# Environmental Assessment:
# LanzaTech Freedom Pines Fuels LLC

**Prepared for:**
U.S. Department of Agriculture
Section 9003 Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program

**Cooperating Agency:**
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**DOE/EA-2143**

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## Acronyms and Abbreviations

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|---|---|
| 2007 RFSP EA | Environmental assessment for the Range Fuels Soperton Plant, published in 2007 (See Section VIII, Reference 1) |
| 2009 RFSP SEA | Supplemental environmental assessment for the Range Fuels Soperton Plant, published in 2009 (See Section VIII, Reference 3) |
| 2011 LT EA | Environmental assessment for a proposed LanzaTech biorefinery, published in 2011 (See Section VIII, Reference 5) |
| AMSL | Above Mean Sea Level |
| ASTM | ASTM International |
| ATJ | Alcohol-to-Jet |
| ATJ-SPK | Alcohol-to-Jet Synthetic Paraffinic Kerosene |
| BMP | Best Management Practices |
| BOD | Basic Oxygen Demand |
| CAA | Clean Air Act |
| CWA | Clean Water Act |
| CZMA | Coastal Zone Management Act |
| DNR | Georgia Department of Natural Resources |
| DOE | U.S. Department of Energy |
| EA | Environmental Assessment |
| EPA | U.S. Environmental Protection Agency |
| EPD | Georgia Environmental Protection Division |
| ESA | Endangered Species Act |
| FEMA | Federal Emergency Management Agency |
| FONSI | Finding of No Significant Impact |
| FPB | Freedom Pines Biorefinery |
| FPF | Freedom Pines Fuels (or the Project) |
| Gpd | Gallons per day |
| IBR | Integrated Biorefinery |
| mg/L | Milligrams per liter |
| NAAQS | National Ambient Air Quality Standards |
| NOAA | National Oceanic and Atmospheric Administration |

| | |
|---|---|
| NRSC | National Resources Conservation Service |
| OSBL | Outside Battery Limits |
| OSHA | U.S. Occupational Safety and Health Administration |
| PTE | Potential to Emit |
| RFSP | Range Fuels Soperton Plant |
| SPCC | Spill Prevention, Control and Countermeasures |
| SR | State Road |
| SWPPP | Storm Water Pollution Prevention Plan |
| TSS | Total Suspended Solids |
| USDA | U.S. Department of Agriculture |
| USFWS | U.S. Fish and Wildlife Service |
| USGS | U.S. Geological Survey |
| WWTP | Wastewater Treatment Plant |

# I. Proposal Description and Need

The U.S. Department of Agriculture (USDA) is proposing to provide a loan guarantee to LanzaTech Freedom Pines Fuels LLC (Borrower). LanzaTech, Inc. (LanzaTech) is the parent company of LanzaTech Freedom Pines Fuels LLC and the Project Sponsor. The Borrower has made an application for a loan guarantee under the USDA's Section 9003 Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program for the Project. LanzaTech intends to leverage the loan guarantee to build an Alcohol-to-Jet (ATJ) unit that will produce 10 million gallons of hydrocarbon fuels annually from ethanol at its Freedom Pines Biorefinery site in Soperton, Georgia (Project).

The U.S. Department of Energy (DOE) has funded biorefinery technology development projects since 2002 to meet two Energy Efficiency and Renewable Energy performance goals: 1) dramatically reduce dependence on imported oil; and 2) spur the creation of the domestic bio-industry. In 2016, DOE issued Funding Opportunity Announcement DE-FOA-0001232, "Project Development for Pilot and Demonstration Scale Manufacturing of Biofuels, Bioproducts, and Biopower (PD2B3)" to identify, evaluate, and select applications proposing project development and execution plans for the manufacture of Advanced biofuel or Cellulosic biofuel (collectively referred to here as "Biofuels", as each are otherwise further defined in the Energy Investment and Security Act of 2007 (EISA 2007) §201), bioproducts, refinery compatible intermediates, or biopower in a domestic pilot or demonstration scale Integrated Biorefinery (IBR). DOE's purpose was to support scale-up and validation of these process technologies to enable the industry to build future pioneer- and commercial-scale facilities. DOE is proposing to support a subset of the Project activities through a cost-shared Cooperative Agreement with the Project Sponsor, LanzaTech. Through a competitive award process, DOE provided Phase 1 project development and engineering funds for the facility under award number DE-EE0007966 and has conditionally awarded Phase 2 funds, subject to completion of Phase 1 requirements. The scope of activities to be funded by DOE (DOE Project) is a subset of and fully contained within the Project.

The Project will implement patented ATJ technology which converts ethanol from any source into synthetic paraffinic kerosene (ATJ-SPK) and diesel, meeting ASTM D7566 Annex A5 and ASTM D975, respectively. Products from the biorefinery will be sold to airlines and fuel distributors for blending with conventional jet and diesel fuel. The feedstock for the facility will be fuel-grade ethanol meeting ASTM D4806. The Project will not produce any other products or co-products. DOE funding will be used for a portion of Project costs through completion of a demonstration run that validates the performance of the installed ATJ facility (DOE Demonstration). Specifically, DOE funding will support detailed engineering of process units and site infrastructure upgrades, engineering of interconnects with the Project host site, site preparation, equipment installation and demonstration, and facility management through the DOE Demonstration.

The physical address for the Project will be 535 Commerce Drive Soperton, Georgia 30457, in a geographic area eligible for USDA's Rural Development program. The rural site selected for the Project is ideal. The potential environmental impacts of a large-scale commercial biorefinery located at the site have been evaluated multiple times with a favorable outcome in each instance. The most comprehensive of these evaluations was a 2007 Environmental Assessment (EA) conducted in connection with a grant from the U.S. Department of Energy that provided partial funding for a biorefinery project constructed by Range Fuels, Inc., (Range Fuels) prior to LanzaTech acquiring the site (the Range Fuels Soperton Plant or "RFSP"). The RFSP, when Range Fuels operated the site, fully functioned as an operating biorefinery at the 125 ton per year biomass scale and was designed to produce up 100 million gallons of ethanol per

year. Although the Range Fuels Soperton Plant was never built out to full scale, the 2007 EA ("2007 RFSP EA", [Reference 1]) of the site described and analyzed potential site-specific impacts on the environment that could result from construction and operation of the full-scale Range Fuels Soperton Plant. Therefore, the Environmental Assessment conducted for DOE in 2007 considered a biorefinery significantly larger than what is proposed for the Project. Based on the information presented in the 2007 RFSP EA, DOE issued a Finding of No Significant Impact (FONSI), allowing the Project to proceed ("2007 DOE FONSI", Attachment 1 [Reference 2]).

Range Fuels later conducted a Supplemental Environmental Assessment ("2009 RFSP SEA", [Reference 3]) that evaluated the impacts of changes to the original RFSP design. In December of 2008, USDA issued a FONSI ("2008 USDA FONSI", Attachment 2, [Reference 4]) in conjunction with a USDA Section 9003 Loan Guarantee application, based on the 2009 RFSP SEA. DOE issued a second FONSI, also based on the 2009 RFSP SEA, in January of 2009 ("2009 DOE FONSI", Attachment 3, [Reference 5]).

In 2011, Range Fuels declared that it would no longer be able to meet its obligations to the USDA and DOE. LanzaTech proposed to acquire the RFSP, and assume the Range Fuels USDA loan guarantee, for purposes of constructing a project that would combine Range Fuels' 125 ton/day biomass gasification with LanzaTech gas fermentation to produce ethanol and 2,3-Butanediol (2,3-BDO), a chemical co-product. LanzaTech conducted an environmental assessment ("2011 LT EA", included in [Reference 6]) which compared the impacts of the new project to those of the RFSP project. In September 2011, USDA issued a FONSI for the proposed LanzaTech project based on the 2011 LT EA ("2011 USDA FONSI", Attachment 4, [Reference 6]). Ultimately, the loan guarantee was not issued and Range Fuels went into default. LanzaTech acquired the Range Fuels Soperton Plant in January of 2012 and renamed it LanzaTech Freedom Pines Biorefinery (FPB).

Since its acquisition of FPB, LanzaTech has maintained all necessary permits and regulatory compliance to ensure good environmental stewardship as it conducts pilot- and demonstration-scale operations, and prepares the engineering, construction and operating plans for the Project. A comprehensive permitting and compliance plan has been established for the Project that includes amending existing permits when possible and obtaining new permits when necessary.

The FPB site is approximately 260 acres overall with 115 acres developed and the remaining 145 acres preserved as greenspace. The FPB site was built, commissioned, and operated from 2007-2011 by Range Fuels. It was initially designed as a wood chip to ethanol facility, and included process steps such as biomass handling, gasification, and thermo-catalytic conversion of syngas. The environmental permits, access to intermodal transportation, utilities, and safety systems that were established for this facility will be recommissioned and utilized for the Project where possible with new process steps and supporting infrastructure installed for the ATJ process.

The existing footprint of the site will remain unchanged with minimal environmental impacts. The Project will utilize previously developed land that has not otherwise been built upon. Implementation of the ATJ technology and supporting infrastructure upgrades will comprise the primary changes to the site. Safety systems, potable water, process water supply, wastewater treatment capabilities, a cooling tower, utility integration and other infrastructure systems are already in place and operational at FPB. LanzaTech will utilize the existing infrastructure, upgrading as necessary to implement its technology. All of the steps in the ATJ process are commercially practiced today in the refining and petrochemical industries at refineries around the world. Therefore, the processes, inputs and outputs and their associated environmental impacts are well known and predictable. Other additions to FPB for the Project will

include installing infrastructure for feedstock receiving and product loadout, and installing tanks for storage of feedstock and finished product.

## II. Primary Beneficiaries and Related Activities

LanzaTech Freedom Pines Fuels will be the primary beneficiary of the Project through production and sale of the ATJ-SPK and diesel products. LanzaTech, Inc. will benefit as the licensor of the ATJ technology and owner of FPB.

There are three main sources of economic impact from the Project: construction, operation, and feedstock procurement, each of which will be covered in more detail in the following sections. The Project will create 100 direct and 30 indirect jobs during construction, and at least 15 direct and 24 indirect jobs during ongoing operations. These jobs are expected to generate $6.5 million in total wages and benefits during construction, and $2.4 million in annual wages and benefits during operation.[1]

During construction the total anticipated increase in local economic activity is $6.5 million. Once the facility is operational, the total annual increase in local economic activity is expected to be $2.4 million for wages and benefits. An additional $1.7 million will be spent on supplies such as natural gas, electricity, water, and so on, the majority of which will stay in the local area. Finally, maintenance, estimated at $800,000 per year, will largely involve purchasing supplies and services from the local area. The total annual increase in local economic activity is expected to be about $5 million.[2]

Additionally, the raw material for this Project is ethanol, the vast majority of which is produced in rural areas. Total annual spending on ethanol feedstock is projected at $39.9 million. Every $1 million in spending on ethanol generates 5.9 jobs in the ethanol industry, so the Project will support 235 ethanol industry jobs. Each of those jobs leads to an additional 1.6 indirect jobs, for an additional 375 jobs. So in addition to the rural economic activity generated locally to the facility, the additional $39.9 million spent sourcing feedstock from rural areas, will supporting 610 jobs.

