



**US Army Corps
of Engineers**
Fort Worth District

Public Notice

Applicant: Bexar County Public Works

Permit Application No.: SWF-2009-00473

Date: February 10, 2012

The purpose of this public notice is to inform you of a proposal for work in which you might be interested. It is also to solicit your comments and information to better enable us to make a reasonable decision on factors affecting the public interest. We hope you will participate in this process.

Regulatory Program

Since its early history, the U.S. Army Corps of Engineers has played an important role in the development of the nation's water resources. Originally, this involved construction of harbor fortifications and coastal defenses. Later duties included the improvement of waterways to provide avenues of commerce. An important part of our mission today is the protection of the nation's waterways through the administration of the U.S. Army Corps of Engineers Regulatory Program.

Section 10

The U.S. Army Corps of Engineers is directed by Congress under Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403) to regulate *all work or structures in or affecting the course, condition or capacity of navigable waters of the United States*. The intent of this law is to protect the navigable capacity of waters important to interstate commerce.

Section 404

The U.S. Army Corps of Engineers is directed by Congress under Section 404 of the Clean Water Act (33 USC 1344) to regulate the *discharge of dredged and fill material into all waters of the United States, including wetlands*. The intent of the law is to protect the nation's waters from the indiscriminate discharge of material capable of causing pollution and to restore and maintain their chemical, physical and biological integrity.

Contact

Name: Mr. Mike Happold

Phone Number: (817) 886-1670

JOINT PUBLIC NOTICE
U.S. ARMY CORPS OF ENGINEERS, FORT WORTH DISTRICT
AND
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

SUBJECT: Application for a Department of the Army Permit under Section 404 of the Clean Water Act (CWA) and for water quality certification under Section 401 of the CWA to discharge dredged and fill material into waters of the United States associated with the construction of the proposed Rosillo Creek NWWC (Bexar County Project SC-15) in the City of Kirby, Bexar County, Texas.

APPLICANT: Bexar County Public Works
Mr. David R. Wegmann, PE
Engineering Services Manager
Attn: Mr. Jeremy Hanzlik, PE
6800 Park Ten Blvd., Suite 180S
San Antonio, TX 78213

APPLICATION NUMBER: SWF-2009-00473

DATE ISSUED: February 10, 2012

LOCATION: The proposed project is located along the West Tributary to Rosillo Creek beginning at Ackerman Road then traversing north through the City of Kirby to FM 78(Old Seguin Road). The proposed project area can be found on the San Antonio East, Texas, U.S. Geological Survey (USGS) 7.5-minute topographic map in the USGS Hydrologic Unit 12100301 (Figure 2). The proposed project is located at approximately N 29.463 Latitude: W -98.386 Longitude (NAD 83 State Plane TX South Central FIPS 4202 Feet).

OTHER AGENCY AUTHORIZATIONS: State Water Quality Certification

PROJECT DESCRIPTION: Bexar County Public Works proposes to deepen an approximately 5,321-linear foot of previously channelized reach to the West Tributary to Rosillo Creek located between Ackerman Road and FM 78. As part of this project, the applicant would replace six existing road crossings (three with bridges, two with multiple concrete box culverts, and one with concrete arch spans) to increase channel conveyance capacity for the purpose of flood control. The proposed channel modifications are located within an urban setting and many of the adjacent residential structures are located in the FEMA 100-year floodplain. Current conditions have also resulted in the flooding of several roadways at crossings of the West Tributary channel including FM 78, Old Seguin Road, Starfire Lane, Redding Road, Kirby Drive, Binz-Engleman Road, and Ackerman Road during storms experienced in 1998, 2002, and 2005. The need for the proposed project is to minimize flood risk to people and property through the modification of the

West Tributary to Rosillo Creek. The stream channel would be modified in order to achieve the flood control objective by conveying 100-year flow without flooding adjacent properties. The applicant proposes to excavate approximately 42,600 cubic yards of material from the existing channel to lower the flow line (6.05 acres total impact). The excavated material would be deposited in an upland location. In addition, the applicant proposes to discharge approximately 736 cubic yards of concrete and 129 cubic yards of rock into the modified channel. The fill activities would result in impacts to 1.7 acres of ephemeral stream channel (concrete-lining) and 0.16 acres (rock rip-rap).

The dominant vegetation observed within the existing West Tributary channel and in the general project vicinity included Bermuda grass (*Cynodon dactylon*) and Johnson grass (*Sorghum halepense*). The dominant vegetation observed with the wetland communities included spikerush (*Eleocharis acicularis*) and flatsedge (*Cyperus* spp.).

The proposed West Tributary channel modification would be conducted within the existing 200-foot wide City of Kirby drainage easement and rights-of-way. The existing channel width would be maintained with excavation of the bottom to deepen the channel and lower the flow line. Approximately 392 linear feet of the existing trapezoidal channel downstream of FM 78 is concrete-lined. The proposed modifications include concrete lining an additional 235 linear feet for the segment between FM 78 and Old Seguin Road as well as 567 linear feet for the segment between Kirby Drive and Binz-Engleman Road to protect existing pipelines. The majority of the channel (3,674 linear feet) downstream of Old Seguin Road would remain earthen with meandering, earthen base flow channel created within the bottom of the lowered trapezoidal channel. Revegetation of the modified channel would be with native grasses and forbs to enhance stream functions within the project area. Wetland pool areas would be created at discharges of existing storm drains in the West Tributary channel and at transitions from concrete-lined areas to earthen channel sections. Wetland pool areas would be lined with rock rip-rap for erosion control and planted with aquatic herbaceous species.

During project planning, the applicant considered several alternatives in an effort to avoid and minimize adverse impacts to waters of the United States. Under the no action alternative, the existing trapezoidal West Tributary channel would remain unaltered and the adjacent homes and road crossings would remain in the 100-year floodplain. Adverse environmental impacts associated with the proposed project would be avoided with the no action alternative; however, the project need and purpose would not be met.

In the second alternative, the applicant considered using a dual pond regional storm water facility with offline weirs to be located upstream of FM 78 within an industrial tract. Together both ponds would require 21.9 acres of right-of-way or drainage easement, and would provide 71.2 acre-feet of total storage. A portion of the tributary and a culvert at FM 78 would have to be lowered and re-graded as part of the improvements. Engineering review of the allowable flow rates at Ackerman Road indicated that even detaining 100 percent of the storm water on industrial tract would not adequately lower the flows to provide an unflooded crossing at Ackerman Road. The results of the engineering analysis also showed that detaining and reducing pond outflow from 4,032 cfs to 1,278 cfs still resulted in excessive flows further downstream. Also, the industrial site does not have enough available land to develop adequate detention ponds to accommodate the required volume to reduce flood elevations downstream. Therefore, the second alternative was determined to be a non-viable option.

In the third alternative, the applicant identified properties downstream of FM 78 that could provide detention. Two sites were identified that could provide a total storage of 11.26 ac-ft. Based on the engineering analysis, the combined result of these two ponds would only reduce the peak flow in the channel from 6,103 cfs to 6,023 cfs or a 1.3 percent reduction. The effect of detention provided on the two available sites would not result in lowering the water surface elevation of the floodplain; therefore, this alternative was determined to be non-viable.

Onsite mitigation would include stream restoration and wetland creation within the proposed project area. The goal of the proposed mitigation is to enhance the functions of the West Tributary to Rosillo Creek beyond the existing hydraulic functions currently provided. The objectives of the proposed mitigation activities include increasing storm drainage capacity to protect public and private properties, increasing diversity of stream habitat and substrate composition within the tributary channel, and increasing coverage of native herbaceous species to provide improvement in habitat quality, aesthetics, erosion control, and water quality. Specifically, the Division's proposed mitigation activities include creation of 3,674 linear feet (0.84 acre) of meandering, earthen base-flow channel; creation of 0.16 acre palustrine emergent wetland; seeding the modified channel with a mixture of native grasses and forbs; planting native aquatic plants within the created wetland pools, and planting of a minimum of three oak trees along the top of bank between Stations 22+00 and 26+00 (Zone D) to mitigate for loss of three hackberry trees within the construction area. The oak trees to be planted may be either bur oak (*Quercus macrocarpa*), chinkapin oak (*Quercus muhlenbergii*), or shumard oak (*Quercus shumardii*). Native seeding mixture for the channel bottom (Zone A) and channel slopes (Zone B) are provided in Tables 1 and 2.

