DART ORANGE LINE
DFW AIRPORT EXTENSION

DART ORANGE LINE DFW AIRPORT EXTENSION
IRVING-3 ENVIRONMENTAL ASSESSMENT

FINAL • SEPTEMBER 2011

DART®

APPENDICES

APPENDICES

APPENDIX A. LIST OF PREPARERS

APPENDIX A. LIST OF PREPARERS

PUBLIC AGENCIES

Federal Transit Administration, Region VI Office

Federal agency responsible for project. Key personnel include:

Peggy Crist, Directory of Planning and Development

Lynn Hayes, Community Planner

Julieann Dwyer, Environmental Protection Specialist

Gail Lyssy, Regional Engineer

Joe Ossi, Environmental Protection Specialist (FTA Headquarters, Washington, D.C.)

Tricia Harr, AICP, Environmental Protection Specialist (FTA Headquarters, Washington, D.C.)

Federal Aviation Administration, Southwest Region

Cooperating agency. Key personnel include:

Paul Blackford, Airport Environmental Specialist

Rodney Clark, Senior Program Manager, Texas Airports Development Office

Dallas Area Rapid Transit, Dallas, Texas

Client agency responsible for project. Key personnel include:

John Hoppie, Project Manager, Irving-3

Steve Salin, Vice President, Capital Planning and Development

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Chris Masters, Assistant Vice President, Rail Program Development

Allen “Bud” Beene, Project Manager III

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Carlos Huerta, Community Affairs

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URS Corporation

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Sandra Lancaster, Environmental Affairs Department

Ed Simon, Environmental Affairs Department

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Wade McClaren, Airport Operations

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Mayra Diaz

Quality Counts, Inc.

Linda Larkins, President

Tarrant County

Joe Trammel, Floodplain Administrator, Public Works

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Texas Parks & Wildlife Department

Karen Hardin

U.S. Army Corps of Engineers Forth Worth District

Wayne Lee

Fredrick Land

USDA-Natural Resource Conservation Service

Laurie Kiniry

U.S. Fish & Wildlife Service

John Morse

APPENDIX B. DISTRIBUTION LIST

APPENDIX B. DISTRIBUTION LIST

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Willie Taylor, Director, Office of Environmental Policy and Compliance, Department of the Interior

Marvin Keller, Bureau of Indian Affairs, Department of the Interior

Elizabeth Meyer, Bureau of Land Management, Department of the Interior

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Tony Russell, Regional Administrator, Federal Emergency Management Agency Region VI

Sal Deocampo, District Engineer, Federal Highway Administration, Texas Division

JD Salinas, Regional Administrator, General Service Administration, Region 7

Shannon Carter, DFW Terminal D Manager, Transportation Security Administration

Michael A. McMullen, Stakeholder Manager, Transportation Security Administration

Bob Cook, Field Office Director, U.S. Department of Housing and Urban Development, Dallas Office

Colonel Richard Muraski, Jr., Commander, U.S. Army Corps of Engineers, Fort Worth District

Wayne Lea, Chief, Regulatory Branch, U.S. Army Corps of Engineers, Fort Worth District

Rear Admiral Mary E. Landry, Commander, U.S. Coast Guard, 8th District

Dr. Alfredo Armendariz, Administrator, U.S. Environmental Protection Agency, Region 6

John Blevins Division Director, Compliance Assurance and Enforcement Division, Office of Planning and Coordination, U.S. Environmental Protection Agency

Dr. Benjamin Tuggle, Acting Director, U.S. Fish and Wildlife Service, Region 2

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Jim Bruseth, Archeologist, Director of State and Federal Review, Texas Historical Commission

Adrian Campbell, Preservation Consultant, Texas Historical Commission

Greg Smith, National Register Coordinator, Texas Historical Commission

William Hale, Dallas District Engineer, Texas Department of Transportation

Robert Brown, P. E. Deputy District Engineer, Texas Department of Transportation

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Dan Perge, Environmental Affairs – Dallas, Division, Texas Department of Transportation

James Randall, Director, Transportation Planning & Programming Division, Texas Department of Transportation

Tony Walker, Region 4 Director, Texas Commission on Environmental Quality

Carter Smith, Executive Director, Texas Parks & Wildlife Department

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Chad Edwards, Program Manager, NCTCOG

John Promise, Director of Environmental and Development, NCTCOG

Rider Scott, Executive Director, Dallas Regional Mobility Coalition

Dick Ruddell, Executive Director, Fort Worth Transportation Authority

Jim Cline, President, Denton County Transportation Authority (DCTA)

Jeffrey P. Fegan, CEO, Dallas/Fort Worth International Airport (DFW Airport)

Andrew L. Bell, Vice President Planning, DFWIA

Bob Blankenship, Planning, DFWIA

Greg Royster, Planning, DFWIA

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Hector Saenz, City Manager, City of Cockrell Hill

Clay Phillips, City Manager, City of Coppell

The Honorable Mayor Doug Stover, City of Coppell

Mary K. Suhm, City Manager, City of Dallas

The Honorable Mayor Dwaine Caraway, City of Dallas

Gary D. Greer, City Manager, City of Farmers Branch

Dale Fisseler, City Manager, City of Fort Worth

The Honorable Mayor Michael J. Moncrief, City of Fort Worth

William E. Dollar, City Manager, City of Garland

Jacqueline L. Lee, City Manager City of Glenn Heights

Bruno Rumbelow, City Manager, City of Grapevine

The Honorable Mayor William D. Tate, City of Grapevine

Bill Lindley, Town Administrator, Town of Highland Park

Tomas Gonzalez, City Manager, City of Irving

The Honorable Mayor Herbert A. Gears, City of Irving

Bruce Glasscock, City Manager, City of Plano

Frank Turner, Deputy City Manager, City of Plano

Bill Keffler, City Manager, City of Richardson

Lynda K. Humble, City Manager, City of Rowlett

Bob Livingston, City Manager, City of University Park

Donald Holzwarth, Director of Public Works, Dallas County

Renee Lamb, P.E., Director of Transportation Services, Tarrant County

U.S. LEGISLATORS

Senator Kay Bailey-Hutchison, United States Senator

Senator John Cornyn, United States Senator

Representative Kenny Marchant, United States Congressman (24th District)

Representative Michael Burgess, United States Congressman (26th District)

Representative Pete Sessions, United States Congressman (32th District)

STATE ELECTED OFFICIALS

Governor Rick Perry, Texas

Senator Bob Deuell, Texas State Senate (2nd District)

Senator Florence Shapiro, Texas State Senate (8th District)

Senator Chris Harris, Texas State Senate (9th District)

Senator Wendy Davis, Texas State Senate (10th District)

Senator Jane Nelson, Texas State Senate (12th District)

Senator John Carona, Texas State Senate (16th District)

Senator Royce West, Texas State Senate (23rd District)

Representative Lon Burnam (90th District)

Representative Kelly Hancock (91st District)

Representative Todd Smith (92nd District)

Representative Barbara Nash (93rd District)

Representative Diane Patrick (94th District)

Representative Marc Veasey (95th District)

Representative William "Bill" Zedler (96th District)

Representative Mark Shelton (97th District)

Representative Vicki Truitt (98th District)

Representative Carlie Geren (99th District)

Representative Eric Johnson, Texas House of Representatives (100th District)

Representative Cindy Burkett, Texas House of Representatives (101st District)

Representative Stefani Carter, Texas House of Representatives (102nd District)

Representative Rafael Anchia, Texas House of Representatives (103rd District)

Representative Roberto Alonzo, Texas House of Representatives (104th District)

Representative Linda Harper-Brown, Texas House of Representatives (105th District)

Representative Rodney Anderson, Texas House of Representatives (106th District)

Representative Kenneth Sheets, Texas House of Representatives (107th District)

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Representative Barbara Mallory Caraway, Texas House of Representatives (110th District)

Representative Yvonne Davis, Texas House of Representatives (111th District)

Representative Angie Chen Button, Texas House of Representatives (112th District)

Representative Joe Driver, Texas House of Representatives (113th District)

Representative Will Hartnett, Texas House of Representatives (114th District)

Representative Jim Jackson, Texas House of Representatives (115th District)

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The Honorable Clay Jenkins, County Judge

The Honorable Maurine Dickey, County Commissioner, District 1

The Honorable Mike Cantrell, County Commissioner, District 2

The Honorable John Wiley Price, County Commissioner, District 3

The Honorable Dr. Elba Garcia, County Commissioner, District 4

LIBRARIES

J. Erik Johnson Central Public Library

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William T. Cozby Public Library, Coppell

INTERESTED ORGANIZATIONS/ASSOCIATIONS/PROPERTY OWNERS

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Michael Burgess, Chairman, Comanche Nation of Oklahoma

Don L. Patterson, President, Tonkawa Tribe of Oklahoma

Stratford Williams, President, Wichita and Affiliated Tribes

Brenda Shemayme Edwards, Chairperson, Caddo Nation

Al Rojas, Interim Director, Dallas Convention Center

Phillip Jones, Dallas Convention and Visitors Bureau

American Airlines, Dan Hagan

American Airlines, Christopher J. Collison

Irving Chamber of Commerce, Chris E. Wallace

Las Colinas Association, Rick Bidne

APPENDIX C. PUBLIC HEARING TRANSCRIPT

PUBLIC HEARING TO RECEIVE COMMENTS ON THE IRVING 3 TO DFW EXTENSIONS - ORANGE LINE

HELD ON THURSDAY, JUNE 2, 2011

DFW AIRPORT MARRIOTT

8440 FREEPORT PARKWAY

IRVING, TEXAS

Transcribed by Barby D. Black, CSR

Transcription date: June 8, 2011

PUBLIC HEARING TO RECEIVE COMMENTS ON THE IRVING 3 TO DFW EXTENSIONS - ORANGE LINE

HELD ON THURSDAY, JUNE 2, 2011
DFW AIRPORT MARRIOTT
8440 FREEPORT PARKWAY
IRVING, TEXAS

Transcribed by Barby D. Black, CSR
Transcription date: June 8, 2011

MR. HUERTA: It is now officially on my watch 7:14 p.m. I'm going to ask the court reporter to start transcribing, and we're going to go ahead and take the first comment from whomever wishes to speak first. All right, Kim.

MS. LIMBERG: Hi. I'm Kim Limberg. I'm a resident of Irving at 1910 Cartwright Street, Irving, Texas. Can I take this out?

MR. HUERTA: Sure.

MS. LIMBERG: My concern is still just the safety issue, the number of times you're going to have plane/train crossings. Early on in the process, I commented about doing the tunnel thing as we approach the airport, and that was said to be cost prohibitive.

I wonder if you considered an open cut depressed section. It kind of lends itself to that because you have a higher elevation at the airport field compared to where you're coming from, the Trinity River, a 500 or so elevation, 600 at the airport.

So it would easily go into a depressed section and provide some shelter for the trains from any incoming planes or anybody missing on landing. I'd like to see maybe an estimate to do a cost comparison versus paying for 400 casualties. Thank you.

MR. HUERTA: Thank you, Kim. Appreciate

it. All right. We'll go ahead and take the next comment from -- just go ahead and start lining up if you want to or however you want to do it. We have -- nobody's registered to speak officially for this public hearing yet, but I know there's some folks that want to speak about the Irving 3 Segment, so just go ahead and go on up. Anybody for official comment? Rick, yes.

MR. LINDSEY: Hello, Carlos. My name is Rick Lindsey. I live at 509 East Rochelle in Irving, and I would like to just make some complimentary statements.

My involvement with the orange line from the beginning goes back many years in trying to decide the alignment, and my compliments are off to you, John and Carlos, and the DART management team and also to the DART board and -- under the leadership of our chairman, Velasco.

They've done a great job. The partnership that I see that DFW International Airport has formed with the DART team has been excellent. The support we're getting from the FAA in terms of trying to move forward with this environmental assessment is moving along very quickly.

They're doing a great job of working together, and you bring in the City of Irving and our

management team there as well as the council and the mayor. So we have a great team that is formed to be the first to get light rail or any rail into DFW.

And I think you mentioned this will benefit the 30,000 plus folks that work out there, plus you can get on the orange line in Plano and ride that all the way to DFW or you can get on the green line and change over or you can get on the blue line.

So we're opening up this whole Dallas area region, and it'll give people an opportunity as well as we're going to give people an opportunity to come into the region, step on our rail system, make it to Irving, make it to our hotels, our convention center, which is a great thing, take it on down to Dallas to their convention or whatever.

It's going to be a very seamless transition. The DFW International folks are doing a tremendous job in designing the terminals. It's going to be a -- kind of a state-of-the-art that I think the rest of the country is going to kind of look and say this is what you should do when you bring rail into the airport or you complete the I-3.

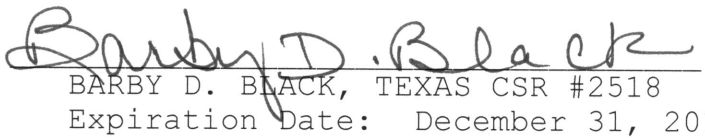
So my congratulations to you and the team, the City of Irving, and the rest of the DART board people for having the vision, leadership from you guys

STATE OF TEXAS)

COUNTY OF DALLAS)

THIS IS TO CERTIFY THAT I, BARBY D. BLACK, a Certified Shorthand Reporter in and for the State of Texas, reported in shorthand the proceedings had at the time and place set forth in the caption hereof, and that the above and foregoing 5 pages contain a full, true, and correct transcript of the said proceedings.

Certified to on this the 8th day of June, 2011.



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NORTH TEXAS TOLLWAY AUTHORITY
Public Notice

The North Texas Tollway Authority (NTTA) will receive sealed bids at 5900 W. Plano Pkwy. Suite 100, Plano, TX 75093 until Monday, May 23, 2011 at 1:00 P.M. for the following project: **02946-H161-03-CN-PM.** Construction of a Sand Stockpile Site beneath State Highway 161 Bridge approximately 800 feet north of Oakdale Road. The approximate Engineer's Estimate is $1.2M.

Mandatory pre-bid meeting will be held on Monday, May 9, 2011 at 1:00 P.M. at 5900 W. Plano Parkway, Suite 200, Plano, TX 75093. The pre-bid meeting is mandatory for all those intending to bid as a prime contractor.

Bid documents including reference reports will be available at www.thomasrepro.com/dfntta on Monday, April 4, 2011. Direct all questions to Director of Procurement at bidpurchasing@ntta.org .

All bids shall be submitted in sealed envelopes marked clearly with the project number, company's name, and bid

stable carton) cartons for the SFSP program. Approximately 2,000 children will be served daily at nearly 20 program locations. Bid items to be delivered to a single warehouse location. Bids must be submitted by 5:00 p.m. on May 13, 2011. Public invited to the opening of bids May 16, 2011, at 11:00 a.m., 4500 S. Cockrell Hill Road, Dallas, Texas, 75236. Invitations for Bid may be obtained by calling 1-214-347-9586 or by e-mailing taylor@nttb.org. In accordance with Federal law and U.S. Department of Agriculture policy, this institution is prohibited from discriminating on the basis of race, color, national origin, sex, age, or disability. To file a complaint of discrimination, write USDA, Director, Office of Adjudication and Compliance, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 260-1026, (866) 632-9992 (toll free), or (202) 401-0216 (TDD). USDA is an equal opportunity provider and employer.

Legal Notices

CITY OF DALLAS
NOTICE
PUBLIC HEARING

A public hearing has been scheduled for May 10, 2011 at 10:30a.m. at Dallas City Hall, 1500 Marilla, 2/B/South, Dallas, Texas, to consider an application for limousine service operating authority submitted by Demis Zewdie dba DZ Limousine Service

11-0935

The front rate for 6-inch thickness reinforced concrete pavement 13.5 feet wide with curb: $74.43/L. F.

The side rate for 6-inch thickness reinforced concrete pavement 2.5 feet wide with curb: $15.42/L. F.

The front rate for 4-inch reinforced concrete sidewalk is: $7.28/L. F. The side rate for 4-inch reinforced concrete sidewalk is: $3.64/L. F.

This project may be eligible to be funded in part by Community Development Block Grant (CDBG) funds provided by the Department of Housing and Urban Development. Low and moderate income residents, who own and occupy their property as a homestead, may be able to apply for a grant from CDBG funds to pay all of their assessment.

CITY OF DALLAS
NOTICE
PUBLIC HEARING

A public hearing has been scheduled for May 10, 2011 at 9:30a.m. at Dallas City Hall, 1500 Marilla, 2/B/South, Dallas, Texas, to consider an application for limousine service operating authority submitted by Eyob Yetbarek dba Highland Transport Dallas.

DART Public Hearing
Orange Line DFW Extension (Irving-3)

DART, along with the Federal Transit Administration (FTA) and in cooperation with the Federal Aviation Administration (FAA), has completed the Draft Environmental Assessment (EA) for the DART Orange Line DFW Extension Project (Irving-3). The Draft EA evaluates and summarizes all environmental impacts associated with the light rail transit (LRT) alignment.

A Public Hearing has been scheduled to receive comments on the Draft EA, and a related Service Plan Amendment, which will identify the alignment, grade separations, a storage yard and the station location for the LRT line into DFW Airport. The Public Hearing is part of a comment period extending from May 16, 2011 through June 17, 2011.

All comments, written or oral will be incorporated into the Final Environmental Assessment. The DART Board will then make the official decisions regarding the Draft EA and Service Plan Amendment for the DART Orange Line DFW Extension Project (Irving-3). Oral comments may be provided at the Public Hearing or at a regular Board Meeting. Written Comment may be submitted online at www.dart.org/IrvingDFW, or sent to: John Hoppie, Project Manager, DART, P.O. Box 660163, Dallas, Texas 75266-0163.

Make plans to join DART staff at the DFW Airport Marriott on June 2, 2011. There will be an Open House at 6 p.m., followed by the presentation and Public Hearing at 6:30 pm. The official Draft EA document will be available online on or before May 16, 2011, at www.dart.org/IrvingDFW, as well as at the Irving Central Library, the Dallas Central Library, Grapevine Public Library and the Coppell William T. Cozby Library. CD copies are also available through DART Community Affairs.

PUBLIC HEARING:
Thursday, June 2, 2011
(Open House at 6 p.m. - Presentation at 6:30 p.m.)
DFW Airport Marriott
8440 Freeport Parkway · Irving, Texas 75063
MAPSCO 11-T · Along DART Bus Route 310

For more information, contact DART Community Affairs at 214.749.2543, or visit www.dart.org/IrvingDFW.

NOTICE OF CITY PLAN COMMISSION HEARING RESIDENTIAL REPLATS

The City Plan Commission of the City of Dallas, Texas, will hold a public hearing at 1:30 p.m., **Thursday, May 19, 2011** in the City Council Chambers of Dallas City Hall, 6th Floor, 1500 Marilla Street, to consider the residential replat described below:

S101-091 6112 Reiger Avenue & 100 S. Glasgow Drive

An application to replat an 18.051 acre tract of land containing all of Lots 6 thru 9 in City Block C/1670; lots 14 thru 17 in City Block E/1669; Lots 1 thru 10 in City Block C/1668, part of City Blocks 1671, 1672, 2785 and 2786 on property bounded by Rieger Avenue, Paulus Street, Covington Lane and Glasgow Drive.

S101-093 2414 thru 2506 Kilburn Avenue

An application to replat all of Lots 1, 2, 3, 4, 5 and 6 in the "Highland Acres Addition" in City Block 4/5156 to create one 2.223 acre lot on 2414 Kilburn Avenue located between Garrison Street and Corrigan Avenue.

Please call Paul Nelson at 214-948-4452 with any questions and refer to the Subdivision File number listed above. At this hearing an opportunity will be provided for all interested parties to be heard concerning these residential replats.

NEW

JUMBLE

THAT SCRAMBLED WORD GAME
by David L. Hoyt and Jeff Knurek

Unscramble these four Jumbles, one letter to each square,

APPENDIX D. RESPONSE TO COMMENTS ON DRAFT EA

Response to Comments Received on Draft EA				
#	***Received by***	***Comment***	***Response***	***Remarks***
1	Public hearing	Kim Limberg expressed concern over safety of an at grade rail line on airport property	Safety is a very important issue for both DART and he Federal Aviation Administration (FAA). FAA is a cooperating agency on this project. The federal action for FAA would be approval of a revision to the *DFW International Airport Layout Plan (ALP)*. Pursuant to 49 USC §47107(a)(16) any FAA determination to approve revision of the ALP to accommodate the proposed alterations to the airport for the LRT project would have to take into consideration the effect such changes would have on the safety, utility, or efficiency of the airport. DART has committed to ongoing and continuous coordination with FAA to ensure that the design of the project does not risk aircraft safety or encroach into protection zones. As part of this effort, DART has completed an Airspace Feasibility Study and has committed to completing a Final Airspace Study and Construction Airspace Studies. A reimbursable agreement between DART, DFW and FAA will allow FAA to review DART's Designs. There are no at-grade plan/train crossings designed into the project. All existing and future taxiways will be on structure over the LRT line. The terrain at the airport does not easily lend itself to the construction of a trench or tunnel without making significant changes to the existing airport infrastructure, utilities, drainage and waters.	See Public Hearing Transcript in App. C
2	Public hearing	Rick Lindsey express appreciation for the Purpose project	Comments Noted	See Public Hearing Transcript in App. C
3	Written comment	FAA letter acknowledging receipt of EA	Comment Noted	Located in App. D

4	Written comment	DOI letter acknowledging receipt of EA	Comment Noted	Located in App. D
5	Written comment	DFW Airport letter suggestion the following changes: • References to the T's rail project should be changed from SW2NE to TEX Rail. • Clarify that DFW, not DART currently provide Terminal shuttle service.	DART appreciates its partnership with DFW Airport on the significant regional project. DART has revised the document as suggested.	Located in App. D
6	Written comment	Comment Card sent to DART by Damien Lu (see comment card scan) indicating author will ride the Orange line to DFW.	Comment Noted	Located in App. D
7	Written comment	Letter from TxDOT requesting that DART revise Section 4.19.1 (Historic Resources) of the EA. They are concerned that the archaeology information provided could lead to vandalism of sites.	DART appreciates the concerns identified by TxDOT and has revised the document as suggested.	Located in App. D

li, a Joint Venture ("MBJ3") as Construction
ive sealed bids for construction subcontracts at DFW
: Satellite Reactivation and Infill Shell / Demolition
)406.009". Bids shall be on a lump sum basis and
ackages:

AL WORK PACKAGE which includes Interior
lition, temporary partitions, concrete, masonry,
:tural steel, sealants, roofing, glass, drywall,
iechanical and electrical make safe; Est. value $
WBE goal 35%

: available on or after Wednesday, May 18, 2011
)0 p.m. at the MBJ3 office located at 3003 S. Service
rport, Texas 75261. Printed copies for purchase will
allas Reprographics, 2300 Reagan St., Dallas, Texas
'000 CD's or Plans can be shipped to out-of-town
's expense. Bidding documents may be examined

:E will be held 1:00pm - 2:00pm on Tuesday, **May 24,**
e Road, DFW Airport Texas 75261

A site walk thru of the Terminal E areas for the
ieduled for **Wednesday, May 25, 2011** at 1:30pm. Walk
Airport Development and Engineering Building, 3003
)FW Airport, TX 75261. For additional information,
(214) 438-6714, Bill Summers at (214) 438-6777 or
6773.

D until 2:00pm LOCAL TIME, **Friday, June 10, 2011**
rport Development and Engineering Building, 3003
Airport 75261. **Bids received after this time will not**
iust be notified the day before sending sealed
ivery service. Otherwise, the proposal may not get
l could be considered late.

reject any or all proposals, to waive technicalities,
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ders in which they are required to demonstrate
maximum practical M/WBE (DBE) participation
it to a percentage of M/WBE (DBE) participation if
successful **bidders** will be required to demonstrate,
submitted with their pricing proposal, their efforts
E's (DBE) at the recommended minimum goal
y contact Sarah Rodriguez at (817) 451-9273 for a
n the DFW area that may be interested in this

eas include, but are not limited to, the following:
rs; concrete place & finish, rebar installation,
ofing, Glass, electrical, Mechanical trades and thru
e above trades.

ount of five percent (5%) of bid amount must
ordance with the Instructions to Bidders.

on Manager, MBJ3

TECA RUSSELL CARCON JOINT VENTURE

ell Carcon, a joint venture ("BARC") as
sk will receive sealed bids for a construction
t titled "Terminal Renewal and Improvement
l A, Phase 1" Contract No. 9500421 ("TRIP,
scope of this work includes Bid Package 03A for
for Terminal A, Phase 1 only, Bid Package 05A for
is for Terminal A, Phase 1 only and Bid Package
kage 03A entails providing turnkey concrete
, rebar supply and install, concrete material and
ng, etc. for Terminal A, Phase 1 only. Bid
rication, erection and installation of structural and
king for in-fill steel only in various locations of
ackage 14A entails the fabrication and installation
nd 3 of Terminal A.

n Basis. The estimated price of this work is:

between $250,000 and $400,000.
between $350,000 and $600,000.
between $6,750,000 and $7,250,000.

able to Contractors on or after Monday, May 16,
5:00 p.m. at MS Dallas Reprographics, 2300
3219, telephone (214) 521-7000 or toll free (866) 699-
site www.msdallas.com; at an estimated amount
n be shipped to out-of-town locations at the
ng documents may be examined at a number of
FW Airport Development and Engineering
Road, DFW Airport, Texas 75261.

l be held 1:30pm - 3:00pm on Friday, May 20, 2011
ment and Engineering Complex, 3003 S Service
dditional information, contact Dan McCollum at
at (972) 973-2429.

will be held 2:30pm - 3:30pm on Thursday, May 19,
elopment and Engineering Building, 3003 S
l information, contact Dan McCollum at (214) 243-
73-2429.

until 10:00am LOCAL TIME, Wednesday, June 8,
Airport Development and Engineering Building,
W Airport 75261. **Bids received after this time will**

eject any or all bids, to waive technicalities, to
oceed to do the work by other means when in the
Bidder may withdraw its Bid within ninety (90)
al date of the opening thereof.

aximum practical M/WBE (DBE) participation at
is policy, BARC has implemented an M/WBE
ers in which they are required to demonstrate
aximum practical M/WBE participation and to
rcentage of M/WBE (DBE) participation if
tractor will be required to demonstrate, through a
with their pricing proposal, their efforts to involve
at the recommended goal level of at least 35% for
d Package 05A and 35% for Bid Package 14A.

s include, but are not limited to, the following:
tion, Concrete Material Supply, Concrete Place
g, Concrete Formwork.

nt of five percent (5%) of bid amount must
dance with the Instructions to Bidders.

Legal Notices | Legal Notices

DALFAC

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Fax (713) 672-7905 · E-mail: pmi@pmi-auction.com

Broken Spoke Saloon Landlord Lockout Online Auction
World Wide Auction has been commissioned to liquidate this saloon to the highest bidder. This Historic club originally established in the early 80s changing hands over the years. Will soon come to an end through this public online auction. I am sure there are many memories within these walls. Restaurant and Bar equipment, freezers, coolers, beer mugs, wine glasses, Margarita glasses, empty kegs even the original bar, sound and light equipment, Credit card machines, ladders, chairs, tables, Western Wall art, antiques, and much more.
335 McDonnell St Lewisville Texas Preview Friday May 20th from 10-2 Auction Ends Saturday May 21st at 10am
Pickup Monday May 23rd from 10-4 only go to http://www.worldwideauctiongroup.com to place bids

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Notice of Availability of Draft Environmental Assessment, DART Orange Line DFW Airport Extension IRVING-3

The Federal Transit Administration (FTA) and Dallas Area Rapid Transit (DART), in cooperation with the Federal Aviation Administration (FAA) have prepared an Environmental Assessment (EA) for the proposed construction of an extension of the Orange Line light rail transit (LRT) alignment to extend to DFW Airport and are advising the Public of its availability for review. The EA was prepared in accordance with the National Environmental Policy Act, FTA, and FAA guidelines to document the benefits and impacts of the proposed action.

PROJECT DESCRIPTION: The proposed project involves the design and construction of an extension of the Orange Line LRT alignment from Belt Line Station to the Central Terminal Area of Dallas/Fort Worth International Airport (DFW Airport), henceforth the DFW Airport Extension.

The proposed project is located in areas of Dallas and Tarrant counties on the northeastern and central portions of DFW Airport. The area analyzed includes portions of the cities of Irving and Grapevine, Texas. The EA focuses on areas proximate to the proposed LRT alignment which begins near the DART Belt Line Station, the current terminus of the DART Orange Line (under construction), near the intersection of Belt Line Road and Valley View Lane in Irving, Texas. The 5.17 mile alignment extends northwest from the Belt Line Station before turning south along International Parkway to end near Terminal A. A storage yard, the DFW Airport LRT Station and its pedestrian linkages are included as part of the proposed action.

The purpose of the DFW Airport Extension Project is to increase regional connectivity, offer an alternative to single occupancy vehicle travel, provide a seamless interface to DFW Airport Central Terminal Area, and improve mobility in the northwest region of the DART Service Area. The No-Build Alternative would not meet the project purpose, but would not introduce any environmental impacts.

The proposed action meets the stated purpose of the project, but has the potential to impact activities and natural resources located on or adjacent to DFW Airport. As such, the Federal Aviation Administration (FAA) has been invited to participate as a cooperating agency. The federal action for FAA would be approval of a revision to the DFW International Airport Layout Plan (ALP). Pursuant to 49 USC §47107(a)(16), the FAA Administrator (under authority delegated from the Secretary of Transportation) must approve any revision or modification to an ALP that FAA believes may adversely affect the safety, efficiency, or utility of the airport before the revision or modification takes effect. The text of this EA includes all elements required for compliance with FAA Order 5050.4B.

The Draft EA identifies the potential environmental consequences of the No-Build and Build Alternatives. effects to the human environment are limited since there are no adjacent residential uses and the majority of the proposed Build Alternative is located within DFW Airport boundaries. Specific environmental effects of the Build Alternative include direct impacts to two business properties with changes to existing infrastructure; moderate noise impacts to two hotel properties; changes to existing visual elements; potential soil and water contamination due to existing hazardous materials; traffic flow restrictions at one intersection; loss of vegetation, direct impact to 0.06 acres of water; and construction related impacts.

Additionally, the Draft EA addresses aeronautical concerns including the visual impact of the Build Alternative and the relocation of an FAA high-mast tower hosting a Low Level Windshear Alert System (LLWAS) and Airport Surface Detection Equipment (ASDE-X). Ongoing coordination with the FAA through final design and construction will ensure these and any additional aeronautical concerns are addressed.

DATES: Written comments on the Draft EA must be received by DART on or before June 17, 2011. DART will conduct a public Hearing at 6 p.m. on Thursday June 2, 2011 at the DFW Airport Marriot, 8440 Freeport Parkway, Irving Texas 75063. After a presentation at 6:30 pm on the results of the Draft EA, the public will have an opportunity to ask questions, make comments, and/or indicate their opinion regarding the EA and the project.

ADDRESSES: Written comments may be submitted online at www.dart.org/dfwextension or sent to:
John Hoppie
Project Manager
Dallas Area Rapid Transit
P.O. Box 660163
Dallas, TX 75266-0163

The Draft EA is posted online at www.dart.org/dfwextension. It is available for public review at DART's offices, 1401 Pacific Avenue, Dallas, Texas and at the following local libraries: Irving Central Library, the Dallas Central Library, Grapevine Public Library and the Coppell William T. Cozby Library.

FOR FURTHER INFORMATION CONTACT: DART Community Affairs at 214-749-2543 or visit online at www.dart.org/dfwextension.

DART

LaGesse Auctione
817-413-0160 or 877-800-3145 J.

Advanc
AUCTION COMPA
www.aacbi
Online Au
214-607-
See Website for Au
TX Lic 1630

Legal Notices | Legal Notices

U.S. Department
of Transportation
Federal Aviation Administration

Airports Division
Southwest Region
Arkansas, Louisiana,
New Mexico, Oklahoma,
Texas

2601 Meacham Boulevard
Fort Worth, Texas 76137

MAY 17 2011

Mr. Stephen Salin
Vice President, Rail Planning
Dallas Area Rapid Transit
P.O. Box 660163
Dallas, TX 75266-0163

Dear Mr. Salin:

Thank you for the opportunity to work as a cooperating agency with the Federal Transit Authority and the Dallas Area Rapid Transit. To provide a comprehensive evaluation, several Federal Aviation Administration (FAA) offices are reviewing the Draft Environmental Assessment.

The Airports Division has been coordinating with our Air Traffic Organization and Region Counsel. If we have any additional comments we will provide them by early June 2011. We plan to have a representative from the Texas Airports Development Office at the June 2, 2011 Public Hearing.

Again, thank you for including FAA as a cooperating agency. We look forward to working with you.

If you have any questions, please contact me at (817) 222-5600.

Sincerely,

Original Signed By

Kelvin L. Solco
Manager, Airports Division

cc: Mr. John Hoppie
Dallas Area Rapid Transit
P.O. Box 660163
Dallas, TX 75266-0163

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
1001 Indian School Road NW, Suite 348
Albuquerque, New Mexico 87104

TAKE PRIDE IN AMERICA

ER 11/437
File 9043.1

June 8, 2011

John Hoppie
Project Manager
Dallas Area Rapid Transit
PO Box 660163
Dallas, TX 75266-0613

Dear Mr. Hoppie:

The U.S. Department of the Interior has reviewed the Notice of Availability of Draft Environmental Assessment, DART Orange Line DFW Airport Extension IRVING-3, Dallas and Tarrant Counties, Texas, and has no comments.

Thank you for the opportunity to review this document.

Sincerely,

Stephen R. Spencer
Regional Environmental Officer

DALLAS/FORT WORTH INTERNATIONAL AIRPORT
3200 EAST AIRFIELD DRIVE, P.O. BOX 619428
DFW AIRPORT, TEXAS 75261-9428
www.dfwairport.com
T 972 574 8888

June 15, 2011

John Hoppie
Project Manager
DART
P.O. Box 660163
Dallas TX 75266-0163

Dear Mr. Hoppie:

DFW Airport has completed review of the Environmental Assessment (EA) document for the I-3 Orange Line. We only have two comments, due to the fact that there has been a significant amount of stakeholder coordination with DFW Airport and DART staffs over the course of the last two years on this project.

General comment: "The T's SW2NE Rail" has been renamed. The Fort Worth T's Board renamed the project to be "The T's TEX Rail." The project name should be corrected throughout the document .

Section 1.2 - Capacity – Last sentence of first paragraph: Change "DART buses" to "DFW Airport operated buses."

We appreciate the opportunity to comment on the EA and will continue to work together to bring the vision of light rail into DFW Airport.

Sincerely,

Greg J. Royster, P.E.
DFW Airport Planning

cc: Andrew L. Bell
Dan Bergman
Sandra Lancaster

Comment Card

Tarjeta De Comentarios

Date /Fecha: Saturday, May 28, 2011

Project /Proyecto: DFW Station

Name /Nombre: Damien Lu

Address /Dirección: 2930 W. Pioneer Dr, Apt #112

City /Ciudad: Irving, Texas

Zip Code /Zona Postal: 75061

Telephone /Teléfono: 972-393-4503

E-mail /Correo Electrónico: damienlu2011@aol.com

Comments /Comentarios:

I may take the DART Rail to DFW Airport Station by Orange Line in the future when I go on vacation to another countries in the world, also transfer DART vehicle at Irving Convention Center. Now I prefer to ride the DART Bus #408 to DFW Airport - South Remote Parking. (there are close to Euless, Coppell, Grapevine, and east Fort Worth) Centreport

IT'S ALL DART CONNECTED

Texas Department of Transportation

P.O. BOX 133067 • DALLAS, TEXAS 75313-3067 • (214) 320-6100

June 16, 2011

Mr. John Hoppie
Project Manager
Dallas Area Rapid Transit
P.O. Box 660163
Dallas, Texas 75266-0163

RE: DART Orange Line DFW Airport Extension
Irving-3 Environmental Assessment-Draft April 2011

Mr. Hoppie:

We have reviewed the document and have the following observations and comments.

We understand that this document deals only with the first phase of two phases which, when completed, will provide connections from both Dallas Area Rapid Transit (DART) and the Fort Worth "T" transit agency to the DFW Airport. The two phases combined do have an impact on our state roadway system, being State Highway 114 and IH-635 (in the second phase) but no direct impact in the first phase. Thus our comments are directed only for the first phase.

We ask that you remove all documentation showing the locations and data of all TxDOT Archeological Projects shown in Figure 4-18, page 124 as TxDOT Policy does not permit the publication of the locations of the surveys so as to avoid vandalism of potential historic sites.

Likewise Pages 126 and 127 need major revisions.

Page 126: Remove from second paragraph: "The location of those surveys is included on figure 4-18 and contains". Delete the text of the four bullets following as well as table 4-30.

Page 127: Remove the first portion of the first sentence by removing the words: "Based on the documents presented in table 4-30, and the TASA,". Restate the first sentence to say: "There are three archaeological sites…." Remove the third and fourth sentence that states: "These sites are listed in table 4-31. All of the archeological sites were historic farmsteads or dairies." Delete table 4-31.

Sincerely,

H. Stan Hall, P.E.
District Advance Project
Development Engineer

APPENDIX E. CORRESPONDENCE

U.S. Department
of Transportation
**Federal Transit
Administration**

REGION VI
Arkansas, Louisiana,
New Mexico, Oklahoma,
Texas

819 Taylor St. Suite 8A36
Fort Worth, TX 76102
817-978-0550
817-978-0575 (fax)

October 29, 2009

Mr. Kelvin Solco
Manager, Southwest Region Airports Division
Federal Aviation Administration
2601 Meacham Boulevard
Fort Worth, TX 76137-4298

Dear Mr. Solco,

The Federal Transit Administration (FTA), in cooperation with Dallas Area Rapid Transit (DART), has initiated an Environmental Assessment (EA) for the proposed I-3 DFW LRT (Light Rail Transit) Extension to DFW Airport, in Dallas County, Texas. Since the project will examine an alignment that extends through Dallas/Fort Worth International Airport (DFWIA), and because of your agency's jurisdiction over airports and expertise in airport planning and analysis, we are requesting you to be a cooperating agency.

The project is located wholly on DFW Airport Property extending from the Belt Line Station on the Northwest Corridor to Irving/DFW LRT Project to the Central Terminal Area of DFW International Airport. The alignment being considered was developed through consultation with DFWIA staff.

The project is expected to enhance airport access by providing an alternate means of travel and improving mobility for residents throughout the DART Service Area by linking with the regional transit system.

Potential environmental impacts associated with the project are anticipated to be minimal but may include:

- Potential floodplain and/or wetland impacts;
- Construction related impacts;
- Potential issues related to airport security and access with an alignment terminating at the central terminal area of the airport;
- Others as determined in the EA process.

Your agency's involvement should entail those areas under its jurisdiction and expertise. The following are activities we will take to maximize interagency cooperation:

- Invite you to coordination meetings;
- Consult with you on relevant technical studies that will be required for the project;
- Organize joint field reviews with you;
- Provide you with project information, including study results;
- Encourage your agency to use the above documents to express your views on subjects within your jurisdiction or expertise; and,
- Include information in the project environmental documents that cooperating agencies need to discharge their National Environmental Policy Act (NEPA) responsibilities and any other requirements regarding jurisdictional approvals, permits, licenses, and/or clearances.

As part of the planning process for the project, it is understood that human factors associated with implementing an LRT line on airport property will need to be analyzed. It is also anticipated that an Airspace Study will be required. Additional analysis may also be needed by FAA environmental specialists to ensure that FAA policies and procedures for preparing an EA are met. Your cooperation in expediting these studies will be appreciated.

You have the right to expect that the EA will enable you to discharge your jurisdictional responsibilities. Likewise you have the obligation to tell us if, at any point in the process, your needs are not being met. We expect that at the end of the process, the EA will satisfy your NEPA requirements including those related to environmental consequences and mitigation.

We look forward to your response to this request and your role as a cooperating agency on this project. If you have any questions or would like to discuss in more detail the project or our agencies' respective roles and responsibilities during the preparation of the EA, please contact Lynn Hayes, FTA Community Planner at 817/978-0565, or John Hoppie, DART Project Manager, at 214/749-2525.

Sincerely,

Robert C. Patrick
Regional Administrator

cc: Lynn Hayes, FTA Region VI
Paul Blackford, FAA
Jeffery Fegan, DFWIA
Gary Thomas, DART
Steve Salin, DART
Eron Linn, DART
John Hoppie, DART

U.S. Department
of Transportation
**Federal Aviation
Administration**

Southwest Region
Arkansas, Louisiana,
New Mexico, Oklahoma,
Texas

Fort Worth, Texas 76193-0000

November 2, 2009

Mr. Robert Patrick
Regional Administrator
Federal Transit Administration, Region VI
819 Taylor Street, Suite 8A36
Fort Worth, TX 76102

Dear Mr. Patrick:

The Federal Aviation Administration (FAA) has received your letter of October 29, 2009, inviting FAA to be a cooperating agency in preparation of an Environmental Assessment (EA) for the proposed I-3 DFW LRT (Light Rail Transit) Extension to DFW Airport, in Dallas County, Texas.

The FAA has statutory responsibility for promoting safe flight of civil aircraft in air commerce. The purpose of FAA action in connection with the proposed construction of the I-3 DFW LRT project is to ensure that the proposed alterations to the airport do not adversely affect the safety, utility, or efficiency of the airport. FAA action is necessary in connection with proposed use of airport residual property because, pursuant to 49 USC § 47107(a)(16), the FAA Administrator (under authority delegated from the Secretary of Transportation) must approve any revision or modification to an Airport Layout Plan (ALP) before the revision or modification takes effect. The Administrator's approval includes a determination that the proposed alterations to the airport, reflected in the ALP revision or modification, do not affect adversely the safety, utility, or efficiency of the airport.

The FAA federal action requires an environmental determination that meets the requirements of FAA Order 5050.4B: *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects* and FAA Order 1050.1E: *Policies and Procedures for Considering Environmental Impacts*. Appendix A of FAA Order 1050.1E requires the evaluation of specific resource categories as part of an EA. Each of these impact categories must be evaluated against FAA's thresholds of significance as indicated in the order.

As described in your letter, our role will include:

- Participation in coordination meetings required for the project.
- Participation in joint field reviews.
- Review of project information and study results on subjects within our jurisdiction or expertise.
- Identifying EA content necessary to discharge our National Environmental Policy Act responsibilities and other requirements regarding jurisdictional approval, permits, licenses, and/or clearances.

The Texas Airports Development Office will be the lead office for the FAA on this project. Your principal FAA contact will be Mr. Paul Blackford, Airport Environmental Specialist. Mr. Blackford may be reached by telephone at (817) 222-5607 or by email at Paul.Blackford@faa.gov.

We look forward to partnering with FTA in the preparation of this EA.

Sincerely,

ORIGINAL SIGNED BY:

Mr. Kelvin Solco
Manager, Southwest Region Airports Division

cc: Mr. Jeff Fegan, DFW
Ms. Sandra Lancaster, DFW
✓Mr. John Hoppie, DART
Ms. Lynn Hayes, FTA Region VI

DALLAS/FORT WORTH INTERNATIONAL AIRPORT
3200 EAST AIRFIELD DRIVE, P.O. BOX 619428
DFW AIRPORT, TEXAS 75261-9428
www.dfwairport.com
T 972 574 8888 F 972 574 0000

July 27, 2007

Mr. J. Michael Nicely
Manager, Texas Airports Development Office
Federal Aviation Administration - Southwest Region
2601 Meacham Blvd.
Fort Worth, Texas 76137-4298

Re: Letter of support for Rail Transit service to DFW Airport

Dear Mr. Nicely:

As the Dallas/Fort Worth Metroplex continues to grow, improved regional mobility is critical to reduce traffic congestion, reduce air pollution, and improve the quality of life. DFW Airport recognizes that without improved regional mobility, increasing traffic congestion will impact ease of passenger & employee access thereby impacting our core business.

To ensure long-term airport access, DFW Airport has been working closely with DART, The T, and the North Central Texas Council of Governments on future light rail service from Dallas and future commuter rail service from Fort Worth. Over the past few years, DFW Airport has initiated numerous rail planning studies examining potential rail stations and alignments. These studies have identified a conceptual rail alignment to a regional rail station within the central terminal area between Terminals A and B. This Terminal A/B station would serve to connect DFW Airport to Dallas & Fort Worth rail systems.

The DFW Airport Board as well as Executive staff have been briefed on rail access planning and are in full support of both DART's and The T's future airport rail service. As a commitment to future rail service, the conceptual rail alignment & station have been incorporated into our most recent Airport Layout Plan update.

If you have any questions, please contact me at your convenience.

Sincerely,

Jeffrey P. Fegan
Chief Executive Officer

cc: John Hoppie (DART)
Paul Blackford (FAA)
David Hennessy (DFW)

DALLAS/FORT WORTH INTERNATIONAL AIRPORT
3200 EAST AIRFIELD DRIVE, P.O. BOX 619428
DFW AIRPORT, TEXAS 75261-9428
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T 972 574 8888 F 972 574 0000

July 27, 2007

Mr. J. Michael Nicely
Manager, Texas Airports Development Office
Federal Aviation Administration - Southwest Region
2601 Meacham Blvd.
Fort Worth, Texas 76137-4298

Re: Land use for rail access to DFW Airport

Dear Mr. Nicely:

During review of DART's Draft Environmental Impact Statement for the I-2 line section, which will terminate at the Belt Line Rd / Valley View Lane station, FAA requested that DFW identify the method through which DFW will allow DART access to DFW property.

The use of DFW land for the construction and operation of the DART light rail system will be under a lease or license agreement between DART and DFW, through which fees will be assessed at fair market value for the property. In addition, there will be no revenue diversion because fees paid under the lease or the license will remain on Airport.

If you have any questions, please contact me at your convenience.

Sincerely,

Jeffrey P. Fegan
Chief Executive Officer

cc: John Hoppie (DART)
Paul Blackford (FAA)
David Hennessy (DFW)

DALLAS/FORT WORTH INTERNATIONAL AIRPORT
COMMERCIAL DEVELOPMENT, P.O. BOX 619428
DFW AIRPORT, TEXAS 75261-9428
www.dfwairport.com
T 972 973 4667 CWood@dfwairport.com

August 6, 2009

Mr. Richey Thompson
URS Corporation
Water Gardens Place
100 E. 15th Street, Suite 200
Fort Worth, TX 76120

Re: Temporary Use of Airport Property

Dear Mr. Thompson:

This letter will serve as your authorization to enter upon Airport property on a temporary basis for the purpose of conducting an Environmental Assessment in conjunction with the DART's I-3 rail line. The attached Exhibit "A" denotes the approximate location of the site. This authorization covers the period from August 7, 2009 through December 31, 2009.

A representative of URS Corporation must contact Mr. Rick Reeter in DFW Airport's Environmental Affairs Department ("EAD") at least 48 hours before work, at 972.973.5577 or rreeter@dfwairport.com, to: (1) notify him of the dates your representative will be on-site performing the authorized work; (2) determine if he desires one of his representatives to accompany your representative; and (3) discuss and agree on the scope and nature of EAD's involvement in authorized work.

Your authorization to temporarily utilize this property must at all times remain in compliance with the provisions of Airport Board Rules and Regulations. In addition, you agree to indemnify, hold harmless, defend and insure the Airport Board, the Cities of Dallas and Fort Worth, their directors, officers, agents, councils and employees from and against any and all claims and causes of action, administrative proceedings, judgments, penalties, fines, damages, losses, demands, liabilities, or expenses whatsoever (including reasonable attorney's fees and costs of litigation, mediation and/or administrative proceedings) which may be brought, alleged, or imposed against the Board, the Cities of Dallas and Fort Worth, their directors, officers, agents, councils, or employees arising directly or indirectly from or in any way connected with (1) any property damage or loss, personal injury, including death, or adverse effect on the environment, arising out of URS Corporation (URSC) action or inaction with regard to the operations of URSC hereunder; (2) the failure of the URSC, its agents or employees, to comply with the terms and conditions of this letter of authorization, or to comply with any applicable federal, state, or local laws, rules, regulations, ordinances, or orders including, but not limited to, any and all applicable environmental laws, rules, regulations, or orders; and/or (3) release of any hazardous or

environmental laws, rules, regulations, or orders; and/or (3) release of any hazardous or regulated substances or waste onto, into, or from the Airport, connected in any way with URSC operations or action or inaction of URSC, its agents or employees, regardless of whether the act, omission, event, or circumstance constituted a violation of applicable law at the time of the occurrence. The rights and obligations set forth in this paragraph shall survive the termination of this letter of authorization.

Provided you agree to the above stated conditions of use, please sign your acceptance and concurrence in the space provided below.

Sincerely,

Christina L. Wood
Manager
Commercial Development

Acceptance and Concurrence

By: _____

Name: Richey Thompson

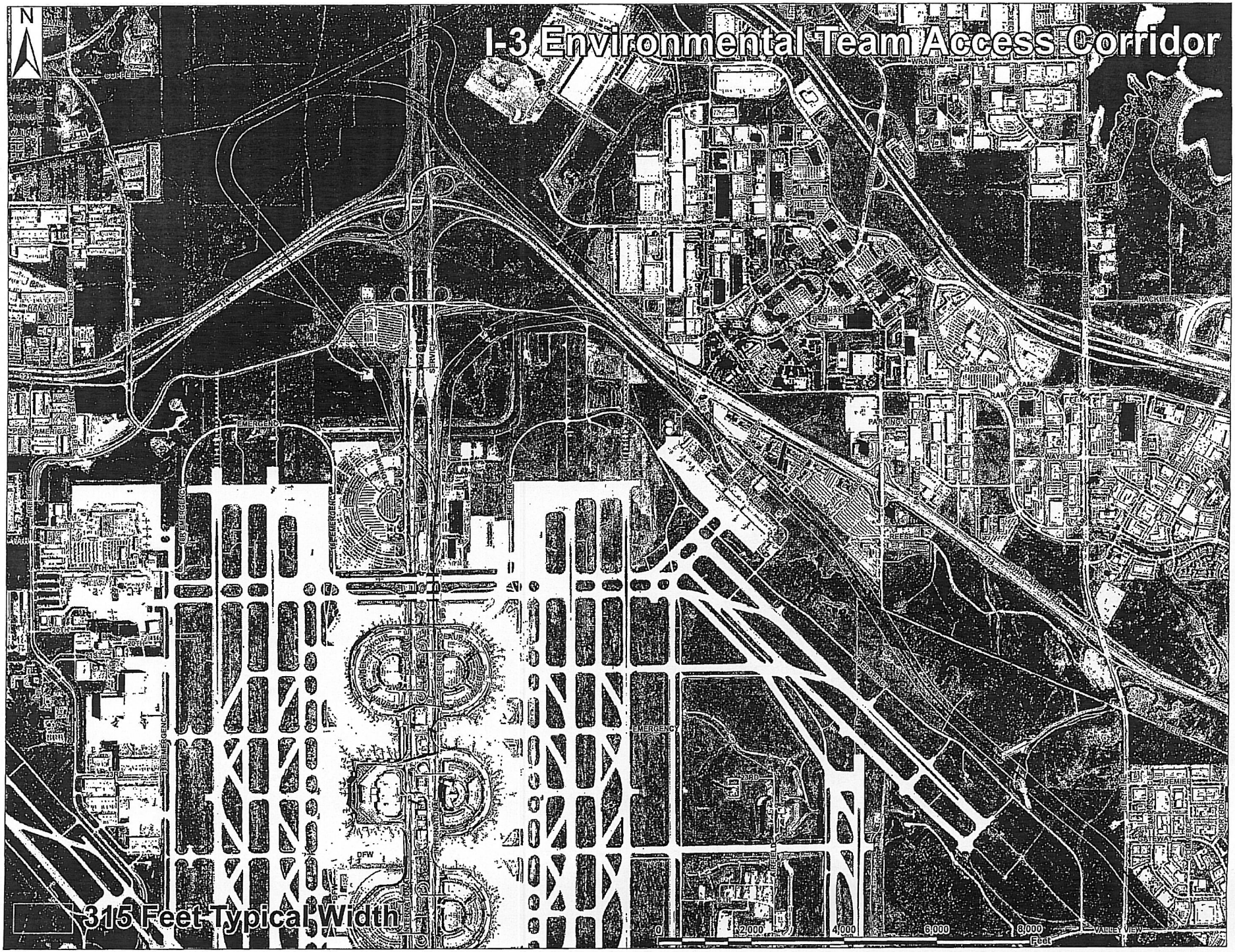
Date: 8/10/2009

CLW/mh

cc: J. Terrell
G. Hedges
R. Reeter

S:\Agrmts Prop Mgmt\Temporary Ltrs\URS Corp Ltr of Authorization-Acceptance & Concurrence-R. Thompson

Exhibit "A"


I-3 Environmental Team Access Corridor
N
315 Feet Typical Width
0
2,000
4,000
6,000
8,000
Feet

DART I-3 PE/EA - ENVIRONMENTAL TEAM REQUESTING DFWIA ACCESS FOR PREPARATION OF EA

URS CONTACT - LORI MOLITOR - (206)-438-2331

FIRM	INDIVIDUALS	DESCRIPTION OF ACTIVITIES	ESTIMATED TIME FRAME TO COMPLETE
URS	MATT THOMPSON CHARLIE ANDREWS	ASSESSING EXISTING HABITATS, INCLUDING VEGETATION AND WATER BODIES ALONG THE I-3 CORRIDOR	As soon as access is given to August 21, 2009. Up to four days in field are anticipated.
URS	KATHERINE TURNER-PEARSON CHARLES NEEL SARAH COLE SHELLY HARTSFIELD	ARCHAEOLOGICAL SURVEY OR TESTING	As soon as access is given to December 2009. Field dates depend on SHPO coordination and permitting.
URS	NICKY DEFREEZE ERICA HOWARD	ARCHITECTURAL HISTORIAN TO DOCUMENT STRUCTURES	
EXCAVATION SERVICES*	ED LEAL	BACKHOE TRENCHING if required	

* CURRENTLY NOT ANTICIPATED TO NEED ACCESS, UNLESS SHPO REQUIRES ANY BACKHOE TRENCHING

Dallas Area Rapid Transit
P.O. Box 660163
Dallas, Texas 75266-0163
214/749-3278

October 1, 2009

RE: Agency Scoping Meeting: DFW Extension Light Rail Transit Project

Dear Agency Representatives:

Dallas Area Rapid Transit (DART) with the Federal Transit Administration (FTA) intends to prepare an Environmental Assessment (EA) on the proposed DFW Extension Light Rail Transit (LRT) Project in Dallas/Fort Worth International Airport, Texas. The Federal Aviation Administration (FAA), having jurisdiction over airports, is being requested to be a cooperation agency in this study. The EA will be prepared in accordance with the National Environmental Policy Act (NEPA), as amended. This notice is to advise interested agencies that an agency scoping meeting will be held on Monday, October 19, 2009, 9:30 am, at Dallas Area Rapid Transit, Room 1C.

The DFW Extension project is the product of the Northwest Corridor Major Investment Study (MIS) completed by DART in early 2000. The MIS identified a Locally Preferred Investment Strategy (LPIS), which included a light rail element with two service lines, the Farmers Branch/Carrollton Line and the Irving/DFW Line. An Environmental Impact Statement (EIS) evaluating alternatives for the Farmers Branch/Carrollton Line was conducted, and FTA issued a Record of Decision (ROD) on this portion of the LPIS on February 5, 2004. An EIS for the Irving portion of the Irving/DFW Line was also conducted and FTA issued a ROD on September 5, 2008.

The LPIS has been subsequently refined through the planning process and coordination with DFW Airport and other regional partners. On June 23, 2009, the DART Board of Directors approved the Phased Approach to the DFW Extension Project. The first phase will bring light rail service directly into DFW Terminal A. A subsequent phase will extend the alignment to interface with commuter rail service on the Cotton Belt RR before turning into Terminal A. The identified primary travel need for the DFW Extension Project is to serve the central terminal area of Dallas Fort Worth International Airport and to facilitate transfers between commuter rail service on the Cotton Belt Line and light rail.

The project is being advanced as an EA in anticipation of a Finding of No Significant Impact (FONSI). DART is inviting all federal, state and local agencies with a possible interest in any aspect of the proposed project or its impacts to an interagency coordination meeting. If you are unable to attend the meeting, Scoping materials and additional information on the project will be available online at (http://www.dart.org/dfwextension). If you have any questions, please do not hesitate to contact me at 214.749.2525. I look forward to seeing at the interagency meeting.

Sincerely,

John Hoppie
Project Manager
Dallas Area Rapid Transit

Name	Title	Agency	Address Line 1	Address Line 2	CityStateZip
Ms. Judith Wilson	NEPA Coordinator	Bureau of Indian Affairs	2051 Mercator Drive		Reston, VA 20191
Mr. William Peterson	Regional Director	Federal Emergency Management Agency	FRC 800 North Loop 288		Denton, TX 76209
Ms. Bonnie Murphy	Regional Administrator	Federal Railroad Administration	4100 International Plaza	Suite 450	Fort Worth, TX 76109-4820
Mr. Wayne Lea	Chief, Regulatory Branch	US Army Corps of Engineers	P.O. Box 17300		Fort Worth, TX 76102
Mr. Richard Greene	Regional Administrator	US Environmental Protection Agency, Region 6	1445 Ross Avenue	Suite 1200	Dallas, TX 75202
Mr. Rowan Gould	Acting Director	US Fish and Wildlife Service, Region 2	P.O. Box 1306		Albuquerque, NM 87103
Ms. Shannon Carter	Terminal D Manager	Transportation Security Administration	510 Airline Drive	Suite 110	Coppell, Texas 75019
Mr. Tom Cloud		US Fish and Wildlife Service	711 Stadium Drive	Suite 252	Arlington, TX 76011
Mr. Richard Varela	Executive Director	Railroad Commission of Texas	P.O. Box 12967		Austin, TX 78711
Mr. F. Lawerence Oaks	Executive Director	Texas Historical Commission	P.O. Box 12276		Austin, TX 78711
Mr. Carter Smith	Executive Director	Texas Parks and Wildlife Department	4200 Smith School Road		Austin, TX 78744-3218
Mr. Robert Brown		TXDOT	4777 H Hwy 80		Mesquite, TX 75150
Mr. Michael Morris	Director of Transportation	NCTCOG	616 Six Flags Drive	P.O. Box 5888	Arlington, TX 76005
Mr. Chad Edwards	Principal Transportation Planner	NCTCOG	616 Six Flags Drive	P.O. Box 5888	Arlington, TX 76005
Mr. Dick Ruddell	President/Executive Director	Fort Worth Transportation Authority	1600 East Lancaster Street		Fort Worth, Tx 76102
Mr. Curvie Hawkins	Planning Director	Fort Worth Transportation Authority	1600 East Lancaster Street		Fort Worth, Tx 76102
Mr. Jim Witt	President	Denton County Transportation Authority	1660 South Stemmons	Suite 250	Lewisville, Texas 75067
Ms. Mary Suhm	City Manager	City of Dallas	1500 Marilla Street	Room 4E North	Dallas, TX 75201
Mr. Ron Whitehead	City Manager	Town of Addison	P.O. Box 9010		Addison, TX 75001-9010
Mr. Leonard Martin	City Manager	City of Carrollton	P.O. Box 110535		Carrollton, TX 75011-0535
Mr. Brett Haney	Interim City Manager	City of Cockrell Hill	4125 W. Clarendon		Dallas, TX 75211
Mr. Gary Greer	City Manager	City of Farmers Branch	P.O. Box 819010		Farmers Branch, TX 75381-9010
Mr. Bill Dollar	City Manager	City of Garland	P.O. Box 469002		Garland, TX 75046-9002
Mr. Philip Mark Prasifka	Interim City Manager	City of Glenn Heights	1938 S. Hampton Road		Glenn Heights, TX 75154
Mr. Bill Lindley	Town Administrator	Town of Highland Park	4700 Drexel Drive		Highland Park, TX 75205
Mr. Tomas Gonzalez	City Manager	City of Irving	825 W. Irving Blvd.		Irving, TX 75060
Mr. Jim Cline	Public Works Director	City of Irving	825 W. Irving Blvd.		Irving, TX 75060
Mr. Thomas Muehlenbeck	City Manager	City of Plano	P.O. Box 860358		Plano, TX 75086-0358
Mr. Bill Keffler	City Manager	City of Richardson	P.O. Box 830309		Richardson, TX 75083-0309
Ms. Lynda Humble	City Manager	City of Rowlett	P.O. Box 99		Rowlett, TX 75088-0099
Mr. Bob Livingston	City Manager	University Park	P.O. Box 8005		Dallas, TX 75205-0005
Mr. Clay Phillips	City Manager	Coppell	255 Parkway Boulevard	P. O. Box 9478	Coppell, Texas 75019
Mr. Ken Griffin	Director of Engineering & Public Works	Coppell	255 Parkway Boulevard	P.O. Box 9478	Coppell, Texas 75019
Mr. Bruno Rumbelow	City Manager	Grapevine	P.O. Box 95104		Grapevine, Texas 76099
Mr. Stan Laster	Director of Public Works	Grapevine	P.O. Box 95104		Grapevine, Texas 76099
Mr. David B. Jodray	Transportation & Public Works	City of Fort Worth	1000 Throckmorton Street		Fort Worth, Texas 76102

October 1, 2009

Ms. LaRue Martin Parker, Chairperson
Caddo Nation
P.O. Box 487
Binger, OK 73309

Dear Chairperson Parker:

Dallas Area Rapid Transit (DART) has proposed the DFW Extension light rail transit line on Dallas/Fort Worth International Airport Property extending from the Belt Line Station (under construction) on the Orange Line to Terminal A. A future phase of the project will extend to the Cotton Belt RR before turning into Terminal A. DART is currently conducting historical and archeological investigations to identify both prehistoric and historic sites within the construction boundaries of this proposed light rail corridor. This work is being conducted as part of the Environmental Assessment for the project for DART.

We respectfully ask that you review the enclosed map and inform us if you have any concerns regarding traditional cultural properties or sacred sites as part of this project. Additional information is available at (http://www.dart.org/dfwextension). Should you have any concerns regarding this project, please contact me within 30 days of receipt of this letter so that we might address or incorporate those concerns as soon as possible. We look forward to hearing from you. Comments should be directed to John Hoppie at 1401 Pacific Avenue, Dallas, Texas 75266; or to jhoppie@dart.org.; or at (214) 749-2525. You are also welcome to attend an inter-agency scoping meeting that will be held at 9:30 a.m. on Monday, October 19 at DART Headquarters located at 1401 Pacific Avenue in Dallas, TX.

Sincerely,

John Hoppie
Project Manager

Enclosure

cc: Lynn Hayes, FTA

Ms. LaRue Martin Parker, Chairperson
Caddo Nation
P.O. Box 487
Binger, OK 73309

Mr. Wallace Coffey, Chairman
Comanche Nation of Oklahoma
P.O. Box 908
Lawton, OK 73502

Mr. Anthony E. Street, President
Tonkawa Tribe of Oklahoma
1 Rush Buffalo Road
Tonkawa OK. 74653

Mr. Gary McAdams
Wichita and Affiliated Tribes
P.O. Box 729
Anadarko, OK 73005

Seal [image]

TONKAWA TRIBE OF OKLAHOMA
Native American Graves Protection
and Repatriation Act

1 RUSH BUFFALO ROAD, TONKAWA, OKLAHOMA 74653
PHONE (580) 628-2561 . FAX: (580) 628-9903
WEB SITE: www.tonkawatribe.com

Mr. Stephen L. Salin, AICP
Vice President, Rail Planning
P.O. Box 660163
Dallas, Texas 75266-0163

Date: August 20, 2009

Regarding the Dallas Area Rapid Transit D2 Study- Alternatives Analysis/Draft Environmental Impact

The Tonkawa Tribe has no specifically designated historical or cultural sites identified in the above listed project area. However if any human remains, funerary objects, or other evidence of historical or cultural significance is inadvertently discovered then the Tonkawa Tribe would certainly be interested in proper disposition thereof.

We appreciate notification by your office of the many projects on-going, and as always the Tonkawa Tribe is willing to work with your representatives in any manner to uphold the provisions of NAGPRA to the extent of our capability.

Respectfully,

Miranda Allen
NAGPRA Representative

URS

RECEIVED
DEC 16 2009
TEXAS HISTORICAL COMMISSION

December 15, 2009

Mr. Mark Wolfe
Executive Director
Texas Historical Commission
P.O. Box 12276
Austin, Texas 78711-2276

CONCUR
by _____
for ~~F. Lawerence Oaks~~ MARK WOLFE
State Historic Preservation Officer
Date DECEMBER 21, 2009

Re: Project review under Section 106 of the National Historic Preservation Act of 1966, as amended: Phase I of the Dallas Area Rapid Transit Irving-3 Preliminary Engineering/Environmental Assessment Project, Tarrant and Dallas County, Texas (URS Project Number 25337852.00001, Reference THC Track Number 201002501).

Dear Mr. Wolfe:

URS Corporation (URS), on behalf of Dallas Area Rapid Transit (DART), requests Section 106 review from the Texas Historical Commission (THC) for historic resources for the above referenced project. APE coordination of this project was previously initiated via letter dated 26 October 2009 (Turner-Pearson and Dobson-Brown to Wolfe, 26 October 2009). Concurrence was received on 17 November 2009 (Denton to Turner-Pearson and Dobson-Brown 17 November 2009, THC Track Number 201002501).

The project consists of the Phase I advancement of the final railway section of the Orange Line (referred to by DART as Irving-3) to its terminus at the Dallas-Fort Worth (DFW) International Airport. The Fort Worth Transportation Authority (the T) is currently advancing the Southwest to Northeast Corridor on the DART-owned Cotton Belt rail corridor located north of State Highway (SH) 114. Upon completion, the two rail projects will be incorporated into the overall public transportation program at DFW Airport and will provide service to air passengers, employees, and North Central Texas commuters. This Preliminary Engineering/Environmental Assessment (PE/EA) is needed to help DART and its partners determine the preferred alignment for the final line segment.

This project is under the authority of the Federal Aviation Administration (FAA) and requires that the project be reviewed under Section 106 of the National Historic Preservation Act of 1966, as amended, and the Antiquities Code of Texas.

URS Corporation
Infomart
1950 North Stemmons Freeway, Suite 6000
Dallas, TX 75207
Tel: 214.741.7777
Fax: 214.741.9413
www.urscorp.com

The enclosed draft report, *Historic Resource Reconnaissance Survey for DART Phase I Irving-3 Rail Project, Tarrant and Dallas Counties, Texas,* presents the results of the historic resources reconnaissance survey conducted for the proposed DART Irving-3 project. The methodology for this survey was described in the initial APE coordination letter referenced above. The survey resulted in the identification of no historic resources.

On behalf of DART, URS respectfully requests the concurrence of the THC regarding the enclosed report, and that no further historic resources investigations are necessary. If the proposed undertaking is altered such that it has the potential to affect the adjacent historic-age resources either physically, or by changing the setting in ways not covered by this report, DART will cease construction activities and not proceed with their undertaking until additional review and clearance by the THC has been completed.

Should you have any questions regarding the enclosed report or the results contained therein, please do not hesitate to contact me.

Sincerely,

Sherry N. DeFreece Emery
Senior Architectural Historian and Conservator
URS Corporation
1950 North Stemmons Freeway, Suite 6000
Dallas, Texas 75207
214-672-2989

Enclosure (1)

Cc: John Hoppie, DART
Lori Molitor, URS
Jerry Smiley, URS

October 26, 2009

Mark Wolfe
Executive Director
Texas Historical Commission
1511 Colorado Street
Austin, Texas 78701

Re: Initial Cultural Resources Coordination for Historic Architectural and Archaeological Resources under the Antiquities Code of Texas and Section 106 (16 U.S.C. 470 et seq.) of the National Historic Preservation Act (NHPA) of 1966, for Phase I of the Dallas Area Rapid Transit (DART) Irving-3 Preliminary Engineering/Environmental Assessment (PE/EA) Project, Tarrant and Dallas Counties, Texas (URS Project Number 25337852.00001).

Dear Mr. Wolf,

URS Corporation (URS), on behalf of the Dallas Area Rapid Transit (DART), requests Section 106 and Antiquities Code of Texas coordination from the Texas Historical Commission (THC) on the above referenced project. The project consists of Phase I of the third railway section of the Orange Line (referred to by DART as Irving-3) to its terminus at the Dallas-Fort Worth (DFW) International Airport. The Fort Worth Transportation Authority (the T) is currently advancing the Southwest to Northeast Corridor on the DART-owned Cotton Belt rail corridor located north of State Highway (SH) 114. Upon completion, the two rail projects will be incorporated into the overall public transportation program at DFW Airport and will provide service to air passengers, employees, and North Central Texas commuters. This Preliminary Engineering/Environmental Assessment (PE/EA) is needed to help DART and its partners determine the preferred alignment for the this line segment.

This project is under the authority of both the Federal Transit Administration (FTA) and the Federal Aviation Administration (FAA) and requires that the project be reviewed under Section 106 of the National Historic Preservation Act of 1966, as amended, and the Antiquities Code of Texas.

The location of the project area is shown on Exhibit 1, which coordinates with the Grapevine, Tex. and Carrollton, Tex. 7.5-minute USGS topographic quadrangle.

URS, on behalf of DART, is requesting concurrence with the proposed Area of Potential Effect (APE), as well as the survey and report methodology for historic resources. URS also requests concurrence that no further archaeological resources investigations are necessary within the proposed railway right-of-way (ROW), and that DART be allowed to proceed with the project within those boundaries.

Description of Undertaking

The proposed project will advance the third line section of the DART Orange Line (Irving-3) railway to its terminus at DFW International Airport, and eventually allow it to connect to the

Cotton Belt rail corridor north of SH-114. The Cotton Belt rail will soon be connected by the Southwest to Northeast Corridor of the Fort Worth Transit Authority (the T). These additional railway sections will allow passengers and employees of DFW to travel by railway to the terminals, decreasing the number of cars traveling to and from the airport on a daily basis. The connection of railways will also allow commuters to pass through DFW Airport and continue on the railway to Dallas, and Dallas commuters to travel north past the airport. This additional line of railway travel to and through DFW Airport should provide an additional capacity for travel among North Texans, reduce congestion, enhance the quality and reliability of the transit service, and improve the safety and operating efficiency of the railway system. This is a two phase project, and only the DART Irving-3 Phase I railway is discussed in this coordination. Phase II will be coordinated at a later date. This portion of the project is entirely on airport property.

The proposed Irving-3 Phase I railway segment will start at the end of the Orange line at the southeast property line of the airport at Valley View Road and Beltline in Dallas County, Texas, and continue northward toward the main terminal complex. The railway will intersect and run adjacent to, SH-114 on the northeast side of the airport terminal and then turn westward and loop south to join the terminal on the east side of the American Airlines parking facility, ending at Terminal A (Exhibit 1).

The proposed railway width is approximately 17 meters (m) (55 feet [ft]) wide, and 8,443 m (27,700 ft) long. The entire railway construction footprint and archaeological APE is 14.5 hectares (35 acres).

The majority of the proposed railway is at grade level or slightly raised 0.6 m (2 ft) above the natural grade. In some areas the railway will be elevated, with load bearing pier beams up to 2.7 m (9 ft) below ground level, and a height of about 8 m (25 ft) above the natural horizon. There are two stream crossings along the railway route; northeast of Emergency Road close to Beltline Road; and along the corner of Esters and Cabell Road (see Exhibit 1). The depths of impacts at the stream crossings are expected to exceed one meter in depth.

Background Information

The project area is on DFW Airport Property in both Tarrant and Dallas Counties, Texas. The airport encompasses 18,000 acres which lies in a segment of land outlined by SH-121, Interstate Highway (IH-635), SH-360, SH-183, and SH-161. The city of Grapevine lies to the northwest, Euless to the southwest, and Irving to the southeast. The Fort Worth metropolitan area is directly west of the airport, and the Dallas Metroplex is to the east. The major water shed at the airport is Big Bear Creek, which runs through the western portion of the airport property and empties into the West Fork River.

Project Setting

Topography and Drainage

Located in northeast Texas, Dallas County covers 233, 617 hectares (577,280 acres). The topography of the county is relatively flat, inclining slightly eastward, with dark, thick, plastic clayey soils with poor permeability. The Trinity River is the main watershed for the county, which drains southeast across the county. The river has a well documented history of flooding and is currently surrounded by a levee system. The county has three natural underground aquifers, though most water for urban uses comes from reservoirs in and around the Trinity River (Coffee et al. 1980).

Tarrant County, located west of Dallas County, is considered to be in the north-central part of the state. The county encompasses 232,581 hectares (574,720 acres), which slopes east and

southeastward. The main watershed is also the Trinity River drainage system, with small creeks and streams emptying into the West Fork, Clear Fork, and Elm Fork tributaries. The topography of Tarrant County varies from nearly level to hilly, with its top elevation 293 m (960 ft) above mean sea level (amsl) at the Parker County line (Ressel 1981).

Geology and Soils

The DFW Airport property is situated on the dividing line between the Blackland Prairie and the Eastern Cross Timbers vegetation and environmental zones as defined by Blair (1950). The line between these two distinct environmental zones coincides with the dividing line between the two geological formations that make up the airport property. This geological divide is just east of Big Bear Creek, running northwest to southwest as it joins Bear Creek (Barnes 1988; Shelton, et al. 2008). The geology on the eastern side of creek is the Eagle Ford Geologic Formation of Late Cretaceous shale, sandstone, and limestone, while the western side is the Woodbine Geologic Formation of sandstone, clay, and shale (Barnes 1988). This undertaking is entirely on the eastern side of the creek and situated entirely on the Eagle Ford Formation.

The majority of the overlying soils in the project area are part of the Ferris-Heiden series, Houston Black-Heiden series, or the Houston Black-Navo-Heiden series. The Ferris-Heiden soil series are deep, gently sloping to strongly sloping, clayey soils that are usually found on uplands. The Houston Black-Heiden soil series are also deep, but ranging from nearly level to strongly sloping, clayey soils found on uplands. The Houston Black-Navo-Heiden soil series are deep, clayey and loamy soils also found on uplands (Coffee 1980; Ressel 1981). A detailed listing of the soils in the projected APE is found in Table 1.

Vegetation

The climate in the Dallas and Tarrant Counties is humid subtropical, with summer highs averaging 96° Fahrenheit (F), and the winters averaging a mild 35°F (TSHA 2009). The Blackland Prairie is typically rolling grasslands. Wildlife in the area includes various songbirds and raptures, deer, raccoons, fox, and armadillos. Native trees found along the lowland creeks include post oak (*Quercus stellata*), blackjack oak *Quercus marilandica*), American Elm (*Ulmus americana*) Pecan (*Carya illinoinensis*), and hickory (*Carya buckleyi*). The vegetation in the rolling hills includes a variety of tall grasses (Blair 1950). Buffalo and Antelope were reported in the area in the early 1800s, but no large mammals continue to occupy the area (Shelton et al. 2008).

