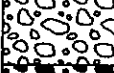




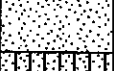






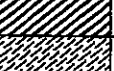




SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		CLEAN SANDS (LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50	SILTS AND CLAYS		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
		SILTS AND CLAYS		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
		SILTS AND CLAYS		OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50	SILTS AND CLAYS		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
		SILTS AND CLAYS		CH	INORGANIC CLAYS OF HIGH PLASTICITY
		SILTS AND CLAYS		OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

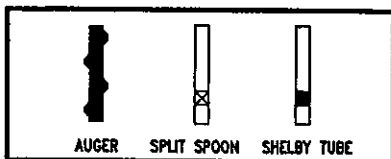
RELATIVE DENSITY - GRANULAR SOILS

CONSISTENCY	N-VALUE (BLOWS/FOOT)
Very Loose	0-4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	Over 50

CONSISTENCY OF COHESIVE SOILS

CONSISTENCY	SHEAR STRENGTH (TSF)
VERY SOFT	0 - 0.25
SOFT	0.25 - 0.50
MEDIUM STIFF	0.50 - 1.00
STIFF	1.00 - 2.00
VERY STIFF	2.00 - 4.00
HARD	4.00 +

SAMPLER TYPES



TERMS AND SYMBOLS

 Apex geoscience inc.

**Northern Cross
Boulevard:
Revised Mitigation
Plan**

September 8, 2004

Prepared for:

TRBP, L.P.
3701 North Harrison
Shawnee, Oklahoma 74804

**Northern Cross Boulevard:
Revised Mitigation Plan
020832.020.1.0001**

USACE Project No. 200300153

Carter=Burgess

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Fort Worth, Texas 76102
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817-735-6148 (fax)
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EXECUTIVE SUMMARY

On May 20, 2003, the U.S. Army Corps of Engineers (USACE) authorized impacts to waters of the U.S. associated with Northern Cross Boulevard in accordance with the report titled "Northern Cross Boulevard: Natural Resources, Impact Assessment and Mitigation Plan" dated March 7, 2003. Due to changes in the site plan for the commercial development adjacent to Northern Cross Boulevard, TRBP, L.P. (TRBP) is requesting to modify the approved mitigation plan.

The project consists of a four-lane roadway and will cross three waters of the U.S. Proposed impacts for the three crossings include 0.49 acres of wetland for Crossing 1; 0.07 acres of wetland for Crossing 2; and 139 linear feet (0.07 acres) of ephemeral stream for Crossing 3.

TRBP is proposing mitigation to offset the impacts of Crossings 1 and 2, which are limited to herbaceous wetlands. Wetland enhancement areas will be formed through the creation of a 50-foot wooded buffer zones that will equal approximately 1.76 acres of plantings, while enhancing 1.13 acres of jurisdictional wetlands, as well as 146 linear feet (0.003 acres) of ephemeral stream. A total of 2.89 acres will be deed-restricted by the proposed mitigation plan to protect waters of the U.S. and the planted buffer zones.

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1.0 INTRODUCTION

TRBP, L.P. (TRBP) is proposing to construct segments of Northern Cross Boulevard and North Sylvania Street in Fort Worth, Texas (*Appendix A, Exhibits 1 through 7*). Efforts have been made to avoid and minimize impacts to waters of the U.S. within the project area. However, the proposed project will result in activities that will impact two herbaceous wetlands and one ephemeral stream. This project was authorized by the U.S. Army Corps of Engineers (USACE) under Nationwide Permit 14 (NWP 14) on May 20, 2003 (USACE Project No. 200300153). However, unforeseen changes in adjacent land use makes the previously approved mitigation plan unfeasible. TRBP is proposing this revised mitigation plan to compensate for unavoidable impacts to waters of the U.S. caused by Crossing 1 and Crossing 2.

2.0 WATERS OF THE U.S.

Waters of the U.S. present on the proposed project site include two ephemeral streams, two wetlands. (*Appendix A, Exhibit 8*).

3.0 IMPACTS TO WATERS OF THE U.S.

The proposed project will impact three waters of the U.S. The construction of the four-lane roadway will result in impacts to waters of the U.S. identified as Crossings 1, 2 and 3 (*Appendix A, Exhibit 9*). Proposed impacts for the three crossings include 0.49 acres for Crossing 1; 0.07 acres for Crossing 2; and 139 linear feet (0.07 acres) for Crossing 3. Crossing 3 falls under the pre-construction notification threshold of 0.10 acres for Nationwide Permit 14 (NWP 14), Linear Transportation Crossings. However, Crossings 1 and 2 include impacts to herbaceous wetlands and mitigation is proposed for these impacts.

4.0 MITIGATION

All appropriate and practical measures were taken to avoid and minimize impacts to waters of the U.S. by the proposed project. The proposed roadway was preliminarily designed using USGS topographic maps to determine the locations of crossings of waters of the U.S. Crossings 2 and 3 were proposed to cross waters of the U.S. at a perpendicular angle, to minimize impacts. The original proposed alignment was changed to minimize impacts at Crossing 1. Crossing 1 now crosses at a perpendicular angle to minimize impacts. Due to the size of the right-of-way and the location of the roadway, relocation of Crossing 1 was not possible.

A mitigation plan has been created to compensate for impacts at Crossings 1 and 2, which impact herbaceous wetlands. The proposed mitigation area will be located adjacent to the proposed roadway, along the northern edge of Wetlands 1 and 2 and a along Tributary 2. The area will be deed-restricted and plantings will have to meet measurable success criteria as outlined in this report. Monitoring will be required to ensure the success of the mitigation areas and annual reports will be required during this monitoring period.

4.1 Mitigation Plan Overview

TRBP proposes to enhance existing wetlands and a streambed with tree and shrub plantings. Wetland enhancement areas will be formed through the creation of 50-foot wooded buffer zones that will measure approximately 1.76 acres of planting, while enhancing 1.13 acres of jurisdictional wetlands. This wooded buffer zone will also in turn enhance 146 linear feet (0.003 acres) of Tributary 2, which will be included within the deed-restricted area. A total of 2.89 acres will be deed restricted by the proposed mitigation plan to protect waters of the U.S. and the planted buffer zones. A summary of the mitigation area is provided in **Table 1**.

Table 1 Mitigation Area Summary

Mitigation Site	Location of Mitigation Site	Type of Benefit	Total Mitigation Planting Area	Enhancement to Waters of the U.S. [linear feet (acres)]	Total Deed Restricted Area (acre)
Mitigation Site 1	Wetland 1 and Tributary 2	Enhancement	0.87	146 (0.25)	1.12
Mitigation Site 2	Wetlands 1 and 2	Enhancement	0.89	-- (0.88)	1.77
Totals			1.76	146 (1.13)	2.89

4.2 Mitigation Sites 1 and 2

Existing Conditions

Wooded buffer zones will be created along the northern edge of Wetlands 1 and 2 and along Tributary 2. Wetland 1 was a herbaceous wetland with dense stands of uniform vegetation, shallow open water pools, open channels and fringe vegetation. Wetland 2 was previously a stock pond but the dam on the east side had been breached forming a small open water area that was surrounded by a wide fringe of wetland vegetation. Tributary 2 was an ephemeral stream with an earthen channel bottom that varied from a shallow swale to a cut depression. Vegetation within the proposed mitigation area included side-oats grama (*Bouteloua curtipendula*), mesquite (*Prosopis glandulosa*), goldenrod (*Solidago* sp.) and yellow indiagrass (*Sorghastrum nutans*), as well as bushy bluestem (*Andropogon glomeratus*) and cattails (*Typha* sp.) within the channel. The buffer zones will create wooded corridors along the tributary and wetlands, providing increased habitat for birds and small animals and provide water quality enhancement.