TABLE 1
Seed Mixture for Channel Bottom (Zone A)

	Common Name	Scientific Name	Seeding Rate (Pounds/Acre)	% of Mix by Weight
Grasses	Prairie Wildrye	<i>Elymus canadensis</i>	2.5	5.32
	Virginia Wildrye	<i>Elymus virginicus</i>	2.5	5.32
	Inland Seoats	<i>Chasmanthium latifolium</i>	3	6.38
	Western Wheatgrass	<i>Elytrigia smithii</i>	2.25	4.79
	Green Sprangletop	<i>Leptochloa dubia</i>	0.5	1.06
	Buffalograss	<i>Buchloe dactyloides</i>	6	12.77
	Blue grama	<i>Bouteloua gracilis</i>	3	6.38
	Bushy Bluestem	<i>Andropogon glomeratus</i>	0.25	0.53
	Little Bluestem	<i>Schizachyrium scoporius</i>	2	4.26
Legumes	Illinois	<i>Desmanthus illinoensis</i>	8	17.02
	Partridge Pea	<i>Chamaecrista fasciculata</i>	10	21.28
Wild- flowers	Cutleaf Daisy	<i>Engelmannia pinnatifida</i>	4	8.51
	Clasping	<i>Dracopis amplexicaulis</i>	0.5	1.06
	Black-eyed Susan	<i>Rudbeckia hirta</i>	0.5	1.06
	Scarlet Sage	<i>Salvia coccinea</i>	2	4.26
TOTAL			47	100

TABLE 2
Seed Mixture for Channel Slope (Zone B)

Common Name		Scientific Name	Seeding Rate (Pounds/Acre)	% of Mix by
Grasses	Prairie Wildrye	<i>Elymus canadensis</i>	2.5	5.78
	Virginia Wildrye	<i>Elymus virginicus</i>	2.5	5.78
	Inland Seaoats	<i>Chasmanthium</i>	3	6.93
	Western Wheatgrass	<i>Pascopyrum smithii</i>	2.25	5.20
	Green Sprangletop	<i>Leptochloa dubia</i>	0.34	0.79
	Buffalograss	<i>Buchloe dactyloides</i>	4	9.25
	Blue grama	<i>Bouteloua gracilis</i>	1.7	3.93
	Little Bluestem	<i>Schizachyrium</i>	1.4	3.24
	Sideoats Grama	<i>Bouteloua curtipendula</i>	1.4	3.24
	Curly Mesquite	<i>Hilaria belangeri</i>	0.34	0.79
Legumes	Illinois Bundleflower	<i>Desmanthus illinoensis</i>	8	18.49
	Partridge Pea	<i>Chamaecrista</i>	10	23.12
Wildflowers	Texas Bluebonnet	<i>Lupinus texensis</i>	2	4.62
	Indian Blanket	<i>Gaillardia pulchella</i>	1	2.31
	Black-eyed Susan	<i>Rudbeckia hirta</i>	0.2	0.46
	Indian Paintbrush	<i>Castilleja indivisa</i>	0.03	0.07
	Pink Evening	<i>Oenothera speciosa</i>	0.1	0.23
	Purple Coneflower	<i>Echinacea purpurea</i>	1	2.31
	Mexican Hat	<i>Ratibida columnaris</i>	0.2	0.46
	Pitcher Sage	<i>Salvia azurea</i>	0.3	0.69
	Plains Coreopsis	<i>Coreopsis tinctoria</i>	0.2	0.46
	Scarlet Sage	<i>Salvia coccinea</i>	0.8	1.85
TOTAL			43.26	100

Upon completion of all phases of the proposed channel modifications and establishment of permanent vegetative cover across the bottom of the modified channel, final plantings of the aquatic species would be conducted following a rainfall event which would supply water to the created wetland pool areas. The aquatic plant species listed in Table 3 would be planted within the pools.

Table 3
Aquatic Plantings Along Edge of Pools or Within Shallow Pools without Rock Riprap (Zone C)

Common Name	Scientific Name	Type/Size	Spacing	Number	Water Depth
Pickerelweed	<i>Pontederia cordata</i>	Rhizome/plug	3' centers	28	4-6"
Arrowhead	<i>Sagittaria latifolia</i> and/or <i>Sagittaria graminea</i>	Rhizome/plug	3' centers	28	4-6"
Longspike Spikerush	<i>Eleocharis palustris</i>	Rhizome/plug	3' centers	28	0-3"
Swamp Smartweed	<i>Polygonum hydropiperoides</i>	Rhizome/plug	3' centers	28	0-3"
Sedge	<i>Carex brittoniana</i> and/or <i>Carex cherokeensis</i> , <i>Carex crus-corvi</i> <i>Carex emoryi</i> <i>Carex flaccosperma</i> <i>Carex frankii</i> <i>Carex meadii</i> <i>Carex muhlenbergii</i> <i>Carex planostachys</i>	Rhizome/plug	3' centers	28	0-3"
Soft Rush	<i>Juncus effusus</i>	Rhizome/plug	3' centers	28	0-6"
Three-square bulrush	<i>Schoenoplectus pungens</i>	Rhizome/plug	3' centers	28	0-3"
Total				194	

The applicant would implement a monitoring and reporting schedule to document the proposed mitigation area for plant survivability and success criteria for a minimum 3-year period. The City of Kirby Public Works Department would be responsible for maintenance activities within the project area. The mitigation area would be maintained as a natural area such that it would not be disturbed by excessive mowing activities. The planted mitigation area may be mown no more than four times per year during the first two years after planting activities are conducted, if needed to control the weedy species and to facilitate establishment of desirable native herbaceous cover. Once desirable native herbaceous species are established, the mitigation area

would not be mown more than two times per year: once during the dormant season (December-February) and once during the growing season during late summer (July-August), and only if needed to control growth of annual weeds (e.g., ragweed). Trash and debris would be removed from the mitigation area, as needed, to maintain flows and functions of the stream channel with the channel mitigation area monitored at a minimum of once per month and following rain events exceeding one inch to determine need for trash removal.

PUBLIC INTEREST REVIEW FACTORS: This application will be reviewed in accordance with 33 CFR 320-332, the Regulatory Program of the USACE, and other pertinent laws, regulations, or executive orders. Our evaluation will also follow the guidelines published by the U.S. Environmental Protection Agency (EPA) pursuant to Section 404(b)(1) of the CWA. The decision whether to issue a permit will be based on an evaluation of the probable impact, including cumulative impact of the proposed activity on the public interest. That decision will reflect the national concerns for both protection and utilization of important resources. The benefits which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered, including its cumulative effects. Among the factors addressed are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and, in general, the needs and welfare of the people.

The USACE is soliciting comments from the public; federal, state, and local agencies and officials; Indian tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the USACE in determining whether to issue, issue with modifications or conditions, or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

STATE WATER QUALITY CERTIFICATION: This project would result in a direct impact of greater than three acres of waters of the state or 1,500 linear feet of stream (or a combination of the two is above the threshold), and as such would not fulfill Tier I criteria for the project. Therefore, Texas Commission on Environmental Quality (TCEQ) certification is required. Concurrent with USACE processing of this Department of the Army application, the TCEQ is reviewing this application under Section 401 of the CWA, and Title 30, Texas Administrative Code Section 279.1-13 to determine if the work would comply with State water quality standards. By virtue of an agreement between the USACE and the TCEQ, this public notice is also issued for the purpose of advising all known interested persons that there is pending before the TCEQ a decision on water quality certification under such act. **Any comments concerning this application may be submitted to the Texas Commission on Environmental Quality, 401 Coordinator, MSC-150, P.O. Box 13087, Austin, Texas 78711-3087.** The public comment period extends 30 days from the date of publication of this notice. A copy of the public notice

with a description of the work is made available for review in the TCEQ's Austin Office. The TCEQ may conduct a public meeting to consider all comments concerning water quality if requested in writing. A request for a public meeting must contain the following information: the name, mailing address, application number, or other recognizable reference to the application; a brief description of the interest of the requestor, or of the person represented by the requestor; and a brief description of how the application, if granted, would adversely affect such interest.