Archaeological Resources

A review of the Texas Archeological Sites Atlas (TASA) (2009) indicated five archaeological surveys and three archaeological sites located within 1,000 m of the project's archaeological APE (Tables 2 and 3; and Exhibit 2). There was a 2004 Texas Department of Transportation (TxDOT) aerial survey conducted on the northeast portion of the project that is situated on the proposed railway footprint. A 1984 linear survey by the Texas Highway Department (THD) was south of the project, a 1986 Federal Highway Administration (FHWA) linear survey ran northeast of the project, and a 2004 TxDOT survey in the area of SH-114 was to the east of the project, as well as a small 2006 TxDOT aerial survey. The archaeological sites are all historic farmsteads or dairies, and all are greatly disturbed. The reports for sites 41DL398 and 41DL403 indicate that they would most likely be destroyed during the construction of the International Commerce Park at DFW. This project has since been built and it is assumed that the sites were subsequently destroyed or further disturbed during its construction. Site 41DL492 is an historic dairy farm that was reported as being greatly disturbed. This site lies just south of the southern end of the proposed Phase I railway.

Table 1. Soil Names within the Project Area and Their Characteristics				
Series	*Soil name and description*	*Average depth centimeters (inches)*	*Landform location*	*Underlying geologic formation*
Burleson	Burleson Clay, 0-1% slopes, deep, nearly level, well drained	203 (80)	Old stream terraces	Upper Cretaceous - Eagle Ford Formation
Ferris & Heiden	Ferris-Heiden complex 5-12% slopes, deep, well drained	198 (78)	Gently rolling and rolling soils on hillsides	Upper Cretaceous - Eagle Ford Formation
Heiden	Heiden clay, 1-3% slopes, deep, well drained, subclass IIe	198 (78)	Gently sloping on uplands	Upper Cretaceous - Eagle Ford Formation
Heiden	Heiden clay, 2-5% slopes, deep, well drained	198 (78)	Gently sloping on uplands	Upper Cretaceous - Eagle Ford Formation
Houston Black	Houston Black clay, 0-1% slopes, deep well drained	178 (70)	Nearly level soil on smooth uplands	Upper Cretaceous - Eagle Ford Formation
Houston Black	Houston Black clay, 1-3% slopes, deep, moderately well drained	203 (80)	Gently sloping on smooth uplands	Upper Cretaceous - Eagle Ford Formation
Leson	Leson clay, 1-3% slopes, deep, well drained	178 (70)	Gently sloping soil on uplands	Upper Cretaceous - Eagle Ford Formation
Ovan	Ovan clay, frequently flooded, deep, moderately well drained	203 (80)	Nearly level on flood plains	Upper Cretaceous - Eagle Ford Formation
Unknown	Urban land, 75% covered with buildings or pavement, unable to identify, 10% residential areas	unknown	Urban land areas	Upper Cretaceous - Eagle Ford Formation

Source: (Coffee et al. 1980; Ressel 1981; and Barnes 1988.).

While not within 1,000 m of the project APE, a 2008 report of investigations on DFW property by AR Consultants, Inc. was reviewed, and recommendations for future work on the airport

property were considered (Shelton et al. 2008). In the report, investigators concluded that approximately 70 percent of the airport property had been impacted by development and construction, and an "Area of Impacts" was delineated where the potential for undisturbed archaeological remains were low (Shelton et al 2008:127). The APE for Phase I falls entirely within this zone.

Table 2. Archaeological Surveys within 1,000 Meters of the Project APE

Type & Number	*Date*	*Agency*	*Investigating Firm*
Linear/ Unknown	June 1984	THD	Unknown
Linear/ Unknown	Feb. 1986	FHWA	Unknown
Areal / #3427	Jul. 2004	FHWA/TxDOT	Parsons
Areal/ #3561	Oct .2004	TxDOT	Geo-Marine
Linear/ #3910	Feb. 2006	TxDOT	Parsons

Source: Texas Archaeological Sites Atlas (2009)

Table 3. Archaeological Sites within 1,000 Meters of the Project APE

Trinomial	*Type*	*Condition*	*Investigating Firm*
41DL398	Historic Farmstead	Disturbed/ destroyed	Geo-Marine
41DL403	Historic Farmstead	Disturbed/ destroyed	Geo-Marine
41DL492	Historic Dairy	Disturbed	AR Consultants

Source: Texas Archaeological Sites Atlas (2009)

Historic Resources

The Texas Historic Sites Atlas (THSA) was consulted to determine if any National Register of Historic Places (NRHP)-listed or previously documented buildings, structures, objects, or state historic markers lie within or near the proposed APE. No historic properties or documented resources of historic age are located within 1,000 m (3,281 ft) of the proposed project.

Recommendations for Archaeological Resource Investigations

The archaeological APE for Phase I of the Irving-3 project lies on a narrow strip of DFW property that is mostly disturbed by previous airport construction and development. It also lies in the "Areas of Impacts" described by Shelton et al. (2008) as being so disturbed that there would be an extremely low probability of finding intact archaeological remains in the area. Based on background research and current development, the project area does not likely contain archaeological sites that meet NRHP eligibility requirements set forth in 36 CFR 60.4 – Criteria of Eligibility, nor any sites that merit designation as State Archaeological Landmarks (SALs), as outlined in 13 TAC 26.8, Criteria for Evaluating Archaeological Sites. Therefore, it is recommended that the project should have no adverse effect on archaeological historic properties or SALs, and no further archaeological investigations are warranted.

In the event that unanticipated archaeological materials are encountered during the construction phase of the proposed project, work in the immediate area will cease and The State Historic Preservation Officer will be notified to initiate post-review procedures.

Recommendations for Historic Resource Investigations

It is proposed that a reconnaissance-level survey of historic-age resources within the proposed historic APE be performed for Phase I of the Irving-3 project. The recommended APE for the survey of the proposed rail line is 150 ft on either side of the proposed ROW, (Exhibit 3). The APE will take into account potential physical and visual impacts that may result from the

proposed undertaking. The reconnaissance survey will be performed by an architectural historian meeting the Secretary of the Interior's qualifications. The resulting survey report will include, but not be limited to, the following information:

- Project description.
- Project area background and historic context that may include research carried out at the following places:
  - local and county histories (obtained at municipal libraries in the project area),
  - Dallas and Tarrant County Appraisal District online records,
  - Dallas and Tarrant County plat records,
  - various internet resources, and
  - maps and aerial photographs (including USGS maps).
- Previously documented historic-age resources within and immediately adjacent to the APE.
- Documentation of each historic-age resource within the APE including:
  - Address or location,
  - Historic and current name, if any,
  - Date of construction,
  - Style,
  - Historic and current use,
  - Property type and subtype,
  - Preliminary NRHP eligibility recommendations,
  - Condition, and
  - Digital photographs (minimum of two views) of each historic-age resource.
- Summary and Recommendations.

A draft report resulting from the historic-age resources survey will be submitted to DART and the THC for comment. Upon receipt of these comments, a final report will be submitted to the THC.

Request for Concurrence

Archaeological Resources

On behalf of DART, URS respectfully requests concurrence of the THC that no further archaeological resources investigations within the Phase I project APE are necessary, and DART may proceed with Phase I of the project.

Historic Age Resources

On behalf of DART, URS respectfully requests the concurrence of the THC regarding the proposed APE, consisting of 150 feet on either side of the proposed ROW for Phase I of the Irving-3 Project. We also request concurrence for the proposed survey and report methodology.

If the proposed undertaking is altered such that it has the potential to affect the adjacent historic-age resources either physically, or by changing the setting in ways not covered by this coordination letter, DART will cease construction activities and not proceed with their undertaking until additional review and clearance by the THC has been completed.

Respectfully,

Katherine Turner-Pearson, RPA
Principal Investigator
URS Corporation
1950 North Stemmons Freeway
Suite 6000
Dallas, Texas 75207
(214) 672-2852

Deborah Dobson-Brown
Cultural and Natural Resources Department Manager
Architectural Historian
URS Corporation
1950 North Stemmons Freeway
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Dallas, Texas 75207
(214) 672-2989

CONCUR
by
for Mark Wolfe
State Historic Preservation Officer
Date 4-17-09
Track# 20100250 1

Attachments: Exhibits 1, 2, and 3 and References

Cc: John Hoppie, DART
Lori Molitor, URS
Jerry Smiley, URS

July 31, 2009

Open Records Coordinator
Texas Parks & Wildlife Department,
Wildlife Division
Wildlife Habitat Assessment Program
4200 Smith School Road
Austin, Texas 78744-3291

Re: Dallas Area Rapid Transit
Irving-3 Preliminary Engineering/Environmental Assessment
Phase I & Phase II Construction of Light Rail Transit System
DFW Airport, Dallas & Tarrant Counties, Texas

To Whom it May Concern:

Dallas Area Rapid Transit (DART) is planning to construct a Light Rail Transit (LRT) system in two phases on the north, northeast, and east sides of DFW Airport in DFW Airport, Dallas and Tarrant Counties, Texas in an effort to provide services to employees, air passengers and other commuters in the North Central Texas region.

The areas where potential construction activities are anticipated to take place on DFW Airport property are as follows:

1. **Phase I**. This route begins at the DART Beltline Station just northwest of Highway 161 and continues along the south side of State Highway 114 to the Terminal A planned platform area. The Beltline Station, where this phase will begin on the far south side of the project area, is located at longitude 32° 53' 21.73" north and latitude 96° 59' 14.34" west. The project will terminate at DFW Airport Terminal A, located at longitude 32° 54' 26.58" north and latitude 97° 02' 20.93" west.
2. **Phase II.** This route begins at State Highway 114 near Freeport Parkway, follows Highway 121 to the Cotton Belt right-of-way and the north side of the airport. The route would then travel south, crossing over Highway 121, then terminate at the Terminal A planned platform area. The beginning latitude and longitude for this project at Freeport Parkway and State Highway 114 is longitude 32° 55' 14.89" north and latitude 97° 01' 15.70" west. The project will terminate at DFW Airport Terminal A, located at longitude 32° 54' 26.58" north and latitude 97° 02' 20.93" west. The far northern boundary of this portion of the project extends to the Cotton Belt right-of-way, which is located at longitude 32° 56' 32.47" north and latitude 97° 02' 24.51" west at Highway 121. One option exists for this portion of the alignment and is shown in the attached figures.

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T 972.406.6950
F 972.406.6951

Various construction activities will take place within the project area including, but are not limited to clearing and grubbing; storm water and erosion control; utility and possibly street relocation; installation of drainage and storm water systems; excavation, embankment, and sub-grade preparation; retaining wall and ballast wall installation; chain-link-fence installation; railway construction; and, bridge construction. Some of the equipment that is anticipated to be used during construction activities includes a bulldozer, motor grader, rubber tired crane, dump trucks, backhoe, trencher, compactor, rubber tired loader, excavator, ramjack, and a tractor with hole auger.

Agricultural and wooded areas (especially along the creeks) dominate the northern portion of the project area. The remaining portions of the project area have either been disturbed or are adjacent to development. Within these disturbed and/or maintained areas that are not developed, herbaceous vegetation dominates. Creeks and drainages are located along both routes within the project area. Waters of the U.S., including wetlands, have the potential to be located within these areas. Since a survey of the project area has not yet been completed, it can not be determine at this time the total acreage of impact that could occur to the ground and waters of the U.S. However, disruption within potential waters of the U.S. will be kept to a minimum, limiting environmental impacts associated with construction. Turbidity curtains and silt fences will be deployed, where necessary, for sediment control during project activities.

Construction activities are anticipated to begin in 2010 or 2011. The completion of this project is anticipated to be in 2013.

This EA is being prepared in accordance with the National Environmental Policy Act (NEPA). To assist in this process, DART has contracted with URS. We are requesting information regarding federally-listed and proposed threatened, endangered, and rare species for Dallas and Tarrant Counties, Texas. A topographic map (Figure 1) and an aerial photograph (Figure 2) showing the boundaries of the proposed project location are included with this letter. In addition, a Review Request from your agency is also included.

We would like the following information from the Texas Parks & Wildlife Department for the surrounding area of the project and for Dallas and Tarrant Counties:

1. Scientific and common name of any federally-listed threatened and endangered species for the counties.
2. List of proposed/candidate species for federal listing for the counties.
3. Known distribution of the species within the project area or within the counties.
4. Scientific and common name of any state-listed threatened and endangered species for the counties.
5. Critical habitat, designated or not designated, for the listed species within the counties.

We would appreciate receiving this information as soon as possible. Your assistance will be greatly appreciated.

URS Corporation
1950 North Stemmons Freeway, Suite 6000
Dallas, Texas 75207
T 972.406.6974
F 214.741.9413

Open Records Coordinator
July 31, 2009

Sincerely,

Charlie Andrews
Senior Environmental Scientist/
Biologist
URS

Attachments

URS Corporation
1950 North Stemmons Freeway, Suite 6000
Dallas, Texas 75207
T 972.406.6974
F 214.741.9413

All Project Review Requests

(Including Threatened and Endangered Species)

Name: **Charlie Andrews** Date: **July 31, 2009**

Your Company: **URS Corporation** Phone: (**972**) **406-6974**

Your Company Address: **1950 North Stemmons Freeway, Suite 6000** Fax: (**214**) **741-9413**

City, State, Zip: **Dallas, Texas 75207** E-mail: **charlie_f_andrews@urscorp.com**

Project Title, Number and Site Location: **DART I-3 PE/EA, Construction of LRT, DFW Airport** County(ies): **Dallas & Tarrant**

1. Scope of Project:

(a) What regulations will this review help you to comply with? OR, if not regulatory, why is the review being requested? Who is the project sponsor?

NEPA, the project sponsor is the Federal Transit Administration

(b) What activities will be conducted at the site? (Especially activity types, extent, and acreage of ground, waterway, and vegetation disturbance and total acreage of site)?

See attached letter for description

(c) If this request is for a site investigation or risk assessment, why is the site being investigated? If applicable, what contaminant pathways are being evaluated?

NA

(d) Schedule of activities – Approximately when will the project be active on the site?

Construction should begin in 2010 or 2011 with completion in 2013.

2. Vegetation: Species, dominant plants, structure and composition, vegetation layers, height of layers, natural vegetation community types.

Based on information gathered from a previous study conducted by URS in 2004 on this portion of the airport, herbaceous vegetation dominates the maintained & disturbed areas and consists predominantly of Bermuda grass, Johnson grass, and eastern gamagrass. Along and near the drainage ditches, low lying vegetation was reported to exist in this area consists predominantly of great ragweed, black willow, broad-leaved cattail, Canada goldenrod, common sunflower, smartweed, and perennial broomweed. Eastern cottonwoods and hackberry were also noted in the wooded areas.

3. Other Natural Resources/Physical Features:

(a) Soils, geology, watercourses, aquifers, flood zones, etc.

A wide variety of soil types exist across the construction area. Heiden clay and Houston Black clay dominate the southeast side of the Phase I route. Urban Land is the soil type in the areas that are developed around the airport. On the north side of the project area, Heiden clay, Houston Black clay, and Navo clay loam are the most prevalent soil types along the Phase II route away from the creek area. The geology for this area consists of Silty Clay Decomposition Residuum within the Quaternary and Tertiary periods. According to information provided on the USGS Grapevine, Texas 7.5-Minute Topographic Map, four creeks are crossed along the potential construction route. Beginning on the far south side, the Phase I route crosses Mud Springs Creek (situated within the Ovan clay soils), then Hackberry Creek (situated within the Ferris-Heiden soil complex) near Cabell Drive as one moves north (Mud Spring Creek is a tributary of Hackberry Creek and is now a concrete-lined ditch). Travelling further north along the Phase I route, this route crosses Grapevine Creek near Highway 114, which is situated within the Houston Black soils. The Phase II route crosses Cottonwood Branch Creek in two places on the far north end of the project area and soils along this creek consist of Trinity Clay. The major aquifer in the area is the Trinity and the minor aquifer in the area is the Woodbine. Hackberry Creek, Grapevine Creek, and Cottonwood Branch Creek are all located within Flood Zone AE where the routes cross these creeks.

(b) Habitat, animals, animal assemblages, other sensitive features, etc.

The most sensitive features along these routes would be along Hackberry Creek, Grapevine Creek, and Cottonwood Branch Creek (Mud Spring Creek currently consists of a concrete-lined drainage ditch along route Phase I with no riparian vegetation). Riparian areas exist along these creeks where more wildlife would be observed. The north side of the project area in the vicinity of Cottonwood Creek and Cotton Belt Railroad is wooded. Animals or signs of these animals that have been observed by URS in the vicinity of the project area in the past includes beaver, coyote, cardinal, ruby-crowned kinglet, chickadee, dove, crow, and red-winged black bird.

4. **Existing Site Development:** Extent of pavement, gravel, shell, or other cover; buildings, landscaped, xeriscaped, drainage system, etc.

Approximately 30 percent or so of the project area is wooded and has not been developed. This area is predominantly concentrated in the vicinity of the Cotton Belt Railroad and Cottonwood Branch Creek. The other portions of the project area are either developed, agricultural, or maintained. Mud Spring Creek consists of a concrete-lined drainage ditch along the Phase I route with no riparian vegetation. The project area will cross parking lots, highways, roadways, and developed airport areas along International Parkway. Since a survey is not yet complete, the extent of the areas of impact is unknown at this time.

5. **Historic Use/Function of Site:** Pasture, forest, urban, row crops, rangeland, wetland, etc. If the request is for a risk assessment, when was, or for how long, has the site been active? Are cultural resources present on the site or will the project cross or impact state lands?

The project area has been used as airport property over the last several decades. Based on observance of agricultural areas in and around the project area on DFW Airport property, it appears that agricultural properties existed prior to development of the airport.

6. **Has a threatened and endangered species survey or assessment,** wetland delineation, or other biological assessment already been performed? (In general, TPWD recommends an on-site habitat assessment be performed.) ☐ Yes ☒ No

(a) If yes, provide surveyor name, qualifications, methods or protocols, acreage surveyed, level of effort, weather conditions, time of day, and dates the survey was performed.

At the time this information was collected, a threatened and endangered species survey and a Waters of the U.S. determination had not been completed. This field visit will be completed in August of 2009

(b) If yes, please provide results and copy of survey/assessment report.

All Project Review Requests (Continued)

(Including Threatened and Endangered Species)

7. **Could current on-site or adjacent habitat support rare species?** [X] Yes [ ] No
Specifically, explain why or why not.

Possibly. To date, a habitat assessment for rare species within the project area has not been conducted. Based on a desktop review of T&E species reported to exist by the TPWD for Dallas and Tarrant Counties, it appears that the following threatened, endangered, or rare species could exist on Site: plains spotted skunk, western burrowing owl, peregrin falcon, golden-cheeked warbler, red wolf, gray wolf, and the Texas garter snake. The skunk, owl, and garter snake are rare species that could be found pretty much anywhere. The peregrine falcon (American and Arctic) is a State Threatened species that has the potential to migrate to the project area for a short period of time. Until a ground survey is completed, it can not be determined if the Federally-endangered golden-cheeked warbler habitat exists within the wooded portions of the project area, especially on the north side. In addition, both Federally-endangered wolf species have the potential to be located in the forested areas on the north end of the project area, though highly unlikely due to the presence of the railroad and agricultural properties in this area. The habitat assessment will be conducted within the month of August 2009 to gain a better of understanding of the habitats present within the project area.

8. **Provide a brief description of potential negative direct and indirect impacts** from proposed project activities or former and current site activities, such as types of habitat and acreage to be degraded or lost, temporarily and permanently. Also, summarize cumulative effects that could be anticipated from the project.

Based on the size of the project area, only a minor amount of woody vegetation would be permanently lost with the construction of the Light Rail Transit (LRT) system. This area is concentrated primarily along the Cotton Belt Railroad on the far north side of the project area. The majority of the ground disturbance within the project area will be to previously disturbed land included mowed areas on airport property, agricultural areas, and developed areas. Herbaceous vegetation exists within the agricultural and manicured areas. This vegetation would also be permanently lost with the construction of the LRT. Potential waters of the U.S. would be dredged and/or filled (area not calculated at the time this information was submitted), but any waters of the U.S. that may be affected by construction activities would only be temporarily impacted. Indirect effects include animals temporarily leaving the area where construction will take place due to the disturbance of these land areas. However, much of the animals observed near the project area in the past would come back to the general area since they have been known to live where human disturbance has occurred. No cumulative impacts are anticipated to occur with the development of this project.

9. **Provide a brief description of planned beneficial mitigation and enhancements** or restoration efforts. Be sure to note the avoidance, minimization, and compensatory mitigation measures planned to address the threat of negative impacts.

At the time this information was submitted, potential mitigation measures have not been developed. However, turbidity curtains and silt fences will be deployed, where necessary, for sediment control around potential waters of the U.S. during project activities.

10. **Include copies of coordination with other agencies** relevant to impacts or enhancements of natural resources for this project.

The same letter that was submitted to TPWD was also submitted to the USFWS and Natural Heritage Department.

11. **Clearly delineate exact location of site and its boundaries** on original or photocopy of relevant portion of USGS 7.5' topographic quadrangle (most preferable) or best map available. Topographic map should show name of quadrangle. The map must contain identifiable features and a scale that allows us to accurately pinpoint your site and shows the site boundaries, if applicable for the project.

Included.

12. **Originals or color-copy photographs** of site and surrounding area with captions or narratives.

Could not include field photographs at time this information was submitted since site visit had not yet been conducted.

13. **Aerial photographs with pertinent features labeled**. Aerials should show the year photograph was taken.

Included.

Send completed form to:

Texas Parks and Wildlife Department
Wildlife Division
Wildlife Habitat Assessment Program
4200 Smith School Road
Austin, Texas 78744-3291
(512) 389-4571 (Phone)
(512) 389-4599 (Fax)

Texas Parks and Wildlife Department maintains the information collected through this form. With few exceptions, you are entitled to be informed about the information we collect. Under Sections 552.021 and 552.023 of the Texas Government Code, you are also entitled to receive and review the information. Under Section 559.004, you are also entitled to have this information corrected.

All Project Review Requests

(Including Threatened and Endangered Species)

Review Service Details

Review requests should include all the information listed on the previous two pages and be sent to the address shown on the previous page. If you are sending in a separate document in lieu of filling out the form, it is not necessary to return the blank form. If you are sending in a filled out form, it is not necessary to include this last page. We will provide you a response based on the most current information available to Texas Parks and Wildlife Department regarding sensitive natural resources. Please expect a response to take on average 4 to 6 weeks from receipt, depending on the size of your request. The more pertinent information you provide, the more customized our review, and the faster our turnaround. Review requests submitted without adequate project detail may cause a delay in our response as we will need to contact you and wait for supplemental information. The potential for adverse impacts to natural resources from project activities varies based on the type of activity; location; season; vegetation; present physical features (both natural and man-made); degree of disturbance; planned avoidance, minimization, mitigation, enhancement, and restoration measures; species-specific tolerance levels; etc. Current color photographs and aerial photographs of the site greatly facilitate the review process. Complete information allows us to more accurately assess the potential for project impacts, as well as, assists us in narrowing the list of rare, threatened, and endangered species and other natural resources that may need to be addressed further.

This service includes an evaluation of your site-specific environmental assessment for impacts to general fish and wildlife and their habitats, such as wetlands, water bodies, and natural communities, and potential impacts to threatened, endangered, and other rare species and special features presently known or potentially occurring in the vicinity of your project. **If you need only state or county rare species lists for preliminary project planning, in lieu of submitting this form please contact our administrative staff at (512) 389-4571 or access the TPWD county list database at:**
http://www.tpwd.state.tx.us/landwater/land/maps/gis/ris/endangered_species/

TEXAS PARKS & WILDLIFE

Life's better outside.™

September 11, 2009

Charlie Andrews
URS Corporation
1950 North Stemmons Freeway, Suite 6000
Dallas, TX 75207

RE: Proposed DART Irving-3 Phase I & II DFW Airport LRT Line (Dallas County)

Dear Mr. Andrews:

On behalf of Dallas Area Rapid Transit (DART), URS Corporation is preparing an Environmental Assessment (EA) for the project referenced above and has requested information regarding rare, threatened, and endangered species for Dallas and Tarrant Counties. The Texas Parks and Wildlife Department (TPWD) reviewed the preliminary project information and offers the following comments and recommendations to minimize impacts to natural resources of the state including rare, threatened, and endangered species and their habitat.

Stream Crossings and Riparian Habitat

Riparian areas are vegetated corridors along drainages that generally provide nesting habitat for birds, soil stabilization for enhanced water quality, and food, cover, and travel corridors for wildlife. Because many species of wildlife travel along riparian corridors it is important to reduce disturbance and fragmentation to riparian corridors. Riparian habitat is a priority for conservation by TPWD across the state.

Recommendation. The amount of vegetation removed, trampled, or disturbed should be minimized in riparian areas. To avoid soil disturbances, machinery and other vehicles should utilize nearby roadways and bridges when crossing drainages, wetlands, and creeks.

Recommendation. Where riparian areas would be crossed using bridge spans, the design should allow usable vertical and horizontal space beneath the bridges for local terrestrial wildlife to cross under the facility. Crossings should also be perpendicular to the stream to minimize loss of riparian habitat.

4200 SMITH SCHOOL ROAD
AUSTIN, TEXAS 78744-3291
512.389.4800
www.tpwd.state.tx.us

The proposed project would involve constructing Phase I and Phase II Light Rail Transit (LRT) lines north, northeast, and east of the DFW Airport within DFW Airport Property. Mud Springs Creek is one of four streams that would be crossed, but it consists of a concrete lined channel with no adjacent riparian vegetation. The remaining three streams contain wooded riparian vegetation that would be cleared to construct and operate the facilities. The majority of clearing would occur along Cottonwood Branch Creek at the northern limit of the project, whereas the other crossings have only small amounts of riparian woodlands present.

> Recommendation. TPWD prefers that necessary stream crossings be placed in exiting open spaces where the riparian buffer is narrow or previously cleared to minimize the amount of riparian habitat disturbance. It appears that the southern crossing of Cottonwood Branch Creek has been placed at a narrow point in the riparian woodlands to minimize impacts.

The Phase II line would split into two routes just after crossing Cottonwood Branch Creek at the northern extent of the proposed project. The LRT would follow two separate routes for a short distance before meeting back up again, though it is not clear the reason why this would be necessary. Splitting the line into two separate routes would require clearing the woodlands that buffer Cottonwood Branch Creek for two alignments.

> Comment. Placement of two separate lines through the woodlands along Cottonwood Branch Creek should be eliminated to minimize impacts to natural resources. Impacts may be minimized if the two tracks for LRT Phase II are collocated on one bridge then proceed to follow alongside the existing Cotton Belt rail corridor. The EA needs to address the issue of splitting the line into two separate routes near the northern crossing of Cottonwood Branch Creek rather than using one alignment shared by two tracks.

Rare Resources

The TPWD Annotated County Lists of Rare Species are available at http://gis.tpwd.state.tx.us/TpwEndangeredSpecies/DesktopDefault.aspx. These lists provide information regarding rare species that have **potential** to occur within each county. Rare species could potentially be impacted if suitable habitat is present at or near the project site.

Recommendation. The county list(s) should be used as a reference to determine if suitable habitat occurs within the proposed project ROW and to determine if the project would impact the species or habitats. The project should be designed and constructed to avoid or minimize adverse impacts and to mitigate any impacts when rare plant and animal species and their habitat are found within or near the project area.

TXNDD

The Texas Natural Diversity Database (TXNDD) is intended to assist users in avoiding harm to rare species or significant ecological features. Given the small proportion of public versus private land in Texas, the TXNDD does not include a representative inventory of rare resources in the state. Absence of information in the database does not imply that a species is absent from that area. Although it is based on the best data available to TPWD regarding rare species, the data from the TXNDD do not provide a definitive statement as to the presences, absence or condition of special species, natural communities, or other significant features within your project area. These data are not inclusive and **cannot be used as presence/absence data**. They represent species that could potentially be in your project area. This information cannot be substituted for on-the-ground surveys. The TXNDD is updated continuously based on new, updated and undigitized records; for questions regarding a record, please contact txndd@tpwd.state.tx.us.

A search of the TXNDD indicated no known occurrences of rare resources within 5 miles of the project.

Landscaping and Water Conservation

There has been a dramatic increase in water demand across North Texas associated with increased development and population growth, thus water conservation is essential to this area. Native vegetation is adapted to the soil and climate of the area and usually requires less maintenance and watering than introduced species. The disease tolerance of native vegetation provides longevity to the landscape without high cost. Native landscapes provide an enjoyable outdoor space for passengers while also benefiting wildlife such as birds and butterflies. Mature trees and shrubs provide nesting, loafing, and forage habitat for birds and other wildlife.

Recommendation. Site planning and construction techniques should be designed to avoid and preserve existing mature native trees and shrubs. Native replacement trees should be planted as mitigation for trees removed.

Recommendation. To enhance the value of the proposed project to both wildlife and passengers and to aid in water conservation, native vegetation beneficial to fish and wildlife should be used for landscaping. The following websites can offer help in finding appropriate native vegetation for the project area: http://www.tpwd.state.tx.us/huntwild/wild/wildscapes/ and http://tpid.tpwd.state.tx.us/.

The information you requested and our project reviews are normally not part of the Open Records process as no document exists for your project area and each project has to be evaluated individually. All projects should be addressed to Kathy Boydston, TPWD Wildlife Division, Wildlife Habitat Assessment Program, 4200 Smith School Road, Austin, TX 78744.

If you have any questions, please contact me at (512) 917-4155.

Sincerely,

Karen B. Hardin
Wildlife Habitat Assessment Program
Wildlife Division

kbh/14328

August 14, 2009

Mr. Wayne Lea
U.S. Army Corps of Engineers
Fort Worth District
Regulatory Branch (CESWF-PER-R)
P.O. Box 17300
Fort Worth, Texas 76102-0300

Re: Project Initiation for Dallas Area Rapid Transit
Irving-3 Preliminary Engineering/Environmental Assessment
Phase I & Phase II Construction of Light Rail Transit System
DFW Airport, Dallas & Tarrant Counties, Texas

Dear Mr. Cloud:

Dallas Area Rapid Transit (DART) is planning to construct a Light Rail Transit (LRT) system in two phases on the north, northeast, and east sides of DFW Airport in DFW Airport, Dallas and Tarrant Counties, Texas in an effort to provide services to employees, air passengers and other commuters in the North Central Texas region.

The areas where potential construction activities are anticipated to take place on DFW Airport property are as follows:

1. **Phase I**. This route begins at the DART Beltline Station just northwest of Highway 161 and continues along the south side of State Highway 114 to the Terminal A planned platform area. The Beltline Station, where this phase will begin on the far south side of the project area, is located at longitude 32° 53' 21.73" north and latitude 96° 59' 14.34" west. The project will terminate at DFW Airport Terminal A, located at longitude 32° 54' 26.58" north and latitude 97° 02' 20.93" west.
2. **Phase II.** This route begins at State Highway 114 near Freeport Parkway, follows Highway 121 to the Cotton Belt right-of-way and the north side of the airport. The route would then travel south, crossing over Highway 121, then terminate at the Terminal A planned platform area. The beginning latitude and longitude for this project at Freeport Parkway and State Highway 114 is located at longitude 32° 55' 14.89" north and latitude 97° 01' 15.70" west. The project will terminate at DFW Airport Terminal A, located at longitude 32° 54' 26.58" north and latitude 97° 02' 20.93" west. The far northern boundary of this portion of the project extends to the Cotton Belt right-of-way, which is located at longitude 32° 56' 32.47" north and latitude 97° 02' 24.51" west at Highway 121. One option exists for this portion of the alignment and is shown in the attached figures.

URS Corporation
3010 LBJ Freeway, Suite 1300
Dallas, Texas 75234
T 972.406.6950
F 972.406.6951

Mr. Wayne Lea
August 14, 2009

Various construction activities will take place within the project area including, but are not limited to: clearing and grubbing; storm water and erosion control; utility and possibly street relocation; installation of drainage and storm water systems; excavation, embankment, and sub-grade preparation; retaining wall and ballast wall installation; chain-link-fence installation; railway construction; and, bridge construction. Some of the equipment that is anticipated to be used during construction activities includes a bulldozer, motor grader, rubber tired crane, dump truck, backhoe, trencher, compactor, rubber tired loader, excavator, ramjack, and a tractor with hole auger.

Agricultural and wooded areas (especially along the creeks) dominate the northern portion of the project area. The remaining portions of the project area have either been disturbed or are adjacent to development. Within these disturbed and/or maintained areas that are not developed, herbaceous vegetation dominates. Creeks and drainages are located along both routes within the project area. Waters of the U.S., including wetlands, have the potential to be located within these areas. Since a survey of the project area has not yet been completed, it can not be determine at this time the total acreage of impact that could occur to the ground and waters of the U.S. However, any disruption within potential waters of the U.S. will be kept to a minimum, limiting environmental impacts associated with construction. Turbidity curtains and silt fences will be deployed, where necessary, for sediment control during project activities. Maps of the proposed project location are included with this letter.

Construction activities are anticipated to begin in 2010 or 2011. The completion of this project is anticipated to be in 2013.

This EA is being prepared in accordance with the National Environmental Policy Act (NEPA). To assist in this process, DART has contracted with URS.

We would like to request the following from the USACE regarding the project area:

1. Creation of a file for this project so once information does arrive at your agency, project activities will not be administratively hindered.
2. Notification of any existing USACE projects (either federally or locally maintained), that are beyond those modifications required for normal operation and maintenance (33 USC 408).

Thank you for your assistance with this project and we look forward to working with your agency on this important project.

Sincerely,

Charlie Andrews
Senior Environmental Scientist/

URS Corporation
1950 North Stemmons Freeway, Suite 6000
Dallas, Texas 75207
T 214.741.7777
F 214.741.9413

Mr. Wayne Lea
August 14, 2009

Biologist
URS

Attachments

URS Corporation
1950 North Stemmons Freeway, Suite 6000
Dallas, Texas 75207
T 214.741.7777
F 214.741.9413

CONVERSATION RECORD Time: Date: 3/10/10

Type: Telephone

Name of Contact: Mr. Wayne Lea, PM and regulator, U.S. Army Corps of Engineers

Subject: Dallas Area Rapid Transit (DART) Irving-3

Summary: The Light Rail Transit alignment crosses Grapevine Creek. The bridge piers are located within the ordinary high water mark (OHWM) at an elevation of 540 feet above sea level, which is where the OHWM begins. Any materials placed at this elevation or below are located within the OHWM and would be an impact to a water of the U.S. Charlie Andrews (URS) contacted Wayne Lee, PM and regulator for the Fort Worth District, U.S. Army Corps of Engineers to discuss the 0.06 acre impact. Mr. Lee stated that with this small of an impact, DART does not need to notify the USACE and they can proceed with construction activities following the guidelines of either Nationwide Permit 25 or 14, depending on construction techniques utilized.

If DART is pouring the piers, they will be working under Nationwide Permit 25.
http://www.nwo.usace.army.mil/html/od-rwy/NP%2025.pdf

If DART is not pouring the piers, then they could operate under the guideline of Nationwide Permit 14 for Linear Transportation Projects:
http://www.belmont.gov/Upload/Document/D240005287/Nationwide%Permit%2014.pdf

Action Required:

none

Name of Person Documenting Conversation: _____

Signature: _____

Date: _____

Dallas Area Rapid Transit
P.O. Box 660163
Dallas, Texas 75266-0163
214/749-3278

May 19, 2010

Mr. Fred Land
U.S. Army Corp of Engineers (USACE)
Regulatory Branch (CESWF-PER-R)
819 Taylor Street, Room 3A37
Fort Worth, TX 76102-0300

Re: Permit 2009-00339
Dallas Area Rapid Transit Proposed Line Section I-3, Phase I
Dallas and Tarrant Counties, Texas

Mr. Land:

Dallas Area Rapid Transit (DART) will soon contract for design-build construction of the final line section of the Irving/DFW Corridor (referred to by DART as Line Section I-3) Light Rail Transit (LRT) line to its terminus at Dallas/Fort Worth International Airport (DFWIA). Line Section I-3 will be developed in two phases. Phase I will extend approximately 5.2 miles from Belt Line Station to its terminus at the DFWIA Terminal A Station. The attached document describes impacts for Phase I only and has been assigned USACE Permit number 2009–00339.

As discussed during your phone conversation with Bonnie Doggett on May 11, 2010, Phase I of Line Section I-3 will impact less than 1/10 acre of waters of the U.S. and has no impacts to jurisdictional wetlands. Since the project will have minimal impacts to jurisdictional waters and no impacts to threatened and endangered species or cultural resources, DART considers the project and project activities covered by Nationwide Permit (NWP) 14, and further that permit coverage will not require a pre-construction notification (PCN). DART requests that USACE communicate its concurrence by reply to this letter, verifying that a PCN is not required for Phase I of Line Section I-3. The attached environmental documentation includes a description of the proposed action, its impacts, and a delineation of waters of the U.S.

If you have any questions, please contact me at (214) 749-2805 or Bonnie Doggett at (512) 340-9801.

Sincerely,

Allen Bud Beene, PE, F. ASCE
DART Project Manager

Enclosure

cc: Bonnie Doggett – Biologist, CP&Y, Inc. Tim McKay Chris Masters
Dan Krueger RPDFR

July 31, 2009

Mr. Tom Cloud
U.S. Fish and Wildlife Service
Arlington, TX Ecological Services Field Office
711 Stadium Drive, Suite 252
Arlington, Texas 76011

Re: Dallas Area Rapid Transit
Irving-3 Preliminary Engineering/Environmental Assessment
Phase I & Phase II Construction of Light Rail Transit System
DFW Airport, Dallas & Tarrant Counties, Texas

Dear Mr. Cloud:

Dallas Area Rapid Transit (DART) is planning to construct a Light Rail Transit (LRT) system in two phases on the north, northeast, and east sides of DFW Airport in DFW Airport, Dallas and Tarrant Counties, Texas in an effort to provide services to employees, air passengers and other commuters in the North Central Texas region.

The areas where potential construction activities are anticipated to take place on DFW Airport property are as follows:

1. **Phase I**. This route begins at the DART Beltline Station just northwest of Highway 161 and continues along the south side of State Highway 114 to the Terminal A planned platform area. The Beltline Station where this phase will begin on the far south side of the project area is located at longitude 32° 53' 21.73" north and latitude 96° 59' 14.34" west. The project will terminate at DFW Airport Terminal A. located at longitude 32° 54' 26.58" north and latitude 97° 02' 20.93" west.
2. **Phase II.** This route begins at State Highway 114 near Freeport Parkway, follows Highway 121 to the Cotton Belt right-of-way and the north side of the airport. The route would then travel south, crossing over Highway 121, then terminate at the Terminal A planned platform area. The beginning latitude and longitude for this project at Freeport Parkway and State Highway 114 is located at longitude 32° 55' 14.89" north and latitude 97° 01' 15.70" west. The project will terminate at DFW Airport Terminal A, located at longitude 32° 54' 26.58" north and latitude 97° 02' 20.93" west. The far northern boundary of this portion of the project extends to the Cotton Belt right-of-way, which is located at longitude 32° 56' 32.47" north and latitude 97° 02' 24.51" west at Highway 121. One option exists for this portion of the alignment and is shown in the attached figures.

URS Corporation
3010 LBJ Freeway, Suite 1300
Dallas, Texas 75234
T 972.406.6950
F 972.406.6951

Various construction activities will take place within the project area including, but are not limited to clearing and grubbing; storm water and erosion control; utility and possibly street relocation; installation of drainage and storm water systems; excavation, embankment, and sub-grade preparation; retaining wall and ballast wall installation; chain-link-fence installation; railway construction; and, bridge construction. Some of the equipment that is anticipated to be used during construction activities includes a bulldozer, motor grader, rubber tired crane, dump truck, backhoe, trencher, compactor, rubber tired loader, excavator, ramjack, and a tractor with hole auger.

Agricultural and wooded areas (especially along the creeks) dominate the northern portion of the project area. The remaining portions of the project area have either been disturbed or are adjacent to development. Within these disturbed and/or maintained areas that are not developed, herbaceous vegetation dominates. Creeks and drainages are located along both routes within the project area. Waters of the U.S., including wetlands, have the potential to be located within these areas. Since a survey of the project area has not yet been completed, it can not be determine at this time the total acreage of impact that could occur to the ground and waters of the U.S. However, any disruption within potential waters of the U.S. will be kept to a minimum, limiting environmental impacts associated with construction. Turbidity curtains and silt fences will be deployed, where necessary, for sediment control during project activities.

Construction activities are anticipated to begin in 2010 or 2011. The completion of this project is anticipated to be in 2013.

This EA is being prepared in accordance with the National Environmental Policy Act (NEPA). To assist in this process, DART has contracted with URS. We are requesting information regarding federally-listed and proposed threatened, endangered, and rare species for Dallas and Tarrant Counties, Texas. A map of the proposed project location is included with this letter.

We would like the following information from the U.S. Fish and Wildlife Service for the surrounding area of the project and for Dallas and Tarrant Counties:

1. Scientific and common name of any federally-listed threatened and endangered species for the counties.
2. List of proposed/candidate species for federal listing for the counties.
3. Known distribution of the species within the project area or within the counties.
4. Critical habitat, designated or not designated, for the listed species within the counties.

We would appreciate receiving this information as soon as possible. Your assistance will be greatly appreciated.

Sincerely,

URS Corporation
1950 North Stemmons Freeway, Suite 6000
Dallas, Texas 75207
T 214.741.7777
F 214.741.9413

Mr. Tom Cloud
July 31, 2009

Charlie Andrews
Senior Environmental Scientist/
Biologist
URS

Attachments

URS Corporation
1950 North Stemmons Freeway, Suite 6000
Dallas, Texas 75207
T 214.741.7777
F 214.741.9413

Dallas Area Rapid Transit
P.O. Box 660163
Dallas, Texas 75266-0163
214/749-3278

April 22, 2011

City of Irving
Planning and Zoning Commission
c/o Urban Development Manager
825 W. Irving Blvd.
Irving, TX 75061

Zoning Case #ZC11-0005

To Whom It May Concern:

This is to advise the Planning and Zoning Commission and the applicant in Zoning Case #ZC11-0005 that Dallas Areas Rapid Transit (DART) has completed a Draft Environmental Assessment (EA) of the Orange Line DFW Extension Project. This study identifies a light rail transit (LRT) line that will be constructed on DFW Airport directly adjacent to the property at 4700 Plaza Drive in Irving, Texas. The report describes the environmental effects associated with the project. The implementation of LRT will introduce new visual elements and a new noise source to the area. As described in the Draft EA, none of these changes introduced by the project will require mitigation. There will also be an at grade rail crossing of Plaza Drive near its intersection with North Airfield Drive.

Final approval of the EA is anticipated this summer and a contractor will be selected to design and construct the project. LRT operations will begin by the end of 2014. The applicant should consider the presence of the LRT project when designing the hotel facility at 4700 Plaza Drive.

The Draft EA will be available online, on or before May 16, 2011. A public hearing on the project will be held on June 2, 2011. Visit www.dart.org/dfwextension to view the report, learn details on the public hearing or to provide comments. Any questions should be directed to John Hoppie at 1401 Pacific Avenue, Dallas, Texas 75266; or at jhoppie@dart.org.; or at (214) 749-2525.

Sincerely,

John Hoppie

John Hoppie
Project Manager

Dallas Area Rapid Transit
P.O. Box 660163
Dallas, Texas 75266-0163
214/749-3278

May 2, 2011

Subject: DART Orange Line DFW Airport Extension (Irving-3) Project

Dear Draft Environmental Assessment Recipient:

We are pleased to transmit the Orange Line DFW Airport Extension (Irving-3) Draft Environmental Assessment (EA). The Draft EA has been approved for circulation and comment by the Federal Transit Administration (FTA) in cooperation with the Federal Aviation Administration (FAA). Your review and comments on the Draft EA document are welcomed.

The Draft EA is being distributed to all appropriate governmental agencies, legislative bodies and concerned organizations and individuals. The Draft EA is available in electronic or hard copy format. Copies are available at DART Headquarters, at libraries in the vicinity of DFW Airport and online at www.dart.org/dfwextension. You may also contact DART Community Affairs at (214) 749-2543 to receive more information on the availability of the document.

The formal public comment period begins on May 16, 2011 and ends on June 17, 2011. A Public Hearing has been scheduled for June 2, 2011. A copy of the Public Hearing Notice is attached for your information. Oral comments may be provided at the Public Hearing or at a regular Board Meeting. Written comments may be submitted online at www.dart.org/dfwextension or sent to: John Hoppie, Project Manager, DART, P.O. Box 660163, Dallas, Texas 75266-0163.

We appreciate your input on the Draft EA, and look forward to your continued participation in the Public Hearing and review process.

Sincerely,

Stephen L. Salin, AICP
Vice President
Rail Planning

APPENDIX F. VEGETATION, WILDLIFE AND SOILS REFERENCE INFORMATION

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
DART	Irving-3 LRT EA/PE, DFW Airport	25337852

Photo No.	Date:
1	8/11/09

Description:

View from Station 500+00 of Phase I, looking northwest.

Photo No.	Date:
2	8/11/09

Description:

View from Station 505+00 of Phase I, looking northwest across Beltline Road.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
DART	Irving-3 LRT EA/PE, DFW Airport	25337852

Photo No.	Date:
3	8/11/09

Description:

View of Mud Springs Creek at Stations 535+00 and 545+00 in Phase I, looking south.

Photo No.	Date:
4	8/11/09

Description:

View of area between Stations 575+00 and 585+00 just west of Phase I, looking southeast.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
DART	Irving-3 LRT EA/PE, DFW Airport	25337852

Photo No.	Date:
5	8/11/09

Description:

View of area at Station 605+00 along Phase I, looking southeast.

Photo No.	Date:
6	8/11/09

Description:

View of area at Station 615+00 along Phase I, looking southeast.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
DART	Irving-3 LRT EA/PE, DFW Airport	25337852

Photo No.	Date:
7	8/11/09

Description:

View of area at Station 635+00 along Phase I at intersection of Airfield and Plaza Drive, looking northwest.

Photo No.	Date:
8	8/11/09

Description:

View from Station 655+00 along Phase I, looking northwest with Airfield Drive on the left.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
DART	Irving-3 LRT EA/PE, DFW Airport	25337852

Photo No.	Date:
9	8/11/09

Description:

View of area between Stations 685+00 to 695+00 along Phase I, looking east with Grapevine Creek behind (not shown).

Photo No.	Date:
10	8/11/09

Description:

View of Grapevine Creek along Phase I in between Stations 685+00 to 695+00, looking south from Airfield Drive.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
DART	Irving-3 LRT EA/PE, DFW Airport	25337852

Photo No.	Date:
11	8/12/09

Description:

View of area just west of Station 705+00 along Phase I, looking south with International Parkway service road on right.

Photo No.	Date:
12	8/11/09

Description:

View of Grapevine Creek along Phase I in between Stations 715+00 to 725+00, looking east from International Parkway service road.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
DART	Irving-3 LRT EA/PE, DFW Airport	25337852

Photo No.	Date:
13	8/11/09

Description:

View of area just north of Station 725+00 along Phase I, looking south.

Photo No.	Date:
14	8/11/09

Description:

View at Station 745+00 along Phase I, looking south toward International Parkway.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
DART	Irving-3 LRT EA/PE, DFW Airport	25337852

Photo No.	Date:
15	8/11/09

Description:

View just north of Station 765+00, looking north down International Parkway service road.

Photo No.	Date:
16	8/11/09

Description:

Additional view just north of Station 765+00, looking north down International Parkway service road with tram on left.

Project Area Soils Underlying the Proposed DART Irving-3 LRT Line Segment Phase I and II Alignments				
LRT Alignment Phase	**Soil Phase or Complex**	**Landform Setting and Parent Material**	**Soil Characteristics**	**Soil Potential and Limiting Features**
I	Branyon clay, 0 to 1 percent slopes	Associated with circular gilgai on stream terraces on river valleys, this soil phase arose from clayey alluvium of Quaternary age derived from mixed sources.	This soil phase is comprised of clay from 0 to 80 inches. It is moderately well drained. With more than 80 inches to the water table, there is no zone of water saturation within a depth of 72 inches. There is more than 80 inches to a root restrictive feature. Water movement in the most restrictive layer is low.	This soil phase is classified as prime farmland. The soil is considered of low strength with regard to traffic-supporting capacity. Its other limiting features include a very high shrink-swell potential and a high risk of corrosion to uncoated steel.
I and II	Burleson clay, 0 to 1 percent slopes	Associated with circular gilgai on stream terraces on river valleys, this soil phase arose from clayey alluvium of Pleistocene age derived from mixed sources.	This soil phase is defined as comprised of clay from 0 to 80 inches in Dallas County, and 0 to 66 inches in Tarrant County. It is moderately well drained. With more than 80 inches to the water table, there is no zone of water saturation within a depth of 72 inches. There is more than 80 inches to a root restrictive feature. Water movement in the most restrictive layer is low.	This soil phase is classified as prime farmland. The soil is considered of low strength with regard to traffic-supporting capacity. Its other limiting features include a very high shrink-swell potential, a high risk of corrosion to uncoated steel, and a moderate risk of corrosion to concrete.
II	Ferris-Heiden complex, 2 to 5 percent slopes	Associated with linear gilgai on ridges on plains, this soil complex arose from residuum weathered from calcareous and clayey shales in Eagleford shale and Taylor marl formations of Cretaceous age.	This soil complex is comprised of 50 percent Ferris and similar soils, 45 percent Heiden and similar soils, and 5 percent minor components. Ferris soils are comprised of clay, from 0 to 60 inches, and Heiden soils are comprised of clay from 0 to 80 inches. Both soils are well drained. With more than 80 inches to the water table, there is no zone of water saturation within a depth of 72 inches. Ferris soils exhibit 40 to 60 inches to densic bedrock as a restrictive feature, while Heiden soils exhibit more than 80 inches to a root restrictive feature. Water movement in the most restrictive layer is low.	This soil complex is considered of low strength with regard to traffic-supporting capacity. Its other limiting features include a very high shrink-swell potential and a high risk of corrosion to uncoated steel.
I	Ferris-Heiden complex, 5 to 12 percent slopes	Associated with linear gilgai on ridges on plains, this soil complex arose from residuum weathered from calcareous and clayey shales in Eagleford shale and Taylor marl formations of Cretaceous age.	This soil complex is comprised of 65 percent Ferris and similar soils, 25 percent Heiden and similar soils, and 10 percent minor components. Ferris soils are comprised of clay from 0 to 72 inches. Heiden soils are comprised of clay from 0 to 80 inches. Both soils are well drained. With more than 80 inches to the water table, there is no zone of water saturation within a depth of 72 inches. Ferris soils exhibit 40 to 60 inches to densic bedrock as a restrictive feature, while Heiden soils exhibit more than 80 inches to a root restrictive feature. Water movement in the most restrictive layer is low.	This soil complex is considered of low strength with regard to traffic-supporting capacity. Its other limiting features include a very high shrink-swell potential and a high risk of corrosion to uncoated steel. Slope is only somewhat limiting.

Project Area Soils Underlying the Proposed DART Irving-3 LRT Line Segment Phase I and II Alignments				
LRT Alignment Phase	**Soil Phase or Complex**	**Landform Setting and Parent Material**	**Soil Characteristics**	**Soil Potential and Limiting Features**
I	Ferris-Urban land complex, 5 to 12 percent slopes	Associated with linear gilgai on ridges on plains, the Ferris soils arose from residuum weather from calcareous shale in Eagleford shale and Taylor marl formations of Cretaceous age.	This soil complex is comprised of 65 percent Ferris and similar soils, 25 percent Urban land, and 10 percent minor components. Urban land is of variable composition from 0 to 40 inches. Ferris soils are comprised of clay, from 0 to 72 inches. These soils are well drained. With more than 80 inches to the water table, there is no zone of water saturation within a depth of 72 inches. There is 40 to 60 inches to densic bedrock as a restrictive feature. Water movement in the most restrictive layer is low.	Urban land has not been rated for soil potential and limiting features. Ferris soils are considered of low strength with regard to traffic-supporting capacity. Their other limiting features include a high shrink-swell potential and a high risk of corrosion to uncoated steel. Slope is only somewhat limiting.
I and II	Heiden clay, 1 to 3 percent slopes	Associated with linear gilgai on ridges on plains, this soil phase arose from clayey residuum weathered from clayey shale of Eagleford shale or Taylor marl.	This soil phase is comprised of clay from 0 to 80 inches. It is well drained. With more than 80 inches to the water table, there is no zone of water saturation within a depth of 72 inches. There is more than 80 inches to a root restrictive feature. Water movement in the most restrictive layer is low.	This soil phase is classified as prime farmland. The soil is considered of low strength with regard to traffic-supporting capacity. Its other limiting features include a very high shrink-swell potential and a high risk of corrosion to uncoated steel.
I	Heiden clay, 2 to 5 percent slopes, eroded	Associated with linear gilgai on ridges on plains, this soil phase arose from clayey residuum weathered from clayey shale of Eagleford shale or Taylor marl.	This soil phase is comprised of clay from 0 to 80 inches. It is well drained. With more than 80 inches to the water table, there is no zone of water saturation within a depth of 72 inches. There is more than 80 inches to a root restrictive feature. Water movement in the most restrictive layer is low.	This soil phase is classified as prime farmland. The soil is considered of low strength with regard to traffic-supporting capacity. Its other limiting features include a very high shrink-swell potential and a high risk of corrosion to uncoated steel.
I and II	Houston Black clay, 0 to 1 percent slopes	Associated with circular gilgai on plains on plains, this soil phase arose from residuum weather from calcareous shale of Taylor marl and Eagleford shale.	This soil phase is comprised of clay from 0 to 78 inches. It is well drained. With more than 80 inches to the water table, there is no zone of water saturation within a depth of 72 inches. There is more than 80 inches to a root restrictive feature. Water movement in the most restrictive layer is low.	This soil phase is classified as prime farmland. The soil is considered of low strength with regard to traffic-supporting capacity. Its other limiting features include a very high shrink-swell potential and a high risk of corrosion to uncoated steel.

Project Area Soils Underlying the Proposed DART Irving-3 LRT Line Segment Phase I and II Alignments				
LRT Alignment Phase	**Soil Phase or Complex**	**Landform Setting and Parent Material**	**Soil Characteristics**	**Soil Potential and Limiting Features**
I and II	Houston Black clay, 1 to 3 percent slopes	Associated with circular gilgai on ridges on plains, soil phase arose from residuum weather from calcareous shale of Taylor marl and Eagleford shale.	This soil phase is defined as comprised of clay from 0 to 78 inches in Dallas County, or 0 to 80 inches in Tarrant County. It is moderately well drained. With more than 80 inches to the water table, there is no zone of water saturation within a depth of 72 inches. There is more than 80 inches to a root restrictive feature. Water movement in the most restrictive layer is low.	This soil phase is classified as prime farmland. The soil is considered of low strength with regard to traffic-supporting capacity. Its other limiting features include a very high shrink-swell potential and a high risk of corrosion to uncoated steel.
II	Houston Black-Urban land complex, 1 to 4 percent slopes	Associated with circular gilgai on ridges on plains, the Houston soils arose from residuum weather from calcareous shale of Taylor marl and Eagleford shale.	This soil complex is comprised of 50 percent Houston and similar soils, 30 percent Urban land, and 20 percent minor components. Urban land is of variable composition, from 0 to 40 inches. Houston black soils are comprised of clay from 0 to 80 inches. They are moderately well drained. With more than 80 inches to the water table, there is no zone of water saturation within a depth of 72 inches. There is more than 80 inches to a root restrictive feature. Water movement in the most restrictive layer is low.	Urban land has not been rated for soil potential and limiting features. Houston black soils are considered of low strength with regard to traffic-supporting capacity. Their other limiting features include a very high shrink-swell potential and a high risk of corrosion to uncoated steel.
II	Leson clay, 1 to 3 percent slopes	Associated with ridges on plains, this soil phase arose from residuum weathered from calcareous shale.	This soil phase is comprised of clay, from 0 to 80 inches. It is moderately well drained. With more than 80 inches to the water table, there is no zone of water saturation within a depth of 72 inches. There is more than 80 inches to a root restrictive feature. Water movement in the most restrictive layer is low.	This soil phase is classified as prime farmland. The soil is considered of low strength with regard to traffic-supporting capacity. Its other limiting features include a high shrink-swell potential and a high risk of corrosion to uncoated steel.
II	Lott silty clay, 1 to 3 percent slopes	Associated with ridges on plains, this soil phase arose from residuum weathered from Austin chalk formation and Pecan gap formation.	This soil phase is comprised of silty clay from 0 to 78 inches, and of silty clay loam from 16 to 80 inches. It is well drained. With more than 80 inches to the water table, there is no zone of water saturation within a depth of 72 inches. There is 40 to 60 inches to dense material as a restrictive feature. Water movement in the most restrictive layer is moderately high.	This soil phase is classified as prime farmland. The soil is considered of low strength with regard to traffic-supporting capacity. Its other limiting features include a high risk of corrosion to uncoated steel. The shrink swell potential is moderate.
II	Lott-Urban land complex, 1 to 5 percent slopes	Associated with ridges on plains, the Lott soils arose from residuum weathered from Austin chalk formation and Pecan gap formation.	This soil complex is comprised of 50 percent Lott and similar soils, 30 percent Urban land, and 20 percent minor components. Urban land is of variable composition, from 0 to 40 inches. Lott soils are comprised of silty clay from 0 to 16 inches, and of silty clay loam from 16 to 80 inches. They are well drained. With more than 80	Urban land has not been rated for soil potential and limiting features. Lott soils are considered of low strength with regard to traffic-supporting capacity. Their other limiting features include a high risk of

Project Area Soils Underlying the Proposed DART Irving-3 LRT Line Segment Phase I and II Alignments				
LRT Alignment Phase	**Soil Phase or Complex**	**Landform Setting and Parent Material**	**Soil Characteristics**	**Soil Potential and Limiting Features**
			inches to the water table, there is no zone of water saturation within a depth of 72 inches. There is 40 to 60 inches to dense material as a restrictive feature. Water movement in the most restrictive layer is moderately high.	corrosion to uncoated steel. The shrink swell potential is moderate.
II	Navo clay loam, 1 to 3 percent slopes	Associated with ridges on plains, this soil phase arose from loamy residuum weathered from sandstone and shale of the Woodbine formation.	This soil phase is comprised of clay loam from 0 to 6 inches, and of clay from 6 to 72 inches. It is moderately well drained. With more than 80 inches to the water table, there is no zone of water saturation within a depth of 72 inches. There is more than 80 inches to a root restrictive feature. Water movement in the most restrictive layer is low.	This soil phase is considered of low strength with regard to traffic-supporting capacity. Its limiting features include a high shrink-swell potential and a high risk of corrosion to uncoated steel.
I	Ovan clay, frequently flooded	Associated with circular gilgai on flood-plain steps on plains, this soil phase arose from clayey alluvium of Quaternary age derived from mixed sources.	This soil phase is comprised of clay from 0 to 80 inches. It is moderately well drained. With more than 80 inches to the water table, there is no zone of water saturation within a depth of 72 inches. There is more than 80 inches to a root restrictive feature. Water movement in the most restrictive layer is low.	This soil phase is considered of low strength with regard to traffic-supporting capacity. Its other limiting features include a high risk of flooding, a high shrink-swell potential, and a high risk of corrosion to uncoated steel.
II	Trinity clay, frequently flooded	Associated with circular gilgai on flood-plains on river valleys, this soil phase arose from clayey alluvium of Holocene age derived from mixed sources.	This soil phase is comprised of clay from 0 to 80 inches. It is somewhat poorly drained. With more than 80 inches to the water table, there is no zone of water saturation within a depth of 72 inches. There is more than 80 inches to a root restrictive feature. Water movement in the most restrictive layer is low.	This soil phase is considered of low strength with regard to traffic-supporting capacity. Its other limiting features include a high risk of flooding, a very high shrink-swell potential, and a high risk of corrosion to uncoated steel.
I and II	Urban land	Found in urban areas, this soil phase arose from variable parent material sources.	Urban land is of variable composition, from 0 to 40 inches.	Urban land has not been rated for soil potential and limiting features.

Sources: NCTCOG 2008, and U.S. NRCS National Cooperative Soil Survey: Web Soil Survey 11/08/2009

TPWD Annotated County List of Rare Species for Dallas and Tarrant Counties DART Irving-3 PE/EA					
Common Name	*Scientific Name*	*County Found*	*Status*	*Habitat Required*	*Habitat Found Along Alignment*
Birds					
Bald eagle	*Haliaeetus leucocephalus*	Dallas/Tarrant	DM, ST	Near rivers and large lakes where fish are abundant and trees are at least 60 feet in height	No
Black-capped vireo	*Vireo atricapilla*	Dallas	E, SE	Oak-juniper woodlands with shrub foliage reaching the ground and open grassy areas	No
Golden-cheeked warbler	*Dendroica chrysoparia*	Dallas	E, SE	Oak-juniper woodlands with mature ashe junipers	No
Interior least tern	*Sterna antillarum*	Dallas/Tarrant	E, SE	Nests along sand and gravel bars within braided streams and rivers.	No
Piping plover	*Charadrius melodus*	Dallas	T, ST	Sparsely vegetated shores and islands of shallow lakes, ponds, rivers, or impoundments.	No
Whooping crane	*Grus americana*	Dallas/Tarrant	E, SE	Dense emergent vegetation (sedges, bulrushes) in shallow ponds, freshwater marshes, wet prairies, and along lake margins. Depends on highly productive wetland ecosystems.	No
Peregrine falcon	*Falco peregrinus*	Dallas/Tarrant	DM, ST	Occupies wide range of habitats during migration, including urban areas (this includes the American and Arctic Peregrin Falcon)	Yes

TPWD Annotated County List of Rare Species for Dallas and Tarrant Counties DART Irving-3 PE/EA					
Common Name	*Scientific Name*	*County Found*	*Status*	*Habitat Required*	*Habitat Found Along Alignment*
Henslow's sparrow	*Ammodramus henslowii*	Dallas/Tarrant	R	Weedy fields or cut-over areas where lots of bunch grass occur along with vines and brambles and bare ground for moving	No
Western burrowing owl	*Athene cunicularia hypugaea*	Dallas/Tarrant	R	Open grasslands, including prairie, plains, savanna and open areas such as vacant lots near airports	Yes
White-faced Ibis	*Plegadis chihi*	Dallas	ST	Prefers freshwater marshes, sloughs, and irrigated rice fields	No
Wood stork	*Mycteria americana*	Dallas	ST	Prairie ponds, flooded pastures or fields, ditches, or other standing shallow water.	No
Fish					
Shovelnose sturgeon	*Scaphirhynchus platorynchus*	Tarrant	ST	open flowing channels with bottoms of sand or gravel	No
Insects					
Black Lordithon rove beetle	*Lordithon niger*	Dallas	R	Only historically known to exist in Texas. Defined habitat requirements unknown.	Unknown
Mammals					
Gray wolf	*Canis lupus*	Tarrant	E, SE	Found in forests, brushlands, or grasslands where suitable cover and denning sites are available. Dens consist of ground burrows excavated in slopes where rocks support roof &	No

TPWD Annotated County List of Rare Species for Dallas and Tarrant Counties DART Irving-3 PE/EA					
Common Name	*Scientific Name*	*County Found*	*Status*	*Habitat Required*	*Habitat Found Along Alignment*
				tunnel of burrow.	
Red wolf	*Canis rufus*	Tarrant	E, SE	Found in brushy and forested areas. Dens are made in sides of slopes or hills.	No
Plains spotted skunk	*Spilogale putoius interrupta*	Dallas/Tarrant	R	Catholic. Found in open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands. Prefers wooded brushy areas and tallgrass prairie.	Yes
Cave myotis bat	*Myotis velifer*	Dallas	R	Cave-dwelling. Also roost in rock crevices, old buildings, carports, under bridges. Roosts in clusters of up to 1,000 individuals.	No
Mollusks					
Fawnsfoot	*Truncilla donaciformis*	Dallas/Tarrant	R	Small and large rivers on sand, mud, rocky mud, and sand/gravel in still to swiftly flowing waters.	No
Little spectaclecase	*Villosa lienosa*	Dallas/Tarrant	R	Creeks, rivers, reservoirs on sandy substrates in slight to moderate current.	No
Louisiana pigtoe	*Pleurobema riddellii*	Dallas/Tarrant	R	Streams and moderate-sized rivers. Usually found in flowing water on substrates of mud, sand, and gravel.	No

TPWD Annotated County List of Rare Species for Dallas and Tarrant Counties DART Irving-3 PE/EA					
Common Name	*Scientific Name*	*County Found*	*Status*	*Habitat Required*	*Habitat Found Along Alignment*
Pistolgrip	*Tritogonia verrucosa*	Dallas/Tarrant	R	Stable substate, rock, hard mud, silt, and soft bottoms. Often buried deeply.	No
Rock pocketbook	*Arcidens confragosus*	Dallas/Tarrant	R	Mud, sand, and gravel substrates of medium to large rivers in standing or slow flowing water.	No
Sandbank pocketbook	*Lamplilis satura*	Dallas/Tarrant	R	Small to large rivers with moderate flows and swift current on gravel, gravel sand, and sand bottoms.	No
Texas heelsplitter	*Potamilus amphichaenus*	Dallas/Tarrant	R	Quite waters in mud or sand and in reservoirs.	No
Wabash pigtoe	*Fusconaia flava*	Dallas	R	Creeks to large rivers on mud, sand, and gravel from all habitats except deep, shifting sand. Found in moderate to swift currents.	No
Reptiles					
Alligator snapping turtle	*Macrochelys temminckii*	Dallas	ST	Found in perennial water bodies, deep water of rivers, canals, lakes, oxbows, swamps, bayous, and ponds near deep running water.	No
Texas garter snake	*Thamnophis sirtalis annectens*	Dallas/Tarrant	R	Prefer wet or moist microhabitats, but is not restricted to them. Hibernates underground.	Yes
Texas horned lizard	*Phrynosoma cornutum*	Dallas/Tarrant	ST	Found in open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees.	No

TPWD Annotated County List of Rare Species for Dallas and Tarrant Counties DART Irving-3 PE/EA					
Common Name	*Scientific Name*	*County Found*	*Status*	*Habitat Required*	*Habitat Found Along Alignment*
Timber/Canbrake Rattlesnake	*Crotalus horridus*	Dallas/Tarrant	ST	Found in swamps, floodplains, upland pine and deciduous woodlands, riparian zones, and abandoned farmland.	Yes
Plants					
Glen Rose yucca	*Yueca necopina*	Dallas/Tarrant	R	Found in grasslands on sandy soils and limestone outcrops.	No
Warnock's coral-root	*Hexalectris warnockii*	Dallas	R	Oak-juniper woodlands on shaded slopes and intermittent, rocky creekbeds in canyons. Also found on the White Rock Escarpment in Dallas Co.	No

Source: TWPD Annotated County List of Rare Species for Dallas and Tarrant Counties, Texas; July 16, 2009

NOTES:

DM - delisted taxon, recovered, being monitoring first five years

E - federally endangered

T - federally threatened

ST - state threatened

SE - state endangered

R - rare species only

APPENDIX G. WETLANDS INFORMATION

EXHIBIT 8: PROJECT SURVEYS

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site:	DART Irving-3 LRT, DFW Airport	City/County:	DFW Airport, Dallas County	Sampling Date:	8/11/09
Applicant/Owner:	DART		State: TX	Sampling Point:	GCr,T1,P1
Investigator(s):	Charlie Andrews/Ronda Derk	Section, Township, Range:	NA		
Landform (hillslope, terrace, etc.):	channel	Local relief (concave, convex, none):	none	Slope (%):	0
Subregion (LRR):	J	Lat: N 32° 55.507'	Long: W 97° 02.013'	Datum:	WGS 1984
Soil Map Unit Name:	Houston Black soils		NWI classification:	R4SBCx	

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☒	No	☐				
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampling Area within a Wetland?**	**Yes**	☒	**No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐				

Remarks: **Sampling point located on the edge of this channel within Grapevine Creek among primarily herbaceous vegetation. All wetland criteria met at this sampling location. Therefore, sampling point located in a wetland.**

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum			
1. *Salix nigra*	30	Yes	FACW+
2. *Morus rubra*	10	Yes	FACU
3.			
4.			
5.			
	40	= Total Cover	
Herb Stratum			
1. *Scirpus pendulus*	53	Yes	OBL
2. *Typha latifolia*	20	Yes	OBL
3. *Ambrosia trifida*	10	No	FAC
4. *Sorghum halepense*	8	No	FACU
5. *Solidago canadensis*	5	No	FACU+
6. *Helianthus annuus*	2	No	FAC
7.			
8.			
	98	= Total Cover	
Woody Vine Stratum			
1. *Rubus trivialis*	20	Yes	FAC
2.			
	20	= Total Cover	

% Bare Ground in Herb Stratum: 0 | % Cover of Biotic Crust: 0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**4**	(A)
Total Number of Dominant Species Across All Strata:	**5**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**80**	(A/B)

Prevalence Index worksheet:

Total %Cover of :	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

Yes Dominance Test is >50%

Prevalence Index is ≤3.0[1]

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present?	**Yes**	☒	**No**	☐

Remarks: Abundant herbaceous vegetation at this sampling point consisting predominantly of bulrush along the creek. This community is hydrophytic based on passing the Dominance Test.

Project Site: DART Irving-3 LRT, DFW Airport

SOIL Sampling Point: GCr,T1,P1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 5/2	70	10YR 6/4	30	C	PL	Loamy clay	moist

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) **(LRR F)**
- ☐ 1 cm Muck (A9) **(LRR F,G,H)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 2.5cm Mucky Peat or Peat (S2) **(LRR G,H)**
- ☐ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ☐ Sandy Gleyed Matrix (S5)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ High Plains Depressions (F16) **(MLRA 72&73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ Coast Prairie Redox (A16) **(LRR F,G,H)**
- ☐ Dark Surface (S7) **(LRR G)**
- ☐ High Plains Depressions (F16)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: Soil at this sampling point has a low enough matrix chroma with redox concentrations to make it a hydric soil with a depleted matrix.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☒ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebates (B13)
- ☒ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☒ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Frost-Heave Hummocks (C11)
- ☐ FAC-Neutral Test (D5)
- ☐ Local Soil Survey Data (D8)

Field Observations:

Surface Water Present?	Yes	☒	No	☐	Depth (inches):	12
Water Table Present?	Yes	☐	No	☒	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):	6

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Multiple hydrology indicators observed at this sampling location, including a slight hydrogen sulfide odor.

EXHIBIT 8: PROJECT SURVEYS

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site:	DART Irving-3 LRT, DFW Airport	City/County:	DFW Airport, Dallas County	Sampling Date:	8/11/09
Applicant/Owner:	DART		State: TX	Sampling Point:	GCr,T1,P2
Investigator(s):	Charlie Andrews/Ronda Derk	Section, Township, Range:	NA		
Landform (hillslope, terrace, etc.):	bank	Local relief (concave, convex, none):	concave	Slope (%):	5
Subregion (LRR):	J	Lat: N 32° 55.506'	Long: W 97° 02.011'	Datum:	WGS 1984
Soil Map Unit Name:	Houston Black soils		NWI classification:	R4SBCx	

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☐	No	☒				
Hydric Soil Present?	Yes	☐	No	☒	**Is the Sampling Area within a Wetland?**	**Yes**	☐	**No** ☒
Wetland Hydrology Present?	Yes	☐	No	☒				

Remarks: **Sampling point located on the bank of this channel along Grapevine Creek where herbaceous vegetation dominates just south of North Airfield Drive. All wetland criteria are missing at this sampling location. Therefore, sampling point is not located in a wetland.**

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum			
1. *Morus rubra*	35	Yes	FACU
2. *Salix nigra*	20	Yes	FACW+
3.			
4.			
5.			
	55	= Total Cover	
Herb Stratum			
1. *Sorghum halepense*	75	Yes	FACU
2. *Ambrosia trifida*	10	No	FAC
3. *Solidago canadensis*	5	No	FACU+
4. *Helianthus annuus*	5	No	FAC
5.			
6.			
7.			
8.			
	95	= Total Cover	
Woody Vine Stratum			
1. *Rubus trivialis*	70	Yes	FAC
2.			
	70	= Total Cover	

% Bare Ground in Herb Stratum: 5 | % Cover of Biotic Crust: 0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**2**	(A)
Total Number of Dominant Species Across All Strata:	**4**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**50**	(A/B)

Prevalence Index worksheet:

	Total %Cover of :		Multiply by:	
OBL species	0		x1 =	0
FACW species	20		x2 =	40
FAC species	85		x3 =	255
FACU species	115		x4 =	460
UPL species	0		x5 =	0
Column Totals:	220	(A)		755 (B)

Prevalence Index = B/A = 3.43

Hydrophytic Vegetation Indicators:

No Dominance Test is >50%

No Prevalence Index is ≤3.0[1]

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present?	**Yes**	☐	**No**	☒

Remarks: Sampling point on bank of Grapevine Creek. Since the Dominance Test failed and the Prevalence Index test failed, hydrophytic vegetation does not appear to be at this sampling location.

