



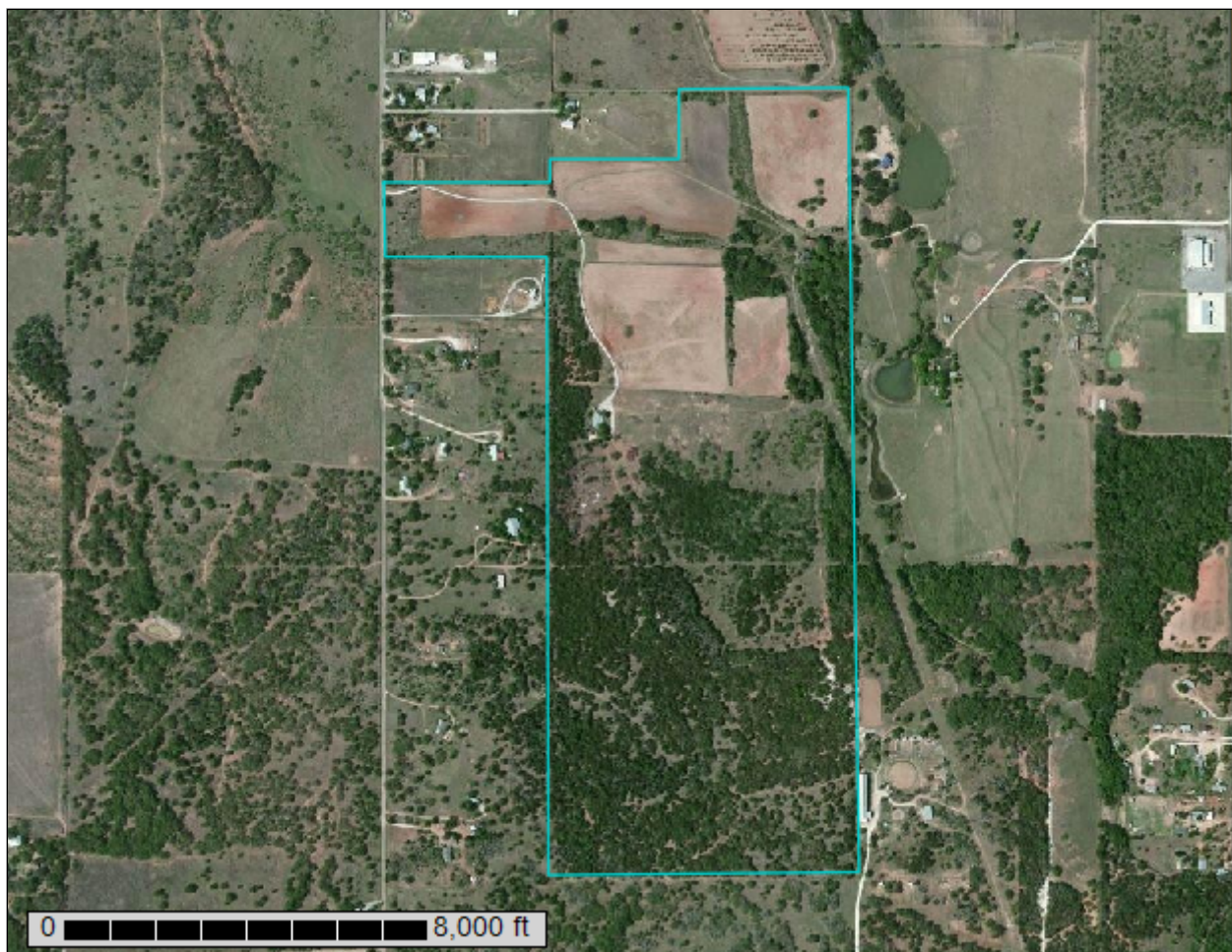
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Natural
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Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Gillespie County, Texas**



