**DRAFT**

# BIOLOGICAL ASSESSMENT IN SUPPORT OF GREENHOUSE GAS PERMITTING FOR A GAS TO GASOLINE PLANT NATGASOLINE LLC TX

Prepared for

**U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA), REGION 6**
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# LIST OF ACRONYMS

| | |
|---|---|
| AA | Action Area |
| ASU | air separation unit |
| BA | Biological Assessment |
| BGEPA | Bald and Gold Eagle Protection Act |
| BMPs | best management practices |
| bpd | barrels per day |
| CAAA | Clean Air Act Amendments |
| CFR | Code of Federal Regulations |
| $CH_4$ | methane |
| CO | carbon monoxide |
| $CO_2$ | carbon dioxide |
| EFH | Essential Fish Habitat |
| EPA | Environmental Protection Agency |
| ESA | Endangered Species Act |
| FMP | fishery management plan |
| FR | Federal Regulations |
| GHG | greenhouse gas |
| HAPC | habitat of particular concern |
| LDAR | leak detection and repair |
| MBTA | Migratory Bird Treaty Act |
| MMPA | Marine Mammal Protection Act |
| MSFCA | Magnuson-Stevens Fishery Conservation Act |
| MSS | maintenance, startup, and shutdown |
| GtG | gas to gas |
| NAAQS | National Ambient Air Quality Standards |
| NMFS | National Marine Fisheries Service |
| NOAA | National Oceanic and Atmospheric Administration |
| NOx | nitrogen oxides |
| $N_2O$ | nitrous oxide |
| $O_3$ | ozone |
| PM2.5 | particular matter equal or less than 2.5 micrometers in diameter |
| PM10 | particulate matter equal or less than 10 micrometers is diameter |
| PSD | Prevention of Significant Deterioration |

| | |
|---|---|
| SIP | State Implementation Plan |
| SOx | sulfur oxides |
| $SO_2$ | sulfur dioxides |
| | |
| tpd | tons per day |
| TPWD | Texas Parks and Wildlife Department |
| | |
| USEPA | U.S. Environmental Protection Agency |
| USFWS | U.S. Fish and Wildlife Service |
| USGS | U.S. Geological Survey |

# EXECUTIVE SUMMARY

Natgasoline LLC (Natgasoline) is submitting a greenhouse gas (GHG) permit application to U.S. Environmental Protection Agency Region 6 (USEPA) to obtain a Prevention of Significant Deterioration (PSD) permit authorizing the construction of a gas to gasoline (GtG) plant at the Natgasoline facility.

USEPA issuance of a GHG PSD permit to Natgasoline is an action subject to the consultation requirements of Section 7 of the Endangered Species Act (ESA). As a requirement under the ESA, this Biological Assessment was performed to assess the potential effects of this project on Federally listed endangered or threatened species and designated critical habitat.

An Action Area (AA) boundary was established based on the direct impacts from construction and operation of the facility and the indirect effects of project air emissions. Air dispersion modeling was performed to assess the increase of air emissions from the project. The modeled project air emissions were above a Federal Significant Impact Levels (SILs) under specific criteria for receptors up to 1.8 kilometers (km) from the project construction area. Accordingly, the AA associated with the project was established to include the construction and operation area and a 1.8-km radius around the proposed GtG plant to account for potential project-related air emission effects.

The BA provides an analysis of available information regarding the construction and operation of the GtG Plant and the existing biological resources surrounding the Natgasoline facility, including Federally listed species, other Federally protected species, and critically endangered habitat. Federally-protected species considered in this BA include Piping Plover, green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle. Based on the findings of this analysis, the construction and operation of the Natgasoline GtG Plant will have no effect on Federally listed threatened or endangered species or designated habitat for purposes of Section 7 of the Endangered Species Act, because no Federally listed threatened or endangered species, suitable habitat, or their designated critical habitat are within the AA for the project.

# 1. INTRODUCTION

Natgasoline, LLC (Natgasoline) is submitting a greenhouse gas (GHG) permit application to U.S. Environmental Protection Agency Region 6 (USEPA) to obtain a Prevention of Significant Deterioration (PSD) permit authorizing the construction of a gas to gasoline (GtG) plant at the Natgasoline facility.

USEPA issuance of a GHG PSD permit to Natgasoline is an action subject to the consultation requirements of Section 7 of the Endangered Species Act (ESA). As a requirement under the ESA, this Biological Assessment (BA) was performed to assess the potential effects of this project on Federally listed endangered or threatened species and designated critical habitat.

## 1.1 PURPOSE

Section 7(a)(2) of the ESA, 16 United States Code (USC) §1536(a)(2), and its implementing regulations at 50 Code of Federal Regulations (CFR) Part 402, requires USEPA to consult with the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS), or both under certain circumstances, to ensure that USEPA issuance of a GHG PSD permit is not likely to jeopardize the continued existence of any Federally listed endangered or threatened species or result in the destruction or adverse modification of such species' designated critical habitat. The overall purpose for creating and submitting this BA is to support USEPA obligations under ESA Section 7. This BA first evaluates and identifies the Action Area (AA), then determines whether USEPA action is likely to: (1) adversely affect listed species or designated critical habitat; (2) jeopardize the continued existence of species that are proposed for listing; or (3) adversely modify proposed critical habitat.

## 1.2 SCOPE OF PROJECT/ACTION

Natgasoline proposes to construct a new motor-grade gasoline production facility in Nederland, Texas that uses methane (natural gas) as feedstock. The proposed new facility will encompass approximately 36 acres and will include 2 main process sections. The first process section, identified herein as the "Methanol Process," will convert methane and water into methanol. The

second process section, identified herein as the "MtG Process," will convert methanol into motor vehicle gasoline and water.

The two process sections are described as follows:

- A 5,500-metric ton per day (tpd) methanol production process that synthesizes refined methanol using methane and water; and
- A 22,000-barrel per day (bpd) gasoline production process that synthesizes gasoline and water using the refined methanol from the proposed new methanol production process.

New process equipment associated with this project includes external combustion sources (e.g., process heaters); a flare; a cooling water tower; storage tanks; vapor combustion unit; wastewater treatment system; and liquid loading with associated piping and other equipment components. The new GtG facility will comprise a new stationary source for purposes of PSD permitting; an additional application has been filed with TCEQ.

## 1.3 SCOPE OF BIOLOGICAL ASSESSMENT

This BA will examine the direct and indirect impacts of the proposed project on the wildlife and habitat within and surrounding the proposed project area. Additionally, this BA will provide a determination regarding if the proposed project will not affect, is not likely to adversely affect, or is likely to adversely affect Federally protected species.

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# 2. AGENCY REGULATIONS

## 2.1 REGULATIONS AND STANDARDS

State and local air pollution control agencies are required to adopt Federally approved control strategies to minimize concentrations of criteria air pollutants by Section 110 of the Clean Air Act (42 USC §7410). These Federally approved plans are referred to as State Implementation Plans (SIPs) and establish best management practices (BMPs) to minimize emissions of criteria air pollutants. Federal air quality standards are currently established for six criteria pollutants of concern, which include carbon monoxide (CO); nitrogen oxides ($NO_x$); sulfur oxides ($SO_x$), commonly measured as sulfur dioxide ($SO_2$); lead; particulate matter (PM) equal to or less than 10 micrometers in aerodynamic diameter ($PM_{10}$) and equal to or less than 2.5 micrometers in aerodynamic diameter ($PM_{2.5}$); and ozone ($O_3$).

Additionally, the USEPA has established primary and secondary National Ambient Air Quality Standards (NAAQS) for each criteria air pollutant under the Clean Air Act Amendments (CAAA) of 1990. Primary standards define levels of air quality necessary to protect public health, including the health of sensitive populations such as people with asthma, children, and the elderly. Secondary standards define levels of air quality necessary to protect against decreased visibility and damage to animals, crops, vegetation, and buildings. Any area of the United States that violates these NAAQS between one and four times per year over a three-year span of time is classified as a "nonattainment area."

The USEPA is required to establish regulations preventing significant deterioration of air quality in attainment areas. PSD increments are measurements of the maximum allowable increase in ambient air concentrations of a criteria pollutant from a baseline concentration after the date the baseline concentration was recorded. A significant impact level (SIL) is a measurable limit above which a source may cause or contribute to a violation of the PSD increment for a criteria pollutant. Before a PSD permit can be issued by the USEPA, the permit applicant must be able to demonstrate that the emissions from the proposed project will not cause a violation of a NAAQS or cause an increase above the PSD increment for the pollutants that would be emitted from the proposed project.

Computer models simulating the dispersion of emitted pollutants from the proposed project into the atmosphere are used to demonstrate compliance with NAAQS and PSD increments and to estimate maximum ground level concentrations at specified receptor locations in the Action Area of the proposed project. The project is determined to have no significant impact on ambient air quality if the modeled concentrations for pollutants and their averaging periods are less than the USEPA-specified SIL. If a determination of no significant impact is made, then no further modeling analysis is required for that pollutant for that averaging period. If a pollutant is predicted to exceed the SIL, then further modeling of the proposed project emissions combined with the existing emissions in the area will be used to calculate estimated total ambient concentrations. The estimated total ambient air concentrations from the model must show that the pollutant does not exceed the applicable NAAQS and PSD increments.

## 2.2 ENDANGERED SPECIES ACT

The ESA of 1973 (16 USC §1531) was instituted to "protect and recover imperiled species and the ecosystems on which they depend." The USFWS and the National Oceanic and Atmospheric Administration – National Marine Fisheries Service (NOAA-NMFS) regulate the ESA. Imperiled species are considered to be those species that are either threatened or endangered. Species that have been proposed for protection under the ESA by USFWS are considered to be candidate species, which are defined as those species that "warrant proposing [ ... ] for listing but [ are ] precluded from doing so by higher listing priorities." Though candidate species do not yet fall under the protection of the ESA, they will be included in analyses for the purposes of this BA.

The ESA prohibits the take or harm of protected species under Section 9 of the act. "Take" is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." "Harm" is defined as "an act which actually kills or injures wildlife." Harm also includes any modifications to a species' habitat that would result in mortality or injury to wildlife or anything that significantly impairs wildlife behavior patterns, including breeding, feeding, or sheltering.

# 3. PROJECT DESCRIPTION

## 3.1 PROJECT PURPOSE AND LOCATION

The construction of the GtG plant in the Beaumont area would create over 130 permanent new jobs. It would also be the first GtG plant in the U.S. and aid in the reduction of domestic dependence on foreign sources of oil. The new plant is proposed with two primary process sections:

- A 5,500-metric tpd methanol production process that synthesizes refined methanol using methane and water; and
- A 22.000- bpd gasoline production process that synthesizes gasoline and water using the refined methanol from the proposed new methanol production process.

The facility will consist of the structures and features presented in Table 3-1.

**Table 3-1**
**Planned Structures at the Natgasoline GtG Plant and Estimated Footprint Dimensions**

| Structure | Estimated Dimensions (square feet) |
|---|---|
| ASU | 44,800 |
| Auxiliary Boiler | 13,800 |
| Control Room Building | 30,300 |
| Cooling Water Tower | 65,100 |
| D-04001 Scrubber | 500 |
| D-04002 Scrubber | 500 |
| Railcar Truck Loading | 2,400 |
| Methanol Process | 265,300 |
| MtG Process | 231,100 |
| Parking | 21,600 |
| Combined Process Areas | 3,000 |
| S-10001 & S-10001 (MSS) Flare | 600 |
| Substation | 35,300 |
| TK-04001 | 2,000 |

| Structure | Estimated Dimensions (square feet) |
|---|---|
| TK-04002 A | 2,000 |
| TK-04002 B | 2,000 |
| TK-0S1 | 1,200 |
| TK-11001 A | 22,800 |
| TK-11001 B | 22,800 |
| TK-FGP1 A | 6,700 |
| Tk-FGP1 B | 5,600 |
| Tk-FGP1 C | 5,600 |
| TK-ST1 A | 1,100 |
| VCU-1 Combustion Unit | 600 |
| Water Treatment | 97,000 |
| Water Treatment Area | 138,900 |
| **Total** | **835,100** |

The proposed GtG plant would be constructed at the location shown in Figure 3-1. The proposed layout of the GtG plant is shown in Figure 3-2.

