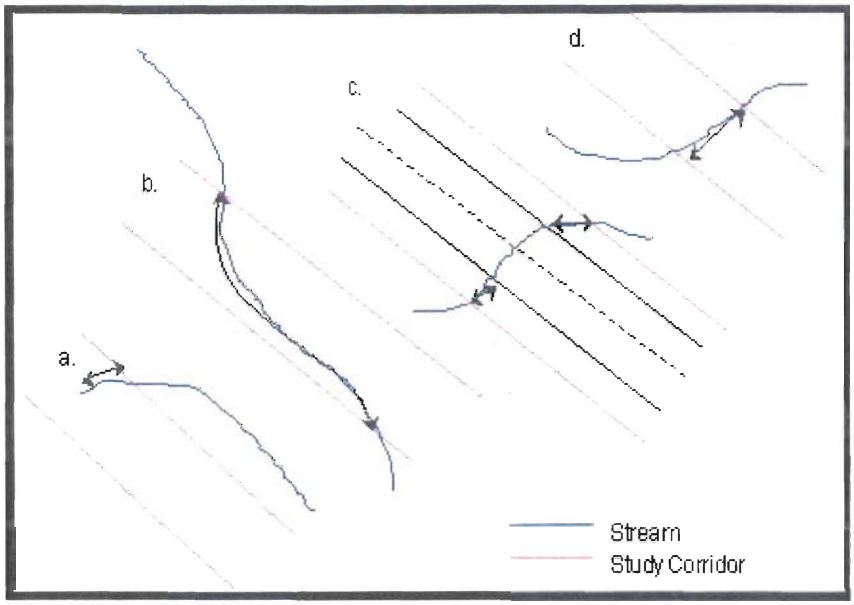
- As a result of the Supreme Court decision on **Rapanos** (June 2006), the agencies (USACE and EPA) jointly issued guidance on the determination of whether a particular water body is subject to CWA section 404 jurisdication. The Supreme Court decision requires that, in certain circumstances, a "significant nexus" evaluation be conducted to support jurisdictional and non-jurisdictional determinations. The guidance is consistent with the Supreme Court's decision in the consolidated cases Rapanos v. United States and Carabell v. United States regarding the scope of the agencies' jurisdiction under the CWA. Specifically, this guidance discusses the agencies' protection of three classes of waters through the following actions:

1) Continuing to regulate "traditionally navigable waters," including all rivers and other waters that are large enough to be used by boats that transport commerce and any wetlands adjacent to such waters;
2) Continuing to regulate "non-navigable tributaries that are relatively permanent and wetlands that are physically connected to these tributaries"; and
3) Continuing to regulate based on case-by-case determinations for other tributaries and adjacent wetlands that have certain characteristics that significantly affect traditionally navigable waters.

- **Executive Order 11990 Protection of Wetlands** issued in 1977 requires that federal activities (including federally funded projects) as a whole result in no net loss of wetlands.

QUANTITATIVE ANAYLSIS

For the DEIS and FEIS, estimates of stream impacts were quantified using the measure tool in ArcGIS 9.2 to measure along USGS mapped streams. The length was quantified within the corridor lines for each alternate. Also described along with the length of stream was the type of impact, for instance, *culvert, culvert extension, bridge, channel movement,* or a combination. The drawing below illustrates examples of how the impact lengths were determined (Figure 1). The first example, (a), exhibits how a stream was measured when the headwaters begin within the study corridor. This was described as a *channel movement* because it is assumed the channel will be moved into a MoDOT roadside ditch due to the small amount of drainage within the corridor limits. The second, (b), demonstrates how a stream that runs through the study corridor was measured. This type of stream was described as a *channel movement* because it is assumed that a culvert will be placed relatively perpendicular to the roadway, thereby reducing the length of stream channel. The same method was used to measure the stream on each side of the existing alignment between corridor lines when the alternative was on existing alignment (c). This type of impact was described as a *culvert extension*. Example (d) demonstrates how a simple stream crossing was measured and assumed that the *culvert* would be at the same or close to the same skew as the stream. Subsequent field reconnaissance was conducted for the preferred alternate where accessible by landowner permission to confirm mapped resources and identify additional resources (See Technical Report for details).



