

**1.a and b. Title: ITR/Peer Review Plan Mill Creek Watershed Feasibility Study
Nashville, TN, August 2007**

Introduction

Located in one of the most rapidly urbanizing areas of Middle Tennessee, the 108-square mile Mill Creek Watershed drains about 13% of Nashville, Davidson County and 6% of Williamson County. About two thirds of the watershed is within Davidson County, one third in Williamson County. The Metropolitan Government of Nashville and Davidson County (Metro Nashville) is the study sponsor. The Feasibility Cost Sharing Agreement was signed in April 2003. Acronyms are listed at the end of this plan.

1.b. and c. Study Purpose: The study evaluates both water quantity and water quality issues as defined by flood damage reduction (FDR) and aquatic ecosystem restoration (ER) issues. A major goal of the study has been to evaluate the impacts of urbanization on water quantity and quality and to develop GIS-based management tools that Metro Nashville can use to manage growth. An extensive effort went into developing gridded, GIS-referenced models that are capable of simulating both event-based and continuous flow. The HEC-GeoHMS software was used to create the GIS basis for the modeling. HEC-HMS software was used for both the event and continuous simulations. The event-based computations provide results of a specific flood event, such as the 1% flood. The HEC-HMS continuous simulation provides the capability of capturing seasonal variation in flow. It simulates long periods (not just flood events) and accounts for seasonal variations in moisture. The model includes an evapotranspiration component that is computed from observed atmospheric data including temperature, sunshine duration, and humidity. It accounts for both the direct runoff and base flow (groundwater) components of the hydrograph. The continuous simulation modeling has shown that development will cause tributaries to Mill Creek to run dry more frequently. It shows that a major problem for the aquatic ecosystem will be lack of water. This is in addition to the other impacts of urbanization such as sedimentation and habitat alteration. Lack of water will impact the federally listed endangered Nashville Crayfish (*Orconectes shoupi*).

Flood damages total about \$3.5 million annually. A standard suite of FDR alternatives is being pursued. Nonstructural measures including floodplain evacuation and home rising have survived the initial screening. Ecosystem alternatives include floodplain and riparian plantings, wetland creation, rain gardens, stream bank protection and in stream habitat structures. Greenways/parks will also be included along with both purposes. While Metro Nashville has stated that they will not buy land for ecosystem restoration alone, there is a considerable amount of existing public land in the watershed and along Mill Creek and its major tributary Sevenmile Creek. Our ecosystem alternatives are limited to existing publicly-owned land and land acquired for FDR and combination purposes. The total project cost will be in the neighborhood of \$15 million or less. This is a small GI study with a study cost of about \$2.2 million.

1.d. Key PDT members

Name	Discipline	Experience
	PM/Formulation	27 yrs/LRD technical expert in ER Plan Formulation
	H&H Subject Matter Expert	13 yrs
	Biologist	7 yrs

	Economist	19 yrs
	Soils Engineering	10 yrs
	Real Estate	16 yrs
	Cost Engineering	2 yrs
	Structural	16 yrs
	Structural	5 yrs

District POC

Project Manager and Plan Formulator
 PO Box 1070, Nashville District Corps of Engineers
 Nashville, TN 37202-1070
 615-736-7192

1.e. Planning Center of Expertise POCs

National Ecosystem Planning Center of Expertise
 US Army Corps of Engineers – Mississippi Valley Division
 CEMVD-RB-T
<http://eco-pcx.usace.army.mil/index.cfm>
 Phone: (601) 634-5854

National Flood Risk Management Center of Expertise
 US Army Corps of Engineers – Louisville District
 CELRL-PM-P
 Phone: (502) 315-6891

Walla Walla District Directorate of Expertise for Civil Works Cost Engineering
 CENWW-EC-X
 Phone: 509-527-7511

2. Level of Review: The district and division believe that no formal external peer review is necessary. ITR is sufficient. Standard methodologies are being used for both the ER and FDR portion of this study. The methodologies and analyses being used for flood damage reduction are standard and have been used in multiple studies. While the continuous flow algorithms are new to HMS, these methods have been available for quite some time. Therefore both the District and HEC believe that external peer review is not needed on the modeling. ITR should be sufficient.

For ecosystem restoration a technical working group composed of local, state and other federal agencies is being used to review critical decisions during this study. The group includes the TDEC, TDA’s non-point source group, TWRA and TDNH. Federal agencies included USFWS, USGS, USDA and NRCS. Metro Nashville, Vanderbilt University, Tennessee Scenic Rivers and the Cumberland River Compact also participated. A smaller group including USFWS, NRCS, TWRA, TDEC and Metro Nashville has reviewed the application of habitat sustainability units to the without project condition. Both groups will continue to meet and participate in the alternative evaluation, refinement, plan selection and draft report. Public comments will be disseminated to the working group. External Peer Review of the flood damage reduction aspects of this study is not anticipated.