Planting Plan

Mitigation Sites 1 and 2 will consist of enhancing the existing wetlands and an ephemeral stream channel by planting trees and shrubs along a wooded buffer zone. The 50-foot, or more, wooded buffer zone will be planted with a mix of native trees and shrubs, as well as a mix of native grasses and forbs to provide adequate ground cover. Species for the proposed mitigation were selected according to what is currently present at the site along existing streams and those that would further enhance and/or restore the vegetative community on-site. Specific numbers of trees and shrubs to be planted within each site are located in **Tables 2 and 3**, respectively. Herbaceous species to be planted within the upland riparian buffer are located in **Table 4**. Mitigation Site 1 measured approximately 1.12 acres in size and will provide a total of 146 linear feet

(0.25 acres) of enhancement to waters of the U.S. Mitigation Site 2 measured approximately 1.77 acres in size and will provide a total of 0.88 acres of enhancement to waters of the U.S.

Table 2. Tree and Shrub Planting List – Mitigation Site 1

Species	Scientific name	Bare-root (~1 inch caliper containerized)
Trees		
Cedar elm	<i>Ulmus crassifolia</i>	261 (87)
Pecan	<i>Carya illinoensis</i>	
Shumard oak	<i>Quercus shumardii</i>	
Common persimmon	<i>Diospyros virginiana</i>	
Shrubs		
Chickasaw plum	<i>Prunus augustifolia</i>	118 (44)
Rough-leaf dogwood	<i>Cornus drummondii</i>	
Redbud	<i>Cercis canadensis</i>	
Coralberry	<i>Symphoricarpos orbiculatus</i>	
*Comparable species may be substituted based on availability and acceptance by the USACE regulatory office. ** No one species should constitute more than 25 percent of total plantings.		

Table 3. Tree and Shrub Planting List – Mitigation Site 2

Species	Scientific name	Bare-root (~1 inch caliper containerized)
Trees		
Cedar elm	<i>Ulmus crassifolia</i>	267 (89)
Pecan	<i>Carya illinoensis</i>	
Shumard oak	<i>Quercus shumardii</i>	
Common persimmon	<i>Diospyros virginiana</i>	
Shrubs		
Chicksaw plum	<i>Prunus augustifolia</i>	120 (45)
Rough-leaf dogwood	<i>Cornus drummondii</i>	
Redbud	<i>Cercis canadensis</i>	
Coralberry	<i>Symphoricarpos orbiculatus</i>	
*Comparable species may be substituted based on availability and acceptance by the USACE regulatory office. ** No one species should constitute more than 25 percent of total plantings.		

Table 4. Native Grass and Forb Planting List

Herbaceous Plants
A combination of any of the following native herbaceous plant species may be used for ground cover: little bluestem (<i>Schizachyrium scoparium</i>), big bluestem (<i>Andropogon gerardii</i>), yellow indiagrass (<i>Sorghastrum nutans</i>), side-oats grama (<i>Bouteloua curtipendula</i>), hairy grama (<i>Bouteloua hirsuta</i>), switchgrass (<i>Panicum virgatum</i>), Canada wildrye (<i>Elymus canadensis</i>) and various native wildflowers and other forbs.
*Comparable native species may be substituted based on availability and acceptance by the USACE regulatory office. ** No one species should constitute more than 25 percent of total plantings.

Wooded Buffer Zone

The 1.76 acres of wooded buffer zone located within each of the mitigation areas will be planted with native trees and shrubs. Approximately 300 bare-root (or 100 containerized) tree seedlings and 135 bare-root (or 50 containerized) shrub seedlings would be planted per acre. This would yield a total of 528 bare-root (or 176 containerized) tree seedlings consisting of pecan (*Carya illinoensis*), common persimmon (*Diospyros virginiana*), cedar elm (*Ulmus crassifolia*) and Shumard oak (*Quercus shumardii*) for both mitigation sites. A total of 238 bare-root (or 89 containerized) shrub seedlings will be planted within each of the mitigation areas, consisting of rough-leaf dogwood (*Cornus drummondii*), redbud (*Cercis canadensis*), coralberry (*Symphoricarpos orbiculatus*) and chickasaw plum (*Prunus angustifolia*). Additionally a mix of native upland grasses and forbs will be seeded within the upland areas of the both mitigation sites.

Planting Maintenance

The mitigation area will not be mowed in order to allow the planted trees, shrubs and native seed bank a chance to establish. Selective removal of invasive or noxious species, such as giant ragweed, johnsongrass or cattails may be necessary to enhance the mitigation area development. This removal will be achieved through selective pruning, hand clearing or other low impact vegetation control methods. It is recommended that the trees and shrubs be planted with a rodent deterrent device such as fencing or protective covering for the stems and trunks of the plantings to prevent loss from beaver or other small mammal predation.

Minimum Acceptable Planting Survival Rate

All woody plants to be planted will be monitored to observe and report survival rates. Dead trees or shrubs will be replaced during the five years following planting to maintain a five-year survival rate of 50 percent for bare-root seedlings or 80 percent for containerized plantings. All upland herbaceous plantings (native grasses and forbs) required by this permit will exhibit at least an 80 percent ground cover five years after planting.

Criteria for Minimum Mitigation Plan Success

The permittee will be responsible for maintenance of the mitigation area created to comply with the conditions of this mitigation plan until such time as the permittee provides documentation to, and receives verification from, the Regulatory Branch, Fort Worth District, USACE, that the mitigation area is functioning as the intended type of ecosystem component and at the acceptable level of ecological performance.

Deed Restriction

The permittee will dedicate in perpetuity the mitigation area described in the mitigation plan. The approximately 2.89-acre mitigation area shall not be disturbed, except by those activities that would not adversely affect the intended extent, condition and function of the areas or by those activities specifically provided for in the approved mitigation plan or special conditions for this permit. The permittee shall survey the mitigation area, develop an appropriate deed restriction and provide the deed restriction to the USACE for review and approval. The permittee will record the approved deed restriction with the County Clerk and provide a copy of the deed restriction to the Regulatory Branch by a date to be determined by the USACE. The restriction shall not

be removed from the deed or modified without written approval of the USACE and conveyance of any interest in the property must be subject to the deed restriction.

Compliance Reporting

The permittee shall staff a qualified mitigation specialist (biologist, ecologist or other specialist qualified in wetland restoration, enhancement and creation work) on site during planting of the understory species to ensure compliance with all mitigation requirements of this permit. The permittee shall have this mitigation specialist conduct all monitoring and produce any required monitoring reports.