Additional second-tier beneficiaries include engineering and design firms, construction companies, industrial service and supply companies, utilities, transporters as well as equipment manufacturers and suppliers.

## III. Description of the Proposal Area

The Project will be located at FPB, formerly the Range Fuels Soperton Plant, situated near the city of Soperton in Treutlen County, Georgia (Figure 1, following page). The Project location is ideally situated for a Southeastern supply chain with access to both rail lines and interstate highways for feedstock delivery and product distribution. The site has ready access to the US Interstate Highway System via I-16, which connects to I-75 near Macon, GA and to I-95 in Savannah, GA. LanzaTech is working with logistics experts to develop the logistics plans for delivering ethanol feedstocks and for transporting, blending and storing over 10 million gallons of blended and neat fuel products. The site is centrally located to serve Gulfstream's headquarters in Savannah, GA (95 miles); Atlanta's Hartsfield-Jackson airport (136 miles); Orlando International Airport (280 miles); FedEx's World Hub in Memphis (430 miles); Robins Air Force Base (60 miles); Naval Station Norfolk (480 miles); and Naval Air Stations Pensacola (310 miles) and Jacksonville (150 miles).

[1] Job estimates and multipliers based on: https://www.epi.org/publication/updated-employment-multipliers-for-the-u-s-economy/

[2] Data developed from Project financial model.

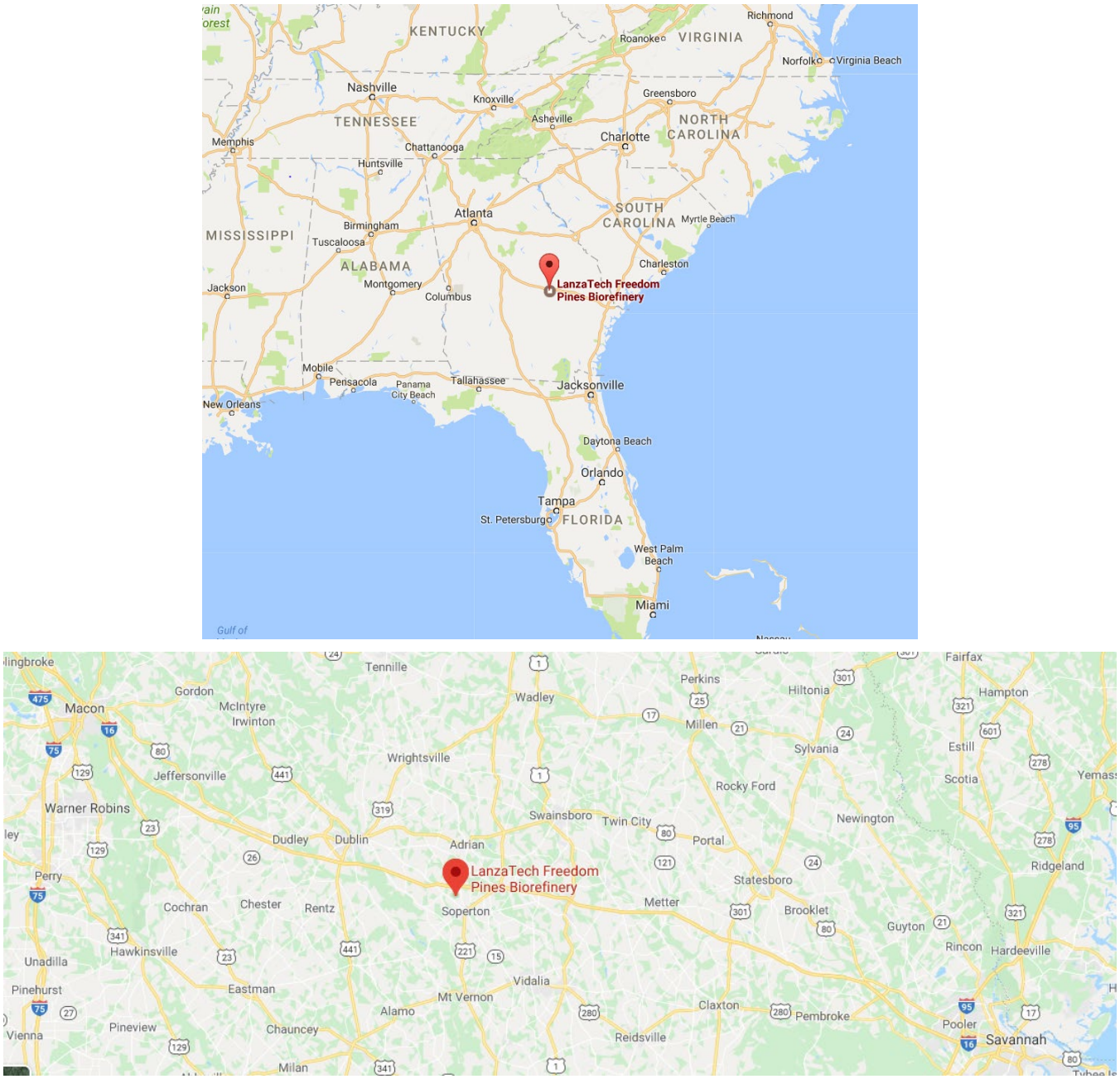


**Figure 1 – Project Location**

The County is largely rural with forestry and agriculture as the primary land uses. The coordinates for the approximate center point of the site are 32° 24’ 10”, -82° 37’ 13” and the site encompasses approximately 260 acres adjacent to an Industrial Park 2 miles northwest of Soperton. The Industrial Park was developed to encourage industrial growth and contains several other commercial operations. There are no land use regulations in Treutlen County or the City of Soperton, and greater than 90% of the County land consists of agriculture and forestry (mostly pine tree plantations). There are scattered residential and neighborhood-type commercial uses, as well as transportation and utility corridors in

within the rural setting. The closest schools and churches are 2.4 miles and 3.2 miles, respectively, to the southeast.

The Project will be constructed on a small piece of a 115-acre tract of the FPB site that was previously developed for the RFSP, including: a production facility, administrative offices, parking, stormwater retention pond, and other civil infrastructure elements. As previously noted, the biorefinery originally contemplated for FPB was significantly larger than what is proposed for the Project. At the time of the initial development by Range Fuels, existing forested and wetland areas along streams in the construction area were preserved as natural greenspace. The remaining portions of the undeveloped site have been preserved as natural greenspace with some corridors included for utility and access considerations. LanzaTech will continue to preserve these areas accordingly.

Figure 2 shows aerial and satellite (lower right) views of a portion of the FPB site. The Project will be located within the developed area of FPB, bounded by a fence on three sides (green dashed lines on the satellite view), with a locked gate on the main access road. The current area in which process equipment and supporting infrastructure is installed (process area) is indicated by the yellow rectangle. Within the process area, the majority of equipment is legacy equipment from RFSP which is not in operation. LanzaTech currently operates gas fermentation bioreactors up to the scale of field pilot plants in the process area. LanzaTech Staff of FPB are issued electronic fobs to open the gate, as will future staff of the Project, if approved; visitors are required to identify themselves over an intercom. The developed area is surrounded by undeveloped woods, which is also owned by LanzaTech.

**Figure 2 – Overview of Project Site**

Figure 3 (following page) is an aerial view of the location to be used for the Project. For orientation, the building visible in the upper left of Figure 2 appears at the far left of Figure 3. The Project process area is denoted by the red rectangle with the star. Figure 3 shows clearly that the Project will be constructed entirely on land previously cleared and developed for the RFSP.


**Figure 3 – Site Overview with Designated Process Area**

Treutlen County is located within the Coastal Plain Physiographic Province in the Atlantic Southern Loam Plains ecoregion. The topography at the site ranges from 250 to 320 feet above average mean sea level. The region is characterized by generally low, flat and gently rolling land with finer-textured soils.

Treutlen County is also located in the Coastal Plain Province, approximately 110 miles west of the Atlantic Ocean. The Coastal Plain geology consists of a seaward-thickening accumulation of sediments overlying igneous and metamorphic bedrock. The sediments consist of alternating layers of sand, clay and limestone that range in age from the Late Cretaceous through Holocene. The uppermost geologic unit throughout the County is the Neogene undifferentiated, which includes the Altamaha Grit, the Citronelle and the Hawthorn formations. The Altamaha Grit is band of subsurface sandstone that underlies about 15,000 square miles of Georgia's Coastal Plain. The Citronelle is mostly fine - to course-grained sand and locally is gravelly and contains layers of hardpan, or cemented iron oxide, that retard ground-water movement. Outcrops of indurated sandstone and claystone are common throughout the County. Underlying the surficial sediments is the Hawthorn Formation, a Miocene sequence of phosphatic clays and dolomitic limestones estimated to exist at depths of up to 200 feet below land surface.

The Project would have minimal impact on geomorphology. The site is located on level to gently sloping land that has been previously developed such that only minor grading will be required. A geotechnical survey conducted for the original development confirmed that the site would be suitable for a biorefinery such as is proposed for the Project. Additional geotechnical surveys will be conducted, as needed, to complement final engineering designs and construction plans.

# IV. Description of Proposed Action and Alternatives

## IV.1 Proposed Action (Preferred Alternative)

The issuing of a loan guarantee under the 9003 Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program requires compliance with the National Environmental Policy Act of 1969, as amended (NEPA; 42 U.S.C. 4321 et seq.); Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500 to 1508); and USDA's implementing procedures at 7 CFR 1970. In addition, DOE's

decision whether and how to distribute federal funds under DE-FOA-0001232, "Project Development for Pilot and Demonstration Scale Manufacturing of Biofuels, Bioproducts, and Biopower (PD2B3)", and requires compliance with DOE's NEPA Implementing Procedures (10 CFR Part 1021). Accordingly, this EA evaluates and demonstrates the potential environmental consequences of issuing a USDA loan guarantee and DOE funding for the Project. In compliance with NEPA and its implementing procedures, this EA examines the potential environmental consequences of USDA's Proposed Action (providing a loan guarantee), DOE's Proposed Action (distribution of federal funds under DE-FOA-0001232), the Project, and the No Action Alternative (under which it is assumed that, as a consequence of USDA's denial of a loan guarantee or DOE withholding of awarded funds, LanzaTech would not proceed with the Project as proposed). The EA's purpose is to inform USDA, the DOE, and the public of the potential environmental consequences of the Project and alternatives.

The USDA Section 9003 Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program (the Program) provides loan guarantees for the development, construction and retrofitting of new and emerging technologies for the development of advanced biofuels, renewable chemicals and biobased products. The Program is specifically governed by the Code of Federal Regulation, 7 CFR 4279, Subpart C and 7 CFR 4287, Subpart D, and continued in the Agricultural Act of 2014 (2014 Farm Bill) (Pub. L. 113-79) and it is authorized under 7 U.S.C. 8103. Additionally, USDA, Rural Development is a mission area that includes three federal agencies – Rural Business-Cooperative Service, Rural Housing Service, and Rural Utilities Service. The agencies have in excess of 50 programs that provide financial assistance and a variety of technical and educational assistance to eligible rural and tribal populations, eligible communities, individuals, cooperatives, and other entities with a goal of improving the quality of life, sustainability, infrastructure, economic opportunity, development, and security in rural America. Financial assistance can include direct loans, guaranteed loans, and grants in order to accomplish program objectives.

