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TECHNICAL REPORT GL-92-1

LOGIC RECONNAISSANCE OF
HREVREPORT, LOUISIANA TO
GERFIELD, TEXAS REACH
REDRIVER WATERWAY

by

PAUL ALBERTSON

Geotechnical Laboratory

DEPARTMENT OF THE ARMY
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REDRIVER WATERWAY

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3909 Halls Ferry Road
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Vicksburg, Mississippi 39180-0060
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Differentiates: laid down by river and brown dirt
Massive sands coarser-grained the middle of
Clays and silt
Differentiated into six distinct environments of deposition laid down by meandering streams. Deposits composed of grey and brown clays and silts.

- Massive sands and gravels. Fine to medium sands becoming coarse-grained with depth. First gravels generally appear near the middle of the deposit.
- Yields little water, not generally an aquifer.

- Yields small quantities of fresh water to a few wells.

- Clays and silts grading downward into sands and gravels.
- Yields small quantities of fresh water to a few wells.
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<th>Deposit Description</th>
<th>Yields</th>
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<td>Massive sands and gravels. Fine to medium sands becoming coarse-grained with depth. First gravels generally appear near the middle of the deposit.</td>
<td>Small to moderate quantities of fresh water to wells.</td>
</tr>
<tr>
<td>Clays and silts grading downward into sands and gravels.</td>
<td>Small to moderate quantities of fresh water to wells.</td>
</tr>
<tr>
<td>Nonmarine, massive sands with minor amounts of sandy clay or shale. In subsurface, lignite and other organic materials are common.</td>
<td>Small to moderate quantities of fresh water to wells.</td>
</tr>
<tr>
<td>Green to red, glauconitic, fossiliferous, sands and clays with ironstone concretions.</td>
<td>Small to moderate quantities of fresh water to wells.</td>
</tr>
<tr>
<td>Interbedded, light gray, glauconitic, lignitic, fossiliferous, sands and clays.</td>
<td>Small to moderate quantities of fresh water to wells.</td>
</tr>
<tr>
<td>Soft to hard, light gray green to red, glauconitic, lignitic, micaceous sands and clays with gypsum crystals.</td>
<td>Small to moderate quantities of fresh water to wells.</td>
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<tr>
<td>Finer to very fine-grained, feldspathic, glauconitic, cross-bedded sands with some siltships and rounded inclusions. Locally iron-cemented sandstone boulders are found at top of formation.</td>
<td>Yields moderate to possibly large quantities of fresh water to wells.</td>
</tr>
<tr>
<td>Interbedded, gray to chocolate brown, calcareous, fine- to medium-grained sands, lignitic silts, clays, and lignite.</td>
<td>Yields no water.</td>
</tr>
<tr>
<td>Massive, dark gray to black, lignitic, micaceous, calcareous clay with calcareous concretions.</td>
<td>Yields no water.</td>
</tr>
<tr>
<td>Light to dark gray, fossiliferous, glauconitic, silts and clays with occasional chalk lenses and calcareous concretions.</td>
<td>Yields no water.</td>
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**Generalized Stratigraphic Column**
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<th>TOPS.RATUM DEPOSITIONAL ENVIRONMENT</th>
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<td>POINT BAR</td>
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### Method of Deposition

Abandoned channels are partially or wholly filled segments of meandering streams formed when the stream starts its course soon after formation, they are usually characterized by open water called "ocho lakes." Subsequently, they may become filled and occasionally completely absorbed by various meander belt deposits. The abandoned segment may represent an entire meander loop formed by the stream cutting directly across a narrow neck of two converging arms of a loop and is termed a neck cutoff. A neck cutoff represents a portion of a loop formed when a stream occupied a large point bar scale during flood stage and abandoned the outer portion of the loop.

Abandoned channels are 0.5 to 1.5 miles long following the loop. These channels are 5 to 10 feet deep and are flanked soft to medium brown to gray clay with silt interbeds.

The larger abandoned channels are believed to be formed in the early Holocene during wetter climatic conditions.
Description of Deposits
Backswamp deposits consist of fine-grained sediments laid down in broad, shallow basins within the floodplains during major periods of stream flooding. The sediment-carrying floodwater may be ponded between the natural levee ridges and the uplands. Backswamp areas typically have very low relief and a distinctive and complicated drainage pattern. The channels alternately serve as tributaries and distributaries at different times of the annual flood cycle.

Natural levees are broad, low ridges which flank both sides of streams that periodically overflow their banks. The deposited and reworked quantities of sediment are deposited closest to the stream channels. The natural levees are highest and thickest in these areas and gradually thin away from the channels. In general, the greater the distance from the stream; the greater the percentage of the finer-grained sediments. Small drainage channels trending at right angles to the parent stream down the backslope of the levee are common. Major crevices are indicated where these channels are large and pronounced. Abandoned crevasse channels are often filled with sediments that are distinctly coarser than the remainder of the natural levee.

Backswamp deposits are sparse in the project area. The backswamps occur between valley walls and inundated bottoms. Based on limited data, the thickness of these deposits is 20 to 30 feet in the Big Cypress Bayou Valley.