The permittee will establish and implement a self-monitoring program that includes the following actions:

- a. Designation, in writing, of a responsible party to coordinate with the Regulatory Branch, Fort Worth District, USACE concerning on-site inspections and compliance with permit conditions;
- b. Notification to the USACE of the schedule of activities for each phase of the project at least 30 days prior to the start of soil-disturbing activities; and
- c. Implementation of a reporting program that shall include annual written compliance reports to the USACE, due October 1 each year, beginning in 2005. The permittee shall include in each report any schedule changes and a summary of all activities that occurred during the reporting period, including demonstration of the permittee's compliance with the permit conditions, and documentation of the progress and/or completion of all authorized work, including mitigation activities. The permittee shall detail in the first report the pre-construction conditions of the project area. The permittee shall include in the report photographs, maps and a description of the impacts to waters of the U.S. Compliance reports are required even if no work is conducted during the reporting period. The permittee shall submit compliance reports until the USACE verifies that the permittee has successfully completed all compensatory mitigation plan requirements, the areas have met the standards of the conditions discussed in this report, and all authorized construction activities have been either completed or deleted from the project.

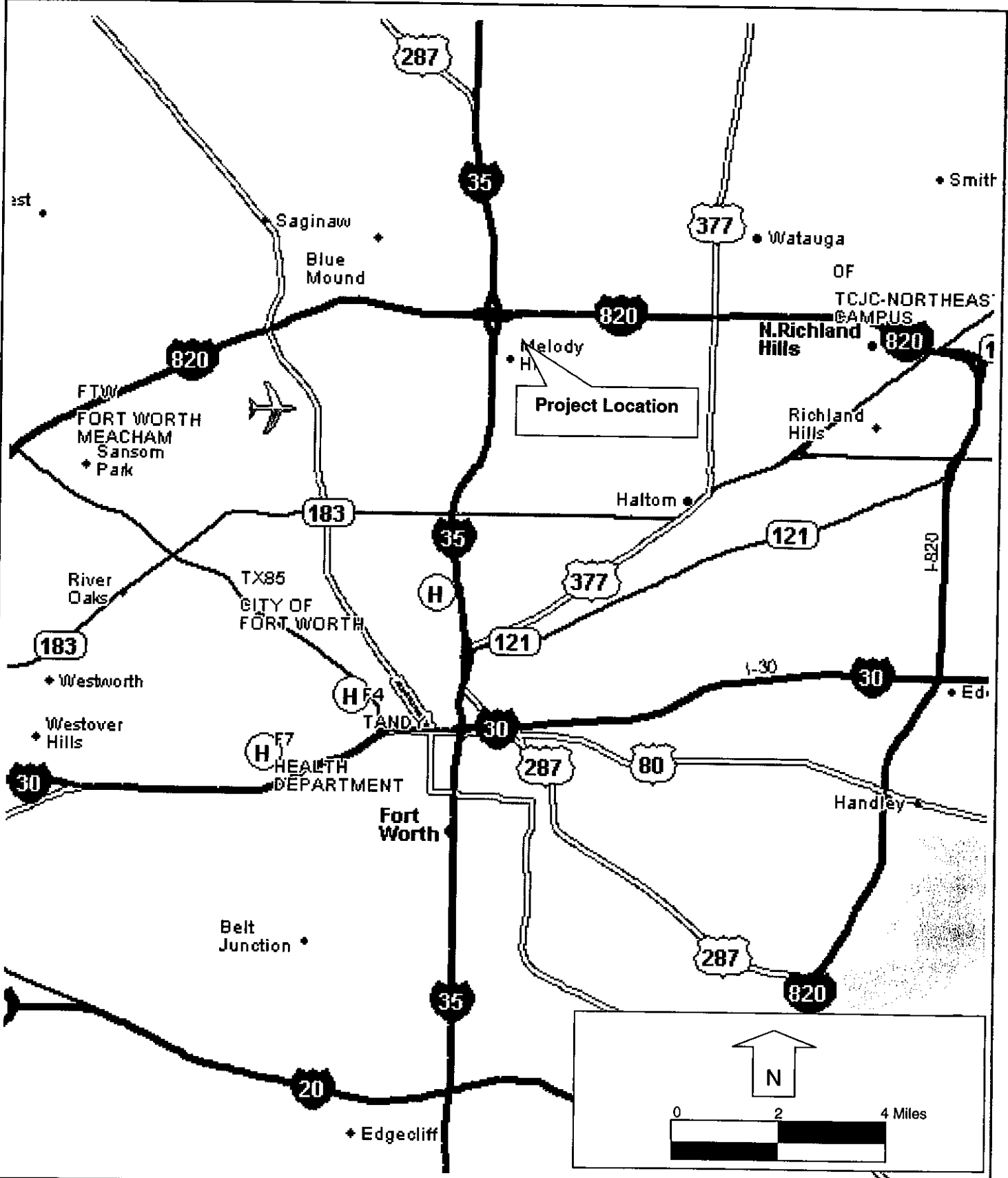
5.0 CONCLUSIONS

TRBP is proposing to extend Northern Cross Boulevard to the Interstate 35W northbound service road, as well as extend North Sylvania Street to connect the existing road to the new extension of Northern Cross Boulevard. The project area will consist of the construction of 3,330 linear feet of roadway near the Interstate Loop 820 and Interstate 35W interchange in Fort Worth, Texas. Construction of the proposed project will result in three crossings of waters of the U.S. within the project area. Proposed impacts to waters of the U.S. at the three crossings include 0.49 acres at Crossing 1; 0.07 acres at Crossing 2; and 139 linear feet (0.07 acres) at Crossing 3. Crossings 1 and 2 involve impacts to herbaceous wetlands. TRBP is proposing to offset these impacts by planting native trees, shrubs, grasses and forbs along the northern edge of Wetlands 1 and 2 and along Tributary 2. Wetland enhancement areas will be formed through the creation of a 50-foot wooded buffer zone that will equal approximately 1.76 acres of planting, while enhancing 1.13 acres of jurisdictional wetlands, as well as 146

linear feet (0.003 acres) of ephemeral stream. A total of 2.89 acres will be deed restricted by the proposed mitigation plan to protect waters of the U.S. and the planted buffer zones.