Accordingly, USDA is implementing the Program by identifying and seeking to support biorefinery projects such as LanzaTech's, which would demonstrate a sustainable technology for the production of jet fuel from ethanol, other than ethanol produced from corn starch. The purpose of the USDA Proposed Action is to support the objectives of the Program as well as USDA's broader mission to foster rural development, biobased manufacturing and the production of environmentally friendly advanced biofuels and other biobased products at commercial scale. Providing the loan guarantee for the Project would achieve the goal of the program to accelerate the construction and operation of commercial biorefinery facilities. The Freedom Pines Fuel Project would also help to attain the Program's goals to create jobs in specific rural areas, commercialize biobased manufacturing technologies for the production of advanced biofuels and biobased products.

The DOE's Funding Opportunity Announcement DE-FOA-0001232, "Project Development for Pilot and Demonstration Scale Manufacturing of Biofuels, Bioproducts, and Biopower (PD2B3)" contemplates funding for development and execution of projects that will manufacture Advanced or Cellulosic Biofuels, bioproducts, refinery-compatible intermediates, or biopower, in pilot or demonstration-scale Integrated Biorefineries. The DOE requires that all recipients selected for funding under DE-FOA-0001232 assist in the timely and effective completion of the NEPA process in the manner most pertinent to their proposed project. The Project will meet the objectives of DE-FOA-0001232 by constructing a demonstration-scale Integrated Biorefinery that produces Advanced and Cellulosic Biofuels by converting Advanced and Cellulosic ethanol feedstocks into jet and diesel products that are themselves Advanced and Cellulosic biofuels. The scope of the DOE funding will encompass detailed engineering of

process units and infrastructure upgrades at FPB, engineering of interconnects at FPB, site preparation, equipment installation and demonstration, and facility management through the "DOE Demonstration".

Under the USDA's Proposed Action and the DOE's Proposed Action (collectively referred to as the "Proposed Action"), USDA would provide a loan guarantee that would aid in the design, planning, construction, commissioning and operations of a commercial scale biorefinery using LanzaTech's ATJ technology to produce 10 million gallons of hydrocarbon fuels per year at the Company's Freedom Pines biorefinery. Under the Proposed Action, DOE would release additional funds under an existing cost-shared Cooperative Agreement (DE-EE0007966) to pay for a portion of Project costs. The LanzaTech-owned FPB demonstration site is located in Soperton, Georgia, and is the location where the Company has conducted its ATJ demonstration of ethanol dehydration and ethylene oligomerization.

Under the Proposed Action, the Project will install process equipment to perform the conversion from ethanol to jet fuel. The process equipment will be delivered to the site as prefabricated skids and reassembled in place. Off-skid equipment such as gas and feed treaters and compressors will be installed. Tankage will be installed to store ethanol feedstock and products. A receiving station will be constructed to transfer ethanol from tanker trucks into storage and loadout stations will be constructed to transfer products to tanker trucks for distribution. Containers will be delivered to the Project site to house analytical equipment and process control systems. Pipe racks, measurement and analytical systems and electrical conduits will be installed to tie the Project equipment to existing utility site infrastructure. All equipment, tanks, and containers will be placed on newly-constructed concrete pads with containment to prevent spills.

## IV.2 No Action Alternative

The No Action Alternative is required under NEPA implementing regulations (40 CFR 1502.14(a)). A No Action Alternative is considered in this EA and provides a benchmark, enabling decision-makers to compare the magnitude of environmental effects of the Proposed Action. Under the No Action Alternative, USDA would not provide a loan guarantee for the Project and it would not come to fruition in the manner described in this EA. Furthermore, in the No Action Alternative, DOE would not provide funding for the Project under the existing Cooperative Agreement (DE-EE0007966). In that case, there would be minimal change to current environmental impacts since there is currently an approved biorefinery operating at FPB. .

## IV.3 Other Alternatives Considered

Two Other Alternatives were considered. 1) **Relocating the Project to a site other than FPB**. LanzaTech has invested significant funds and personnel time to acquire and upgrade FPB. The Project will also make use of installed infrastructure and improvements to FPB previously made by Range Fuels. Relocation of the Project to a new site would be expected to significantly increase Project cost and therefore was not considered for further detailed analysis. 2) **Moving the Project to a different location within FPB**. The location within FPB identified for construction of the Project is within the only section of FPB that was previously cleared and graded by RFSP and has sufficient area for the Project. Moving the project to another location at FPB would cause additional land to be disturbed. It would also increase the distance from the Project to existing infrastructure, increasing the cost for utility and other connections. Therefore, moving the Project within FPB was not considered for further analysis. As a result, the only Alternative remaining is the No Action Alternative.

# V. Environmental Impact

## V.1 Scope of Analysis

This Environmental Assessment is conducted in the context of prior Environmental Assessments (2007 RFSP EA, 2009 RFSP SEA, 2011 LT EA). Section V.2 presents a summary of impacts in comparison to the impacts for projects at the Freedom Pines location for which USDA or DOE previously granted a FONSI. Additional details in specific areas are presented in Section V.3.

## V.2 Summary of Environmental Impacts

The following Summary of Impacts compares (A) the site conditions prior to construction of the Range Fuels biorefinery, (B) the impacts identified in the 2007 RFSP EA and 2009 RFSP SEA, (C) the impacts identified in the 2011 LT EA, and (D) the impacts of the Project proposed by LanzaTech here. Columns (A), (B), and (C) are taken directly from a table presented in the 2011 LT EA, which led to the 2011 USDA FONSI.

## Table 1: Summary of Environmental Impacts

| Category | (A)<br>Existing Environment<br>As of 2007<br>2007 RFSP EA | (B)<br>Consequences of RFSP Construction and Operation<br>2007 RFSP EA, 2009 RFSP SEA | (C)<br>Differences in LanzaTech 2011 Proposed Construction and Operation<br>2011 LT EA | (D)<br>Differences in Freedom Pines Fuels Construction and Operation<br>Proposed Project |
|---|---|---|---|---|
| **1. Land Use and General Site Description** | The county is rural with forestry and some agricultural uses. Forestry accounts for 80% of the county's land use. The facility is located 2 miles northwest of Soperton in an Industrial Park occupied by 7 other commercial operations. The majority of the site was previously cleared and consists of old field plant communities, streams, and wetlands. Buffer areas around streams and wetland | Create 12.8 acres of impervious surface and 1.3 acres of planned paved road. Would not change intended industrial use of land and would have negligible impact on forest land in Treutlen county. | LanzaTech units are within Range Fuels' planned area of impervious surface. | The Project will lie entirely within the RFSP planned area of impervious surface. |
| **2. Geomorphology, Geology, Seismic Hazard, and Soils** | The topography at the site ranges from 250 to 320 feet above average mean sea level (AMSL). Four soil series occur within the proposed project area: Gilead, Lakeland, Norfolk, and Plummer. The Gilead and Norfolk Series cover the majority of the proposed project area. The Gilead Series consists of moderately well drained, firm, clayey soils found in the upper coastal plain and has moderately slow permeability. Two soil types from the Norfolk soil series (Norfolk loamy sand with 2 to 5 percent slopes and Norfolk loamy sand with 2 to 5 percent slopes, eroded) that are designated as prime farmland by the NRCS) occur on the proposed project site (Alex Comegys - NRCS personal communication, July 20, 2007). | Minimal impact on geomorphology. Low risk for earthquake. New disturbance to ~48.3 acres of soils. Negligible impact on prime farmland. Based on review of the Treutlen County, Georgia Soil Survey, soils from the Norfolk soil series covered 24.6 acres of the Range Fuel project site. | Reduced area of soil disturbance. | All new equipment, tanks, and interconnections will be installed within the area previously developed for the RFSP. |

| Category | (A)<br>Existing Environment<br>As of 2007<br>2007 RFSP EA | (B)<br>Consequences of RFSP Construction and Operation<br>2007 RFSP EA, 2009 RFSP SEA | (C)<br>Differences in LanzaTech 2011 Proposed Construction and Operation<br>2011 LT EA | (D)<br>Differences in Freedom Pines Fuels Construction and Operation<br>Proposed Project |
|---|---|---|---|---|
| **3. Hydrology** | **Surface Water:** There are three unnamed streams within the Range Fuels site. The primary stream is approximately 2 feet wide. This stream flows from the northeast to the southwest and is joined by two additional unnamed streams within the property. One of the tributary streams is a perennial stream that originates offsite and the other is an intermittent stream that flows only in response to an offsite water discharge. The primary drainage on the property originates from farm ponds offsite, with additional flows provided by a spring/ seep in the northeastern portion of the property. There are no Federal Emergency Management Agency (FEMA) designated floodplains or floodways on the site (Treutlen County, 2006).<br><br>**Groundwater:** Several aquifers underlie the lower half of the Oconee River basin in Treutlen County, which includes the Range Fuels site. The only aquifer that receives recharge in Treutlen County is the surficial aquifer, and this recharge area is more than 5 miles away from the site. | No encroachment on surface waters or existing buffers. Potential soil disturbance during construction, with possible modified surface water runoff patterns. Mitigated through use of construction and post-construction BMPs. Planned groundwater withdrawal of 316,800 gpd would have minimal impact on other groundwater users. | Water supplied by City of Soperton; no need for additional groundwater withdrawals. | Water for the Freedom Pines Biorefinery site is provided by the City of Soperton. There will be no need for additional groundwater withdrawals. The site is served by a city-owned well with a capacity of approximately 500,000 gallons per day. The well serves roughly a dozen parties. Freedom Pines is the largest consumer. Total consumption from the well is approximately 30,000 gallons per day or 6% of capacity, prior to the proposed facility.<br><br>The proposed facility will produce water during ethanol dehydration. Produced water from the process will be recycled in the plant. Depending upon final design decisions and seasonal effects, the facility may be a net producer or consumer of water. The range of water impacts is estimated to be between 30,000 gallons per day of production and 30,000 gallons per day of consumption. In the most conservative case, 30,000 gallons per day of consumption would bring the total consumption from the well to 12% of well capacity, including other current users.<br><br>**Floodplain:** The proposed Project is located in a Zone X (area of minimal flood hazard). **Coastal Zones:** The proposed Project is not located in a coastal zone. |

