Attachment 2

Summary of Impacts for Mitigation
STREAMS

Project Information:

Project #: 58007-1220-64
Federal #: NH-27(45)
PIN: 102236.00

SR-27 (US-72) Interchange with I-24
Marion County

In-Lieu Fees	Permit ID	Stream Name	Impact Station	Length of Stream Impact (ft.)
$19,800			274+45.00 on Ramp A &	99 (132 x 0.75)
$11,200	IARAP #1	Unnamed tributary to Battle Creek (STR-1)	147+54.22 on I-24	56 (56 x 1)
$8,600			135+09.11 on I-24 & 512+48.00 to 513+64.00 on	42.8 (57 x 0.75)
$1,600	IARAP #2	Unnamed Tributary to Battle Creek (STR-2)	Ramp C	8 (8 x 1)
Total: **$41,200**				

For the above stream impacts, a total payment of $ 41,200 is proposed to the In-Lieu Fee Stream Mitigation Program. Please cite this payment to the TSMP in your permits.

Summary of Impacts for Mitigation
WETLANDS

Project Information:

Project #: 58007-1220-64
Federal #: NH-27(45)
PIN: 102236.00

SR-27 (US-72) Interchange with I-24
Marion County

Mitigation (acres)	Permit ID	Wetland Label	Impact Station	Permanent Impact (acres)
14.76 (7.380 x 2)	I 404	WTL-1	From 265+00.00 to 279+58.93 on Ramp A	7.380
0.24 (0.012 x 2)	I 404	WTL-3	From 404+50.00 on SR-27 to 817+00.00 on Ramp F	0.120
Total: **15.00**				

We propose to mitigate the permanent wetland impacts by purchasing, at a 2:1 ratio, 15 acres of wetland restoration from the Sequatchie Valley Wetland Mitigation Site constructed by MRW Environmental, LLC.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL DIVISION
SUITE 900, JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243-0334

August 27, 2007

Ms. Leigh Ann Tribble
Environmental Program Engineer
Federal Highway Administration
640 Grassmere Park Road, Suite 112
Nashville, Tennessee, 37211

Subject: Right-of-Way Reevaluation for Environmental Conditions
State Route 27, (U. S. 72) Interchange Modification at Interstate 24
Marion County, Tennessee
Federal Aid Numbers: NH-27(45)
State Project Numbers: (Preliminary Engineering) 58007-1220-64 and
(Right-of-Way) 58007-2224-14
Pin Number 102236.00

Dear Ms. Tribble:

This reevaluation of environmental effects for this project has been conducted in accordance with 23CFR771.117. The Categorical Exclusion (C.E.) for this project was approved on February 7, 2005. The proposed project is now being advanced for the right-of-way phase.

The most current Right-of-way Plans (2007) indicates that the only change to the proposed project will be the addition of an additional lane to Ramp E. There are no other changes to proposed project. The basic setting of the affected environment has not been altered and the project corridor is of essentially the same character as previously studied. There are no other substantial modifications of land use or new development.

The Technical Studies were revisited for this reevaluation. The impacts have not changed and the examination of the ROW Plans indicated that there have been no new environmental consequences or effects not presented and/or discussed in the Categorical Exclusion or this reevaluation. The area of potential effect was covered under the original technical studies.

In an email dated August 24, 2007 the Ecology section stated that "the ecology report from the previous evaluation (Categorical Exclusion) still applies. One Federal/state listed aquatic animal (A) species, the Pink Mucket (Lampsilis abrupta) has been noted in the Tennessee River both upstream and downstream of the confluence of Battle Creek. However, the last downstream observation of this species was over 50 years ago and it is highly unlikely,

that this species would be found in Battle Creek, and certainly not a tributary to Battle Creek. Sediment effects could occur at the tributaries during construction and these impacts will be minimized by good sediment control planning and implementation. There should be no impacts to endangered or threatened species for this project. (The e-mail dated August 24, 2007 from the Ecology Section is attached).

In an e-mail dated August 2, 2007, a TDOT Archaeologist stated that "he had reviewed the June 2007 Right-of-Way plans for the subject project. The archaeological portion of the 2002 combined cultural resources assessment remains valid, as does the SHPO letter of December 16, 2002". (See the attached e-mail dated August 2, 2007).

A TDOT Historian reviewed the original 2002 historic architecture report, SHPO letter, and the 2007 right-of-way plans and stated that "after reviewing project plans, the original 2002 historic report adequately covered the project area identified in the 2007 plans. Therefore, the 2002 historic report and TN-SHPO letters continue to fulfill requirements found in 36 CFR 800 of the National Historic Preservation Act of 1966". (See attached e-mail from dated August 8, 2007).

"Pursuant to 36 CFR 800", nine (9) consultation letters were sent to the following American Indian Tribes on May 23, 2002: Eastern Band of Cherokee Indians, The Cherokee Nation, The Chickasaw Nation, Choctaw Nation of Oklahoma, Muscogee (Creek) Nation, Seminole Nation of Oklahoma, United Keetoowah Band of Cherokee Indians, Eastern Shawnee Tribe of Oklahoma, and the Quapaw Tribe of Oklahoma. The Chickasaw Nation, Muscogee (Creek) Nation of Oklahoma, and the Eastern Shawnee Tribe of Oklahoma were the only tribes to reply. In their replies they stated that "they are currently unaware of documentation (historic properties or traditional cultural, religious and/or sacred sites) linking Indian religious sites to the proposed construction. However, if any human skeletal remains and/or artifacts falling under Native American Graves Protection and Repatriation Act (NAGPRA) are inadvertently discovered or uncovered during construction, the construction activity should stop immediately, and the appropriate persons, including state and tribes be contacted". (The American Indian replies are on file in the Environmental Division).

The Air and Noise Impact Section reviewed the project files and current right-of-way plans and stated in an e-mail on August 13, 2007 that "they had I have reviewed the Air/Noise report completed on May 2, 2002 for this project. It is their "opinion that there have not been any significant changes and the study conclusions remain valid for the purposes of the right-of-way reevaluation". (See the attached e-mail dated August 13, 2007).

The Hazardous Material Impact Section reviewed the project files of the subject project on August 13, 2007 and stated that "there is no change to the hazardous material statement in the approved Categorical Exclusion". (See the Hazardous Material Impact e-mail dated August 13, 2007).

There are no other substantial changes in the environmental effects, or the concept of the project as discussed in the Categorical Exclusion. There are no other new developments

that would affect the conditions and impacts previously reported. The anticipated impacts have not changed and the examination of the right-of-way plans indicated that there have been no new environmental consequences.

A space is provided below for your concurrence in this Right-of-Way Reevaluation.

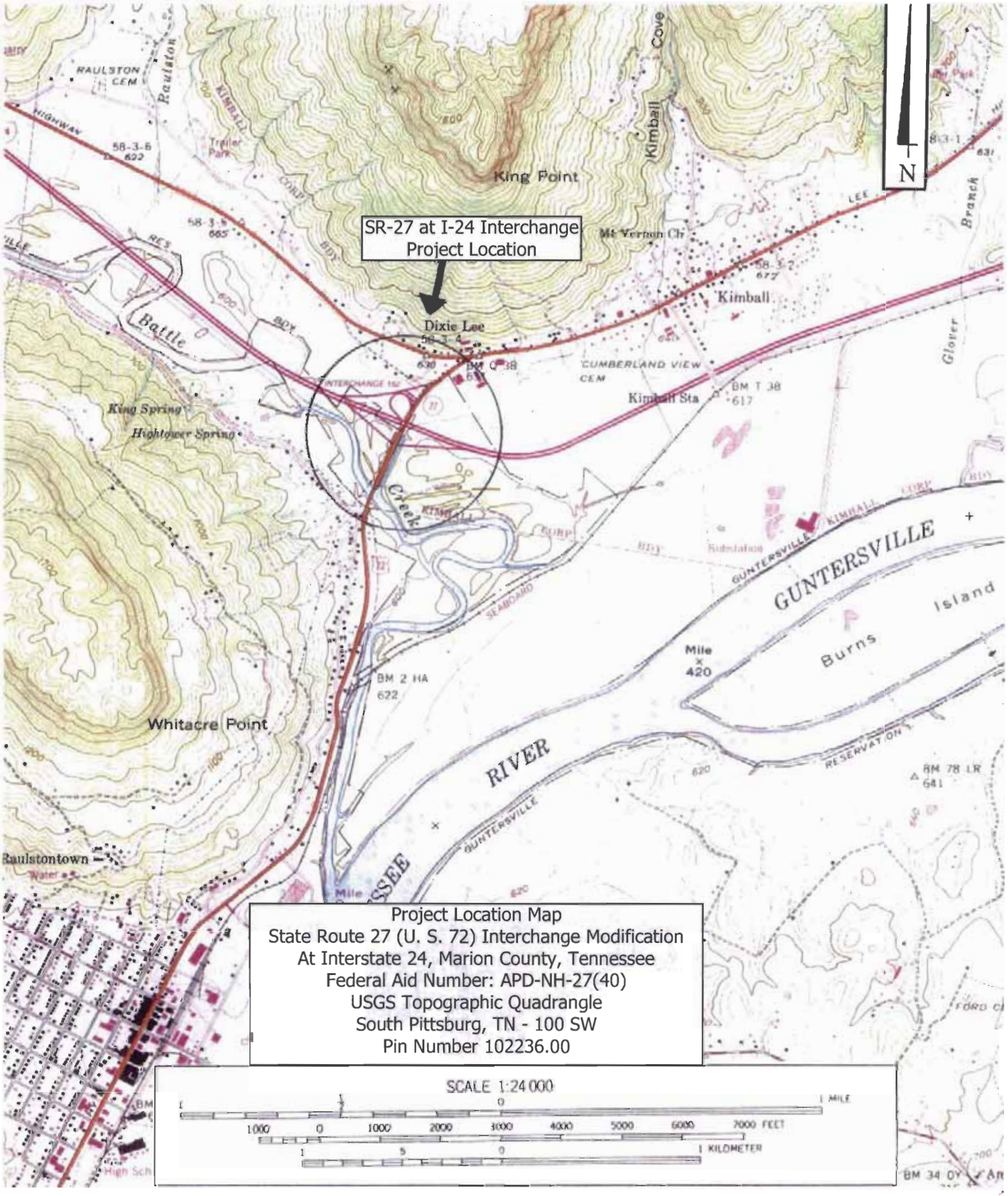
Sincerely,

(for) Charles Bush
Transportation Manager II

CONNCURRENCE: Leigh Ann Tribble DATE: 8-31-07
Environmental Program Engineer

CEB:JTM:jtm
with attachment

cc: Mr. Mr. Harold Jackson
Mr. Ronnie Porter
Mr. Jeff Jones
Mr. John Hewitt
Mr. Jim Ladieu
Mr. Gary King
Mr. Rick Pack
Ms. Harriet Martin
Ms. Lia Obaid
Mr. Tom Love
Mr. Jim Ozment
Dr. Deedee Kathman
Ms. Martha Carver
Mr. Gerald Kline
Ms. Ann Epperson
Mr. Bobby Johnson
Mr. Bob Hayzlett
Mr. Bill Greene
Ms. Susan Ralph
Ms. Jill Hall
Mr. Arran Addington
Ms. Maria Hunter
Project Files
Reading Files



Project Location Map
State Route 27 (U. S. 72) Interchange Modification
At Interstate 24, Marion County, Tennessee
Federal Aid Number: APD-NH-27(40)
USGS Topographic Quadrangle
South Pittsburg, TN - 100 SW
Pin Number 102236.00

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL PLANNING AND PERMITS DIVISION
SUITE 900, JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243-0334

Approved 5/11/05
Interchange
Env Doc
CAT 2Y

February 7, 2005

Mr. Brian Brasher
Area Engineer
Federal Highway Administration
640 Grassmere Park, Suite 112
Nashville, Tennessee 37211

102236.00

Subject: **Categorical Exclusion**, State Route 27 (US 72) Interchange Modification at I-24, Marion County, Tennessee, PIN 102236.00.

Dear Mr. Brasher:

The Environmental Division has evaluated the subject project for compliance with environmental laws and regulations. The findings, supported by a project location map (Figure 1) and with regard to each area of concern, are outlined below. It is our recommendation that the project be classified as a Categorical Exclusion.

Purpose of Project

The purpose of the project is to increase the efficiency and improve operational characteristics of this interchange. A project to increase vertical clearances between the I-24 and US 72 bridges has been approved, and it is possible to make further improvements ***concurrently*** in order to reduce overall construction costs, down-time, and lengthy traffic congestion associated with the project.

Project Description

The project calls for a number of improvements associated with the existing interchange. Foremost would be the addition of a new directional ramp from I-24 westbound to US 72 northbound in the northeast quadrant of the interchange. It has been determined that growing traffic loads over time, particularly truck traffic, will make the existing northbound turn from the *northwest* quadrant increasingly problematic. The ramp construction in the northeast quadrant, as designed, would provide a northbound free-flow facility and allow

elimination of the existing traffic light. The existing turn lane in the northwest quadrant would be scarified and sealed off.

The vertical clearance issue with the I-24 bridges is central to the project. This is a valid safety concern and will be addressed by replacing the existing bridges with one bridge sixty feet (60') in width, with barrier, and so constructed to accommodate future lane widening. Further, the vertical clearance will be raised to 16.50 feet, exceeding the current AASHTO standard for bridge clearance of 16.00 feet. The additional clearance will allow repaving as required, and the proposed width will accommodate lane additions as traffic loads increase.

An Interchange Modification Study was completed in October of 2002. In addition to the vertical clearance corrections, replacement of the bridges, and ramp construction, the study also proposed converting the existing single continuous through-lane on each side at the interchange to a two lane design. This is intended to maintain route continuity and improve overall functionality. Additional ramp terminal improvements are proposed. Three of the four existing I-24 ramps will be increased in length to meet AASHTO acceleration/deceleration length standards. Likewise, two turn lanes from US 72 to I-24 will be lengthened to meet TDOT deceleration standards. A deceleration lane will be added on US 72 at the I-24 eastbound ramp, decreasing the likelihood of rear-end collisions at that location. Improvements are intended for several US 72 ramp terminals; turn lanes will be added, existing lanes lengthened, or signage will be replaced to meet AASHTO design standards. For orientation, please see the attached functional layouts.

Relocation Impacts

The project will not involve relocation impacts.

Air and Noise Impacts

No increase in noise levels or air quality impacts is anticipated as a result of this project.

Executive Order 11988 - Floodplain Management

The project lies within the Battle Creek Floodplain. Impacts to the floodplain have been avoided or minimized during earlier interchange modernization efforts. TDOT will design the project to allow for the passage of floods and in all respects to be consistent with Executive Order 11988.

Executive Order 11990 – Protection of Wetlands

An Ecology Study was completed November 12, 2004. Jurisdictional wetlands occur in the northeast quadrant of the interchange project site in the area of an off ramp of I-24. Of the approximate fifteen (15) wetland acres in the quadrant, three (3) acres will be directly impacted by construction filling. TDOT proposes to mitigate this acreage, either on-site or by banking at a suitable location at the applicable ratio. Efforts will be made to further

avoid or minimize adverse impacts to the remaining. This acreage is currently owned by the Tennessee Valley Authority (TVA).

The Department finds there is no reasonable or practical alternative to the current Ramp A design in the northeast quadrant that would avoid this wetland acquisition.

Fish and Wildlife Coordination Act of 1958

No channel modifications are required for this project.

Endangered Species Act of 1973

The U. S. Fish and Wildlife Service (USFWS) was contacted to determine if any endangered or threatened species have been identified in the vicinity of the proposed project. Their response, dated October 28, 2004, is attached and states that no adverse impacts to wetlands or federally listed endangered or threatened species are anticipated.