3. The criteria for “influential scientific information or assessment” have not been met.
4. **Review Schedule:** Independent Technical Review will occur at several points during the study. A review will occur of the without project condition and alternative screening as presented in the feasibility meeting scoping document. This review will begin in September 2007. ITR will also occur after alternative evaluation, refinement and selection of the tentatively selected plan as presented in the alternative formulation briefing document. The AFB is scheduled for May of 2008. ITR will also be conducted on the draft and final reports, scheduled for November 2008 and May 2009 respectively.
5. No external peer review is anticipated.
6. A public meeting has been held to discuss goals and objectives. Additional meetings will be held as the study progresses in the spring of 2008 to present alternatives and again with the draft report. Topics will include alternative screening, selection of plans to be studied in detail and recommended plan selection. A public meeting will be held during public review of the draft report which is scheduled for November 2008. All public comments will be included in the final EA/EIS and provided to the ITR team.

ITR

7.-12. An ITR team including key members from outside the district and division have been selected and are discussed below. Discussions between the District and Division in April 2007 led to a conclusion that no External Review is necessary. Also, after coordination by the Great Lakes and Ohio River Division with the Ecosystem Planning Center of Expertise and the Flood Damage Reduction Center of Expertise, the ecosystem center was given the lead for this study. The majority of alternative solutions will focus on ecosystem restoration. There will be a minimum of 8 reviewers on the ITR team. All ITR will be conducted using DrChecks. I

ITR members are listed below.

Name	Discipline	District	Experience
	FDR Plan Formulation	LRL	LRD Technical Expert
	ER Plan Formulation /NEPA	LRH	LRD Technical Expert
	Economist	LRC	29 yrs
	H&H	LRN	12 yrs
	ER Plan Formulation	SPK	SPD Technical Expert
	Cost Estimating	NWW	Cost estimating technical expert
	Geotechnical	LRN	20 yr
	Real Estate	LRN	

An SPK planner will lead the ITR team. An LRL planner will serve as the reviewer for flood damage reduction and an LRH biologist will serve as the NEPA reviewer. The without project condition H&H is underway and the economics review has already been done by LRN and LRC personnel respectively. The LRC representative has over 29 years as a flood damage reduction economist with the Chicago District and has worked

on numerous high profile and complicated projects for Chicago and Louisville Districts. He is now retired, but is available by contract. Other technical members will be assigned as the study progresses to include a reviewer for each technical element represented on the PDT.

Individual members of the ITR team shall review technical products as they are completed, submitting comments to the PDT, receiving responses from the PDT and resolving and certifying individual products, including the without project condition, feasibility scoping package, alternative formulation briefing package and draft feasibility report.

13. No controversy, significant negative environmental, social or economic impacts are anticipated. The magnitude and risk of the project is small. Alternatives include raising and evacuating flood prone homes, floodplain and riparian plantings, wetland creation, rain gardens, stream bank protection, in stream habitat structures and recreational opportunities including greenways and neighborhood parks

14. Upon approval this document will be placed on the district's website.

15. Models being used include HEC's FDA, GeoRAZ and Geo HMS and IWR's ICA model. No additional model certification is anticipated.

16. Implementation costs will be less than \$15 million.

17. Walla Walla Dx will be coordinated as appropriate and when appropriate. There are currently on screening level cost estimates.

ACRONYMS & ABBREVIATIONS

AFB – Alternative Formulation Briefing

DrChecks – Software System used for comments and responses

ECO-PCX - National Ecosystem Planning Center of Expertise

ER – Ecosystem Restoration

EIS – Environmental Impact Statement

EPR – External Peer Review

FCSA – Feasibility Cost Sharing Agreement

FEIS – Final Environmental Impact Statement

FDA – Flood Damage Assessment Program

FDR – Flood Damage Reduction

FSM – Feasibility Scoping Meeting

GeoRAZ – Geo-referenced River Analysis System

GeoHMS – Geo-referenced Hydrologic Modeling System

GIS – Geographic Information System

HEC – Hydrologic Engineering Center

H&H – Hydraulics and hydrology

ICA – Incremental Cost Analyses

ITR – Independent Technical Review

IWR – Institute for Water Resources

LRC – Chicago District

LRD – Great Lakes and Ohio River Division

LRH – Huntington District

LRL – Louisville District

NEPA – National Environmental Policy Act

NRCS – Natural Resources Conservation Service

NWW – Walla Walla District

PDT – Project Delivery Team

PM – Project Management

PRP - Peer Review Plan

SPK – Sacramento District

TDA - Tennessee Department of Agriculture including the non-point source group,

TDEC - Tennessee Department of Environment and Conservation,

TWRA - Tennessee Wildlife Resources Agency

TDNH - Tennessee Department of Natural Heritage.

USFWS – US Fish and Wildlife Service

USGS – US Geological Service

USDA – US Department of Agriculture

Walla Walla Dx - Walla Walla District Directorate of Expertise for Civil Works
Cost Engineering