| Category | (A)<br>Existing Environment<br>As of 2007<br>2007 RFSP EA | (B)<br>Consequences of RFSP Construction and Operation<br>2007 RFSP EA, 2009 RFSP SEA | (C)<br>Differences in LanzaTech 2011 Proposed Construction and Operation<br>2011 LT EA | (D)<br>Differences in Freedom Pines Fuels Construction and Operation<br>Proposed Project |
|---|---|---|---|---|
| **4. Water Quality** | The 303(d) List of Waters reports on streams and lakes identified as impaired for one or more pollutants and do not meet one or more water quality standards. There are no 303(d) (DNR, 2007) listed segments of impaired waters near the project area. Because there would be no changes in harvest site runoff characteristics following removal of feedstock, there would be no impacts to water quality resulting from the purchase of feedstock materials. | Impact of runoff during construction mitigated by BMPs. Post-construction, impact of additional impervious surfaces expected to have no direct impacts to existing stream and wetland buffers. Post-construction grading and detention pond to contain or treat stormwater. Facility SPCC plan to minimize potential impacts to surficial aquifer due to hazardous material release. | Unchanged. See Table 4-1[3] for specifics. | Impact of runoff during construction will be mitigated by Best Management Practices. Post-construction impervious surfaces are less than those planned for the RFSP. The volume and contaminants in effluent from the Project will be lower than levels considered in any of the prior EAs. |
| **5. Wetlands** | Approximately 18 acres of forested wetlands have been identified on the project site within the Industrial Park. Approximately 90 percent of the wetlands on the site are within a forested area immediately adjacent to perennial and intermittent streams that bisect the property, extending 30 to 100 feet to either side of the stream channel. The remaining 10 percent of onsite wetlands are emergent wetlands located in the eastern portion of the parcel that would remain undeveloped. Additional wetlands are located on the parcel adjacent to the Industrial Park that would contain the chipper. This parcel contains two small forested wetlands. Both wetland areas are located outside of the area proposed for the chipper, storage areas, and truck travel. | Layout of Range plant and supporting infrastructure avoided encroachment on wetlands and associated buffers. No long term negative impacts to wetland hydrology from replacement of the culvert. Encroachment into two wetlands totaling 0.61 acres were self-reported and addressed in Supplemental EA. The encroachments were found to have negligible temporary impacts to hydrology. With purchase of mitigation credits, the encroachments considered to have no net impacts on the wetland. | Unchanged. Facility will remain within planned footprint. | LanzaTech engaged a wetland expert to conduct a thorough site review to identify wetlands on the site. Based on initial finding from the wetland delineation, there will be no impact to wetlands. A report detailing wetland boundaries and type accompanies this EA. The wetland expert concluded that Project work is sufficiently far from any delineated wetlands that consultation from the US Army Corps of Engineers is not required.. |

[3] Note: Table 4-1 from 2011 LT FONSI is reproduced in Section V.2.4 with updates for Freedom Pines Fuels Project.

| Category | (A)<br><br>Existing Environment<br>As of 2007<br><br>2007 RFSP EA | (B)<br><br>Consequences of RFSP Construction and Operation<br><br>2007 RFSP EA, 2009 RFSP SEA | (C)<br>Differences in LanzaTech 2011 Proposed Construction and Operation<br>2011 LT EA | (D)<br><br>Differences in Freedom Pines Fuels Construction and Operation<br><br>Proposed Project |
|---|---|---|---|---|
| **6. Biological Resources** | The facility site includes 6 parcels totaling approximately 275.1 acres. Approximately 67.4 of the 275.1 acres would be developed for the project and the remaining acreage would be kept as natural and landscaped greenspace. The main facility site would cover 115.7 acres, much of which has been previously cleared. Within the previously cleared areas, much of the northern and western areas of the site are vegetated with native grasses, dominated by brooms edge, while the southern and eastern portions of the site are predominantly bare dirt. The areas surrounding wetlands and streams on the parcel were not cleared and a 30- to 100-foot wide strip of mature trees remains around the streams and wetlands. These forested areas are dominated by hardwoods (red maple, magnolia, sweet gum and willow oak). It is expected that the site and the surrounding areas would contain a variety of common small animals including field mice, armadillos, opossums, foxes, rabbits, snakes and squirrels, as well as a variety of birds typical of the upper coastal plain of Georgia in forested areas. The northwestern and western perimeter | Possible minor impacts to biological resources and habitat quality. Displacement of animals during construction mitigated by ability to migrate to adjacent habitat via preserved riparian corridors and forest habitat. Activity during operations would have negligible impact on regional populations. Feedstock is normally removed from harvest sites before replanting and therefore does not provide habitat for nearby animals. | Unchanged. | Unchanged. All areas to be used for the proposed Project were previously cleared for the RFSP and approved under prior EAs. |

| Category | (A)<br><br>Existing Environment<br>As of 2007<br><br>2007 RFSP EA | (B)<br><br>Consequences of RFSP Construction and Operation<br><br>2007 RFSP EA, 2009 RFSP SEA | (C)<br>Differences in LanzaTech 2011 Proposed Construction and Operation<br>2011 LT EA | (D)<br><br>Differences in Freedom Pines Fuels Construction and Operation<br><br>Proposed Project |
|---|---|---|---|---|
| **7. Protected Species** | CH2M HILL conducted multiple site visits in the spring and summer of 2007 to assess the site for protected species. No federally protected species were identified during these site visits. Habitat and evidence of the presence for gopher tortoise, state listed as threatened, were identified. None of the other protected species known to occur in Treutlen County were observed within or adjacent to the project boundaries. | Gopher tortoise burrows were identified. A gopher tortoise relocation program was implemented and exclusion fences constructed. Range agreed to notify USFWS if Indigo Snakes were found. | Unchanged. | Unchanged.<br><br>A desktop review was undertaken to document species in the area currently identified as threatened and endangered. The results are consistent with previous findings documented in environmental reviews. There are two species identified for potential presence on the site, the gopher tortoise and indigo snake. While conducting wetland delineations on the site as described above, a small number of gopher tortoise burrows were noted and located. None of the burrows appeared to be in active use by tortoises or other wildlife, including protected species such as the indigo snake The US Fish and Wildlife agency was contacted and given the opportunity to comment on potential impacts to threatened or endangered species. US FWS responded that they have no additional comments in light of existing strategies to mitigate potential impacts to these species by (a) installing exclusion fences around the construction site; and (b) informing USFWS and DNR if the species were observed in the Project area. |

| Category | (A)<br>Existing Environment<br>As of 2007<br>2007 RFSP EA | (B)<br>Consequences of RFSP Construction and Operation<br>2007 RFSP EA, 2009 RFSP SEA | (C)<br>Differences in LanzaTech 2011 Proposed Construction and Operation<br>2011 LT EA | (D)<br>Differences in Freedom Pines Fuels Construction and Operation<br>Proposed Project |
|---|---|---|---|---|
| **8. Safety and Occupational Health** | Firefighting services currently are provided for the Industrial Park by the Soperton Fire Department, located in downtown Soperton approximately three miles from the proposed plant. Police services at the proposed plant would be provided by the Treutlen County Sheriff's Office in Soperton. Medical services, including emergency rooms, are available at the Fairview Park Hospital in Dublin, Meadows Regional Medical Center in Vidalia, and Emanuel Medical Center, in Swainsboro, approximately 26, 21, and 25 miles, respectively, from the proposed plant. | Hazards result from high temperature and pressure operations, and from toxic and flammable materials. Hazards addressed in site safety plan. | Hazards from high temperature and pressure operations reduced. Significant reduction in hazard from 2,3-BDO product compared to methanol. Ethanol product unchanged. See Tables 8-1, 8-2 for details.<br>See Attachment 2[4] regarding microbe safety. | Safety services are unchanged from the RFSP. No new hazards are introduced by the Project. Plant capacity is less than the RFSP.<br>Storage of hazardous and flammables less than ethanol storage for the RFSP. |
| **9. Noise** | Noise, in the context of this analysis, refers to sounds generated by activities that could affect employees of the facility, employees of nearby commercial operations, residents near the proposed facility, or wildlife. Noise levels within the Treutlen County Industrial Park are variable, depending on truck and train traffic in the area. While no specific data have been compiled for the Treutlen County Industrial Park, background noise levels in these areas would be expected to range from 40 db, to 75 dBa, with occasional upward spikes related to rail and road traffic. | Construction noise limited to daylight hours. Staff to use hearing protection and follow OSHA standards. Operational noise primarily due to chipping. No adverse impacts to outdoor or indoor activities in local residences. Noise disturbance for truck deliveries at one residence during daylight hours only. | Significantly reduced noise levels: (1) no chipper planned; (2) estimated 10 trucks/day at current capacity versus > 500 considered in Range EA.<br>Surrounding forest acreage will be maintained as a noise buffer | Significantly reduced noise levels than the RFSP, as also noted in 2011 LT EA: (1) no chipper or wood-handling equipment; (2) estimated 10 total trucks per day for feedstock and product, or <4% of the traffic considered in the 2007 RFSP EA. |
| **10. Meteorolog** | Treutlen County is characterized by a warm and humid, temperate climate. Average annual temperature ranges from lows of about 53°F to highs of approximately 78°F. Average annual precipitation is approximately 46 inches. Treutlen County has a low incidence of tornadoes, which is 3.1 times lower than the national average. Only one damaging tornado has occurred since 1950. Georgia has not experienced a major hurricane (Category 2 or greater) since before 1900. | No impact on climate or weather. Minor potential risk for severe weather to adversely impact operations. | Unchanged | Unchanged.<br>Project equipment and storage designed for safe operation at the extremes of local weather, including freezes. HS&E procedures will include tornado and hurricane preparations. |

[4] Refers to attachment in 2011 USDA EA, Attachment 4.

| Category | (A)<br>Existing Environment<br>As of 2007<br>2007 RFSP EA | (B)<br>Consequences of RFSP Construction and Operation<br>2007 RFSP EA, 2009 RFSP SEA | (C)<br>Differences in LanzaTech 2011 Proposed Construction and Operation<br>2011 LT EA | (D)<br>Differences in Freedom Pines Fuels Construction and Operation<br>Proposed Project |
|---|---|---|---|---|
| **11. Air Quality** | Treutlen County is in attainment for all criteria air pollutants, including the new 8-hour ozone standard (USEPA, 2007b). Because the proposed facility would not be built in a criteria air pollutant non-attainment or maintenance area or emit any criteria pollutant in excess of the major source threshold of 100 tpy, a full CAA conformity determination is not required. | Temporary and minor construction-related air quality impacts due to dust during construction. Criteria pollutants below threshold for Prevention of Significant Deterioration regulations. Facility to be constructed and operate under "Air Permit to Construct and Operate" issued by EPD. Ambient concentrations of all toxic air pollutants below acceptable ambient concentrations (AAC). | Unchanged. See Table 11-1[5] for details. | Unchanged.<br>Will fall within the current air quality impacts. |
| **12. Waste Management and Hazardous Materials** | Treutlen County has no landfill sites within the county. Solid wastes are collected and transported to the Toombs County Landfill. The Toombs County landfill is located approximately 18 miles southeast of the site along SR 29, and has capacity to accept solid wastes for an additional 20 years, and is permitted to accept both solids/ sludges and construction/ demolition debris. No hazardous waste sites or hazardous materials have been identified on the site of the Proposed Action. | No known hazardous waste sites. No impacts from hazardous materials during construction. Spill prevention and containment measure and flare placement designed to reduce impacts from fuel production, storage, transport. No hazardous wastes generated and solid wastes can be accommodated in existing Toombs County Landfill. | No hazardous wastes generated.<br>Biocatalyst replaces solid inorganic catalyst and is disposed of through anaerobic digestion.<br>Residual solids from digester are returned to gasifier feed or disposed of with char, leaving no net solid output from the unit. | No hazardous waste generated. |

