ESSENTIAL FISH HABITAT ASSESSMENT
FOR
ADDED COMBUSTION SOURCES AT THE
PL PROPYLENE LLC FACILITY
HARRIS COUNTY, TEXAS

Submitted To:

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VI
MULTIMEDIA PLANNING AND PERMITTING DIVISION
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Submitted For:

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Submitted By:

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FIGURES

ACRONYMS

EPA	U.S. Environmental Protection Agency
EFH	Essential Fish Habitat
GMFMC	Gulf of Mexico Fishery Management Council
HSC	Houston Ship Channel
MGD	million gallons per day
PLP	PL Propylene
TCEQ	Texas Commission on Environmental Quality
TPDES	Texas Pollutant Discharge Elimination System
TXNDD	Texas Natural Diversity Database
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compounds
WET	whole effluent toxicity

1.0 INTRODUCTION

The purpose of this document is to present the findings of the Essential Fish Habitat (EFH) assessment as required by the Magnuson-Stevens Fishery Conservation and Management Act (1976) as amended through 2007 (NMFS, 2007) for a proposed construction project at the PL Propylene (PLP) propane dehydrogenation facility in Houston, Harris County, Texas (Project). This assessment is required because the Project includes a Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0000393000 (TX0006068) for wastewater discharges made to an unnamed ditch thence to Texas Commission on Environmental Quality (TCEQ) Water Quality Segment No. 1007, Houston Ship Channel / Buffalo Bayou Tidal.

This report includes a brief project description (Section 2); a description of the EFH and effects of proposed actions on it (Section 3), our conclusions (Section 4), and references cited (Section 5).

2.0 PROJECT DESCRIPTION AND PROPOSED ACTIONS

2.1 PROJECT SUMMARY

The purpose of the Project is to increase the production of propylene by building a second propane dehydrogenation unit within the existing PLP facility located at 9822 La Porte Freeway, Houston, Texas 77017 (Figure 1). The projected construction start date is April, 2013. The projected operation start date is October 2014.

2.2 STUDY AREA

The Project site is located in an area characterized as a highly industrial corridor along U.S. Highway 225 in Harris County, Texas. The study area for the Essential Fish Habitat includes the Project site and immediate vicinity which include Sims Bayou and Buffalo Bayou (Houston Ship Channel). Air dispersion modeling results show that no receptors are located over either of these waterways. However, the existing facility operates a wastewater outfall that discharges treated effluent into Sims Bayou.

Each area type is defined below, with references to project maps in the attached Figures that illustrate the boundaries of each study area.

Project Site: Construction of the proposed expansion, associated infrastructure, and auxiliary equipment will take place within the existing facility in an area approximately 200 meters by 200 meters. A construction laydown yard of similar size will be utilized on an adjacent tract which is composed of abandoned residential lots. The construction area and the laydown yard are shown on Figure 2.

Property Boundary: The Project will be constructed on a 15-acre parcel located within the fenced boundaries of an existing industrial facility. These 15 acres are currently used for storage or laydown yards, transport, below ground piping, flare piping, and other light industrial uses.

Wastewater Outfall/Sims Bayou: The wastewater outfall (Outfall 001) is located 0.5 miles south of the property boundary at Sims Bayou (Figure 3). Sims Bayou is a fresh water tributary of Buffalo Bayou/Houston Ship Channel. The wastewater outfall is approximately 2.85 miles upstream on Sims Bayou before reaching the Houston Ship Channel.

2.3 WASTEWATER DISCHARGE

The wastewater discharge from the PLP facility is authorized by TPDES Permit No. WQ0000393000 (TX0006068) and is made to an unnamed ditch thence to TCEQ Water Quality Segment No. 1007, Houston Ship Channel/Buffalo Bayou Tidal (HSC). The outfall is located 2.85 miles upstream on Sims Bayou before the confluence with the Houston Ship Channel (Figure 3).

Permit WQ0000393000 authorizes the discharge of treated process wastewater and utility wastewaters, hydrostatic test water, and storm water at a daily average flow not to exceed 1,500,000 gallons per day (1.5 MGD) via Outfall 001. The expansion Project is expected to raise the Outfall 001 daily average discharge from the current volume of 0.7 MGD to an estimated volume of 1.4 MGD, i.e. less than the permitted daily average flow. However, the wastewater generation processes and effluent quality of the Outfall 001 discharge are expected to be the same as those from the current plant configuration. The manufacturing processes proposed in the expansion will be identical to existing processes resulting in no change of pollutant concentrations in the effluent.