TYPES OF WETLANDS

Palustrine Wetlands

Palustrine wetlands cover less than 20 acres, lack active wave-formed or bedrock shoreline features, and have water depths at low water of less than six feet. Palustrine wetlands are subsequently classified according to dominant vegetation:

• Palustrine unconsolidated bottom (PUB) are characterized by particles smaller than stone and a vegetative cover less than 30 percent. This classification is typically applied to small "pond-like" wetlands.

• Palustrine emergent wetlands (PEM) are characterized by herbaceous (non-woody) plants. Emergent wetlands are also known as marshes, meadows, fens, etc.

• Palustrine scrub-shrub (PSS) wetlands are characterized by woody vegetation that is less than 20 feet tall.

• Palustrine forested wetlands (PFO) are characterized by woody vegetation that is 20 feet tall or taller.

Riverine Wetlands
Riverine wetlands are those contained within stream channels that are not dominated by trees, shrubs, or emergent vegetation. The USFWS riverine classification is typically used to describe perennial or intermittent streams/rivers and active (at least seasonally) side channels. This classification is not typically used in describing wetlands; rather these resources are classified as perennial or intermittent streams.

Miscellaneous

How will project impacts to water resources be avoided and/or minimized?
Impacts to water resources can be avoided and/or minimized through implementing MoDOT's SWPPP, placing rock blanket at culvert outlets to minimize velocities and minimizing the channelization of streams, etc. When the new alignment is collocated with the existing facility, impacts are limited to one locality. Design/construction methods used to minimize impacts include steepening the side slopes of the roadway to limit the footprint, compressing the median width, and adjusting the alignment to minimize overall project impacts. Additionally, impacts to first and second order streams will be minimized by using energy dissipators to reduce downstream velocities.

Are there locations in the study corridor where mitigation can occur?
MoDOT currently owns and maintains the MoDOT Mari-Osa Delta Region Mitigation Bank, a wetland and stream mitigation bank. It is located within the Osage/Ozark Ecological Drainage Unit (EDU). This drainage unit serves as the service area for the Bank. The drainage unit is composed of smaller basins, and the Lower Osage River Basin is a component of it. Impacts within the Route 63 corridor (within the same drainage unit/service area) can be debited from the Bank at a ratio of 1:1. Impacts outside the drainage unit (for instance, within the Gasconade or Bourbeuse River drainage units) will have an increased ratio in order to debit from the Bank. The ratio for outside the watershed is typically 2:1. Approximately half of the corridor falls within the service area for the Bank (Figure 2).

MSMM Adverse Impact Worksheet (Preferred)

Adverse Impact Factors for Riverine Systems Worksheet

Stream Type Impacted	Ephemeral 0.1			Intermittent 0.4			Perennial 0.8		
Priority Area	Tertiary 0.1			Secondary 0.4			Primary 0.8		
Existing Condition	Functionally Impaired 0.1			Moderately functional 0.8			Fully Functional 1.6		
Duration	Temporary 0.05			Recurrent 0.1			Permanent 0.3		
Activity	Clearing 0.05	Utility Crossing/ Bridge Footing 0.15	Below Grade Culvert 0.3	Armor 0.5	Detention 0.75	Morphologic Change 1.5	Impoundment (dam) 2.0	Pipe 2.2	Fill 2.5
Linear Impact	<100' 0	100' - 200' 0.05	201' - 500' 0.1	501' - 1000' 0.2	>1000 linear feet (LF) 0.1 reach 500 LF of impacts (exhample: scaling factor for 5,280 LF of impacts = 1.1				