[5] Note: Table 11-1 from 2011 LT FONSI is reproduced in Section V.2.11 with updates for Freedom Pines Fuels Project.

| Category | (A)<br>Existing Environment<br>As of 2007<br>2007 RFSP EA | (B)<br>Consequences of RFSP Construction and Operation<br>2007 RFSP EA, 2009 RFSP SEA | (C)<br>Differences in LanzaTech 2011 Proposed Construction and Operation<br>2011 LT EA | (D)<br>Differences in Freedom Pines Fuels Construction and Operation<br>Proposed Project |
|---|---|---|---|---|
| **13. Cultural Resources** | In July of 2007, Brockington and Associates, Inc. conducted a field survey of the site in compliance with Section 106 of the National Historic Preservation Act, and 36 CFR Part 800. Research found only one previously recorded archaeological site (9TU20) within a 1.6-km (1-mile] radius of the project tract. Site 9TU20 consists of a small scatter of lithics and ceramics. The site was recorded by Garrow and Associates, Inc., in 2000 and was found to not be eligible for nomination to the NRHP. No previously recorded historic structures or other architectural resources were identified within 1.6 km (1 mile) of the field survey. During the structures survey, no intact structures older than 50 years were identified within the project area. | No NHRPO eligible cultural resources were found. | Unchanged. | LanzaTech and its consultant conducted an additional literature review of the site. That review identified 4 archeological sites that were recommended as not eligible for the National Historic Places. The map resulting from that review was provided to the State Historic Preservation Office. LanzaTech will submit the SHPO's Environmental Review Form after receiving hard copy photographs from the site. The SHPO submittal will be included with applicable Tribal consultations. |

| Category | (A)<br>Existing Environment<br>As of 2007<br>2007 RFSP EA | (B)<br>Consequences of RFSP Construction and Operation<br>2007 RFSP EA, 2009 RFSP SEA | (C)<br>Differences in LanzaTech 2011 Proposed Construction and Operation<br>2011 LT EA | (D)<br>Differences in Freedom Pines Fuels Construction and Operation<br>Proposed Project |
|---|---|---|---|---|
| **14. Transportation** | The Georgia Central Railways local line runs along the southwestern boundary of the Treutlen County Industrial Park. This line transports goods and materials to a mainline junction in Dublin. There is no train service on weekends and the rail line does not support passenger service. Approximately 3 miles north of the Soperton Industrial Park, there is an exchange from SR 15 onto the main interstate route serving the area, 1-16. The most direct route from 1-16 to the proposed site is via SR 15 to Commerce Drive. However, SR 29 provides an alternate route to the site from 1-16 and some traffic originating west of Soperton travels via SR 29. SR 15 is a North-South rural arterial between Soperton and 1-16. The roadway consists of two twelve foot travel lanes, two foot paved shoulders, one foot grass shoulders and ditches. The traffic capacity of this section of SR 15 for its given level of service is 1,600 vehicles per hour in each direction. For this section of SR 15, the peak hour use over the past ten years would be 204 vehicles in each direction, which is 12.75 percent of the capacity of SR 15 for its given level of service. SR 29 is a North-South rural arterial between Soperton and 1-16. The roadway consists of two 12-foot travel lanes, 2-foot paved shoulders, 1-foot grass shoulders, and ditches. The intersection used to access State Route 29 is a "Y" intersection with the acute angle near 45 degrees (45°) and a large turning radius on the northern corner. The traffic capacity of SR 29 for its given level of service is 1,600 vehicles per hour in each direction. For this section of SR 29, the peak hour use over the past 10 years would be 389 vehicles in each direction, which is 24.31 percent of the capacity of SR 29 for its given level of service. | Will not exceed capacity. No additional facilities required. | Will not exceed capacity. No additional facilities required. | The planned transportation requirement is <4% of that planned for the RFSP and one sixth of the traffic when the RFSP was operating at reduced capacity (125 ton per day of biomass feedstock). |

| Category | (A)<br>Existing Environment<br>As of 2007<br>2007 RFSP EA | (B)<br>Consequences of RFSP Construction and Operation<br>2007 RFSP EA, 2009 RFSP SEA | (C)<br>Differences in LanzaTech 2011 Proposed Construction and Operation<br>2011 LT EA | (D)<br>Differences in Freedom Pines Fuels Construction and Operation<br>Proposed Project |
|---|---|---|---|---|
| **15. Utility Infrastructure** | **Natural Gas:** Natural Gas pipelines, supplied by Atlanta Gas Light, currently run immediately adjacent to Commerce Drive along a portion of the southern border of the parcel for the proposed plant. Additional four inch lines would be installed by Atlanta Gas Light along Commerce Drive and onto the facility. **Potable Water:** Range Fuels signed a Memorandum of Understanding with the Soperton Municipal Water Supply to receive up to 0.72 mgd of municipal water. Four-inch water lines are in place in the Industrial Park to provide potable and process water and fire protection for planned industrial development. **Wastewater:** The City of Soperton WWTP receives flow from the sewer system installed in the Industrial Park. The City has indicated that its WWTP has between 0.1 and 0.2 mgd of available capacity to process wastewater from the project. **Power:** Regionally, the existing power infrastructure was adequate to support the requirements of the proposed plant. No power lines were on the site and a 115 kV to 25 kV substation had to be built on-site to accommodate the Range Fuels project. New 115 kV transmission lines were constructed to connect the substation to the grid. | Atlanta Gas Light installed new gas lines. Georgia Power completed construction of new 115 kV transmission lines and a new substation. | No new power, water or natural gas requirements (see "Inputs & Outputs" table). | There are no new power water or natural gas requirements.<br>Requirements for wastewater disposal were analyzed in the context of existing permits and City/County infrastructure. Based on discussions with local authorities, existing City WWTP infrastructure will be adequate for the Project's operating requirements. Existing site civil infrastructure will continue to be sufficient for stormwater management requirements in the construction and operations phase.<br>The power infrastructure installed by Georgia Power and Range Fuels is adequate to support the Project, with the addition of a motor control center and panel board local to the plant to deliver power and meter consumption. |
| **16. Aesthetics** | The proposed location of the Range Fuels facility is predominately within an existing Industrial Park containing seven current businesses. Most of the buildings in the Industrial Park have metal exteriors, with the exception of the Easter Seals and County Training facilities, which have brick facades. None of the existing buildings in the Industrial Park exceed 35 feet in height. There is a water tower located in the Industrial Park that is approximately 120 feet tall. | Plant and support facilities are minimally visible to all but neighboring businesses and not readily visible to closest residences. Plant structures < 100 feet, reducing visibility. Georgia Power infrastructure had negligible impacts on aesthetics. Facility and security lighting is unavoidable long-term adverse impact to night sky views in immediate vicinity. | Unchanged. Maximum height of new units is 25 meters, which is below Range Fuels' planned maximum of 100 feet. | The maximum height of Project equipment is 144 feet. There are two radio towers within Treutlen County. The WJHH-AM tower (217 feet) is located at the Treutlen County School District property, 2.9 miles from the site. The WKTM-FM tower (302 feet) is located 4 miles to the northeast of the site, near I-16. No new structures have been built in the immediate vicinity of the site since the time of previous EAs. Visibility from local businesses and residences is unchanged. |

| Category | (A)<br><br>Existing Environment<br>As of 2007<br><br>2007 RFSP EA | (B)<br><br>Consequences of RFSP Construction and Operation<br><br>2007 RFSP EA, 2009 RFSP SEA | (C)<br>Differences in LanzaTech 2011 Proposed Construction and Operation<br>2011 LT EA | (D)<br><br>Differences in Freedom Pines Fuels Construction and Operation<br><br>Proposed Project |
|---|---|---|---|---|
| **17. Socioeconomic Factors** | See page 16 of the accompanying excerpt from the DOE EA.<br><br>[Excerpt from RF EA to be provided] | The project's job creation and economic impact, both during construction and plant operation, are expected to have a positive influence on all key socioeconomic factors. Minority residents are not expected to be negatively impacted by construction or operation of the project. | Unchanged. | Unchanged from prior EAs. |

## V.3 Affected Environment and Environmental Consequences

### V.3.1. Land Use

***Existing Environment***

The proposed Project is located in a rural area, Treutlen County, where forestry (pine plantations) and agriculture are the predominant land use types. The Project is located within an industrial park about two miles northwest of the City of Soperton, Georgia, that supports other commercial operations. The closest schools and churches are 2.4 miles and 3.2 miles, respectively to the southeast, otherwise there are interspersed residential and neighborhood-type commercial uses.

***Impacts and Mitigation***

The Project will lie entirely within areas previously cleared for installation of RFSP process equipment and evaluated in all prior EAs. There are no land use regulations in Treutlen County or the City of Soperton, therefore, no impacts or mitigation are anticipated.

### V.3.2. Geomorphology, Geology, Seismic Hazard, and Soils

***Existing Environment***

The proposed Project is located in Teutlen County, Georgia, ranging from 250 to 320 Above Mean Sea Level (AMSL), with a low seismic hazard. Pace Geotechnical Incorporated performed a Preliminary Subsurface Exploration and Geotechnical Engineering Evaluation in 2007 for a cellulosic ethanol plant (RFSP) located at the Project site. The geological and soil conditions are unchanged. The site is in the Neogene Undifferentiated formation of the Coastal Plan and in the Coastal Plain Physiographic Province of Georgia. The Project Area consists of four soils series according to the National Resources Conservation Service (NRCS), including Tifton loamy sand, Norfolk loamy sand, Plummer sand, and Gilead Lakeland Cuthbert sands, in order of descending percentage (Figure 4). Norfolk loamy sand, Tifton loamy sand, and Gilead Lakeland Cuthbert sands are well drained; Plummer sand is poorly drained.

**Figure 4 – National Resources Conservation Service Soils Map**

***Impacts and Mitigation***

The 2007 RFSP EA included a geotechnical survey and evaluation of soil types in the RFSP project area. Of the total RFSP project area, 24.6 acres were found to be of soil types designated as prime farmland (Norfolk loamy sand with 2 to 5 percent slopes and Norfolk loamy sand with 2 to 5 percent slopes, eroded). The 2007 RFSP EA contained the following analysis and conclusion:[6]

> *"The 24.6 acres of prime farmland that would be converted to industrial use represents a negligible amount of the prime farmland within Treutlen County. The two designated prime farmland soil types that occur on the site occur on approximately 8,680 acres in Treutlen County (approximately 7 percent of the county; USDA, 1964). Slightly less than 0.3 percent of these two series within the county would be converted. Other soil types that have been designated as prime farmland in Treutlen County would not be impacted by the proposed project. The area where the prime farmland would be lost is being developed as an Industrial Park and these soils have been permanently removed from agricultural production independent of the proposed project. Any impacts to prime farmland would be negligible."*

Because the Freedom Pines Fuels Project lies entirely within the area covered by the analysis above and previously cleared by Range Fuels, there will be no impacts (and no required mitigation) to soils.

### V.3.3. Hydrology

***Existing Environment***

#### Surface Water

Wetland and waterbody delineations of the proposed Project were conducted by Wenck Associates, Inc (Wenck) on July 17-20 and September 3-7, 2018. A total of five wetlands, two streams, and one wet ditch were delineated within a larger footprint. The details of these features are presented in Attachment 5.

