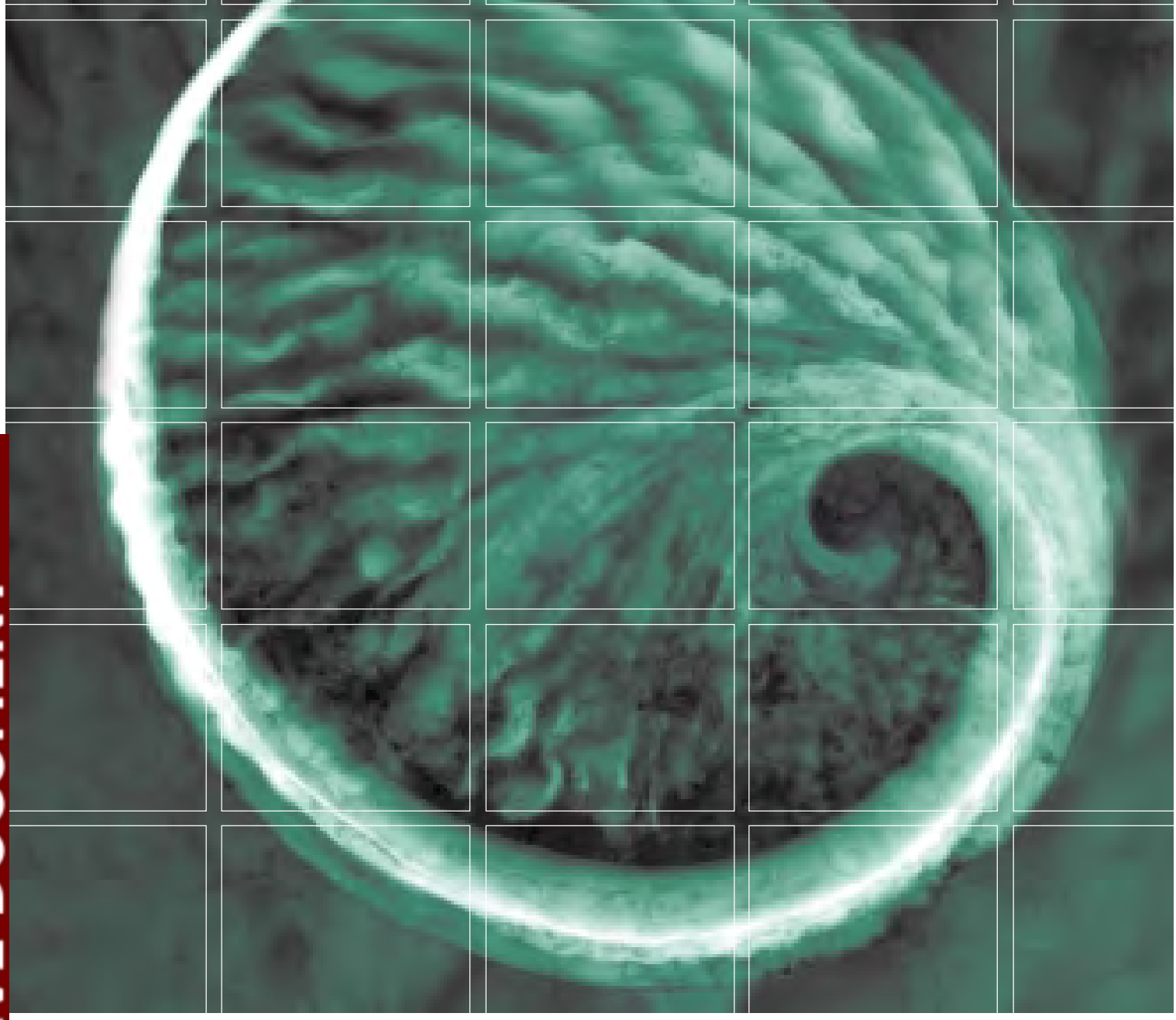

Biological Assessment: Tenaska Roan's Prairie Generating Station Project

Tenaska Roan's Prairie Partners, LLC
Grimes County, Texas

February 25, 2014

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Grimes County, Texas

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ACRONYMS

BA	Biological Assessment
BACT	Best Available Control Technology
BMP	Best Management Practice
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalents
dB	Decibels
dBA	Adjusted Decibels
ERM	Environmental Resources Management
ESA	Endangered Species Act
ESL	Effects Screening Levels
GHG	Greenhouse Gas
GIS	Geographic Information Systems
HAP	Hazardous Air Pollutants
HUD	US Department of Housing and Urban Development
MBTA	Migratory Bird Treaty Act
NAAQS	National Ambient Air Quality Standards
NASS	National Agriculture Statistics Service
NMFS	National Marine Fisheries Service
NO_2	Nitrogen Dioxide
NO_X	Nitrogen Oxides
NRCS	National Resource Conservation Service
NSPS	New Source Performance Standards
OHWM	Ordinary High Water Mark
OSHA	Occupational Safety and Health Administration
Pb	Lead
PM	Particulate Matter
PSD	Prevention of Significant Deterioration
RO	Reverse Osmosis
SIL	Significant Impact Level
SO_2	Sulfur Dioxide
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TPDES	Texas Pollutant Discharge Elimination System
TPWD	Texas Parks and Wildlife Department
TSS	Total Suspended Solids
TXNDD	Texas Natural Diversity Database
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Service
USFWS	U.S. Fish and Wildlife Service
VOC	Volatile Organic Compounds

In accordance with the Prevention of Significant Deterioration (PSD) provisions of the Clean Air Act codified at 40 CFR 52.21, Tenaska Roan's Prairie Partners, LLC (Tenaska) submitted on July 22, 2013 a Greenhouse Gas (GHG) PSD Permit Application for a proposed electric generating station (the Project) in Grimes County, Texas known as the Tenaska Roan's Prairie Generating Station (Generating Station). Tenaska plans to initiate construction of the Project in January 2015 and begin operation by June 2016.

The purpose of this Biological Assessment (BA) is to provide the results of an assessment of the potential impacts of the proposed Project on federally listed species protected by the Endangered Species Act (ESA) as outlined in the requirements under Section 7 of the ESA as it relates to GHG permits issued by the United States Environmental Protection Agency (USEPA). The information provided in this BA is presented for utilization in informal consultation with the appropriate supporting federal agencies. Accordingly, this analysis provides recommendations for the U.S. Fish and Wildlife Service (USFWS) determinations of effect for each federally listed species, as outlined in the table below.

TABLE ES-1: Summary of Anticipated Effects on Federally Listed Species Potentially Occurring in the Action Area

Federally Listed Species	*Listing Agency*	*Recommended Determination of Effect*
Interior least tern (*Sterna antillarum athalassos*)	*TPWD*	No effect
Red-cockaded woodpecker *(Picoides borealis)*	*TPWD*	No effect
Whooping crane *(Grus americana)*	*USFWS*	No effect
Louisiana black bear *(Ursus americanus luteolus)*	*TPWD*	No effect
Red wolf *(Canis rufus)*	*TPWD*	No effect
Navasota ladies'-tresses *(Spiranthes parksii)*	*USFWS*	No effect

1.0 INTRODUCTION

1.1 PROPOSED ACTION

Tenaska Roan's Prairie Partners, LLC (Tenaska) intends to build and operate an electric generating station (the Project) in Grimes County, Texas known as the Tenaska Roan's Prairie Generating Station (Generating Station). The Project will be a peaking power production facility which will include three gas turbines, one diesel-powered emergency generator, and one diesel-powered fire pump engine. Siemens SGT6-5000F(5ee), GE 7FA.05, or GE 7FA.04 simple cycle turbines are the current basis for the process design. The gas turbines will combust natural gas exclusively and will be capable of generating a total nominal gross output of 507 to 694 MWe, depending upon turbine model and ambient conditions. Each combustion turbine will utilize low nitrogen oxides (NO_X) burners to minimize NO_X emissions.

Two diesel fired emergency engines will be installed. One of these engines (2,937 hp) will be used to provide emergency electric power for control systems, and the other (575 hp) will be used to power a firewater pump.

Components of the Project considered as part of the biological assessment evaluation include the following:

- Generating and Auxiliary Equipment
- Storm Water Retention Pond(s);
- Storm Water Outfall Structure(s);
- Wastewater Utility Line and/or wastewater Outfall Structure;
- Make-up Water Supply Interconnect Line;
- Potable Water Interconnect Line(s);
- Access Roads; and
- Construction Laydown Areas.

1.2 DEFINITION OF STUDY AREAS

The Project is located on an approximate 195 acre land located on Hwy 30 approximately 1 mile east of Roans Prairie, Texas (Figure 1-1). The Generating Station will consist of approximately 17 acres of land and will be located approximately one half mile west of the Tenaska Frontier Generating Station.

An Action Area is defined in 50 CFR 402.02 as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The Action Area was determined by identifying the maximum area in which the proposed project may result in significant direct and indirect impacts in and around the Project Site. Both construction and operation phases of the proposed project were considered. Indirect impacts to surrounding areas

may include noise, lighting, dust, erosion, stream sedimentation, air emissions, and physical disturbances. Because air emissions have the potential for widest impact away from the project site, the Action Area was based on determining a de minimis effects boundary. The Action Area for this project was determined by using the Significant Impact Levels (SILs) analysis from the air quality modeling conducted in support of the PSD air permit application for criteria pollutants. The SILs analysis determines the Radius of Impact (ROI) from the Project's emissions, which is defined as the distance to the farthest receptor at which any SIL is exceeded. Based on the SILs analysis the ROI did not extend beyond the boundaries of the Project Site. Therefore, the Action Area for the project has been defined as the area within the existing property boundary plus a 1,000 foot buffer to account for impacts not resulting from air emissions such as noise, light, incidental physical disturbances and potential utility tie-ins to the Frontier Generating Station. This defined Action Area will serve as the potential area of impact for completing the effects determination for threatened and endangered species.

1.3 AGENCY REGULATIONS

On May 3, 2011, the USEPA promulgated a Federal Implementation Plan (FIP) for Texas in which USEPA assumed the role of PSD permitting authority for large GHG-emitting sources in Texas in accordance with the thresholds established under the Tailoring Rule, which USEPA published on June 3, 2010.

Development of the proposed Project will require Tenaska to obtain a Federal GHG PSD Permit and the following sections provide more details on applicable agency regulations.

1.3.1 National Ambient Air Quality Standards

Air pollutants can be categorized as primary or secondary. Primary pollutants include pollutants like NO_x, sulfur dioxide (SO_2), carbon monoxide (CO), particulate matter (PM), volatile organic compounds (VOCs), and lead (Pb). These pollutants are directly emitted by specific emission sources. Secondary pollutants are formed when primary pollutants react with atmospheric compounds (e.g., water, nitrogen, oxygen) under various atmospheric conditions (e.g., temperature, humidity, light intensity). An example of a secondary pollutant is ground-level ozone, which is formed when the primary, or precursor, pollutants of NO_x and VOCs chemically react in the presence of sunlight. The USEPA has established National Ambient Air Quality Standards (NAAQS) concentrations for six different pollutants: SO_2, nitrogen dioxide (NO_2), CO, PM (that with aerodynamic diameters of less than or equal to 10 micrometers and 2.5 micrometers, or PM_{10} and $PM_{2.5}$, respectively), Pb, and ozone.

Grimes County is designated "attainment" or unclassifiable for all pollutants because ambient concentrations of these pollutants are less than their respective

NAAQS. Because of this, the proposed Project is required to submit a PSD permit application.

1.3.2 Threatened, Endangered, and Other Protected Species

The Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 50 CFR 17) provides for the conservation of ecosystems upon which endangered species of fish, wildlife, and plants depend. The Act:

- Authorizes the determination and listing of species as endangered and threatened;
- Prohibits unauthorized taking, possession, sale, and transport of endangered species; and
- Authorizes the assessment of civil and criminal penalties for violating the Act or regulations.

Section 7 of the Endangered Species Act requires federal agencies to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of such species.

When the action of a federal agency may affect a protected species, that agency is required to consult with either the National Marine Fisheries Service (NMFS) or the US Fish and Wildlife Service (USFWS), depending upon the protected species that may be affected. The USFWS maintains an online database that may be utilized in a preliminary desktop assessment to determine which, if any, threatened or endangered species may have the potential to occur near the proposed Project site. If it is determined that the proposed Project could potentially impact these species, species-specific surveys may be performed on-site.

Information regarding the potential for impact to threatened and endangered species should be provided with the federal permit application, and as a supplement to the GHG permit application. The USEPA will utilize the information in the permit applications to make an official determination of the potential for the Project to impact protected species at the site. If adverse impacts are likely, the USEPA may include mitigation or avoidance measures as permit conditions. The USEPA and Tenaska will coordinate with the appropriate federal agencies to assess, avoid, and minimize impacts and to plan mitigation of unavoidable adverse impacts.

1.3.3 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712) implements various treaties and conventions between the U.S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. The MBTA makes it illegal for anyone to take, possess, import, export, transport, sell, purchase,

barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to federal regulations. The USFWS is responsible for administering and enforcing the MBTA, and issues permits to qualified applicants for the following types of activities: falconry, raptor propagation, scientific collecting, special purposes (rehabilitation, educational, migratory game bird propagation, and salvage), take of depredating birds, taxidermy, and waterfowl sale and disposal. A list of the 1,007 species of birds protected by the MBTA is available at 50 CFR 10.13.

2.0 PROJECT DESCRIPTION

Tenaska is planning to build and operate a peaking power generation facility in Grimes County, Texas. The Project will provide up to 694 nominal gross megawatts (MW) of power to supplement the Electric Reliability Council of Texas (ERCOT) power grid during peak power demand. Tenaska is proposing three simple cycle natural gas-fired turbines for power generation, one diesel-fired emergency generator and one diesel-fired fire pump engine.

The Project is being designed as a natural gas-fueled power generating facility to serve the peaking segment of the ERCOT wholesale power market. This market segment is characterized by increases in daytime demand during the summer months, and relatively infrequent, high-demand "peak" periods that occur when demand is extraordinarily high and supply decreases substantially due to plants going off-line (including renewable wind resources). Natural gas fueled peaking units, which are capable of quickly providing supplemental power to the electric grid, are ideal for providing generation and load balancing against unanticipated or uncontrollable changes in load or generation. Peaking plants have traditionally been configured with simple cycle combustion units, and there is ample operational evidence showing that they can reliably meet peaking demand.

Storm water and effluent water from the generating station will be conveyed using surface ditching or below grade piping into an on-site ephemeral stream that currently connects two on-site ponds. Water from the stream flows eastward from the site and then continues southeastward merging with Flagtail Creek, approximately 2.5 miles downstream. Generating station effluent and point-source storm water will be discharged as appropriate in accordance with the applicable Texas Pollutant Discharge Elimination Permit(s).

Development of access roads and construction laydown areas will be a part of this project and may include both temporary and permanent locations within the proposed project boundary.

Source water for the generating station will be provided by interconnection pipeline extending across the neighboring Tenaska Frontier Partners property immediately east of the Project. Natural gas will likely be supplied by Kinder Morgan Tejas, Atmos and /or Energy Transfer pipelines in Grimes County. The Project will have its own switchyard and electrical interconnection point to the CenterPoint transmission system.

2.1 PROJECT SCHEDULE

Tenaska plans to initiate construction of the Project in January 2015 and commercial operation of the plant is currently targeted for June 2016.

2.2 *PROJECT LOCATION*

The Project is located on Hwy 30 approximately 1 mile east of Roans Prairie, Texas. The Project land tract encompasses approximately 195 acres and is located within the Blackland prairie physiographic province in the San Jacinto River Basin (Figure 2-1). The latitude and longitudinal coordinates for the site are:

USGS Topographic Map Quad: Roans Prairie

Latitude/Longitude: 30° 35'5.86"N
95°55'23.90"W

2.3 *REGIONAL CHARACTERISTICS*

The property is situated in the Southern Post Oak Savanna within the East Central Texas Plains. The East Central Texas Plains were originally covered by post oak savanna vegetation. This region is currently used mainly for pasture and range land. Soils tend to be acidic with sands and sandy loams on the uplands and clay to clay loams in low-lying areas (Griffith et al. 2007).

