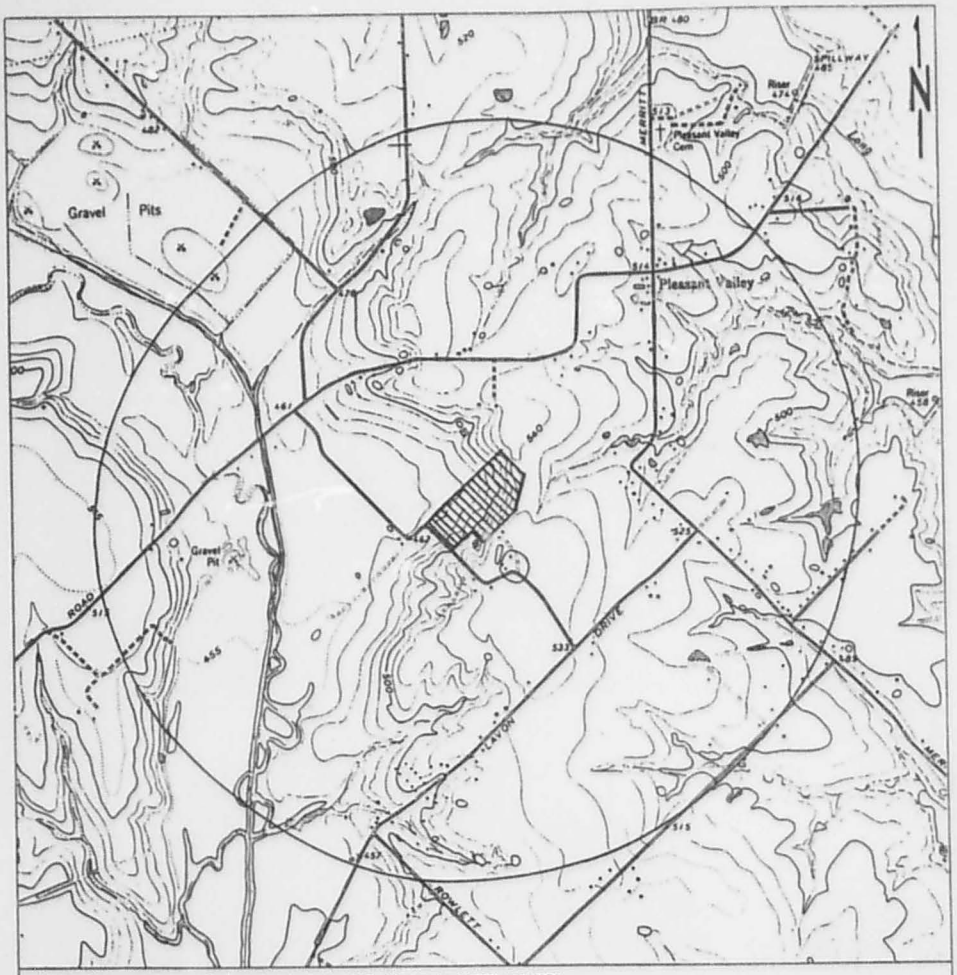
REDACTED VERSION

Reference 1
U.S. Geological Survey, 7.5 minute topographic map, Rowlett, Tex., 1959 (photorevised 1968 and 1973).

90044954

000028



NOTE: Topographic Map, Rowlett Quadrangle. 1959. Photorevised 1968 and 1973

SCALE 1:24 000

1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 KILOMETER

TEXAS

QUADRANGLE LOCATION

Location Map

Miles Road Landfill

Garland, Texas

FLUOR DANIEL

Figure 1

Reference 2
Texas Department of Health, "Potential Hazardous Waste Site Identification and Preliminary Assessment", February 24, 1981.

EXAS DEPARTMENT OF HEALTH

EPA

POTENTIAL HAZARDOUS WASTE SITE IDENTIFICATION AND PRELIMINARY ASSESSMENT

REGION: 6

SITE NUMBER (to be assigned by HQ): TX07048

NOTE: This form is completed for each potential hazardous waste site to help set priorities for site inspection. The information submitted on this form is based on available records and may be updated on subsequent forms as a result of additional inquiries and on-site inspections.

GENERAL INSTRUCTIONS: Complete Sections I and III through X as completely as possible before Section II (*Preliminary Assessment*). File this form in the Regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force (*EN-335*); 401 M St., SW; Washington, DC 20460.

GARLAND CITY OF LDFL-MILES ROAD IDENTIFICATION TXD 980697072

A. SITE NAME: Miles Road Landfill Site-#05/50586 ,

B. STREET (or other identifier): Miles Road, ½ mile NW of Castle Dr., NE side of road

C. CITY: Garland

D. STATE: TX

E. ZIP CODE: 75040

F. COUNTY NAME: Dallas 113

G. OWNER/OPERATOR (if known)
1. NAME: owner: Vaughn McCallum, RFD 2, Rowlett, TX
operator: City of Garland

2. TELEPHONE NUMBER: ph: 214/475-2912
ph: 214/494-7100

H. TYPE OF OWNERSHIP
☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL XXX 5. PRIVATE ☐ 6. UNKNOWN

I. SITE DESCRIPTION
This site was used as the city landfill from February 1973 to June 1975. No liquid or hazardous waste accepted at this site. Only municipal solid waste was accepted.

J. HOW IDENTIFIED (i.e., citizen's complaints, OSHA citations, etc.): North Central Texas COG

K. DATE IDENTIFIED (mo., day, & yr.): 9/23/80

L. PRINCIPAL STATE CONTACT
1. NAME: [illegible], P.E.

2. TELEPHONE NUMBER: 512/458-7271

II. PRELIMINARY ASSESSMENT (complete this section last)

A. APPARENT SERIOUSNESS OF PROBLEM
☐ 1. HIGH ☐ 2. MEDIUM ☐ 3. LOW XX 4. NONE ☐ 5. UNKNOWN

B. RECOMMENDATION
XX 1. NO ACTION NEEDED (no hazard)
☐ 2. IMMEDIATE SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR:
b. WILL BE PERFORMED BY:
☐ 3. SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR:
b. WILL BE PERFORMED BY:
☐ 4. SITE INSPECTION NEEDED (low priority)

C. PREPARER INFORMATION
1. NAME: Rex H. Hunt Rex H. Hunt, P.E.
2. TELEPHONE NUMBER: 817/460-3032
3. DATE (mo., day, & yr.): 02/24/81

III. SITE INFORMATION

A. SITE STATUS
☐ 1. ACTIVE (Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)
XX 2. INACTIVE (Those sites which no longer receive wastes.)
☐ 3. OTHER (specify): (Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)

SUPERFUND FILE

B. IS GENERATOR ON SITE?
XXX 1. NO
☐ 2. YES (specify generator's four-digit SIC Code):

FEB 24 1992

C. AREA OF SITE (in acres): 45

D. IF APPARENT SERIOUSNESS OF SITE IS HIGH, SPECIFY COORDINATES
1. LATITUDE (deg.—min.—sec.): 32°57'
2. LONGITUDE (deg.—min.—sec.): 96°36'

REORGANIZED

E. ARE THERE BUILDINGS ON THE SITE?
XXX 1. NO ☐ 2. YES (specify):

DATE 2/13/81

Continued from Front

V. CHARACTERIZATION OF SITE ACTIV.

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

'X'	A. TRANSPORTER	'X'	B. STORER	'X'	C. TREATER	'X'	D. DISPOSER
	1. RAIL		1. PILE		1. FILTRATION	XX	1. LANDFILL
	2. SHIP		2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	3. BARGE		3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
	4. TRUCK		4. TANK, ABOVE GROUND		4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
	5. PIPELINE		5. TANK, BELOW GROUND		5. CHEM./PHYS. TREATMENT		5. MIDNIGHT DUMPING
	6. OTHER (specify):		6. OTHER (specify):		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY		8. OTHER (specify):
					9. OTHER (specify):		

E. SPECIFY DETAILS OF SITE ACTIVITIES AS NEEDED

This site was used only for disposal of municipal solid waste. No hazardous or liquid waste was disposed of in this site.

V. WASTE RELATED INFORMATION

A. WASTE TYPE

[ ] 1 UNKNOWN [ ] 2. LIQUID [XX] 3. SOLID [ ] 4. SLUDGE [ ] 5. GAS

B. WASTE CHARACTERISTICS

[ ] 1 UNKNOWN [ ] 2. CORROSIVE [ ] 3. IGNITABLE [ ] 4 RADIOACTIVE [ ] 5 HIGHLY VOLATILE
[ ] 6 TOXIC [ ] 7 REACTIVE [ ] 8 INERT [ ] 9 FLAMMABLE

[XX] 10. OTHER (specify): municipal solid waste

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

no records available

2. Estimate the amount (specify unit of measure) of waste by category; mark 'X' to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT 67000	AMOUNT
UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE tons	UNIT OF MEASURE
'X' (1) PAINT, PIGMENTS	'X' (1) OILY WASTES	'X' (1) HALOGENATED SOLVENTS	'X' (1) ACIDS	'X' (1) FLYASH	'X' (1) LABORATORY PHARMACEUT.
(2) METALS SLUDGES	(2) OTHER (specify):	(2) NON-HALOGNTD. SOLVENTS	(2) PICKLING LIQUORS	(2) ASBESTOS	(2) HOSPITAL
(3) POTW		(3) OTHER (specify):	(3) CAUSTICS	(3) MILLING/ MINE TAILINGS	(3) RADIOACTIVE
(4) ALUMINUM SLUDGE			(4) PESTICIDES	(4) FERROUS SMLTG. WASTES	(4) MUNICIPAL
(5) OTHER (specify):			(5) DYES/INKS	(5) NON-FERROUS SMLTG. WASTES	(5) OTHER (specify):
			(6) CYANIDE	XX (6) OTHER (specify): municipal solid waste. Amount estimated based on an average population of 40000 served. Remainder of the population served by Quail Creek landfill.	
			(7) PHENOLS		
			(8) HALOGENS		
			(9) PCB		
			(10) METALS		
			(11) OTHER (specify)		

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00003

Continued From Page 2

V. WASTE RELATED INFORMATION (continued)

3. LIST SUBSTANCES OF GREATEST CONCERN WHICH MAY BE ON THE SITE (place in descending order of hazard).

As this site accepted only municipal solid waste and as adequate access control and operational control was exercised by the city, no hazardous waste problem is anticipated.

4. ADDITIONAL COMMENTS OR NARRATIVE DESCRIPTION OF SITUATION KNOWN OR REPORTED TO EXIST AT THE SITE.

VI. HAZARD DESCRIPTION

A. TYPE OF HAZARD	B. POTENTIAL HAZARD (mark 'X')	C. ALLEGED INCIDENT (mark 'X')	D. DATE OF INCIDENT (mo., day, yr.)	E. REMARKS
1. NO HAZARD	XXXX			
2. HUMAN HEALTH				
3. NON-WORKER INJURY/EXPOSURE				
4. WORKER INJURY				
5. CONTAMINATION OF WATER SUPPLY				
6. CONTAMINATION OF FOOD CHAIN				
7. CONTAMINATION OF GROUND WATER				
8. CONTAMINATION OF SURFACE WATER				
9. DAMAGE TO FLORA/FAUNA				
10. FISH KILL				
11. CONTAMINATION OF AIR				
12. NOTICEABLE ODORS				
13. CONTAMINATION OF SOIL				
14. PROPERTY DAMAGE				
15. FIRE OR EXPLOSION				
16. SPILLS/LEAKING CONTAINERS/ RUNOFF/STANDING LIQUIDS				
17. SEWER, STORM DRAIN PROBLEMS				
18. EROSION PROBLEMS				
19. INADEQUATE SECURITY				
20. INCOMPATIBLE WASTES				
21. MIDNIGHT DUMPING				
22. OTHER (specify):				

0000034

Continued From Front

VII. PERMIT INFORMATION

A. INDICATE ALL APPLICABLE PERMITS HELD BY THE SITE.

NONE

- [ ] 1. NPDES PERMIT
- [ ] 2. SPCC PLAN
- [ ] 3. STATE PERMIT *(specify)*: _____
- [ ] 4. AIR PERMITS
- [ ] 5. LOCAL PERMIT
- [ ] 6. RCRA TRANSPORTER
- [ ] 7. RCRA STORER
- [ ] 8. RCRA TREATER
- [ ] 9. RCRA DISPOSER
- [ ] 10. OTHER *(specify)*: _____

B. IN COMPLIANCE?

- [X] 1. YES
- [ ] 2. NO
- [ ] 3. UNKNOWN

4. WITH RESPECT TO *(list regulation name & number)*: _____

VIII. PAST REGULATORY ACTIONS

- [X] A. NONE
- [ ] B. YES *(summarize below)*

IX. INSPECTION ACTIVITY *(past or on-going)*

- [X] A. NONE
- [ ] B. YES *(complete items 1, 2, 3, & 4 below)*

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION (mo., day, & yr.)	3. PERFORMED BY: (EPA/State)	4. DESCRIPTION

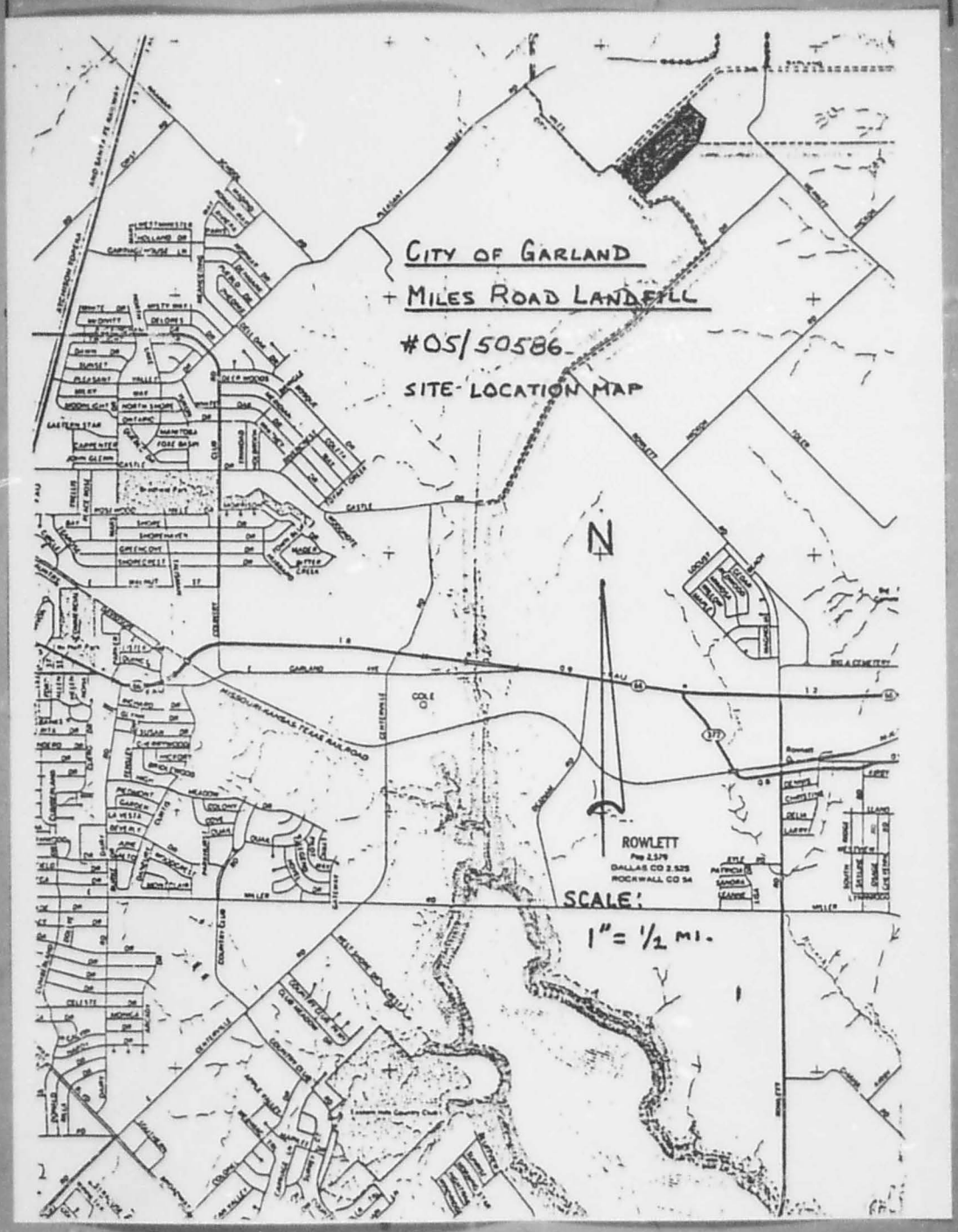
X. REMEDIAL ACTIVITY *(past or on-going)*

- [X] A. NONE
- [ ] B. YES *(complete items 1, 2, 3, & 4 below)*

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION (mo., day, & yr.)	3. PERFORMED BY: (EPA/State)	4. DESCRIPTION

NOTE: Based on the information in Sections III through X, fill out the Preliminary Assessment *(Section II)* information on the first page of this form.