ENDANGERED AND THREATENED SPECIES: The USACE has reviewed the U.S. Fish and Wildlife Service's (USFWS) latest published version of endangered and threatened species to determine if any may occur in the project area. The proposed project would be located in Bexar County where ten cave dwelling invertebrates are known to occur as listed endangered species under the authority of the Endangered Species Act of 1973, as amended. These ten species include the ground beetle (*Rhadine exilis*), the ground beetle (*Rhadine infernalis*), Helotes mold beetle (*Batrisesodes venyivi*), Cokendolpher Cave Harvestman (*Texella cokendolpheri*), Robber Baron cave spider (*Cicurina baronia*), Madla's cave spider (*Cicurina madla*), Braken Bat Cave meshweaver (*Cicurina venii*), Vesper cave spider (*Cicurina vespera*), Government Canyon cave spider (*Neoleptoneta microps*), and Peck's cave amphipod (*Stygobromus pecki*). In addition to cave dwelling invertebrates, nine other listed endangered species are known to occur or may occur as migrants. These nine species include the black-capped Vireo (*Vireo atricapilla*), golden-cheeked warbler (*Dendroica chrysoparia*), whooping crane (*Grus americana*), Comal Springs dryopid beetle (*Stygoparnus comalensis*), Comal Springs riffle beetle (*Heterelmis comalensis*), the fountain darter (*Etheostoma fonticola*), San Marcos gambusia (*Gambusia georgei*), Texas blind salamander (*Typhlomolge rathbuni*), and Texas wild-rice (*Zizania texana*). The San Marcos salamander (*Eurycea nana*), a listed threatened species, is also known to occur in Bexar County. Our initial review indicates that the proposed work would have no effect on federally-listed endangered or threatened species. In a concurrence letter dated August 16, 2011, the USFWS reviewed the subject project and determined no further action was warranted in regards to federally-listed threatened and endangered species.

NATIONAL REGISTER OF HISTORIC PLACES: The area of the proposed project was surveyed for the presence of historic and prehistoric sites. A pedestrian survey, including shovel testing, confirmed the creek channel had been modified by previous work including extensive and substantial previous surface and subsurface mechanical impacts from prior channel modifications to West Tributary to Rosillo Creek, overhead and buried utilities, and roadway construction. No sites were identified. The possibility of finding any prehistoric or historic sites during construction is low.

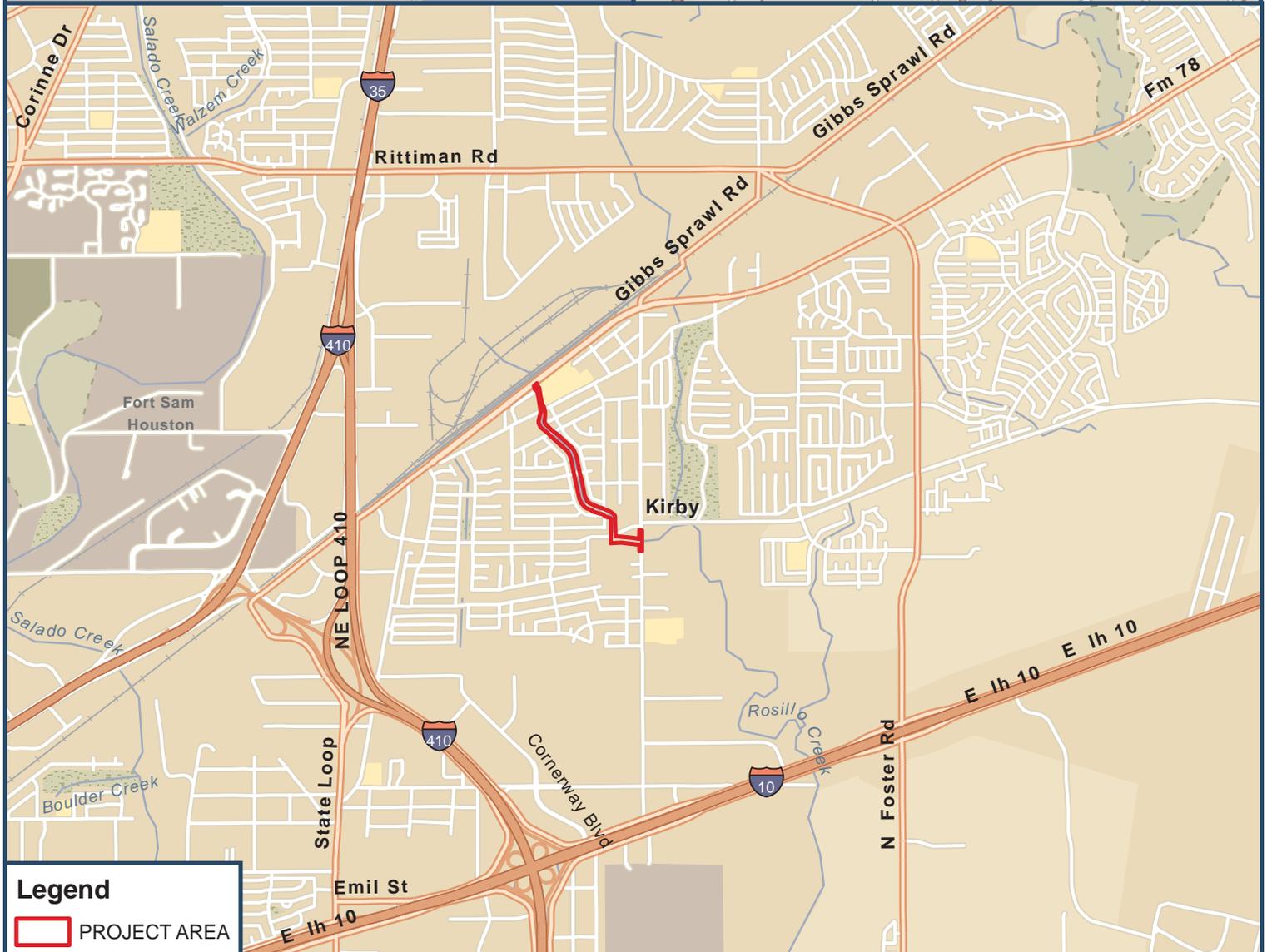
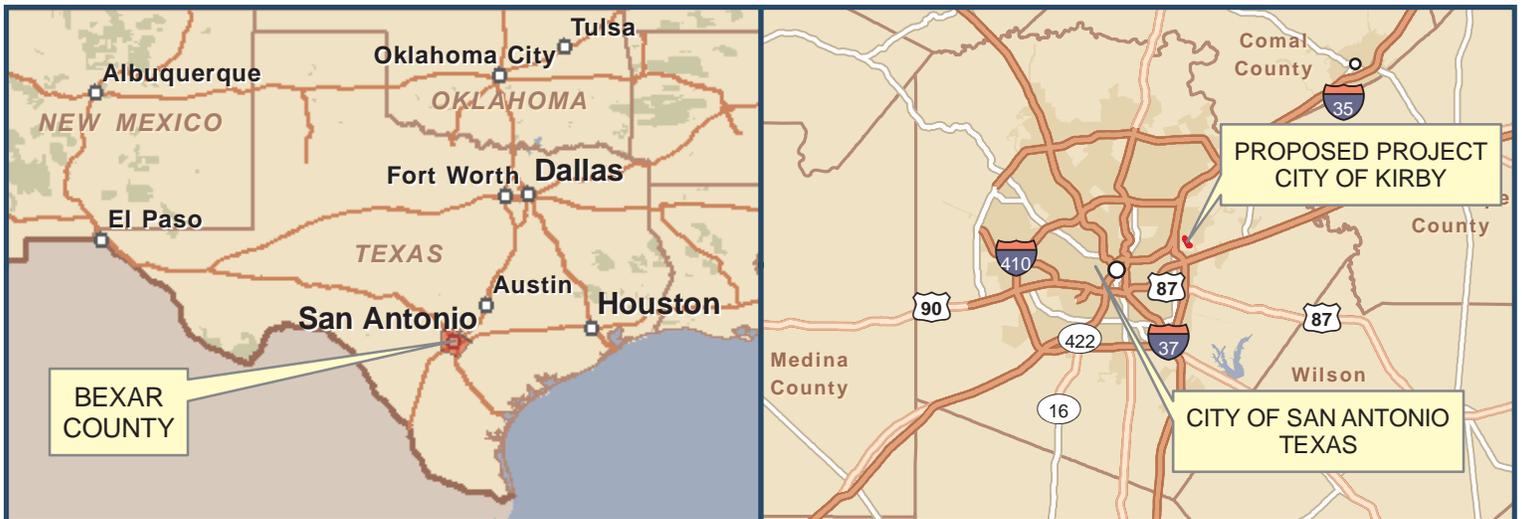
FLOODPLAIN MANAGEMENT: The USACE is sending a copy of this public notice to the local floodplain administrator. In accordance with 44 CFR part 60 (Flood Plain Management Regulations Criteria for Land Management and Use), the floodplain administrators of participating communities are required to review all proposed development to determine if a floodplain development permit is required and maintain records of such review.