## 3.2 CONSTRUCTION INFORMATION

### 3.2.1 Construction Activities and Schedule

Construction of the GtG plant is scheduled to begin in 2013. A finalized schedule of construction will depend on the USEPA's schedule for issuing the GHG permit. Once started, construction is estimated to take approximately 24 months to complete.

A finalized list of equipment necessary for the construction of the GtG plant was not available as of the date of this report. However, it is expected that the construction equipment required will be equivalent to the industry standards for a project of this scope and may include heavy earth-moving equipment such as cranes, bulldozers, backhoes, and/or excavators.

### 3.2.2 Emission Controls

Best Management Practices (BMP) will be incorporated during the construction of the GtG plant to minimize emissions from construction equipment.

## 3.3 OPERATION AND MAINTENANCE INFORMATION

### 3.3.1 Operations

The proposed new GtG facility would be composed of two main process operations: the methanol process and the MtG process. The methanol process would be designed to produce 5,500 tpd of methanol from methane and water. The MtG would be designed to produce 22,000 bpd of gasoline from methanol feedstock. The GtG plant would also be supported by utility operations and other ancillary equipment as described below.

#### *3.3.1.1 Methanol Process Description*

The proposed new methanol process would synthesize methanol using methane as feedstock. Methane (natural gas) would be delivered to the methanol process by pipeline. The majority of the methane received by the facility would be used as chemical feedstock for the methanol process, and a portion of the natural gas would be burned as fuel. The chemical feedstock portion of the methane would first be treated to remove sulfur compounds and then otherwise pretreated for use in the methanol process.

#### *3.3.1.2 MTG Process Description*

The proposed new MtG Unit would synthesize motor-grade gasoline using methanol as feedstock. The methanol feedstock would be from the new Methanol process.

#### *3.3.1.3 Supporting Operations*

The proposed new GtG plant would be supported by various auxiliary operations. An auxiliary boiler would be used to provide steam to the plant. An Air Separation Unit (ASU), owned and operated by a separate company, would be located at the site in order to provide oxygen to the secondary reformer (i.e., the ATR). Additionally, a cooling water tower would provide the necessary process cooling water; a plant flare would control emissions in cases of upset or emergency and/or planned maintenance, startup, and shutdown (MSS); and a waste water

treatment plant will also be constructed. The proposed locations of the supporting operations in relation to the main process areas are shown on Figure 3-2.

### 3.3.2 Linear Facilities

Operation of the GtG facility would require the construction of related linear facilities including pipelines for product transfer, raw water, wastewater and utilities. All new pipelines are proposed to be located within the site property boundaries or along existing pipeline routes. The proposed Natgasoline pipeline routes and existing pipelines mapped by the Texas Railroad Commission are shown on Figure 2-3. Natgasoline proposes to include new pipelines within or along existing pipelines in previously disturbed areas. The pipeline routes contain habitat similar to the habitat within the proposed project construction area.

LEGEND

- PROCESS AREAS
- STORAGE AND LOADING
- EMISSION POINTS
- OTHER STRUCTURES
- PROPERTY BOUNDARY


N

0 2,000 4,000

Feet

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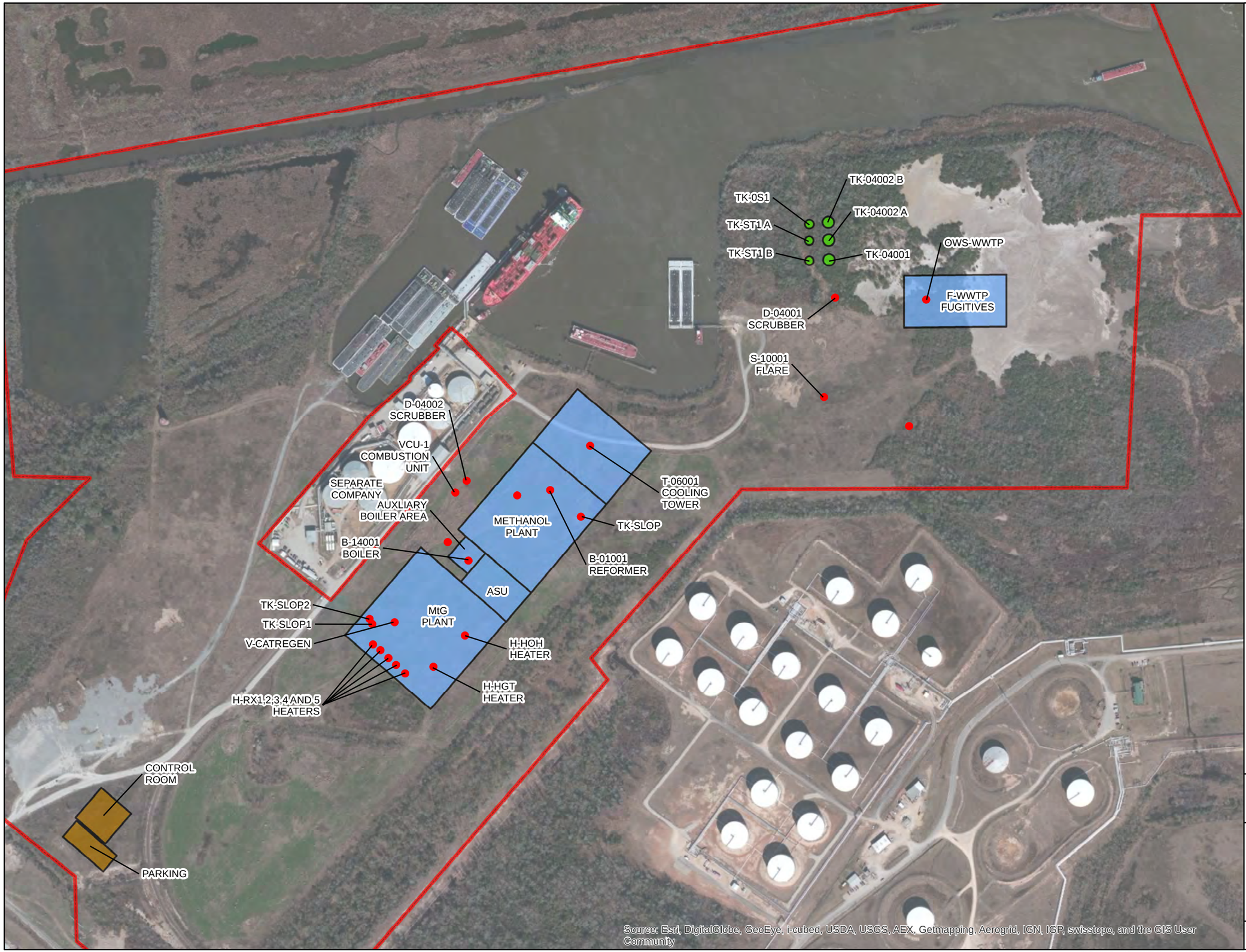
FIGURE 3-1
SITE LOCATION MAP

NATGASOLINE, LLC GHG PERMIT
BIOLOGICAL ASSESSMENT
BEAUMONT, TX

| DATE | PROJECT NO | SCALE |
|---|---|---|
| APR 2014 | 15089.001.001 | AS SHOWN |

FILE: I:\GIS Project Files\15089_Natgasoline LLC\001_Beaumont\mxd\Biological_Assessment\Figure 3-1 Site Location Map.mxd 4:14:02 PM 4/21/2014 herrinm




LEGEND

- PROCESS AREAS
- STORAGE AND LOADING
- EMISSION POINTS
- OTHER STRUCTURES
- PROPERTY BOUNDARY

N

0 400 800

Feet

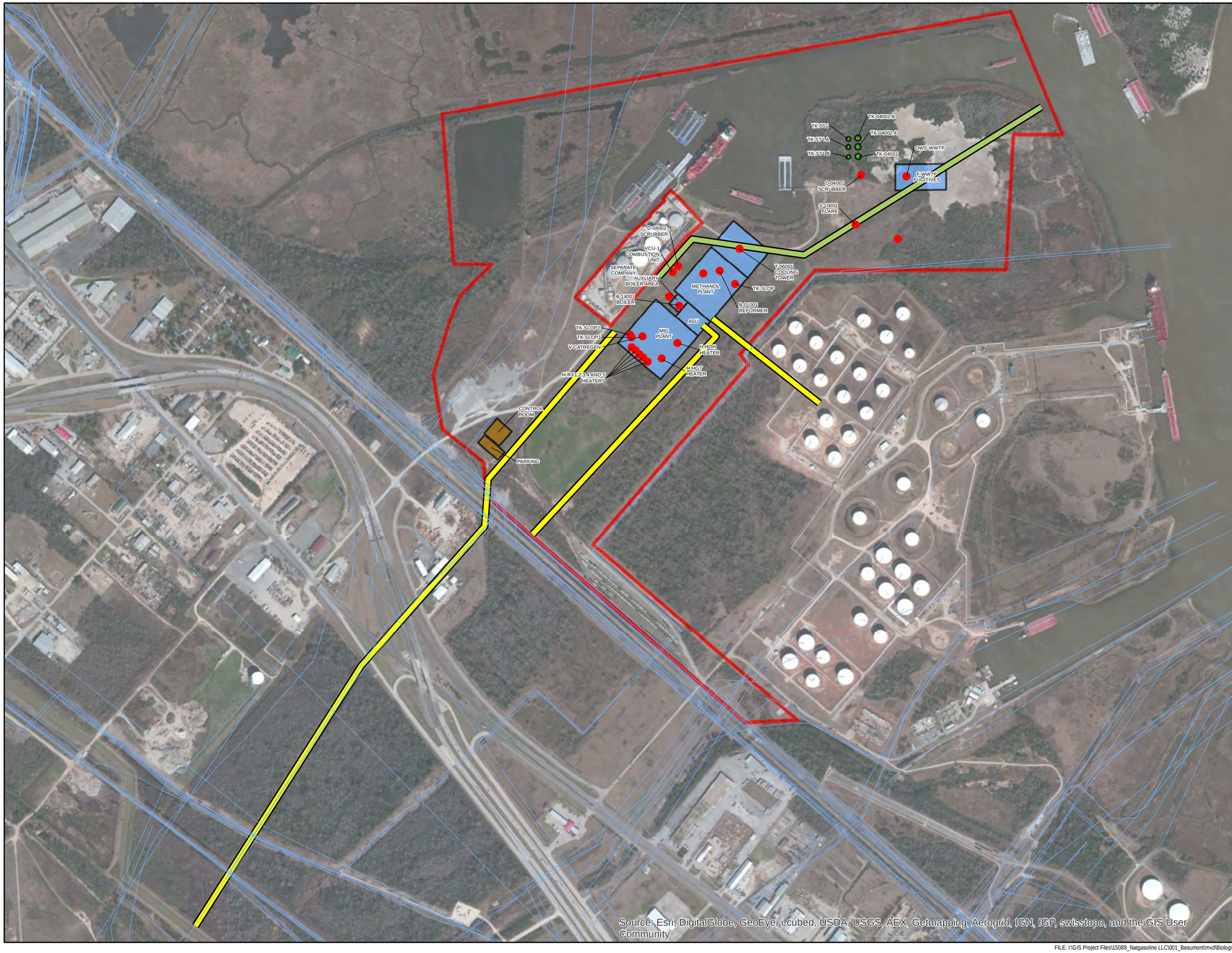
WESTON SOLUTIONS

FIGURE 3-2
PLANT LAYOUT MAP

NATGASOLINE, LLC GHG PERMIT
BIOLOGICAL ASSESSMENT
BEAUMONT, TX

| DATE | PROJECT NO | SCALE |
|---|---|---|
| FEB 2013 | 15089.001.001 | AS SHOWN |

FILE: I:\GIS Project Files\15089_Natgasoline LLC\001_Beaumont\mxd\Biological_Assessment\Figure 3-2 Plant Layout Map.mxd 4:19:10 PM 4/21/2014 herrinm




LEGEND

- PROCESS AREAS
- STORAGE AND LOADING
- EMISSION POINTS
- OTHER STRUCTURES
- PROPERTY BOUNDARY
- EXISTING PIPELINES
- PROPOSED PIPELINE CORRIDOR
- PROPOSED WASTEWATER PIPELINE

N

0 800 1,600

Feet

SOURCE: Railroad Commission of Texas, 2014, Pipelines.