APPENDIX A

Site Maps



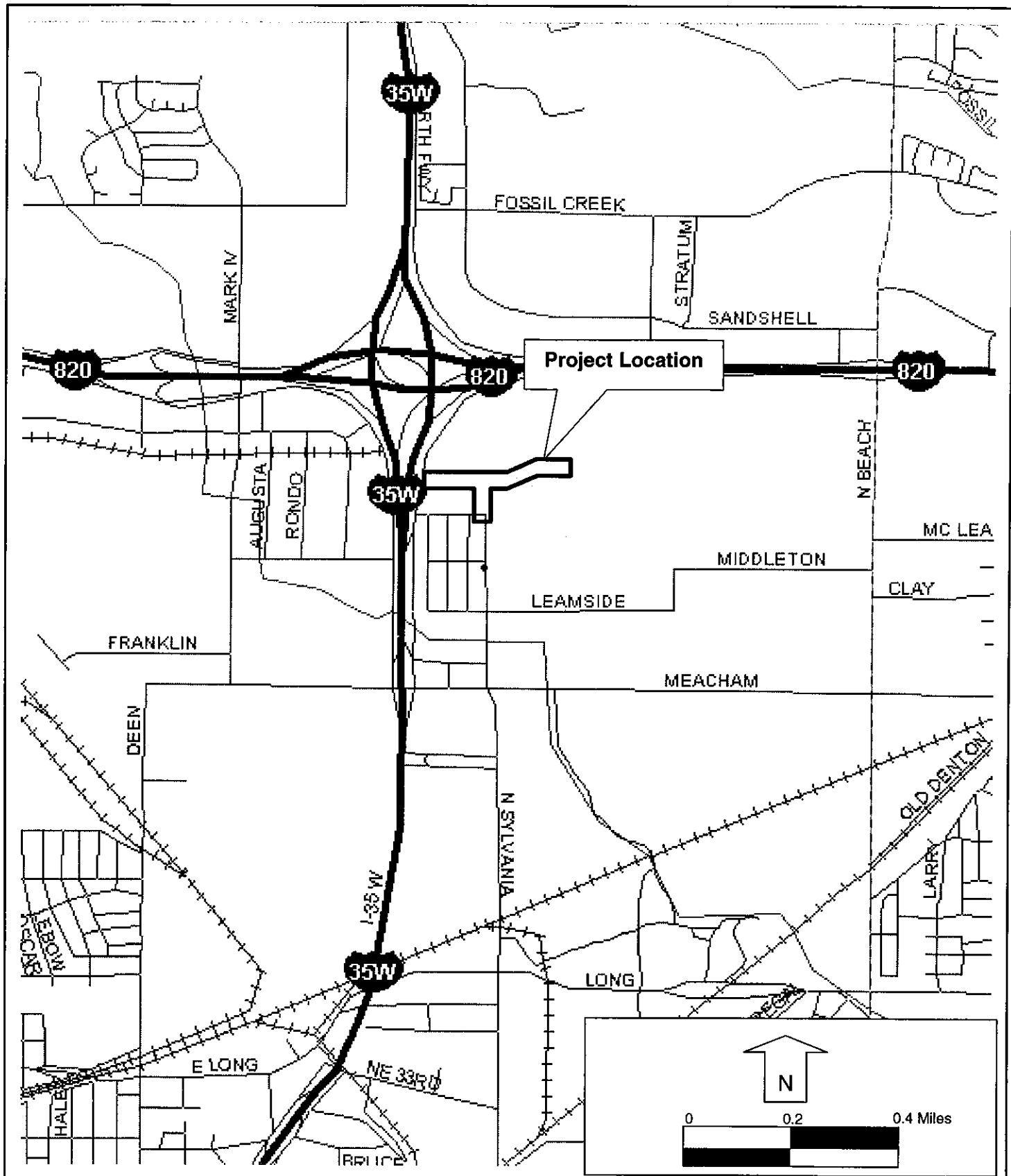
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Vicinity Map
 Northern Cross Boulevard
 Fort Worth, Texas

C&B Project No. 020832.020

Source:
 Precision Mapping
 4.0
 02/01

Exhibit
1



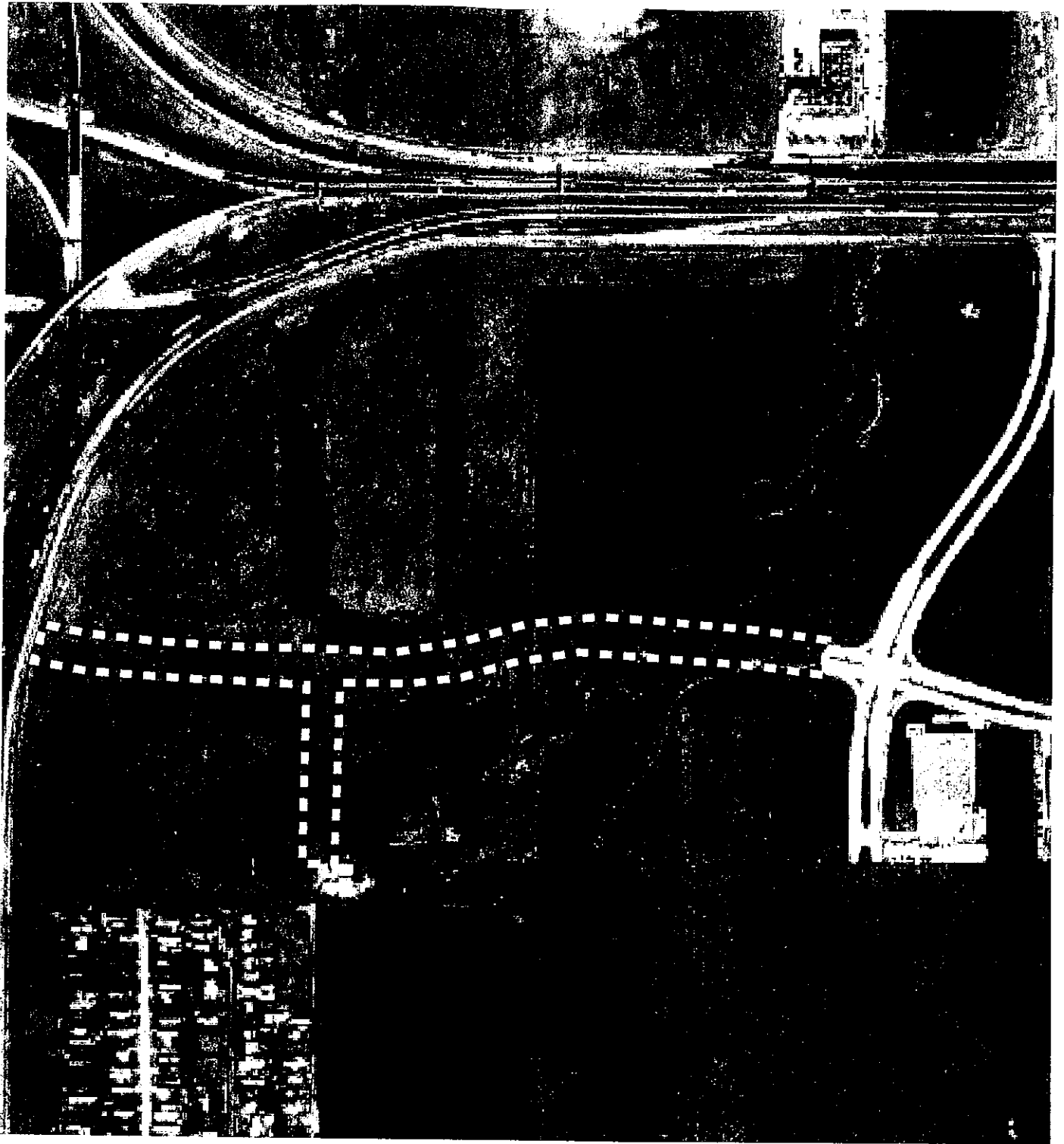
Carter Burgess

Local Area Map
 Northern Cross Boulevard
 Fort Worth, Texas
 C&B Project No. 020832.020