SOLICITATION OF COMMENTS: The public notice is being distributed to all known interested persons in order to assist in developing fact upon which a decision by the USACE may be based. For accuracy and completeness of the record, all data in support or in opposition to the proposed work should be submitted in writing setting forth sufficient detail to furnish a clear understanding of the reasons for support or opposition.

PUBLIC HEARING: Prior to the close of the comment period any person may make a written request for a public hearing setting forth the particular reasons for the request. The District Engineer will determine whether the issues raised are substantial and should be considered in his permit decision. If a public hearing is warranted, all known interested persons will be notified of the time, date, and location.

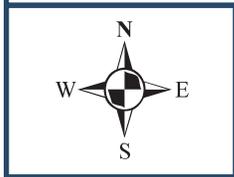
CLOSE OF COMMENT PERIOD: All comments pertaining to this Public Notice must reach this office on or before March 10, 2012, which is the close of the comment period. Extensions of the comment period may be granted for valid reasons provided a written request is received by the limiting date. If no comments are received by that date, it will be considered that there are no objections. Comments and requests for additional information should be submitted to: Regulatory Branch, CESWF-PER-R; U.S. Army Corps of Engineers; Post Office Box 17300; Fort Worth, Texas 76102-0300. You may visit the Regulatory Branch in Room 3A37 of the Federal Building at 819 Taylor Street in Fort Worth between 08:00 A.M. and 03:30 P.M., Monday through Friday. Telephone inquiries should be directed to (817) 886 -1731. Please note that names and addresses of those who submit comments in response to this public notice may be made publicity available.

**DISTRICT ENGINEER
FORT WORTH DISTRICT
CORPS OF ENGINEERS**



Legend

PROJECT AREA



DATE: MAY 19, 2011



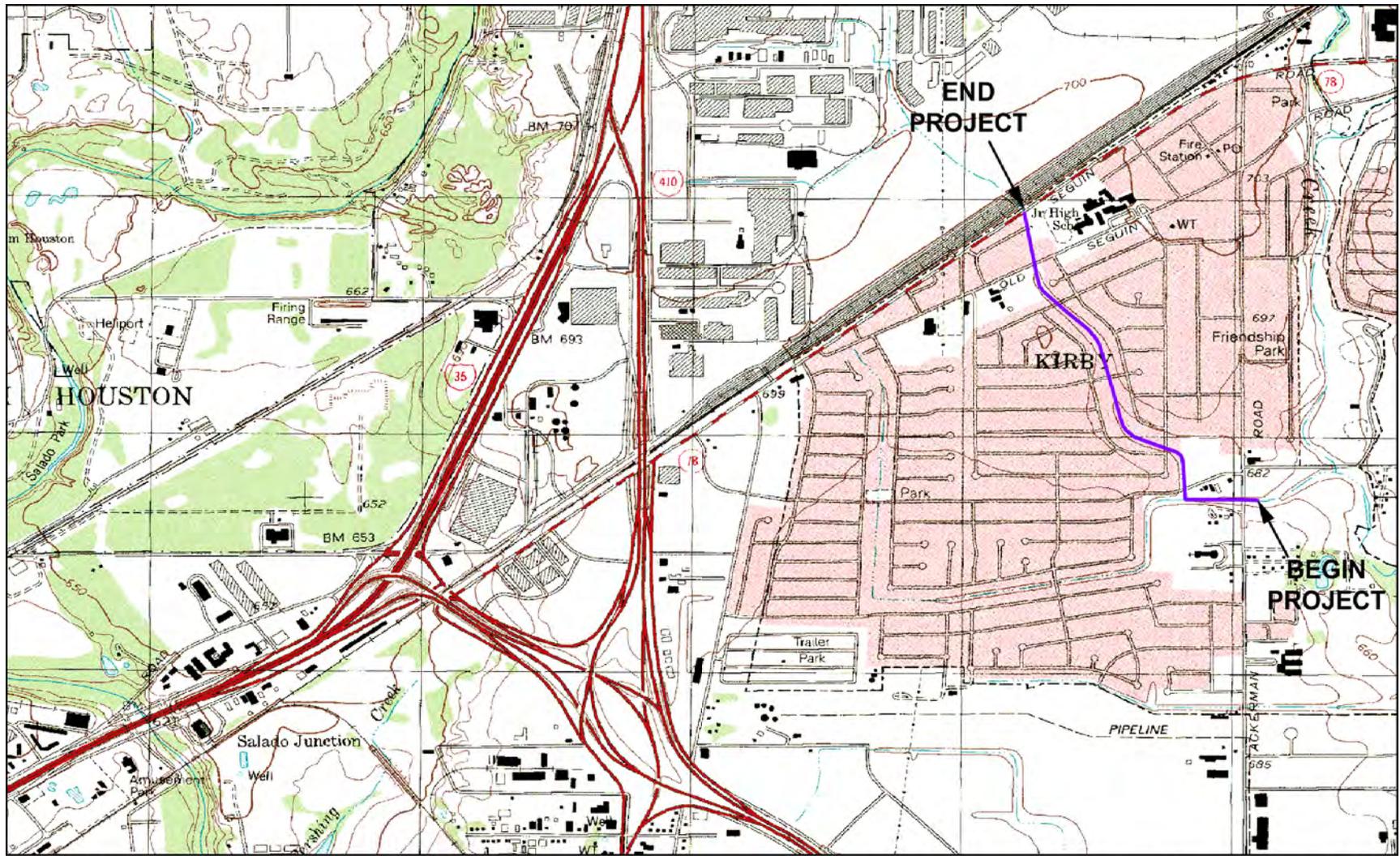
SOURCE: ESRI BASE DATA

**FIGURE 1
GENERAL LOCATION
ROSILLO CREEK NWWC (SC-15)**

ALAN PLUMMER
ASSOCIATES, INC.
ENVIRONMENTAL
ENGINEERS AND SCIENTISTS
1320 S. UNIVERSITY DRIVE
SUITE 300
FORT WORTH, TEXAS 76107
PHONE: (817) 806-1700
FAX: (817) 870-2536

