

National Park Service
U.S. Department of the Interior

Big Thicket National Preserve
Texas



Environmental Assessment

Unit Petroleum Company
Proposal to Construct and Operate
an 8-inch Gathering Line across the
Menard Creek Corridor Unit

Big Thicket National Preserve
Polk County, Texas

February 2017

In 1916, Congress created the National Park Service in the Department of the Interior to:

...promote and regulate the use of the Federal areas known as national parks, monuments, and reservations...by such means and measures as to conform to the fundamental purpose of said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations. (NPS Organic Act, 16 U.S.C. § 1)

Prepared by
United States Department of the Interior • National Park Service

Environmental Assessment

Unit Petroleum Company Proposal to Construct and Operate an 8-inch Gathering Line across the Menard Creek Corridor Unit

Summary: In accordance with National Park Service (NPS) regulations for nonfederal oil and gas rights, Unit Petroleum Company (UPC) has submitted a Plan of Operations (Plan) to the NPS to construct and operate a gathering line across the Menard Creek Corridor Unit (MCCU or Unit), Big Thicket National Preserve (Preserve), to connect the existing, producing, shut-in, UPC Holly Grove #1 (HG₁) gas well located west of MCCU to the existing UPC Segno Gathering System (SGS) located east of MCCU at the existing UPC Allar #1 (A₁) gas well. The completed shut-in HG₁ well is awaiting a means to transport the natural gas to the existing SGS east of MCCU.

UPC has successfully drilled and operated several natural gas wells located east of the MCCU that are all connected to the SGS. The SGS delivers the produced wet natural gas from these wells to a sales point located east of the Big Sandy Creek Unit (BSCU). UPC currently owns approximately 1,820 acres of non-federal, privately held (fee) minerals west of, and adjacent to, MCCU, 480 acres of which are directly beneath MCCU.

This Environmental Assessment (EA) evaluates two alternatives. Alternative A, No Action, evaluates conditions in which the horizontally directionally drilled (HDD) bore would not be drilled / installed; therefore, there would be no new impacts on the environment. Alternative B, Proposed Action, evaluates the proposal to HDD bore the gathering line beneath MCCU which is estimated to be completed in 5 days. It also evaluates constructing and connecting the MCCU bored section to the HG₁ and A₁ wells to complete the SGS connection, as well as routine maintenance during operation and the one-time decommissioning of the bored section.

By HDD boring the gathering line entirely from outside the MCCU as proposed, and applying other mitigation measures, potential impacts on Unit resources and values would be avoided or substantially reduced. Potential impacts on Unit resources and values, as summarized in Section 1, are expected to be of low intensity (no effect, or negligible to minor). Therefore, many topics have been dismissed from further analysis in this EA. The only Unit resource carried through for further analysis is natural soundscape.

Increased noise levels would be localized in the vicinity of the surface locations on private property, most noticeably at the entry location west of MCCU where the HDD boring rig would be situated, but also at the later trenching and installation activities as well as subsequent periodic maintenance and decommissioning, all resulting in short-term to long-term, negligible to moderate, adverse impacts on natural soundscape within the Unit.

Public Comment: If you wish to comment on the EA, you may do so online at the NPS website “Planning, Environment, and Public Comment” <http://parkplanning.nps.gov/bith/>, or you may mail or hand deliver comments to the address below. This EA will be on public review for 30 days ending **March 28, 2017**. Before including your address, telephone number, e-mail address, or other personally identifying information in your comment, you should be aware that your entire comment, including your personally identifying information, may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

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1.0 PURPOSE OF AND NEED FOR ACTION

The National Park Service (NPS) is considering a proposal from Unit Petroleum Company (UPC), to construct and operate an 8 inch inside diameter (henceforth, 8 inch diameter), gathering line across the Menard Creek Corridor Unit (MCCU or Unit) of Big Thicket National Preserve (Preserve). The purpose of this analysis is to provide a decision-making framework for the NPS to approve the use of parklands for UPC to develop its nonfederal mineral rights, while protecting park resources and values, and allowing for a safe visitor experience; and to determine whether an Environmental Impact Statement (EIS) should be prepared.

Congress established the Big Thicket National Preserve on October 11, 1974 (Pub. L. No. 93-439, 88 Stat. 1254, codified as amended at 16 U.S.C. § 698-698e), as the nation's first preserve, "[i]n order to assure the preservation, conservation, and protection of the natural, scenic and recreational values of a significant portion of the Big Thicket area in the State of Texas and to provide for the enhancement and public enjoyment thereof." The authorizing legislation directs the Secretary of the Interior to administer the lands within the Preserve "in a manner which will assure their natural and ecological integrity in perpetuity." The Preserve comprises 15 separate units, totaling approximately 112,000 acres. The U.S. Government acquired lands within the Preserve's authorized boundaries; however, private entities retained ownership of the mineral estate underlying their lands, and the State of Texas retained ownership of the mineral estate underlying the Neches River and navigable reaches of Pine Island Bayou. Although the U.S. Government does not own any of the mineral estates underlying the Preserve, Congress charged the NPS with protecting the Preserve from oil and gas operations that may adversely impact the Preserve's resources and values. Given the Preserve's enabling statute, oil and gas exploration and development activities at the Preserve are activities clearly contemplated by Congress and addressed in both statute and NPS regulations, and are not unusual or unexpected occurrences. Mineral exploration and development are also addressed in the Preserve's Oil and Gas Management Plan (NPS 2006), and the Preserve's recently updated General Management Plan (NPS 2014), as described below under Approved Park Planning Documents.

In March 2016, UPC submitted to the NPS a Plan of Operations to construct and operate the 8 inch gathering line across the MCCU. The NPS reviewed the Plan and identified needed changes in a letter dated April 8, 2016. The revised Plan incorporating the requested changes was received by the NPS on May 13, 2016. The NPS reviewed and determined the Plan of Operations to be substantially complete on July 22, 2016, and "accepted" the Plan for formal processing. The NPS must decide whether to approve the plan and if so, if additional mitigation measures are needed.

Figure 1 is a Project Location Map depicting the 15 units of the Preserve, and the proposed project location. Figure 2 depicts the proposed HDD entry and exit points and bore route for placement of the gathering line.

FIGURE 1. PROJECT LOCATION MAP

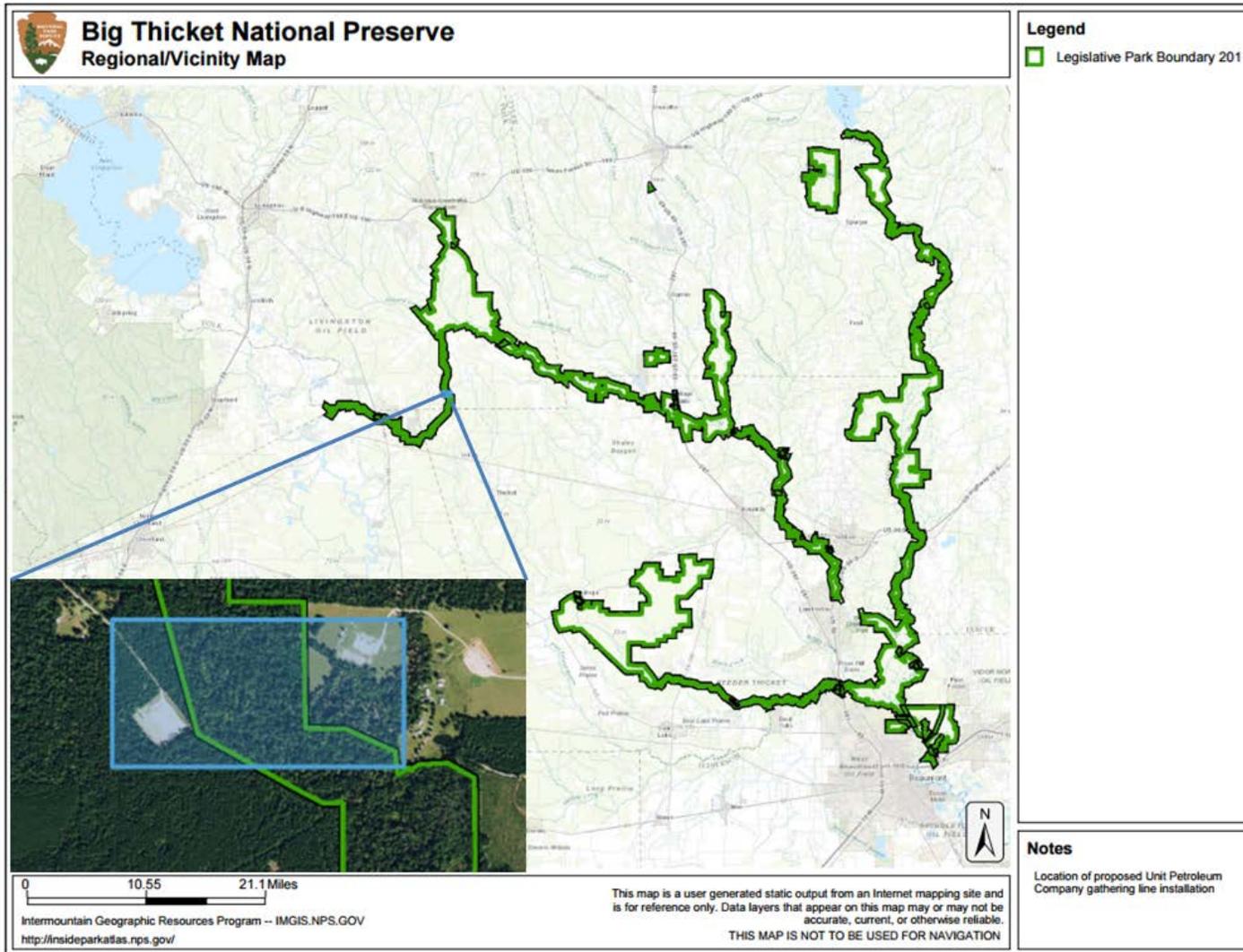
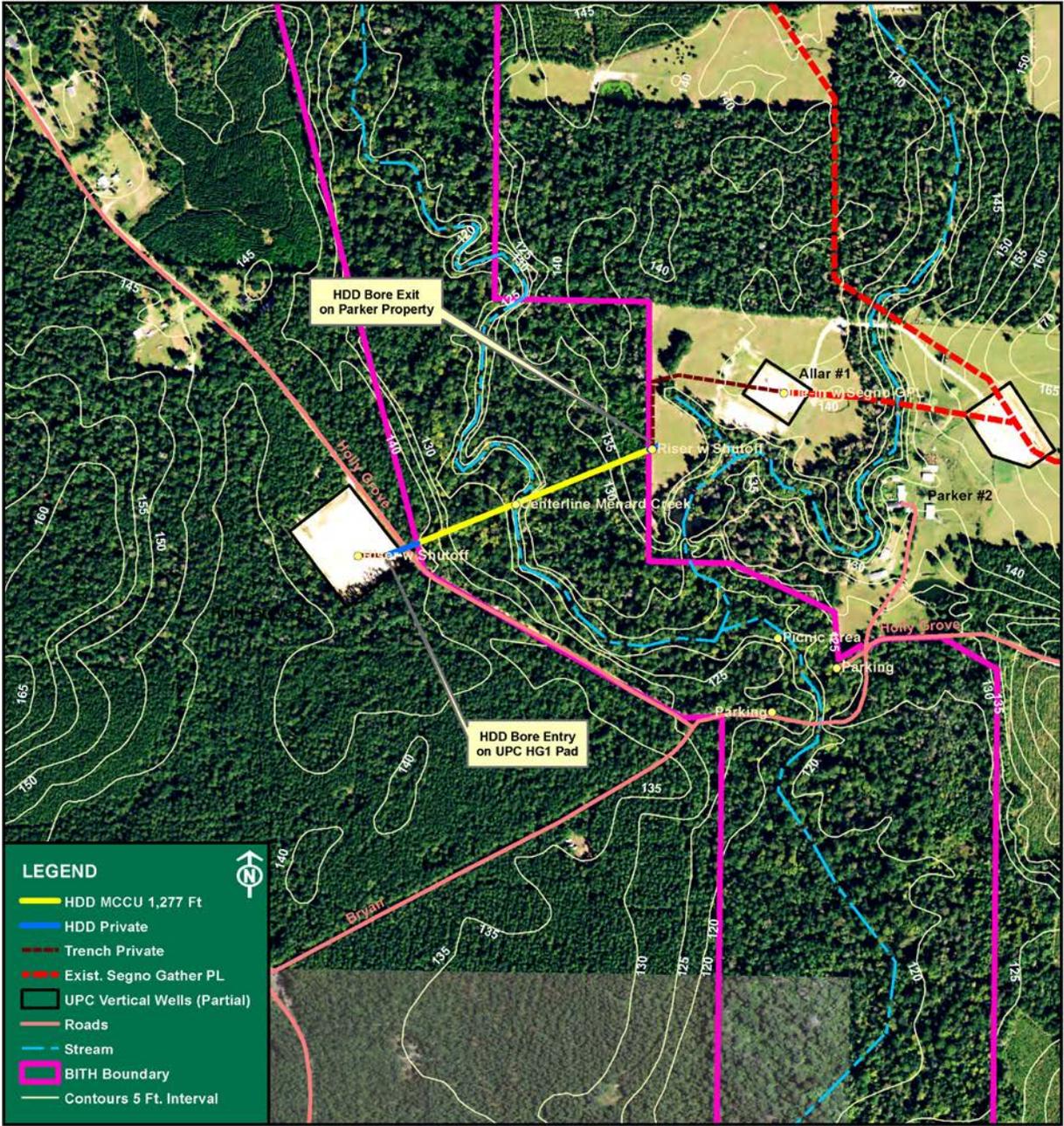


FIGURE 2. HDD BORE PROJECT AREA

**UNIT PETROLEUM COMPANY (UPC) PROPOSED GATHERING LINE
Connecting UPC Wells Holly Grove #1 and Allar #1, by HDD Boring
Beneath Menard Creek Corridor, Big Thicket National Preserve, Polk Co. TX**



PROJECT AREA - 2014 1-M NAIP BACKGROUND

1.1 Objectives

The objectives of taking action are to:

- Provide UPC, as the lessee of nonfederal oil and gas mineral interests, reasonable access for development of their mineral estate.
- Avoid or minimize impacts on the Unit’s resources and values, visitor use and experience, and human health and safety.