000035


CITY OF GARLAND
MILES ROAD LANDFILL
#05/50586
SITE-LOCATION MAP
N
ROWLETT
SCALE:
1" = 1/2 MI.

Reference 3
Texas Department of Health, "Potential Hazardous Waste Site
Final Strategy Determination", February 24, 1981.

00003

TEXAS DEPARTMENT OF HEALTH

EPA

POTENTIAL HAZARDOUS WASTE SITE
FINAL STRATEGY DETERMINATION

REGION: 6 | SITE NUMBER: TX07048

File this form in the regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force (EN-335), 401 M St., SW, Washington, DC 20460.

I. SITE IDENTIFICATION

TXD 980 697072

A. SITE NAME	B. STREET	
GARLAND CITY OF LDFL-MILES ROAD Miles Road Landfill Site-#05/50586	Miles Rd., ½ Mi. NW of Castle Dr., NE side of road	
C. CITY: Garland	D. STATE: TEXAS	E. ZIP CODE: 75040

II. FINAL DETERMINATION

Indicate the recommended action(s) and agency(ies) that should be involved by marking 'X' in the appropriate boxes.

RECOMMENDATION	MARK 'X'	ACTION AGENCY: EPA	STATE	LOCAL	PRIVATE
A. NO ACTION NEEDED	XXX				
B. REMEDIAL ACTION NEEDED, BUT NO RESOURCES AVAILABLE (If yes, complete Section III.)					
C. REMEDIAL ACTION (If yes, complete Section IV.)					
D. ENFORCEMENT ACTION (If yes, specify in Part E whether the case will be primarily managed by the EPA or the State and what type of enforcement action is anticipated.)					

E. RATIONALE FOR FINAL STRATEGY DETERMINATION

As this site was operated as a municipal solid waste site only and as adequate access and operational control was exercised by the city, no hazardous waste problem is anticipated.

F. IF A CASE DEVELOPMENT PLAN HAS BEEN PREPARED, SPECIFY THE DATE PREPARED (mo., day, & yr.)

G. IF AN ENFORCEMENT CASE HAS BEEN FILED, SPECIFY THE DATE FILED (mo., day, & yr.)

H. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE (mo., day, & yr.)
Rex H. Hunt Rex H. Hunt, P.E.	817/460-3032	02/24/81

III. REMEDIAL ACTIONS TO BE TAKEN WHEN RESOURCES BECOME AVAILABLE

List all remedial actions, such as excavation, removal, etc. to be taken as soon as resources become available. See instructions for a list of Key Words for each of the actions to be used in the spaces below. Provide an estimate of the approximate cost of the remedy.

A. REMEDIAL ACTION	B. ESTIMATED COST	C. REMARKS
	$	
	$	
	$	
	$	
	$	SUPERFUND FILE
	$	
	$	FEB 24 1992
	$	REORGANIZED
D. TOTAL ESTIMATED COST	$	

DATE 2/13/81

EPA Form T2070-5 (10-79)

Continued From Front

IV. REMEDIAL ACTIONS

A. SHORT TERM/EMERGENCY ACTIONS *(On Site and Off-Site)*: List all emergency actions taken or planned to bring the site under immediate control, e.g., restrict access, provide alternate water supply, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE *(mo.,day,&yr)*	3. ACTION END DATE *(mo.,day,&yr)*	4. ACTION AGENCY *(EPA, State, Private Party)*	5. COST	6. SPECIFY 311 OR OTHER ACTION. INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

B. LONG TERM STRATEGY *(On Site and Off-Site)*: List all long term solutions, e.g., excavation, removal, ground water monitoring wells, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE *(mo.,day,&yr)*	3. ACTION END DATE *(mo.,day,&yr)*	4. ACTION AGENCY *(EPA, State Private Party)*	5. COST	6. SPECIFY 311 OR OTHER ACTION. INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

C. MANHOURS AND COST BY ACTION AGENCY

1. ACTION AGENCY	2. TOTAL MAN-HOURS FOR REMEDIAL ACTIVITIES	3. TOTAL COST FOR REMEDIAL ACTIVITIES
a. EPA		$
b. STATE		$
c. PRIVATE PARTIES		$
d. OTHER *(specify)*:		$

Reference 4
Record of Telephone Conversations between Tom Casabonne, Fluor Daniel, and the Dallas County Tax Office (various personnel). March 22-30, 1993.

000040

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

FROM: Tom Casabonne

DATE: March 22-30, '93

LOCATION: Irvine, 552M

TIME:

TO: Dallas County Tax Office

P.O. NO.

LOCATION: (214) 653-7811 (3) (1)

OTHER REF. Legal descriptions and owners

Before calling the Dallas County Tax Office, I first obtained tax account numbers for the various plots by calling the tax office of the Garland Independent School District at (214) 494-8570. Lisa Freeman looked up the sites on the plats in that office and faxed me the maps that we needed along with tax account numbers for each plot. She also sent me the most current owner information that she had. I verified and corrected that data by calling the Dallas County Tax Office and getting the information over the telephone. That information is shown below:

Miles Rd.

Tax Account No. (b) (6) [redacted] located at 23 Miles Rd.
Legal Description: Abst 225, pg 580, Tr 23 [29.71 ac]
Owner: Joel Vaughn McCallum (9214 Miles Rd., Rowlett, TX 75088)

Castle & Miles

Tax Account No. (b) (6) [redacted]
Legal Description: Abst 225, pg 580, Tr 21 [59.92 ac]
Owner: City of Garland

Castle Drive

Tax Account No. 65022558010170000
Legal Description: Abst 225, pg 580, Tr 17 [127.50 ac]
Owner: City of Garland

Tax Account No. 65022558010150000
Legal Description: Abst 225, pg 580, Tr 15 [19.82 ac]
Owner: City of Garland

Tax Account No. 65022558010160000
Legal Description: Abst 225, pg 580, Tr 16 [2.0 ac]
Owner: City of Garland

The following parcels are small, adjacent plots which all belong to the City of Garland. The legal descriptions were not verified with the Dallas County Tax Office.

000041

Tax Account No. 65022558010140000
Legal Description: Abst 225, Tr 14

Tax Account No. 65022558010410000
Legal Description: Abst 225, Tr 41

Tax Account No. 65022558010400000
Legal Description: Abst 225, Tr 40

Tax Account No. 65022558010360000
Legal Description: Abst 225, Tr 36

Tax Account No. 65022558010370000
Legal Description: Abst 225, Tr 37

Tax Account No. 65022558010380000
Legal Description: Abst 225, Tr 38

Tax Account No. 65022558010390000
Legal Description: Abst 225, Tr 39

Tax Account No. 65022558010470000
Legal Description: Abst 225, Tr 47

Tax Account No. 65022558010420000
Legal Description: Abst 225, Tr 42

Tax Account No. 65022558010430000
Legal Description: Abst 225, Tr 43

Tax Account No. 650225580010440000
Legal Description: Abst 225, Tr 44

Tax Account No. 65022558010460000
Legal Description: Abst 225, Tr 46

Tax Account No. 65022558010450000
Legal Description: Abst 225, Tr 45

East Garland Rd.

Tax Account No (b) (6) [redacted] located at 2826 Centerville Rd.
Legal Description: Abst 952, Tr 6 [11.461 ac]
Owner: Maderia Corp., Paul Penkova (b) (6) [redacted] The tax office said that this property is involved in multi-suit no. 30087, with a total of $12,607.15 owed in back taxes for the years '90, '91, and '92. For more information call the master court at (214) 653-6010.

Tax Account No. 65095209110050000, located at 1100 Commerce.
Legal Description: Abst 0952, pg 091 [20.0 ac]
Owner: City of Dallas (1500 Marilla, Dallas, TX 75201)

000042

Quail Creek

Tax Account No (b) (6) [redacted] located at 1100 State Hwy 66.
Legal Description: Abst 952, pg 090, Tr 11.5 [8.319 ac]
Owner: Millcreek Associates Limited Partnership (b) (6) [redacted]

Tax Account No (b) (6) [redacted] located at 1520 Commerce.
Legal Description: Abst 952, pg 90, Tr 1 [49.9816 ac]
Owner: Cambridge Consolidated (b) (6) [redacted] The county Law Office is suing the owner to recover $19,806.82 in back taxes, which are owed from 1988-92. For more information, call the master court at (214) 653-6010 and ask about case no. 93-30070TA.

East Miller Rd.

Tax Account No. (b) (6) [redacted]
Legal Description: Abst 761, pg 363, Tr 37 [13.016 ac]
Owner: Oleta Mae Cannaday (301 Edgefield, Garland, TX 75040)

Tax Account No. (b) (6) [redacted]
Legal Description: Abst 761, pg 363, Tr 38 [1.0 ac]
Owner: F. T. Drum (2110 E. Miller Rd., Garland, TX 75043)

Tax Account No (b) (6) [redacted]
Legal Description: Abst 1681, pg 380, Tr 1 [5.49 ac]
Owner: F. T. Drum (2110 E. Miller Rd., Garland, TX 75043)

Tax Account No. (b) (6) [redacted]
Legal Description: Abst 982, pg 250, Tr 1 [3.56 ac]
Owner: F. T. Drum (2110 E. Miller Rd., Garland, TX 75043)

000043

Reference 5
Record of Telephone Conversation between Tom Casabonne, Fluor Daniel, and Ken Smith, Landfill Director City of Garland Sanitation Department. March 16, 1993.

000044

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

FROM:	Tom Casabonne	DATE:	3-16-93
LOCATION:	Irvine, 552M	TIME:	14:25
TO:	Ken Smith (214) 205-2713	P.O. NO.	
LOCATION:	Landfill Director, City of Garland	OTHER REF.	

Mr. Smith gave me the following information on Garland landfills:

Miles Rd. - Owned by Vaughn McCallum (9214 Miles Rd., Rowlett, TX). The site is closed. It has a clay liner on the bottom and 3 ft. final cover on the surface, with no other controls. No sampling has been conducted and there have been no releases. It was last checked in November '92 (the city sanitation dept. checks the sites every 6 months). It is currently being used to graze sheep.

Castle Drive/Castle Miles - Operating under permit 1062A, issued 8-26-87. The original operating permit number for Castle Drive was 1026, issued on 9-19-77. It has a clay liner with 13 monitoring wells around the site. They check for methane around perimeter on an annual basis. Mr. Smith says that the site was enlarged by adding about 30 acres "on the inside of the L." Castle Miles operates under permit 1277, issued on 9-10-79. They plan to use this site until 1999. It is a municipal landfill, so they turn away liquids and hazardous materials.

East Garland Rd. - Eight to ten acres, operated under permit 05/50582 from May '70 to May '73. (That differs from our EPA file, which says May '70 to April '71, but Mr. Smith said he wouldn't argue with the EPA on this point. His dates of operation were also different on the Quail Creek and East Miller Rd. sites.) It was last inspected in November '92.

Quail Creek - Approximately 20 acres, operated from May '72 to May '73. (EPA file says May '72 to March '75.) His information lists two owners: Sunbelt Federal Savings (300 E. Carpenter Freeway, Irving, TX 75016) and Cambridge Consolidated (b) (6) [redacted] It was last inspected in November '92.

East Miller Rd. - Approximately 10 acres, operated from May '71 to May '72. (EPA file says July '71 to May '72.) Owners are Oleta M. Cannaday (b) (6) [redacted] and Emma Drum (600 Main St., Garland, TX 75040).

0 0 0 0 4 5

Reference 6
Record of Telephone Conversation between Josh Sacker, Fluor Daniel, and Jack May, City of Garland Water Department. April 8, 1993.

000046

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

FROM: Josh Sacker JS

DATE: 4/8/93

LOCATION: Environmental Services

TIME:

TO: Project Files - ARCS

P.O. NO.

LOCATION:

OTHER REF. ARCS Hazardous Ranking System

Conversation with Jack May, Chief of City of Garland Water Department (214) 205-3200.

There are no municipal wells in Garland, it is all surface water for city distribution. Surface water source for Garland is Lake Levon, approximately 25 miles northeast of the city. The water is carried by pipeline. Lake Levon is a U.S. Army Corps of Engineer reservoir. Garland used a number of wells (about five) prior to 1960 for water supply, however, these were ineffective due to depth (approximately 3,200 below ground surface) and high water temperatures. They were abandoned in accordance with Texas State law and filled with sand and concrete. They were located in Central Garland (near the intersections of Main and Commerce streets), some were located farther to the northwest). He said there may be some shallow water locally, but yields are not adequate for municipal purposes. The city does not have information on the location of private wells. Treated waste water was previously discharged to Lake Ray Hubbard. This treatment plant is owned by the City of Garland and serves the cities of Rowlett, Garland, and Sachse. The treatment effluent has been re-routed into another basin and is no longer discharged to Lake Ray Hubbard.

JS4-9-93C.II

000047

Reference 7
Record of Telephone Conversation between Josh Sacker,
Fluor Daniel, and Jeff Reed, U.S. Fish & Wildlife Service
Ecological Division. April 7, 1993.

000048

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

FROM: Mr. Josh Sacker JS

DATE: April 7, 1993

LOCATION: Irvine, 552M

TIME:

TO: Project File

P.O. NO.

LOCATION:

OTHER REF. ARCS 06/635336
Haz Ranking System

Conversation with Jeff Reed, U.S. Fish & Wildlife Service Ecological Division, Arlington, TX (817) 887-7830 Contact Ref. No. 2-12-93-P-128 (to be used in any future request or contact). Mr. Reed stated that there were no anticipated federally listed threatened or endangered species within the landfills (terrestrial), or within drainage pathways (aquatic species) leading from these landfills. I provided the location of the landfills as within 2 or 3 miles from the intersection of Route 66 and Centerville Road. He said he was very familiar with this area. Mr. Reed considered the possibility of bird species using habitats within the landfills or drainage pathways that are covered under the Migratory Bird Treaty Act. However, he concluded that, due to the urban/developed nature of the general vicinity, endangered or threatened species (including the whooping crane, bald eagle, cormorants, water turkeys) would not be expected in these areas. Various non-threatened species of ducks or geese are found in these areas. Mr. Reed stated that no federally listed species are expected to be at risk in these areas. He stated some of Rowlett Creek has been acquired by the City of Garland or County with state matching funds and is a wildlife/recreational sanctuary. He referred to the County (Dallas?) Open Space Plan regarding this issue. He also stated that there were no Federally Designated Sensitive Habitats in the area. He qualified this by saying Federally Designated Habitats includes many things, but that there were no federal habitats of concern in the area, other than the possible exception of wetlands. He said to contact Texas State Parks & Wildlife regarding State Listed Species at (512) 448-4311 (Austin, TX).

Action Items: Call Mr. Reed back

Questions:

1. Does lack of endangered or threatened species apply to Lake Ray Hubbard?

2. Does lack of endangered or threatened species apply to plant species?

3. Can you respond to this telephone conversation in writing.

JS4793A.II

000049

Reference 8
Record of Telephone Conversation between Josh Sacker, Fluor Daniel, and Dorinda Sullivan, State of Texas Parks & Wildlife. April 7, 1993.

000050

0000051

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

FROM: Josh Sacker — DATE: 4/7/93

LOCATION: Environmental Services — TIME:

TO: Project Files - ARCS — P.O. NO.

LOCATION: — OTHER REF. ARCS Haz. Ranking System

Conversation with Ms. Dorinda Sullivan who is with the State of Texas Parks & Wildlife at (512) 448-4311.

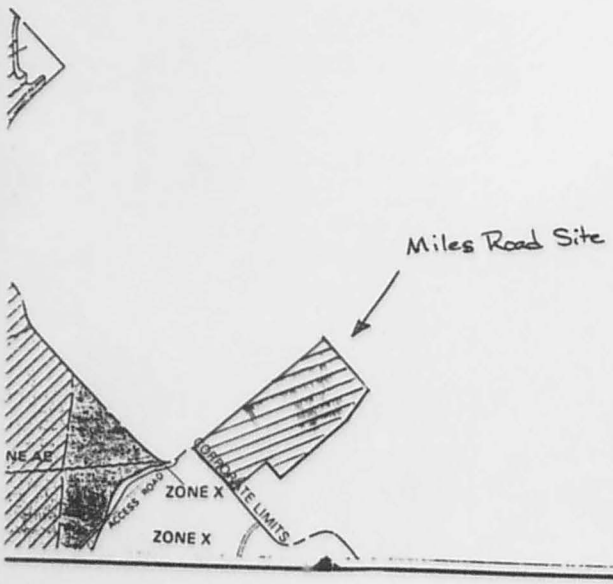
Ms. Sullivan stated that there were no known endangered or threatened species in the landfill areas or drainage pathways from these landfills all the way to, and including, Lake Ray Hubbart. Of possible environmental sensitivity are rookeries (bird nesting grounds) for Cattle Egrets and Little Blue Herons, neither of which is threatened or endangered, however, she said he did not believe the lake was a locality for Bald Eagles or Whooping Cranes. However, the State's effort regarding the Bald Eagle has been deficient recently. The Texas Garder Snake is listed by the State in Category 2, which indicates that available information suggests there may be reason to warrant listing as threatened or endangered, but that additional information needs to be collected before final determination can be made.