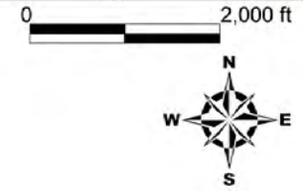
FIGURE 1

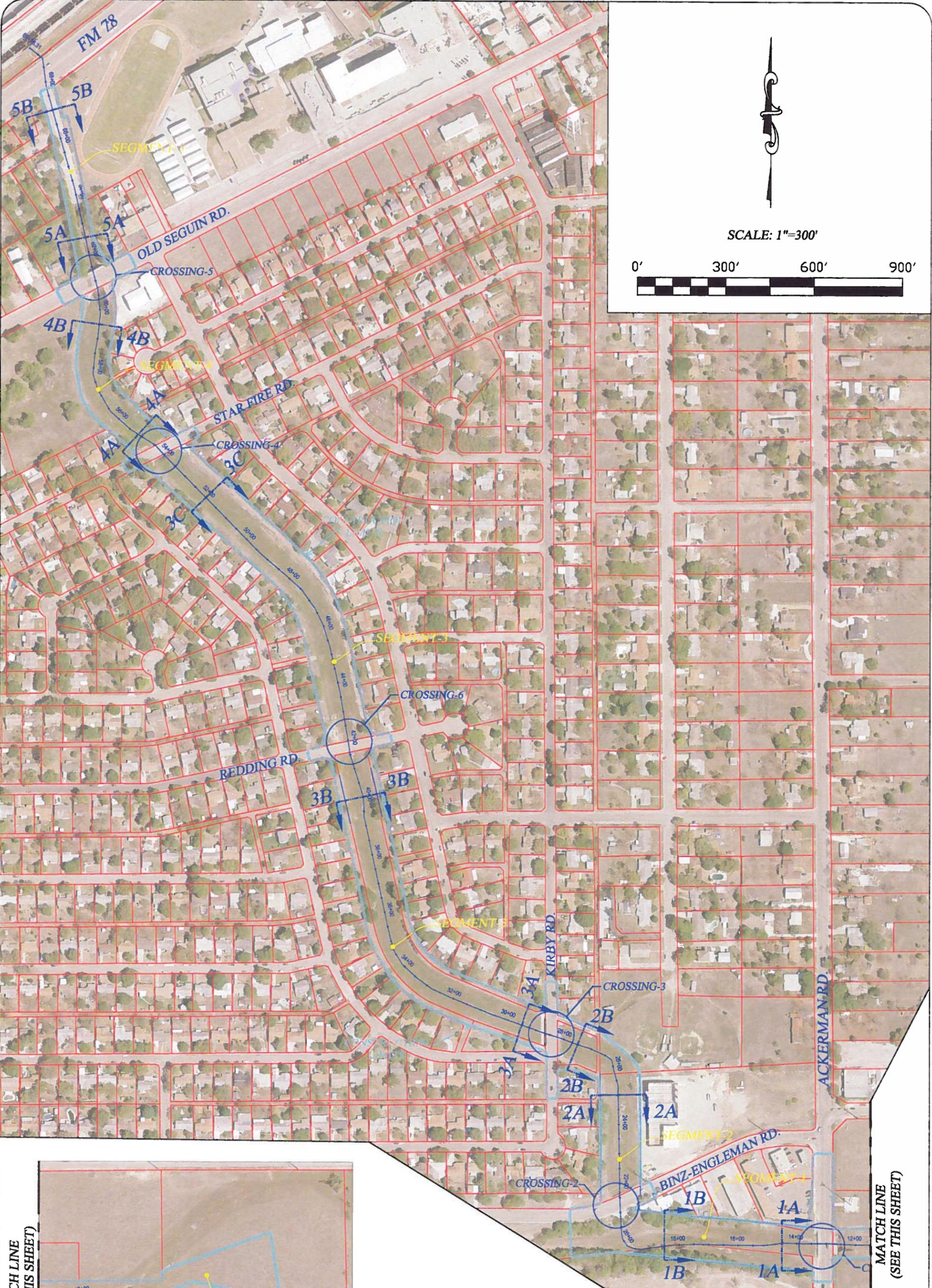
USACE PROJECT NUMBER
2009-00473



Base map: 7.5' USGS
topographic quadrangle,
East San Antonio, Texas
[http://www.tnris.state.tx.us/
datadownload/download.jsp](http://www.tnris.state.tx.us/datadownload/download.jsp)
Accessed 8/10

Figure 2
Project Location on USGS Base Map
Rosillo Creek NWWC (SC-15) Project
Kirby, Bexar County, Texas





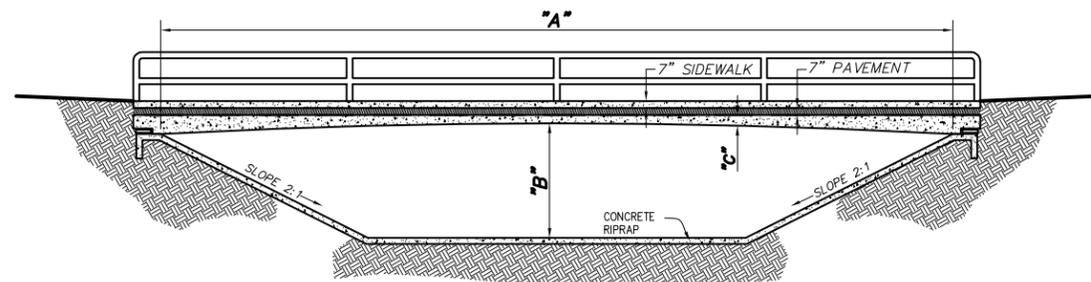
NOTE:
 SEE SECTION DETAILS
 AND CROSSINGS ON
 SHEET 2 OF 3 & SHEET 3 OF 3

DATE: 11-07-11
 DESIGNED BY: J.A.C.
 DRAWN BY: J.A.C.
 CHECKED BY: J.A.M.
 SCALE: 1"=300'
 JOB No. 185000101

PATE ENGINEERS
 TBPL F-002726
 8200 IH-10 West, Suite 316, San Antonio, Tx. 78230
 Phone: 210-340-8481

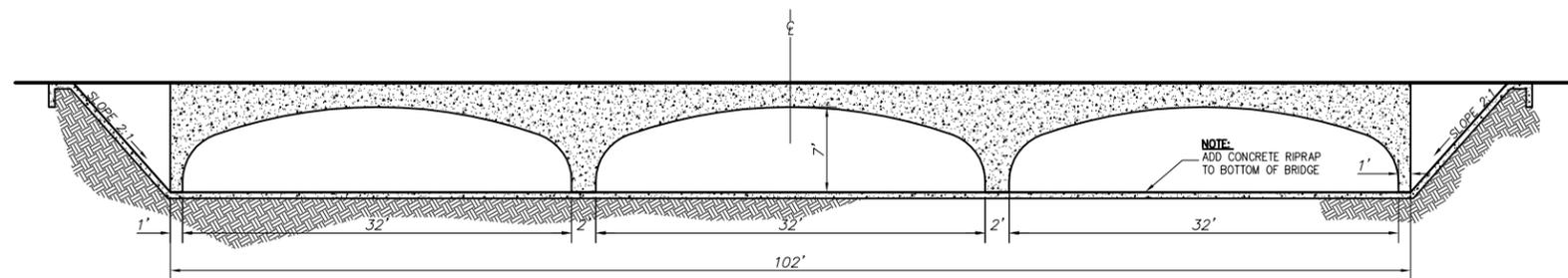
Figure 3
 Project Location on Aerial Base Map
 Rosillo Creek NWWC (SC-15) Project
 Kirby, Bexar County, Texas

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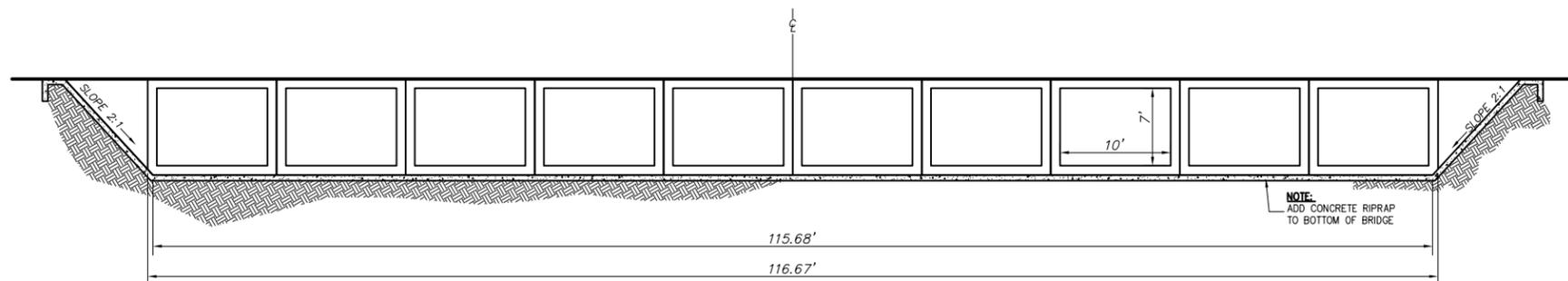