WESTON SOLUTIONS

FIGURE 3-3
PROPOSED LINEAR FACILITIES

NATGASOLINE, LLC GHG PERMIT
BIOLOGICAL ASSESSMENT
BEAUMONT, TX

| DATE | PROJECT NO | SCALE |
|---|---|---|
| FEB 2013 | 15089.001.001 | AS SHOWN |

FILE: I:\GIS Project Files\15089_Natgasoline LLC\001_Beaumont\mxd\Biological_Assessment\Figure 3-3 Proposed Linear Facilities.mxd 4:20:33 PM 4/21/2014 herrinm

# 4. EVALUATION AND IDENTIFICATION OF THE ACTION AREA

As defined by 50 CFR §402.02, an AA is defined as "all areas to be affected directly or indirectly by the Federal action and not only the immediate areas involved in the action." The evaluation of biological resources potentially affected by EPA action is focused on impacts within the project AA. For both direct and indirect effects analyses, the AA should include not only the limits of physical disturbance for construction and operation of the project, but also any natural resources impacted by air pollutant emissions associated with the project. For projects like this that involve air pollutant emissions, the geographic limits of the AA are dependent on the projected emissions concentrations as most practicably demonstrated by air dispersion modeling.

The evaluation of the project effects on biological resources compares the existing or environmental baseline conditions within the AA with the conditions after the implementation of the proposed project. Baseline conditions include the following:

> *[ … ] the past and present impacts of all Federal, State, or private actions and other human activities in an Action Area, the anticipated impacts of all proposed Federal projects in an Action Area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process.* (50 CFR §402.02)

By comparing the baseline with the proposed future conditions, the effects of the proposed project on species, suitable habitat, or their designated critical habitat are measured independently of other effects, and the incremental effects of the proposed action on designated species or habitat are isolated.

## 4.1 ACTION AREA DELINEATION METHOD

The geographic boundaries of the AA were established using an evaluation of the direct impacts due to construction and operation of the project and the evaluation of air emissions dispersion modeling results for indirect effects. Descriptions of the effects due to the direct and indirect factors are provided in the following sections. The boundaries of the action area are shown in Figure 4-1.

### 4.1.1 Construction and Operating Area Analysis

This project includes the construction of an approximate 800,000-square foot GtG plant and associated supporting operations, including linear facilities, on approximately 35-acres of previously disturbed and maintained agricultural land and a dredge spoils area adjacent to the Neches River. Natgasoline has not developed detailed construction plans for the GtG project as of the date of this report. However, construction operations are anticipated to align with industry standards for the construction of an industrial plant of this size. There will likely be digging and ground disturbance associated with the construction of this facility, but BMPs will be employed to reduce emissions, fugitive dust, and habitat disturbance. There will be an increase in localized truck and barge traffic related to the construction of the facility. The increase in traffic is expected to last approximately two years. Once operational, the project is expected to support 130 employees. A moderate increase in local traffic is expected to result from the project operations. The noise volume and light levels generated through the project construction and operation will increase due to the construction equipment and typical daily facility activities.

The total project area is expected to cover approximately 800,000-square feet along the Neches River, and associated linear facilities shown on Figure 3-3.. This area will include a methanol process, MtG process, ASU, water treatment plant, parking areas, boilers, and storage tanks. As shown on Figures 3-2 and 3-3, the proposed locations for the process areas and the supporting operations are located in previous disturbed areas, including a maintained agricultural field and a past dredge spoil area.

### 4.1.2 Air Emissions Analysis

The following sections describe GHG emission calculation methods applied to each source type associated with the proposed GtG project.

#### *4.1.2.1 Combustion Sources*

Natgasoline proposes to construct nine new external combustion sources as part of the GtG project: the steam reformer, auxiliary boiler, and seven process heaters. GHG emissions from these nine combustion units were calculated using the proposed hourly and annual firing rates

and GHG emission factors for natural gas fuel combustion from 40 CFR Part 98 Subpart C, Table C-1 and Table C-2.

#### *4.1.2.2 Process Flare Emissions*

A plant flare will also be used as a part of plant operation. During normal operations, only natural gas (pilot gas and supplemental fuel) and compressor seal vent gas (process waste gas) will be combusted in the plant flare. Emissions from the combustion of the pilot gas were calculated using estimated maximum hourly and annual pilot gas flow rates in conjunction with the emission factor for carbon dioxide ($CO_2$) from USEPA AP- 42 Table 1.4-2 (July 1998) and emission factors for methane ($CH_4$) and $N_2O$ from 40 CFR Part 98 Subpart C, Table C-2.

The compressor seal vent gas is primarily comprised of nitrogen with some concentration (≤100 ppmv) of hydrocarbon contamination. There will also be some supplemental natural gas combined with this steam in order to raise the heat value of the waste gas to an acceptable level per §60.18. Emissions from the compressor seal vents were calculated using the estimated waste gas and supplemental natural gas flow rates and compositions and the appropriate emission factors. The $CO_2$ emission factor is from USEPA AP-42 Table 1.4-2 (July 1998). Emissions of $N_2O$ were based on the emission factor 40 CFR Part 98 Subpart C, Table C-2. Emissions of $CH_4$ were based on the estimated concentration of $CH_4$ in the waste gas stream and a flare destruction efficiency of 99%.

Waste gas flaring will occur during periods of unit startups. Specifically, synthesis gas and expansion gas process vents will be routed to the flare during limited portions of the methanol process startup operations.

Waste gas flaring will also occur during equipment clearing for maintenance purposes. Flare emissions from planned clearing of equipment were calculated based on the flare burning a volume of saturated gasoline vapor with a small amount of residual liquid volume. Hourly equipment clearing emissions for the flare were calculated assuming the largest process vessel on-site would be cleared to the flare in a single hour. Annual equipment clearing emissions were calculated based on the maximum estimated number of planned plant shutdowns that would occur in any 12-month period, and each shutdown was assumed to include the total volume of all

plant process equipment. These emissions calculation methods are intended to provide conservative potential GHG emissions estimates and are not intended to reflect planned actual maintenance practices.

Emissions of $CH_4$ and $N_2O$ from the waste gas flaring were calculated using the estimated organic vapor flow rates and emission factors from 40 CFR Part 98 Subpart C, Table C-2. The total global warming potentials in $CO_2$ were calculated based on the factors in 40 CFR Part 98 Subpart A, Table A-1.

#### *4.1.2.3 Vapor Combustor*

Vapors collected from gasoline product loading operations will be routed to a vapor combustor (EPN: VCU-1) for control. $CO_2$ from burning the collected loading vapors were calculated using the loading vapor loss calculations in USEPA AP-42 Section 5.2 (June 2008) and GHG emission factors from USEPA AP-42 Table 1.4-2 (July 1998).

#### *4.1.2.4 Fugitive Components*

Fugitive emissions of methane were calculated based on the calculated volatile organic compound (VOC) fugitive emission rates and the methane content of the fuel gas. VOC fugitive component leak emission factors were based on the estimated number of fugitive components and "SOCMI without Ethylene" factors from the TCEQ Technical Guidance Package for Equipment Leak Fugitives (November 2000). The monitoring credits were based on the TCEQ 28VHP leak detection and repair (LDAR) program. Total $CH_4$ emissions were calculated based the fuel gas containing 90% methane and 10% VOC by weight.

#### *4.1.2.5 Process Condensate Vents*

The process condensate stripper (EPN: D-01501) and process condensate degasser (D-05001) in the methanol unit will receive process condensate water from various processes. The condensate stripper will use steam stripping to remove gaseous contaminants, which will be routed through the stripper vent to the atmosphere. The vent stream will be primarily comprised of steam and air; however, a small amount of $CO_2$ and $CH_4$ will be emitted from the stripper vent. Emissions were calculated using the estimated vent flow rate and concentrations of $CO_2$ and $CH_4$. The

condensate degasser will remove $CO_2$ from the wastewater stream (less than 1% by weight). There will be no $CH_4$ emissions from the condensate degasser vent.

#### *4.1.2.6 Catalyst Regeneration*

The catalyst in the GtG reactors will be regenerated on a frequent basis to remove the coke that accumulates on the catalyst. The coke will be removed in a combustion process that will produce $CO_2$ emissions, which will then be routed to the atmosphere. There will be three different burn phases during the catalyst regeneration process: a main burn, a transition burn, and a clean-up burn. The three burn phases will use oxygen at varying flow rates and temperatures to remove any coke from the catalyst. Emissions were calculated using the estimated flue gas flow rates and $CO_2$ concentrations during the three different phases.

### 4.1.3 Air Emissions Model

Air emissions were evaluated based upon State air permitting requirements to assist in defining the AA. The project related emissions of CO, $NO_x$, and $PM_{2.5}$ and $PM_{10}$ were evaluated on an annual and hourly basis. The increases in emission rates were modeled in accordance with TCEQ minor NSR modeling protocols. This approach ensures that the incremental effects of the proposed project were evaluated.

The modeling results show that SILs were exceeded at a receptor location for $PM_{2.5}$ on an hourly basis at approximately 1,800 meters from the project construction area. Modeled air emissions for $NO_x$ 1-hr air emissions exceeded the associated SIL at a receptor location approximately 1,500 meters from the project construction area. Modeled CO air emissions exceeded the associated 8-hr SIL at a receptor location approximately 1,000 meters from the project construction area. Modeled emissions of $PM_{10}$ did not exceed any SILs at any receptor locations outside of the Natgasoline property. Details of the air emissions modeling are provided in Appendix A.

## 4.2 DETERMINATION OF ACTION AREA

The potential for effects related to the proposed project includes the area in which construction and operation will take place, and the area where air emissions modeling indicates the potential

for air emissions to exceed a SIL. Direct effects may result from increases in noise, dust, traffic, and light expected during the construction or operations associated with the project. Because the project includes new construction and would include new air emissions sources, indirect effects may result from an increase in local air emissions. Due to the modeled air emissions associated with this project, the AA includes a 1.8-km radius around the area in which construction and operation will take place.


WESTON SOLUTIONS

FIGURE 4-1
PROJECT ACTION AREA
NATGASOLINE, LLC GHG PERMIT
BIOLOGICAL ASSESSMENT
BEAUMONT, TX

| DATE | PROJECT NO | SCALE |
|---|---|---|
| APR 2014 | 15089.001.001 | AS SHOWN |

FILE: I:\GIS Project Files\15089_Natgasoline LLC\001_Beaumont\mxd\Biological_Assessment\Figure 4-1 Project Action Area.mxd 4:27:01 PM 4/21/2014 herrinm

# 5. BACKGROUND BIOLOGICAL INFORMATION

## 5.1 GENERAL REGIONAL ECOLOGY

The project area is located in the Gulf Coast Prairies and Marshes ecoregion of Texas (TPWD, 2012). Historically, this region was dominated by tallgrass prairies and live oak woodlands, but much of the habitat has been lost due to agricultural and urban developments. This region of Texas consists of a slowly drained, level plain less than 150 feet above mean sea level in elevation and barrier islands off the coast. Several streams and rivers cross the region as they flow from inland areas to the Gulf of Mexico. Common vegetation communities in this ecoregion include salt grass marshes along bays and estuaries, remnant tall grass prairies, and oak mottes. Old growth woodlands can still be found in some river bottoms throughout the region (TPWD, 2012). Though much of the native habitat of this ecoregion has been lost, it still serves as important habitat for numerous species of migratory birds. The bays, estuaries, and rivers also serve as vital spawning areas for species of fish and shrimp (TPWD, 2012).