1.2 Special Mandates and Direction

The NPS evaluates project-specific proposals for oil and gas production and transportation on a case-by-case basis by applying a variety of current legal and policy requirements prior to issuing a permit under the general regulatory framework of the NPS Nonfederal Oil and Gas Rights Regulations (36 CFR 9B). The following discussion is a summary of the basic management direction the NPS follows for permitting nonfederal oil and gas operations in units of the National Park System.

1.2.1 NPS Nonfederal Oil and Gas Regulations, 36 CFR 9B

In 1916, Congress passed the NPS Organic Act, 16 U.S.C. § 1 et seq. Section 3 of the Organic Act authorizes the Secretary of the Interior to “make and publish such rules and regulations as he may deem necessary or proper for the use of the parks. . .” (16 U.S.C. § 3).

Pursuant to Section 3 of the NPS Organic Act and individual park statutes, the Secretary of the Interior promulgated regulations at 36 CFR Part 9, Subpart B (“9B regulations”) in 1979. The NPS updated the regulations effective December 5, 2016. The 9B regulations apply “to all operators conducting non-federal oil or gas operations on lands or waters within System units outside of Alaska, regardless of the ownership or legislative jurisdiction status of those lands of waters” (36 CFR §9.30(b)).

The 9B regulations and other regulatory requirements assist park managers in managing oil and gas activities so they may be conducted in a manner consistent with the NPS mandate to protect park resources and values.

1.2.2 NPS Oversight and Monitoring of Nonfederal Oil and Gas Operations

Under 36 CFR § 9.121 the NPS may access the area of operations at any time to monitor the potential effects of the operations and to ensure compliance with the plan of operations. In the event of any release (from within the drilled section of the gathering line, or that would pose an imminent threat to Preserve resources) of contaminating substances, as defined at 36 CFR § 9.40, UPC would promptly report the following information to the Superintendent of the Preserve: the time the release was discovered; the type of product released; the location; estimated spill volume; cause of the spill; area covered; estimated rate of release if the spill is ongoing; direction of spill movement; description of the contaminated area; proximity to surface waters, roads, or trails; weather conditions; what steps are being taken to remedy the situation; and initial response equipment required. In the event of a major release (characterized by a gas line

break or rupture or release in excess of five barrels of liquid), UPC would provide a written report to the Superintendent within 10 working days of the incident. In addition to the information contained in the initial report, the written report would include steps that would be, or have been, taken to prevent recurrence of the incident. All approved plans of operations have a spill contingency plan that is reviewed and approved by the NPS.

In addition to the remedies available to the NPS under the 9B regulations, an operator is also subject to the remedial provisions found in all applicable federal, state, and local laws. For instance, under the System Unit Resource Protection Act, 54 U.S.C. § 100731-100725, the NPS has authority to recover up to triple damages from the operator. This statute is a strict liability statute that authorizes the NPS to recover response costs and damage from a person who destroys, cause the loss of, or injures park system resources. “Park system resources” include any living or nonliving resource that is located within a park. While recovering such compensation is always an option for the NPS, the Service has a practice of encouraging operators to take appropriate measures in advance to protect park resources. Making the investment now to employ mitigation measures to lower the risk of potential impacts to park resources is a fiscally responsible step that would lower the operator’s potential liability exposure.

1.2.3 Approved Park Planning Documents

Approved park planning documents also provide a framework for determining how nonfederal oil and gas operations are conducted within Big Thicket National Preserve.

The NPS completed an Oil and Gas Management Plan (OGMP) for Big Thicket National Preserve in February 2006 (NPS 2006). The OGMP identifies Preserve resources and values susceptible to adverse impacts from oil and gas operations; describes performance standards and lists required operating stipulations and recommended mitigation measures for oil and gas operations to protect and prevent impairment to Preserve resources and values from adverse impacts from oil and gas operations and to avoid or minimize impacts from oil and gas operations on visitor use and enjoyment, human health and safety; and provides pertinent information to oil and gas operators to facilitate planning and compliance with NPS and other applicable regulations.

The General Management Plan is the major planning document for all National Park System units. The GMP sets forth the basic philosophy of the unit, and provides strategies for resolving issues, and achieving identified management objectives required for resource management and visitor use. The Final General Management Plan, Environmental Impact Statement, Big Thicket National Preserve was completed in 2014 (NPS 2014), replacing the 1980 GMP. As per the GMP, the Preserve’s OGMP, combined with the NPS nonfederal oil and gas regulations found at 36 CFR Part 9 Subpart B will continue to provide guidance on the NPS regulation of oil and gas activity within the preserve.

During the scoping and development of the Plan of Operations for the UPC gathering line and the EA, the planning framework provided in the Preserve’s OGMP and GMP have been followed.

1.3 Issues and Impact Topics Evaluated

The NPS identified the following impact topics for full evaluation in this EA:

- Natural Soundscape - Vehicles and equipment used for constructing the gathering line including a horizontal drilling rig, and the subsequent operation and eventual decommissioning of the gathering line would result in increased noise.

1.4 Issues and Impact Topics Eliminated From Further Analysis

Issues are retained for consideration and discussed in detail if:

- the environmental impacts associated with the issue are central to the proposal or of critical importance;
- a detailed analysis of environmental impacts related to the issue is necessary to make a reasoned choice between alternatives;
- the environmental impacts associated with the issue are a big point of contention among the public or other agencies; or
- there are potentially significant impacts to resources associated with the issue.

If none of the considerations above apply to an issue, they are dismissed from detailed analysis. Brief explanations for dismissal of issues and impact topics are provided below.

1.4.1 Environmental Justice

Executive Order 12898, “General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. Per the United States Census Bureau (USDC Census Bureau 2016), Polk County is not considered “low income” as fewer than 20 percent of their residents is below the poverty level (18.5 percent per the United States Census Bureau, 2014). Polk County consists predominately of white persons, comprising 84.1 percent of the total population in 2014. Since UPC would implement mitigation measures as described in Section 2.3.6, particularly protection of usable quality water zones in accordance with Railroad Commission of Texas (RRC 2016a) Statewide Rules 13 and 14 and spill prevention, the proposed action would not have disproportionate health or environmental effects on low income or minority populations in the community; therefore, environmental justice was dismissed as an impact topic in this EA.

1.4.2 Lightscape

The construction of the HDD bored gathering line is planned over a 5 day period during daylight hours. The actual HDD boring operation would require 3 days include the initial pilot bore followed by the back ream and simultaneous (back) pulling of the 8 inch gathering line pipe. Artificial lighting at the entry and exit surface locations would only be necessary if emergency conditions arise during the day that necessitates night time operations.

If nighttime operations become necessary, portable outdoor lights on telescoping masts would be located at the entry and exit and elevated to a height of approximately 20 feet and pointed downward on the equipment; the lights would be energized by portable generators. The lights would be located a minimum of 165 feet from the Unit boundary at the entry and 58 feet from the Unit boundary at the exit. The Unit is densely forested at each location. If construction occurs during dormant (winter) season, light penetration into the Unit would slightly increase due to reduced foliage. Construction would last 5 days with 3 days of boring, so if lighting became necessary, it would likely be for 1 night, or part of 1 night. Because of these conditions, there would be negligible potential for adverse impacts to lightscape. Therefore, the topic of lightscares was dismissed from further analysis in this EA.

1.4.3 Geology and Soils

Based on data from the USDA Natural Resource Conservation Service (NRCS) online Web Soil Survey (NRCS 2016) accessed on November 15, 2016, there are three soil types included in the project area, with the following properties and ratings by project location.

Entry location on the Holly Grove #1 well pad

- VtaA - Votaw fine sand, 0 to 1 percent slopes
- Prime Farmland - No
- Hydric Rating - 1
- Flooding Frequency – None
- Depth to Water Table – 160 feet

Menard Creek Corridor Unit HDD bore

- HatA - Hatliff-Pluck-Kian complex, 0 to 1 percent slopes
- Prime Farmland – No
- Hydric Rating - 62
- Flooding Frequency - Frequent
- Depth to Water Table - >157 feet

Exit location and trench to the Allar #1 well pad on the Parker property

- BoB - Boykin loamy fine sand, 1 to 5 percent slopes
- Prime Farmland - No
- Hydric Rating - 0
- Flooding Frequency – None

- Depth to Water Table - >200 feet

The deeper geology is the Wilcox oil and gas producing trend. The Wilcox group (Lower Eocene) is a thick sequence of terrigenous clastic sediments and represents the oldest sandstone / shale sequence within the Gulf Coast Tertiary System.

Lind & Associates, Inc. of Beaumont, Texas conducted a subsurface soil stratigraphy sampling on March 17 and 18, 2016 at both the entry location and the exit (Lind & Associates, Inc. March 2016). At the entry location on the HG1 well pad, the soil at a depth of 70 feet is described as a medium dense, brown and red silty-sand with some gravel. At the exit location in the Parker pasture, the soil at a depth of 70 feet is described as a dense to very dense, tan, brown and red slightly silty-sand with some rocks. No obstructions or rock strata were encountered on either side. Dense silty-sands have physical properties that are conducive to HDD construction and this strata was chosen for the bore pathway with a resulting depth of 37.5 feet below the invert of Menard Creek (TexLa Directional Drilling, Matt W. Stanley, President, telephone, July 8, 2016).

The gathering line would be constructed entirely beneath MCCU at depths ranging from 12.5 feet to 60 feet beneath the surface and would result in the removal of 931 cubic yards of soil from the space to be occupied by the gathering line.

The potential for hydraulic fracturing, also called hydrofracturing or frac-outs, where drilling fluid escapes the bore hole along a stratigraphic feature that provides a pathway to the surface, is very unlikely. The geotechnical investigation found no strata through which this bore would pass that provides a likely pathway for drilling fluids to escape to the surface. The dense silty-sand soil strata chosen for the primary depth of the bore has physical properties conducive to boring and is less likely than other soil types (clay for instance) for wall fracturing or collapse. During HDD construction, the contractor would utilize a downhole pressure monitoring tool during both the pilot hole and back reaming operations that would immediately indicate the loss of pressure and a potential frac-out, in which case drilling would immediately stop and amendments to the drilling fluid would be made to stop the leakage. Any drilling fluids that might have escaped to the surface would then be immediately removed and mitigated according to the drilling contractors Spill Prevention Containment and Contingency Plan (SPCC).

Surface subsidence would not occur. Immediately after construction, the annular space between the 16 inch diameter back ream hole and the installed 8.625 inch outside diameter gathering line would be back filled with the same bentonite slurry used in the course of HDD operation. The slurry would harden to a density similar to the surrounding soil strata and thus prevent wall collapse and any resulting surface subsidence.

The potential for leaks and spills from gathering line maintenance and operation over a period of years is very low. Corrosion inhibitors or other liquid chemicals would be periodically injected into the gathering line but in such small amounts, that if they escaped or were spilled they would be quickly contained and removed by the personnel involved. During abandonment procedures the fresh water used to purge the line would be removed by a vacuum truck and the likelihood of a spill is remote. The line would then be filled with an inert gas and capped.

Contamination through the migration of fluids along the ground surface is very unlikely. Drilling mud would be the most likely fluid to possibly escape from the off-site drilling locations. Drilling mud consists of bentonite and xanthum gum products mixed with water. Bentonite is a naturally occurring inert colloidal clay. Because the bore stratum is sand rather than clay, harsher additives such as detergents, thinners and dispersants would not be needed. Drilling fluid components are adjusted during the drilling process based on drilling fluid flow rate, hole diameter, reaming diameter, and penetration rates. Ultimately, HDD drilling fluid is almost inert with little potential for long-term environmental damage. Mitigation measures identified as part of the proposal would minimize the possibility of drilling fluid and other liquid contaminants escaping onto MCCU.

Vehicle use could result in soil disturbance from and soil contamination from the escape of vehicle fuel, lubricant, or coolant. Heavy equipment and vehicle fuel tanks usually have storage capacity of 100 gallons or less. Construction operation requires minimal land clearing and vegetation removal, resulting in very little soil disturbance and susceptibility to erosion. During rain events, runoff containing sediment or oils from vehicles or construction equipment could reach adjacent lands. However, construction is anticipated to require only 5 days, thus reducing soil erosion exposure and any releases of vehicle fluids, which would be immediately contained, removed, impacted soils excavated, and all waste properly disposed of offsite. The overall flow path of migration from the entry location into the Unit is 165 feet (with Holly Grove Road acting as a diversion), and the exit location is 58 feet from the Unit boundary. Both locations have a low gradient into the Unit which would slow runoff. The potential for runoff to reach lands inside the Unit would be remote, based on mitigation measures, site topography and geographic features. If an escape were to occur, there would be ample time, equipment (vacuum trucks) and space to respond to even a major release before there would be impacts on geology and soils in the Unit. The potential for adverse impacts on geology and soils in the Unit would be negligible from the construction of the HDD bored 8 inch gathering line.

Construction of the UPC gathering line outside the Unit would result in the short-term disturbance to geology and soils on up to 0.53 acres at the surface locations and trenching operations outside the boundary. Mitigation measures to protect soils during the drilling and transportation activities include complying with a SPCC Plan, constructing silt fencing and placing hay bales around the sites of surface disturbance, using a closed-loop containerized mud system, and disposing of drilling mud and well cuttings off-site. These measures are intended to minimize and contain any spilled substances. After the end of production activity, the area would be reclaimed. The proposed activities would result in localized, short-term to long-term, adverse impacts on geology and soils on adjacent lands.

Because impacts on geology and soils would be negligible based on the soil type, site topography, geographic features, and mitigations that would help to confine any releases to the site, the topic of geology and soils was dismissed from further analysis in this EA.

1.4.4 Water Resources, Floodplains, and Wetlands

Because the gathering line would be constructed entirely beneath MCCU at depths from the surface ranging from 12.5 feet (shallowest) at the eastern MCCU boundary to 60 feet (deepest) approximately 490 feet from the eastern boundary, there would be no impacts on the water resources, floodplains, and wetlands within the Unit from the in-park subsurface operations.

