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ATTACHMENT C
PURPOSE, NEED AND ALTERNATIVES ANALYSIS

PURPOSE AND NEED

Project Purpose: To facilitate the safe and efficient construction of a new polyethylene unit on the east side of the existing facility.

Project Need: Sufficient land acreage in proximity to the existing Beaumont Polyethylene Plant (BPEP) to safely and efficiently accommodate laydown, staging and fabrication for the construction of a new polyethylene unit (BPEX) on the east side of the existing facility. A general rule of thumb for large chemical plant construction projects is that approximately three times the construction area is needed for laydown, staging and fabrication yards (not including parking). The expansion construction area for BPEX is approximately 33 acres; therefore, approximately 95 to 100 acres of laydown area would be required. As an example, two existing chemical plant construction sites were analyzed from Google Earth imagery to determine the existing laydown space relative to the expansion construction area for those projects (see Table 1 below). Laydown areas for these existing construction projects range between 2.6 and 3 times the construction site area.

Table 1: Examples of Laydown Needs for Actual Construction Projects in Texas

| Area | Example Facility #1 Baytown, TX | Example Facility #2 Mont Belvieu, TX |
|--|------------------------------------|---|
| Construction Site(s) | ~65 acres | ~32 acres |
| Laydown, Parking & Temporary Facilities | ~171 acres (2.6X) | ~96 acres (3X) |

Note: Acreage estimates for example facilities based on aerial photography of sites currently undergoing construction.

The existing BPEP facility only has ~ 43 acres of available laydown useable by the project and to be shared by the rail expansion. These areas will be utilized to the maximum extent practicable to support construction of the new unit, but have limited utility for large equipment laydown due to obstructions of the existing rail facilities and drainage facilities. Additional laydown is required for the large equipment. The property immediately east and adjacent to the expansion site is the only available area without logistical and safety constraints (as discussed below). Adequate storage must be available for piping, conduit, structural steel, etc., allowing timely and safe access, minimizing safety hazards and ensuring material preservation. One of the major safety and logistical concerns is placing heavy truck traffic on US Highway 90 for shuttling of material to/from the jobsite, specifically the interactions with personal vehicles (construction workforce and public). Highway 90 is a 75 mph thoroughfare not designed to facilitate heavy construction traffic. Staging immediately adjacent to the construction site is imperative to minimize distance and quantity of critical heavy haul lifts to final foundation site which will significantly reduce project exposure to lifting/transport incidents both to construction personnel and the public. Much of the material and equipment for the project is large sized with long lead time, and/or custom made specific to the project. The order of assembly is critical to ensuring safe installation and start-up of the project. Therefore, sufficient space is needed both for storage and assembly, with sufficient volume of materials to allow work crews to accomplish their tasks in a timely fashion. The area must also include safe walking paths, openings wide enough for efficient personnel and equipment access and be easily accessible by large-size forklift/cranes/heavy haul/rigging equipment. Equipment must be able to be moved in and out safely and not laid out in such a way that the area is overloaded with activities, equipment and material. The area will include space to construct portions of the project at grade and in proximity to the construction location. The area will also house temporary equipment necessary to support construction activities such as generators, welding machines, compressors, etc. Many of the activities in the area will require safety zones or safe minimum work distances. The area will include safety and personnel equipment such as eye wash stations, safety showers, fire protection equipment, drinking water, hand wash stations, port-o-cans, etc.

ALTERNATIVES ANALYSIS

On-Site Alternatives: The onsite alternative essentially includes reduction of the available space to avoid some or all of the onsite wetlands with adequate buffer to prevent secondary adverse effects to the wetlands (~25 ft upland buffer). As indicated above, nearly 100 acres total laydown area will be needed. The subject parcel is 54.2 acres in size; therefore, it is of minimum size already to meet total project needs. As can be seen from Figure 1, avoidance of the two wetlands with a minimum 25-foot buffer zone results in approximately 48 acres of remaining space that is much less efficient due to lack of continuity and connectivity for assembly and moving of large equipment. The avoidance of wetlands on-site is deemed non-practicable from a site efficiency standpoint.

Off-Site Alternatives: As indicated above, safety is a focus for the execution of this project. Equipment will range in sizes up to 131 feet and weight up to 520 tons (see Table 2 below). The 54.2 acre subject site is of minimum size for proximity-dependent large equipment laydown, assembly, and safe worker access. Alternative off-site locations in close proximity and surrounding the new unit construction site were investigated for feasibility of use. Keeping in mind the necessity to assemble and move large pieces of equipment and numerous personnel and construction equipment in a safe and efficient manner, adjacent sites in the 4 cardinal directions were investigated. Figure 2 illustrates constraints to use of off-site locations surrounding the BPEP facility.