Project Site: DART Irving-3 LRT, DFW Airport

SOIL Sampling Point: GCr,T1,P2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 5/4	70	10YR 3/1	30	C	PL	clay	crumbly and dry

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) **(LRR F)**
- ☐ 1 cm Muck (A9) **(LRR F,G,H)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 2.5cm Mucky Peat or Peat (S2) **(LRR G,H)**
- ☐ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ☐ Sandy Gleyed Matrix (S5)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
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- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
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- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ High Plains Depressions (F16) **(MLRA 72&73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ Coast Prairie Redox (A16) **(LRR F,G,H)**
- ☐ Dark Surface (S7) **(LRR G)**
- ☐ High Plains Depressions (F16)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Based on the absence of hydric soil indicators, hydric soils do not appear to be located at this sampling location.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Frost-Heave Hummocks (C11)
- ☐ FAC-Neutral Test (D5)
- ☐ Local Soil Survey Data (D8)

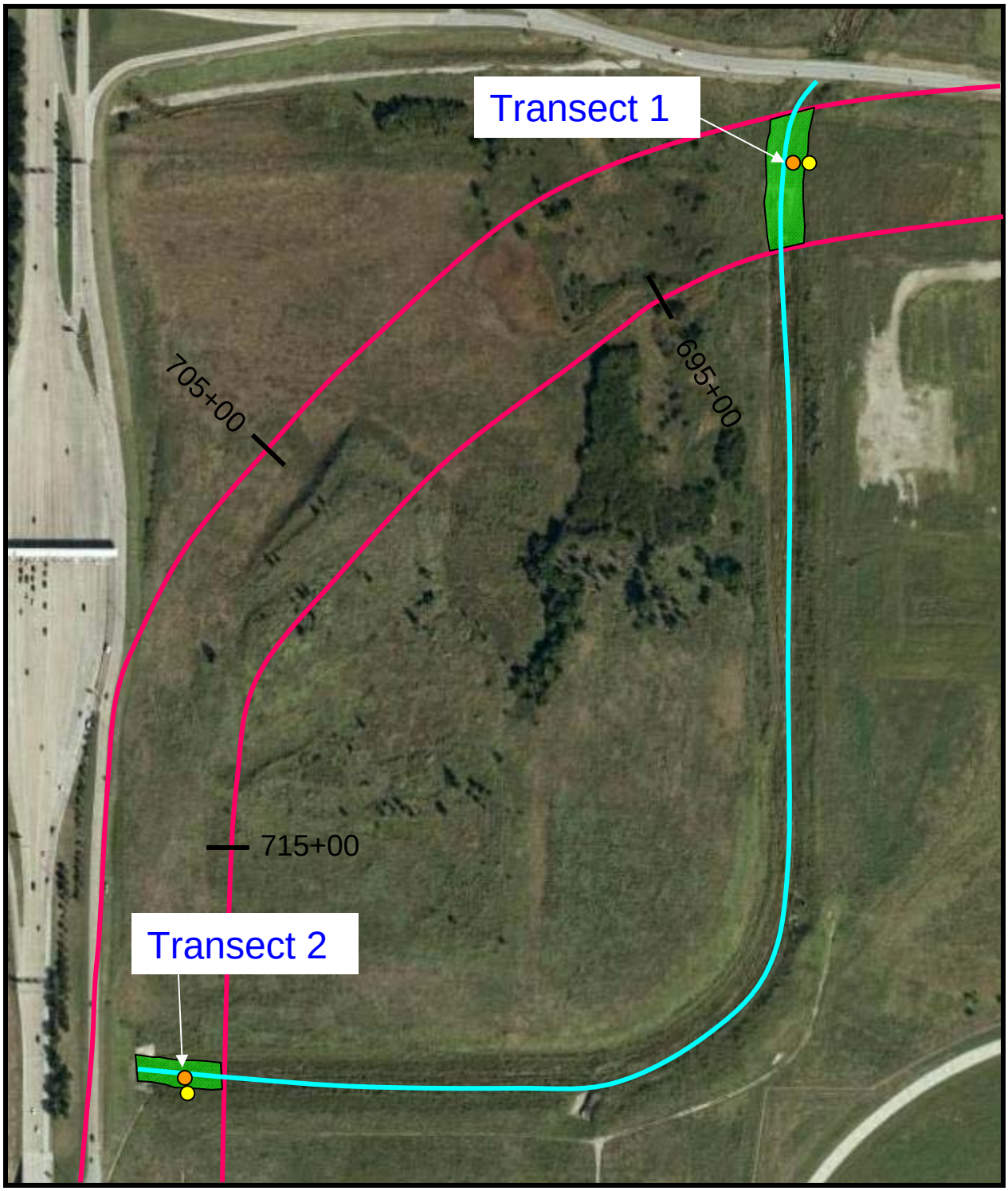
Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):
Water Table Present?	Yes	☐	No	☒	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Based on the absence of hydrology indicators observed, hydrology does not appear to be located at this sampling location.



Legend

- Phase I ROW
- Grapevine Creek
- Sampling Point 1
- Sampling Point 2
- Limits of Wetland Area

N

Image Source: Google™ 2007©

DETAIL MAP – GRAPEVINE CREEK (PHASE 1)

IRVING-3
Light Rail Transit Line
DFW Airport, Dallas & Tarrant Counties, Texas

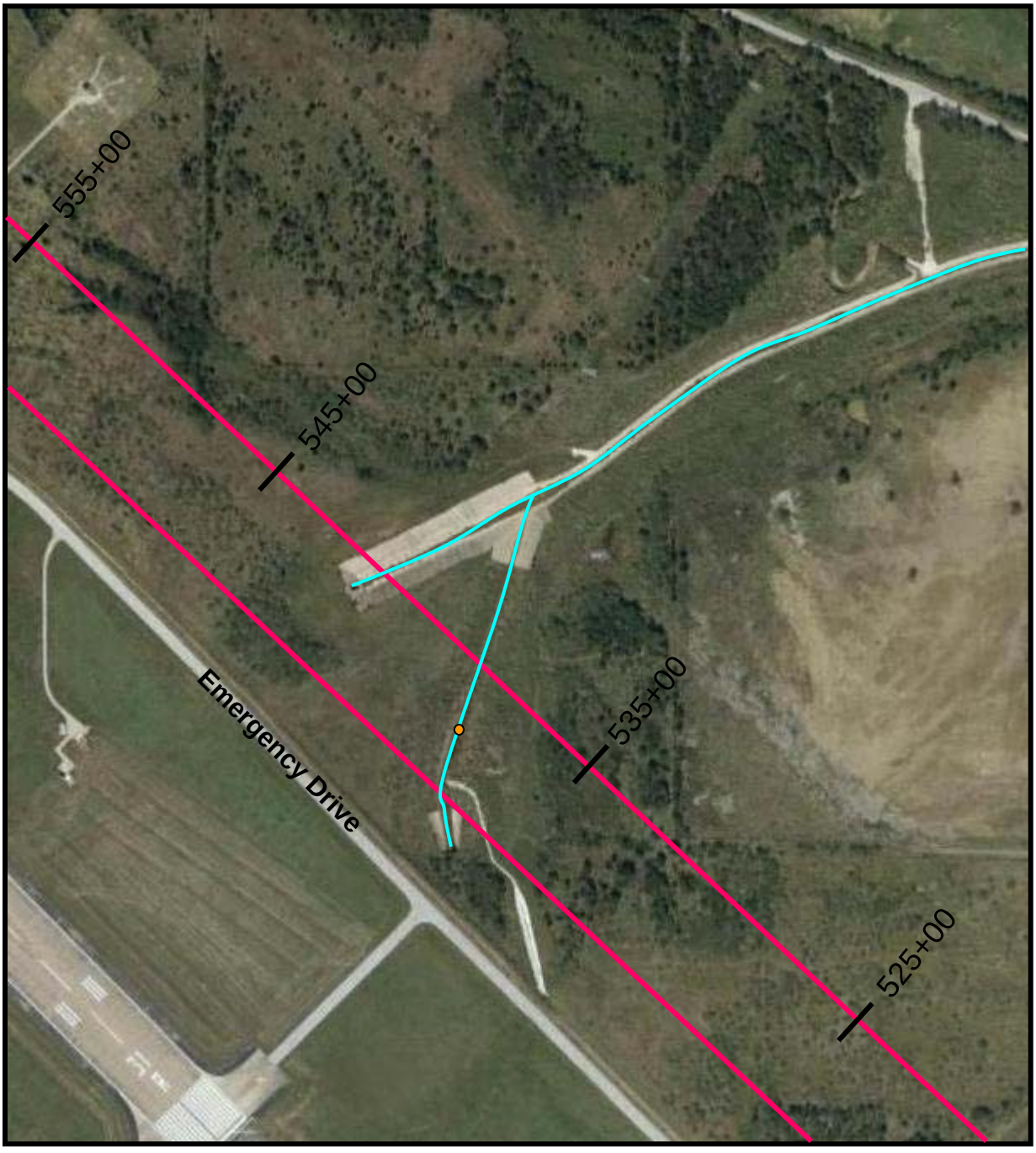
PREPARED FOR: DART

0 183 365
Scale in Feet

PROJECT MGR.:	RT
DRAWN BY:	CFA
DATE:	07/29/09
Project No .	25337852.00001

URS

Fig. 3-5



Legend

- Phase I ROW
- Mud Springs Creek (Water of the U.S.)
- Transect 1, Point 1

N

DETAIL MAP – MUD SPRINGS CREEK

IRVING-3
Light Rail Transit Line
DFW Airport, Dallas & Tarrant Counties, Texas

PREPARED FOR: DART

0 229 458
Scale in Feet

PROJECT MGR.:	RT
DRAWN BY:	CFA
DATE:	07/29/09
Project No .	25337852.00001

URS

Fig. 3-2

Image Source: Google™ 2007©

Legend

- Phase I ROW
- Hackberry Creek (Water of the U.S.)
- Transect 1, Point 1

N

Image Source: Google™ 2007©

DETAIL MAP – HACKBERRY CREEK

IRVING-3
Light Rail Transit Line
DFW Airport, Dallas & Tarrant Counties, Texas

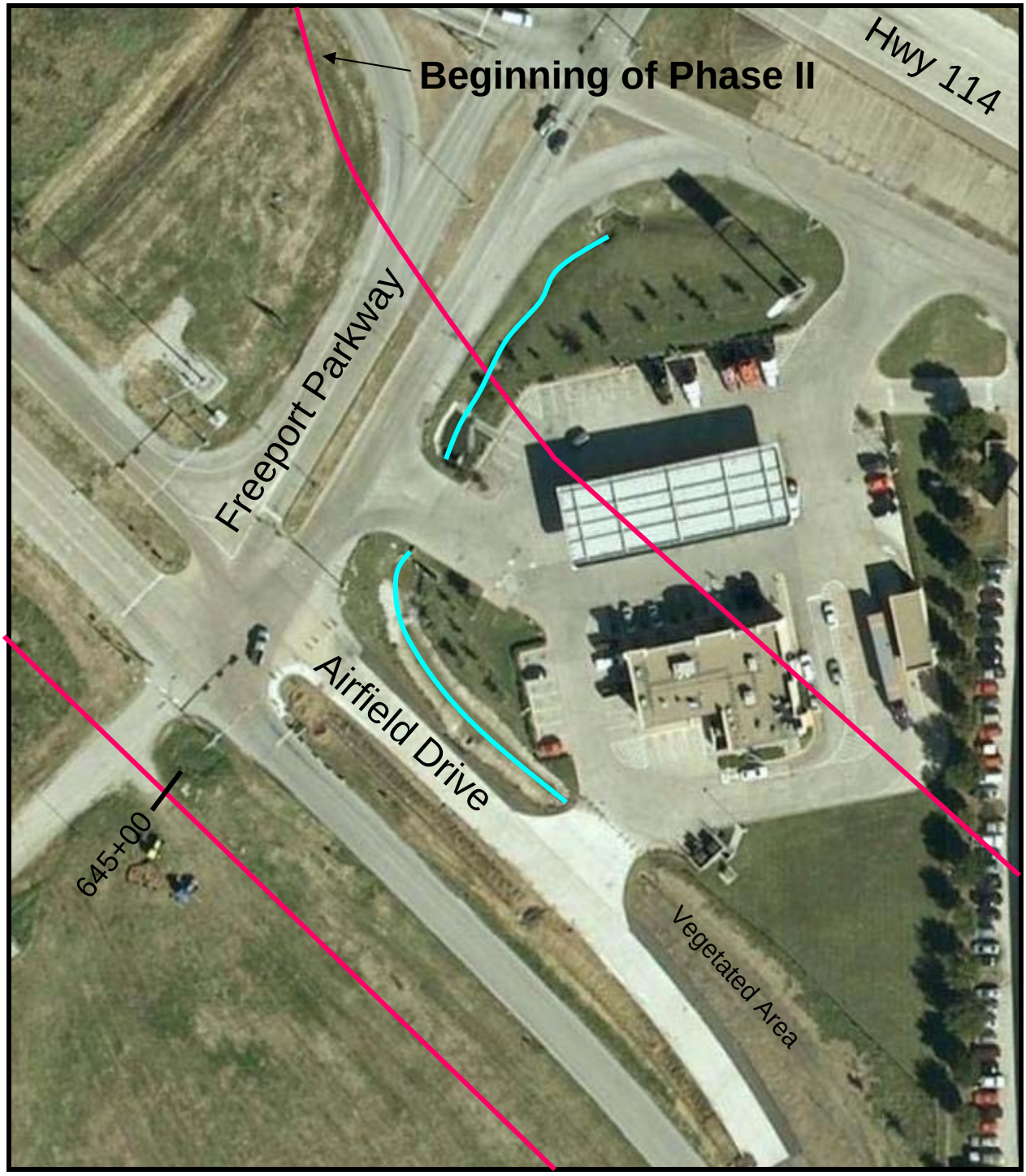
PREPARED FOR: DART

0 108 216
Scale in Feet

PROJECT MGR.:	RT
DRAWN BY:	CFA
DATE:	07/29/09
Project No .	25337852.00001

URS

Fig. 3-3



Legend

- Phase I ROW
- ED-1 (Water of the U.S.)

N

Image Source: Google™ 2007©

DETAIL MAP – ED-1

IRVING-3
Light Rail Transit Line
DFW Airport, Dallas & Tarrant Counties, Texas

PREPARED FOR: DART

0 48.5 97
Scale in Feet

PROJECT MGR.:	RT
DRAWN BY:	CFA
DATE:	07/29/09
Project No .	25337852.00001

URS

Fig. 3-4

APPENDIX H. HAZARDOUS MATERIALS INVENTORY

APPENDIX H. HAZARDOUS MATERIALS INVENTORY

Environmental Records Source Findings as associated with the Proposed DART Irving-3 LRT Line Segment Phase I and II Alignments					
MAP ID	**Site Name and Address[1]**	**Geo-Physical Position and Characteristics[2]**	**Environmental Database or Registry** / **Summary of Information within Database Search Report** / **Risk Evaluation Comment**	**Site Identification Number**	**Risk[3]**
1	DFW Int'l Regional Airport, between HWY 114 & HWY 183 (PO Drawer DFW DFW Airport, TX 75261	Site lies within the bounds of DFW Airport. (Precise location not determined.)	**Database:** FRS **Summary:** National compliance database system (NCDB). [The NCDB tracks regional compliance and enforcement for the National Pesticides and Toxic Substances Compliance and Enforcement Program.] **Comment:** This listing represents registration in the NCDB, and does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination.	**Site ID:** 110011467992	L
1	DFW Airport MS4 within DFW Airport Limits DFW Airport, TX 75261	Site lies within the bounds of DFW Airport. (Precise location not determined.)	**Database:** FRS **Summary:** Permit compliance system (PCS), [The PCS provides information on companies that have been issued permits to discharge waste water into rivers.] **Comment:** This listing represents registration in the PCS, and does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination.	**Site ID:** 110038335058	L
1	DFW Airport MS4 Approximately 18,000 acres within DFW Airport Limits, Tarrant County, TX 75261	Site lies within the bounds of DFW Airport. (Precise location not determined.)	**Database:** FRS **Summary:** TCEQ alternate control requirement **Comment:** An alternative mechanism is required in order to meet permit conditions and/or other regulatory requirements. This listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination.	**Site ID:** 110038201193	L
1	DFW International Airport NE Corner of Tarrant County and NW Corner of Dallas County Tarrant County, TX 75261	Database listing encompasses entire bounds of DFW Airport. (Additional details not applicable.)	**Database:** NPDES **Summary:** Industrial facility: Airports, flying fields and ser... **Comment:** This listing represents a storm water discharge permit only, and does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination.	**Site ID:** TX0025101	L
1	Dallas/Fort Worth Airport North Airfield Drive, Irving Fort Worth, Tarrant County, TX 76051	Site lies within the bounds of DFW Airport. (Precise location not determined.)	**Database:** FRS **Summary:** Aerometric information retrieval system/ Air quality subsystem (AIRS/AQS). [Information on air releases is contained in the AIRS, while the AQS contains measurements of ambient concentrations of air pollutants and meteorological data from monitoring stations operated by U.S. EPA, state and local agencies. The AQS also contains descriptive information about each monitoring station, including its geographic location and who operates it.] **Comment:** This listing represents registration only, and does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination.	**Site ID:** 110020780154	L
1	DFW International Airport Dallas, TX	Site lies within the bounds of DFW Airport. (Precise location not determined.)	**Database:** DOCKETS **Summary:** Administrative Action in civil court, associated with TSCA 16, in 1987. Docket number VI-297C. Consent instrument with $1,000 penalty. **Comment:** DFW Airport personnel were not familiar with this listing during informal interview. The age of the issue, its low dollar penalty, and the lack of current knowledge seem to imply that this listing represents a lower level of present-day risk.	**Site ID:** 06-1987-0047	L

Environmental Records Source Findings as associated with the Proposed DART Irving-3 LRT Line Segment Phase I and II Alignments					
MAP ID	**Site Name and Address[1]**	**Geo-Physical Position and Characteristics[2]**	**Environmental Database or Registry** / **Summary of Information within Database Search Report** / **Risk Evaluation Comment**	**Site Identification Number**	**Risk[3]**
1	DFW Airport DFW Regional Airport Dallas, TX 75261	Site lies within the bounds of DFW Airport. (Precise location not determined.)	**Database:** IHW **Summary:** Inactive waste generator. **Comment: This d**atabase listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination. Inactive status further lowers level of risk.	**Site ID:** 32488	L
1	American Airlines DFW Airport Dallas, Dallas County, TX 75261	Site lies within the bounds of DFW Airport. (Precise location not determined.)	**Database:** FRS **Summary:** TCEQ alternate control requirement. **Comment:** An alternative mechanism is required in order to meet permit conditions and/or other regulatory requirements. This listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination.	**Site ID:** 110033234998	L
1	ATA Airlines DFW International Airport Terminal D Dallas, Dallas County, TX 75261	Site lies within the bounds of DFW Airport. (Precise location not determined.)	**Database:** FRS **Summary:** TCEQ alternate control requirement. **Comment:** See comment for MAP ID 1, Site 110033234998.	**Site ID:** 110033254458	L
1	Delta Airlines, Inc. Dept. 587, PO Box 610262 Dallas, TX 75261	Site lies within the bounds of DFW Airport. (Precise location not determined.)	**Database:** AIRSAFS **Summary:** AIRS/ Air Facility System (AFS). [The AFS contains compliance and permit data for stationary sources regulated by the U.S. EPA, state and local air pollution agencies.] Operating. In compliance with procedural requirements for EPA compliance. No enforcement actions reported. **Comment: This d**atabase listing does not denote regulatory violation, hazardous materials incident, or evidence of environmental contamination.	**Site ID:** 4811300850	L
1	DFW Airport Air Traffic Control Tower (ATCT) DFW Airport, Tarrant County, TX 75261	Multiple air traffic control towers are located within the bounds of DFW Airport. (Additional details not applicable.)	**Database:** FRS **Summary:** TCEQ alternate control requirement. **Comment:** This site's location exceeds the ASTM-prescribed search radius (to include Subject Property only). See also comment for MAP ID 1, Site 110038201193.	**Site ID:** 110034319333	L
1	DFW Airport DFW Airport, TX 75261	Site lies within the bounds of DFW Airport. (Precise location not determined.)	**Database:** PST **Summary:** One 550-gallon steel diesel UST was permanently filled in place in 1986. Owned by Federal Aviation Administration. **Comment:** This database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination.	**Site ID:** 0035836	L
1	DFW Airport D RTR DFW Airport, TX 75261	Site lies within the bounds of DFW Airport. (Precise location not determined.)	**Database:** PST **Summary:** One 515-gallon steel diesel UST was removed from the ground in 1998. Owned by Federal Aviation Administration. **Comment: The u**nderground petroleum storage has been removed. This database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination.	**Site ID:** 0035806	L

Environmental Records Source Findings as associated with the Proposed DART Irving-3 LRT Line Segment Phase I and II Alignments					
MAP ID	**Site Name and Address[1]**	**Geo-Physical Position and Characteristics[2]**	**Environmental Database or Registry** / **Summary of Information within Database Search Report** / **Risk Evaluation Comment**	**Site Identification Number**	**Risk[3]**
1	DFW Airport B RT DFW Airport, TX 75261	Site lies within the bounds of DFW Airport. (Precise location not determined.)	**Database:** PST	**Site ID:** 0035808	L
			Summary: One 515-gallon steel diesel UST was removed from the ground in 1998. Owned by Federal Aviation Administration.		
			Comment: See comment for MAP ID 1, Site 0035806.		
1	DFW Airport RTR DFW Airport, TX 75261	Site lies within the bounds of DFW Airport. (Precise location not determined.)	**Database:** PST	**Site ID:** 0035810	L
			Summary: One 515 gallon steel diesel UST was removed from the ground in 1998. Owned by Federal Aviation Administration.		
			Comment: See comment for MAP ID 1, Site 0035806.		
1	DFW Airport VORTAC DFW Airport, TX 75261	Site lies within the bounds of DFW Airport. (Precise location not determined.)	**Database:** PST	**Site ID:** 0035852	L
			Summary: One 1,000-gallon steel diesel UST was removed from the ground in 1996. Owned by Federal Aviation Administration.		
			Comment: See comment for MAP ID 1, Site 0035806.		
1	Roadway Lighting Pad DFW Airport Dallas, Dallas County, TX	Site lies within the bounds of DFW Airport. (Precise location not determined.)	**Database:** SPILLS	**Site ID:** 10/11/91006	L
			Summary: One-gallon spill of transformer oil with no waterway impact, in 1991. Responsible party identified as Texas Utilities Electric Company.		
			Comment: Although the precise location of this incident has not been determined, the age and small size of the incident reduces its level of risk.		
1	DFW Airport Terminal Irving, Tarrant County, TX	Site lies within the bounds of DFW Airport. (Precise location not determined.)	**Database:** ERNS	**Site ID:** 1323604135	L
			Summary: Four gallons of hydraulic oil was released due to aircraft operator/mechanical error, in 2001. No impact to water. Responsible party identified as American.		
			Comment: Although the location of this incident has not been determined, it may be presumed to have occurred in aircraft zones (runways, ramps, and maintenance areas), which are outside the ASTM-prescribed target area. Also, the age and small size of the incident reduces its level of risk.		
1	DFW International Airport Dallas, TX 72561	Incidents occurred within the bounds of DFW Airport, on-board aircrafts and/or within related passenger baggage/ shipping areas. (Additional details not applicable.)	**Database:** HMIRS	**Site ID:** Various (34) site identification numbers (Incident Report #'s) as summarized below.	L
			Summary: Various minor incidents involving hazardous materials in small quantities, on-board aircrafts and/or within related passenger baggage/ shipping areas. Includes Incident Report #'s: 1999071925, 1999050327, 1999111246, 2000100755, 2001050592, 2003060659, 2003110218, 1999071587, 1999091800, 1999121493, 2000110450, 2001061332, 2003090359, 2000050986, 424403, 2006020101, 1999070190, 1999100389, 1999121492, 2000030779, 1999090403, 421930, 433713, 2001060052, 403790, 1999060073, 1999071924, 1994061783, 1997070839, 1999061146, 1999061147, 2000030103, 2000041068, 1993030546.		
			Comment: These various incident sites are not geo-physically proximal to the proposed alignment, and locations exceed the ASTM-prescribed search radius (to include Subject Property only).		

Environmental Records Source Findings as associated with the Proposed DART Irving-3 LRT Line Segment Phase I and II Alignments

MAP ID	Site Name and Address[1]	Geo-Physical Position and Characteristics[2]	Environmental Database or Registry / Site Identification Number / Summary of Information within Database Search Report / Risk Evaluation Comment	Risk[3]
1A	Airport Cargo State HWY 360, HWY 183 South, Hwy... Dallas, TX	Site is located within 60 feet of the proposed alignment's southern ROW. It is situated up-gradient, and at a higher elevation (531 to 551 feet AMSL) than the alignment. Underlying soils include Houston Black clay, 0 to 1 percent slopes, and Houston Black clay, 1 to 3 percent slopes.	**Database:** APAR **Site ID:** 1460 **Summary:** Airport cargo freight area. VCP in active remediation. APAR received in 2005. **Comment:** According to DFW Airport personnel, the affected property includes 53 acres around the Airport Cargo freight area. The site is reportedly bounded on its east/northeast side by North Airfield Drive. This site, also known as the Northeast Cargo VCP, is monitored quarterly for chlorinated solvents and jet fuel. Monitoring wells for chlorinated solvents are located at 12 to 25 feet depth, and wells for petroleum are located at eight feet depth. No suficially-visible concerns were observed during preliminary field reconnaissance. It is recommended consultation and possible permitting through the DFWAirport Environmental Affairs Department be undertaken prior to construction adjacent to this VCP area.	H
1B	DFW Airport DFW Airport, Tarrant County, TX 75261-0031	Site is located more than one mile west of the proposed alignment. (Additional details not applicable.)	**Database:** ERNS **Site ID:** 3431820462 **Summary:** 900-gallons of Jet fuel JP-8 released when contractor struck pressure relief line during excavation project, with impact to soil, in 1998. Responsible party not reported. **Comment:** According to DFW Airport personnel, this incident occurred at the Jet Fuel A Tank Farm, which is not located geo-physically proximal to the proposed alignment. Its location exceeds the ASTM-prescribed search radius (to include Subject Property only).	L
1C	Star Enterprises N. International Parkway L 1 DFW Irving, TX 75261	Site is located 0.10 mile (500 feet) west of, up-gradient to, and at a higher elevation (564 feet AMSL) than the alignment. Underlying soil is Urban land.	**Database:** IHW **Site ID:** 75620 **Summary:** Inactive non-industrial and/or municipal CESQG. No waste records. Non-notifier. **Comment:** According to DFW Airport personnel, this site is associated with the former location of a Texaco facility. **The d**atabase listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination.	L
1D	Hayes Leasing Company, Inc. DFW Airport Dallas, TX 75261	Site is located 0.18 mile (927 feet) west of, down-gradient from, and at a higher elevation (561 feet AMSL) than the proposed alignment. The underlying soil is Urban land.	**Database:** IHW **Site ID:** 66468 **Summary:** Inactive non-industrial and/or municipal CESQG. No waste records. Non-notifier. **Comment:** According to DFW Airport personnel, this site is associated with the former location of an AVIS facility. **The d**atabase listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination.	L
1D	Hayes Leasing Company, Inc. International Parkway N End 1 W DFW Airport, TX 75261	See geo-physical position and characteristics description above.	**Database:** IHW **Site ID:** 73639 **Summary:** Inactive non-industrial and/or municipal CESQG. No waste records. Non-notifier. **Comment:** See comment for this site at MAP ID 1D, Site 66468.	L
1E	Dallas /Fort Worth Airport 2W North Ground Service Equipment DFW Airport, Tarrant County, TX 75261	Site is located 0.11 mile (598 feet) southwest of, up-gradient to, and at a higher elevation (595 feet AMSL) than the proposed alignment. Soil is Urban land.	**Database:** FRS **Site ID:** 110034561828 **Summary:** TCEQ alternate control requirement. **Comment:** This database listing may be out of date. An alternative mechanism is/was required in order to meet permit conditions and/or other regulatory requirements. The listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination. Also, the approximate site of the referenced former Terminal 2W (now Terminal B), exceeds the ASTM-prescribed search radius (to include the Subject Property only).	L

Environmental Records Source Findings as associated with the Proposed DART Irving-3 LRT Line Segment Phase I and II Alignments					
MAP ID	**Site Name and Address[1]**	**Geo-Physical Position and Characteristics[2]**	**Environmental Database or Registry** / **Summary of Information within Database Search Report** / **Risk Evaluation Comment**	**Site Identification Number**	**Risk[3]**
1F	DFW Airport Dallas County, TX	This site's polygon encompasses the central terminals area of DFW Airport. It underlies the central airport terminus of the alignment. Located at elevations ranging from 587 to 600 feet AMSL, the site is multi-gradient throughout the polygon, but is predominantly up-gradient to the alignment from the north end of the polygon. The underlying soil type is Urban land.	**Database:** GWCC **Summary:** Light Non-Aqueous Phase Liquid (LNAPL) contamination was confirmed by the TCEQ Remediation Division/Corrective Action Program in March 2000. Executive Action was taken at the highest level of the agency, via the issuance of an administrative order. The effectiveness of the remedy is being monitored. **Comment:** According to DFW Airport personnel, this listing is likely related to an active remediation project located within an area referred to as the Central Terminal Area (CTA) Agreed Order. Terminal C is has been nearly cleaned, while some jet fuel remains at Terminal A. A map of the site provided by DFW Airport shows a polygon encompassing all terminal buildings and shows additional small pockets of subsurface petroleum contamination. No surficially-visible concerns were observed during preliminary vehicular field reconnaissance. DFW Airport has committed to the construction of the foundational aspects of the proposed LRT line within this zone, to include all portions of the project which require excavation, soil disturbance and/or related exposure to the subsurface.	**Site ID:** 72593-GWCC	M
1G	DFW Airport De-Icing Pad HY DFW Airport, Tarrant County, TX 75261	Multiple deicing stations are located in aircraft runway and terminal areas of DFW Airport, upstream of various creeks which cross the proposed alignment in multiple locations. These creek crossings are underlain by assorted clay soils and/or Urban land.	**Database:** ERNS **Summary:** 2,000 gallons of ethylene glycol released during de-icing activities, with runoff into Grapevine Creek, in 2000. Responsible party identified as Dallas/Ft.Worth. **Comment:** While the DFW Airport deicing stations referenced by MAP ID 1G are located outside of the ASTM-prescribed search radius (to include the Subject Property only), the referenced impacted creek(s) cross the proposed alignment in multiple locations. According to DFW Airport personnel, the quantity of glycol reported to regulatory agencies frequently reflected the total amount used during deicing activities on a specified date, not necessarily the amount entering the creek(s) (unless otherwise noted in the listing). The age of the incident somewhat reduces its level of risk, while the volume of glycol involved and the combined effect of multiple events over a period of several years increases the risk. No concerns were visually observed at the creek crossings during field reconnaissance.	**Site ID:** 113638403	M
1G	DFW Airport Dallas, Dallas County, TX	See geo-physical position and characteristics description above.	**Database:** SPILLS **Summary:** 275,565 pounds (estimate 8,726 gallons) of propylene glycol was spilled in 1998, with 54,520 pounds (estimate 6,296 gallons) impact to Hackberry Creek and other waters. Responsible party identified as DFW Airport. **Comment:** Discharges and spills associated with deicing activities prior to 1999 ran-off to storm drains which fed area creeks. See additional comments at MAP ID 1G, Site ID 113638403.	**Site ID:** 12/23/98001	M
1G	DFW Airport Dallas, Tarrant County, TX	See geo-physical position and characteristics description above.	**Database:** SPILLS **Summary:** 10,393 pounds (estimate 1,200 gallons) of ethylene glycol spilled in 1997, with 1242 pounds (estimate 143 gallons) impact to Hackberry and Grapevine creeks. **Comment:** See comments at MAP ID 1G, Site ID 12/23/98001.	**Site ID:** 12/27/97001	M

Environmental Records Source Findings as associated with the Proposed DART Irving-3 LRT Line Segment Phase I and II Alignments

MAP ID	Site Name and Address[1]	Geo-Physical Position and Characteristics[2]	Environmental Database or Registry / Site Identification Number / Summary of Information within Database Search Report / Risk Evaluation Comment	Risk[3]
1G or **1H**	DFW Airport DFW Airport, Dallas County, TX 75261	Multiple deicing stations are located in aircraft runway and terminal areas of DFW Airport, upstream of various creeks, some of which cross the proposed alignment in multiple locations. These crossings are underlain by assorted clay soils and/or Urban land.	**Database:** ERNS **Site ID:** 921198550 **Summary:** Ethylene glycol released during de-icing procedures, in 1997, with impact to water, including: 6,996 pounds (estimate 808 gallons) on Nov.11, 14740 pounds (1,702 gallons) on Nov.15, and 11,634 pounds (1,343 gallons) on Nov.16. Responsible party identified as DFW Airport. **Comment:** See comments at MAP ID 1G - Site ID 12/23/98001 (above), and MAP ID 1H - Site 84573 (below).	M
1G or **1H**	DFW Airport Irving, Dallas County, TX	See geo-physical position and characteristics description above.	**Database:** ERNS **Site ID:** 1182144678 **Summary:** 5,765.3 pounds (estimate 665 gallons) of diethylene glycol released from de-icing operations, with impact to water, in 1997. Responsible party identified as DFW Airport. **Comment:** See comments at MAP ID 1G - Site ID 12/23/98001 (above), and MAP ID 1H - Site 84573 (below).	M
1H	DFW Regional Airport Dallas, Dallas County, TX	Multiple deicing stations are located on DFW Airport, down-gradient of the proposed alignment, and do not discharge to waters that cross the proposed alignment. (Additional details not applicable.)	**Database:** SPILLS **Site ID:** 84573 **Summary:** 61,010 gallons of ethylene glycol from de-icing activities spilled to lower West Fork Trinity River. Responsible party identified as DFW Airport. Incident dispute opened in 2006; current status not reported. Rick Reeter advised a vac truck had been removing... **Comment:** Deicing stations identified by MAP ID 1H discharge to other waters which do not cross the alignment and would not impact the project.	L
1I or **1L**	DFW Airport Dallas, Dallas County, TX 75261	Site is located more than one mile south or west of the proposed alignment. (Additional details not applicable.)	**Database:** ERNS **Site ID:** 268990470 **Summary:** 40 gallons of AFFF accidentally discharged from fire system due to equipment failure, with impact to water, in 1995. Responsible party not reported. **Comment:** According to DFW Airport personnel, this incident occurred at one of the two Airport aircraft maintenance hangers, both of which are located outside of the ASTM-prescribed search radius (to include the Subject Property only). However, their impact to water would likely have entered creeks that cross the proposed alignment. Although fluorochemical surfactants are a typical key component for producing foam in AFFF, and a portion of the fluorocarbon molecule is persistent in the environment and may be bioaccumulative and toxic, the age and size of the incident reduces the level of risk.	L
1J	DFW Airport Dallas, Tarrant County, TX	Site is located more than one mile west of the proposed alignment. (Additional details not applicable.)	**Database:** SPILLS **Site ID:** 7/12/92004 **Summary:** 8,000 gallons of Jet A fuel spilled, in 1992, with unknown affect to waterway. Responsible party identified as DFW Airport. **Comment:** According to DFW Airport personnel, this incident occurred at the Jet Fuel A Tank Farm, which is not located geo-physically proximal to the proposed alignment. Its location exceeds the ASTM-prescribed search radius (to include Subject Property only).	L
1J	DFW Airport DFW Airport, Tarrant County,	See geo-physical position and characteristics description above.	**Database:** ERNS **Site ID:** 2528260734 **Summary:** 325,000 of gallons Jet fuel JP-8 released from unregulated storage tank, in 1998. Spill contained	L

Environmental Records Source Findings as associated with the Proposed DART Irving-3 LRT Line Segment Phase I and II Alignments

MAP ID	Site Name and Address[1]	Geo-Physical Position and Characteristics[2]	Environmental Database or Registry / Site Identification Number / Summary of Information within Database Search Report / Risk Evaluation Comment	Risk[3]
	TX 75261-0031		within secondary containment. Impact to water reported. Responsible party identified as Ogden Aviation. **Comment:** See comment for this site at MAP ID 1J, Site 7/12/92004.	
1K	DFW Airport Dallas, Dallas County, TX 75261	Site is located more than one mile south/west of the proposed alignment. (Additional details not applicable.)	**Database:** ERNS **Site ID:** 4077769639 **Summary:** 1,100 gallons of Jet fuel JP-5 (heavy kerosene) leaked from aircraft fuel system during maintenance, in 1995. 500 gallons recovered, remainder flushed to water treatment plant. Responsible party identified as Delta Airlines. **Comment:** According to DFW Airport personnel, this incident likely occurred around Gate E-13 of Terminal E. The site is not located geo-physically proximal to the proposed alignment. Its location also exceeds the ASTM-prescribed search radius (to include the Subject Property only).	L
1K	DFW Airport Dallas, Dallas County, TX	See geo-physical position and characteristics description above.	**Database:** SPILLS **Site ID:** 2/15/99007 **Summary:** 195 gallons of Jet A fuel, spilled in 1999, with 90 gallons to Trinity River Treatment Plant. Responsible party identified as Aero Mexico. **Comment:** According to DFW Airport personnel, this incident occurred at Terminal E. This site is not located geo-physically proximal to the proposed alignment. Its location also exceeds the ASTM-prescribed search radius (to include the Subject Property only).	L
1K	DFW Airport Dallas, Tarrant County, TX	See geo-physical position and characteristics description above.	**Database:** ERNS **Site ID:** 2568144049 **Summary:** 185 gallons of Jet fuel JP-8 released due to fuel venting from wings of aircraft, with impact to storm drains feeding treatment plant, in 2004. Responsible party identified as Aero Mexico. **Comment:** See comment for this site at MAP ID 1K, Site ID 2/15/99007.	L
1L	Dallas Fort Worth Airport Dallas, Dallas County, TX	Site is located more than one mile south/west of the proposed alignment. (Additional details not applicable.)	**Database:** ERNS **Site ID:** 649798071 **Summary:** 2,000 gallons of Jet A fuel discharged from an aircraft fuel tank due to equipment failure, in 2007. Waterway impact unknown. Responsible party identified as American. **Comment:** According to DFW personnel, this incident occurred at the former Delta maintenance hanger, and all fuel was contained with no impact to the environment. Also, the site is not located geo-physically proximal to the proposed alignment. Its location also exceeds the ASTM-prescribed search radius (to include the Subject Property only).	L
1L	DFW Airport Dallas, Dallas County, TX 75261	See geo-physical position and characteristics description above.	**Database:** ERNS **Site ID:** 532791957 **Summary:** Eighty gallons of diesel oil leaked from AST due to equipment failure, in 1994. Responsible party identified as Delta Airlines. **Comment:** According to DFW personnel, incident occurred at former Delta maintenance hanger. Site is not located geo-physically proximal to alignment, and location exceeds ASTM-prescribed search radius.	L
1L	DFW Airport Irving, Dallas County, TX 75261	See geo-physical position and characteristics description above.	**Database:** ERNS **Site ID:** 441855524 **Summary:** Unknown quantity of fire retardant foam released due to equipment failure, in 1995. Environmental impact not reported. Responsible party identified as Delta Airlines. **Comment:** According to DFW personnel, this incident likely occurred at the former Delta maintenance hanger. This site is not located geo-physically proximal to the proposed alignment. Its location also exceeds the ASTM-prescribed search radius (to include the Subject Property only).	L

Environmental Records Source Findings as associated with the Proposed DART Irving-3 LRT Line Segment Phase I and II Alignments					
MAP ID	**Site Name and Address[1]**	**Geo-Physical Position and Characteristics[2]**	**Environmental Database or Registry** / **Summary of Information within Database Search Report** / **Risk Evaluation Comment**	**Site Identification Number**	**Risk[3]**
1L	DFW International DFW Airport, Dallas County, TX 75261	See geo-physical position and characteristics description above.	**Database:** ERNS	**Site ID:** 1193531783	L
			Summary: 500 gallons of AFFF (aqueous film forming foam) leaked from fire system, in 1996. Responsible party identified as Delta Airlines, Inc.		
			Comment: See comment for this site at MAP ID 1L, Site ID 441855524.		
1L	DFW Airport Dallas, Dallas County, TX	See geo-physical position and characteristics description above.	**Database:** SPILLS	**Site ID:** 10/12/97005	L
			Summary: 1,000 gallons of Astromat orange, spilled in 1997. Environmental impact not reported. Responsible party identified as Delta Airlines.		
			Comment: See comment for this site at MAP ID 1L, Site ID 441855524.		
1L	Delta Airlines Maintenance Hangar DFW Airport Dallas, Dallas County, TX	See geo-physical position and characteristics description above.	**Database:** SPILLS	**Site ID:** 2/22/96004	L
			Summary: 200 gallons of AFFF (fire fighting foam) 3% foam concentrate, spilled in 1996, with 25-gallon impact to storm sewer. Responsible party identified as Delta Airlines.		
			Comment: According to DFW personnel, incident occurred at former Delta maintenance hanger, location of which exceeds ASTM-prescribed search radius. Despite the distance to the proposed alignment, incident's impact to storm water would likely have entered Hackberry Creek, which crosses the alignment. Fluorochemical surfactants are a typical key component to producing foam in AFFF, and a portion of the fluorocarbon molecule is persistent in the environment (may be bioaccumulative and toxic). Site reconnaissance revealed clear water, aquatic life (minnows), and healthy vegetation at proposed crossing.		
1L or 1M	Dallas Fort Worth DFW Airport, Dallas County, TX 75261	Site is located more than one mile south/west of the proposed alignment. (Additional details not applicable.)	**Database:** ERNS	**Site ID:** 1257602505	L
			Summary: 1,000 gallons of petroleum released into water when oily water separator sludge fell out of truck, due to operator error, in 1999. Responsible party identified as Delta Airlines.		
			Comment: According to DFW personnel, this incident occurred at either the former Delta maintenance hanger, or the area of the former Delta buildings/grounds located south of Terminal E. While these locations exceed the ASTM-prescribed search radius (to include the Subject Property only), their impact to water would likely have impacted a creek that crosses the proposed alignment. The age of the incident somewhat reduces its level of risk.		
1M	DFW Airport DFW Airport, TX 75261	Site is located more than one mile south/WSW of the proposed alignment. (Additional details not applicable.)	**Database:** LPST	**Site ID:** 091416	L
			Summary: LPST reported in 1987. Soil contamination only; required full site assessment and remedial action plan. Potentially responsible party identified as Hertz Corp. Phase 2 report received; review pending.		
			Comment: According to DFW Airport personnel, site is located on south side of area of former Delta Airlines buildings and grounds, south of Terminal E. Site is not located geo-physically proximal to the alignment. It location also exceeds the ASTM-prescribed search radius (to include the Subject Property only).		
1M	Ramp 5E DFW Airport Dallas, Tarrant County, TX	See geo-physical position and characteristics description above.	**Database:** ERNS	**Site ID:** 1863432136	L
			Summary: One hundred gallons of Jet A fuel vented from aircraft wing, in 2007. Material reached water. Responsible party identified as ATA Airlines.		
			Comment: According to DFW Airport personnel, Ramp 5E is associated with the former Delta Airlines buildings and grounds, south of Terminal E. This site is not located geo-physically proximal to the proposed		

Environmental Records Source Findings as associated with the Proposed DART Irving-3 LRT Line Segment Phase I and II Alignments					
MAP ID	**Site Name and Address[1]**	**Geo-Physical Position and Characteristics[2]**	**Environmental Database or Registry** / **Summary of Information within Database Search Report** / **Risk Evaluation Comment**	**Site Identification Number**	**Risk[3]**
			alignment. Its location also exceeds the ASTM-prescribed search radius (to include the Subject Property only).		
1M	5W GSE Southwest Holding Area DFW Airport, TX 75261-9047	See geo-physical position and characteristics description above.	**Database:** PST	**Site ID:** 0069171	L
			Summary: Fleet re-fueling site. Owned by American Airlines. Two active 10,000-gallon steel gasoline ASTs are stored within concrete containment. Both were installed in 2001. One inactive 3000-gallon double-wall steel gasoline AST was installed in 1996.		
			Comment: This site is not geo-physically proximal to the proposed alignment. And, its location exceeds the ASTM-prescribed search radius (to include 0.25 mile).		
1N	Ditch on Airfield Drive DFW Airport Dallas County, TX 75261	Site lies within bounds of DFW Airport on Airfield Drive, which forms a loop around the main developed property. (Precise location not determined.) The proposed alignment follows portions of this road.	**Database:** SPILLS	**Site ID:** 1/8/93014	L
			Summary: Unknown quantity of fire-fighting foam spill in 1993, with no impact to waterway. Responsible party unknown.		
			Comment: Fluorochemical surfactants are a typical key component for producing foam in AFFF, and a portion of the fluorocarbon molecule is persistent in the environment and may be bioaccumulative and toxic. Although the precise location of this incident has not been determined, the age of the incident somewhat reduces its level of risk.		
1N	Airfield Drive DFW Airport, Dallas County, TX 75261	See geo-physical position and characteristics description above.	**Database:** SPILLS	**Site ID:** 10/17/02002	L
			Summary: Fifteen gallons hydraulic fluid spilled, in 2002; affected stormwater drainage. Responsible party identified as Dana Prikyl.		
			Comment: Private vehicle involved in minor spill incident. Although the precise location of this incident has not been determined, the age and small size of the incident reduce its level of risk.		
1	DFW Airport Dallas, Tarrant County, TX	More than one mile South. (Additional details not applicable.)	**Database:** ERNS	**Site ID:** 4052921353	L
			Comments: An unknown amount of Jet fuel JP-8 released due to hose-line rupture on private plane, with impact to a storm drain, in 2004. Responsible party identified as TXI.		
			Comment: According to DFW Airport personnel, this incident occurred at a location more than a mile south of the proposed alignment. Site is not located geo-physically proximal to the proposed alignment. It location also exceeds the ASTM-prescribed search radius (to include the Subject Property only).		
1	DFW Regional Airport Dallas, Dallas County, TX	More than one mile South or Northwest. (Additional details not applicable.)	**Database:** SPILLS	**Site ID:** 24401	L
			Summary: 45,920 gallons of municipal waste spilled, with impact to stormwater/ process water retention pond, and Bear Creek. Responsible party identified as DFW Airport. Customer identified as Sunmount Corporation. Discharge sampled; temporary berm constructed to... Disputed in 2003. Closed.		
			Comment: According to DFW Airport personnel, this incident likely occurred at one of the two Sunmount batch plants, both of which lie outside the ASTM-prescribed search radius (to include the Subject Property only).		
1	Adjacent to NW Tarmac of DFW Airport by Hwy 360 Grapevine, Tarrant County, TX	More than one mile West. (Additional details not applicable.)	**Database:** SPILLS	**Site ID:** 5/20/94005	L
			Summary: Fifteen-gallon spill of diesel and water, with no waterway impact, in 1994. Responsible party identified as Sky King Freight.		
			Comment: The NW Tarmac is not geo-physically proximal to the proposed alignment. And, its location		

Environmental Records Source Findings as associated with the Proposed DART Irving-3 LRT Line Segment Phase I and II Alignments

MAP ID	Site Name and Address[1]	Geo-Physical Position and Characteristics[2]	Environmental Database or Registry / Site Identification Number / Summary of Information within Database Search Report / Risk Evaluation Comment	Risk[3]
			exceeds the ASTM-prescribed search radius (to include Subject Property only).	
2	Blue Star Mart 2901 N Airfield Drive DFW Airport, TX 75261	Site is located 0.040 mile (210 feet) north of, up-gradient to, and at equal elevation (541 feet AMSL) with proposed alignment. Underlying soil type is Houston Black clay, 0 to 1 percent slopes.	**Database:** PST; **Site ID:** 0074742 **Summary:** Retail site. Two active 20,000 gallon double-wall FRP gasoline USTs were installed in 2001. **Comment:** Although the site has registered underground hazardous chemical storage, the database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination.	L
2	Gilbert TX CC 2900 N Airfield Drive Dallas, TX 75261	See geo-physical position and characteristics description above.	**Database:** PST; **Site ID:** 0061209 **Summary:** Fleet re-fueling site. Two inactive 10,000 gallons steel gasoline ASTs, installed in 1991, both within earthen dikes. **Comment:** See comment for this site at MAP ID 2, Site ID 0074742.	L
3	Nusil Technology LLC 6125 West Campus Circle Drive Irving, TX 75063	Site is located 0.070 mile (370 feet) NE, cross-gradient, and at equal elevation (512 feet AMSL) with alignment. Soil is Burleson clay, 0 to 1 percent slopes.	**Database:** TIER II; **Site ID:** 4YL5E40022GG **Summary:** Fabricated rubber products, NEC, site. Tier II report signed in February 2007. **Comment:** Although the site has registered hazardous chemical storage, the database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination. See additional comments for MAP ID 3, Site ID TXD988065512.	L
3	Nusil (Texas Division) 6125 West Campus Circle Drive Irving, TX 75063	See geo-physical position and characteristics description above.	**Database:** TIER II; **Site ID:** 5NPTXM002DMS **Summary:** Fabricated rubber products, NEC, and synthetic rubber manufacturing site. Tier II report signed in February 2008. **Comment:** See comments for this site at MAP ID 3, Site ID 4YL5E40022GG and Site ID TXD988065512.	L
3	Nusil Technology LLC 6125 West Campus Circle Drive Irving, TX 75063	See geo-physical position and characteristics description above.	**Database:** RCRAG; **Site ID:** TXD988065512 **Summary:** All other rubber product manufacturing site. RCRA-LQG. Inspection, violations, and verbal enforcement in 2000. Inspections in 2005 and 2008 with no recorded violations. **Comment: No contamination reported within record.** Follow-up inspections record no issues or concerns. The site is proximal and cross-gradient with the proposed alignment. No surficially-visible concerns were observed during preliminary vehicular field reconnaissance.	L
3	Nusil Technology 6125 West Campus Circle Drive Irving, TX 75063	See geo-physical position and characteristics description above.	**Database:** IHW; **Site ID:** 85565 **Summary:** Silicone fabrication site. Active industrial LQG. **Comment:** Database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination. See additional comments for this site at MAP ID 3, Site ID 4YL5E40022GG and Site ID TXD988065512.	L
4	American Airlines Ground Service Equipment Dallas, Dallas County, TX	Site is located 0.080 mile (420 feet) east of, cross-gradient with, and at an equal elevation (567 feet AMSL) with the proposed alignment. Underlying soil type is Houston Black-Urban land	**Database:** APAR; **Site ID:** 72593 **Summary:** Active IHW corrective action. Completed workload. APAR received January 2003. **Comment:** This database listing implies the assessment of subsurface environmental media (soil and/or groundwater) for potential contamination at or from the site. The results of the APAR were not included within the database search report. The site is proximal and up-gradient to the proposed alignment. No concerns were visually observed during preliminary vehicular field reconnaissance. It is recommended that	M

Environmental Records Source Findings as associated with the Proposed DART Irving-3 LRT Line Segment Phase I and II Alignments

MAP ID	Site Name and Address[1]	Geo-Physical Position and Characteristics[2]	Environmental Database or Registry / Site Identification Number / Summary of Information within Database Search Report / Risk Evaluation Comment	Risk[3]
		complex, 1 to 4 percent slopes.	additional information be procured via interview and/or APAR review (i.e., Freedom of Information Act request. Specifically, the material, the extent of contamination, and its current status should be determined in order to accurately assess the environmental risk to the proposed alignment.	
5	The Parking Spot 4505 Plaza Drive Irving, TX 75063	Site is located 0.090 mile (475 feet) northeast of, up-gradient to, and at a higher elevation (544 feet AMSL) than the proposed alignment. Underlying soil type is Houston Black clay, 0 to 1 percent slopes.	**Database:** PST **Site ID:** 0068992 **Summary:** Fleet re-fueling site. Two active USTs were installed in 1994, including: one 8,000 gallon double-wall FRP diesel tank, and one 4,000 gallon double-wall FRP gasoline tank. **Comment:** Although the site has registered underground hazardous chemical storage, the database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination. See additional comments for this site at MAP ID 5, Site ID 922.	L
5	Key Park Airport Parking 4505 Plaza Drive Irving, TX	See geo-physical position and characteristics description above.	**Database:** VCP **Site ID:** 922 **Summary:** Car Rental Facility with USTs. 1999 VCP agreement for soils/ groundwater affected by BTEX and TPH. Cleaned up to non-residential standards; method not reported. Completed VCP, with final certificate issued in 2002. **Comment:** Clean-up to non-residential standards does not guarantee that all contamination is gone. The site is proximal and up-gradient to both the proposed Phase I and Phase II alignments. No concerns were visually observed during preliminary field reconnaissance. It is recommended that additional information be procured via interviews and/or VCP file review (i.e., Freedom of Information Act request), to determine whether advance environmental sampling is warranted. Specifically, the extent of contamination and its current status should be determined in order to accurately assess the environmental risk to the proposed alignment.	M
5	Dollar Car Rental 4505 Plaza Drive Irving, TX 75063	See geo-physical position and characteristics description above.	**Database:** LPST **Site ID:** 113536 **Summary:** One active 8,000 gallon double-wall FRP diesel UST was installed in 1994. LPST was reported in 1998. Groundwater impact, with no apparent threat or impacts to receptors. Potentially responsible party identified as PRG Parking Irving LHA Inc. Final concurrence has been issued, and the case closed. **Comment:** Issue resolved to regulatory agency satisfaction. See additional comments for this site at MAP ID 5, Site ID 0068992 and Site ID 922.	L
6	Fidelity Investments 6001 Campus Circle Drive Irving, TX 75063	Site is located 0.090 mile (475 feet) east of, down-gradient, and at lower elevation (498 feet AMSL) than proposed alignment. Underlying soil is Ferris-Heiden complex, 5 to 12 percent slopes.	**Database:** LPST **Site ID:** 106778 **Summary:** One active 15,000 gallon FRP diesel UST was installed in 1986. LPST was reported in 1993. Soil contamination only, which required full site assessment and remedial action plan. Potentially responsible party identified as Fidelity Properties Company. Final concurrence has been issued, and the case closed. **Comment:** Issue resolved to regulatory agency satisfaction. See additional comments for this site at MAP ID 6, Site ID 0071402 and Site ID 33633.	L
6	Fidelity Investments 6001 Campus Circle Drive Irving, TX 75063	See geo-physical position and characteristics description above.	**Database:** PST **Site ID:** 0071402 **Summary:** Five active USTs, including two 15,000 gallon single-wall FRP diesel tanks installed in 1986, two 10,000 gallon double-wall FRP diesel tanks installed in 1994, and one 500 gallon double-wall FRP tank of unknown content installed in 1986.	L

Environmental Records Source Findings as associated with the Proposed DART Irving-3 LRT Line Segment Phase I and II Alignments

MAP ID	Site Name and Address[1]	Geo-Physical Position and Characteristics[2]	Environmental Database or Registry / Site Identification Number / Summary of Information within Database Search Report / Risk Evaluation Comment	Risk[3]
			Comment: Although the site has registered underground hazardous chemical storage, database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination. See additional comments for this site at MAP ID 6, Site 106778 and Site 33633.	
6	Fidelity Investments 6001 Campus Circle Drive Irving, TX 75063	See geo-physical position and characteristics description above.	**Database:** IHW; **Site ID:** 33633 **Summary:** Inactive industrial LQG. **Comment:** Database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination. See additional comments for this site at MAP ID 6, Site ID 106778 and Site ID 0071402.	L
7	American Airlines Airmail Automotive DFW Airport, TX 75261	Site is located 0.090 mile (475 feet) east of, up-gradient, and at equal elevation (574 feet AMSL) with proposed alignment. Soil is Houston Black-Urban land complex, 1 to 4 percent slopes.	**Database:** PST; **Site ID:** 0058395 **Summary:** Aircraft re-fueling site. One active 1,000 gallon double-wall FRP used oil UST. **Comment:** Although the site has registered underground hazardous chemical storage, the database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination.	L
8	Capps Van & Car Rental 4950 John Carpenter Freeway Irving, TX 75063	Site is located 0.120 mile (635 feet) northeast of, down-gradient, and at lower elevation (541 feet AMSL) than proposed alignment. Soil is Houston Black clay, 0 to 1 percent slopes.	**Database:** PST; **Site ID:** 0069694 **Summary:** Fleet re-fueling site. One active 4,000 gallon double-wall jacketed steel gasoline UST. **Comment:** Although the site has registered underground hazardous chemical storage, the database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination.	L
9	Beckett Corporation 5931 Campus Circle Drive Irving, TX 75063	Site is located 0.120 mile (635 feet) east of, down-gradient from, and at a lower elevation (482 feet AMSL) than the proposed alignment. Underlying soil type is Ferris-Heiden complex, 5 to 12 percent slopes.	**Database:** TIER II; **Site ID:** 32WW52002TW7 **Summary:** Tier II report signed in December 2007. **Comment:** Although the site has registered hazardous chemical storage, the database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination. See additional comment for this site at MAP ID 9, Site ID TWR000018382.	L
9	Beckett Corporation 5931 Campus Circle Drive Irving, TX 75063	See geo-physical position and characteristics description above.	**Database:** NLRRCRAG; **Site ID:** TWR000018382 **Summary:** Pump and Pumping Equipment Manufacturing site. No longer a RCRA generator. **Comment:** Database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination. See additional comment for this site at MAP ID 9, Site ID 32WW52002TW7.	L
9	Beckett 5931 Campus Circle Drive Irving, TX 75063	See geo-physical position and characteristics description above.	**Database:** IHW; **Site ID:** 85828 **Summary:** Manufacturer of fractional horsepower water pumps. Inactive CESQG. **Comment:** See comments for this site at MAP ID 9, Site ID 32WW52002TW7 and Site ID TWR000018382.	L
10	American Eagle Airlines Inc. DFW Airport Terminal A	Site is located 0.120 mile (635 feet) east of, up-gradient to, and	**Database:** RCRAG; **Site ID:** TXR000040709 **Summary:** RCRA-SQG.	L

Environmental Records Source Findings as associated with the Proposed DART Irving-3 LRT Line Segment Phase I and II Alignments					
MAP ID	**Site Name and Address[1]**	**Geo-Physical Position and Characteristics[2]**	**Environmental Database or Registry** / **Site Identification Number** / **Summary of Information within Database Search Report** / **Risk Evaluation Comment**		**Risk[3]**
	DFW Airport, TX 75261	at a higher elevation (590 feet AMSL) than the proposed alignment. Underlying soil type is Urban land.	**Comment:** Database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination.		
11	DFW Airport Marriott 8440 Freeport Parkway Irving, TX 75063	Site is located 0.140 mile (740 feet) northeast of, down-gradient from, and at a lower elevation (538 feet AMSL) than the proposed alignment. Underlying soil type is Houston Black clay, 0 to 1 percent slopes.	**Database:** PST	**Site ID:** 0022172	L
			Summary: One 2,000 gallon FRP diesel UST was removed from the ground in 1999.		
			Comment: Although the site has registered underground hazardous chemical storage, the database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination. See additional comment for this site at MAP ID 11, Site ID 109759.		
11	DFW Airport Marriott 8440 Freeport Parkway Irving, TX 75063	See geo-physical position and characteristics description above.	**Database:** LPST	**Site ID:** 109759	L
			Summary: One 2,000 gallon FRP diesel UST was installed in 1982. LPST was reported in 1995. No groundwater impact, and no apparent threats or impacts to receptors. Potentially responsible party identified as Potomac Hotel c/o Host Marriott. The 2,000 gallon UST was removed from the ground in 1999. Final concurrence was issued and the case closed.		
			Comment: Issue resolved to agency satisfaction. See additional comment for this site at MAP ID 11, Site ID 0022172.		
12	Federal Express Corporation 2963 N. Airfield Drive DFW Airport, TX 75261	Site is located 0.140 mile (740 feet) southwest of, up-gradient, and at equal elevation (544 feet AMSL) with proposed alignment. Underlying soil type is Houston Black clay, 0 to 1 percent slopes.	**Database:** PST	**Site ID:** 0058676	L
			Summary: Fleet re-fueling site. Three USTs were removed from the ground in 1997, including one 10,000 gallon double-wall FRP gasoline tank, one 12,000 gallon double-wall FRP diesel tank, and 550 gallon single-wall FRP used oil tank.		
			Comment: Although the site has registered hazardous chemical storage, database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination. See additional comments for this site at MAP ID 12, Site ID 3K02H601KXN2 and Site ID 76260.		
12	Federal Express DFWR 2963 N. Airfield Drive Irving, TX 75261	See geo-physical position and characteristics description above.	**Database:** TIER II	**Site ID:** 3K02H601KXN2	L
			Summary: Tier II report signed in January 2008.		
			Comment: See comments for this site at MAP ID 12, Site ID 0058676 and Site ID 76260.		
12	DFW Airport 2963 N. Airfield Drive Dallas, TX 75261	See geo-physical position and characteristics description above.	**Database:** IHW	**Site ID:** 76260	L
			Summary: Inactive non-industrial and/or municipal SQG.		
			Comment: Database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of contamination. See additional comment for this site at MAP ID 12, Site ID 00558676.		
13	Federal Express DFW Airport 2967 N Airfield Drive DFW Airport, TX 75261	Site is located 0.150 mile (790 feet) southwest of, up-gradient, and at equal elevation (544 feet AMSL) with alignment. Underlying soil type is Houston-	**Database:** PST	**Site ID:** 0069995	L
			Summary: Fleet re-fueling site. Two inactive 10,000 gallon steel ASTs were installed in 1997, one diesel and one gasoline.		
			Comment: Although the site has registered underground hazardous chemical storage, the database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental		

Environmental Records Source Findings as associated with the Proposed DART Irving-3 LRT Line Segment Phase I and II Alignments					
MAP ID	**Site Name and Address[1]**	**Geo-Physical Position and Characteristics[2]**	**Environmental Database or Registry** / **Summary of Information within Database Search Report** / **Risk Evaluation Comment**	**Site Identification Number**	**Risk[3]**
		Black clay, 1 to 3 percent slopes.	contamination.		
13	AVIA Development Group 2967 N Airfield Drive DFW Airport, TX 75261	See geo-physical position and characteristics description above.	**Database:** PST	**Site ID:** 0043825	L
			Summary: Aircraft re-fueling site. Two 10,000 gallon single-wall FRP USTs were removed from the ground in 1994, one diesel and one gasoline.		
			Comment: See comment for this site at MAP ID 13, Site ID 0069995.		
14	ENTACT 6025 Commerce, Suite 500 Irving, TX 75063	Site is located 0.170 mile (900 feet) northeast of, down-gradient, and at lower elevation (505 feet AMSL) than proposed alignment. Soil is Heiden clay, 1 to 3 percent slopes.	**Database:** IHW	**Site ID:** 41903	L
			Summary: Active site. Non-notifier. Not a waste generator. No waste records.		
			Comment: Database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination.		
15	DPS Station 3 3131 N. Airfield Drive DFW Airport, TX 75261	Site is located 0.190 mile (1005 feet) southwest of, up-gradient, and at higher elevation (538 feet AMSL) than proposed alignment. Soil is Houston-Black clay, 1 to 3 percent slopes.	**Database:** LPST	**Site ID:** 097174	L
			Summary: LPST was reported in 1990. Soil contamination only, which required full site assessment and remedial action plan. Potentially responsible party identified as DFW International Airport. Final concurrence was issued, and the case closed.		
			Comment: Issue resolved to regulatory agency satisfaction.		
16	Alamo Rent-A-Car LLC. 7650 Esters Boulevard Irving, TX 75063	Site is located 0.200 mile (1055 feet) northeast of, cross-gradient, and at higher elevation (538 feet AMSL) than proposed alignment. Soil is Houston Black clay, 0 to 1 percent slopes.	**Database:** PST	**Site ID:** 0046368	L
			Summary: Three USTs were removed from the ground in 2002, including: two 12,000 gallon double-wall composite steel/FRP tanks, one gasoline and the other diesel; and one 550 gallon composite steel/FRP used oil tank.		
			Comment: Although the site has registered underground hazardous chemical storage, the database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination. See additional comment for this site at MAP ID 16, Site ID 00111143.		
16	Alamo Rent-A-Car LLC. 7650 Esters Boulevard Irving, TX 75063	See geo-physical position and characteristics description above.	**Database:** LPST	**Site ID:** 111143	L
			Summary: One 12,000 gallon double-wall composite steel/FRP gasoline UST was installed in 1986. LPST was reported in 1996. Groundwater impact, with public/domestic water supply well located within 0.25 mile. Potentially responsible party identified as ANC Rental Corp. Final concurrence was issued, and the case closed. The 12,000 gallon UST was removed from the ground in 2002.		
			Comment: Issue resolved to regulatory agency satisfaction. See comment at MAP ID 16, Site ID 0046368.		
17	Thrifty Rent A Car System 7700 Esters Boulevard Irving, TX 75063	Site is located 0.230 mile (1215 feet) northeast of, cross-gradient, and at higher elevation (541 feet AMSL) than alignment. Underlying soil is Houston Black clay, 0 to 1 percent slopes.	**Database:** PST	**Site ID:** 0049315	L
			Summary: Fleet re-fueling. One 10,000 gallon single-wall steel gasoline UST removed from ground, 2002.		
			Comment: Although the site has registered underground hazardous chemical storage, the database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination.		

Environmental Records Source Findings as associated with the Proposed DART Irving-3 LRT Line Segment Phase I and II Alignments					
MAP ID	**Site Name and Address[1]**	**Geo-Physical Position and Characteristics[2]**	**Environmental Database or Registry** / **Site Identification Number** / **Summary of Information within Database Search Report** / **Risk Evaluation Comment**		**Risk[3]**
18	Hubbell Distribution Inc. 6425 Campus Circle Drive West Irving, TX 75063	Site is located 0.280 mile (1480 feet) northeast of, down-gradient, and at equal elevation (508 feet AMSL) with proposed alignment. Soil is Ferris-Heiden complex, 5 to 12 percent slopes.	**Database:** TIER II **Summary:** Tier II report signed in February 2008. **Comment:** Although the site has registered hazardous chemical storage, the database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination.	**Site ID:** 5NMS2J002GUR	L
19	Glamour Tech Labs 4829 Royal Lane Irving, TX 75063	Site is located 0.320 mile (1690 feet) northeast of, down-gradient, and at lower elevation (535 feet AMSL) than proposed alignment. Soil is Houston Black clay, 0 to 1 percent slopes.	**Database:** NFRAP **Summary:** No details recorded. **Comment:** The issue has been resolved to the extent that site has been removed from CERCLA-list. Removal from CERCLA-list does not guarantee that all contamination is gone, only that if still present, it is not at a level of NPL-concern. However, the site is not geo-physically proximal to the proposed alignment and its clay soil would tend to restrict the migration of contamination.	**Site ID:** TXD981155864	L
20	MCI-IRNATX 2477 Gateway Drive Irving, TX 75063	Site is located 0.350 mile (1850 feet) northeast of, down-gradient, and at lower elevation (489 feet AMSL) than proposed alignment. Soil is Ferris-Heiden complex, 5 to 12 percent slopes.	**Database:** TIER II **Summary:** Tier II report signed in January 2008. **Comment:** Although the site has registered hazardous chemical storage, the database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination.	**Site ID:** 23GH140F8NZ2	L
21	Northlake 8505 Freeport Parkway Irving, TX 75063	Site is located 0.350 mile (1850 feet) northeast of, down-gradient, and at lower elevation (535 feet AMSL) than proposed alignment. Soil is Houston Black clay, 0 to 1 percent slopes.	**Database:** TIER II **Summary:** Tier II report signed in January 2008. **Comment:** Although the site has registered hazardous chemical storage, the database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination.	**Site ID:** FAWS0145478	L
22	Acuity Brands Lighting 2700 Esters Irving, TX 75261	Site is located 0.410 mile (2165 feet) north of, down-gradient from, and at higher elevation (617 feet AMSL) than the proposed alignment. Underlying soil type is Heiden clay, 1 to 3 percent slopes.	**Database:** TIER II **Summary:** Tier II report signed in January 2008. **Comment:** Although the site has registered hazardous chemical storage, the database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination.	**Site ID:** 48R472017PUZ	L
22	Siemens Energy & Automation, Inc. 2700 Esters Boulevard, Suite 200B DFW Airport, TX 75261	See geo-physical position and characteristics description above.	**Database:** TIER II **Summary:** Tier II report signed in January 2008. **Comment:** See comment for this site at MAP ID 22, Site 48R472017PUZ.	**Site ID:** 5TM82H0027QH	L
23	FLQ Approach Lighting DFW Runway 17C System	Site is located 0.420 mile (2220 feet) southwest of, up-gradient,	**Database:** TIER II **Summary:** Tier II report signed in February 2008.	**Site ID:** 47EM2H002BZ8	L

Environmental Records Source Findings as associated with the Proposed DART Irving-3 LRT Line Segment Phase I and II Alignments

MAP ID	Site Name and Address[1]	Geo-Physical Position and Characteristics[2]	Environmental Database or Registry / Site Identification Number / Summary of Information within Database Search Report / Risk Evaluation Comment	Risk[3]
	DFW Airport, TX 75261	and at higher elevation (558 feet AMSL) than proposed alignment. Underlying soil is Houston-Black clay, 1 to 3 percent slopes.	**Comment:** Although the site has registered hazardous chemical storage, the database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination.	
24	American Honda Motor 4525 Royal Lane Irving, TX 75063	Site is located 0.430 mile (2270 feet) northeast of, down-gradient from, and at a lower elevation (535 feet AMSL) than the proposed alignment. Underlying soil is Houston Black clay, 0 to 1 percent slopes.	**Database:** TIER II; **Site ID:** 5KZAE5002T1A **Summary:** Tier II report signed in January 2008. **Comment:** Although the site has registered hazardous chemical storage, the database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination. See additional comment for this site at MAP ID 24, Site ID 109741.	L
24	American Honda Motor 4529 Royal Lane Irving, TX 75063	See geo-physical position and characteristics description above.	**Database:** LPST; **Site ID:** 109741 One 500 gallon FRP used oil UST removed from the ground in 1995. LPST was reported in 1995. No groundwater impact, and no apparent threats or impacts to receptors. Potentially responsible party identified as American Honda Motor Co. Final concurrence was issued, and the case closed. **Comments:** Issue resolved to regulatory agency satisfaction. See additional comment for this site at MAP ID 24, Site ID 5KZAE5002T1A.	L
25	PPZ Approach Lighting DFW Runway 17L System DFW Airport, TX 75261	Site is located 0.440 mile (2325 feet) southwest of, up-gradient to, and at equal elevation (495 feet AMSL) with the proposed alignment. Underlying soil is Ovan clay, frequently flooded.	**Database:** TIER II; **Site ID:** 47EMBD00A196 **Summary:** Tier II report signed in February 2008. **Comment:** Although the site has registered hazardous chemical storage, the database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination.	L
26	Capps Rent A Car 7902 Esters Boulevard Irving, TX 75063	Site is located 0.440 mile (2325 feet) northeast of, down-gradient, and at higher elevation (538 feet AMSL) than the proposed alignment. Underlying soil is Houston Black clay, 0 to 1 percent slopes.	**Database:** LPST; **Site ID:** 092140 **Summary:** One 4,000 gallon composite steel/FRP gasoline UST was installed in 1988. LPST was reported in 1988. Soil contamination, which required full site assessment and remedial action plan. Potentially responsible party identified as Capps Rent A Car. Final concurrence was issued and the case closed. The 4,000 gallon UST was removed from the ground in 1997. **Comment:** Issue resolved to regulatory agency satisfaction.	L
27	B & B Products 6921 N. Belt Line Road. Irving, TX 75063	Site is located 0.480 mile (2535 feet) northeast of, down-gradient, and at lower elevation (462 feet AMSL) than proposed alignment. Underlying soil type is Ovan clay, frequently flooded.	**Database:** LPST; **Site ID:** 101893 **Summary:** One 4,000 gallon steel diesel UST was removed from the ground in 1992. LPST was reported in 1992. Groundwater impact, with no apparent threats or impacts to receptors. Potentially responsible party identified as B & B Products Co. Final concurrence was issued and the case closed. **Comment:** Issue resolved to regulatory agency satisfaction.	L
28	Airport Surveillance Radar Facility ASR-9	Site is located more than 0.250 mile west of the proposed	**Database:** PST; **Site ID:** 0066951 **Summary:** One active 2,000-gallon steel diesel AST within a concrete containment structure was installed	L

Environmental Records Source Findings as associated with the Proposed DART Irving-3 LRT Line Segment Phase I and II Alignments

MAP ID	Site Name and Address[1]	Geo-Physical Position and Characteristics[2]	Environmental Database or Registry / Site Identification Number / Summary of Information within Database Search Report / Risk Evaluation Comment	Risk[3]
	2100 N. Airfield Drive Dallas, TX 75261	alignment. (Additional details not applicable.)	in 1995. Owned by Federal Aviation Administration. **Comments:** Although the site has registered underground hazardous chemical storage, database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination. Although this site lies outside the ASTM-prescribed search radius for the proposed Phase I alignment, it is located 0.120 mile (633 feet) west of, cross-gradient to and at an equal elevation (590 feet AMSL) as the Phase II alignment. The underlying soil type is Heiden clay, with 1 to 3 percent slopes.	
29	Sequoia Lumber Company 1065 E. Northwest Highway Grapevine, TX 76051	Site is located more than one mile west of the proposed alignment. (Additional details not applicable.)	**Database:** LPST **Site ID:** 110259 **Summary:** One 1,000 gallon steel diesel UST was removed from the ground in 1990. LPST was reported in 1996. Potentially responsible party identified as Sequoia Supply. No groundwater impact, and no apparent threats or impacts to receptors. Final concurrence was issued, and the case closed. **Comments:** Issue ha been resolved to the regulatory agency's satisfaction. Although this site lies outside the ASTM-prescribed search radius for the proposed Phase I alignment, it is located 0.410 mile (2,165 feet) west of, up-gradient to, and at a higher elevation (610 feet AMSL) than the Phase II alignment. The underlying soil type is Houston-Black-Urban land complex, with 1 to 4 percent slopes.	L
30	Ryder Transportation Services #0115A 1150 E. Northwest Highway Grapevine, TX 76051	Site is located more than one mile west of the proposed alignment. (Additional details not applicable.)	**Database:** TIER II **Site ID:** 1F9Y2300E387 **Summary:** Tier II report signed in February 2007. **Comments:** Although the site has registered hazardous chemical storage, the database listing does not directly denote regulatory violation, hazardous materials incident, or evidence of environmental contamination. Although this site lies outside the ASTM-prescribed search radius for the proposed Phase I alignment, it is located 0.480 mile (2,534 feet) west of, up-gradient to, and at a higher elevation (607 feet AMSL) than the Phase II alignment. The underlying soil type is Houston Black clay, with 1 to 3 percent slopes. See additional comment for this site at MAP ID 30, Site ID 107902.	L
30	Ryder Truck Rental 1150 E. Northwest Highway Grapevine, TX 76051	Site is located more than one mile west of the proposed alignment. (Additional details not applicable.)	**Database:** LPST **Site ID:** 107902 **Summary:** One 6,000-gallon steel new-oil UST was installed in 1979. LPST was reported in 1993. Soil contamination only, which required full site assessment and remedial action plan. Potentially responsible party identified as Ryder Truck Rental, Inc. The 6,000-gallon steel oil UST was removed from the ground in 1995. Final concurrence was issued, and the case closed. **Comments:** Issue has been resolved to regulatory agency's satisfaction. See additional comment for this site at MAP ID 30, Site ID 1F9Y2300E387.	L
31	Advanced Graphics Technologies, Inc. 942 Minters Chapel Road Grapevine, TX 76051	Site is located more than one mile west of the proposed alignment. (Additional details not applicable.)	**Database:** RCRAC **Site ID:** TXD051375434 **Summary:** Industry classifications include: electroplating, plating, polishing, anodizing...;printing machinery and equipment manufacturing; and jewelry and silverware manufacturing. RCRA-SQG. Wastes include: corrosive, chromium, electroplating-related wastestreams (bath solutions, bath residues, and wastewater treatment sludges), and trichloroethene. Extensive list of compliance evaluations, violations, and written informal enforcement actions between 1985 and 1995. Enforcement actions escalated from 1995 through state level administrative order issued in 2003. Compliance evaluation inspection conducted in 2007. **Comments:** No violations recorded after 2002, and no enforcement actions recorded after 2003. The	L

Environmental Records Source Findings as associated with the Proposed DART Irving-3 LRT Line Segment Phase I and II Alignments					
MAP ID	**Site Name and Address[1]**	**Geo-Physical Position and Characteristics[2]**	**Environmental Database or Registry** / **Summary of Information within Database Search Report** / **Risk Evaluation Comment**	**Site Identification Number**	**Risk[3]**
			nature of the site's industrial activities, however, raises the site's risk of heavy metals and/or solvents contamination. Although site lies outside the ASTM-prescribed search radius for the proposed Phase I alignment, it is located 0.680 mile (3,590 feet) west of, up-gradient to, and at higher elevation (602 feet AMSL) than the Phase II alignment. The underlying soil is Houston Black clay, with 1 to 3 percent slopes.		
N/A	Former Exxon RS 65744 Irving. TX 75038	Zip code underlies eastern terminus of proposed alignment. Area is generally underlain by assorted clay soils or Urban land.	**Database:** PST **Summary:** One 1,000-gallon steel UST was removed from the ground in 1987; former contents unknown. **Comment:** Although the site has registered underground hazardous chemical storage, database listing does not denote regulatory violation, hazardous materials incident, or evidence of contamination.	**Site ID:** 0026517	L

[1] *Site names and addresses are written as they appeared in the database search reports.*

[2] *Geo-physical position and characteristics information is presented in relation to the proposed DART Irving-3 Phase I alignment. Information concerning the each sites location in relation to the Phase II alignment is presented within the risk evaluation comments, only where relevant.*

[3] *The risk of encountering or affecting contamination associated with each identified site, has been classified as Low (L), Moderate (M) or High (H).*

Source: GeoSearch, Radius Report: DART I-3 Phase I, 09/08/2009; GeoSearch, Radius Report: DART I-3 Phase II, 09/08/2009; and URS Study Team, 2009

APPENDIX I. IRVING-3 LINE SECTION 10% DESIGN REPORT

Design Report
Irving/DFW Airport Corridor
Orange Line LRT Extension

Preliminary Engineering – 10% Design
Orange Line Section I-3 Phase I

July 2010

URS Corporation
ID# 3162

TABLE OF CONTENTS

TABLES AND FIGURES

APPENDICES

1.0 INTRODUCTION

With this project, Dallas Area Rapid Transit (DART) is advancing the design of the third line section of the Irving/DFW Corridor (referred to by DART as the Orange Line Section I-3) to its terminus at Dallas/Fort Worth International Airport (DFW Airport). At the same time, the Fort Worth Transportation Authority (the T) is advancing the Southwest-to-Northeast Rail Corridor (SW2NE) utilizing the DART owned Cotton Belt right-of-way located north of SH 114. When completed, the two rail projects will be incorporated into the overall public transportation program at DFW Airport and will provide service to employees, air passengers and other commuters in the North Central Texas region. Once the preliminary engineering is completed, DART and its partners will have a preferred alignment for the final segment of the line section.