The Southern Post Oak Savanna ecoregion has more woods and forest than adjacent ecoregions and consists of mainly hardwoods compared to pines to the east. Current land cover is a mix of post oak woods, improved pasture and rangeland with a thick understory of yaupon and eastern red cedar in some parts. The soils have sand and sandy loam textures. Vegetation includes oak savannas or oak-hickory forest with post oak, blackjack oak, black hickory and grasses of little bluestem, purpletop, curly threeawn and yellow Indiangrass. The understory consists of yaupon, eastern red cedar, winged elm, American beautyberry and farkleberry (Griffith et al. 2007).

2.4 *SITE DESCRIPTION*

The Project is located within Grimes County in southeastern Texas, approximately forty miles northwest of Houston. Grimes County covers 799 square miles (Jackson 2013). The western portion of the county is drained by the Navasota and Brazos rivers, while the eastern portion is drained by the West Fork of the San Jacinto River. The northernmost areas are drained by the Trinity River. According to the Natural Resources Conservation Service (NRCS) soils survey, the county is dominated by clay and clay loam soils, specifically Frelsburg clay, Nahatche clay loam and Shiro loamy fine sand. The Action Area contains Arol fine sandy loams, Blieblerville clay, Elmina loamy fine sand, Falba fine sandy loam, Flatonia clay loam, Greenvine clay, Nahatche clay loam and Singleton fine sandy loam (Figure 2-2). USDA Land cover in the Action Area is comprised predominantly by pasture/hay/grassland, shrubland, wetlands and rural developed lands (Figure 2-3).

At the time of the field study the property consisted of open grassland habitat with mixed forested communities that include oak trees, mesquite, cedar, hackberry and Osage orange. The property is currently used for cattle pasture land.

2.5 SITE HISTORY

Based on review of historic aerial and topographic maps (Appendix A), the property has been undeveloped and most likely associated with pasture land dating back to the early 1950's. Information provided by current land users of the site indicate the property has been used for cattle purposes dating back to the early 1900's. Aerial images indicate there to be at least two transmission line right of way (ROW) located on site. Data from the Texas Rail Road Commission indicates there are four pipelines that cross the site (Figure 2-4).

2.6 EMISSIONS CONTROLS

As previously noted, Grimes County is designated "attainment" for all pollutants because ambient concentrations of these pollutants are less than their respective NAAQS. Because of this, the proposed Project is required to submit a PSD permit application.

Per 30 TAC §116.111(a)(2)(c), new or modified major facilities must utilize Best Available Control Technology (BACT), with consideration given to the technical and economic feasibility of available technologies.

The Project will utilize BACT to control emissions and minimize impacts to the surrounding environment. The majority of the emissions will result from the three simple cycle combustion turbines (CTs). Dry, low-NO_X combustors will be employed as BACT for controlling emissions of NO_X from these turbines. Additionally, good combustion practices will be employed as BACT for emissions of CO and VOCs. Clean fuel (natural gas) will be utilized as BACT to minimize emissions of PM/PM_{10}/$PM_{2.5}$) from the turbines. PSD was not triggered for SO_2. Other emission sources at the proposed facility include:

- One (1) Diesel Emergency Generator
- One (1) Diesel Emergency Fire Pump Engine
- Fugitive emissions from insulated electrical equipment
- Fugitive emissions from fuel piping components and
- Miscellaneous Maintenance/Startup/Shutdown activities

Estimated emissions rates from the Project are shown in Table 2-1 below:

TABLE 2-1: Maximum Emissions for all Pollutants Associated with the Project

Pollutant	Maximum Emission Rate[1] (lb/hour)			Annual Emission Rate (ton/year)		
	Siemens Turbines Scenario[2]	*GE 7FA.05 Turbines Scenario[2]*	*GE 7FA.04 Turbines Scenario[2]*	*Siemens Turbines Scenario[2]*	*GE 7FA.05 Turbines Scenario[2]*	*GE 7FA.04 Turbines Scenario[2]*
NO_X	327.05	271.21	253.39	356.32	347.05	321.02
CO	1952.42	684.43	675.02	111.56	171.55	154.38
VOC	219.65	71.8	59.13	13.97	16.29	15.62
SO_2	12.77	8.90	8.23	13.29	12.94	11.96
PM	42.55	31.51	27.93	43.02	44.12	38.89
PM_{10}	42.55	31.51	27.93	43.02	44.12	38.89
$PM_{2.5}$	42.55	31.51	27.93	43.02	44.12	38.89
H_2SO_4 Mist	1.61	0.92	0.86	2.34	1.34	1.25
Lead	0.03	0.03	0.03	0.05	0.05	0.04
CO_2	879,029	856,139	791,898	1,278,052	1,244,632	1,150,839
CH_4	33.75	33.33	32.14	26.99	26.37	24.64
N_2O	1.64	1.60	1.48	2.36	2.30	2.12
SF_6	<0.01	<0.01	<0.01	0.01	0.01	0.01
CO_2e	880,296	857,384	793,081	1,279,559	1,246,107	1,152,224
Total HAP (excluding lead)	3.46	3.38	3.15	4.6	4.48	4.15
Formaldehyde	0.84	0.81	0.75	1.21	1.18	1.09 6.28

1. Hourly emission rates provided are the maximum hourly emissions, and take into account Maintenance, Startup, and Shutdown (MSS) and normal operating emissions.
2. The proposed project consists of three turbines of one of the following turbine models: Siemens SGT6-5000F(5ee) Turbine, GE 7FA.05 Turbine, or GE 7FA.04 Turbine. Therefore, potential emissions are provided for all three turbine models.

Additional details on air emissions modeling is provided in Section 3.0 of this report and analysis of potential effects of emissions on sensitive receptors is detailed in Section 5.0.

2.7 NOISE

Noise is defined as unwanted sound that interferes with normal human activities. Sound is defined by the loudness (measured in decibels (dB)) and the frequency (measured in hertz). In noise impact analyses with regard to human receptors, the combined effect of loudness and frequency is measured as adjusted decibels (dBA). The Occupational Health and Safety Administration (OSHA) regulates occupational noise exposure under 29 CFR 1910.95. Employers are required to implement a hearing conservation program including noise monitoring, employee notification, and employee hearing testing if the 8-hour time-weighted average exceeds 85 dBA of noise exposure. Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level. The U.S. Department of Housing and Urban Development (HUD) outlines noise criteria and standards in 24 CFR Part 51. HUD considers exterior noise at sensitive receptors to be "acceptable" if it does not exceed a day and night average sound level of 65 dB, "normally unacceptable" between 65 dB and 75 dB, and "unacceptable" above 75 dB.

Grimes County does not have any noise ordinances or regulations associated with industrial development.

2.8 DUST

The deposition of particulate emissions and dust from construction and operation of the proposed Project has the potential to adversely affect the resources within the Action Area.

Dust accumulation as a result of construction activity and vehicle traffic may affect vegetation by covering the surface of the plant including flowers, leaves, and stems. This has the potential to impede critical biological processes by blocking pores and light receptor cells on the plant's surface, inhibiting plant growth (Coffin, 2007). Airborne dust also reduces air breathability for both humans and wildlife, and may also spread chemicals or pathogens if contaminated, which can cause health problems when inhaled (Kruse, 2004).

Tenaska will employ dust control measures during construction of the Project to minimize generation of fugitive dust. These measures will be outlined in accordance with a construction storm water permit that will be obtained prior to construction of the Project. Any dust generated from construction activities will be temporary, minimized using best management practices (BMPs) as required by the construction storm water permit, and impacts are expected to be negligible. The operational facility will also use dust control measures to minimize dust from raw material, product and off-specification material storage piles. Most vehicular traffic areas will be paved.

Given these mitigative steps, no effects from dust on threatened or endangered species or critical habits are anticipated to result from the proposed Project.

2.9 WATER AND WASTEWATER

Tenaska is currently evaluating water sourcing and wastewater options for the proposed Project. Where practicable Tenaska will seek to connect to existing water sources and utilize existing infrastructure associated with the Frontier Generating Station.

2.9.1 Water Sourcing and Water Rights

Source water for the generating station will be provided by interconnection pipeline extending across the neighboring Tenaska Frontier Partners property immediately east of the Project. No new water use permits are currently anticipated for this project. Existing infrastructure will be utilized for pumping of water. An approximately 0.6 mile water utility line will be constructed between the source water interconnect point and the proposed Project.

2.9.2 Wastewater Discharge

The discharge of wastewater from the Project will be evaluated to determine the potential impacts to resources within the Action Area. Wastewater will be discharged via a wastewater/storm water outfall located on an on-site ephemeral stream located within the Project property (Figure 5-3). The stream extends between two ponds used for cattle and flows primarily eastward from the Project for approximately 2.5 miles, where it merges with Flagtail Creek. The wastewater produced from operation of the Project will be ultimately discharged to this stream through a single wastewater outfall where it will be discharged to meet the current effluent requirements as established in the Project's Texas Pollutant Discharge Elimination System (TPDES) permit.

3.0 IDENTIFICATION OF THE ACTION AREA

3.1 ACTION AREA DEFINED

The Action Area is defined in 50 CFR 402.02 as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." Potential impacts from the Project include physical disturbances associated with construction and operation, noise, light, dust, erosion, sedimentation, air emissions, and wastewater discharges to surface water. Air emissions were determined to impact the largest area on and surrounding the Action Area. Accordingly, the boundaries of the Action Area were determined based upon air emission dispersion modeling results.

Air dispersion modeling indicated that an Action Area will extend out to the boundary of the 195-acre property. For the purposes of the BA, the Action Area was identified by the maximum area that could potentially be impacted by construction and operation depicted by the SIL model and plus a 1,000 foot buffer area (Figure 2-1). A buffer area was included in this evaluation to account for any potential impacts to threatened and endangered species and designated critical habitat due to the construction and operation of the Project.

3.2 ACTION AREA DELINEATION METHODOLOGY AND RESULTS

The boundary of the Action Area was delineated by air quality impact analysis (modeling) and includes all receptors in the modeling domain with impacts above the "significant impact levels" (SILs) and a buffer component. The air quality impact levels are determined by performing a detailed air dispersion modeling analysis using the EPA and TCEQ guidelines appropriate to the source and emissions. Tenaska used the most up-to-date air models recommended by the EPA, as well as most recent guidance provided by the EPA and the TCEQ. The analysis takes into account local terrain, actual meteorological data (provided by TCEQ), project plant design including stack and building parameters, and worst-case maximum emission rates from the individual sources proposed by this application.

Detailed modeling protocols as well as modeling results are being submitted to the TCEQ and the EPA under a separate cover in support of the non-GHG PSD Pre-Construction Air Permit Application.

3.2.1 Significant Impact Level Dispersion Modeling

Using approved air dispersion modeling techniques, the maximum predicted concentration due to the proposed project for each pollutant and averaging period are included below in comparison to the SIL.

TABLE 3-1: Summary of Project Criteria Pollutant Air Dispersion Modeling

Pollutant	Standard	Averaging Period	*Max Off-site Concentration (µg/m³)*	SIL (µg/m³)	Less than SIL?
NO_2	NAAQS	1-hour	6.56	7.5 [1]	Yes
		Annual	0.41	1	Yes
CO	NAAQS	1-hour	497.63	2,000	Yes
		8-hour	409.07	500	Yes
PM_{10}	NAAQS	24-hour	0.77	5	Yes
		Annual	0.03	1	Yes
$PM_{2.5}$	NAAQS	24-hour	0.77	1.2	Yes
		Annual	0.03	0.3	Yes
SO2	NAAQS	1-hour	1.04	7.8	Yes
		3-hour	1.00	25	Yes
		24-hour	0.79	5	Yes
		Annual	0.09	1	Yes

The SIL is a threshold level set by the EPA. If the maximum concentration value from a project is less than the SIL, the modeled source impacts may, depending upon the appropriate background concentration, be considered insignificant and not considered to cause or contribute to a violation of a NAAQS or PSD Increment for that pollutant and averaging period. The maximum concentration values (for all averaging periods) for NO_2, CO, PM_{10}, $PM_{2.5}$, and SO_2 emissions are less than the respective SIL. SO_2 was modeled for its contribution to secondary $PM_{2.5}$ formation as well as the Texas State Property Line Standards.

3.2.2 Other Contaminants

In addition to the emission rates calculated for criteria pollutants, emission rates were calculated for other pollutants that may be emitted by the project. A dispersion modeling analysis was performed for these pollutants in accordance with TCEQ guidelines for modeling of non-criteria pollutants. Specifically, an air quality dispersion modeling analysis was performed for sulfuric acid mist (1-hour and 24-hour) to demonstrate compliance with the State Property Line standards for net ground-level concentration. The State Property Line modeling analysis includes all the project sources that emit sulfuric acid mist. The maximum predicted ground level concentration at each receptor is compared to the applicable State Property Line standard.

A comparison of the modeled concentrations of the Project's non-criteria pollutant emissions to TCEQ established State Property Line standards is shown in Table 3-2 below. Based on these results, the maximum predicted concentrations of all modeled pollutants are below the respective State Property Line standard. Accordingly, no adverse welfare impacts are expected to occur within the action area as the result of the additional emissions of these pollutants.

TABLE 3-2: Summary of Project Non-Criteria Pollutant Air Dispersion Modeling

Pollutant	CAS	Averaging Period	Max Concentration ($\mu g/m^3$)	ESL ($\mu g/m^3$)	% of Standard
H_2SO_4 Mist	7664-93-9	1-Hour	0.108	50	0.22%
		24-Hour	0.058	15	0.39%

4.0 FEDERALLY LISTED SPECIES AND DESIGNATED CRITICAL HABITAT THAT MAY POTENTIALLY OCCUR IN THE ACTION AREA

The USFWS and Texas Parks and Wildlife Department (TPWD) threatened and endangered species databases and Texas Natural Diversity Database (TXNDD) occurrence data were reviewed to determine which, if any, federally-listed species may have the potential to occur within the Action Area. The species that are federally listed on the TPWD and USFWS lists for Grimes County are presented in Table 4-1 below.

4.1 FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES

TABLE 4-1: Federally Listed Threatened and Endangered Species Potentially Occurring in Grimes County

Common Name	*Scientific Name*	*Federal Status*	*State Status*
Birds			
Interior least tern	*Sterna antillarum athalassos*	LE	E
Red-cockaded woodpecker	*Picoides borealis*	LE	E
Whooping crane	*Grus Americana*	LE	E
Mammals			
Louisiana black bear	*Ursus americanus luteolus*	LT	T
Red wolf	*Canis rufus*	LE	E
Plants			
Navasota ladies'-tresses	*Spiranthes parksii*	LE	E

LE = Listed Endangered (Federal)
LT= Listed threatened (federal)
E = Endangered (State)
T = Threatened (State)
Source: USFWS, TPWD, 2013

Detailed information on life history, known habitats, known occurrences and range for each federally listed species potentially occurring in the Action Area are provided in the following sections.

4.1.1 Interior Least Tern

With a 20 inch wingspan, and length of between 8 and 10 inches, the least tern is the smallest North American tern. Sexually mature males and females are

similar in appearance, with a black cap, a grey and white countershading, black nape and eye stripe, white forehead, a yellow bill that is tipped either black or brown, and legs that can be either yellow or orange. They are extremely streamlined fliers due to their pointed wings. New hatchlings are yellow with brown mottling, and are rather small (TPWD, 2013).

The least tern prefers open areas and their preferred nesting areas include islands, sandbars near unobstructed river channels, salt flats, various beaches, and shorelines of lakes. With human development threatening natural nesting sites, least terns have started selecting some manmade sites including sand or gravel pits, shorelines of reservoirs, and ash disposal areas from power plants. The least tern preys on small fishes, which necessitate shallow waters close to their nesting habitats (TPWD, 2013).

While the tern does breed inland along the Missouri, Mississippi, Colorado, Arkansas, Red, and Rio Grande Rivers, it has recently been evidenced that these subspecies may interbreed with the coastal populations. This tern is migratory, and breeding occurs in the United States during the springtime, with the bird wintering along the Central American Coastline (TPWD, 2013).