Table 2: Example of Equipment Sizes

| Description | Inside Diameter (feet) | Tangent Line (feet) | Quantity |
|-------------|------------------------|---------------------|----------|
| Vessel #1 | 19 | 131 | 1 |
| Vessel #2 | 17 | 83 | 1 |
| Vessel #3 | 19 | 68 | 2 |
| Vessel #4 | 8 | 60 | 2 |
| Vessel #5 | 23 | 58 | 1 |
| Vessel #6 | 21 | 47 | 4 |
| Vessel #7 | 8 | 37 | 2 |
| Vessel #8 | 6 | 31 | 3 |
| Vessel #9 | 8 | 31 | 2 |
| Vessel #10 | 9 | 27 | 1 |
| Vessel #11 | 10 | 27 | 1 |
| Vessel #12 | 24 | 25 | 2 |
| Vessel #13 | 14 | 22 | 1 |
| Vessel #14 | 7 | 17 | 1 |
| Vessel #15 | 7 | 15 | 1 |

North: Sites located north of the BPEP New Unit Construction Site are constrained by the New Rail Construction Site which will be under construction simultaneously with the New Unit. Early construction of the new rail is imperative to support continued base plant operations whilst additional rail modifications are being made at the existing site to accommodate the expansion.

Additionally, Sour Lake Road, a narrow/two lane road intended primarily for rural residential use, and existing rail facilities also cross the north boundary that would necessitate dangerous crossings for large equipment and personnel. Based on NWI maps, significant wetlands are also present north of Sour Lake Road. Sites to the north are deemed non-practicable due to access and safety concerns for moving large equipment and personnel as well considerable

disruption to residents ingress/egress from their homes. It is possible wetland impacts could be equal or greater than the proposed site.

East: To the east of the BPEP New Unit Construction Site is the Beaumont Municipal Airport, a required detention basin, and an existing industrial facility (GE Betz) in addition to Willow Marsh Bayou. If portions of the airport property were to be available, a new major crossing of Willow Marsh Bayou would be required as well as an additional detention basin. Areas further east of the airport are heavily residential. Use of US Highway 90 or Sour Lake Road from points east of the New Unit site would be a significant traffic safety concern as well as involve several crossings of existing rail facilities. Sites to the east, if acquisition was possible, are deemed non-practicable due to access and safety concerns for moving large equipment and personnel. As indicated above, US Highway 90 is a 75 mph thoroughfare not designed to facilitate heavy construction traffic.

South: Nearly the entire area south of the existing BPEP facility and the New Unit Construction Site is heavily residential. Beyond the residential area is a large wetland area represented on NWI maps. Access to the south would involve crossing of US Highway 90, an existing rail facility, and/or pipeline/transmission line corridors. Sites to the south are deemed non-practicable due to the presence of residential areas and access and safety concerns for moving large equipment and personnel as well as considerable disruption to resident's ingress/egress from their homes. It is possible wetland impacts could also be equal or greater than the proposed site.