Section 106 of the National Historic Preservation Act of 1966

There are no structures, sites, or properties listed on the National Register of Historic Places (NRHP), or eligible for inclusion on the NRHP listing, within close proximity to, or affected by, this project. A copy of the relevant State Historic Preservation Office (SHPO) letter, addressing cultural resources in the Area of Potential Effect (APE) and dated December 16, 2002, is attached.

Section 4 (f) of the Department of Transportation Act of 1966

No land given protection under Section 4 (f) will be affected by this project.

Hazardous Waste Evaluations

Spills on highways are a potential source of water quality degradation and a possible public health hazard. The Tennessee Emergency Management Agency (TEMA) has the responsibility and authority for coordination of all state and local agencies during accidents involving hazardous materials. The TEMA has demonstrated its ability to effectively manage such incidents.

There are no underground storage tanks (UST) or known hazardous material sites at or in close proximity to the proposed project.

In the event hazardous substances/wastes are encountered within the proposed right-of-way, disposition shall be subject to the applicable sections of the Federal Resource Conservation and Recovery Act, as amended, and the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, and the Tennessee Hazardous Waste Management Act of 1983.

The project as proposed will not involve significant impacts to planned growth, land use, or existing travel patterns. The above findings demonstrate the fact that the proposed improvements will not individually or cumulatively have any significant environmental impacts. Therefore, it is our recommendation that this project be classified as a **Categorical Exclusion** under the provisions of 23 CFR, 771.117.

Yours truly,

(for) Charles Bush
Transportation Manager II

CONCURRENCE: _____ DATE: 2/24/05
FHWA Division Administrator

CEB:vlj
Enclosures
cc: Doug Delaney
Vic Jordan
Ronnie Porter
Project file
Jeff Jones
Reading file

TENNESSEE HISTORICAL COMMISSION
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
2941 LEBANON ROAD
NASHVILLE, TN 37243-0442
(615) 532-1550

December 16, 2002

Ms. Martha Carver
Environmental Planning
TDOT, 9th. Floor Polk Bldg
Nashville, Tennessee, 37219

RE: FHWA, ARCHITECTURAL/ARCHAEOLOGICAL SURVEY REPORT, I-24/US-72/US-64 INTERCHANGE IMP., KIMBALL, MARION COUNTY

Dear Ms. Carver:

In response to your request, received on Thursday, December 12, 2002, we have reviewed the documents you submitted regarding your proposed undertaking. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act. This Act requires federal agencies or applicant for federal assistance to consult with the appropriate State Historic Preservation Office before they carry out their proposed undertakings. The Advisory Council on Historic Preservation has codified procedures for carrying out Section 106 review in 36 CFR 800. You may wish to familiarize yourself with these procedures (Federal Register, December 12, 2000, pages 77698-77739) if you are unsure about the Section 106 process. You may also find additional information concerning the Section 106 process and the Tennessee SHPO's documentation requirements at www.state.tn.us/environment/hist/sect106.htm.

Considering the information provided, we find that the area of potential effect for this undertaking contains no cultural resources eligible for listing in the National Register of Historic Places. You should notify interested persons and make the documentation associated with this finding available to the public.

All borrow areas outside proposed rights-of-way will require separate certification as specified under Section 107.06-Federal Aid Provisions. If your agency proposes any modifications in current project plans or discovers any archaeological remains during the ground disturbance or construction phase, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act.

This office appreciates your cooperation.

Sincerely,

Herbert L. Harper
Executive Director and
Deputy State Historic
Preservation Officer

HLH/jyg

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL DIVISION
SUITE 900 - JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243-0334

To: Lia Obaid
TDOT Design Division

From: Christina Richards
Ecology Section

Date: 15 May 2009

Subject: **Marion County: US-27 & I-24 Interchange; PE No.; PIN**

Please update the environmental boundaries with the following information. Changes were initiated due to the need of the hydraulic offset basin.

A reevaluation of WTL-1 has changed the amount of impact. Temporary impacts are now at 1.26 acres and permanent impacts are at 5.93 acres. Mike Williams is working with Ken Morgan on a mitigation site that has been initially approved by TDEC and USACE. All standard procedures for temporary impacts need to be followed for these impacts. The USACE has commented that the contractor will need to contact them about where they are storing the topsoil. WTL-2 will have 0.15 acres of temporary impacts. WTL-3 will have 0.73 acres of temporary impacts and 0.12 acres of permanent impacts. WTL-5 is a new wetland in the lower portion of the curved I-24 westbound off ramp. It is 0.05 acres and will have no impact. All new wetland boundaries are already on the plans.

STR-2 will have to be relocated from station 512+48 to 513+64. Please follow the standard relocation procedures attached to this memorandum. It is currently located in the rip rap ditch along the I-24 westbound on ramp. The beginning of STR-1 will be encapsulated. Mitigate with the in-lieu fee program.

If you have any questions or comments please contact me at Christina.Richards@state.tn.us or 615-253-8690. Thank you very much.

Copy: Design: Memo; Form J
Permits: Memo; Form J
Jim Waters: Memo
Project file: Memo; Form J
Reading file: Memo

Natural Resources Mitigation Sketches/Information

Project: **SR-27 (US-72); Interchange @ I-24; Pin # 102236.00; Project No. 58007-1220-64; Marion County**

Date: 2 March 2006 Biologist: Jeff Duke Company: Civil & Environmental Consultants, Inc.
Updated: 15 May 2008 by C. Richards (TDOT)

Station	Map label	Marked-up plans sheet (A); notes (B); mitigation plan (C) attached	Calculate permanent & temporary wetland impacts & provide to Chrissy Richards and John Hewitt	Apply "standard" stream relocation configuration & instructions	Survey boundaries as flagged in field	General notes and/or specific changes requested
145+00	WTL-1	A, B, C	X			A hydraulic storage basin will be constructed over the majority of the wetland. Mitigation is being pursued at a sight provided by Ken Morgan. This sight is off project and we have not determined the mitigation ratios at this time. The topsoil will still need to be stocked and replaced according to the temporary impact procedures.
701+50	WTL-2	A, B, C	X			Wetland will have 0.15 acres of temporary impact s. For temporary impacts, follow Standard Temporary Impact procedure.
Approx. 404+50 to aprox. 817+00	WTL-3	A,B,C	X			Wetland will have 0.73 acres of temporary impacts and 0.12 acres of permanent impacts.
274+50	STR-1	A, B				Since STR-1 is already encapsulated for greater than 200 feet, the new encapsulation will need to be mitigated with the in-lieu fee program. There are seeps within the wetland area that will be covered by the new ramp. Use a French drain to provide drainage of area into stream.
512+48 to 513+64	STR-2	A,B,C		X		Steam is currently in rip-rap ditch. If possible, plant trees according to the standard stream relocation procedures. Mitigate any loss of stream length with the in-lieu fee program.

Permit sketches are required for:

- New stream encapsulations greater than 200' (includes streams and springs)
- Culverts with stream encapsulation extensions that bring the total to greater than 200' (existing culvert plus proposed stream encapsulation is greater than 200'). (If existing length is less than 200' but proposed encapsulation will make the culvert greater than 200', the entire length needs mitigation. If the existing length is greater than 200', only the proposed extension needs mitigation.)
- Culverts of any length with transitions (small channel relocations at the ends) longer than 50 ft.
- Total new stream alteration (transitions or relocations with or without new culvert, including rip-rap) over 200 ft.; for this rule, the existing culvert is not counted as part of the total new stream alteration for mitigation purposes only

Note: Any transitions or channel relocations greater than 50 feet will require tree planting from the wingwall or clear zone to the edge of right-of-way. Also, transitions less than 50 feet that do not mimic the dimensions of the existing stream channel will require mitigation.

Standard Stream Mitigation (STR-2)

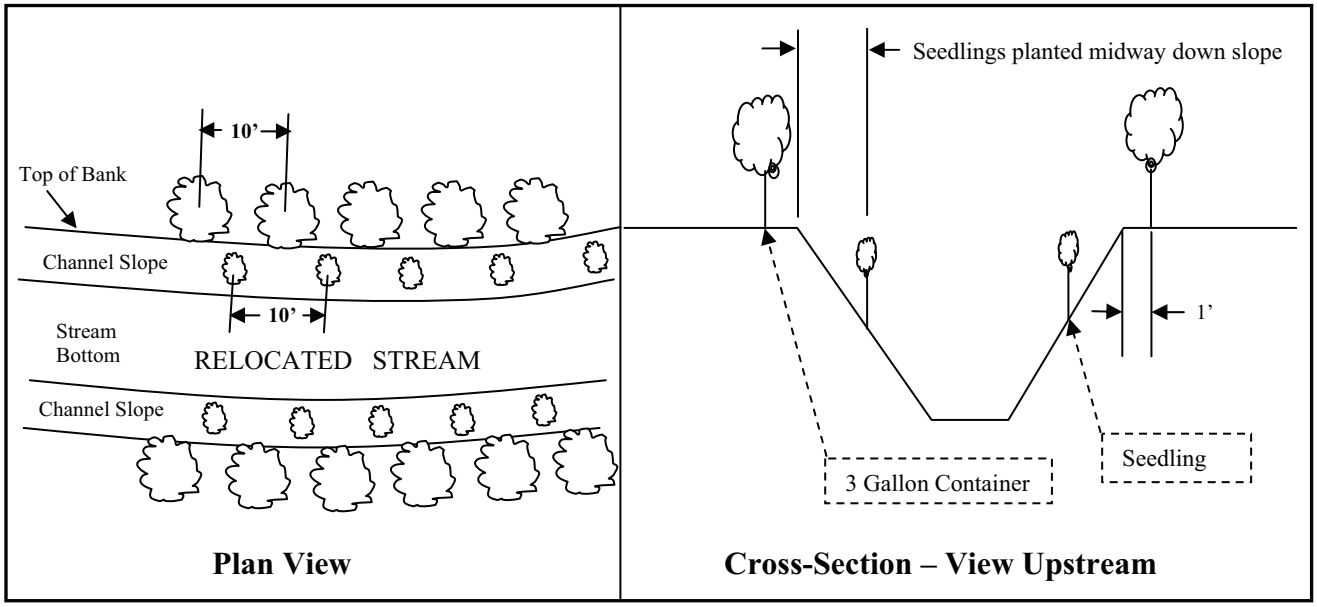
Apply these measures to all applicable streams listed in Form J. Duplicate the length, bottom channel width, elevations, side slopes, meander wavelength, and curvature of the existing channels to the extent possible. Each channel should transition smoothly from its beginning elevation to its tie-in elevation in the receiving stream, without profile drops or jumps. Locate the new channels in as flat an area as possible to avoid unusually high side slopes; this may require some additional right-of-way. Channel length placed in spring-boxes or culverts counts as part of the new channel length (but may require off-site compensatory mitigation that would not be required for an open channel). Channel side slopes should mimic existing channel side slopes, if possible, and be stabilized using appropriate BMPs – the use of rip-rap should be avoided if possible. If rip-rap is required, the rip-rap should be imbedded into the soil so that the top of the rip-rap is flush with the bottom and sides of the channel.

Plant two alternating rows of tree or shrub species on both sides of the new channels; the first row shall be bare root seedlings that are planted on the channel slope, centered on the midpoint of the slope. Along the top of bank, 3-gallon container-grown trees are to be planted within one foot of the top of bank, unless directed otherwise.

Rip-rap, if required, should be limited to ends of culverts. All relocated channels and their accompanying mitigation features, including trees, are to be placed in right-of-way rather than easements; this may require acquisition of additional right-of-way. Use the following specifications for planted species (leave item number blank):

Item #	Description	Unit
802-13.01	ALNUS SERRULATA (HAZEL ALDER 2-5FT CNTNR GRWN)	Each
802-13.59	LINDERA BENZOIN (SPICEBUSH SDLNG BARE ROOT)	Each
802-12.11	CERCIS CANADENSIS (REDBUD SEEDLNG B.R.)	Each
802-12.12	CORNUS FLORIDA (FLOWERING DOGWOOD SEEDLNG B.R.)	Each

Figure 1. SPACING FOR PLANTING ALONG RELOCATED STREAM.



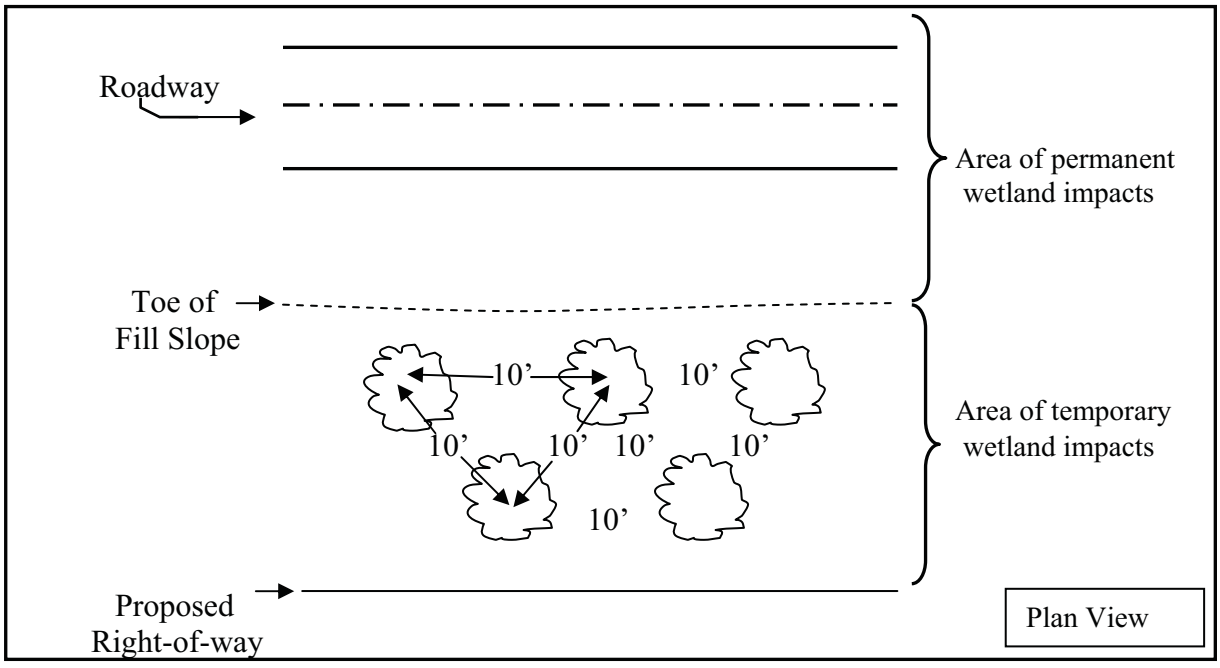
Standard On-site Mitigation for Temporary Wetland Impact Areas

Apply these measures to all applicable temporary wetland impact areas listed in Form J. For temporary wetland impact areas, remove the top six to 12 inches of topsoil and stockpile it until construction is complete. Once construction activities are completed, restore all temporary wetland impact areas to pre-construction conditions. This includes removing haul roads (if applicable), restoring the site to the original (pre-construction) elevation and spreading stockpiled topsoil back over the wetland site. The area of temporary impacts will then be seeded, covered with straw and planted with tree seedlings to stabilize the site. Seedlings will be planted on 10-foot centers. Place a note on the present and proposed layout sheets to protect wetland areas located beyond the limits of the fill slope and proposed right-of-way. Use the following tree specifications (leave item number blank):

Item #	Description	Unit
802-13.53	CEPHALANTHUS OCCIDENTALIS (BUTTONBUSH SDLNG BARE ROOT)	Each
802-13.54	CORNUS AMOMUM (SILKY DOGWOOD SDLNG BARE ROOT)	Each
802-13.56	HYDRANGEA QUERCIFOLIA (OAKLF HYDRANGEA SDLNG BARE ROOT)	Each
802-12.30	QUERCUS BICOLOR (SWAMP WHITE OAK SEEDLNG B.R.)	Each
802-12.20	NYSSA AQUATICA (SWAMP TUPELO SEEDLNG B.R.)	Each

Ht = Height, BR = Bare Root

TREE PLANTING SCHEME FOR TEMPORARY WETLAND IMPACT AREAS



Please place the following notes in the Special Notes section of the plans:

Topsoil is to be removed from all areas of temporary wetland impacts and stockpiled prior to construction.