1.1 Background

In recent years, the terminus location of the DART and the T projects has changed several times reflecting both the regional significance and the technical complexity of the projects. Details regarding alignment, station connection and funding are still pending per an agreement among the agency partners: DART, DFW, the T and North Central Texas Council of Governments (NCTCOG).

Previous rail planning studies include the Northwest Corridor Major Investment Study completed by DART in 2000 and the DFW Rail Planning and Implementation Study, a joint effort of the NCTCOG, DFW Airport, DART, the T and the Texas Department of Transportation (TxDOT) in 2004. The T's SW2NE project is planned to provide commuter rail service to DFW Airport by 2013. DFW Airport has also recently completed a Strategic Plan and updated a number of documents related to their airport development plan. The airport administration continues to be a strong advocate for rail access to the airport.

DART contracted URS Corporation for the development of the Preliminary Engineering and Environmental Assessment (PE/EA) for the Orange Line Section I-3 in June 2009. Orange Line Section I-3 will be developed in two phases. Phase I is planned to extend approximately 5.2 miles from Belt Line Station to its terminus at the DFW Airport Terminal A Station. Phase II would branch off of Phase I near the intersection of Freeport Parkway and North Airfield Drive and extend north to interface with the future passenger rail service on the Cotton Belt rail corridor. From there, Phase II would head south into DFW Airport connecting with Phase I near Crossunder #1 at International Parkway. The alignment would extend approximately 4.3 miles from the interfaces with the Phase I alignment. The timeframe for the implementation of Phase II is unknown at the time of this report and is dependent upon the development of passenger rail service along the Cotton Belt rail corridor.

This design report will only focus on the aspects associated with the Orange Line Section I-3 Phase I alignment.

1.2 Extent of Preliminary Engineering

This design report for Orange Line Section I-3 Phase I documents the Preliminary Engineering (PE) 10% design and clarifies any issues which may not be evident in the attached preliminary engineering drawings. The report is divided into the following sections:

- Horizontal and Vertical Alignment
- Right-of-Way (Permanent Easement for LRT)
- Utility Modifications
- Bridge and Structural Design
- Drainage

- Station Design
- Traffic Improvements and Impacts
- Environmental Considerations
- Geotechnical Considerations
- Coordination with Other Disciplines

The purpose of the PE design is to form a baseline to evaluate future alternatives and refinements. The goal is to prove the engineering feasibility of the selected alignment as modified by the DART Board of Directors. The PE design plans are of sufficient detail to generate preliminary quantities, thus enabling DART to form a baseline budget. The budget value and baseline quantities will be the first itemized costs produced for the project, since the previous planning estimates were general in nature and not based on project specific limitations. Due to constraints of the available right-of-way (ROW) and considerations to minimize impact to future DFW Airport expansion and utilities, additional detailed engineering was performed. The developed design, details and special planning assumptions provide a foundation for the final design. See Appendix A for Special Planning Assumptions.

2.0 HORIZONTAL AND VERTICAL ALIGNMENT

2.1 Base Mapping

The Orange Line Section I-3 PE alignment drawings were generated using base aerial mapping from DFW Airport Base Mapping, along with supplemental ground survey data. Due to scheduling constraints, new aerial base mapping was not generated for the PE design effort. Service dates for the base mapping vary and the data is outdated due to continued DFW Airport expansion projects as well as continuing Chesapeake natural gas drilling and distribution operations on site. It is strongly recommended that DART conduct aerial mapping as well as planimetric updates along the PE alignment during final design. The updated base mapping along with current planimetrics would produce the most accurate final alignment design and earthwork quantities.

The base mapping was delivered to the PE/EA Team by DFW Airport in DFW Airport's coordinate system (DFW88). The files were translated to the Texas Coordinate System, NAD83, and converted to surface coordinates using a combined scale factor of 1.000136506. The 10% PE package was designed in the surface coordinate system and delivered to DART.

The 5% PE package was designed using International Feet Units per direction from DART CADD to URS at the beginning of the project. However, at the time of the 5% submittal, the I-3 project surveyors discovered a software discrepancy in MicroStation (V8) and recommended against the use of International Feet Units and requested a review of the initial DART direction. During a conference call held between DART's CADD department and the General Planning Consultant (GPC) team on September 15, 2009, it was agreed by all parties that Survey Feet Units will be used to complete the remaining design of this project, not International Feet Units. The use of Survey Feet Units will allow this project to be designed in accordance with DART CADD standards utilizing a coordinate system that will match previously designed and constructed DART projects.

2.2 Overview

The Phase I 10% PE plans were prepared utilizing DFW Airport base mapping with the aid of supplemental field surveying. The horizontal and vertical alignments were calculated to four decimal places and form the basis for final design/design build. The proposed guideway alignment conforms to the Design Criteria as presented in the DART Light Rail Project Design

Criteria Manual Volume 1, January 2003 Revision 10, except as noted on the drawings. The alignment was designed for a maximum possible train operating speed of 65 mph.
The major design constraints for the line section are as follows:

- The lack of an existing DART-owned ROW, which typically assists in defining the alignment. Also, the existing topography challenges due to a lack of existing DART-owned ROW. In most of the DART Light Rail Transit (LRT) line sections, the alignments are built in ROW following existing freight operations (active or abandoned), so the topography within the ROW was suitable for LRT operations with fairly minor grading adjustments. Extensive coordination with the major land owner, DFW Airport, will be critical to the development of the alignment through the design process due to necessary grading to accommodate the LRT.

- Coordinating the design with TxDOT's plans for major roadway improvement projects for the SH 114 Corridor and DFW Connector Project, as well as DFW Airport infrastructure improvement projects. The proposed highway improvements are in various stages of design and construction and all have varying completion dates. The final section designers will need to continue coordination as the design progresses.

- Coordinating the project with DFW Airport regarding the design of the Terminal A Station, as well as coordinating survey control between the two projects. At this time, it appears DFW Airport will be performing the final design effort for the Terminal A Station Platform improvements along with the associated utilities and equipment, while DART will be performing the final design of the rail improvements up to and into the platform area including the determination of the top of platform elevation. The actual scope of the final I-3 design effort for both DART and DFW Airport in the area of the Terminal A Station must be established in a detailed manner prior to finalizing the project in order to avoid confusion. Also, it is very important the project surveyors working with both entities recognize there is currently a difference in the vertical datums and horizontal coordinate systems being used by DART and DFW Airport for the completion of each of the projects. The difference in the vertical datums and horizontal coordinate systems between the two projects must be precisely determined prior to final design so the exact horizontal and vertical location of the proposed platform can be identified consistently as part of both projects and translated between the two as required without discrepancy.

- Oncor Crossing - From approximate station 513+00 to 514+00 the LRT alignment crosses four existing Oncor underground 138 KV transmission lines. The crossing is shown to be spanned by a bridge structure for the 10% submittal. The underground high voltage transmission lines generate heat. Typical LRT embankment cannot be built over the lines. Preliminary coordination has taken place between DART and Oncor for the proposed crossing, but the final designer shall continue to coordinate throughout the final design regarding the specific requirements for Oncor. Please refer to utility section of this report for more information.

- Pinch Point - From approximate station 644+00 to 670+00 the LRT alignment is designed to operate within an area termed the "Pinch Point". The Pinch Point has limited available right-of-way to construct the guideway and will only get more congested in the future once the planned TxDOT improvements for SH 114 are constructed; at the time the 10% plans were designed there was not a definite time frame for the TxDOT construction. Through the Pinch Point the LRT will be constrained by DFW Airport's newly constructed North Airfield Drive to the south and

the existing and future SH 114 main lanes and ramps to the north. Once the future SH 114 improvements are constructed, TxDOT will need to investigate the need for a traffic barrier to be constructed along the southern edge of the future exit ramp due to clear zone requirements. There is also a newly constructed Chesapeake gas line and saltwater line that falls within the footprint of the LRT guideway. The 10% plans show these utilities to be relocated to the south side of North Airfield Drive. Initial coordination with Chesapeake has occurred for the relocation, but the final designer shall continue the coordination efforts with DFW Airport, TxDOT and Chesapeake. The *Assessment and Analysis of Potential Operation Impacts from the proposed Dallas Area Rapid Transit (DART) Light Rail Access, I-3 Route, onto the Dallas/Fort Worth International Airport* study prepared by Jacobs Engineering Group in June 2010 also identifies the pinch point as an issue for Human Factors because in this area the proposed alignment comes within 270 feet of the North East End-Around Taxiway System (NE EAT), a future project planned by DFW Airport. The main concern raised is related to visual scenes observed by pilots and air traffic controllers. Recommended mitigation is suggested in order to assist pilots' ability to discriminate the presence of the light rail transit system near the planned NE EAT.

- International Parkway Corridor - From approximate station 730+00 to the end of the project the LRT alignment is located between the North Service Road and Northbound Main Lanes of DFW Airport's International Parkway. The guideway is designed so that it is generally located along DFW Airport's abandoned Air Trans guideway. Initial coordination for the alignment in this area with DFW Airport has led to the development of a demarcation line for the roles and responsibilities for the design and construction of the guideway and associated elements. Although, at the time of the 10% design the exact demarcation limits where not determined, the initial conversations concluded that DART would be provided an envelope to construct the guideway and systems elements. Final designer shall continue the coordination throughout final design.

- Existing Taxiway Crossings – The LRT is designed to operate beneath existing Taxiways Y & Z from approximate station 754+50 to 760+50. The guideway profile is designed so that minimum vertical clearance is 20.5-ft to the low chord of the taxiway bridges. The desired minimum clearance of 22-ft could not be achieved in this area due to the existing substructures of the taxiway bridges. The 20.5-ft clearance is sufficient to construct the Overhead Contact System (OCS) wires independent of the taxiway bridge structures, so the wires will not be in contact with the existing structure. DFW Airport has requested the clearance between the existing structures and OCS wires be maximized, to allow flexibility in the future when the taxiway bridges are reconstructed, possibly with deeper beams. DART understands the significance of this request; however, the OCS design is not part of the PE/Planning scope. In the next level of design, DART will require the final designer to explore innovative OCS design alternatives to lower the profile for the OCS wires as much as possible to maximize the clearance. Coordination with DFW Airport will need to continue throughout final design.

2.3 Horizontal Alignment

The LRT guideway alignment of Orange Line Section I-3 Phase I is designed as a double track alignment with 15 foot-6 inch track centers and a maximum design speed of 65 mph. Lower design speeds were utilized in areas where existing constraints would not accommodate larger radius curves. The alignment will consist of at-grade, retained earth, cut sections and aerial structures. The centerline of the northbound (NB) track is used for the alignment control and is referred to as the "control track." The final section designers should confirm the Line Section I-

2 end of the line stationing and re-station the I-3 alignment to provide a continuous stationing scheme without equations throughout the Irving/DFW Corridor.
Orange Line Section I-3 Phase I begins west of the proposed Belt Line Station (I-2) and travels in a general northwestern direction to the intersection of Freeport Parkway and Airfield Drive. The alignment continues in a northwestern direction paralleling Airfield Drive and then turns southwest toward International Parkway. At International Parkway, it turns south and terminates at the DFW Airport Terminal A Station between the NB main lanes of International Parkway and NB Service Road, and beneath the existing DFW Airport Skylink Automated People Mover system.

The alignment will run through what is currently Chesapeake's AD Fracture Pond from approximate Station 702+00 to 707+00. The final designer shall coordinate with DFW Airport and Chesapeake for DFW Airport's removal of the fracture pond. The removal of the fracture pond should include restoring the area to pre-existing conditions.

Coordination with DART's Systems and Operations personnel was conducted near the end of 10% design. Initial coordination efforts resulted in identifying possible/preliminary locations for the Traction Power Substations (TPSS) and special trackwork for the 10% PE design submittal. These locations are shown on the plans and should be coordinated with DART Systems Engineering/Integration team and Oncor to optimize the locations of TPSS as the design progresses. Proper load studies to determine if the preliminary locations of TPSS are adequate will need to be analyzed by the final section designers.

DART may require additional access roads or driveways along the project. The 10% PE plans include preliminary access roads for the TPSS locations, but the final designer should continue to develop the routes and coordination throughout final design.

2.4 Vertical Alignment

The Orange Line Section I-3 Phase I vertical alignment begins on retained fill and rises to an aerial structure crossing over Belt Line Road. After the crossing, the profile slopes downward to be at-grade, crosses over several drainage channels on a mixture of at-grade, retained fill and aerial structure sections, continues at-grade following the existing ground line and intersects NAVAID Access Road with an at-grade crossing. The alignment continues at-grade, enters into a fill section and a grade separated crossing over the future North Airfield Drive extension before continuing on aerial structure over Hackberry Creek. After spanning Hackberry Creek, the profile descends to at-grade and travels parallel to the northern edge of DFW Airport property before increasing in grade to an aerial structure that spans over Freeport Parkway and a drainage ditch. The profile descends in grade transitioning from a retained fill section to at-grade section and continues at-grade between North Airfield Drive and SH 114 before starting to climb to retained fill and eventually ascending on aerial structure to cross over North Airfield Drive and Grapevine Creek. The grade separation over North Airfield Drive was requested by DFW Airport due to its emergency vehicle use of the roadway. Previously, the FAA indicated that the aerial structure may become an airspace issue. However, per the airspace study titled Assessment and Analysis of Potential Operational Impacts from the Proposed Dallas Area Rapid Transit Light Rail Access, I-3 Route, onto the Dallas/Fort Worth International Airport completed in June 2010, the aerial structure does not cause an airspace issue. The profile descends beneath the DFW Airport future taxiway bridges on a mixture of retained fill and at-grade and then continues at-grade until the at-grade crossing of the Chesapeake Access Road. The profile then continues at-grade until ascending to a grade separation at an existing drainage channel and the NB Service Road. The profile then decreases in elevation to retained fill and follows the existing grade until it transitions into a

retained cut section and travels beneath two existing taxiways to its terminus at Terminal A Station.

2.5 Aeronautical Analysis

DART contracted Jacobs Engineering Group Inc. to conduct the necessary studies required for FAA approvals of the Orange Line Section I-3 Extension. Jacobs prepared an **Assessment and Analysis of Potential Operational Impacts from the proposed Dallas Area Rapid Transit (DART) Light Rail Access, I-3 Route, onto Dallas/Fort Worth International Airport**, in June 2010. This report provides the results of the analysis and assessments for the I-3 project as it relates to the following:

Airport Design Standards
Airport Airspace
Terminal Instrument Procedures
Part 77 – Objects Affecting Navigable Airspace, Navigations Systems, Airport & Airfield Operations, Airport Tennant Infrastructure and Facilities, Human Factors and FAA Safety Risk Management Decision Documentation

The results of the report concluded that the proposed route for I-3 should not adversely affect airport or aircraft operations. Fifteen suggested mitigation measures have been identified in the report, which will be required as part of the project approval and implementation. Mitigation measures still need to be reviewed and approved by the FAA, and the measures are listed below:

1. Develop and submit and Airspace Feasibility Study to allow the FAA to assess and provide formal comments on the proposed project.
2. Obtain FAA concurrence on the DART I-3 route through the Runway 17C and 17L RPZ's.
3. Confirm with DFW and the FAA that DART infrastructure that increases Minimum Descent Altitudes over existing obstructions will be acceptable.
4. Confirm with the FAA that a 30% Flight Inspection Error Tolerance level, based on a "worst case" modeling scheme will be acceptable.
5. Identify to the FAA that Communication shadowing, from the DFW infrastructure, may cause communication coverage issues on the Future NE EAT.
6. Confirm with the FAA that the proposed DART Rail development, located on the North side of the FAA's 1E and 2E RTR facilities, will be designed so that there will not be any increased flooding issues, as result of the DART project.
7. Confirm that the FAA will have continuous access (24 hours per day, 7 days per week) to their facilities to perform their safety critical functions.
8. Coordinate early in the design phase with the FAA, to develop a plan to relocate the LLWAS Remote Station #4 and associated systems, to minimize any operational impacts.
9. Coordinate early in the design phase with the FAA, to develop a plan to relocate the ASDE-X, Remote Unit #2, located on the LLWAS Remote Station #4 pole, to minimize any operational impacts.
10. Coordinate early in the design phase with the FAA, to develop a plan and strategy to minimize any potential reflections that the DFW West ASR may encounter during either the construction or the operational phases.
11. Coordinate early in the design phase with the FAA, to develop a plan and strategy to minimize any potential reflections (multipath) that the DFW East ASDE may encounter during either the construction or the operational phases.
12. Develop a plan on how to minimize the construction area lighting that could cause an adverse visual scene for pilots or air traffic controllers.
13. Chesapeake Pad Site "AY" Scada Communications Path Mitigation

14. Coordinate early in the design phase with the FAA, to develop acceptable DART Rail Security Fence Visual Screening, that focuses on aircraft day and night operations. Visual Screening could possibly include installing PVC slates into the guideway fencing and installing red obstruction lighting on top of the OCS poles in the vicinity of the Pinch Point, which is the area from Freeport Parkway to Grapevine Creek (approximate Guideway stationing 645+00 to 694+00).
15. Coordinate early in design phase with the FAA, to see what assistance will be required of DART for the development and approval of a FAA Safety Risk Management Decision Document.

Final Designers shall continue to coordinate with the FAA & DFW Airport as the project advances.

3.0 RIGHT-OF-WAY

3.1 Available ROW

DART will need to coordinate its ROW or permanent LRT easement needs with all parties as the project advances. Since DART does not own ROW along the proposed I-3 Corridor, it would need to coordinate with both DFW Airport and TxDOT. DART would need to share a small portion of the TxDOT owned ROW in the pinch point area west of Freeport Parkway. DART recently worked with DFW Airport on the ROW for Line Section I-2 and TxDOT for the ROW on the first two Irving line sections. Consideration for minimizing the overall ROW needs will continue to be explored during the final engineering design process. The property for Orange Line Section I-3 consists of city, state and DFW Airport owned ROW.

3.2 ROW Requirements

The Orange Line Section I-3 will be constructed almost entirely within DFW Airport property. Conceptual real estate requirements and refined LRT easement lines have been developed and shown in the ROW Plan sheets. ROW/easement lines are set under the following general rules.

- An 80-foot wide permanent easement is set as the ROW/easement line for at-grade sections.
- A 60-foot wide permanent easement width is set as the ROW/easement line for grade separated sections as well as constrained areas (this includes pinch points and along International Parkway where existing structures and the roadway affect ROW availability).
- Temporary easements would also be required in several locations in order to grade from proposed elevation out to existing ground.

For the purpose of this document and for consistency with other DART reports, the LRT permanent easement will be referred to as the ROW.

4.0 UTILITY MODIFICATIONS

Existing Utility Composite drawings and Utility Modification Composite drawings have been prepared for the 10% submittal using record drawings and Geographic Information Systems (GIS) information obtained from the City of Irving, DFW Airport, Oncor Electric, Atmos Energy, Dallas Water Utilities and other utility companies. The completeness and accuracy of this information has not been fully verified and should be used for planning purposes only. The final designer for the DART rail system should verify and obtain accurate horizontal and vertical information for all existing and proposed utilities using subsurface utility engineering

(SUE) or other methods as required to obtain appropriate information necessary for the design.

In an effort to begin the verification of existing utilities as soon as possible, initial limited subsurface utility engineering (SUE) investigations have been performed as part of the current DART General Engineering Consultant (GEC) contract. Existing utilities in approximately 40 locations were selected to be potholed and surveyed. Potholing consists of localized excavation of the utility line with a vacuum truck to allow the exact horizontal and vertical location of the existing utility line to be identified and documented. See **Appendix C** for a "Summary Initial Limited SUE" collected during the potholing process. In addition to potholing, existing utility lines have been located horizontally in many areas of the corridor using available methods like electromagnetic and acoustic technologies or the survey of above ground features associated with the utility lines. Approximately 18,000 feet of existing utility lines have been horizontally designated and documented within the corridor. The initial limited SUE information has been incorporated into the 10% project design deliverables and will be provided to the design-builder for use in completing the project.

An initial utility crossing matrix has been developed and is included in Appendix B. The most significant utility crossings or potential utility modifications that may be required for the design and construction of Orange Line Section I-3 Phase I include:

- Underground Verizon duct bank near Station 505+73
- Underground FPL fiber optic duct bank near Station 506+60
- Underground Oncor street lighting cable near Station 506+70
- Underground AT&T duct banks near Station 507+60
- Overhead Oncor electric and Time Warner Communications cables near Station 507+68
- Underground 138 KV Oncor electric conduits near Station 513+75
- An FAA 2400 volt direct buried electric cable near Station 557+90
- Two FAA direct buried 100 pair copper communication cables near Stations 559+66 and 559+88
- A Verizon underground telephone duct bank near Station 587+50
- An Oncor overhead electric distribution line from Station 605+00 to Station 612+10
- A Qwest underground fiber optic cable running longitudinally in the ROW between Stations 603+65 and 647+90
- A 3-inch gas main near Station 641+40
- An 8-inch DFW Airport sanitary sewer line near Station 643+60
- An 8-inch DFW Airport water main near Station 643+40
- A 30-inch water main that provides water to DFW Airport from Dallas at Station 644+90
- A 30-inch DFW Airport water main at Station 644+80
- A Time Warner Communications underground fiber optic cable near Station 646+30
- An FAA wind shear tower at Station 646+40
- Traffic control facilities at the intersection of Freeport Parkway and Airfield Drive
- A 6-feet x 3-feet DFW Airport Multiple Conduit Bank near Station 647+00
- An 18-inch sanitary sewer near Station 648+00
- An underground Verizon telephone duct bank near Station 648+50
- An 8-inch Chesapeake fuel line between Stations 648+00 and 655+00
- An 8-inch Chesapeake natural gas line and 10-inch saltwater line between Stations 648+30 and 669+30
- An Oncor overhead electric distribution line near Station 676+70
- An 8-inch Chesapeake natural gas line and 10-inch saltwater line near station 685+75

- A 24-inch PVC DFW Airport water main at Station 686+10
- A 16-inch water main stub out near Station 686+60
- A Qwest underground fiber optic cable near Station 686+70
- A Time Warner underground fiber optic cable near Station 687+05
- An underground Oncor electric conduit near Station 688+90
- An underground Verizon telephone duct bank near Station 688+40
- An 8-inch Chesapeake fuel line near Station 692+80
- A Chesapeake gas line near Station 701+80
- An Oncor 4-inch underground electric service to a Chesapeake gas facility near Station 718+50
- An 84-inch storm sewer at Station 723+90
- A DFW Airport / Oncor underground electric 480 V secondary service duct near Station 726+93
- A 36-inch water main at Station 727+76
- An Atmos 4-inch gas main near Station 727+80
- A 21-inch DFW Airport water main that skews across the ROW from Station 728+20 to 735+10
- A 10 E 6 (Approximately 4-feet high by 2-feet wide) critical trunk line underground electric duct bank skewing across the ROW from Station 730+00 to 735+00
- A 10 E 6 (Approximately 4-feet high by 2-feet wide) critical trunk line underground electric duct bank skewing across the ROW from Station 745+00 to 750+20
- A 10 E 6 (Approximately 4-feet high by 2-feet wide) critical trunk line underground electric duct bank running longitudinally along the east ROW and under proposed walls from Station 752+00 to 762+00
- Underground electric lines and street lighting facilities between Stations 748+40 and 757+20
- An underground Verizon telephone conduit near Station 748+36
- A 24-inch storm sewer near Station 748+93
- A 30-inch storm sewer near Station 751+72
- A 12-inch PVC Water main near Station 752+12
- An 8-inch sanitary sewer near Station 752+32
- A storm sewer crossing at Station 753+48, then running longitudinally under the SB rail line from Station 753+48 to 760+54
- Underground electric street lighting cables and high mast light poles between Stations 760+90 and 768+65
- A six way underground Verizon telephone conduit near Station 761+45
- An FAA telephone conduit near Station 761+66 that carries communications for the airport
- Electric switch equipment near Station 761+80
- A traffic signal power panel near Station 762+00
- A 16-inch DFW Airport water main near Station 763+05
- A storm sewer that skews longitudinally and across the ROW from Station 761+70 to 763+10
- A storm sewer that runs longitudinally and across the ROW from Station 763+40 to 766+60
- An underground Oncor electric duct near Station 764+00 that provides electric service to the terminals
- An underground six-way Verizon telephone conduit near Station 766+91
- A utility tunnel carrying four 8-inch water pipes near Station 766+98
- An underground Oncor electric duct near Station 768+10

Early coordination with the utility owners will be critical to planning for the protection and/or modification of these facilities. Power and water facilities cannot be taken out of service without regard to the time of year and the demand for service. Normally, large water mains and electric power facilities can be shut down during the winter months when demand for water and electricity is at its lowest. The service requirements for the operation of the airport must also be taken into consideration. Large power and water facilities may require items or equipment that take a long period of time to acquire. Construction costs for moving these large facilities can be very significant. Early coordination with the utility owners will be crucial to keeping the project on schedule.

Some overhead wire crossings may require adjustment in both directions if they do not meet DART's clearance requirements for the overhead catenary system, or if the catenary does not meet the power company's requirements for safe clearance. Overhead crossings could be relocated underground. Parallel overhead lines may need to be relocated away from the track to eliminate conflicts with the future guideway. At the crossing near Station 513+75, the buried 138 KV electrical conduits casing, location and depth should be evaluated. According to Oncor, these 138 KV transmission lines are encased in oil-filled conduits and generate heat. No embankment directly over these transmission lines is allowed. Many buried electric conduits are encased in concrete, and if there is no conflict with the proposed grading or violation of DART requirements, the conduits may be able to remain undisturbed. See Appendix D for Oncor's encroachment application, guidelines for use of property and construction limitations.

All utility crossings will need to be reviewed for DART's utility crossing requirements. Water and sanitary sewer mains will need to be encased. Utilities that cross on a diagonal may need to be realigned to cross the at-grade tracks perpendicularly where possible. Utilities that cross the proposed rail at a bridge may not require adjustment as long as the proposed bridge piers are not in conflict with the utility. Drainage culverts to be crossed should be evaluated for their condition and load carrying capability. Storm sewers running longitudinally under the proposed rail should be relocated out of the proposed rail embankment. Any culverts of substandard condition or hydraulic capacity should be replaced or upgraded prior to construction of the light rail.

Wherever utilities should be relocated or reconstructed, the work should be designed to conform to DART standards and the standards of the utility owner. There are various water, sewer, gas, electric, telephone and fiber optic lines under the future subgrade of the proposed alignment. Coordination with the owner/operator of the utilities is a very important part of the process to relocate these utilities and avoid conflicts.

4.1 Recommended Utility Investigations and Modifications

At the present time, the utility investigations described below have been performed as part of the initial limited SUE effort or are recommended to be performed during later stages of design prior to construction. Further investigation should be conducted regarding any utilities either crossing or closely paralleling the proposed alignment. The recommended relocation work or utility modification scope described below is based upon the initial limited SUE. The final utility modification and relocation scope may change significantly pending the outcome of additional utility investigation to be performed during later stages of the design.

- Underground Verizon duct bank near Station 505+73 (behind the east curb line of Belt Line Road) – The proposed LRT crossing over Belt Line Road will be grade-separated. DART utility accommodation policy does not require an underground utility passing under a rail bridge be encased and/or relocated. However, this duct bank has been

located as part of the initial limited SUE effort and appears to be very close to one of the proposed bridge piers. If the pier is in conflict and the location of the bridge columns cannot be adjusted, the duct bank should be relocated. According to Verizon, they would not be able to relocate just a section of duct bank crossing under the LRT alignment. If the duct bank is modified, an entire section of duct bank would have to be rebuilt, and the cost would be very significant. For this reason, adjusting the location of the bridge columns may be the most feasible option.

- Relocate existing Oncor street lighting cable in the center median of Belt Line Road near Station 506+70 due to a conflict with a proposed bridge pier in the center of the median. This line has been located as part of the initial limited SUE effort.
- FPL Fiber Optic Cable duct bank consisting of 16 - 1.25 inch polyethylene conduits in center median of Belt Line Road near Station 506+60 – This duct bank has been located as part of the initial limited SUE effort. At this time, there does not appear to be a conflict with the proposed bridge piers. If a conflict is identified later and the pier cannot be redesigned, then the fiber optic cables should be relocated.
- Underground AT&T duct banks near Station 507+60 (behind the west curb line of Belt Line Road. One is AT&T local service. The other is AT&T long distance) – These duct banks have been located as part of the initial limited SUE effort. Based on preliminary bridge layout plans, there does not appear to be a conflict with the proposed bridge piers. If a conflict is identified later and the location of the bridge columns cannot be adjusted, the duct banks should be relocated. If the duct banks are modified, an entire section of the duct banks would have to be rebuilt, and the cost would be very significant. For this reason, adjusting the location of the bridge columns to clear the AT&T duct banks may be the most feasible option.
- Overhead Oncor Electric and Time Warner Communications cables near Station 507+60 (along the west side of the Belt Line Road ROW) – It is probable that the elevation of the overhead cables will not meet vertical clearance requirements for the LRT catenary system. If this is the case, they would have to be raised vertically or re-constructed underground per DART's utility accommodation policy. The final 10% design drawings show the relocation of these utilities underground and around the proposed bridge columns.
- Underground 138 KV Oncor electric conduits near Station 513+75 – The horizontal location of these conduits has been approximately identified as part of the initial limited SUE effort. These existing 138 KV underground conduits are 4 to 5.5 feet below existing grade according to record drawings and consist of 8-inch steel pipes filled with special insulating oil that is kept at a pressure of 200 PSI. The loading, proposed grade and actual depth of the conduits below existing grade should be evaluated by the final designer. Oncor has determined that the effect of an earthen fill embankment over the conduits would adversely affect heat dissipation from the conductors, and that the DART rail should bridge over the conduits. The grading over the existing conduits should remain as close as possible to existing grades. Before any work takes place in the vicinity of these conduits, the contractor should contact Mike Shea at (972) 721-6255 (B), (972) 816-4677 (Cell), michael.shea@oncor.com. The final designer will be required to complete and submit a permit application to Oncor Electric Delivery Company to cross these underground transmission facilities. The permit application requires a non-refundable $250 permit application fee to Ms. Denita Wesley, Right-of-Way Agent, Oncor Electric Delivery Company, 115 S. 7th Street, Fort Worth, Texas 76102, Phone (817) 215-6029, E-mail DWESLEY1@oncor.com.
- Underground FAA 2400 volt direct buried cable near Station 557+90 – This line has been located as part of the initial limited SUE effort. According to the SUE pothole data, this line should be lowered and concrete encased in order to meet DART design

criteria regarding depth of cover and encasement below the proposed rail and parallel drainage ditches.

- Two underground direct buried FAA 100 pair copper communication cables near Stations 559+66 and 559+88 – These lines have been located as part of the initial limited SUE effort. According to the SUE pothole data, these lines should be lowered and concrete encased in order to meet DART design criteria regarding depth of cover and encasement below the proposed rail and parallel drainage ditches.
- An underground Verizon telephone duct crosses the proposed rail near Station 587+50. This line has been located as part of the initial limited SUE effort. This line is located below a proposed bridge structure.
- A Qwest fiber optic duct consisting of four 1.5-inch polyethylene conduits enters the ROW near Station 603+50 and runs longitudinally within the ROW to Station 647+50. This line has been located as part of the initial limited SUE effort between project stations 612+00 and 626+00 and also between stations 639+00 and 648+00. DART should evaluate their utility policy and Qwest should evaluate their needs for access and maintenance of this cable. DART and Qwest should decide if all or part of this fiber optic cable should be relocated outside of the ROW. A portion of this duct from Station 612+00 to 626+00 is recommended to be relocated away from the proposed tracks toward the DFW Airport property line and is currently shown that way on the final 10% design drawings. Another section of this line between project stations 639+00 and 641+00 is also proposed to be relocated due to conflicts with proposed bridge embankment walls. Several proposed bridge piers are also very close to the Qwest fiber optic duct near Freeport Parkway.
- An Oncor overhead electric line enters the ROW near Station 605+00 and continues longitudinally along the north ROW to Station 612+10, where it turns south and crosses the proposed rail alignment. At the crossing, adequate vertical clearance should be verified and the overhead electric line should possibly be rerouted underground to cross the LRT ROW. The overhead electric line that runs parallel to the tracks within the ROW should be evaluated for proper clearance from the proposed overhead catenary system. DART policy requires a minimum horizontal distance of 25 feet from the center of the tracks to a parallel overhead power line. If the clearance requirements or DART policy are violated, then the Oncor overhead facilities should be relocated.
- A 25,000 volt Oncor primary feeder direct buried cable crosses the DART ROW near Station 612+00 then turns west along the north ROW line. Underground service lines cross the DART ROW near Stations 614+00 and 626+00. These lines should be evaluated for depth and alignment. Oncor says that power service for these locations could be rerouted to serve the buildings from overhead power lines in the front of the building along Airfield Drive. Any remaining underground electric lines that cross DART ROW must be concrete encased or capped in accordance with DART policy.
- A 3-inch gas main crosses the proposed DART alignment near Station 641+40. This line has been located as part of the initial limited SUE effort. This line is located below a proposed bridge structure. At this time there does not appear to be a conflict with the proposed bridge piers; however, a bridge pier will be drilled very close to the existing gas main. Special care should be taken to protect this line during construction of the proposed bridge. Also, the gas main should have cut-off valves installed on both sides of the proposed DART ROW in accordance with DART policy.
- An 8-inch DFW Airport sanitary sewer crosses the rail alignment near Station 643+50. The bridge piers appear to clear the sewer main.
- An 8-inch DFW Airport water main is within the ROW from Station 643+40 to 645+00 and appears to be very close to a proposed bridge pier. This main has a fire hydrant and 2-inch water service for the gas station and restaurant east of Freeport Parkway.

This main should be potholed to verify the alignment and confirm that there is no conflict with the proposed pier. If there is a conflict, the water main should be relocated or the bridge pier redesigned to clear the line.

- A 30-inch DFW Airport water main crosses the ROW near Station 644+80. This water line has been located as part of the initial limited SUE effort. This line is located below a proposed bridge structure. Based on the preliminary bridge layout plans, this water line does not appear to conflict with the proposed bridge piers at this time.
- A DWU 30-inch concrete water main crosses the ROW near Station 644+90. This water line has been located as part of the initial limited SUE effort. This line is located below a proposed bridge structure. Based on the preliminary bridge layout plans, this water line does not appear to conflict with the proposed bridge piers at this time. This water main provides most of the water needs of DFW Airport. This 30" water main from Dallas is critical to DFW Airport and cannot be taken out of service at any time.
- An underground Time Warner Communications fiber optic cable crosses the proposed ROW near Station 646+20. This fiber optic cable has been located as part of the initial limited SUE effort. This line is located beneath a proposed bridge structure and is very close to and may directly conflict with one of the proposed bridge piers. Special care should be taken to protect this line in this area, and relocation or adjustment of this line may be required adjacent to the proposed bridge pier at this location.
- A FAA Wind Shear facility near Station 646+40 at the northwest corner of Freeport Parkway and Airfield Drive should be relocated along with the buried electric and phone service lines to the facility.
- Traffic control facilities at the intersection of Freeport Parkway and Airfield Drive should be relocated.
- A Chesapeake 8-inch fuel line is located roughly parallel to and slightly outside of the proposed DART ROW between stations 646+00 and 652+00. This line has been located as part of the initial limited SUE effort. According to the SUE information, this line will not conflict with the proposed rail improvements between these two stations. This line does appear to conflict with the proposed rail improvements northwest of station 652+00; however, this line is proposed to be relocated by others in that area as shown in the DFW Airport construction plans for "DFW Airport Perimeter Taxiway Northeast Quadrant."
- A 6-feet by 3-feet DFW Airport underground electric street lighting multiple conduit bank (MCB) crosses the ROW near Station 647+00. This MCB has been located as part of the initial limited SUE effort. This duct bank carries street lighting cables and a 15 KV primary feeder. This duct bank crosses the proposed ROW beneath a proposed bridge structure and does not appear to conflict with the bridge piers as shown on the preliminary bridge layout.
- An underground Verizon telephone duct bank crosses the ROW near Station 648+40. This duct bank has been located as part of the initial limited SUE effort. This duct bank crosses the proposed ROW beneath a proposed bridge structure and does not appear to conflict with the bridge piers as shown on the preliminary bridge layout.
- An 18-inch sanitary sewer that crosses the ROW near Station 648+00 should be positively located and surveyed to verify the alignment and clearance from proposed bridge piers.
- An 8-inch Chesapeake gas line and 10-inch Chesapeake salt water line should be relocated from Station 648+30 to Station 669+00 to clear proposed DART ROW, bridge piers and earth fill embankment.
- An Oncor overhead electric line crossing the ROW near Station 676+70 should be rerouted underground into a concrete encased duct bank across the proposed ROW.
- An 8-inch Chesapeake gas line and 10-inch Chesapeake salt water line skew across the proposed ROW near Station 685+75. Both of these lines are located beneath a

proposed bridge structure. The 8" gas line has been located as part of the initial limited SUE effort. This line is close to, but does not appear to directly conflict with, a proposed bridge pier. It is very possible construction activities associated with the nearby proposed bridge pier could disturb and damage this existing gas line. Special care should be taken to protect this utility during construction of the project if this line is to remain in its current location. If it is not possible to protect the gas line during construction of the proposed bridge pier, the gas line may have to be relocated in this area.

- A 24-inch PVC water main with a 16-inch water main stub-out crosses the proposed alignment near Station 686+00. The 24" water main has been located as part of the initial limited SUE effort and does not appear to conflict with the nearby proposed bridge piers. The plug at the west end of the 16-inch PVC water main is very close to a proposed bridge pier near Station 686+60. The drilling of the bridge pier could disturb the soil and concrete blocking that holds the plug in place. If it is determined that there will not be a direct conflict with the pier, but the pier is close enough to the plug to cause concern, the 16-inch valve could be closed at the connection to the 24-inch water main, and the pressure relieved from the 16-inch stub out with the fire hydrant to allow the pier drilling to proceed. After the concrete has set in the pier, the water could be turned back on. DFW Airport may want to evaluate whether or not they want to keep the 16-inch stub out and fire hydrant at this time or have these facilities relocated or removed.
- An underground DFW Airport/Oncor electric duct bank that skews across the proposed ROW near Station 688+00 should be potholed and surveyed to verify alignment, depth and clearance from proposed bridge piers.
- An underground Verizon telephone duct bank skews across the proposed alignment near Station 688+40. This line has been located as part of the initial limited SUE effort. This line is located beneath a proposed bridge structure and does not appear to conflict with the proposed bridge piers.
- A Chesapeake 8-inch fuel line skews across the proposed ROW near Station 692+70. This line has been located as part of the initial limited SUE effort. This line is located beneath a proposed bridge structure and is close to, but does not appear to directly conflict with, the proposed bridge piers. It is very possible construction activities associated with the nearby proposed bridge pier could disturb and damage this existing fuel line. Special care should be taken to protect this utility during construction of the project if this line is to remain in its current location.
- A Chesapeake gas line crosses the ROW near Station 701+80. This line has been located as part of the initial limited SUE effort. According to the SUE pothole data, this line is too shallow to safely remain at its current elevation below the footings of the proposed embankment walls in this area. The gas line should be replaced, lowered and encased inside a steel encasement pipe across the proposed ROW at this location in accordance with DART standards.
- An underground Oncor electric service to a Chesapeake facility near Station 718+50 should be evaluated for future need. If Chesapeake needs to retain electric service to this facility, the 4-inch conduit should be potholed and surveyed to verify the alignment, depth and concrete encasement. If the line is not encased in concrete, it should be encased or concrete capped in accordance with DART requirements. This underground electric service will cross the rail in a fill area with retaining walls on both sides of the rail line.
- An 84-inch storm sewer will be very close to bridge piers at Station 723+90. This storm sewer should be potholed and surveyed to verify clearance from the proposed bridge piers that will be on both sides of the storm sewer.

- A DFW Airport/Oncor underground electric 480 V secondary service duct crosses the proposed ROW near Station 726+93. This duct has been located as part of the initial limited SUE effort. According to the SUE information, this duct crosses the DART ROW beneath a proposed bridge structure and does not appear to conflict with the proposed bridge piers as shown on the preliminary bridge layout.
- An Atmos 4-inch gas main skews across the proposed ROW near Station 728+15. This line has been located as part of the initial limited SUE effort. This line is located beneath a proposed bridge structure and is close to, but does not appear to directly conflict with, the proposed bridge piers. It is very possible construction activities associated with the nearby proposed bridge pier could disturb and damage this existing gas line. Special care should be taken to protect this utility during construction of the project if this line is to remain in its current location. Cut off valves for this gas line should be added on either side of the proposed DART ROW per DART requirements.
- A 21-inch DFW Airport Reinforced Concrete Cylinder Pipe (RCCP) water main skews across the proposed DART ROW from Station 728+20 to 735+10. This water main has been located as part of the initial limited SUE effort and was determined to be very close to several proposed bridge piers. This water line is proposed to be relocated in this area as part of the 10% design plans because of these conflicts.
- A DFW Airport/Oncor 10 E 6 critical trunk line underground electric duct bank skews across the proposed DART ROW from Station 730+00 to 735+00. This duct bank has been located as part of the initial limited SUE effort. Based on preliminary bridge layout plans, there does not appear to be a conflict with the proposed bridge piers. If a conflict is identified later, it is recommended that the location of the proposed bridge columns be revised to avoid this duct bank during the final design process prior to construction. This is the main feed for power to the airport and everything possible should be done in order to prevent the need to relocate this duct bank.
- A DFW Airport/Verizon duct bank crosses the proposed alignment near Station 733+44. This duct bank has been located as part of the initial limited SUE effort. This duct bank crosses under a proposed bridge structure and appears not to conflict with the proposed bridge piers.
- A DFW Airport/Oncor duct bank crosses the proposed DART ROW near Station 739+70. This duct bank has been located as part of the initial limited SUE effort. This duct bank crosses under a proposed bridge structure and appears not to conflict with the proposed bridge piers.
- A DFW Airport/Verizon duct crosses the proposed DART ROW near Station 740+15. This duct bank crosses under a proposed bridge structure and appears not to conflict with the proposed bridge piers.
- A DFW Airport/Verizon duct near Station 748+36 should be potholed and surveyed to verify the existence of concrete encasement. If it is not encased, the line should be concrete encased or capped in accordance with DART requirements.
- A DFW Airport 24-inch storm sewer crosses the proposed DART ROW near Station 748+93. This pipe should be encased in concrete and any laterals and inlets should be relocated out from under the proposed rail line.
- A DFW Airport/Oncor 10 E 6 critical trunk line underground electric duct bank enters the east side of the proposed ROW near Station 745+00. That same duct bank will run parallel and very close to proposed walls along the east side of the tracks from Station 752+00 to 762+00. There is also an Oncor manhole near Station 755+60. This duct system needs to be evaluated for maintenance accessibility due to its proximity to the proposed wall. Coordination is required between DART, Oncor and DFW Airport to determine the disposition of this underground electric duct bank. This is the major power supply to the airport, so everything should be done to avoid relocating the duct.

- A DFW Airport 30-inch storm sewer crosses the proposed DART ROW near Station 751+72. This pipe needs to be encased in concrete across the proposed DART ROW or upgraded / protected in another manner.
- A 12-inch PVC DFW Airport water main crosses the proposed DART ROW near Station 752+32. This water main should be relocated and encased inside a steel encasement pipe and a bend should be relocated out from under a proposed wall on the east side.
- An 8-inch PVC DFW Airport sanitary sewer main crosses the proposed DART ROW at Station 752+12. This sanitary sewer main should be encased across the ROW per DART standards and relocated on the east side of the ROW to maintain TCEQ-required clearance from the water main.
- A DFW Airport 30-inch storm sewer crosses into proposed DART ROW near Station 753+48 where it connects to a manhole located on the centerline of the proposed northbound rail. The storm sewer system flows to the north, where it picks up several inlets from both sides of the proposed ROW. The inlets furthest upstream are near Station 760+54 along the south side of Taxiway Z. This storm sewer system should be relocated out from under the rails and constructed according to DART standards where it crosses the proposed DART ROW.
- There are underground electric lines and street lighting facilities along the west side of the proposed DART ROW from Stations 748+40 to 757+20. The underground electric lines in this area were located as part of the initial limited SUE effort between stations 748+40 and 754+00. These street lighting facilities and all associated underground electric infrastructure should be relocated out of the proposed DART ROW. A street lighting engineer should redesign the lighting for International Parkway and the DART rail line in this area.
- A DFW Airport/Verizon 6 way underground telephone duct crosses the proposed DART ROW near Station 761+45. This duct has been located as part of the initial limited SUE effort. According to the SUE information, this line appears to be concrete encased at the test hole location inside the proposed DART ROW area. This line also appears to have adequate cover for the construction of the proposed rail as shown in the 10% drawings. If the duct is not concrete encased across the entire proposed ROW, it needs to be concrete encased or capped in accordance with DART standards.
- There is a FAA communications duct that crosses the proposed ROW near Station 761+66. This carries very important communication lines that airport operations depend upon to communicate between computers, planes and air traffic controllers. The lines have been described as very deep, around 30 feet below existing grade. More information needs to be obtained regarding these communication lines. If the existing lines are encased in concrete and of adequate depth, it would be best to leave these lines in place and not do anything to them.
- Various underground electric street lighting cables and high mast poles need to be relocated out of the proposed DART ROW from Station 760+90 to 768+65. Street lighting in this area needs to be redesigned.
- Existing electric switch equipment exists between the proposed tracks near Station 761+80. This equipment should be removed and relocated. Coordination with Oncor and DFW Airport to minimize power outages to adjacent buildings is required during the performance of this work.
- An existing traffic signal power panel exists between the proposed tracks near Station 762+00. This panel should be removed and relocated.
- A 16-inch DFW Airport water main crosses the proposed DART ROW near Station 763+05. This main should be placed inside a steel encasement pipe across the DART ROW in accordance with DART standards.

- A DFW Airport/Oncor electric duct crosses the proposed DART ROW near Station 764+00. This duct bank has been located horizontally as part of the initial limited SUE effort. This duct should be potholed to verify depth and existing encasement. If the duct is not concrete encased and sufficiently deep, it should be lowered and concrete encased or capped as required in accordance with DART standards.
- Storm drainage from Station 761+70 to 766+80 should be redesigned outside of the area under the proposed tracks and constructed according to DART standards where it must cross the proposed tracks.
- A DFW Airport/Verizon underground 6-way telephone duct crosses the proposed DART ROW near Station 766+91. The telephone duct should be potholed and surveyed to verify the alignment, depth and concrete encasement. If the duct is not concrete encased and sufficiently deep, it should be lowered and concrete encased or capped across the proposed DART ROW in accordance with DART standards.
- An 8.5 feet by 8 feet underground utility tunnel containing four 8-inch water lines and other possible utility lines crosses the proposed DART ROW near Station 766+98. The water pipelines are chilled water lines or hot water lines for HVAC in the terminals. This tunnel has been located as part of the initial limited SUE effort to verify its position and depth below the proposed tracks and station platform in this area. According to the SUE pothole results, there appears to be adequate clearance between the top of the tunnel and the proposed platform elevation.
- A DFW Airport/Oncor underground electric conduit crosses the proposed DART ROW near Station 768+10. This conduit has been located as part of the initial limited SUE effort. According to the SUE pothole data and because of the proposed cut in this area, this line should be lowered and concrete encased in order to meet DART design criteria regarding depth of cover and encasement below the proposed rail and platform at this location.

5.0 BRIDGE AND STRUCTURAL DESIGN

The design of the bridges and other structural components was performed in accordance with DART Design Criteria.

5.1 Bridge Design

Listed below are the bridges and other structures along the alignment of DART Orange Line Section I-3 Phase I:

- North Belt Line Road Overpass Bridge
- Esters Boulevard Overpass Bridge
- Freeport Parkway Overpass Bridge
- North Airfield Drive Overpass Bridge
- Elevated bridge/structure along the DFW Airport International Parkway NB Service Road
- Additional short bridges/structures over existing creeks, channels, culverts or buried transmission lines
- Central instrument house (CIH) and the existing taxiway bridge pier protection walls

The North Belt Line Road Overpass Bridge is located between Station 501+28 and 511+25. The North Belt Line Road Overpass has 11 spans and a total length of 997 feet. A 92-feet span and a 100-feet span will be located directly over the main traffic lanes of North Belt Line Road, while the rest of the spans would have a typical span length of 90 feet or smaller. About 200 feet west of the North Belt Line Road Overpass Bridge, there will be a one 80 feet long

span bridge to cross the Oncor 138 KV underground transmission lines. Coordination with OnCor will be required to insure the owner of the utility can adequately access the transmission lines.
The Esters Boulevard Overpass will be located between Stations 582+68 and 588+75. This structure has seven spans and a total length of 607 feet. One 115-foot span will cross over the main channel of Hackberry Creek, while a 101 feet long span would cross over the Cabell Drive. The rest of the spans are 90 feet or less in length.

Freeport Parkway Overpass Bridge would be located between Stations 640+40 and 653+62. The bridge has 15 spans and a total length of 1,332 feet. A 95-foot span is located at the rail turnout, which is also where the proposed DART Line Section I-3 Phase I track rail would connect to the Orange Line Section I-3 future Phase II track rail. All other spans have length of 90 feet or less. The portion of the bridge (spans five through eight) is designed to be wider in order to accommodate for the rail turnout. A two-span continuous deck is also designed for the spans 4 - 5 and 6 – 7 at the rail interface.

North Airfield Drive Overpass Bridge is located between Stations 677+82 and 694+18. It has 17 spans and a total length of 1,636 feet. The superstructure of this bridge is designed to be as shallow as possible to satisfy the requirement for the overhead flying zone. One 110 foot span and one 106-foot span are located directly over the main traffic lanes of North Airfield Drive and one 110-foot span is over the main drainage channel of Grapevine Creek. All the other bridge spans are 90 feet or less in length.

The elevated bridge along the International Parkway NB Service Road is located between Stations 721+81 and 744+41. It has 26 spans and a total length of 2,260 feet. There are two 100-foot spans that are located over the main drainage channel of the existing drainage ditch, between the piers 10 and 11 to miss impacting the underground utility lines. All the other bridge spans are 90 feet or less in length. A portion of the bridge (spans 19 through 22) is designed to be wider in order to accommodate the rail turnout, which is also where the proposed DART Orange Line Section I-3 Phase I track alignment connects to Orange Line Section I-3 future Phase II track alignment. A Two-span continuous deck is also designed for spans 20 - 21 and 22 - 23 at the rail interface.

There is a list of shorter structures along the alignment:

- One 90-foot span bridge over Hackberry Creek Tributary 3 between Station 519+38 to Station 520+28.
- A three-span bridge with a total length of 220 feet crosses over Mud Springs Creek at Station 537+50 to Station 539+70.
- One 60-foot span bridge over DFW Airport existing culvert J1A at Station 543+60 to Station 544+21.

The pre-stressed concrete AASHTO Type IV beam is designed to support all bridges along the entire alignment. The direct fixation rail is considered for any bridge of 600 feet in length and longer. The remaining short bridges are designed to be supported on ballast, which is further supported on concrete decks. These short bridges are designed to span across the creek channels and/or existing culverts.

All the proposed bridge substructures/piers are positioned to have minimal or zero impact on the existing underground utilities or nearby existing roadways throughout the entire project limit. Most of the bridges are supported by single column piers. Two-column or three-column piers are used to support the portion of the continuous slab bridge at each rail turnout linking the DART I–3 Phase I and future Phase II track at the Freeport Parkway Overpass Bridge and

at the upper station end of the elevated bridge along International Parkway. One two-column straddle bent would be used to support the bridge over International Parkway. There are many locations where the dual-column bents are used to span over the existing underground 84-inch diameter RCP storm drain and the underground utility lines such as electric lines. The cantilevered single column piers are also designed for many locations to avoid impacting existing underground utilities.

The DART I-3 Phase I light rail tracks run under the existing DFW Airport taxiway bridges. The nearest track centerline is 14 feet away from the existing taxiway bridge piers. Protection walls are proposed to protect those bridge piers. The protection wall is composed of concrete wall supported on 4-foot diameter drilled shafts.

There is one Central Instrument House (CIH) located at each of the two intersection points/turnouts between Phase I and future Phase II tracks. The top of the elevated CIH platform should be leveled with the top of the adjacent bridge side walkway.

5.2 Retaining Wall Design

The locations of retaining walls have been included in the 10% plans. Cast in place (CIP) retaining walls and MSE walls will be used to support retained cut and retained fill conditions. CIP walls, rather than the MSE walls, would be used in all cases when the walls extend below the 100-year flood elevations.

6.0 DRAINAGE

6.1 Research and Assumptions

Drainage area maps for Orange Line Section I-3 Phase I were prepared using a combination of existing drainage area maps provided by DFW Airport record documents and aerial topography maps. Any additionally needed topographic data was obtained from NCTCOG aerial photography or from field survey.

Drainage discharges have been calculated for a 100-year storm event to provide adequate drainage facilities in accordance with DART design criteria. The Rational Method was used for drainage areas less than 130 acres, and discharges were computed with 100-year storm intensities using curves developed from rainfall frequency data provided by NWS HYDRO-35 (June, 1977) per DART design criteria. An approximated time of concentration and composite runoff coefficient for each drainage area was computed and peak discharges were then determined. Discharges for drainage areas larger than 130 acres were obtained using the SCS Method or hydraulic computations of major storm conveyance systems from record construction drawings. Drainage area maps and area calculations reflect the basin delineations and expected flows.

As-built data for existing storm structures was provided by DFW Airport via record construction documents and CADD files generated from GIS software. This information was compared and verified for consistency with existing storm structures. Due to security measures, limited field observations could be made to verify locations and the size of existing storm structures. However, some supplemental ground survey was performed and utilized to verify drainage characteristics of several existing drainages structures and channels. An accurate field survey will be required prior to final system design to ensure that all drainage areas and flows are properly addressed in the design and that connections to existing systems are accurate.

Existing drainage crossings along the proposed alignment were examined and analyzed to determine whether or not a full replacement or additional culverts and/or extensions would be necessary to convey design flows. The structural integrity of the existing drainage facilities should be evaluated with respect to design loadings prior to any final decision on their suitability for use in the final design. Storm sewers and culverts will be provided for increased runoff and any drainage sub-areas created by the work performed to construct the line. New drainage structures at track crossings need to meet current storm drainage design requirements. These storm sewers should connect to existing systems, which would not be improved beyond the DART ROW or limits of construction unless determined otherwise by the final section designer.

6.2 Overview

Generally Orange Line Section I-3 Phase I crosses drainage sub-basins contributing to creeks including Grapevine Creek, Hackberry Creek and Mud Springs Creek. Most of the Orange Line Section I-3 Phase I neither changes drainage areas nor alters overall runoff characteristics of major basins crossing the proposed alignment. Minor changes to the existing drainage, flow paths and runoff characteristics should be expected along and adjacent to the DART LRT easement. Construction of Orange Line Section I-3 Phase I should have minimal impact on existing drainage patterns.

The 10% PE submittal demonstrates intermediate designs utilizing combinations of open channels or ditches with culvert crossings and includes storm sewer relocations and modifications. Complete underdrain systems design was not included as part of this preliminary design. Underdrain systems design will be the responsibility of the final section designer. Open channel ditches located within the DART LRT easement will be utilized to carry 100-year storm runoff. Areas along the alignment where the permanent easement is limited will require drainage easements for constructing planned drainage ditches or storm structures as incurred from the 10% PE design. Ditches will generally have a depth of two feet and a minimum bottom width of two feet, with maximum 3:1 foreslopes and 4:1 backslopes. In areas along the alignment where it is required to reduce the DART LRT easement width or additional drainage easement widths are needed due to constraints by manmade or natural features, low height reinforced concrete flumes may be used pending the condition that design capacity can be achieved. Proposed ditches will generally have the same profile as the vertical alignment grade of the track, with some exceptions of the proposed ditches connecting to existing ditches or structures, or the need to create an artificial high point that causes grades to flow against the grade of the track. All cross-sections and Utility Modification Composite sheets will reflect the horizontal and vertical location of drainage ditches.

In areas along the alignment where planned drainage ditches intercept storm runoff from large drainage areas, underground storm systems and inlets may be required in addition to open channels and flumes to convey storm runoff to existing creeks and tributaries. These underground storm systems will be designed by the final section designer.

After review by DFW Airport planning department, comments regarding drainage for this project included the request to perform streambank/channel protection and conveyance analyses per NCTCOG iSWM criteria and to determine if improvements to existing drainage structures outside of the DART LRT easement will be required due to proposed drainage impacts. All further analyses should be performed by the final section designer.

6.3 Drainage at Specific Locations

The hydraulic capacity of existing creek and tributary crossings was calculated and compared to the expected storm water runoff. Hydraulic studies were further performed for creek crossings including Grapevine Creek, Hackberry Creek and Mud Springs Creek using HEC-RAS modeling to determine 100-year water surface elevations, and cross-sections were developed to determine the water surface limits. The vertical alignment of the track at these crossings was then determined using DART design criteria with respect to the 100-year water surface elevations and limits. Due to the large area that the 100-year water surface limits consumes for the proposed crossing of Grapevine Creek, it was analyzed and determined that retained fill beyond the floodway limits of Grapevine Creek was suitable and that no adverse effect would be created, and the net effect of the proposed track on the 100-year water surface elevation and limits would be relatively minor. No modifications were planned for creeks beneath proposed aerial rail crossings with the exception of slope stabilization that may be required as determined by the final section designer. An existing 22-foot storm drainage pipe located at Station 544+00 will remain in place, and a structurally reinforced rail crossing will be utilized to cross the pipe.

Proposed culvert rail crossings located at Stations 575+80 and 639+10 were provided for drainage sub-areas created by the work. Proposed inline culverts were provided for ditches crossing existing roads, private driveways and TPSS sites. A summary of proposed and existing culvert structures is provided in Table 6.1. Replaced and/or relocated storm sewers and inlets including, but not limited to, systems concentrating along the east side of International Parkway just north of DFW Airport Terminal A will be connected to existing systems and are reflected in the Modified Utility Composite sheets.

In effort to avoid conflict with a Qwest underground fiber duct line, a 2-foot concrete flume was placed between Stations 604+00 and 634+80 on the NB side in substitution of a ditch. However, a portion of this Qwest line requires relocation between Stations 612+00 and 626+00. Please refer to the Utility Modifications section of the design report for more information regarding utility relocations.

Table 6.1 DART Orange Line Section I-3, Phase I 10% Design – Line Structure Summary

Structure No.	Drainage Area		Runoff Coeff.	Time of Conc.	Rainfall Intensity	Flow	Existing Structure	Proposed Structure	Remarks
	No.	Ac.	C	(min)	(in/hr)	(cfs)			
ST 1	G-1	1829	-	-	-	5133	22' SPP	-	To Remain
ST 2	G-5	2.5	0.5	10	8.88	11.1	-	24” RCP	In Line Culvert
ST 3	AB	0.8	0.5	10	8.88	3.6	-	21” RCP	In Line Culvert
ST 4	F-5	24.5	0.5	15	7.56	92.6	-	3-4'X2' RCB	Rail Crossing
ST 5	V	12.8	0.5	15	7.56	48.4	-	2-3’X2’ RCB	In Line Culvert
ST 6	E-4	1.2	0.5	10	8.88	5.3	-	21" RCP	In Line Culvert
ST 7	E-3, E-4	8.2	0.71	10	8.88	51.9	-	2-4'X2' RCB	In Line Culvert
ST 8	U, T-2	4.7	0.5	10	8.88	17.3*	-	3'X2' RCB	In Line Culvert
ST 9	E-2,E-3,E-4	12.4	0.64	10	8.88	65.3*	-	2-5'X3' RCB	Rail Crossing
ST 10	T-2,E-2,E-3,E-4,U	17.1	0.6	10	8.88	89.3*	36" RCP	2-5'X3' RCB	Ex. Str. Up Sized
ST 11	D-1, D-2	93.0	0.59	15	7.56	415	3-6'X3' RCB	-	To Remain
ST 12	O	1.5	0.9	10	8.88	12.0	-	21" RCP	Connect to Ex. 21" RCP
ST 13	C-1, L	14.4	0.56	10	8.88	71.4	-	1-6'X3' RCB	Connect to Ex. 3-24" RCP
ST 14	B-7	2.4	0.5	15	7.56	9.1	-	21" RCP	In Line Culvert
ST 15	B-5	18.8	0.65	10	8.88	108	-	2-4’X2’ RCB	In Line Culvert
ST 16	B-5	18.8	0.65	10	8.88	4.5*	-	21” RCP	In Line Culvert
ST 17	A-2	5.6	0.9	10	8.88	7.9*	-	21” RCP	In Line Culvert
ST 18	W, AF	5.3	0.5	10	8.88	19.1*	-	3’X2’ RCB	In Line Culvert

*Portion of Drainage Area’s Flow.
SPP = Steel Plated Pipe, RCP = Reinforced Concrete Pipe, RCB = Reinforced Concrete Box

7.0 STATION DESIGN

7.1 Terminal A LRT Station

The Orange Line Section I-3 Phase I includes one station located at the terminus of the Orange Line rail corridor adjacent to DFW Airport's Terminal A. The location of the LRT station has been collaborated with DFW Airport and the T whose terminal station is located on the opposite side of International Parkway adjacent to DFW Airport's Terminal B. While DART will be responsible for the basic LRT infrastructure such as trackwork and systems elements, DFW Airport will take the lead role in the overall station design, including the connection with the airport terminals, as well as the pedestrian connection between DART's LRT station and the T's commuter rail station. Coordination between the DFW Airport Final Station Designer and DART's LRT Final Designer shall be conducted in order to ensure the difference in coordinate systems is addressed and properly converted during the final design period. In the first station design coordination meeting held on December 18, 2009, attended by representatives from the DART and the T design teams, DFW Airport's consultants unveiled a general master plan for the two stations and the support facilities. An overall pedestrian path was presented that links the two stations together and connects them to the two airport terminals utilizing the existing guideway structure/ROW of the abandoned Air Trans system. DFW Airport IT systems, including flight information display, will be included in DFW Airport's station design.

Due to a number of physical constraints and the intended at-grade pedestrian connections discussed above, utilizing DART's standard center platform as the LRT terminus station was considered and determined unfeasible for this location. The widened track area required for the center platform configuration would be highly disruptive to the enormous amount of existing utilities along this segment of the line section which is located between two airport terminals. DFW Airport's design team and the GPC have tentatively agreed to utilize DART's standard side platform configuration to initiate the station design.

The terminal station design includes a crew room. Tail track will not be provided at the end of the platform due to space constraints. Instead, a storage area is provided approximately 1,200 feet north of the terminal station (see section 11.5 for more detail discussion on storage track design). A maintenance track and a crew room are also shown in the storage track area. A number of parking spaces and an access driveway from DFW Airport's NB Service Road are included in the final I-3 10% PE submittal documents.

8.0 TRAFFIC IMPROVEMENTS AND IMPACTS

8.1 At-Grade Crossings

Orange Line Section I-3 Phase I has four at-grade crossings. These crossings occur at NAVAID Access Road (558+10), Plaza Drive (635+22), Chesapeake Access Road (716+00) and Crossunder 2 (762+85). The change in profile at Crossunder 2 and the proximity of the proposed rail necessitated a vertical alignment adjustment to the North Service Road. The terminus of the proposed rail and location of the station platform require the relocation of the entrance ramp to International Parkway at this location. Proposed pavement structure thicknesses are required to follow the DFW Airport Design Criteria Manual or a design exception/waiver would be required by a DFW Airport Building Official. At the date of this report Section 2.5.2 Roadway Thickness of the DFW Airport Design Criteria Manual is being revised. The following is the proposed pavement structure revision recommendation: 10-inch continuously reinforced concrete pavement (CRCP), 2.5-inch asphalt bond breaker, 12-inch crushed concrete base and 12-inch to 24-inch lime stabilized subgrade. The following is a description of streets impacted by the rail improvements. Additional information about each

street modification can be found in the final 10% PE design plans submitted along with this report.

8.1.1 NAVAID Access Road

NAVAID Access Road is a single-lane, two-way road that provides access to one of DFW Airport's Navigational Aids. It is a 10-foot wide asphalt road and is proposed to be widened to 24 feet as the road crosses the proposed rail. The access road intersects Orange Line Section I-3 Phase I at station 558+10. Access to the Navigational Aid shall be maintained on a 24/7 basis during construction of the Orange Line Sections I-3.

8.1.2 Plaza Drive

Plaza Drive is a two-lane municipal street within the City of Irving. It is a 37-foot wide asphalt road with a concrete curb and gutter, and concrete sidewalk for a portion of its length. It is proposed to be reconstructed to meet current city standards for concrete roads. A 4-foot median is proposed to be added near the rail crossing.

8.1.3 Maintenance Road

The Maintenance Road is a single-lane, two-way gravel road that provides access to an Oncor site. This access road is proposed to be relocated to the west along North Airfield Drive. The relocation eliminates an at-grade crossing.

8.1.4 Chesapeake Access Road

Chesapeake Access Road is a single-lane, two-way gravel road that provides access to the Chesapeake well site. The access road is proposed to be realigned to provide a perpendicular crossing as well as cross the track in a tangent section.

8.1.5 North Service Road

The North Service Road is a two-lane concrete road with a curb and gutter, and sidewalk on its left side. The North Service Road transitions to asphalt with no outside curb and gutter under one of the taxiway overpasses. There is an existing traffic signal at the intersection with Crossunder 2. It is suggested that the curb and gutter on the west side of the service road be removed and replaced with concrete traffic barrier.

8.1.6 Crossunder 2

Crossunder 2 is a two-lane concrete road with curb and gutter and an 8-foot wide median.

8.1.7 International Parkway Entrance Ramp

This is an entrance ramp to NB International Parkway. It is a one-lane ramp with a 12-foot concrete travel lane and curb and gutter on the west side (inside). It also includes a 6-foot asphalt shoulder on the east side (outside). This ramp is being relocated to provide space for the terminus station of the rail line.

8.1.8 Future SH 114 Exit Ramp

In the future when SH 114 is reconstructed and widened the westbound exit ramp to Freeport Parkway will be relocated to the south. This relocation comes in close proximity to the Orange Line Section I-3 Phase I. According to current schematic layouts, Line Section I-3 Phase I is in the future ramp's clear zone. It is suggested that upon construction of the new exit ramp, a concrete traffic barrier be installed on the edge of the ramp shoulder.

8.2 Grade Separated Crossings

New grade separations for Orange Line Section I-3 Phase I are proposed at Belt Line Road, future North Airfield Drive extension (583+60), Freeport Parkway (645+00), North Airfield Drive (687+88) and DFW Airport NB Service Road (729+40).

8.3 Closed Crossings

No roadway crossings are proposed to be closed.

8.4 Methodology and Analysis

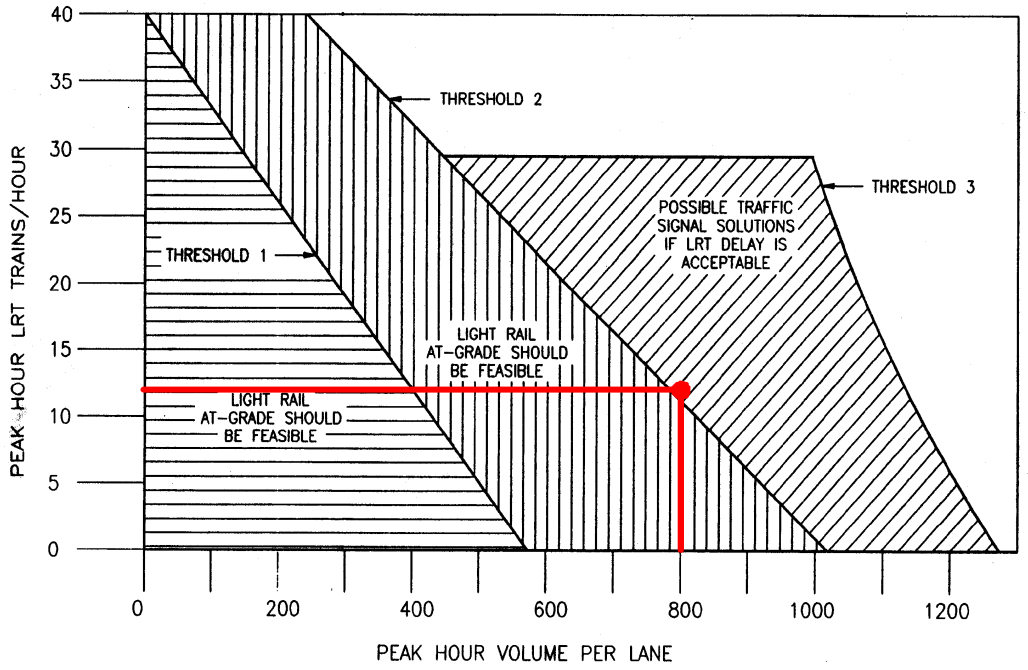
An evaluation and inventory of existing conditions was first performed through site visits and acquisition and review of record plans. Upon review of existing conditions, design criteria were established for the proposed street improvements. The design criteria are based upon the following manuals: DFW Airport's Design Criteria Manual, April 2005; AASHTO's A Policy on Geometric Design of Highways and Streets, 2001; and TxDOT's Roadway Design Manual, March 2009.

It is assumed that pavement structures for the reconstructed streets will match the record plans and city standards. Proposed typical sections and horizontal layouts were developed based on typical sections found in record drawings.

A grade separation warrant analysis was prepared and will be submitted under a separate cover. The report evaluates future conditions associated with the proposed crossings. The recommendations are based upon existing and projected traffic conditions and a traffic operational analysis for each of the potential grade crossings and parking facilities in the LRT corridor. The traffic analysis was performed using previously approved methods and tools such as Synchro/SimTraffic, an intersection traffic operations analysis software based on procedures found in the *2000 Highway Capacity Manual (HCM) (Transportation Research Board Special Report 209)*. Also, the report applies the methodology developed by the Institute of Transportation Engineers (ITE) as the preliminary screening criteria to determine the impact of an at-grade LRT crossing of each facility in the corridor alignment. The attached nomograph provides the established ITE criteria.

As explained in past studies for earlier stages of the DART system, at-grade crossings are typically deemed acceptable for road crossings with average daily traffic (ADT) volumes of less than 15,000 vehicles per day (vpd). Above 15,000 daily trips, the "acceptability" of the at-grade crossing depends on several factors including what minimum Level of Service (LOS) will be tolerated. More specifically, this analysis employs the general guideline that an at-grade crossing with LRT preemption with ten minute headways (i.e. an approximate frequency of one vehicle every 5 minutes) can accommodate 800 vehicles per hour, per lane at LOS D. This peak hour flow corresponds to a six-lane arterial with an ADT of about 40,000 vpd with 60% directional distribution and a peak hour factor of 10%. For a four-lane arterial, this corresponds to about 27,000 vpd with the same characteristics.

