The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 16, 2014, and executed by FHWA and TxDOT.
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BHE Recommended Alternatives and Environmental Resources
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1.0 INTRODUCTION AND ENVIRONMENTAL SETTING

The anticipated growth of the City of El Paso and Ciudad Juarez, Mexico, will continue to affect the communities of the Lower Valley by bringing increased economic opportunities, as well as substantial challenges to the existing transportation system. The communities of the Lower Valley include City of Socorro, City of San Elizario, Town of Clint, Fabens, and Tornillo Census Designated Places (CDPs).

Since the late 1980s, the Lower Valley area has transformed from a primarily agricultural area to increasingly commercialized, industrialized, and residential communities. Typical residential communities as well as “colonia” developments have emerged.1 Overall, the Lower Valley land is changing from primarily agricultural and rural uses to residential, commercial, and industrialized urban uses.

This report describes the affected environment related to the future implementation of the Recommended Alternatives identified as part of this BHE PEL Study. This evaluation of the affected environment will provide the baseline information to be used in further project development.

The BHE PEL study area or “study area” is located within the southwest portion of El Paso County in an area known as the Lower Valley. The northern limit of the study area is Loop 375 (Americas Avenue) between the Zaragoza International Port of Entry (POE) and Interstate 10 (I-10). I-10 is a vital trans-continental trade corridor and the only continuous east-west route through El Paso. The study area extends approximately 20 miles in a southeasterly direction to just south of the Fabens International POE (future Tornillo-Guadalupe International POE). The western limit of the study area is the Rio Grande and the eastern limit is I-10. The study area is approximately 70,654 acres (110 square miles). Figure 1 shows the boundaries of the study area.

The study area includes the entire area of the City of Socorro, the City of San Elizario, the Town of Clint, the Fabens CDP, the majority of the Tornillo CDP, and a small portion of the City of El Paso. The study area consists of urbanized land uses that include single family residential, commercial, industrial, civic and military, and agricultural land uses. The municipalities and CDPs within the study area are presented in Figure 1.

All resource descriptions and data presented in this report are within or immediately adjacent to the study area boundaries.

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1 The term “colonia” refers to residential areas along the Texas-Mexico border that may lack some of the most basic living necessities, such as potable water and sewer systems, electricity, paved roads, and safe and sanitary housing (Texas Secretary of State 2010).
Figure 1: BHE PEL Study Area
2.0 ALTERNATIVES

This section describes the No-Build Alternative and the Recommended Alternatives, which were identified as the result of a three level screening process utilized during the BHE PEL Study. The alternatives are further described in the BHE PEL Study Alternative Development and Screening Technical Report (Appendix F).

No-Build Alternative
The “No Build” Alternative represents the baseline condition in the study area as if no additional improvements are implemented other than those already programmed (fiscally constrained in the Horizon 2040 Metropolitan Transportation Plan [MTP]).

The No-Build Alternative provides a baseline to gauge how effective various build alternatives would help accomplish the purpose and need. This alternative is required to be considered in the BHE PEL Study and National Environmental Policy Act (NEPA) analyses.

The No-Build Alternative includes the preservation of the existing transportation network and any programmed transportation improvements that have been identified as fiscally constrained in the MTP. As such, the No-Build Alternative includes all of the short-term operational improvements currently underway and planned within the study area, in addition to all other programmed transportation projects in the region that are contained in the MTP.

Build Alternatives
The alternative screening process consisted of multiple levels of screening blending a varied group of strategies, corridor needs and goals into a set of refined transportation alternatives through an elaborate evaluation process.