Upon completion of construction activities, temporary haul roads are to be removed. Excavated material from the haul roads is to be disposed of as directed by the engineer.

Upon completion of construction activities, all temporary wetland impact areas are to be restored to pre-construction contours and the stockpiled wetland topsoil spread to restore these areas to pre-construction elevation.

Khalid Ahmed - Marion Co. I-24/US-27 Interchange; Species Update

From: Christina Richards
To: Ahmed, Khalid
Date: 9/24/2009 10:30 AM
Subject: Marion Co. I-24/US-27 Interchange; Species Update

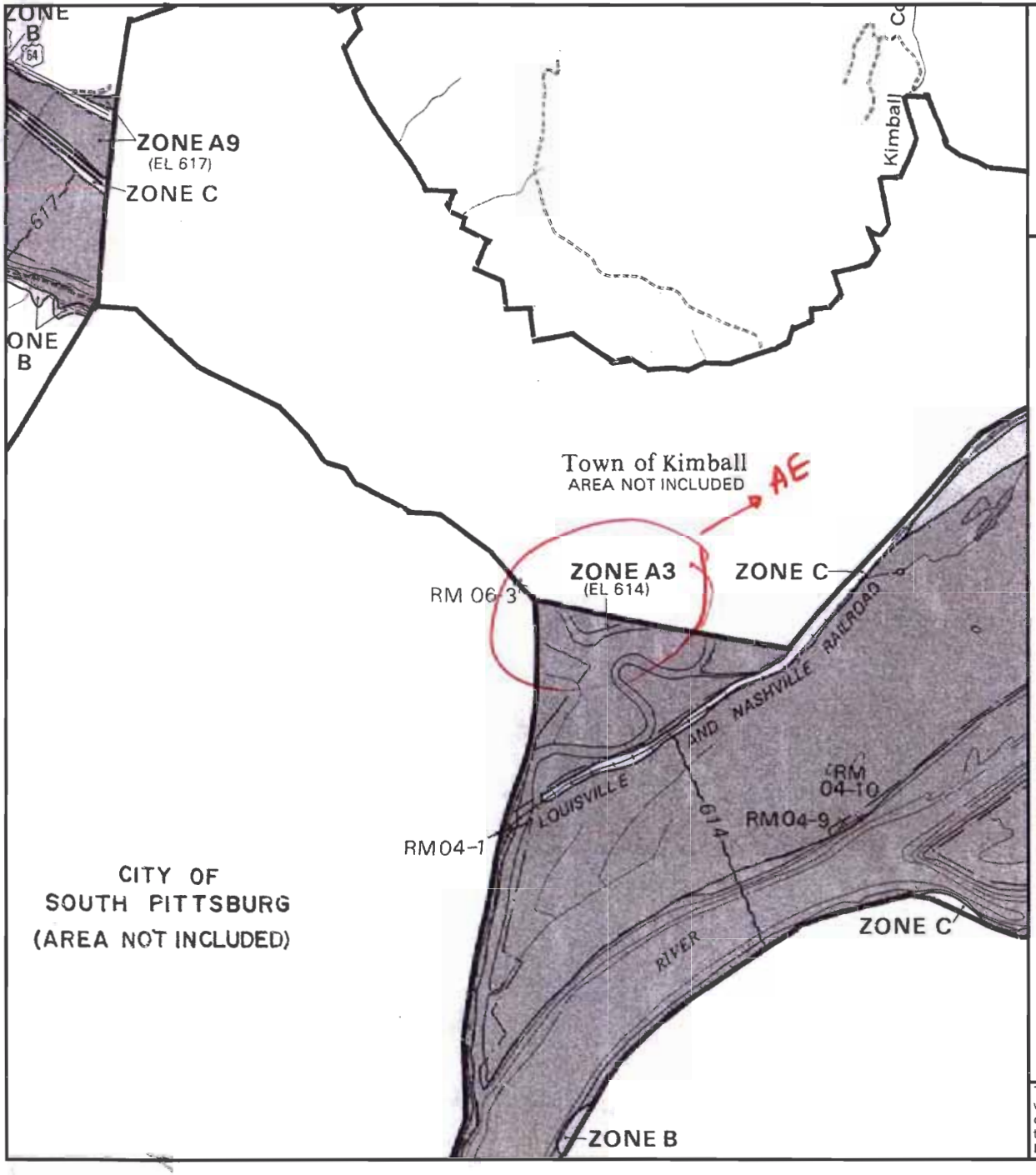
Khalid,

There are no changes to the Form N submitted with the original environmental boundaries. A review of the TDEC database has reviled no additional species that need coordination.

Please let me know if you need additional information.

Thanks,

Christina Richards
Environmental Division
Ecology Section
James K. Polk Building
505 Deaderick Street
Nashville, TN 37243
615-253-8690 (office)
615-741-1098 (fax)



APPROXIMATE SCALE

2000 0 2000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

MARION COUNTY, TENNESSEE
(UNINCORPORATED AREAS)

PANEL 150 OF 200

COMMUNITY-PANEL NUMBER
470114 0150 B

EFFECTIVE DATE:
MAY 15, 1980

U.S. DEPARTMENT OF HOUSING
AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL DIVISION
SUITE 900 - JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243-0334

MEMORANDUM

To: Lia Obaid
TDOT Design Division

From: Christina Richards
Ecology Section

Date: 4 February 2008

Subject: ENVIRONMENTAL BOUNDARIES AND MITIGATION DESIGN FOR: **Marion County: S.R. 27 (U.S. 72) Interchange with I-24; PE No. 58007-1220-64; PIN No. 102236.00**

An ecological evaluation of the subject project has been conducted with the following results:

__X__ Wetlands present: There are three (3) wetlands within the project area. The current plans have the wrong boundaries for WTL-2. It should start at the fence line at the base of the slope of Ramp E. Also, this wetland is considered an Exceptional Tennessee Waters. Avoidance of this wetland should be a priority. Tighten the slopes for Ramp E to prevent filling in the edge of this wetland. A large section of WTL-1 and portions of WTL-2 combined will have 2.0 acres of permanent and 2.0 acres of temporary impacts. The impact assessment on the plans shows the wrong acreage. These wetlands have been surveyed by Gary Chapman; please contact him to get the correct amounts per wetland. Communication with the Tennessee Valley Authority (TVA) is ongoing. Current plans are to purchase the surrounding tract of land and use it as onsite mitigation. This would keep the mitigation ratios at 2:1. If this purchase cannot be made, we will be at a loss for mitigation alternatives as we have found no other place within the 8 digit HUC code that we could use for mitigation. Place orange construction fencing 10 feet from the new slope line to keep vehicles and personnel from damaging more wetland than necessary. Do not create a ditch line at the base of the slope, as this would increase the chances of draining the wetland, thus increasing mitigation requirements. Please see forms G and J for details on the wetlands and mitigation recommendations.

_____ No wetlands identified

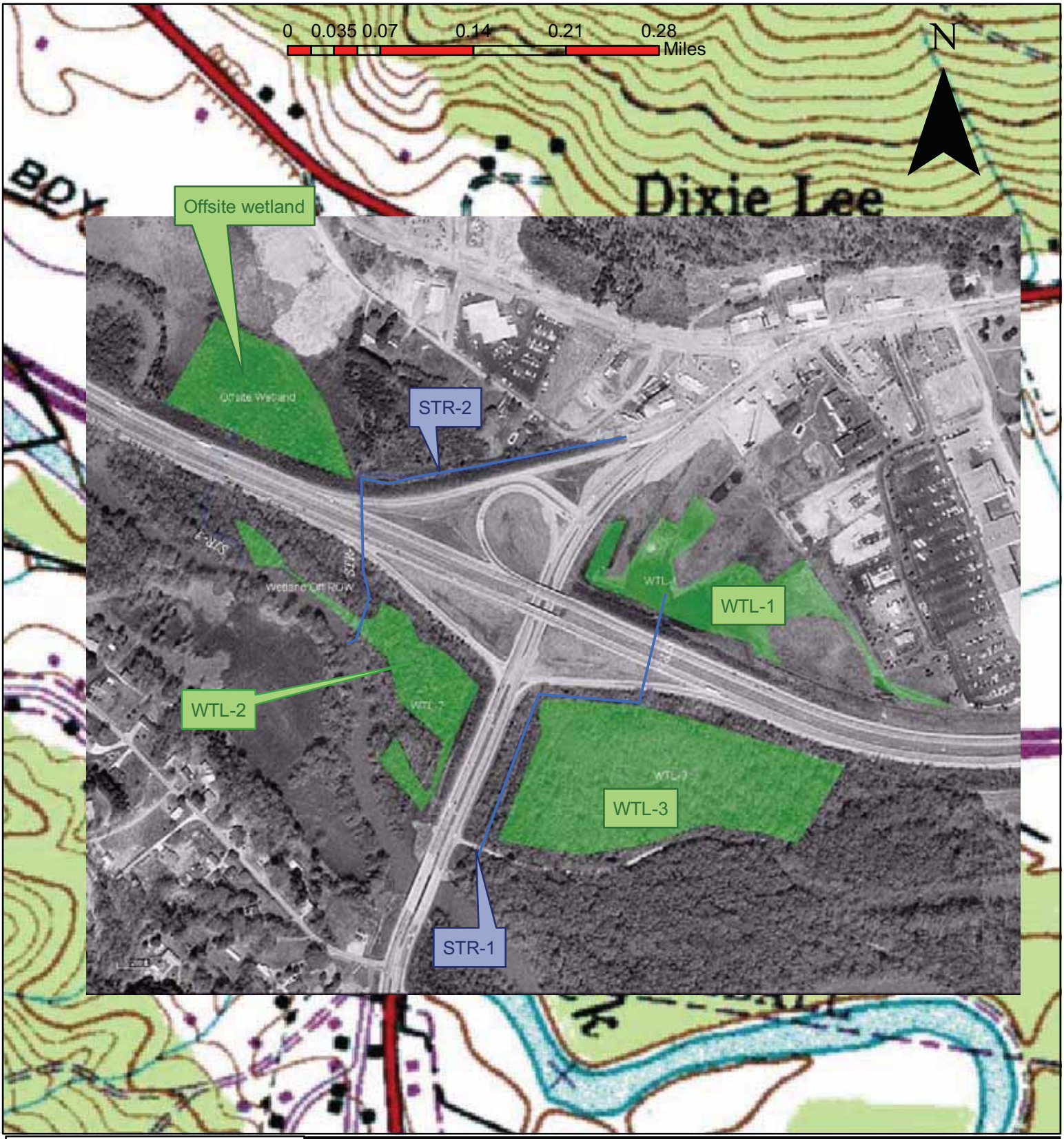
__X__ Streams present: There are three (3) streams within the project area. The unnamed tributary to Battle Creek, STR-1, will be encapsulated under the new west bound I-24 off ramp. STR-1 starts from many seeps within WTL-1, these seeps will need to be captured to allow for continued flow. Since the existing culvert is already greater than 200 feet, only the new encapsulation will require mitigation. Please mitigate stream length loss with the in-lieu fee program. All streams will need to be surveyed and put on the plans. See forms G and J for details of these streams and mitigation recommendations.

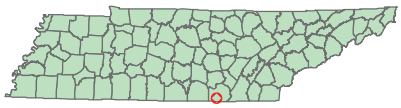
_____ No streams present

__X__ Protected species identified in project impact area: There are two (2) protected species within a one mile radius and twelve (12) protected species within a four mile radius of this project. The USFWS and TWRA have stated that best management practices are sufficient to protect these species. Please see Form N for a list and details of these species.

If you have any questions or comments please contact me at Christina.Richards@state.tn.us or 615-253-8690. Thank you very much.

Copy: Permits: Memo, Forms G, J, N, Topo, Photos, Agency Correspondence
Jim Waters: Memo, Forms G, J, N, Topo, Photos, Agency Correspondence
Project file: Memo, Forms G, J, N, Topo, Photos, Agency Correspondence
Reading file: Memo





Marion County, SR 27 (US 72) Interchange at I-24
28 January 2008
USGS South-Pittsburg Quadrangle
P.E. No. 58007-1220-64
PIN No. 102236.00

TDOT

Ecology Field Data Sheet: **Water Resources** Form G

County: Marion Route: SR-27 (US-72) LM: N/A PE No. 58007-1220-64 PIN No. 102236.00
Project Description: SR-27 (US-72); Interchange @ I-24
Date of survey: 2 March 2006 Biologists: J. Duke, J. Nunley Affiliation: CEC

1-Station: from plans			147+50 CL I-24
2-Map label			STR-1
3-Potential impact			Crossing, Runoff
4-Feature type			Watercourse
5-Feature name			Unnamed Tributary to Battle Creek
6-Feature description:			
	what is it		Perennial Stream
	blue-line on topo? (y/n)		Y
CHANNEL DESCRIPTION	defined channel (y/n)		Y
	channel bottom width		1’ to 5’
	top of bank width		2’ to 6’
	bank height		1’
	substratum		Mud / Silt, Clay
	riffle/run/pool		80% pool / 20% slow run
	in-stream root wads		N
STREAMBANKS	bank stability	LB	Stable
		RB	Stable
	dominant species	LB	**Trees** 100% =Red Maple, Black Willow, Box Elder, Water Oak;
		RB	**Trees** 100% = Red Maple, Black Willow, Box Elder, Water Oak;
	overhead canopy (%)		25%
WATER	water flow (y/n)		Y
	water depth		Up to 1’
	water width		1’ to 5’
	groundwater connection		Y, seeps from WTL-1
INSTREAM	benthos		Yes (water striders, isopods)
	fish		Yes
	algae		Yes
	other aquatic life		None Seen
GENERAL	habitat assessment score		80
	portion affected		Only portion for construction of Ramp A
	photo number (s)		2527 – 2529, 2541, 2543
	rainfall information		None previous 48 hours
	other		
7-Watershed		HUC code	06030001
		HUC name	Guntersville
8-Determination: TDOT/ consultant			Perennial Stream
9-Determination: Confirmed? By?			Not Required
10-Mitigation: to be included in design			Yes
11-Notes Indicate if stream is Tier II/III or on 303(d) list			Encapsulated under I-24 > 200 feet, will need mitigation of additional encapsulation.