FIGURE 1
POTENTIAL THRESHOLD LEVELS FOR AT-GRADE OPERATION
(VARYING TRAFFIC VOLUME AND LRT FREQUENCY)



ASSUMPTIONS:

- DOUBLE TRACK LRT, WITH EQUAL FREQUENCY IN EACH DIRECTION
- CONFLICTING TRAFFIC INTERSECTION LOS NOT TO EXCEED "D"
- THRESHOLDS 1 AND 2 SPAN LIKELY RANGE OF URBAN CAPACITY, ASSUMING TRAFFIC SIGNAL PRE-EMPTION

Grade Separation Thresholds	
Threshold 1	**At grade operation is feasible**
Threshold 2	**At grade operation should be feasible**
Threshold 3	**At grade operation possible with delay to LRT trains**
Threshold 4	**May require grade separation**

8.4.1 Vehicular Traffic Data

Existing and future daily peak hour traffic volumes were obtained for key roadways in the vicinity of the corridor alignment. Future traffic projections for the year 2030 were obtained from the updated version of the North Central Texas Council of Governments (NCTCOG) 2030 model or based on projections developed using historic growth patterns or projected growth in the area for those locations where the model underestimated future demand.

8.4.2 Detailed Analysis Process:

A detailed grade separation warrant analysis was conducted at the proposed Belt Line Road crossing (Station 507+00), which included an evaluation of LOS with and without the proposed crossing using the Synchro software. The signal preemption evaluation assumed ten minute LRT headways in each direction, or twelve signal preemptions per hour during the peak periods. These twelve train arrivals were then equally distributed at points within the signal cycle to simulate the effects of random preemptions. Finally, the estimated vehicle delays in the twelve preemption signal cycles were averaged with the remaining peak hour signal cycles

where no train is present. This weighted average of vehicle delay was used to estimate the LOS of an at-grade LRT crossing of the arterial.

Tables 8.1 and 8.2 illustrate the results of the level of service and queuing analysis for the intersection of Belt Line Road and Gateway Drive, which is the location most affected by the Belt Line Road crossing:

Table 8.1 A.M. and P.M. Peak Hour Intersection Delay and Level of Service Belt Line Road and Gateway Drive

Intersection	2030					
	Without LRT[1]		With LRT[2]		Weighted Average	
	Delay	LOS	Delay	LOS	Delay	LOS
A.M. Peak	55.2	E	68.0	E	60.3	E
P.M. Peak	24.8	C	126.2	F	65.4	E

1: Timings were optimized.

2: Timings and phasing were altered to accommodate DART crossing.

Table 8.2 Average and Maximum Queues

Direction	2009		2030			
	Without LRT		Without LRT[1]		With LRT[2]	
	Average Queue (Ft)	Max Queue (Ft)	Average Queue (Ft)	Max Queue (Ft)	Average Queue (Ft)	Max Queue (Ft)
Northbound to Gateway Drive						
A.M. Peak	480	**545**	968	**1092**	290	**376**
P.M. Peak	130	168	260	304	128	143
Northbound to DART Crossing						
A.M. Peak	N/A				773	**872**
P.M. Peak					170	199
Southbound to Valley View Lane						
A.M. Peak	73	120	176	273	176	273
P.M. Peak	432	**663**	1062	**1145**	1062	**1145**

1: Timings were optimized.

2: Timings and phasing were altered to accommodate DART crossing.

The results of the analysis at this location indicate that grade separation is warranted, since significant additional delays, queuing and a deterioration of the LOS would take place as a result of at grade operations.

A detailed Synchro analysis was also conducted for the Plaza Drive crossing (Station 635+00). This roadway carries a low volume of traffic (about 5,000 vehicles per day) and the results of the analysis indicate little or no degradation of the LOS at this crossing and near adjacent roadways or intersections as a result of at-grade operations.

The following is a summary of the crossing recommendations for the locations under study:

Table 8.3 Crossing Locations Under Study

Crossing Location	Station	Grade Separation Warrant Met?	Recommendation
North Airfield Drive	688+00	No	Grade separation due to DFW Airport concerns over emergency vehicles circulation
Freeport Parkway	645+00	Likely Yes	Grade separation due to vertical transition constraints
Plaza Drive	635+00	No	At-grade crossing with automatic gates and lights
17L Navaid Road	584+00	No	Grade separation due to environmental concerns
Belt Line Road	507+00	Yes	Grade separation

9.0 ENVIRONMENTAL CONSIDERATIONS

In order to comply with federal environmental regulations set forth by the National Environmental Policy Act of 1969, an Environmental Assessment (EA) is being prepared to evaluate the social, natural and cultural resources potentially affected by implementation of the proposed LRT alignment. This document is currently under development and is expected to be completed in the Summer of 2010. The following is a summary of findings and environmental mitigation measures identified in the preliminary EA. This is not an all-inclusive list. A review of the final EA document, once approved by the Federal Transit Administration (FTA), should be performed and all requirements set forth within that document adhered to during final design.

9.1 Land Use and Zoning

While the majority of land uses within the proposed LRT alignment study area are designated as airport, vacant, industrial or office, the area near the intersection of the LRT alignment and Plaza Drive contains hotel/motel uses which are viewed as sensitive land uses and could be affected by transit operations.

Several areas that are currently open space or vacant land are planned for development by the DFW Commercial Land Use Plan (May, 2007). These areas are near the planned Belt Line Road Station where the rail project begins.

City of Irving zoning surrounding the proposed LRT alignment consists of S-P-1 (Site Plan-1), S-P-2 (Site Plan-2), C-O (Commercial Office), C-C (Community Commercial), ML-20A (Light Industrial) and FWY (Freeway). DFW Airport does not have zoning districts for its property.

9.2 Demographic Characteristics

Portions of the proposed LRT alignment fall within four census tracts: 141.03, 141.12, 141.24 and 1137.06. Only census tract 141.12 has a population documented in the 2000 U.S. Census data within a quarter mile of the proposed LRT alignment. The total population document in census tract 141.12 is five.

Racial characteristics of those five people is 100% white. Ethnic characteristics indicate 20% of the five persons are Hispanic (one person). Income statistics indicate that no more than 21% of the total population within census tracts: 141.03, 141.12, 141.24 and 1137.06 are considered low income. No demographic or environmental justice impacts are anticipated as a result of implementation of the proposed LRT alignment.

9.3 Community Resources

No residential areas fall within a quarter mile of the proposed alignment. Neither is there educational, hospital or outdoor assembly land uses within a quarter mile of the proposed LRT alignment. However, Heartland World Ministries Church is located at 3600 North Belt Line Road in Las Colinas and would occur within a quarter mile of the proposed alignment.

9.4 Acquisitions and Displacements

The proposed action would result in impacts to two business properties. A portion of these properties located along Airfield Drive between Esters Road and Freeport Parkway, is needed to provide adequate right-of-way for LRT operations. The two properties are a Federal Express facility and a warehouse building located at 3010 N. Airfield Drive currently occupied by IAS Air.

The cities of Dallas and Fort Worth own the land occupied by these two business facilities. The DFW Airport Board has authority granted by the two cities to enter into long term leases for the properties. The Federal Express facility and 3010 N. Airfield Drive are under a long term lease to AFCO and Aeroterm, respectively. These two firms specialize in the leasing and management of airport properties. AFCO and Aeroterm have leasehold interests giving them controlling interest in the land and improvements until the lease expiration at which time DFW Airport becomes the owner of leasehold improvements.

AFCO currently subleases its facility to Federal Express and Aeroterm subleases its facility to IAS Air. Federal Express is a logistics service company that uses the impacted property for employee parking and tractor trailer storage. IAS Air is also a logistics service company that has used the 3010 N. Airfield Drive property to provide mail handling services to the United States Post Office on a contract basis. IAS Air has informed DART that they currently do not have contract and the facility is not being used.

The LRT line would also occupy other potentially developable property owned by DFW Airport; however, DFW Airport supports the implementation of LRT and the use of DFW property.

Typically, for all real property acquired, DART would compensate the property owner for the fair market value of their property and for damages to any remaining parcels. However, for this project, the cities of Dallas and Fort Worth through DFW Airport are the property owners for all potentially displaced properties and would continue to own the land after construction of the proposed LRT alignment. The use of airport land needed to build and operate the proposed LRT project would be through a lease, license or easement agreement between DART and DFW Airport.

Given the complex ownership and lease structure of the two impacted business properties, an independent appraisal of the properties will be conducted to determine legal rights and interests of each of the parties involved. This appraisal will be conducted in accordance with the DART Board of Directors' Real Estate Policy and Procedures, as amended, and the Uniform Relocation Assistance and Real Property Acquisition Policies Act (URA) of 1970 (42USC 4601).

Mitigation measures for displacements resulting from the proposed project would consist of fair compensation for the property acquired, relocation assistance or other assistance, in accordance with the URA. Relocation benefits would be available to eligible businesses (owner occupants and tenants) that would be displaced by the proposed action. DFW Airport and DART are currently developing a Memorandum of Agreement (MOA) to govern any property displacements or disputes.

A mitigation plan has been developed to alleviate impacts to business operations at the Federal Express facility. DART has devised a recommended plan for reconfiguring the remainder of the existing Federal Express parking area to accommodate all trailer storage needs. Additional parking to accommodate the displaced employee parking would be constructed south of North Airfield Drive, adjacent to the employee entrance to the Federal Express center. The facility is also located on the south side of North Airfield Drive. This recommended plan is considered a connected action of the proposed project.

As there is no current activity at 3010 N. Airfield Drive facility, no mitigation plan has been developed for the business impact. DART will work with DFW Airport to ultimately determine the practicality of salvaging a portion of the structure.

9.5 Visual and Aesthetic Resources

The proposed LRT alignment consists of six distinct visual inventory units. None of these units contained any significant vistas or aesthetic elements; however, each visual inventory unit contains views of the proposed LRT alignment. Design considerations should be made to accommodate screening guidelines required by DFW Airport in all areas of LRT infrastructure construction.

In Visual Unit #3, located near the intersection of the proposed LRT alignment and Plaza Drive, viewers and land uses could be potentially impacted by changes to the aesthetic conditions of the existing area. Iif existing screening vegetation is disturbed by construction, it would be replaced with similar vegetation that, once mature, would fulfill the same function.

DFW Airport has established design criteria and image elements for facilities constructed within the boundaries of the airport. DART would coordinate with DFW Airport staff to incorporate the appropriate elements into the final design of the rail line.

DFW Airport staff has indicated a desire to soften the views of the TPSS facilities located within high-visibility areas. Specifically, there is a desire to soften the views of TPSS #9 located within Unit #3; and TPSS #10 and TPSS #11 located within Unit #5. This would be accomplished by installing chain link fencing with PVC slats.

In Visual Unit #5, DART would, if practicable, keep the existing vegetation between International Parkway and the proposed storage yard. DART would coordinate with DFW Airport staff to incorporate DFW Airport image elements into the design of the storage yard. Various measures can be employed to soften the visual impact of the facility including the use of appropriate lighting materials and finishes and the use of solid visual barriers or vegetation to minimize intrusion into the visual environment for affected viewers.

In Unit #6, DFW's desire to develop a signature station at the airport would be accomplished through DART's Design Standards for stations and existing Art and Design Program. DFW would take the lead in the design of the station and station access.

9.6 Noise and Vibration

Noise and vibration analyses were completed to identify LRT alignment impacts, if any, to nearby businesses. Two noise sensitive receptors were identified: Sleep Inn DFW (50 feet from the proposed LRT alignment centerline) and Hawthorne Suites (60 feet from the proposed LRT alignment centerline). Both of these sites are considered to be Category 2 land uses according to FTA guidance. Using the FTA general noise assessment model, a moderate impact was predicted for the Sleep Inn DFW; however, mitigation is not required by FTA for moderate impacts. No impacts were predicted for Hawthorn Suites.

Two vibration sensitive receptors were identified: Sleep Inn DFW and Hawthorn Suites. Both of these sites are considered to be Category 2 land uses according to FTA guidance. Using the FTA methodology, the screening analysis determined that the hotels would not be impacted by the vibrations resulting from the proposed LRT alignment.

9.7 Parking

One parking area was identified adjacent to the proposed LRT alignment as being affected by the proposed LRT alignment. The proposed LRT alignment is planned to run through part of the Federal Express facility parking lot located directly southeast of the junction of Plaza Drive and North Airfield Drive. The number of employee parking stalls affected could be as many as 30. In addition about 50 tractor trailer stalls would also be displaced; therefore, an impact would occur. The land is currently under a lease agreement between Federal Express and the DFW Airport.

DART has devised a conceptual plan for reconfiguring the remainder of the existing Federal Express parking area to accommodate all trailer storage needs. Additional parking to accommodate the displaced employee parking would be constructed south of North Airfield Drive, adjacent to the employee entrance to the Federal Express facility. The facility is also located on the south side of North Airfield Drive, therefore, this solution would improve pedestrian safety by eliminating the need for employees to cross North Airfield Drive in order to access the facility from the parking lot as they do in the current configuration.

DFW Airport parking management and regulations would ensure that there would be no parking demand at the DFW LRT Station.

9.8 Public Services, Safety and Security

One public safety station operated by the DFW Airport Department of Public Safety (DPS) exists within proximity to the proposed LRT alignment. Due to the location of the alignment on the edge of DFW Airport property, the alignment is not expected to affect DPS operations within airport property.

9.9 National and State Forests, Wilderness Areas, Eligible Designated Wild and Scenic Rivers and Prime & Unique Farmland

The LRT alignment would not impact any national or state forests, wilderness areas, eligible designated wild and scenic rivers or prime and unique farmland.

9.10 Threatened or Endangered Species

No habitat supporting federally threatened or endangered species was found surrounding the proposed LRT alignment. Habitats for two state threatened species were found surrounding the proposed LRT alignment: Peregrine falcon and Timber/Canbrake Rattlesnake. However, based

on the research conducted for these species, no impact is anticipated because of the existing human disturbance near the proposed LRT alignment.

9.11 Water Resources

Waters of the United States that would be crossed by the proposed LRT alignment include: Mud Springs Creek, Hackberry Creek, a tributary of Grapevine Creek designated as Ephemeral Drainage 1 in the EA document and Grapevine Creek. The proposed alignment would impact 0.06 acres within the high water mark of Ephemeral Drainage 1; however, because the area impacted is less than 0.5 acres, no permitting or mitigation is required.

Wetland areas exist near the proposed LRT alignment at the crossing of Grapevine Creek immediately west of Station 685+00 and in between Stations 715+00 and 725+00.

9.12 Floodplains

Four areas of the proposed LRT alignment fall within designated floodplains. These areas are located near Stations 520+00, 530+00, between Stations 585+00 to 586+00 and between Stations 675+00 and 685+00. DART design guidelines should be followed when designing line sections in floodplain areas.

9.13 Water Quality

The proposed LRT alignment crosses three creeks – Grapevine Creek, Hackberry Creek and Mud Springs Creek (a tributary of Hackberry Creek). According to information provided by TCEQ, Grapevine Creek, located in between Stations 685+00 to 695+00 and 715+00 to 725+00, qualifies as an impaired water body and studies are currently underway by TCEQ. If these studies suggest any mitigation, such mitigation should be strictly adhered to in order to fulfill requirements of permitting or state environmental regulations.

9.14 Air Quality

The proposed project includes no additional bus service to support the Belt Line Station or the Terminal A Station. While the LRT operations require a minimal amount of energy generation, the proposed project results in a net benefit to regional air quality. Following the TxDOT Environmental Manual guidelines, a microscale carbon monoxide air quality analysis is not required for this project. This project is an extension of the larger Northwest Corridor LRT Line to Irving and DFW Airport project that has been included in the previous 2006-2008 Transportation Improvement Plan, and the current conformity analysis that was found to conform by the NCTCOG on April 2009 and by the U.S. Department of Transportation in July 2009.

9.15 Physiography and Geology

The proposed LRT alignment is over the Eagle Ford and Barnett Shale geological formations with Alluvium and Quaternary deposits along the stream channels of Hackberry Creek and Mud Spring Creek.

The proposed LRT alignment is within the Trinity (subcrop) major aquifer (Major Aquifers of Texas 2006) and Woodbine minor aquifer (Minor Aquifers of Texas, 1990). Most of the area's drinking water, however, is procured from surface water reservoirs (THC).

9.16 Historic, Cultural and Archaeological Resources

A historic resources survey resulted in a finding that there are no historic resources within the proposed LRT alignment area of potential effect. A report stating these findings has been submitted for concurrence to the Texas Historical Commission.

There are no known archaeological sites within the proposed LRT alignment area of potential effect, and there is a low likelihood for the discovery of archaeological sites. The THC has agreed and concurred that no survey is necessary in the project area of potential effect.

9.17 Hazardous Materials

There are twenty-seven potential hazardous materials source sites identified in relation to the proposed LRT alignment. All but four of them present a low risk of potential hazardous materials contamination. Sites of high concern include:

- The Northeast Cargo Voluntary Cleanup Program site (Map ID 1A in the EA document) is located adjacent to the proposed LRT alignment ROW and beneath the proposed Federal Express parking mitigation area. The site's proximity to the proposed LRT alignment, its gradient, active status and materials of concern combine to determine that the site represents a moderate risk of potential (present or future) hazardous materials encounter to the proposed alignment.
- The central terminal area of DFW Airport (Map ID 1F on Figures 3-19 and 3-20 in the EA document), where the alignment approaches Terminal A, is considered a state groundwater contamination case site. The site represents pockets of subsurface petroleum (Light Non-Aqueous Phase Liquid, or LNAPL) contamination that are under active remediation. The topographic gradient associated with this site runs predominantly north toward the alignment and therefore presents a high risk of potential hazardous materials encounter to the proposed alignment.
- Chesapeake natural gas drilling and operation activities occur within proximity of the proposed LRT alignment and include well pad sites, gas pipelines and salt water pipelines. These activities present a moderate to high risk of contamination for the potential LRT alignment during construction and/or operation due to the potential for: pipeline leaks or rupture, air emissions at wellheads during well development and/or during production, spills of brackish waters and/or related wastes during collection and/or transport, leaks from production and storage equipment at pad sites, and in the rare case, a wellhead blowout.

In addition to the sites identified above, low to moderate risks of contamination are present where excavation activities occur near downstream waters that are associated with numerous glycol-related releases as recorded between the years 1997 and 2000, in quantities ranging from 143 gallons to 6,296 gallons per incident (i.e., Grapevine Creek, Hackberry Creek and Mud Springs Creek). A result of discontinued winter deicing activities, the glycols generated during these releases have resulted in the potential presence of residual byproducts within soils near affected water courses. Construction of structural supports for elevated spans of the LRT line and/or construction or modification to storm water drainage features to be located near the affected water bodies are of special concern.

Although no land purchases are required for the proposed LRT alignment, DART is currently undergoing negotiations with DFW Airport, the property owner of the project ROW. Through these negotiations, a memorandum of understanding is expected to be reached, which will outline the procedures to be undertaken and levels of liability for all construction- and operations-related activities. Preparation of a Phase I Environmental Site Assessments (ESA) for zones of potential

DART liability is recommended, such as the demolition of buildings, even if no land is directly purchased or acquired. A Phase II ESA (which typically includes the sampling of potentially affected media, including: soils, water, etc.) may also be undertaken to further identify and quantify existing hazardous materials contamination so the need for cleanup or mitigation can be determined.

10.0 GEOTECHNICAL CONSIDERATIONS

A copy of the Preliminary Geotechnical Investigation Report prepared for the preliminary design of Orange Line Section I-3 is submitted under separate cover. The report presents preliminary foundation design recommendations and includes the results of field and laboratory investigations used in the development of the Preliminary Design. Boring plans and associated boring logs that are located within limits of Orange Line Section I-3 are included in **Appendix E**.

11.0 COORDINATION WITH OTHER DISCIPLINES

11.1 Traction Electrification

TPSS site locations are provided along the Orange Line Section I-3 10% Phase I alignment based on approximate distance separation between substations from previous DART projects experience. There are five TPSS locations identified on the 10% design plans. These TPSS site locations are conservative in nature since there are unknown variables that may or may not affect the traction power system performance. Only after a Traction Power Load Flow Analysis (TPLFA) is performed, can these sites be validated, re-designed or adjusted.

Depending on the Orange Line Section I-3 10% Phase I project delivery method, further design flexibility and coordination with DFW Authorities maybe required, after a TPLFA is performed. Some of these sites may need to be re-located or adjusted to improve the overall traction power system performance.

The locations of these five TPSS site were coordinated with utility providers. Every TPSS site along Orange Line Section I-3 10% Phase I will require a step-down transformer to convert from the utility service voltage of 25 KV available along DFW property to the TPSS service voltage of 12.47/13.2 KV. At some of these sites, additional upgrades to the utility feeder capacity and ductwork will be needed in order to supply the additional required electrical loads. Some locations will also require screening to comply with DFW Airport design standards.

Final designer will need to run load flow study to verify if the preliminary locations of Traction Power Substations are correct.

11.2 Signals

Manholes, duct banks and conduits installed in the facilities contract allow for the subsequent installation of signal and communication cables by the systems contractor. A minimum clear cross-section of 24 inches wide by 24 inches high is required for the signal and communication cables. The top of the duct banks are located a minimum of three feet below the bottom of the subballast. Manholes are located approximately 300 feet on center to facilitate cable installation and maintenance operations. All conduits would be sloped to drain toward the manholes. Orange Line Section I-3 will be fully signalized and the final section designer should coordinate placement of systems elements with the Systems Design Consultant (SDC).

11.3 Corrosion Control

Corrosion control studies on the LRT should be performed during final design to determine the need for corrosion protection. The SDC shall provide the final section designer with corrosion protection recommendations as well as the locations of test stations to be installed.

11.4 System Design

The final section designer should work closely with DART and the SDC to complete the final design package and make the line section fully functional and compatible.

11.5 Storage Track

Invariably DART terminal stations on various line sections have car storage tracks located at the end of the station platform tracks. Similar requirements were examined to locate the storage tracks at the Terminal A Station; however, the station location is in a constrained area between International Parkway and the NB Service Road with access ramps to Terminal A. There is not enough room to locate storage and maintenance tracks south of the Terminal Station. Alternate locations for the storage tracks were studied in the vicinity of the Terminal A Station and the most feasible location was determined to be about 1200 feet north of the station from approximate station 742+00 to 753+00 between the LRT tracks and the Northbound Service Road. The storage yard will consist of 2 storage tracks providing approximately 1,000 feet of storage. Also, a 500 feet non-powered maintenance track will be constructed for storage of maintenance of way vehicles. Nine 10-ft x 20-ft parking spaces will be provided at the storage yard, along with a crew room. The existing terrain where the yard is proposed consists of large earthen berms, and will require extensive grading. Preliminary coordination for the storage yard area with DFW Airport and DART's Systems and Operations personnel has occurred, and DFW Airport may require visual screening for the storage yard. The details for the visual screening have yet to be agreed to by both parties at the time the 10% documents were released, so final designer shall continue the coordination throughout the final design. The final designer will also need a design exception for the storage since storage will not be located at the end of the line section.

Appendix A

DART I-3 Phase I Special Planning Assumptions

DART I-3 Phase I Special Planning Assumptions

The following are assumptions unique to this line segment:

- The LRT will be operated and maintained within a permanent easement mostly within the limits of DFW Airport Property. Typical widths for the permanent easement are 80-ft for at-grade segments and 60-ft for aerial and retained earth segments.

- The platform and certain infrastructure improvements at the Terminal A Station will be constructed by DFW Airport. A side platform instead of a center platform was chosen for the terminal station due to physical constraints.

- A design exception will be needed for the Storage and Maintenance Tracks located approximately 1,200-ft north of the Terminal A Station due to deviation from DART's standard tail track requirements.

- Embankment fill over the existing Oncor 138 KV underground electric lines near project station 514+00 will not be allowed by the utility owner.

- The existing Oncor / DFWIA 10E6 critical trunk line between approximate stations 730+00 and 765+00 will remain in place and will be protected and left undisturbed by the proposed construction of this project.

- All track embankment or near side slopes within the designated permanent easement will be 3:1 maximum. Far side slopes and slopes outside the permanent easement will be 4:1 maximum.

- Two grade separations are based on the latest configurations for future DFW Airport Infrastructure improvement plans (Esters Blvd. and E. Airfield Extension and the extension of Crossunder #1).

- As the LRT passes beneath the Future Perimeter Taxiway, the Taxiway will be bridged by others with spans accommodating the LRT.

- As the LRT passes through the existing Chesapeake Frac Pond, the pond will be abandoned and returned to pre-existing conditions by others.

- A design exception is required for the LRT crossing beneath the existing Taxiways Y & Z due to the design clearance (20.5') being less than the required 22' minimum clearance. The final designer shall perform special OCS design to maximize the clearance between the top of the OCS and the low beams of the taxiway bridges.

Appendix B

Orange Line Section I-3
Existing Utility Crossing List

DWG. NO.	STATION	UTILITY / CROSSING	SIZE	OWNER
UC2-0002	505+73	UG TELEPHONE CONDUIT	12 WAY (3 WIDE BY 4 HIGH)	VERIZON
UC2-0002	505+81 - 506+00	WATER	12"	CITY OF IRVING
UC2-0002	506+60	FIBER OPTIC CABLE	16 - 11/4" PE DUCTS BY HDD	FPL CABLE
UC2-0002	506+70	STREET LIGHT ELEC. CABLE	UNKNOWN	ONCOR
UC2-002 - UC2-0003	505+89 - 507+47	BELT LINE ROAD	6 LANE THOROUGHFARE	CITY OF IRVING
UC2-0003	507+48 - 507+60	FIBER OPTIC CABLE	UNKNOWN	AT&T - TCG
UC2-0003	507+48 - 507+60	FIBER OPTIC CABLE	1" & 1.9" DUCTS	AT&T LONG DISTANCE
UC2-0003	507+68	ELECTRICAL DISTRIBUTION	OVERHEAD	ONCOR
UC2-0003	507+68	CABLE TV / INTERNET	OVERHEAD	VERIZON
UC2-0003	507+68	CABLE TV / INTERNET	OVERHEAD	TIME WARNER
UC2-0003	513+75	ONCOR ELECTRIC TRANS.	4 ~ 8" STL CONDUITS 138 KV	ONCOR ELECTRIC
UC2-0004	519+70 - 519+72	TRIBUT. 3 HACKBERRY CREEK		
UC2-0006	538+72	MUD SPRINGS CREEK CHANNEL		
UC2-0007	543+90	264" SPP - LINE J1A	21 Ft., W/18' CONC. LINER	DFW AIRPORT
UC2-0009	557+90	U. G. ELEC. DIR. BURIED CABLE	2400 V	FAA
UC2-0009	558+12 - 558+20	NAVAID RD		
UC2-0009	559+66 - 559+88	U. G. COMM. CABLE	100 PAIR	FAA
UC2-0009	559+66 - 559+88	U. G. COMMUN. CABLE	100 PAIR	FAA
UC2-0012	584+85 - 585+85	HACKBERRY CREEK		
UC2-0012	586+32 - 586+64	17L NAVAID RD		
UC2-0013	587+50	UG TELEPHONE DUCT	UNKNOWN	DFW AIRPORT / VERIZON
UC2-0015 - UC2-0020	603+65 - 647+90	UG FIBER OPTIC CABLE	4 ~ 11/2" PE CONDUITS	QWEST
UC2-0015 - UC2-0016	605+00 - 612+10	OH ELECTRIC (LONGITUDINAL)	25,000 V	ONCOR
UC2-0016	612+00	UG ELECTRIC	2 - 4", 25,000 V	ONCOR
UC2-0016	612+08	OH ELECTRIC		ONCOR
UC2-0016 - UC2-0017	612+00 - 613+60	UG ELECTRIC (LONGITUDINAL)	2 - 4", 25,000 V	ONCOR
UC2-0016	613+54	UG ELECTRIC SERVICE	2"	ONCOR
UC2-0016	614+50	UG ELECTRIC SERVICE	2"	ONCOR
UC2-0016 - UC2-0017	614+40 - 626+00	UG ELECTRIC (LONGITUDINALLY)	2 - 4", 25,000 V	ONCOR
UC2-0017	626+00	UG ELECTRIC SERVICE		ONCOR
UC2-0018	628+35 - 634+49	ELECTRICAL U/G (ABANDONED)	UNKNOWN	ONCOR
UC2-0018	630+26 - 630+41	ELECTRICAL U/G		Fed Ex
UC2-0018 - UC2-0019	634+90	UGE & ONCOR UGE		
UC2-0018 - UC2-0019	635+03 - 635+47	PLAZA DR		
UC2-0019	641+40	NATURAL GAS	3" IP POLY II	ATMOS
UC2-0019	642+50 - 643+01	DRIVEWAY		SHELL
UC2-0020	643+40	SANITARY SEWER	8"	DFW AIRPORT
UC2-0020	643+56 -643+59	WATER	6"	DFW AIRPORT
UC2-0020	643+40 - 644+75	WATER	8"	DFW AIRPORT
UC2-0020	644+90	WATER	30"	DWU
UC2-0020	644+80	WATER	30"	DFW AIRPORT
UC2-0020	644+90	CULVERT HEADWALL	30"	DFW AIRPORT
UC2-0020	645+17 - 646+02	FREEPORT PARKWAY	4 LANE DIVIDED	DFW AIRPORT
UC2-0020	645+47 - 646+07	UG ELECTRIC STREET LIGHT		DFW AIRPORT
UC2-0020	646+30	UG FIBER OPTIC CABLE		T W.COMMUNICATIONS
DWG. NO.	**STATION**	**UTILITY / CROSSING**	**SIZE**	**OWNER**

UC2-0020	646+28	U/G ELECTRIC SERVICE	3" or 4"	ONCOR
UC2-0020	646+28 - 647+33	DFW AIRPORT ST. LIGHT UGE		
UC2-0020	646+45	UG TELEPHONE CABLE	1", 100 PAIR	VERIZON
UC2-0020	646+40	WIND SHEAR FACILITY	BIG	FAA
UC2-0020	646+66	STREET LIGHT ELEC. CABLE UGE		
UC2-0020	646+68	TxDOT STREET LIGHTING UGE		
UC2-0020	647+02	ONCOR UGE		
UC2-0020	647+00	6X3 MCB	480 V ST. LIGHT, 25KV PRIMARY	DFW AIRPORT / ONCOR
UC2-0020	648+50	UG TELEPHONE DUCT		VERIZON
UC2-0020	648+00 - 648+07	SANITARY SEWER	18"	DFW AIRPORT
UC2-0020 - UC2-0021	648+00 - 655+00	FUEL LINE	8"	CHESAPEAKE
UC2-0020 - UC2-0023	648+30 - 669+30	SALTWATER LINE	10"	CHESAPEAKE
UC2-0020 - UC2-0023	648+45 - 668+90	NATURAL GAS	8"	CHESAPEAKE
UC2-0022	662+60	STORM DRAIN HEADWALL		
UC2-0024	676+70	OH ELECTRIC	25 KV	ONCOR
UC2-0025	685+75	GAS & SALTWATER	8" & 10"	CHESAPEAKE
UC2-0025	686+10	WATER	24"	DFW AIRPORT
UC2-0025	686+60	WATER STUBOUT	16"	DFW AIRPORT
UC2-0025	686+70	FIBER OPTIC CABLE	4 - 1-1/2" PE CONDUITS	QWEST
UC2-0025	687+05	FIBER OPTIC CABLE	2"	TW COMMUNICATIONS
UC2-0025	687+08 - 687+90	N. AIRFIELD DRIVE	4 LANE DIVIDED	DFW AIRPORT
UC2-0025	687+24 - 688+03	UG ELECTRIC ST. LIGHTING		DFW AIRPORT / ONCOR
UC2-0025	688+90	UG ELECTRIC	4" CONDUIT, 25 KV	DFW AIRPORT / ONCOR
UC2-0025	688+40	UG TELEPHONE DUCT	UNKNOWN	DFW AIRPORT / VERIZON
UC2-0026	691+69 - 691+80	GRAPEVINE CREEK		
UC2-0026	692+80	FUEL LINE	8"	CHESAPEAKE
UC2-0027	701+80	GAS	UNKNOWN	CHESAPEAKE
UC2-0027	702+40 - 706+50	CHESAPEAKE FRAC POND	2 ACRES	CHESAPEAKE
UC2-0027	718+50	UG ELECTRIC SERVICE	4" CONDUIT	DFW AIRPORT / ONCOR
UC2-0027	722+20	UG TELEPHONE DUCT	6 WAY (2 WIDE BY 3 HIGH)	DFW AIRPORT / VERIZON
UC2-0027	722+10 - 722+74	RCP STM	36"	DFW AIRPORT
UC2-0029 - UC2-0030	722+73 - 723+55	GRAPEVINE CR. DRAIN. CHANNEL		DFW AIRPORT
UC2-0030	724+00	RCP STM	84"	DFW AIRPORT
UC2-0030	724+15 - 724+72	DRAINAGE FLUME		DFW AIRPORT
UC2-0030	726+93 - 727+44	UG ELECTRIC CONDUIT	2~4" CONDUITS	DFW AIRPORT
UC2-0030	727+76	RCCP WATER	36"	DFW AIRPORT
UC2-0030	727+25 - 728+50	GAS	4"	ATMOS
UC2-0030 - UC2-0031	728+20 - 735+10	WATER	21"	DFW AIRPORT
UC2-0030	729+15 - 729+45	RCP CULVERT	UNKWN - CROSS SERVICE RD.	DFW AIRPORT
UC2-0030	729+00 - 729+80	INTERNATIONAL PKWY NORTH SERVICE ROAD		
UC2-0030	729+45 - 730+90	RCP STM	24"	DFW AIRPORT

DWG. NO.	STATION	UTILITY / CROSSING	SIZE	OWNER
UC2-0030	730+98 - 730+99	RCP STM	24"	DFW AIRPORT
UC2-0030 - UC2-0031	730+00 - 735+00	UG ELECTRIC DUCT BANK 10E6	10-6" DUCTS, CONCRETE ENC.	DFW AIRPORT / ONCOR
UC2-0031	732+50	UG ELECTRIC DUCT BANK	SERVICE TO DE-ICING FACILITY	DFW AIRPORT / ONCOR
UC2-0031	733+44	UG TELEPHONE DUCT	6 WAY (2 WIDE BY 3 HIGH)	DFW AIRPORT / Verizon
UC2-0032	739+73 - 739+74	UG ELECTRIC 6E4	6 WAY (2 WIDE BY 3 HIGH)	DFW AIRPORT / ONCOR
UC2-0032	740+15	UG TELEPHONE CONDUIT	6 WAY (2 WIDE BY 3 HIGH)	DFW AIRPORT / VERIZON
UC2-0032	740+43 - 740+44	RCP STM	24"	DFW AIRPORT
UC2-0032	743+00 - 746+87	ONCOR UGE		
UC2-0032 - UC2-0034	745+00 - 762+00	UG ELECTRIC DUCT BANK 10E6	10-6" DUCTS, CONC. ENC.	DFW AIRPORT / ONCOR
UC2-0033	748+36	UG TELEPHONE CONDUIT	6 WAY (2 WIDE BY 3 HIGH)	DFW AIRPORT / VERIZON
UC2-0033	748+93	RCP STM	24"	DFW AIRPORT
UC2-0033	748+40 - 757+20	UG ELECTRIC ST. LIGHTING		DFW AIRPORT
UC2-0033	751+72	RCP STM	30"	DFW AIRPORT
UC2-0033	752+12	PVC WATER	12"	DFW AIRPORT
UC2-0033	752+32	PVC SANITARY SEWER	8"	
UC2-0033	753+48	RCP STM	36"	DFW AIRPORT
UC2-0033 - UC2-0034	753+48 - 760+54	VARIOUS STM SWRS	LONGIT. UNDER SB RAIL	DFW AIRPORT
UC2-0033 - UC2-0034	754+72 - 756+80	TAXIWAY Y		DFW AIRPORT
UC2-0034	755+27	18" STORM DRAIN		
UC2-0034	755+41	18" STORM DRAIN		
UC2-0034	756+81	18" STORM DRAIN		
UC2-0034	756+85	18" STORM DRAIN		
UC2-0034	758+48 - 760+55	TAXIWAY Z		DFW AIRPORT
UC2-0034	757+13	ELECTRICAL U/G 2T4	STREET LIGHTING	DFW AIRPORT
UC2-0034	758+45	18" STORM DRAIN		
UC2-0034	758+74	18" STORM DRAIN		
UC2-0034 - UC2-0035	760+90 - 768+65	UG ELECTRIC	UNKNOWN	DFW AIRPORT
UC2-0034	761+45	UG TELEPHONE DUCT	6 WAY (2 WIDE BY 3 HIGH)	DFW AIRPORT / VERIZON
UC2-0034 - UC2-0035	761+45 - 768+65	ELECTRIC STREET LIGHTING	UNKNOWN	DFW AIRPORT
UC2-0034	761+66	UG TELEPHONE DUCT	UNKNOWN	FAA
UC2-0034 - UC2-0035	761+70 - 763+10	RCP STM SEWER	UNKNOWN	DFW AIRPORT
0034 - 0035	762+39 - 763+24	CROSSUNDER #2		DFW AIRPORT
UC2-0034	762+60	UG ELECTRICAL	UNKNOWN	DFW AIRPORT
UC2-0035	763+05	RCCP WATER	16"	DFW AIRPORT
UC2-0035	764+00	UG ELECTRIC CONDUIT 4E4	FEEDS THE TERMINALS	DFW AIRPORT / ONCOR
UC2-0035	763+40 - 766+60	STM SWR		DFW AIRPORT
UC2-0035	764+62	STORM DRAIN		
UC2-0035	766+15 - 767+20	DRAINAGE FLUME		DFW AIRPORT
UC2-0035	766+91	UG TELEPHONE CONDUIT	6 WAY (2 WIDE BY 3 HIGH)	DFW AIRPORT / FAA
UC2-0035	766+98	MULT WATER LINES	4 ~ 8"	DFW AIRPORT
UC2-0035	768+10	UG ELECTRIC CONDUIT		DFW AIRPORT / ONCOR

Appendix C

Summary of Initial Limited SUE

GORRONDONA & ASSOCIATES, INC.
Survey, SUE & Utility Coordination
6707 Brentwood Stair Road, Suite 50
Fort Worth, Texas 76112, #F-7933

SUMMARY of TEST HOLE COORDINATES

Point	Test Hole No.	Northing (y)	Easting (x)	Ground Elevation (z)	Depth to Top of Utility	Top of Utility Elevation	General Notes
N/A	1	7011617.22	2432035.52	518.53	6.50	512.03	12-4" PVC VERIZON DUCTS
"	2	7011713.43	2431976.23	519.10	6.34	512.76	3-2" PVC FIBER LITE FOC
"	3	7011779.37	2431919.28	518.99	5.44	513.55	3-2" PVC AT&T FOC
"	3A	7011784.73	2431912.38	519.27	4.96	514.31	2" PE AT&T FOC
"	8	7015225.01	2428200.35	519.64	3.39	516.25	1" DBC DFW/FAA
"	9	7015355.86	2428079.34	520.67	3.51	517.16	2-1" PE DFW/FAA
"	10	7015369.30	2428060.06	520.72	3.94	516.78	2-1" PE DFW/FAA
"	11	7017563.48	2426404.56	505.24	3.80	501.44	COMM LINE IN 12" CASING (SIZE UNK)
"	12A	7020007.18	2424414.10	546.35	8.70	537.65	3-2" PE QWEST FOC
"	13	7020362.59	2424055.05	545.45	2.68	542.77	(1) 1/2" & (1) 3/4" QWEST DBC
"	14	7021484.29	2422918.41	542.74	7.22	535.52	3-2" PE QWEST FOC
"	14A	7021652.81	2422753.59	543.27	7.86	535.41	3-1" PE QWEST FOC
"	15	7021692.44	2422712.19	542.41	8.90	533.51	GROUND WATER ENCOUNTERED (SIZE UNK)
"	15A	7021820.11	2422588.51	543.34	6.16	537.18	3-1" PE QWEST FOC
"	16	7021910.53	2422498.71	543.01	4.54	538.47	2-2" PE QWEST FOC
"	17	7022077.50	2422340.00	540.83	9.10	531.73	10" PVC CHESAPEAKE SALTWATER LINE
"	17A	7022394.43	2422029.14	542.83	7.02	535.81	10" PVC CHESAPEAKE SALTWATER LINE
"	18	7022080.12	2422326.93	541.62	9.66	531.96	8" STL CHESAPEAKE GAS LINE
"	18A	7022644.40	2421727.11	546.65	21.24	525.41	8" STL CHESAPEAKE GAS LINE
"	22	7023310.62	2417821.30	550.70	3.23	547.47	CHESAPEAKE GAS LINE UNDER CAP (SIZE UNK)
"	24	7018652.89	2417000.25	578.15	0.86	577.29	2-4" PVC BURIED ELEC
"	25	7018490.07	2417053.00	587.70	15.30	572.40	BURIED ELEC IN CONC CASING
N/A	26	7018446.02	2416990.85	580.43	2.81	577.62	2" PE DFW BURIED ELECTRIC

General Location: DFW AIRPORT, TEXAS
Project Name: DART LINE SECTION I-3 SUE
Client Name: TRACK-3
G&A Project No: TRCK1001.02
Prepared By: LP Date: 06/30/10 Checked By: AL Date: 07/01/10 Sheet 1 of 2

GORRONDONA & ASSOCIATES, INC.
Survey, SUE & Utility Coordination
6707 Brentwood Stair Road, Suite 50
Fort Worth, Texas 76112, #F-7933

SUMMARY of TEST HOLE COORDINATES

Point	Test Hole No.	Northing (y)	Easting (x)	Ground Elevation (z)	Depth to Top of Utility	Top of Utility Elevation	General Notes
N/A	27	7018409.39	2417048.42	578.24	13.66	564.58	TXU BURIED ELEC IN CONC CASE (SIZE UNK)
"	28	7018279.98	2416969.46	579.63	0.89	578.74	1 1/" PVC DFW BURIED ELECTRIC
"	31	7017542.34	2417007.04	569.18	9.92	559.26	VERIZON COMM LINE IN CONC (SIZE UNK)
"	32	7017521.06	2417004.78	568.71	13.45	555.26	DFW COMM LINE IN CONC (SIZE UNK)
"	35	7017010.22	2416875.22	593.04	14.58	578.46	UNK UTILITY IN CONC (SIZE UNK)
"	36	7016866.79	2416879.94	591.67	9.77	581.90	ELEC LINE IN CONC (SIZE UNK)
"	37	7016983.42	2416888.38	589.39	23.10	566.29	DFW/FAA TUNNEL
N/A	38	7020939.92	2417174.77	580.21	1.42	578.79	(2) 1/2" PVC BURIED ELEC

General Location:DFW AIRPORT, TEXAS
Project Name: DART LINE SECTION I-3 SUE
Client Name: TRACK-3
G&A Project No: TRCK1001.02
Prepared By: LP Date: 06/30/10 Checked By: AL Date: 07/01/10 Sheet 2 of 2

Appendix D

Oncor's Encroachment Application, Guidelines for Use of Property And Construction Limitations

ONCOR

Right of Way, Suite 1125

115 W. 7th Street
Fort Worth, Texas 76102
817.898.4ROW (817.898.4769)

Transmission Encroachment/Easement Crossing Application

Requestor Information

Name: _____ Date: _____
(Property Owner)

Primary Contact: _____
(If Property Owned by an Entity) *Last* *First*

Address: _____
Street Address *Apartment/Unit #/Suite*

_____
City *State* *ZIP Code*

Phone: ( ) _____ E-mail Address: _____

Oncor Property Legal Description

To expedite include Oncor Recorded Legal Description (Vol. and Pg. of current Recorded Deed/Easement) or County Tax

_____

_____

_____

_____

_____

Additional Identifiable Information

Mapsco Reference: _____

Proximity to Major Intersection: _____
Cross Roads

Property Address

Physical Address: _____

City: _____ County: _____

Type of Encroachment/Easement Crossing

☐ **Street**

☐ **Paving** (Driveway, Sidewalk)

☐ **Utility** (Including Pipeline Crossings) _____ Size of Pipe

☐ **Other**

Comments: _____

_____

EEC Application Oncor ED ROW 042007

Please Attach the Following to the Application:

1. A property survey or drawing prepared by a registered professional surveyor, maximum 8 ½" x 14", of legible and clear detail, indicating all dimensions of the encroachment, including a north arrow and a volume/page of the Oncor right-of-way property. The survey or drawing must be of legible quality for filing with the County of Deed Records Office. Copies of surveys or drawings that are not easily reproduced will not be accepted.

2. A **Non-Refundable** processing fee of **$250** made payable to Oncor Electric Delivery Company must accompany this application.

3. For street and underground utility crossing(s), the following must be submitted as well:
   A. A grade plan and profile of the street and/or utility crossing.
   B. An accurate distance from Oncor's closest structure/tower to the crossing(s) and Oncor tower #

PLEASE NOTE:

Encroachment request including, but not limited to, open-ditch drainage, drainage swales, headwalls, detention ponds, flumes, light standards, fire hydrants, Fire Lanes other than 90 degrees, dumpsters and parallel/longitudinal placement of facilities within the right of way are not acceptable and *will not be approved* by Oncor. All crossings must be no closer than 25' from any tower or structure and must be underground, with the exception of street crossings. All crossings must cross the right of way at no less than 45 degrees.

For Gas Pipeline Crossings ONLY:

As a dig-in preventative, Oncor requires, Oncor requires, one of the following protective barriers; 1) a concrete protective barrier between the surface and the pipe that is a minimum of one foot thick by one foot wide, with the top of the concrete barrier to be at least one foot below the surface or final grade, 2) construct the gas pipeline inside of a proper protective steel casing, 3) where electric facilities are located above ground, install the pipeline a minimum of 10 feet below the ground surface, or 4) where electric facilities are located below ground, install the pipeline at a depth that provides for a minimum of a 10 foot clearance between the pipeline and the underground electric facilities.

Oncor Electric Delivery Company requires approximately 4 – 6 weeks to review your request upon receipt of a completed application and the above mentioned items. Please be assured that Oncor is aware of the urgency of your request and will make every effort to expedite your application.

Should the request be approved, Right of Way Services will prepare an instrument to be signed by the proper parties. The owner will sign an original and one copy. A copy will be returned for your use and Oncor will record the instrument. No Construction Activity shall commence on the Oncor Right of Way Area until you have received the fully executed instrument from Oncor.

Disclaimer and Signature

I certify that I have provided accurate information and any deletion or inaccuracy may delay processing or invalidate this application.

Printed Name of Requestor: _____

Signature of Requestor : _____ Date: _____

EEC Application Oncor ED ROW 042007

Guidelines for Use of Company Property by Others

October 2008

Oncor Electric Delivery Company Policy

It is the policy of Oncor to not unreasonably withhold the granting of easements, rights-of -way and licenses on its real estate property for street, road, utility and drainage crossings, and other approved uses. **The following set of guidelines are intended to state Oncor Electric Delivery Company's general policy for use of it's right of way by others and are not all inclusive in nature nor do they imply approval of any kind by Oncor.** Each request for use is reviewed individually, and must be approved by Transmission Engineering, Transmission Operating, Distribution Engineering, Transmission Planning and any other Company organization having a vested interest in the request. Approval must be obtained from all organizations in order to grant the request.

All requests should be addressed to Oncor Electric Delivery Company, Right of Way, 115 W. 7th Street, Suite 1125, Fort Worth TX 76102. Each request should be accompanied by a description of the rights sought, surveys, maps, drawings, statement of purpose and any other information deemed necessary. A $250 non-refundable administration fee, paid at the time of the request, is charged to cover Company review and document preparation. An application form for use of Oncor Right of Way will be furnished upon request.

Fees will be based on county appraisal values.

Fee Simple Property

Easement rights for crossings of Oncor fee owned rights-of-way that do not interfere with the construction, reconstruction, operation and maintenance of Oncor facilities may be granted if the crossing is not less than 45 degrees to the centerline of the right-of-way.

Fire Lanes are not included in crossings and will be considered only when crossing at 90 degrees. Each **Fire Lane** request will be reviewed individually for approval.

Longitudinal rights will not be granted for the placement of utilities, roads, pipelines, fences, or other uses along Oncor rights-of-way.

Licenses for parking, agricultural, and other surface uses may be granted provided the applicant is the adjacent landowner. The license will be personal, revocable and non-assignable. Licenses for parking will be granted for over flow parking only; **no code required parking will be allowed**. The licensee will be responsible for all mowing and maintenance of the right-of-way affected by the licensed area.

Fees for easements and licenses will be based on county appraisal values of adjacent properties.

Easement Right of Way

Encroachment by third parties on Oncor easement rights-of-ways that meet the above criteria for approval may be granted by an Encroachment Agreement. The proposed user will be required to obtain whatever rights and permission, other than Oncor's that are necessary from the property owner.

Construction Limitations

When a request is granted, Right of Way Services will prepare the appropriate document for signatures by Oncor and the grantee. In addition to the provisions of the Agreement, the approved facility will be subject to the following construction limitations:

1. You are notified, and should advise your employees, representatives, agents, and contractors, who enter the property that they will be working in the vicinity of high voltage electrical facilities and should take proper precautions, included but not limited to the following stipulations and in compliance, at all times, with Chapter 752, V.T.C.A., Health & Safety Code.
2. Blasting is not to be permitted on Oncor right-of-way or under Oncor lines.

3. Construction on electric transmission line easements acquired by Oncor after January 1, 2003 shall comply with the requirements of Public Utility Commission Substantive Rules §25.101, as amended from time to time.
4. Grading will be done in order to leave the right-of-way as near as possible to present condition. Spoil dirt will be removed from the right-of-way and no trash is to be left on right-of-way. Slopes shall be graded so that trucks can go down the right-of-way when required and such that they can be mechanically maintained.
5. Equipment and materials will not be stored on the right-of-way during construction without written approval of the Supervisor of Regional Transmission.
6. Street or road crossings are to be based on drawings submitted. Any change in alignment or elevation will be resubmitted for approval.
7. Runways or air take off and landing strips are not permitted on the right-of-way.
8. No signs, lights or guard lights will be permitted on the right-of-way.
9. Equipment shall not be within fifteen (15) feet of the lowest conductor.
10. Any pre-approved fencing will not exceed eight (8) feet in height, and if metal in nature, will be grounded, at ten (10) feet intervals, with an appropriate driven ground. Gates should be at least sixteen (16) feet in width to allow Oncor access to the right-of-way.
11. No dumpsters will be allowed on Oncor right-of-way or fee owned property.
12. Drag lines will not be used under the line or on Oncor right-of-way.
13. The existing grade shall not be disturbed, excavated or filled within 25 feet of the nearest edge of any tower.
14. Right-of-way will be protected from washing and erosion by Oncor approved method before any permits are granted.
15. No obstruction shall be installed on the right-of-way that would interfere with access to Oncor structures or prevent mechanical maintenance.
16. Before any work is done under Oncor lines or by Oncor structures notify the Region Transmission Department.
17. No hazardous materials will be stored on the right of way.
18. For purposes of this document, "Hazardous Materials" means and includes those substances, including, without limitation, asbestos-containing material containing more than one percent (1%) asbestos by weight, or the group of organic compounds known as polychlorinated biphenyls, flammable explosives, radioactive materials, chemicals known to cause cancer or reproductive toxicity and includes any items included in the definition of hazardous or toxic waste, materials or substances under any Hazardous Material Law. "Hazardous Material Laws" collectively means and includes any present and future local, state and federal law relating to the environment and environmental conditions including, without limitation, the Resource Conservation and Recovery Act of 1976 ("RCRA"), 42 U.S.C. §6901 et seq., the Comprehensive Environmental Response, Compensation and Liability Act of 1980, ("CERCLA"), 42 U.S.C. §§9601-9657, as amended by the Superfund Amendments and Reauthorization Act of 1986 ("SARA"), the Hazardous Material Transportation Act, 49 U.S.C. §6901 et seq., the Federal Water Pollution Control Act, 33 U.S.C. §1251, et seq., the Clean Air Act, 42 U.S.C. §741 et seq., the Clean Water Act, 33 U.S.C. §7401 et seq., the Toxic Substances Control Act, 15 U.S.C. §§2601-2629, the Safe Drinking Water Act, 42 U.S.C. §§300f-330j, and all the regulations, orders, and decrees now or hereafter promulgated thereunder.
19. Brush and cut timber will not be piled or stacked on Oncor right-of-way or will not be burned upon or in close proximity to the conductors or towers.
20. No structures or obstructions, such as buildings, garages, barns, sheds, guard houses, etc., will be permitted on the right-of-way.

Landscaping on Oncor Right of Way

Landscaping on Oncor right-of-way is permitted when landscaping plans are approved in writing by Oncor.

No lighting or sprinkler systems are allowed on the right-of-way.

The following is a list of typical trees permitted on the right-of-way. In no case shall a tree with a mature height of more than 15 feet be permitted.

Texas Mountain Laurel – Sophora secundiflora
Japanese Maple – Acer palmatum var.
Yaupon Holly – Ilex vomitoria
Rusty Black Haw – Viburnum rufidulum
Flame Leaf Sumac – Rhus lanceolata
Rough-leaf Dogwood – Cornus drummondii
Vitex – Vitex angus-castus
Mexican Plum – Prunus Mexicana
Viburnam – Viburnam spp.
Chinese Photinia – Photinia serrulata
Texas Persimmon – Diospyros texana
Mexican Buckeye – Ungnadia speciosa
Peach – Prunus persica
Possumhaw – Ilex decidua

Right of Way

Suite 1125
115 W. 7th Street
Fort Worth, Texas 76102
817.898.4ROW
817.898.4769

CONSTRUCTION LIMITATIONS
ON ONCOR ELECTRIC DELIVERY COMPANY RIGHT OF WAY
EXHIBIT "B"

1. You are notified, and should advise your employees, representatives, agents, and contractors, who enter the property that they will be working in the vicinity of high voltage electrical facilities and should take proper precautions, included but not limited to the following stipulations and in compliance, at all times, with Chapter 752, V.T.C.A., Health & Safety Code.

2. Blasting is not to be permitted on ONCOR right-of-way or under ONCOR lines.

3. Construction on electric transmission line easements acquired by ONCOR after January 1,2003 shall comply with the requirements of Public Utility Commission Substantive Rules §25.101, as amended from time to time.

4. Grading will be done in order to leave the right-of-way as near as possible to present condition. Spoil dirt will be removed from the right-of-way and no trash is to be left on right-of-way. Slopes shall be graded so that trucks can go down the right-of-way when required and such that the slopes can be mechanically maintained.

5. Equipment and materials will not be stored on the right-of-way during construction without written approval of the Supervisor of Regional Transmission.

6. Street or road crossings are to be based on drawings submitted. Any change in alignment or elevation will be resubmitted for approval.

7. No signs, lights or guard lights will be permitted on the right-of-way.

8. Equipment shall not be placed within fifteen (15) feet of the power lines.

9. Any pre-approved fencing will not exceed eight (8) feet in height, and if metal in nature, will be grounded, at ten (10) feet intervals, with an appropriate driven ground. Gates should be at least sixteen (16) feet in width to allow ONCOR access to the right-of-way.

ENCROACHMENT ON EASEMENT **Page 1**

10. No dumpsters will be allowed on ONCOR right-of-way or fee owned property.

11. Draglines will not be used under the line or on ONCOR right-of-way.

12. The existing grade shall not be disturbed, excavated or filled within 25 feet of the nearest edge of any tower.

13. Right-of-way will be protected from washing and erosion by ONCOR approved method before any permits are granted. No discharging of water will be allowed within any portion of the right of way.

14. No obstruction shall be installed on the right-of-way that would interfere with access to ONCOR structures or prevent mechanical maintenance.

15. Before any work is done under ONCOR lines or by ONCOR structures notify the Region Transmission Department, (817) 496-2731, or (817) 496-2736.

16. No hazardous materials will be stored on the right of way.

17. For purposes of this document, "Hazardous Materials" means and includes those substances, including, without limitation, asbestos-containing material containing more than one percent (1%) asbestos by weight, or the group of organic compounds known as polychlorinated biphenyls, flammable explosives, radioactive materials, chemicals known to cause cancer or reproductive toxicity and includes any items included in the definition of hazardous or toxic waste, materials or substances under any Hazardous Material Law.
"Hazardous Material Laws" collectively means and includes any present and future local, state and federal law relating to the environment and environmental conditions including, without limitation, the Resource Conservation and Recovery Act of 1976 ("RCRA"), 42 U.S.C. §6901 et seq., the Comprehensive Environmental Response, Compensation and Liability Act of 1980, ("CERCLA"), 42 U.S.C. §§9601-9657, as amended by the Superfund Amendments and Reauthorization Act of 1986 ("SARA"), the Hazardous Material Transportation Act, 49 U.S.C. §6901 et seq., the Federal Water Pollution Control Act, 33 U.S.C. §1251, et seq., the Clean Air Act, 42 U.S.C. §741 et seq., the Clean Water Act, 33 U.S.C. §7401 et seq., the Toxic Substances Control Act, 15 U.S.C. §§2601-2629, the Safe

Drinking Water Act, 42 U.S.C. §§300f-330j, and all the regulations, orders, and decrees now or hereafter promulgated thereunder.

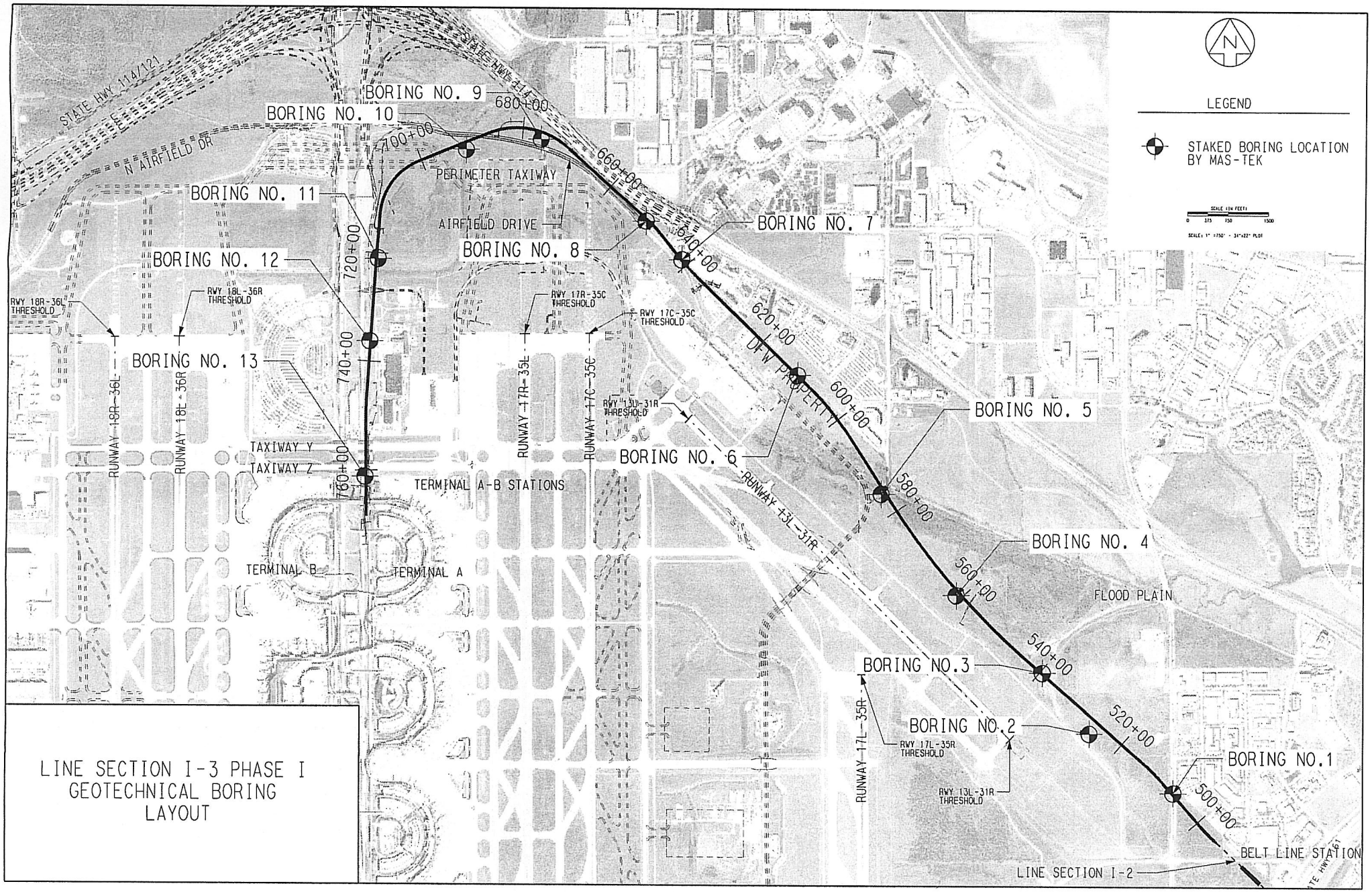
18. Brush and cut timber will not be piled or stacked on ONCOR right-of-way or will not be burned upon or in close proximity to the conductors or towers.

19. No structures or obstructions, such as buildings, garages, barns, sheds, guard houses, etc., will be permitted on the right-of-way.

20. Landscaping on ONCOR right-of-way is permitted when ONCOR approves landscaping plans in writing. No lighting or sprinkler systems are allowed on the right-of-way.

ENCROACHMENT ON EASEMENT **Page 3**

Appendix E
Preliminary Geotechnical Investigation Soil Boring Logs


LEGEND
STAKED BORING LOCATION BY MAS-TEK
BORING NO. 1
BORING NO. 2
BORING NO.3
BORING NO. 4
BORING NO. 5
BORING NO. 6
BORING NO. 7
BORING NO. 8
BORING NO. 9
BORING NO. 10
BORING NO. 11
BORING NO. 12
BORING NO. 13
500+00
520+00
540+00
560+00
580+00
600+00
620+00
640+00
660+00
680+00
700+00
720+00
740+00
760+00
STATE HWY 114/121
N AIRFIELD DR
PERIMETER TAXIWAY
AIRFIELD DRIVE
DFW PROPERTY
FLOOD PLAIN
TERMINAL A-B STATIONS
TERMINAL A
TERMINAL B
TAXIWAY Y
TAXIWAY Z
RUNWAY 18R-36L
RUNWAY 18L-36R
RUNWAY 17R-35L
RUNWAY 17C-35C
RUNWAY 13L-31R
RUNWAY 17L-35R
RWY 18R-36L THRESHOLD
RWY 18L-36R THRESHOLD
RWY 17R-35C THRESHOLD
RWY 17C-35C THRESHOLD
RWY 13L-31R THRESHOLD
RWY 17L-35R THRESHOLD
RWY 13L-31R THRESHOLD
BELT LINE STATION
LINE SECTION I-2
LINE SECTION I-3 PHASE I GEOTECHNICAL BORING LAYOUT

KEY TO LOG TERMS & SYMBOLS

Symbol	Description
Strata symbols	
	CLAY
	CLAY, shaley
	SHALE, weathered
	SHALE
	Sandy Gravelly Clay
	Clay-Shale
Misc. Symbols	
	Boring continues
	Water table when checked
	Water table at boring completion

Symbol	Description
Soil Samplers	
	Thin Wall Shelby Tube
	Auger
	THD Cone Penetration Test
	Rock Core

Notes:

1. Exploratory borings were drilled on dates indicated using truck mounted drilling equipment.

2. Water level observations are noted on boring logs.

3. Results of tests conducted on samples recovered are reported on the boring logs. Abbreviations used are:

DD = natural dry density (pcf)	LL = liquid limit (%)
MC = natural moisture content (%)	PL = plastic limit (%)
Uncon.= unconfined compression (tsf)	PI = plasticity index
P.Pen.= hand penetrometer (tsf)	-200 = percent passing #200

4. Rock Cores
   - REC = (Recovery) sum of core sample recovered divided by length of run, expressed as percentage.
   - RQD = (Rock Quality Designation) sum of core sample recovery 4" or greater in length divided by the run, expressed as percentage.

LOG OF BORING B-1

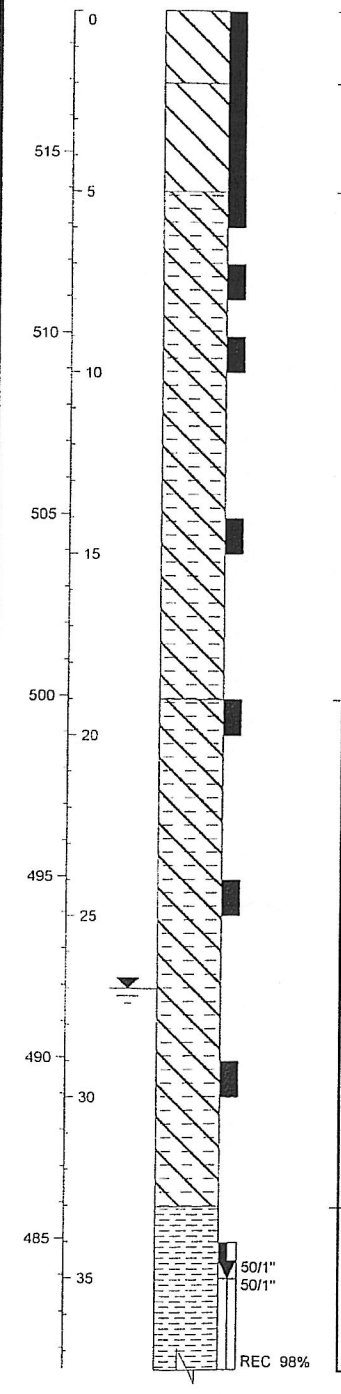
Project: DART I-3 - DFW Airport, Texas | Location: See Figure 1 | Project No.: E09-0705

Date: 11/19/2009 | Elev.: 518.9 | Station: 506+85 | Offset: 4.9' RT

Depth to water at completion of boring: 55' after bailing | North: | East:

Depth to water when checked: after 1 day | was: 27'

Depth to caving when checked: | was:



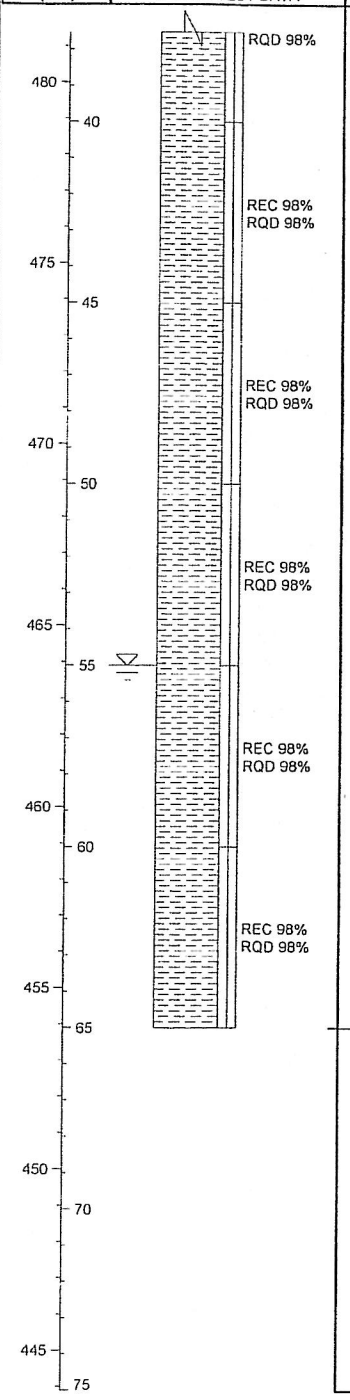
ELEVATION/ DEPTH (feet)	DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
	Brown & dark brown CLAY w/ well graded sand layer (FILL)							2.6 1.75		
	Dark gray CLAY w/ iron nodules	26	64	22	42		97	2.75 2.0 2.7	4.3	8.5
	Brownish yellow & gray shaley CLAY w/ ironstone fragments & gypsum crystals, jointed	25	78	29	49		100	2.0 2.75 3.5 4.5+	3.6	2.1
	Olive brown & gray shaley CLAY w/ calcium deposits & gypsum crystals, jointed -w/ dark gray shale seams below 29' -seepage at 30'	30	88	31	57			3.25 4.0 4.5++		
	Moderately hard dark gray SHALE w/ bentonite seams & very hard limestone seams	15					114		50.9	1.5

Notes: Completion Depth: 65'

FIGURE:2

LOG OF BORING B-1

Project: DART I-3 - DFW Airport, Texas
Location: See Figure 1
Project No.: E09-0705
Date: 11/19/2009
Elev.: 518.9
Station: 506+85
Offset: 4.9' RT
Depth to water at completion of boring: 55' after bailing
North:
East:
Depth to water when checked: after 1 day
was: 27'
Depth to caving when checked:
was:



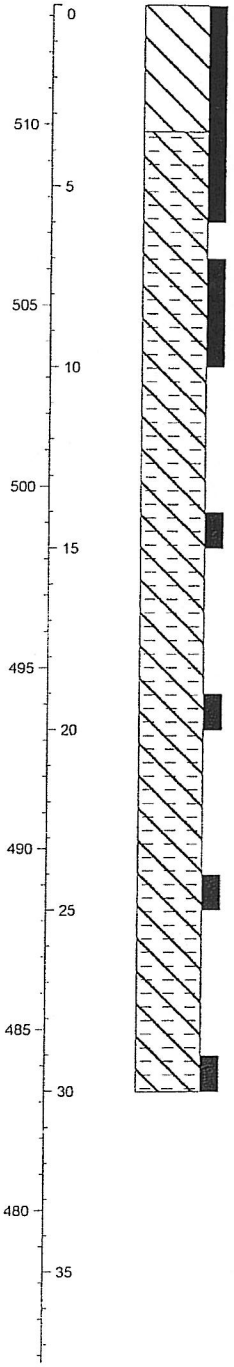
ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS & FIELD TEST DATA	DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
		Moderately hard dark gray SHALE w/ bentonite seams									
			16					111		91.0	2.6
		- low angle, planar, smooth fracture at 57'									
			15					111		109.9	2.1
		Boring terminated at 65'									

Notes: Completion Depth: 65'

FIGURE:3

LOG OF BORING B-2

Project: DART I-3 - DFW Airport, Texas
Location: See Figure 1
Project No.: E09-0705
Date: 11/22/2009 Elev.: 513.3
Station: 525+77
Offset: 313.4' LT
Depth to water at completion of boring: Dry
North:
East:
Depth to water when checked:
was:
Depth to caving when checked:
was:



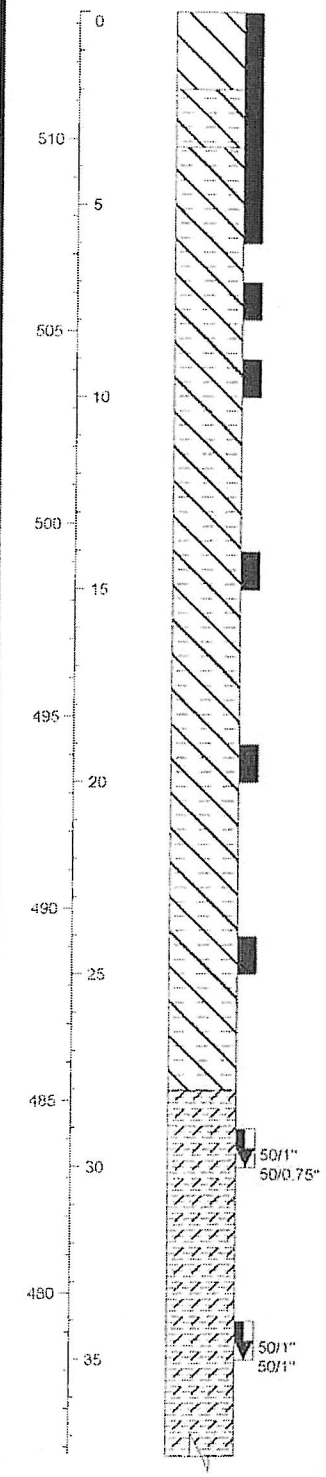
DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
Brown CLAY w/ occasional brownish yellow clay seams (FILL)							0.8		
	28						0.9		
	27					95	1.5	2.8	9.9
-occasional ironstone fragments at 4'							2.2		
Olive brown & gray shaley CLAY w/ gypsum crystals, jointed							4.5++		
	21	69	25	44			4.5++		
							4.5++		
							4.5++		
	24					102	4.5++		
							4.5++		
							4.5++		
							4.5++		
-w/ cemented sand seams below 29.5'							4.5++		
Boring terminated at 30'									

Notes: Completion Depth: 30'

FIGURE:4

LOG OF BORING B-2A

Project: DART I-3 - DFW Airport, Texas
Location: See Figure 1
Project No.: E09-0705
Date: 04/21/2010
Elev.: 513.3
Station: 525+77
Offset: 320' LT
Depth to water at completion of boring: Dry
Depth to water when checked: was:
Depth to caving when checked: was:

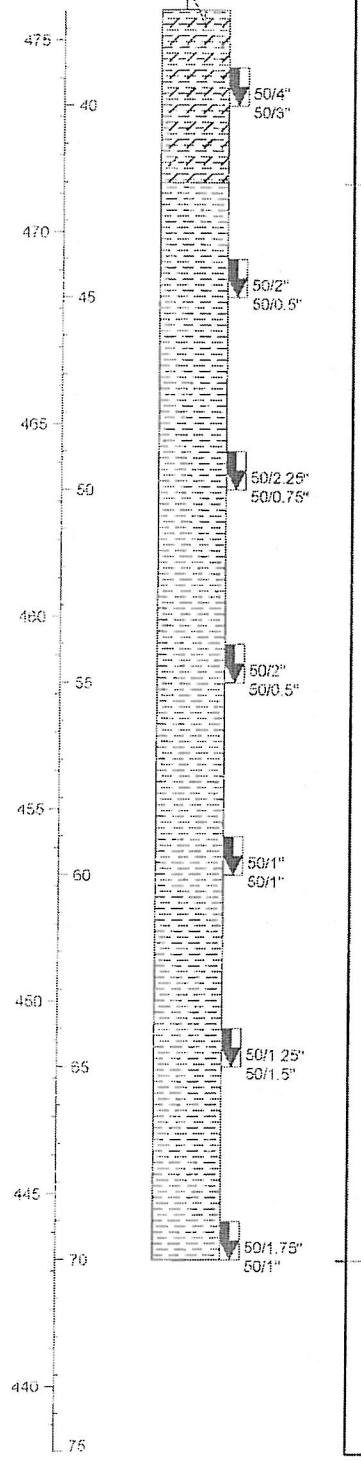


DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P PEN tsf	UNCON ksf	Strain %
Brown CLAY w/ occasional brownish yellow clay seams (FILL)							1.6 1.3		
Tan & light gray shaley CLAY -occasional ironstone fragments at 4'							2.6 4.5++		
Olive brown, tan & gray shaley CLAY w/ gypsum crystals, jointed							4.5++ 4.5++ 4.5++ 4.5++ 4.5++ 4.5++ 4.5++		
Dark gray weathered SHALE w/ tan & gray shaley clay layers, jointed -cemented sand seams below 29'							4.5++		

Notes: Completion Depth: 70'

LOG OF BORING B-2A

Project: DART I-3 - DFW Airport, Texas
Location: See Figure 1
Project No.: E09-0705
Date: 04/21/2010
Elev.: 513.3
Station: 525+77
Offset: 320' LT
Depth to water at completion of boring: Dry
Depth to water when checked:
was:
Depth to caving when checked:
was:

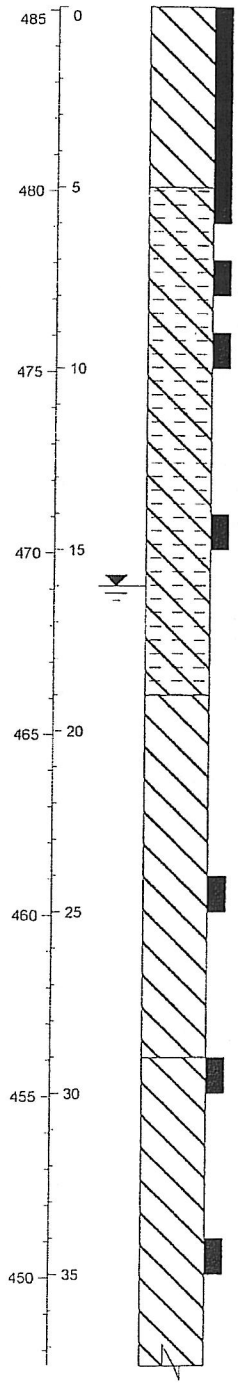


ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS & FIELD TEST DATA	DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P PEN tsf	UNCON ksf	Strain %
		Moderately hard dark gray SHALE									
		Boring terminated at 70'									

Notes: Completion Depth: 70'

LOG OF BORING B-3

Project: DART I-3 - DFW Airport, Texas
Location: See Figure 1
Project No.: E09-0705
Date: 11/20/2009 Elev.: 485.1
Station: 540+23
Offset: 53.7' LT
Depth to water at completion of boring: 52'
North:
East:
Depth to water when checked: after 1 day
was: 16'
Depth to caving when checked:
was:



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS & FIELD TEST DATA	DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
		Dark brown & yellow CLAY & shaley CLAY, jointed (FILL)							1.6		
									1.7		
									1.4	2.6	9.5
			30	70	24	46			1.7		
									1.5		
		Olive brown & gray shaley CLAY, jointed	24					101	2.4	4.8	9.8
			32	78	28	50			2.75		
									2.9		
									2.4		
			28					96	2.2	4.2	4.4
		Brown CLAY, jointed							2.8		
			27	71	26	45		96	2.3	4.6	4.2
		Olive brown, yellowish brown & gray CLAY, jointed							2.2		
			30	77	28	49		92	2.4	4.8	4.3

Notes: Completion Depth: 70'

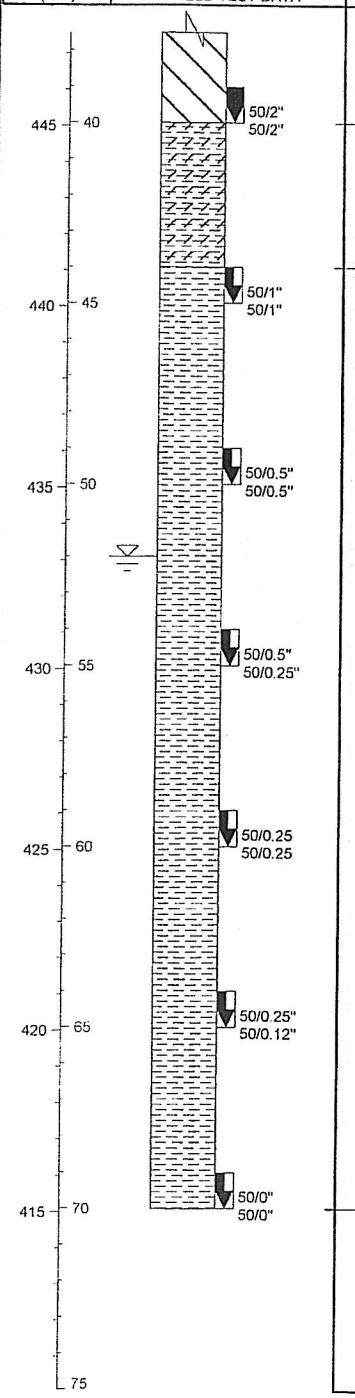
FIGURE:5

LOG OF BORING B-3

Project: DART I-3 - DFW Airport, Texas
Date: 11/20/2009 Elev.: 485.1
Depth to water at completion of boring: 52'
Depth to water when checked: after 1 day
Depth to caving when checked:

Location: See Figure 1
Station: 540+23
North:
was: 16'
was:

Project No.: E09-0705
Offset: 53.7' LT
East:



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS & FIELD TEST DATA	DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
		Olive brown, yellowish brown & gray CLAY, jointed -seepage at 40'	31					91	1.7	3.4	3.4
		Dark gray weathered SHALE w/ tan seams, fractured									
		Moderately hard dark gray SHALE w/ very hard limestone seams									
		Boring terminated at 70'									

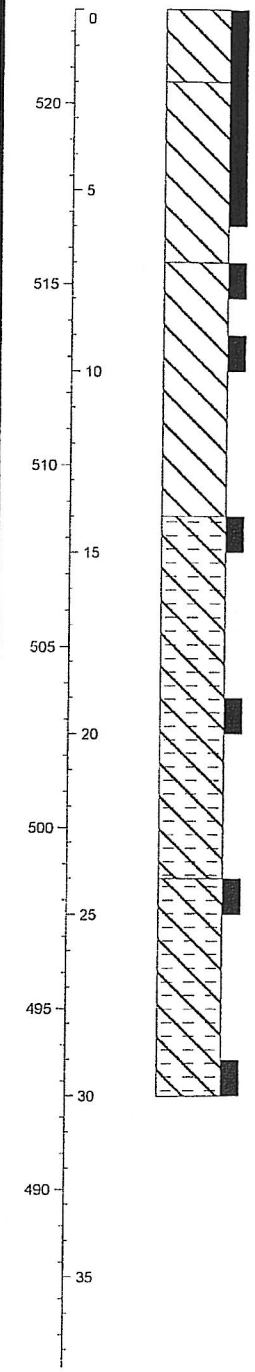
Notes: Completion Depth: 70'

FIGURE:6

MTE, INC.