The entry location would be 165 feet from the west MCCU boundary on an existing, rock surfaced, well pad. The exit location would be 58 feet from the east MCCU boundary in an open pasture. Both locations are on flat terrain with little slope. Both locations are outside the 100-year floodplain. According to the Texas Commission on Environmental Quality Form TCEQ-0051 (Depth of Usable – Quality Ground Water to be Protected), the depth to usable quality groundwater for the HG1 and the A1 wells are each the same at 1,925 feet below the land surface and the interval from the land surface to a depth of 600 feet contains water of superior quality which must be isolated from water in underlying beds. The nearest stream within the Unit is Menard Creek. Where the bore would cross beneath the centerline of Menard Creek would be 710 feet east of the entry location and 780 feet west of the exit location.

UPC would implement a number of mitigation measures identified as part of the proposal that would prevent drilling mud, other contaminated fluids and sediments from entering groundwater, streamflow, floodplains, or wetlands. The HDD bore and connecting gathering line has been engineered to avoid streams and wetlands and would be accessed by existing roads without any human or construction activity occurring on MCCU surface. In addition, UPC's proposed mitigation measures implemented at the HDD entry and exit locations during construction and the mitigation measures and precautions installed for the later operation and maintenance phase are designed to confine impacts to the surface locations, further preventing impacts on water-related resources. These same mitigation measures would also limit the potential for runoff of contaminants to streamflow, floodplains, and wetlands, and subsurface impacts to groundwater for all phases of construction, production, and gathering line abandonment.

The effects from the connected actions to water resources would be primarily associated with surface impacts from vehicle use, gathering line maintenance activities and construction of connecting gathering lines and include the following:

- During rain events, runoff containing sediment or oils from vehicles or construction equipment could reach adjacent flow pathways to surface water. However, mechanical clearing and stabilization of the entry and exit locations would result in a less than a 5 day period of soil exposure and any releases of vehicle fluids would be immediately contained, removed, impacted soils excavated, and all waste properly disposed offsite.
- Pipe wall or valve failure could result in releases of wet natural gas to neighboring properties. Releases would likely be contained and remediated immediately due to the many automatic failure sensors and shutoff valves installed throughout the SGL

- Abandonment would provide for evacuating, purging and filling with fresh water as per all RRC requirements making impacts to water resources very unlikely.
- The probability for a major spill would be very low. The UPC SPCC, including committed manpower, would be implemented to prevent a release from reaching the Unit or remove and/or remediate released and impacted material. The same resources and efforts would be committed to potential water resource impacts outside the Unit.

There would be no impacts on water resources from proposed in-park operations, and impacts from the connected actions would be negligible based on water resources at the sites, mitigation to prevent off-site transport of any released contaminants, and the low chance of catastrophic release. Therefore, the topic of water resources in and outside the Unit was dismissed from further analysis in this EA.

1.4.5 Vegetation

The vegetation in the Unit in the proposed project area is mapped as the Lower Slope Hardwood Pine type by Harcombe and Marks (1979), except for a 150-foot wide band of Upper Slope Pine Oak Forest directly across from the HG1 location. A walking transect following the bore alignment identified the following species on the upper slopes: loblolly pine (*Pinus taeda*), shortleaf pine (*P. echinata*), eastern redcedar (*Juniperus virginiana*), American holly (*Ilex americana*), redbay (*Persea borbonea*), American beech (*Fagus grandifolia*), southern magnolia (*Magnolia grandifolia*), water oak (*Quercus nigra*), willow oak (*Q. phellos*) and white oak (*Q. alba*). Understory, midstory, vine and herbaceous species on the upper slope included: yaupon holly (*Ilex vomitoria*), deerberry (*Vaccinium* spp.), American beautyberry (*Callicarpa americana*), greenbriar (*Smilax* spp.), dewberry (*Rubus* spp.) and woodoats (*Chasmanthium* spp.). Within the Menard Creek flood plain and along its bank the following species were observed: baldcypress (*Taxodium distichum*), river birch (*Betula nigra*), black willow (*Salix nigra*), American hornbeam (*Carpinus caroliniana*), evening trumpetflower (*Gelsemium sempervirens*), and giant cane (*Arundinaria gigantea*).

Outside the Unit, the exit location on the Parker property is in a bahiagrass (*Paspalum notadum*) pasture. The entry location at the HG1 well pad is a hardened surface generally lacking vegetation. The entry and exit locations would be regraded and reseeded after the installation of the gathering line and/or plugging the HG1 well, which would remain rock surfaced until abandoned.

Under the Proposed Action, the 8 inch gathering line would be directionally drilled from privately owned entry and exit surface locations outside the Unit and reaching a depth of 37.5 feet below the invert of Menard Creek. Gyroscopic and GPS technology would guide the bit beneath the Unit and there would be no disturbance whatever to vegetation within the Unit. There would be no impacts on vegetation within the Unit from the proposed in-park subsurface HDD boring operations.

The possible impacts on the vegetation would relate to off-site migration of contaminants and sediment that could adversely affect adjacent vegetation. Wet natural gas and other hydrocarbons and chemicals can damage or kill vegetation, and soils and

sediment can smother plants or coat leaves. As previously described, topography at the entry and exit locations is relatively flat. Accordingly, there would be a low potential for migration of contaminants into the Unit and if this were to occur, there would be ample time and space to respond to even a major release before there would be impacts on vegetation in the Unit.

Construction of the gathering line would result in clearing of vegetation on up to 0.53 acres. After the gathering line is constructed the sites of surface disturbance would be reclaimed. Mitigation that would reduce impacts on offsite vegetation would be similar to those measures listed for Section 1.4.3, “Geology and Soils” and 1.4.4 “Water Resources, Floodplains and Wetlands” including SPCC plans, berms, erosion control measures, and self-contained systems. For these reasons, and with the application of mitigation measures, potential adverse impacts on vegetation in and outside the Unit from HDD boring operations over the short-term and long-term are expected to be negligible. There would be no air-quality related impacts on this resource.

There would be no impacts on vegetation from the proposed in-park HDD bored gathering line. Impacts on vegetation in the Unit from connected actions would be negligible based on the low chance of a catastrophic release, mitigation to prevent releases and offsite contamination, and the relatively flat topography and low runoff potential. Therefore, the topic of vegetation in the Unit was dismissed from further analysis in this EA.

1.4.6 Fish and Wildlife

The abundant and diverse vegetation of the Preserve supports aquatic and terrestrial habitats for a variety of fish and wildlife. Sixty species of mammals are either documented or believed to inhabit the Preserve. Birds are the most visible and diverse group of vertebrate fauna found in the Preserve. Currently, 176 species have been documented. Approximately 85 species of reptiles and amphibians are believed to inhabit the Preserve (Harcombe et al. 1996). Ninety- two species of fish are believed to inhabit Preserve waters. A recent comprehensive inventory of invertebrates documented over 1800 species (Bordelon and Knudson 1999).

Under the Proposed Action, the gathering line would be directionally drilled from privately owned entry and exit surface locations outside the Unit and reach a depth of 37.5 feet below the invert of Menard Creek. Gyroscopic and GPS technology would guide the bit beneath the Unit and there would be no human or construction disturbance whatever on the surface of the Unit that would result in impacts to wildlife, fish and aquatic life from the in-park subsurface operations.

Construction of the UPC gathering line outside the Unit would result in the short-term disturbance to terrestrial wildlife habitat on up to 0.53 acres at the surface locations and trenching operations outside the boundary. After the end of production activity, this area would be reclaimed. The entry would be located on a well pad surfaced with rock aggregate and the exit would be in an improved pasture, neither of which provide high quality habitat for terrestrial wildlife.

The nearest waterbodies where fish and aquatic life are present are Menard Creek and the privately owned man-made pond east of MCCU. The proposed project would be constructed in areas that would avoid streams and wetlands. Mitigation measures designed to protect groundwater, streamflow, floodplains and wetlands during all phases of the HDD bore, construction, production, and future abandonment (See Section 1.4.4) would limit the potential for contaminated runoff to impact water quality and fish and aquatic life.

The probability of a major rupture and loss of wet natural gas would be very low, as described in previous resource topic dismissals. Should a release occur, the SPCC Plan including committed manpower, would be implemented to remove and/or remediate released and impacted material. This and the mitigation measures mentioned in previous sections would protect all aquatic life by protecting the water resources in which they are found. These mitigation measures also would protect surrounding terrestrial wildlife habitat from the migration of sediment, hydrocarbons, and chemicals should an incident occur. Mitigation measures would include automated communication sensors that notify UPC of a line rupture and automatically shutoff the valves that would isolate the rupture. RRC regulations regarding pipeline abandonment also ensure that contaminants are not left inside the pipe. Mitigation such as containment berms, hay bales, silt fencing, closed mud system, emergency vacuum trucks, would provide protection by further mitigating any unforeseen incidents should they occur. The SPCC plan and mandatory measures provided are recognized by the NPS as suitable for protection of resources found within and outside the Unit.

Given the above, there would be no impacts on wildlife, fish and aquatic life from in-park HDD gathering line construction, and impacts from connected actions would be negligible based on mitigation to prevent off-site releases of soil, wet natural gas or chemicals, and the low chance of catastrophic release. For the reasons, the topic of fish and wildlife was dismissed from further analysis.

1.4.7 Special Status Species

Under the Endangered Species Act of 1973 (ESA), the NPS has responsibility to address impacts to federally listed threatened, endangered, candidate, and species proposed for listing. Also, NPS policy requires that state listed species, and others identified as species of management concern by the park, are to be managed in parks in a manner similar to those that are federally listed. The park has not identified any park-specific species of management concern.

A summary of potential impacts on special status species is provided below. For a more detailed analysis, see Appendix A.

Federally Threatened and Endangered Species

The NPS used the US Fish and Wildlife Service website, Information for Planning and Conservation (IPaC) (USFWS 2016a), and the Environmental Conservation Online System (ECOS) (USFWS 2016b) to obtain a list of federal endangered, threatened, proposed and candidate species and also designated critical habitat for Polk County, Texas, the county within which the gathering line project would occur. IPaC currently lists 4 birds and 1 plant species as threatened or endangered, but with no designated critical habitat, in Polk County: Least Tern (*Sterna antillarum*), Piping Plover (*Charadrius melodus*), Red Knot (*Calidris canutus rufa*), Red-cockaded Woodpecker (*Picoides borealis*), and Texas Trailing Phlox (*Phlox nivalis ssp. texensis*). ECOS also indicated that on October 6, 2016 FWS published the proposed rule to list the Louisiana Pine Snake (*Pituophis ruthveni*), as threatened.

As described in Appendix A, habitat for the Least Tern, Piping Plover, Red Knot, Red-cockaded Woodpecker, and Texas Trailing Phlox does not exist in the action area. Neither Red-cockaded Woodpeckers nor Louisiana Pine Snakes were directly observed during field evaluations, nor was any suitable potential habitat observed for these species. Furthermore, neither of these species has any recent history of occurrence in Polk County.

Based on the above information, there would be no effect to any federally listed species or critical habitat from the proposed management action.

State Threatened and Endangered Species Suspected Based on Habitat

The NPS reviewed the Texas Parks and Wildlife Department's (TPWD) Rare Threatened and Endangered Species of Texas by County webpage to obtain a list of 32 state-identified threatened, endangered, and species of greatest conservation need for Polk County.

Of the 32 state-listed species, only five aquatic species could potentially be impacted by the proposed gathering line: Creek Chubsucker (*Erimyzon oblongus*), Louisiana Pigtoe (*Pleurobema riddellii*), Texas Heelsplitter (*Potamilus amphichaenus*), Texas Pigtoe (*Fusconaia askewi*), and Triangle Pigtoe (*Fusconaia lananensis*).

These five aquatic species may occur in Menard Creek based on the presence of potential suitable habitat and the known distribution of the species. Field observations of Menard Creek indicate that it possesses habitat qualities that could support these species, primarily flowing water with a mud, sand and gravel substrate.

Potential impacts to these five aquatic species would be primarily associated with siltation during construction and spills or releases of pollutants during gathering line construction, operation and maintenance. Direct and indirect effects from these potential impacts would be from the reduction of water quality associated with inadvertent introduction of silt and/or pollutants into the creek. The 165-foot and 58-foot distances between the construction entry and exit locations and the Unit boundary, in combination with the planned erosion control measures, would control and prevent any soil movement from entering the creek. Similarly, potential spills during

construction and HDD drilling operations would be primarily confined to the entry and exit locations. Given the distances between these points and the Unit boundary, combined with project design and mitigation measures, the probability that a spill during construction from either the entry or exit locations could migrate and ultimately reach Menard Creek is negligible. A direct or indirect release of wet natural gas or corrosion inhibitors into Menard Creek from a pipe wall or valve failure would also be unlikely due to mitigation measures, including automatic failure sensors and shutoff valves that would immediately limit the volume of any release. Given this, it is unlikely a spill into Menard Creek would occur that could adversely affect these aquatic species or their habitat.

1.4.8 Cultural Resources

Under Section 106 of the National Historic Preservation Act (NHPA), the NPS has responsibility to consider the effects their undertakings may have on cultural resources listed on or eligible for listing on the National Register of Historic Places, within the Unit's boundaries.

The NPS does not have authority to require UPC to subcontract an archeological survey in the project area on the lands adjacent to the Unit. However, UPC voluntarily contracted with Dr. Victor Galan, President of Deep East Texas Archeological Consultants (DETAC) located in Nacogdoches, Texas. DETAC conducted a desktop analysis querying the Texas Historical Commission's (THC) online Texas Historic Sites Atlas (<http://atlas.thc.state.tx.us/>). The search area included the area within a 0.5 mile radius from both the entry and exit locations, inclusive of the Unit and the project area. Dr. Galan found one previously recorded historic period homestead not recommended for listing in the National Register of Historic Places roughly 0.5 miles northwest of the entry location and found no sites within the search radii that are eligible for, or recommended for listing in the National Register of Historic Places. DETAC wrote a letter to THC describing the project and the desktop analysis outcome recommending that no pedestrian survey would be necessary to which THC concurred.

There would be no potential for surface or subsurface impacts to cultural resources within the Unit from HDD boring the gathering line. There would be no surface disturbance within the Unit so impacts to surface or near surface cultural resources would not occur. There would be no subsurface impacts to cultural resources within the Unit because the shallowest depth that the bore would cross the Unit is 12.5 feet where the bore intersects the Unit boundary near the exit location. It is highly unlikely that the bore would intersect and impact any cultural resources along its path within the Unit at depths ranging from 12.5 feet to 60 feet. Therefore, in-park operations would have no effect on cultural resources.