STREET	SPAN- "A"	DEPTH-"B"	BEAM SIZE-"C"
OLD SEGUIN RD.	65 FT	8.5 FT	20 INCHES
BINZ ENGLEMAN	90 FT	10 FT	36 INCHES
ACKERMAN RD.	120 FT	8.2 FT	36 INCHES

CROSSING-1,2, & 5
PROPOSED IMPROVEMENTS
BRIDGE DETAILS
 NOT TO SCALE



CROSSING-4
STARFIRE RD.
3- 32'x7' ARCH SPAN CULVERTS
LENGTH~ 45'
 NOT TO SCALE



CROSSING-3 AND CROSSING-6
KIRBY DR.
10- 10'x7' DIRECT DRIVE BOX CULVERTS
LENGTH~46'
 NOT TO SCALE

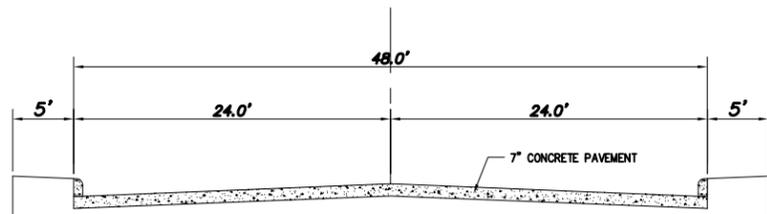
CROSS SECTION AND DETAILS
FOR
ROSILLO CREEK

DATE: 11-07-11
 DESIGNED BY: JAC
 DRAWN BY: RAD
 CHECKED BY: JAC
 Figure 4

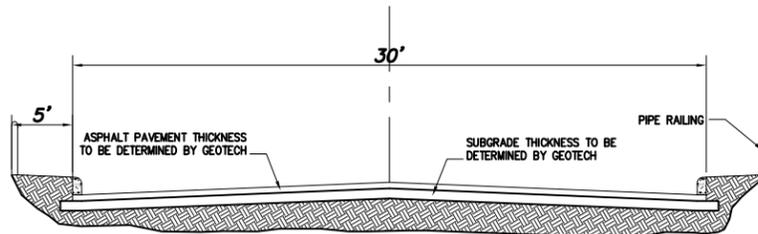
PATE ENGINEERS
 8200 IH-10 West - Suite 440
 San Antonio, Texas 78230
 OFFICE: (210) 340-8481 FAX: (210) 340-3964

JOB No.
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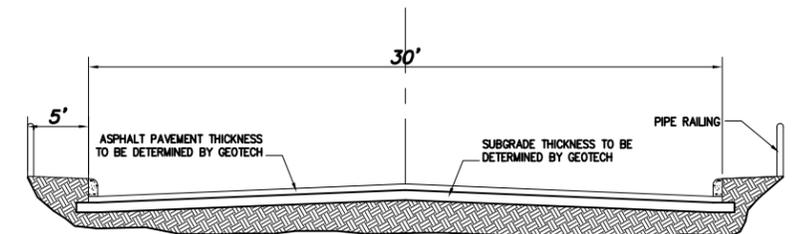
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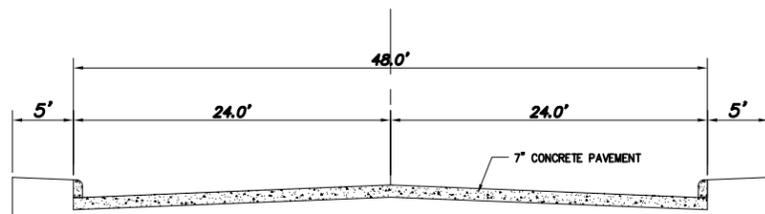
CROSSING-1
ACKERMAN ROAD CROSS SECTION
NOT TO SCALE



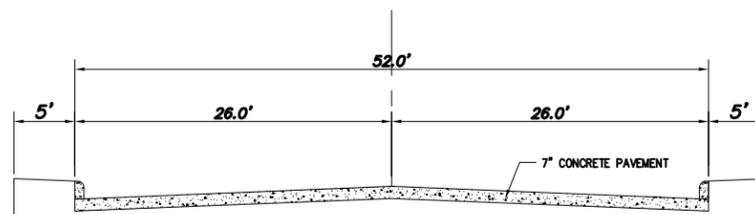
CROSSING-3
KIRBY DR. CROSS SECTION
NOT TO SCALE



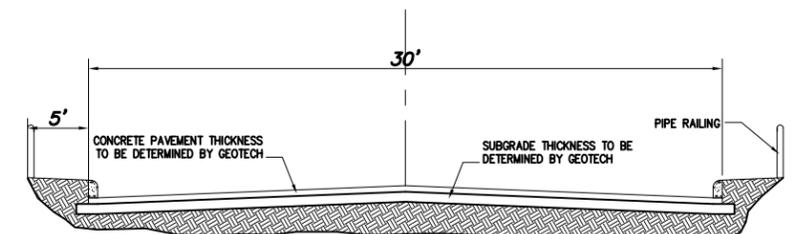
CROSSING-4
STARFIRE RD. CROSS SECTION
NOT TO SCALE