The alternative screening methodology included three levels of screening, which began with the Universe of Alternatives. The Universe of Alternatives for the BHE PEL Study was developed utilizing the following precedents and processes:

- Reference and guiding documents, including:
  - 1997 Border Highway Extension Feasibility Study,
  - 2006 El Paso County Border Highway Extension-East;
  - Horizon 2040 MTP;
  - BHE PEL Study precedent documents, such as the travel demand modeling validation for the study area, BHE PEL Study Purpose and Need Technical Report (Appendix C), the BHE PEL Study Alternative Screening Methodology (ASM) (included as Attachment A in Appendix F), and the BHE PEL Study Environmental Constraints Report (Appendix B);
- Input from the Technical Work Group (TWG) and Early Coordination Public Meetings; and
- Follow-up coordination with individual stakeholder groups.
Each of the alternatives in the Universe of Alternative was carried through the Level 1 screening analysis and examined with regard to several broad factors, or screening criteria that were related to the purpose and need of the project. The Level 1 alternative screening was a fatal flaw analysis used to identify the Preliminary Alternatives, or resulting alternatives from the Level 1 screening.

The Level 2 alternative screening included evaluating the Preliminary Alternatives against detailed screening criteria, in four categories (engineering, cost, environmental, and public involvement), qualitatively, to identify those alternatives suitable for further evaluation. This evaluation used preliminary data, professional judgment, and public input to screen the alternatives. The Reasonable Alternatives were the result of the Level 2 screening process.

The Level 3 alternative screening included evaluating the Reasonable Alternatives using screening criteria, in four categories (engineering, cost, environmental, and public involvement), mostly quantitatively, and in more detail than the Level 2 screening. This detailed evaluation included defining and quantifying construction costs, traffic benefits, right-of-way impacts, and environmental impacts. Traffic benefits were assessed utilizing the 2040 travel demand model to calculate the roadway operations, which were quantified by level of service (LOS), vehicle hours traveled (VHT), and vehicle miles traveled (VMT). The Recommended Alternatives were the result of the final Level 3 screening process.

Although the alternatives were evaluated individually, there are several alternatives that were grouped together to create functional corridors that would be implemented as one project. Table 1 identifies the Recommended Alternatives grouped into functional corridors as appropriate. The Recommended Alternatives are illustrated on Figure 2. The BHE PEL Study Alternative Development and Screening Technical Report (Appendix F) provides a more detailed description of the alternatives.

The Recommended Alternatives include the proposed Border Highway Extension, which is defined as a new location roadway connecting the Border Highway West via Loop 375 to the Manuel F. Aguilera Highway (Farm-to-Market 3380 (FM 3380)) near the Fabens International POE (future Tornillo-Guadalupe International POE).

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Alameda Avenue (State Highway 20 (SH 20)) widening from Loop 375 to Herring Road.</td>
</tr>
<tr>
<td>5 Mod</td>
<td>North Loop Drive widening from Horizon Boulevard (FM 1281) to Clint Cutoff Road (FM 1110).</td>
</tr>
<tr>
<td>22</td>
<td>I-10 Mainlanes widening from Loop 375 to O.T. Smith Road (FM 1109).</td>
</tr>
<tr>
<td>15 and 16 (I-10 Frontage)</td>
<td>Alternative 15 - construction of new eastbound frontage road from Clint Cutoff Road (FM 1110) to O.T. Smith Road.</td>
</tr>
<tr>
<td>Alternative</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Roads) Alternative 16</td>
<td>construction of westbound frontage road from Clint Cutoff Road to O.T. Smith Road.</td>
</tr>
<tr>
<td>9, 17, 12, and 13 Mod-Rev (Border Highway Extension) Alternative 9</td>
<td>construction of Border Highway Extension utilizing existing Pan American Drive at Loop 375.</td>
</tr>
<tr>
<td></td>
<td>Alternative 17 - construction of Border Highway Extension from the terminus of Alternative 9, through Socorro, which would be generally located along the Rio Grande.</td>
</tr>
<tr>
<td></td>
<td>Alternative 12 - construction of Border Highway Extension from terminus of Alternative 17 to Middle Island Road.</td>
</tr>
<tr>
<td></td>
<td>Alternative 13 - Mod-Rev construction of Border Highway Extension from terminus of Alternative 12 utilizing Middle Island Road (FM 76) and terminating at the Manuel F. Aguilera Highway, east of the Fabens International POE (future Tornillo-Guadalupe International POE).</td>
</tr>
<tr>
<td>I Mod-Rev</td>
<td>Extension of Old Hueco Tanks Road from North Loop Drive (FM 76) to the proposed Border Highway Extension.</td>
</tr>
<tr>
<td>L</td>
<td>New Socorro connection that includes constructing a new location arterial from I-10 to the proposed Border Highway Extension near City of Socorro’s southern boundary.</td>
</tr>
<tr>
<td>N and F (New FM 1110) Alternative N</td>
<td>includes widening San Elizario Road (FM 1110) from I-10 to North Loop Drive.</td>
</tr>
<tr>
<td></td>
<td>Alternative F includes realigning FM 1110 from North Loop Drive to the proposed Border Highway Extension, utilizing new location, generally following the existing Herring Road.</td>
</tr>
<tr>
<td>P</td>
<td>New I-10 connection includes construction of a new location arterial from I-10 to proposed Border Highway Extension between Clint Cutoff Road and Fabens Drive (FM 793).</td>
</tr>
<tr>
<td>R Mod</td>
<td>Known as &quot;Fabens South Connection&quot;, this alternative includes construction of a new location arterial from I-10 at Fabens Drive to the proposed Border Highway Extension at Middle Island Road (FM 76).</td>
</tr>
</tbody>
</table>