### 5.1.1 Land Use

The majority of Jefferson County has been developed for agricultural, industrial, or urban facilities, leaving only small, fractured areas of native habitat. Pastureland for cattle and crops such as rice, sugarcane, forage, and grain make a large part of agricultural developments in the county (TSHA, 2012). The Neches River leading into Sabine Lake and the proximity of the Gulf of Mexico make Jefferson County a prime location for deepwater transport of goods. Industrial developments within the county include petrochemical facilities, ship building, and rubber manufacturing (TSHA, 2012).

The land immediately surrounding the proposed project has been heavily developed with industrial facilities with some undeveloped properties intermixed. Agricultural facilities are farther to the west of the property, and the City of Beaumont is less than 1/4 mile to the northwest. The properties immediately across the Neches River from the proposed project appear to be largely undeveloped.

### 5.1.2 Climate

Climate in the Gulf Coast Prairies and Marshes ecoregion varies widely over the large area covered by the region. Southwestern-most portions of the area receive an average of 23 inches of rain per year, whereas northeastern-most portions receive an average of 56 inches of rain per year (TAMU, 2012). The growing season lasts for more than 300 days out of the year (TPWD, 2012). Temperatures in the region are hot during the summer and mild during the winter with high humidity prevalent throughout the year.

The Beaumont, TX area receives an average of 60.47 inches a year (NOAA, 2012). The month with the highest average precipitation is June, while April has the lowest average precipitation. Average monthly temperatures throughout the year range from a low of 43.2 degrees Fahrenheit (˚F) in January to a high of 92.2 ˚F in August. Yearly temperature averages range from a low of 59.7 ˚F to a high of 78.4 ˚F (NOAA, 2012).

### 5.1.3 Topography

The topography of the Gulf Coast Prairies and Marshes ecoregion is considered flat to less prominent as elevations increase inland (TAMU, 2012). The project area itself is also flat with little to no change in elevation throughout the property.

### 5.1.4 Geology and Soils

Soils in the Gulf Coast Prairies and Marshes tend to be sandy (TAMU, 2012). Soils in the area are acidic, while sand tends to have a high loam component (TPWD, 2012). Clays within the region occur primarily in river bottoms (TWPD, 2012).

Soils within the AA are dominated by clays and urban land complexes along with some loam, sand, and silt loams (NRCS, 2012). A complete list of soils mapped within the Natgasoline survey is in Table 5-1, and a map of soils is provided in Figure 5-1.

**Table 5-1**
**Soils in the Action Area**

| Map Unit | Map Unit Name | Acres | Percent of Project Area |
|---|---|---|---|
| AsA | Anahuac-Aris Complex | 40.5 | 3.8 |
| CeA | Caplen Mucky Peat | 86.6 | 8.2 |
| ImA | Ijam Clay | 327.6 | 30.9 |
| LaA | Labelle Silt Loam | 57.5 | 5.4 |
| LeA | Labelle Urban Land Complex | 47.7 | 4.5 |
| LwA | Leton Loam, Ponded | 3 | 0.3 |
| NcC | Neches Coars Sand | 169.9 | 16 |
| NuC | Neel-Urban Land Complex | 190.9 | 18 |

## 5.2 WATER RESOURCES

### 5.2.1 Surface Water

The proposed project area falls immediately adjacent to the Neches River, which flows for approximately 416 miles from northwest to southeast, ending with the river mouth on Sabine Lake on the northeastern edge of Port Arthur (TSHA, 2012). Major tributaries of the river include the Angelina River, Bayou La Nana, Ayish Bayou, Pine Island Bayou, Village Creek, Kickapoo Creek, and Flat Creek. The drainage area of the river covers approximately 10,011 square miles, with an average drainage of 6,000,000 acre-feet per year. The Angelina River accounts for approximately one-third of the drainage in the Neches River Basin (TSHA, 2012). Two major reservoirs, Lake Palestine and Lake B.A. Steinhagen, and one small reservoir, Rhine Lake, are located along the Neches River. Tyler, TX is the largest city along the river, followed by Beaumont, Lufkin, and Nacogdoches (TSHA, 2012). Water from the Neches River is a major source of drinking water for the City of Beaumont (CoB, 2011).

Surface water is present within the boundaries of the AA. Surface water and freshwater emergent wetlands areas are present in the northern portion of the AA, and the Neches River is within the eastern most portion of the AA (NWI, 2012). The areas of proposed construction do not include wetlands or other surface water. Surface water and wetlands within and adjacent to the AA are shown in Figure 5-2.

### 5.2.2 Groundwater

The Gulf Coast Aquifer underlies the subject property. It stretches along the Gulf Coast from Florida through Texas and into Mexico, and is 100 miles wide in many sections (Schulmeiser, 2012). The Gulf Coast Aquifer is a system of four major component aquifers. The uppermost and easternmost component is the Chicot Aquifer, from which water for municipal and agricultural purposes is pumped. The three other components of the aquifer in descending order are the Evangeline Aquifer, the Jasper Aquifer, and the Catahoula-restricted Aquifer (Schulmeiser, 2012). Major cities over the Texas section of the Gulf Coast Aquifer include Beaumont, Brownsville, Corpus Christi, Galveston, and Houston. Over-pumping of the aquifer has resulted in saltwater intrusion of the aquifer and an increased rate of land subsidence. Contamination of the aquifer related to spills and leaks from petrochemical operations also threaten the aquifer (Schulmeiser, 2012).

## 5.3 VEGETATION

Historically, vegetation in the vicinity of the project area would likely have been composed of salt grass marshes or tallgrass prairies with oak mottes possibly scattered throughout (TPWD, 2012). Today, much of the AA has been developed with urban-industrial facilities. Dominant woody vegetation consists of sweetgum (*Liquidambar styraciflua*), Chinese tallow (*Sapium sebiferum*), black willow (*Salix nigra*), and blackjack oak (*Quercus marilandica*). Dominant herbaceous species consist of Johnson grass (*Sorghum halepense*), Kleberg bluestem (*Dichanthium annulatum)*, curly doc (*Rumex crispus)*, and giant reed (*Arundo donax*). Photographs of the AA are provided in Appendix B.

## 5.4 PROTECTED SPECIES

Descriptions of the Federally listed species found in Jefferson County are discussed in the following sections.

### 5.4.1 Piping Plover

Piping plover (*Charadrius melodus*) is listed as endangered by the USFWS and TPWD in Jefferson County (USFWS, 2012; TPWD, 2012). The plover is a wintering migrant along Gulf

coastal areas of the U.S. They inhabit sandy beaches and bayside mud or salt flats. The species feed primarily on marine worms, beetles, spiders, crustaceans, mollusks, and other small marine animals (TPWD, 2012). Piping plovers reach sexual maturity at one year of age. Mating season lasts from late March through April with males building nests and performing courtship dances to attract a female. Females lay 4 eggs that take 25 days to incubate and hatch. There are only 5,000 known breeding pairs of piping plovers, with Texas serving as the wintering home for 35% of the known population (TPWD, 2012).

### 5.4.2 Sprague's Pipit

The Sprague's pipit **(***Anthus spragueii)* is a rare and declining songbird. It is a buff-colored, sparrow-sized bird with a slender bill and prominent dark eyes and a pale face. It inhabits open grasslands and feeds and nests exclusively on the ground. It breeds and winters in open grassland with good drainage and no shrubs and trees. The pipit's summer breeding territory is in the northern central U.S. and central Canada. The Pipit's diet consists primarily of insects and spiders along with seeds. The bird is only in Texas during winter migration, between mid-September to early April. In Texas, the bird is strongly tied to native upland prairie, can be locally common in coastal grasslands, but is rare farther west. The bird is rare in fragmented habitats, and it avoids habitat edges. (USFWS, 2012b).

### 5.4.3 Smalltooth Sawfish

The smalltooth sawfish (*Pristis pectinata*) is listed as endangered by the TPWD in Jefferson County (TPWD, 2012). It is a cartilaginous fish, otherwise known as an elasmochranch, that can grow up to 25 feet in length and weigh up to 770 pounds (NOAA, 2013). Sawfish are actually modified rays that have shark-like bodies and gill slits on their ventral side. The smalltooth sawfish is one of two sawfish species known to occur in U.S. waters. Smalltooth sawfish prefer different habitat types throughout their lifecycle with young fish staying close to shore in areas with muddy or sandy bottoms whereas adult fish can be found in a variety of habitat types including mangrove swamps, seagrass beds, and coral reefs (TPWD, 2013). The species is only found in the U.S. in the Atlantic Ocean and Gulf of Mexico, though the current range of this species is believed to be limited to the southern tip of the Florida peninsula (NOAA, 2013).

### 5.4.4 Louisiana Black Bear

The Louisiana black bear (*Ursus americanus luteolus*) is listed as endangered by the TPWD in Jefferson County (TPWD, 2012). The bear has black hair and a short, well-haired tail and a yellowish-brown muzzle (Mammals of Texas Online, 2012). Adult males may weigh 300 to 400 pounds, and adult females 120 to over 180 pounds. The Louisiana black bear's head is long, narrow, and flat when compared to other bears. The bear was once a common inhabitant of forested regions of eastern Texas, Louisiana, and Mississippi. It is habitat generalist. Males have large home ranges and are usually solitary. The breeding period occurs during summer (Mammals of Texas Online, 2012). Only approximately 300 Louisiana black bears are left in Louisiana, restricted to the Tensas and Atchafalaya river basins. In Texas they are considered a possible transient, potentially within bottomland hardwoods and large tracts of inaccessible forested areas (USFWS, 2012g).

### 5.4.5 Red Wolf

The red wolf (*Canis rufus*) is listed as endangered by the TPWD in Jefferson County (TPWD, 2012). The wolf is mainly gray with blackish hairs and occasional reddish or yellowish hairs (Mammals of Texas Online, 2012). It is smaller and more slender than the gray wolf. The red wolf historically ranged throughout the southeastern U.S., from the Atlantic coast to central Texas. The wolf typically travels and forages in small family groups or alone. The species was declared extinct in the wild; formerly, density was likely one wolf per square mile. The suitable habitat included upland and lowland forests, shrub lands, coastal prairies, and marshes or other areas of heavy vegetative cover. Experimental populations have been reintroduced in North Carolina and Tennessee (USFWS, 2012h).

### 5.4.6 Green Sea Turtle

The green sea turtle (*Chelonia mydas*) is listed as endangered by the USFWS and TPWD in Jefferson County (USFWS, 2012; TPWD, 2012). It is a small-to-medium-sized marine turtle that is generally found in shallow waters inside reefs, bays, and inlets (USFWS, 2012). Though they are the largest of the hard-shelled sea turtles, they have a comparatively small head to other species (NOAA, 2012b). They are the only fully herbivorous sea turtle, feeding primarily on seagrass and algae. The greenish-colored fat from which their name is derived is thought to be a

result of their unique diet. Green sea turtle females nest on sandy beaches between the months of June and September, with peak nesting occurring in June and July. On average, a single female will have five clutches per season, with a two-week interval between nesting cycles (NOAA, 2012b). Eggs take approximately two months to incubate. Hatchlings of the species spend the first several years of their lives in coastal waters. Juveniles of the species are the only members that have an omnivorous diet, feeding on pelagic animals as well as plants until they reach a certain age and leave the coastal waters for benthic foraging grounds, where they become almost exclusively herbivorous (NOAA, 2012b).