4.1.2 Red-cockaded woodpecker

Red-cockaded woodpeckers are approximately eight inches long with black wings, black cap and a dull white breast with black spots and a barred, black and white back. They typically live in family groups containing a mated pair, their chicks and young adult helpers. The helpers help build cavities and care for future chicks. The family group roosts and nests in clusters of trees up to thirty trees (TPWD 2013).

Red-cockaded woodpeckers prefer open pine forests with large, widely-spaced older trees and prey on insects found under the bark and along the branches of the pine trees. They peck the entrance around their cavity to get the sticky sap flowing around the hole. The sap keeps predators like snakes away from the nest cavity. Big, old pine trees are being replaced with younger, smaller pines leading contributing to their endangered status (TPWD 2013).

4.1.3 Whooping crane

Whooping cranes have a wingspan of 7.5 feet and stand nearly 5 feet tall. They are white with rust-colored patches on the top and back of their head with yellow eyes and long, black legs and bills. Their diet consists of blue crabs, clams, frogs, minnows, rodents, small birds and berries (TPWD, 2013).

Whooping cranes breed in northern Canada and spend winters on the Texas coast. Their fall migration to Texas begins in mid-September and they return to Canada in late March or early April. During migration they will utilize large open fields as stopover areas. Whooping cranes mate for life and hatchlings stay with their parents during their first winter and separate when the spring

migration occurs. The greatest threats to whooping cranes are power lines, illegal hunting and habitat loss (TPWD 2013).

4.1.4 Louisiana black bear

The Louisiana black bear is one of 16 subspecies of the American black bear (*Ursus americanus)*. Black bears have long black hair, a short, well-haired tail and a large, bulky body. Louisiana black bears are distinguished by their relatively long, narrow and skulls and proportionately large molar teeth. They are classified as carnivores, but are opportunistic omnivores and their diet is largely determined by food availability (USFWS, 1995).

The current known range of the Louisiana black bear is in the Tensas and Atchafalaya river basins in Louisiana. They require large, relatively remote blocks of land and typically inhabit bottomland hardwood communities. They also require high quality cover for bedding, denning and escape cover as forests become smaller and more fragmented (USFWS, 1995).

4.1.5 Red wolf

Red wolves are mostly brown and buff colored with some black along their backs, but have a characteristic reddish color of fur behind the ears and along the neck and legs. Adults weight 45-80 pounds and stand about 26 inches and the shoulder and are about four feet long from the tip of the nose to the end of the tail. They travel and forage in small family groups or alone (USFWS 2013).

Red wolves are found in upland and lowland forests, shrublands and coastal prairies and marshes with heavy vegetative cover. They are opportunistic feeders and their diet consists of a variety of invertebrates and vertebrates, particularly favoring marsh rabbits, nutria and carrion. The red wolf is believed to be extirpated in the state of Texas (NatureServe, 2012).

4.1.6 Navasota ladies'-tresses

This member of the orchid family is an erect, slender-stemmed perennial herb, 8-15 inches tall. The roots are clusters of fleshy tubers. Leaves are long and thin and found primarily at ground level, but are usually gone by flowering time. Flowers are creamy white and arranged in a loose spiral up the stem. Conspicuously white-tipped bracts occur underneath each 1/4 inch-long flower. Flower petals are round or oval. The side petals have a green central stripe, and the lip (bottom petal) is distinctly ragged (TPWD, 2013).

Navasota ladies'-tresses are endemic to the Oak Woodlands and Prairies region of east-central Texas. They occur primarily in seasonally moist soils along open wooded margins of creeks, drainages, and intermittent tributaries of the Brazos and Navasota Rivers. Navasota ladies'-tresses is thought to require small-scale, patchy natural disturbances that provide canopy openings necessary to maintain habitat. They bud from early to late October, flower from mid-October to mid-

November, and form fruit from mid-October to the first frost (usually late November). After frost, the plants die back and do not reappear until early spring, when basal rosettes can be seen. Populations are known to fluctuate from year to year and it is thought that cool, wet conditions (without hard frosts) between January and May provide ideal growing conditions for this orchid. Like other orchids, Navasota ladies'-tresses are often found in areas that are slightly wetter than surrounding areas of the landscape, although surface moisture may not be obvious (TPWD, 2013).

This species has a limited range and low population numbers. It has been impacted by habitat loss and degradation due to urban development (primarily in the Bryan/College Station area), road construction, lignite mining, and oil and gas development. Collection by hobbyists and unscrupulous commercial operators remains a threat, especially since orchids tend to attract wide and intense interest. When Navasota ladies'-tresses was listed as endangered, only two populations were known, both in Brazos County. Once thought to be extremely rare, it is now known to be locally common in parts of its range. Since 1982, many more populations have been discovered in Brazos, Burleson, Fayette, Freestone, Grimes, Jasper, Leon, Madison, Milam, Robertson, and Washington Counties (TPWD, 2013).

4.2 DESIGNATED FEDERAL CRITICAL HABITAT

According to the USFWS database and Critical Habitat Mapper there is no designated federal critical habitat associated with the Project or within the Action Area. The nearest designated federal critical habitat is for the Houston toad located approximately 70.5 km (44 mi) east of the Property.

4.3 TEXAS NATURAL DIVERSITY DATABASE

A request was submitted to the TPWD to obtain information from the TXNDD. The TXNDD, established in 1983, is the TPWD's most comprehensive source of information on which includes rare, threatened, and endangered plants, animals, invertebrates, exemplary natural communities, and other significant features (elements). The TXNDD is continually updated, providing current or additional information on statewide status and locations of these unique elements of natural diversity. However, the data is not all-inclusive, as there are gaps in coverage and species data. This deficiency is a result of insufficient access to land and/or data, and shortage of staff and resources needed to collect and process data on all rare and significant resources. Although it is based on the best data available to TPWD regarding rare species, these data do not provide a definitive statement as to the presence, absence, or condition of special species, natural communities, or other significant features in any area. Nor can these data substitute for on-site evaluation by qualified biologists. The TXNDD information is intended to assist users in avoiding harm to rare species or significant ecological features.

Response to the TXNDD request included an element occurrence listing, element occurrence report, and geographic information systems (GIS)-compatible shapefile of element occurrence boundaries. Figure 4-1 depicts an aerial map of the site vicinity overlain with the shapefile obtained from TXNDD. Element occurrence records corresponding with the boundaries depicted in Figure 4-1 are attached in Appendix B of this document. According to the TXNDD database no occurrences of federally-listed threatened or endangered species have been documented in the Action Area. Navasota ladies'-tresses were documented approximately 4 km (2.7) miles northwest of the Action Area in 1985 and 1991. No sitings were documented during subsequent observations for these areas in 1993 and 2008.

5.0 EFFECTS ANALYSIS

The following sections discuss the methods and results of the desktop review and field surveys performed to determine the ecological receptors present within the Project site and the Action Area, as well as the potential effects on these receptors from the proposed Project.

5.1 METHODS

5.1.1 Desktop and Literature Review

As presented in Section 4.0, the USFWS and TPWD threatened and endangered species databases and TXNDD occurrence data were reviewed to determine which, if any, federally-listed or state-listed species may have the potential to occur on or near the Project site or within the Action Area. Based on the data reviewed no federally-listed threatened or endangered species were shown to occur in the Action Area. Navasota ladies'-tresses was the only species documented in proximity to the Action Area.

5.1.2 Habitat Assessment and Field Surveys

Subsequent to the desktop and literature review, field reconnaissance visits were performed in September 2012, May 2013, October 2013, and November 2013. Field surveys were designed to document the presence or absence of threatened and endangered species and habitats that may support sensitive species, as well as provide a characterization of habitats and land use within the Action Area.

The field surveys conducted within the Action Area consisted of assessing the habitat throughout the 195-acre site as well as within the 1,000 ft buffer area. Transects running east-west across the site were traversed to assess habitat types and to document wildlife. Visual assessments from the fence line were performed for the surrounding properties as access to these areas was not available. Transects and survey locations are shown in Figure 5-1.

The make-up water supply interconnect line extends approximately 0.6 miles east of the Project across the Frontier Generating Station site property. A portion of the line falls outside the Action Area, therefore, an additional study area was required for the proposed water supply interconnect line right-of-way (ROW). Field surveys were conducted along the entire length of the interconnect line and included a 100 ft. study area (50 ft. each side of centerline). The ROW was routed away from potentially sensitive biological areas. Construction and operation of the proposed water supply interconnect line will not have any impacts on the identified streams.

Information obtained during desktop review was visually checked in the field to "ground-truth" the data and to provide the most comprehensive analysis of the existing conditions at the subject site. All vegetation and wildlife observed were identified to the species level of taxonomy, if possible. A photographic log of the

conditions observed at the subject site is provided in Appendix C. Locations of features identified in the photographic log are shown in Figures 5-1 and 5-3.

5.2 RESULTS

The following sections provide the results of the background information, field observations, and analysis performed to evaluate the potential for the proposed action to affect the federally listed threatened and endangered species that have the potential to occur in the Action Area.

5.2.1 Background Research

Prior to conducting the field survey, ERM performed a desktop study of the Survey Area by reviewing available information from the following sources:

- U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle maps;
- USFWS National Wetlands Inventory (NWI) Maps;
- Federal Emergency Management Agency (FEMA) Flood Hazard Maps;
- Aerial photographs (December, 2010); and
- U.S. Department of Agriculture (USDA), NRCS County Soil Surveys.

Review of these documents assisted in the planning and execution of the field surveys and provided a baseline for determining the overall conditions within the Project site.

Data identified during the desktop analysis were used to assess and evaluate potential jurisdictional status of identified waterbodies and to provide a summary of those features potentially impacted by the development of the Property. Jurisdictional status was evaluated based on several factors:

- Using Ordinary High Water Mark (OHWM), if present, in each of the stream features; and
- Evaluating USGS topographic maps to determine the drainage status of streams (i.e. if a blue line or blue dashed line is present on topographic maps then a stream feature is considered jurisdictional and then further evaluated in the field).

5.2.2 Habitats in the Action Area

This section provides a description of the potential habitat in the Action Area to provide context to evaluate the potential for occurrence and effects determinations for the listed threatened and endangered species.

5.2.2.1 Overview of Habitats in the Action Area

A review of USGS topographic quadrangle maps and aerial photographs of the area indicate that the property has been undeveloped and likely associated with

pasture land dating to 1900's. The Action Area has two power line ROWs and three pipeline ROWs extending through it.

During field observations, the Action Area was documented to contain areas of open grassland on the northern and central portions of Project and mixed forest communities on the southern portion. Eight small waterbodies including ponds and an ephemeral stream were interspersed throughout the Project with an additional five documented along the water supply interconnect line ROW.

Open Grassland

This habitat was observed in the northern and central portions of the Action Area, and interspersed within the mixed forested community in the southern portion of the Action Area. This habitat is currently being used as cattle pastureland. Dominant vegetation encountered included: coastal Bermuda grass (*Cynodon dactylon*), switchgrass (*Panicum spp.*), setaria *(Setaria spp.)*, bluestem (*Andropogon spp.)*, ryegrass (*Lolium spp.*), wild oats (*Avena fatua*), needlegrass *(Stipa spp.)*, dock *(Rumex spp.)* and quaking grass (B*riza spp.*).

This habitat is commonly used by a variety of wildlife including song birds, deer, and small mammals such as raccoon, armadillo, squirrels, field mice, cotton rats to name a few. Because the property provides open space and is located within the migratory bird flyway it may provide suitable habitat as stopover habitat for whooping cranes during their spring and fall migrations. It should be noted, however, that there have been no documented occurrences of the whooping crane within Grimes County.

Mixed Forest Community

Mixed forested communities are located predominantly in the southern portion of the property with areas of forested communities lining some of the property fence lines. Dominant forested vegetation observed during the site visit included: honey mesquite (*Prosopis glandulosa*), hackberry (*Celtis spp.)*, Osage orange (*Maclura pomifera*), oak (*Quercus spp.*), yaupon (*Ilex vomitoria*), cedar (*Cedrus spp.*), juniper (*Juniperus spp.*), possum haw (*Ilex decidua*) and elm (*Ulmus spp.*).

Based on the habitat needs supported by those listed species, the mixed forested communities could potentially support habitat specific to the Navasota ladies-tress, specifically in the areas along the ephemeral stream.

Waterbodies

FEMA flood maps indicate the Project site and the Action Area do not fall within the 100-year flood plain. NWI maps identified several small ponds within the Action area (Figure 5-2).

Field surveys identified six ponds and two ephemeral streams within the Project site and four ephemeral and one perennial stream along the water supply

interconnect line ROW(Figure 5-3). The six ponds are bermed features and are highly disturbed by routine cattle use. Each of the ponds contain some coverage of wetland plants that include; spike rush, pond weed, and water primrose.

The two ephemeral streams are present within the Action Area and are associated with the mixed forest community. Both of the features were almost entirely dry at the time of the survey. Ephemeral stream S1AGR005 flows eastward and is located in the central portion of the site. It flows between a large pond located outside of and immediately west of the Project property boundary line and pond S1AGR006 located near the eastern boundary Project property boundary. It then continues approximately 2.5 miles eastward off site where it drains into Flagtail Creek. Habitat within this creek includes sandy soils and overhanging oak trees, hackberry's and shrub species including yaupon and cedars. Stream S1AGR008 is located on the southeast portion of the Action Area and is a completely dry wash. This feature is heavily vegetated with shrub species including yaupon and cedar.

The habitat evaluated along stream S1AGR005 has the potential to support the Navasota ladies'-tresses which includes seasonally moist sandy loam soils along open wooded margins of creeks, drainages, and intermittent tributaries. However, field surveys did not identify the presence of this species.

Four ephemeral and one intermittent waterbodies were identified along the proposed water supply interconnect line ROW. Waterbody S1AGR201 is a drainage ditch that receives water from site and drains south into the adjacent field. There are two smaller features (swales) S1AGR202 and S1AGR203 that connect to S1AGR201; however, there no natural bed or banks associated with these features and no discernible flow patterns were identified. Waterbody S1AGR204 is a small drainage ditch from the south side of the plant that flows south and drains into a small pond south of the ROW. Stream S1AGR205 is an intermittent stream that crosses the ROW and flows south where it drains into stream S1AGR006 and then flows into Flagtail Creek. Waterbodies S1AGR201, S1AGR202, S1AGR203 and S1AGR204 do not have any habitat characteristics associated with the threatened and endangered species. S1AGR205 has wooded banks and sandy-clay soils potentially associated with the Navasota ladies-tresses.

One small (0.0008 acre) PEM wetland (W1AGR201) was identified adjacent to the ROW near waterbody S1AGR205. No habitats associated with threatened or endangered species were identified with this feature.

5.2.3 Potential for Occurrence and Recommended Determination of Effect for Federally Listed Species

5.2.3.1 Interior least tern

The Action Area contains very little wetland habitat or streams with habitats associated with the interior least tern. The three existing streams do not contain

open sandy soils or sandbars which provide suitable habitat for this species. There are no large streams or rivers near the site and transient use by the interior least tern is not expected. Based on this, it is not expected that the Project will have any direct or indirect impacts on this species or its habitats.

The proposed project will have "*No effect*" on the interior least tern.

5.2.3.2 Red-cockaded woodpecker

The Action Area does not contain any open pine forests or other associated habitat suitable for the supporting the red-cockaded woodpecker. Essential habitats include large stands of mature pine trees to nest and/or roost in. No large stands of pine trees are located within 20 miles of the site. Due to the lack of habitats it is expected that the Project will not have any direct or indirect impacts on this species.

The proposed project will have "*No effect*" on the red-cockaded woodpecker.

5.2.3.3 Whooping crane

The Action Area contains open fields with mixed grasses, located within the whooping crane flyway that has the potential to be used for stopover habitat during fall and spring migrations. TXNDD data from TPWD indicates no known occurrences of the species within Grimes County. The Project site currently contains overhead power lines which may presently deter use by the whooping crane. The Project is not anticipated to have direct impacts to the species as it is expected that activities within the site will deter any use by this species during construction.