**Transit Alternatives**

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR-1</td>
<td>New bus rapid transit route (BRT) along Alameda Avenue from Loop 375 to Horizon Boulevard. Alternative also includes enhancing the existing El Paso County Rural Transit Route 40 from Loop 375 to O.T. Smith Road in Tornillo.</td>
</tr>
<tr>
<td>TR-2</td>
<td>Extension of the current El Paso Rural County Transit Route 40 from Stop 5 at Alameda Avenue at the proposed Manuel F. Aguilera Highway and terminating at the Fabens International POE (future Tornillo-Guadalupe International POE).</td>
</tr>
</tbody>
</table>

**Bicycle/Pedestrian Alternatives**

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BP-1</td>
<td>Bike/Pedestrian connection from proposed border trails along Old Hueco Tanks Road and Horizon Boulevard to El Paso County Rural Transit stop for Routes 30, 40, and 84.</td>
</tr>
<tr>
<td>BP-2</td>
<td>Bike/Pedestrian footbridge connection from Rio Bosque Park across Socorro Road.</td>
</tr>
<tr>
<td>BP-3</td>
<td>Bike/Pedestrian connection from proposed border trails along the Rio Grande to Socorro Road.</td>
</tr>
<tr>
<td>BP-4</td>
<td>Bike/Pedestrian connection from proposed bike trail to El Paso County Rural Transit Route 84 Bus Stop 5 along Socorro Road.</td>
</tr>
<tr>
<td>Alternative</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>BP-5</td>
<td>Bike/Pedestrian connection from the Fabens International POE (future Tornillo-Guadalupe International POE) to El Paso County Rural Transit Route 40 Stop 5 along the Manuel F. Aguilera Highway.</td>
</tr>
</tbody>
</table>

Notes:
1. It was determined that the Border Highway Extension could be constructed in two phases, with the first phase located between Loop 375 and FM 1110. The second phase, would be located in the most rural part of the study area, would extend from FM 1110 to FM 3380, near the Fabens International POE (future Tornillo-Guadalupe International POE).
2. Although the transit alternatives are recommended for future, further study, minimal environmental impacts were determined during the BHE PEL. This report will not address those environmental impacts.
Figure 2: BHE PEL Recommended Alternatives
3.0 EXISTING ENVIRONMENT

The BHE PEL Study Environmental Constraints Report (Appendix B) was prepared for the Study to document the existing infrastructure and environmental constraints within the study area. The study area was defined during the early stages of preparation of the BHE PEL Study Environmental Constraints Report (Appendix B) in 2011 in coordination with Texas Department of Transportation’s (TxDOT) Environmental Affairs Division (ENV). The study area is previously described in Section 1.0.