Outfall 002 is authorized for the discharge of storm water following first flush and incidental discharges of process wastewater, utility wastewater, and hydrostatic test water on an intermittent and flow variable basis. Consisting primarily of storm water, the discharge volumes of flow and water quality of this discharge will not be significantly affected by the Project.

2.4 AIR EMISSIONS

Through air-dispersion modeling, the maximum area was defined in which the emissions from the Project may exceed the significant impact levels for criteria pollutants and de minimis levels for noncriteria pollutants. The results were used to determine whether significant direct and indirect impacts may occur to essential fish habitat. According to the dispersion model no air emissions which exceed the SILs will occur over open water which may include essential fish habitat. Therefore the construction and operation of the Project would not impact essential fish habitat through air emissions and further consideration of air emission impacts to essential fish habitat is unnecessary.

3.0 ESSENTIAL FISH HABITAT (EFH)

3.1 EFH DEFINED

As defined by 16 USC 1802(10), EFH constitutes those aquatic and associated land areas, specifically enumerated as the:

1) water way substrate
2) water column
3) water properties necessary to any life-cycle stage of aquatic organisms

The air dispersion model defined concentrations which exceed the SIL to extend to a maximum distance of 0.50 miles (0.8 kilometers) from the Project site. While this area does not include any EFH, an EFH assessment was necessary due to increased wastewater discharges into the HSC via an unnamed ditch draining into Sims Bayou and thence into the HSC.

3.2 EFH Within the Project Vicinity

Existing wastewater discharge is directed via an unnamed ditch into Sims Bayou, approximately 2.85 stream miles south of the confluence of Sims Bayou with the HSC, historically known as Buffalo Bayou, and ultimately into San Jacinto Bay. Dredging began in Buffalo Bayou as early as the late 1800's, and dredging to 15 meters depth continues to the present day to permit industrial navigation (Lester & Gonzalez, 2011). While fresh water naturally enters the HSC at its origin, the mouth of the HSC in San Jacinto Bay connects the HSC to tidal and estuarine marine waters. As a result, the HSC is a tide-influenced, brackish water body.

According to the National Marine Fisheries Service (NMFS), the portion of Sims Bayou and the HSC that is adjacent to the facility is potential EFH for all life stages of red drum (*Sciaenops ocellatus*), white shrimp (*Penaeus setiferus*), pink shrimp (*Peneaus duorarum*), brown shrimp (*Penaeus aztecus*) and royal red shrimp (*Pleoticus robustus*). Additionally, all life stages of 43 species of coastal migratory pelagics and reef fish can potentially use this EFH including gray triggerfish (*Balistes capriscus*), hogfish (*Lachnolaimus maximus*) and multiple species of jacks (*Carangidae*), snapper (*Lutjanidae*), tilefish (*Malacanthidae*) and grouper (*Serranidae*) (NMFS, 2012). This EFH encompasses multiple species that are managed by the Gulf of Mexico Fishery Management Council (GMFMC, 2012), one of eight regional Fishery Management Councils established by the Fishery Conservation and Management Act of 1976 that prepares fishery management plans designed to manage fishery resources from where state waters end, out to the 200-mile limit of the Gulf of Mexico.

According to the USFWS (USFWS, 2012), there are no areas federally designated as critical habitat for any threatened or endangered species within Sims Bayou, Buffalo Bayou or San Jacinto Bay. According to NMFS 2012 no Habitat of Particular Concern occurs within Sims Bayou, Buffalo Bayou (HSC) or San Jacinto Bay.

3.3 EFFECTS OF PROJECT ON EFH

Air Emissions: Air emissions from the Project which exceed the SIL do not encompass aquatic areas or essential fish habitat. Therefore, construction and operation of the Project would not impact essential fish habitat through air emissions. Air emissions resulting from the Project are discussed in detail in the *Biological Assessment* Section 4.2.1.

Direct Impacts: The proposed actions do not involve altering the structure of the HSC; any EFH and associated substrate will remain intact. Turbidity will not change. PL Propylene does not rely on any ship traffic from the HSC and is entirely landlocked. No additional ship traffic would result from the Project.