There are no sensitive habitats (such as parks or wildlife sanctuaries) in the area according to Ms. Sullivan, with the possible exception of wetlands. There may be some significant woodland areas near Lake Ray Hubbart (Sugarberry-Elm or Texas Oak Series), but the State has not identified these as sensitive ares. Plant species in and around landfill are not endangered and include common grasses such as Little Blue Stern and Indian Grass Stern. If previously undisturbed areas are to be disturbed during landfill closure then "Native Prairie Remanents" requirements may take effect. For additional information particularly in regard to migratory birds, call (b) (6) [redacted] in Lolita, Texas at (b) (6) [redacted] (he may work out of his home).

JS4-9-93A.II

000052

Reference 9
Federal Emergency Management Agency, Flood Insurance Rate Maps, Garland, Texas, Community-Panel Number 485471 0020 D, Map Revised Date August 15, 1990.



3/16/83 from the City of Dallas, Texas.

August 15, 1990 ... to update corporate limits, to change base flood elevations, to change special flood hazard areas, to update map format, to add roads and road names, to incorporate previously issued letters of map revision, and to incorporate previously issued letters of map amendment.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE

1000 0 1000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
GARLAND, TEXAS
DALLAS AND COLLIN COUNTIES

PANEL 10 OF 30
(SEE MAP INDEX FOR PANELS NOT PRINTED)

PANEL LOCATION

COMMUNITY-PANEL NUMBER
485471 0010 D

MAP REVISED:
AUGUST 15, 1990

Federal Emergency Management Agency

Reference 10
Record of Telephone Conversation between Tom Casabonne, Fluor Daniel, and Ken Smith, Landfill Director City of Garland Sanitation Department. April 5, 1993.

00005

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

FROM: Tom Casabonne

DATE: 4-5-93

LOCATION: Irvine, X6657

TIME: 9:00 am

TO: Ken Smith (214) 205-2713

P.O. NO.

LOCATION: Garland, TX.

OTHER REF. Site access

Mr. Smith said that when a difference occurs between his records and the Dallas County Tax Office records regarding site ownership, he would defer to the county's records. The county had shown different ownership on sites such as Quail Creek, where Mr. Smith's records indicated owners such as Sunbelt Federal Savings. The county shows other owners (refer to my two previous telephone logs with Ken Smith and the County Tax Office). Mr. Smith also said to send letters to him when we request site access. He will also escort Fluor Daniel around the sites when a site visit is made.

He said that the 13 wells around the current site (Castle Drive) are 35 to 50 feet deep. The site has a clay liner which is a minimum of 3 ft. thick, and the state requires soil caps on closed landfills. He also has analytical data from the well monitoring program, although it was too much information for him to fax. All of the other sites in the area just have a natural clay liner, with approximately 2 ft. of topsoil for a cap. At the East Miller Road Site, Mr. Smith said that the Lakeview subdivision is not on the old site--it is approximately 100 ft. south of the site. The City of Dallas owns the land east of the East Miller Road site because it falls within the "take line" for Lake Ray Hubbard.

liners

0000056

Reference 11
County and City Data Book. U.S. Department of Commerce,
Bureau of the Census. Pg 715. 1988.

000057

A Statistical Abstract Supplement

County and City Data Book

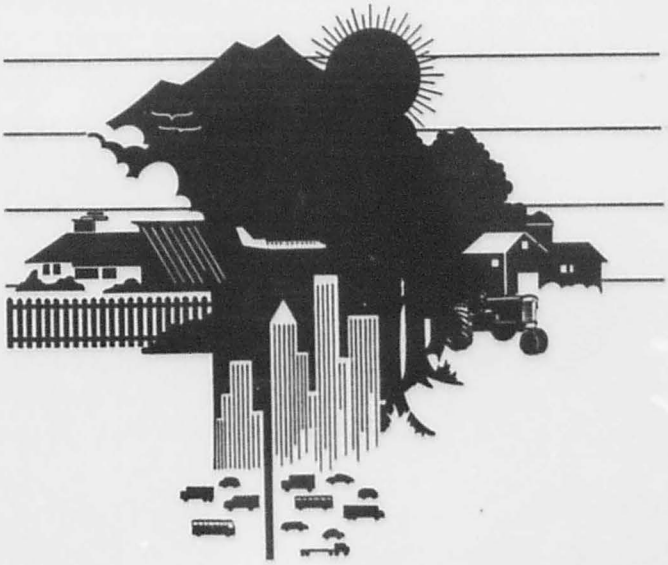
1988

States

Counties

Cities of 25,000 or More

Places of 2,500 or More



U.S. Department of Commerce

C. William Verity, Secretary
Donna C. Tuttle, Deputy Secretary
Robert Ortner, Under Secretary for Economic Affairs

BUREAU OF THE CENSUS
John G. Keane, Director

Table C. Cities — Households, Vital Statistics, Hospitals, and Crime

City	Households, 1990				Births, 1994			Deaths, 1994				Hospitals, 1995			Serious crimes known to police, 1995		
			Percent—		Number			Number		Rate			Beds		Number		
	Number	Persons per household	Female family householder[1]	One-person[2]	Total	To mothers under 20 yr. old (Percent)	Rate[3]	Total	Infant[4]	Total[5]	Infant[6]	Number	Number	Rate[7]	Total	Violent[8]	Rate[9]
	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
TEXAS—Con.																	
Del Rio	8 724	3.42	11.2	15.8	703	16.4	20.4	221	9	6.7	12.8	2	106	305	1 692	158	4 958
Denison	17 522	2.38	7.2	30.2	911	14.8	18.5	369	4	7.8	4.4	1	361	654	4 540	358	9 065
Duncanville	6 634	3.13	8.2	10.3	498	8.5	15.4	155	5	4.9	10.1	-	-	-	1 979	70	6 282
El Paso	126 167	3.28	13.3	16.9	10 414	14.9	22.5	2 650	100	5.7	9.6	13	2 360	480	33 697	3 662	7 096
Fort Worth	144 032	2.60	11.9	28.3	9 069	19.3	21.9	4 154	129	10.0	14.2	17	3 029	705	58 658	6 352	13 687
Galveston	24 013	2.49	14.2	31.5	1 107	18.4	17.7	663	11	10.6	9.9	3	1 088	2 139	6 654	867	8 910
Garland	45 978	3.01	9.3	13.4	3 246	12.2	20.3	653	19	4.1	5.9	3	358	203	9 209	441	5 814
Grand Prairie	23 714	2.89	9.6	15.6	1 721	17.7	20.0	448	18	5.2	10.5	2	386	403	7 266	520	6 791
Haltom City	10 463	2.74	9.2	18.3	411	16.3	13.0	209	3	6.6	7.3	-	-	-	2 963	112	9 065
Harlingen	13 091	3.23	12.1	16.1	934	15.4	16.0	399	8	7.7	8.6	3	618	1 119	3 862	207	7 656
Houston	602 696	2.62	11.5	35.7	37 685	16.2	22.1	11 714	449	6.9	11.9	45	13 601	787	155 910	18 461	8 928
Hurst	11 111	2.81	8.6	15.8	517	11.2	15.0	177	5	5.1	9.7	-	-	-	2 789	169	7 945
Irving	40 164	2.70	8.4	20.9	2 403	13.7	20.0	690	25	5.7	10.4	2	281	219	12 025	645	9 783
Killeen	16 672	2.77	8.5	17.1	2 234	18.0	40.1	235	27	4.2	12.1	1	78	131	4 137	277	7 637
Kingsville	9 151	3.00	9.7	19.7	713	19.6	23.8	172	4	5.7	5.6	1	136	476	1 679	84	5 246
Laredo	23 903	3.79	15.9	14.1	2 566	13.6	23.6	566	23	5.4	9.0	3	446	361	7 978	800	7 170
Longview	22 934	2.66	9.3	22.5	1 253	15.6	17.1	600	14	8.2	11.2	2	363	491	5 139	265	6 948
Lubbock	60 783	2.70	8.5	22.9	3 581	17.0	20.1	1 179	44	6.6	12.3	9	1 550	832	17 579	1 522	9 517
Lufkin	10 180	2.75	10.2	23.3	680	21.4	21.6	309	10	10.1	16.2	2	371	1 156	2 005	129	6 212
McAllen	19 448	3.28	11.5	16.5	1 565	10.4	20.6	463	25	6.0	15.8	4	543	662	5 480	257	7 098
Mesquite	21 368	3.11	10.2	11.2	1 666	12.8	21.6	386	15	5.0	9.0	3	409	461	6 790	449	8 905
Midland	25 558	2.74	7.7	21.7	1 922	12.3	19.8	558	16	5.7	8.3	3	305	311	4 487	459	4 975
Nacogdoches	8 268	2.47	10.6	27.1	396	16.4	13.8	230	2	8.0	5.1	2	348	1 228	1 311	129	4 359
North Richland Hills	10 500	2.90	7.1	13.8	430	11.4	11.6	141	4	3.8	9.3	1	160	364	2 469	112	7 041
Odessa	32 139	2.78	8.1	20.4	2 386	17.9	22.1	623	26	5.7	10.8	2	470	464	9 483	367	9 522
Paris	9 822	2.50	12.0	29.8	410	24.1	15.7	352	3	13.4	7.3	2	367	1 477	3 180	391	11 647
Pasadena	38 750	2.88	8.5	17.9	2 396	16.1	19.6	631	22	5.3	9.4	4	805	662	6 903	706	5 569
Plano	22 221	3.24	6.6	9.9	1 709	5.7	18.3	314	9	3.4	5.3	1	233	210	5 539	181	6 141
Port Arthur	22 130	2.74	12.3	24.0	1 103	17.8	17.2	725	11	11.3	10.0	2	501	603	3 157	305	4 524
Richardson	24 087	2.99	8.9	12.4	1 008	5.1	13.1	303	5	3.9	5.0	1	242	310	4 343	119	5 328
San Angelo	26 578	2.64	9.2	24.1	1 641	17.5	18.5	720	13	8.5	7.9	4	767	912	5 418	404	6 381
San Antonio	258 964	2.97	13.8	22.1	16 836	16.6	20.0	6 408	216	7.6	12.8	23	7 352	804	83 591	5 393	9 687
Sherman	11 718	2.49	10.1	25.6	581	20.1	18.6	356	3	11.4	5.2	2	368	1 231	2 626	131	7 940
Temple	16 039	2.58	9.9	27.0	782	16.1	17.4	476	8	10.6	10.2	3	1 792	3 847	2 710	141	6 014
Texarkana	12 144	2.53	14.7	28.6	573	21.8	17.4	450	13	13.7	22.7	3	573	1 730	2 953	250	8 674
Texas City	14 045	2.90	10.6	17.7	679	18.3	15.6	335	6	7.7	8.8	2	424	1 004	3 283	195	7 157
Tyler	28 024	2.64	11.0	24.8	1 354	16.6	18.5	753	21	10.3	15.5	6	886	1 280	7 382	449	9 295
Victoria	17 220	2.81	9.2	19.6	1 201	17.7	21.8	383	4	7.1	3.3	3	546	964	3 947	328	6 704
Waco	37 578	2.51	12.2	27.4	2 259	21.3	21.7	1 214	23	11.7	10.2	5	1 580	1 502	9 795	791	9 187
Wichita Falls	33 647	2.58	9.5	24.5	1 816	14.4	16.4	920	30	9.3	16.5	4	1 136	1 137	8 512	614	8 406
UTAH	448 603	3.20	7.6	17.2	38 299	8.7	23.2	8 987	350	5.4	9.1	47	5 423	326	87 470	4 396	5 317
Bountiful	9 138	3.57	6.7	11.3	625	6.9	16.2	182	5	5.8	8.0	1	128	371	1 242	107	3 488
Logan	9 291	2.70	6.2	22.9	861	5.8	29.9	164	7	5.7	8.1	1	154	533	897	35	3 009
Murray	9 109	2.81	8.8	21.7	618	10.5	22.9	160	1	5.9	1.6	1	243	1 024	3 136	142	11 096
Ogden	23 965	2.82	10.2	26.4	1 566	15.4	23.0	706	23	10.4	14.7	2	550	815	8 322	322	9 071
Orem	13 955	3.73	7.5	9.5	1 603	8.0	29.6	207	18	3.4	10.0	1	30	32	2 324	39	3 913
Provo	20 083	3.37	6.4	12.7	2 395	5.0	32.3	352	23	4.7	8.8	2	654	844	2 966	109	3 662
Salt Lake City	67 576	2.35	9.0	34.2	3 795	10.0	23.0	1 685	43	10.2	11.3	10	2 300	1 452	19 037	1 083	11 593
Sandy City	12 975	3.02	5.6	6.3	1 382	5.1	21.8	116	8	1.8	5.8	1	50	74	2 495	90	4 162
West Jordan	6 761	4.01	6.6	5.4	957	6.9	24.6	79	13	2.0	13.6	1	50	113	1 636	119	5 366
VERMONT	176 325	2.75	8.8	22.0	8 020	10.0	15.1	4 532	70	8.6	8.7	19	2 867	528	20 601	790	3 888
Burlington	13 107	2.44	10.1	30.7	466	12.4	12.3	330	7	8.7	15.0	1	491	1 282	3 976	100	10 217
VIRGINIA	1 863 073	2.77	10.8	20.5	62 719	12.6	14.7	44 310	1 005	7.9	12.1	138	30 096	520	215 634	16 613	3 779
Alexandria	49 004	2.07	9.9	41.3	1 945	8.5	18.2	813	35	7.6	18.0	4	766	711	7 670	802	7 079
Blacksburg town	9 068	2.43	5.1	21.8	346	9.3	8.1	83	3	2.7	12.2	1	146	461	1 286	25	4 036
Charlottesville	15 401	2.50	11.7	28.9	580	11.7	14.3	391	7	9.8	12.1	3	1 039	2 528	3 109	221	7 562
Chesapeake	36 383	3.11	11.9	13.1	2 135	13.5	16.9	866	21	7.0	9.8	1	210	156	5 112	407	4 007
Danville	17 511	2.55	14.6	25.5	588	17.5	13.2	577	9	12.9	15.3	1	363	857	1 408	63	3 111
Hampton	41 506	2.83	13.7	16.5	2 119	13.5	16.8	869	30	6.9	14.2	4	1 067	847	7 094	370	5 580
Lynchburg	23 940	2.50	13.2	24.8	988	15.7	12.9	734	13	10.3	15.0	2	696	1 022	3 220	368	4 725
Newport News	51 314	2.73	13.6	21.0	2 950	15.2	19.1	1 153	37	7.5	12.5	5	842	583	7 301	757	4 664

[1]No spouse present. [2]Householder living alone. [3]Per 1,000 resident population estimated as of July 1, 1994. [4]Deaths of infants under 1 year old. [5]Deaths of infants under 1 year old per 1,000 live births. [6]Per 100,000 resident population estimated as of July 1, 1995. [7]Per 100,000 resident population estimated for 1995 by the FBI. [8]Includes murder and nonnegligent manslaughter, forcible rape, robbery, and aggravated assault. [9]Per 100,000 resident population estimated for 1995 by the FBI.

Reference 12
Miles Road Landfill Reconnaissance Field Notebook. William Walters. 5/11/93.

0 0 0 0 6 0

Miles Rd. Landfill

1

5/11/83

Back fence line 687 ft
real property line extends another 4 ft
(Vaughn McCallum

The landfill terraces are visually apparent and standing water is in some of the terraces which have subsided. Thick grasses.

Property has been crowned so that the runoff goes in between the [illegible] poles

Old water tank was dug out & filled
terraces used to be level along there lenetime

Vaughn didn't know about any well water use for surrounding residents

Sheep on site - used as pasture. Also grasses (coastal) is harvested for horse feed.