A determination of "*No effect*" is recommended for this species.

5.2.3.4 Louisiana black bear

The Action Area and surrounding lands do contain large, relatively remote blocks of land; however none of the lands are comprised of the bottomland hardwood communities that Louisiana black bears require. Furthermore, the Louisiana black bear has not been documented in Grimes County and has a known current range for primarily counties that are located in eastern Texas associated with large forested communities. Based on this, there are no anticipated direct or indirect impacts associated with the Project for the Louisiana black bear.

A determination of "*No effect*" is recommended for this species.

5.2.3.5 Red wolf

Red wolves historical have been found in upland and lowland forests, shrublands and coastal prairies and marshes with heavy vegetative cover. To

date the Red wolf has been considered extirpated in Texas since the early 1980's. Although, the mixed forest community habitat may provide some cover and potential foraging habitat for the red wolf it is not anticipated the species will occur on site. The Project is not anticipated to have direct or indirect impacts on the Red wolf.

Due to this, a determination of "*No effect"* is recommended for this species.

5.2.3.6 Navasota ladies'-tresses

Navasota ladies'-tresses occur primarily in seasonally moist sandy loam soils along open wooded margins of creeks, drainages, and intermittent tributaries of the Brazos and Navasota Rivers. Field assessments identified moist sandy soils and wooded creek margins along the ephemeral stream (S1AGR006) and intermittent stream (S1AGR205). Although, some habitat components were observed on site, no plants were documented during the field surveys in September 2012, May 2013, October 2013 or November 2013. It should be noted that the associated streams do not fall within the Brazos or Navasota watersheds which are associated with this species.

No Navasota ladies'-tresses were observed during the field surveys, including those conducted during their flowering period (late October and November. The Project will only have a small impact to the ephemeral stream (S1AGR006) associated with the wastewater outfall structure and no impacts will occur to stream S1AGR205. No direct or indirect impacts are anticipated for this species.

A determination of "*No effect"* is recommended for this species.

5.3 DESIGNATED FEDERAL CRITICAL HABITAT

There is no designated federal critical habitat in the Action Area. The nearest designated federal critical habitat is for the Houston toad and is located approximately 70.5 km (44 mi) east of the Property.

5.4 INTERDEPENDENT AND INTERRELATED ACTIONS

The proposed project is limited to the construction and operation of the new 694 MW peaking power generation facility, the water supply interconnect line across the Frontier Generating Station site property, and the wastewater utility line and associated outfall structure in Grimes County, Texas. Interdependent or interrelated actions associated with the Project may include the natural gas tie-in to on-site pipelines and the transmission connection to the on-site substation.

5.5 DETERMINATION OF EFFECT SUMMARY

A species-specific analysis of potential impacts of the proposed Project resulted in a determination of *no effect* for all 6 of the threatened and endangered species analyzed in this report within the Action Area. These species will not have

direct or indirect impacts from the Project within the Action Area. A summary of the threatened and endangered species and recommended determination of effects is presented below in Table 5-1.

TABLE 5-1: Summary of Anticipated Effects on Federally Listed Species Potentially Occurring in the Action Area

Federally Listed Species	*Listing Agency*	*Recommended Determination of Effect*
Interior least tern (*Sterna antillarum athalassos*)	*TPWD*	No effect
Red-cockaded woodpecker *(Picoides borealis)*	*TPWD*	No effect
Whooping crane *(Grus americana)*	*USFWS*	No effect
Louisiana black bear *(Ursus americanus luteolus)*	*TPWD*	No effect
Red wolf *(Canis rufus)*	*TPWD*	No effect
Navasota ladies'-tresses *(Spiranthes parksii)*	*USFWS*	No effect

6.0 CONSERVATION AND MITIGATION MEASURES

The construction and operation of the proposed Project will likely have no direct or indirect impacts on the six federally-protected species or their habitat. Tenaska will utilize BACT to control emissions and thus minimize impacts to the surrounding environment. The proposed emissions of each pollutant subject to PSD review are consistent with both the TCEQ BACT guidance and the limits in the USEPA's RACT/BACT/LAER Clearinghouse (RBLC); and, are considered to be the top level of control available for new and modified peaking power facilities.

Tenaska has located the proposed project within an area that will avoid and minimize impacts to federally-protected species and their habitats. Furthermore, Tenaska will utilize additional measures, such as Best Management Practices (BMP's) that will avoid adverse impacts during construction and operation of project. Selected BMP's will be matched and adapted to meet the site-specific requirements of the project and local environment. Examples of BMP's may include use of silt fences and hay bales to reduce and prevent sedimentation and erosion, use of water trucks to control airborne dust from construction vehicles, use of low intensity lights and hood or direct lights downward to prevent avian impacts.

6.1 THREATENED AND ENDANGERED SPECIES

Based on field reconnaissance and assessment of potential impacts to species and their available habitats, no loss of threatened or endangered species and/or critical habitat is expected to result from construction or operation of the proposed Project. No protected species were observed or have been documented within the Action Area of the Project.

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Figures

February 25, 2014
Project No. 0189555

Environmental Resources Management
CityCentre Four
840 West Sam Houston Parkway North, Suite 600
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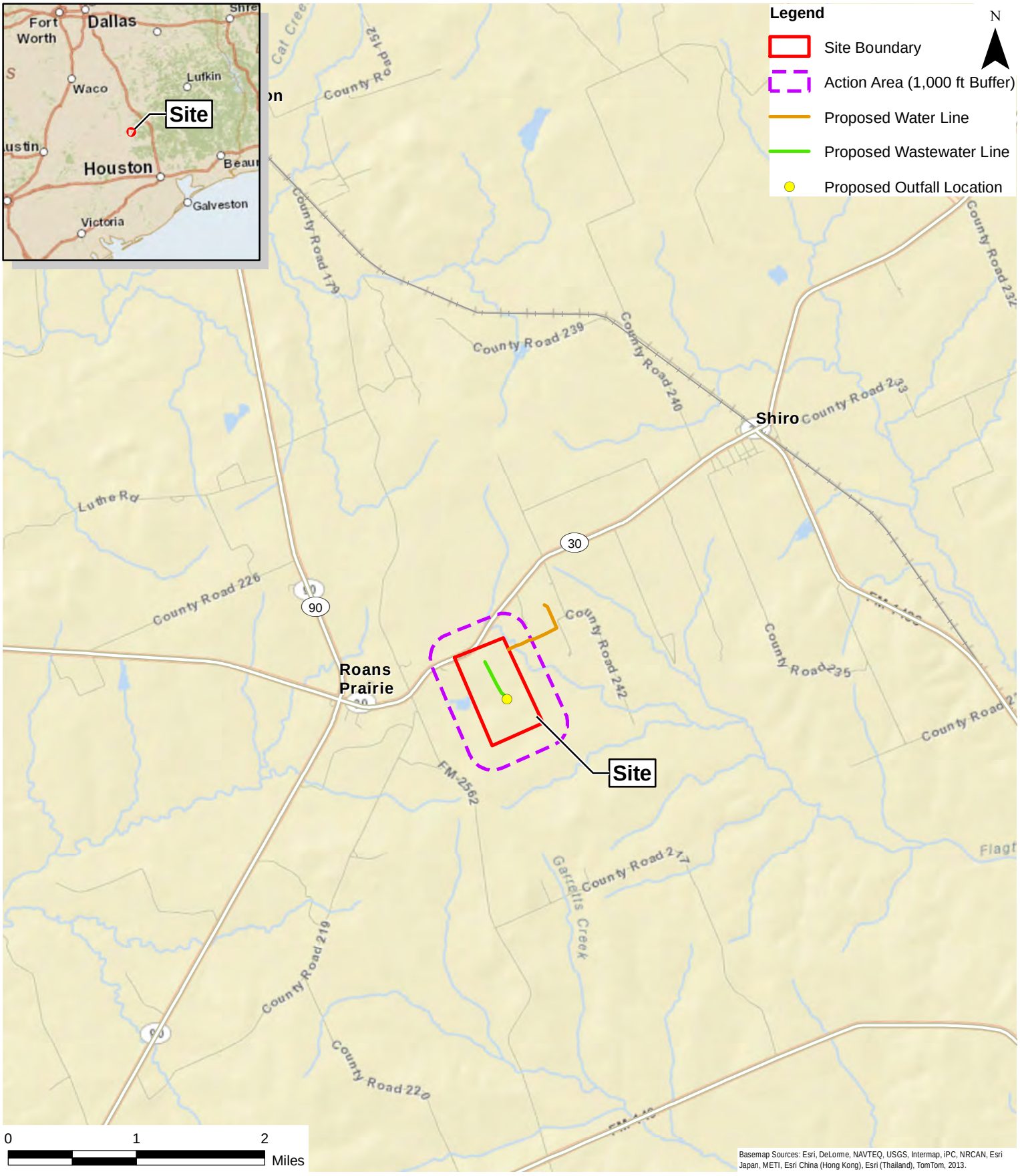

Environmental Resources Management

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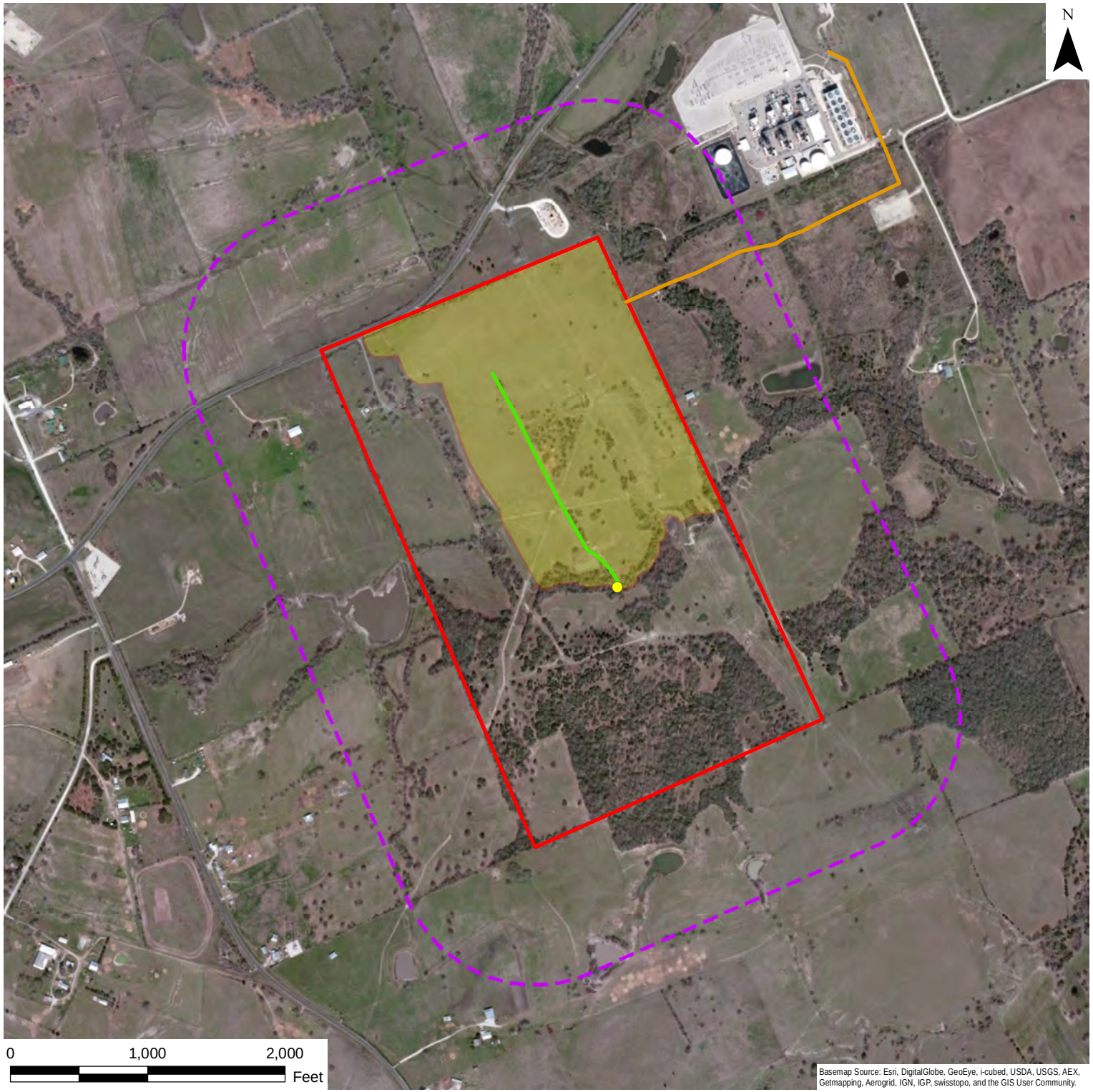
FIGURE 1-1
PROJECT SITE VICINITY MAP
Biological Assessment Report
Tenaska, Inc.
Grimes County, Texas

ERM



Legend

- Project Site
- Action Area (1,000 ft Buffer)
- Proposed Water Line
- Proposed Wastewater Line
- Proposed Outfall Location
- Area of Potential Land Disturbance

FIGURE 2-1
PROJECT STUDY AREA

Biological Assessment Report

Tenaska, Inc.

Grimes County, Texas

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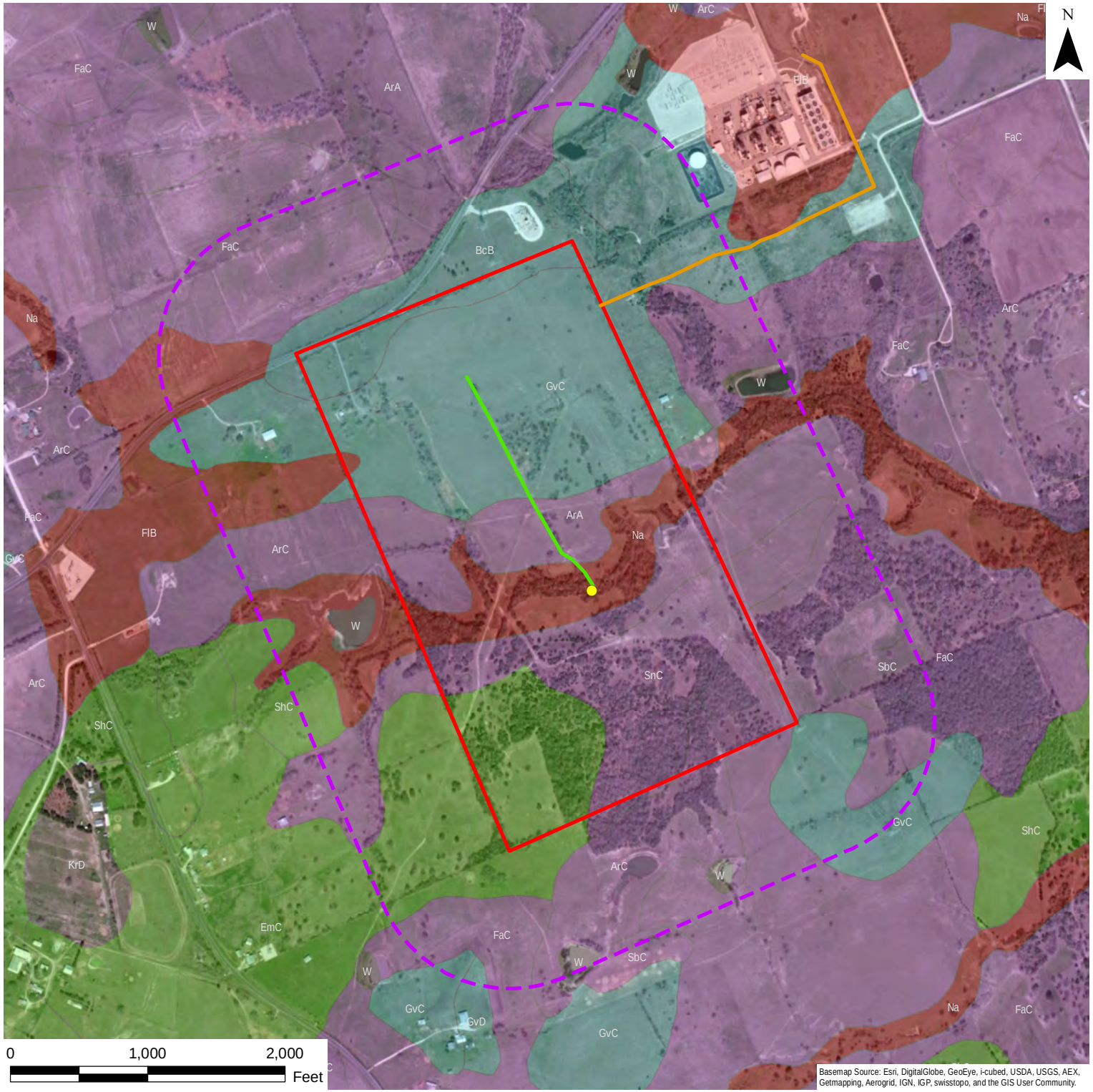
Environmental Resources Management