CROSSING-2
BINZ-ENGELMAN RD. CROSS SECTION
NOT TO SCALE



CROSSING-5
OLD SEGUIN RD. CROSS SECTION
NOT TO SCALE



CROSSING-6
REDDING DR. CROSS SECTION
NOT TO SCALE

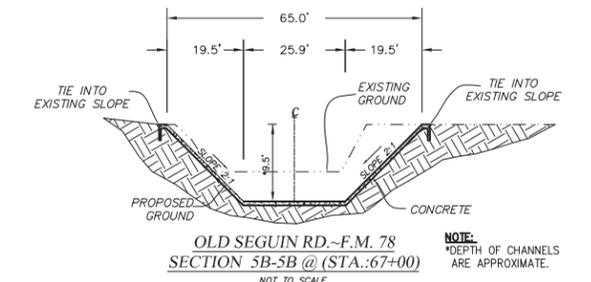
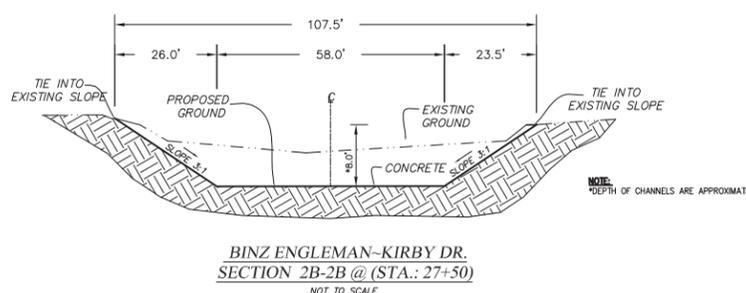
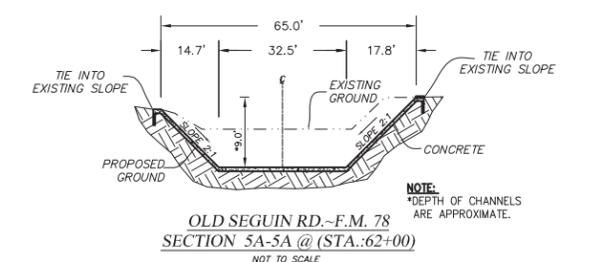
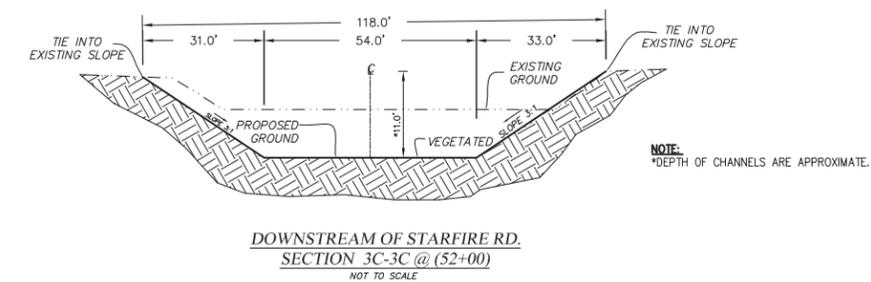
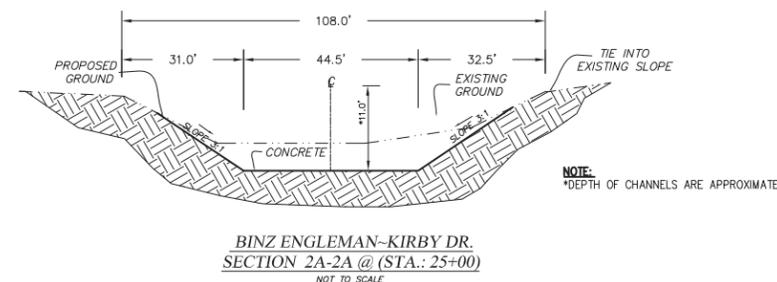
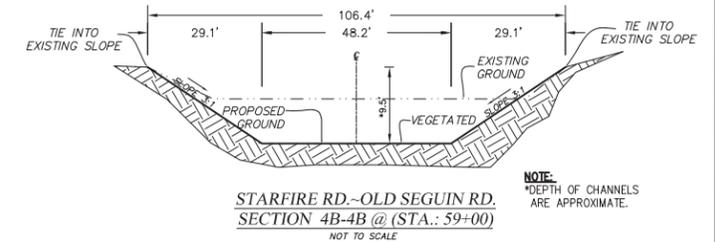
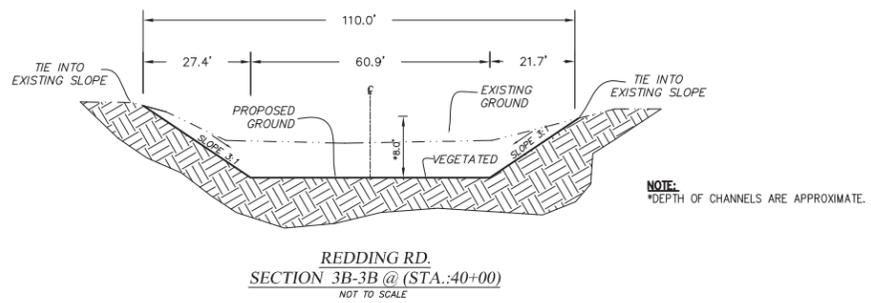
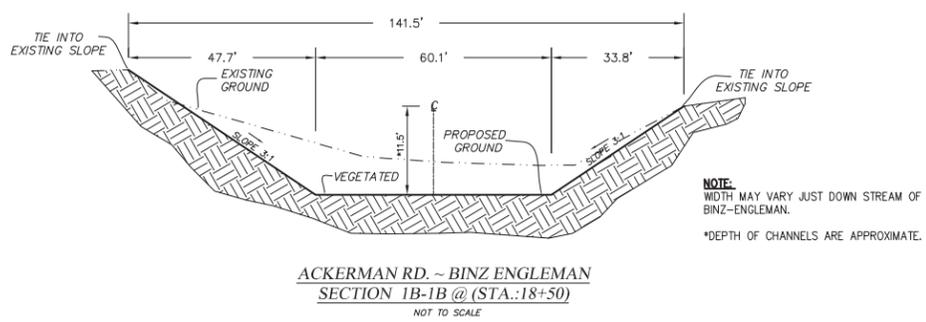
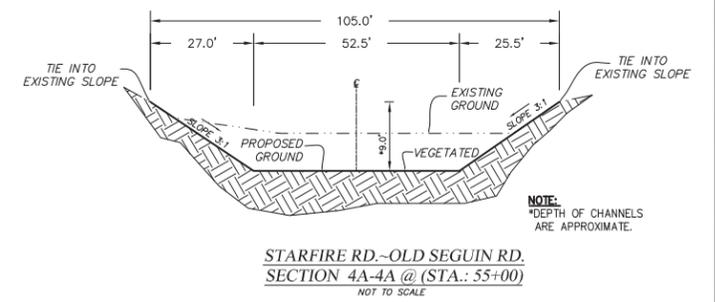
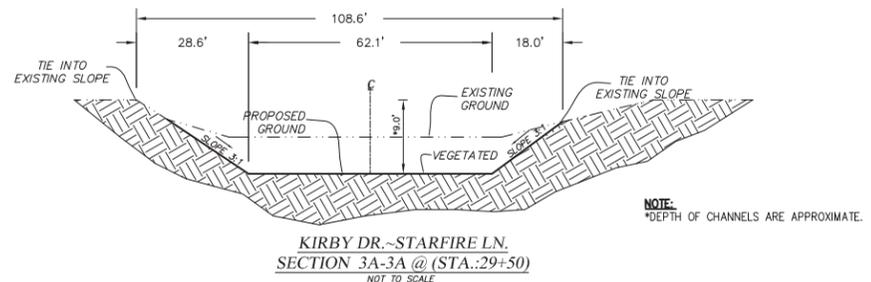
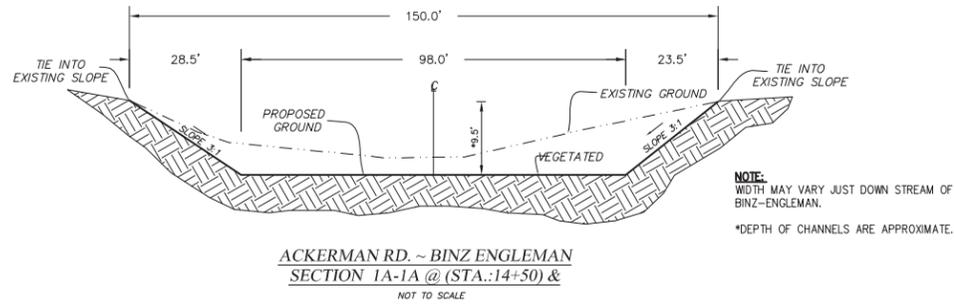
PAVEMENT CROSS SECTION AND DETAILS
FOR
ROSILLO CREEK

DATE: 11-07-11
DESIGNED BY: JAC
DRAWN BY: RAD
CHECKED BY: JAC
Figure 5

PATE ENGINEERS
8200 IH-10 West - Suite 440
San Antonio, Texas 78230
OFFICE: (210) 340-8481 FAX: (210) 340-3964

JOB No.
185000100

Z:\185000100\Exhibits\PRO-IMPROVEMENT_EX.dwg Jan 23, 2012 - 8:24am Defreitas, Robert