Segment/Stream No.	S1/2-S2	S2/4-S3	S4-S4	S4-S5	S4/10-S6	S10/7b-S2	S10/7b-S3	S18-S1	Groner-1
Stream Type Impacted	0.8	0.8	0.8	0.8	0.8	0.4	0.8	0.4	0.1
Priority Area	0.1	0.1	0.1	0.1	0.1	0.1	0.8	0.8	0.8
Existing Condition	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Duration	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Activity	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Linear Impact	0.5	0.01	0.20	0.10	0.80	0.30	0.10	0.10	0.20
Sum of Factors	5.8	5.31	5.5	5.4	6.1	5.2	6.1	5.7	5.5
LF Stream Impacted in Reach	5030	280	780	460	3,515	1,500	380	324	870
M x LF	29,174	1,487	4,290	2,484	21,442	7,800	2,318	1,847	4785

Segment/Stream No.	S18/19-S2	S19-S3	Winkelman-S1	Winkelman-S2	Winkelman-S	S23-S1	S23-S2	S23-S3	S23-S4
Stream Type Impacted	0.4	0.4	0.4	0.1	0.1	0.4	0.4	0.4	0.4
Priority Area	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Existing Condition	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Duration	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Activity	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Linear Impact	0.20	0.20	0.05	0.10	0.10	0.20	0.20	0.30	0.20
Sum of Factors	5.8	5.8	5.7	5.4	5.4	5.8	5.8	5.9	5.8
LF Stream Impacted in Reach	810	800	101	312	348	715	854	2,280	790
M x LF	4698	4640	571	1685	1879	4147	4953	13452	4582

Segment/Stream No.	S23-S5	S24-S1	S24-S2	S25-S1	S25-S2	S25-S3	S25-S4	Hobein-S1	Hobein-S2
Stream Type Impacted	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.1
Priority Area	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Existing Condition	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Duration	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Activity	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Linear Impact	0.20	0.20	0.40	0.10	0.20	0.20	0.20	0.20	0.20
Sum of Factors	5.8	5.8	6	5.7	5.8	5.8	5.8	5.8	5.5
LF Stream Impacted in Reach	845	830	2,055	1,020	805	1,475	840	769	903
M x LF	4901	4814	12330	5814	4669	8555	4872	4460	4967

Segment/Stream No.	Hobein-S3	Hobein-S4	Hobein-S5	S34-S5	S34-S6	S34-S7	S34-S8	S34-S9	S34/39-S10
Stream Type Impacted	0.1	0.1	0.1	0.4	0.4	0.4	0.4	0.4	0.4
Priority Area	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Existing Condition	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Duration	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Activity	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Linear Impact	0.10	0.10	0.10	0.20	0.1	0.2	0.4	0.2	0.25
Sum of Factors	5.4	5.4	5.4	5.8	5.7	5.8	6	5.8	5.85
LF Stream Impacted in Reach	413	480	410	1,070	440	903	1910	870	1100
M x LF	2230	2592	2214	6206	2508	5237	11460	5046	6435

Segment/Stream No.	S39-S11	S39-S12	S39-S12a	S39-S13	S39-S14	Berhorst-S1	Berhorst-S2	S41-S1	S41-S2
Stream Type Impacted	0.4	0.4	0.4	0.4	0.4	0.1	0.1	0.4	0.4
Priority Area	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Existing Condition	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Duration	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Activity	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Linear Impact	0.2	0.4	0.25	0.20	0.10	0.20	0.20	0.60	0.20
Sum of Factors	5.8	6	5.85	5.8	5.7	5.5	5.5	6.2	5.8
LF Stream Impacted in Reach	570	1700	1,100	950	390	557	630	2,750	760
M x LF	3306	10200	6435	5510	2223	3064	3465	17050	4408

Segment/Stream No.	S43-S3	McKinney-S	S36/45-S20	Ready-S1	S45/36a-S1	S48/36a-S1	S48-S1	S48-S1 (trib1)	S48-S1(trib2)
Stream Type Impacted	0.4	0.1	0.4	0.1	0.4	0.4	0.4	0.4	0.1
Priority Area	0.8	0.8	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Existing Condition	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Duration	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Activity	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Linear Impact	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.2	0.1
Sum of Factors	5.8	5.5	5.1	4.8	5.1	5.1	5.1	5.1	4.7
LF Stream Impacted in Reach	815	925	672	543	980	750	880	940	297
M x LF	4727	5088	3427	2606	4998	3825	4488	4794	1396