#### Ground Water

The proposed Project is located in the Gordan and Upper/Lower Floridian aquifers according to the United States Geologic Survey (USGS). The existing facility is served by a City of Soperton-owned well with a capacity of 500,000 gallons per day. Data indicates that this well serves about a dozen other users, however, Freedom Pines is the largest user (~30,000 gallons per day [or ~6% of capacity]). The City of Soperton has provided a letter that up to 100,000 gallons per day could be provided from the existing well (Attachment 6).

#### Floodplain

The proposed area is not located in a designated Federal Emergency Management Agency (FEMA) floodplain. The FEMA Flood Map Service Center shows that the proposed Project is located in a Zone X area (minimal flood hazard; Figure 5, following page).

[6] 2007 RFSP EA, pg 43.

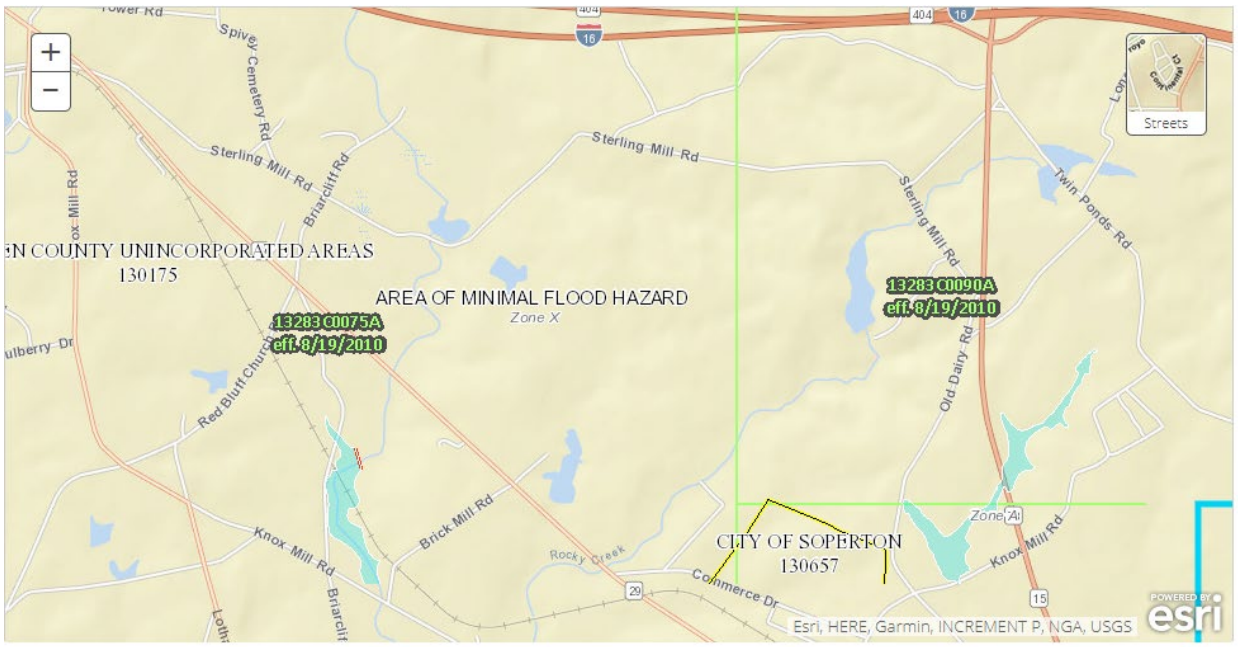


**Figure 5 – FEMA Flood Map Service Center Map**

### Coastal Zone Management Areas

The proposed Project is not located within any designated Coastal Zone Management Act (CZMA) areas. The interactive National Oceanic and Atmospheric Administration (NOAA) Coastal Mapper tool was used to verify this information and is shown in Figure 6.

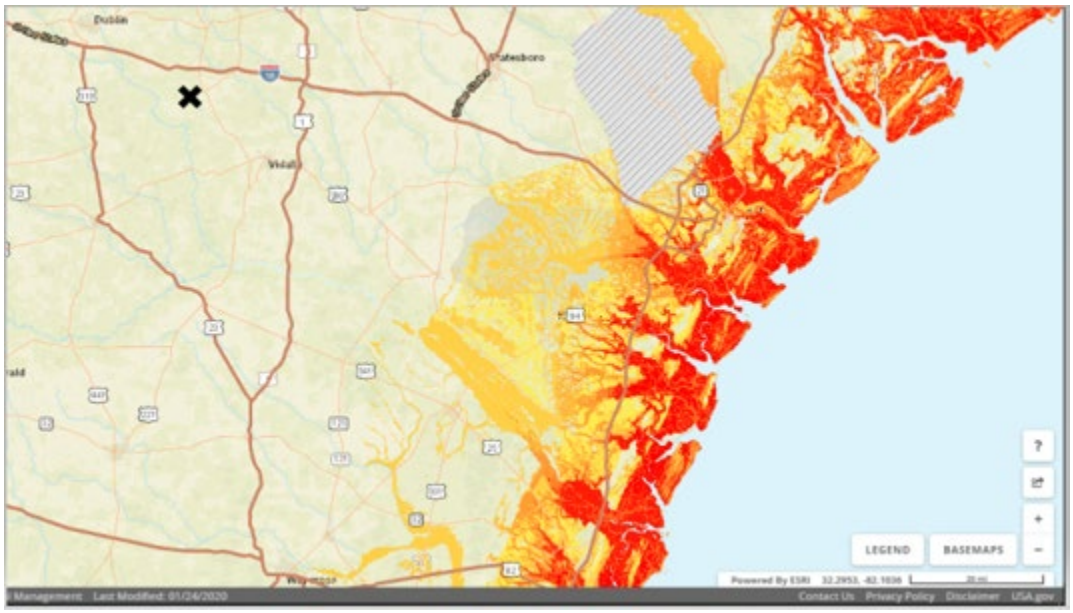


**Figure 6 – NOAA Coastal Mapper**

***Impacts and Mitigation***

Impacts to surface waters will be avoided by siting and designing the proposed Project within upland areas. As such, no mitigation will be required as there will be no impacts to surface waters. No additional groundwater withdrawals will be required therefore no impacts will occur and no mitigation is required for groundwater. Since the proposed Project does not intersect any FEMA-designated floodplains, no impacts will occur, thus no mitigation is required. Since the proposed Project does not intersect any designated coastal zones, no impacts will occur, thus no mitigation is required.

### V.3.4. Water Quality

***Existing Environment***

The Georgia Environmental Protection Division (EPD) regulates water quality in Georgia, and updates and maintains the List of 303 (d) Impaired Waters for the state, pursuant to the Clean Water Act (CWA). According to the EPD, there are no 303(d) listed segments within or near the proposed Project, that do not meet water quality standards.

***Impacts and Mitigation***

Freedom Pines will mitigate impacts to water quality during the construction phase of the proposed Project by implementing Best Management Practices (e.g., erosion and sediment control). Freedom Pines will develop a Storm Water Pollution Prevention Plan (SWPPP) prior to the onset of construction. During the 2007 construction of the RFSP, a stormwater detention pond was constructed to contain and treat stormwater to mitigate the new impervious surfaces. The additional impervious surfaces are expected to have no impact to the existing streams and wetlands as no surface water impacts are anticipated.

The facility developed a Spill Prevention, Control and Countermeasures (SPCC) Plan in 2007 to minimize water quality impacts to the aquifer or nearby surface waters in the event of an accidental hazardous materials release. The SPCC Plan will be updated prior to the start of operations.

Freedom Pines Fuels has evaluated the water that will be discharged from the Project and modeled the composition of the effluent that will be produced during operations. The upper limits of contaminants remain unchanged (Table 2). The flow to the Soperton WWTP is well under the volume for which the Project site is currently permitted.

Table 2 compares water effluent produced by prior projects which have received FONSIs and the proposed Freedom Pines Fuels Project.

**Table 2. Comparison of water effluents to those of prior proposed projects.**

| | With Range (2007 RFSP EA)* | With LanzaTech (2011 LT EA)* | With Freedom Pines Fuels Project |
|---|---|---|---|
| **Flows** | | | |
| Sanitary wastewater discharge to Soperton WWTP (gpd) | ≤5,000 | Unchanged - similar staffing levels | ≤5,000 (similar staffing levels) |
| On-site WWTP discharge of treated water to stream (gpd) | 60,000* | 75,000 | No effluent to stream |
| Changes in harvest site runoff characteristics after feedstock removal | none | none | none |
| **Pollutants** | | | |
| BOD | < 50 mg/L | Unchanged | Unchanged |
| TSS | < 50 mg/L | Unchanged | Unchanged |
| $NH_3$-N | < 10 mg/L | Unchanged | Unchanged |

* *From Table 4-1 in 2011 LT FONSI.*

### V.3.5. Wetlands

***Existing Environment***

Wetland and waterbody delineations of the proposed Project were conducted by Wenck on July 17-20 and September 3-7, 2018. A total of five wetlands, two streams, and one wet ditch were delineated within a larger footprint. The details of these features are presented in Attachment 5.

During construction of the RFSP facility in 2007 a total of 0.61 acres of two forested wetlands were permanently impacted (see 0 for details). These impacts were reported in the 2009 RFSP SEA.[7] During construction of the stormwater retention pond, 0.54 acres of one wetland were filled. Additionally, 0.07 acres of a second wetland were cleared during the RFSP site preparation. The former owner self-reported the encroachments. The 0.07 acres of cleared wetland were subsequently restored with its associated buffer, eliminating the impact. The former owner purchased applicable wetland mitigation credits to offset the 0.54 acres of filled wetland, resulting in no net loss of wetlands.

***Impacts and Mitigation***

Impacts to wetlands will be avoided by siting and designing the proposed Project in upland areas. As such, no mitigation will be required as there will be no impact to wetlands.

[7] SEA, pp

### V.3.6. Biological Resources

***Existing Environment***

Biological resources within the proposed Project Area are typical for the upper coastal plain of Georgia. While the predominant land uses are agriculture and forestry, native plants, animal, and habitats do occur within the Project Area. Vegetation observed during the spring and summer habitat assessment conducted by CH2M Hill (2007 RFSP EA) and the wetland delineations performed by Wenck in 2018 indicated that the herbaceous species included brooms edge grass (*Andropogon virginicus*), Greenbriar (*Smilax rotundifolia*), false maiden fern (*Macrothelypteris torresiana*), bahiagrass (*Paspalum notatum*), sensitive fern (*Onoclea sensibilis*), wood nettle (*Laportea canadensis*) swordfern (*Macrothelypteris torresiana*), spleenwort species (*Asplenium spp.*), and a variety of sedge species (*Carex spp.*). The tree stratum observed consists of long-leaf pine (*Pinus palustris*) within the pine plantations, and the following species in the non-planted areas: red maple (Acer rubrum), sweetgum (*Liquidambar styraciflua*), willow oak (*Quercus phellos*), sweetbay (*Magnolia virginiana*), and swamp titi (Cyrilla racemiflora).