Ecology Field Data Sheet: **Water Resources** Form G

County: Marion Route: SR-27 (US-72) LM: N/A PE No. 58007-1220-64 PIN No. 102236.00
Project Description: SR-27 (US-72); Interchange @ I-24
Date of survey: 2 March 2006 Biologists: J. Duke, J. Nunley Affiliation: CEC

1-Station: from plans			707+00 Ramp E
2-Map label			STR-2
3-Potential impact			Crossing / Runoff
4-Feature type			Watercourse
5-Feature name			Unnamed tributary to Battle Creek
6-Feature description:			
	what is it		Intermittent Stream
	blue-line on topo? (y/n)		N
CHANNEL DESCRIPTION	defined channel (y/n)		Y
	channel bottom width		4’
	top of bank width		8’
	bank height		3.5’
	substratum		Mud / Silt (Hard Pack Clay)
	riffle/run/pool		0% / 25% / 75%
	in-stream root wads		N
STREAMBANKS	bank stability	LB	Moderately Stable
		RB	Stable
	dominant species	LB	**Trees** 100% = Sycamore, Tulip Poplar, Water Oak, Red Maple
		RB	**Trees** 100% = Sycamore, Tulip Poplar, Water Oak, Red Maple
	overhead canopy (%)		100%
WATER	water flow (y/n)		Y
	water depth		6”
	water width		3’
	groundwater connection		unknown
INSTREAM	benthos		Snails
	fish		None seen
	algae		Yes
	other aquatic life		None seen
GENERAL	habitat assessment score		61
	portion affected		None
	photo number (s)		2536, 2537, 0029, 0030
	rainfall information		None previous 48 hours
	other		
7-Watershed		HUC code	06030001
		HUC name	Guntersville
8-Determination: TDOT/ consultant			Intermittent Stream
9-Determination: Confirmed? By?			Not required
10-Mitigation: to be included in design			No
11-Notes Indicate if stream is Tier II/III or on 303(d) list			

Revised 8/2005

Ecology Field Data Sheet: **Water Resources** Form G

County: Marion Route: SR-27 (US-72) LM: N/A PE No. 58007-1220-64 PIN No. 102236.00
Project Description: SR-27 (US-72); Interchange @ I-24
Date of survey: 2 March 2006 Biologists: J. Duke, J. Nunley Affiliation: CEC

1-Station: from plans			127+90 CL I-24
2-Map label			STR-3
3-Potential impact			Runoff
4-Feature type			Watercourse
5-Feature name			Unnamed tributary to Battle Creek
6-Feature description:			
	what is it		Intermittent Stream
	blue-line on topo? (y/n)		N
CHANNEL DESCRIPTION	defined channel (y/n)		Y
	channel bottom width		3’ – 5’
	top of bank width		10’
	bank height		1’ – 3’
	substratum		Mud / silt
	riffle/run/pool		0% / 20% / 80%
	in-stream root wads		Yes
STREAMBANKS	bank stability	LB	Stable
		RB	Stable
	dominant species	LB	**Trees** 100% = Sycamore, Tulip Poplar, Water Oak, Red Maple
		RB	**Trees** 100% = Sycamore, Tulip Poplar, Water oak, Red Maple
	overhead canopy (%)		100%
WATER	water flow (y/n)		Y
	water depth		1” – 2”
	water width		1’
	groundwater connection		unknown
INSTREAM	benthos		Y (oligochaetes, isopods, burrowing mayflies)
	fish		No
	algae		Yes
	other aquatic life		
GENERAL	habitat assessment score		76
	portion affected		None
	photo number (s)		2538, 2539
	rainfall information		None previous 48 hours
	other		
7-Watershed		HUC code	06030001
		HUC name	Guntersville
8-Determination: TDOT/ consultant			Perennial Stream
9-Determination: Confirmed? By?			Not required
10-Mitigation: to be included in design			No
11-Notes Indicate if stream is Tier II/III or on 303(d) list			

Revised 8/2005

Ecology Field Data Sheet: **Wetlands** Form G

County: Marion Route: SR-27 (US-72) LM: N/A PE No. 58007-1220-64 PIN No. 102236.00
Project Description: SR-27 (US-72); Interchange @ I-24
Date of survey: 2 March 2006 Biologists: J. Duke, J. Nunley Affiliation: CEC

1-Station: from plans			708+50 R to 714+25 R of Ramp E
		261+00 – 279+00 of Ramp A	401+25 L to 408+00 L of US-72
2-Map label		WTL-1	WTL-2
3-Potential impact		Fill, Runoff	Fill, Runoff
4-Feature type		Possible wetland	Possible Wetland
5-Feature name		N/A	N/A
6-Feature description:			
	wetland type*	Emergent and Scrub/Shrub	Forested and Emergent
VEGETATION	dominant wetland plant species	Black Willow, Green Ash	Willow Oak, Sweetgum
		Buttonbush, Seedbox	Water Oak, Red maple
		Cattails,	Frank's sedge
		Various Sedges (Carex spp.)	Soft Rush
		Soft rush, Nut Sedge	Nut Sedge
WATER	surface water connection (y/n)**	Y	Y
	ground water connection (y/n/unkn)**	Y	unkn
	avg. water depth	Moist soils to 1 ft.	Moist soils to 1 ft.
SOILS	Munsell soil colors	10YR4/1 w/ 5YR5/8 mottles	10YR4/2 w/ 5YR4/6 mottles
		Slight to medium mottles	Mottling medium to strong
		Stiff clay, iron concretions	Iron concretions, sandy loam
GENERAL	approximate size (acres)	~6.5 acres	~3.5 acres
	portion affected (acres) (permanent)	~3.0 acres	< 1.0 acre
	portion affected (acres) (temporary)	~0.5 acres	<0.1 acre
	photo number (s)	2520 - 2526	2532 – 2535, 2540
	other		
7-Watershed	HUC code	06030001	06030001
	HUC name	Guntersville	Guntersville
8-Determination: TDOT/ consultant		Contiguous Wetland / J. Duke of CEC, Inc	Contiguous Wetland / J. Duke of CEC, Inc.
9-Determination: Confirmed? By?			
10-Mitigation: to be included in design		Yes	Yes
11-Notes		Beaver dams present. Wetland delineation had previously been performed only on TVA property. Wetland flagging stopped at TDOT ROW fence. Most of the delineation was accurate.	Wetland located within floodplain of Battle Creek. Along US-72 under utility line easement wetland is an emergent marsh and along I-24 beginning at tow of roadway slope wetland is a forested floodplain wetland.

* Forested, Scrub-shrub, Emergent or Bog

** Y = Contiguous N = Isolated Unkn = Unknown

Ecology Field Data Sheet: **Wetlands** Form G

County: Marion Route: SR-27 (US-72) LM: N/A PE No. 58007-1220-64 PIN No. 102236.00
Project Description: SR-27 (US-72); Interchange @ I-24
Date of survey: 2 March 2006 Biologists: J. Duke, J. Nunley Affiliation: CEC

1-Station: from plans			801+00 R – 820+00 R of Ramp F	
			403+00 R to 407+00 R of US-72	
2-Map label			WTL-3	
3-Potential impact			None	
4-Feature type			Possible wetland	
5-Feature name			N/A	
6-Feature description:				
wetland type*			Forested	
VEGETATION	dominant wetland plant species		Willow Oak	
			Water Oak	
			Woolgrass	
			Black Willow	
			Soft Rush	
WATER	surface water connection (y/n)**		Y	
	ground water connection (y/n/unkn)**		unknown	
	avg. water depth		Up to 2 ft.	
SOILS	Munsell soil colors		10YR4/2 w/ 5YR4/6 mottles	
			Mottling Medium	
			Iron Concretions	
GENERAL	approximate size (acres)		> 15 acres	
	portion affected (acres) (permanent)		None	
	portion affected (acres) (temporary)		None	
	photo number (s)		2542 and 2544	
	other			
7-Watershed		HUC code	06030001	
		HUC name	Guntersville	
8-Determination: TDOT/ consultant			Contiguous Wetland / J. Duke of CEC, Inc.	
9-Determination: Confirmed? By?				
10-Mitigation: to be included in design			No	
11-Notes				

* Forested, Scrub-shrub, Emergent or Bog

** Y = Contiguous N = Isolated Unkn = Unknown

Photo 1 (2520) – WTL -1

View towards the south of WTL-1 in background with upland field in foreground. I-24 is just beyond tree line in background of photo. Near Sta. 277+00 CL Ramp A.

Photo 2 (2521) – WTL-1

View towards the north, J. Duke is in the process of completing a wetland data field sheet. Near Sta. 276+00 CL Ramp A.

Photo 3 (2522)

View of exposed concrete manhole in the south central portion of WTL-1 near the confluence with STR-1. Near Sta. 275+00 L Ramp A.

Photo 4 (2523)

View towards the northeast of pipe discharge from manhole in previous photo. Photo was taken from near the TDOT ROW fence. Near Sta. 275+00 L Ramp A.

Photo 5 (2524) – WTL-1

View towards the east. Tractor-trailer trucks seen in the background are on I-24. Near Sta. 274+50 CL Ramp A.

Photo 6 (2525) – WTL-1

View towards the southeast at the eastern end of the wetland. I-24 is visible in the background. Near Sta. 268+00 R Ramp A.

Photo 7 (2526) – WTL-1

Tree line to the right is the I-24 roadway embankment. Near Sta. 274+00 L Ramp A.

Photo 8 (2527) – STR-1

Beginning of STR-1 near TDOT ROW fence. WTL-1 is evident in the background. View is towards the east in an upstream direction. Near Sta. 274+50 L Ramp A.

Photo 9 (2528) – STR-1

View is downstream. Stream flows into 72" CMP, which is visible in the center of photo. I-24 roadway embankment is to the left. Near Sta. 274+50 L Ramp A.

Photo 10 (2529) – STR-1

View is downstream at 72" CMP under I-24. Photo was taken from the TDOT ROW fence on the north side of I-24. Near Sta. 275+00 L Ramp A.

Photo 11 (2532) – WTL-2

View is towards the north, Ramp E is in background and US-72 is to the right. Near Sta. 402+00 L SR-27.

Photo 12 (2533) – WTL-2

View is towards the north, Ramp E is in background and US-72 is to the right. TDOT ROW fence is visible to the right. Plans indicate that Ramp E and US-72 will be widened from the existing fence to approximately the utility pole observed in background (~20 ft.). Near Sta. 407+00 L SR-27.

Photo 13 (2534) – WTL-2

View is towards the west, Ramp E embankment is to the right side of photo. Near Sta. 713+00 R Ramp E.

Photo 14 (2535) – WTL-2

View is towards the northwest with Ramp E / I-24 visible in background. Near Sta. 710+00 R Ramp E.

Photo 15 (2536) – STR-2

View is downstream, towards the south. Near Sta. 707+00R Ramp E.

Photo 16 (2537) – STR-2

View is upstream, towards the north. Near Sta. 707+00R Ramp E.

Photo 17 (2538) – STR-3

View is upstream, towards the north.
Near Sta. 127+90R I-24.

Photo 18 (2539) – STR-3

View is downstream, towards the south.
Near Sta. 127+90R I-24.

Photo 19 (2540) – WTL-2

Continuation of WTL-2 south of I-24 located off the ROW. Near Sta. 704+00R Ramp E.

Photo 20 (2541) – STR-1

View is upstream (north). US-72 is to the left. Note the exposed banks from numerous backwater events from Battle Creek. This is a continuation of stream 1 located in the southeast quadrant of the project (south of I-24). Near Sta. 402+00R SR-27.

Photo 21 (2542) – WTL-3

Offsite wetland located just outside TDOT ROW and to the east of STR-1 and east of US-72. Near Sta. 405+00R SR-27.

Photo 22 (2543) – STR-1

Outlet of culvert from under I-24 / Ramp F. View is upstream. Near Sta. 803+50R Ramp F.

Photo 23 (2544) – STR-1 and WTL-3

STR-1 is flowing along the right side of photo in a downstream direction. WTL-3 begins at streambank and extends to the south and east off TDOT ROW. Near Sta. 803+50R Ramp F.

Photo 24 (2545)

View of inner circle of Ramp B. Potential wetland was evaluated in this loop. Hydric soils were not present.

Photo 25 (2546)

Potential wetland located in median between I-24, Ramp E, and US-72. Spike rush and sedges were observed in a low spot due to improper drainage. Hydric soils were lacking; therefore, it was determined that this was not a wetland.

Photo 26 (2547)

Off-site wetland. Open water and beaver impounded wetlands located north of I-24 and Ramp C. Wetland begins just beyond the TDOT ROW fence. According to the plans no proposed work is to occur in this quadrant. Near Sta. 127+00L I-24.

Photo 27 (2548)

Off-site wetland. Open water and beaver impounded wetlands located north of I-24 and Ramp C. Wetland begins just beyond the TDOT ROW fence. According to the plans no proposed work is to occur in this quadrant. Near Sta. 127+00L I-24.

Photo 28 (0029) – STR-2

Beginning of STR-2 at culvert outlet near fireworks store. View is upstream near Sta. 421+00L.

Photo 29 (0030) – STR-2

Downstream view of STR-2 in same located as Photo 28.

Photo 30 (0031)

Roadside ditch located near Sta. 506+10 R just beyond TDOT ROW. This roadside ditch flows into a 36” CMP under a city road prior to emptying into STR-2.

Natural Resources Mitigation Sketches/Information

Project: **SR-27 (US-72); Interchange @ I-24; Pin # 102236.00; Project No. 58007-1220-64; Marion County**

Date: 2 March 2006 Biologist: Jeff Duke Company: Civil & Environmental Consultants, Inc.
Updated: 1 February 2008 by C. Richards (TDOT)

Station	Map label	Marked-up plans sheet (A); notes (B); mitigation plan (C) attached	Calculate permanent & temporary wetland impacts & provide to Chrissy Richards and John Hewitt	Apply "standard" stream relocation configuration & instructions	Survey boundaries as flagged in field	General notes and/or specific changes requested
261+00 to 279+00 Ramp A	WTL-1	A, B, C	X			For temporary impacts, follow Standard Temporary Impact procedure. Mitigation is being arranged with TVA. The surrounding tract may be purchased to provide for onsite mitigation at a ratio of 2:1. There are no other places within the 8-digit HUC that can be used for mitigation, thus increasing the mitigation ratio and and extending the time required to get the permit. To provide for minimal impacts, place orange construction fence 10 feet from bottom of slope to protect the existing wetland. Do not create a ditch line at the bottom of the ramp slope, to prevent any drainage of the current wetland.
708+50R to 714+25 R of Ramp E and 401+25L to 408+00L of SR-27	WTL-2	A, B, C	X			For temporary impacts, follow Standard Temporary Impact procedure. Mitigation is being arranged with TVA. The surrounding tract may be purchased to provide for onsite mitigation at a ratio of 2:1. There are no other places within the 8-digit HUC that can be used for mitigation, thus increasing the mitigation ratio and extending the time required to get the permit. To provide for minimal impacts, place orange construction fence 10 feet from bottom of slope to protect the existing wetland. Do not create a ditch line at the bottom of the ramp

						slope, to prevent any drainage of the current wetland.
274+50	STR-1	A, B				Since STR-1 is already encapsulated for greater than 200 feet, the new encapsulation will need to be mitigated with the in-lieu fee program. There are seeps within the wetland area that will be covered by the new ramp. Use a French drain to provide for drainage of area into stream.

Permit sketches are required for:

- New stream encapsulations greater than 200' (includes streams and springs)
- Culverts with stream encapsulation extensions that bring the total to greater than 200' (existing culvert plus proposed stream encapsulation is greater than 200'). (If existing length is less than 200' but proposed encapsulation will make the culvert greater than 200', the entire length needs mitigation. If the existing length is greater than 200', only the proposed extension needs mitigation.)
- Culverts of any length with transitions (small channel relocations at the ends) longer than 50 ft.
- Total new stream alteration (transitions or relocations with or without new culvert, including rip-rap) over 200 ft.; for this rule, the existing culvert is not counted as part of the total new stream alteration for mitigation purposes only

Note: Any transitions or channel relocations greater than 50 feet will require tree planting from the wingwall or clear zone to the edge of right-of-way. Also, transitions less than 50 feet that do not mimic the dimensions of the existing stream channel will require mitigation.