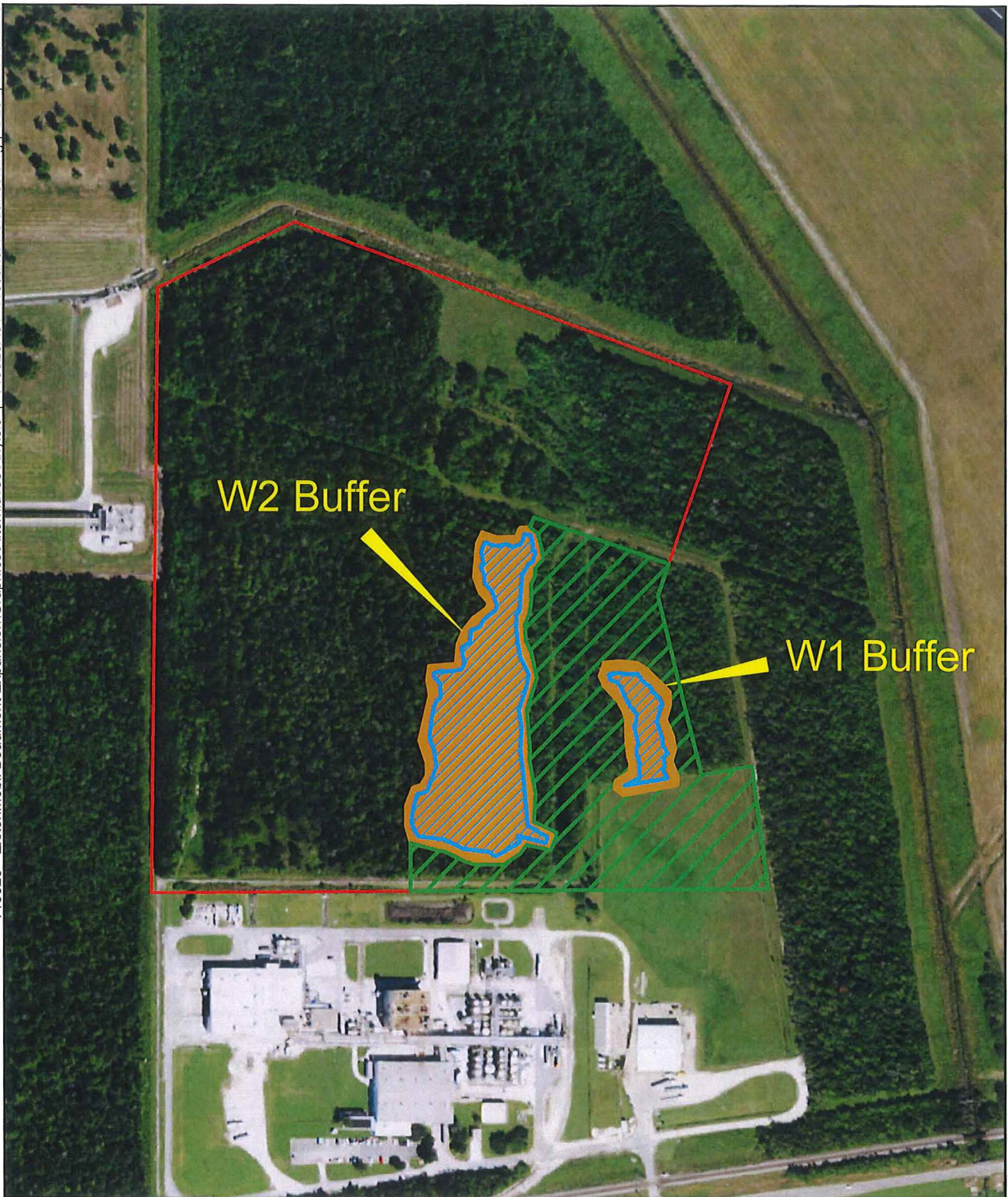
West: The west offers more potential undeveloped space, however, the west is constrained by the need to cross a large electric transmission line corridor, the LNVA water canal, several pipeline corridors, and several existing rail facilities, all of which represent significant safety and cost considerations for moving large equipment and personnel. Additionally, the existing BPEP facility must be circumvented either to the north or the south. The south end of the facility is the main entrance to the plant and is the primary safety evacuation route in the event of an accident. Several rail crossings would be necessary within the plant. The north end of the existing facility is constrained by a restricted flare radiation zone and by several rail crossings in addition to the New Rail Construction Site. Moving large equipment and numerous personnel through these areas would represent a significant logistical and safety concern. Utilization of areas west of the existing BPEP facility would cost an estimated additional \$25 million in addition to the costs of using non-wetland portions of the Preferred Alternative location due to the need to relocate or modify pipelines, transmission lines, the LNVA canal, and existing rail facilities. The property owner of the property west of BPEP is unwilling to negotiate a sale or lease of their land to ExxonMobil for use in this expansion project. This alternative is non-practicable.

Preferred Alternative:

The preferred alternative represents the only location for large equipment laydown and assembly and construction personnel staging without significant logistical and safety issues. While the site is of minimal size, the preferred alternative site is large enough to accommodate the critical laydown and staging needs. The shared rail expansion laydown areas on the north part of the facility can accommodate less critical and more easily transportable small equipment without the need to modify utilities or put dangerous construction traffic on public roadways.