Segment/Stream No.	S48-S1(trib3)	S48-S2	S48-S3	S48-S4	S48-S5	S48-S6	S48-S7	S54-S1	S54-S2
Stream Type Impacted	0.1	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Priority Area	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Existing Condition	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Duration	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Activity	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Linear Impact	0.1	0.20	0.20	0.40	0.20	0.20	0.20	0.10	0.20
Sum of Factors	4.7	5.1	5.1	5.3	5.1	5.1	5.1	5	5.1
LF Stream Impacted in Reach	480	1,030	810	2,080	770	795	810	250	600
M x LF	2256	5253	4131	11024	3927	4055	4131	1250	3060

Segment/Stream No.	S54-S4	S54-S6	S54-S7	S54-S8	S54-S9	S54-S10	S55-S11	S61-S1	S61-S2
Stream Type Impacted	0.8	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Priority Area	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Existing Condition	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Duration	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Activity	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Linear Impact	0.00	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Sum of Factors	5.3	5	5	5	5	5	5	5	5
LF Stream Impacted in Reach	0	360	360	290	285	420	350	370	310
M x LF	0	1800	1800	1450	1425	2100	1750	1850	1550

Segment/Stream No.	S61-S4	S61-S5	S61-S6	S61-S7	S61-S8	S61-S9
Stream Type Impacted	0.4	0.4	0.4	0.4	0.4	0.4
Priority Area	0.1	0.1	0.1	0.1	0.1	0.1
Existing Condition	1.6	1.6	1.6	1.6	1.6	1.6
Duration	0.3	0.3	0.3	0.3	0.3	0.3
Activity	2.5	2.5	2.5	2.5	2.5	2.5
Linear Impact	0.20	0.10	0.10	0.10	0.10	0.20
Sum of Factors	5.1	5	5	5	5	5.1
LF Stream Impacted in Reach	675	265	320	323	315	830
M x LF	3443	1325	1600	1615	1575	4233

Number of Stream Credits Needed: **373,155**

Stream Table (Preferred and Field Verified)