Standard On-site Mitigation for Temporary Wetland Impact Areas

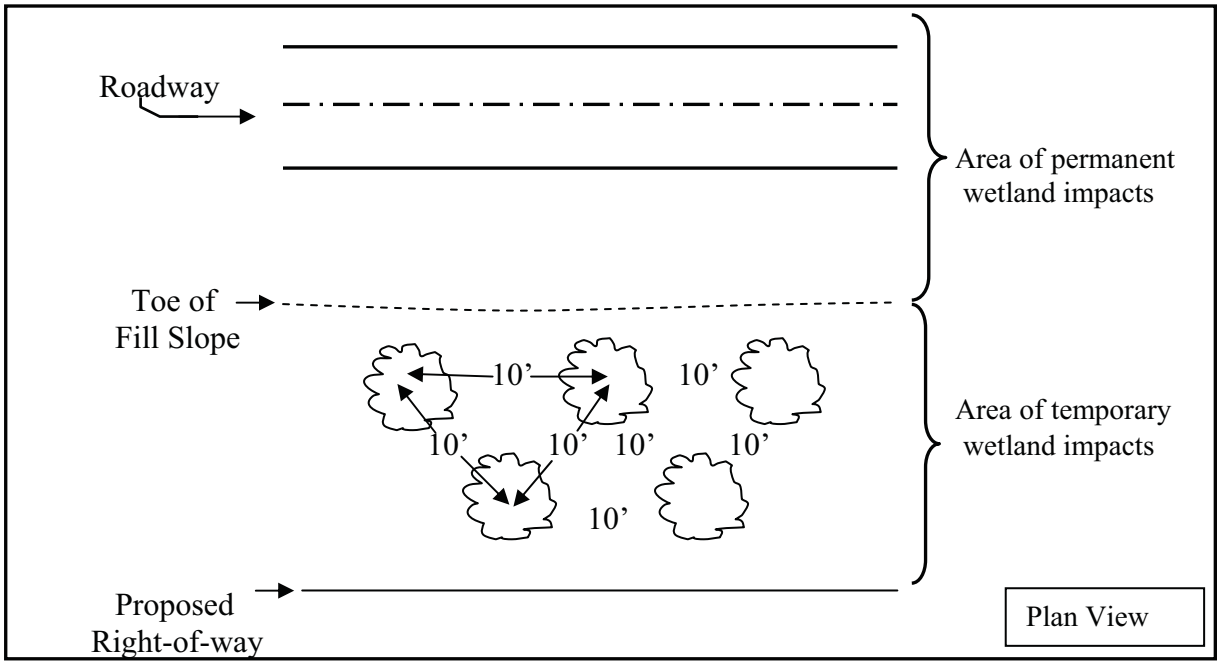
Apply these measures to all applicable temporary wetland impact areas listed in Form J. For temporary wetland impact areas, remove the top six to 12 inches of topsoil and stockpile it until construction is complete. Once construction activities are completed, restore all temporary wetland impact areas to pre-construction conditions. This includes removing haul roads (if applicable), restoring the site to the original (pre-construction) elevation and spreading stockpiled topsoil back over the wetland site. The area of temporary impacts will then be seeded, covered with straw and planted with tree seedlings to stabilize the site. Seedlings will be planted on 10-foot centers. Place a note on the present and proposed layout sheets to protect wetland areas located beyond the limits of the fill slope and proposed right-of-way.

Use the following tree specifications for replanting temporary wetland impacts for WTL-2. WTL-1 is emergent and scrub/shrub.

Item #	Description	Quantity	Unit
	Seedling - *Quercus phellos,* willow oak 18”-24" Ht, BR		Each
	Seedling - *Quercus nigra,* water oak 18”-24" Ht, BR		Each
	Seedling - *Liquidamber styraciflua,* sweet gum 18”-24" Ht, BR		Each
	Seedling - *Acer rubrum,* red maple 18”-24" Ht, BR		Each
	Seedling - *Betula nigra,* river birch 18”-24” Ht, BR		Each

Ht = Height, BR = Bare Root

TREE PLANTING SCHEME FOR TEMPORARY WETLAND IMPACT AREAS



SR-27 (US-72); Interchange @ I-24, Marion County
Pin # 102236.00; Project No. 58007-1220-64 Scope J

Please place the following notes in the Special Notes section of the plans:

Topsoil is to be removed from all areas of temporary wetland impacts and stockpiled prior to construction.

Upon completion of construction activities, temporary haul roads are to be removed. Excavated material from the haul roads is to be disposed of as directed by the engineer.

Upon completion of construction activities, all temporary wetland impact areas are to be restored to pre-construction contours and the stockpiled wetland topsoil spread to restore these areas to pre-construction elevation.

From: Rob Todd
To: Christina Richards
Date: 1/24/2008 1:55 PM
Subject: Re: Marion Co. I-24 interchange at S.R. 27 (US 72); PIN # 102236.00

Christina:

Based upon the information that you have provided me, BMP's would be sufficient to minimize impacts to rare species for this project.

Thank you for the opportunity to review and comment.

Robert M. Todd
Tennessee Wildlife Resources Agency
Environmental Services Division
Ellington Agricultural Center
P.O. Box 40747
Nashville, TN 37204
Phone: 615-781-6572
Fax: 615-781-6667
E-mail address: Rob.Todd@state.tn.us

>>> Christina Richards 1/8/2008 1:41 PM >>>
Hey Rob,

TDOT is proposing to build a new off ramp at this interchange. I've included an incomplete Form N, photos, and topo. Site visits have confirmed wetland impacts both temporary and permanent. There are also two streams on the project, though only one intermittent stream will be impacted. This impact is an additional encapsulation under the new ramp. I would appreciate any comments you might have on the project. If you need further information, please feel free to contact me.

Thanks,

Christina Richards
Environmental Division
Ecology Section
James K. Polk Building
505 Deaderick Street
Nashville, TN 37243
615-253-8690 (office)
615-741-1098 (fax)

Species Review Form

Project: Marion Co. I-24 at S.R. 27 (U.S. 27) interchange; P.E. #58007-1220-64, PIN #102236.00

Date of Field Study: 2 March 2006 **Date TDEC Database Checked:** 28 February 2006 **Biologists:** J. Duke
Updated by C. Richards 16 July 2007

Species reported within 1 mile radius of project:

1. Species Scientific and common names, followed by (A) for animal or (P) for plant	2. Status		3. Species is potentially present in R-O-W because: **(A)** it is listed by TDEC within ROW **(B)** habitat is present **(C)** Observed during site visit **(D)** critical habitat present	4. Species is considered likely NOT present in R-O-W because: **(A)** Present habitat unsuitable **(B)** Not observed during site visit **(C)** Original record questionable **(D)** Considered extinct/extirpated	5. (**A**) BMPs are sufficient to protect species (**B**) Special Notes are included on project plans to protect species **(C)** Individuals may be affected	6 Habitat (include blooming, breeding or other information; where found according to TDEC database; year last observed)	7. Notes
	Fed	TN					
Corvax corax, common raven (A)		T		A,B,C	A	**Last obs.** 1914-04-16 Howell (1924) reported a pair was observed soaring from Long Island Gulch, AL up river into TN.	TWRA states BMPs are sufficient to protect species.
Lampsilis abrupta, pink mucket (A)	LE	E		A,B	A	**Last obs.** 1956 collected in TN river that is now Nickajack Lake.	TWRA states BMPs are sufficient to protect species.

Species reported within 1-mile to 4-mile radius of project:

1. Species Scientific and common names, followed by (A) for animal or (P) for plant	2. Status		3. Species is potentially present in R-O-W because: **(A)** it is listed by TDEC within ROW **(B)** habitat is present **(C)** Observed during site visit **(D)** critical habitat present	4. Species is considered likely NOT present in R-O-W because: **(A)** Present habitat unsuitable **(B)** Not observed during site visit **(C)** Original record questionable **(D)** Considered extinct/extirpated	5. (**A**) BMPs are sufficient to protect species (**B**) Special Notes are included on project plans to protect species **(C)** Individuals may be affected	6 Habitat (include blooming, breeding or other information; where found according to TDEC database; year last observed; reference)	7. Notes
	Fed	TN					

Project: Marion Co. I-24 at S.R. 27 (U.S. 27) interchange; P.E. #58007-1220-64, PIN #102236.00

Date of Field Study: 2 March 2006 **Date TDEC Database Checked:** 28 February 2006 **Biologists:** J. Duke
Updated by C. Richards 16 July 2007

Athearnia anthonyi, Anthony's river snail (A)	LE	E		A,B		**Last obs.** 1994 in Guntersville Reservoir, TN River mi. 422.8	TWRA states BMPs are sufficient to protect species.
Haliaeetus leucocephalus, bald eagle (A)		D		B		**Last obs.** 2002-04 approx. 0.9mi. NE of Nickajack Dam, N of Shellmound Rd.	TWRA states BMPs are sufficient to protect species.
Hyla gratiosa, barking treefrog (A)		D	B			**Last obs.** 1998-06-22 in a pond and wetland across from New Hope Fire Dept. on HWY 156.	TWRA states BMPs are sufficient to protect species.
Marstonia ogmorhaphe, royal snail (A)	LE	E		A,B		**Last obs.** 2002-05-30 in Town Creek immediately downstream and adjacent to HWY 64/72 bridge.	TWRA states BMPs are sufficient to protect species.
Neotoma magister, eastern woodrat (A)		D		A,B		**Last obs.** 1996-07-11 in a small, deep sinkhole on the W bank of Poplar Spring Branch, NW of South Pittsburg.	TWRA states BMPs are sufficient to protect species.
Percina tanasi, snail darter (A)	LT	T		A,B		**Last obs.** 1981-08-04 at TN River mi. 422.9.	TWRA states BMPs are sufficient to protect species.
Asplenium scolopendrium var. americanum, Hart's-tongue fern (P)	LT	E		A,B		**Last obs.** 1998-06-22 in a small, deep sinkhole on the W bank of Poplar Spring Branch, NW of South Pittsburg.	
Hottonia inflate, featherfoil (P)		S		A,B		**Last obs.** PRE-1988 in Gum Swamp. Habitat: Freshwater aquatic plant. Blooms from May to August. Ref. Connecticut Botanical Society webpage.	No vegetation in streams.
Lilium michiganense, Michigan lily (P)		T		B		**Last obs.** 1985-04-06 in Battle Creek by I-24. **Habitat:** wet meadows, creeksides, seepage places, pond edges, and moist barrens (grassy areas with poor tree growth). Open, wet areas. Blooms from beginning of June to beginning of August. **Ref.** Guide to Rare Plants by the Tennessee Division of Forestry	
Silene regia, royal catchfly (P)		S		A,B		**Last obs.** 1960-06-01 near South Pittsburg in a cove behind the old cement plant. **Habitat:** Prairies and open woods. Flowering late June through August. **Ref.** Ohio Dept. of Natural Resources.	
Trillium lancifolium, narrow-leaved trillium (P)		E		A,B		**Last obs.** 1980 in Battle Creek by I-24. **Habitat:** Found on rocky wooded slopes, cane brakes and wooded alluvial soils. Seems to prefer limestone soils and N-facing slopes. Flowering from late April through mid-May. **Ref.** Guide to Rare Plants. Divison of Forestry, Dept. of Agriculture.	
Viola tripartite var. tripartite, three-parted violet (P)		S		A,B		**Last obs.** 1960-06-04 in moist sandstone cove, Happy Hollow near S. Pittsburg. **Habitat:** Rich woodlands and dry oak or oak-hickory woods.	

Project: Marion Co. I-24 at S.R. 27 (U.S. 27) interchange; P.E. #58007-1220-64, PIN #102236.00

Date of Field Study: 2 March 2006 **Date TDEC Database Checked:** 28 February 2006 **Biologists:** J. Duke
Updated by C. Richards 16 July 2007

USFWS letter: Yes __X__ (attached) No _____ (explain)

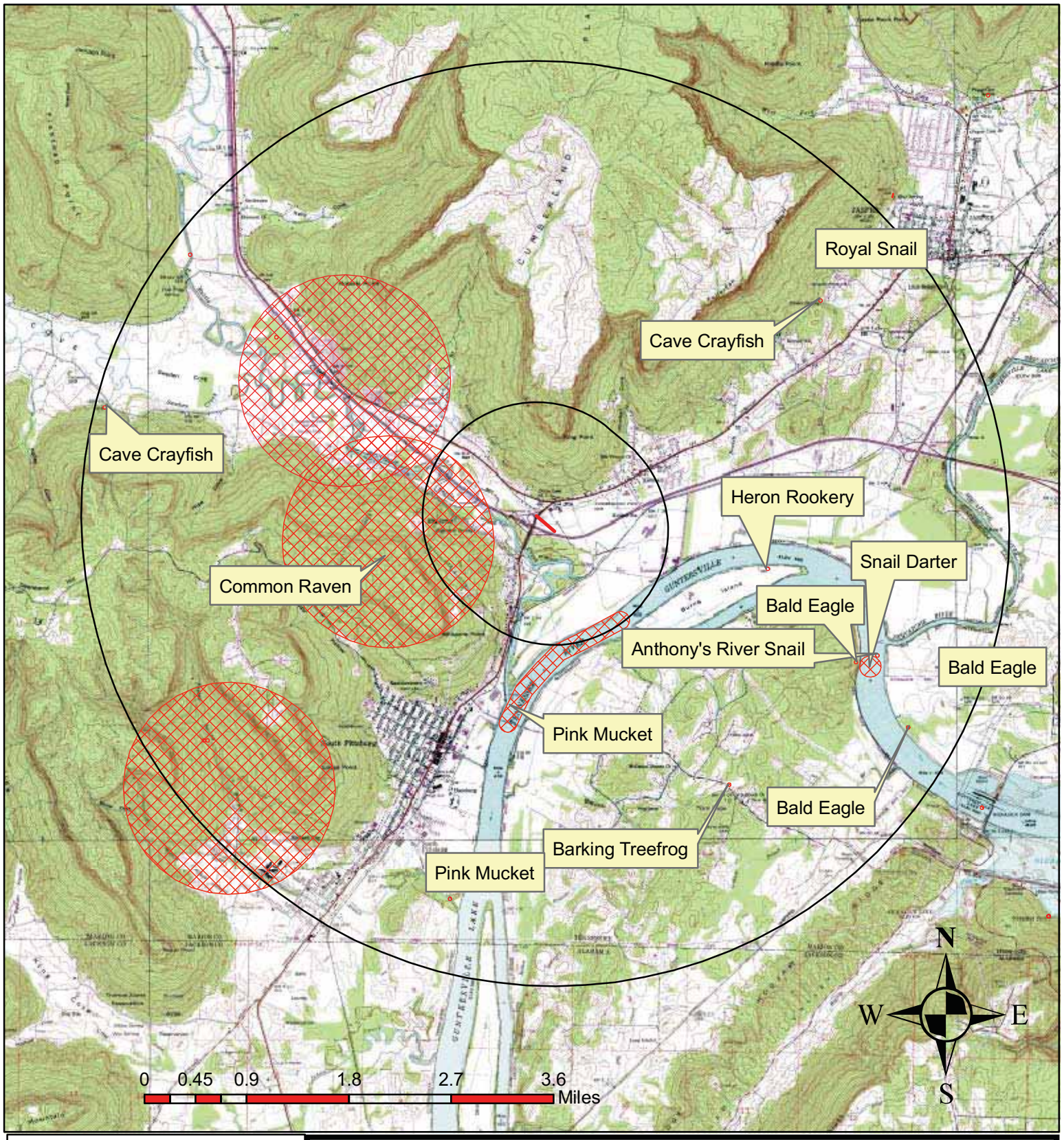
Biological Assessment: Yes _____ (response letter attached; see below) No __X_

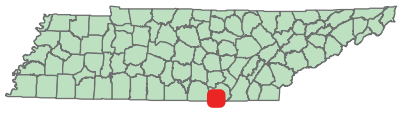
Species (scientific and common names)	USFWS conclusion[1]

[1] Choose from “no effect"; "not likely to adversely affect;" "likely to adversely affect;" "not likely to jeopardize" based on FWS concurrence letter

List Natural Areas, management areas, refuges, or similar sites within or adjacent to project (attach 7.5 minute topographic map with pertinent boundaries of area marked)

Area Name	Type of Area	Pertinent Notes
None		





Marion County: SR-27 (US-72); Interchange at I-24

6 February 2007

USGS Marion Qudarangle

PE No. 58007-1220-64

PIN No. 102236.00

TDOT

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
Environmental Division
SUITE 900, JAMES K. POLK BUILDING
NASHVILLE, TENNESSEE 37243-0349

19 November 2007

Dr. Lee Barclay
U. S. Department of Interior
Fish and Wildlife Service
446 Neal Street
Cookeville, TN 38501

Subject: **Marion County: I-24 interchange at S.R. 27 (U.S. 72); PE No. 58007-1220-64; PIN No. 102236.00**

Dear Dr. Barclay:

On October 19, 2004 CEC, Inc wrote to inform you of a TDOT proposal to build a new off ramp at the I-24 interchange with S.R. 27 (U.S. 72). They requested a list or endangered or threatened species that may be in the vicinity of the proposed project. On October 24, 2004 you replied that there were no significant adverse impacts to wetlands or federally listed endangered or threatened species anticipated from this proposal.