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140020 - ExxonMobil Beaumont Expansion\Graphics\Alternatives Analysis | 140020A01 WetlandAvoidance.dwg | GLS | 04/19/2016



MAP SOURCE:
USDA, 2014

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FEET



LEGEND

-  Wetlands
-  Buffers
-  Inefficient Space

Figure 1

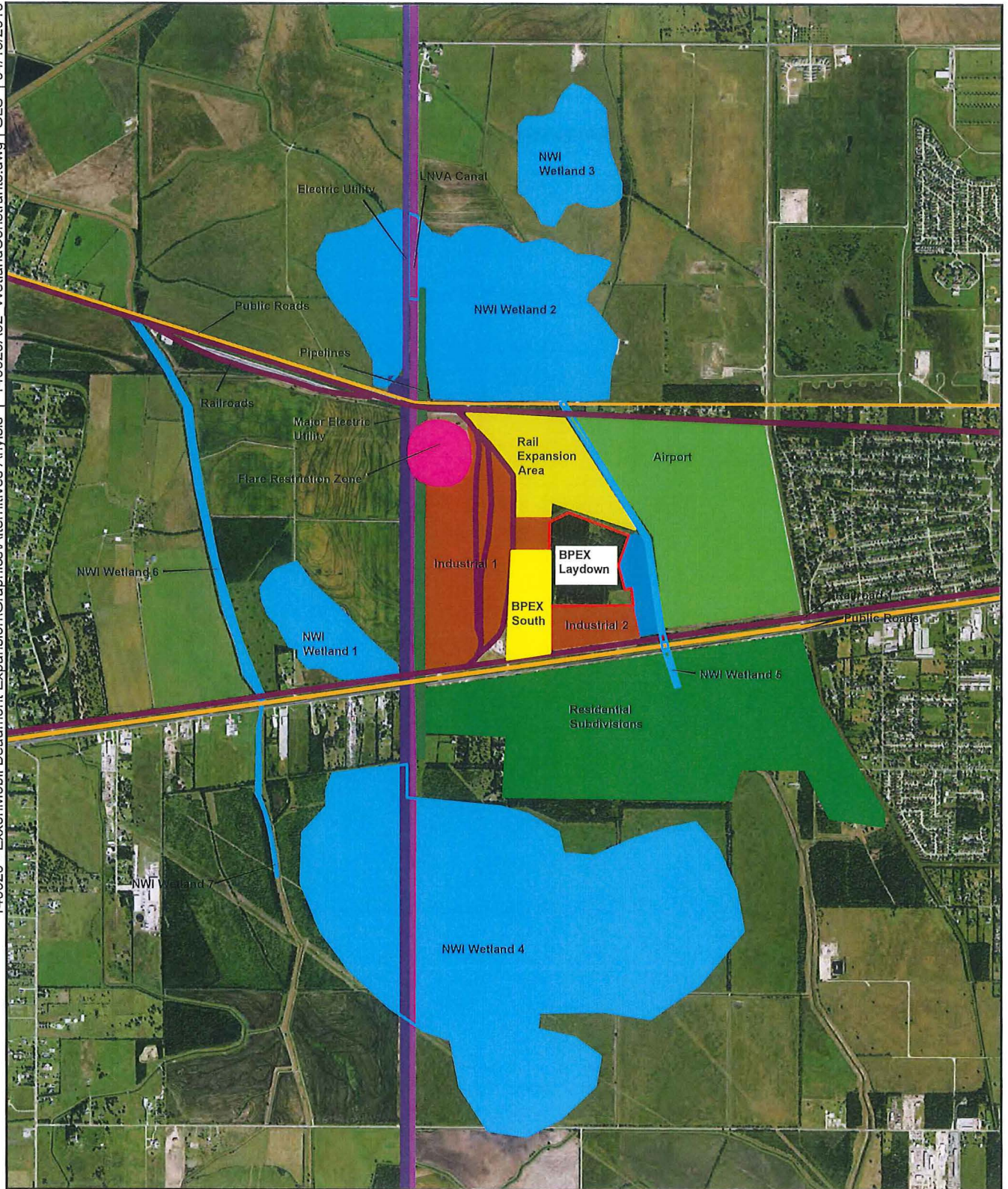
Wetland Avoidance
Proposed Laydown Areas
ExxonMobil Beaumont Polyethylene Plant
Beaumont, Jefferson County, Texas

Do Not Scale This Drawing

Horizon
Environmental Services, Inc.

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140020 - ExxonMobil Beaumont Expansion\Graphics\Alternatives Analysis | 140020A02 WetlandConstraints.dwg | GLS | 04/19/2016



MAP SOURCE:
USDA, 2014



0 408 816
FEET

Horizon
Environmental Services, Inc.

"Do Not Scale This Drawing"

Figure 2
Constraints to Alternatives
Proposed Laydown Areas
ExxonMobil Beaumont Polyethylene Plant
Beaumont, Jefferson County, Texas