Typical backswamp deposits are brown to gray, clayey silt; scattered lenses of silt, organic matter, and wood fragments.

Natural levees occur along abandoned courses and channels and adjacent to the active Cypress Bayou channel. The higher and better drained levee deposits bordering older courses are visible by noting a vegetation change from cypress tamarac to oaks and pin oak species. Other levee deposits are observed by recent post-settlement basins in filling or simply eroded by water movement. Natural levee perching scours vary in height from 2 to 5 feet and in width from 100 to 1000 feet.

Natural levee deposits typically consist of brown, silty sands, silt, and clay; silt and clay clays which exhibit moderate amounts of oxidation. Since natural levees are well drained, the water content of these soils is low and organic matter is seldom present except for roots.
GEOLOGICAL INVESTIGATION

SHREVEPORT, LA - DAINGERFIELD, TX

SECTION A - A'

CADDYO

(HIGHWAY 43)
GEOLOGICAL INVESTIGATION
SHREVEPORT, LA - DAINGERFIELD, TX

SECTION B - B'
CADDIO
(LONGHORN)
SHREVEPORT, LA - DANGERFIELD, TX
SURFACE GEOLOGY
JEFFERSON, TX
2/92
GEOLOGICAL INVESTIGATION
SHREVEPORT, LA - DAINGERFIELD, TX
SECTION A - A'
JEFFERSON
(HIGHWAY 59)
ENVIRONMENTS OF DEPOSITION

NATURAL LEVEE
POINT BAR
BACKSWAMP
ABANDONED CHANNEL
ABANDONED COURSE
UNDIFFERENTIATED SAND AND GRAVEL

LITHOLOGY

SAND
Silty Sand
Silt
Sandy Clay
CLAY
SHALE

MAPPING SYMBOLS

QTU TERRACE DEPOSITS UNDIFF.

Ecr BLACK CYPRESS BAROU

TERTIARY SURFACE

Ecr SPARTA

Eow WECHES

Eeq QUEEN CITY

Ecr REKLAW

Ewu WILCOX UNDIFF.
GEOLOGICAL INVESTIGATION
SHREVEPORT, LA - DAINGERFIELD, TX

SECTION B - B'
JEFFERSON
( WOODLAWN OIL FIELD)
LEGEND

QUARTERNARY

RECENT
POINT BAR
BACKSWAMP
ABANDONED CHANNEL
ABANDONED COURSE
UNDIFFERENTIATED ALLUVIUM

PLEISTOCENE

HEOCENE
CLAIBORNE GROUP

SPARTA FORMATION
WECHES FORMATION
QUEEN CITY FORMATION
REKLAW FORMATION
WILCOX GROUP UNDIFFERENTIATED

TERTIARY

CONTACT
FAULT
BORING
PIEZOMETER

UNDIFFERENTIATED TERRACE DEPOSITS
LEGEND

ENVIORNMENTS OF DEPOSITION

- Natural levee
- Point bar
- Backswamp
- Abandoned channel
- Abandoned course

LITHOLOGY

- Undifferentiated sand and gravel
- Sand
- Silty sand
- Silt
- Sandy clay
- Clay
- Shale
- Fill

MAPPING SYMBOLS

- Qai: Alluvium undiff.
- Qtu: Terrace deposits undiff.
- Tertiary surface
- Eoc: Sparta
- Eow: Wesches
- Eq: Queen city
- Eor: Reklaw
- Ewu: Wilcox undiff.
GEOLOGICAL INVESTIGATION
SHREVEPORT, LA - DAINGERFIELD, TX
SECTION B - B'
LAKE O' THE PINES
(FERRELLS BRIDGE DAM)
LEGEND

QUARTERNARY

RECENT

NATURAL LEVEE

POINT BAR

BACKSWAMP

ABANDONED CHANNEL

ABANDONED COURSE

UNDIFFERENTIATED ALLUVIUM

PLEISTOCENE

UNDIFFERENTIATED TERRACE DEPOSITS

TERTIARY

EOCENE

CLAIBORNE GROUP

SPARTA FORMATION

WECHES FORMATION

QUEEN CITY FORMATION

REKLAW FORMATION

WILCOX GROUP UNDIFFERENTIATED

CONTACT

FAULT

BORING

PIEZOMETER
GEOLOGICAL INVESTIGATION
SHREVEPORT, LA - DAINGERFIELD, TX
SECTION A - A'
LONESTAR
(ELLISON)
BARNES CREEK RESERVOIR

LONE STAR

BIG CYPRESS BAYOU

BC - 2
BC - 3
BC - 4

QTu

ECQ

10,000 20,000 30,000 40,000 DISTANCE IN FEET

MAPPING SYMBOLS

Qal ALLUVIUM UNDIFF.
Qhu TERRACE DEPOSITS UNDIFF.
QQ TERTIARY SURFACE
Eco SPARTA
Eco SPAR
Ecm WEXIES
Eq Queen City
Ear REKLAW
Emu WILCOX UNDIFF.

GEOLICAL INVESTIGATION
SHREVEPORT, LA - DAINGERFIELD, TX
SECTION B - B'
LONESTAR
(HIGHWAY 259)