Based on the desktop analysis, and because the entry and exit locations and trenched gathering line sections would occur entirely within severely disturbed sites (a hardened well pad and an improved pasture), impacts to cultural resources from operations outside the Unit would be very unlikely.

Based on the above information, the topic of cultural resources in the Unit was dismissed from further analysis in this EA.

1.4.9 Visitor Use and Experience

There is no potential for visitor use and experience impacts within the Unit from HDD boring operations occurring inside the Unit because these actions would occur 12.5 to 60 feet below the surface.

Project-related activities occurring outside the Unit could impact Unit visitors. The potential release of contaminants from the entry and exit sites could result in a localized closure to visitors due to contamination and remediation operations. However, as described previously, UPC has included mitigation measures (primarily an SPCC Plan), to minimize the potential for a spill and provide for response measures in the event of a release; therefore, the likelihood of such a closure is small.

Construction, operation, maintenance, and decommissioning of the gathering line outside the Unit also could impact Unit visitors as noted in Section 3.1, "Impacts on Natural Soundscape." Model results indicate that day use visitors recreating in the part of the Unit that falls within a radius of 1,920 feet from the gathering line entry point or 1,013 feet from the exit point would be subject to project-related noise as described below. Within these radii, noise levels would range from 61 to 65 dBA at each Unit boundary to 49 to 52 dBA in the interior of the Unit along Menard Creek. At 65 dBA, the noise level would be similar to that produced by a household vacuum cleaner; at 49 dBA, the noise level would be similar to that produced by conversation. These increased noise levels would generally last from 1 day (for routine maintenance and decommissioning) to 5 days (for initial construction).

Based on the above information, the topic of visitor use and experience in the Unit was dismissed from further analysis in this EA.

1.4.10 Indian Trust Resources and Sacred Sites

Within the Unit and project area, there are no Indian trust resources retained by, or reserved by or for, any Indian Tribe through treaties, statutes, judicial decisions, and Executive Orders, which are protected by a fiduciary obligation on the part of the United States.

In previous consultations with the Alabama-Coushatta Tribe of Texas for the Big Thicket National Preserve Oil and Gas Management Plan, the tribe expressed interest in preserving the Coushatta Trace, which bisects the Big Sandy Creek Unit, and pre-contact archeological sites. No surface disturbance is planned or proposed on NPS lands and the Coushatta Trace locally known as the Priest Trail is located 10.5 miles north of the project area and will not be impacted. In addition, as described in Section 1.4.8, "Cultural Resources in the Unit," UPC voluntarily contracted with Dr. Victor Galan, President of DETAC, to conduct a desktop analysis querying the Texas Historical Commission's (THC) online Texas Historic Sites Atlas (<http://atlas.thc.state.tx.us/>). Dr. Galan found no documented sacred sites within the 0.5 mile search criteria. Therefore, at this time, the NPS believes there are no sacred sites located within the Unit or project area.

Because there are no Indian trust resources or known sacred sites located or designated within the Unit or project area, these topics have been dismissed from further analysis in this EA. The NPS has initiated tribal consultation for this project with the Alabama-Coushatta Tribe of Texas, Absentee-Shawnee Tribe of Indians of Oklahoma, Caddo Nation of Oklahoma, Poarch Band of Creeks, The Muscogee (Creek) Nation, and the Thlopthlocco Tribal Town. If new information about sacred sites or other concerns is made available as a result of this consultation, the NPS may reconsider this dismissal.

1.4.11 Air Quality

The Clean Air Act (CAA), which was last amended in 1990, requires the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) (40 CFR, part 50) for pollutants considered harmful to public health and the environment. The EPA has set NAAQS for six principal pollutants, which are called "criteria" air pollutants. The six pollutants include: sulfur dioxide (SO₂), lead (Pb), nitrogen dioxide (NO₂), ozone (O₃), particle pollution (PM), and carbon monoxide (CO) (TCEQ 2016a).

The Texas Commission on Environmental Quality (TCEQ) is tasked by the EPA to comply with the CAA and NAAQS. TCEQ has developed a Texas State Implementation Plan (SIP) as the state's comprehensive plan to clean the air and meet federal air quality standards.

Polk County is located north of, and contiguous to, two designated TCEQ planning areas. The Houston, Galveston, Brazoria (HGB) area includes Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller Counties. The Beaumont-Port Arthur (BPA) area includes Hardin, Jefferson, and Orange Counties. The southern boundary of Polk County touches northeast Liberty County in the HGB, and northwest Hardin County in the BPA. The current attainment status for all six principal pollutants in both the HGB and BPA areas is "Unclassifiable / Attainment" which is defined by the EPA as "meeting the standard or expected to be meeting the standard despite a lack of monitoring data" (TCEQ 2016b).

Among the six criteria air pollutants monitored for NAAQS, only ozone is monitored in Polk County. As part of EPA's Clean Air Status and Trends Network (CASTNET), an ozone measuring instrument was installed on the Alabama-Coushatta Indian Reservation in 2011. It is located near Tombigbee Road approximately 14.5 miles north of this project area and has a CASTNET ID number of ALC188. This instrument is part of a network of ozone monitors called a Combined Statistical Area (CSA) and the data collected is reported directly to the EPA. Nonattainment for ozone is currently considered to have a Design Value (DV) >70 ppm. DV is defined as the three year average of the annual 4th highest daily maximum 8 hour average ozone concentration at each monitor in an area. The highest DV for an area is compared with the NAAQS. If the highest DV is higher than the NAAQS, then the area could be designated as nonattainment. As of August 3, 2016, the TCEQ position on Polk County is that the CASTNET monitor in Polk County does not have a valid 2013 through 2015 design value because the monitor does not meet data completeness requirements. However, the

incomplete data shows a 2015 design value of 64 ppb, or 6 ppb below nonattainment (TCEQ 2016c).

During most of the year, prevailing air flow is from the southeast and Gulf of Mexico, shifting to flow from the northwest during passages of major continental air masses (cold fronts) that generally occur in late fall, winter, and early spring. The airshed of the southern portions of the Preserve is also affected by air currents (inshore / offshore flows) from the Gulf of Mexico with daily heating and cooling. These flow patterns are considered important because they transport various air pollutants from the nearby industrial and urban areas.

The Preserve is designated a Class II area under the Prevention of Significant Deterioration (PSD) provisions of the CAA. As such, the Preserve's air quality is protected by allowing limited increases (i.e., allowable increments) over baseline concentrations of pollution for the pollutants SO₂, NO₂, and PM. The PSD permitting program is administered by TCEQ and applies to defined categories of new or modified sources of air pollution with emissions greater than 100 tons per year and all other sources greater than 250 tons per year. Based on the level of emissions, oil and gas operations may or may not be subject to the PSD permitting program. Emissions from these and other pollution sources affecting the Preserve would be considered on a project-by-project basis in the assessment of air quality impacts allowed under the PSD increment system. Emission limitations under CAA New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants may apply to certain production facilities.

The Preserve's fire management program and nonfederal oil and gas operations could locally affect air quality in the Preserve and surrounding area. Industrialization (primarily petrochemical and public utility industries) and urbanization contribute more appreciably to air quality in the vicinity of the Preserve. The nearest fire management areas in the Preserve are approximately 7 miles to the north in the Big Sandy Creek Unit. Other than timber management, there is little industrial activity in the area.

The entry location west of the Unit would have approximately 8 pieces of machinery (engines) that would be positioned approximately 165 feet from the Unit boundary. The exit location east of the Unit would have approximately 4 pieces of machinery (engines) that would be positioned approximately 58 feet from the Unit boundary. It is estimated that construction would require 5 days total, including 3 days of actual boring when peak engine emissions would occur. Because there would be approximately 12 pieces of machinery variously located at the entry and exit, and positioned some distance away from the Unit boundary, and operating for 5 days total, the potential for adverse impacts to air quality within the Unit would be negligible. Prevailing winds are also expected to help transport emissions out of the area.

Drilling and installing the gathering line would result in localized and short-term increases in particulate matter during construction activities. Vehicles and machinery would temporarily and slightly increase emissions of PM, SO₂, NO₂ and CO. The gathering line's periodic routine maintenance and one-time decommissioning would require far less equipment and thus produce far fewer emissions and impacts to air quality.

Because the gathering line would be constructed entirely beneath MCCU at depths ranging from 12.5 feet to 65 feet with construction lasting only 5 days with up to 12 pieces of machinery located between 165 feet and 58 feet from the Unit boundary, where ambient winds would likely further dissipate emission concentrations before reaching the Unit, and because the best available information indicates that Polk County is 6 ppb below ozone DV, and because periodic maintenance and ultimate decommissioning would require even less equipment, producing lower emissions than construction, there would be negligible and short-term impacts on air quality from the proposed gathering line. Based on the above information, the topic of air quality was dismissed from further analysis in this EA.

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2.0 ALTERNATIVES

Two alternatives are described and evaluated in this EA: Alternative A, No Action; and Alternative B, Proposed Action, Plan of Operations as Submitted. Alternative locations and strategies that were considered but dismissed from further analysis are then described.

2.1 Alternative A, No Action

The No Action Alternative is required under the National Environmental Policy Act (NEPA) and establishes a benchmark for comparing the present management direction and environmental consequences of the action alternative. Under No Action, UPC would not construct and operate the gathering line.

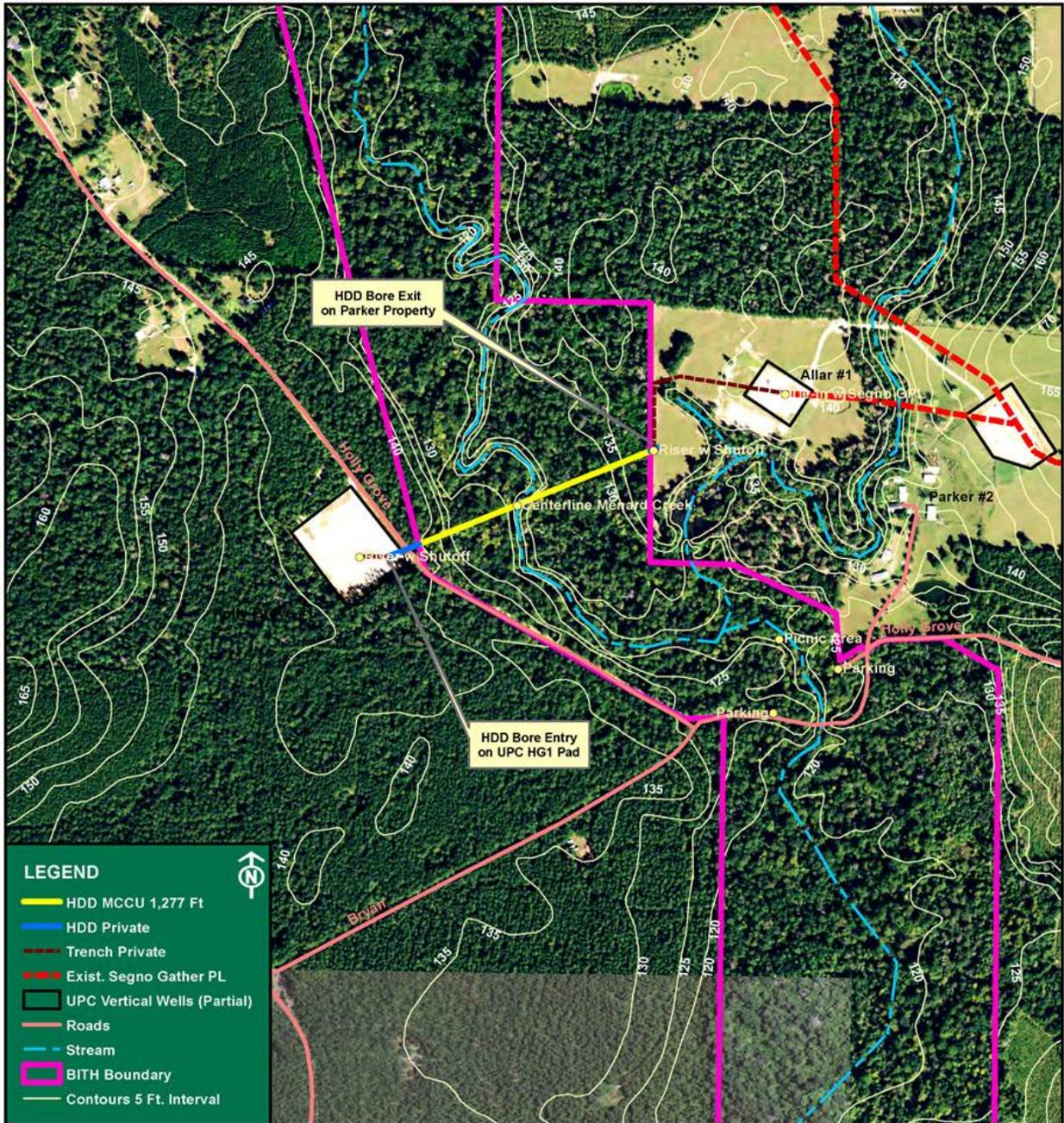
2.2 Alternative B, Proposed Action, Plan of Operations as Submitted (NPS Preferred Alternative)

Under Alternative B, UPC would construct and operate the gathering line as proposed in its Plan of Operations. Figure 3 shows the proposed HDD bored section of the gathering line and the trenched section to tie-in to the existing SGS at the Allar #1 (A1) well pad. The bore entrance would be west of MCCU on the stabilized (aggregate surfaced) HG1 well pad in the southeast quadrant and would require a bore pit approximately 10 feet wide by 20 feet long by 7 feet deep, which would be refilled when construction is completed. All entry boring equipment and facilities would be located on the HG1 surfaced pad. The bore exit pit would be approximately 10 feet wide by 15 feet long by 7 feet deep and located east of the MCCU boundary on the privately owned Parker property where UPC has leased the nonfederal minerals and the surface occupancy and use. The total length of the HDD bore would be approximately 1,500 feet from entry to exit. The portion of the bore beneath MCCU would be 1,277 feet (horizontal surface distance). The bore would be completed by first drilling a 9.5 inch diameter pilot hole, and then back-reaming a 16 inch diameter hole to accommodate the pipe's outside diameter of 8.625 inches (0.50 inch wall thickness). However, because the bore stratum is a dense sand rather than clay, harsher additives such as detergents, thinners and dispersants would not be needed. Drilling fluid components are adjusted during the drilling process based on drilling fluid flow rate, hole diameter, reaming diameter, and penetration rates.