In order to identify the environmental and infrastructure constraints associated with the study area, information was collected through database searches, imagery analyses, Google Maps (http://maps.google.com), desktop geographic information system (GIS) analyses, and limited field reconnaissance of the study area. The field reconnaissance consisted of windshield surveys performed in January and May 2006, September 2010, and June 2013. Data collected during the preparation of the constraints report identified infrastructure elements, socio-economic demographics, land use, natural resources, cultural resources, hazardous materials, traffic noise, and air quality.

Data collection has continued since the preparation of the initial constraints report in 2013. Information received from various entities during the technical work group meetings, public meetings, and stakeholder meetings were incorporated into the BHE PEL Study Environmental Constraints Report (Appendix B).

4.0 AFFECTED ENVIRONMENT

Through the alternative screening process, each Reasonable Alternative was developed to a level of detail to define the corridor’s general location and basic right-of-way (ROW) requirements. The level of alternative development was sufficient to allow for a qualitative and quantitative evaluation of a range of criteria and measures that were based on the study goals. This process is discussed in detail in the BHE PEL Study Alternative Development and Screening Technical Report (Appendix F). A corridor width for each alternative was determined and environmental resources, within the corridor of each alternative, were identified and each resource was assigned a rating. The methodology utilized to assign a rating for each resource is detailed in the BHE PEL Study Alternative Development and Screening Technical Report (Appendix F).

The environmental resources located within the study area were researched and documented in the BHE PEL Study Environmental Constraints Report (Appendix B). Additionally, stakeholder, agency, and tribal/sovereign nation coordination was conducted throughout the BHE PEL Study, as documented in the BHE PEL Study Agency Coordination Technical Report (Appendix D), which was also utilized to determine the resources within the study area.

At this time, it is not possible to determine specific impacts based on design due to the conceptual nature of the alternatives. Therefore, all of the environmental resources and issues within each corridor that received a negative rating are considered potentially impacted. However, the actual detailed design of the alternative may not impact each
environmental resource identified within the corridor. Negative ratings were assigned based on a designated range of thresholds, typically of a quantity, to assess the potential level of impact. It should be noted that although a resource may be identified in this report, the potential impact or proximity to the resource may not be considered critical. Further analysis for potential impacts would be required by future study teams once a project was proposed for development during the project-specific design phase.

The environmental resources and issues evaluated for each alternative consisted of:

- Community Resources
- Socio-Economic and Environmental Justice
- Cultural Resources
- Ysleta del Sur Pueblo (YDSP) Sovereign Nation/Tigua Land
- Park Land
- Water Resources
- Drainage Features
- Floodplains
- Biological Resources
- Agricultural Resources
- Hazardous Materials
- Air Quality
- Traffic Noise

The following sections discuss the alignment of each of the Recommended Alternatives and identify the affected environmental resources for each. Affected resources are those that have received a negative rating in the alternative evaluation matrices. Environmental resources that received a neutral rating are not considered impacted and are not included in the description of affected resources for the alternative. In addition to these environmental resources, the affects to border access and security were also considered since some of the alternatives are adjacent to the U.S./Mexico International Border.

4.1 Alternative 3 – Alameda Avenue Widening

Alternative 3 would include widening Alameda Avenue between Loop 375 and Herring Road. Currently, Alameda Avenue is a four-lane, urban principal arterial with shoulders. Alameda Avenue traverses south from Loop 375 crossing S. Moon Road, through the City of Socorro, intersects Horizon Boulevard (FM 1281), Vineyard Road, and

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2 For the socioeconomic analysis, the U.S. Census Bureau (USCB) 2010 Census and 2008-2012 American Community Survey (ACS) data were used to analyze the census block groups and census blocks contained either wholly or partially within the corridor of each Recommended Alternative. The average percentage of the minority population for the study area is 84.2 percent. The average percentage of the Limited English Proficiency (LEP) population for the study area is 40.9 percent. These averages were used to determine whether a high LEP or minority population would be within or adjacent to the Recommended Alternative.