5/11/93

Houses within 1/4 miles - 4 (est)

JC Trimble has a well close to the site
2415 Pleasant Valley - Drinking water

? Next Door Neighbor?
Houses within 1/2 mile
7 on pleasant Valley
25 on Mesa
5 on Castle

37 total

Robert D. Sewell Elementary
B.G. Hudson Middle school
for Miles NW of site 1/2 - 1 mile
- Sewell elementary is 1 mile w.s. Sewell site

No schools within 200 feet
2 residences (McCallum) within 200 feet
Operating landfill within 200 feet (barely)
No other businesses within 200 feet
only agricultural or open field otherwise within 200 feet

Reference 13
Geologic Atlas of Texas, Dallas Sheet. Bureau of Economic Geology, the University of Texas at Austin. 1972.

00063

PROPERTY
OF
U.S. GOVERNMENT

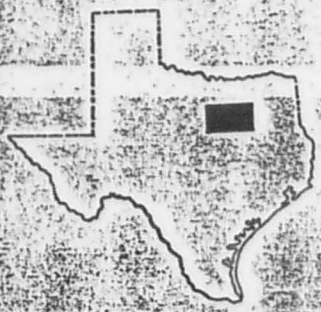
BUREAU OF ECONOMIC GEOLOGY
THE UNIVERSITY OF TEXAS AT AUSTIN
AUSTIN, TEXAS 78713-7508

W. L. FISHER, *Director*

GEOLOGIC ATLAS OF TEXAS

Dallas Sheet

Scale: 1:250,000



1972

0000064

Upper Cretaceous

Lower Cretaceous

CRETACEOUS

Ko

Ozan Formation ("lower Taylor marl")

Clay, calcareous, silt and sand content increases upward, montmorillonitic, blocky, conchoidal fracture, medium gray; some glauconite, phosphate pellets, hematite nodules, and pyrite nodules; some very thin limestone lenses locally in lower part; weathers light brownish gray with poor fissility, grades upward to Wolfe City Formation; marine megafossils; thickness 500± feet

Kau

Austin Chalk

Upper and lower parts, chalk, mostly microgranular calcite, massive, some interbeds and partings of calcareous clay, thin bentonitic beds locally in lower part, lower part forms westward-facing scarp; light gray. Middle part, mostly thin-bedded marl with interbeds of massive chalk, locally burrowed, marcasite-pyrite nodules common, light gray. Weathers white, marine megafossils scarce, thickness 300–500 feet, thins southward

Kef

Eagle Ford Group undivided

North of Hill County, shale, sandstone, and limestone; shale, bituminous, selenitic, with calcareous concretions and large septaria; sandstone and sandy limestone in upper and middle parts, platy, burrowed, medium to dark gray; in lower part bentonitic; hard limestone bed marks base in Ellis and Johnson Counties; locally forms low cuesta; thickness 200–300 feet

Kwb

Woodbine Formation

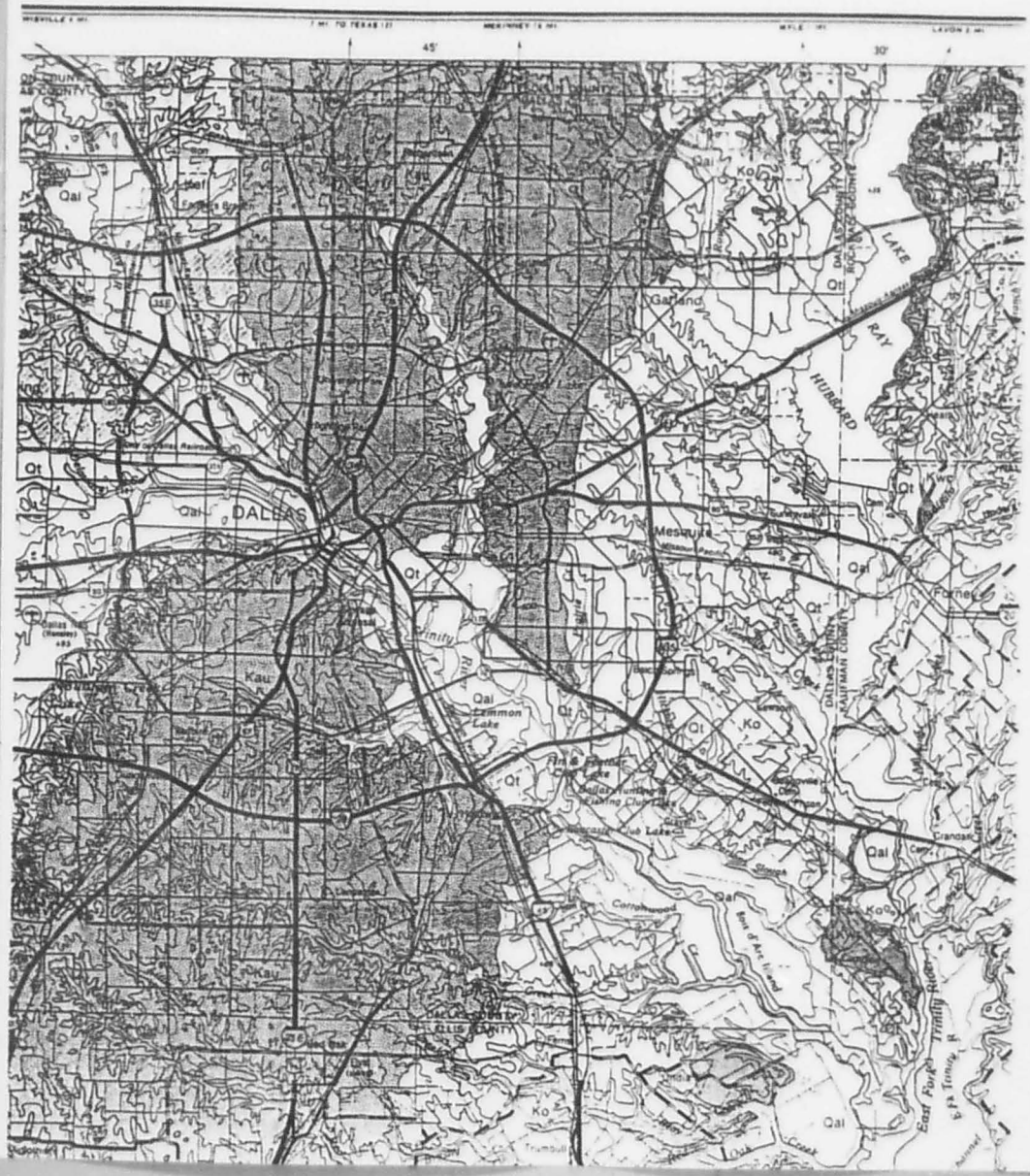
Sandstone, some clay and shale. Upper part, mostly sandtone, fine grained, well sorted, in part tuffaceous, ripple marked, large scale cross-bedding, reddish brown; near top some sandstone with large discoid concretions, medium to coarse grained, friable; some shale, jarositic, gray, fissile; some marine megafossils, oyster reefs locally. Middle part, mostly sandstone, fine grained, cross-bedded; some interbeds of clay, carbonaceous, in part sandy, gray to brown. Lower part, interbedded sandstone and clay; sandstone, fine grained, very thinly bedded to massive, some beds of ironstone and ironstone conglomerate, white, red, brown; clay, sandy, gray to brown; channeled locally. Thickness 175–250 feet, thickens northward

Kgm

Grayson Marl and Main Street Limestone undivided

Mostly Grayson Marl, *mostly calcareous clay and marl, blocky, yellowish gray and medium gray; some 0.25–1.0-foot limestone beds in upper one-third, very fine grained, fossiliferous; weathers yellowish brown, forms gentle slope; thickness 60–100 feet, thins northward*

Main Street Limestone, *medium grained, chalky, some 6–8-foot units of calcareous shale, thin bedded to massive, distinctly bedded to wavy bedded and nodular, yellowish gray; weathers light gray to white; thickness 20–35 feet, thins northward*



45'
30'
Qal
Qt
Ko
Kau
DALLAS
Garland
Mesquite
Forney
LAKE
RAY
HUBBARD
Lemmon Lake
Trinity
Cottonwood
East Fork Trinity River

Reference 14
Soil Survey of Dallas County, Texas. United States Department of Agriculture, Soil Conservation Service. Pgs 23, 24, 26, 27, 78, 143 & 144; and Sheet Number 13. February, 1980.

ıited States Department of Agriculture
il Conservation Service
cooperation with
xas Agricultural Experiment Station

soil survey of

Dallas County, Texas

to rock, and the gravelly surface layer of the Eddy soil are limitations.

These soils are in capability subclass VIe and in the Chalky Ridge range site.

31—Eddy-Urban land complex, 1 to 4 percent slopes. This complex is made up of gently sloping, shallow and very shallow, well drained soils and areas of Urban land. The areas generally are oval or oblong and range from 20 to as much as a few hundred acres.

The Eddy soil makes up about 55 percent of this complex, and Urban land, which consists of areas covered with buildings and pavement, makes up 25 percent. Minor soils make up the rest. The soil in yards generally has been altered by cutting and filling, shallow excavations, and other development operations. In some yards, a layer of loamy topsoil 2 to 4 inches thick has been added to the soil. The Eddy soil and Urban land are so intermingled that it was not practical to separate them in mapping at the scale used.

Typically, the surface layer of the Eddy soil is grayish brown, moderately alkaline clay loam 5 inches thick. The layer below that, to a depth of 11 inches, consists of platy soft chalky limestone and about 15 percent grayish brown clay loam. The underlying material is white, soft chalky limestone.

Permeability is moderately slow, and the available water capacity is very low. Runoff is medium, and the hazard of erosion is severe.

Included in mapping are small areas of Brackett and Stephen soils. The included soils make up less than 20 percent of any one mapped area.

The Eddy soil has medium potential for urban uses. The shallowness to rock and corrosivity are the main limitations; however, the rock is soft and rippable and provides a good footing for foundations. Because the erosion hazard is severe, care is needed during construction to prevent soil loss.

This map unit was not assigned to a capability subclass or a range site.

32—Eddy-Urban land complex, 4 to 8 percent slopes. This complex is made up of gently sloping to sloping, shallow and very shallow, well drained soils and areas of Urban land. The areas generally are oval or oblong and range from 15 to as much as a few hundred acres.

The Eddy soil makes up about 50 percent of this complex, and Urban land, which consists of areas covered with buildings and pavement, makes up 30 percent. Minor soils make up the rest. The soil in yards has been altered by cutting, filling, and leveling during construction, and limestone fragments have been mixed into the soil. In most yards, a layer of loamy topsoil 2 to 4 inches thick has been added. The Eddy soil and Urban land are so intermingled that it was not practical to separate them in mapping at the scale used.

Typically, the surface layer of the Eddy soil is moderately alkaline, grayish brown clay loam 4 inches thick. The layer below that, to a depth of 11 inches, consists of platy, soft limestone and about 15 percent, by volume, grayish brown clay loam. The underlying material is white, soft chalky limestone.

Permeability is moderately slow, and the available water capacity is very low. Runoff is rapid, and the hazard of erosion is severe.

Included in mapping are small areas of Austin, Brackett, and Stephen soils. The included soils make up less than 20 percent of any one mapped area.

The Eddy soil has medium potential for urban uses. The shallowness to rock and corrosivity are limitations; however, the rock is rippable and provides a good footing for foundations. Erosion is a hazard but can be controlled through careful installation.

This map unit was not assigned to a capability subclass or a range site.

33—Eufaula loamy fine sand, 0 to 2 percent slopes. This is a deep, nearly level to gently sloping, somewhat excessively drained soil on old low terraces a few feet above the flood plain of the Trinity River. The areas are oblong and range from 30 to about 100 acres.

Typically, the surface layer is neutral, brown loamy fine sand about 13 inches thick. To a depth of 44 inches, the soil is mildly alkaline, strong brown loamy fine sand that has reddish brown mottles. To a depth of 80 inches, it is mottled reddish yellow and strong brown, moderately alkaline loamy fine sand.

Permeability is rapid, and the available water capacity is low. Runoff is very slow, and water erosion is a slight hazard. Wind erosion is a moderate hazard.

Included in mapping are small areas of Seagoville soils and areas of a soil that is similar to this Eufaula soil except that it has a surface layer of fine sandy loam. The included soils make up less than 20 percent of the mapped areas.

This soil is used mainly as pasture, for which it has low potential. The low available water capacity and low fertility of the soil are limitations. This soil is well suited to improved bermudagrass.

This soil has low potential for crops. It can be cultivated, but the yield of crops is low unless the soil is properly fertilized. Crop residue should be left on the surface of the soil to help conserve moisture, prevent wind erosion, and maintain productivity.

This soil has high potential for urban uses. It has few limitations to urban development. The walls of cuts and excavations tend to cave in or slough. In many areas, this soil is used for mining gravel and sand.

This soil is in capability subclass IVs and in the Deep Sand range site.

34—Ferris-Heiden complex, 5 to 12 percent slopes. This complex is made up of deep, well drained, gently rolling and rolling soils on hillsides. The areas generally are oblong and range from 15 to several hundred acres.

The Ferris soil makes up about 60 percent of this complex, the Heiden soil makes up about 20 percent,

and minor soils make up the rest. The Ferris soil is on the steeper slopes, and the Heiden soil is in valleys, on the lower part of slopes, and on ridgetops. These soils are so intermingled that it was not practical to separate them in mapping at the scale used.

Typically, the surface layer of the Ferris soil is moderately alkaline, light yellowish brown clay 3 inches thick. To a depth of 28 inches, the soil is moderately alkaline, olive clay. To a depth of 41 inches, it is moderately alkaline, light brownish gray clay. To a depth of 72 inches, the soil is mottled light brownish gray, light olive brown, and gray shaly clay.

Permeability is very slow, and the available water capacity is high. Runoff is rapid, and the hazard of erosion is severe.

Typically, the surface layer of the Heiden soil is moderately alkaline, dark grayish brown clay 19 inches thick. To a depth of 45 inches, the soil is moderately alkaline, grayish brown clay. The layer below that, to a depth of 78 inches, is mottled brownish gray, olive yellow, and brownish yellow, moderately alkaline shaly clay.

Permeability is very slow, and the available water capacity is high. Runoff is rapid, and the hazard of erosion is severe.

Included in mapping are small areas of Normangee, Houston Black, Trinity, and Vertel soils. The included soils make up less than 20 percent of any one mapped area.

The soils in this complex are used mainly as rangeland and pasture. They have medium potential for these uses. The yield of forage on rangeland is good. The climax plant community consists of tall and mid grasses. Proper stocking and controlled grazing are needed in managing rangeland and pasture on these soils. The rapid runoff and the severe hazard of erosion are limitations to establishing introduced grasses. These soils have low potential for use as cropland.

These soils have low potential for urban uses. Limitations to urban uses are the very high shrink-swell potential, low strength, and corrosivity of the soils, the unstable slopes, and the hazard of erosion; they are difficult and costly to overcome. In addition, the walls of excavations tend to cave in or slough. These soils are limited for recreation uses by the clayey texture of the soil, the very slow permeability, and the steepness of slopes.

These soils are in capability subclass VIe. The Ferris soil is in the Eroded Blackland range site, and the Heiden soil is in the Blackland range site.

35—Ferris-Urban land complex, 5 to 12 percent slopes. This complex is made up of deep, well drained, sloping and strongly sloping soils and areas of Urban land. The areas are irregular in shape and range from 15 to several hundred acres in size.

Typically, the Ferris soil makes up about 60 percent of this complex, and Urban land, which consists of areas covered with buildings and pavement, makes up 25 percent; minor soils make up the rest. On about 50 percent of the acreage the soil has been altered by cutting, filling, and shaping. In many places, the cutting and shaping have exposed the underlying shaly clay. A thin layer of loamy and sandy topsoil has been added to many yards. The Ferris soil and Urban land are so intermingled that it was not practical to separate them in mapping at the scale used.

Typically, the surface layer of the Ferris soil is moderately alkaline, light yellowish brown clay 3 inches thick. To a depth of 28 inches, the soil is moderately alkaline, olive clay. To a depth of 41 inches, it is moderately alkaline, light brownish gray clay. The layer below that, to a depth of 72 inches, consists of mottled, light brownish gray, light olive brown, and gray shaly clay.

Permeability of the Ferris soil is very slow, and the available water capacity is high. Runoff is rapid, and the hazard of erosion is severe.

Included in mapping are small areas of Heiden and Vertel soils. The included soils make up no more than 15 percent of any one mapped area.

The Ferris soil has low potential for urban uses. Limitations to urban uses are the very high shrink-swell potential, low strength, and corrosivity of the soil, the unstable slopes, and the severe hazard of erosion. In addition, the walls of excavations tend to cave in or slough. These limitations are difficult to overcome.

This map unit was not assigned to a capability subclass or a range site.