Pipe grade would be an epoxy coated X-42/52. Prior to completing the bore, the gathering line pipe would be laid-out on the A1 side of the project where it would be welded, X-rayed, all joints properly coated and the weld would then be tested with an electronic defect detector and also pressurized with water (hydro tested), before being pulled back through the back-reamed bore. The entire bore length (1,500 feet long by 16 inch diameter) would remove approximately 25,143 cubic feet of soil or 931 cubic yards. At the east exit-side there would be one section of trenched and buried gathering line connecting the exit to the existing SGS on the A1 well pad location. This trenched portion of the gathering line would be approximately 1,000 feet long with a 20-foot wide work area and right-of-way for a total of 0.46 disturbed surface acres. At the west entry-side there would be one section of trenched

FIGURE 3. PROPOSED ACTION

**UNIT PETROLEUM COMPANY (UPC) PROPOSED GATHERING LINE
 Connecting UPC Wells Holly Grove #1 and Allar #1, by HDD Boring
 Beneath Menard Creek Corridor, Big Thicket National Preserve, Polk Co. TX**



0 250 500 750 1,000 2,000 Feet
PROJECT AREA - 2014 1-M NAIP BACKGROUND

and buried gathering line connecting the entry to the existing HG1 well. This trenched portion of the gathering line would be approximately 150 feet long with a 20-foot wide work area and right-of-way for a total of 0.07 disturbed surface acres. The total amount of disturbed surface acres for the trenched portion would be 0.53 acres (including the entrance and exit locations / pits), all located on private property and previously disturbed areas including well locations and improved pasture, where no trees or shrubs would be cut and no streams would be crossed.

2.2.1 Locations of the Gathering Line

The proposed gathering line consists of two sections; the bore from HG1 to the Parker property and the open trench from the entry and exit to the tie-ins on the HG1 and A1 well pads. The bored section is the section that would facilitate crossing the Unit and would be approximately 1,500 feet in total length (165 feet from entry to boundary + 1,277 feet beneath MCCU + 58 feet from boundary to exit = 1,500 feet). The open trench sections would total approximately 1,150 feet including 1,000 feet at the exit and 150 feet at the entrance. Please see the following sections for more detail and descriptions of other parts of the proposed operations.

The gathering line would be completed in 5 days. The boring operation is expected to take 3 days of this time. Construction of the gathering line would commence as soon as possible after approval from the NPS is obtained.

2.2.2 Access

Access to the surface location at the bore entrance is directly off of Holly Grove Road. Access to the exit point and open trench section on the Parker property would be from existing farm roads and well roads and the A1 well pad.

The directional rig would require two cables placed approximately 10 to 15 feet apart on the surface of the Preserve to guide the bit underground. Access across the Unit would be by foot only. Cutting of vegetation would not be necessary as the guide path was flagged using plastic ribbon during the alignment plat survey. This was accomplished using GPS and no limbs were cut during the survey.

2.2.3 Surface Locations

UPC has surface use rights at each surface location. The HG1 rock-surfaced well pad would contain all the entrance and drilling equipment including the directional drilling rig; a mud mixing tank; a water truck; a cable truck for directional control; a drill pipe truck; an open top steel tank for the collection of cuttings; and a vacuum truck for the removal and disposal of mud and cuttings. A pit would be dug approximately 10 feet x 20 feet by 7 feet deep to accommodate the bore machine entry and deflection. The area of surface disturbance would be limited to 200 square feet (10 ft x 20 ft) and the volume of disturbance for each pit would be about 1,400 cubic feet (10 ft x 20 ft x 7 ft). A well pad containment dike already exists along Holly Grove Road at the edge of the HG1 well pad and another dike would be constructed around the bore pit itself. Silt fencing and hay bales would be placed at the site to reduce the potential for migration of contaminants

from the site. Vacuum trucks would be available at each location for emergency evacuation of fluids should the unanticipated accident occur.

The exit of the directionally drilled section as proposed is located in a pasture on the Parker property. The direct area of disturbance at the exit location is estimated to be approximately 5 feet X 5 feet or 25 square feet which is included in the estimated surface disturbance width of 20 feet for the trenched section of gathering line. The equipment at this site would include welding trucks and pipe trailers. The section of pipe to be pulled through from this end would be laid out down the existing road system. The bore section would be completed before the open trench section would begin. Both operations would include placement of silt fencing and hay bales to reduce the potential for migration of contaminants to the surrounding area.

2.2.4 Gathering Line

Pipe grade would be an epoxy coated X-42/52. The maximum allowable operating pressure (MAOP) of this line would be 1,440 psi. Initial hydrostatic testing would be conducted at 2,160 psi as required by State specifications. The final operating pressure would be 1,000 psi, or less. To prevent external corrosion, and in addition to the external epoxy coating, UPC would install anodes at each end of this bored section of gathering line to prevent electrolysis. For internal protection, UPC would periodically inject a corrosion inhibitor into the gathering line pipe. Monitoring the effectiveness of these treatments and precautions would be accomplished by installing weight loss analysis corrosion coupons at each end of the bore which would be periodically analyzed. UPC would also periodically launch an inline inspection pig to provide information on the condition of the pipe and the extent and location of any potential problem, such as corrosion.

Safety systems upstream of the bored crossing would consist of a pneumatic high/low Pressure Pilot actuator installed on the HG1 well head to stop the flow of natural gas in the event of an alarm condition. A secondary safety system would include pressure relief valves mounted on HG1 production equipment. Overpressure conditions would also be electronically monitored with an automated telephone callout system that would alert operators that are duty around the clock (24/7/365). The downstream safety system would consist of an automatic one-way safety check valve to prevent flow from coming backwards into this line.

2.2.5 Directionally Drilled Portion of the Gathering Line

The bore entrance location would be on the existing HG1 well pad. Boring would be accomplished using a “Vermeer D220x300 Navigator” boring machine. The HG1 well pad is already surfaced / stabilized with rock aggregate and would also be enclosed with a ring levy as a secondary containment for any fluids that might inadvertently escape the bore location. The mud system would be a closed loop using the “Thunderstorm II” mixing and cleaning fluid system. Mud pits to contain mud returns would be dug at the entry point on the HG1 and at the exit point on the Parker property near the A1 well pad. Vacuum trucks would be kept onsite to transfer mud from the mud pits to the mud tanks as needed. Lost circulation materials would also be kept onsite. Traditional

bentonite and xanthum gum products would be mixed with water to create the drilling fluid. Water for the drilling fluid would be provided by an onsite water well at the HG1. During all boring activities, personnel would carefully track and observe surface conditions at the entrance and exit to ensure that no release of drilling fluids occur.

The exit location for the 9.5 inch diameter pilot hole would be located on the Parker property near the A1 well pad on the east side of the MCCU. A containment levy would also be constructed around the exit location as a secondary precaution against fluid release. The initial 9.5 inch diameter pilot hole would then be back-reamed to a diameter of approximately 16 inches. Prior to boring the pilot hole, the 8 inch inside diameter gathering line pipe would be laid-out on the A1 side of the project where it would be welded, X-rayed, all joints properly coated, “jeeped” with an electronic defect detector, and finally hydro tested, before being pulled back through the pilot hole.

Surface guidance of the bore path would be provided by a gyroscopic guidance system. At completion of the job, UPC would provide the NPS with a digital printout of actual placement of the bored gathering line (“as-Built”) which would be provided by Drillguide Steering Tools. See their website at: www.drillguide.com

Personnel on site would include seven boring crew operators, one mud engineer, one UPS construction supervisor and one foreman. One track-hoe would be located on each side of the bore with one operator each and also at least five support personnel. Additional personnel and machinery may be necessary to complete the operation as needed. On the east exit property UPC would lay hardwood mats alongside the trenched section to accommodate all-weather operations and minimize surface disturbance and erosion.

2.2.6 Trenched Portion of the Gathering Line

The trenched section of the gathering line on the east side at the Parker property would run from the bore exit location northerly along the MCCU boundary and then easterly to the A1 well pad where the tie-in to the SGS would be made. This section is approximately 1,000 feet long and uses this alignment to avoid crossing an intermittent stream. On the HG1 entry location side, it is estimated that 150 feet of trenched gathering line would be needed to tie-in the HG1 and create facilities for future tie-ins. This section would occur entirely within the existing rock surfaced well pad.

The trenched sections of the gathering line would be buried 36 inches to 48 inches below ground surface, and would require the disturbance of a 20-foot wide corridor to run the welding and ditching machinery. The proposed area of disturbance for both trenched sections is approximately 1,150 feet X 20 feet or 0.53 acres.

2.2.7 Operation and Maintenance

To prevent external pipe corrosion, and in addition to the external epoxy coating, UPC would install anodes at each end of this bored section of gathering line to prevent electrolysis. For internal pipe protection, UPC would periodically inject a corrosion inhibitor into the gathering line pipe. Monitoring the effectiveness of these treatments

and precautions would be accomplished by installing weight loss analysis corrosion coupons at each end of the bore which would be periodically analyzed. UPC would also launch an inline inspection pig monthly into this bored crossing to provide information on the condition of the pipe and the extent and location of any potential problem.

2.2.8 Reclamation Plans

UPC would provide the Preserve with copies of permits submitted to or issued by the Railroad Commission of Texas (RRC) governing the operation of the Holly Grove #1, and for future wells drilled within the gas units that include acreage within the MCCU, including permits to deepen, shut-in, re-enter, and eventually plug and abandon the well. Such permits shall be provided to the Preserve within 30 days of UPC's submittal to RRC, or issuance from RRC. When there is no reportable production quantities for no more than eighteen (18) months from the gas units that include acreage within the Menard Creek Corridor Unit, the gathering line would be decommissioned and abandoned.

All of the proposed surface locations including the entrance and exit of the directionally drilled section as well as the surface of the trenched section of the UPC gathering line would be graded to a condition as near as possible to original elevations and reseeded after operations are completed including plugging the HG1 after production has ceased. All survey stakes, flagging, trash, or other waste would be removed from the surface of Big Thicket National Preserve and the entire project area.

Upon abandonment of production and gas transport operations under the Preserve using this gathering line, UPC would remove the hydrocarbons from the UPC gathering line. The pipe would then be filled with fresh water and capped at both ends. No impacts to the surface of the Preserve are expected. If however, there are surface impacts inside the Preserve, UPC has included a statement in their Plan of Operations that indicates they would clean-up and restore affected areas within the Preserve in a manner acceptable to the Superintendent.

In order to reduce impacts on the human environment, UPC has incorporated the following mitigation measures listed in Table 1 in its Plan of Operations.

TABLE 1. MITIGATION MEASURES UNDER PROPOSED ACTION (ALTERNATIVE B)

Mitigation Measures Alt. B	Resource(s) Protected
Project Planning and Site Construction	
To eliminate noise pollution associated with this project during nighttime hours (darkness), all construction activities are planned during daylight hours, unless unforeseen circumstances require otherwise	All natural resources and human health and safety
UPC will also make earnest efforts to conduct work during weekdays to avoid disturbing weekend recreational users of MCCU, again, unless unforeseen circumstances require otherwise	All natural resources and human health and safety
Prepare and comply with a Spill Prevention Control & Countermeasure (SPCC) Plan	All natural resources and human health and safety
Drilling surface locations, access roads, and all above-surface infrastructure is located outside of MCCU	All natural resources and values in BITH
Drilling surface locations, trenching and installation operations need minimal vegetative clearing or surface disturbance on private property and NO vegetative clearing or surface disturbance on MCCU	Soils, water resources, floodplains, wetlands, vegetation
Schedule construction during daylight hours to avoid nighttime operations	Lightscape and all natural resources and human health and safety (nighttime noise pollution / disturbance)
Place silt fencing, hay bales and earthen berms as needed around any construction site of surface disturbance	Water resources, vegetation, soils
Minimize length of gathering line impacting MCCU	All natural resources and values in BITH
Gathering Line Drilling	
The HG1 well pad is already surfaced/stabilized with rock aggregate and will also be enclosed with a ring levee as a secondary containment for any fluids that might inadvertently escape the bore location	All natural resources and values in BITH
A containment levee will also be constructed around the exit location as a secondary precaution against fluid release	All natural resources and values in BITH
Vacuum trucks will be kept onsite to transfer mud from the mud pits to the mud tanks as needed	Water resources, soils, vegetation
Directionally drill gathering line from outside MCCU	All natural resources and values in BITH
Use a closed-loop containerized mud system	Water resources, soils, vegetation

Mitigation Measures Alt. B	Resource(s) Protected
Use superior grade, heavy-wall, epoxy coated pipe for improved safety	Groundwater
Use mud system and mud products with minimal environmental hazard	Water resources, soils, vegetation
Follow BITH rules for vegetative trimming for line of sight operations	Vegetation
Reclaim sites of surface disturbance by regrading, reclaiming and reseeding as needed	Soils, vegetation, water resources
Dispose of drilling mud and well cuttings off-site and legally	All natural resources and values in BITH
Product Transport and Pipeline Operation	
To prevent external pipe corrosion, and in addition to the external epoxy coating, UPC will install anodes at each end of this bored section of gathering pipeline to prevent electrolysis	All natural resources and values in BITH
For internal pipe protection, UPC will periodically inject a corrosion inhibitor into the gathering line pipe	All natural resources and values in BITH
Install automated, sensed, check valves and shut off valves on wells and gathering line. Monitor potential pipe corrosion with regular pigging and sensors	All natural resources and values in BITH
Pressure of gas in line is always less than rated pressure	All natural resources and values in BITH
Notify regulatory authorities and BITH Superintendent within 24 hours in the event of a release or spill of hydrocarbon products or other contaminating substance	All natural resources and values in BITH
Abandonment / Reclamation	
Gathering line will be purged, decontaminated, filled with water and abandoned in place according to BITH requirements	All natural resources and values in BITH
If BITH damage occurs, UPC agrees to reclaim / restore affected areas in MCCU to a condition acceptable to the Superintendent	All natural resources and values in BITH

2.2.9 Performance Bond

The approval of the Plan of Operations would be conditioned on UPC tendering a performance bond. Because construction of the gathering line via HDD would result in no surface disturbance within the MCCU, and the line would be abandoned in-place, there would be no reclamation required in the MCCU. Therefore, the NPS has set the bond amount at \$50,000, based solely on the liability portion of the operations.