3 Cultural resources include archeological and non-archeological historic resources.
Passmore Road, passes through Clint where it intersects S. San Elizario Road (FM 1110), and terminates at Herring Road.

Alternative 3 proposes to improve the roadway’s level of service (LOS) by construction of one additional travel lane in each direction, while maintaining the existing traffic control and access characteristics. Alternative 3 is approximately 8.8 miles long and improves connectivity through its intersections with Horizon Boulevard and S. San Elizario Road. The ROW width is approximately 122 feet and would encompass approximately 129 acres (including existing ROW). See Map Sheets 1 through 4 of 7 (Attachment A) to view the corridor location.

Potentially affected environmental resources and issues associated with the widening of Alameda Avenue between Loop 375 and Herring Road are identified below, followed by a more detailed description.

- Community Resources
- Socio-Economic and Environmental Justice
- Cultural Resources
- Tigua Land
- Drainage Features
- Floodplains
- Biological Resources
- Agricultural Resources
- Hazardous Materials
- Air Quality
- Traffic Noise

Community Resources
Various schools and places of worship are adjacent to Alternative 3 and various designated neighborhoods are located adjacent to the northern corridor section. These areas may potentially be impacted by Alternative 3. The PEL process takes into consideration community needs and stakeholder input; however, more detailed design approaches and solutions would be determined during the NEPA and design phase at a project-level.

Socio-Economic and Environmental Justice
The U.S. Census Bureau (USCB) 2010 data shows that the percentages for both the minority and Limited English Proficiency (LEP) populations are greater than the study area average (84.2 and 40.9 percent, respectively); therefore, it can be concluded that the high minority and LEP populations would be within or adjacent to Alternative 3.

Cultural Resources
The alternative would cross through the Tigua Trust Land Buffer and Tigua Trust Land. The corridor overlaps a National Register of Historic Places (NRHP)-listed El Paso County Water Improvement District No. 1 (EPCWID1) system canal and also overlaps
the NRHP-listed Franklin Canal. Alternative 3 would pass by the NRHP-eligible Pena
House near the intersection of Alameda Avenue and Horizon Boulevard.

Adverse impacts to EPCWID1 may generally be avoided by spanning irrigation features
rather than placing piers within or upon irrigation structures and by avoiding any impact
to the function of the EPCWID1 system, as described below in Drainage Irrigation
Features.

**Tigua Land**
The alternative would cross 19 Ysleta del Sur Pueblo (YDSP) sovereign nation (Tigua)
Trust Land parcels.

During coordination with the YDSP sovereign nation, conducted throughout the BHE
PEL Study, the Tiguas mentioned the possibility of “land swapping” if a project were to
require additional ROW from the YDSP. Planning-level decisions regarding agreements
or mitigation strategies include activities and concepts that may be adopted or
incorporated during the project-specific NEPA process. Coordination with the YDSP
sovereign nation is documented in the BHE PEL Study Agency Coordination Technical
Report (Appendix D).

**Drainage Features**
There are 12 drainage features located within the corridor of Alternative 3. These
features and the linear feet of each corridor’s potential impact are listed in Table 2.

<table>
<thead>
<tr>
<th>Drainage Feature</th>
<th>Length of Impact (linear feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bovee Lateral</td>
<td>3</td>
</tr>
<tr>
<td>Clint Lateral</td>
<td>174</td>
</tr>
<tr>
<td>Clint Spur Drain</td>
<td>149</td>
</tr>
<tr>
<td>Daugherty Lateral</td>
<td>128</td>
</tr>
<tr>
<td>Franklin Canal</td>
<td>9,474</td>
</tr>
<tr>
<td>Glardon Lateral</td>
<td>6</td>
</tr>
<tr>
<td>Green Lateral</td>
<td>190</td>
</tr>
<tr>
<td>Juan De Herrera Branch Canal</td>
<td>122</td>
</tr>
<tr>
<td>Mesa Drain Interceptor</td>
<td>122</td>
</tr>
<tr>
<td>Middle Drain</td>
<td>133</td>
</tr>
<tr>
<td>Salatral Lateral</td>
<td>175</td>
</tr>
<tr>
<td>Wadlington Lateral</td>
<td>148</td>
</tr>
</tbody>
</table>

Note: 1. Alternative 3 would cross the Franklin Canal twice, the
estimated length of the impact includes both crossings.