LOG OF BORING B-4

Project: DART I-3 - DFW Airport, Texas
Location: See Figure 1
Project No.: E09-0705
Date: 11/19/2009 Elev.: 522.6
Station: 565+48
Offset: 235.5' LT
Depth to water at completion of boring: Dry
North:
East:
Depth to water when checked:
was:
Depth to caving when checked:
was:



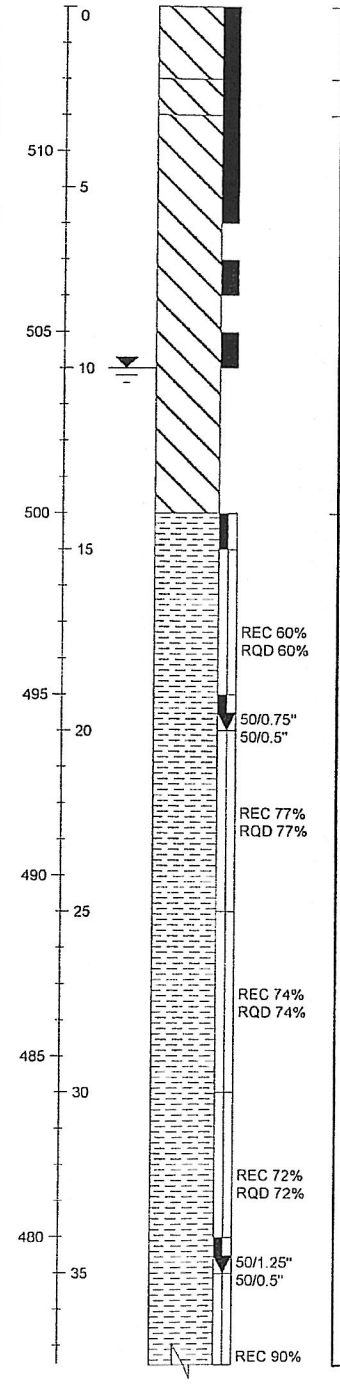
DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
Brown & dark brown CLAY (FILL)							1.9		
	31	72	26	46		88	1.5	2.9	6.3
Brown CLAY w/ occasional dark brown clay seams & calcareous nodules (FILL)							2.0		
							1.9		
							2.7		
	28	75	27	48		94	2.1	4.1	7.0
Brownish yellow and gray CLAY w/ iron & calcareous nodules, jointed (FILL)							3.25		
	24	72	26	46		102	4.0	6.9	3.4
-dark gray clay seam at 9'							4.5+		
-possible fill below 11'									
Yellowish brown & gray shaley CLAY w/ iron nodules, jointed							3.2		
							4.2		
Olive brown & gray shaley CLAY w/ gypsum crystals & bentonite seams, jointed							3.9		
							4.5		
Boring terminated at 30'									

Notes: Completion Depth: 30'

FIGURE:7

LOG OF BORING B-5

Project: DART I-3 - DFW Airport, Texas Location: See Figure 1 Project No.: E09-0705
Date: 11/18/2009 Elev.: 514.0 Station: 584+06 Offset: 65.2' LT
Depth to water at completion of boring: 40' after bailing North: East:
Depth to water when checked: after 1 day was: 10'
Depth to caving when checked: was:



DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
Brown CLAY w/ dark brown clay (FILL)							2.0		
							2.0		
Yellowish brown CLAY (FILL)	27	71	26	45		94	1.7	3.2	10.5
Olive brown & gray CLAY, jointed							1.75		
	34	89	28	61		88	1.75		
-w/ bentonite seams at 5' to 6'	50	126	56	70		69	2.25	3.8	5.8
-w/ sand seams below 7'							2.7		
							3.4		
-seepage at 13'									
Moderately hard dark gray SHALE w/ bentonite seams & very hard limestone seams									
	17					111		92.7	2.2
- low angle, planar, smooth fracture at 26.5'									
	17					109		161.0	2.2

Notes: Completion Depth: 45'

FIGURE:8

LOG OF BORING B-5

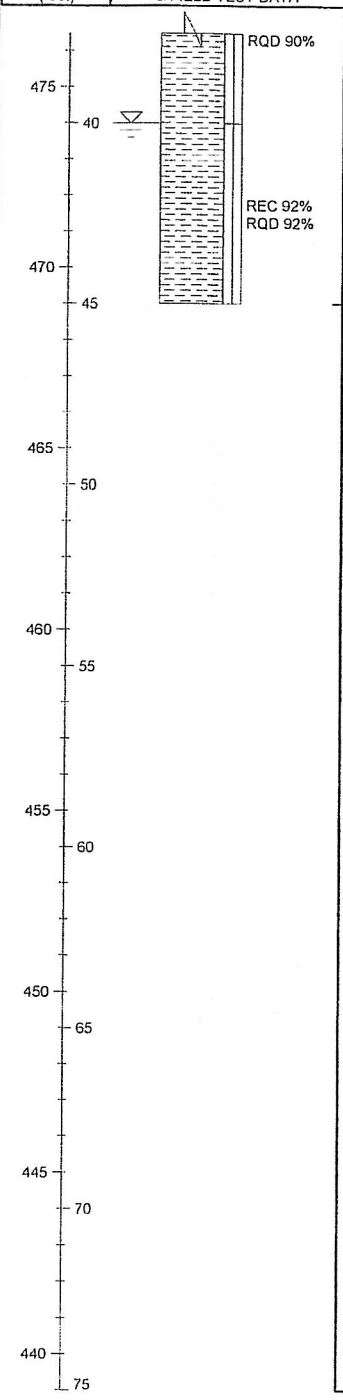
Project: DART I-3 - DFW Airport, Texas | Location: See Figure 1 | Project No.: E09-0705

Date: 11/18/2009 | Elev.: 514.0 | Station: 584+06 | Offset: 65.2' LT

Depth to water at completion of boring: 40' after bailing | North: | East:

Depth to water when checked: after 1 day | was: 10'

Depth to caving when checked: | was:



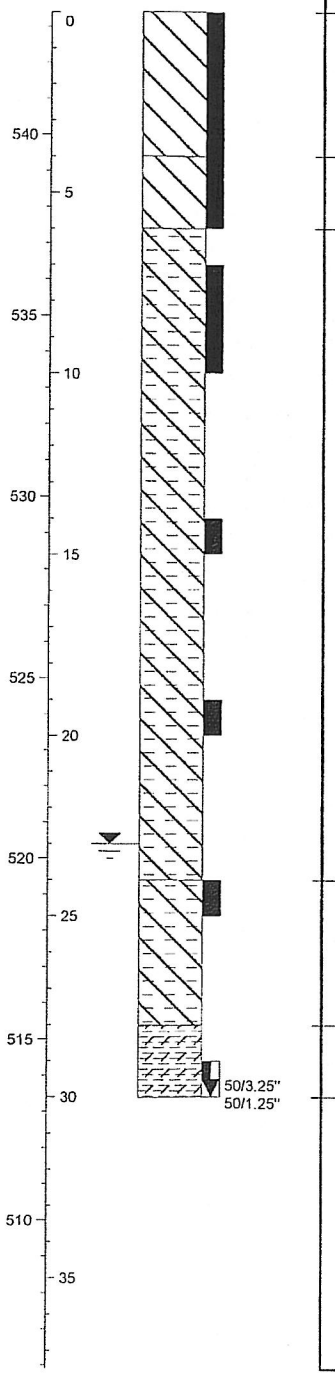
ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS & FIELD TEST DATA	DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
		Moderately hard dark gray SHALE w/ bentonite seams & very hard limestone seams	15					115		67.1	1.6
		Boring terminated at 45'									

Notes: Completion Depth: 45'

FIGURE:9

LOG OF BORING B-6

Project: DART I-3 - DFW Airport, Texas
Location: See Figure 1
Project No.: E09-0705
Date: 11/11/2009 Elev.: 543.4
Station: 610+57
Offset: 1.5' LT
Depth to water at completion of boring: Dry
North:
East:
Depth to water when checked: after 1 day
was: 23'
Depth to caving when checked:
was:



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS & FIELD TEST DATA	DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
		Dark brown CLAY w/ dark gray clay seams (FILL)	34	76	27	49		84	1.5 0.8 0.9 1.25	1.6	7.0
		Brown CLAY w/ dark gray clay seams (FILL)	29	77	27	50		93	2.1 3.8	3.2	2.6
		Brownish yellow & light gray shaley CLAY, jointed	34	89	34	55		90	4.0 3.8	7.8	4.0
		-w/ iron & sulfur seams at 19'							3.7		
									3.9		
		Olive brown & gray shaley CLAY w/ bentonite seams, jointed							1.4		
		Dark gray weathered SHALE w/ iron stained fractures									
		Boring terminated at 30'									

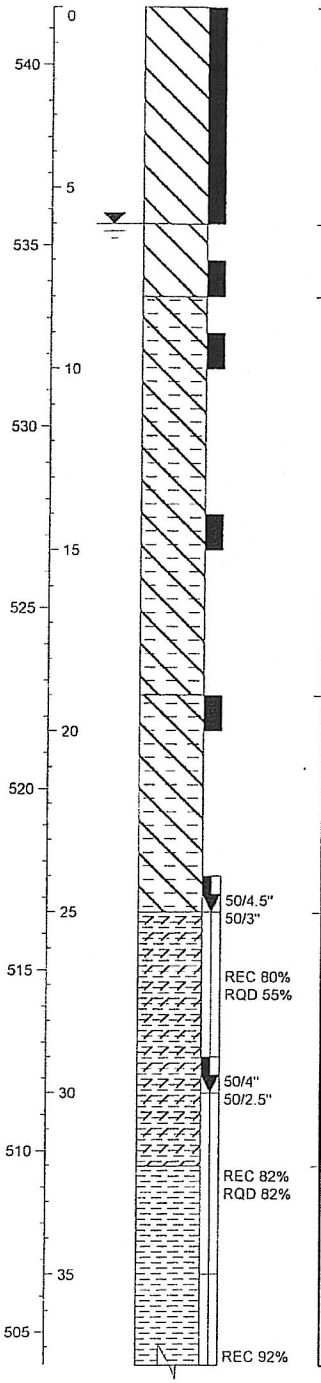
Notes: Completion Depth: 30'

FIGURE:10

MTE, INC.

LOG OF BORING B-7

Project: DART I-3 - DFW Airport, Texas Location: See Figure 1 Project No.: E09-0705
Date: 11/12/2009 Elev.: 541.6 Station: 640+52 Offset: 29.6' RT
Depth to water at completion of boring: 56' after bailing North: East:
Depth to water when checked: after 1 day was: 6'
Depth to caving when checked: was:



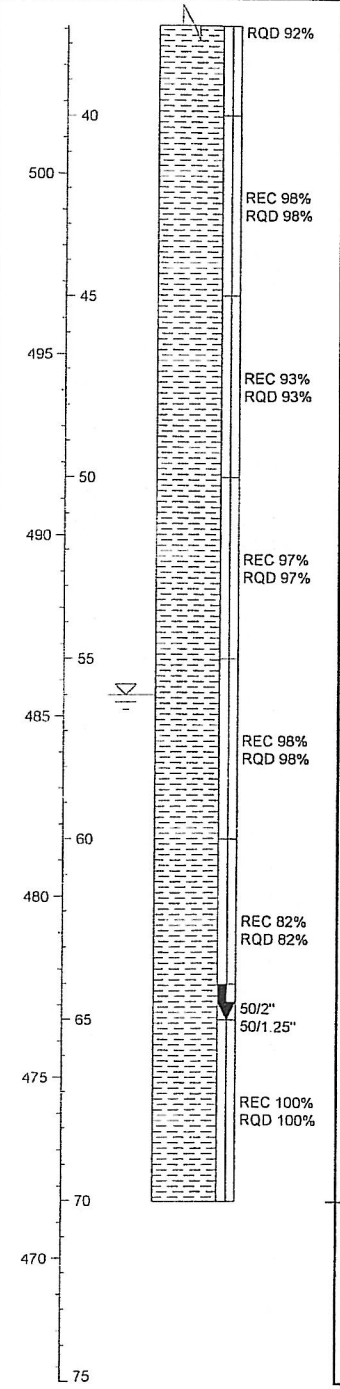
DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
Brown CLAY w/ dark brown & brownish yellow clay seams (FILL)							0.7		
							0.9		
	37					80	0.8	1.6	5.7
	37	97	35	62			1.3		
							1.5		
							1.4		
Brown & gray CLAY w/ gypsum crystals	33	75	27	48		90	1.9	3.6	9.1
Brownish yellow & light gray shaley CLAY, jointed							1.9		
	33	90	31	59		86	2.7		
Olive brown, yellow & gray shaley CLAY, jointed							2.75		
-seepage at 22'									
							3.4		
Dark gray weathered SHALE w/ bentonite seams, tan seams & iron stained fractures	14					114		103.9	1.5
Moderately hard dark gray SHALE w/ bentonite seams & very hard limestone seams									

Notes: Completion Depth: 70'

FIGURE:11

LOG OF BORING B-7

Project: DART I-3 - DFW Airport, Texas
Location: See Figure 1
Project No.: E09-0705
Date: 11/12/2009
Elev.: 541.6
Station: 640+52
Offset: 29.6' RT
Depth to water at completion of boring: 56' after bailing
North:
East:
Depth to water when checked: after 1 day
was: 6'
Depth to caving when checked:
was:



DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
Moderately hard dark gray SHALE w/ bentonite seams & very hard limestone seams	15					114		78.8	1.8
-hard sandstone seam at 52'									
	16					110		75.4	2.1
-hard sandstone seam at 67'									
	15					112		96.1	1.9
-hard sandstone seam at 69'									
Boring terminated at 70'									

Notes: Completion Depth: 70'

FIGURE:12

LOG OF BORING B-8

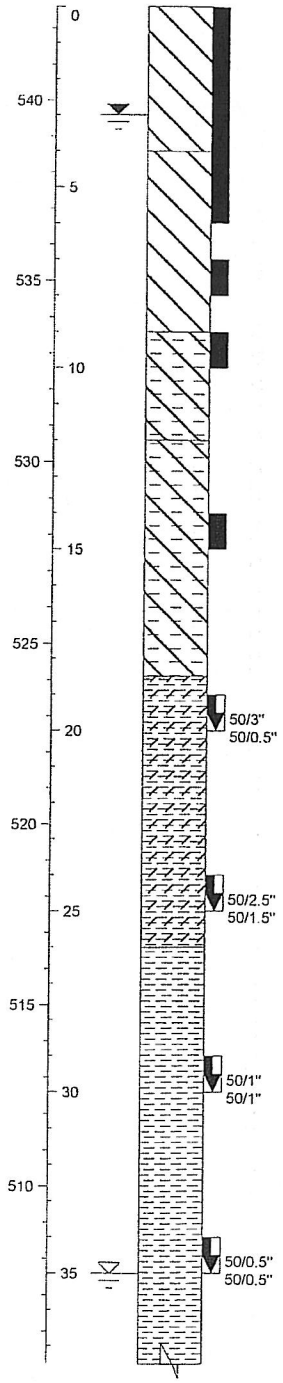
Project: DART I-3 - DFW Airport, Texas | Location: See Figure 1 | Project No.: E09-0705

Date: 11/05/2009 | Elev.: 542.6 | Station: 650+84 | Offset: 54.7' LT

Depth to water at completion of boring: 35' after bailing | North: | East:

Depth to water when checked: after 1 day | was: 3'3"

Depth to caving when checked: | was:



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS & FIELD TEST DATA	DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
		Brown CLAY w/ yellowish brown & dark brown clay seams (FILL)	30	72	26	46			1.4 2.1 2.4		
			30					91	1.4	2.7	5.8
		Olive brown CLAY	28					94	1.25 1.5 1.5	2.8	6.2
		Brownish yellow & gray shaley CLAY, jointed	41	82	30	52		80	2.1	1.8*	3.2
		Olive brown, yellow & gray shaley CLAY w/ bentonite seams, jointed -seepage at 17'							3.9		
		Dark gray weathered SHALE w/ iron stained fractures, tan seams & hard limestone seams									
		Moderately hard dark gray SHALE w/ very hard limestone seams									

Notes: Completion Depth: 70' *Failed along slickensided fracture

FIGURE:13

MTE, INC.

LOG OF BORING B-8

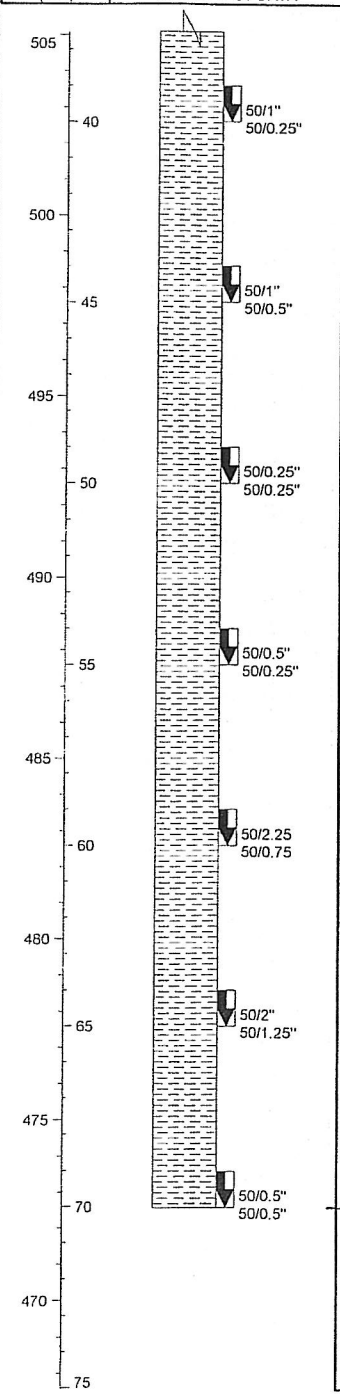
Project: DART I-3 - DFW Airport, Texas | Location: See Figure 1 | Project No.: E09-0705

Date: 11/05/2009 | Elev.: 542.6 | Station: 650+84 | Offset: 54.7' LT

Depth to water at completion of boring: 35' after bailing | North: | East:

Depth to water when checked: after 1 day | was: 3'3"

Depth to caving when checked: | was:



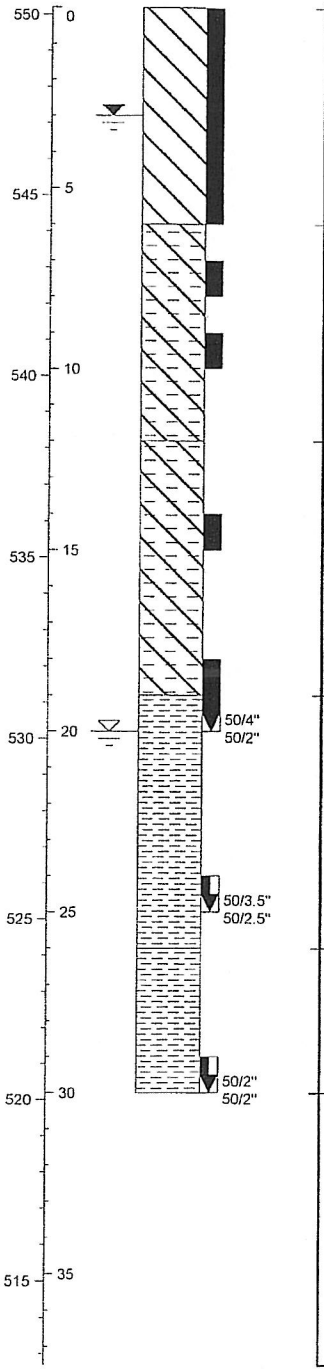
ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS & FIELD TEST DATA	DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
		Moderately hard dark gray SHALE w/ very hard limestone seams									
		Boring terminated at 70'									

Notes: Completion Depth: 70' *Failed along slickensided fracture

FIGURE:14

LOG OF BORING B-9

Project: DART I-3 - DFW Airport, Texas
Location: See Figure 1
Project No.: E09-0705
Date: 11/04/2009 Elev.: 550.2
Station: 675+93
Offset: 151.8' LT
Depth to water at completion of boring: 20'
North:
East:
Depth to water when checked: after 1 day
was: 3'3"
Depth to caving when checked:
was:



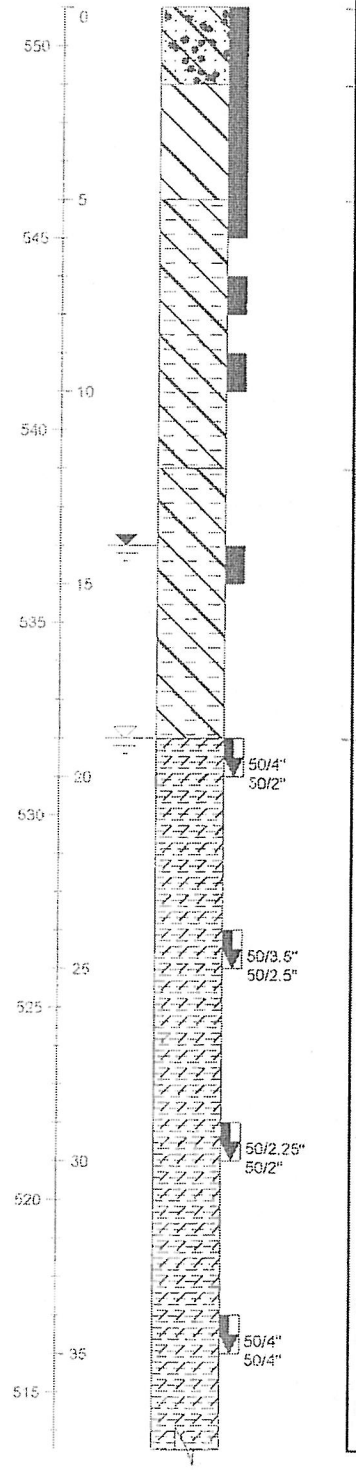
DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
Dark brown CLAY w/ olive brown clay seams (FILL)							2.6		
							2.25		
	27	67	24	43		92	2.25	4.4	7.5
							2.25		
							2.7		
							2.7		
Brownish yellow & gray shaley CLAY w/ bentonite seams, jointed	33	88	30	58			1.2		
							4.5	6.9	8.1
Olive brown, yellow & gray shaley CLAY w/ gypsum crystals, jointed									
-seepage at 14'							4.4		
Dark gray weathered SHALE w/ iron stained fractures & tan seams							4.5		
Dark gray weathered SHALE w/ iron stained fractures									
Boring terminated at 30'									

Notes: Completion Depth: 30'

FIGURE:15

LOG OF BORING B-9A

Project: DART I-3 - DFW Airport, Texas
Location: See Figure 1
Project No.: E09-0705
Date: 04/20/2010 Elev.: 551
Station: 675+85
Offset: 151.8' LT
Depth to water at completion of boring: 19'
Depth to water when checked: during drilling was: 14'
Depth to caving when checked: was:

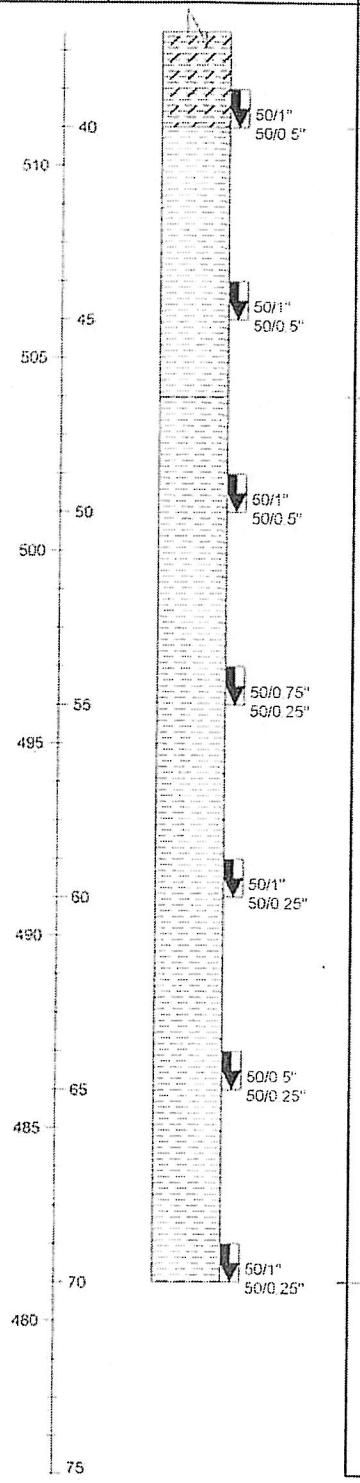


DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P PEN tsf	UNCON ksf	Strain %
Dark brown sandy gravelly CLAY w/ olive brown clay seams (FILL)							2.6 2.25		
Dark brown & olive brown CLAY (Possible FILL)							2.25 2.25 2.1		
Brownish yellow tan & gray shaley CLAY w/ Bentonite seams, jointed							1.6 1.2 4.5		
Olive brown, yellow & gray shaley CLAY w/ gypsum crystals, jointed -seepage at 14'							2.8		
Dark gray weathered SHALE w/ iron stained fractures & tan shaley clay layers, jointed							4.5		

Notes: Completion Depth: 70'

LOG OF BORING B-9A

Project: DART I-3 - DFW Airport, Texas
Location: See Figure 1
Project No.: E09-0705
Date: 04/20/2010 **Elev.:** 551
Station: 675+85
Offset: 151.8' LT
Depth to water at completion of boring: 19'
Depth to water when checked: during drilling was: 14'
Depth to caving when checked: was:

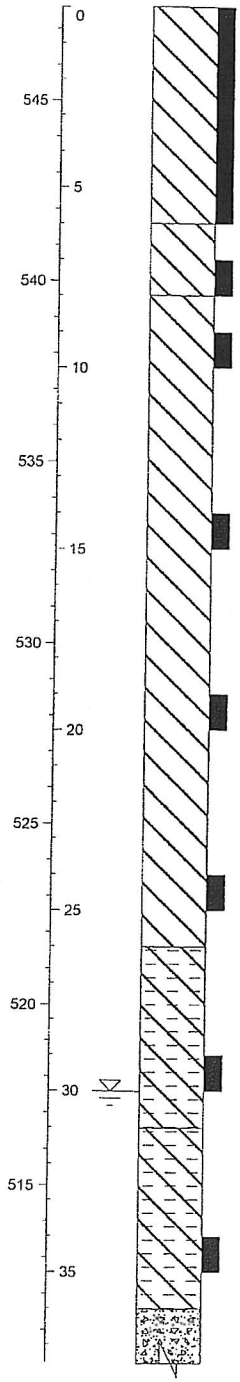


DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P PEN tsf	UNCON ksf	Strain %
Moderately hard dark gray SHALE									
Moderately hard dark gray SHALE w/ light gray hard sandstone seams									
Boring terminated at 70'									

Notes: **Completion Depth: 70'**

LOG OF BORING B-10

Project: DART I-3 - DFW Airport, Texas
Location: See Figure 1
Project No.: E09-0705
Date: 11/16/2009 Elev.: 547.6
Station: 691+56
Offset: 145.1' LT
Depth to water at completion of boring: 30'
North:
East:
Depth to water when checked:
was:
Depth to caving when checked:
was:



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS & FIELD TEST DATA	DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
		Dark brown & brown CLAY w/ dark gray clay seams (FILL)							2.5		
									2.5		
									1.9		
			28	77	27	50		92	1.5	3.0	5.5
									1.9		
									2.6		
		Yellowish brown & gray CLAY	28					96	1.9	3.7	12.0
		Brownish yellow & gray CLAY, jointed	28	56	20	36			1.3		
			28	74	25	49		95	2.5	4.9	10.3
									2.6		
									3.1		
		Olive brown & gray shaley CLAY w/ iron & sulfur seams, jointed	26	69	23	46		97	2.4	4.8	5.3
		Dark gray & tan shaley CLAY w/ sulfur seams & fine sand seams, fractured -seepage at 33'	30	88	32	56		93	4.1	7.5	4.2
		Olive gray cemented SAND									

Notes: Completion Depth: 70'

FIGURE:16

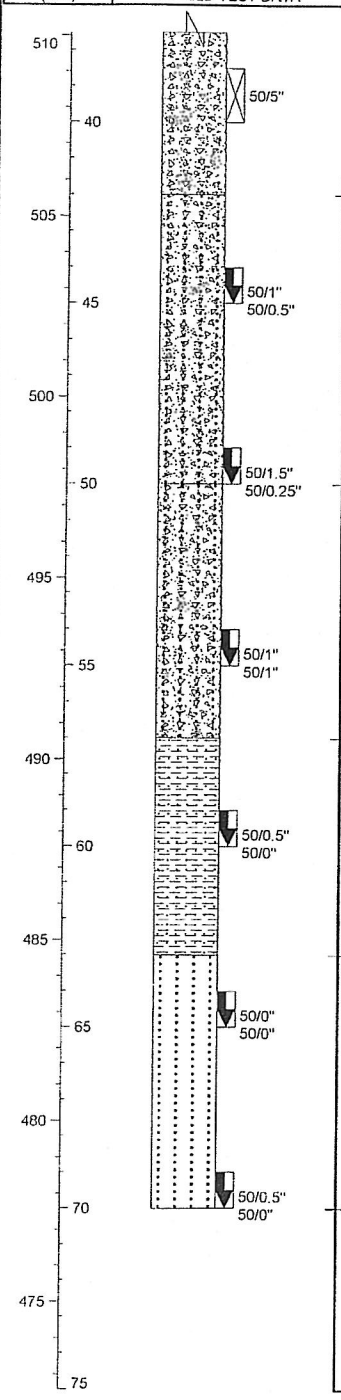
MTE, INC.

LOG OF BORING B-10

Project: DART I-3 - DFW Airport, Texas
Date: 11/16/2009 Elev.: 547.6
Depth to water at completion of boring: 30'
Depth to water when checked:
Depth to caving when checked:

Location: See Figure 1
Station: 691+56
North:
was:
was:

Project No.: E09-0705
Offset: 145.1' LT
East:



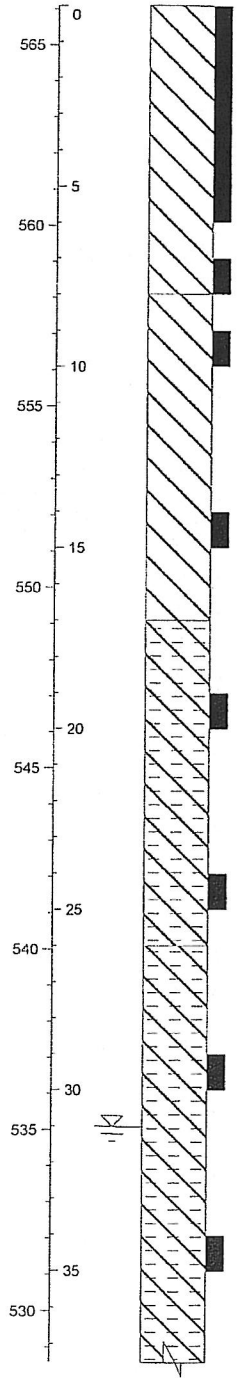
DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
Olive gray cemented SAND									
Light gray weakly cemented SANDSTONE									
Light gray weakly cemented SANDSTONE w/ very hard sandstone layers & sandy shale layers									
Moderately hard to hard gray sandy SHALE w/ cemented sand layers									
Very hard light gray SANDSTONE w/ cemented sand layers									
Boring terminated at 70'									

Notes: Completion Depth: 70'

FIGURE:17

LOG OF BORING B-11

Project: DART I-3 - DFW Airport, Texas
Location: See Figure 1
Project No.: E09-0705
Date: 11/18/2009 Elev.: 566.1
Station: 721+12
Offset: 32.6' LT
Depth to water at completion of boring: 31'
North:
East:
Depth to water when checked:
was:
Depth to caving when checked:
was:



DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
Brown CLAY w/ dark brown clay layers & yellow clay seams (FILL)							1.75		
							2.0		
	33	81	29	52		89	1.5	3.0	1.7
							2.25		
							2.6		
	31					92	2.1	3.5	2.6
	32	83	31	52			1.7		
Dark gray CLAY w/ occasional calcium nodules & iron nodules, jointed	26					97	3.2	5.7	7.5
	26	69	24	45		97	2.9	5.7	7.7
Medium gray & light gray shaley CLAY w/ brownish yellow shaley clay seams, jointed							2.8		
	27	81	30	51		98	2.4	3.9	2.3
Olive brown, yellow & gray shaley CLAY, jointed							4.1		
-seepage at 34'	30	88	32	56		93	4.0	7.6	4.2

Notes: Completion Depth: 70'

FIGURE:18

LOG OF BORING B-11

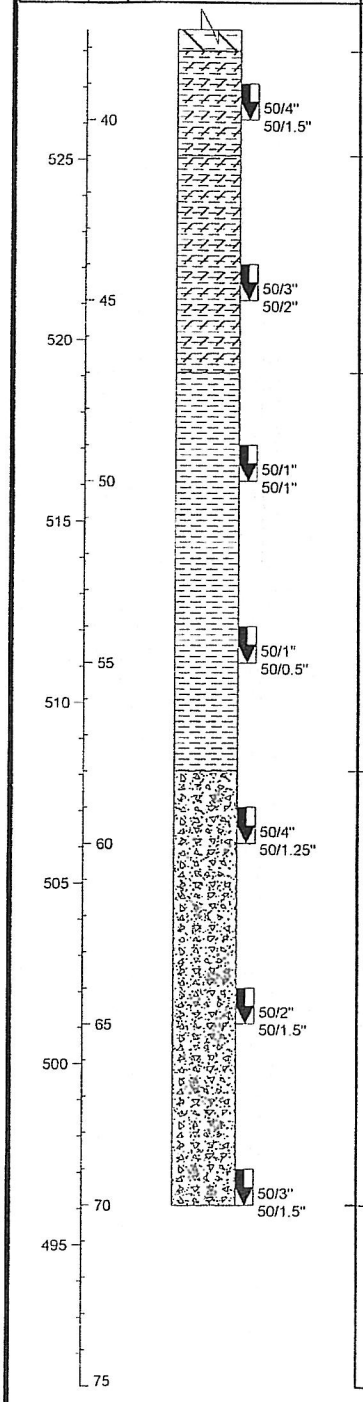
Project: DART I-3 - DFW Airport, Texas | Location: See Figure 1 | Project No.: E09-0705

Date: 11/18/2009 | Elev.: 566.1 | Station: 721+12 | Offset: 32.6' LT

Depth to water at completion of boring: 31' | North: | East:

Depth to water when checked: | was:

Depth to caving when checked: | was:



DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
Dark gray weathered SHALE w/ tan seams, fractured									
Dark gray weathered SHALE w/ iron stained fractures									
Moderately hard dark gray SHALE w/ hard limestone seams & sandstone seams									
Gray cemented SAND w/ hard sandstone seams									
Boring terminated at 70'									

Notes: Completion Depth: 70'

FIGURE:19

LOG OF BORING B-12

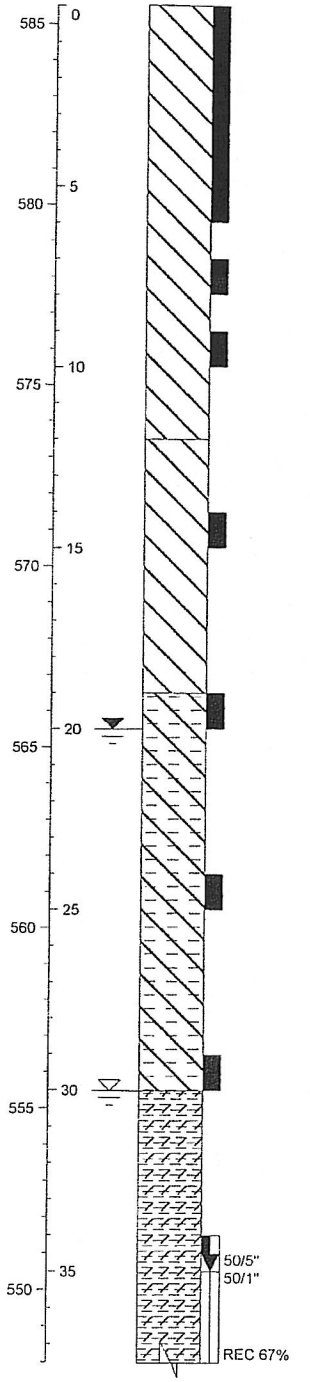
Project: DART I-3 - DFW Airport, Texas | Location: See Figure 1 | Project No.: E09-0705

Date: 11/10/2009 | Elev.: 585.5 | Station: 736+41 | Offset: 12.9' RT

Depth to water at completion of boring: 30' after bailing | North: | East:

Depth to water when checked: after 1 day | was: 20'

Depth to caving when checked: | was:



DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
Dark brown, brown & dark gray CLAY w/ yellowish brown clay layers (FILL)							3.75		
							1.9		
	34	81	30	51		87	1.5	2.6	3.8
							2.1		
							1.8		
							2.7		
-w/ yellowish brown shaley clay layers below 7'	22					103	4.5++		
	28					95	4.25	8.2	4.8
Olive brown & gray CLAY w/ calcareous nodules, jointed									
	22	66	23	43		102	4.5		
Olive brown & gray shaley CLAY w/ calcium deposits & gypsum crystals, jointed -seepage at 20'	32					89	4.4	5.8	3.8
							4.3		
-bentonite shale layer at 29' to 30'	49	116	42	74		69	1.7		
Dark gray weathered SHALE w/ tan seams & iron stained fractures									

Notes: Completion Depth: 70' *Slickensided fractures at 58' and 59'

FIGURE:20

MTE, INC.

LOG OF BORING B-12

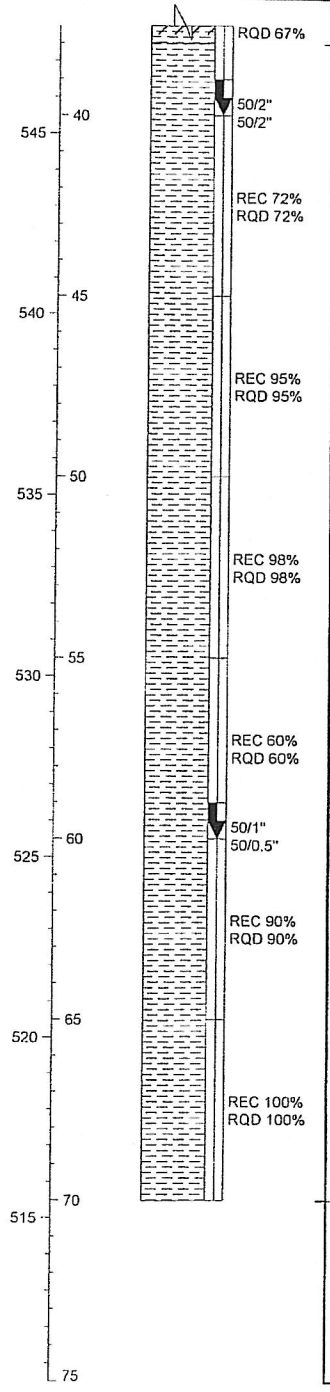
Project: DART I-3 - DFW Airport, Texas | Location: See Figure 1 | Project No.: E09-0705

Date: 11/10/2009 | Elev.: 585.5 | Station: 736+41 | Offset: 12.9' RT

Depth to water at completion of boring: 30' after bailing | North: | East:

Depth to water when checked: after 1 day | was: 20'

Depth to caving when checked: | was:



DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
Moderately hard dark gray SHALE									
Moderately hard dark gray SHALE w/ bentonite seams & very hard limestone seams	16					108		46.7	1.9
	16					112		87.2	1.8
-slickensided fracture at 58'									
-slickensided fracture at 59'									
-w/ cemented sand & hard sandstone seams below 63'	16					111		126.7	2.2
Boring terminated at 70'									

Notes: Completion Depth: 70' *Slickensided fractures at 58' and 59'

FIGURE:21

MTE, INC.

LOG OF BORING B-13

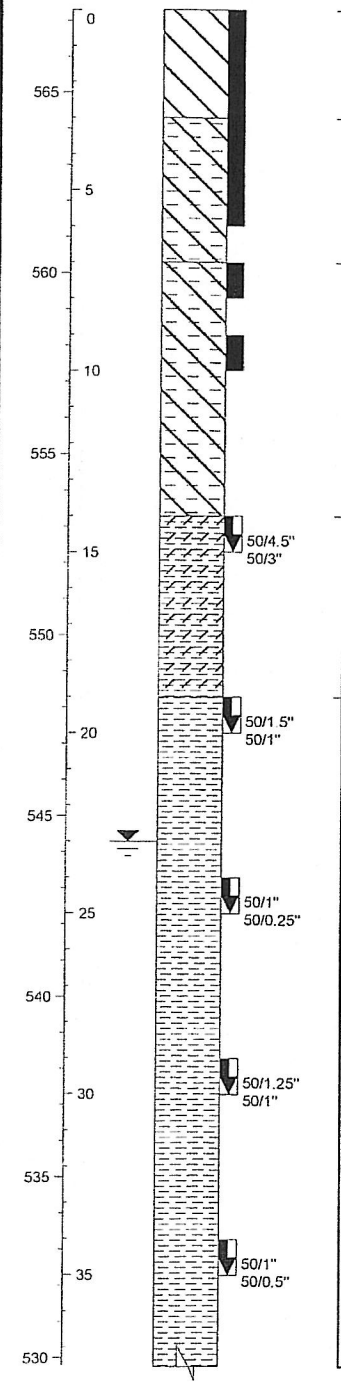
Project: DART I-3 - DFW Airport, Texas | Location: See Figure 1 | Project No.: E09-0705

Date: 11/17/2009 | Elev.: 567.3 | Station: 762+06 | Offset: 12.1' RT

Depth to water at completion of boring: 61' after bailing | North: | East:

Depth to water when checked: after 1 day | was: 23'

Depth to caving when checked: | was:



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS & FIELD TEST DATA	DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
		Dark brown & brownish yellow CLAY (FILL)							1.7		
			26	68	23	45		95	1.4	2.2	6.0
									1.7		
		Tan shaley CLAY w/ bentonite seams, jointed							3.5		
			33					88	3.6	5.8	7.1
									3.7		
		Olive brown and gray shaley CLAY, jointed							4.5++		
			34	85	35	50		87	4.5		
		-seepage at 13' during drilling									
		Dark gray weathered SHALE w/ iron stained fractures & tan seams									
		Moderately hard dark gray SHALE w/ hard limestone seams									

Notes: Completion Depth: 70'

FIGURE:22

LOG OF BORING B-13

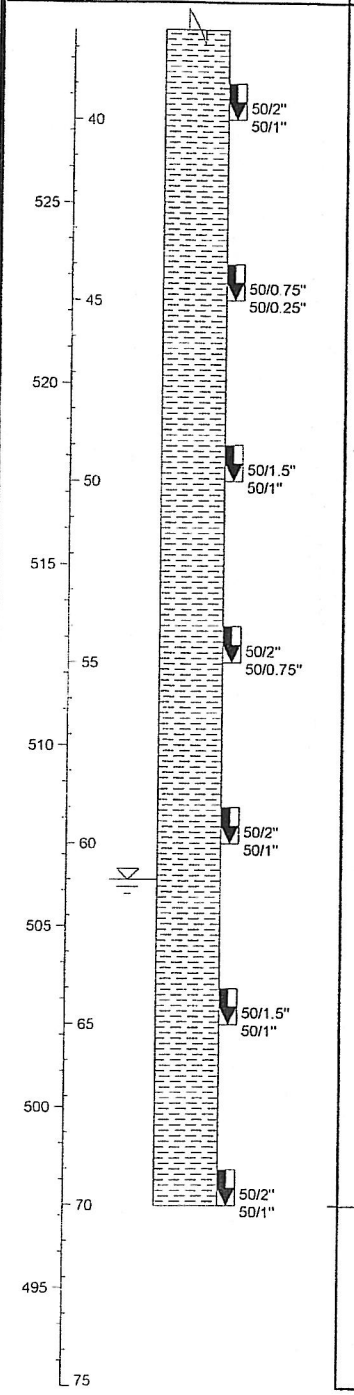
Project: DART I-3 - DFW Airport, Texas | Location: See Figure 1 | Project No.: E09-0705

Date: 11/17/2009 | Elev.: 567.3 | Station: 762+06 | Offset: 12.1' RT

Depth to water at completion of boring: 61' after bailing | North: | East:

Depth to water when checked: after 1 day | was: 23'

Depth to caving when checked: | was:



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS & FIELD TEST DATA	DESCRIPTION	MC %	LL %	PL %	PI	-200 %	DD pcf	P.PEN tsf	UNCON ksf	Strain %
		Moderately hard dark gray SHALE w/ hard limestone seams									
		Boring terminated at 70'									

Notes: Completion Depth: 70'

FIGURE:23

APPENDIX K. NOISE MODEL OUTPUT REPORT

****
Filename.....30802
Test Location.....
Employee Name.....
Employee Number.....
Department.....

DFW AIRPORT EXTENTION PROJECT
HAWTHORN SUITES HOTEL
AM PEAK HR 6:00 - 9:00 AM
OCTOBER 2009
DURATION 30:09

Calibrator Type.....
Calibrator Cal. Date...
****

METROSONICS db-3080 V1.12 SERIAL # 4028
REPORT PRINTED ON 12/15/09 at 10:36:55

User ID: 23844

URS Corp
612-370-0700

TOTAL INTERVALS.....121
INTERVAL LENGTH.....00:01:00

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....FAST
FILTER.....A WT.

PRE-TEST CALIBRATION RANGE...41.0 TO 141.0 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 29 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 73.7dB
Lav (80)..... 72.7dB
Lav (90)..... 72.6dB
SEL..... 106.2dB

TWA..... 61.7dB
TWA (80)..... 60.7dB
TWA (90)..... 60.6dB

Lmax..... 105.5dB 01/01/96 at 00:00:00
Lpk..... 129.6dB 01/01/96 at 00:00:00
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.11%
PROJ. DOSE (80).. 1.75%
DOSE (90)..... 0.11%
PROJ. DOSE (90).. 1.75%

<<< AMPLITUDE DISTRIBUTION REPORT FOR TEST NUMBER 1 OF 29 >>>

TOTAL SAMPLES: 115776

dB	SAMPLES	% OF TOTAL
54	66	0.06
55	4495	3.88
56	14787	12.77
57	16863	14.57
58	10884	9.40
59	9272	8.01
60	6934	5.99
61	7148	6.17
62	7803	6.74
63	6121	5.29
64	3735	3.23
65	3403	2.94
66	2618	2.26
67	2884	2.49
68	2123	1.83
69	2571	2.22
70	2052	1.77
71	1776	1.53
72	1420	1.23
73	1643	1.42
74	1439	1.24
75	1940	1.68
76	1167	1.01
77	923	0.80
78	756	0.65
79	483	0.42
80	196	0.17
81	115	0.10
82	26	0.02
83	2	0.00
84	2	0.00
85	2	0.00
86	2	0.00
87	2	0.00
88	2	0.00
89	2	0.00
90	1	0.00
91	2	0.00
92	2	0.00
93	2	0.00
94	1	0.00
95	2	0.00
96	2	0.00
97	2	0.00
98	2	0.00
99	2	0.00
100	1	0.00
101	3	0.00
102	81	0.07
103	8	0.01
104	6	0.01
105	2	0.00

Ln(-0.0) = 105dB
Ln(10.0) = 71dB
Ln(50.0) = 60dB
Ln(99.9) = 55dB

	NO CUTOFF	80dB CUTOFF	90dB CUTOFF
Lav(4)	67.9dB	62.4dB	61.9dB
Lav(5)	65.7dB	53.0dB	51.9dB
Lav(6)	64.6dB	44.1dB	42.1dB

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**********************************************************************
Filename..............30802
Test Location.........
Employee Name.........
Employee Number.......
Department............

Calibrator Type.......
Calibrator Cal. Date...
**********************************************************************
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DFW AIRPORT EXTENSION PROJECT
SLEEP INN DFW
AM PEAK HOUR 8:00 - 9:00 AM
DURATION: 30:02

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METROSONICS db-3080  V1.12  SERIAL # 4028
REPORT PRINTED ON 12/15/09 at 10:38:34

User ID: 23844

URS Corp
612-370-0700



TOTAL INTERVALS......121
INTERVAL LENGTH......00:01:00

AUTO STOP............NO
CLOCK SYNCH..........YES
RESPONSE RATE........FAST
FILTER...............A WT.

PRE-TEST CALIBRATION RANGE...41.0 TO 141.0 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE


<<< SUMMARY REPORT FOR TEST NUMBER 2 OF 29 >>>

EXCHANGE RATE.........3dB
CUTOFFS.................. 80dB  90dB
CEILING..............115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav.............  64.1dB
Lav ( 80).......  46.0dB
Lav ( 90).......  41.0dB
SEL.............  96.5dB

TWA.............  52.1dB
TWA ( 80).......  41.0dB
TWA ( 90).......  41.0dB

Lmax............  81.5dB  01/01/96 at 00:21:01
Lpk............UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE ( 80)........     0.00%
PROJ. DOSE ( 80)..     0.00%
DOSE ( 90)........     0.00%
PROJ. DOSE ( 90)..     0.00%
```

<<< AMPLITUDE DISTRIBUTION REPORT FOR TEST NUMBER 2 OF 29 >>>

TOTAL SAMPLES: 115328

dB	SAMPLES	% OF TOTAL
52	7	0.01
53	543	0.47
54	4582	3.97
55	11563	10.03
56	12729	11.04
57	15385	13.34
58	12365	10.72
59	13143	11.40
60	8432	7.31
61	7861	6.82
62	4620	4.01
63	4414	3.83
64	2992	2.59
65	3032	2.63
66	2254	1.95
67	2132	1.85
68	1794	1.56
69	1441	1.25
70	859	0.74
71	1011	0.88
72	1093	0.95
73	965	0.84
74	686	0.59
75	656	0.57
76	387	0.34
77	253	0.22
78	68	0.06
79	22	0.02
80	30	0.03
81	9	0.01

Ln(-0.0) = 81dB
Ln(10.0) = 66dB
Ln(50.0) = 59dB
Ln(99.9) = 53dB

	NO CUTOFF	80dB CUTOFF	90dB CUTOFF
Lav(4)	62.4dB	41.0dB	41.0dB
Lav(5)	61.7dB	41.0dB	41.0dB
Lav(6)	61.3dB	41.0dB	41.0dB

****
Filename.....30802
Test Location.....
Employee Name.....
Employee Number.....
Department.....

DFW AIRPORT EXTENSION PROJECT
HAWTHORN SUITES HOTEL
MIDDAY PEAK 10:00AM - 2:00PM
OCTOBER 2009
DURATION: 30:40

Calibrator Type.....
Calibrator Cal. Date...
****

METROSONICS db-3080 V1.12 SERIAL # 4028
REPORT PRINTED ON 12/15/09 at 10:39:38

User ID: 23844

URS Corp
612-370-0700

TOTAL INTERVALS.....123
INTERVAL LENGTH.....00:01:00

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....FAST
FILTER.....A WT.

PRE-TEST CALIBRATION RANGE...41.0 TO 141.0 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 3 OF 29 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 66.8dB
Lav (80)..... 64.3dB
Lav (90)..... 64.0dB
SEL..... 99.4dB

TWA..... 54.9dB
TWA (80)..... 52.4dB
TWA (90)..... 52.1dB

Lmax..... 105.1dB 01/01/96 at 00:00:00
Lpk..... 133.8dB 01/01/96 at 00:00:00
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.01%
PROJ. DOSE (80).. 0.15%
DOSE (90)..... 0.01%
PROJ. DOSE (90).. 0.15%

<<< AMPLITUDE DISTRIBUTION REPORT FOR TEST NUMBER 3 OF 29 >>>

TOTAL SAMPLES: 117760

dB	SAMPLES	% OF TOTAL
49	7	0.01
50	834	0.71
51	8521	7.24
52	11000	9.34
53	15135	12.85
54	10790	9.16
55	12200	10.36
56	10888	9.25
57	9598	8.15
58	6010	5.10
59	6221	5.28
60	4113	3.49
61	4194	3.56
62	2528	2.15
63	2196	1.86
64	1524	1.29
65	1583	1.34
66	1220	1.04
67	1240	1.05
68	1018	0.86
69	1002	0.85
70	782	0.66
71	874	0.74
72	771	0.65
73	863	0.73
74	700	0.59
75	651	0.55
76	440	0.37
77	426	0.36
78	196	0.17
79	87	0.07
80	26	0.02
81	43	0.04
82	17	0.01
83	11	0.01
84	8	0.01
85	3	0.00
86	1	0.00
87	2	0.00
88	2	0.00
89	2	0.00
90	2	0.00
91	1	0.00
92	2	0.00
93	2	0.00
94	2	0.00
95	3	0.00
96	4	0.00
97	3	0.00
98	2	0.00
99	2	0.00
100	2	0.00
101	2	0.00
102	2	0.00
103	2	0.00
104	1	0.00
105	1	0.00

Ln(-0.0) = 105dB
Ln(10.0) = 65dB
Ln(50.0) = 56dB
Ln(99.9) = 50dB

	NO CUTOFF	80dB CUTOFF	90dB CUTOFF
Lav(4)	62.2dB	52.4dB	51.3dB
Lav(5)	60.6dB	41.6dB	41.0dB
Lav(6)	59.7dB	41.0dB	41.0dB

****
Filename.....30802
Test Location.....
Employee Name.....
Employee Number.....
Department.....

DFW AIRPORT EXTENSION PROJECT
SLEEP INN DFW
MIDDAY PEAK 10:00AM - 2:00PM
OCTOBER 2009
DURATION: 30:38

Calibrator Type.....
Calibrator Cal. Date...
****

METROSONICS db-3080 V1.12 SERIAL # 4028
REPORT PRINTED ON 12/15/09 at 10:39:57

User ID: 23844

URS Corp
612-370-0700

TOTAL INTERVALS.....123
INTERVAL LENGTH.....00:01:00

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....FAST
FILTER.....A WT.

PRE-TEST CALIBRATION RANGE...41.0 TO 141.0 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 4 OF 29 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 66.9dB
Lav (80)..... 65.2dB
Lav (90)..... 65.1dB
SEL..... 99.5dB

TWA..... 55.0dB
TWA (80)..... 53.3dB
TWA (90)..... 53.2dB

Lmax..... 100.7dB 01/01/96 at 00:00:00
Lpk..... 115.6dB 01/01/96 at 00:00:00
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.02%
PROJ. DOSE (80).. 0.31%
DOSE (90)..... 0.02%
PROJ. DOSE (90).. 0.31%

<<< AMPLITUDE DISTRIBUTION REPORT FOR TEST NUMBER 4 OF 29 >>>

TOTAL SAMPLES: 117632

dB	SAMPLES	% OF TOTAL
47	634	0.54
48	2891	2.46
49	6881	5.85
50	6980	5.93
51	10653	9.06
52	10002	8.50
53	10621	9.03
54	7979	6.78
55	9351	7.95
56	7357	6.25
57	7146	6.07
58	5195	4.42
59	5551	4.72
60	3832	3.26
61	3453	2.94
62	2303	1.96
63	2528	2.15
64	1766	1.50
65	2027	1.72
66	1610	1.37
67	1771	1.51
68	1353	1.15
69	1360	1.16
70	962	0.82
71	937	0.80
72	738	0.63
73	594	0.50
74	365	0.31
75	318	0.27
76	170	0.14
77	105	0.09
78	71	0.06
79	41	0.03
80	25	0.02
81	2	0.00
82	1	0.00
83	2	0.00
84	2	0.00
85	2	0.00
86	2	0.00
87	2	0.00
88	2	0.00
89	2	0.00
90	2	0.00
91	1	0.00
92	2	0.00
93	2	0.00
94	2	0.00
95	2	0.00
96	2	0.00
97	2	0.00
98	1	0.00
99	5	0.00
100	24	0.02

Ln(-0.0) = 100dB
Ln(10.0) = 65dB

Ln(50.0) = 55dB
Ln(99.9) = 47dB

	NO CUTOFF	80dB CUTOFF	90dB CUTOFF
Lav(4)	61.6dB	53.4dB	53.0dB
Lav(5)	59.8dB	42.4dB	41.6dB
Lav(6)	58.9dB	41.0dB	41.0dB

****
Filename.....30802
Test Location.....
Employee Name.....
Employee Number.....
Department.....

DFW AIRPORT EXTENSION PROJECT
HAWTHORN SUITES HOTEL
PM PEAK 3:00-6:00 PM
OCTOBER 2009
DURATION: 31:26

Calibrator Type.....
Calibrator Cal. Date...
****

METROSONICS db-3080 V1.12 SERIAL # 4028
REPORT PRINTED ON 12/15/09 at 10:40:21

User ID: 23844

URS Corp
612-370-0700

TOTAL INTERVALS.....126
INTERVAL LENGTH.....00:01:00

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....FAST
FILTER.....A WT.

PRE-TEST CALIBRATION RANGE...41.0 TO 141.0 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 5 OF 29 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 66.9dB
Lav (80)..... 63.2dB
Lav (90)..... 62.7dB
SEL..... 99.5dB

TWA..... 55.1dB
TWA (80)..... 51.4dB
TWA (90)..... 50.9dB

Lmax..... 100.3dB 01/01/96 at 00:00:00
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.01%
PROJ. DOSE (80).. 0.15%
DOSE (90)..... 0.01%
PROJ. DOSE (90).. 0.15%

<<< AMPLITUDE DISTRIBUTION REPORT FOR TEST NUMBER 5 OF 29 >>>

TOTAL SAMPLES: 120704

dB	SAMPLES	% OF TOTAL
51	854	0.71
52	7172	5.94
53	14781	12.25
54	9853	8.16
55	11228	9.30
56	9778	8.10
57	10339	8.57
58	7532	6.24
59	7962	6.60
60	4836	4.01
61	5012	4.15
62	3702	3.07
63	3742	3.10
64	2461	2.04
65	2782	2.30
66	2103	1.74
67	2517	2.09
68	2470	2.05
69	2485	2.06
70	1942	1.61
71	2216	1.84
72	1153	0.96
73	1132	0.94
74	839	0.70
75	722	0.60
76	347	0.29
77	312	0.26
78	122	0.10
79	109	0.09
80	70	0.06
81	49	0.04
82	23	0.02
83	13	0.01
84	2	0.00
85	2	0.00
86	2	0.00
87	2	0.00
88	2	0.00
89	2	0.00
90	1	0.00
91	2	0.00
92	2	0.00
93	2	0.00
94	2	0.00
95	2	0.00
96	2	0.00
97	2	0.00
98	4	0.00
99	8	0.01
100	7	0.01

Ln(-0.0) = 100dB
Ln(10.0) = 68dB
Ln(50.0) = 57dB
Ln(99.9) = 51dB

NO CUTOFF 80dB CUTOFF 90dB CUTOFF

Lav(4)	63.5dB	51.9dB	50.3dB
Lav(5)	62.2dB	41.6dB	41.0dB
Lav(6)	61.5dB	41.0dB	41.0dB

****
Filename.....30802
Test Location.....
Employee Name.....
Employee Number.....
Department.....

DFW AIRPORT EXTENSION PROJECT
SLEEP INN DFW
PM PEAK 3:00 - 6:00 PM
OCTOBER 2009
DURATION: 30:02

Calibrator Type.....
Calibrator Cal. Date...
****

METROSONICS db-3080 V1.12 SERIAL # 4028
REPORT PRINTED ON 12/15/09 at 10:40:39

User ID: 23844

URS Corp
612-370-0700

TOTAL INTERVALS.....121
INTERVAL LENGTH.....00:01:00

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....FAST
FILTER.....A WT.

PRE-TEST CALIBRATION RANGE...41.0 TO 141.0 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 6 OF 29 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 66.5dB
Lav (80)..... 65.1dB
Lav (90)..... 65.1dB
SEL..... 99.0dB

TWA..... 54.5dB
TWA (80)..... 53.2dB
TWA (90)..... 53.1dB

Lmax..... 99.1dB 01/01/96 at 00:00:00
Lpk..... 112.3dB 01/01/96 at 00:00:00
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.02%
PROJ. DOSE (80).. 0.31%
DOSE (90)..... 0.01%
PROJ. DOSE (90).. 0.15%

<<< AMPLITUDE DISTRIBUTION REPORT FOR TEST NUMBER 6 OF 29 >>>

TOTAL SAMPLES: 115328

dB	SAMPLES	% OF TOTAL
48	551	0.48
49	4757	4.12
50	7125	6.18
51	11223	9.73
52	8946	7.76
53	9943	8.62
54	9509	8.25
55	9022	7.82
56	6513	5.65
57	6573	5.70
58	5887	5.10
59	7033	6.10
60	4561	3.95
61	4573	3.97
62	3322	2.88
63	3361	2.91
64	2182	1.89
65	2217	1.92
66	1813	1.57
67	1801	1.56
68	1023	0.89
69	976	0.85
70	637	0.55
71	634	0.55
72	363	0.31
73	396	0.34
74	156	0.14
75	90	0.08
76	46	0.04
77	9	0.01
78	1	0.00
79	2	0.00
80	2	0.00
81	2	0.00
82	2	0.00
83	2	0.00
84	2	0.00
85	2	0.00
86	2	0.00
87	2	0.00
88	1	0.00
89	2	0.00
90	2	0.00
91	2	0.00
92	2	0.00
93	2	0.00
94	1	0.00
95	3	0.00
96	1	0.00
97	32	0.03
98	18	0.02
99	1	0.00

Ln(-0.0) = 99dB
Ln(10.0) = 64dB
Ln(50.0) = 55dB
Ln(99.9) = 48dB

	NO CUTOFF	80dB CUTOFF	90dB CUTOFF
Lav(4)	61.2dB	53.7dB	53.5dB
Lav(5)	59.4dB	43.1dB	42.7dB
Lav(6)	58.6dB	41.0dB	41.0dB

****
Filename.....30802
Test Location.....
Employee Name.....
Employee Number.....
Department.....

DFW AIRPORT EXTENSION PROJECT
SLEEP INN DFW
EVENING PEAK 10:00 PM - 12:00 AM
OCTOBER 2009
DURATION : 30:07

Calibrator Type.....
Calibrator Cal. Date...
****

METROSONICS db-3080 V1.12 SERIAL # 4028
REPORT PRINTED ON 12/15/09 at 10:40:57

User ID: 23844

URS Corp
612-370-0700

TOTAL INTERVALS.....121
INTERVAL LENGTH.....00:01:00

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....FAST
FILTER.....A WT.

PRE-TEST CALIBRATION RANGE...41.0 TO 141.0 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 7 OF 29 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 66.6dB
Lav (80)..... 65.1dB
Lav (90)..... 65.0dB
SEL..... 99.0dB

TWA..... 54.6dB
TWA (80)..... 53.1dB
TWA (90)..... 53.0dB

Lmax..... 98.4dB 01/01/96 at 00:00:00
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.01%
PROJ. DOSE (80).. 0.15%
DOSE (90)..... 0.01%
PROJ. DOSE (90).. 0.15%

<<< AMPLITUDE DISTRIBUTION REPORT FOR TEST NUMBER 7 OF 29 >>>

TOTAL SAMPLES: 115648

dB	SAMPLES	% OF TOTAL
49	5	0.00
50	1857	1.61
51	14231	12.31
52	13257	11.46
53	16198	14.01
54	12513	10.82
55	12577	10.88
56	8783	7.59
57	6468	5.59
58	3250	2.81
59	4249	3.67
60	2543	2.20
61	2294	1.98
62	1811	1.57
63	2062	1.78
64	1606	1.39
65	1930	1.67
66	1650	1.43
67	1712	1.48
68	1672	1.45
69	1670	1.44
70	1118	0.97
71	972	0.84
72	425	0.37
73	287	0.25
74	195	0.17
75	113	0.10
76	50	0.04
77	34	0.03
78	17	0.01
79	5	0.00
80	15	0.01
81	2	0.00
82	2	0.00
83	2	0.00
84	2	0.00
85	2	0.00
86	1	0.00
87	2	0.00
88	2	0.00
89	2	0.00
90	2	0.00
91	1	0.00
92	2	0.00
93	2	0.00
94	2	0.00
95	3	0.00
96	2	0.00
97	4	0.00
98	44	0.04

Ln(-0.0) = 98dB
Ln(10.0) = 65dB
Ln(50.0) = 54dB
Ln(99.9) = 50dB

NO CUTOFF 80dB CUTOFF 90dB CUTOFF

Lav(4)	61.3dB	54.0dB	53.7dB
Lav(5)	59.4dB	43.4dB	42.9dB
Lav(6)	58.5dB	41.0dB	41.0dB

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**********************************************************************
Filename.............30802
Test Location.........
Employee Name.........
Employee Number.......
Department............
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DFW AIRPORT EXTENSION PROJECT
HAWTHORN SUITES HOTEL
EVENING PEAK 10:00PM - 12:00AM
OCTOBER 2009
DURATION : 30:03

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Calibrator Type.......
Calibrator Cal. Date...
**********************************************************************

METROSONICS db-3080  V1.12  SERIAL # 4028
REPORT PRINTED ON 12/15/09 at 10:41:18

User ID: 23844

URS Corp
612-370-0700



TOTAL INTERVALS......121
INTERVAL LENGTH......00:01:00

AUTO STOP............NO
CLOCK SYNCH..........YES
RESPONSE RATE........FAST
FILTER...............A WT.

PRE-TEST CALIBRATION RANGE...41.0 TO 141.0 dB
POST-TEST CALIBRATION RANGE...54.8 TO 154.8
CUTOFF USED FOR TIME HISTORY Lav...NONE


<<< SUMMARY REPORT FOR TEST NUMBER 8 OF 29 >>>

EXCHANGE RATE..........3dB
CUTOFFS................. 80dB  90dB
CEILING.................115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav.............  67.1dB
Lav ( 80).......  66.4dB
Lav ( 90).......  66.4dB
SEL.............  99.6dB

TWA.............  55.1dB
TWA ( 80).......  54.5dB
TWA ( 90).......  54.4dB

Lmax........... 100.7dB  01/01/96 at 00:00:00
Lpk............UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE ( 80)........     0.02%
PROJ. DOSE ( 80)..     0.31%
DOSE ( 90)........     0.02%
PROJ. DOSE ( 90)..     0.31%
```

<<< AMPLITUDE DISTRIBUTION REPORT FOR TEST NUMBER 8 OF 29 >>>

TOTAL SAMPLES: 115392

dB	SAMPLES	% OF TOTAL
52	470	0.41
53	9035	7.83
54	7003	6.07
55	25493	22.09
56	23869	20.69
57	21959	19.03
58	8161	7.07
59	5841	5.06
60	3648	3.16
61	3384	2.93
62	1470	1.27
63	1108	0.96
64	669	0.58
65	648	0.56
66	790	0.68
67	616	0.53
68	387	0.34
69	358	0.31
70	193	0.17
71	91	0.08
72	31	0.03
73	22	0.02
74	29	0.03
75	32	0.03
76	4	0.00
77	2	0.00
78	1	0.00
79	2	0.00
80	2	0.00
81	2	0.00
82	2	0.00
83	2	0.00
84	1	0.00
85	3	0.00
86	1	0.00
87	2	0.00
88	2	0.00
89	2	0.00
90	2	0.00
91	2	0.00
92	1	0.00
93	2	0.00
94	2	0.00
95	2	0.00
96	2	0.00
97	3	0.00
98	3	0.00
99	5	0.00
100	33	0.03

Ln(-0.0) = 100dB
Ln(10.0) = 60dB
Ln(50.0) = 56dB
Ln(99.9) = 52dB

	NO CUTOFF	80dB CUTOFF	90dB CUTOFF
Lav(4)	60.4dB	54.9dB	54.7dB

Lav(5)	58.4dB	44.1dB	43.7dB
Lav(6)	57.8dB	41.0dB	41.0dB

APPENDIX L. AERONAUTICAL ASSESSMENT FOR RAIL ACCESS ONTO DFW AIRPORT

JACOBS

January 3, 2011

Mr. John Hoppie
Dallas Area Rapid Transit
Program Manager
1401 Pacific Avenue
Dallas, Texas 75202

Attn: Mr. John Hoppie

Subject: DART I-3 Rail Access Aeronautical Assessment Findings Supplement

Dear Mr. Hoppie:

Jacobs Engineering Group Inc. in June 2010, completed an aeronautical assessment for the potential aeronautical effects of the proposed DART I-3 Rail system onto the Dallas Fort Worth International Airport (DFW). The study was based on a 10% design level for the proposed project. The results of that study provided positive results for the project to go forward, as well as technical guidance for the designers, DFW Airport and the Federal Aviation Administration (FAA).