Source:
 Precision Mapping
 4.0
 02/01

Exhibit
2

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Legend

Study Boundary



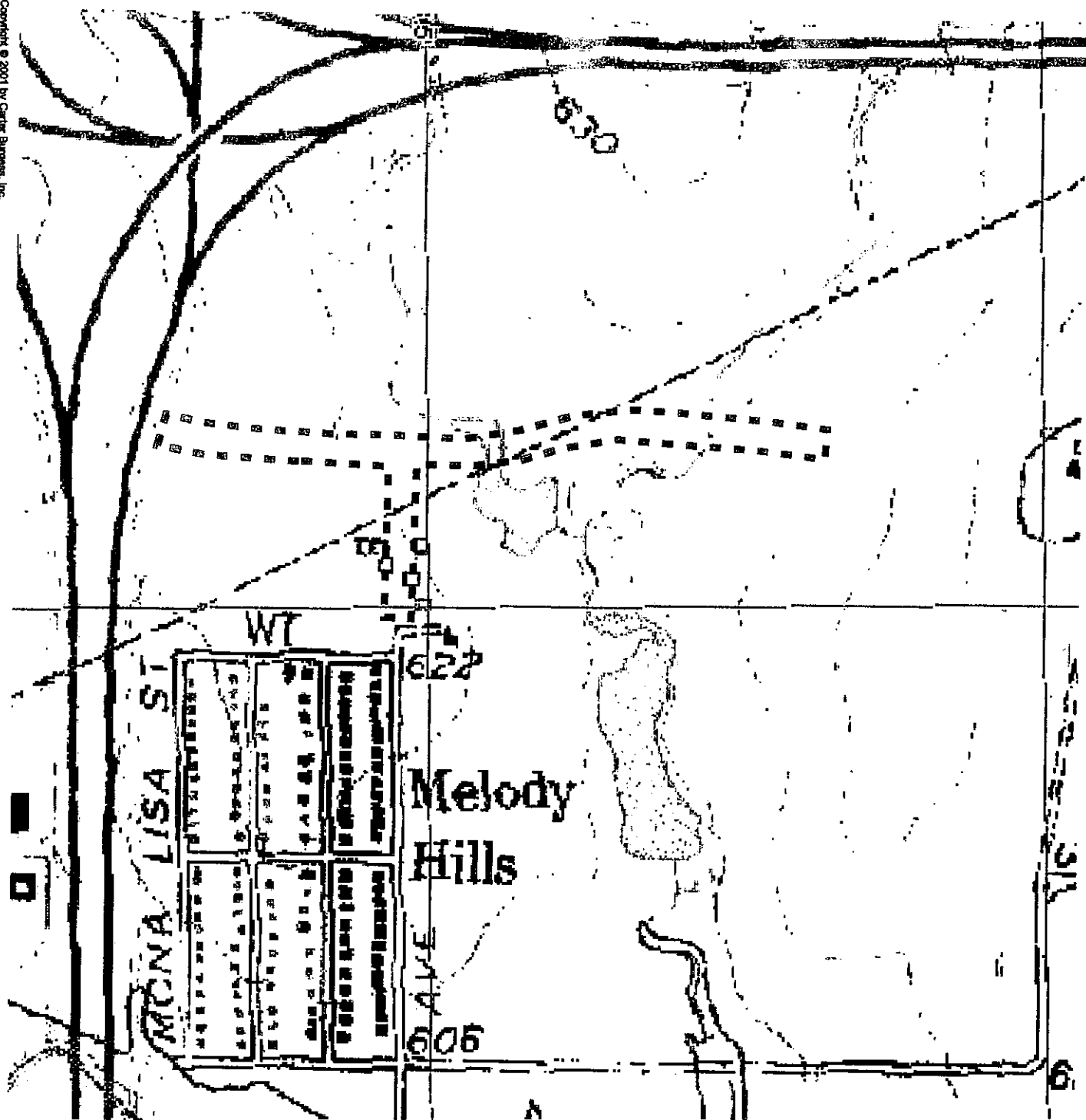
Carter Burgess

Digital Orthophoto Quadrangle
Northern Cross Boulevard
Fort Worth, Texas

C&B Project No. 020822-000

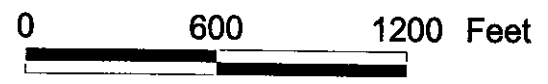
Source:
DOQ - TNRIS, 1995

Exhibit
3



Legend

Study Boundary

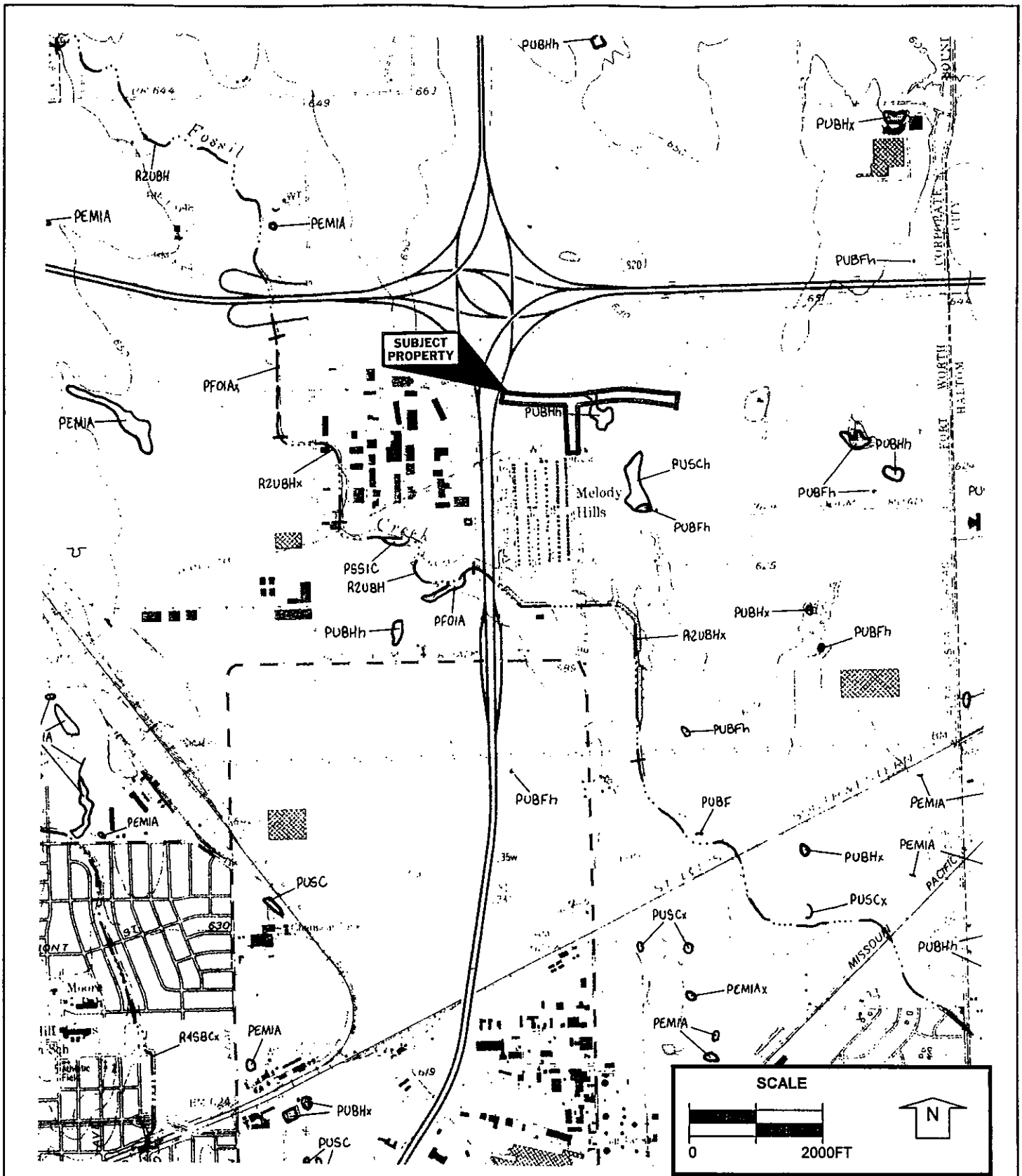


Carter Burgess

Digital Orthophoto Quadrangle
Northern Cross Boulevard
Fort Worth, Texas

Source:
USGS, Haltom City
Quadrangle, 1955
Photorevised 1981

Exhibit
4



CarterBurgess

National Wetlands Inventory Map
 Northern Cross Boulevard
 Fort Worth, Texas

C&B Project No. 020832.020

Source:
 U.S. Dept of Interior, FWS
 Haltom City, TX Quadrangle
 1955
 Photorevised 1981

Exhibit
5

480596

LEGEND

Special Flood Hazard Areas Inundated By 100-year Flood



Zone A No base flood elevation determined.