2.3 Alternatives Considered but Dismissed from Further Analysis

During the scoping process for the project, alternative locations and methods were considered for the installation of the UPC gathering line. The Preserve along with UPC the NPS Minerals / Oil and Gas Program Leader for the Intermountain Region, and the Geologic Resources Division discussed these alternative locations and methods. For the reasons described below, these alternatives were not subjected to further analysis.

2.3.1 Acquisition of Mineral Rights that are Part of UPC's Proposal

In the event that a proposed operation cannot be sufficiently modified to prevent the impairment of park resources and values, the NPS may seek to extinguish the associated mineral right through acquisition, subject to the appropriation of funds from Congress. With respect to UPC's gathering line proposal, mitigation measures were identified and applied, most notably directional drilling from surface locations outside the Unit. These mitigation measures substantially reduced the potential for adverse impacts to Unit resources and values. As a result, the acquisition of mineral rights was dismissed from further consideration in this EA.

2.3.2 Trench and Install Gathering Line Alternatives

The following optional approaches for trenching the gathering line were considered:

- 1) Trenching the gathering line along the existing pipeline corridor to the north or the existing pipeline corridor to the south. (When UPC explored this option they had difficulty reaching an agreement with either of the existing pipeline owners for shared use of the right of way.)

All of the options available to trench and install the UPC gathering line across the Unit would cause surface impacts to Preserve resources. These alternatives do not meet the project objectives of allowing reasonable access for the lessee, minimizing or mitigating impacts on resources and values, and preventing impairment to Preserve resources as well as the proposed action. As a result, the options to trench and install the gathering line were dismissed from further consideration in this EA.

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3.0. AFFECTED ENVIRONMENTS AND ENVIRONMENTAL CONSEQUENCES

This section describes direct, indirect, and cumulative impacts under the two alternatives. The impact analysis includes a factual description of what is likely to happen to a resource if an alternative is implemented. The analysis also discusses and interprets the importance of those impacts by considering resource context and impact intensity.

Cumulative Impacts

The Council on Environmental Quality (CEQ) regulations, which implement the National Environmental Policy Act of 1969 (42 U. S. C. 4321 et seq.), require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions" (40 CFR 1508.7).

The following descriptions of park development and operations, and adjacent land uses provide the basis for analyzing cumulative impacts in this section.

NPS Development and Operations

Park developments that support visitor uses in the MCCU include two day-use areas, one of which is a birding hot spot with a hiking trail and the other a swimming area. These developments are located in two disjunct areas. The birding hot spot area, hiking trail and day-use area is located near Romayor and is approximately 8.0 miles to the west of the nearest oil and gas development associated with this proposed action. The Holly Grove day-use and parking area is located 0.2 miles from the exit location and 0.4 miles from the entrance location; however, in each case, almost the entire distance is heavily forested. Visitor use at both locations is generally light in the winter months and relatively heavy during the spring and summer.

Adjacent Land Uses

Of the land uses immediately adjacent to the Preserve, commercial and private forestry account for approximately 95 percent of the land area (Harcombe and Callaway 1997). Additional uses related to timberlands include encroachment onto Preserve lands, public safety concerns regarding hunting clubs on adjacent timberlands, and public use of timber company roads to access the Preserve (Harcombe and Callaway 1997).

The Railroad Commission of Texas (RRC 2016b) production data available for Polk County during the period between January 1, 2015 to December 31, 2015, shows production of 974,540 bbl oil and condensate, and 12,957,613 mcf of natural gas from gas wells and casingheads in the two counties.

3.1 Impacts on Natural Soundscape

Background

The NPS defines natural soundscape as the aggregate of all natural sounds that occur in parks, absent human-caused noise, together with the physical capacity for transmitting the natural sounds. It includes all of the sounds of nature, including such “non-quiet” sounds as birds calling, waterfalls, thunder, and waves breaking against the shore. Some natural sounds are also part of the biological or other physical resource components of parks (e.g., noise and sounds made by natural processes such as wind in trees, thunder, running water). Natural sounds occur within and beyond the range of sounds that humans can perceive, and can be transmitted through water, air, or solid material.

Sound levels are measured in decibels (dB), a logarithmic measure of acoustic energy. Because the human ear is not uniformly sensitive to all noise frequencies, the “A” weighted decibel (dBA) was derived to correspond with the ear’s sensitivity. The A-weighted frequency scale uses specific weighting of sound pressure level to better approximate human response to sound. The L90 corresponds to the 10th percentile, or the sound level that is exceeded 90% of the time. This number is analogous to the “background”, or residual sound level.

Affected Environment

The area of analysis includes the entry and exit drilling locations, representing the highest noise-producing activity, and includes the distance required for the HDD drilling noise to attenuate to the measured background sound level of 41 dBA (Foch 1999). For the entrance, the total radial distance is 1,920 feet with the entry being 165 feet from the MCCU boundary. For the exit, the total radial distance is 1,013 feet with the exit being 58 feet from the MCCU boundary. Beyond this distance, there is an increased likelihood that noise sources would no longer adversely affect the natural sounds of the Unit.

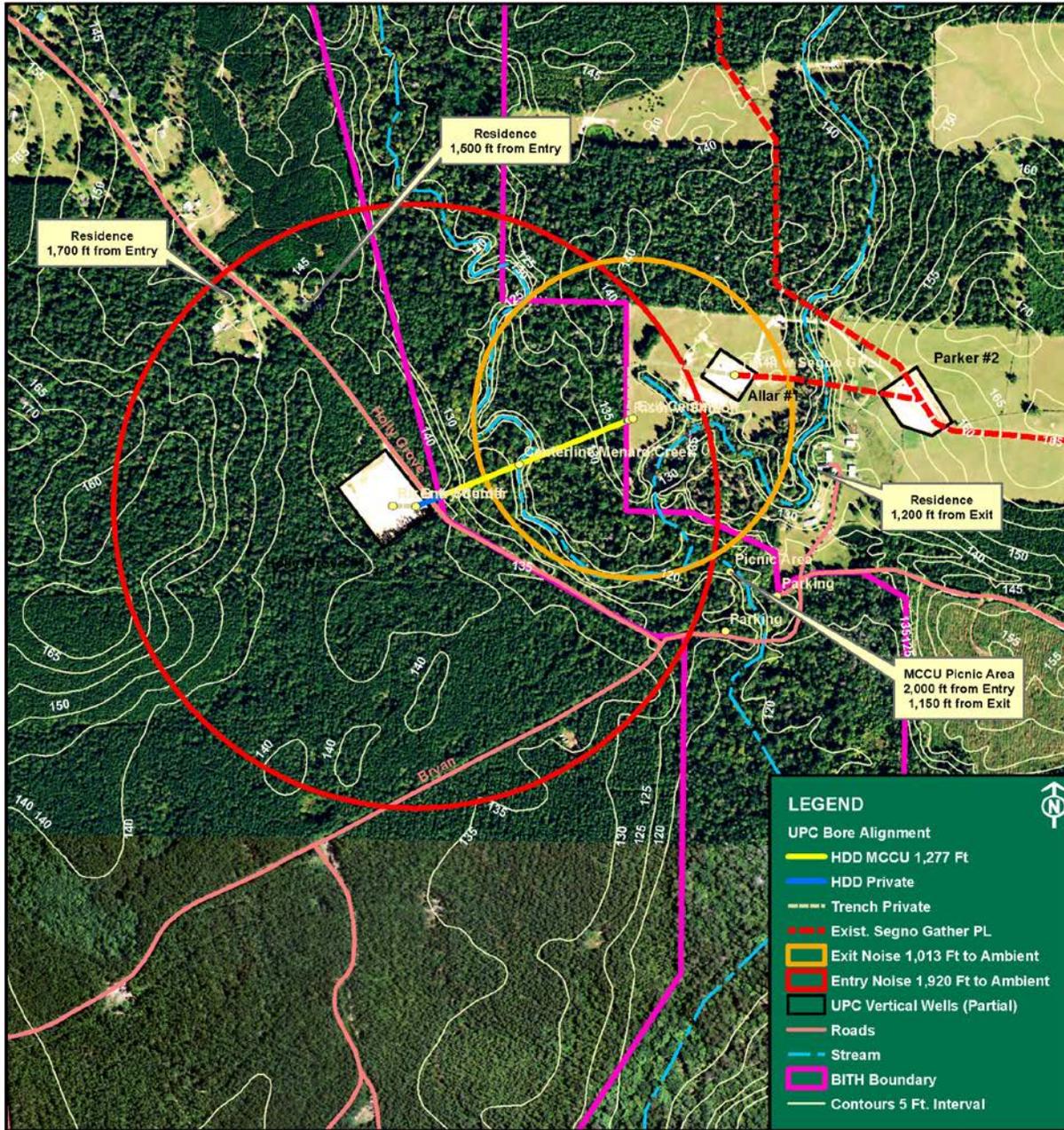
In 1999, short-term noise level monitoring was conducted in the late morning hours at a helicopter landing area along Timber Slough Road within the Upper Slope Pine Oak Forest of the Neches Bottom / Jack Gore Baygall Unit. No such noise level monitoring has occurred on MCCU, but given the similarities in forest density and species composition and terrain, the data can be reasonably used for MCCU. Ambient L90 values recorded during this time was 41dBA. Table 2 below provides a list of decibel sound levels, equivalent sounds, and how they might feel to a human listener (NPS 2006). Based on this table, the ambient L90 value of 41dBA recorded along Timber Slough Road is considered equivalent to sounds during a quiet evening at home, a drilling rig at 1,500 feet, and bird calls. The following Table 2 indicates the sound level comparisons and the Figure 4 map shows the analysis area.

TABLE 2. SOUND LEVEL COMPARISON CHART

How it Feels	Equivalent Sounds	Decibels	Sound Levels at Various Locations in Big Thicket National Preserve
Near permanent damage level from short exposure	Large caliber rifles (e.g., .243, 30-06)	140-160	
Pain to ears	.22 caliber weapon	130-140	
Very loud	Air compressor @ 20 ft. Garbage trucks and city buses	100	
Conversation Stops	Power Lawnmower Diesel truck @ 25 ft.		
Intolerable for phone use	Steady flow of freeway traffic 10 HP outboard motor Garbage disposal	90	
	Near drilling rig Automatic dishwasher Muffled jet ski @ 50 ft. Vacuum cleaner	80	
	Drilling rig @ 200 ft. Window air conditioner outside @ 2 ft.	70	
Quiet	Window air conditioner in room Drilling rig @ 800 ft. Normal conversation	60	
Sleep interference	Quiet home in evening	50	
	Bird calls Drilling rig @ 1500 ft. Library	40	Big Sandy Creek along Big Sandy Horse Trail Jack Gore Baygall Unit Lance Rosier Unit—end of Church House Rd. Turkey Creek Unit on Turkey Creek Trail and at NPS Ranch House Beech Creek Unit along Beech Woods Trail
	Soft whisper	30	
	In a quiet house at midnight Leaves rustling	20	

FIGURE 4. NOISE ANALYSIS AREA

**UNIT PETROLEUM COMPANY (UPC) PROPOSED GATHERING LINE
Connecting UPC Wells Holly Grove #1 and Allar #1, by HDD Boring
Beneath Menard Creek Corridor, Big Thicket National Preserve, Polk Co. TX**



SOUND ANALYSIS AREA - 2014 1-M NAIP BACKGROUND

Environmental Consequences

Impacts on Natural Soundscape under Alternative A, No Action

Under Alternative A, No Action, the UPC gathering line would not be directionally drilled and installed, resulting in no new impacts on the natural soundscape.

Cumulative Impacts

Since there would be no direct or indirect impacts on the natural soundscape under Alternative A, No Action, there would be no cumulative impacts.

Impacts on Natural Soundscape under Alternative B, Proposed Action, Plan of Operations as Submitted (NPS Preferred Alternative)

Spherical spreading describes the decrease in the level of sound when a sound wave propagates away from a source uniformly in all directions. According to information on sound wave propagation and attenuation by Washington State Department of Transportation (Washington State Department of Transportation 2015), sound attenuates at 6 decibels per doubling of distance over hard acoustical sites, such as paved and concrete urban environments, and 7.5 decibels over soft acoustical sites such as forests and fields. Other site-specific environmental conditions, including atmospheric absorption and terrain shielding can also increase this attenuation rate, particularly over large distances. According to Cook and Haverbeke (1974), tree cover alone may attenuate noise levels by of 4 to 8 decibels (typical). Tree cover in the area is almost continuous and contiguous west of MCCU around the entry location.

The HDD drill used in this project would be a Vermeer D220X300 Navigator Horizontal Directional Drill with a 415 HP (gross) Caterpillar C13 ACERT Tier 4i diesel engine. The sound performance specification for the CAT C13 ACERT engine is 106 dBA when standing approximately 5 feet from the machine (called spectator noise).

Table 3 below uses the 7.5 dBA attenuation rate for soft sites. The entry site uses the HDD drills ACERT engine “spectator noise” specification of 106 dBA at a distance of approximately 5 feet. The exit site uses 99 dBA at 4.8 feet, or 7 dBA less than the entry site noise level (Hoover and Keith 2010). The resulting area of analysis for natural soundscapes encompasses an area that lies within a radius of 1,920 feet from the entry location and a radius of 1,013 feet from the exit location before noise levels emanating from each location attenuate to the estimated ambient noise level of 41 dBA. The 1,920-foot radius includes an area of 266 acres and the 1,013-foot radius includes 74 acres, while the area of overlap between the areas includes 53 acres.

TABLE 3. SOUND LEVEL ATTENUATION

Entry		Exit	
Distance (ft.) from Point Source	Noise Level (dBA)	Distance (ft.) from Point Source	Noise Level (dBA)
3.125	110	3.125	103
4.8	*106	4.8	**99
6.25	102.5	6.25	95.5
12.5	95	12.5	88
25	87.5	25	80.5
50	***80	50	73
100	72.5	100	65.5
200	65	200	58
400	57.5	400	50.5
800	50	800	43
1,013	48	1,013	****41
1,600	42.5	1,600	35.5
1,920	****41	1,920	28
3,200	35	3,200	20.5

* 106 dBA at 4.8 ft. from ACERT engine (spectator noise level spec.)