Fugitive Dust: EFH will not be directly impacted by construction or operations. Dust could be emitted during earth disturbing activities associated with construction. This is expected to only last a short time and dust suppression techniques, such as watering exposed soil, can be implemented to reduce the amount of dust. During operation dust emissions are expected to be negligible. As a result, fugitive dust emissions will have no effect on EFH.

Noise: The Project is being constructed within the developed portion of an active polypropylene dehydrogenation facility. The existing facility is located in a developed portion of Harris County. The increase in noise level is expected to be minimal. As a result, the increases in noise levels associated with construction and operation of the Project will have no effect on EFH.

Wastewater Discharge: The assessment of water quality impacts could be modeled using available modeling software to estimate conditions. However, the evaluation of using actual historic water quality data and process knowledge, along with whole effluent toxicity testing provides a superior assessment of potential impacts compared to modeling.

As displayed in the table below, the actual concentration of conventional pollutants and metals in the wastewater discharge from PL Propylene Outfall 001 as a result of the plant expansion project were compared to the most recent data available for the receiving stream, Sims Bayou Tidal (part of the Houston Ship Channel/Buffalo Bayou Tidal in Segment No. 1007 of the San Jacinto River Basin). The concentrations of constituents in the Outfall 001 were obtained from actual samples collected during wastewater monitoring in compliance with TPDES Permit No. WQ0000393000 (TX0006068). Information with regard to the water quality of Sims Bayou was obtained from the following sources:

1) the EPA MyWATERS Mapper for water quality monitoring station No. 11302 located within the Sims Bayou Tidal,
2) analytical data for station No. 11302 maintained in the EPA **STORET** (short for STOrage and RETrieval) Data Warehouse, and
3) water quality information provided by the TCEQ for Segment 1007 of the San Jacinto River Basin.

According to the TCEQ database, Sims Bayou in the vicinity of the PL Propylene Outfall 001 has a 7-day, 2-year (7Q2) flow of 40.56 cubic feet per second or 26.213 MGD as compared to the increase of 0.7 MGD of wastewater discharge from the proposed expansion of the PL Propylene plant. The table below provides a calculation of the concentrations of constituents that would result from the mixture of the wastewater discharge from PL Propylene Outfall 001 expansion project with the water in Sims Bayou. The water quality data provided in the following table for Outfall 001 is being used as a surrogate for anticipated discharges for the Project. A percent increase or decrease in the concentration of the mixture that would result from the wastewater discharge is provided in the last column. Due to the effective treatment of wastewater generated at the facility the water quality of Sims Bayou is actually improved as a result of the discharge at Outfall 001. The data indicates there is either no measurable change or that there is a negative (-) change (i.e. a water quality improvement) that would occur as a result of the incremental increase in the discharge to Sims Bayou from PL Propylene Outfall 001 for all parameters for which comparative water quality data was available. One such improvement includes dissolved oxygen where there is an increase of 0.32% in the concentration of the mixture. The only measurable change involves total suspended solids (TSS) which results in a negligible increase in TSS from 9.0 to 9.43 mg/l. Furthermore, this concentration will be further diluted by dispersion which will occur along the 2.85 mile path to the HSC.

PL Propylene Outfall 001 and Sims Bayou at Houston Ship Channel Tidal (1007)
Monitored Pollutant Concentrations

Parameter	PL Propylene Wastewater Average Concentration Outfall 001 (mg/L) (Actual)	Sims Bayou Monitored Values (mg/L)	Concentration of Mixture Daily Avg. (mg/L)	Percent Change (+ / -)
Conventional Constituents				
BOD (5-day)	3.65	NA	N/A	N/A
CBOD (5-day)	ND	NA	N/A	N/A
Chemical Oxygen Demand	52	NA	N/A	N/A
Total Organic Carbon	19.9	NA	N/A	N/A
Dissolved Oxygen	4.53	4.03	4.04	0.32%
Ammonia Nitrogen	0.473	NA	N/A	N/A
Total Suspended Solids	25.5	9	9.43	4.77%
Nitrate Nitrogen	0.729	NA	N/A	N/A
Total Organic Nitrogen	1.18	NA	N/A	N/A
Total Phosphorous	0.894	NA	N/A	N/A
Oil and Grease	ND	NA	N/A	N/A
Total Residual Chlorine	0.04	NA	N/A	N/A
Total Dissolved Solids	1170	NA	N/A	N/A
Sulfate	426	NA	N/A	N/A
Chloride	194	1080	1056.95	-2.13%
Fluoride	NA		N/A	N/A