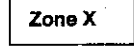


Zone AE Base flood Elevations determined.



Floodway

Other Flood Areas

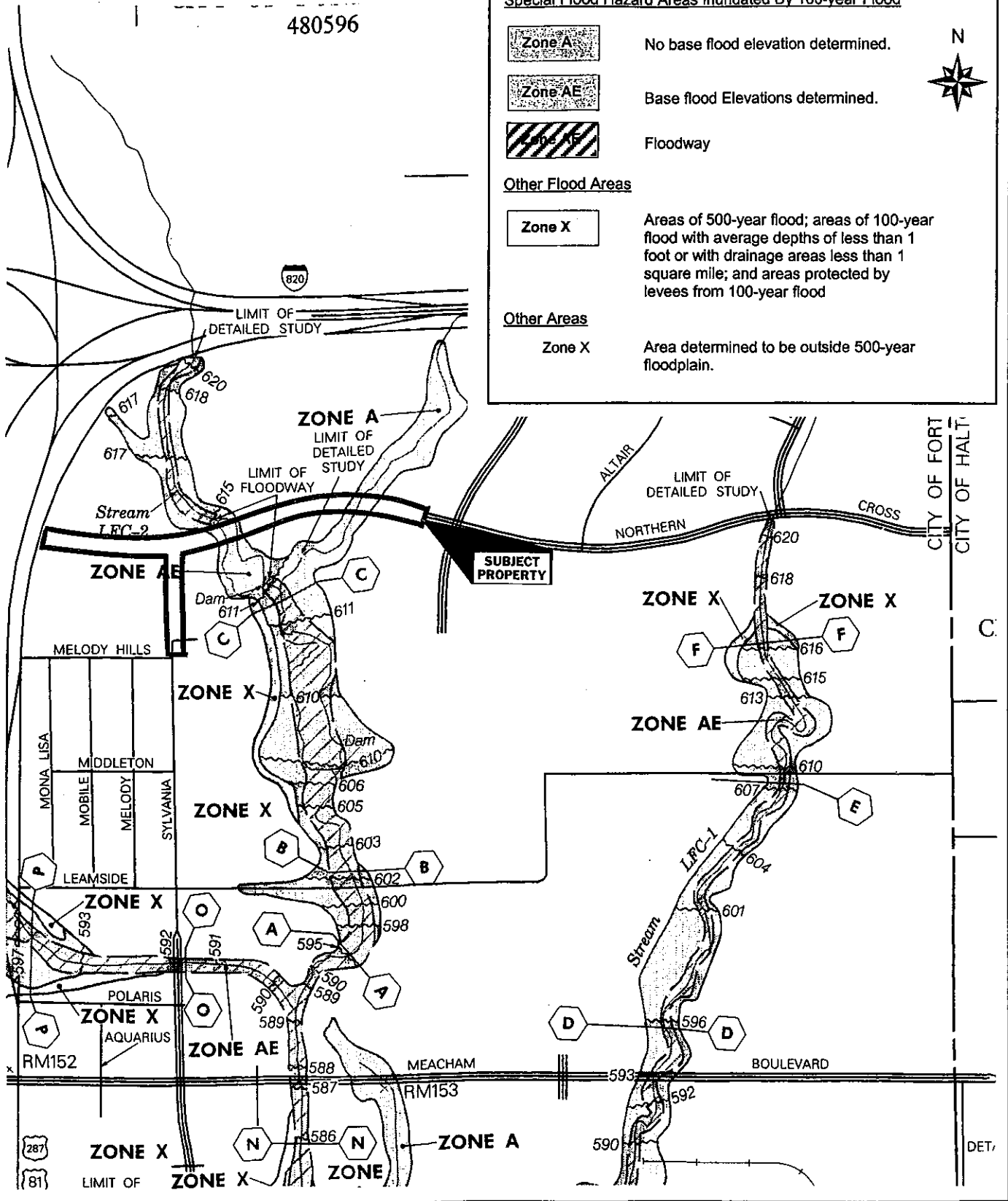


Zone X Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood

Other Areas

Zone X

Area determined to be outside 500-year floodplain.