### 5.4.7 Hawksbill Sea Turtle

The hawksbill sea turtle (*Eretmochelys imbricata*) is listed as endangered by the USFWS and TPWD in Jefferson County (USFWS, 2012; TPWD, 2012). It is a small-to-medium-sized marine turtle that frequents rocky areas, coral reefs, shallow coastal areas, lagoons or ocean islands, and narrow creeks and passes (USFWS 2012). The species is seldom seen in water deeper than 65 feet. They are named after the unique shape of their beak-like mouth, which allows the species to reach into holes and crevices in coral reefs to find sponges, their primary source of food as adults (NOAA 2012b). Female hawksbill sea turtles return to their natal beaches every two to three years to lay between three and five clutches per season. They commonly nest on pocket beaches with little or no sand or high up on beach in dune vegetation. Hatchlings and juveniles are known to take shelter in floating algal mats (NOAA 2012b).

### 5.4.8 Kemp's Ridley Sea Turtle

The Kemp's Ridley sea turtle (*Lepidochelys kempii*) is listed as endangered by the USFWS and TPWD in Jefferson County (USFWS, 2012; TPWD, 2012). It is one of the smallest sea turtles, with adults only reaching up to 2 feet in length and weighing up to 100 pounds (USFWS 2012). Suitable habitat for the species includes near-shore and inshore waters of the northern Gulf of Mexico. Adults of the species occupy primarily neritic habitats with muddy or sandy bottoms (NOAA, 2012b). The species feeds primarily on swimming crabs, but is also known to prey upon fish, jellyfish, and mollusks. Female Kemp's Ridley seat turtles lay two to three clutches of eggs on sandy beaches per season, which take 50 to 60 days to incubate. Hatchlings enter the ocean and head for open water where they are caught up in ocean currents. Juveniles of the

species take refuge and feed in floating sargassum seaweed until about the age of two years, where they join the more mature members of the species in the neritic zone (NOAA, 2012b).

### 5.4.9 Leatherback Sea Turtle

The leatherback sea turtle (*Dermochelys coriacea*) is listed as endangered by the USFWS and TPWD in Jefferson County (USFWS, 2012; TPWD, 2012). It is the largest living sea turtle in the world (NOAA 2012). Adults can measure up to 6.5 feet in length and weight up to 2,000 pounds. They are also the only sea turtle to lack a hard, boney shell, instead having an approximately 1.5-inch-thick carapace consisting of leathery, oil-saturated connective tissue overlaying loosely interlocking dermal bones (NOAA 2012b). They are commonly thought of as a pelagic species, but they have also been known to forage in coastal waters. Their primary prey species are jellyfish and salps. Females lay several clutches of eggs throughout a nesting season at 8- to 12-day intervals (NOAA, 2012b). Eggs take approximately 60 to 65 days to incubate and hatch.

### 5.4.10 Loggerhead Sea Turtle

The loggerhead sea turtle (*Caretta caretta*) is listed as threatened by the USFWS and TPWD in Jefferson County (USFWS, 2012; TPWD, 2012). It is a large sea turtle that can grow up to 3 feet in length and weigh up to 200 pounds (USFWS, 2012). It is widely distributed within its range, having been observed hundreds of miles out to sea as well as in inshore areas such as bays, lagoons, salt marshes, creeks, ship channels, and the mouths of large rivers. The species is named for their large heads and powerful jaws which allow them to feed on hard-shelled prey such as whelks and conch (NOAA, 2012b). Female loggerheads nest on high energy beaches with coarse sand. The nesting season is between April and September, with females laying three to five clutches per season. Eggs take approximately two months to incubate and hatch. Hatchlings enter the ocean and are known to spend days swimming away from land until they reach areas where surface water converge to form a downwelling and where floating material such as seaweed has accumulated. Once juveniles reach 7 to 12 years of age, they return to the neritic zone until maturing into adulthood (NOAA, 2012b).

### 5.4.11 Texas Natural Diversity Database Results

Data obtained from the Texas Natural Diversity Database (TNDD) indicates that there are two rookeries within approximately two miles of the project area. However, the rookeries have been classified as "not sensitive" by the database. Spatial information from TNDD is depicted in Figure 5-2.

**Soil Name**

- Anahuac-Aris complex, 0 to 1 percent slopes
- Caplen mucky peat, 0 to 1 percent slopes, frequently flooded, tidal
- Ijam clay, 0 to 2 percent slopes, frequently flooded, tidal
- Labelle silt loam, 0 to 1 percent slopes
- Labelle-Urban land complex, 0 to 1 percent slopes
- Leton loam, ponded, 0 to 1 percent slopes
- Neches coarse sand, 2 to 5 percent slopes
- Neel-Urban land complex, 2 to 5 percent slopes, rarely flooded, tidal
- Water

LEGEND

- PROCESS AREAS
- STORAGE AND LOADING
- EMISSION POINTS
- OTHER STRUCTURES
- PROPERTY BOUNDARY

N

0 700 1,400

Feet

SOURCE: NRCS

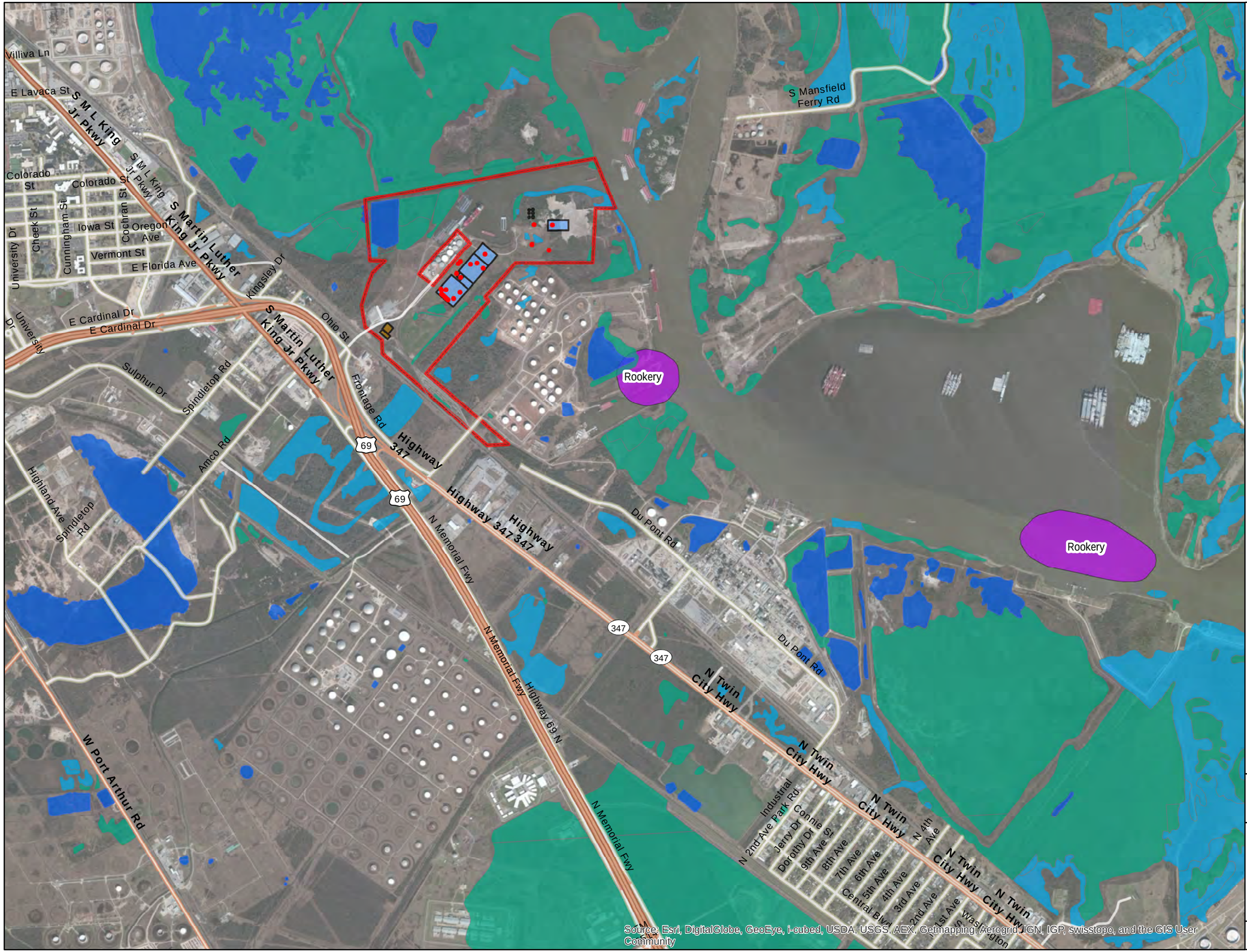
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

WESTON SOLUTIONS

FIGURE 5-1
SOIL MAP
NATGASOLINE, LLC GHG PERMIT
BIOLOGICAL ASSESSMENT
BEAUMONT, TX

| DATE | PROJECT NO | SCALE |
|---|---|---|
| APR 2014 | 15089.001.001 | AS SHOWN |

FILE: I:\GIS Project Files\15089_Natgasoline LLC\001_Beaumont\mxd\Biological_Assessment\Figure 5-1 Soil Map.mxd 4:31:52 PM 4/21/2014 herrinm




LEGEND

- PROCESS AREAS
- STORAGE AND LOADING
- EMISSION POINTS
- OTHER STRUCTURES
- PROPERTY BOUNDARY

Wetland Type

- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Lake

TNDD

- Rookery (Not Sensitive)

N

0 2,000 4,000

Feet

SOURCE: USFWS AND TNDD

WESTON SOLUTIONS

FIGURE 5-2
NWI AND TNDD MAP

NATGASOLINE, LLC GHG PERMIT
BIOLOGICAL ASSESSMENT
BEAUMONT, TX

| DATE | PROJECT NO | SCALE |
|---|---|---|
| APR 2014 | 15089.001.001 | AS SHOWN |

FILE: I:\GIS Project Files\15089_Natgasoline LLC\001_Beaumont\mxd\Biological_Assessment\Figure 5-2 NWI Map.mxd 4:37:04 PM 4/21/2014 herrinm

# 6. PROTECTED SPECIES HABITAT EVALUATION

## 6.1 PLANT COMMUNITIES OBSERVED

Plant communities observed during the 2012 site visit are typical of the area surrounding the Natgasoline property. The most prevalent habitat type on the Natgasoline property and the AA is characterized by mesic upland forest areas dominated by sweetgum (*Liquidamba styraciflua*) and laurel oak (*Quercus laurifolia*) along with blackjack oak (*Quercus marilandica*), yaupon holly (*Ilex vomitoria*), baccharis (*Baccharis* spp), and willow oak (*Quercus phellos*). Smaller areas of dry, upland forested areas on the property were dominated by short-leaf pine (*Pinus echinata*). Open grassland areas on the property were dominated by curly dock (*Rumex crispus*), Johnson grass (*Sorghum halepense*), and Kleberg bluestem (*Dichanthium annulatum*). Bottomland and swamp forests were observed around surface water, dominated by green ash (*Fraxinus pennsylvanica*), laurel oak, willow oak, and sweetgum. The proposed project area includes approximately 100 acres of regularly mowed and maintained agricultural land and approximately 30 acres of dredge spoil area with little vegetative growth.

## 6.2 PROTECTED SPECIES HABITAT ANALYSIS

Few of the Federally protected species identified as occurring in the vicinity of the Natgasoline facility have suitable habitat that was identified on Natgasoline property or within the AA. The habitat found on Natgasoline property and the AA is highly fragmented by existing facilities within the property as well as developments on adjacent properties, fence lines, and canals. There are commercial and residential developments to the west and industrial developments to the southeast and southwest of the property. The area immediately to the north of the property and included as the northern third of the AA is generally undeveloped with a mix of forested, wetland and open habitat. The Neches River is to the east of the property.