36—Frio silty clay, occasionally flooded. This is a deep, well drained, nearly level soil on flood plains. The areas generally are long and narrow and range from about 20 to several hundred acres. This soil is occasionally flooded. The floodwaters are shallow, and the floods are of brief duration. Some areas are protected by levees.

Typically, the surface layer is moderately alkaline, dark grayish brown silty clay 7 inches thick (fig. 9). To a depth of 32 inches, the soil is moderately alkaline, very dark grayish brown silty clay. To a depth of 53 inches, it is moderately alkaline, very dark grayish brown silty clay. To a depth of 74 inches, the soil is moderately alkaline, brown silty clay loam.

Permeability is moderately slow, and the available water capacity is high. Runoff is slow, and the hazard of erosion is slight.

Included in mapping are small areas of Gowen and Trinity soils. The included soils make up less than 10 percent of any one mapped area.

This soil is used mainly as cropland and pasture. It has high potential for use as cropland and high potential for use as pasture. This soil is well suited to the crops commonly grown in the county. The yield of crops is good if the soil is properly managed. This soil is well suited to improved bermudagrass.

This soil has low potential for urban uses because of the hazard of flooding and the low strength and corrosivity of the soil. It has low potential for recreation uses

floodwaters are shallow, and the floods are of brief duration.

Typically, the surface layer is a moderately alkaline, dark grayish brown loam 21 inches thick. To a depth of 32 inches, the soil is moderately alkaline, dark grayish brown clay loam, and there are thin strata of brown sandy loam. To a depth of 53 inches, the soil is moderately alkaline, grayish brown sandy clay loam, and there are thin strata of fine sand. To a depth of 80 inches, the soil is mottled, dark gray and dark yellowish brown, moderately alkaline sandy clay.

Permeability is moderate, and the available water capacity is high. Runoff is slow, and the hazard of erosion is slight.

Included in mapping are small areas of Frio and Trinity soils. The included soils make up less than 15 percent of any one mapped area.

This soil is used mainly as pasture, for which it has high potential. It is well suited to improved bermudagrass. This soil has high potential for crops. If this soil is used for crops, leaving crop residue on the surface will help to conserve moisture and maintain tilth and productivity.

This soil has low potential for urban uses because of the hazard of flooding and the corrosivity of the soil to uncoated steel. The flooding is a limitation that is difficult to overcome. Limitations to recreation uses are the clayey surface texture and the hazard of flooding.

This soil is in capability subclass IIw and in the Loamy Bottomland range site.

40—Gowen loam, frequently flooded. This a a deep, well drained, nearly level soil on flood plains. The areas are long and narrow and range from 15 to 40 acres. This soil generally is flooded one or more times each year. The floodwaters are shallow, and the floods are of brief duration.

Typically, the surface layer is neutral, brown clay loam 4 inches thick. To a depth of 35 inches, the soil is moderately alkaline, dark grayish brown loam and there are a few thin strata of brown clay loam. To a depth of 53 inches, the soil is moderately alkaline, grayish brown sandy clay loam, and there are common thin strata of fine sand. To a depth of 80 inches, the soil is moderately alkaline, dark gray and dark yellowish brown sandy clay.

Permeability is moderate, and the available water capacity is high. Runoff is slow, and the hazard of erosion is slight.

Included in mapping are small areas of Frio and Trinity soils. The included soils make up less than 20 percent of any one mapped area.

This soil is used as pasture, for which it has high potential. The yield of forage is high. This soil is well suited to improved bermudagrass. This soil has low potential for crops, mainly because of the hazard of flooding.

This soil has very low potential for urban and recreation uses. The hazard of flooding and the corrosivity of the soil are the main limitations.

This soil is in capability subclass Vw and in the Loamy Bottomland range site.

41—Heiden clay, 1 to 3 percent slopes. This is a deep, well drained, gently sloping soil on uplands. The areas are oblong and range from 15 to about 200 acres.

Typically, the surface layer is moderately alkaline, dark gray clay 6 inches thick. To a depth of 37 inches, the soil is moderately alkaline, very dark grayish brown clay. To a depth of 56 inches, it is moderately alkaline, grayish brown clay that has gray and yellowish brown mottles. The underlying material, to a depth of 78 inches, is shaly clay mottled in shades of gray and yellow.

Permeability is very slow, and the available water capacity is high. Runoff is medium, and the hazard of erosion is moderate.

Included in mapping are small areas of Normangee, Houston Black, and Wilson soils. The included soils make up less than 10 percent of any one mapped area.

This soil is used mainly as cropland and pasture. It has high potential for these uses. The yield of forage and crops is high if the soil is properly managed. Crop residue should be left on the surface to help control runoff and erosion and to maintain tilth and productivity. If this soil is used for row crops, terraces and contour farming are needed. This soil is well suited to improved bermudagrass. This soil is well suited to use as rangeland. The climax plant community consists of tall and mid grasses.

This soil has low potential for urban uses. The very high shrink-swell potential, corrosivity, and low strength of the soil are limitations. In addition, the walls of cuts and excavations tend to cave in or slough. These limitations can be overcome through good design and careful installation. This soil has low potential for recreation uses. The clayey surface texture is the main limitation.

This soil is in capability subclass IIe and in the Blackland range site.

42—Heiden clay, 2 to 5 percent slopes, eroded. This is a deep, well drained, gently sloping soil on uplands. The areas are mainly oblong to long and narrow and range from 15 to about 100 acres. In most areas, erosion has removed about 50 percent of the surface layer. Shallow gullies are common and are 20 to 60 feet apart. There are deep gullies in some mapped areas.

Typically, the surface layer is moderately alkaline, dark gray clay 6 inches thick. To a depth of 37 inches, the soil is moderately alkaline, dark grayish brown clay. To a depth of 56 inches, it is moderately alkaline, grayish brown clay. The underlying material, to a depth of 78 inches, is shaly clay that has gray and yellow mottles.

Permeability is very slow, and the available water capacity is high. Runoff is rapid, and the hazard of erosion is severe.

Included in mapping are small areas of Ferris soils. The included soils make up less than 20 percent of any one mapped area.

This soil is used mainly as pasture, for which it has medium potential. It is well suited to improved bermuda-

grass. The yield of forage is good if the soil is properly managed. This soil has low potential for use as cropland because of the severe hazard of erosion. The use of close-growing crops and keeping crop residue on the soil help to control runoff and erosion and to maintain tilth and productivity. This soil is well suited to use as rangeland. The climax plant community consists of tall and mid grasses.

This soil has low potential for urban uses. The very high shrink-swell potential, corrosivity, and low strength of the soil and the severe hazard of erosion are limitations. In addition, the walls of cuts and excavations tend to cave in or slough. These limitations can be overcome through good design and careful installation. The clayey surface texture is a limitation to the use of this soil for camp and picnic areas. The slope is a limitation to playground uses.

This soil is in capability subclass IIIe and in the Blackland range site.

43—Houston Black clay, 0 to 1 percent slopes. This is a deep, moderately well drained, nearly level soil on smooth uplands. The areas are irregular in shape and range from 10 to a few hundred acres in size.

Typically, the surface layer is moderately alkaline, very dark gray clay 6 inches thick. To a depth of 38 inches, the soil is moderately alkaline, black clay. To a depth of 52 inches, it is moderately alkaline, very dark gray clay. To a depth of 70 inches, the soil is moderately alkaline, dark grayish brown clay that has many light olive brown mottles.

Permeability is very slow, and the available water capacity is high. Runoff is slow, and the hazard of erosion is slight.

Included in mapping are small areas of Branyon and Burleson soils and small areas of gently sloping Houston Black soils. The included soils make up less than 10 percent of any one mapped area.

This soil is used mainly as cropland, for which it has high potential. The yield of crops commonly grown in the county is good if the soil is properly managed. Leaving crop residue on the surface helps to maintain tilth and productivity. This soil has high potential for use as pasture. It is well suited to improved bermudagrass.

This soil has low potential for urban uses. The very high shrink-swell potential, corrosivity, and low strength of the soil are limitations. In addition, the walls of cuts and excavations tend to cave in or slough. These limitations can be overcome through good design and careful installation. The clayey surface texture is a limitation to recreation uses.

This soil is in capability subclass IIw and in the Blackland range site.

44—Houston Black clay, 1 to 3 percent slopes. This is a deep, moderately well drained, gently sloping soil on smooth uplands. The areas are oblong or irregular in shape and range from 10 to several hundred acres in size.

Typically, the surface layer is moderately alkaline, very dark gray clay 6 inches thick. To a depth of 38 inches, the soil is moderately alkaline, black clay, and to a depth of 52 inches, it is moderately alkaline, very dark gray clay. To a depth of 70 inches, the soil is moderately alkaline, dark grayish brown clay that has many light olive brown mottles.

Permeability is very slow, and the available water capacity is high. Runoff is medium, and the hazard of erosion is moderate.

Included in mapping are small areas of Burleson, Dalco, and Heiden soils. The included soils make up less than 10 percent of any one mapped area.

This soil is used mainly as cropland, for which it has high potential. The yield of crops commonly grown in the county is good if the soil is properly managed. Leaving crop residue on or near the surface helps to control runoff and to maintain tilth and productivity. Terraces and contour farming help to control runoff and erosion. This soil has high potential for use as pasture. It is well suited to improved bermudagrass.

This soil has low potential for urban uses. The very high shrink-swell potential, corrosivity, and low strength of the soil and the hazard of erosion are limitations. In addition, the walls of cuts and excavations tend to cave in or slough. These limitations can be overcome through good design and careful installation. The clayey surface texture is a limitation to recreation uses.

This soil is in capability subclass IIe and in the Blackland range site.

45—Houston Black-Urban land complex, 0 to 4 percent slopes. This complex is made up of deep, moderately well drained, nearly level and gently sloping soils and areas of Urban land. The areas are mainly oval and oblong and range from 20 to several hundred acres.

The Houston Black soil makes up about 40 percent of this complex, and Urban land, which consists of areas covered with buildings and pavement, makes up 35 percent. Minor soils make up the rest. In many places, excavation for service lines has altered the soil. In some yards, a layer of loamy or sandy topsoil 2 or 3 inches thick has been spread over the surface. The Houston Black soil and Urban land are so intermingled that it was not practical to separate them in mapping at the scale used.

Typically, the surface layer of the Houston Black soil is moderately alkaline, very dark gray clay 6 inches thick. To a depth of 38 inches, the soil is moderately alkaline, black clay, and to a depth of 52 inches, it is moderately alkaline, very dark gray clay. To a depth of 70 inches, the soil is moderately alkaline, dark grayish brown clay that has light olive brown mottles.

Permeability is very slow, and the available water capacity is high. Runoff is medium, and the hazard of erosion is moderate.

Included in mapping are small areas of Burleson, Dalco, Heiden, and Wilson soils. Some of the included

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1951-74 at Dallas, Texas]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[1]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	55.6	35.4	45.5	82	11	58	1.78	.72	2.63	4	1.3
February---	60.1	39.0	49.6	84	17	98	2.05	.91	2.98	4	.5
March------	67.7	46.0	56.8	91	23	278	2.56	.75	4.02	4	.2
April------	76.7	56.0	66.4	92	35	492	4.81	2.09	7.01	6	.0
May--------	83.9	64.1	74.0	97	45	744	4.16	2.10	5.84	6	.0
June-------	91.4	71.9	81.7	101	58	951	3.01	1.00	4.61	4	.0
July-------	95.8	76.2	86.0	106	65	1,116	1.94	.37	3.17	3	.0
August-----	95.7	75.3	85.5	106	64	1,101	2.14	.53	3.41	3	.0
September--	88.2	68.1	78.2	101	50	846	3.77	1.58	5.58	5	.0
October----	78.5	57.2	67.9	94	38	555	3.88	.88	6.23	4	.0
November---	66.0	45.4	55.8	85	25	204	2.69	1.15	3.93	4	.0
December---	58.3	38.3	48.3	82	16	87	2.27	.74	3.48	4	.2
Year-----	76.5	56.1	66.3	107	11	6,530	35.06	26.55	43.03	51	2.2

[1] A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50° F).

TABLE 18.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Reaction	Shrink-swell potential	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete	Erosion factors: K	Erosion factors: T
	In	In/hr	In/in	pH					
Crockett:									
20, 21, 22	0-7	0.6-2.0	0.11-0.20	5.6-7.3	Low	Moderate	Low	0.43	5
	7-53	<0.06	0.14-0.18	5.6-7.8	High	High	Low	0.32	
	53-80	0.06-0.2	0.15-0.20	7.4-8.4	Moderate	High	Low	0.32	
Dalco:									
23, 24	0-35	<0.06	0.12-0.18	7.4-8.4	Very high	High	Low	0.32	3
Dutek:									
25	0-34	6.0-20	0.05-0.10	5.6-7.3	Very low	Low	Moderate	0.20	5
	34-54	0.6-2.0	0.12-0.17	5.1-6.0	Low	Moderate	Moderate	0.24	
	54-64	0.6-6.0	0.10-0.16	4.5-6.0	Low	Moderate	High	0.24	
	64-75	2.0-20	0.05-0.10	4.5-6.0	Very low	Low	High	0.20	
Eddy:									
26, 27	0-4	0.2-0.6	0.10-0.13	7.9-8.4	Low	High	Low	0.24	1
	4-11	0.2-0.6	0.03-0.07	7.9-8.4	Low	High	Low	0.24	
	11-40	---	---	---	---	---	---	---	
28:									
Eddy part	0-4	0.2-0.6	0.10-0.13	7.9-8.4	Low	High	Low	0.24	1
	4-11	0.2-0.6	0.03-0.07	7.9-8.4	Low	High	Low	0.24	
	11-40	---	---	---	---	---	---	---	
Brackett part	0-16	0.2-0.6	0.10-0.20	7.9-8.4	Low	High	Low	0.32	2
	16-29	---	---	---	---	---	---	---	
29:									
Eddy part	0-4	0.2-0.6	0.10-0.13	7.9-8.4	Low	High	Low	0.24	1
	4-11	0.2-0.6	0.03-0.07	7.9-8.4	Low	High	Low	0.24	
	11-40	---	---	---	---	---	---	---	
Brackett part	0-16	0.2-0.6	0.10-0.20	7.9-8.4	Low	High	Low	0.32	2
	16-29	---	---	---	---	---	---	---	
Urban land part.									
30:									
Eddy part	0-4	0.2-0.6	0.10-0.13	7.9-8.4	Low	High	Low	0.24	1
	4-11	0.2-0.6	0.03-0.07	7.9-8.4	Low	High	Low	0.24	
	11-40	---	---	---	---	---	---	---	
Stephen part	0-14	0.2-0.6	0.10-0.15	7.9-8.4	Moderate	High	Low	0.32	1
	14-20	---	---	---	---	---	---	---	
31, 32:									
Eddy part	0-4	0.2-0.6	0.10-0.13	7.9-8.4	Low	High	Low	0.24	1
	4-11	0.2-0.6	0.03-0.07	7.9-8.4	Low	High	Low	0.24	
	11-40	---	---	---	---	---	---	---	
Urban land part.									
Eufaula:									
33	0-80	6.0-20.0	0.05-0.11	5.1-7.3	Low	Low	Moderate	0.17	5
Ferris:									
34:									
Ferris part	0-72	<0.06	0.15-0.18	7.9-8.4	Very high	High	Low	0.32	4
Heiden part	0-37	<0.06	0.15-0.20	7.9-8.4	Very high	High	Low	0.32	5
	37-78	<0.06	0.12-0.20	7.9-8.4	Very high	High	Low	0.32	
35:									
Ferris part	0-72	<0.06	0.15-0.18	7.9-8.4	Very high	High	Low	0.32	4