Additional analysis and assessments has since been performed based on preliminary questions that have arisen as a part of the formal environmental review process with the FAA and Federal Transit Authority (FTA). A summary of those efforts and their findings are summarized as follows;

1. **Obstruction Lighting** - The DART I-3 alignment will cross under and near the runway approach and departure paths to DFW Runways 17L/35R, 17C/35C and 17R/35L. The DART infrastructure (Catenary Poles and Wires) will need to be obstruction (OB) lighted, to provide enhanced safety awareness to aircraft and pilots. The OB lights will be positioned on top of the catenary poles and will have an unobstructed illumination by other catenary infrastructure to the runway threshold and approach path. Figures 1 and 2, attached to this technical memorandum, provide the preliminary locations where the OB lights will be required.

2. **Microwave Communication Path** - The DART I-3 alignment will cross under and near a FAA microwave communication path. This microwave path contains critical FAA communications and data that must be protected. Microwave paths transmit their signals to and from designated sites within a cylinder, for the most part. Limited penetration by objects into the cylinder, are acceptable, but are determined based on the actual size and type of object and the amount of penetration. Preliminary analysis indicates that the preliminary DART I-3 designed path will be less of an adverse obstruction to the microwave path than the existing DFW Hyatt Hotel, Figure 3. Once the final design of the I-3 route in the specific area has been finalized, simple simulation using trucks could be used to quantify the potential effect with FAA assistance.

3. **Navigational Aid Signal Interference** – The Runway 31R Localizer provides lateral course information to landing aircraft. Adverse reflections of the localizers signals off of some objects can impact the operations of these navigational systems. Jacobs

developed and performed, in conjunction with the FAA Technical Center, math modeling for the propagated localizer signals. The proposed DART I-3 rail vehicles will cause an increase in distortion of the propagated signal, to a point that is considered "significant" by the FAA. The FAA (Air Traffic Organization) is planning on replacing the existing system in the summer of 2011 with a more enhanced system that will not be affected by these types of reflections. Jacobs will assist DART in monitoring and facilitating the progress of the Runway 31R Localizer upgrade.

4. **Airport Surface Detection Radar Equipment (ASDE)** – Jacobs developed exhibits for coordination and evaluation with the FAA's Systems Engineering Group (ATO-W), to assess the potential impacts from the proposed I-3 rail route and operations. These systems are sometimes susceptible to signals being reflected off of buildings, aircraft or vehicles, that may indicate to an air traffic controller, a false aircraft. The FAA's ATO-W engineer indicated that there is a slim chance that this could occur on the Holding Bay for Runway 17R, as shown in Figure 4. ATO-W advised that this is not unusual to occur with various airport development projects and if found, would require optimization to be performed by their staff engineers. Jacobs will monitor the projects development and coordinate with local FAA and ATO-W for scheduled assessments and mitigation, as required.

5. **Airspace Feasibility Study -** A preliminary airspace study was completed to provide various FAA lines of business an opportunity to evaluate the feasibility of the proposed project, based on a 10% design level. There were no adverse comments identified by the FAA. Once the projects designs reach the 75% level, additional airspace studies will be required for processing with the FAA for the both the permanent features and the associated construction equipment to build the I-3.

Jacobs believes that the analysis and assessments that have been completed, the aeronautical issues identified and will be mitigated in a predictable manner, so that the national airspace system will not be compromised. Jacobs will proactively assist DART through this process to ensure the desired operational outcomes.

If you have any questions or comments, please feel free to call me at 817-735-6776.

Sincerely,

Richard K. Compton

Richard K. Compton
Senior Program Manager
Transportation / Aviation
Jacobs Engineering Group Inc.

enclosure: DART Supporting Figures1 through 4

Figure 1
Caternary Pole Obstruction Lighting Area
Runways 17R & 17C

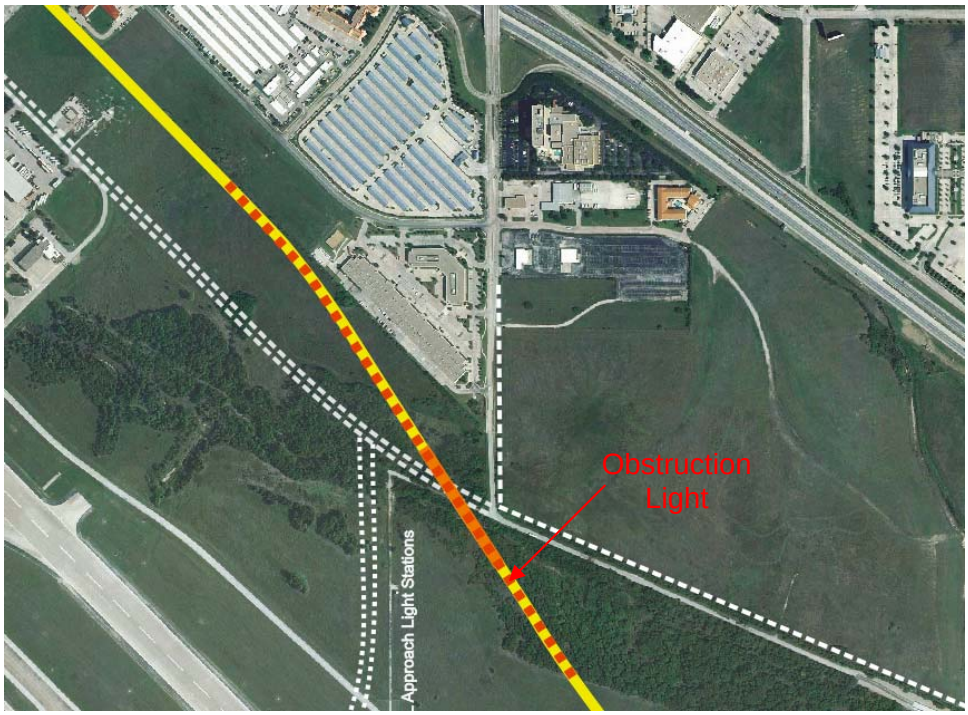


Figure 2
Caternary Pole Obstruction Lighting Area
Runway 17L

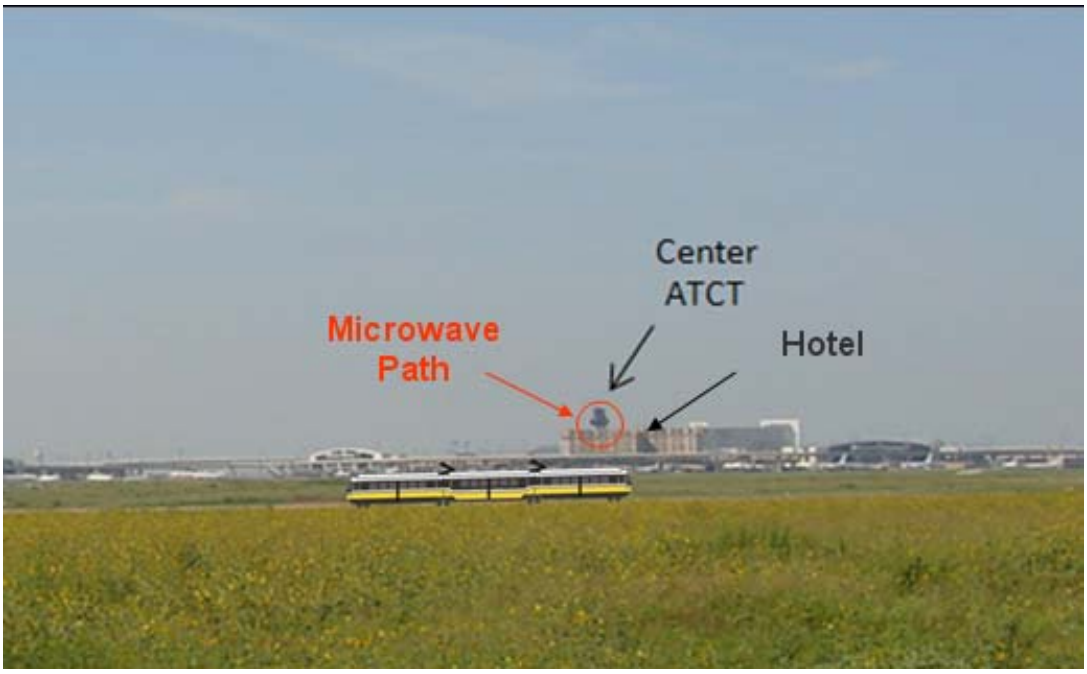


Figure 3
Microwave Communication Path

Figure 4
ASDE and Aircraft Holding Apron

Assessment and Analysis of Potential Operational Impacts from the proposed Dallas Area Rapid Transit (DART) Light Rail Access, I-3 Route, onto the Dallas/Fort Worth International Airport

June 2010

Prepared by:
Richard K. Compton
Sr. Program Manager for Aviation
Jacobs Engineering Group Inc.
777 Main Street
Fort Worth, Texas 76102

JACOBS™

Abstract

The Dallas Area Rapid Transit (DART) is in planning a dual track route onto the Dallas/Fort Worth International Airport (DFW) to a termination point at Terminal A. To achieve federal approval for this project, an Environmental Assessment and other associated analysis and assessments must be successfully accomplished and approved by the regulatory agencies as well as DFW. This report provides those agencies and stakeholders, key decision making information towards the approval of the planned DART project.

This report specifically provides the results of analysis and assessments of: Airport Design Standards, Airport Airspace, Terminal Instrument Procedures, Part 77 – Objects Affecting Navigable Airspace, Navigations Systems, Airport & Airfield Operations, Airport Tennant Infrastructure and Facilities, Human Factors and FAA Safety Risk Management Decision Documentation.

Some systems, such as the FAA's Airport Surface Detection Equipment (ASDE), cannot be completely modeled for every planned scenario. The FAA will further assess and analyze the ASDE system as the construction and operations begin for any operational issues and impacts that will require further mitigation. This mitigation could require immediate actions by the proponent and could impact selected construction activities until mitigated.

Human Factors visual scene issues were identified for aircraft operations on the North East End Around Taxiway (NE EAT) system. Preliminary mitigation options have been identified that would minimize those identified affects.

The results of the analysis and assessments performed, concludes that the proposed DART route and operations should not adversely affect airport or aircraft operations for the proposed I-3 Route. Mitigation has been identified in this report for selected features and systems which will be required as a part of the project approval and implementation.

Table of Contents

List of Figures

List of Tables

List of Terms

Introduction

The Dallas Area Rapid Transit (DART) is in planning a dual track route onto the Dallas/Fort Worth International Airport (DFW) to a termination point at Terminal A, as shown in Figure 1. To meet federal approval of this plan, an Environmental Assessment and other associated analysis and assessments must be successfully accomplished and approved by the regulatory agencies as well as DFW. This report provides those agencies and stakeholders key decision making information towards the approval of the planned DART project.

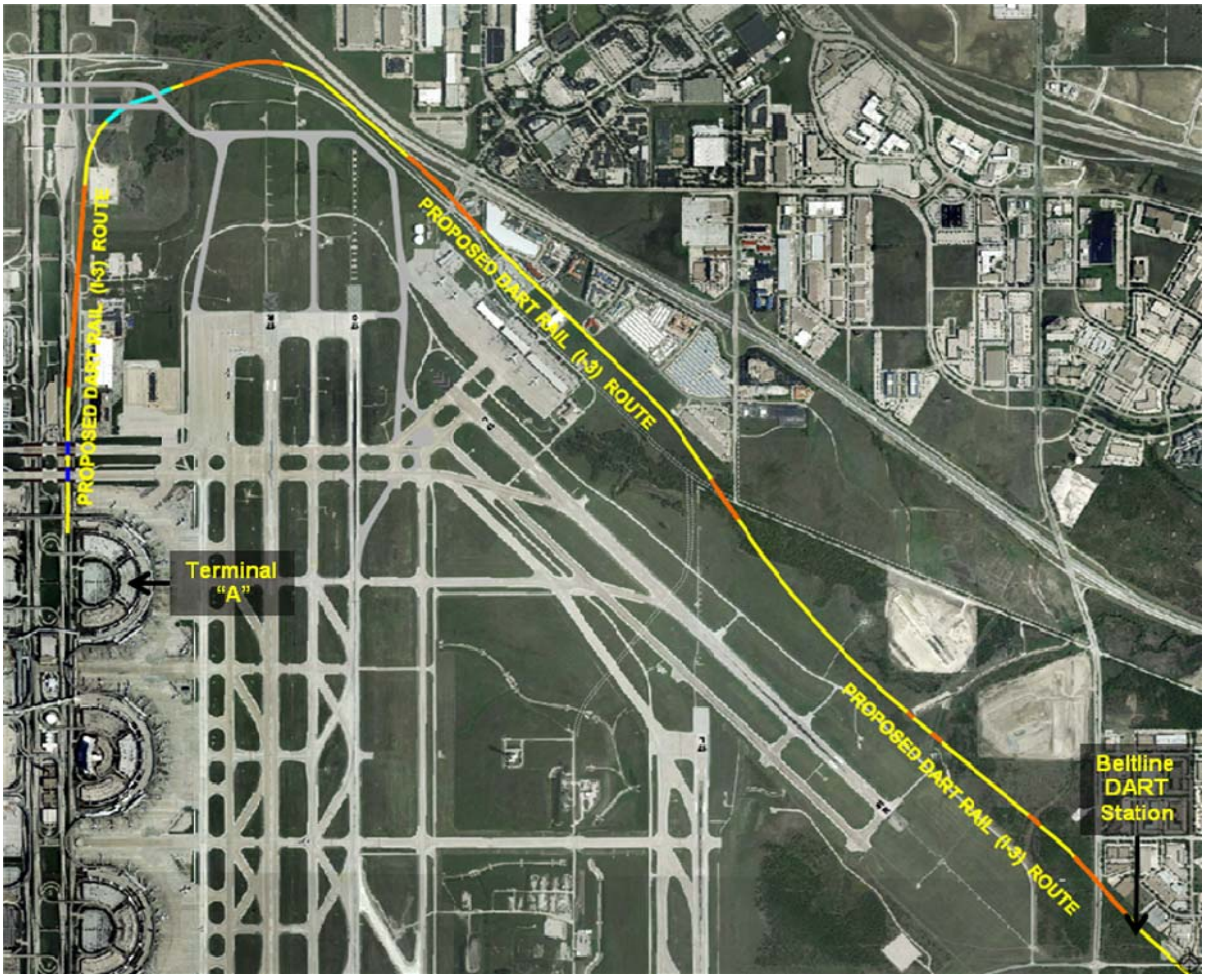


Figure 1: Proposed DART Rail Route

Jacobs Engineering Group Inc. (Jacobs) was selected to assess and analyze various aeronautical aspects of the proposed project to understand those potential affects, the resulting impacts and potential mitigation strategies.

Jacobs has identified in this report, 17 issues that will need to be addressed for the environmental assessment approval.

Previous Studies

DFW initiated 2 previous studies beginning in 2007 on various proposed DART routes that have been very beneficial to tailor and configure the proposed route as proposed in this report.

In 2007 a parallel DART route was proposed parallel to Runway 13L/31R, which was very similar configuration of the current plan. Jacobs conducted an assessment and analysis was conducted on the FAA;'s Runway 31R Localizer navigation system for potential adverse affects. Initial results from a Math Modeling assessment discovered that the Catenary overhead wiring was going to be a significant issue. Further Jacobs discussions with the FAA Technical Center modeling team discovered that there was an issue with the software modeling tool and was later corrected to yield no adverse impacts to the Localizer system.

In 2008 Jacobs performed at the request of DFW, a Route Alternatives Analysis for an area near the Northeast Cargo and FAA communication facilities. Three proposed routes were assessed and analyzed on their potential impacts to airport and FAA operations. Two of these routes were found to have substantial impacts to FAA systems and communication coverage on the movement areas of the airfield. The third route proposed had negligible impacts and closely resembles the proposed route contained in this report.

Assessment and Analysis

Jacobs developed a process for assessment and analysis of the proposed DART Rail project that would assess the potential aeronautical affects and human factors affects. To accomplish the process the following key areas were assessed and analyzed;

- Airport Design Standards,
- FAR Part 77, Objects Affecting Navigable Airspace,
- Terminal Instrument Procedures,
- Area Navigation,
- Significant Airport Features,
- Human Factors, and
- Safety Risk Management

Airport Design Standards

The FAA's Airports Division foundational and regulatory design standards were assessed for the various aspects of the DART light rail route, infrastructure, construction activities and operational phases. The current version of FAA Advisory Circular 150/5300-13, Airport Design, was used as the reference for compliance.

The following airport design standards were assessed for compliance:

- Runway Protection Zone (RPZ)
- Runway Approach & Inner Transitional Obstacle Free Zone
- Runway Safety Area
- Runway Obstacle Free Area
- Threshold Siting Surface (#9)
- Airports Departure Surface
- Airports Glide Path Qualification Surface

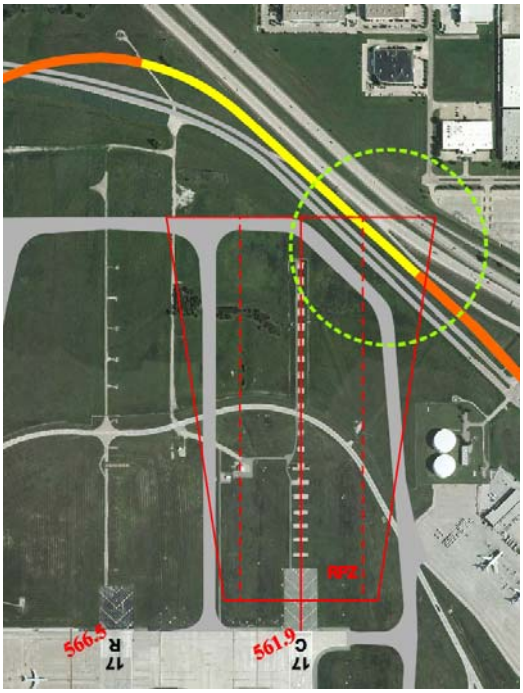


Figure 2: Runway 17C RPZ

Runway Protection Zone:

The Runway Protection Zone (RPZ) is designed to minimize the potential impact to people and property near the runway approaches. This is achieved through restricting the assembly of people and infrastructure within the RPZ. The RPZ additionally restricts the establishment of above ground fuel storage facilities.

The proposed DART rail route crosses through the RPZ's for Runways 17C and 17L. Jacobs' review, assessment and analysis of the proposed route through the RPZ's, is as follows:

The **Runway 17L RPZ**, as shown in Figure 3, illustrates a minor penetration of the RPZ. Since the DART vehicle operations are not planning to stop within the RPZ, Jacobs believes that this meets the intent of the FAA's RPZ Standard, by restricting the gathering and assemble of people and minimizes the exposure of property (DART assets).

Figure 3: Runway 17L RPZ

The **Runway 17C RPZ**, as shown in Figure 2, illustrates a more significant penetration to this area. Other existing features, such as the very active State Highway 114 traffic and the light to medium activity on DFW's North Airfield Drive, currently penetrate the RPZ. The DART vehicle operations are not planned to stop within this RPZ.

Jacobs believes that limited and infrequent activity of DART vehicles within the two RPZ's identified, would be an acceptable level of risk consistent with the current operations within the RPZ.

Runway Inner Approach & Inner Transitional, Obstacle Free Zone (RIAOFZ) & (ITOFZ):

The Obstacle Free Zone is a clearance surface that cannot be penetrated. Taxiing or parked aircraft, vehicles and buildings are examples of unacceptable obstacles. Penetrations to these surfaces will remove the visibility credit provided by approach lighting systems.

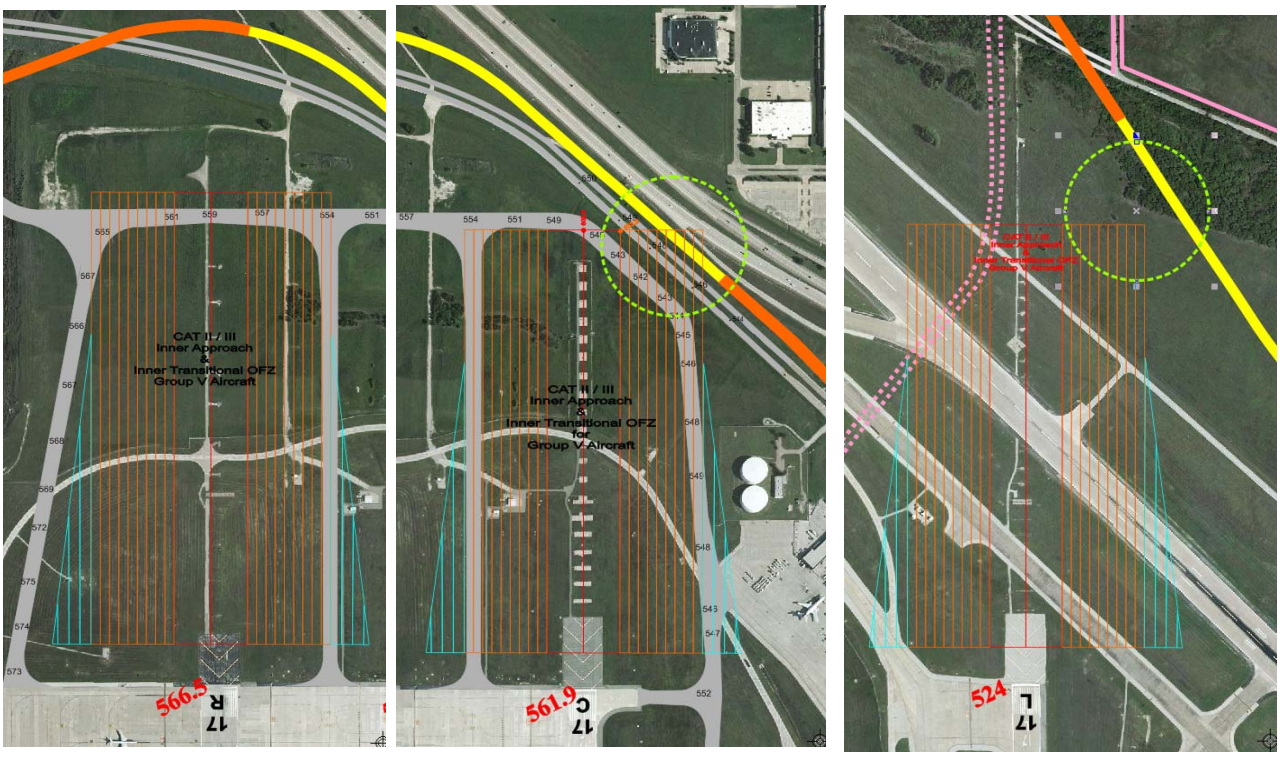


Figure 4: Runway 17R, 17C & 17L Inner Approach & Transitional Surfaces

The Runway 17R Inner Transitional OFZ, will not overlay any portion of the proposed DART Rail route.

The Runway 17C Inner Transitional OFZ, as shown in Figure 4, will overlay the proposed DART Rail route. The analysis revealed that the DART Rail infrastructure and vehicles will be located below the IATOZ by at least 30 feet.

The Runway 17L Inner Transitional OFZ, as shown in Figure 4, does not overlay the proposed DART Rail route and will not be impacted by the proposed route. No further analysis is required.

Runway Safety Area:

The Runway Safety Area (RSA) is located on the ground and extends beyond the Runway Threshold by 1,200 feet. The width of the RSA is 500 feet and is centered on the runway centerline.

The RSA for Runways 17L/C/R will not be impacted by the proposed DART route.

Runway Object Free Area:

The Runway Object Free Area (ROFA) is located on the ground and extends beyond the Runway Threshold by 1,200 feet. The overall width of the ROFA is 800 feet and is centered o the runway centerline.

The ROFA for Runways 17L/C/R will not be impacted by the proposed DART route.

Threshold Siting Surface (TSS):

The Threshold Siting Surface (TSS) provides clearing requirements for obstacles within the Approach area. The TSS #9 surface begins 200 feet from the runway threshold and extends outward for 10,000 feet at a positive slope of 34:1. TSS #9 is required for runways with instrument procedures with minimums less than ¾ mile of visibility.

The Runway 17L, 17C and 17R Threshold Siting Surfaces will cross over the proposed DART Rail route at several locations, as shown in Figure 5. These areas were assessed individually for potential impacts to these clearance surfaces. The Threshold Siting Surfaces for the runways listed will not be penetrated by the proposed DART route.

The Runway 17R TSS #9, overlies the proposed DART Rail route. The DART infrastructure and vehicles will be clear of the TSS #9 surface by at least 50 feet and will not be impacted by the proposed route.

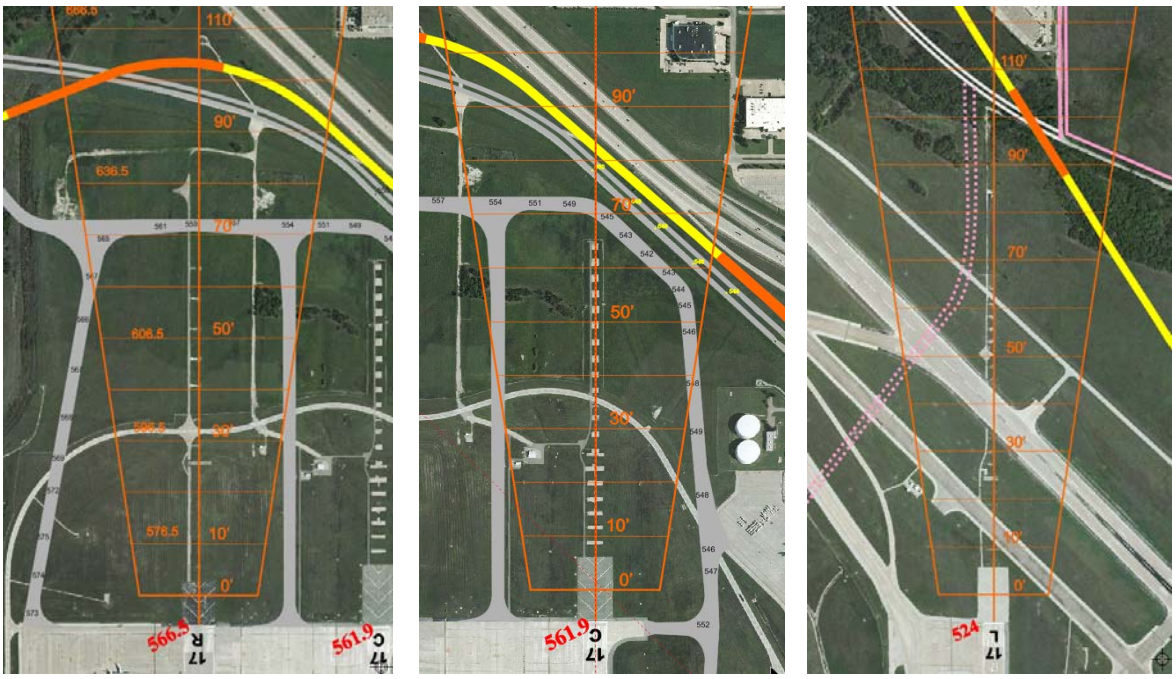


Figure 5: Threshold Siting Surfaces for Runways 17R, 17C & 17L

The Runway 17C TSS #9, overlies the proposed DART rail route. The DART infrastructure and vehicles will be clear of the TSS #9 surface by at least 40 feet and will not be impacted by the proposed route.

The Runway 17L TSS #9, overlies the proposed DART rail route. The DART infrastructure and vehicles will be clear of the TSS #9 surface by at least 50 feet and will not be impacted by the proposed route.

Airports Departure Surface:

The Airports Departure Surface is a clearance surface that limits the height of objects within this surface area, to provide safe and predictable aircraft departures under various visibility conditions. The surface starts at the Runway Threshold elevation and rises outward at a slope 40:1.

This Airports surface provides airport sponsors which runways are designated for instrument departures, for enhanced airport sponsor airspace and obstruction management.

Figure 6: Runway 35L Airports Departure Surface

This clearance surface, provides departing aircraft a flight path, free of obstacles. To achieve the lowest departure minimums and least restrictions, no objects may penetrate this surface, in accordance with FAA Order 8260.46 Departure Program.

The Runway 35L, 35C and 35R Departure Surfaces will cross over the proposed DART Rail route at several locations. These areas were assessed for potential impacts to these clearance surfaces. The Departure Surfaces for the runways listed will not be impacted by the proposed DART route.

Figure 7: Runway 35C Airports Departure Surface

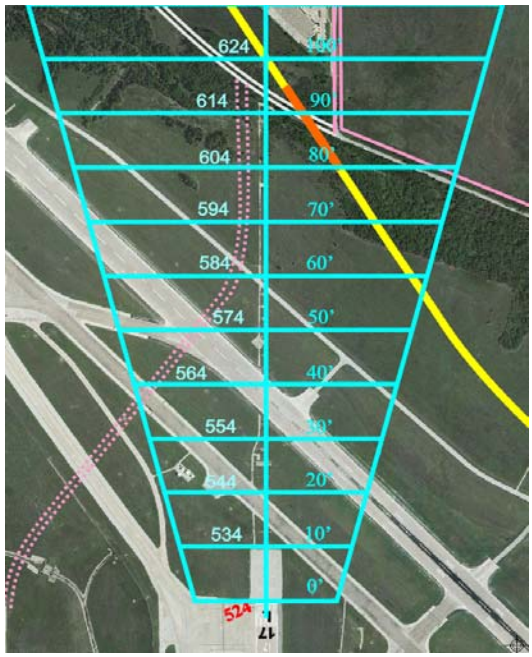


Figure 8: Runway 35R Airports Departure Surface

- The Runway 35L Departure Surface will not be penetrated by the DART Rail infrastructure by at least 50 feet, as shown in Figure 6.
- The Runway 35C Departure Surface will not be penetrated by the DART Rail infrastructure by at least 18 feet, as shown in Figure 7.
- The Runway 35R Departure Surface will not be penetrated by the DART Rail infrastructure by at least 30 feet, as shown in Figure 8.

Airports Glide Path Qualification Surface (GQS):

The FAA Airports Division GQS surface is designed to limit objects within the final visual descent area of the approach, to help ensure stabilized approaches in the last phases of the landing segment. This surface is located between the Decision Altitude (DA) Point and the Runway Threshold. The Airports GQS is a generic surface that provides airport sponsors an evaluation and airspace management tool, to mitigate any potential penetrations to this surface.

The Airports GQS Surface starts at the runway threshold elevation and extends out and upward at a positive slope of 30:1, as shown in Figure 9.

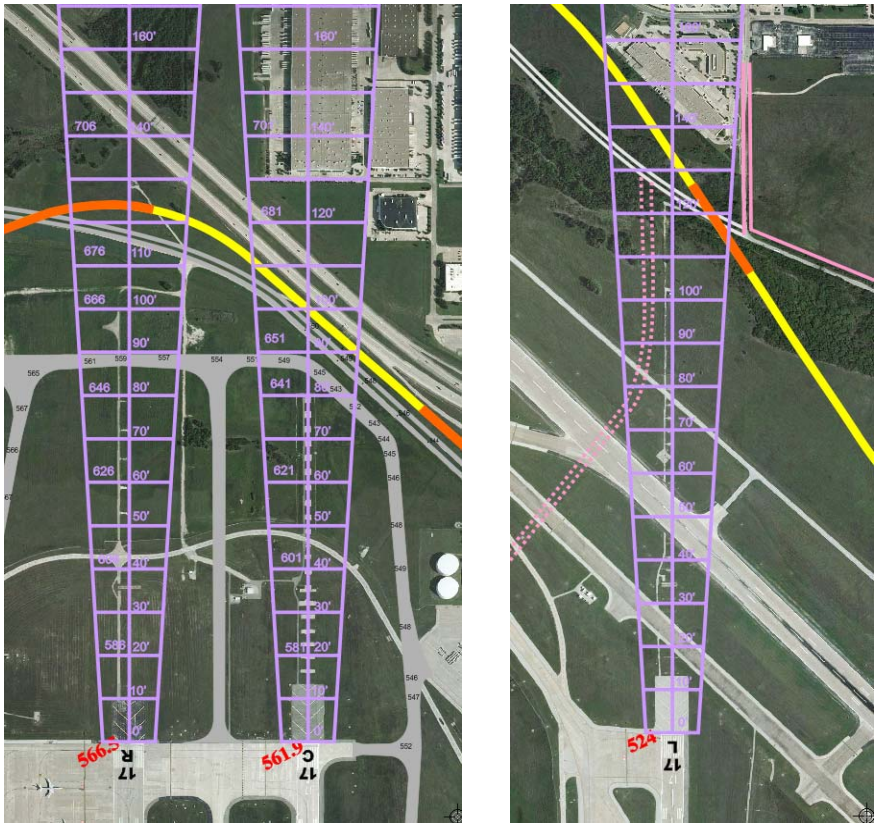


Figure 9: Runway 17R, 17C and 17L Airport GQS Surfaces

The FAA Flight Standards (FS) Division has GQS surfaces, as identified under Terminal Instrument Procedures and Radio Navigation (RNAV), which are tailored to specific types of approaches and aircraft, which is based primarily on the runway Threshold Crossing Height. The FS GQS will typically not be as restrictive as the Airports GQS surface. The Flight Standards GQS surface cannot be penetrated and if it is, the associated instrument procedure(s) are terminated for use by aircraft, until successful mitigation of the penetration has been completed and approved by the FAA.

There were no penetrations to either the Airports' nor the Flight Standards GQS surfaces were found by the proposed project.

Aeronautical Analysis

To better understand the potential impacts from a proposed project on airport/aircraft operations, various assessments and analysis must be conducted. Three specific types of aeronautical analysis were performed as a part of this reports task. The assessments conducted as a part of this report were based on planning information, provided by DART.

Prior to the start of construction, a more complete analysis will be conducted through the FAR Part 77 Airspace Studies. Those studies will be based on:

- Planning Information,
- Design Information for permanent features, and
- Temporary Construction Equipment

These studies will look at specific program areas by the FAA for environmental & design compliance with federal guidance, requirements and standards. This report provides preliminary results based on an assessment based on planning information only. The specific program areas assessed for this report are:

- FAR Part 77, Objects Affecting Navigable Airspace:
- Terminal Instrument Procedures (TERPS)
- Area Navigation

FAR Part 77, Objects Affecting Navigable Airspace:

Part 77 provides the initial means to assess and manage navigable airspace around airports and heliports. Penetration by obstacles to the various Part 77 surfaces, requires further assessment to determine if a penetration is a hazard to navigation.

- Part 77 comprises the following imaginary surfaces, as shown in Figure 10, FAR Part 77 Surfaces.
- Primary,
- Approach,
- Transitional,
- Horizontal, and
- Conical

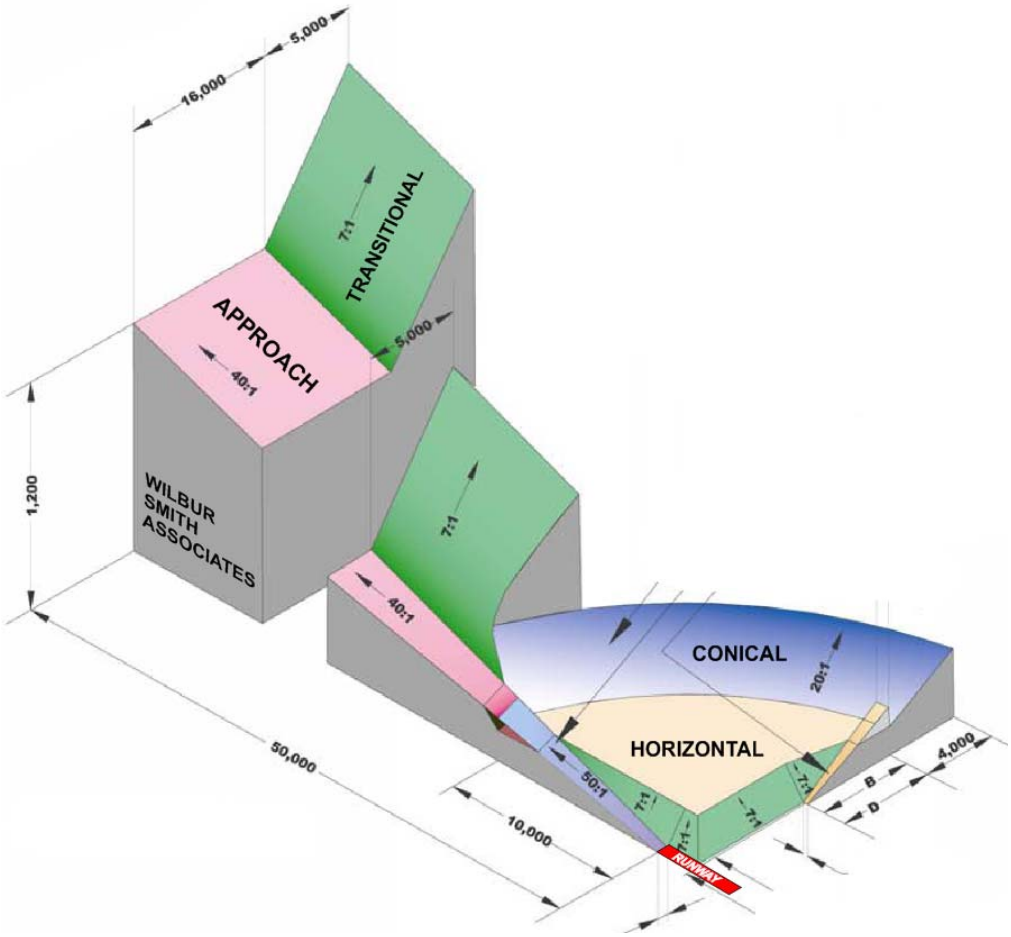


Figure 10: FAR Part 77 Surfaces

Figure 10, illustrates the location of the Part 77 Approach Surfaces with an associated runway. Each runway must be assessed individually for any surface penetration. The potential penetrations form the DRAT Rail project, would come from the Catenary Poles, which are the highest objects associated with the DART Rail Infrastructure. The DART Catenary pole elevations are shown in BLUE text in Figures11 and 12.

After evaluating the proposed DART projects' configuration and geometry in relationship to the airports' various runways, the Approach Surface was chosen as the most critical of the Part 77 surfaces to assess for this project. The Approach surface starts200 feet from the runway threshold and extends out and upward at a 50 to 1 slope.

Runway 17R Part 77 Approach: The DART Route across the Runway 17R Approach contains both at-grade and elevated sections, as shown in Figure 11. The highest point of the Catenary Infrastructure reaches a height of 598 feet AMSL. The Part 77 Approach Surface lowest point is at a height of 626 feet AMSL. The proposed DART Rail infrastructure will be clear of the Approach Surface by at least 30 feet.

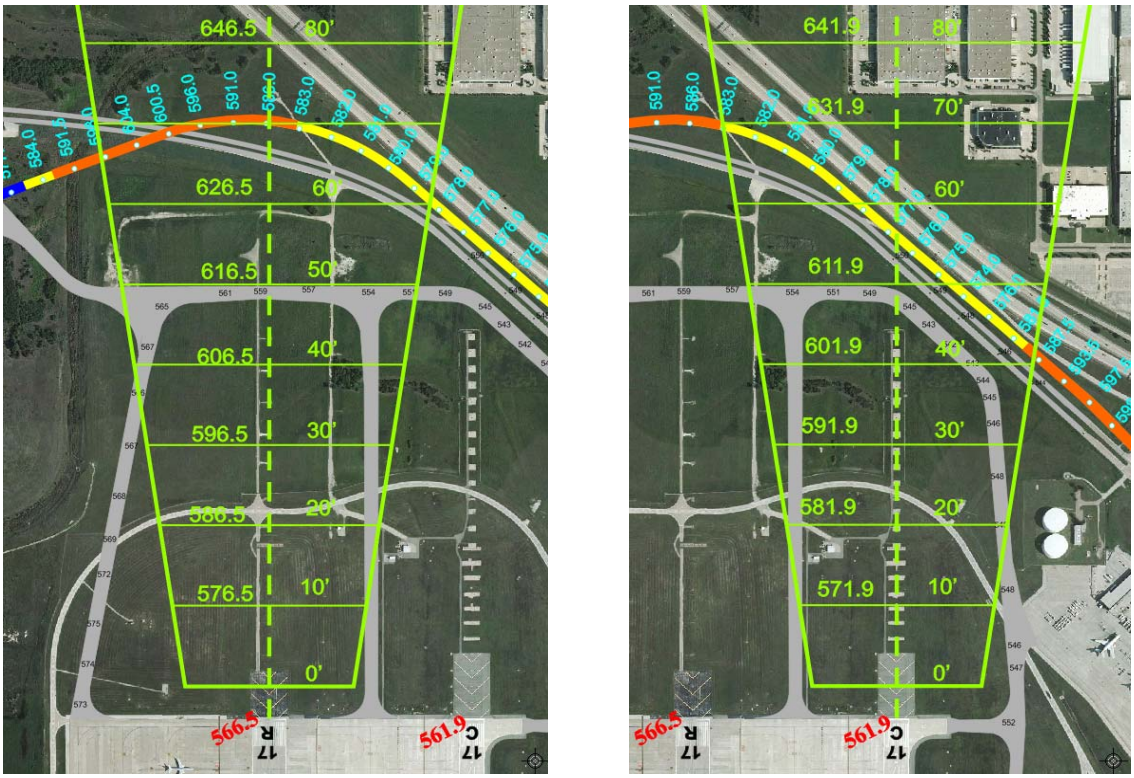


Figure 11: Runway 17R & 17C Part 77 Approach Surfaces

Runway 17C Part 77 Approach: The DART Route across the Runway 17C Approach contains both at-grade and elevated sections, as shown in Figure 11. The highest point of the Catenary Infrastructure reaches a height of 548 feet AMSL. The Part 77 Approach Surface lowest point is at a height of 601 feet AMSL. The proposed DART Rail infrastructure will be clear of the Approach Surface by at least 17 feet.

Runway 17L Part 77 Approach: The DART Route across the Runway 17C Approach contains only at-grade sections, as shown in Figure 12 . The highest point of the Catenary Infrastructure reaches a height of 548 feet AMSL. The Part 77 Approach Surface lowest point is at a height of 601 feet AMSL.

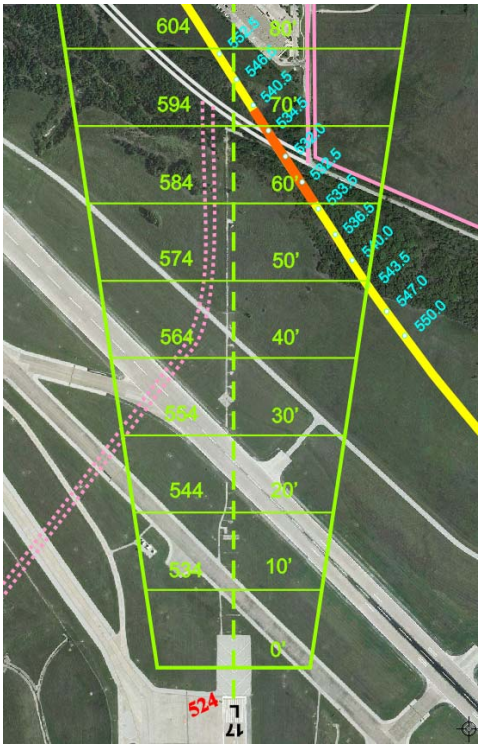


Figure 12: Runway 17L, Part 77 Approach Surface

The proposed DART Rail infrastructure will be clear of the Approach Surface by at least 17 feet.

Runway 31R Part 77 Approach: The DART Route I-3 and I-2 runs parallel to Runway 31R and contains both at-grade and elevated sections, as shown in Figure 13. The highest point of the Catenary Infrastructure reaches a height of 565 feet AMSL, which is located outside the Approach Surface. The proposed DART Rail infrastructure will be outside of the I-3 Part 77 Approach Surface.

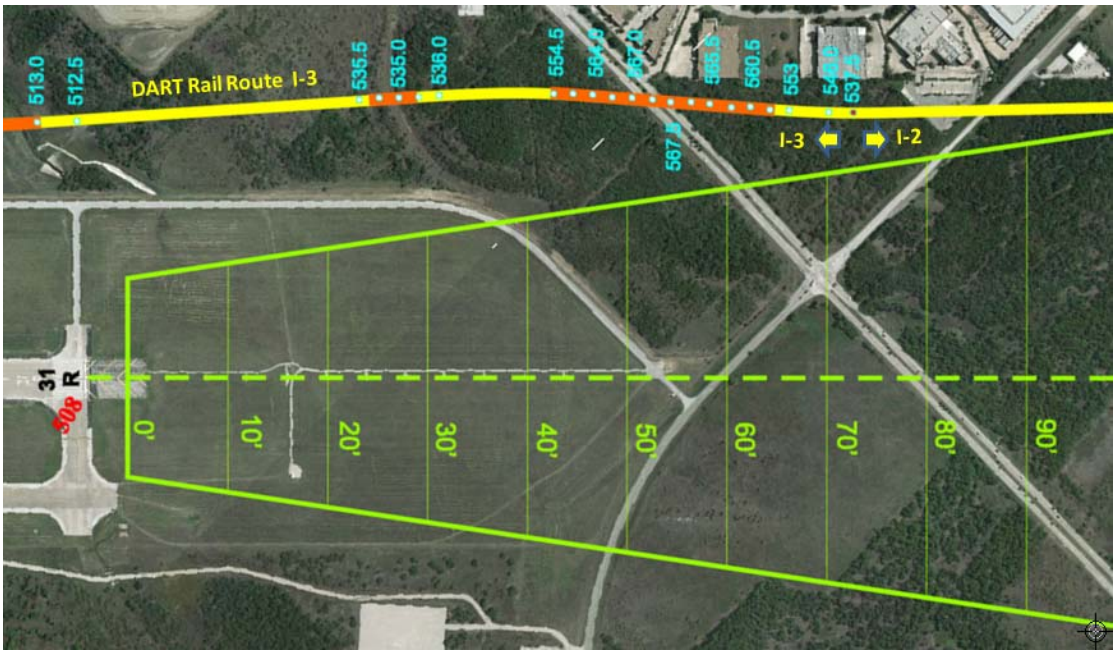


Figure 13: Runway 31R, Part 77 Approach Surface

Terminal Instrument Procedures (TERPS)

Pilots and their aircraft use instrument procedures developed by the FAA, for precision approaches & departures to and from airports. The procedures are developed based on strict rules and processes. The associated imaginary surfaces described herein are clearance surfaces, in which to achieve the lowest landing or departure minimums, they cannot be penetrated.

DFW currently has 51 Approach and 53 Departure procedures. The type of instrument approach procedures include:

- ILS (Categories I, II, and III),
- RNAV, and
- RNP

This report serves as a preliminary TERPS assessment and analysis for the various TERPS procedures described. The following TERPS surfaces were assessed for this report. Those TERPS surfaces are as follows:

- Departure
- Precision Final
- Missed Approach
- Glidepath Qualification
- Localizer Final
- LNAV/VNAV
- RNP

TERPS Departure Surface:

The proposed DART Rail route will cross under four runway departure surfaces. Runways 35L, 35C and 35R are for all aircraft on north departures and Runway 13L is for aircraft up to turbo prop for South departures.

The Departure surface starts at the runway threshold elevation and extends outward at a positive slope of 40 to 1, as shown in Figures 14, 15 and 16.

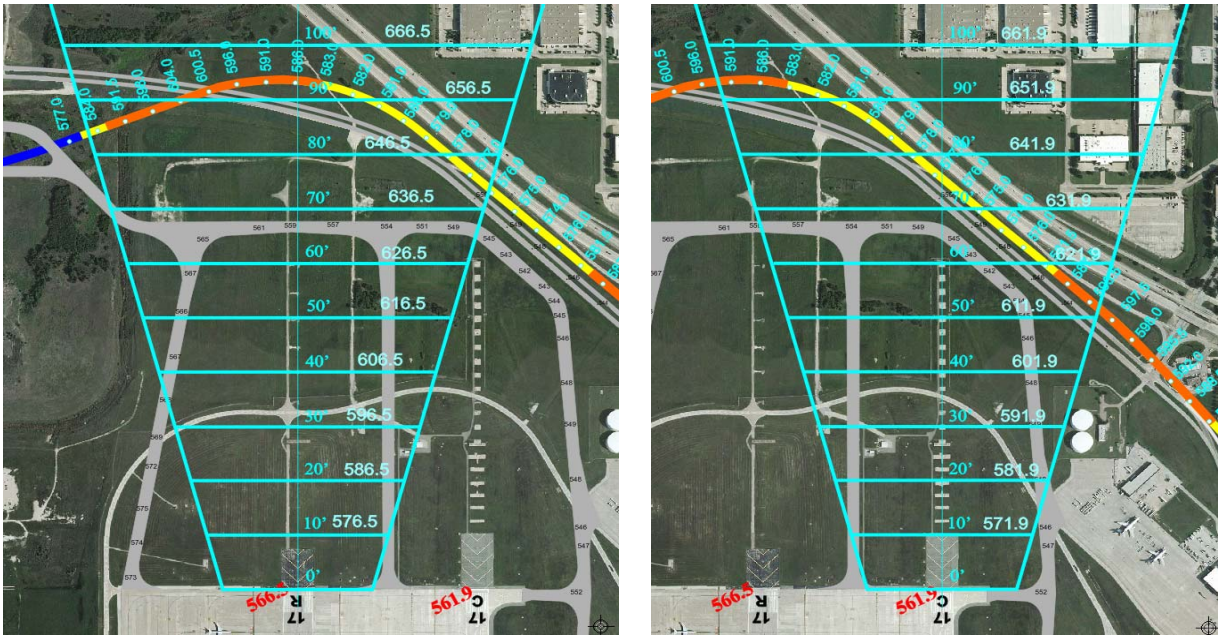


Figure 14: Runway 35L and 35C Departure Surfaces

Any penetrations to the departure surfaces will cause an increase in departure minimums. The increase could be; 1.) reduced Take-off Run Available, 2.) increased Climb Gradient, or 3.) increased Visibility. Airports and the FAA typically do not approve this type of an impact for permanent features, but will consider short term temporary impacts for construction activities. Those activities would be studied and approved through the FAA Airspace process.

The **Runway 35L Departure Surface**, as shown in Figure 14, will be clear of the proposed DART Rail infrastructure by at least 30 feet and would not be an adverse impact to runway departures.

The **Runway 35C Departure Surface,** as shown in Figure 14, will be clear of the proposed DART Rail infrastructure by at least 10 feet and would not be an adverse impact to runway departures.

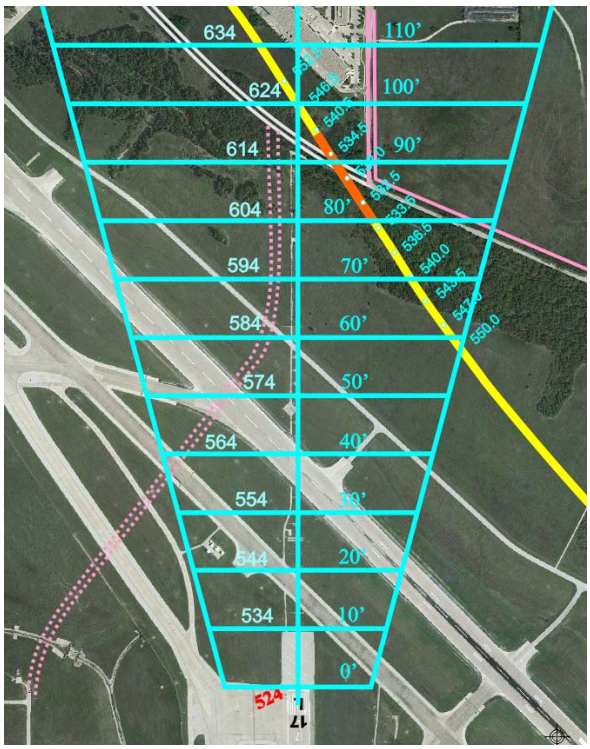


Figure 15: Runway 35R, Departure Surface

The **Runway 35R Departure Surface,** as shown in Figure 15, will be clear of the proposed DART Rail infrastructure by at least 25 feet and would not be an adverse impact to runway departures.

The **Runway 13L Departure Surface,** as shown in Figure 16, will be clear of the proposed DART Rail infrastructure by at least 10 feet and would not be an adverse impact to runway departures.

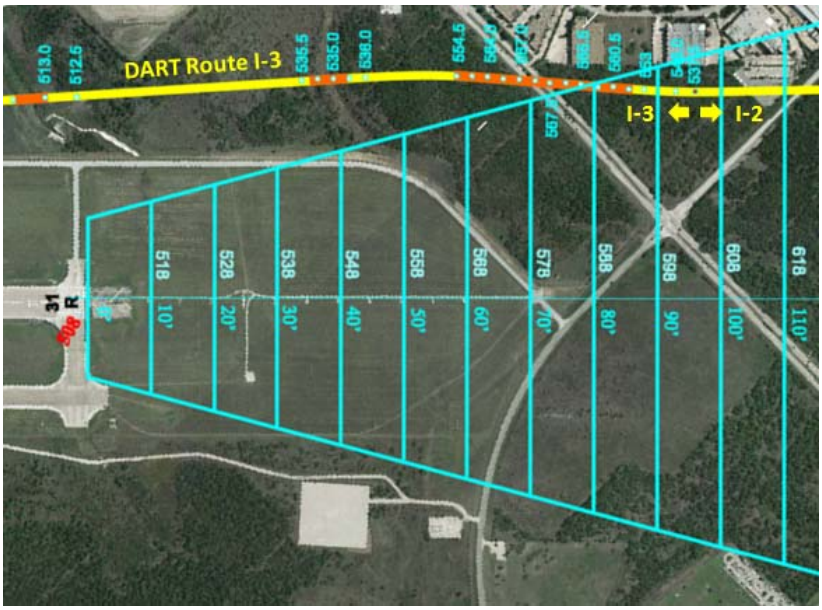


Figure 16: Runway 13L, Departure Surface

TERPS Precision Final Approach:

The proposed DART Rail route will cross under the Precision Final Approach surfaces of runways 17R, 17C, 17L and 31R.

The Precision Final surface starts 200 feet out from the Runway Threshold, at the runway threshold elevation, and extends outward at a positive slope of 34 to 1, as shown in Figure 17. The Precision Final surface has two additional wings that rise perpendicular to the runway extended centerline and outward at slopes of 5 to 1 and then 6 to 1 respectively.

Any penetrations to the Precision Final Surfaces will cause either an increase in landing minimums or termination of the procedure. DFW Airport will not support a penetration to this surface.

The Precision Final Approach surface is vertically located above the Departure surface, discussed earlier. None of the 4 runways identified, will be impacted by the proposed project.

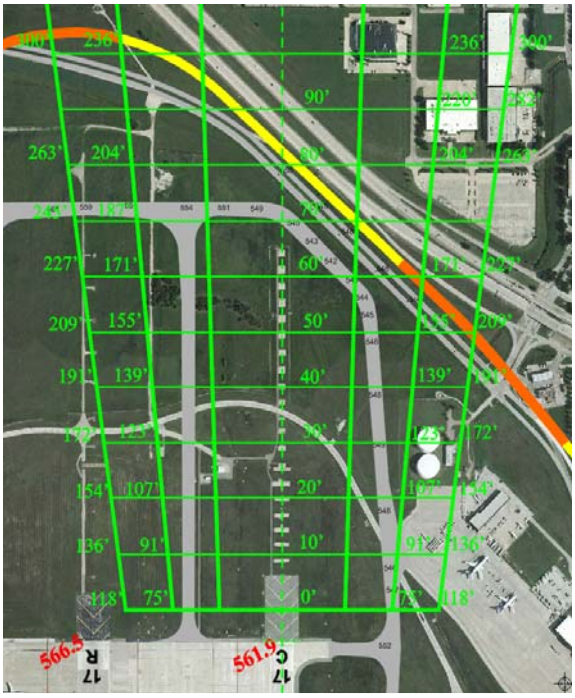


Figure 17: Runway 17C, Precision Final Approach Surface

TERPS Missed Approach - Category I:

The TERPS Missed Approach Surface is used for Category I Approaches with minimums down to ceiling height of 200 feet and ½ mile of visibility. The surface rides on top of the Precision Final Approach surface for approximately 1,460 feet and then rises up at a positive slope of 28.5 to 1 and outward as shown in Orange, in Figure 18.

There are no penetrations to this surface by the proposed project.

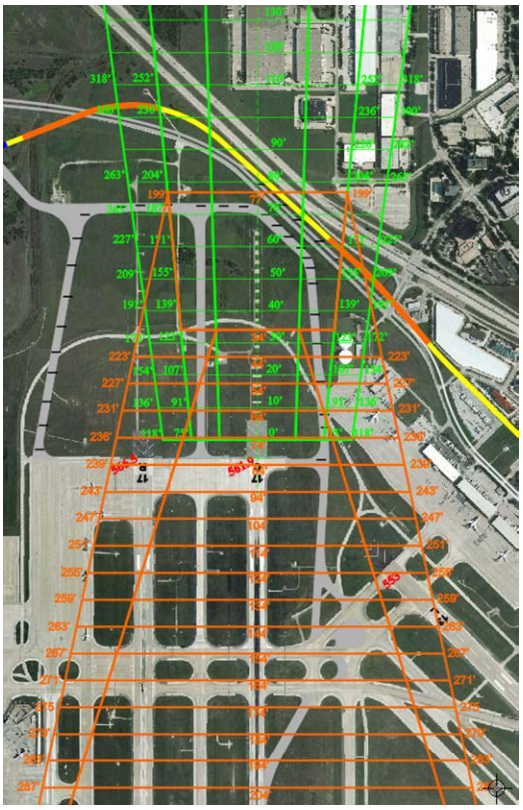


Figure 18: Runway 17C, Missed Approach Surface

TERPS Missed Approach - Category II / III:

The TERPS Missed Approach Surface is used for Category II & III Approaches with minimums down to ceiling height of 100 feet and 0 mile of visibility. The surface begins 200 feet prior to the landing runway threshold, at the runway centerline elevation, for 3,200 feet. The surface then rises at a positive slope of 40 to 1, for an additional 6,000 feet to an elevation of 150 feet above the runway.

None of the runways Category II / III Missed Approach Surface will reach the DART Rail route project area. Runway 17L/35R's CAT II/III Missed Approach Surface, comes the closest to the proposed DART Rail route, as shown in Figure 19.

There will be no penetrations to this surface by the proposed project.

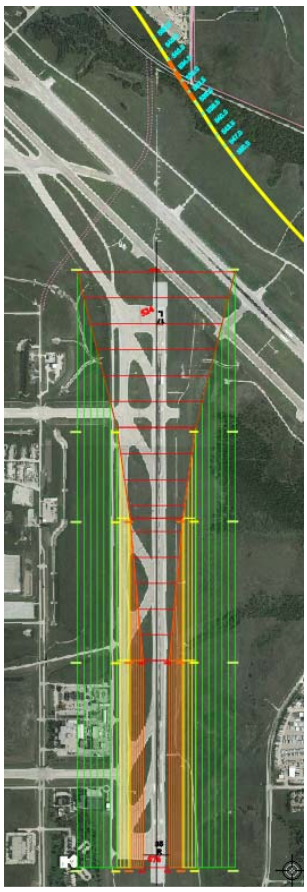


Figure 19: Runway 35R, CAT II/III Missed Approach Surface

Glidepath Qualification Surface (GQS):

The proposed DART Rail route will cross under the GQS surfaces of runways 17R, 17C, and 17L.

The GQS is a clearance surface that limits the height of obstacles between the runway threshold and the Decision Altitude (DA) point, for all vertically guided procedures.

Obstacles that penetrate this surface will cause the instrument procedure to be terminated, until successful mitigation has been completed and approved by the FAA.

The GQS is tailored for each airports' runway, based on the category of aircraft using the runway. DFW's GQS are designed for aircraft that requires a minimum

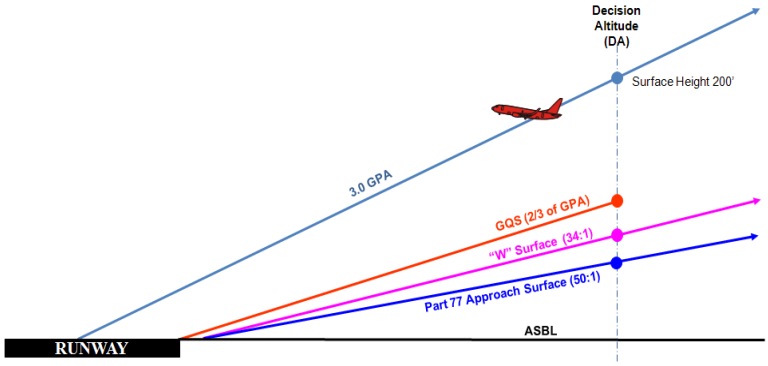


Figure 20: Imaginary Surface Profile View

Threshold Crossing Height of 50 feet and no higher than 60 feet.

The GQS extends from the runway threshold out to the Decision Altitude (DA) point, which is located approximately 2820 feet from the runway threshold, as shown in Figure 20. This surface is located vertically above the Precision Final Approach Surface.

There are no penetrations to the GQS surfaces by the proposed project.

Localizer Final Trapezoid:

The Instrument Landing System (ILS) is comprised of a Glide Slope (GS) and a Localizer (LOC), which provide lateral as well as vertical guidance to aircraft on a final approach. In the event that the GS is out of service, lateral guidance provided by the LOC provides essential navigational service to aircraft from the Final Approach Fix to the landing runway threshold.

The imaginary surface associated with the LOC is the Localizer Final Trapezoid. This surface starts at the runway threshold and extends outward approximately 10 miles, as shown in Figure 21: Localizer Final Trapezoid.

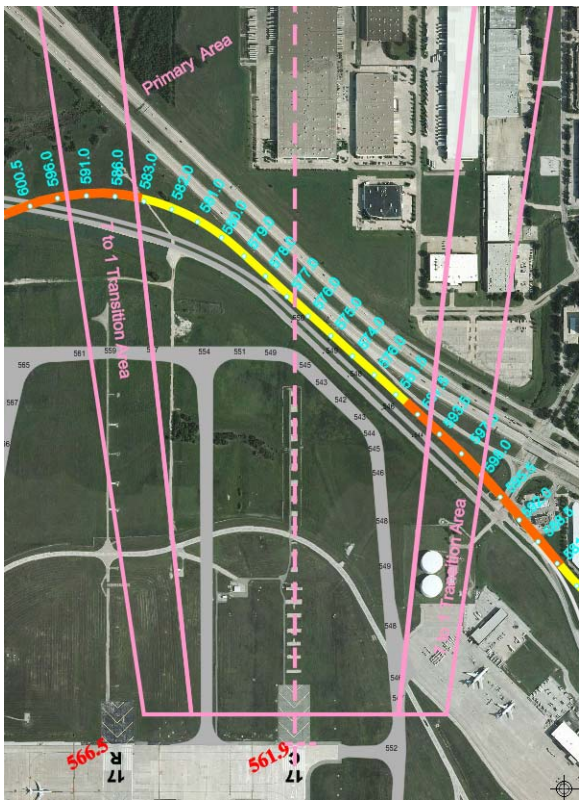


Figure 21: Runway 17C, Localizer Trapezoid Surface

This level surface (Primary Area) is equal to the highest object within the Primary Area, plus 250 feet of a Required Obstacle Clearance (ROC) buffer. FAA's TERPS criteria, requires that no obstacles may penetrate the 7 to 1, Transition Surface, after the adjustment of the Primary Area. If penetrations still exist, then the Primary Area is adjusted upward until the Transition Area is free of penetrations.

DFW's Runway 17C ILS has a 200 foot ceiling & ½ mile visibility instrument procedure. In addition, there is a straight-in procedure (LOC only) that provides a 500 foot & 1 mile visibility procedure. This procedures' minimums are high, to account for the existing obstacles within the imaginary surfaces. The formal airspace review of the proposed project and associated obstacle survey will determine if these minimums will need to be increased or not.

It is anticipated that any small increase to Runways 17R, 17C and 17L straight-in procedure (LOC only) minimums, if required, those increases would be a minimal operational impact.

Area Navigation (TERPS)

DFW currently has several types of Area Navigation (GPS procedures), that comprise both non-vertically and vertically guided instrument procedures, such as:

- Localizer Performance with Vertical (LPV),
- Lateral & Vertical Navigation (LNAV/VNAV),
- Lateral Navigation (LNAV), and
- Required Navigational Performance (RNP)

Localizer Performance with Vertical (LPV):

The LPV is a vertically guided instrument procedure that provides both lateral and vertical guidance to a runway. These procedures provide minimums typically down to as low as 200 feet ceiling and ¾ mile of visibility, making them nearly equivalent to a ground-based Instrument Landing System.

These procedures are typically not used significantly by the air carriers at DFW currently, as the primary means of flight operations.

The LPV imaginary obstacle clearance surfaces are currently, exactly the same as the ground-based Precision Final Approach surfaces, described earlier. The assessment and analysis performed on those surfaces, found no penetrations by the proposed project.

It is anticipated that no increase to these minimums, would be required from the proposed project.

Lateral & Vertical Navigation (LNAV / VNAV):

LNAV / VNAV is a vertically guided instrument procedure that provides only lateral guidance to a runway. These procedures provide minimums typically down to as low as 500 feet ceiling and 1 ¾ mile of visibility and as high as 700 & 1 ¾ . The vertical guidance is provided by the aircrafts Baro-VNAV system, that is somewhat affected by cold temperatures. Because of the temperature variances, these procedures often do not provide a significant decrease in landing minimums.

These procedures are typically not used by the air carriers at DFW as the primary means of flight operations.

Penetrations to the LNAV / VNAV imaginary obstacle clearance surfaces will have a variable Required Obstacle Clearance (ROC) added on top of the highest obstacle within the surfaces, to provide adequate clearance between the aircraft flight path and the obstacle. This variable ROC value is dependent on multiple elements such as:

- Temperature
- Glidepath angle
- Threshold Crossing Height

These procedure minimums are typically high, to account for the existing obstacles within the imaginary surfaces. A formal airspace review of the proposed project and associated obstacle survey will determine if these minimums will need to be increased or not.

It is anticipated that if any small increase to these minimums, if required, would not be an operational impact to DFW

Lateral Navigation (LNAV):

LNAV is a non-vertically guided instrument procedure that provides only lateral guidance to a runway. These procedures provide minimums down to as low as 400 feet ceiling and 1 mile of visibility and as high as 700 & 1 ¾ .

These procedures are typically not used by the air carriers at DFW as the primary means of flight operations.

Penetrations to the LNAV imaginary obstacle clearance surfaces will have a 250 foot Required Obstacle Clearance (ROC) added on top of the highest obstacle within the surfaces, to provide adequate clearance between the aircraft flight path and the obstacle.

This procedures' minimums are high, to account for the existing obstacles within the imaginary surfaces. A formal airspace review of the proposed project and associated obstacle survey will determine if these minimums will need to be increased or not.

It is anticipated that if any small increase to these minimums, if required, would not be an operational impact to DFW.

Required Navigational Performance (RNP):

RNP procedures are another type of 3-D instrument procedure that are being developed and implemented at airports. Current RNAV applications do not exploit the full benefit of aircraft/navigation performance capabilities provided by the equipment of some operators. Where the use of these advanced capabilities will allow more efficient routings, a reduction to Decision Altitude (DA) of at least 50 feet, a decrease in visibility by at least ¼ mile, or lateral/vertical paths that would otherwise be unavailable. The benefits from these procedures are:

- Tailored Approaches
- Continuous Decent Approaches

DFW currently has 3 RNP procedures for Runways 13R, 31L and 31R. As the RNP program begins to produce more RNP procedures and users update their aircraft, the airport planners should take steps to protect the airspace for those new procedures.

The Runway 31 overlies a portion of the DART Rail route and was the only runway evaluated for this report.

The RNP Final Segment Obstacle Clearance Surface begins at the runway threshold end & elevation and extends outward at a positive slope. This slope varies based on the Vertical Error Budget (VEB). The VEB is derived primarily from the:

- RNP segment value
- Temperature

The Obstacle Clearance Surface must remain clear of any penetrations. Obstacles that penetrate an OCS may be mitigated by one of the following actions:

- Remove or lower obstacle,
- Lower the RNP value for the segment,
- Adjust the lateral path,
- Raise Glidepath Angle, or
- Raise TCH, or adjust HAT

No mitigation actions are anticipated as a result of the proposed project.

FAA Navigational Systems

Jacobs provided a briefing with the Central Service Area, FAA Technical Operations staff from both DFW TRACON and the FAA Southwest Regional Office, to provide an overview of the proposed project and a preliminary list of FAA facilities, systems and services within the project area categorized as follows:

- Instrument Landing Systems (ILS)
- Approach Lighting Systems
- Communication
- Weather
- Radar

At the conclusion of the briefing a revised list was developed for actual assessment for the proposed project, as shown in Table 1.

All attendees agreed that the list was very comprehensive list of facilities, systems and services.

	FAA Facility, System & Service	Potential Issues
1	ASR – Northeast Airport	Multi-path
2	ASDE – East ATCT	Multi-path
3	Multi-Lateration Sensors	Relocation or Line-of-Sight
4	Signal Integrity & Monitor Sensors	ASR & ARSR
5	Communication – Radios	RTR's 1E, 2E and 4E
6	Communication – Point-to-Point	Microwave, UHF & VHF
7	Communication – Coverage	Aircraft movement areas
8	Weather – LLWAS Sensors	LLWAS #4 & #5
9	Weather – ITWS	DFW
10	Weather – TDWR	DFW
11	Instrument Landing System – Localizer	Runway 31R
12	Approach Lighting System – MALSR	Runway 17R
13	Approach Lighting System – ALSF	Runway 17C
14	Approach Lighting System – ALSF	Runway 17L

Table 1: FAA Facilities, Systems and Service Assessment List

The following is an overview, analysis performed and summary of results, for each of those Facilities, Systems and Services identified for assessment.

Instrument Landing Systems

Runway 31R Localizer: The Runway 31R Localizer was identified as being potentially susceptible to reflections from the proposed DART Rail route, as shown in Figure 22. This route runs on the North side and parallel to Runway 31R for the entire length of the runway. ILS systems propagated signals can be susceptible from adverse reflections into the flight paths. These adverse reflections are regenerated from Flat Surfaces and Wires, such as; large buildings, aircraft hangars, light rail vehicles, power lines and other aircraft.

Figure 22: Runway 13L / 31R and DART Rail Route

The typical signal coverage area for a Category I Localizer system is very large, as shown in Figure 23. Objects within these areas can reflect signals back into the approach paths which can adversely affect the performance of the radiated signals.

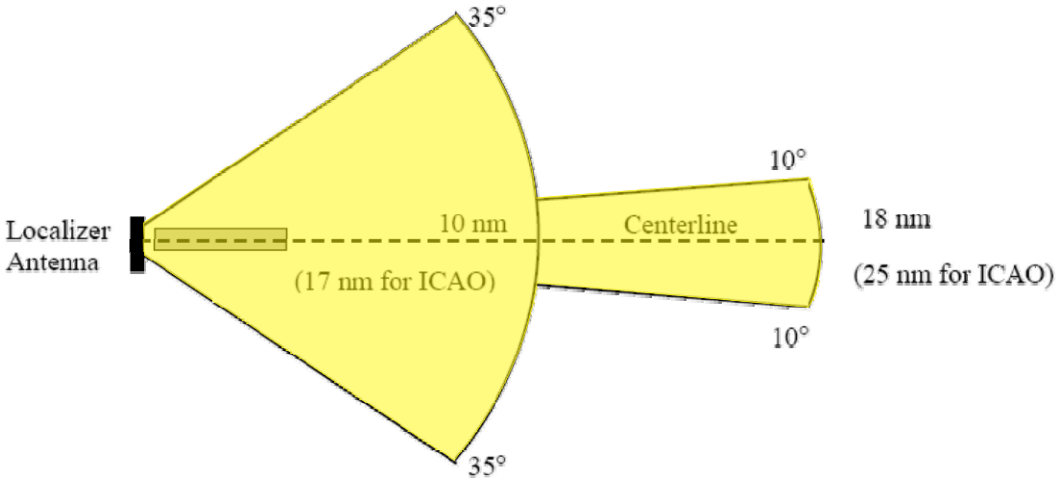


Figure 23: Localizer Propagated Signal Coverage Area

The DFW Runway 31R Localizer is a Category I system, capable of providing landing minimums down to 200 foot ceiling height and ½ mile of visibility. This runway is used primarily when the airport is in a North Flow of operations.

The previous 5 year Flight Inspection history was reviewed for histirical system performance. The results of those inspections indicate that there has not been any significant issues identified, as shown in Table 2. A site survey of the area indicates that there are a few new buildings approximately 2,000 feet northwest of the Runway 31R Threshold, that have been built within the past 3 years. This area should continue to see additional development and potential signal reflections from those structures is likely.

Date	Zone 1			Zone 2			Zone 3			90 Hz Clearances		150 Hz Clearances	
	uA	Distance	%	uA	Distance	%	uA	Distance	%	uA	Az	uA	Az
08/12/09	2	4.56	6.7	2	0.58	13.3	2	0.57	13.3	300	20.1	260	29.6
10/29/08	2	4.76	6.7	1	0.58	6.7	2	0.01	13.3	289	20.9	275	29.6
01/10/08	4	4.97	13.3	2	0.58	13.3	2	0.02	13.3	293	20.3	256	29.6
02/28/07	2	4.03	6.7	1	0.58	6.7	1	0.16	6.7	293	20.3	278	30.4
07/10/06	2	4.69	6.7	1	0.58	6.7	2	0.35	13.3	307	20.6	257	29.6
Average	**2.4**	**4.60**	**8.0**	**1.4**	**0.58**	**4.7**	**1.8**	**0.22**	**6.0**	**296**		**265**	
Std Dev	0.9			0.5			0.4			7		10	
A+2SD	**4.2**		**14.0**	**2.5**		**8.3**	**2.7**		**9.0**				
A-2SD										**282**		**244**	

Table 2: Runway 31R Localizer Flight Inspection Summary

To assess the effects on ILS systems for proposed development, FAA/Ohio University Math Modeling tools was utilized to assist in the assessment and analysis of the proposed project. The model can be initiated to assess ether the incremental development of a high-rise building or a worst case scenario, that incorporates all scenarios as one modeling surface.