### 6.2.1 Piping Plover

There is no piping plover habitat within the AA. The species prefers habitat areas with open, sandy beaches and bayside mud or salt flats (USFWS, 2012). The banks adjacent to the Neches River on the Natgasoline property are vegetated with no area of open, sandy soil observed.

There were also no mud or salt flats observed on Natgasoline property. There is abundant suitable habitat for the species adjacent to Sabine Lake and the coast of the Gulf of Mexico, approximately 12 miles and 25 miles to the southeast of the Natgasoline facility, respectively.

According to the Cornell Lab of Ornithology Ebird program, piping plover areas of high activity, are all located along the coast of the Gulf of Mexico. The most recent individual sighting of the plover near the Natgasoline facility is located approximately 12 miles to the southwest. There are no reported sightings of this species on Natgasoline property.

### 6.2.2 Sprague Pipit

The Sprague's pipit primarily inhabits open grasslands and feeds and nests exclusively on the ground. In Texas, the bird is strongly tied to native upland prairie, can be locally common in coastal grasslands, but is rare farther west. The bird is rare in fragmented habitats, and it avoids habitat edges (USFWS, 2012b). There is no suitable habitat for the Sprague's Pipit within the AA. Upland prairies and coastal grasslands are not present in the AA region. Additionally, the surrounding area is highly fragmented and not suitable for Pipit habitat. There are no reported sightings of the Sprague's pipit in the vicinity of the facility (TNDD, 2012).

#### *6.2.2.1 Smalltooth Sawfish*

The smalltooth sawfish is only found in the U.S. in the Atlantic Ocean and Gulf of Mexico, though the current range of this species is believed to be limited to the southern tip of the Florida peninsula (NOAA, 2013). There is no habitat for the sawfish in or adjacent to the proposed facility.

### 6.2.3 Louisiana Black Bear

There is limited suitable habitat for Louisiana black bears on the Natgasoline property. The species would likely only occur as transient on the Natgasoline property, utilizing bottomland hardwood forests as corridors (TPWD, 2013). However, more suitable habitat for this species exists in undeveloped areas to the north and east of the Natgasoline property. Louisiana black bears also tend to avoid areas with human disturbance (USFWS, 2012g). The species would like avoid the more developed Natgasoline property in favor of less disturbed areas to the north and east.

### 6.2.4 Red Wolf

There is no habitat for the red wolf within the AA. The red wolf is extirpated and therefore not present within the vicinity of the proposed facility.

### 6.2.5 Sea Turtle Species

As discussed in Section 5.2 of this report, there is little suitable habitat for marine species adjacent to the Natgasoline facility, including sea turtles. Leatherback sea turtles are limited to deep water habitats and have never been observed within Sabine Lake or the Neches River (WGI, 2012). Likewise, hawksbill sea turtles prefer rocky habitats and coral reefs and have never been observed in Sabine Lake or the Neches River. Loggerhead, green, and Kemp's Ridley sea turtles will utilize coastal bodies of water that are tidally influenced and have been observed in Sabine Lake, but it is unlikely that they would enter the Neches River (WGI, 2012). The NOAA Marine Fisheries Service was contacted during the preparation of this BA. The potential effect on sea turtles due to the proposed project was discussed with Nicole Bailey, Endangered Species Act Consultant with NOAA (Baliey, 2013). NOAA does not typically include the segment of the Neches River that is within the AA as sea turtle habitat. The project will not result in additional boat traffic on the Neches River or Sabine Lake, therefore there will be no increase of effects to sea turtles resulting from boat strikes. It summary, NOAA does not expect that the project as described would affect sea turtle species.

# 7. EFFECTS OF THE PROPOSED ACTION

## 7.1 AIR QUALITY EFFECTS

### 7.1.1 Emissions

The primary emission from the GtG plant will be $CO_2$, with a total potential to emit of 1,120,246.9 tons per year. Other major emissions from the GtG plant include $CH_4$ (49.5 tons/year) and $N_2O$ (2.09 tons/year).

### 7.1.2 Fugitive Dust

There is expected to be minimal fugitive dust from the GtG plant construction. BMPs such as water trucks to wet roads and construction areas to control for dust stirred up by heavy vehicles are suggest. The operation of the GtG plant itself is not anticipated to produce significant levels of fugitive dust.

### 7.1.3 Impacts of Air Pollution Sources on Flora and Fauna

Air pollution is not expected to have a significant effect on flora and fauna within the AA. The vast majority of pollutants released from the GtG plant will disperse into the atmosphere and will not affect terrestrial or aquatic species. Most species of avifauna are unlikely to be impacted by atmospheric pollutants, as they will quickly disperse into the atmosphere and will not remain present in the area in significant concentrations.

## 7.2 WATER QUALITY EFFECTS

### 7.2.1 Waste Water

Waste water from the facility will be passed through a permitted waste water treatment system associated with the GtG plant before being discharged into the Neches River. Liquid effluent from the GtG plant and blow down of steam-drums from the demineralized water treatment will be mixed with blowdown from the cooling tower and routed to the Neches River. Water contaminated with organics will be treated in a State-permitted waste water treatment unit.

### 7.2.2 Stormwater

Details of the stormwater system for the Natgasoline GtG plant are not known at the time of this report. The stormwater system will be State-permitted, and is not anticipated to have a significant impact on surface water in the vicinity of the GtG plant. BMPs will be used to mitigate impacts from stormwater on surrounding habitat.

## 7.3 NOISE EFFECTS

Noise related to the construction and operation of the GtG plant is not expected to have a significant impact on biological resources within the AA. The project area is located within a developed chemical-industrial area with pre-existing impacts from noise. Construction and operations of the Natgasoline facility is unlikely to significant elevate noise levels in the area from the baseline levels.

## 7.4 FEDERALLY PROTECTED SPECIES EFFECTS

The three possible determinations for the impact of the proposed project are listed species are as follows:

- **No effect** – Project activities will have no adverse or beneficial effect on the listed species;
- **Not likely to adversely affect** – Project activities may directly or indirectly affect the listed species or its habitat. However, the effects are likely to be discountable, insignificant, or beneficial; and
- **Likely to adversely affect** – Project activities are anticipated to have significant adverse effects (direct or indirect) on the listed species or its habitat.

No critical habitat was identified within the Natgasoline property boundaries or within a 1.8-km radius of the subject property (USFWS, 2012). Federally listed T&E species are listed in Table 8-1.

## Table 7-1
## Federally Listed Threatened and Endangered Species in Jefferson County, TX

| Common Name | Scientific Name | Federal Status | State Status | Suitable Habitat Occurrence in the Survey Area | Potential Species Presence |
|---|---|---|---|---|---|
| **Birds** | | | | | |
| Piping Plover | *Charadrius melodus* | E | T | **No** - Wintering migrant along the Texas Gulf Coast. Found in beaches and bayside mud or salt flats. | Possible Migrant Over Area |
| Sprague Pipit | *Anthus spragueii* | C | - | **No –** Strongly tied to native upland prairie | Possible Migrant Over Area |
| **Fish** | | | | | |
| Smalltooth Sawfish | *Pristis pectinata* | E | E | **No** – Gulf and Atlantic habitat. No habitat near or within facility. | No |
| **Mammals** | | | | | |
| Louisiana Black Bear | *Ursus americanus luteolus* | T | T | **No** – Found in large tracts of inaccessible forest area. | Not Likely |
| Red Wolf | *Canis rufus* | E | E | **No –** Extirpated. | No |
| **Reptiles** | | | | | |
| Green Sea Turtle | *Chelonia mydas* | E | T | **No** - Found in gulf and bay system in shallow water seagrass beds, open water between feeding and nesting areas, and on barrier island beaches. | Not Likely |
| Hawksbill Sea Turtle | *Eretmochelys imbricata* | E | E | **No** - Found in gulf and bay system in warm shallow waters, especially in rocky marine environments such as coral reefs and jetties. | Not Likely |
| Kemp's Ridley Sea Turtle | *Lepidochelys kempii* | E | E | **No** - Found in gulf and bay system with adults staying within shallow waters in the Gulf of Mexico. | Not Likely |
| Leatherback Sea Turtle | *Dermochelys coriacea* | E | E | **No** - Found in gulf and bay system. Has the widest range of any open water reptile. | Not Likely |
| Loggerhead Sea Turtle | *Caretta caretta* | T | T | **No** - Juveniles are found in the gulf and bay system whereas adults are the most pelagic of the sea turtles. | Not Likely |

### 7.4.1 Piping Plover

The piping plover (*Charadrius melodus*) can be found on open, sandy beaches and bayside mud or salt flats (USFWS, 2012). While it is possible that a member of the species might transition across the project area, there is little to no suitable habitat within or immediately adjacent to the project action area. Abundant appropriate habitat for this species is located approximately 25 miles to the south of the project along the coast of the Gulf of Mexico. It is unlikely that the proposed project activities will impact this species; therefore it is anticipated that there will be **no effect** on the piping plover.

### 7.4.2 Sprague Pipit

The Sprague's pipit primarily inhabits open grasslands and feeds and nests exclusively on the ground. In Texas, the bird is strongly tied to native upland prairie, can be locally common in coastal grasslands, but is rare farther west. The bird is rare in fragmented habitats, and it avoids habitat edges (USFWS, 2012b). There is no suitable habitat for the Sprague's Pipit within the AA. It is unlikely that the proposed project activities will impact this species; therefore it is anticipated that there will be **no effect** on the Sprague pipit.

### 7.4.3 Smalltooth Sawfish

The smalltooth sawfish is only found in the U.S. in the Atlantic Ocean and Gulf of Mexico, though the current range of this species is believed to be limited to the southern tip of the Florida peninsula (NOAA, 2013). There is no habitat for the sawfish in or adjacent to the proposed facility. It is unlikely that the proposed project activities will impact this species; therefore it is anticipated that there will be **no effect** on the smalltooth sawfish.

### 7.4.4 Louisiana Black Bear

Though historically Jefferson County was known to have Louisiana Black Bear populations, it is thought that the population was extirpated prior to 1905 (USFWS, 1992). In Texas, the rare transient bear is only expected to use large tracks of heavily vegetated land, primarily in bottomland hardwoods (USFWS, 1992). It is unlikely that the proposed project activities will

impact this species; therefore it is anticipated that there will be **no effect** on the Louisiana Black Bear.

### 7.4.5 Red Wolf

There is no habitat for the red wolf within the AA. The red wolf is extirpated and therefore not present within the vicinity of the proposed facility. It is unlikely that the proposed project activities will impact this species; therefore it is anticipated that there will be **no effect** on the Red Wolf.

### 7.4.6 Green Sea Turtle

NOAA does not include the segment of the Neches River that is within the AA as sea turtle habitat. Green sea turtles (*Chelonia mydas*) are primarily only found on beaches during nesting, in open ocean convergence zones, and in benthic feeding areas (NOAA, 2012). Given the 25-mile distance separating the project area from appropriate habitat in the Gulf of Mexico, it is unlikely that proposed project activities will impact green sea turtles. Therefore, it is anticipated that there will be **no effect** to green sea turtles from the proposed project activities.

### 7.4.7 Hawksbill Sea Turtle

NOAA does not include the segment of the Neches River that is within the AA as sea turtle habitat. The hawksbill sea turtle (*Eretmochelys imbricata*) frequents rocky areas, coral reefs, shallow coastal areas, lagoons or ocean islands, and narrow creeks and passes (USFWS 2012). It is unlikely that hawksbill sea turtles would move as far inland as the waters in and around the project area given its 25-mile distance from the Gulf of Mexico. Therefore, the proposed project is anticipated to have **no effect** on this species.

### 7.4.8 Kemp's Ridley Sea Turtle

NOAA does not typically include the segment of the Neches River that is within the AA as sea turtle habitat. Kemp's Ridley sea turtle (*Lepidochelys kempii*) habitat for the species includes near-shore and inshore waters of the northern Gulf of Mexico. Given the approximately 25-mile distance from the project area to the Gulf of Mexico, it is unlikely that proposed project activities would have a significant impact on this species. The project is anticipated to have **no effect** on this species.