Legend

- Project Site
- Action Area (1,000 ft Buffer)
- Proposed Water Line
- Proposed Wastewater Line
- Proposed Outfall Location

NRCS Soil Texture

- Clay
- Clay Loam
- Fine Sand
- Fine Sandy Loam
- Loamy Sand
- Silt Loam
- Silty Clay

FIGURE 2-2
NRCS SOILS MAP

Biological Assessment Report

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Grimes County, Texas

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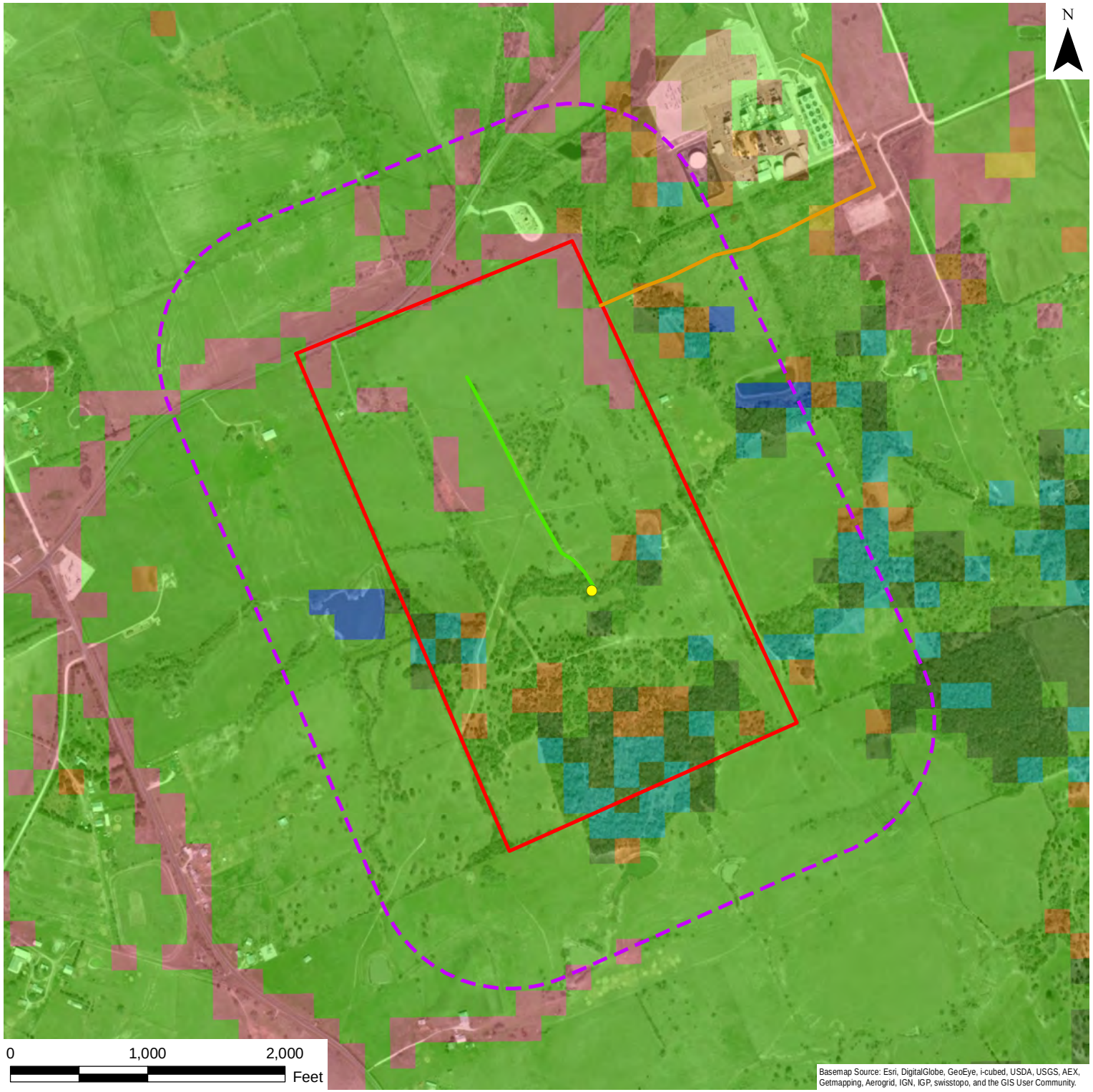
Environmental Resources Management



Legend

- Project Site
- Action Area (1,000 ft Buffer)
- Proposed Water Line
- Proposed Wastewater Line
- Proposed Outfall Location

USDA NASS Cropland Data Layer 2009

- Cropland
- Barren
- Forested
- Developed
- Pasture/Hay/Grassland
- Wetlands
- Water
- Shrubland

FIGURE 2-3
LANDCOVER MAP

Biological Assessment Report

Tenaska, Inc.

Grimes County, Texas

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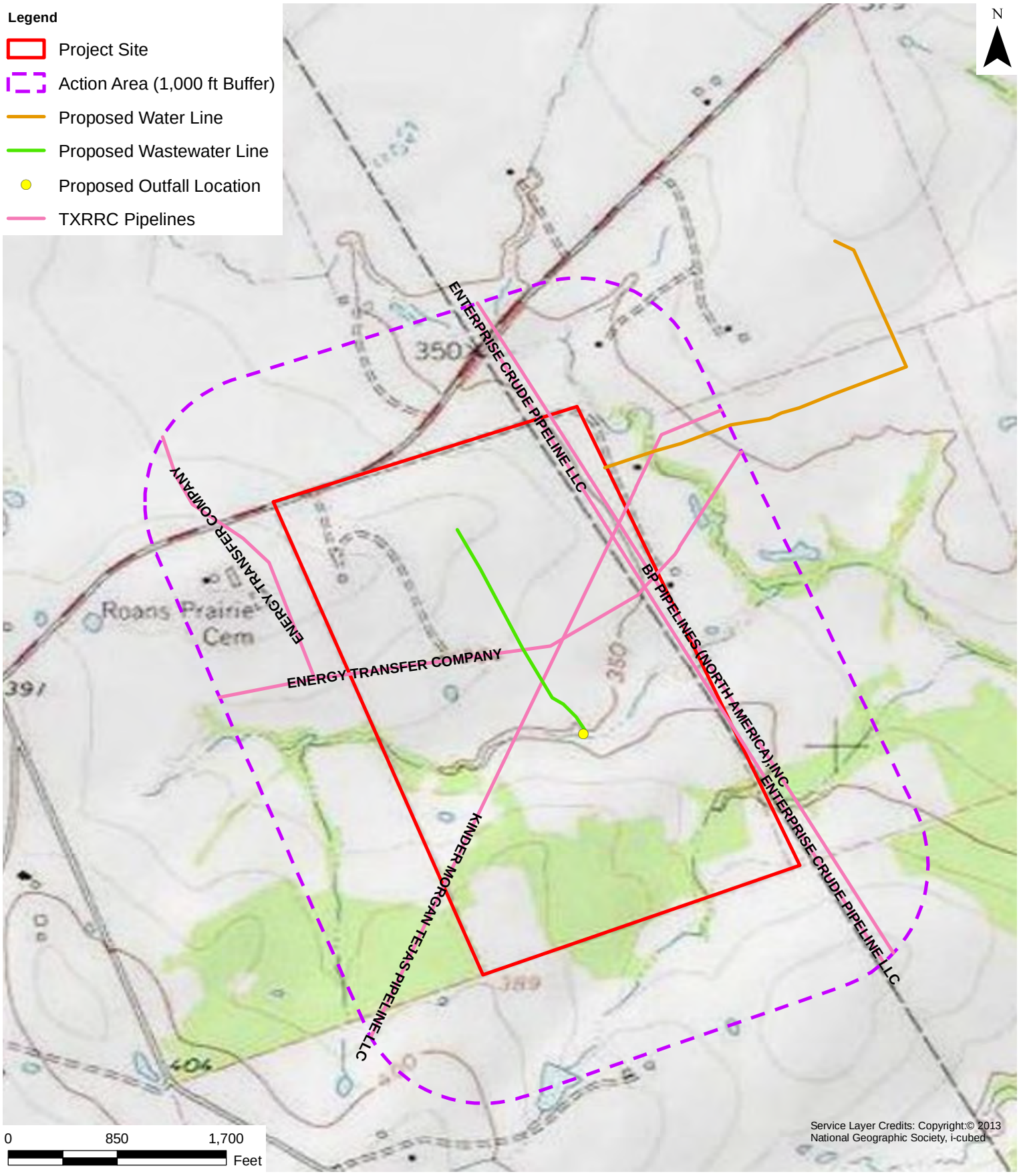
Environmental Resources Management



Environmental Resources Management

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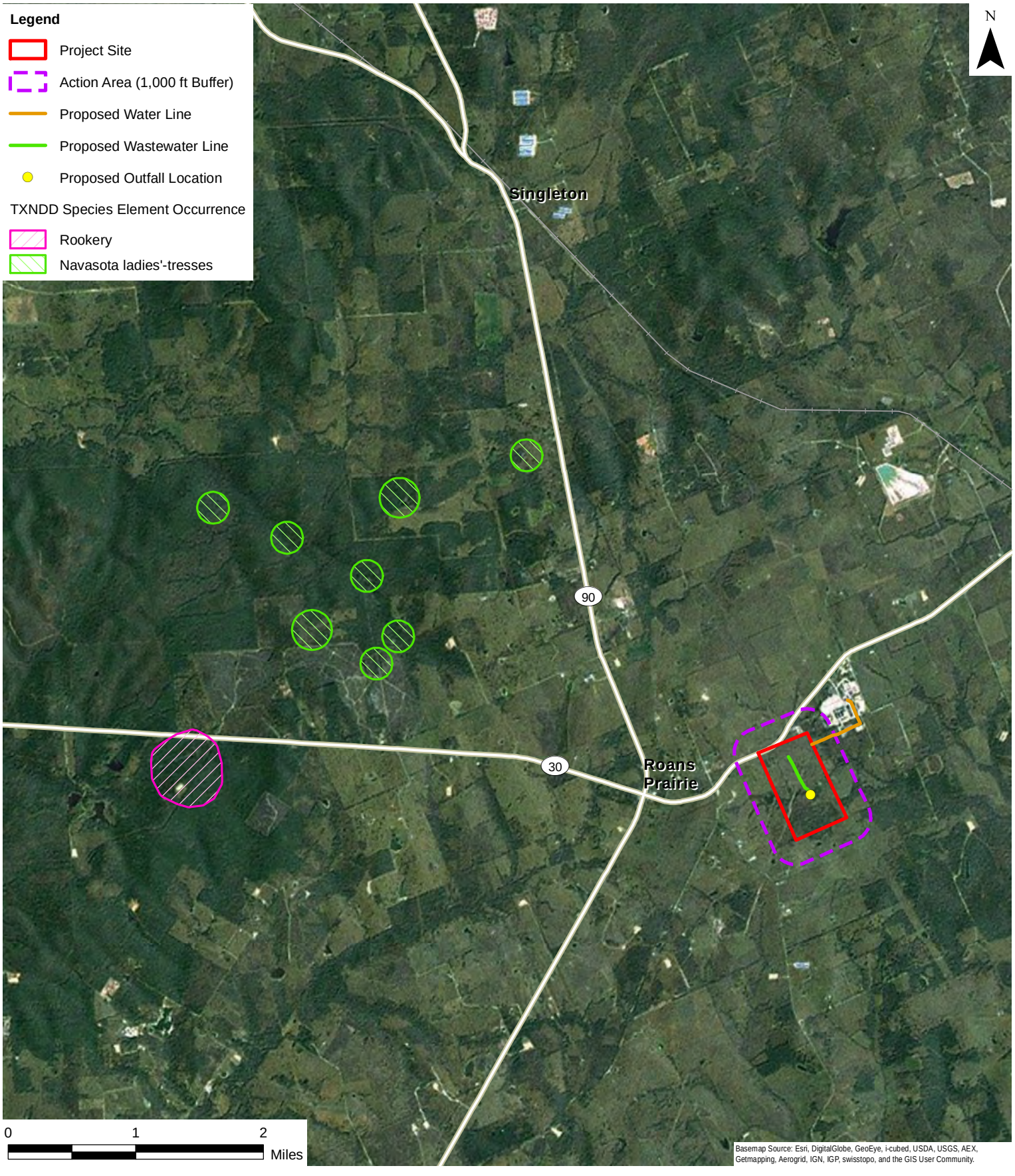
FIGURE 2-4
PIPELINE ROW LOCATIONS
Biological Assessment Report
Tenaska, Inc.
Grimes County, Texas

ERM



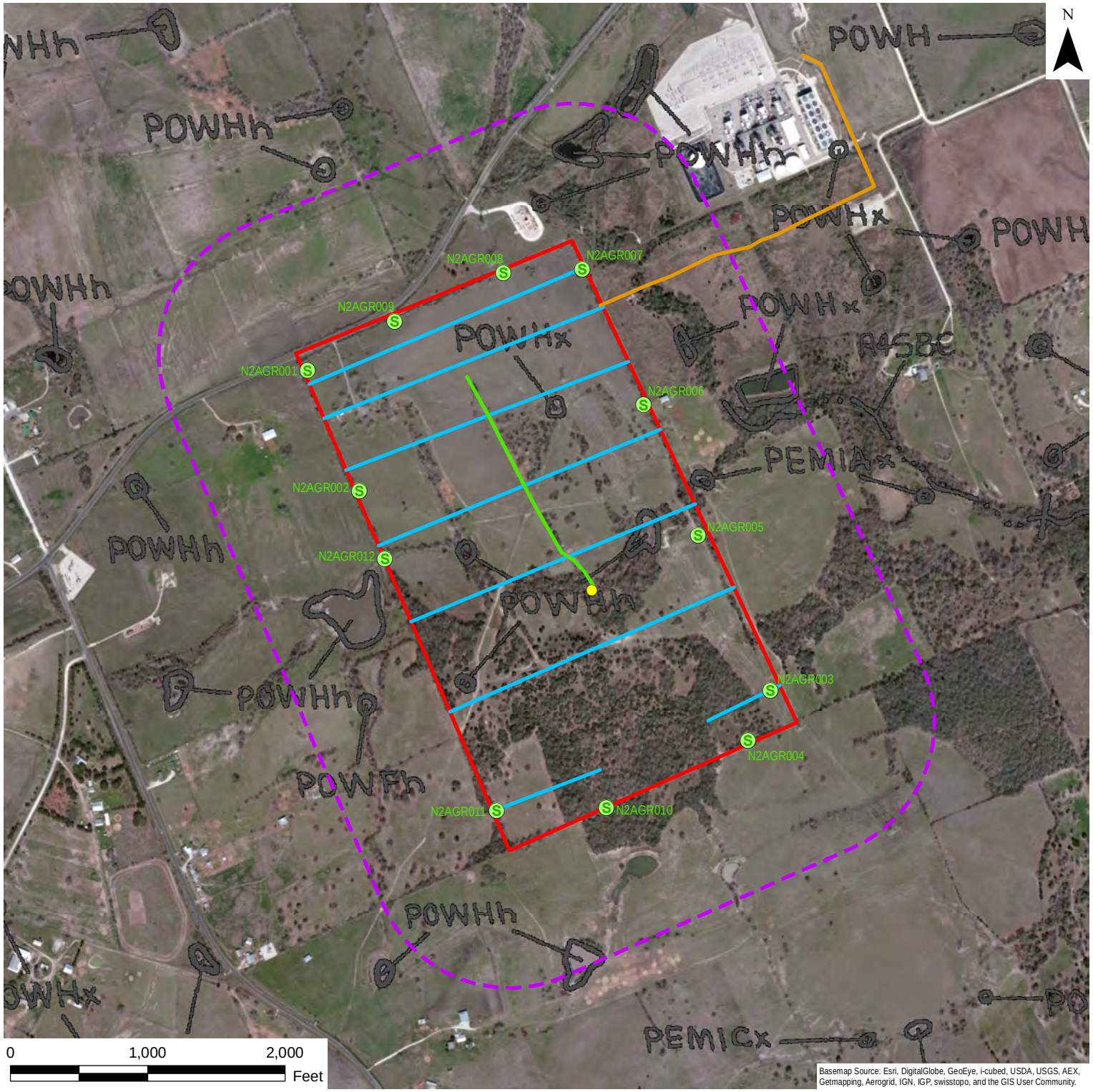
Environmental Resources Management

DESIGN:	A Ragatz	DRAWN:	I Tobar	CHKD.:	A Ragatz
DATE:	2/17/2014	SCALE:	AS SHOWN	REVISION:	0