Parameter	PL Propylene Wastewater Average Concentration Outfall 001 (mg/L) (Actual)	Sims Bayou Monitored Values (mg/L)	Concentration of Mixture Daily Avg. (mg/L)	Percent Change (+ / -)
Metals				
Total Aluminum	1.23	NA	N/A	N/A
Total Antimony	<0.03	NA	N/A	N/A
Total Arsenic	0.0118	0.02	0.0198	-1.07%
Total Barium	0.219	141	138.3383	-2.60%
Total Beryllium	<0.004	0.62	N/A	N/A
Total Cadmium	0.0005	0.16	0.1559	-2.59%
Total Chromium	0.0005	0.02	0.0195	-2.54%
Trivalent Chromium	N/A	N/A	N/A	N/A
Hexavalent Chromium	<0.010	N/A	N/A	N/A
Total Copper	0.0186	0.092	0.090091	-2.08%
Cyanide	<0.020	N/A	N/A	N/A
Total Lead	0.0025	0.133	0.129606	-2.55%
Total Mercury	<0.0002	0.1	0.09740161	-2.60%
Total Nickel	0.00689	0.13	0.12680	-2.46%
Total Selenium	<0.010	NA	NA	NA
Total Silver	<0.002	NA	<0.004	0.0000%
Total Thallium	<0.010	0.88	NA	NA
Total Zinc	0.074	0.192	0.003873	-1.60%

(Note: In performing these calculations, a value equal to ½ of the detection limit was used in cases where the concentration of the parameter in the PL Propylene Outfall 001 discharge was reported to be less than the detection limit.)

The TPDES permit requires that the final effluent be routinely analyzed using whole effluent toxicity (WET) testing methods per the requirements of 40 CFR 122.44(d)(1)(i). Studies have shown that the surrogate organisms used in WET testing are of similar sensitivity to listed threatened or endangered species and are reliable indicators of potential toxic effects (Mayer, et al 2008; Dwyer, et al. 2004; Sappington, et al. 2001). Toxicity in these tests is defined as a statistically significant difference at the 95% confidence interval between the survival, reproduction, or growth of the test organisms at or below a specified effluent dilution (i.e., the critical dilution) compared to the survival, reproduction, or growth or the test organisms in the control (i.e., 0% effluent). WET testing follows a pass/fail criterion with no calculation of specific concentrations of individual constituents. In this regard, any "harmful quantity" would be signaled by a test failure.

Through the past five years of record, WET testing performed on the facility Outfall 001 discharge has not failed and thus has not indicated the presence of harmful quantities of toxic constituents in the effluent. Because the additional effluent generated by the expansion Project will be handled exactly as for the current effluent, the effluent quality from the expansion Project is expected to be the same as the current discharge. For these reasons, the likelihood of toxicological impacts to aquatic life, including listed threatened or endangered species, should be discountable. Data shows that the concentrations of constituents in the wastewater

discharge will have a negligible effect on the receiving waters and would actually improve water quality of the receiving stream.

The PLP facility will have an Oil and Hazardous Materials Spill Prevention, Control, and Countermeasure Plan and Storm Water Pollution Prevention Plan in place prior to operation and the facility employees will be trained to implement these plans. These plans will be utilized during operations, and maintenance of the proposed additional combustion sources.

3.4 EFFECTS OF PROJECT ON MANAGED SPECIES

EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Within estuaries, EFH is further defined as "all waters and substrates (mud, sand, shell, rock, and associated biological communities) within these estuarine boundaries, including the subtidal vegetation (sea grasses and algae) and adjacent tidal vegetation (marshes and mangroves)" (GMFMC, 1998). Because of its connection to San Jacinto Bay and Upper Galveston Bay, the HSC may contain possible EFH for multiple aquatic species that are managed by the GMFMC.

Relative to the Galveston Bay system, this upstream section of the HSC, an industrial waterway, is relatively depleted in managed species – some of which, e.g., pink shrimp, red drum - may be virtually absent (Seiler et al. 1991). Preferred habitat for all these species is of higher salinity than expected for waters in the upper San Jacinto Bay and upstream within the HSC. Seiler et al. (1991) indicate that the only managed species occurring regularly or semi-regularly within Segment 1007 of the HSC are brown shrimp and white shrimp.