### 7.4.9 Leatherback Sea Turtle

NOAA does not typically include the segment of the Neches River that is within the AA as sea turtle habitat. Leatherback sea turtles (*Dermochelys coriacea*) are commonly thought of as a pelagic species, but they have also been known to forage in coastal waters (USFWS, 2012). Due to the 25-mile distance separating the project area from suitable habitat for this species in the Gulf of Mexico, proposed project activities are unlikely to impact this species. The proposed project is therefore anticipated to have **no effect** on the leatherback sea turtle.

#### *7.4.9.1 Loggerhead Sea Turtle*

NOAA does not typically include the segment of the Neches River that is within the AA as sea turtle habitat. The loggerhead sea turtle (*Caretta caretta*) occupy open water as well as in inshore areas such as bays, lagoons, salt marshes, creeks, ship channels, and the mouths of large rivers (NOAA, 2012). It is unlikely that loggerhead sea turtles would move as far inland as the waters in and around the project area, as it is located over 25 miles from the Gulf of Mexico. Therefore, the proposed project is anticipated to have **no effect** on this species.

# 8. CONCLUSIONS

The issuance of a PSD permit to Natgasoline, LLC for the construction of a Gas to Gasoline Plant in Beaumont, Texas will have no effect on Federally listed threatened or endangered species or designated critical habitat for the purposes of Section 7 of the Endangered Species Act. No Federally listed threatened or endangered species, suitable habitat, or designated critical habitats are within the AA of the proposed project.

The area encompassed by the AA is a developed, industrialized area with no appropriate habitat for Federally listed species. Limited suitable habitat for bald eagles exists within the AA, but more suitable and abundant habitat exists outside of the AA. There is no appropriate habitat for listed species immediately adjacent to the Natgasoline property or the AA. The proposed project is therefore expected to have no effect on Federally listed species.

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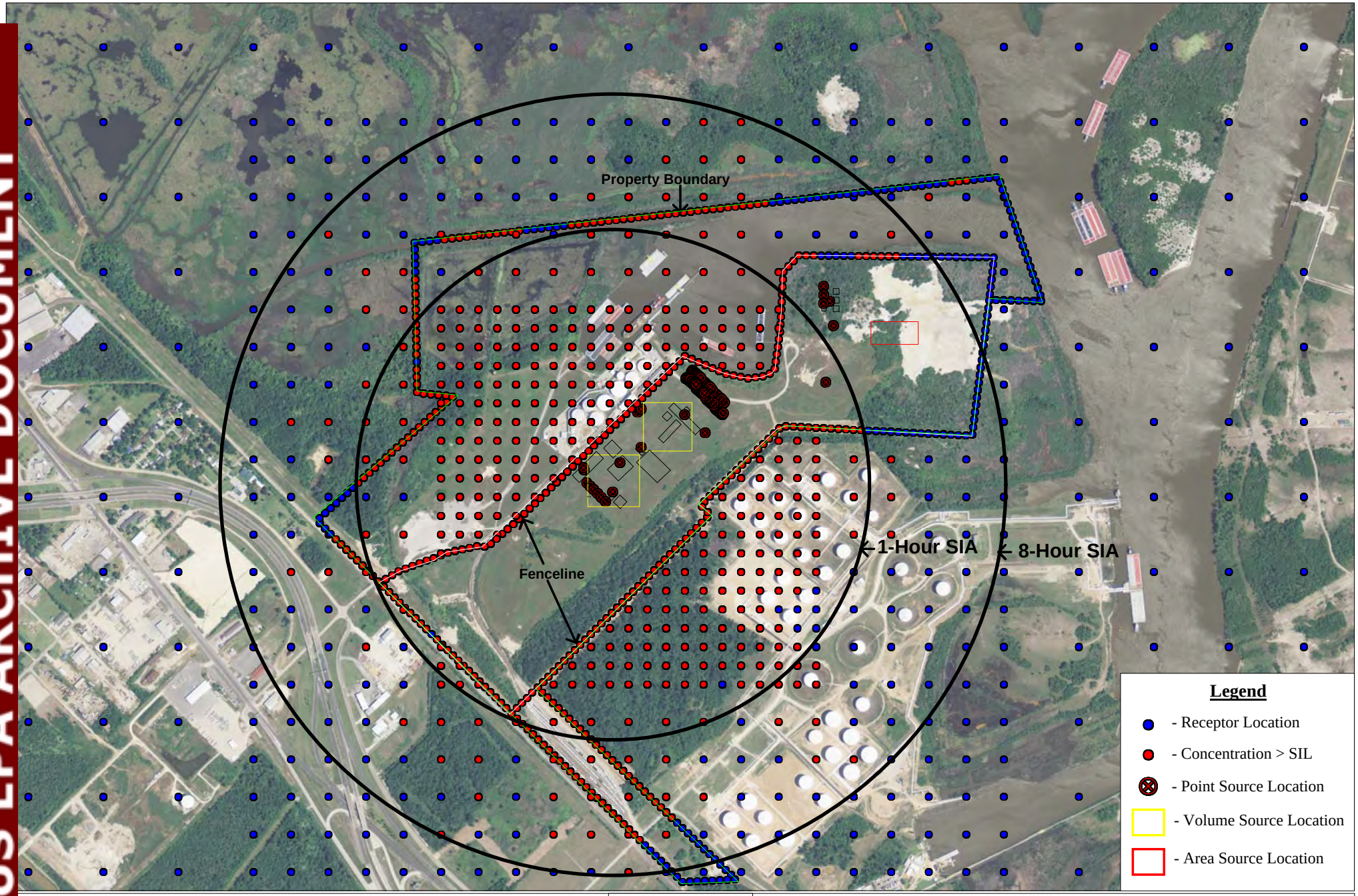
# 10. LIST OF PREPARERS

| | |
|---|---|
| Kathleen Mittmann | B.S. Biology M.S. Biology |
| Erin Johnson | B.S. Microbiology, M.S. Oceanography |

# APPENDIX A
# AIR EMISSIONS MODELING




Scale in Meters

0 600 1,200

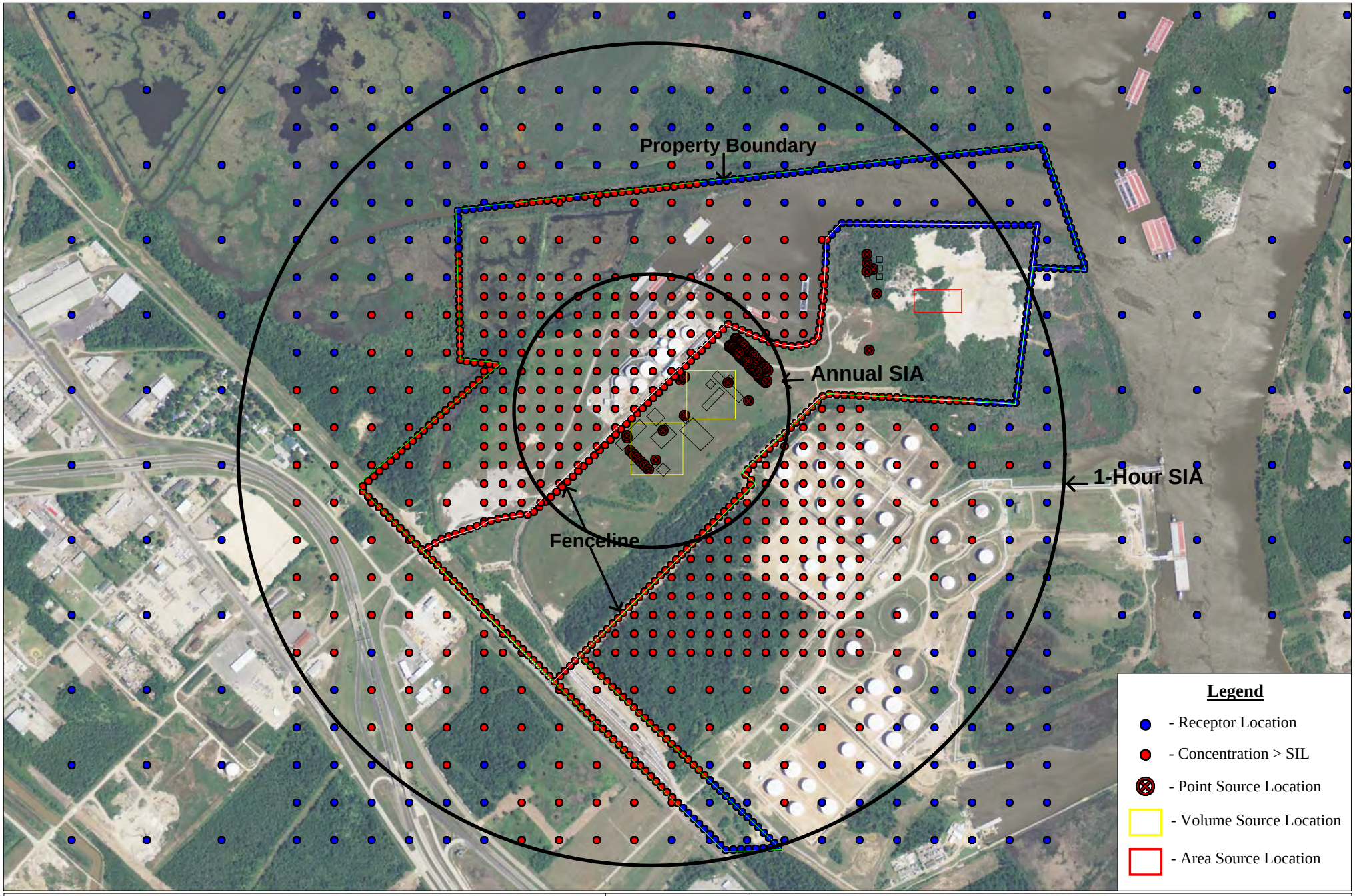
N
W E
S

Base Map: National Agriculture Imagery Program (NAIP) Orthoimagery for Zone 15 Texas State Quarter Quadrangle BEAUMONT EAST, SE; PORT ACRES, NW; PORT ACRES, NE; Dated 2010.