FILE: N:\Projects\Tenaska\Roans Prairie (Grimes County)\Models_GIS\MXD\BiologicalAssessment\Fig4-1_TXNDD_Element_Occurrence.mxd

FIGURE 4-1
TXNDD ELEMENT OCCURRENCE DATA
IN THE VICINITY OF THE PROJECT SITE
Biological Assessment Report
Tenaska, Inc.
Grimes County, Texas

ERM



Legend

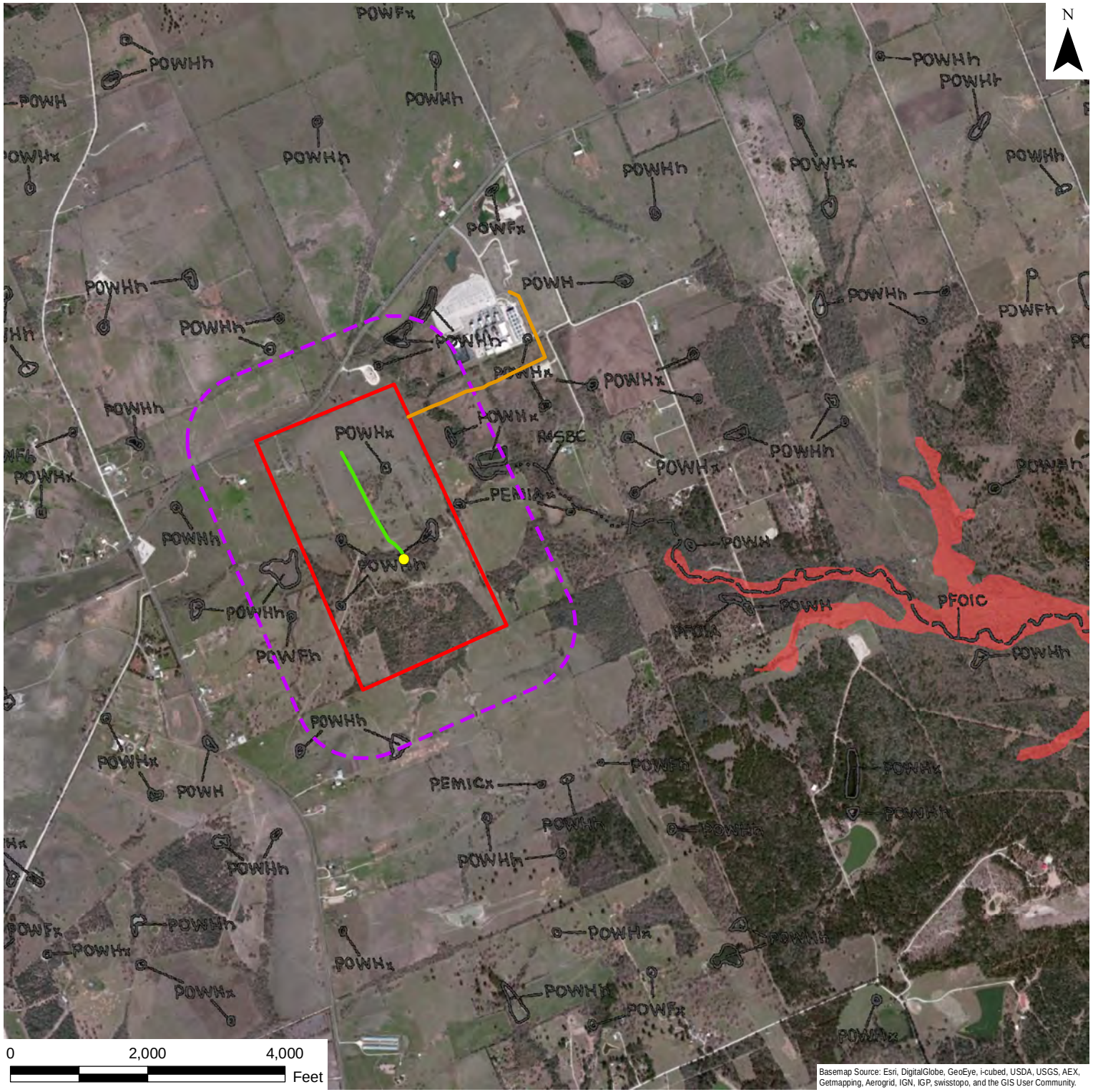
- Project Site
- Action Area (1,000 ft Buffer)
- Proposed Water Line
- Proposed Wastewater Line
- Proposed Outfall Location
- Habitat Survey Point
- Transects Surveyed
- NWI Wetland Type from Scanned Map (Digital Data Unavailable)

FIGURE 5-1
HABITAT SURVEY MAP
Biological Assessment Report
Tenaska, Inc.
Grimes County, Texas

DESIGN:	A Ragatz	DRAWN:	I Tobar/S King
CHECKED:	A Ragatz	DATE:	2/17/2014
SCALE:	AS SHOWN	REVISION:	0

FILE: N:\Projects\Tenaska\Roans Prairie (Grimes County)\Models_GIS\MXD\BiologicalAssessment\Fig5-1_HabitatSurveyMap.mxd

ERM
Environmental Resources Management



Legend

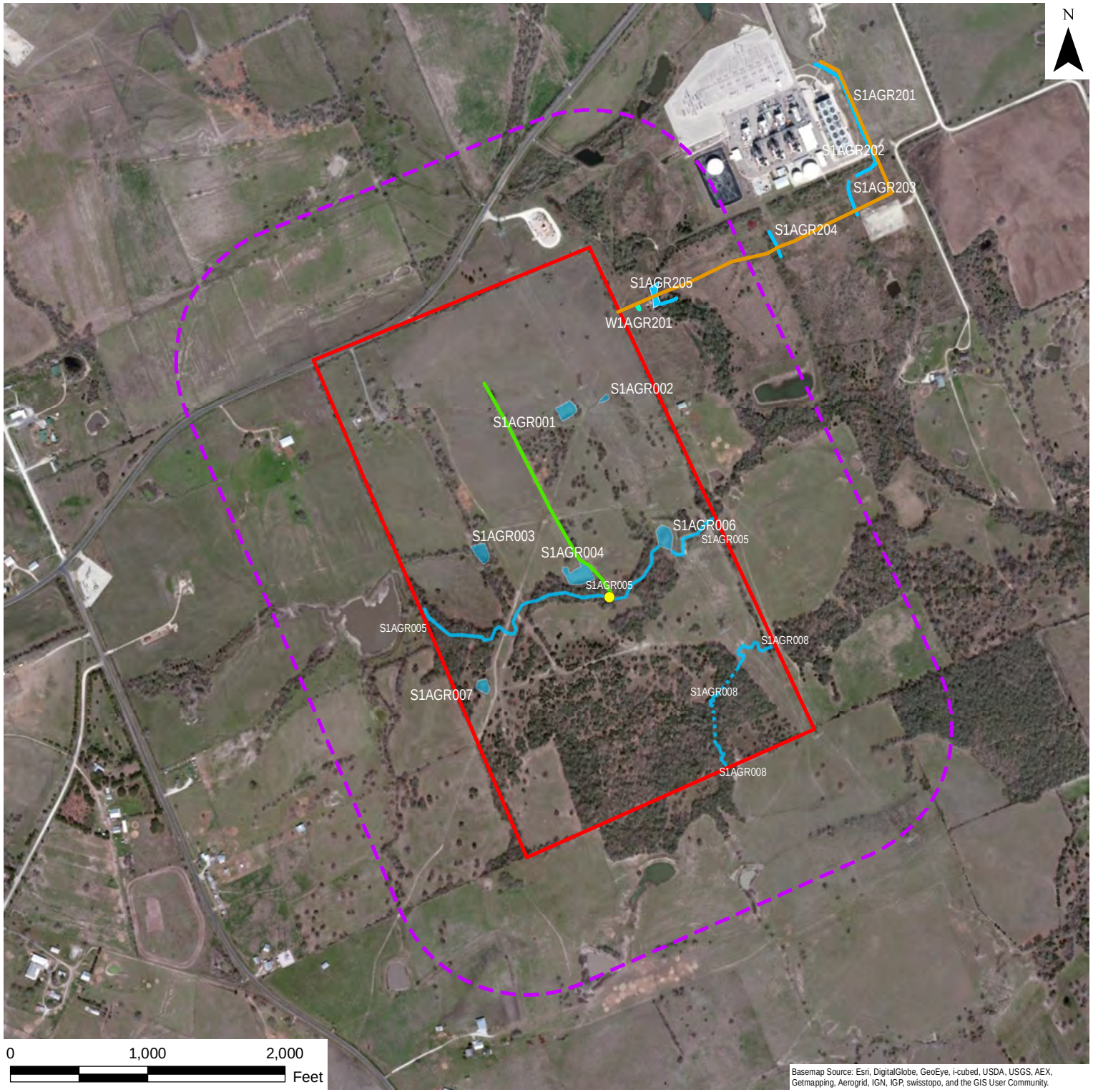
- Project Site
- Action Area (1,000 ft Buffer)
- Proposed Water Line
- Proposed Wastewater Line
- Proposed Outfall Location
- FEMA General Flood Hazard Zone
- NWI Wetland Type from Scanned Map (Digital Data Unavailable)

FIGURE 5-2
NWI AND FEMA FLOODPLAIN MAP
Biological Assessment Report
Tenaska, Inc.
Grimes County, Texas

DESIGN:	A Ragatz	DRAWN:	I Tobar
CHECKED:	A Ragatz	DATE:	2/17/2014
SCALE:	AS SHOWN	REVISION:	0

FILE: N:\Projects\Tenaska\Roans Prairie (Grimes County)\Models_GIS\MXD\BiologicalAssessment\Fig5-2_NWI_FEMAFloodplainMap.mxd

Environmental Resources Management
ERM



Legend

- Project Site
- Action Area (1,000 ft Buffer)
- Proposed Water Line
- Proposed Wastewater line
- Proposed Outfall Location
- Waterbody
- Approximate Waterbody Extent
- Wetland

FIGURE 5-3
AERIAL MAP WITH
DELINEATED WATERBODIES
Biological Assessment Report
Tenaska, Inc.
Grimes County, Texas

DESIGN:	A Ragatz	DRAWN:	I Tobar/S King
CHECKED:	A Ragatz	DATE:	2/17/2014
SCALE:	AS SHOWN	REVISION:	0

FILE: N:\Projects\Tenaska\Roans Prairie (Grimes County)\Models_GIS\MXD\BiologicalAssessment\Fig5-3_Delineated_Waterbodies.mxd

Environmental Resources Management

EDR Historical Topographic Maps and Aerial Photos

Appendix A

February 25, 2014
Project No. 0189555

Environmental Resources Management
CityCentre Four
840 West Sam Houston Parkway North, Suite 600
Houston, Texas 77024-3920
(281) 600-1000

Roans Prairie
Hwy 30
Anderson, TX 77830

Inquiry Number: 3606017.2
May 16, 2013

The EDR Aerial Photo Decade Package

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Date EDR Searched Historical Sources:

Aerial Photography May 16, 2013

Target Property:

Hwy 30

Anderson, TX 77830

Year	Scale	Details	Source
1953	Aerial Photograph. Scale: 1"=1500'	Flight Year: 1953 Best Copy Available from original source	AMS
1960	Aerial Photograph. Scale: 1"=500'	Flight Year: 1960	USGS
1981	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1981 Best Copy Available from original source	USGS
1988	Aerial Photograph. Scale: 1"=500'	Flight Year: 1988	TXDOT
1995	Aerial Photograph. Scale: 1"=500'	/DOQQ - acquisition dates: 1995	EDR
2004	Aerial Photograph. Scale: 1"=500'	Flight Year: 2004	USDA-CIR
2005	Aerial Photograph. Scale: 1"=500'	Flight Year: 2005	EDR
2006	Aerial Photograph. Scale: 1"=500'	Flight Year: 2006	EDR
2008	Aerial Photograph. Scale: 1"=500'	Flight Year: 2008	EDR
2010	Aerial Photograph. Scale: 1"=500'	Flight Year: 2010	EDR
2012	Aerial Photograph. Scale: 1"=500'	Flight Year: 2012	EDR


INQUIRY #: 3606017.2
YEAR: 1953
= 1500'
N


INQUIRY #: 3606017.2
YEAR: 1960
= 500'
N


INQUIRY #: 3606017.2
YEAR: 1981
= 1000'
N

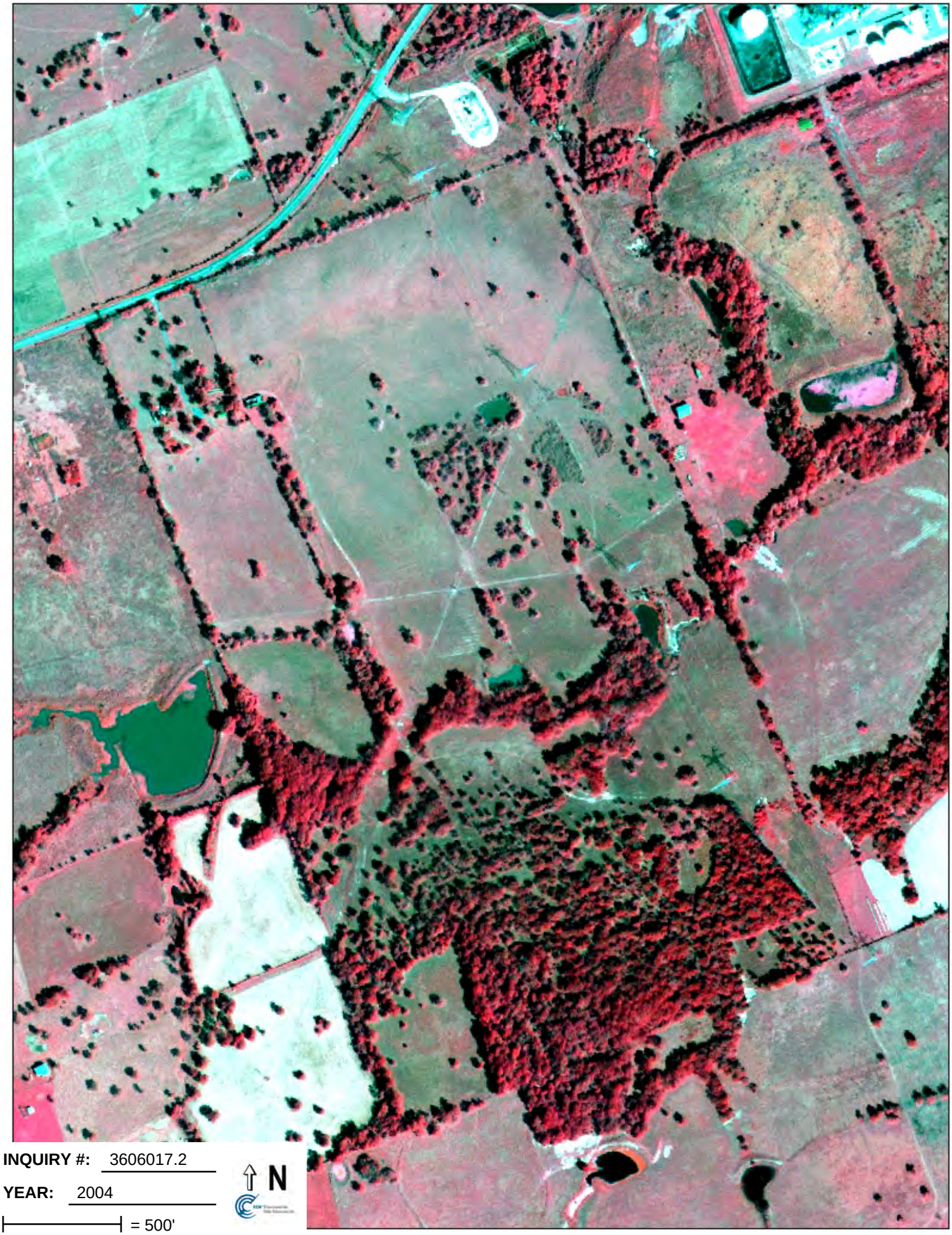
INQUIRY #: 3606017.2

YEAR: 1988

= 500'