Brown Shrimp: In estuaries, brown shrimp postlarvae and juveniles are associated with shallow vegetated habitats, as well as silty sand and non-vegetated mud bottoms. The density of late postlarvae and juveniles is highest in marsh edge habitat and submerged vegetation, followed by tidal creeks, inner marsh, shallow open water, and oyster reefs. In unvegetated areas, muddy substrates seem to be preferred. Juveniles and sub-adults of brown shrimp occur from secondary estuarine channels out to the continental shelf but prefer shallow estuarine areas, particularly the soft, muddy areas associated with plant-water interfaces. Adult brown shrimp occur in neritic Gulf waters and are associated with silt, muddy sand, and sandy substrates (GMFMC 1998). Within the HSC, brown shrimp are rare (Seiler et al. 1991). On the basis of no disturbance of EFH substrate, and the negligible levels of effect for emissions deposition, wastewater discharge, and run-off, no adverse effects on brown shrimp are expected as a result of the Project.

White Shrimp: White shrimp are offshore and estuarine dwellers and are pelagic or demersal, depending on life stage. The eggs are demersal and larval stages are planktonic; both stages occur in near-shore marine waters. Postlarvae and juveniles inhabit mostly mud or peat bottoms with large quantities of decaying organic matter or vegetative cover. Densities are usually highest in marsh edges and submerged aquatic vegetation, followed by marsh ponds and channels, inner marsh, and oyster reefs. White shrimp juveniles prefer salinities of less than 10

ppt and frequently are found in tidal rivers and tributaries. They move to coastal areas to mature and spawn. Adult white shrimp are demersal and inhabit soft mud or silt bottoms, generally in near-shore Gulf waters to depths less than 30 meters (GMFMC 1998). Within the HSC, white shrimp are likely but not abundant (Seiler et al. 1991). On the basis of no disturbance of EFH substrate, and the negligible levels of effect for emissions deposition, wastewater discharge, and run-off, no adverse effects on white shrimp are expected as a result of the Project.

Other Species: For other managed species, occurrence within the HSC would be considered incidental and transient. For species that may occur in the HSC on this incidental basis, based on no disturbance of EFH substrate, and the negligible levels of effect for emissions deposition, wastewater discharge, and run-off, no adverse effects to these species potentially occurring within the HSC are expected as a result of the Project.

4.0 CONCLUSIONS

The proposed facility expansion will not adversely impact or degrade any EFH directly through alteration of the HSC or EFH substrate. The proposed facility expansion will not adversely impact or degrade any EFH indirectly through wastewater, air, or other related discharges.

EFH does not exist within any portion of the Project. No EFH will be adversely impacted by direct alteration during construction or operation or by airborne emissions during operation.

The proposed expansion project will result in an increase in wastewater discharge volume from 0.7 MGD to 1.4 MGD. However, since the concentrations of the vast majority of monitored constituents within the treated affluent are less than those in the receiving water, the effects are negligible and in most cases beneficial. Continual vertical and longitude dispersion of the discharge would occur over the 2.85 stream miles it would travel to reach the Houston Ship Channel. Due to similar operating parameters and chemical loading, the pollutant concentration of the effluent will not change from current conditions. Therefore, the project is not expected to have any negative effects on aquatic habitat or exceed any established Water Quality Based Effluent Levels. Furthermore, historic WET results indicate that the proposed discharge of effluent from the facility will not adversely affect aquatic species or habitat. Additionally, the discharge will continue to comply with applicable State of Texas water quality standards for the receiving segment, including temperature. No EFH will be adversely impacted by wastewater discharge.

During construction of the proposed additions to the PL Propylene plant, PLP will follow the TCEQ requirement to obtain a construction storm water permit for the Project. The site will employ best management practices to prevent contamination due to storm water runoff, including erosion control and stabilization, minimization of offsite vehicle tracking and dust generation, and other practices as warranted by site specific conditions. The site will also follow the notification, recordkeeping, and reporting requirements of TCEQ's construction storm water management program The PLP facility will have an Oil and Hazardous Materials Spill Prevention, Control, and Countermeasure Plan and Storm Water Pollution Prevention Plan in place prior to operation and the facility employees will be trained to implement these plans. These plans will be utilized during operations, and maintenance of the proposed additional combustion sources. No EFH will be adversely impacted by storm water emissions.