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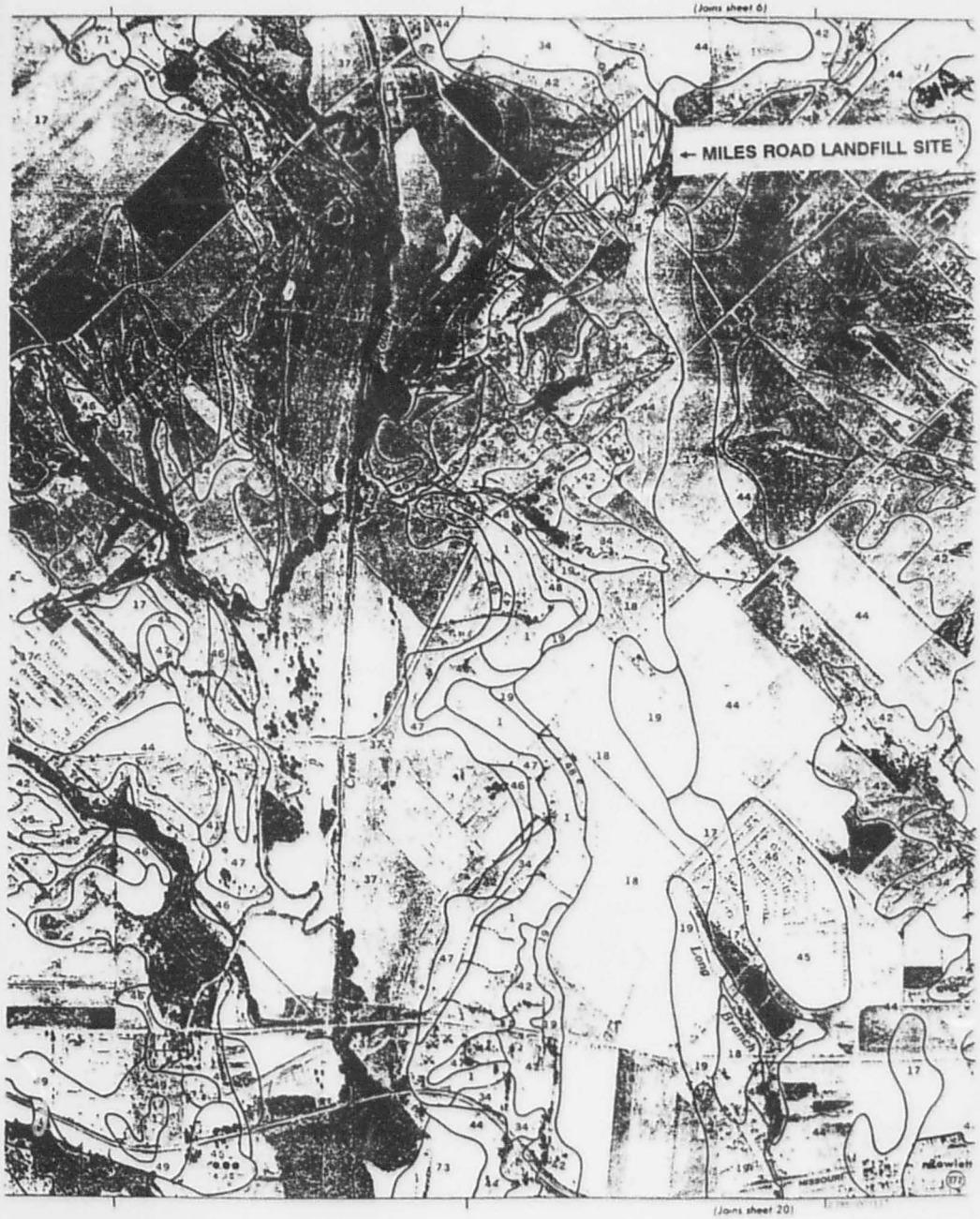
TABLE 18.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Reaction	Shrink-swell potential	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete	Erosion factors: K	Erosion factors: T
	In	In/hr	In/in	pH					
Ferris:									
Urban land part.									
Frio:									
36, 37	0-53	0.2-0.6	0.15-0.22	7.9-8.4	Moderate	High	Low	---	---
	53-74	0.2-0.6	0.11-0.22	7.9-8.4	Moderate	High	Low	---	
38:									
Frio part	0-53	0.2-0.6	0.15-0.22	7.9-8.4	Moderate	High	Low	---	---
	53-74	0.2-0.6	0.11-0.22	7.9-8.4	Moderate	High	Low	---	
Urban land part.									
Gowen:									
39, 40	0-32	0.6-2.0	0.15-0.20	6.6-8.4	Moderate	Moderate	Low	---	---
	32-80	0.6-2.0	0.15-0.20	6.6-8.4	Moderate	Moderate	Low	---	
Heiden:									
41, 42	0-37	<0.06	0.15-0.20	7.9-8.4	Very high	High	Low	0.32	5
	37-78	<0.06	0.12-0.20	7.9-8.4	Very high	High	Low	0.32	
Houston Black:									
43, 44	0-6	<0.06	0.15-0.20	7.4-8.4	Very high	High	Low	0.32	4
	6-70	<0.06	0.15-0.20	7.4-8.4	Very high	High	Low	0.32	
45:									
Houston Black part	0-6	<0.06	0.15-0.20	7.4-8.4	Very high	High	Low	0.32	4
	6-70	<0.06	0.15-0.20	7.4-8.4	Very high	High	Low	0.32	
Urban land part.									
Lewisville:									
46, 47, 48	0-15	0.6-2.0	0.16-0.20	7.9-8.4	High	High	Low	0.32	5
	15-41	0.6-2.0	0.14-0.18	7.9-8.4	High	High	Low	0.37	
	41-75	0.6-2.0	0.14-0.18	7.9-8.4	High	High	Low	---	
49, 50:									
Lewisville part	0-15	0.6-2.0	0.16-0.20	7.9-8.4	High	High	Low	0.32	5
	15-41	0.6-2.0	0.14-0.18	7.9-8.4	High	High	Low	0.37	
	41-75	0.6-2.0	0.14-0.18	7.9-8.4	High	High	Low	---	
Urban land part.									
Mabank:									
51, 52	0-5	0.6-2.0	0.11-0.15	5.6-7.3	Low	Moderate	Moderate	0.43	5
	5-65	<0.06	0.12-0.18	5.6-8.4	High	High	Moderate	0.32	
Normangee:									
53	0-9	0.06-0.2	0.15-0.20	5.6-7.3	Moderate	High	Low	0.43	3
	9-66	<0.06	0.12-0.18	5.6-8.4	High	High	Low	0.37	
	66-71	<0.06	0.12-0.18	6.1-8.4	High	High	Low	---	
Ovan:									
54, 55	0-80	<0.06	0.15-0.20	7.9-8.4	High	High	Low	0.32	5
Pits and Dumps:									
56.									
Rader:									
57:									
Rader part	0-8	2.0-6.0	0.10-0.15	4.5-6.5	Low	Moderate	Moderate	0.32	5
	8-16	0.2-0.6	0.12-0.18	4.5-5.5	Moderate	High	Moderate	0.32	
	16-64	<0.06	0.12-0.18	4.5-6.5	High	High	Moderate	0.32	

DALLAS COUNTY, TEXAS — SHEET NUMBER 13



Reference 15
Geographic Exposure Modeling System, Census data for the
Miles Road Landfill Site, Garland, Texas. May 13, 1993.

87000

COVERAGE

STATE	COUNTY	STATE NAME	COUNTY NAME
48	85	Texas	Collin Co
48	113	Texas	Dallas Co

CENTER POINT AT STATE : 48 Texas
COUNTY : 113 Dallas Co

REGION OF THE COUNTRY

Zipcode found: 75088 at a distance of 4.5 Km

STATE	CITY NAME	FIPSCODE	LATITUDE	LONGITUDE
TX	ROWLETT	48113	32.9033	96.5667

CENSUS DATA

Miles Road Landfill

LATITUDE 32:56:31 LONGITUDE 96:34:46 1990 POPULATION

KM	0.00-.400	.400-.800	.800-1.60	1.60-3.20	3.20-4.80	4.80-6.40	SECTOR TOTALS
S 1	0	0	0	0	1960	202	2162
S 2	0	0	0	2510	3069	0	5579
S 3	0	0	0	0	3600	4624	8224
S 4	0	0	0	4898	5658	12526	23082
RING TOTALS	0	0	0	7408	14287	17352	39047

Reference 16
Record of Telephone Conversation between William Walters, Fluor Daniel, and Ken Smith, Landfill Director City of Garland Sanitation Department. May 21, 1993.

0 0 0 0 0 8 1

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

FROM: William Walters

LOCATION: Irvine, CA

TO: Ken Smith, Landfill Director, City of Garland (214) 205-2713

LOCATION: Garland, TX

DATE: May 21, 1993

TIME: 1:00 pm PST

P.O. NO. 635336-41

OTHER REF. ARCS Si

The following information items were discussed during this call:

1. Mr. Smith noted that there were not 13 monitoring wells on-site at the operating landfill (Castle Drive and Castle & Miles sites). Rather there were 11 monitoring wells and 3 wells that were used for a characterization study. These characterization study wells (CSWs) were drilled after high solids results from monitoring well (MW) number 10 were discovered. The CSWs are approximately: up gradient 10 feet from MW number 10 (CSW 10A), 100 feet down gradient from MW 10 (CSW 10B) and 220 feet down gradient from MW 10 (CSW 10C). These CSWs were drilled in July 1991. Mr. Smith also noted that MWs 3A and 8A are so designated because they had to be redrilled after being accidentally damaged by site equipment.

2. Mr. Smith was not sure if Vaughn McCallum has a ground water well but he did note that two nearby property owners (one north of the operating landfill on Castle Drive and one south on Castle) had ground water wells. He also noted that these wells were not currently used for drinking water, as these two residences were connected to the municipal water pipeline that runs along Castle Drive.

3. Mr. Smith was not aware of the existence of the two monitoring wells that were discovered on the Quail Creek landfill during the site reconnaissance.

4. Mr. Smith did not have any maps of the Quail Creek landfill site, showing the locations of the landfill cells, but he thought that the City of Garland Engineering Department may have these maps. He also did not know if the landfill cells were located inside or outside of the 500 year floodplain of Mills Branch that is adjacent to this landfill.

KenSmith.TC1

00082

5. Mr. Smith noted that the cells in the Mills Road landfill do not extent to the City of Garland power right of way located on the northwest side of this property. He noted that the access road to the landfill was where the power right of way is now.

6. Mr. Smith noted that the "old burning dump", that is adjacent to the operating landfill, burned and buried municipal wastes. He also noted that the "old burning dump" was closed in early 1968. He did not know when the "old burning dump" started operations.

7. Mr. Smith noted that the black and yellow clays on top of the Castle & Miles site are both 12 to 18 inches thick. The use of different clays was due to material availability.

8. Mr. Smith noted that he believed that the Drum property (Miller Road Landfill) was considerably different in appearance from the Cannaday property because the Drums allowed other wastes to be laid after landfill closure. He thought that these wastes included road construction waste from the improvement of Centerville Road.

KenSmith.TC1

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Reference 17
"WELL LOCATIONS NEAR THE MILES ROAD LANDFILL" map,
North Central Texas Council of Governments, Department of
Environmental Resources. July 14, 1993.

000084

North Central Texas Council Of Governments

July 16, 1993

Jonathan Stewart
Fluor Daniel
12790 Merit Drive, Suite 200
Dallas, Texas 75252

Dear Mr. Stewart:

I am providing the Geographic Information System maps which you requested several weeks ago. The original request was for GIS plots of the areas surrounding 6 landfill sites, the available information on area water wells within a 4-mile radius. Information was also requested on surface water intake locations.

As I indicated during our phone conversation, NCTCOG's well coverage is adapted from Texas Water Development Board data, and NOT a complete database. Most of the wells are more significant public supply wells. The following wells are within the area of interest:

3303601	City of Garland - Plugged		
3303901	City of Garland - Plugged		
3303902	City of Garland - Plugged		
3303903	City of Garland - Plugged		
3303904	City of Garland - Plugged		
3303905	City of Garland - Plugged		
3303801	City of Garland - Plugged		
3304101	Owner unknown	Woodbine	Depth=1388 ft
3304801	City of Rowlett	Paluxy	Depth = 2658 ft

All of the Garland wells are shown as plugged. The status of the other two wells is unknown, and there is no information on how many people are served. It is likely that the well with the unknown owner is some sort of private well. The Rowlett well can be check with city staff to determine its status.

To our knowledge there is only surface water intake on Lake Ray Hubbard near Forney Dam. Dallas withdraws water for treatment at the Dallas Eastside Water Treatment Plant and it passes into the Dallas distribution system. Dallas is authorized to divert 80.1 MGD, with 54.1 MGD considered a dependable yield. The entire Dallas system serves 1.7 million customers, with the water from Lake Ray Hubbard blended with other sources during distribution. You might calculate a rough estimate by dividing the volume withdrawn by a gallons per capita per day figure, but it would be difficult to determine the number of persons served.

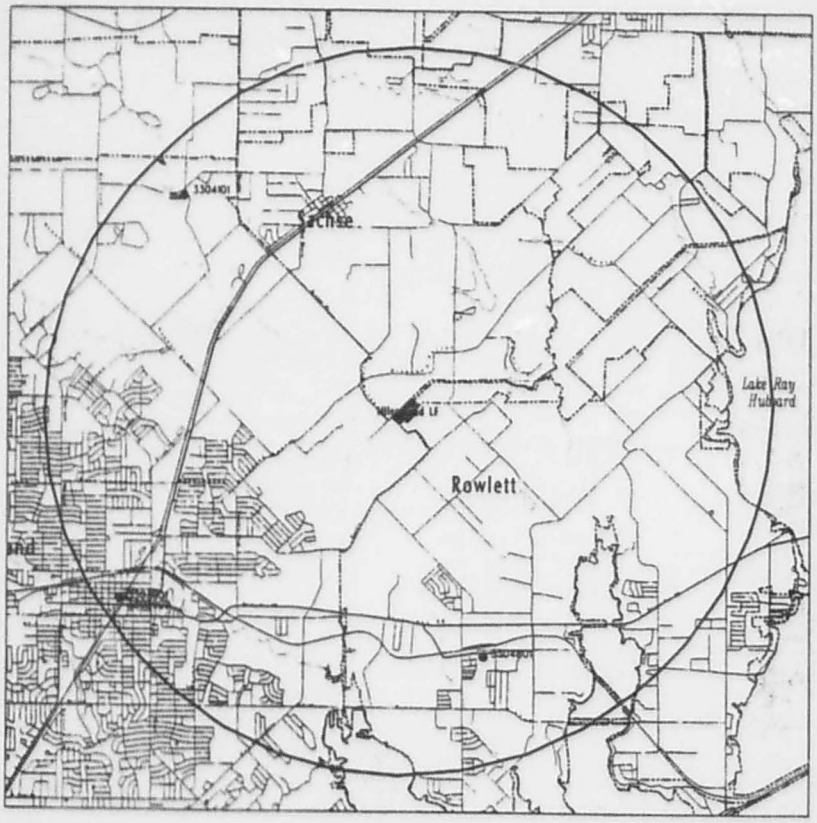
I hope that this information proves useful. Please contact me if there are any questions.

Sincerely,

Samuel W. Brush

616 Six Flags Drive, Centerpoint Two
P.O. Box 5888, Arlington, Texas 76005-5888
(817) 640-3300 FAX 817-640-7806 recycled paper

WELL LOCATIONS NEAR THE MILES ROAD LANDFILL



City Boundaries
Primary Roads
Other Roads
Streams/Shorelines
Railways
Four Mile Buffer Boundary

Public Supply Wells
- Active
- Inactive
- Plugged
- Abandoned
- Status Under Review

Other Wells
- Active
- Inactive
- Plugged
- Abandoned
- Status Under Review

North Central Texas Council of Governments
Department of Environmental Resources

Reference 18
Record of Telephone Conversation between William Walters, Fluor Daniel, and Junior Garza, City of Rowlett Public Utilities. August 24, 1993.

00008 7

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

FROM: William Walters (FD)

DATE: August 24, 1993

LOCATION: Irvine, CA

TIME: 7:45 a.m. PST

TO: Junior Garza, City of Rowlett, Public Utilities (214) 475-1314

P.O. NO. 06635336-41

OTHER REF. City of Garland Landfill Site Investigations

LOCATION: Rowlett, TX

I discussed the public supply well shown to be in the City of Rowlett by the North Central Texas Council of Government's well location maps produced for the City of Garland Landfill Sites. Mr. Garza noted that the pumping and distribution equipment for this artesian well had been removed and the well capped some years ago. Mr. Garza indicated that the City of Rowlett was exclusively using water supplied from Lake Levon.

ROWLETT.WEL

00008

Reference 19
Record of Telephone Conversation between William Walters, Fluor Daniel, and Ken Smith, Landfill Director, City of Garland Sanitation Department. August 31, 1993.

00008

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

FROM: William Walters, FD

DATE: August 31, 1993

LOCATION: Irvine, CA

TIME: 10:50 a.m. PST

TO: Ken Smith, Landfill
Director City of Garland Sanitation
Department (214) 205-2713

P.O. NO. 635336-41

OTHER REF. City of Garland Landfill SIs

LOCATION: Garland, TX

Mr. Smith answered the following questions in regards to the City of Garland Landfills:

1) What is the depth of the waste at the landfills?

Miles Road Landfill	- 10-15 feet from grade
Miller Road Landfill	- 10-15 feet from grade
E. Garland Road Landfill	- 10-15 feet from grade
Miller Road Landfill	- 10-15 feet from grade
Castle Drive Landfill	- 15-20 feet from grade
Castle Drive & Miles Road Landfill	- 15-20 feet from grade

2) What is the estimated quantity of waste for the Castle Drive and Castle Drive & Miles Road Landfill?