N


INQUIRY #: 3606017.2
YEAR: 1995
= 500'
N



INQUIRY #: 3606017.2

YEAR: 2004

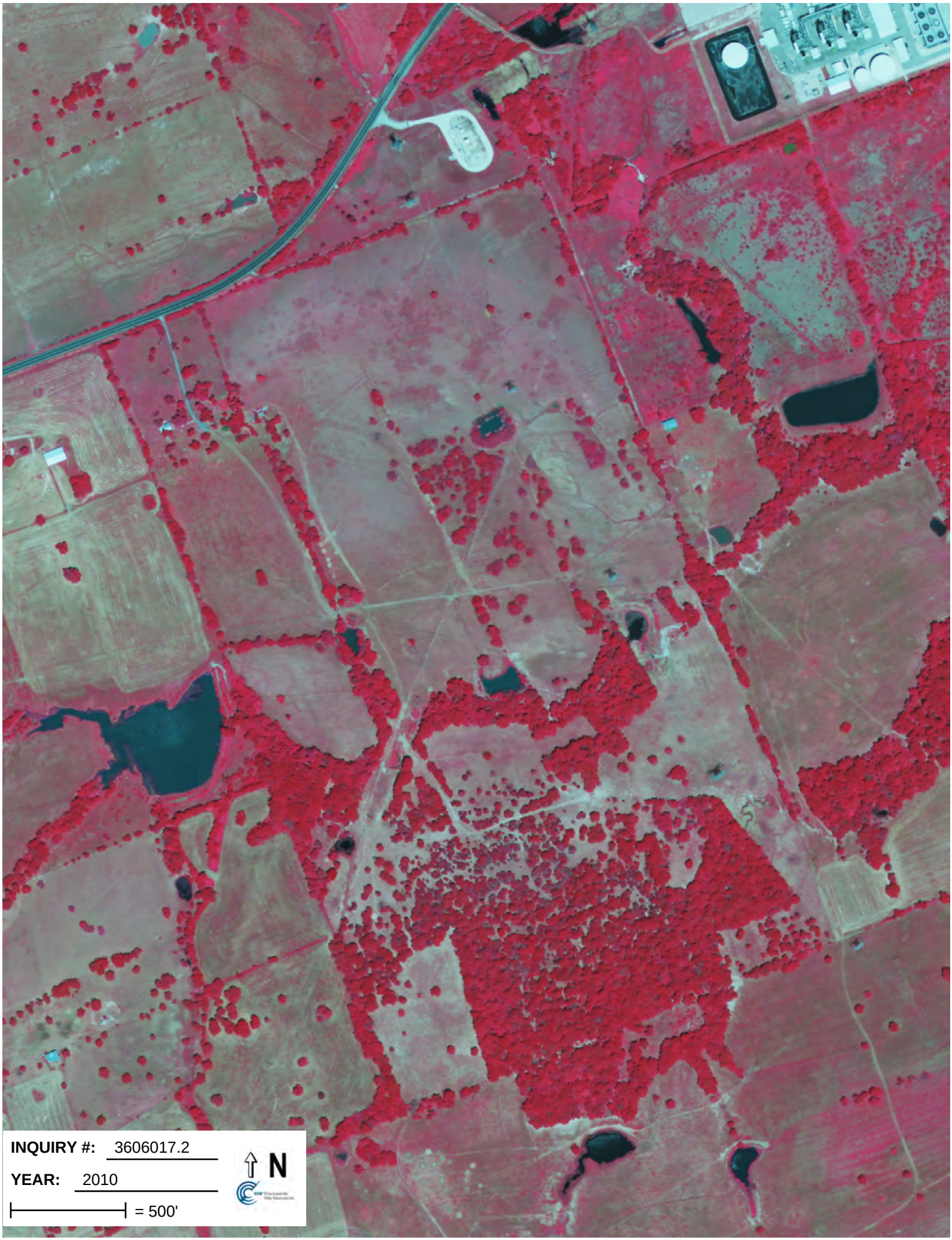
= 500'

N


INQUIRY #: 3606017.2
YEAR: 2005
= 500'
N


INQUIRY #: 3606017.2
YEAR: 2006
= 500'
N


INQUIRY #: 3606017.2
YEAR: 2008
= 500'
N


INQUIRY #: 3606017.2
YEAR: 2010
= 500'
N


INQUIRY #: 3606017.2
YEAR: 2012
= 500'
N

Roans Prairie
Hwy 30
Anderson, TX 77830

Inquiry Number: 3606017.1
May 14, 2013

EDR Historical Topographic Map Report

EDR® Environmental Data Resources Inc

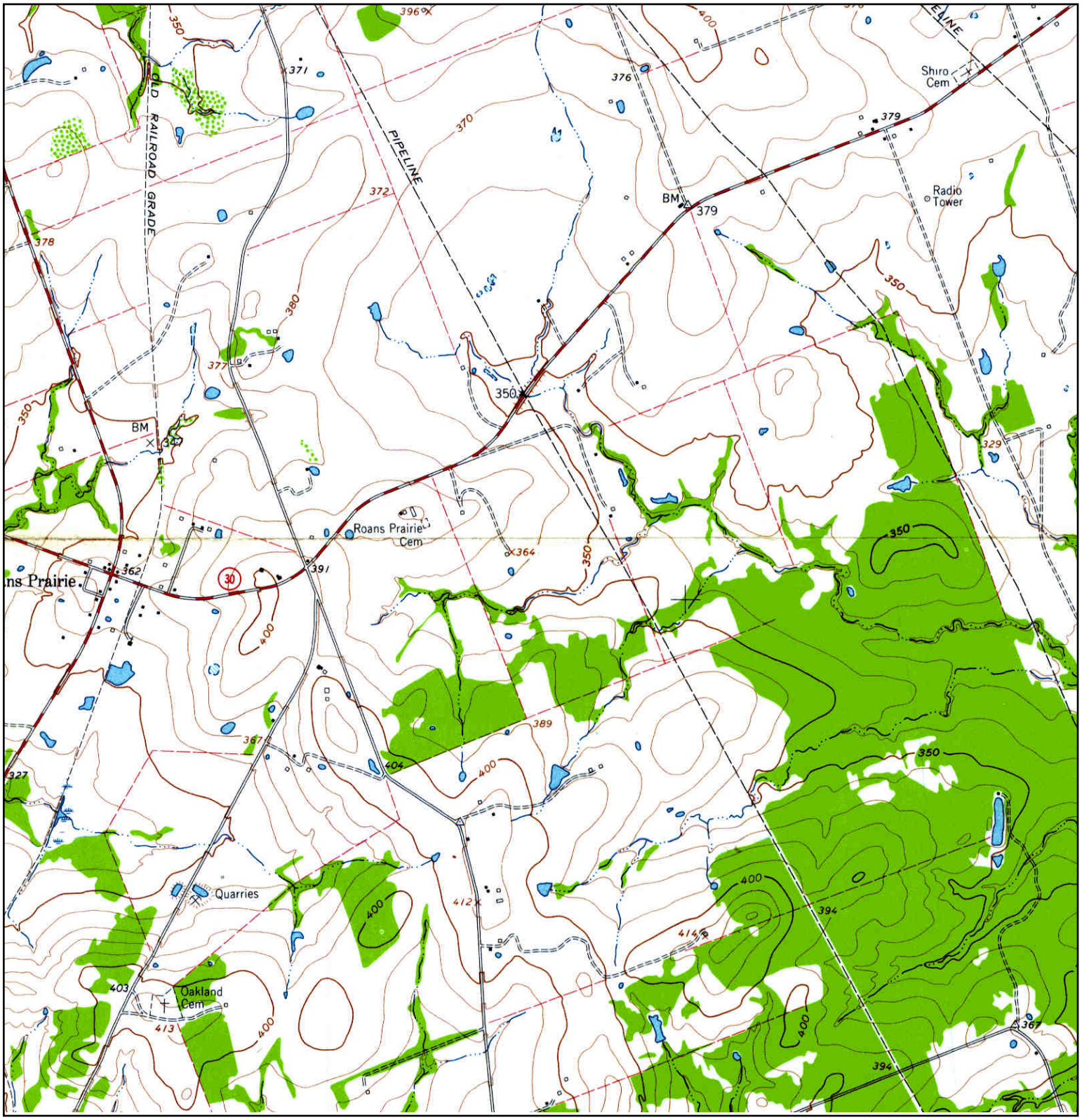
440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

EDR Historical Topographic Map Report

Environmental Data Resources, Inc.s (EDR) Historical Topographic Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topographic Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the early 1900s.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Historical Topographic Map



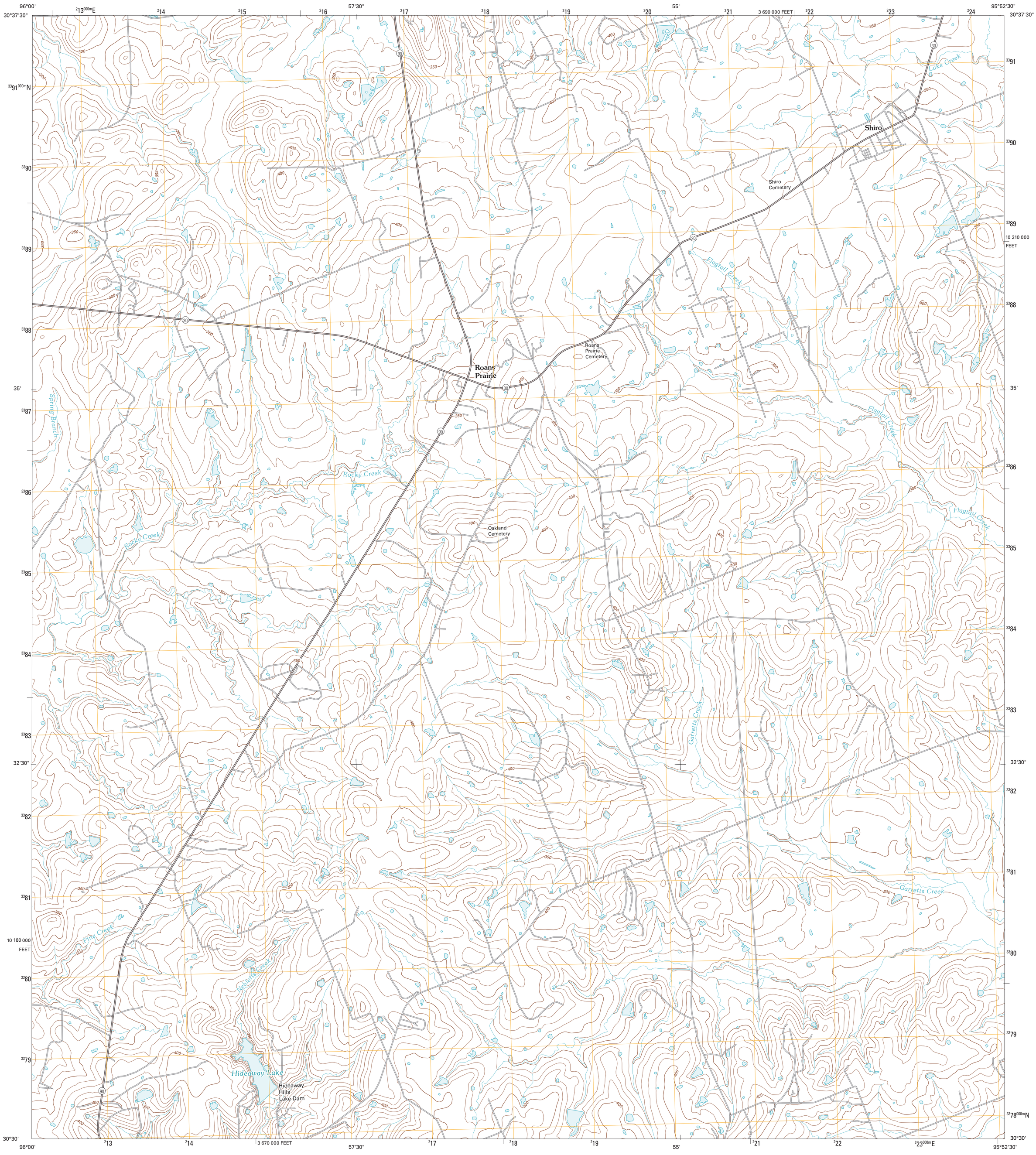
N	TARGET QUAD			
	NAME:	ROANS PRAIRIE	SITE NAME: Roans Prairie	CLIENT: ERM - Southwest, Inc.
	MAP YEAR:	1962	ADDRESS: Hwy 30	CONTACT: Amanda Ragatz
			Anderson, TX 77830	INQUIRY#: 3606017.1
	SERIES:	7.5	LAT/LONG: 30.585 / -95.9233	RESEARCH DATE: 05/14/2013
	SCALE:	1:24000		

U.S. DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY

USGS science for a changing world

The National Map US Topo

ROANS PRAIRIE QUADRANGLE
TEXAS
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid: Universal Transverse Mercator, Zone 15R
10 000-foot ticks: Texas Coordinate System of 1983
(central zone)

Imagery.....NAIP, January 2009
Roads.....US Census Bureau TIGER data with limited USGS updates, 2007
Names.....GNIS, 2008
Hydrography.....National Hydrography Dataset, 1995
Contours.....National Elevation Dataset, 2003

UTM GRID AND 2010 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000-m Square ID
TP
Grid Zone Designation
15R

SCALE 1:24 000

CONTOUR INTERVAL 10 FEET

This map was produced to conform with version 0.5.10 of the draft USGS Standards for 7.5-Minute Quadrangle Maps.
A metadata file associated with this product is also draft version 0.5.10

QUADRANGLE LOCATION

Keith	Singleton	Loma
Carlos	Roans Prairie	Richards
Navasota	Anderson	Dacus

ADJOINING 7.5' QUADRANGLES
TX 3095-322

ROAD CLASSIFICATION

Interstate Route	State Route
US Route	Local Road
Ramp	4WD

Interstate Route · US Route · State Route

ROANS PRAIRIE, TX
2010

TXNDD Element Occurrence Records

Appendix B

February 25, 2014
Project No. 0189555

Environmental Resources Management
CityCentre Four
840 West Sam Houston Parkway North, Suite 600
Houston, Texas 77024-3920
(281) 600-1000

Element Occurrence Record

Scientific Name: Rookery **Occurrence #:** 232 **Eo Id:** 4059

Common Name: **Track Status:** Track all extant and selected historical EOs

TX Protection Status:

Global Rank: GNR **State Rank:** SNR **Federal Status:**

Location Information:

Watershed:

12070103 - Navasota

County Name:	State:	Mapsheet:
Grimes	TX	30096-E1, Carlos

Directions:

NORTH-NORTHEAST OF NAVASOTA; EAST OF COLLEGE STATION; ALONG HIGHWAY 30 EAST; CA. 5 MILES EAST OF CARLOS

Survey Information:

First Observation: 1976 **Survey Date:** **Last Observation:** 1976

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description: UNKNOWN; SIZE UNKNOWN

Comments: COLONY NUMBER 586-054

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE GREAT BLUE HERON

Managed Area:

Managed Area Name

Reference:

Citation:

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Spiranthes parksii
Occurrence #: 50 **Eo Id:** 4095
Common Name: Navasota ladies'-tresses
Track Status: Track all extant and selected historical EOs
TX Protection Status: E
Global Rank: G3 **State Rank:** S3 **Federal Status:** LE

Location Information:

Watershed:

12070103 - Navasota

County Name:	State:	Mapsheet:
Grimes	TX	30095-F8, Singleton 30095-E8, Roans Prairie

Directions:

Site is located 2 miles S of Singleton, approx. 1200 ft. W of Hwy 90 and approx. 900 ft. E of HL&P powerline.