December 10, 2015

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<http://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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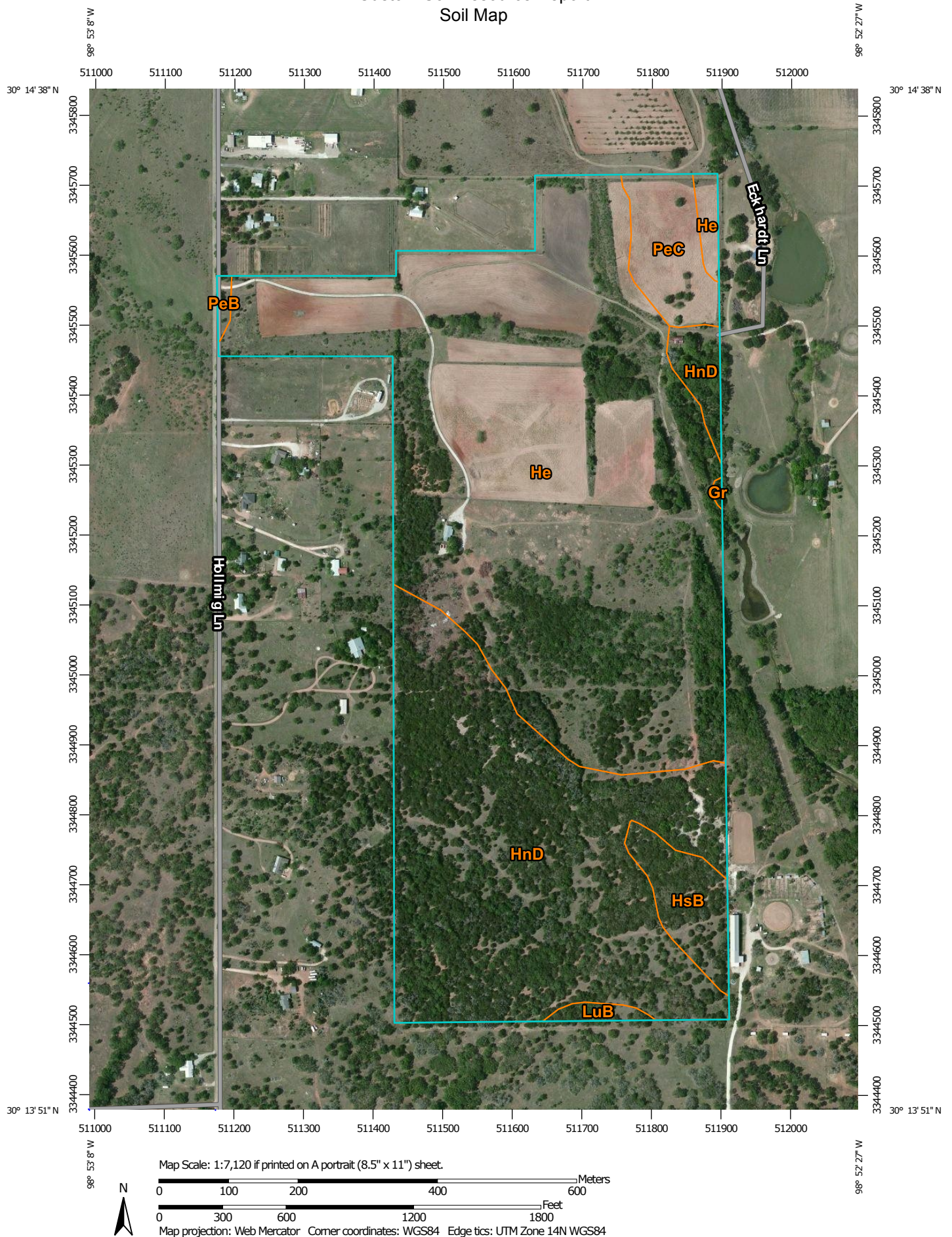
Contents

Preface	2
Soil Map	5
Soil Map.....	6
Legend.....	7
Map Unit Legend.....	8
Map Unit Descriptions.....	8
Gillespie County, Texas.....	10
Gr—Boerne and Oakalla soils, channeled, frequently flooded.....	10
He—Heaton loamy fine sand.....	11
HnD—Hensley loam, 3 to 8 percent slopes.....	12
HsB—Hensley soils, 1 to 3 percent slopes.....	13
LuB—Luckenbach clay loam, 0 to 3 percent slopes.....	14
PeB—Pedernales fine sandy loam, 1 to 3 percent slopes.....	15
PeC—Pedernales fine sandy loam, 3 to 5 percent slopes.....	17
References	19