It is anticipated that those features that are perpendicular to Alternative 3 would be
crossed using bridges or culverts. It is not known at this time how the drainage features
horizontal to the alternative would be modified.
Floodplains
Alternative 3 would impact 0.1 acre within the 100-year floodplain, which is less than one percent of the total area of the corridor.

Biological Resources
The existing mapped Ecological Mapping Systems of Texas (ESMT) habitats located within the corridor are Row crops, Trans-Pecos: Desert Wash Grassland, Trans-Pecos: Riparian Barren, Trans-Pecos: Riparian Shrubland, and Urban Low Intensity. The habitat threshold requiring additional coordination with Texas Parks and Wildlife Department (TPWD) per the 2013 Memorandum of Understanding (MOU) would be exceeded. Per available Texas Natural Diversity Database (TXNDD) data, the alternative is within the mapped range of the Pecos River Muskrat. Drainage features within this alternative would be impacted which may provide suitable habitat for the species.

Agricultural Resources
Alternative 3 would impact 5 acres of agricultural land, which is less than 10 percent of the total area of the corridor.

Hazardous Materials
There are six mapped leaking petroleum storage tanks (LPST) sites, three petroleum storage tank (PST) sites, and two Resource Conservation and Recovery Act (RCRA) Generator (RCRAG) sites adjacent to corridor.

Air Quality
The proposed alternative would consist of widening the existing roadway, which would relieve traffic congestion and improve air quality; however, the proposed alternative is partially located within the PM10 nonattainment area. In addition, the alternative is adjacent to an intermodal freight distribution center.

Traffic Noise
Several facilities and neighborhoods are located adjacent to the corridor for the proposed alternative. There are 333 residential parcels within the cities of Socorro and El Paso, 2 schools (Socorro High School and Socorro Ernesto Serna Elementary), 5 churches (Templo Pagiel, The Body of Christ, LaLuz Del Mundo, Iglesia Dios con Nosotros, Iglesia Eben Ezer Para Niños), and 2 daycares (Golden Child and Escontrias Early Childhood).

4.2 Alternative 5 Mod – North Loop Drive Widening
Alternative 5 Mod would include widening North Loop Drive (FM 76) from Horizon Boulevard to Clint Cutoff Road (FM 1110). Currently, North Loop Drive is a two-lane, rural major arterial with shoulders. North Loop Drive traverses south from Loop 375 intersecting with Old Hueco Tanks Road, N. Moon Road, and Horizon Boulevard in the City of Socorro, where it terminates at Clint Cutoff Road.
Alternative 5 Mod proposes to improve LOS by construction of one additional travel lane in each direction, while maintaining the existing traffic control and access characteristics. Alternative 5 Mod is approximately 5.6 miles long. The ROW width is approximately 122 feet and would encompass approximately 83 acres (including existing ROW). See Map Sheets 2 through 4 of 7 (Attachment A) to view the corridor location.

Potentially affected environmental resources and issues associated with the widening of North Loop Drive are listed below, followed by a more detailed description.

- Community Resources
- Socio-Economic and Environmental Justice
- Cultural Resources
- Drainage Features
- Floodplains
- Biological Resources
- Agricultural Resources
- Hazardous Materials
- Traffic Noise

**Community Resources**
Places of worship are adjacent to the corridor of Alternative 5 Mod and may potentially be impacted by the proposed alternative. The PEL process takes into consideration community needs and stakeholder input; however, more detailed design approaches and solutions would be determined during the NEPA and design phase at a project-level.