We request an updated evaluation of this project. Please include in your reply letter the entire project description listed in the subject line above.

Thank you very much for your assistance. If you have any questions or need additional information, please call me at 615-253-8690 (email: Christina.Richards@state.tn.us).

Sincerely yours,

Christina Richards
Environmental Division

copy: Project file

No significant adverse impacts to wetlands or federally listed endangered or threatened species are anticipated from this proposal.

Lee Barclay 12/11/07
Field Supervisor Date
U. S. Fish and Wildlife Service
Cookeville, TN 38501

CIII

October 19, 2004

Dr. Lee Barclay
U.S. Department of Interior
Fish and Wildlife Service
446 Neal Street
Cookeville, TN 38501

RE: Interchange Modifications; Marion County, SR-27 (US-72) Interchange @ I-24; P.E. 58007-1220-64; Pin #58007-1220-64

Dear Dr. Barclay:

The Tennessee Department of Transportation is planning to perform modifications to the intersection referenced above and shown on the attached map. It is requested that you provide us with a list of threatened or endangered species that may be present in the vicinity of the proposed project. This request for a species list is in compliance with the Fish and Wildlife Coordination Act of 1958, and the Endangered Species Act of 1973 (amended).

We request that you include in your reply letter the entire project description listed in the subject line of this letter. As always, your assistance is appreciated. If you have any questions or need any additional information, please feel free to call me at (615) 333-7797.

Sincerely,
CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Chris E. Catron
Senior Biologist

CEC/vg

Attachment

No significant adverse impacts to wetlands or federally listed endangered or threatened species are anticipated from this proposal.

Lee Barclay 10/28/04
Field Supervisor Date
U.S. Fish and Wildlife Service
Cookeville, TN 38501

Civil & Environmental Consultants, Inc.

Nashville 624 Grassmere Park Drive
Suite 21
Nashville, Tennessee 37211
Phone 615/333-7797
Fax 615/333-7751
Toll Free 800/763-2326 (CECN)
E-mail nashville@cecinc.com

Pittsburgh 800/365-2324
Chicago 877/963-6026
Cincinnati 800/759-5614
Columbus 888/598-6808
Export 800/899-3610
Indianapolis 877/746-0749
St. Louis 866/250-3679

Corporate Web Site http://www.cecinc.com

Offset Plan for TVA Power and Flood Control Storage Loss
State Route 27 (US-72) Interchange at Interstate 24 – Marion County, Tennessee
July 21, 2008

This interchange project will add Ramp A in the northeast quadrant and improve the vertical clearance for Interstate 24 (I-24) for improved functionality of the State Route 27 (SR-27) and I-24 interchange resulting in fill in the TVA flood control storage zone on Guntersville Reservoir.

History of the Project

The Tennessee Department of Transportation (TDOT) is improving the functionality of the interchange at SR-27 and I-24 in Marion County, Tennessee. The interchange is located north of Battle Creek which flows into the Tennessee River in the Guntersville Reservoir at river mile 418.62.

The TDOT Bureau of Planning and Development prepared an Interchange Modification Study for this project in October 2002. The report stated that the clearance over SR-27 needs to be improved and the acceleration and deceleration lengths on the ramps need to be improved to meet current AASHTO guidelines. The new ramp A will decrease the traffic on the loop ramp improving its performance and increasing the safety of the interchange.

A Categorical Exclusion was approved by the Federal Highway Administration (FHWA) on February 7, 2005 and a re-evaluation was completed on August 27, 2007. The project area contains no threatened or endangered species or historic or cultural resource sites. Native American consultant letters were sent and no tribes were aware of documentation of cultural, historic, or sacred sites near the project but the tribes would like to be consulted immediately if something is found during construction. All environmental permits according to U.S. Army Corps of Engineers (USACE) Section 404 guidelines and TDEC ARAP guidelines will be obtained.

The town of Kimball is participating in the FEMA Flood Insurance Program. There are base flood elevations determined for Battle Creek and Kimball Cove Branch but no floodways have been established for these streams in the published flood study for the Town of Kimball dated May 19, 1987. The controlling elevations at this location would be from Battle Creek and the Tennessee River, Guntersville Reservoir. The 100 and 500 year flood elevations at the interchange location are 613.6 and 616.7 (NGVD 1929), respectively according to TVA data.

The Town of Kimball is very concerned about backwater flooding of the commercial area from the Tennessee River. TDOT has participated throughout the project development in discussions with the Town of Kimball, the USACE and TVA regarding flooding issues and possible solutions that could be constructed in conjunction with this project. Thompson Engineering, the consultant preparing the roadway plans for TDOT, performed a hydraulic and hydrologic analysis for the project and made some

recommendations. These recommendations include a flap gate on the 72" culvert under the interchange and a flood gate on the box culverts east of the interchange in conjunction with use of the TVA property in the north east quadrant of the interchange as flood control storage as it is currently. It has since been determined that federal funds for the project cannot be used for the flood control structures and no state funds are available for that purpose at this time.

Proposed Improvements

As described previously, the clearance over SR-27 needs to be improved and the acceleration and deceleration lengths on the ramps need to be improved to meet current AASHTO guidelines. The new ramp A will decrease the traffic on the loop ramp improving its performance and increasing the safety of the interchange.

The proposed interchange modifications will be constructed on the same alignment as the existing. The construction will be phased so the traffic can be maintained on both existing routes until the project is completed.

I-24 carries approximately 44,940 cars a day currently and is estimated to carry 73,280 by the year 2027. SR-27 carries 24,780 cars a day currently and is estimated to carry 37,170 by the year 2027. The proposed interchange will have greater functionality and be safer for the traveling public.

Anticipated Amount of Flood Control and Power Storage Loss

The roadway elevations of both routes are above the flood stages for Battle Creek and Tennessee River, Guntersville Reservoir. Fill will have to be placed within the flood control storage zone, however to carry the roadways and ramps.

The power storage zone for Guntersville Reservoir is between elevations 593.0 and 595.0 and there is no proposed fill in the power storage zone. The flood control storage zone is between elevations 593.0 and 616.7 with an estimated fill of 71,776 cubic yards (44.5 acre-ft). This volume is greater than the net loss of 1 acre-foot of flood control storage allowable by TVA, using its standard methods for such calculations.

Proposed Mitigation Plan

TDOT proposes to mitigate the fills in the flood control storage zone by excavating material in the TVA property shown as tract 1 of the project plans in the north east quadrant of the interchange and hauling it upland. An average depth of approximately 3.0 ft over the 14.86 acre site will offset the calculated fill volumes. The material excavated will not likely be suitable road fill material, so it must be hauled away from the project site.

The benefits of this mitigation plan outweigh the costs since this area will offset the flood control storage fill volumes, provide on-site wetland mitigation for the areas impacted by the project, and preserve the flood control storage for the Town of Kimball.

Alternatives Considered

1) The no-build alternative was not chosen because the safety and functionality of the interchange would continue to degrade as traffic volumes increase over time.

2) Spanning the entire boundary below elevation 616.7 in an attempt to eliminate all fills was not chosen because it is cost prohibitive and would still not eliminate all the fills in the floodplain. An option to get below 1 acre-ft of fill would require a bridge for almost the entire length of Ramp A. That bridge alone would be approximately 1800 ft long and an additional cost of $4.9 million at $90 per square foot.

3) The use of retaining walls in all four quadrants of the interchange was not chosen because it is cost prohibitive and would not eliminate all the fills in the floodplain or get below 1 acre-ft of allowable fill. The cost of 1900 ft of retaining wall along Ramp A alone at $45 per square foot would cost over $725,000.

When evaluating the above alternatives, it is apparent that the proposed mitigation plan to avoid the loss of flood control storage at this project site by use of the TVA property is the only practical alternative.

Benefits of the Project

I-24 and SR-27 are major routes on the National Highway System carrying high traffic volumes across the state of Tennessee. These interchange modifications will make these routes safer for the traveling public and lead to more efficient movement of goods and services through the area.

This project will greatly benefit the traveling public and the fill in the flood control storage zone will be offset as described.

SEQUATCHIE VALLEY
MITIGATION PROJECT PROPOSAL

MARION COUNTY, TENNESSEE

July 2006

Prepared for:

Tennessee Department of Environment and Conservation
Division of Water Pollution Control
7th Floor, L & C Annex
401 Church Street
Nashville, Tennessee 37243-1534

Prepared by:

MRW Properties LLC
P.O. Box 102
32 North Main Street
Sparta, Tennessee 3858

TABLE OF CONTENTS

BACKGROUND

The mitigation site is located on Shelton Road in Marion County, Tennessee; site coordinates are W85^0 32' 51", N35^0 05' 11" (Figure 1). Figure 2 is an aerial view of the site (the approximate property boundary is marked in red). The project site totals 22.83 acres and consists of approximately 16.66 acres of open land and approximately 6.17 acres of woodland (Figures 3 and 4). The site was ditched and drained prior to 1985 and the majority of it was cleared and used for crop production, primarily soybeans, since that time. The objective of this proposal is to detail how the site will be restored to wetland status with the goal of using the site to mitigate for unavoidable wetland impacts in Marion, Grundy, Hamilton, Sequatchie and other nearby counties.

The following site description is based on an evaluation conducted by Ken Morgan and Tom Roberts (MRW Properties). Agency personnel who have visited the site include Tracy Dardy, Julianna Kyzer, and Mike Lee with the Tennessee Department of Environment and Conservation (TDEC), and Mike Williams of the Tennessee Department of Transportation (TDOT).

VEGETATION

The dominant vegetation community in unaltered headwater slope wetlands in Tennessee (the Hydrogeomorphic (HGM) classification for this site) is forest composed primarily of willow oak (*Quercus phellos*), red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*) and similar species in the overstory. Common understory species include various dogwoods (*Cornus* spp.), ironwood (*Carpinus caroliniana*), and possumhaw (*Viburnum nudum*). Numerous other species can occur depending on individual site conditions and disturbance history. Burns and Honkala (1990) is the primary source of information used to determine the vegetation that occurs in unaltered wetlands.

The majority of the proposed mitigation site has been cleared, thus the plant community there is significantly different from that found in reference wetlands within the region. The 16.66 acre field (Figure 3) currently is a herbaceous community characterized by tall fescue (*Festuca arundinacea*), broomsedge (*Andropogon virginicus*), Johnsongrass (*Sorgum halapense*), panic grass (*Panicum virgatum*),

goldenrods (*Solidago* spp.), and blackberry (*Rubus* spp.) with soft rush (*Juncus effusus*) and fox sedge (*Carex vulpiniodia*) in small areas in which the water table is near the surface.

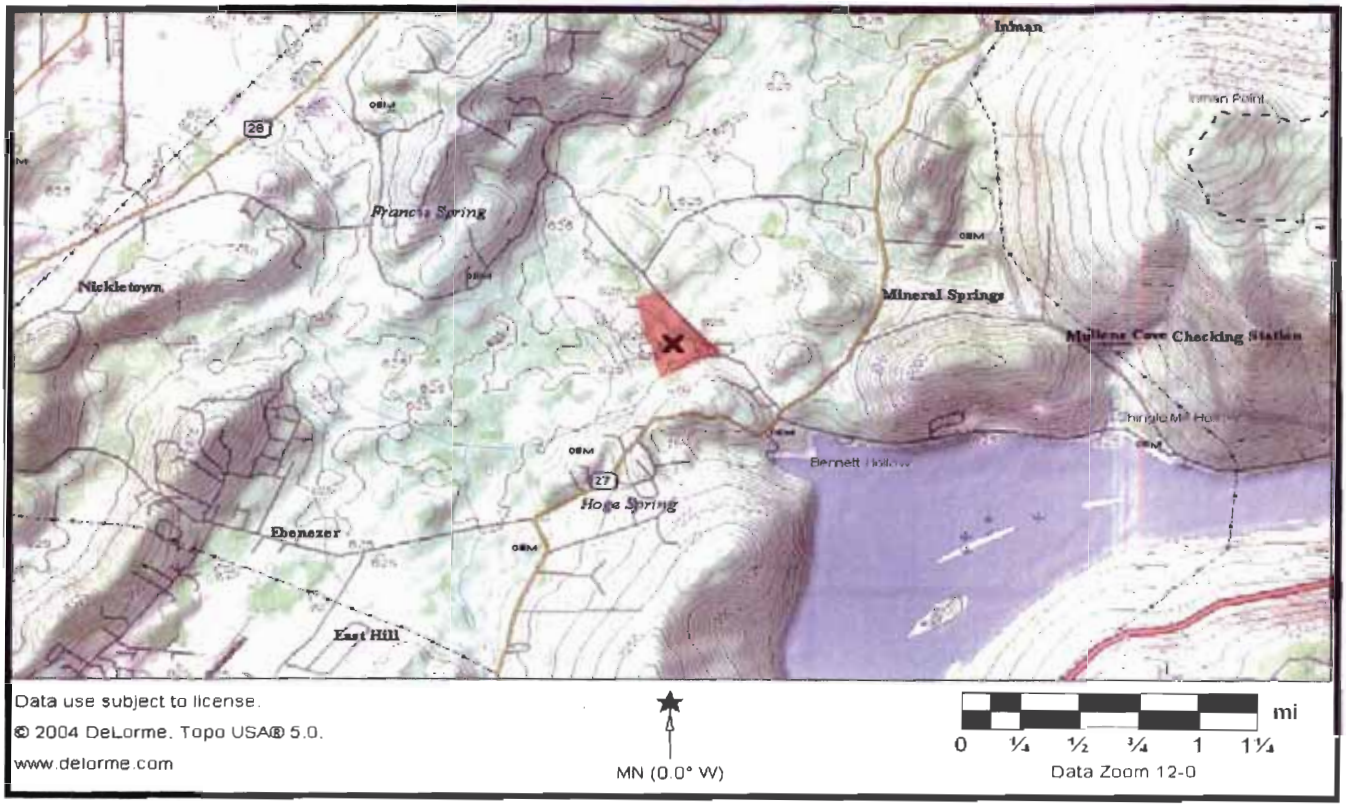


Figure 1. Approximate location of mitigation area (red X) located southwest of Mineral Springs on the Sequatchie, TN Quad.

Figure 2. Aerial view of the proposed mitigation site (22.83 acres.)

Figure 3. Photo of current condition of the 16.66 open portion of the proposed mitigation site.

Figure 4. Photo of representative portion of the 6.17 acres of forest at the proposed mitigation site.

The primary overstory species in the 6.17 acre forested portion of the site are red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), hackberry (*Celtis occidentalis*), and eastern red cedar (*Juniperus virguniana*) (Figure 4). The management history of this portion of the site is unknown, but the species composition and diameter of the trees indicates that the site has been logged in recent decades. The presence of shade intolerant sweetgum and cedar indicates that the site was much more open at some time in the past and in fact may have been cleared. The presence of cedar also indicates that the site is much drier than it was prior to drainage. Common ground-level species include poison ivy (*Toxicodendron radicans*), Japanese honeysuckle (*Lonicera japonica*), and common greenbriar (*Smilax rotundifolia*). European privet (*Ligustrum vulgare*), a common species in must of southeastern Tennessee, is found in portions of the site.