It is expected that the site would support small animals including mice, vole, armadillos, raccoons, opossums, foxes, rabbits, deer, squirrels, snakes, frogs, and various birds.

***Impacts and Mitigation***

Impacts to biological resources are not expected as the proposed Project has previously been cleared under four prior FONSI's. Therefore, no mitigation is required.

### V.3.7. Protected Species

***Existing Environment***

The United States Fish and Wildlife Service (USFWS) administers the list of federally threatened, endangered, and special concern species and their habitats under the purview of Section 7 of the Endangered Species Act (ESA). Georgia maintains a state threatened or endangered species program in addition to the USFWS listed species. A review of federally listed species was conducted in 2018 by Wenck and Freedom Pines prior to conducting field habitat assessments, indicating that the eastern indigo snake (*Drymarchon corais couperi*) is listed as federally threatened, and the gopher tortoise (*Gopherus polyphemus*) is listed as state threatened and is a federal candidate species.

**Eastern Indigo Snake**

The eastern indigo snake uses a wide variety of habitats throughout the coastal plains of Florida and Georgia, and extreme southern portions of Alabama and Mississippi. In southeast Georgia the eastern indigo snake has been found utilizing wetlands, creek bottoms, and upland areas during summer months and may be found in sandhills or gopher tortoise holes to stay warm in winter months. This species feeds on gopher tortoises, other snakes, lizards, mammals, frogs, and birds. During an August, 2007 meeting, DNR and USFWS determined that the proposed construction area is too far north for occurrence of the federally protected Indigo Snake. However, should any Indigo Snakes be found at the construction site, Range Fuels committed to notifying USFWS and informal consultation would be initiated to avoid impacts and resolve any concerns. With the preservation of approximately 200 acres of natural greenspace and implementation of the proposed project design features, any impacts to protected species were anticipated to be negligible.

#### Gopher Tortoise

The gopher tortoise is a dry-land turtle that prefers sandy soils associated with long-leaf pine and oak sandhills in Florida, and southern segments of Georgia, Alabama, Mississippi, and Louisiana. In Georgia they have been found in mixed hardwood-pines, sandhills, and long-leaf pine habitats, where they feed on grasses, berries, flowers, and mushrooms. They dig burrows throughout the active season to serve as protection from the elements and from predators; many other species cohabitate these gopher holes such as mammals (rabbits, opossum, armadillos), snakes (including the eastern indigo snake), and other reptiles and amphibians. Range Fuels coordinated with the Georgia Department of Natural Resources (DNR) during construction of the RFSP to develop and implement a gopher tortoise relocation plan. The Georgia DNR approved the action and supervised tortoise relocation activities during the Summer 2008 and additional tortoise exclusion fencing was placed around the modified construction area.

***Impacts and Mitigation***

#### Eastern Indigo Snake

Habitat assessments were conducted in tandem with the wetland and waterbody delineations conducted by Wenck on July 17-20 and September 3-7, 2018. While Wenck did not conduct presence/absence surveys, the habitat assessments indicate that it is unlikely that eastern indigo snake is present on the proposed Project site (0). Several gopher tortoise holes were identified during the habitat assessment, but all were determined to be inactive. Since the eastern indigo snake relies on gopher tortoises as a food source, coupled with the fact that the proposed Project site is at the northern edge of the snake's potential range, this project may affect but is unlikely to adversely affect this species. The USFWS was informally consulted for this Project in 2019, based on previous consultations for 2007 and 2011, and they agreed that the current mitigation strategy of notifying the USFWS if any eastern indigo snakes are found are sufficient (Attachment 8).

#### Gopher Tortoise

Habitat assessments for the gopher tortoise were conducted in tandem with the wetland and waterbody delineations conducted by Wenck on July 17-20 and September 3-7, 2018. While Wenck did not conduct presence/absence surveys, the habitat assessments did identify at least 10 gopher tortoise burrows adjacent to wetlands and mostly along sandy slopes (Attachment 5). More gopher tortoise burrows are assumed to be present within the area, but Wenck only reviewed the proposed Project site. All gopher burrows are assumed to be inactive based on the observed conditions of the burrows, thus, this project may affect but is unlikely to adversely affect this species. The USFWS was informally consulted for this Project in 2019, based on previous consultations for 2007 and 2011, and they agreed that the current mitigation strategies of implementing a tortoise relocation program if needed and utilizing exclusion fencing are sufficient (Attachment 8).

### V.3.8. Safety and Occupational Health

***Existing Environment***

The Soperton Fire Department serves the Industrial Park. It is located approximately 3 miles away from the site. The Project site has a fire ring with hydrants for use in case of emergency. The Treutlen County Sherriff's Department in downtown Soperton provides police services. Medical services are available in Dublin (Fairview Park Hospital), Vidalia (Meadows Regional Medical Center) and Swainsboro (Emanuel Medical Center). The 2007 RFSP EA evaluated production of 100 million gallons per year of ethanol, with on-site storage of 4.5 million gallons ethanol and 0.9 million gallons methanol. The Project Area currently

has no storage tanks or flammable materials. The host site has storage tanks containing flammable materials, including ethanol and methanol plus small quantities of jet range hydrocarbons, diesel, and gasoline. The Project Area and its prior uses have been evaluated by the site host: Freedom Pines Biorefinery. No plant operations have taken place in the area designated for the Freedom Pines Facility. The area where the plant will be constructed is not in active use and has not been used previously to process or store chemicals or any other hazardous materials.

***Impacts and Mitigation***

The fire, police, and medical services remain unchanged from prior conditions. The Freedom Pines Fuels facility will store flammable materials in smaller quantities than those planned for the RFSP and evaluated in the 2007 RFSP EA. The existing site conditions are not expected to have an adverse effect on personnel that construct or operate the Freedom Pines Fuels plant. For additional assurance, Freedom Pines Fuels will conduct a Phase 1 Environmental Site Assessment in the area of the planned Freedom Pines Fuels plant before onset of construction. The facility will be operated under strict adherence to U.S. OSHA requirements, including Process Safety Management Regulation OSHA 29 CFR 1190.119.

### V.3.9. Noise

***Existing Environment***

The existing noise environment is unchanged since the Environmental Assessment performed for DOE by Range Fuels in 2007 (2007 RFSP EA). No new buildings have been constructed that would be affected by noise during construction or operation of the Project. The closest residence is 1500 feet from the proposed construction area. Construction would occur during daylight hours, up to six days a week. Nearby employees and residents could notice construction-related noise, which would be above background levels but confined to daytime hours. Direct exposure would be temporary, limited to times when personnel were traveling between vehicles and buildings or among buildings.

***Impacts and Mitigation***

The noise impacts of the Freedom Pines Fuels Project will be significantly lower than those of the Range Fuels Project during both construction and operation. The potential noise impacts of construction and operations of the proposal Range Fuels project are provided in Attachment 9. The Range Fuels facility was designed to be stick built, with construction of both process units and OSBL equipment taking place onsite. In contrast, the Freedom Pines Facility process units will be constructed offsite and delivered as modules by truck. This will limit construction-related noise to installation of OSBL equipment, preparation of foundations, etc. for the modules, and module installation. The noise levels of the Freedom Pines Fuels Project will also be significantly lower during operations, due to the absence of any wood-handling equipment (e.g. no chipper, dryer, conveyer) and reduced truck traffic (e.g. an average of 10 trucks per day for feedstock and product delivery vs 1 truck every 1.8 minutes for the RFSP (267 trucks per 8 hour day, Attachment 9)[8]. Noise mitigation is provided by the surrounding forest buffer, which has been retained and has grown since the 2007 RFSP EA.

[8]2009 RFSP SEA, page 18.

### V.3.10. Meteorology

***Existing Environment***

The local climate and weather are unchanged since the Environmental Assessment performed for DOE by Range Fuels in 2007 (2007 RFSP EA). Treutlen County has a temperate climate with average temperatures between 53F and 78F. The County has a low incidence of tornadoes, 3.1 times lower than the national average. Treutlen County is 90 miles west of the Atlantic coast and is unlikely to experience a direct hit from a hurricane because hurricanes in the South Atlantic typically hit the Georgia coast while traveling north. The County does experience heavy rainfall during major storms and occasional spells of below freezing weather during the winter. See Attachment 10, excerpted from the 2007 RFSP EA for details.

***Impacts and Mitigation***

The Project will have no impact on local weather or climate. The site is designed to handle water runoff during heavy rainfall and all process units are designed for operation in sub-freezing temperatures. Although tornadoes are rare in the area, standalone tornado shelters have been installed at the site.

### V.3.11. Air Quality

***Existing Environment***

The Federal Clean Air Act (CAA) required the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. NAAQS include two types of air quality standards. Primary standards protect the public, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards protect the public welfare, with respect to protection against decreased visibility, damage to animals, crops, vegetation, and buildings. EPA has established NAAQS for six principal pollutants, which are called criteria pollutants. They include nitrogen oxides (NOx, including nitrogen dioxide [$NO_2$]), carbon monoxide (CO), particulate matter (PM), sulfur dioxide ($SO_2$), ozone ($O_3$), and lead (Pb).

Treutlen County is in attainment for all criteria pollutants. The Freedom Pines Fuels facility will not be built in a criteria air pollutant non-attainment or maintenance area. It will not emit any criteria pollutant in excess of the major source threshold of 100 tons per year. Therefore, a full CAA conformity determination is not required.

***Impacts and Mitigation***

The expected maximum annual Potential to Emit (PTE) emissions of the Freedom Pines Facility are significantly lower than those anticipated in the 2007 DOE EA and 2011 USDA EA, as shown in Table 3 (following page). Therefore, no mitigation is expected to be required.

**Table 3. Comparison of criteria pollutants to those of prior proposed projects.**

Maximum Annual (PTE) Criteria Pollutant Emissions* (maximum operation)

| | With Range** (2007 DOE EA) | With LanzaTech**,*** (2011 USDA EA) | With Freedom Pines Fuels*** Project |
|---|---|---|---|
| $PM_{2.5}$ | 41.2 | Unchanged | <5 |
| PM | 93 | Unchanged | <5 |
| NOx | 95.5 | Unchanged | <5 |
| SOx | 0.72 | Unchanged | <0.1 |
| CO | 86.6 | Unchanged | <15 |
| VOC | 26.2 | Unchanged | <10 |
| HAPs (total) | 9 | Unchanged | <5 |
| HAPs (individual) | all < 10 | Unchanged | all < 1 |

**Air Toxics also will be unchanged from those listed in the 2007 RFSP EA.*

***From Table 4-1 in 2011 LT FONSI.*

****Emissions dominated by existing units at site*

### V.3.12. Waste Management and Hazardous Materials

***Existing Environment***

Treutlen County has no landfill sites within the county. Freedom Pines Biorefinery is currently a small quantity generator of hazardous wastes. Solid wastes are collected and transported to the Toombs County Landfill. The Toombs county landfill is located approximately 18 miles southeast of the site, at 2974 Lyons Center Road and is permitted to accept both solids/sludges and construction/demolition debris. No hazardous wastes or hazardous materials have been identified at the site.

***Impacts and Mitigation***

Limited construction debris will be generated due to the method of construction and will be transported to landfill via standard means. The Project will not change the status of the site as a small quantity generator of hazardous waste. Sludges and solid wastes will be transported to the Toombs County Landfill. Therefore, no mitigation will be required.