The math model developed for this assessment was the worst case scenario. This scenario assumes that the DART Rail infrastructure, not only the Catenary & Wires will be present all the time, but the Rail Vehicles will be as well. This essentially places a continuous reflective wall, at the height of the Rail Vehicles (14 feet) for the entire route, as shown in Figure 25. DART Rail Vehicle frequency will be substantially less than the modeling results, but it provides a very good planning result.

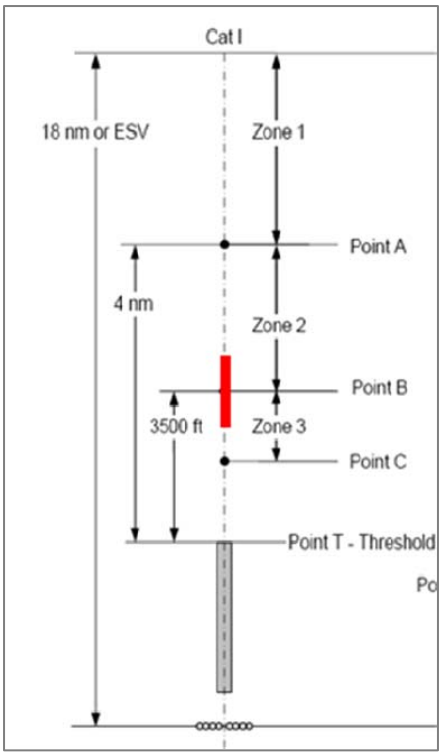


Figure 24: Category I Flight Inspection Zones

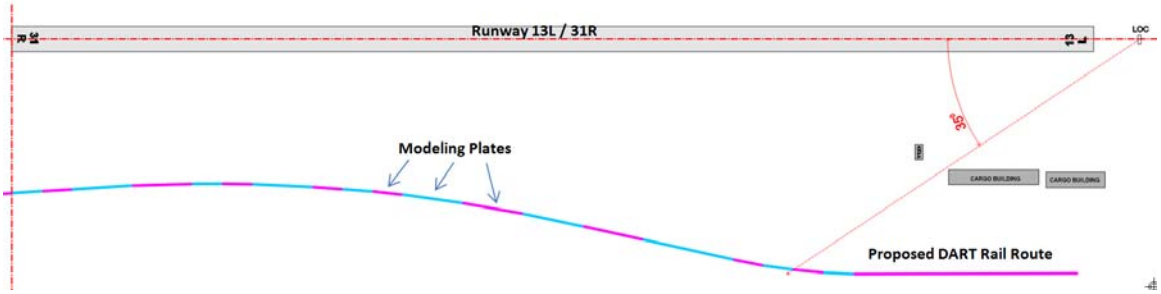


Figure 25: Runway 31R Localizer Math Model Graphic

The Localizer Flight Inspection performance areas, required for a Category I system, are contained within Zones 1, 2 and 3, as shown in Figure 24. These areas reach to a point about 2,800 feet from the runway threshold (Point C).

The Localizer modeling package was assessed by the FAA William J. Hughes Technical Center, using the Ohio University Navaids Performance Prediction Model (OUNPPM) version 092909 (Math Modeling system). The proposed DART infrastructure (guideways, rail vehicles, catenary poles and associated wiring), along with selected existing airport buildings and Oncor power transmission lines were assessed to provide the worst case scenario. Jacobs additionally requested that the modeling include not only the existing the single frequency, 8 element log periodic antenna, but the proposed localizer system upgrade with a dual frequencies and a 14 element antenna as well.

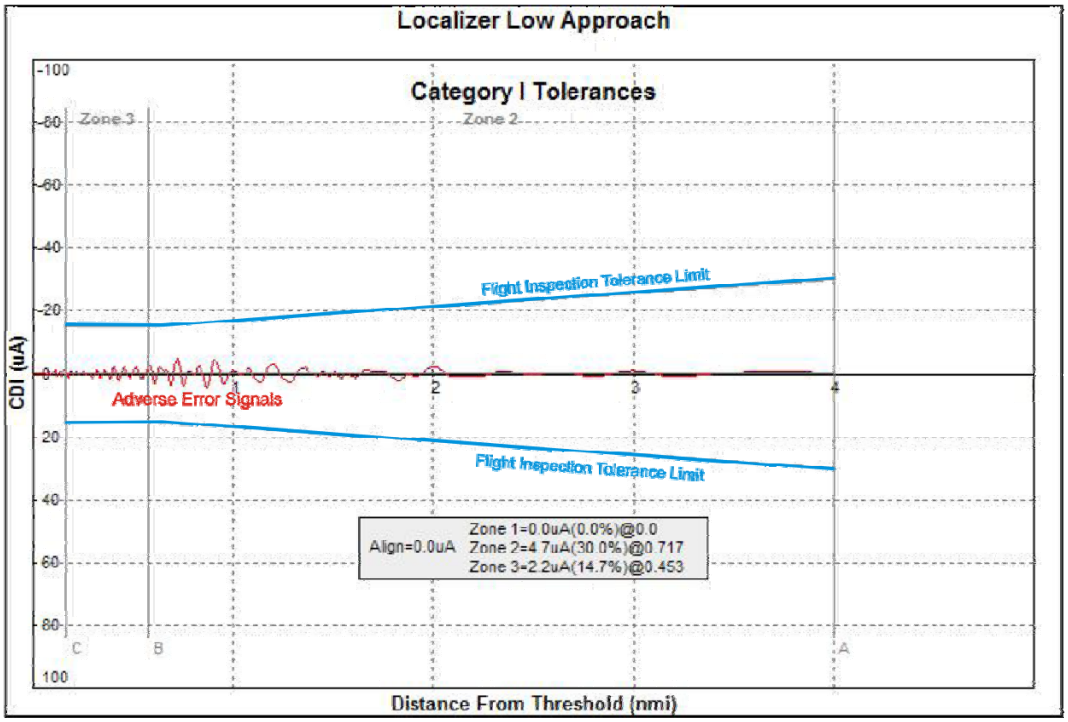


Figure 26: Existing Runway 31R Localizer (8 - Element) Math Modeling Results with DART Infrastructure

The results of the proposed scenario modeling, indicates that the combined loading (worst case scenario) produced an approximate error to the propagated signal in the amount of 30% of allowable flight inspection tolerances, as shown in RED in Figures 24 and 26. The FAA considered the error to be “significant” by their operational standards.

The amount of error is higher than the planned DART rail vehicle operations, where less than 2 per cent of the DART Rail route on DFW will be occupied at any one time.

When the modeling was performed on the proposed FAA Localizer system upgrade, the error dropped down to 3.3% of allowable flight inspection tolerances, as shown in Figure 27: Planned Runway 31R Localizer (14-10 System) Math Modeling with DART Infrastructure.

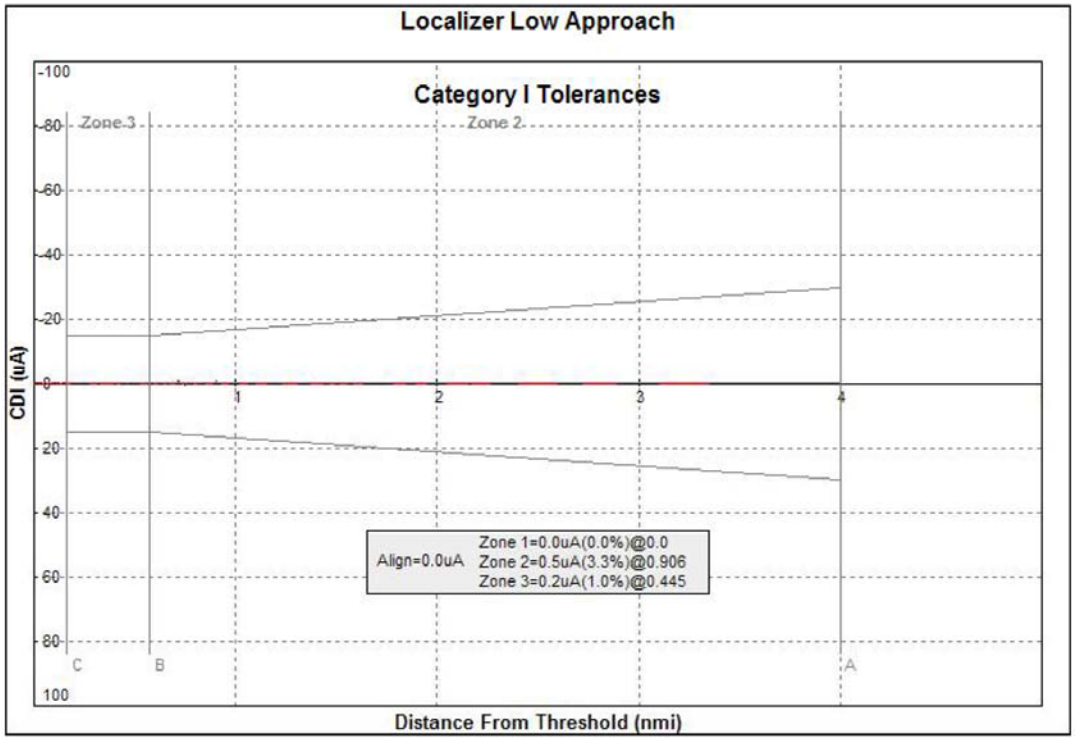


Figure 27: Planned Runway 31R Localizer (14-10 System) Math Modeling with DART Infrastructure

It should be noted that the modeling performed as a “worst case”, in which the results were predicated as if there were DART Rail vehicles on the entire length of the I-3 segment. The more realistic operational loading with rail vehicles would be reduced from 100% down to a 2 to 4% loading factor. This loading level would significantly reduce the impact to the current localizer system.

The FAA has a planned replacement and upgrade of this system scheduled for the summer of 2011. It is anticipated that the construction activities of the I-3 segment will not adversely affect the Runway 31R Localizer.

In discussions with the FAA it is Jacobs' professional opinion is that there will be no additional impact to the Runway 31R Localizer, which would prevent the construction of the DART Rail infrastructure and operations.

Approach Lighting Systems

The proposed project will come in close proximity to three FAA Approach Lighting Systems, for Runways 17R, 17C and 17R. These systems extend approximately 2600 feet out from the Runway Thresholds, toward the DART Rail route.

FAA Airport Design and Flight Standards Obstacle Assessment & Category II/III ILS Requirements, mandate that the associated Light Planes of these systems cannot be penetrated without adversely affecting their operations. The Light Plane consists of a Primary Plane (that runs through the middle of the lights) and a Secondary Plane on either side of the Primary Plane. These planes extend 200 feet beyond the outermost light fixture. Penetration of these planes precludes Category II & III operations.

Aircraft must be able to see the last approach light from an elevation ½ degree below the intended glide path angle at a point 1,600 feet in advance of the outermost light fixture and 250 feet either side of the intended runway approach centerline course.

Runway 17R MALSR: This system comes within approximately 1,000 feet of the planned DART Rail route. There were no identified operational impacts to this system from the proposed project.

Runway 17C ALSF: This system and its' associated clearance surfaces, comes within approximately 150 feet of the planned DART Rail Route, as shown in Figure 28. There were no identified operational impacts to this system from the proposed project.

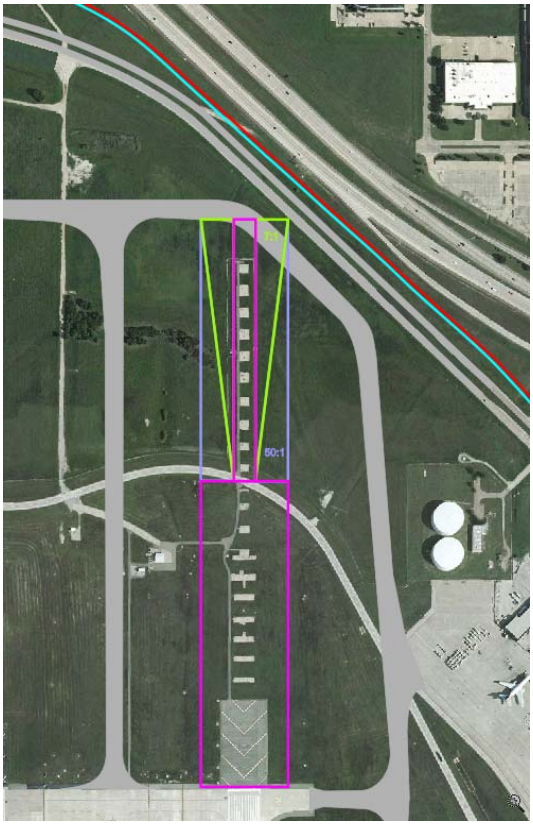


Figure 28: Runway 17C Approach Lighting System

Runway 17L ALSF: This system and its' associated clearance surfaces, comes within approximately 550 feet of the planned DART Rail Route. There were no identified operational impacts to this system from the proposed project.

Communication

The FAA and airport sponsors typically have numerous communication systems throughout the airport. These systems are used primarily on the airport, but often extend beyond the airport boundary.

The FAA communication systems are critical to the air traffic ground and airborne operations of an airport and must be protected as required under the airports' FAR Part 139 Certification of Airports, Part 139.333 Protection of Navigation aids. The assessment of the FAA communication systems are divided into three categories:

- Broadcast systems,
- Point-to-Point systems, and
- Facility / Infrastructure Impacts

Broadcast Communication Systems: The FAA has numerous broadcast communication systems located on DFW. These systems provide air traffic communications both on the airports' operational surface area as well as aircraft in the approach & departure corridors.

A line-of-sight assessment of these broadcast systems was performed for both the current coverage as well as the future coverage, when the DART Rail infrastructure has been established was conducted. The assessment was to identify areas of communication shadows (areas where communication cannot be received).

The proposed DART Rail route and associated infrastructure, will not induce any additional shadowing onto the operational areas of the airport or approach/departure corridors.

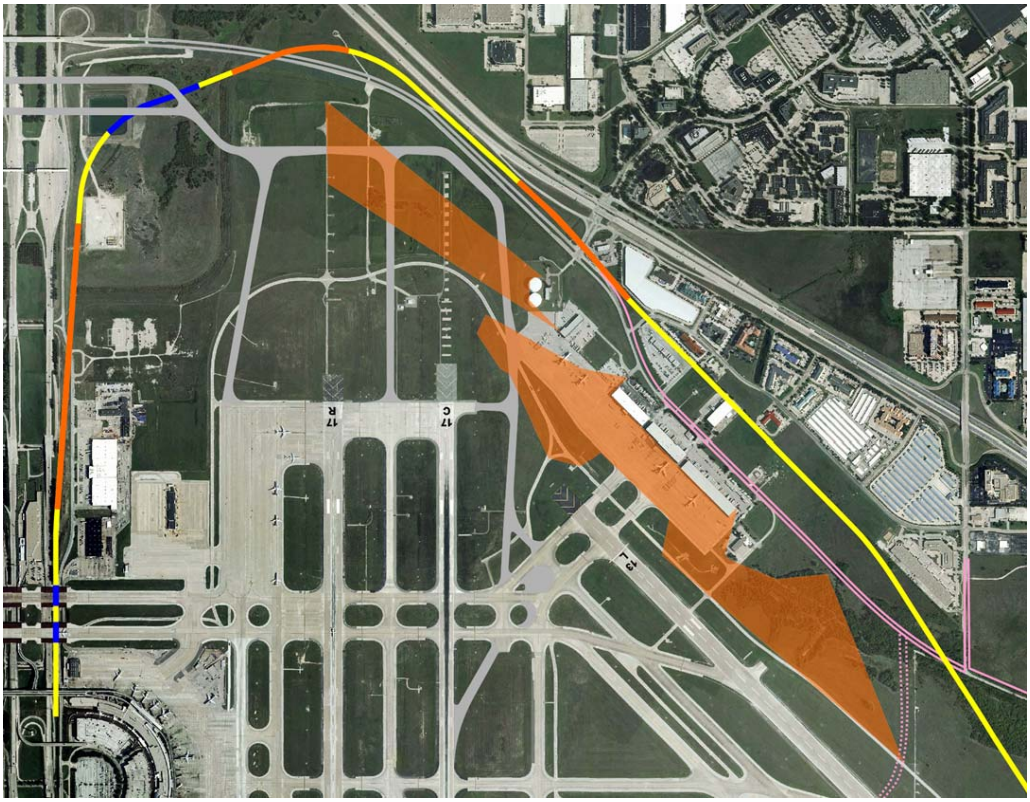


Figure 29: Existing FAA Communication Shadows

The existing communication shadows however, will require further FAA assessment and mitigation to optimize communication coverage for the proposed North East End-Around Taxiway system. Several areas, as shown in Orange in Figure 29, have significant shadowing, that could impact air traffic communications. Mitigation of these shadows should be considered prior to the activation of the Northeast End-Around Taxiway.

Point-to-Point Communication Link Systems: The FAA has numerous point-to-point communication systems such as microwave, UHF or VHF data links on DFW, as shown in Figure 30. These systems focus signals in specific paths to/from selected navigational systems. Typical systems at DFW are;

- Microwave Link between NE Surveillance Radar to Central ATCT
- Moving Target Reflector to NE Surveillance Radar
- CPME BEACON Sensor to NE Surveillance Radar/BEACON
- LLWAS Remote Sensors to Central ATCT

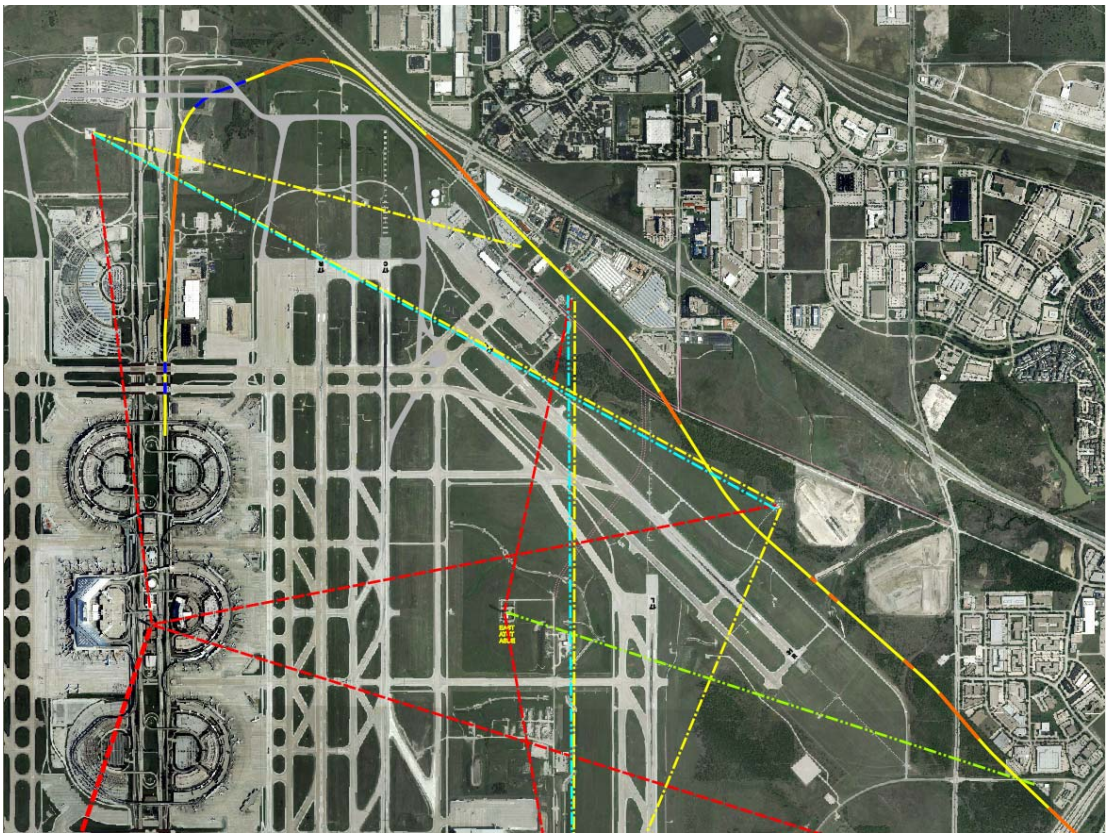


Figure 30: Illustration of Existing FAA Point-to-Point Communication Paths

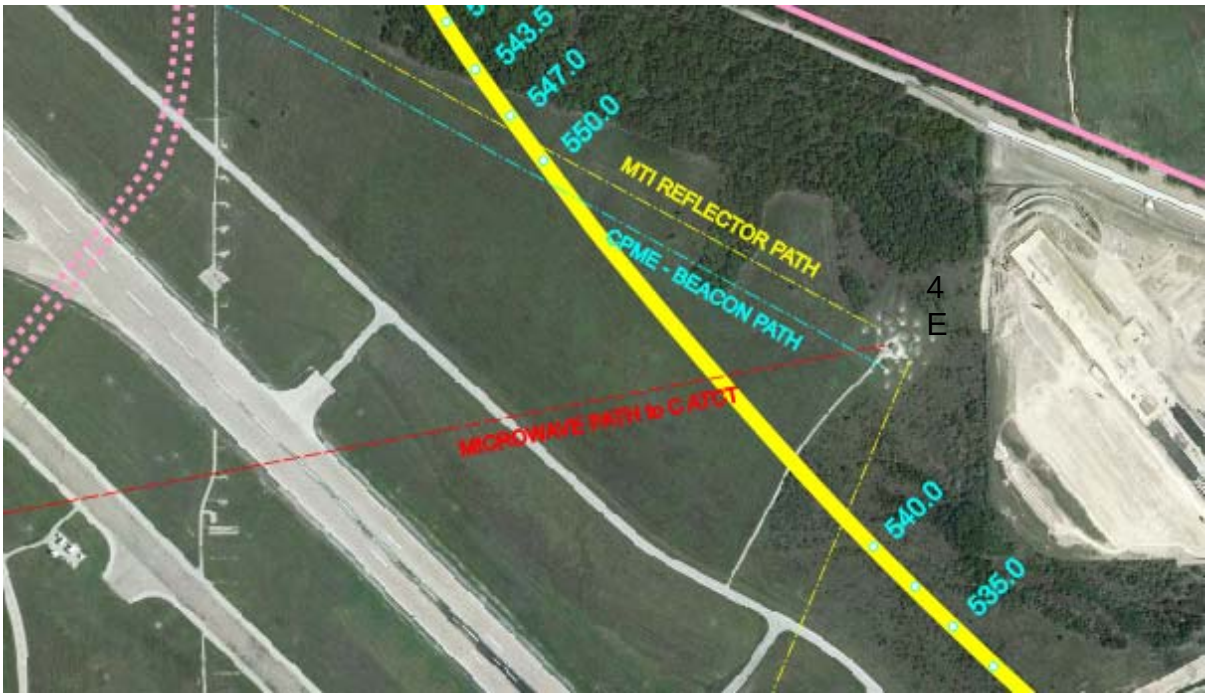


Figure 31: FAA Microwave Path from 4E RTR to Center ATCT

Figure 32: FAA Microwave Path Line-of-Sight from 4E RTR to Center ATCT

A line-of-sight (LOS) evaluation of the proposed DART Rail route and the various point-to-point systems was performed. The results of the line of sight evaluation, as shown in Figure 32, indicates that the DART Rail infrastructure may impact the 4E RTR to Central ATCT Microwave Path Fresnel Zone clearance. The LOS photo was taken from the center of the microwave dish. A similar situation was encountered on the west side of the airport when DFW built Terminal D and the associated Grand Hyatt hotel. Communication to/from the 1W RTR facility was re-routed from the Central Airport Traffic Control Tower (ATCT) to the West ATCT. Should the FAA determine that there is an operational impact to the microwave link, there are some additional alternatives. Those alternatives are as follows;

- Increase the height of the antenna at the 4E RTR site,
- Change the path to feed through the East ATCT.

A more complete diagram of the various DFW point to point communication links, their type, location coordinates, and antenna height is provided in the Appendices of this report.

Facility / Infrastructure Impacts: The FAA has two Remote Transmit Receiver facilities (RTR-1E and RTR-2E) very near the proposed DART Rail Route, as shown in Figure 33. A site visit to both of these facilities, shortly after a medium rain event, indicates that there is a significant drainage issue on the FAA plots. When it rains, water will be standing (up to 2 inches in depth) through-out both plots for several days.

The addition of the DART Rail Line infrastructure, adjacent to the FAA facilities, will only compound the drainage issue if drainage is not taken in to consideration. DART should coordinate with the FAA during the Design Phase of their project to ensure that their project will not compound the drainage issue on the FAA facility plots.

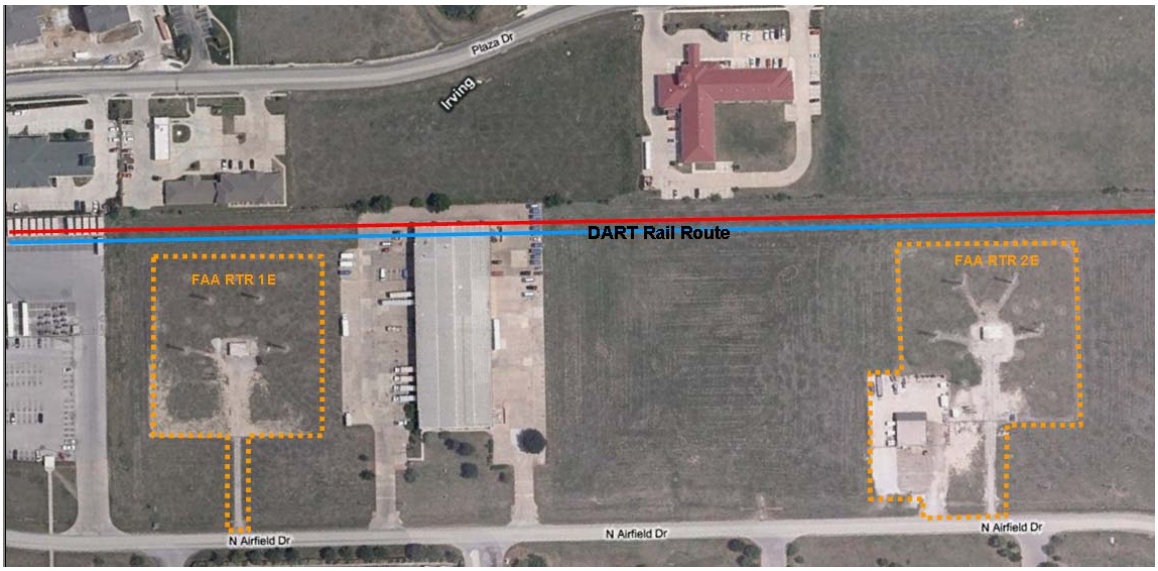


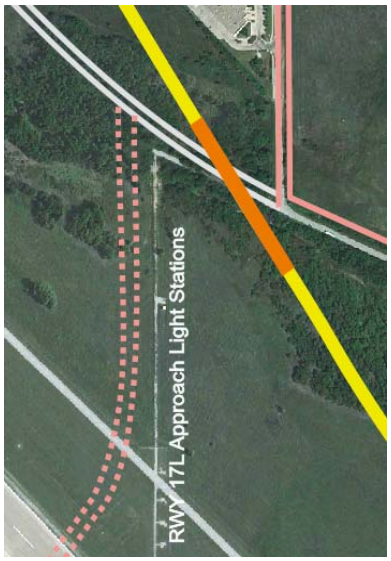
Figure 33: FAA Communication Facilities 1E and 2E

FAA Infrastructure, Facility & System Access: The FAA will require continuous access to their facilities during the DART Rail route construction.

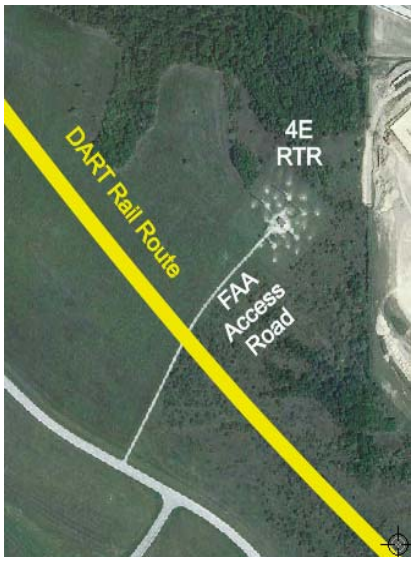
The DART Rail contractor will need to work with the local FAA representatives to provide an alternate access route to their facilities. Those Facility & Systems are as follows:

- RTR 1E
- RTR 2E
- RTR 4E
- Runway 17L Approach Light Stations
- LLWAS Remote Station #4

LLWAS Remote Station #4



RWY 17L Approach Light Stations



RTR 4E

Figure 34: FAA Facility Access Roads

Weather

Several weather systems will be impacted by the establishment of the DART Rail infrastructure in the Northwest quadrant of the Airport. Those systems and their impacts and connected actions are as follows:

The Low Level Wind Shear Alerting System – Network Expansion (LLWAS-NE): The LLWAS-NE Remote Station #4, (Point #1), as shown Figure 35, will need to be relocated due to the routing of the DART guideway going directly through LLWAS Sensor. Jacobs provided the FAA three potential locations for a relocated site. The FAA's Weather Sensors Meteorologist, AJW-14A, on Oklahoma City, Ok., has looked at other alternatives, and selected one of the proposed sites (Point #2), as shown in Figure 36. This relocated site will be within existing FAA property, at the 1E RTR facility. The pole will be established in the Northwest corner of the FAA RTR 1E facility plot. AJW-14A has stated that this location will provide the optimal coverage for the wind shear network.

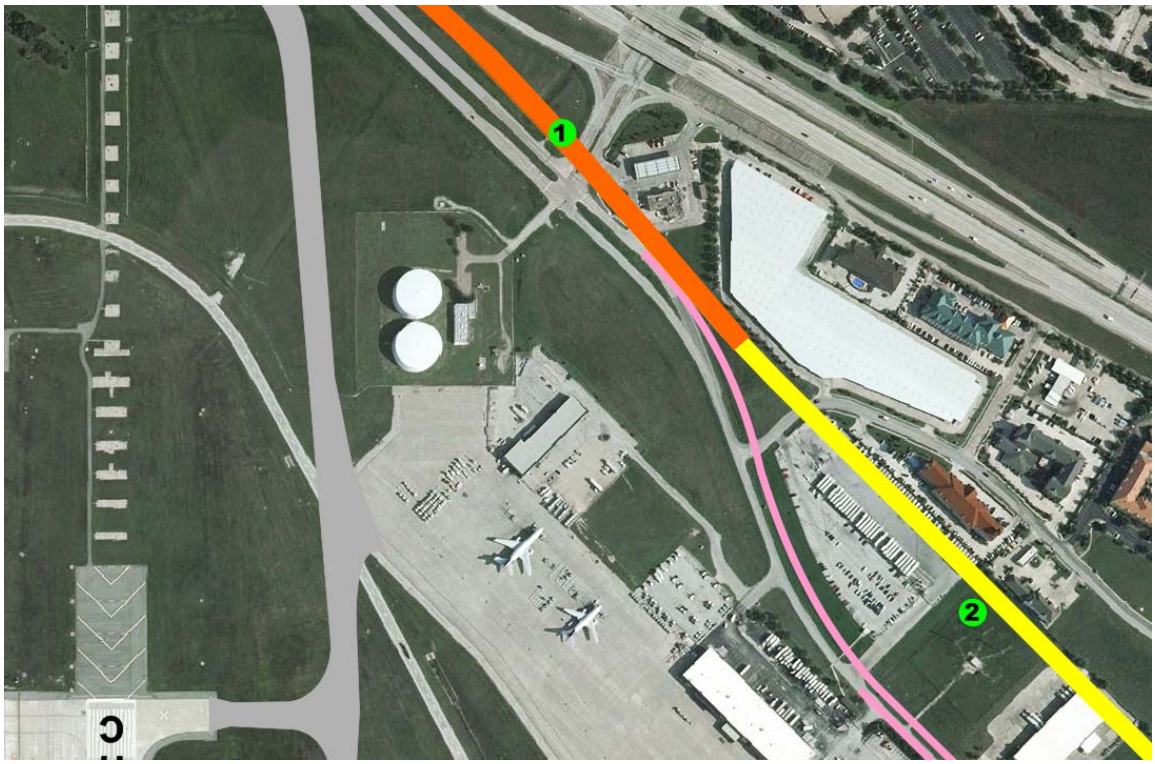


Figure 35: FAA LLWAS Remote Sensor Relocation Diagram

The method to relocate the sensor may require the “hot cut-over” of the LLWAS Sensor, to minimize the wind shear detection capability down-time. This would best be achieved through the establishment of new high mast pole infrastructure and associated electronic equipment at the new relocated site and then cut-over to the new system at a predetermined FAA timeline.

Figure 36: FAA RTR Site 1E and Proposed LLWAS Remote Sensor #4 & ASDE RU #2

The relocation of this LLWAS Sensor will additionally require changes, not only to the LLWAS system, but also the Terminal Doppler Weather Radar System (TDWR), the Integrated Weather Information System (ITWS), and the ASDE-X Remote Unit #2, through revised software adaptation changes to those systems at the time of relocation. These changes are necessary to accurately identify the source of the various sensors located on the relocated LLWAS Sensor pole.

Adequate time must be planned to allow for the development of the LLWAS Software Adaptation, testing and integration.

Integrated Terminal Weather Information System (ITWS): The ITWS will require software adaptation changes at the same time of the LLWAS Sensor #4 relocation, to account for the revised location of the LLWAS Sensor #4 location. Adequate time must be planned to allow for the development of the ITWS Software Adaptation, testing and integration.

Terminal Doppler Weather Radar System (TDWR): The TDWR will require software adaptation changes at the time of the LLWAS Sensor #4 relocation, to account for the revised location of the LLWAS Sensor #4 location. Adequate time must be planned to allow for the development of the TDWR Software Adaptation, testing and integration.

ASDE-X Remote Unit (RU) #2: The ASDE-X RU #2 is co-located on the LLWAS-NE Remote Station #4 high mast pole. The relocation of the LLWAS #4 Sensor pole will require the relocation of the ASDE-X RU as well. The ASDE-X system will require an update to the software to account for the relocated ASDE-X RU Detection Sensor location. The ASDE-X Software Adaptation file installation, testing and acceptance will need to accomplished at the same time as the at the time of the LLWAS Sensor #4 relocation activities.

The method to relocate the ASDE-X RU Sensor may require the "hot cut-over" of the Sensor, to minimize the airport surface and approach detection capability down-time. This would best be achieved through the establishment of new electronic equipment at the new relocated site and then cut-over to the new system at a predetermined FAA timeline

Adequate time must be planned to allow for the development of the ASDE-X Software Adaptation, testing and integration.

Radar

DFW has several types of Radar systems supporting the airports operations. Three of these systems were assessed as a part of this report, due to their proximity to the proposed project area.

Both Airport Surveillance Radar (ASR) systems were assessed in part for the radar system operation, but also for other point-to-point communication systems that either originate or terminate at the radar facility.

The East Airport Surface Detection Equipment (ASDE) system was assessed due to the potential impacts from the DART Rail infrastructure on airport operations.

The following are the findings from those radar assessments.

Airport Surveillance Radar System (ASR):

West ASR System: The West ASR system, as shown in Figure 37, provides radar coverage to both sides of the airport. These systems were sited to provide coverage down to 35 feet above the landing thresholds.

The proposed DART Rail route will run between the radar facility and the Runway 17R, 17C and 17L landing thresholds. The planned DART Rail route will consist of tunnel, at-grade or elevated guideway for the areas in the landing thresholds or final approach areas.

The planned DART Rail route comes within approximately 1,700 feet of the West ASR facility. The ASR antenna is located on top of a 70 foot tall tower to optimize the obstacle clearance from ground base airport infrastructure. The FAA siting guidance for Advisory Circular 150-5300-13, Chapter 6, states that buildings and other infrastructure should be at least 1,500 feet from the antenna. The planned DART Rail route meets this criteria.

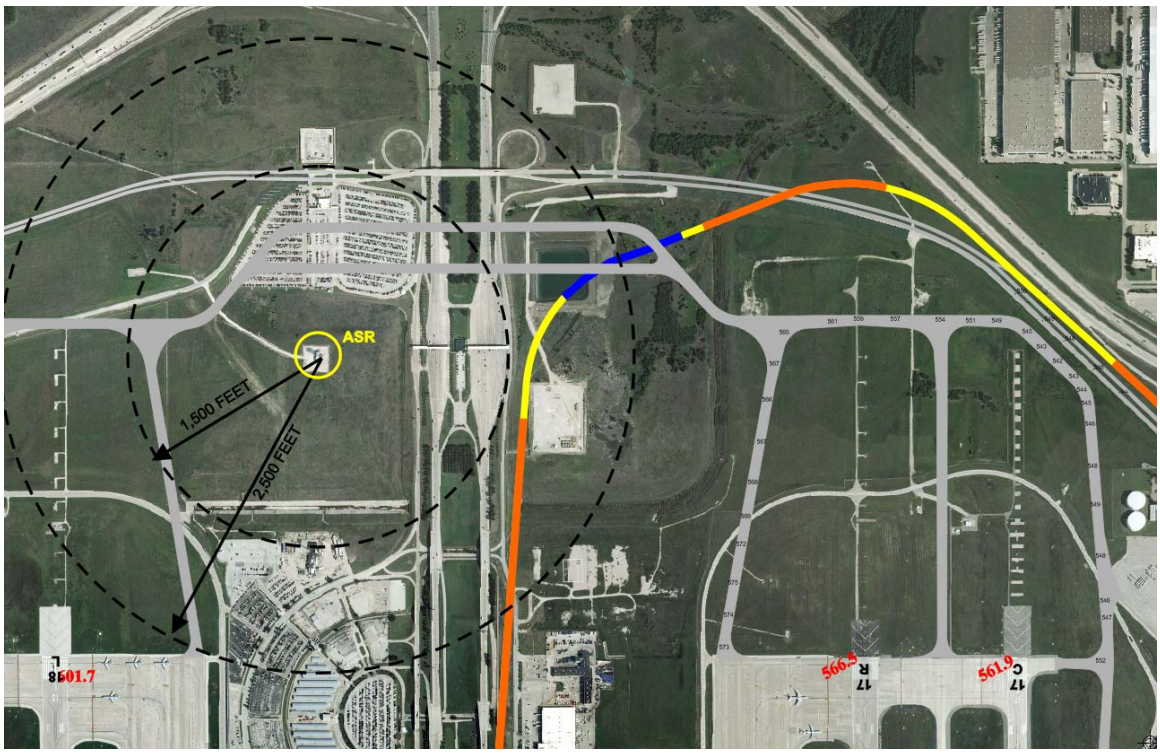


Figure 37: FAA West Airport Surveillance Radar and DART Rail Route

In interviews and discussions with FAA Technical operations personnel, if adverse signal reflections from the DART rail infrastructure or vehicles are detected, the FAA may need to optimize the system to minimize those effects. This is a normal part of the system optimization for such development activities.

Radar coverage and operation should not to be affected by the planned DART Rail infrastructure, but will be monitored by the FAA for system performance.

The West ASR system has several point-to-point communication paths (5) that either originate or terminate at the radar facility.

Calibration Performance Monitor Equipment (CPME) Beacon Target Sensors: There are two CPME Sensors located at the ASR facility. One path goes to the Central ATC and the other at the RTR-4E Communications facility. The CPME sensor at the RTR-4E facility was assessed for line of sight clearance. This sensor is used to assist FAA system operations personnel validate the accuracy of the radar video displays. This sensor is located approximately 50 feet above the ground level. The proposed DART Rail route will not induce any blockage to this sensor.

Moving Target Indicator (MTI) reflectors: Two MTI reflectors for the East ASR system, are located at the RTR-4E and RTR-1E Communication facilities. These reflectors are used to assist FAA system operations personnel validate the accuracy of the radar video displays.

Both MTI reflectors are located more than 43 feet above ground level. The proposed DART Rail route will not induce any blockage to these reflector operations, however other existing infrastructure such as trees and aircraft could become an MTI Reflector performance issue, as shown in Figure 38: Line of Sight from RTR 4E to West ASR.

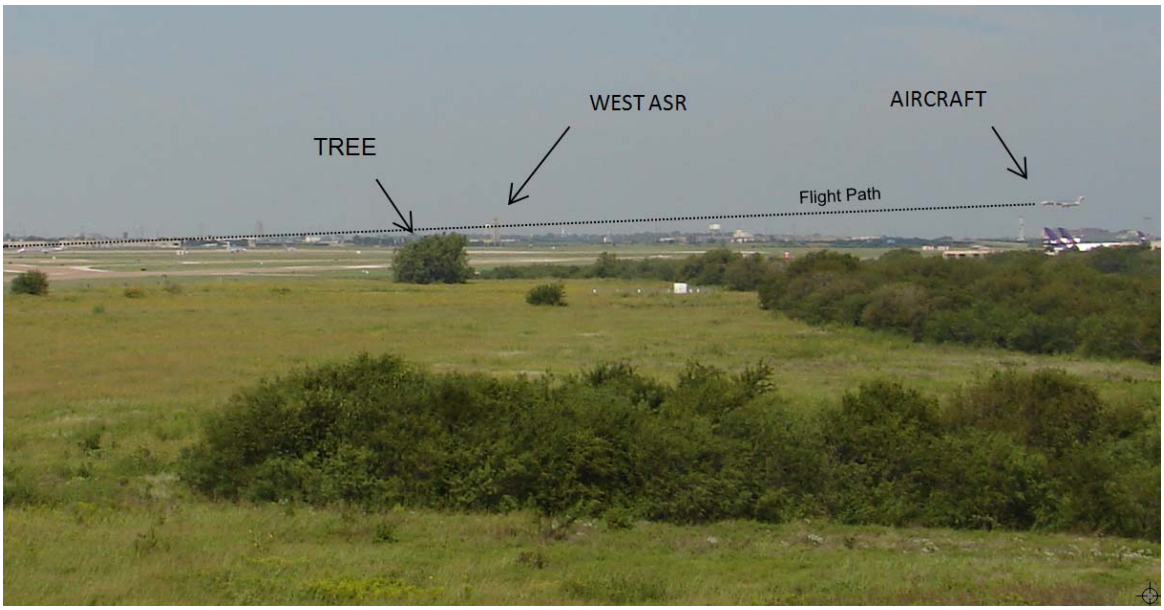


Figure 38: Line of Sight from RTR 4E to West ASR

Microwave Communication Link: A microwave path originates from the radar facility and terminates at the Central ATCT. The proposed DART Rail route will not induce any blockage to this communications path.

East Airport Surveillance Radar System: The East ASR system is located approximately 9,000 feet from the closest part of the DART Rail route. This system has several point-to-point communication paths (5) that either originate or terminate at the radar facility.

Calibration Performance Monitor Equipment (CPME) Beacon Target Sensors: There are two CPME Sensors located at the ASR facility. One path goes to the Central ATC and the other at the RTR-2E Communications facility. The CPME sensor at the RTR-2E facility was assessed for line of sight clearance. This sensor is used to assist FAA system operations personnel validate the accuracy of the radar video displays. This sensor is located approximately 46 feet above the ground level. The proposed DART Rail route will not induce any blockage to this sensor.

Moving Target Indicator (MTI) reflectors: Two MTI reflectors for the East ASR system, are located at the RTR-4E and RTR-2E Communication facilities. These reflectors are used to assist FAA system operations personnel validate the accuracy of the radar video displays.

Both MTI reflectors are located more than 43 feet above ground level. The proposed DART Rail route will not induce any blockage to these reflector operations.

Microwave Communication Link: A microwave path originates from the radar facility and terminates at the East ATCT. The proposed DART Rail route will not induce any blockage to this communications path.

Airport Surface Detection Equipment (ASDE-3):

The East ASDE-3 system is located on the East ATCT. This system provides detection and tracking of aircraft and vehicles within the airport operations movement areas (taxiways and runways). These systems are susceptible to adverse reflections being reflected. The result of these reflected signals can be a multipath signal, that shows up as a false aircraft target. Potential sources of reflections are large flat surfaces, such as the elevated DART Rail infrastructure or the rail vehicles.

The ASDE was assessed by the FAA's Systems Engineering Group, AOS-230 / ATO-W, in Oklahoma City, Ok. The results of their assessment and analysis, is as follows:

- 95% of the rail route is outside of the perimeter of the airport.
- There is a very slim chance that some multipath could show up, however, the Northeast Holding Bay area is a candidate location, as a momentary reflection, but they should not be adverse to the operation.

The ASDE system may need to have some optimization to reduce or eliminate the multipath signals. The FAA's AOS-230 / ATO-W group would perform that optimization, along with local support staff.

The proposed DART Rail route may have a very slim chance to induce a reflection into the movement area, but these could be either eliminated or minimized successfully.

Other Impacted Airport Features

Chesapeake Energy Pad Site "AC":

Pad Site "AC" is located close to the proposed DART Rail route, as shown in Figure 39.

Chesapeake operates and monitors Pad Site infrastructure through electronic monitoring systems. These SCADA systems, rely on point to point communication links from the Pad Site to control/monitor location.

Pad Site "AC" communicates with Pad Site "AM", which is located approximately 10,000 feet North-Northeast of "AC".

The proposed DART Rail route will impact the communication link due to the elevated guideway next to the Pad Site blocking the line-of-sight path.

Mitigation alternatives for the SCADA communication link would be to Increase the height of the antenna at Pad Site "AC" to a height that would be over the DART Rail Infrastructure.

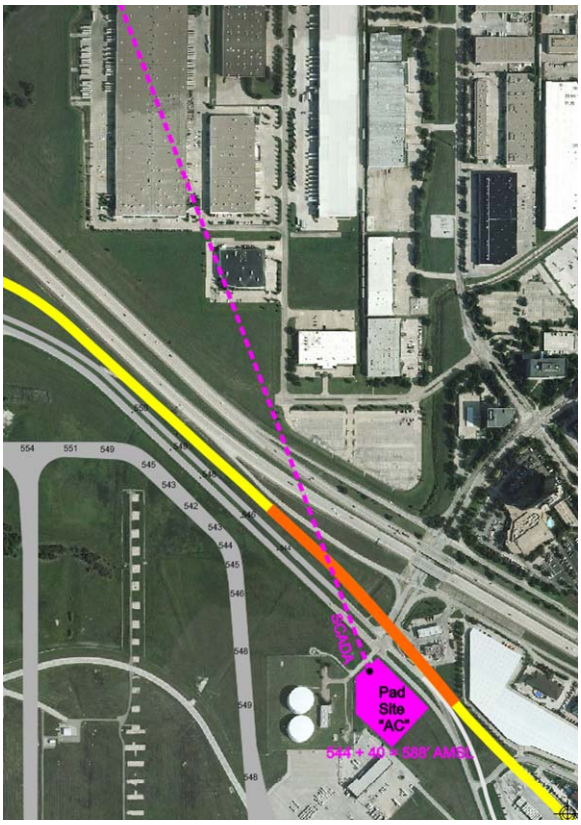


Figure 39: Chesapeake Pad Site "AC "

Advanced coordination with Chesapeake will be required to mitigate their communication link, to minimize any operational impacts.

North East End-Around Taxiway System (NE EAT):

The NE EAT allows aircraft to go out and around the ends of runways without having to cross active runways. The NE EAT extends out 2,650 feet from the runway threshold. The outer limits of the planned NE EAT, will come in close proximity to other transportation infrastructure. The NE EAT will come within 200 feet of the North Airfield Drive, 270 feet to the proposed DART Rail route and 370 feet to State Highway 114. This confined area is commonly known as the "Pinch Point", as shown in Figures 40 and 41.

All required FAA safety & design standards and TERPS clearances between the NE EAT and other infrastructure identified herein appear to meet all airport design standards.

Other assessments, such as Human Factors analysis, was studied as a part of this planned project.

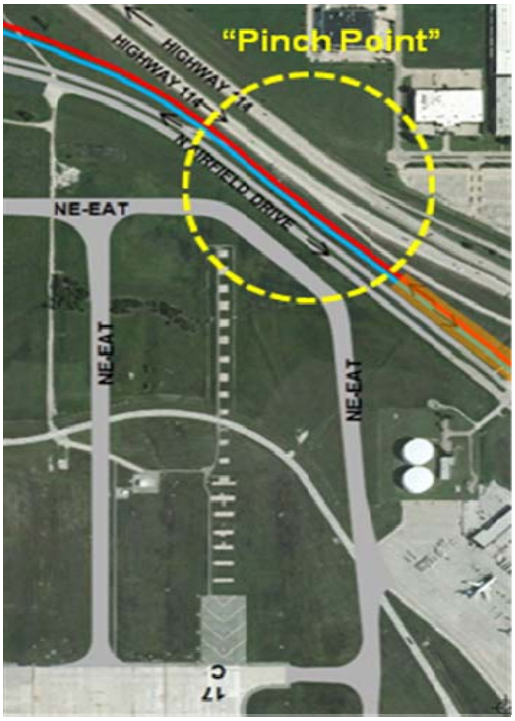


Figure 41: NE EAT "Pinch Point"

Human Factors

Human Factors issues associated with air traffic controller and pilot activities, for operations on the NE EAT, in the area of the Pinch Point have been identified. Those human factors issues were assessed as a part of this report.

The concerns raised were primarily about:

- Air traffics' visual scene in the area of the Pinch Point
- Pilot reactions when taxiing on the NE EAT with roadway and DART Rail vehicle operations in close proximity of the aircraft.
- Pilot visual scene

The following is a summary of the issues, findings and potential mitigation, as required.

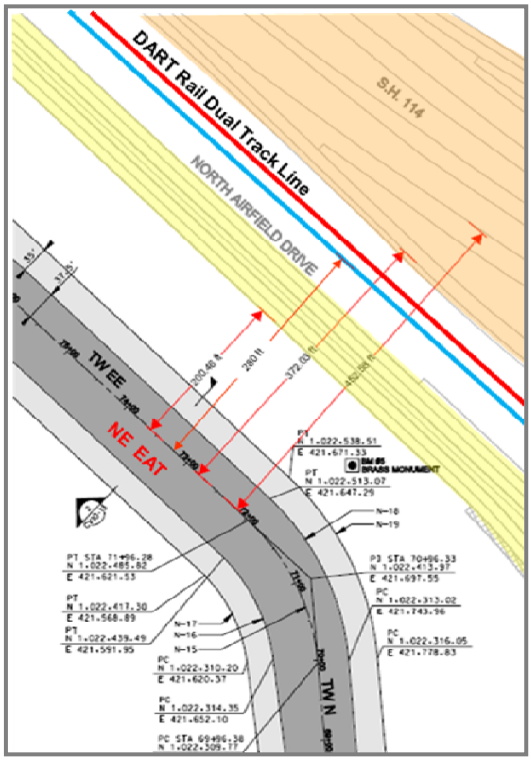


Figure 40 : NE EAT Pinch Point Clearance Dimensions

The existing NE EAT geometry will be effectively the same as SE EAT, as viewed from the East ATCT. Air traffic controllers have been operating traffic on the SE EAT for approximately over a year.
Human Factors, as they relate to air traffic, are for their ability to acquire and discriminate aircraft or vehicles within a very short timeframe with ease, confidence and a comfortable workload.

Figure 42: View from East ATCT to SE EAT

Interviews with air traffic personnel indicated that there are no visual scene issues impairing their ability to discriminate either vehicles or aircraft on the SE EAT.

Figure 43: View from East ATCT to Planned NE EAT

In addition to visual traffic management, air traffic additionally utilizes the ASDE-X radar and display system to assist them in the monitoring and detection of aircraft and vehicles on the movement areas of the airfield, such as the EAT. Discussion with air traffic, indicate that they do not anticipate any difference in their operation or workload than those currently encountered on the SE EAT.

The NE EAT will be constructed sometime after the DART Rail will become operational in 2014.

The initial visual scene presented to the air traffic controllers (DART Rail vehicle movements to and from Terminal “A”), will not be much different than today’s operation, as shown in Figure 43.

When the NE EAT is constructed, air traffic will be looking at traffic on the NE EAT that will be in close proximity to the DART Rail route and existing roadways (North Airfield Drive and State Highway 114). Their ability to quickly acquire and discriminate activity on the NE EAT will be augmented by the use of the ASDE-X system. Lighting (for roadways and DART vehicles) will need to be coordinated in advance so that they do not produce a high point light source for air traffic controllers trying to acquire traffic on the NE EAT. Applying hoods, aiming or color of the lights will help minimize those affects.

Aircraft Operations: To fully assess the human factors associated with aircraft operations, Jacobs utilized the resources of a Human Factors Engineering Psychologist from Mr. Mark Reisweber, FAA Flight Standards organization, whom Jacobs has worked with on several other projects. The following is a summary of Mr. Reisweber’s professional assessment and analysis of the proposed project based on modeling information provided to him by Jacobs. That modeling information and Mr. Reiswebers’ complete comments are available in the appendix to this report. Mr. Reisweber’s abbreviated comments are as follows:

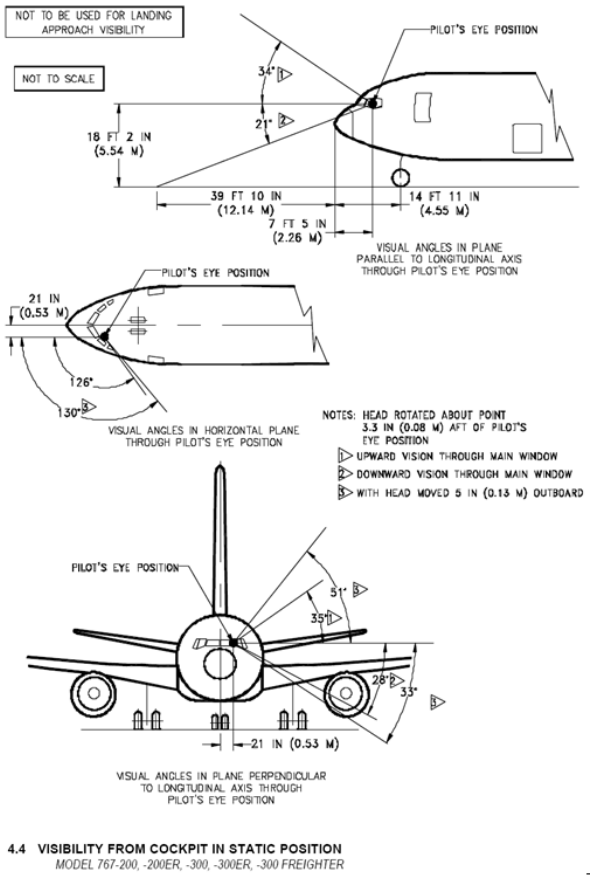


Figure 44: Aircraft Visibility

FAA Flight Standards Comments: The presence of DART Rail traffic in close proximity to the NE Quadrant EAT may create a level of distraction or confusion to taxiing pilots who might react in contravention to normal EAT taxiing operations, thereby rendering end-around taxi operations unsafe.

Modern commercial aircraft cockpits are designed to give pilots maximum visual acquisition predominantly through the front windscreen, with an

effective viewing angle of approximately 120 degrees + or – 10 degrees to the left or right. There may be a potential distraction from a DART Rail vehicles that travel from outside that viewing angle into the pilot's primary field of view.

In the proposed DART Rail configuration, a train might appear either directly in front of a taxiing aircraft if it that train is moving northwest to southeast.

Conversely, a train might appear in the pilot's periphery if it's moving from the southeast to northwest. In the first case, it would seem that the crew would have sufficient time to visually acquire the train, cognitively process its movement and have enough time to determine that its intended path is safe.

A train appearing in the crew's periphery (most probably through the side window, travelling from southeast to northwest) would require more cognitive processing time. Without completing a full safety study, Mr. Reisweber can only conjecture that the aircraft crew most probably would have enough time and attentional resources to collectively determine that the train does not present a safety hazard.

Human Factors: HF as they relate to pilots during taxiing operations, are for their ability to:

- Navigating the aircraft within the confines of the taxiway geometry,
- Maintaining a safe operational distance with the aircraft to the front,
- Avoiding collision with incurring vehicles or aircraft.

Taxiing Operations: If, in the course of those duties, the taxiing pilots are distracted for any moment, their attention might be diverted for a period of time from the primary requirements. The concern that then surfaces is whether the pilot or crew has enough individual or collective attentional resources to acquire the DART Rail vehicles and make an assessment of it's risk and return to their primary duties.

Conspicuity: Logically, anything associated with the DART Rail that makes it more conspicuous and recognizable as a train, eliminates the risk of confusion and helps reduce crew cognitive burden.

Known and recognizable cultural infrastructure (catenary wire configuration, stanchions, pole lighting, bridges, etc.) will point out the presence of a rail system whether a train is actually there or not. These features most likely will help reduce any required attention and free the crew to perform their primary pilot duties. Conventional airport signage may also help.

Night Conditions: As in most aircraft operations, night conditions present a set of different issues, most predominantly in the area of visual acuity, depth perception and scanning techniques. Lighted rail infrastructure (stanchions,

catenaries, bridges, etc.) will help define the position and orientation of the rail, forewarning the crew of potential rail traffic. Depending upon the exact relative position of the aircraft to an oncoming train, any potential similarity between rail headlights and generic aircraft nose/wheel lights might present confusion. The light on an oncoming train might incorrectly signal the approach of an oncoming taxiing aircraft. Flight Standards strongly recommends that rail traffic utilize dissimilar lighting, using any number and types of signal coding. Coding could be in the form of light orientation, differing colors, blinking, dimming or any combination thereof.

Typically, any assessment of workload and/or comfort would be done through both subjective and objective analysis, most probably during a scientifically-based study. Time and budgetary constraints preclude Flight Standards such an evaluation. This discussion has made certain assumptions from which these general comments were rendered.

FAA Flight Standards Note: This represents a very cursory review of the concept of the DART Rail and it's proximity to the NE Quadrant EAT system. This does not constitute a fully developed scientific data collection and analysis effort and does not make fully developed conclusions and recommendations. Within the framework of addressing several factors (e.g. distraction, confusion, night operations, etc) Mr. Reisweber had to make several assumptions. From that, Mr. Reisweber addressed the potential human performance impact of a train operating near the taxiway.

TERMS: An explanation of the term Attentional, is provided below to help understand the human factor concern as;

Term 1: Attentional

- **Attention** is the cognitive process of selectively concentrating on one aspect of the environment while ignoring other things. Attention has also been referred to as the allocation of processing resources.

- Several types of cognitive bias occur due to an **attentional bias**. One example is when a person does not examine all possible outcomes when making a judgment about a correlation or association. They may focus on one or two possibilities, while ignoring the rest.

Human Factors Mitigation: Mitigating the Human Factors as describe above could be achieved with similar techniques previously developed through other scientific studies conducted and approved by the FAA for the aircraft departure operation for the SE EAT. The mitigation developed by the FAA included partially screening vehicles (aircraft, trucks and cars) to provide a visual scene to the pilots that those vehicles were not in the same operational space as they were. Visual Screens were established for the SE EAT, as shown in Figure 42 and has proven to be effective in providing

adequate mitigation for safe aircraft operations by reducing confusion and enhanced conspicuity and discrimination of the visual scene.

Figure 46 and 47, illustrate in part the visual scene in question for taxiing on the NE EAT aircraft in different times of the day. The suggested mitigation of partial screening could be achieved by enhancing the already planned safety/security fencing along the DART Rail route. This enhancement could include adding polypropelene webbing or slats integrated into the cyclone fencing as shown in the examples below in Figure 45.

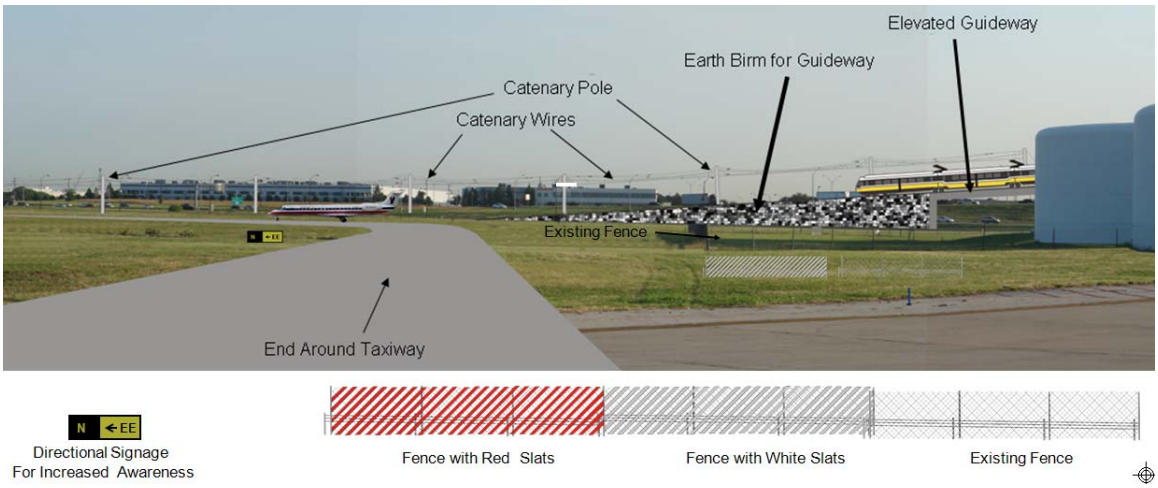


Figure 45: Visual Scene Screening Options

Figure 46 , illustrates the potential visual scene options to aircraft operating on the NE EAT. From these examples the fencing with the Red Slats appears to offer the best discrimination.

Figure 46: Screening and Discrimination Options

The addition of RED Obstruction Lighting on top of the Catenary Poles will additionally assist pilots understand that they are approaching some infrastructure where clearance could be an issue and additional attention is required, as shown in Figure 47.

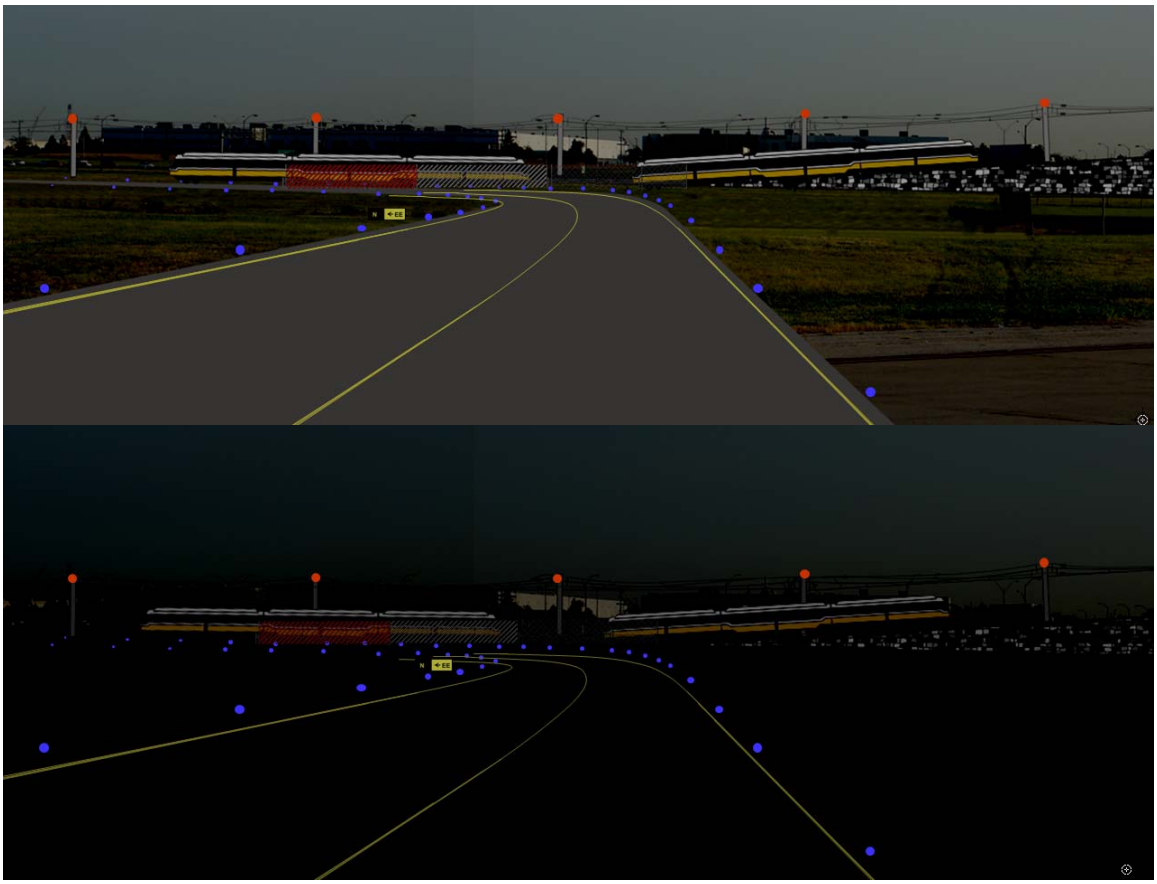


Figure 47: Simulated Night Visual Scenes on the NE EAT

Dart Rail Vehicles currently have several sources of lighting on their vehicles for various operational purposes. These lighting schemes are the same on both ends of the vehicles.

Strobe Lights: Strobe lights operate any time the operator sounds the horn or activates the gong on the train. When the operator activates either the horn or gong the both strobe lights on the car automatically start and continue to flash for 10 seconds after the last horn/gong activation. "All" strobe lights in the train operate all at the same time when the horn/bell is activated. That is, for a 2 car train, if the horn/gong is activated, all 4 strobe lights (2 per car) will all activate simultaneously and all will continue to strobe for 10 sec after the last horn/gong activation.

Figure 48: DART Rail Vehicle Night Lighting

Head Lights: Head lights are on continuously on the "front end" (operating and control end) of the train, whenever the train is turned on. The headlights are standard automotive head lights with high and low beam that are controlled by the operator, as required.

Other Lighting: The other lights in the immediate vicinity of the head lights are as follows: "Red" trail lights and brake lights, "Yellow/amber" marker lights and turn signals (these lights operate the same as automotive tail, brake and turn signal lights).

Auxiliary Lights: Two, high power, "auxiliary headlights" are located at the top of the windshield, one on each end of the destination sign. The auxiliary headlights are separate from the headlights and independently controlled by the operator to be used as required for additional illumination of the track way for use during high speed operation in poorly illuminated areas or tunnels. It is possible to have headlights (high or low beam) and auxiliary headlights illuminated both at the same time.

Interior Lighting: Interior lighting is on all the time.

The various DART Vehicle standard illumination schemes, should help distinguish itself for other types of transportation such as aircraft, trucks and cars, thereby increasing the possibility that better discrimination of what the vehicle is and where by pilots, will be enhanced and less distracting.

DART Rail Visual Screening Area: The location where the enhanced screening should be implemented to assist in mitigating the human factors for the proposed DART Rail route is shown in Figure 49. The location of the Visual Screen is shown as a Red Dashed Line.

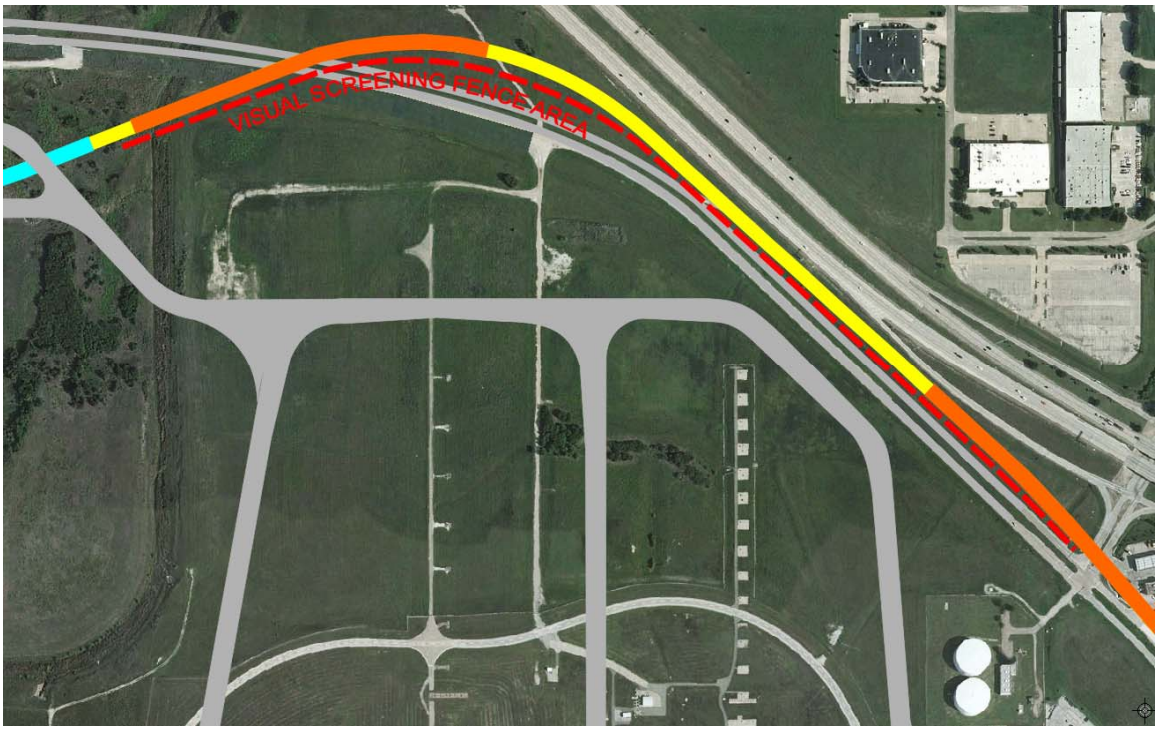


Figure 49: Visual Screening Fence Area

DFW will be establishing an additional fence (between the NE EAT and the North Airfield Drive) to isolate the NE EAT (Airport Operations Area), from the public access area. This fence will be established as a part of the NE EAT construction project.

There may be an additional need to implement screening (similar to the DART alternatives) on the DFW fence to provide additional discrimination and conspicuity of the visual scene.

Safety Risk Management

The FAA's Airports Division will assess the proposed project to determine if the proposed project meets Airport Design Standards. Jacobs' assessment of the proposed DART project does not adversely impact any FAA Airport Design Standards. It is our understanding that FAA's Airports Division would then not be required to make a Safety Risk Decision

The FAA is in the process of implementing Safety Risk Management & Safety Management Systems within their various lines of business. Airport projects,

like the DART Rail Access onto DFW, will require that a Safety Risk Assessment and Decision to be accomplished and documented by the FAA. The FAA's Air Traffic Organization (ATO) will be responsible for assessing, analyzing, developing mitigation solutions as required and documenting the process and associated results in a Safety Risk Management Decision Document (SRMD).

DFW Airport and DART may be asked to provide information and participation in the development of some portions of the FAA's safety risk process and mitigation.

Conclusions

The proposed Dallas Area Rapid Transit (DART) Rail access onto DFW International Airport was assessed and analyzed for various aeronautical aspects of the proposed project to understand those potential affects, the resulting impacts and potential mitigation strategies.

The results of the analysis and assessments performed, concludes that the proposed DART route and operations should not adversely affect airport or aircraft operations for the proposed I-3 Route. Mitigation for the issues documented in this report, will need to be mitigated as a part of the project approval and implementation.

Jacobs has identified 15 issues that will need to be addressed and or mitigated for the environmental assessment approval.

The following is a List of those Identified Issue Mitigation Actions;

1. Develop and submit an Airspace Feasibility Study to allow the FAA to assess and provide formal comments on the proposed project.
2. Obtain FAA concurrence on the DART Rail route through the Runway 17C and 17L RPZ's.
3. Confirm with DFW and the FAA that DART infrastructure that increases Minimum Descent Altitudes over existing obstruction s will be acceptable.
4. Confirm with the FAA that a 30% Flight Inspection Error Tolerance level, based on a "worst case" modeling scheme will be acceptable.
5. Identify to the FAA that Communication shadowing, from existing DFW infrastructure, may cause communication coverage issues on the Future NE EAT.

6. Confirm with the FAA that the proposed DART Rail development, located on the North side of the FAA's 1E and 2E RTR facilities, will be designed so that there will not be any increased flooding issues, as a result of their project.
7. Confirm that the FAA will have continuous access (24 hours per day, 7 days per week) to their facilities to perform their safety critical functions.
8. Coordinate early in the design phase with the FAA, to develop a plan to relocate the LLWAS Remote Station #4 and associated systems, to minimize any operational impacts.
9. Coordinate early in the design phase with the FAA, to develop a plan to relocate the ASDE-X, Remote Unit #2, located on the LLWAS Remote Station #4 pole, to minimize any operational impacts.
10. Coordinate early in the design phase with the FAA, to develop a plan and strategy to minimize any potential reflections that the DFW West ASR may encounter during either the construction or the operational phases.
11. Coordinate early in the design phase with the FAA, to develop a plan and strategy to minimize any potential reflections (multipath) that the DFW East ASDE may encounter during either the construction or the operational phases.
12. Develop a plan on how to minimize the construction area lighting that could cause an adverse visual scene for pilots or air traffic controllers.
13. Chesapeake Pad Site "AC" SCADA Communication Path Mitigation
14. Coordinate early in the design phase with the FAA, to develop acceptable DART Rail Security Fence Visual Screening, which focuses on aircraft day & night operations.
15. Coordinate early in the design phase with the FAA, for the location area (Runway 17R & 17 C and 17L approach areas) for the RED Obstruction Lighting on top of the Catenary Poles.
16. Coordinate early in the design phase with the FAA, to see what assistance will be required of DART for the development and approval of a FAA Safety Risk Management Decision Document.
17. Planning and coordination for the Design-Build and Construction Phases of the project. These phases will require planning and coordination for formal airspace processing and approvals, prior to the start of any construction work, for any temporary and permanent features.

Appendices

1. FAA Technical Center Math Modeling Report for Runway 31R Localizer
2. FAA Aeronautical Center Modeling and Assessment Report for the DFW East ASDE-3 / ASDE-X
3. FAA Aeronautical Center Modeling and Assessment Report for the DFW North East End Around Taxiway Operations

APPENDIX M. REFERENCES/WORKS CITED

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