From the 1992 annual operating report submitted to the State of Texas the total landfill complex estimated waste quantity is 8,231,399 cubic yards. The proportion that has been disposed at each site is not available.

3) What is the acreage of the area used as landfill at the operating landfill complex?

The operating landfill complex is 191 acres of which 30 acres will not be used as landfill.

landfill.dph

Reference 20
Record of Telephone Conversation between William Walters, Fluor Daniel, and Bobby Farquhar, State of Texas Parks and Wildlife. August 31, 1993.

00009

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

FROM: William Walters, FD

LOCATION: Irvine, CA

TO: Bobby Farquhar, State of Texas, Parks and Wildlife, (817) 732-0761

LOCATION: Fort Worth, TX

DATE: 8/31 & 9/7, 1993

TIME: 1:35 p.m. PST

P.O. NO. 635336-41

OTHER REF. Fish Productivity

August 31, 1993

Mr. Farquhar said that they do not survey Lake Ray Hubbard. Therefore, he could not tell me what the fishing pressure was at Lake Ray Hubbard. Mr. Farquhar did note that there was full year data available for Lake Lewisville. I asked Mr. Farquhar to provide the data for Lake Lewisville. He said that the 1991 year fishing pressure for Lake Lewisville was 43 hours/hectare and the fish caught was 0.25 kg/hr. Mr. Farquhar noted that there could be significant error in using this data for other fisheries.

September 7, 1993

Mr. Farquhar noted that to his knowledge there was no fishing productivity data available for rivers or streams in this region of Texas. He did note however, that they on occasion have killed fish electronically in the Trinity river for epidemiological studies.

fish.dta

000092

Reference 21
Record of Telephone Conversation between Tom Casabonne, Fluor Daniel, and Rene Caraveo, Environmental Monitoring Manager, City of Dallas Water Utilities. June 7, 1993.

0000093

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

FROM: Tom Casabonne — DATE: 6-7-93

LOCATION: Irvine, x6657 — TIME: 15:00

TO: Rene Caraveo, Envtl. Monit. Mgr. — P.O. NO.

LOCATION: Dallas, TX, (214) 670-0936 — OTHER REF. Analysis

I had a couple of phone conversations with Mr. Caraveo today to follow up on a conversation I had with Terry Hodgins on 5-27-93. He told me that Dallas is the only municipality that takes water out of Lake Ray Hubbard. Water from that intake is mixed with water from two other sources (including Lake Tawakoni) and blended to serve 1.6 million people in Dallas. The blend of the water from the three different intakes is constantly varied, so there is no fixed ratio of water drawn from the three sources.

Lake Ray Hubbard covers approximately 22,745 surface acres, and the entire watershed covers about 301 square miles.

I also spoke with Lindy Bond, who works with Rene Caraveo. When we are sampling on Dallas property (within the take line of Lake Ray Hubbard), Lindy wants us to split our samples so they can test them as well. In order to duplicate our tests, he would like us to send information on our analytes, limits, and methodologies. Lindy Bond's phone number is (214) 670-0936, and his fax number is (714) 670-8056. I told him that this would take a couple of days, and I will check on it again when I'm back in Irvine on Thursday, 6-10-93.

Analysis

460000

Reference 22
Water Resources Data, Texas, Water Year 1991. Volume 1. Arkansas River Basin, Red River Basin, Sabine River Basin, Neches River Basin, Trinity River Basin, and Intervening Coastal Basins. H.D. Buckner and W.J. Shelby. U.S. Geological Survey Water-Data Report TX-91-1. 1991

00009

08061540 ROWLETT CREEK NEAR SACHSE, TX

LOCATION.--Lat 32°[illegible]'35", long 96°36'51", Dallas County, Hydrologic Unit 12030106, on left bank at downstream side of bridge on State Highway 78, 150 ft downstream from Gulf, Colorado, and Santa Fe Railway Co. bridge, 250 ft downstream from Spring Creek, and 1.5 mi southwest of Sachse.

DRAINAGE AREA.--120 mi².

PERIOD OF RECORD.--March 1968 to current year.

GAGE.--Water-stage recorder. Datum of gage is 450.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair except those for estimated daily discharges, which are fair. There are no known diversions above station. The North Texas Municipal Water District returns sewage effluent into a tributary above this station. Several observations of water temperature were made during the year. Rain gage and gage-height telemeter at station.

AVERAGE DISCHARGE.--23 years (water years 1969-91), 106 ft³/s (76,800 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 31,900 ft³/s May 17, 1989 (gage height, 29.62 ft); no flow Aug. 24 to Sept. 2, 1969.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1942, 35.4 ft in 1947, from information by State Department of Highways and Public Transportation.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,500 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Apr. 12	0600	*16,300	*27.09	May 24	2200	4,540	21.86
Apr. 13	1500	6,990	24.57				

Minimum daily discharge, 13 ft³/s Oct. 7 and Aug. 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	17	36	42	78	177	67	83	e77	54	22	219
2	20	19	146	40	75	98	65	81	e287	52	21	627
3	222	19	79	38	75	84	65	e1030	e726	137	20	136
4	34	376	44	37	270	82	63	e347	e103	67	18	61
5	17	48	40	50	259	81	62	e245	e370	55	18	53
6	15	28	39	224	161	77	63	142	e146	51	18	46
7	13	23	35	86	127	e72	64	120	738	49	17	112
8	20	824	33	64	114	71	64	505	274	46	16	110
9	771	334	33	183	107	68	61	186	121	43	64	52
10	45	83	33	543	103	68	57	152	102	41	35	45
11	30	57	32	123	97	69	114	136	98	40	23	41
12	26	49	31	94	92	70	3810	123	90	41	73	38
13	24	44	31	86	92	75	2470	114	80	37	83	37
14	22	40	30	130	85	80	469	838	76	38	51	38
15	20	37	29	593	79	92	221	518	69	38	33	69
16	21	37	43	151	80	87	175	144	82	46	28	52
17	19	35	45	114	81	110	297	110	77	37	23	42
18	23	35	86	241	85	84	290	98	68	35	25	44
19	19	37	42	440	75	77	156	124	65	34	23	284
20	18	35	35	164	71	78	136	86	63	32	19	58
21	25	133	117	128	72	78	130	83	62	32	18	44
22	26	303	e45	114	697	160	111	90	64	32	203	42
23	21	73	33	105	152	81	115	77	1540	32	44	44
24	19	46	32	104	121	74	107	703	111	31	22	305
25	18	40	31	101	106	74	135	1420	77	31	16	82
26	18	50	35	94	96	72	103	e171	71	30	19	50
27	18	188	50	90	92	242	157	e128	67	77	21	42
28	19	67	41	86	89	92	181	e109	62	264	14	38
29	20	43	108	84	---	76	167	e97	60	39	13	37
30	20	32	52	92	---	72	94	e87	66	26	418	37
31	19	---	44	87	---	68	---	e75	---	23	49	---
TOTAL	1624	3152	1510	4528	3631	2789	10089	8222	5892	1590	1467	2885
MEAN	52.4	105	48.7	146	130	90.0	336	265	196	51.3	47.3	96.2
MAX	771	824	146	593	697	242	3810	1420	1540	264	418	627
MIN	13	17	29	37	71	68	57	75	60	23	13	37
AC-FT	3220	6250	3000	8980	7200	5530	20010	16310	11690	3150	2910	5720

CAL YR 1990 TOTAL 72341 MEAN 198 MAX 5870 MIN 13 AC-FT 143500
WTR YR 1991 TOTAL 47379 MEAN 130 MAX 3810 MIN 13 AC-FT 93980

e Estimated

08061550 LAKE RAY HUBBARD NEAR FORNEY, TX

LOCATION.--Lat 32°48'00", long 96°29'45", Kaufman County, Hydrologic Unit 12030106, near right end of spillway in Forney Dam on East Fork Trinity River, 0.5 mi upstream from Duck Creek, 1.8 mi upstream from bridge on Interstate Highway 20, 3.8 mi northwest of Forney, 24 mi downstream from Lavon Dam, and 31.8 mi upstream from mouth.

DRAINAGE AREA.--1,071 mi².

PERIOD OF RECORD.--January 1968 to current year.
Water-quality records.--Chemical analyses: October 1969 to September 1979.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--The lake is formed by a rolled earthfill dam 12,500 ft long, including a 664-foot gated spillway with fourteen 40- by 28-foot tainter gates. Closure was made in September 1967, but the gates were not closed until Mar. 22, 1970. Low-flow releases are made through three 4.5- by 6.75-foot sluiceways. The lake was built by the city of Dallas for municipal water supply. Flow is affected at times by discharge from the flood-detention pools of 14 floodwater-retarding structures with a combined detention capacity of 12,530 acre-ft. These structures control runoff from 44.5 mi² above this station and below Lavon Lake station (08060500). Gage-height telemeter at station. Area and capacity tables are based on surveys made in 1953 and 1959. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam	450.0	-
Design flood	440.5	611,500
Top of tainter gates	437.5	536,700
Top of conservation pool	435.5	489,900
Crest of spillway (sill of tainter gates)	409.5	83,130
Lowest gated outlet (invert)	368.0	80

COOPERATION.--The area and capacity tables were provided by Forrest and Cotton, Consulting Engineers, for the city of Dallas.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 544,100 acre-ft May 4, 1990 (elevation, 437.81 ft); minimum since first appreciable filling following closure of gates on Mar. 22, 1970, 326,600 acre-ft Sept. 29, 30, 1978 (elevation, 427.48 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 509,900 acre-ft Apr. 12 at 1000 hours (elevation, 436.37 ft); minimum, 458,900 acre-ft Dec. 25 (elevation, 434.11 ft).

Capacity table (elevation, in feet, and total contents, in acre-feet)

434.0	456,500	436.0	501,400
435.0	478,600	437.0	524,700

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	467500	460400	464000	461800	483400	490400	487700	487900	489700	486300	467500	465500
2	466200	460200	466800	463300	483600	493100	487000	488800	492700	485400	466600	466400
3	467500	460000	466200	462900	483600	489700	487900	491100	489700	486500	465700	467900
4	467000	462600	464400	461800	487700	489900	487900	488800	489200	485400	465100	467500
5	466400	461300	463700	462900	490800	489200	487700	490400	491100	484700	463700	466800
6	465900	460700	465900	465900	490600	491100	487700	489700	489900	484000	463100	466400
7	466400	460400	463500	465500	490200	490800	487000	489500	490800	483100	462600	466400
8	467700	468600	463100	465100	489900	489900	487200	490400	490800	482500	461300	466200
9	470400	467900	462900	467900	489900	489500	487900	488600	489900	481800	462900	465900
10	468400	467300	462600	472600	490400	488100	486100	488600	490800	480200	462600	465500
11	467900	466800	462000	473300	490400	485600	495400	488800	490600	480000	462000	464800
12	467700	466400	462600	471900	489200	489500	499100	489200	490800	478900	462400	464000
13	466800	465700	463100	471500	490600	489900	496100	488800	490400	478200	463500	463100
14	466800	465100	462400	475000	493600	489000	486700	492400	490200	478200	464000	462900
15	466400	464400	463100	476600	490400	488600	488300	491500	489900	477100	464000	462600
16	465500	465100	462200	477100	489000	488800	489200	489900	490400	476400	463300	463300
17	466800	462900	462200	478000	489700	489200	492200	490600	489700	475500	463500	462400
18	465100	463100	462400	480000	491500	489000	490200	491500	489700	473900	463500	464600
19	464200	462700	462600	482000	491500	488100	489000	490600	489200	472800	462900	463100
20	464200	461300	463100	483400	490400	488800	487900	489900	488300	471900	462200	461800
21	464800	462400	463700	482900	491100	488800	488300	489500	487700	470800	462000	461300
22	463700	465700	462600	482200	491100	489200	489900	489700	491700	469000	464800	461800
23	463500	465300	460900	483100	487900	489500	490200	489700	492000	469300	464600	461800
24	463300	464600	459800	483400	489900	489000	491500	493300	489500	469000	464200	464000
25	462400	464000	460000	483600	491300	488600	489900	491500	489500	468800	463700	462900
26	462200	464200	461100	483100	490600	486700	488300	489900	489700	467900	463100	462900
27	463300	466200	460400	484000	489700	490600	488800	490400	488300	468600	462400	461800
28	461800	465300	460700	483100	490200	489700	487200	490200	487700	469500	462000	461500
29	461300	465100	464000	485600	---	489500	485200	489700	487000	469900	461500	461500
30	461500	463700	463100	484500	---	489000	485800	488800	486500	469300	465100	461500
31	461300	---	467200	483600	---	488100	---	489700	---	468200	464800	---
MAX	470400	468600	466800	485600	493600	493100	499100	493300	492700	486500	467500	467500
MIN	461300	460000	459800	461800	483400	485600	485200	487900	486500	467900	461300	461300
(↑)	434.22	434.33	434.26	435.22	435.51	435.47	435.32	435.49	435.35	434.53	434.38	434.23
(Δ)	-7100	+2400	-1500	+21400	+6600	-2100	-2300	+3900	-3200	-18300	-3400	-3300

CAL YR 1990 MAX 535900 MIN 454300 (Δ) +7000
WTR YR 1991 MAX 499100 MIN 459800 (Δ) -6900

(↑) Elevation, in feet, at end of month.
(Δ) Change in contents, in acre-feet.

08061700 DUCK CREEK NEAR GARLAND, TX

LOCATION.--Lat 32°49'58", long 96°35'43", Dallas County, Hydrologic Unit 12030106, on right bank in the median area between the dual bridges on Belt Line Road, 6.0 mi southeast of Garland, and 7.7 mi upstream from mouth.

DRAINAGE AREA.--31.6 mi².

PERIOD OF RECORD.--January 1958 to current year.
Water-quality records.--Chemical analyses: January 1969 to September 1982. Chemical and biochemical analyses: July 1988 to September 1989. Sediment analyses: January 1979.

REVISED RECORDS.--WSP 1922: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 430.02 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1962, at datum 4.00 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow is slightly regulated by several small on-channel dams. There are several small diversions above station including the irrigation of a golf course. Low flows are sustained by effluents from the city of Garland. Record rain gage located at station.