5.0 LITERATURE CITED

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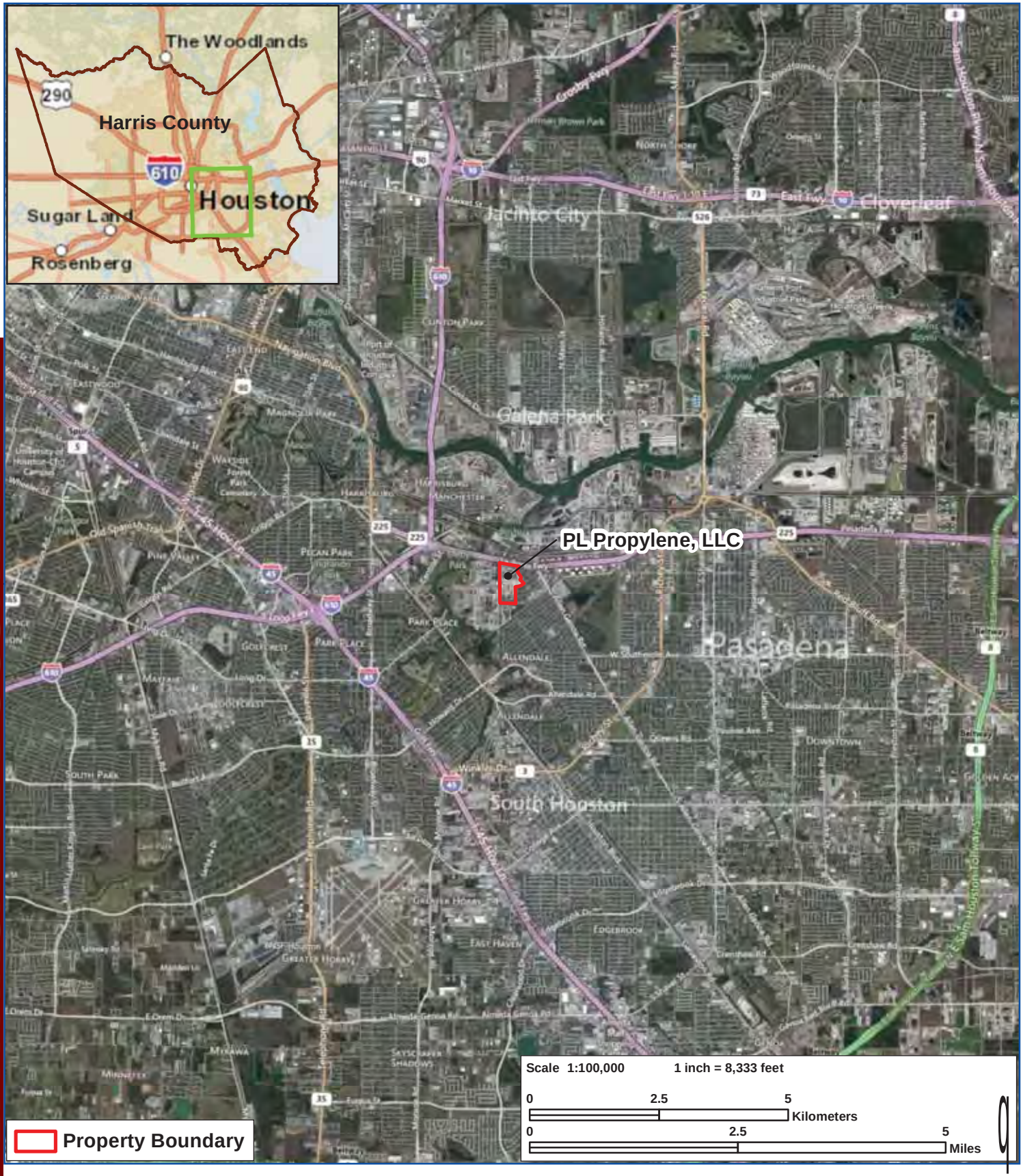
FIGURES



Datum: GCS NAD 1983, UTM Zone 15
Map Sources: ESRI Bing Hybrid Basemap & Streets Basemap;
PL Propylene, LLC