Survey Information:

First Observation: 1985-11-06 **Survey Date:** 1985-11-06 **Last Observation:** 1985-11-06
Eo Type: **Eo Rank:** E **Eo Rank Date:** 1985-11-06
Observed Area:

Comments:

General Description: Site described as mostly pine-hardwood woodland with a cultivated oat field in the east-central section of the site. At the south end of the site is a former bog as indicated by low relief and abundant Sphagnum moss. The S. parksii plants were found around the edges of the former bog. The area is typical S. parksii habitat except for the abundance of tall grasses, lack of drainages or eroded areas and close proximity to standing water.

Comments: During the 1985 survey other Spiranthes species were observed in flower: 80 S. cernua (woodland form) and 4 S. cernua (peloric form). In 1989 numbering of search sites was redefined to give each site since 1984 a consecutive number. The site represented by this record includes TMPA 1985 survey site # R7 (permanent site # 95).

Protection Comments:

Management Comments:

Data:

EO Data: 28 Oct-6 Nov 1985: 6 Spiranthes parksii were observed in flower.

Managed Area:

Managed Area Name

Reference:

Citation:

Parker, Kathie. 1995. Legend for Spiranthes parksii on the 30 year mine area map of the Gibbons Creek Lignite Mine. Submitted to Dr. Bolton Williams, Texas Municipal Power Agency, Bryan, Texas. 5 pp. May 1995.

Williams, Bolton. 2001. Letter to Sandy Birnbaum containing a map and legend for Spiranthes parksii on the 30 year mine area of the Gibbons Creek Lignite Mine. March 19, 2001.

Tejas Ecological Services. 1992. A report on the 1991-1992 survey/monitor/transplant program for Navasota ladies'-tresses on the Gibbons Creek Lignite Mine, Grimes County, Texas. Prepared for Texas Municipal Power Agency, Bryan, TX. 12 pp. 14 July 1992.

Tejas Ecological Services. 1994. A report on the 1993-1994 survey/monitor/transplant program for Navasota ladies'-tresses on the Gibbons Creek Lignite Mine, Grimes County, Texas. Prepared for Texas Municipal Power Agency, Bryan, TX. 10 pp. 23 July 1994.

North American Environmental Services, Inc. 1985. 1985 survey for Spiranthes parksii in Grimes County, Texas. Prepared for Texas Municipal Power Agency. 16 December 1985.

Parker, Kathleen. 1997. Letter of 21 November to Jackie Poole with new Spiranthes parksii populations.

Specimen:

Element Occurrence Record

Scientific Name: Spiranthes parksii
Occurrence #: 51 **Eo Id:** 2836
Common Name: Navasota ladies'-tresses
Track Status: Track all extant and selected historical EOs
TX Protection Status: E
Global Rank: G3 **State Rank:** S3 **Federal Status:** LE

Location Information:

Watershed:

12070103 - Navasota

County Name:	State:	Mapsheet:
Grimes	TX	30095-E8, Roans Prairie 30096-E1, Carlos

Directions:

The general vicinity of these observations is SW of Singleton, S of CR 177 and NW of Roans Prairie, N of Hwy 30. The directions are generalized as this record consists of multiple observations.

Survey Information:

First Observation: 1985-11-06 **Survey Date:** 2008-11-05 **Last Observation:** 1991-11-02
Eo Type: **Eo Rank:** E **Eo Rank Date:** 1991-11-02
Observed Area:

Comments:

General Description: In 1986, all sites had a pine component. Two sites were described as pine upland with scattered hardwood; another as almost pure pine; and the other three as pine-hardwood woodland. Several sites had dense understory of shrubs. Yaupon was also mentioned for several sites. A couple of sites also had tall grasses. One site had a drainage eroded down to solid rock. The habitat description is a summary of multiple source features.

Comments: In 2006, a private landowner applied for a permit to create a 130 ac. lake within the area of occupied by this record. Two areas previously occupied by Spiranthes parksii will be impacted. In 2009 mitigation plans were still in process. The sites represented by this record include TMPA 1985 survey site #s R17-17A, R21, S19, S23, S24, S26, S28 which are also permanent site #s 104, 108, 138, 142,143, 145, 147, respectively. During the 1985 survey other Spiranthes species were observed in flower: a total of 84 S. cernua (woodland form), 41 S. cernua (peloric form), and 1 S. gracilis. This record represents the consolidation of EO #s 51, 52, and 57-61.

Protection Comments:

Management Comments:

Data:

EO Data: 28 Oct-6 Nov 1985: A total of 46 flowering S. parksii were observed at 7 sites. 21 Oct-2 Nov 1991: Of the five sites surveyed, only one site had S. parksii; four flowering plants were observed. 8-12 Nov 1993: No S. parksii were observed at the two sites surveyed. 5 Nov 2008: No S. parksii were observed at the two sites surveyed.

Managed Area:

Managed Area Name

Reference:

Citation:

Williams, Bolton. 2001. Letter to Sandy Birnbaum containing a map and legend for Spiranthes parksii on the 30 year mine area of the Gibbons Creek Lignite Mine. March 19, 2001.

Parker, Kathie. 1995. Legend for Spiranthes parksii on the 30 year mine area map of the Gibbons Creek Lignite Mine. Submitted to Dr. Bolton Williams, Texas Municipal Power Agency, Bryan, Texas. 5 pp. May 1995.

Tejas Ecological Services. 1992. A report on the 1991-1992 survey/monitor/transplant program for Navasota ladies'-tresses on the Gibbons Creek Lignite Mine, Grimes County, Texas. Prepared for Texas Municipal Power Agency, Bryan, TX. 12 pp. 14 July 1992.

North American Environmental Services, Inc. 1985. 1985 survey for Spiranthes parksii in Grimes County, Texas. Prepared for Texas Municipal Power Agency. 16 December 1985.

Parker, Kathleen. 1997. Letter of 21 November to Jackie Poole with new Spiranthes parksii populations.

Tejas Ecological Services. 1994. A report on the 1993-1994 survey/monitor/transplant program for Navasota ladies'-tresses on the Gibbons Creek Lignite Mine, Grimes County, Texas. Prepared for Texas Municipal Power Agency, Bryan, TX. 10 pp. 23 July 1994.

Jones & Ridenour, Inc. 2009. Compensatory mitigation plan for the Kim R. Smith Lake Project tributary of Sulphur Creek, Grimes County, Texas. U.S. Army Corps of Engineers Project No. 200600156. Created for Velvin & Weeks Consulting Engineers, Athens, TX.

Specimen:

Photographic Log

Appendix C

February 25, 2014
Project No. 0189555

Environmental Resources Management
CityCentre Four
840 West Sam Houston Parkway North, Suite 600
Houston, Texas 77024-3920
(281) 600-1000

Environmental
Resources
Management

CityCentre Four
840 West Sam Houston Parkway North, Suite 600
Houston, Texas 77024-3920
(281) 600-1000
(281) 520-4625 (fax)

Photographic Log

Client: Tenaska, Inc.	**Project Number:** 0189555
Project Name: Roan's Prairie Generating Station	**Location:** Grimes County, TX

Photograph ID: N2AGR001_050113_1W

Feature: N2AGR001

Date: 5/01/13

Comments: Photo taken facing west.

Photograph ID: N2AGR002_050113_2W

Feature: N2AGR002

Date: 5/01/13

Comments: Photo taken facing west.

PHOTOGRAPHIC LOG

Client: Tenaska, Inc.	**Project Number:** 0189555
Project Name: Roan's Prairie Generating Station	**Location:** Grimes County, TX

Photograph ID: N2AGR003_050113_4E

Feature: N2AGR003

Date: 5/01/2013

Comments: Photo taken facing east.

Photograph ID: N2AGR004_050113_6S

Feature: N2AGR004

Date: 5/01/2013

Comments: Photo taken facing south.

PHOTOGRAPHIC LOG

Client: Tenaska, Inc.	**Project Number:** 0189555
Project Name: Roan's Prairie Generating Station	**Location:** Grimes County, TX

Photograph ID: N2AGR005_050113_7E **Feature:** N2AGR005 **Date:** 5/01/2013 **Comments:** Photo taken facing east.	
Photograph ID: N2AGR006_050113_12E **Feature:** N2AGR006 **Date:** 5/01/13 **Comments:** Photo taken facing east.	

PHOTOGRAPHIC LOG

Client: Tenaska, Inc.	**Project Number:** 0189555
Project Name: Roan's Prairie Generating Station	**Location:** Grimes County, TX

Photograph ID: N2AGR007_050113_13E **Feature:** N2AGR007 **Date:** 5/01/2013 **Comments:** Photo taken facing east.	
Photograph ID: N2AGR008_050113_14N **Feature:** N2AGR008 **Date:** 5/01/2013 **Comments:** Photo taken facing north.	

PHOTOGRAPHIC LOG

Client: Tenaska, Inc.	**Project Number:** 0189555
Project Name: Roan's Prairie Generating Station	**Location:** Grimes County, TX

Photograph ID: N2AGR009_050113_15N

Feature: N2AGR009

Date: 5/01/2013

Comments: Photo taken facing north.

Photograph ID: N2AGR010_050213_7S

Feature: N2AGR010

Date: 5/02/2013

Comments: Photo taken facing south.

PHOTOGRAPHIC LOG

Client: Tenaska, Inc.	**Project Number:** 0189555
Project Name: Roan's Prairie Generating Station	**Location:** Grimes County, TX

Photograph ID: N2AGR011_050213_8 W

Feature: N2AGR011

Date: 05/02/2013

Comments: Photo taken facing west.

Photograph ID: N2AGR012_050213_11 W

Feature: N2AGR012

Date: 05/02/2013

Comments: Photo taken facing west.

PHOTOGRAPHIC LOG

Client: Tenaska, Inc.	**Project Number:** 0189555
Project Name: Roan's Prairie Generating Station	**Location:** Grimes County, TX

Photograph ID: S1AGR001_050113_10S

Feature: S1AGR001

Date: 05/01/2013

Comments: Photo taken facing south.

Photograph ID: S1AGR003_050113_3S

Feature: S1AGR003

Date: 5/01/2013

Comments: Photo taken facing south.

PHOTOGRAPHIC LOG

Client: Tenaska, Inc.		**Project Number:**	0189555
Project Name: Roan's Prairie Generating Station		**Location:**	Grimes County, TX
Photograph ID: S1AGR004_050213_9S **Feature:** S1AGR004 **Date:** 5/02/2013 **Comments:** Photo taken facing south.			
Photograph ID: S1AGR005_050113_8E **Feature:** S1AGR005 **Date:** 5/01/2013 **Comments:** Photo taken facing east.			

PHOTOGRAPHIC LOG

Client: Tenaska, Inc.		**Project Number:**	0189555
Project Name: Roan's Prairie Generating Station		**Location:**	Grimes County, TX
Photograph ID: S1AGR006_050113_9N **Feature:** S1AGR006 **Date:** 5/01/2013 **Comments:** Photo taken facing north.			
Photograph ID: N3AGR001_110713_S **Feature:** N3AGR001 **Date:** 11/07/13 **Comments:** Photo taken south along starting point of water utility line. Location is adjacent to Frontier Generating Station.			

PHOTOGRAPHIC LOG

Client: Tenaska, Inc.	**Project Number:** 0189555
Project Name: Roan's Prairie Generating Station	**Location:** Grimes County, TX

Photograph ID: N3AGR002_110713_S

Feature: N3AGR002

Date: 11/07/13

Comments: Photo taken south along water utility line adjacent to Frontier Generating Station

Photograph ID: N3AGR003_110713_S

Feature: N3AGR003

Date: 11/07/13

Comments: Photo taken looking south along water utility line. Location is where utility will now begin heading west.

PHOTOGRAPHIC LOG

Client: Tenaska, Inc.	**Project Number:** 0189555
Project Name: Roan's Prairie Generating Station	**Location:** Grimes County, TX

Photograph ID: N3AGR004_110713_W **Feature:** N3AGR004 **Date:** 11/07/13 **Comments:** Photo taken looking west along water utility line.	
Photograph ID: N3AGR005_110713_W **Feature:** N3AGR005 **Date:** 11/07/13 **Comments:** Photo taken looking back east along central portion of water utility line.	

PHOTOGRAPHIC LOG

Client: Tenaska, Inc.	**Project Number:** 0189555
Project Name: Roan's Prairie Generating Station	**Location:** Grimes County, TX

Photograph ID: N3AGR006_110713_W

Feature: N3AGR006

Date: 11/07/13

Comments: Photo taken looking west along water utility line near small drainage ditch, S1AGR004.

Photograph ID: N3AGR007_110713_W

Feature: N3AGR007

Date: 11/07/13

Comments: Photo taken looking west along water utility line.

PHOTOGRAPHIC LOG

Client: Tenaska, Inc.		**Project Number:**	0189555
Project Name: Roan's Prairie Generating Station		**Location:**	Grimes County, TX
Photograph ID: N3AGR008_110713_w **Feature:** N3AGR008 **Date:** 11/07/13 **Comments:** Photo taken looking west along water utility line at the property fence line. Area is within an existing pipeline and transmission line ROW.			
Photograph ID: S1AGR001_110713_S **Feature:** S1AGR001 **Date:** 11/07/13 **Comments:** Photo looking south along drainage ditch.			

PHOTOGRAPHIC LOG

Client: Tenaska, Inc.		**Project Number:**	0189555
Project Name: Roan's Prairie Generating Station		**Location:**	Grimes County, TX
Photograph ID: S1AGR002_110713_w **Feature:** S1AGR002 **Date:** 11/07/13 **Comments:** Photo looking west at small ephemeral drainage feature in the tree line just south of the Frontier Generating Station.			
Photograph ID: S1AGR003_110713_w **Feature:** S1AGR003 **Date:** 11/07/13 **Comments:** Photo looking north at small ephemeral drainage feature.			

PHOTOGRAPHIC LOG

Client: Tenaska, Inc.	**Project Number:** 0189555
Project Name: Roan's Prairie Generating Station	**Location:** Grimes County, TX

Photograph ID: S1AGR004_110713_N

Feature: S1AGR004

Date: 11/07/13

Comments: Photo taken looking north along a drainage ditch from the Frontier Generating Station.

Photograph ID: S1AGR005_110713_N

Feature: S1AGR005

Date: 11/07/13

Comments: Photo taken looking south along small creek bed.

PHOTOGRAPHIC LOG

Client: Tenaska, Inc.		**Project Number:**	0189555
Project Name: Roan's Prairie Generating Station		**Location:**	Grimes County, TX
Photograph ID: W1AGR001_110713_W **Feature:** W1AGR001 **Date:** 11/07/13 **Comments:** Photo taken looking west at PEM wetland Wetland is within an existing pipeline and transmission line ROW.			
Photograph ID: **Feature:** **Date:** **Comments:**	**Space Intentionally left Blank**		