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Custom Soil Resource Report


MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit


 Clay Spot


 Closed Depression

 Gravel Pit

 Gravelly Spot


 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry


 Miscellaneous Water


 Perennial Water

 Rock Outcrop


 Saline Spot

 Sandy Spot

 Severely Eroded Spot


 Sinkhole


 Slide or Slip


 Sodic Spot

 Spoil Area

 Stony Spot


 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals


Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Gillespie County, Texas
Survey Area Data: Version 10, Sep 21, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 6, 2011—Apr 18, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Gillespie County, Texas (TX171)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Gr	Boerne and Oakalla soils, channeled, frequently flooded	0.1	0.1%
He	Heaton loamy fine sand	83.7	58.1%
HnD	Hensley loam, 3 to 8 percent slopes	49.2	34.2%
HsB	Hensley soils, 1 to 3 percent slopes	4.5	3.1%
LuB	Luckenbach clay loam, 0 to 3 percent slopes	0.8	0.5%
PeB	Pedernales fine sandy loam, 1 to 3 percent slopes	0.4	0.3%
PeC	Pedernales fine sandy loam, 3 to 5 percent slopes	5.4	3.8%
Totals for Area of Interest		144.0	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been

observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Gillespie County, Texas

Gr—Boerne and Oakalla soils, channeled, frequently flooded

Map Unit Setting

National map unit symbol: d91k
Elevation: 600 to 2,300 feet
Mean annual precipitation: 24 to 36 inches
Mean annual air temperature: 64 to 70 degrees F
Frost-free period: 210 to 255 days
Farmland classification: Not prime farmland

Map Unit Composition

Boerne and similar soils: 60 percent
Oakalla, pe <44, and similar soils: 39 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boerne

Setting

Landform: Flood plains, stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Alluvium derived from limestone

Typical profile

H1 - 0 to 19 inches: loam
H2 - 19 to 49 inches: loam
H3 - 49 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum in profile: 75 percent
Available water storage in profile: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A
Ecological site: Loamy Bottomland 23-31" PZ (R081BY335TX)

Description of Oakalla, Pe <44

Setting

Landform: Flood plains, flood plains
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Alluvium derived from limestone

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Typical profile

H1 - 0 to 26 inches: silty clay loam
H2 - 26 to 51 inches: silty clay loam
H3 - 51 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum in profile: 60 percent
Available water storage in profile: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B
Ecological site: Loamy Bottomland 23-31" PZ (R081BY335TX)

Minor Components

Unnamed, hydric

Percent of map unit: 1 percent
Landform: Sloughs

He—Heaton loamy fine sand

Map Unit Setting

National map unit symbol: d91n
Elevation: 1,400 to 2,100 feet
Mean annual precipitation: 26 to 32 inches
Mean annual air temperature: 64 to 68 degrees F
Frost-free period: 210 to 270 days
Farmland classification: Farmland of statewide importance, if irrigated

Map Unit Composition

Heaton and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Heaton

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex

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Across-slope shape: Linear

Parent material: Mixed sources alluvium

Typical profile

H1 - 0 to 28 inches: loamy fine sand

H2 - 28 to 67 inches: sandy clay loam

H3 - 67 to 90 inches: sandy clay loam

Properties and qualities

Slope: 1 to 5 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Ecological site: Sandy 25-32" PZ (R082AY372TX)

HnD—Hensley loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: d91p

Elevation: 350 to 2,250 feet

Mean annual precipitation: 24 to 40 inches

Mean annual air temperature: 64 to 66 degrees F

Frost-free period: 210 to 250 days

Farmland classification: Not prime farmland

Map Unit Composition

Hensley and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hensley

Setting

Landform: Plains

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Residuum weathered from limestone

Typical profile

H1 - 0 to 4 inches: loam

H2 - 4 to 18 inches: clay

H3 - 18 to 21 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: Redland 23-31" PZ (R081BY340TX)

HsB—Hensley soils, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: d91q
Elevation: 350 to 2,250 feet
Mean annual precipitation: 24 to 40 inches
Mean annual air temperature: 64 to 66 degrees F
Frost-free period: 210 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Hensley and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hensley

Setting

Landform: Plains
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Residuum weathered from limestone

Typical profile

H1 - 0 to 4 inches: loam
H2 - 4 to 18 inches: clay
H3 - 18 to 21 inches: bedrock

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches

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Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: D

Ecological site: Redland 23-31" PZ (R081BY340TX)