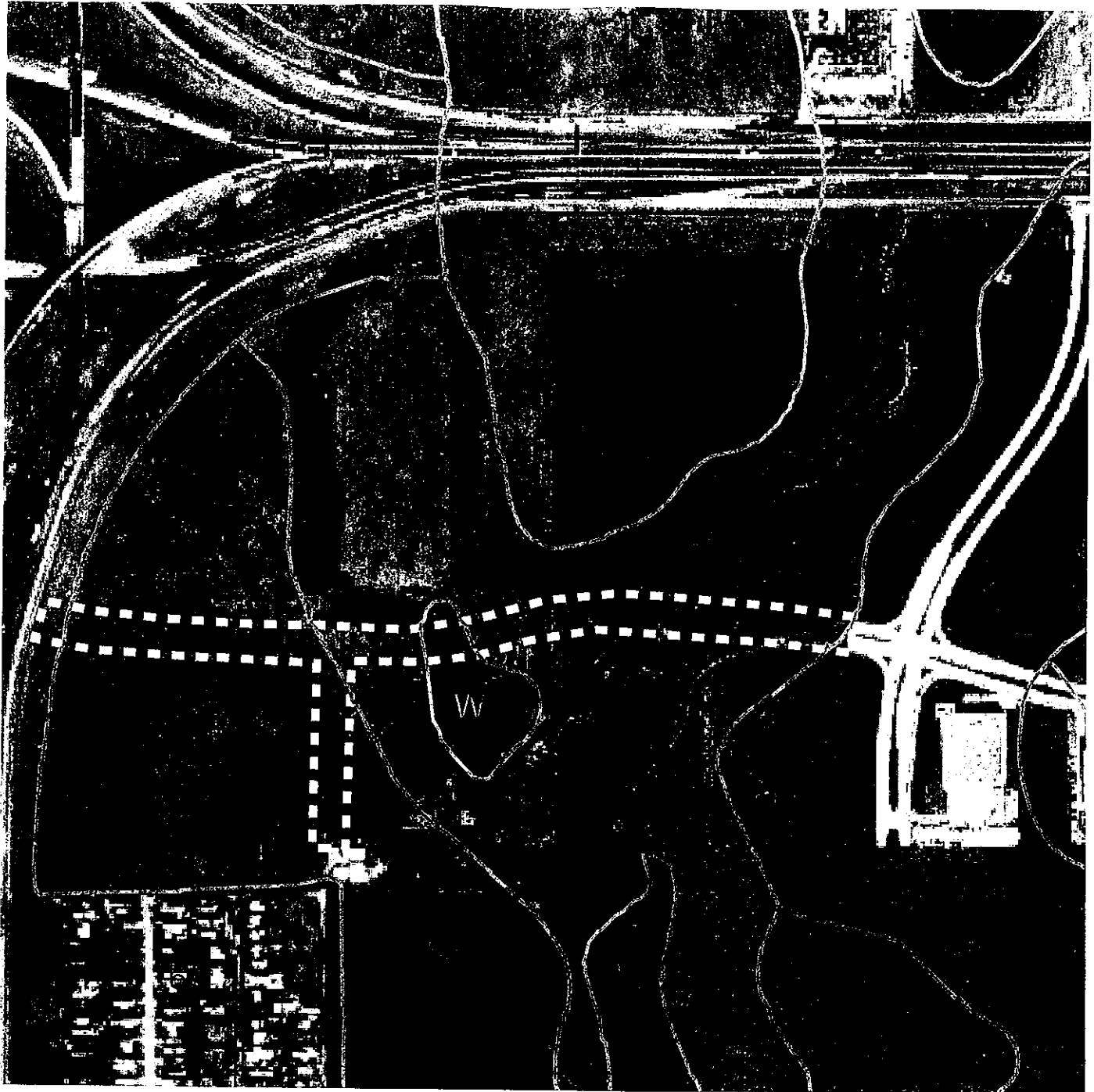


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Flood Insurance Rate Map
Northern Cross Boulevard
Fort Worth, Texas
C&B Project No. 020832.020

Source:
Federal Emergency Management
Agency
Map No: 48439C0285 H
Map Revised: 08/02/95

Exhibit
6



Legend

Study Boundary

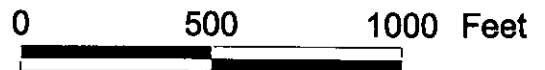
Soil Type Boundary

Soil Types

W Water

65 Sanger clay, 1 to 3 percent slopes

74 Slidell clay, 1 to 3 percent slopes



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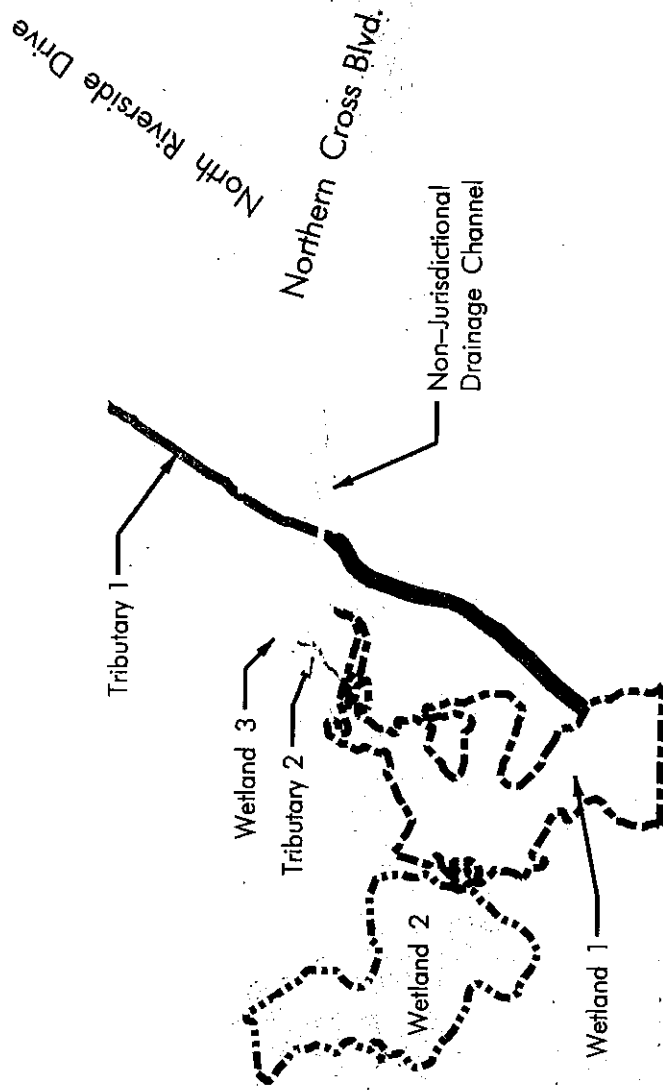
Soils Map
Northern Cross Boulevard
Fort Worth, Texas

Source:

Soils - USDA, 1981,
DOQ - TNRIS, 1995





Exhibit

7



Melody Hills

LEGEND

	Waters of the U.S.
	Jurisdictional Wetland
	Non-Jurisdictional Waters
	Proposed Alignment

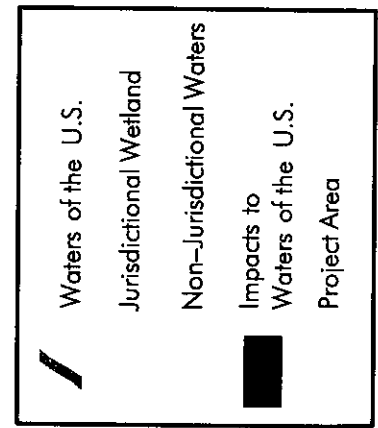
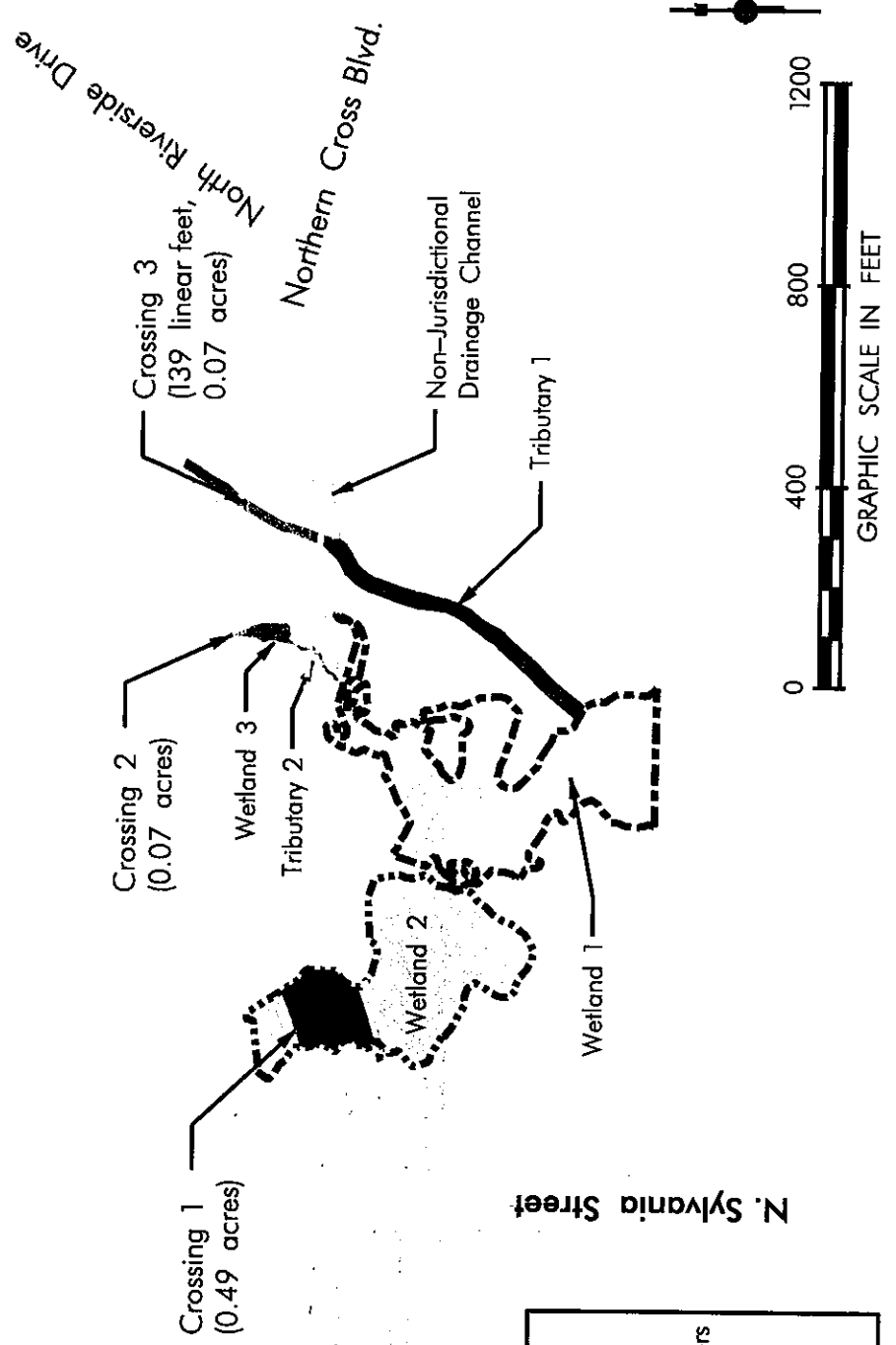