** Hoover & Keith (2010) "...exit...typically 6 to 8 dBA lower...than entry..." - 7dBA used

*** Agrees with FHA Spec. of 80 dBA at 50 ft. for Horizontal Boring Hydraulic Jack

**** Ambient sound level of Neches Bottom/Jack Gore Baygall Unit (Foch, 1999)

There are 2 Noise Sensitive Areas (NSA) within the analysis area. An NSA is a management designation that limits the noise level from long-term and/or continuous noise producing sources because of the area's use by humans or special status wildlife species and the importance of reduced noise levels to such use. Two residential homes are inside the 1,920- foot sound radius located 1,500 feet and 1,700 feet north of the entry location.

One residence is outside the 1,013- foot sound radius and is located 1,200 feet east of the exit location. The Holly Grove day-use and parking area is outside both the 1,920- foot and 1,013- foot radii. Please see the map included as Figure 4 which shows all of these locations and the two radii. The FHWA Roadway Construction Noise Model version 1.1(FHWA 2016b) was used to estimate the noise level at the 2 NSA locations inside the analysis area (In) and also the 2 NSA locations that are located just beyond the analysis area (Out) as indicated in Table 4 below.

TABLE 4. FHWA RCNM NOISE SENSITIVE AREA ANALYSIS

Noise Sensitive Area	Distance Ft	Spec. Lmax	Actual Lmax	Shielding dBA	*Lmax	**L10	dBA Range
Res. N. of Entry (In)	1,700	80	82	7.5	43.9	40.8	41-44
Res. N. of Entry (In)	1,500	80	82	7.5	45	41.9	42-45
Res. E. of Exit (Out)	1,200	70	73	7.5	37.7	37.7	38
Day-use E. of Entry (Out)	2,000	80	82	7.5	42.5	39.4	40-43

*Calculated Lmax: the A-weighted, maximum sound level

**Calculated L10: the noise level just exceeded for 10% of the measurement period

Model results indicate any person or persons recreating within the area of analysis (the entry 1,920- foot and the exit 1,013- foot radii) would be subject to varying levels of noise depending on their location that would range from 61 to 65 dBA at each Unit boundary and 49 to 52 dBA in the interior of the Unit along Menard Creek. The overall range of noise is estimated to be between 49 and 65 dBA, or respectively, similar to the noise level produced by conversation and a household vacuum cleaner. As described in Table 1 “Mitigation Measures,” UPC would schedule all construction activities during daylight hours to avoid nighttime operations, which would occur only as the result of unavoidable (emergency) conditions.

Constructing the gathering line, routine maintenance and eventual decommissioning would result in increased noise levels for periods ranging from 1day (routine maintenance and decommissioning) to 5days (construction). Elevated noise would be greatest during the short-term estimate of 3 days drilling and 5 days total construction period for the bored section of gathering line. Sound levels would reach up to 106 dBA immediately beside the drilling rig. At 1,920 feet from the drilling rig, sound levels would approach the estimated background level of 41 dBA.

The exit location is a small open pasture ultimately surrounded by forest at various distances. Elevated noise during the drilling phase would result in adverse impacts on natural soundscapes within 1,920 feet of the drilling equipment and 1,013 feet of the exit location. The Unit is 1,277 feet wide at the site of the bored section of gathering line. The Unit boundary is approximately 165 feet from the entry location and 58 feet from the exit location. This means that elevated noise would extend from the entry location across the Unit to the exit location during the 3- day drilling phase.

During operation of the gathering line, routine maintenance could occur. These maintenance activities could involve the use of pickup trucks (75 dBA), flatbed trucks (74 dBA) and welding machines (74 dBA). During decommissioning of the gathering line, equipment could include pickup and flatbed trucks, cutting torches (74 dBA), backhoes (78 dBA) and front loaders (79 dBA). Routine maintenance could occasionally increase noise levels for a likely period of 1 day at estimated levels ranging from 74-75 dBA. Decommissioning could increase noise levels for a likely period of 1 day (over the entire lifetime of the gathering line) at estimated levels ranging from 74-79 dBA. Both routine maintenance and decommissioning of the gathering line could occur over a shorter

period of time and at a lower dBA than construction. The FHWA Roadway Construction Noise Model (RCNM, version 1.1) was used for machinery dBA levels.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions that have impacted noise levels in MCCU include: various local equipment (lawn mowers, chainsaws, farm tractors, power tools); logging equipment (skidders, feller-bunchers, loaders, haul trucks); maintenance and construction of right-of-ways and utility easements (bush-hogs and mulchers); firearms during the general hunting season and extended feral hog season; equipment on well sites outside MCCU (compressors); swimmers, picnickers, canoers, kayakers; 16-wheelers, pickup and flatbed trucks and passenger vehicles; aircraft overflights; boat motors; motorcycles and all-terrain vehicles.

These man-made activities create sounds that could be present periodically and throughout the year ranging from 41 dBA (ambient sound level in quiet areas of the Unit); to periodic vehicular traffic (75 dBA for pickup trucks); to higher peak sound levels for large caliber gun fire occurring infrequently. Collectively, all of these actions have had, and would continue to have seasonal, long-term and short-term adverse impacts on the MCCU soundscape due to noise levels ranging from 41 dBA to 79 dBA for short times and confined areas. As previously described in this EA, the direct and indirect impacts of Alternative B on the MCCU soundscape would be short-term, lasting from 1-day to 5-days, and for the 2 identified NSAs inside the noise analysis area (Table 3), noise levels would range from 41 dBA to 45 dBA, indicating an estimated noise level of 3 dBA above ambient. When the effects of Alternative B are combined with other past, present, and reasonably foreseeable future impacts, the total cumulative impact on the Unit would continue to be minimally adverse. The incremental impacts of Alternative B would contribute slightly to, but would not substantially change, the impacts that are already occurring.

4.0 CONSULTATION

Persons and agencies consulted are listed below:

National Park Service

Wayne Prokopetz, Superintendent, Big Thicket National Preserve, Kountze, TX
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Federal Government

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State Government

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Amy Turner, Texas Parks and Wildlife Department

Organizations and Businesses

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General Public

Individuals and entities on Big Thicket National Preserve mailing list

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APPENDIX A

Impacts on Special Status Species

Under the Endangered Species Act of 1973 (ESA), the NPS has responsibility to address impacts to federally listed threatened, endangered, candidate, and species proposed for listing. Also, NPS policy requires that state listed species, and others identified as species of management concern by the park, are to be managed in parks in a manner similar to those that are federally listed. The park has not identified any park-specific species of management concern.

Action Area

Potential project impacts to physical, chemical, and biological components of land, air, and water include noise impacts from HDD drilling operations and the inadvertent release of pollutants from the pipeline into Menard Creek. The combined zone of effect for these two project impacts define the outermost extent of the geographic area of all probable project related impacts and provide the limits of the action area boundary.

Potential impacts to Menard Creek would be primarily associated with spills or releases of pollutants during gathering line construction and activities associated with operation and maintenance. Reclamation and abandonment of the gathering line would be restricted to purging the pipeline of natural gas, filling it with it with an inert gas and capping. None of these procedures represent an impact to Menard Creek or adjacent terrestrial habitats and were dismissed as factors relevant to defining the limits of the action area boundary. A number of project design considerations and measures to minimize and mitigate the potential for fluid releases and procedures to manage and respond to releases when they do occur would be implemented. These include using current technologies to manage and direct HDD drilling operations that limit the potential escape of drilling fluids; an SPCC plan to manage and respond to releases; on-site containment systems and processes during construction and HDD drilling operations; erosion control measures; and pipeline inspection, monitoring and treatment processes that limit the potential of pipeline wall failure. Potential spills during construction and HDD drilling operations would be primarily confined to the entry and exit locations both of which are located over 700 feet from the centerline of Menard Creek. Given these distances in combination with the above described measures and processes, there is low probability that a spill from either the entry or exit locations could ultimately reach Menard Creek. A direct or indirect release of wet natural gas or corrosion inhibitors into Menard Creek from a pipe wall or valve failure is also unlikely due to the minimization and mitigation measures that have been described including automatic failure sensors and shutoff valves that would immediately limit the volume of any release. Given this combination of project design considerations and measures, it is unlikely a spill into Menard Creek would occur or if a spill does occur proposed measures would limit the volume and impact to negligible levels.

The area of analysis for noise impacts includes the entry and exit drilling locations, representing the highest noise-producing activity, and includes the distance required for the HDD drilling noise to attenuate to the measured background sound level of 41 dBA.

The radial distances from the drilling locations to reach this level of attenuation are 1,920 feet for the entrance and 1,013 for the exit. Beyond the distances for these two locations, there is an increased likelihood that noise sources would no longer adversely affect the natural sounds of the Unit or listed species that potentially occur in the area. The combined noise analysis areas for the entry and exit locations provide the outermost extent of effect and was used to define and limit the boundary of the action area. Given the limited potential of a spill from the gathering line into Menard Creek and the assumption that a spill would be confined and limited to the immediate vicinity of where the gathering line crosses the creek, impacts associated with spills are considered within the action area boundary defined by the noise analysis area.

Federally Threatened and Endangered Species Suspected Based on Habitat

The US Fish and Wildlife Service (FWS) websites named Information for Planning and Conservation (IPaC) (USFWS 2016a) and Environmental Conservation Online System (ECOS) (USFWS 2016b) were used to obtain a list of federal endangered, threatened, proposed and candidate species and also designated critical habitat for Polk County, Texas. IPaC was accessed initially on February 5, 2016 (for the field survey) and again on November 16, 2016 (for the final EA). EC OS was accessed on November 28, 2016 to confirm the most current listing status of the Louisiana Pine Snake (*Pituophis ruthveni*). IPac currently lists 4 birds and 1 plant species as threatened or endangered with no designated critical habitat in Polk County. ECOS indicates that on October 6, 2016 FWS published the proposed rule to list the Louisiana Pine Snake as threatened.

The action area was reviewed for potential/suitable habitat for listed species. Species with no potential or suitable habitat or outside of the species' distributional range were excluded from further review. Appendix A1 below lists those species that are known or could potentially occur in the action area, species having the potential to occur within the action area based on habitat requirements and known locations, and those that have been excluded from further analysis with rationale. A brief description of their range and habitat requirements is also included.

Field evaluation of habitat conditions was completed within the action area on February 9, 2016 by Mr. Joe Hamrick (Raven, Compliance Project Manager, Huntsville, TX) and on February 16, 2016 by Mr. Eric Keith (Raven, Project Manager, Huntsville, TX). These surveys included both presence/absence observations for individual species and an evaluation of habitat conditions to determine whether suitable potential habitat is present in the project area that would support listed species identified for Polk County, Texas. These surveys were conducted for listed species identified by FWS and TPWD for Polk County.

APPENDIX A1 FEDERALLY LISTED ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES FOR POLK COUNTY, TEXAS

Species Common Name, <i>Scientific Name</i>	Federal Status ¹	Potential to Occur	Critical Habitat	Exclusion Rationale ²	Habitat Description & Range in Action Area
Amphibians and Reptiles					
Louisiana Pine Snake, <i>Pituophis ruthveni</i>	P	No	No	HAB	Open, grassy, fire-maintained, mixed deciduous-longleaf pine woodlands; primary prey is pocket gophers; breeds Apr-Sep
Birds					
Least Tern, <i>Sterna antillarum</i>	E	No	No	HAB	Least terns nest on barren to sparsely vegetated sandbars along rivers, sand and gravel pits, lake and reservoir shorelines, and occasionally gravel rooftops. They hover over and dive into standing or flowing water to catch small fish. Interior least terns breed in isolated areas along the Missouri, Mississippi, Ohio, Red, and Rio Grande river systems. They winter along coastal areas of Central and South America and the Caribbean Islands, but not a lot is known about their wintering areas.
Piping Plover, <i>Charadrius melodus</i>	T	No	No	HAB	Sandy beaches, tidal flats. Nests in open sandy situations near water, in a variety of settings: beaches along Atlantic Coast and Great Lakes; sandbars along major rivers on northern Great Plains; gravel or sand flats next to alkali lakes. Winters along coast, on tidal flats and beaches. Piping plovers are migratory birds. In the spring and summer they breed in northern United States and Canada. There are three locations where piping plovers nest in North America: the shorelines of the Great Lakes, the shores of rivers and lakes in the Northern Great Plains, and along the Atlantic Coast. Their nesting range has become smaller over the years,

Species Common Name, <i>Scientific Name</i>	Federal Status ¹	Potential to Occur	Critical Habitat	Exclusion Rationale ²	Habitat Description & Range in Action Area
					especially in the Great Lakes area. In the fall, plovers migrate south and winter along the coast of the Gulf of Mexico or other southern locations. Critical Habitat has been designated for the piping plover, but it is not in Polk County, Texas.
Red Knot, <i>Calidris canutus rufa</i>	T	No	No	HAB	Tidal flats, shores; tundra (summer). In migration and winter on coastal mudflats and tidal zones, sometimes on open sandy beaches of the sort favored by Sanderlings. Nests on Arctic tundra, usually on rather high and barren areas inland from coast, but typically near a pond or stream. It nests in the far north, mostly well above the Arctic Circle (the first known nest was discovered during Admiral Peary's expedition to the North Pole in 1909); its winter range includes shorelines around the world, south to Australia and southern South America.
Red-cockaded Woodpecker, <i>Picoides borealis</i>	E	No	No	HAB	Open, grassy, fire-maintained pine forests; constructs nest cavity in older living pine (60+ years); forages in younger pine (30+ years); prefers longleaf, shortleaf, and loblolly
Plants					
Texas Trailing Phlox, <i>Phlox nivalis ssp. texensis</i>	E	No	No	HAB	Relatively open, fire-maintained pine or pine-hardwood forests on soils with a deep, sandy surface layer and clayey subsurface layers; flowers late Mar-Apr

¹Status Codes: E=Endangered; T=Threatened; P=Proposed; C=Candidate

²Exclusion Rationale Codes: ODR=Outside known distributional range of the species; HAB=No habitat present in action area; ELE=Outside of elevational range of species; SEA=Species not expected to occur during the season of use/impact

Effect Determinations for Federally Listed Species

The Least Tern, Piping Plover, Red Knot, Red-cockaded Woodpecker, and Texas Trailing Phlox are dismissed from further analysis, as the habitat for these species does not exist in the action area. Neither Red-cockaded Woodpeckers nor Louisiana Pine Snakes were directly observed during field evaluations, nor was any suitable potential habitat observed for these species anywhere in the action area. The Louisiana Pine Snake is now rarely encountered in Texas. Recent records from the last 10 years have confirmed the presence of Louisiana Pine Snakes in only 5 Texas counties: Sabine, Newton, Angelina, Jasper and Tyler (U.S. Fish and Wildlife Service, 2014). Similarly, the Red-cockaded Woodpecker is also now rare in Texas, particularly in and around Polk County. There are 2 nearby Audubon Society Christmas Bird Count Circles, the Turkey Creek (TXTC) and Pineywoods (TXTP) circles, neither of which have any records of RCW (National Audubon Society, 2016). The nearest US Geological Survey Breeding Bird Survey Route is the Big Sandy BITH line (number 83904) which also has no records of RCW (US Geological Survey, 2016). The last observation of Red-cockaded Woodpecker reported for Polk County in eBird was on November 1987 (eBird 2016). Given neither of these species have any recent history of occurrence in Polk County and field evaluations indicate no potential suitable habitat is present in the action area for either species, both species were also excluded from further analysis. Based on the above rationale, there would be “no effect” to any federally listed or proposed species (listed in Appendix A1 above) from the proposed management action.