LuB—Luckenbach clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2t0rl

Elevation: 1,000 to 1,900 feet

Mean annual precipitation: 28 to 32 inches

Mean annual air temperature: 65 to 67 degrees F

Frost-free period: 215 to 240 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Luckenbach and similar soils: 92 percent

Minor components: 8 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Luckenbach

Setting

Landform: Stream terraces, hillslopes

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Base slope, tread

Down-slope shape: Linear, convex

Across-slope shape: Linear

Parent material: Calcareous loamy and clayey alluvium derived from limestone

Typical profile

Ap - 0 to 18 inches: clay loam

Bt - 18 to 30 inches: clay

Btk - 30 to 38 inches: clay

Bk - 38 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

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Calcium carbonate, maximum in profile: 50 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 2.0

Available water storage in profile: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C

Ecological site: Clay Loam 23-31" PZ (R081BY326TX)

Minor Components

Pedernales

Percent of map unit: 4 percent

Landform: Hillslopes

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Base slope

Down-slope shape: Linear

Across-slope shape: Convex

Ecological site: Tight Sandy Loam 25-32" PZ (R082AY378TX)

Hensley

Percent of map unit: 3 percent

Landform: Hillslopes

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Base slope

Down-slope shape: Linear

Across-slope shape: Convex

Ecological site: Redland 23-31" PZ (R081BY340TX)

Nuvalde

Percent of map unit: 1 percent

Landform: Stream terraces

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Clay Loam 23-31" PZ (R081BY326TX)

PeB—Pedernales fine sandy loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2t2m7

Elevation: 670 to 2,000 feet

Mean annual precipitation: 26 to 32 inches

Mean annual air temperature: 65 to 67 degrees F

Frost-free period: 220 to 240 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Pedernales and similar soils: 90 percent

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Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pedernales

Setting

Landform: Hillslopes

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Base slope

Down-slope shape: Linear

Across-slope shape: Convex

Parent material: Calcareous loamy slope alluvium over residuum weathered from sandstone

Typical profile

Ap - 0 to 11 inches: fine sandy loam

Bt - 11 to 37 inches: sandy clay

Btk - 37 to 43 inches: sandy clay loam

BCtk - 43 to 80 inches: sandy clay loam

Properties and qualities

Slope: 1 to 3 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 35 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 2.0

Available water storage in profile: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): 2e

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C

Ecological site: Tight Sandy Loam 25-32" PZ (R082AY378TX)

Minor Components

Hye

Percent of map unit: 5 percent

Landform: Hillslopes

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Base slope

Down-slope shape: Convex

Across-slope shape: Convex

Ecological site: Red Sandy Loam 25-32" PZ (R082AY369TX)

Luckenbach

Percent of map unit: 3 percent

Landform: Stream terraces

Landform position (three-dimensional): Tread

Down-slope shape: Linear

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Across-slope shape: Linear
Ecological site: Clay Loam 23-31" PZ (R081BY326TX)

Hensley

Percent of map unit: 2 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Redland 23-31" PZ (R081BY340TX)

PeC—Pedernales fine sandy loam, 3 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2t2mc
Elevation: 670 to 2,000 feet
Mean annual precipitation: 26 to 32 inches
Mean annual air temperature: 65 to 67 degrees F
Frost-free period: 220 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Pedernales and similar soils: 91 percent
Minor components: 9 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pedernales

Setting

Landform: Hillslopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Calcareous loamy slope alluvium over residuum weathered from sandstone

Typical profile

Ap - 0 to 11 inches: fine sandy loam
Bt - 11 to 37 inches: sandy clay
Btk - 37 to 43 inches: sandy clay loam
BCtk - 43 to 80 inches: sandy clay loam

Properties and qualities

Slope: 3 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

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Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 35 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 2.0
Available water storage in profile: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Tight Sandy Loam 25-32" PZ (R082AY378TX)

Minor Components

Hensley

Percent of map unit: 3 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Redland 23-31" PZ (R081BY340TX)

Hye

Percent of map unit: 3 percent
Landform: Hillslopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Red Sandy Loam 25-32" PZ (R082AY369TX)

Luckenbach

Percent of map unit: 2 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clay Loam 23-31" PZ (R081BY326TX)

Doss

Percent of map unit: 1 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Shallow 29-35" PZ (R081CY574TX)

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