### V.3.13. Cultural Resources

***Existing Environment***

Previous cultural resources surveys have identified five archeologic sites, however, none were considered eligible for the National Historic Places (no figures are provided due to confidentiality of these resources). Site 9TU2D was identified by Garrow and Associates, Inc. in 2000 and consisted of small lithic scatter and ceramics. Sites 9TU28, 9TU29, 9TU30, and 9TU31 were identified in June, 2018 and were determined to be ineligible. LanzaTech is completed a follow up questionnaire from the State of Georgia Historic Preservation Division (HPD) and received a letter stating that"… it is HPD's opinion that the subject project, as proposed, will have no adverse effect to historic properties within its APE, as defined in 36 CFR Part 800.5(d)(1), due to distance, intervening vegetation, and existing modern intrusions" (Attachment 11). Consultations with the applicable tribes including the Alabama-Quassarte Tribal Town, Coushatta Tribe of Louisiana, and Muscogee (Creek) Nation was initiated on July 30, 2020.

***Impacts and Mitigation***

At this time, no impacts to cultural resources, archeological artifacts, or historical places are expected. However, if consultations with SHPO or any of the tribes indicate otherwise, LanzaTech will work with the SHPO and/or Tribes as needed to avoid, minimize, or mitigate resource impacts.

### V.3.14. Transportation

***Existing Environment***

The site is located approximately 2 miles northwest of the town of Soperton on Commerce Drive between SR 29 and SR 15.The site has ready access to the US Interstate Highway System via I-16, which connects to I-75 near Macon, GA and to I-95 in Savannah, GA. Current routes to I-16 from Commerce Drive are via SR 29, or via Knox Mill Road to SR-15. SR 15 is a North-South rural arterial between Soperton and I-16, with two 12-foot travel lanes, 2-foot paved shoulders, 1-foot grass shoulders and ditches. The I-16 SR 15 interchange is a standard four-ramp intersection. Per conversations with Treutlen County Commissioners, there has been no significant change in traffic on SR-15 since 2011, when the most recent EA was performed for operations at the site. The 2007 RFSP EA considered traffic of 254 trucks per day to deliver wood feedstock to the site, which was increased to 267 in the 2009 RFSP SEA.[9] The 2007 RFSP EA evaluated construction and use of a new road to directly connect the site with I-15, bypassing Knox Mill Road. The road corridor was cleared by Range Fuels but no road was built.

***Impacts and Mitigation***

The impacts of the Project in the area of transportation will be lower than those evaluated in the 2007 RFSP EA for the planned RFSP. The impact of truck and automobile traffic during construction will be lower than that assessed for RFSP due to the method of construction, which limits the number of trucks and construction workers needed to build the plant. During operations, automobile traffic for personnel will be less than 50% of those planned for the RFSP, due to lower staffing requirements. The Project will receive ethanol deliveries and transport hydrocarbon products by Interstate-16 via Commerce Drive, Knox Mill Road, and SR-15. This will increase local truck traffic over current levels by an average of 10 tanker trucks per day. This is one sixth of the actual truck traffic during operation of the RFSP at the 125 ton/day scale and less than 4% of the truck traffic increase planned and evaluated for the RFSP at full capacity. Therefore, no mitigation is required for transportation.

[9] 2009 RFSP SEA, pg 18.

### V.3.15. Utility Infrastructure

***Existing Environment***

The Project will use the existing energy infrastructure and other utilities put in place for the RFSP. The Project site is equipped with all required utilities, including natural gas, electricity, potable and process water, fire suppression ring, wastewater and stormwater infrastructure. The gas lines installed by Atlanta Gas and Light for Range Fuels have sufficient capacity for the Project. Georgia Power has confirmed that the existing electrical infrastructure will deliver more than the required power. The City of Soperton has confirmed the availability of water from the existing well that serves the Project site.

***Impacts and Mitigation***

The Project places no new requirements on utilities above those previously planned and encompassed under prior Environmental Assessments and FONSIs for the Range Fuels Soperton Plant. There will be no new utility infrastructure installed and therefore no impacts or required mitigation.

### V.3.16. Aesthetics

***Existing Environment***

The existing environment is unchanged since that reviewed for LanzaTech's prior project in the 2011 LT FONSI (Attachment 4). The location of the Freedom Pines Fuels facility is on the existing Freedom Pines Biorefinery site, which is largely located within an existing Industrial Park that contains several businesses. The facility is located on the highest topographical point within the Industrial Park. The existing plant and support facilities are minimally visible to all but neighboring businesses and not readily visible to closest residences. Existing plant structures are < 100 feet in height. In addition to a roughly 120-foot water tower located in the Industrial Park, unchanged since the 2007 DOE EA, there are two radio towers within Treutlen County. The WJHH-AM tower (217 feet) is located at the Treutlen County School District property, 2.9 miles from the site. The WKTM-FM tower (302 feet) is located 4 miles to the northeast of the site, adjacent to I-16. No new structures have been built in the immediate vicinity of the site since the time of previous EAs and the visibility of the site from local businesses and residences remains unchanged. Existing operations are 24/7 with security and facility lighting during the nighttime hours.

***Impacts and Mitigation***

The maximum height of equipment in the new facility is 144 feet. Visibility will remain limited to all but the immediate neighboring businesses due to distance and increased height of the tree buffers. Operations of the facility will be 24/7, as in the existing environment, but additional facility and security lighting will be needed. This lighting is not expected to significantly increase adverse impacts to night sky views in immediate vicinity.

### V.3.17. Socioeconomic Factors

***Existing Environment***

Soperton, Georgia, is located in Treutlen County - a rural county that has grown by only 0.3% between 2010 and 2019, with a total population estimated as 6,901 in 2019. During the same period, the State of Georgia saw growth of 9.6% during the same period. In 2018, total Treutlen County payroll was $17.9M and total employment was 669, a decrease of 3.6% from 2017. Georgia employment increased by 2.2% and U.S. employment by 1.8% during the same period. For the period 2014 – 2018, the median income in Treutlen County $37,606 and per-capita income was $23,907 (both in 2018 dollars). The poverty rate

in the county is over 26%. Home ownership in Treutlen County for the period 2014 – 2018 was 70.9% with an average home value of $70,900. During the same period, home ownership for the State of Georgia was 63.1% with an average home value of $166,800. The County (2019 estimate) is 63.8% White and 31.9% African American, and 3% Hispanic or Latino, with the balance American Indian, Asian, or mixed race. [10]

***Impacts and Mitigation***

The Project is expected to increase local employment by 100 direct and 30 indirect jobs during construction, and at least 15 direct and 24 indirect jobs during ongoing operations. These jobs are expected to generate $6.5 million in total wages and benefits during construction and $2.4 million in annual wages and benefits during operation.[11] This represents a significant increase in local economic activity, $6.5 million during construction and $2.4 million during operation. Maintenance, estimated at $800,000 per year, will largely involve purchasing supplies and services from the local area. The total annual increase in local economic activity is expected to be about $5 million, when utilities are also taken into account.[12] The Project will also provide educational opportunities for students from local schools, through visits to classrooms by staff, and universities, such as Georgia Southern University, through internships.

## VI. Cumulative Effects

The impacts in each category have been compared to those assessed in prior Environmental Assessments for projects at the same site. The cumulative impacts for this Project are anticipated to be minimal and less than those evaluated in the 2007 RFSP EA, 2009 RFSP SEA, and the 2011 LT EA, all of which resulted in Findings of No Significant Impact. The Project is expected to have a net positive cumulative impact on the human environment because the plant would produce low carbon fuels that also reduce emissions of air pollutants. In-flight testing by the National Research Council of Canada showed that a blend of 92% ATJ-SPK, produced using Project technology, with petroleum-derived aromatics reduced total and nonvolatile particle number emissions by over 95% compared to Jet A1 fuel.[13] These fuels will help airlines and transportation companies meet their environmental goals and diversify their transportation fuel supply. The Project will also create demand for advanced ethanol that will strengthen the U.S. rural economy and provide a market to offset demand reductions for road transport.

## VII. Preparers

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[10] Treutlen County: https://www.census.gov/quickfacts/fact/table/treutlencountygeorgia/PST045219#PST045219;
State of Georgia: https://www.census.gov/quickfacts/fact/table/GA,US/LFE041218#LFE041218
[11] Job estimates and multipliers based on:
https://www.epi.org/publication/updated-employment-multipliers-for-the-u-s-economy/
[12] Data developed from Project financial model.
[13] S. Tran, et al. "Comparison of Particle Number Emissions from In-Flight Aircraft Fueled with Jet A1, JP-5 and an Alcohol-to-Jet Fuel Blend". **Energy & Fuels**.
https://pubs.acs.org/action/showCitFormats?doi=10.1021/acs.energyfuels.0c00260&ref=pdf.

## VIII. References


1. (2007 RFSP EA) Final Environmental Assessment for Construction and Operation of a Proposed Ethanol Cellulosic Ethanol Plant, Range Fuels, Inc., DOE/EA-1597 (October 2007). https://www.energy.gov/nepa/downloads/ea-1597-final-environmental-assessment
2. (2007 DOE FONSI) DOE Finding of No Significant Impact for DOE/EA-1597, issued October 15, 2007. https://www.energy.gov/sites/prod/files/nepapub/nepa_documents/RedDont/EA-1597-FONSI-2007.pdf
3. (2009 RFSP SEA) Supplemental Environmental Assessment and Notice of Wetlands Involvement Construction and Operation of a Proposed Cellulosic Ethanol Plant, Range Fuels Soperton Plant, LLC (formerly Range Fuels Inc.) Treutlen County, Georgia, DOE/EA-1647 (January 2009). https://www.energy.gov/nepa/downloads/ea-1647-supplemental-environmental-assessment
4. (2008 USDA FONSI) USDA Finding of No Significant Impact for DOE/EA-1647, issued December 31, 2008. See Attachment 2.
5. (2009 USDA FONSI) DOE Finding of No Significant Impact for DOE/EA-1647, issued January 14, 2009. https://www.energy.gov/sites/prod/files/nepapub/nepa_documents/RedDont/EA-1647-FONSI-2009.pdf
6. (2011 LT EA, 2001 USDA FONSI) Published together with USDA Finding of No Significant Impact, issued September 23, 2011. https://www.rd.usda.gov/sites/default/files/FONSILanza2.pdf

**DOE Finding of No Significant Impact (RFSP, October 2007)**

# USDA Finding of No Significant Impact (RFSP, December 2008)

# DOE Finding of No Significant Impact (RFSP, January 2009)

[redacted]USDA Finding of No Significant Impact (LanzaTech, September 2011)

[redacted]Wetland Delineation Report.

**Letter from City of Soperton regarding water supply.**

**Map of wetlands impacted by RFSP.**

*(Excerpted from 2009 RFSP SEA)*

[redacted]**USFWS consultation.**

## [redacted]Anticipated noise impacts from RFSP.

*(Excerpted from 2007 RFSP EA)*

## Treutlen County meteorological conditions.

*(Excerpted from 2007 RFSP EA)*

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