Segment/Stream No. from DEIS	Stream ID	Description	Jurisdictional	Stream Type	Fill Type	Width at OHWM (ft)	Depth at OHWM (ft)	Length est. from corridor limits (ft)	Area of Impact (ft2)	Volume of fill (cy)	Priority Area	Stream Credits Needed	Cost to Mitigate at SSTF ($25.00/credit)
S1/2-S2	1	Trib. Maries	JD	P	culvert/channel movement	No Access		5,030			T	29,174	$729,350
S2/4-S3	2	Trib. Maries	JD	P	channel movement	5	0.5	280	1,400	26	T	1,487	$37,175
S4-S4	3	Trib. Maries	JD	P	culvert	6	0.5	780	4,680	87	T	4,290	$107,250
S4-S5	4	Trib. Maries	JD	P	channel movement	1.5	0.5	460	690	13	T	2,484	$62,100
S4/10-S6	5	Trib. Maries	JD	P	channel movement	4	1	3,515	14,060	521	T	21,442	$536,038
S10/7b-S2	7	Trib. Maries	JD	I	channel movement	10	2	1,500	15,000	1,111	P	7,800	$195,000
S10/7b-S3	8	Maries R. on	JD	P	Bridge	150	5	380	57,000	10,556	P	2,318	$57,950
S18-S1	9	Secondary	JD	I	culvert	1.5	0.5	324	486	9	P	1,847	$46,170
Groner-1	10	Secondary	JD	E	culvert	4	1	870	3,480	129	P	4,785	$119,625
S18/19-S2	11	Secondary	JD	I	culvert	2	0.5	810	1,620	30	P	4,698	$117,450
S19-S3	12	Trib. Maries	JD	I	culvert	2	0.5	600	1,600	30	P	4,640	$116,000
Winkelman-S1	13	Trib. Maries	JD	I	culvert	4	1	101	404	15	P	571	$14,275
Winkelman-S2	14	Trib. Maries	JD	E	culvert	2	0.5	312	624	12	P	1,686	$42,125
Winkelman-S3	15	Trib. Maries	NJD	E	culvert	1	0.5	302	302	6	P	0	$0
Winkelman-S4	16	Trib. Maries	JD	E	culvert	1	0.5	348	348	6	P	1,879	$46,975
S23-S1	17	Secondary	JD	I	channel movement	4	1	715	2,860	106	P	4,147	$103,675
S23-S2	18	Trib. Deer	JD	I	culvert	2	1	854	1,708	63	P	4,953	$123,830
S23-S3	19	Deer Creek	JD	I	culvert/channel movement	20	1	2,280	45,600	1,689	P	13,452	$336,300
S23-S4	20	Secondary		I	culvert			720			P	4,562	$114,050
S23-S5	21	Secondary		I	culvert			845			P	4,901	$122,525
S24-S1	22	Trib. Maries		I	culvert	No Access		1,814			P	4,814	$120,350
S24-S2	23	Trib. Maries		I	culvert/channel movement			1,720			P	12,370	$309,250
S25-S1	24	Trib. Maries		I	culvert			1,020			P	6,014	$145,350
S25-S2	25	Trib. Maries	JD	I	channel movement	5	2	805	4,025	298	P	4,869	$116,725
S25-S3	26	Trib. Maries	JD	I	culvert	8	2	1,475	11,800	874	P	8,555	$213,875
S25-S4	27	Trib. Maries	JD	I	culvert	2	0.5	840	1,680	31	P	4,872	$121,800
Hobein-S1	28	Trib. To S25-	JD	I	culvert	1.5	0.5	769	1,154	21	P	4,460	$111,505
Hobein-S2	29	Trib. To S25-	JD	E	channel movement	1	0.5	903	903	17	P	4,967	$124,163
Hobein-S3	30	Trib. Maries	JD	E	channel movement	2	0.5	413	826	15	P	2,230	$55,755
Hobein-S4	31	Trib. Maries	JD	E	channel movement	1	0.5	480	480	9	P	2,592	$64,800
Hobein-S5	32	Trib. Maries	JD	E	channel movement	1	0.5	410	410	8	P	2,214	$55,350
S34-S5	33	Trib. School	JD	I	culvert	5	1	1,070	5,350	198	P	6,206	$155,150
S34-S6	34	Trib. School		I	channel movement	No Access		440			P	2,558	$63,700
S34-S7	36	Trib. School	JD	I	culvert	15	2	903	13,545	1,003	P	5,237	$130,935
S34-S8	36	Trib. School	JD	I	channel movement	1	1	1,910	1,910	71	P	11,460	$286,500
S34-S9	37	Trib. School		I	channel movement	No Access		870			P	5,046	$126,150
S34/39-S10	38	Trib. School	JD	I	culvert	5	1	1,100	5,500	204	P	6,435	$160,875
S39-S11	39	Hollow	JD	I	channel movement	5	1	570	2,850	106	P	3,306	$82,650