WESTON SOLUTIONS

# Figure 1
# CO Significant Impact Area

Natgasoline, LLC
Jefferson County
Nederland, Texas




Scale in Meters

0 600 1,200

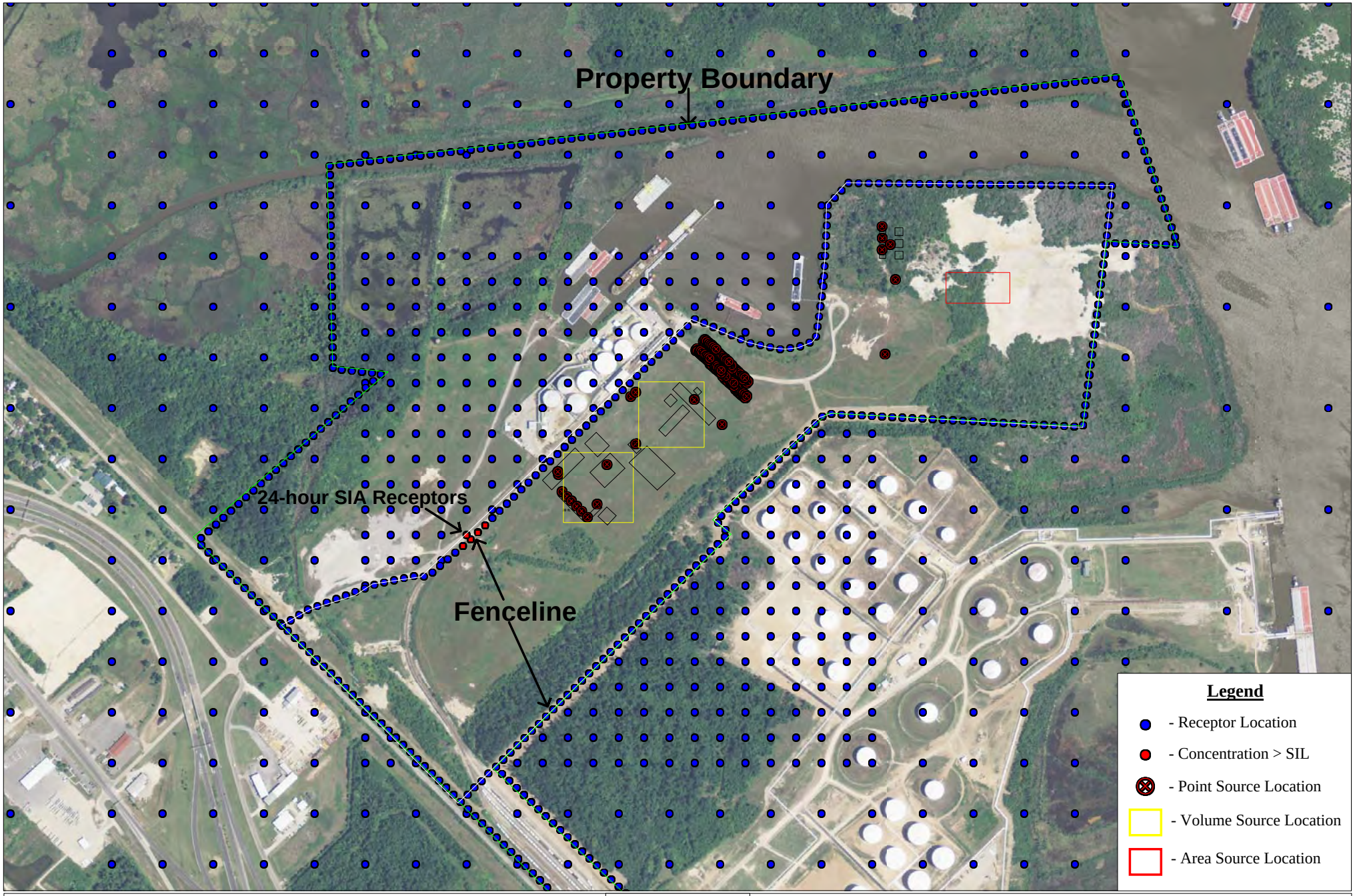
N W E S

Base Map: National Agriculture Imagery Program (NAIP) Orthoimagery for Zone 15 Texas State Quarter Quadrangle BEAUMONT EAST, SE; PORT ACRES, NW; PORT ACRES, NE; Dated 2010.

WESTON SOLUTIONS

# Figure 2
# NOx Significant Impact Area

Natgasoline, LLC
Jefferson County
Nederland, Texas




Scale in Meters

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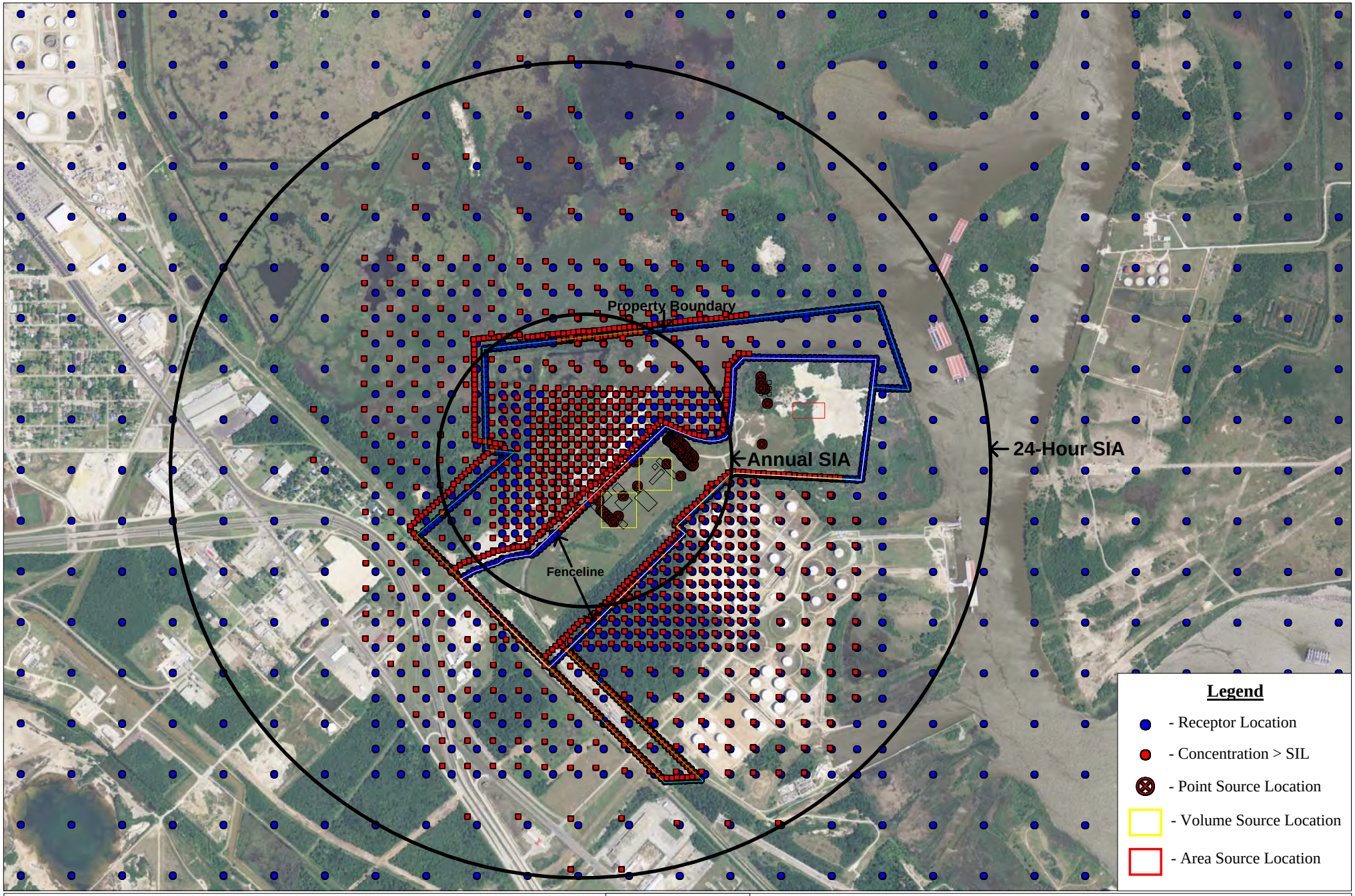
N W E S

Base Map: National Agriculture Imagery Program (NAIP) Orthoimagery for Zone 15 Texas State Quarter Quadrangle BEAUMONT EAST, SE; PORT ACRES, NW; PORT ACRES, NE; Dated 2010.

WESTON SOLUTIONS

# Figure 3
# PM10 Significant Impact Area

Natgasoline, LLC
Jefferson County
Nederland, Texas




**Scale in Meters**

0 900 1,800

N W E S

Base Map: National Agriculture Imagery Program (NAIP) Orthoimagery for Zone 15 Texas State Quarter Quadrangle BEAUMONT EAST, SE; PORT ACRES, NW; PORT ACRES, NE; Dated 2010.

# Figure 4
# PM2.5 Significant Impact Area

Natgasoline, LLC
Jefferson County
Nederland, Texas

# APPENDIX B
# PHOTOLOG

# PHOTOGRAPH NO. 1

**Date:** 10/24/12
**Direction:** NE

**Description:**

View of proposed storage and loading area for Natgasoline GtG plant construction


# PHOTOGRAPH NO. 2

**Date:** 10/24/12
**Direction:** SE

**Description:**

View of proposed storage and loading area for Natgasoline GtG plant construction

# PHOTOGRAPH NO. 3

**Date:** 10/24/12
**Direction:**

**Description:**

Typical Wetland habitat near Natgasoline property


# PHOTOGRAPH NO. 4

**Date:** 10/24/12
**Direction:**

**Description:**

Typical upland forest area on Natgasoline property

# PHOTOGRAPH NO. 5

**Date:** 10/24/12
**Direction:**

**Description:**

Typical edge habitat on Natgasoline property


# PHOTOGRAPH NO. 6

**Date:** 10/24/12
**Direction:**

**Description:**

Typical habitat surrounding surface water on Natgasoline property

# PHOTOGRAPH NO. 7

**Date:** 10/24/12
**Direction:**

**Description:**

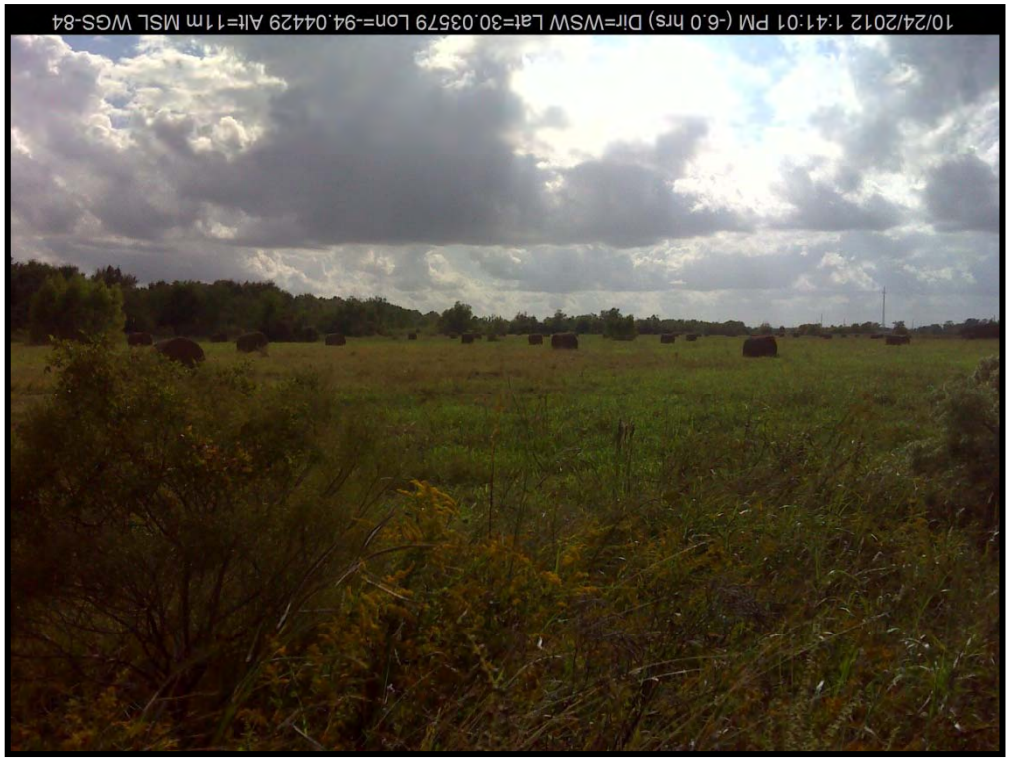
Area of potential GtG Plant construction


# PHOTOGRAPH NO. 8

**Date:** 10/24/12
**Direction:**

**Description:**

Area of potential GtG Plant construction



# PHOTOGRAPH NO. 9

**Date:** 10/24/12
**Direction:** dd

**Description:**

Proposed process areas for Natgasoline GtG Plant construction


# PHOTOGRAPH NO. 10

**Date:** 10/24/12
**Direction:**

**Description:**

Typical upland habitat on Natgasoline property

# PHOTOGRAPH NO. 11

**Date:** 10/24/12
**Direction:**

**Description:**

Typical mesic forest habitat on Natgasoline property


# PHOTOGRAPH NO. 12

**Date:** 10/24/12
**Direction:**

**Description:**

Typical bottomland forest on Natgasoline property