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Waters of the U.S.
Northern Cross Boulevard
Fort Worth, Texas

Project No. 020832.020

Exhibit
8



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Interstate Loop 820

North Riverside Drive

Tributary 1

Northern Cross Blvd.

Non-Jurisdictional
Drainage Channel

Tributary 2

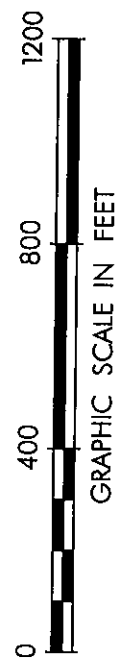
Wetland 3

Mitigation Site 1







Wetland 2

Wetland 1

Mitigation Site 2



LEGEND

-  Waters of the U.S.
-  Jurisdictional Wetland
-  Non-Jurisdictional Waters
-  Impacts to Waters of the U.S.
-  Project Boundary
-  Upland Riparian Buffer

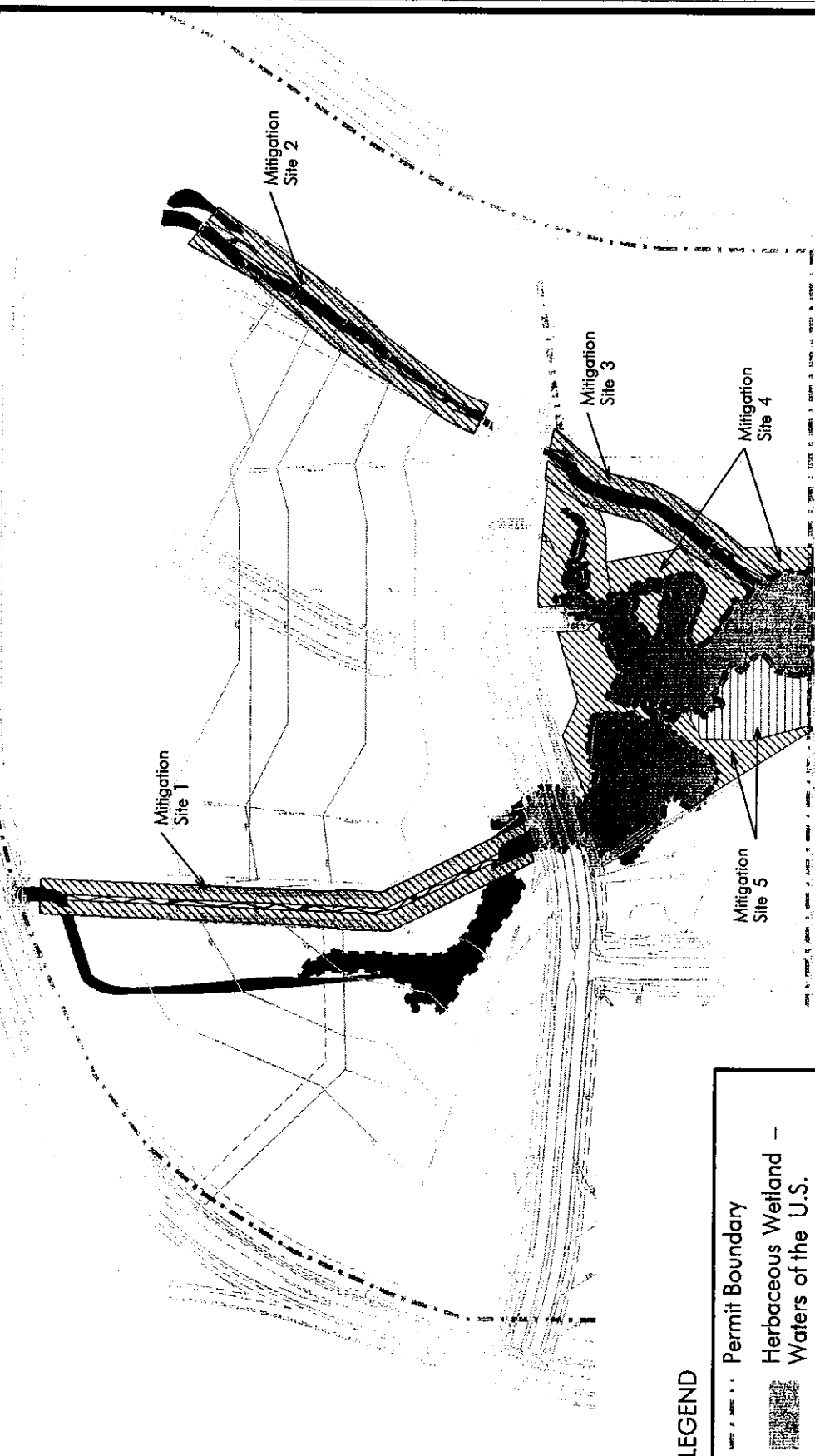
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Carter=Burgess


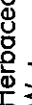





Proposed Mitigation Planting Area
Northern Cross Boulevard
Fort Worth, Texas

Project No. 020832.020

Exhibit
10



LEGEND

-  Permit Boundary
-  Herbaceous Wetland - Waters of the U.S.
-  Drainage Channel Not a Waters of the U.S.
-  Impacts to Waters of the U.S.
-  Upland Riparian Buffer
-  Created Wetland
-  Upland Riparian Buffer (NWP 14 - Northern Cross Boulevard)

Carter=Burgess

Proposed Mitigation Plan
Northern Cross Development
Fort Worth, Tarrant County, Texas
C&B Project No. 020832.020

Exhibit

1

Interstate 35W

Melody Hills

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