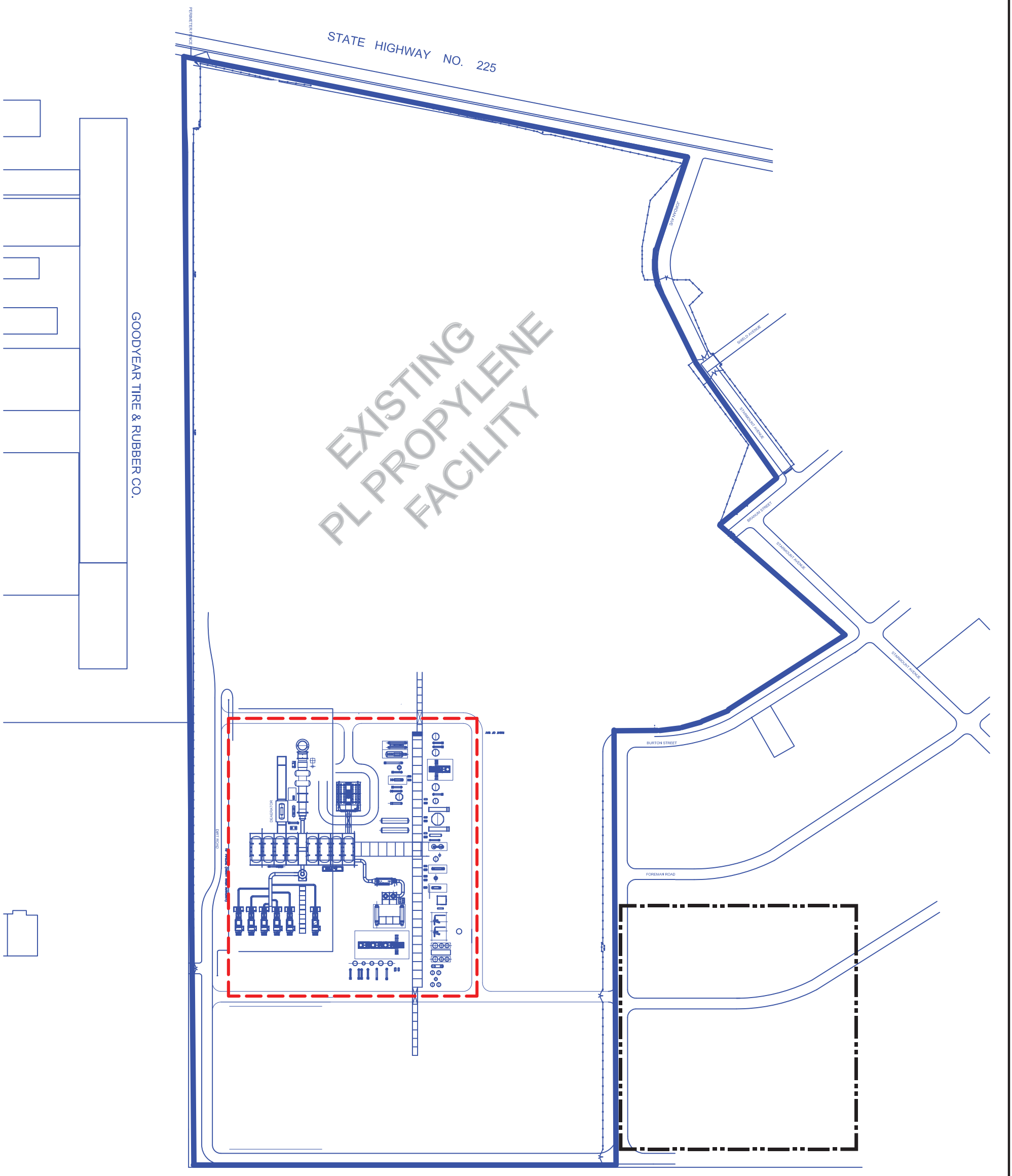
zephyr

FIGURE 1: PROJECT LOCATION

PL Propylene, LLC
Harris County, Texas

K:\PL Propylene LLC\Draft BA\Figures

Drafted By:	Reviewed By:	Project No.:	Date:
J. Knowles	R. Fisher	011377	09/10/2012



Legend

- Approximate Property Boundary
- Approximate Expansion Boundary
- Approximate Construction Laydown Yard Boundary

N

0 20 40 60 80 100 150

SCALE (IN METERS)