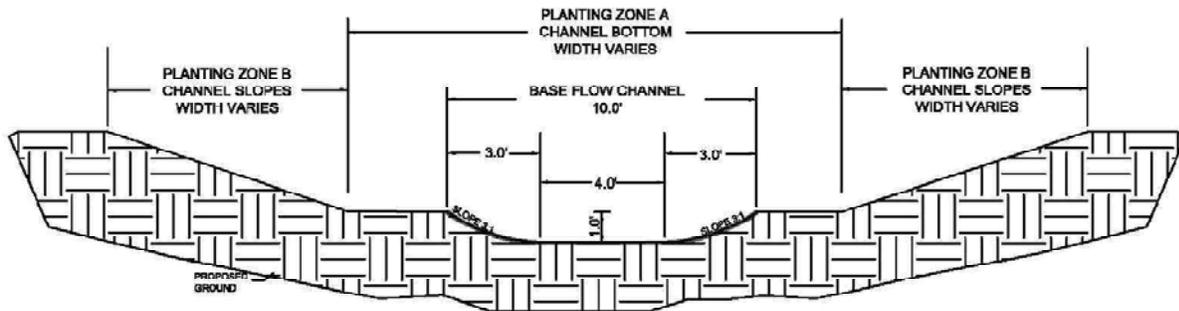


CROSS SECTION AND DETAILS
FOR
ROSILLO CREEK

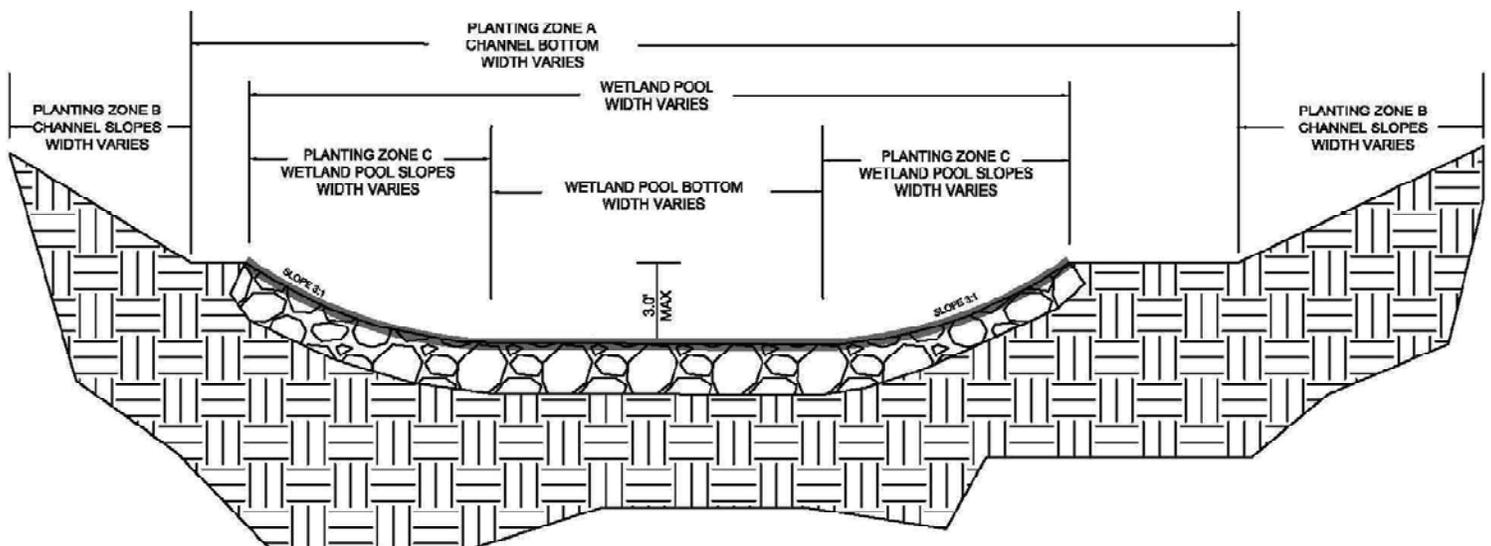
DATE: 1-23-12
DESIGNED BY: JAC
DRAWN BY: RAD
CHECKED BY: JAC
Figure 6

PATE ENGINEERS
8200 IH-10 West - Suite 440
San Antonio, Texas 78230
OFFICE: (210) 340-8481 FAX: (210) 340-3964

JOB No.
185000100



TYPICAL BASE FLOW CHANNEL DETAIL WITH PROPOSED PLANTING ZONES



TYPICAL WETLAND POOL DETAIL WITH PROPOSED PLANTING ZONES



DATE: MAY 19, 2011

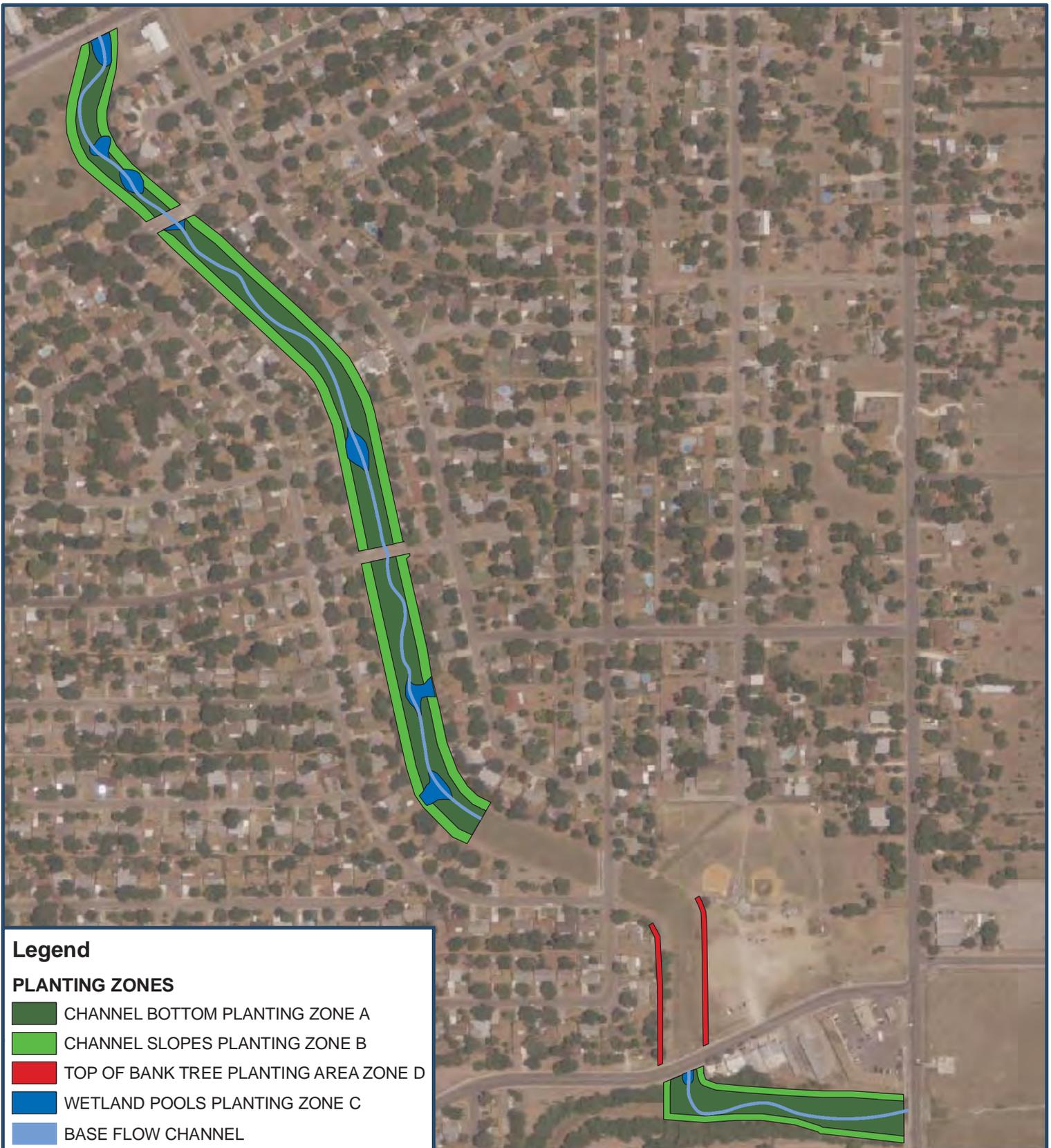
**BASE FLOW CHANNEL AND WETLAND POOL CROSS SECTIONS
ROSILLO CREEK NWWC (SC-15)
MITIGATION PLAN**

ALAN PLUMMER
ASSOCIATES, INC.
ENVIRONMENTAL
ENGINEERS AND SCIENTISTS
1320 S. UNIVERSITY DRIVE
SUITE 300
FORT WORTH, TEXAS 76107
PHONE: (817) 806-1700
FAX: (817) 870-2536

FIGURE 7

FIGURE NOT TO SCALE

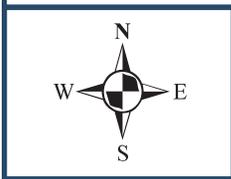
USACE PROJECT NUMBER
2009-00473



Legend

PLANTING ZONES

- CHANNEL BOTTOM PLANTING ZONE A
- CHANNEL SLOPES PLANTING ZONE B
- TOP OF BANK TREE PLANTING AREA ZONE D
- WETLAND POOLS PLANTING ZONE C
- BASE FLOW CHANNEL



DATE: MAY 19, 2011

FIGURE 8

ROSILLO CREEK NWWC (SC-15)
MITIGATION PLAN

ALAN PLUMMER ASSOCIATES, INC.
 ENVIRONMENTAL ENGINEERS AND SCIENTISTS
 1320 S. UNIVERSITY DRIVE SUITE 300
 FORT WORTH, TEXAS 76107
 PHONE: (817) 806-1700
 FAX: (817) 870-2536

FIGURE 8



SOURCE: TNRRIS

USACE PROJECT NUMBER
2009-00473