S39-S12	40	School Hollow	JD	I	culvert	5	1	1,700	8,500	315	P	10,200	$255,000
S39-S12a	41	School Hollow	JD	I	channel movement	5	1	1,100	5,500	204	P	6,435	$160,875
S39-S13	42	Wansing	JD	I	culvert	5	1.5	950	4,750	264	P	5,510	$137,750
S39-S14	43	Trib. Wansing	JD	I	channel movement	1	0.5	390	390	7	P	2,223	$55,575
Berhorst-S1	44	Trib. Wansing	JD	E	channel movement	1	0.5	557	557	10	P	3,064	$76,588
Berhorst-S2	45	Trib. Wansing	JD	E	channel movement	1	0.5	630	630	12	P	3,465	$86,625
S41-S1	46	Secondary	JD	I	channel movement	6	2	2,750	16,500	1,222	P	17,050	$426,250
S41-S2	47	Trib. Maries	JD	I	culvert	6	1	760	4,560	169	P	4,408	$110,200
S43-S3	48	Trib. Maries	JD	I	culvert	8	1.5	815	6,520	362	P	4,727	$118,175
McKinney-S1	49	Trib. Maries	JD	E	channel movement	2	1	925	1,850	69	P	5,088	$127,200
S36/45-S20	50	Trib. Crumb	JD	I	culvert	3	1.5	672	2,016	112	T	3,427	$85,675
Ready-S1	51	Trib. Crumb	JD	E	channel movement	2	0.5	543	1,086	20	T	2,676	$66,150
S45/36a-S1	52	Trib. Crumb		I	culvert	No Access		990	990	36	T	4,958	$124,450
S48/36a-S1	53	Trib. Crumb		I	culvert			250	750	28	T	3,805	$95,125
S48-S1	54	Daggett	JD	I	culvert	5	1	880	4,400	163	T	4,488	$112,200
S48-S1 (trib 1)	55	Daggett	JD	I	channel movement	2	0.5	940	1,880	35	T	4,794	$119,850
S48-S1 (trib 2)	56	Daggett	JD	E	channel movement	1	0.5	297	297	6	T	1,396	$34,900
S48-S1 (trib 3)	57	Daggett	JD	E	channel movement	1	0.5	480	480	9	T	2,256	$56,400
S48-S2	58	Trib. Indian	JD	I	culvert	8	1	1,030	8,240	305	T	5,253	$131,325
S48-S3	59	Indian Creek	JD	I	culvert	25	1	810	20,250	750	T	4,131	$103,275
S48-S4	60	Trib. Indian	JD	I	culvert	5	0.5	2,080	10,400	193	T	11,024	$275,600
S48-S5	61	Trib. Insh	JD	E	culvert	5	0.5	770	3,850	71	T	3,927	$98,175
S48-S6	62	Trib. Irish	JD	I	culvert	8	1	795	6,360	236	T	4,055	$101,363
S48-S7	63	Irish Creek	JD	I	culvert	15	2	810	12,150	900	T	4,131	$103,275
S54-S1	64	Trib. Jim	JD	I	culvert extension	2.5	0.5	250	625	12	T	1,250	$31,250
S54-S2	65	Trib.	JD	I	channel movement	2	0.5	600	1,200	22	T	3,060	$76,500
S54-S4	66	Gasconade	JD	P	None	300	Unk	0	0	0	T	0	$0
S54-S6	67	Trib. Spring	JD	I	culvert extension	6	1	360	2,160	80	T	1,800	$45,000
S54-S7	68	Trib. Spring	JD	I	culvert extension	2	1	360	720	27	T	1,800	$45,000
S54-S8	69	Trib. Spring	JD	I	culvert extension	1	0.5	290	290	5	T	1,450	$36,250
S54-S9	70	Trib. Little	JD	I	culvert extension	1	0.5	285	285	5	T	1,425	$35,625
S54-S10	71	Trib. Little	JD	I	culvert extension	2	0.5	420	840	16	T	2,100	$52,500
S55-S11	72	Little Spring	JD	I	culvert extension	6	0.5-1	350	2,100	78	T	1,750	$43,750
S61-S1	73	Trib.	JD	I	culvert extension	8	0.5	370	2,960	55	T	1,850	$46,250
S61-S2	74	Trib. Spring	JD	I	culvert extension	2	0.5	310	620	11	T	1,550	$38,750
S61-S4	75	Trib. Spring	JD	I	culvert extension	5	0.5	675	3,375	63	T	3,443	$86,063
S61-S5	76	Trib. Spring	JD	I	culvert extension	12	0.5	265	3,180	59	T	1,325	$33,125
S61-S6	77	Trib. Spring	JD	I	culvert	20	0.5	320	6,400	119	T	1,600	$40,000
S61-S7	78	Trib. Spring	JD	I	culvert	4	0.5	323	1,292	24	T	1,615	$40,375
S61-S8	79	Spring Creek	JD	I	culvert	20	0.5-1	315	6,300	233	T	1,575	$39,375
S61-S9	80	Trib. Spring	JD	I	culvert extension/channel	15	0.5-1	830	12,450	461	T	4,233	$105,825
Total								66,594				373,155	$9,328,883