FIGURE 2			
PLOT PLAN			
PL PROPYLENE LLC			
File Name: H:\PL Propylene\Jens Graphics for 11377 BA			
Designed By: RvC	Checked By: S. McVey	Project No.: 11377	Date: 09/10/2012

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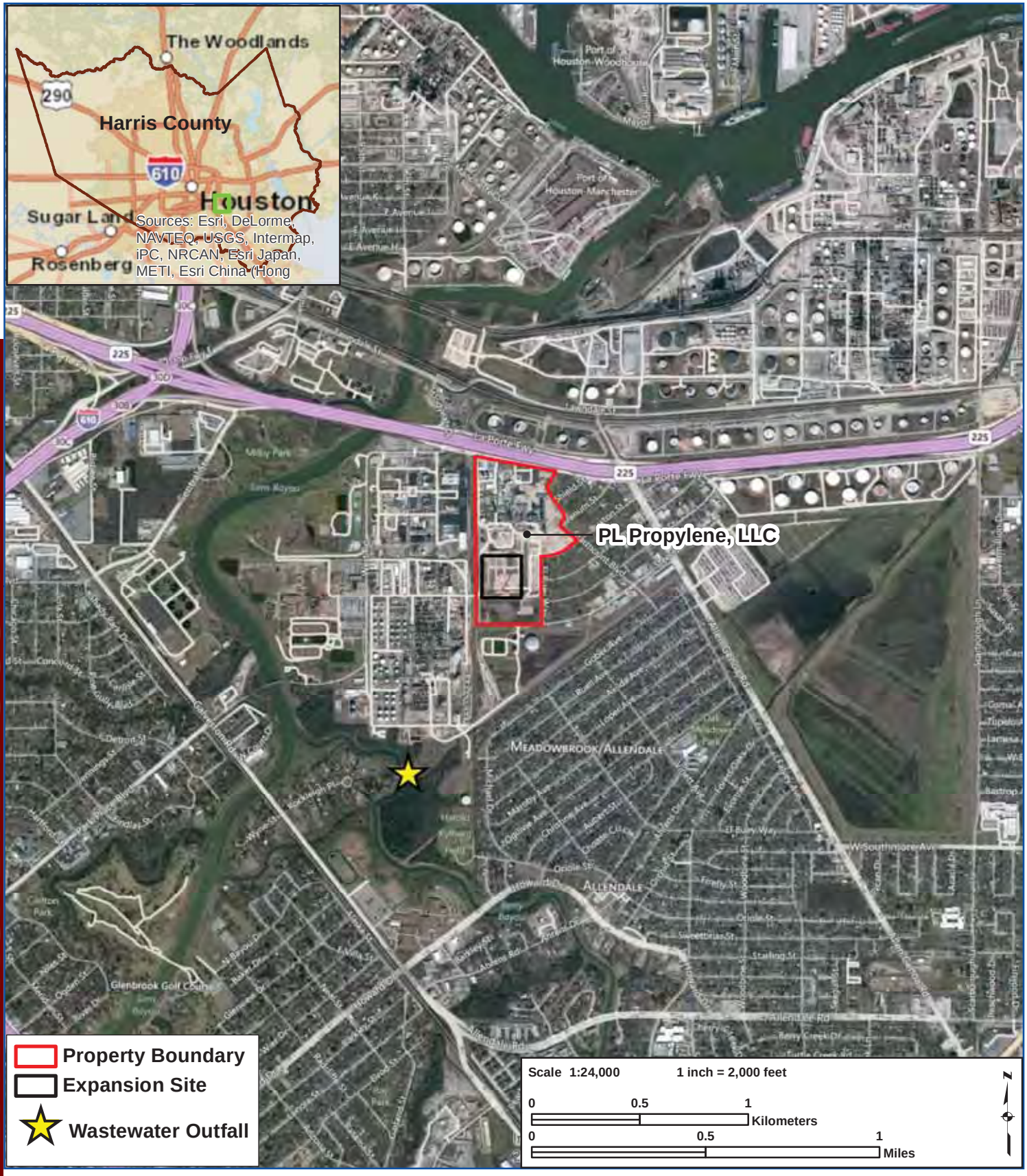

Datum: GCS NAD 1983, UTM Zone 15
Map Sources: ESRI Bing Hybrid Basemap & Streets Basemap;
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FIGURE 3: PROJECT AREA MAP

PL Propylene, LLC
Harris County, Texas

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