State Threatened and Endangered Species Suspected Based on Habitat

The Texas Parks and Wildlife Department’s (TPWD) Rare Threatened and Endangered Species of Texas by County webpage was accessed initially on February 5, 2016 (for the field survey) and again on November 16, 2016 (for the final EA) to obtain a list of state-identified threatened, endangered, and species of greatest conservation need for Polk County. The TPWD species list did not change between these two dates. The following table lists those species.

APPENDIX A2 . STATE LISTED ENDANGERED, THREATENED AND SPECIES OF GREATEST CONSERVATION NEED FOR POLK COUNTY, TEXAS

Species Common Name, <i>Scientific Name</i>	State Status ¹	Potential to Occur	Critical Habitat	Exclusion Rationale ²	Habitat Description & Range in Action Area
Amphibians and Reptiles					
Southern Crawfish Frog, <i>Lithobates areolatus areolatus</i>	SGCN	No	No	HAB	Abandoned crawfish holes, small mammal burrows; moist meadows, pasture, pine scrub, river flood plains; only leaves burrow area to breed

Species Common Name, <i>Scientific Name</i>	State Status ¹	Potential to Occur	Critical Habitat	Exclusion Rationale ²	Habitat Description & Range in Action Area
Alligator Snapping Turtle, <i>Macrochelys temminckii</i>	T	No	No	HAB	Perennial water bodies, deep rivers, lakes, swamps; mud bottom, abundant aquatic vegetation; may migrate several miles along rivers; active Mar-Oct; breeds Apr-Oct
Timber Rattlesnake, <i>Crotalus horridus</i>	T	No	No	HAB	Swamps, floodplains, upland pine, deciduous woodlands, riparian zones, farmland; sandy soil or black clay; prefers dense ground cover: grapevines, palmetto
Birds					
American Peregrine Falcon, <i>Falco peregrinus anatum</i>	T	No	No	HAB	Year-round resident, winters along coast, breeds in west TX, nests in tall cliff eyries; wide range of habitats during migration; low-altitude migrant
Arctic Peregrine Falcon, <i>Falco peregrinus tundrius</i>	SGCN	No	No	HAB	Migrant throughout TX from subspecies' far northern breeding range, winters along coast, breeds in west TX, nests in tall cliff eyries; wide range of habitats during migration; low-altitude migrant
Bachman's Sparrow, <i>Aimophila aestivalis</i>	T	No	No	HAB	Open pine woods with scattered bushes, grassy understory, overgrown grassy hillsides or fields with thickets and brambles, grassy orchards; nests on ground against grass tuft or under low shrub
Bald Eagle, <i>Haliaeetus leucocephalus</i>	T	No	No	HAB	Near rivers, large lakes; nests in tall trees or cliffs near water; communal roost, especially in winter; hunts live prey, scavenges, and pirates food from other birds
Henslow's Sparrow, <i>Ammodramus henslowii</i>	SGCN	No	No	HAB	Wintering individuals (not flocks) found in weedy fields or cut-over areas with bunch grasses, vines, brambles; key component is bare ground for running/walking

Species Common Name, <i>Scientific Name</i>	State Status ¹	Potential to Occur	Critical Habitat	Exclusion Rationale ²	Habitat Description & Range in Action Area
Peregrine Falcon, <i>Falco peregrinus</i>	T	No	No	HAB	Migrates across TX from breeding areas in US, Canada, winters along coast; subspecies (<i>F. p. anatum</i>) also resident breeder in west TX; two subspecies' status differ, <i>F.p. tundrius</i> not FWS listed in TX; subspecies not easily distinguished at distance so reference usually made at species level
Sprague's Pipit, <i>Anthus spragueii</i>	SGCN	No	No	HAB	Only in TX during migration and winter, mid Sep-Apr; short to medium distance diurnal migrant; strongly tied to native upland prairie, locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size, avoids edges
Swallow-tailed Kite, <i>Elanoides forficatus</i>	T	No	No	HAB	Lowland, swampy forests, ranging into open woodland; marshes, rivers, lakes, ponds; nests high in tall tree in clearing or on forest edge, usually in pine, cypress, or deciduous trees
Wood Stork, <i>Mycteria americana</i>	T	No	No	HAB	Forages in prairie ponds, flooded pastures, shallow standing water; roosts communally in tall snags often with other wading birds; breeds in Mexico, moves to Gulf States to mud flats, even forests; formerly nested in TX, no breeding records since 1960
Fishes					
American Eel, <i>Anguilla rostrata</i>	SGCN	No	No	ODR	Coastal waterways below lakes to gulf; spawns Jan-Feb in ocean, larva move to coastal waters, metamorphose, females move to freshwater; in most aquatic habitats with access to ocean, mud bottoms, still waters, large streams, lakes; can travel overland in wet areas; males in brackish estuaries; diet varies widely, geographically, and seasonally

Species Common Name, <i>Scientific Name</i>	State Status ¹	Potential to Occur	Critical Habitat	Exclusion Rationale ²	Habitat Description & Range in Action Area
Creek Chubsucker, <i>Erimyzon oblongus</i>	T	Yes	No		Tributaries of Red, Sabine, Neches, Trinity, and San Jacinto Rivers; small rivers, creeks, seldom in lakes or springs; prefers headwaters; young typically in headwaters or marshes; spawns in river mouths, pools, riffles, lake outlets, upstream creeks
Orangebelly Darter, <i>Etheostoma radiosum</i>	SGCN	No	No	ODR	Red through Angelina Rivers; headwaters, high gradient to sluggish streams, gravel, rubble riffles; eggs buried in gravel, riffle raceways, post-larvae in quiet water, move to faster water as they mature, young feed mostly on copepods and cladocerans, adults on mayfly and fly larvae, spawn late Feb to mid-Apr in east TX
Paddlefish, <i>Polyodon spathula</i>	T	No	No	ODR, HAB	Large, free-flowing rivers, will frequent lakes with access to spawning sites; spawns in fast, shallow water over gravel; larvae may drift from reservoir to reservoir
Mammals					
Black Bear, <i>Ursus americanus</i>	T	No	No	HAB	Bottomland hardwoods and large tracts of inaccessible forested areas
Louisiana Black Bear, <i>Ursus americanus luteolus</i>	T	No	No	HAB	Bottomland hardwoods and large tracts of inaccessible forested areas
Plains Spotted Skunk, <i>Spilogale putorius interrupta</i>	SGCN	No	No	HAB	Catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, woodlands; prefers brushy woods, tallgrass prairie
Rafinesque's Big-eared Bat, <i>Corynorhinus rafinesquii</i>	T	No	No	HAB	Roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures
Red Wolf, <i>Canis rufus</i>	E	No	No	HAB	Extirpated; formerly known throughout eastern half of TX in brushy, forested areas, as well as coastal prairies

Species Common Name, <i>Scientific Name</i>	State Status ¹	Potential to Occur	Critical Habitat	Exclusion Rationale ²	Habitat Description & Range in Action Area
Southeastern Myotis Bat, <i>Myotis austroriparius</i>	SGCN	No	No	HAB	Roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures
Mollusks					
Louisiana Pigtoe, <i>Pleurobema riddellii</i>	T	Yes	No		Streams, moderate-size rivers, usually flowing water, substrates of mud, sand, and gravel; not generally known from impoundments; Sabine, Neches, Trinity River basins
Sandbank Pocketbook, <i>Lampsilis satura</i>	T	No	No	ODR	Small to large rivers with moderate flow, swift current on gravel, gravel-sand, and sand bottoms; Sulfur, San Jacinto and Neches River basins
Southern Hickorynut, <i>Obovaria jacksoniana</i>	T	No	No	ODR	Medium sized gravel substrates, low to moderate current; Neches, Sabine, and Cypress River basins
Texas Heelsplitter, <i>Potamilus amphichaenus</i>	T	Yes	No		Quiet waters in mud or sand and also in reservoirs; Sabine, Neches, and Trinity River basins
Texas Pigtoe, <i>Fusconaia askewi</i>	T	Yes	No		Rivers with mixed mud, sand, and fine gravel in protected areas associated with fallen trees or other structures; Sabine through Trinity, San Jacinto River basins
Triangle Pigtoe, <i>Fusconaia lananensis</i>	T	Yes	No		Mixed mud, sand, and fine gravel substrates; Neches River basin in the Angelina branch and possibly Village Creek
Plants					
Florida Pinkroot, <i>Spigelia texana</i>	SGCN	No	No	HAB	Woodlands on loamy soils; perennial; flowers Mar-Nov; fruits Apr-Nov
Panicled Indigobush, <i>Amorpha paniculata</i>	SGCN	No	No	HAB	Stout shrub, 9 ft tall, acid seep forests, peat bogs, floodplain forests, seasonal wetlands at edge of saline prairies; fuzzy leaflets with raised veins underneath; flower panicles 8-16 in long, slender, above foliage; perennial; flowers summer

Species Common Name, <i>Scientific Name</i>	State Status ¹	Potential to Occur	Critical Habitat	Exclusion Rationale ²	Habitat Description & Range in Action Area
Texas Screwstem, <i>Bartonia texana</i>	SGCN	No	No	HAB	Acid seeps, pine-oak forests, gentle slopes, baygall shrub thickets at spring heads; clumps of bryophytes at tree bases, on roots, logs; flowers Sep-Nov, fruits mid-late Oct
Topeka purple-coneflower, <i>Echinacea atrorubens</i>	SGCN	No	No	HAB	Mostly tallgrass prairies of the southern Great Plains, blackland prairies, also limestone hillsides; perennial; flowers Jan-Jun; fruits Jan-May

¹Status Codes: E=Endangered; T=Threatened; SGCN=Species of greatest conservation need, but with no regulatory listing status

²Exclusion Rationale Codes: ODR=Outside known distributional range of the species; HAB=No habitat present in action area; ELE=Outside of elevational range of species; SEA=Species not expected to occur during the season of use/impact

TPWD lists 32 species for Polk County. Five of these species were carried forward for further analysis based on the presence of potential suitable habitat in the action area and the known distributional ranges of the species. All five are aquatic species, including: Creek Chubsucker, Louisiana Pigtoe, Texas Heelsplitter, Texas Pigtoe, and Triangle Pigtoe. The remaining 27 species were not carried forward for further analysis for reasons described in Appendix A2.

Environmental Baseline

Five aquatic species may occur in Menard Creek based on the presence of potential suitable habitat in the action area and the known distribution of the species. The Creek Chubsucker is an herbivorous and invertivorous freshwater fish species that occupies small rivers and creeks of various types and is often associated with sand and gravel bottomed pools and vegetation (Page and Burr 2011). The remaining four aquatic species are freshwater mussels that are known to occupy streams and moderate-size rivers usually with flowing water and a substrate of mixed mud, sand, and fine gravel (Howells et al. 1996, Howells 1997). Field observations of Menard Creek indicate that it possesses habitat qualities that could support these species, primarily flowing water with a mud, sand and gravel substrate. All five of these species are restricted endemics that have experienced large-scale recent declines in numbers and whose complete range is not fully known. Major threats to these species include an array of activities including increased siltation, pollution, fluctuating water levels and competition with various non-native aquatic species (Neck and Howells 1994).

Potential impacts to the 5 aquatic species that may occur in Menard Creek would be primarily associated with siltation during construction and spills or releases of pollutants during gathering line construction, operation and maintenance. Direct and indirect effects from these potential impacts would be from the reduction of water quality associated with inadvertent introduction of silt and/or pollutants into the creek. Water

quality could be adversely impacted in the immediate vicinity of where the gathering line crosses beneath Menard Creek and downstream. The distance and magnitude of downstream effects would be influenced by multiple factors including but not limited to: volume of material released in the creek, stream velocity, stream volume and ambient temperatures. A spill may result in increased levels of mortality for all 5 species depending on the concentration and toxicity of the material(s) released. Reduced oxygen levels may also contribute to mortality either from the direct release of material into the creek and/or the accumulation of organic matter from organisms dying from the release.

The large distances between the construction entry and exit locations and Menard Creek (165 feet and 58 feet, respectively), in combination with the planned erosion control measures would control and prevent any soil movement from entering the creek.

Project design considerations and measures to minimize and mitigate the potential for fluid releases and procedures to manage and respond to releases when they do occur would be implemented. These include using current technologies to manage and direct HDD drilling operations that limit the potential escape of drilling fluids; an SPCC plan to manage and respond to releases; on-site containment systems and processes during construction and HDD drilling operations; erosion control measures; and pipeline inspection, monitoring and treatment processes that limit the potential of pipeline wall failure. Potential spills during construction and HDD drilling operations would be primarily confined to the entry and exit locations both of which are located over 700 feet from the centerline of Menard Creek. Given these distances in combination with the above described measures and processes, the probability that a spill during construction from either the entry or exit locations could migrate and ultimately reach Menard Creek is negligible.

A direct or indirect release of wet natural gas or corrosion inhibitors into Menard Creek from a pipe wall or valve failure is also unlikely due to the minimization and mitigation measures that have been described, including automatic failure sensors and shutoff valves that would immediately limit the volume of any release. Given this combination of project design considerations and measures, it is unlikely a spill into Menard Creek would occur that could adversely affect these aquatic species or their habitat.

Based on the above rationale, habitat for the state listed species addressed in this assessment would not be affected by this action. Therefore, there would be no impact to any of these species (listed in Appendix A2 above) from the proposed management action.

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