Pond Table (Preferred and Field Verified)

Pond ID *from DEIS	Pond ID	Description	JD	100 year floodplai	Size	Classification
S2-P2	1	Pond		No	0.55	
S2-P3	2	Pond		No	0.16	
S4-P1	3	Pond		No	1.32	
Brendel-P1	4	Pond		No	0.23	
S4-P2	5	Pond	NJD	No	0.13	PUBGh
S10-P1	6	Pond	NJD	Yes	0.09	PUBFh
S19-P1	7	nd-hilltop isolat	NJD	No	0.07	PUBFh
Willibrand-P1	8	line w/ wetland	JD	No	1	not mapped
S23-P1	9	Pond-instream	JD	No	1	PUBGh
S23-P2	10	Pond-drained	NJD	No	0.16	not there
S23-P3	11	Pond		No	0.09	
S23-P4	12	Pond		No	0.14	
S23-P5	13	Pond		No	0.14	
S24-P1	14	Pond		No	0.16	
S25-P1	15	Pond		No	0.16	
S34-P1	16	Pond	NJD	No	0.5	PUBGh
S34-P2	17	Pond	NJD	No	0.18	PUBGh
S34-P3	18	Pond	NJD	No	0.15	PUBFh
S34-P4	19	Pond	NJD	No	0.15	Not there
S34-P5	20	Pond	NJD	No	0.09	not there
S34-P6	21	Pond - not there	NJD	No	0.16	not there
Stratman-P1	22	Pond	NJD	No		unk
S39a-P1	23	Pond	NJD	No	0.66	PUBGh
Kyle-P1	24	Pond	NJD	No	0.1	na
S36-P15	25	Pond	NJD	No	0.2	PUBGh
S39-P7	26	Pond	NJD	No	0.23	Not there
Wieberg-P1	27	Pond	NJD	No	0.3	Not mapped
S39-P8	28	Pond		No	0.1	
S39-P9	29	Pond		No	0.23	
S43-P10	30	Pond	NJD	No	0.19	PUBGh
S45-P1	31	Pond	NJD	No	0.1	PUBFh
S48-P1	32	headwater streams above	JD	No	0.13	PUBGh
S48-P2	33	Pond	NJD	No	0.09	
S55-P1	34	Pond	NJD	No	0.3	PUBGh
S57-P1	35	Pond - not there	NJD	No	0.16	unk
S56/60-P3	36	Pond	NJD	No	0.1	PUBFh
S61-P1	37	Pond	NJD	No	0.44	PUBGh
S61-P3	38	ond-non existar	NJD	No	0.14	not there
S61-P4	39	nd -hole in grou	NJD	No	0.23	PUBFx
Total					**10.33**	
Total impacted and JD ponds					**2.13**	

No Access

No Access

No Access

Wetlands Table (Preferred and Field Verified)

Wetland ID*	Wetland ID	Wetland Classification	Size (acres)	100-year floodplain	Jurisdictional
S10-W1	1	PEMC	0.25	Yes	does not exist
S10/7b-S2	2	PEM/PSS	0.2	Yes	Yes
S54-W1	3	PFO1A	16.35	Yes	No
S54-W2	4	PFO1A	3.26	Yes	no impact
S54-S5east	5	stream on topo	0.13	Yes	Yes
S54-S5west	6	stream on topo	0.33	Yes	Yes
S61-W1	7	PEMCh	0.1	No	No
S61-W2	8	PEMCh	0.17	No	No
Total			**20.06**		
Acres of impacted and JD wetlands			**0.66**		