SOILS

The only soil series mapped at the site is Purdy, described taxonomically as a Typic Endoaquult. The texture in the upper 9 inches is a silt loam, from 9 to 19 inches a silty clay loam, and from 19 to 42

inches a silty clay. It is described as occurring on flats and depressions on terraces and formed in alluvium washed in from the adjacent uplands. Purdy soils are similar to the more common Guthrie series except that they formed in alluvium rather that residuum. Both series have a fragipan in the subsoil, but the pans may be weakly developed and discontinuous. In the Purdy series, the fragipan typically occurs at 19 inches. The series is classified as "poorly drained" and is on the hydric soil list for Marion County.

Purdy soils are not well suited to row crops or even pasture although many areas in central and eastern Tennessee have been converted to such uses. The Putnam County soil survey states that "a few areas are planted to corn or grain sorghum, but yields are low and failures are common. Pasture generally is of poor quality." Regardless of the intended land use, drainage is necessary to lower the groundwater level to a depth that will allow non-adapted plants to survive and grow. In addition to the Marion and Putnam Country soil surveys, *Wet Soils of Tennessee* (Talley and Monteith 1994) was a source of information on the characteristics of the Purdy series.

HYDROLOGY

The hydrology of unaltered headwater slope wetlands in central and eastern Tennessee is dominated by down-gradient movement from the surrounding watershed mostly in the form of interflow. In wetlands with either Purdy or Guthrie soils, both the subsoil and upper horizons are wet, especially during winter and spring. Depressions in portions of some sites may pond water well into the growing season. The Purdy series is described as having an apparent high water table from 1 foot below the surface to 1 foot above the surface from November through June. Because of its landscape position, Purdy does not flood.

Current hydrology of the site is significantly altered due to a series of ditches (Figure 5) that were constructed to drain the site and convert it to agricultural production. The primary alteration is a large drainage ditch (figure 5, B) (approximately 3^{+} feet deep) that runs SW to NE and bisects the cleared portion of the property. Such ditches are effective in draining Purdy soils as they remove surface water following rainfall events and lower the groundwater table for a considerable distance. Calculations using the ellipse equation (USDA 1997) indicate such an alteration in a Purdy soil effectively will remove

"wetland hydrology" to a distance of at least 58 feet on each side of the ditch. Because of the groundwater movement is toward the ditch (due to the slope of the site), it is likely that the water table is lowered substantially further. There also is a series of smaller ditches located along the eastern portion of the site. The primary one (Figure 5, A) was a natural stream channel that has been excavated to a depth of between 2 and 3 feet; it runs the length of the site at the field:woodland interface. Other ditches are located within the forested portion of the site and drain into it. The ditches within the wooded area vary in depth, but mostly are 1 to 2 feet deep. Calculations using the ellipse equation (USDA 1997) indicate such alterations (using 1.5 and 2.5 feet as an average depth) in a Purdy soil effectively will remove "wetland hydrology" to a distance of 58 feet on each side of the ditches respectively.

Figure 5. Aerial view showing approximate location of excavated drainage ditches.

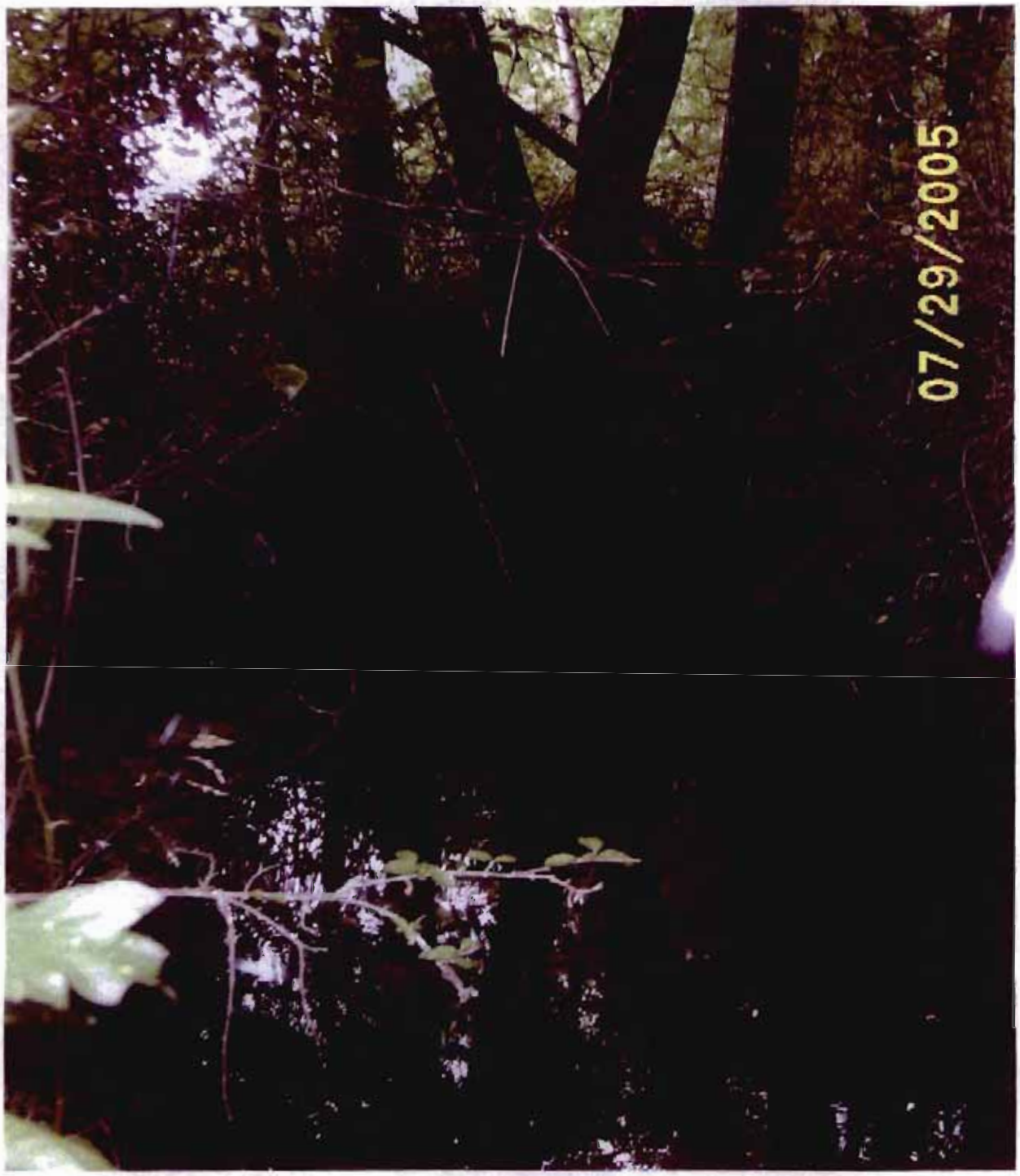


Figure 6. Photo of excavated ditch ("A") bisecting length of the site from southeast to northwest.

Figure 7. Photo of excavated stream channel ("B") bisecting site from south to northwest.

These hydrologic alterations along with the removal of the native forest community have resulted in the majority of the site no longer meeting the criteria for being considered wetland. Because these changes are reversible, the site is an excellent candidate for restoration and subsequent use to mitigate unavoidable wetland losses in the area. Sites such as this are considered the most desirable type of land for wetland mitigation because they occur in the proper landscape position and previously possessed wetland hydrology, soils, and vegetation. The likelihood of restoring wetland conditions at such sites is much higher than creating wetland conditions in upland areas.

Of the total, 16.66 acres of open land is suitable for restoration (Figure 8) and 6.17 acres of forested land is suitable for a combination of restoration and enhancement (Figure 9).

Figure 8. Aerial view showing portion of the site proposed for restoration.

Figure 9. Aerial view showing portion of the site proposed for restoration and enhancement.

PROPOSED RESTORATION AND ENHANCEMENT

VEGETATION

Field

The 16.66 acres of cleared land will be planted with native tree species that occur in headwater wetlands in the area. Species include willow oak, green ash, cherrybark oak (*Q. pagodaefolia*), white oak (*Q. alba*), persimmon (*Diospyros virginiana*), and others recommended by local regulatory personnel. One or more of the water-tolerant dogwoods (*Cornus* spp.), ironwood, and possumhaw will be planted as understory species based on availablility. Trees will be planted on ten-foot centers along sinuous rows at a density of 450/acre.

Planting locations for each species will be determined by relative elevations of the site and the individual species tolerance to saturation and inundation. Although most of the site is relatively level, it does slope generally in a northward direction and there are portions that are somewhat lower in elevation and will be saturated or inundated for longer periods during the growing season. Overcup oak (*Q. lyrata*) which is known to occur in portions of southeastern Tennessee, will be planted in the lowest portions of the site if approved by the regulatory agencies. Willow oak, green ash, persimmon, dogwood, and ironwood will be planted at intermediate elevations. Higher portions of the site near the edge of the wetland will be planted primarily with white oak and cherrybark oak. No one species will comprise more than 40% of the trees planted. Species such as sweetgum and red maple likely will volunteer and become established at the site on their own. Once mature, this suite of planted and volunteer tree species will provide an abundance of food and cover for a variety of wildlife including mammals, birds, reptiles, and amphibians characteristic of wetlands in the area. Additionally, during the early and intermediate stages of succession, the area will be a highly diverse plant community that supports specialized species that depend on seral habitats. Examples include the common yellowthroat (*Geothlypis trichas*) and yellow warbler (*Dendroica petechia*).

Woodland

Work in the 6.17 acres of forest will entail the planting of willow in portions of the area in which the canopy is relatively open. In the remainder of the area, shade tolerant species such as ironwood, dogwoods, and possumhaw that will survive in selected areas under the existing forest canopy will be planted. Density of these plantings will vary across portions of the site and will depend largely on the density of existing understory species.

HYDROLOGY

To restore and enhance the characteristic hydrology of the site, several modifications are needed. The primary restoration activity will be to fill the main ditch bisecting the property. This will prevent the drainage of surface water and will restore groundwater hydrology to a sizable portion of the site. Care will

be taken not to damage the larger, more desirable trees that are growing adjacent to the ditch. This activity will result in a shallow swale that will facilitate the natural drainage of water from the site.

The ditches within the wooded portion of the site will be blocked or filled in several locations to slow the movement of water from the area during and following rain events. Generally, shallow ditches will be blocked whereas deeper ones will be filled. Filling of the deeper ditches will aid in the restoration of groundwater levels to pre-existing conditions.

The incised stream channel than now drains the eastern portion of the site will be modified by installing a series of shallow weirs at strategic locations. These weirs will result in a gradual increase in bed elevation by trapping sediments while still allowing the movement of fish and other stream organisms. These weirs will slow the movement of water from the site following heavy rainfall events and over time will dramatically improve the level of function in this degraded channel. As bed elevation is increased, groundwater levels adjacent to the channel in both the field and forest will be restored to near-surface levels and overbank flooding will occur during periods of high flows.

To restore a more natural overland flow pattern, a low berm will be constructed at the southeastern portion of the site to divert water to the central portion of the area. This will have no adverse impact on the stream itself as flows will remain sufficient to maintain its integrity.

Lastly, shallow micro-depressions that mimic the small concave features found in mature forested wetlands due to tree falls will be excavated in the open portion of the site. The resulting "pit and mound" topography will provide additional breeding habitat for amphibians in addition to drinking water for other vertebrates.

As shown in Appendix A, these activities will result in a total of 18.67 acres of restoration land and 4.16 acres of enhancement land. The survey was conducted by Bartlett Surveying on July 28, 2005.

PROPOSED MONITORING

Monitoring of the mitigation site will aid in determining if it is returning to pre-alteration conditions. Collection of this data will be used to determine if the project can be considered a success, or

if mid-course modifications are warranted. Monitoring of the site will take place annually for a five-year period. Details of the monitoring program are described in the sections below.

HYDROLOGY AND SOILS

Once work on the ditches, incised stream channel, and micro-depressions has been completed, shallow groundwater wells will be installed in the northwestern, northeastern, southwestern, and southeastern areas of the site. Monitoring of the 4 wells will take place periodically from early March to early June in order to determine if the hydroperiod of the site has returned to that consistent with an unaltered Purdy soil. Presence and depth of ponding in the micro-depressions will be noted. Soil from areas judged to be characteristic of the site will be described; information from the upper 18 inches of the soil profile that will be recorded includes texture, Munsell color, and types and abundance of redoximorphic features present.

VEGETATION

Monitoring of vegetation throughout the site will be conducted in late summer. In both the field and wooded portions of the site, data describing the composition of the plant community and the survival of planted trees will be collected. Transects of varying lengths will be established in each identifiable plant community. Location and number of transects will be determined prior to the first monitoring event. Data collected will include total percent cover, percent cover by species, and species richness. Percent survival of trees planted in the open area will be determined by walking rows and tallying trees as either living or dead. Percent survival of planted trees within the wooded restoration/enhancement area will be determined in the same manner.

WILDLIFE MONITORING

Utilization of the site by wildlife will be documented during site visits conducted to monitor hydrology and sample vegetation. Monitoring of wildlife will include direct observations and aural verification, as well as evidence of presence such as tracks, hair, nests, and eggs. A list of wildlife species will then be produced for each monitoring period.

PHOTOGRAPHIC DOCUMENTATION

Photographs of the mitigation site will be taken from numerous points established prior to the first monitoring event. Each point will be marked by driving a PVC pipe into the ground; GPS coordinates of each location will be recorded. Photographs will be taken at these points during every monitoring event to provide a record of the changes that take place as the plant community matures.

MONITORING REPORTS

Monitoring reports will enable the regulatory agencies to determine if the proposed mitigation is successful based on pre-determined performance standards. Reports will include locations of transects and photographic points, monitoring protocol, and results and evaluation of data collected. Specifically data on hydrology, vegetation, and soils will be evaluated to determine if the criteria for being considered jurisdictional wetland as described in the 1987 Wetland Delineation Manual (U. S. Army Corps of Engineers 1987) are met. Data collected also will be used to assess selected functions performed by the restored wetland. Note: development of Hydrogeomorphic (HGM) assessments of slope wetlands in Tennessee will be underway when the first of the monitoring reports for this site are due. Assessing the mitigation area with those models will be helpful in tracking the functional development of this site. Monitoring reports will be submitted for review to all interested regulatory agencies within 60 days of the annual monitoring event.

PERFORMANCE STANDARDS/CRITERIA

The success or failure of the mitigation efforts ultimately will be determined by the hydroperiod, vegetation structure and composition, and soil conditions that develop at the site following the restoration and enhancement actions proposed. The following performance standards/criteria will be used to make that determination.

1. The site should develop and maintain a hydroperiod that is consistent with a Purdy soil by the end of the five-year monitoring period.
2. Species in the FAC, FACW, or OBL categories should cover no less than 70% of the restored portion of the site at the end of the five-year monitoring period.

3. Survival of planted trees in both the restoration and restoration/enhancement areas will be no less than 70% at the end of the five-year period.

If any of these standards are not met at the end of the five-year monitoring period, corrective measures will be taken and monitoring will continue on an annual basis until they are met.

LITERATURE CITED

Talley T. S. and S. Monteith. 1994. Tennessee Wetland Conservation Strategy. Technical Report Series: Wet Soils of Tennessee. Tennessee State Planning Office. Nashville, TN. Tennessee Department of Environment and Conservation.

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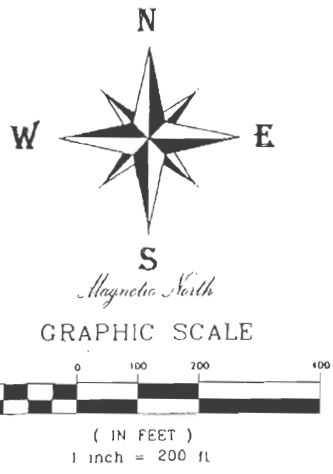
Burns, R. M. and B. H. Honkala. 1990. Silvics of North America: 2. Hardwoods. Agricultural Handbook 654. U. S. Department of Agriculture, Forest Service, Washington, DC. 877 pp.