AVERAGE DISCHARGE.--33 years, 22.1 ft³/s (14.22 in/yr), 23,980 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,900 ft³/s Apr. 16, 1990 (gage height, 21.06 ft, present datum); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since about 1895, 21.5 ft (present datum) June 13, 1949, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,500 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Apr. 12	0145	*15,700	*20.77	May 24	2400	3,610	17.34
Apr. 13	1245	14,200	20.39	June 23	0345	6,220	18.21

Minimum daily discharge, 1.0 ft³/s Oct. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.0	1.4	5.1	5.6	5.8	56	6.6	10	7.5	5.3	3.4	132
2	1.2	1.4	91	5.4	5.3	13	6.7	9.5	63	4.1	3.1	59
3	65	1.4	19	6.0	5.0	10	7.6	195	184	18	3.2	14
4	8.1	e147	7.7	5.0	195	9.2	7.2	81	13	13	3.1	7.2
5	2.6	e16	6.2	8.0	167	8.8	7.4	43	92	5.6	3.0	5.5
6	1.9	e4.7	5.8	170	24	8.3	7.3	11	33	4.9	2.4	4.2
7	1.4	e2.3	5.2	25	12	7.6	9.4	9.6	93	3.5	2.3	31
8	3.0	e291	4.3	10	10	7.3	7.3	141	35	3.1	2.2	24
9	351	e126	4.2	166	8.4	7.3	7.4	22	11	2.4	21	5.4
10	6.5	e29	4.2	422	7.5	6.7	6.5	12	9.4	2.4	12	3.6
11	3.9	e13	3.6	25	6.9	7.1	71	10	9.2	3.2	5.8	3.1
12	2.9	e6.7	3.9	11	6.4	7.1	2770	9.2	7.9	2.6	76	2.7
13	2.5	e4.0	4.0	8.7	6.2	7.6	2300	8.1	6.8	2.3	102	2.7
14	2.4	2.9	4.1	84	6.1	8.5	99	121	6.0	2.2	58	4.7
15	2.1	2.8	3.8	81	5.4	12	39	107	7.8	2.0	13	15
16	2.0	2.9	4.6	13	5.3	12	21	14	29	2.2	7.9	4.5
17	1.9	2.7	8.9	10	5.4	21	274	10	12	2.7	5.6	3.9
18	1.9	2.4	34	155	9.4	9.1	190	9.6	7.2	2.7	4.4	10
19	1.9	2.3	6.5	134	5.9	7.2	78	30	6.0	2.3	3.6	169
20	1.6	2.5	4.1	16	4.9	7.4	21	16	5.3	2.1	2.5	8.3
21	5.9	75	10	11	5.1	7.6	16	8.3	5.3	1.9	4.1	4.3
22	6.1	231	4.5	9.2	275	102	15	8.0	5.6	1.8	228	3.6
23	2.9	18	3.0	8.7	19	14	14	10	897	1.6	15	3.1
24	3.7	8.9	2.8	9.7	14	10	13	337	13	42	6.3	91
25	2.3	7.0	4.0	7.7	11	10	25	408	8.8	20	4.6	12
26	1.8	15	43	6.7	9.9	9.8	12	19	7.8	10	36	4.1
27	1.6	91	34	6.2	9.3	70	30	12	7.1	77	13	3.3
28	1.6	14	7.0	5.6	9.3	13	47	9.3	5.7	206	4.8	2.5
29	1.6	7.0	67	5.7	---	9.3	27	7.7	4.5	11	4.3	2.2
30	1.7	5.7	11	7.8	---	8.4	11	7.5	9.2	6.1	378	2.2
31	1.5	---	5.3	8.7	---	7.1	---	6.3	---	4.1	18	---
TOTAL	495.5	1135.0	421.8	1447.7	854.5	494.4	6096.4	1702.1	1602.1	468.1	1046.6	638.1
MEAN	16.0	37.8	13.6	46.7	30.5	15.9	203	54.9	53.4	15.1	33.8	21.3
MAX	351	291	91	422	275	102	2770	408	897	206	378	169
MIN	1.0	1.4	2.8	5.0	4.9	6.7	6.5	6.3	4.5	1.6	2.2	2.2
AC-FT	983	2250	837	2870	1690	981	12090	3380	3180	928	2080	1270
CFSM	.51	1.20	.43	1.48	.97	.50	6.43	1.74	1.69	.48	1.07	.67
IN.	.58	1.34	.50	1.70	1.01	.58	7.18	2.00	1.89	.55	1.23	.75

CAL YR 1990 TOTAL 23121.4 MEAN 63.3 MAX 2680 MIN 1.0 AC-FT 45860 CFSM 2.00 IN. 27.22
WTR YR 1991 TOTAL 16402.3 MEAN 44.9 MAX 2770 MIN 1.0 AC-FT 32530 CFSM 1.42 IN. 19.31

e Estimated

08061750 EAST FORK TRINITY RIVER NEAR FORNEY, TX

LOCATION.--Lat 32°46'27", long 96°30'12", Kaufman County, Hydrologic Unit 12030106, on right bank 25 ft downstream from bridge on Interstate Highway 20, 0.2 mi downstream from Duck Creek, 1.9 mi downstream from Lake Ray Hubbard Dam, 2.5 mi upstream from Texas and Pacific Railroad Co. bridge, 2.6 mi northwest of Forney, and 30.8 mi upstream from mouth.

DRAINAGE AREA.--1,118 mi², of which 1,071 mi² is above Lake Ray Hubbard.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1973 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 374.86 ft above National Geodetic Vertical Datum of 1929 (from State Department of Highways and Public Transportation bridge plans). Prior to Aug. 26, 1975, recording gage at 3-foot higher datum located at site 126 ft upstream and 868 ft to left. From Aug. 26, 1975, to May 12, 1977, recording gage at 3-foot higher datum located at site 105 ft downstream. From May 13, 1977, to Sept. 30, 1984, recording gage at 3-foot higher datum at current site.

REMARKS.--Records fair except those for estimated daily discharges, which are poor. Flow is regulated by Lake Ray Hubbard (station 08061550) 1.9 mi upstream. Low flow is sustained by sewage effluent discharge from the city of Garland into Duck Creek, which enters the East Fork Trinity River 0.2 mi upstream from this station. Gage-height telemeter at station.

AVERAGE DISCHARGE.--18 years (water years 1974-91), 600 ft³/s (434,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 53,000 ft³/s May 3, 1990 (gage height, 22.01 ft), from rating extended above 52,300 ft³/s; minimum daily, 13 ft³/s Oct. 18, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 38,200 ft³/s (calculated from Lake Ray Hubbard release data and incremental discharge values for Duck Creek near Garland, station 08061700) Apr. 13 at about 1300 hours (gage height, about 20.3 ft, from rating table value nearest the calculated peak discharge); minimum daily, 23 ft³/s July 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36	28	45	54	60	288	33	976	248	31	34	122
2	35	25	69	52	56	522	31	971	83	32	32	249
3	51	25	175	48	53	290	34	2750	1580	32	33	119
4	90	126	65	49	127	49	33	2150	478	65	33	58
5	39	149	52	46	414	43	33	2430	357	40	31	43
6	35	38	50	171	637	41	32	2190	1220	33	30	37
7	33	36	46	205	586	46	33	2210	1250	25	30	40
8	33	213	43	90	342	56	33	2390	1770	26	29	104
9	298	688	43	80	82	39	34	2290	1290	33	31	52
10	79	110	43	605	68	35	30	2220	896	34	65	47
11	39	64	43	204	63	37	32	2200	891	33	45	36
12	32	51	41	102	56	31	e12900	1570	892	29	57	34
13	31	42	41	88	46	38	e23400	382	536	27	177	35
14	31	39	39	84	47	35	e8910	178	45	25	184	33
15	37	36	40	315	56	30	e28	1820	37	26	88	55
16	37	33	40	153	56	40	e435	1040	39	26	53	48
17	36	32	45	97	54	43	e1870	1090	70	26	45	43
18	32	31	67	167	50	45	e2150	543	39	27	41	42
19	28	31	67	411	59	32	e2710	692	35	27	34	250
20	27	33	45	156	176	29	e2200	837	35	26	34	121
21	30	32	46	104	541	29	e2710	90	35	25	263	55
22	36	369	65	92	2220	84	e2240	50	35	25	180	45
23	32	178	53	81	881	81	2200	54	2280	25	55	41
24	30	70	50	75	97	39	2010	102	1530	23	45	71
25	38	52	47	73	69	31	2040	5760	63	99	37	179
26	35	46	50	64	762	31	2020	1870	48	43	38	56
27	25	95	124	62	495	53	2030	918	42	42	90	46
28	25	133	60	69	260	323	2030	1590	35	332	46	41
29	39	57	85	74	---	55	2440	1360	31	109	36	41
30	40	46	118	78	---	36	1660	928	34	46	394	39
31	38	---	60	67	---	34	---	665	---	42	140	---
TOTAL	1427	2908	1857	4016	7913	2565	75341	44616	15924	1434	2430	2182
MEAN	46.0	96.9	59.9	130	283	82.7	2511	1439	531	46.3	78.4	72.7
MAX	298	688	175	605	2220	522	23400	5760	2280	332	394	250
MIN	25	25	39	46	46	29	28	50	31	23	29	33
AC-FT	2830	5770	3680	7970	15700	5090	149400	88500	31590	2840	4820	4330

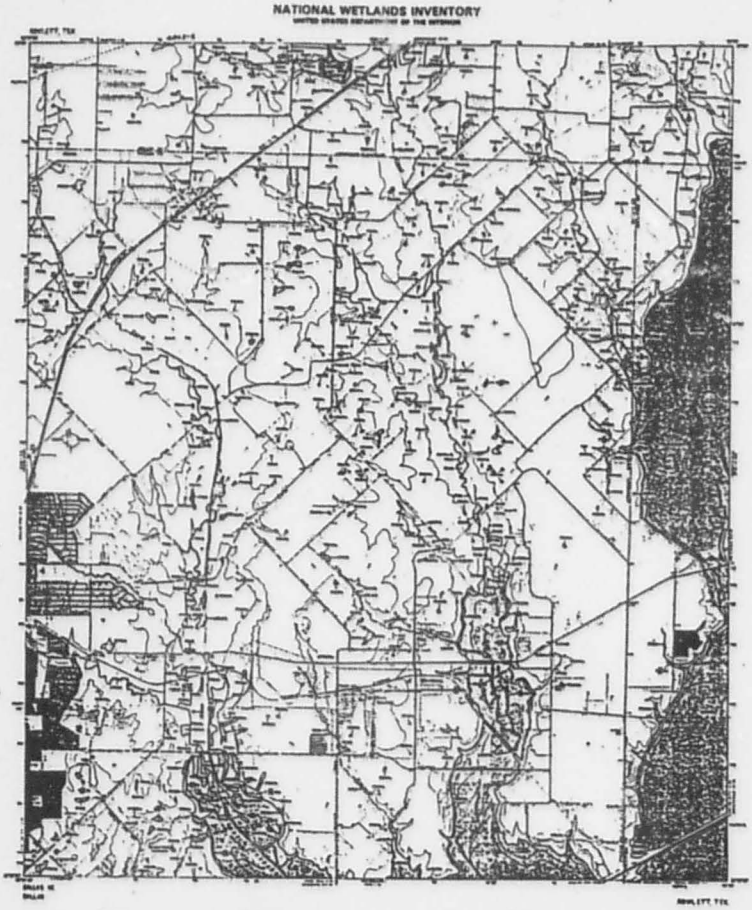
CAL YR 1990 TOTAL 509569 MEAN 1396 MAX 50700 MIN 25 AC-FT 1011000
WTR YR 1991 TOTAL 162613 MEAN 446 MAX 23400 MIN 23 AC-FT 322500

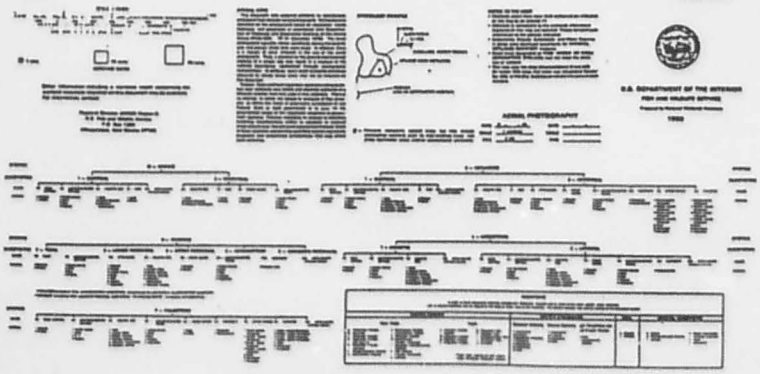
e Estimated

Reference 23
National Wetlands Inventory Maps, Rowlett, Wylie, and Garland, TX Quadrangles. U.S. Department of the Interior, Fish and Wildlife Service. Maps dated 1989, 1992, and 1989, respectively.

00010000

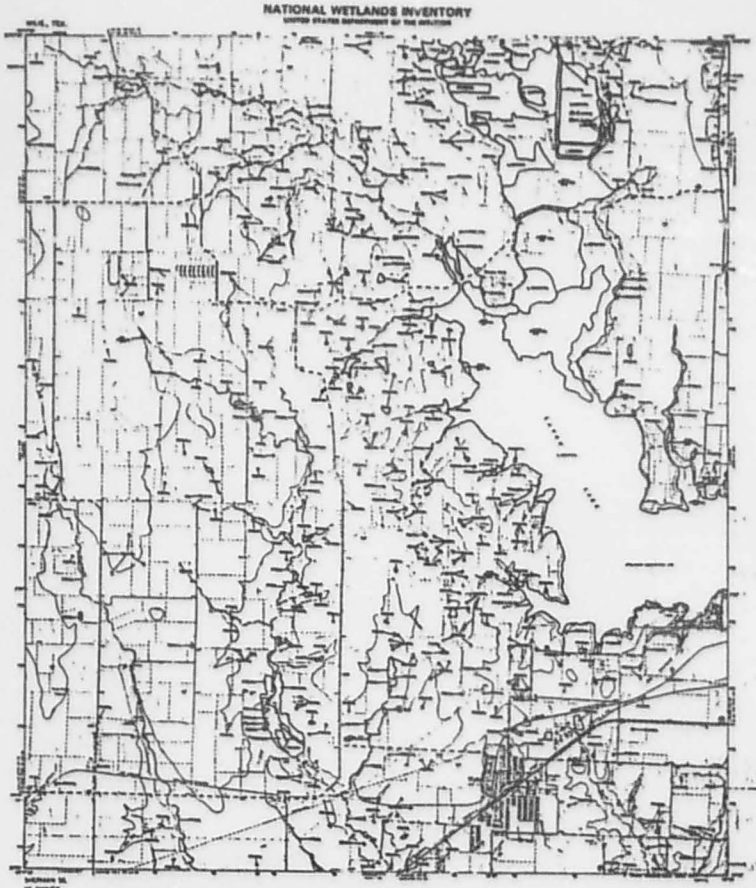
NATIONAL WETLANDS INVENTORY

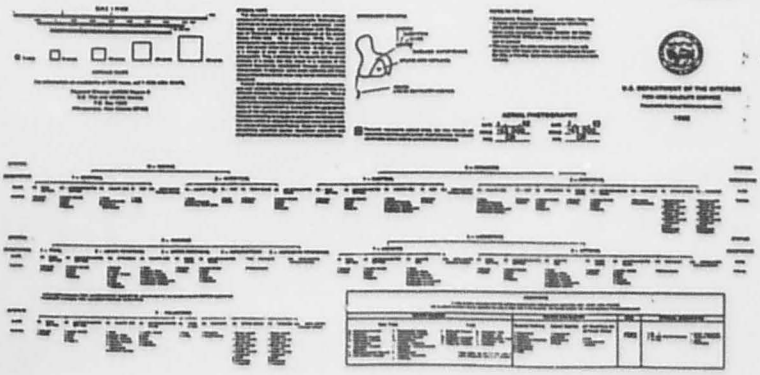
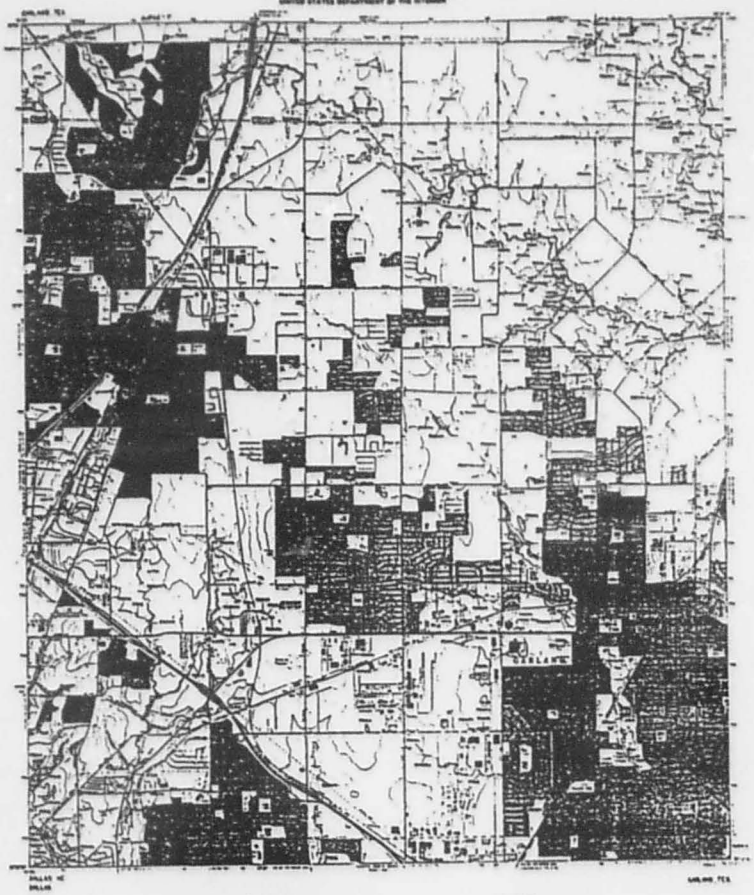
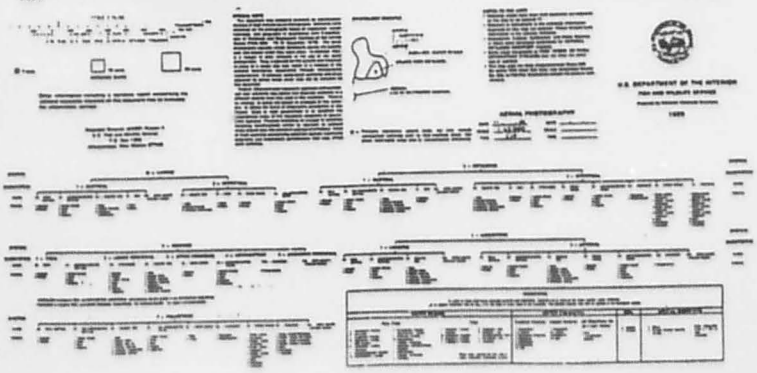




NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR





NATIONAL WETLANDS INVENTORY