U. S. Army Corps of Engineers. 1987. Corps of Engineers Wetland Delineation Manual. Technical Report Y-87-1. Waterways Experiment Station. Vicksburg, MS.

APPENDIX A

CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	TANGENT	BEARING	CHORD
C1	45025.00'	415.31'	0°31'43"	207.66'	S43°49'46"E	415.31'
C2	475.00'	71.63'	8°38'25"	35.88'	S48°24'50"E	71.56'
C3	124.16'	38.27'	17°39'42"	19.29'	S51°27'53"W	38.12'

LINE TABLE		
LINE	BEARING	DISTANCE
L1	S42°38'02"W	10.19'



PRELIMINARY

THIS SURVEY WAS DONE WITHOUT THE BENEFIT OF A TITLE SEARCH.

I HEREBY CERTIFY THAT THIS IS A CATEGORY I SURVEY AND THE RATIO OF PRECISION OF THE UNADJUSTED SURVEY IS 1:10,000 AS SHOWN HEREON

ALFRED W BARTLETT
TENNESSEE REGISTRATION NO. 1762
DATE OF SURVEY_____

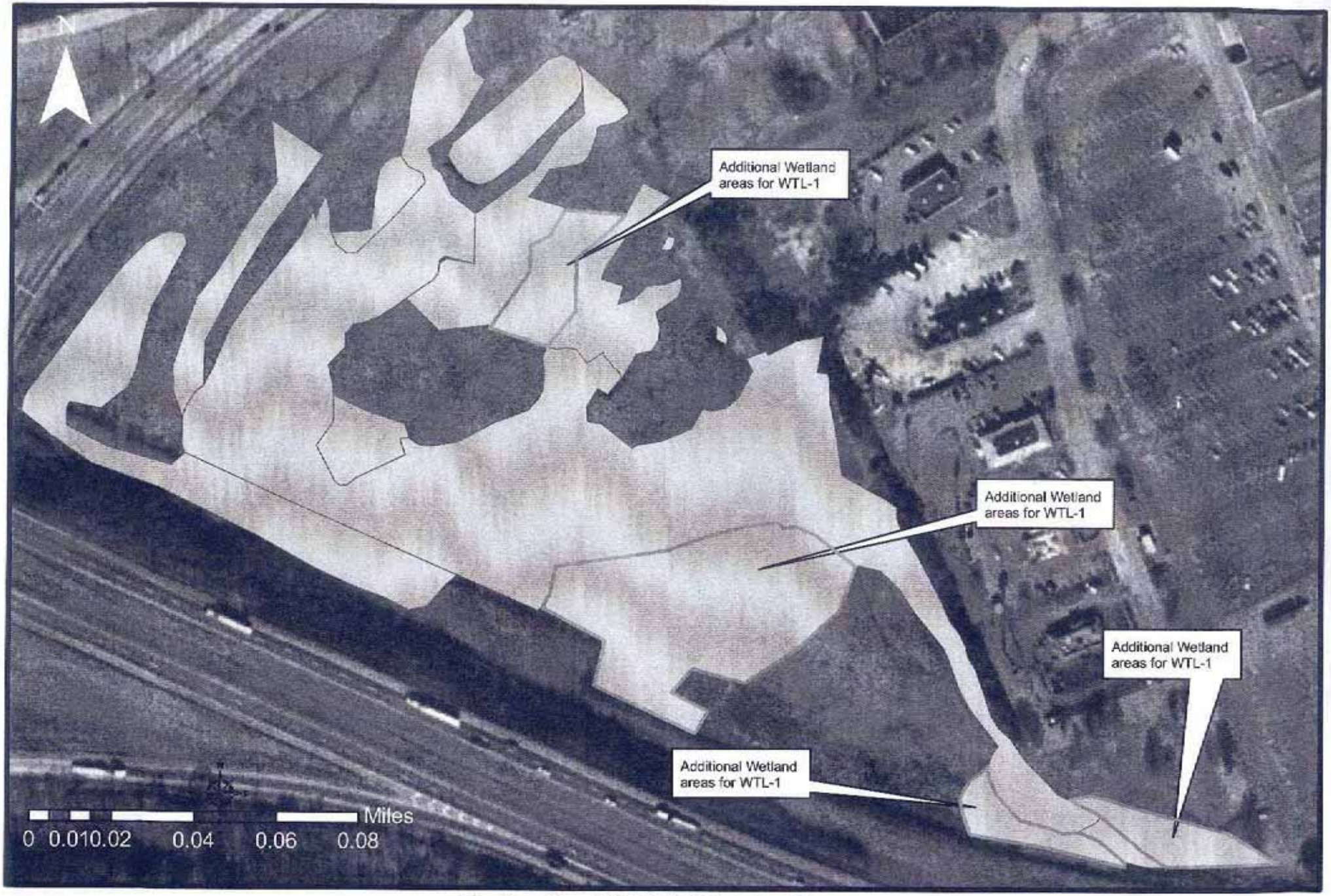
LEGEND

IP(O)	IRON PIN OLD
IP(N)	IRON PIN NEW

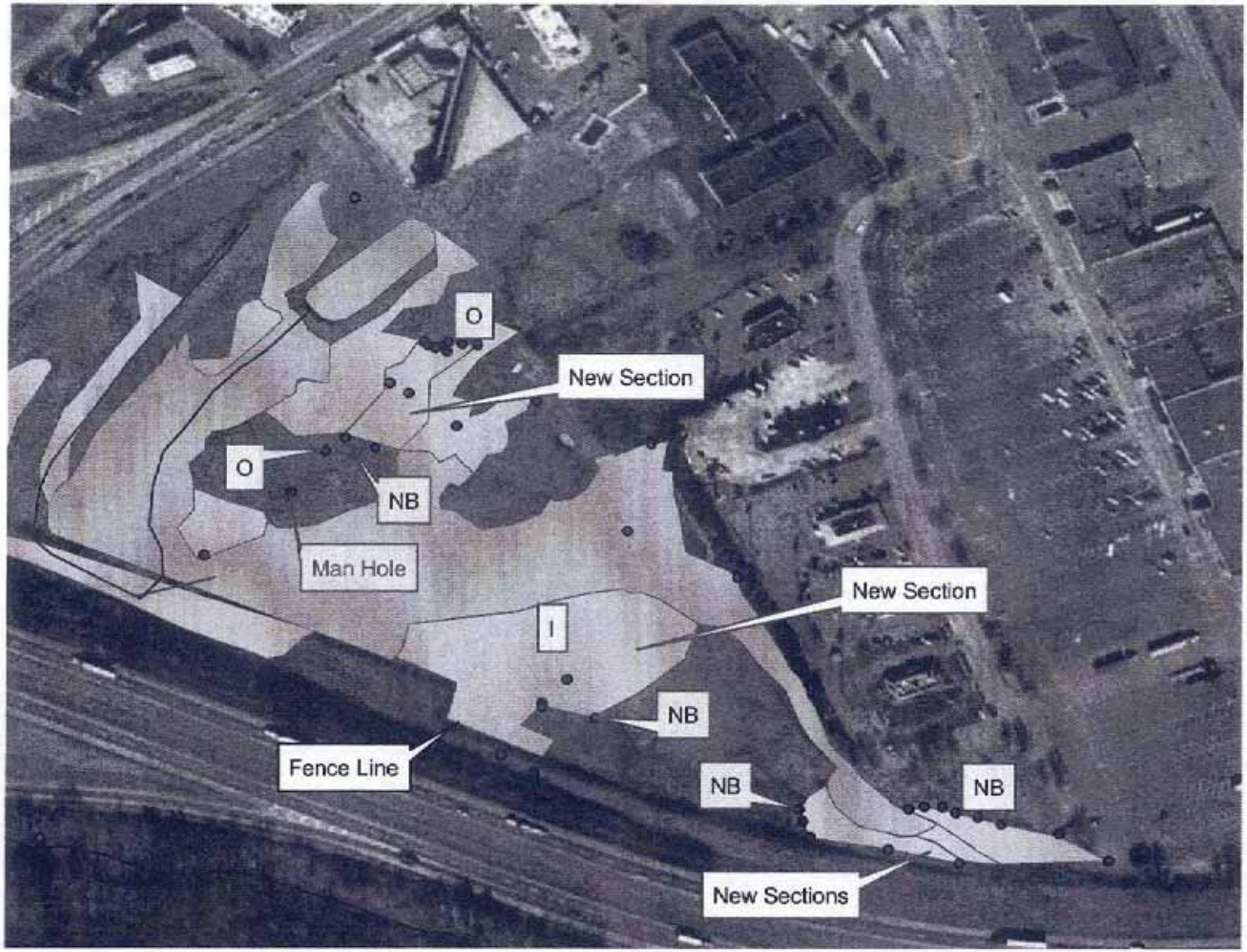
Bartlett Surveying
[illegible]

Jim Ward

2nd CIVIL DISTRICT	TOTAL ACRES: 22.83±
MARION COUNTY, TN	SCALE: 1"=200'
TAX MAP 106 P/O 11.02	DATE: 7/28/2005
P/O BK 221 PG 882-886	DRAWING #05-282 A3



Marion Co. US-27/I-24 Interchange
Wetland 1 Boundaries
4 December 2009
PIN 102236.00
PE 58007-1220-14


O
New Section
O
NB
Man Hole
New Section
I
NB
Fence Line
NB
NB
New Sections

Ecology Field Data Sheet: **Wetlands** Form G

Project: Marion Co. I-24 Interchange with US-27; PE; PIN
Date of survey: 16 Dec 2009 **Biologist: C. Richards, T. Nehus** **Affiliation: TDOT; CEC, Inc.**

1-Station: from plans	Not available
2-Lat/Long	85° 41' 12.132"W 35°2' 22.263'N
3-Map label	WTL-1 (upland point)
4-Potential impact	Fill
5-Feature name	Battle Creek
6-Feature description:	
7- Wetland type	Forested: ___ Scrub/Shrub: ___ Emergent: x ___ Bog/Fen: ___ Aquatic Bed: ___

Dominant Plant Species	Indicator	Stratum	Dominant Plant Species	Indicator	Stratum
Pyrus calleryana (Bradford Pear)	Unlisted	T, S	*Rubus* spp. (Blackberry)	FAC	H
Elaeagnus umbellata (Autumn Olive)	Unlisted	S	*Lonicera* spp. (Honeysuckle)	FAC	H
Lingustrum sempervi (Privet)	FACU	S			

Hydrophytic Vegetation:	% of Dominants OBL, FACW, FAC = 60%	Hydrophytic Vegetation Present: ___ Yes __X__ No

Hydrology	**Primary Hydrology Indicators**	**Secondary Hydrology Indicators**
Depth of inundation _0__ in. Depth to water in pit>12" in. Depth to Sat. Soil >12" in. Surface water connection: ___Yes _x___ No Ground water connection: __ Yes __x_ No ____ Unkn.	Inundated _____ Saturated (upper 12") _____ Water Marks _____ Drift Lines _____ Sediment Deposits _____ Drainage Patterns _____	Oxidized Root Channels _____ Water-stained Leaves _____ Fac-Neutral Test _____ Other _____
	Isolated:_____ Abutting:_____ Adjacent:	Wetland Hydrology Present: ___Yes _X__No

Soils	Map Unit Name: Wolftever	Drainage Class: Moderately Well Drained
Soil Profile Description	Subgroup: Aquaic Hapluderts	Confirmed Map Unit Type: _____YES __X____NO

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance	Texture, concretions	Hydric Soil Indicators	
0-12"	A	10YR 5/4	None	None	None	Sulfidic Odor	
						Gleyed or Low Chroma (=1) matrix	
						Chroma ≤2 w/ mottles	
						Concretions	
						Reducing Conditions	
						Hydric Soils List	

Hydric Soils Present: _____YES __X__NO
Rationale/Remarks:

approximate size (ac.) ____	portion affected (ac.) (permanent) 100%	portion affected (ac.) (temporary) 0%
width of buffer zone (ft)	0'	
photo number(s)	none	
8-Watershed HUC code	06030001	
8-Watershed HUC name	Battle Creek	
9-Determination: TDOT/ consultant	Hydrophytic Vegetation Present? ____Yes __x__No Hydric Soils Present? ____Yes __x__No Wetland Hydrology Present? ____Yes __x__No Is Sampling Point in a Wetland? ___Yes x No	
10-Determination: Confirmed? By?	TDEC, Mike Lee and Chip Hannah	
11-Mitigation: to be included in design	Yes	
12-Notes	Area is upland within a wetland.	

Ecology Field Data Sheet: **Wetlands** Form G

Project: Marion Co. I-24 Interchange with US-27; PE; PIN
Date of survey: 16 Dec 2009 **Biologist: C. Richards, T. Nehus** **Affiliation: TDOT; CEC, Inc.**

1-Station: from plans	Not available
2-Lat/Long	85° 41' 13.747"W 35°2' 23.104"N
3-Map label	WTL-1 (wetland point)
4-Potential impact	Fill
5-Feature name	Battle Creek
6-Feature description:	
7- W etland type	Forested: ___ Scrub/Shrub: ___ Emergent: x ___ Bog/Fen: ___ Aquatic Bed: ___

Dominant Plant Species	Indicator	Stratum	Dominant Plant Species	Indicator	Stratum
Salix nigra (Black willow)	OBL	S, T	*Scirpus cyperinus* (Woolgrass)	OBL	H
Juncus spp.	FACW	H	Various sedges	OBL	H
Cornus amomum (silky dogwood)	FACW+	S	*Pyrus calleryana* (Bradford Pear)	FAC	S, T

Hydrophytic Vegetation:	% of Dominants OBL, FACW, FAC = 100%	Hydrophytic Vegetation Present: __x__ Yes ___ No

Hydrology	**Primary Hydrology Indicators**	**Secondary Hydrology Indicators**
Depth of inundation _0"_ in. Depth to water in pit _8"_ in. Depth to Sat. Soil __0"__ in. Surface water connection: __x__Yes ____ No Ground water connection: _x_ Yes ___ No ____ Unkn.	Inundated _____ Saturated (upper 12") __x___ Water Marks _____ Drift Lines _____ Sediment Deposits __x___ Drainage Patterns _____	Oxidized Root Channels __x___ Water-stained Leaves _____ Fac-Neutral Test _____ Other _____
	Isolated: _____ Abutting: __x___ Adjacent: _____	Wetland Hydrology Present: __x__Yes _____No

Soils	Map Unit Name: Wolftever	Drainage Class: Moderately Well Drained
Soil Profile Description	Subgroup: Aquaic Hapluderts	Confirmed Map Unit Type: _____YES __X___NO

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance	Texture, concretions	Hydric Soil Indicators	
0-12"	A	10YR 5/2	10YR 5/6	Abundant	Mg conc	Sulfidic Odor	
						Gleyed or Low Chroma (=1) matrix	
						Chroma ≤2 w/ mottles	x
						Concretions	x
						Reducing Conditions	
						Hydric Soils List	

Hydric Soils Present: __x___YES _____NO
Rationale/Remarks:

approximate size (ac.) _8___	portion affected (ac.) (permanent) 100%	portion affected (ac.) (temporary) 0%
width of buffer zone (ft)	0'	
photo number(s)	none	
8-Watershed HUC code	06030001	
8-Watershed HUC name	Battle Creek	
9-Determination: TDOT/ consultant	Hydrophytic Vegetation Present? ____Yes ____No Hydric Soils Present? ____Yes ____No Wetland Hydrology Present? Yes No Is Sampling Point in a Wetland? Yes No	
10-Determination: Confirmed? By?	TDEC, Mike Lee and Chip Hannah	
11-Mitigation: to be included in design	Yes	
12-Notes		