**Socio-Economic and Environmental Justice**
The USCB data shows that the percentages for both the minority and LEP populations are greater than the study area average (84.2 and 40.9 percent, respectively); therefore, it can be concluded that high minority and LEP populations would be within or adjacent to Alternative 5 Mod.

**Cultural Resources**
The corridor overlaps NRHP-listed EPCWID1 system canals.

Adverse impacts to EPCWID1 may generally be avoided by spanning irrigation features rather than placing piers within or upon irrigation structures and by avoiding any impact to the function of the EPCWID1 system, as described below in Drainage Features.

**Drainage Features**
There are six drainage features located within the corridor of the proposed alternative. These features and the linear feet of each within the corridor are listed in Table 3.
Table 3: Alternative 5 Mod Drainage and Irrigation Features

<table>
<thead>
<tr>
<th>Drainage Feature</th>
<th>Length of Impact (linear feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daugherty Lateral</td>
<td>157</td>
</tr>
<tr>
<td>Mesa Drain</td>
<td>124</td>
</tr>
<tr>
<td>Y-197 Lateral</td>
<td>158</td>
</tr>
<tr>
<td>Y-251 Lateral</td>
<td>116</td>
</tr>
<tr>
<td>Y-303 Lateral</td>
<td>13</td>
</tr>
<tr>
<td>Ysleta Lateral</td>
<td>8,110</td>
</tr>
</tbody>
</table>

It is anticipated that those features that are perpendicular to the alternative would be crossed using bridges or culverts. It is not known at this time how the drainage features horizontal to the alternative would be modified.

Floodplains
Alternative 5 Mod would impact approximately 21 acres located within the 100-year floodplain, which is more than 20 percent of the total area of the corridor.

Biological Resources
The existing mapped EMST habitats located within the corridor are Row crops, Trans-Pecos: Desert Wash Grassland, Trans-Pecos: Riparian Shrubland, and Urban Low Intensity. The habitat threshold requiring additional coordination with TPWD per the 2013 MOU would be exceeded. Per available TXNDD data, Alternative 5 Mod is within the mapped range of the Pecos River Muskrat and sand prickly-pear. This alternative would potentially impact drainage features and agricultural land, which may provide suitable habitat for these species.

Agricultural Resources
Alternative 5 Mod would impact approximately 25 acres of agricultural land, which is less than 50 percent of the total area of the corridor.

Hazardous Materials
There is one mapped leaking petroleum storage tank (LPST) site adjacent to the corridor.

Traffic Noise
Several facilities and neighborhoods are located adjacent to Alternative 5 Mod, which include 107 residential parcels within and between the cities of Socorro and Clint, 3 churches (Church of Jesus Christ of Latter-Day Saints, Templo Aposento Alto, and Iglesia de Jesucristo Testigo) and one park (Joe Carrasco Park).
4.3 Alternative 22 – Widening of I-10 Mainlanes

Alternative 22 would include widening I-10 from Loop 375 to O.T. Smith Road (FM 1109) in Tornillo.

Alternative 22 proposes to improve LOS by constructing one additional travel lane in each direction, while maintaining the existing traffic control and access characteristics. Alternative 22 is approximately 21.7 miles long. The ROW width is approximately 322 feet and would encompass approximately 292 acres (it is estimated that no additional ROW would be required). See Map Sheets 1 through 7 (Attachment A) to view the corridor location.

Potentially affected environmental resources and issues associated with the widening of I-10 Mainlanes from Loop 375 to O.T. Smith Road are below, followed by a more detailed description.

- Water Resources
- Floodplains
- Air Quality
- Traffic Noise

**Water Resources**

Although there are no NWI mapped features within the Alternative 22 corridor, aerial imagery analysis indicates some arroyos are present within the corridor.

**Floodplains**

Alternative 22 would impact approximately 5 acres located within the 100-year floodplain, which is less than 20 percent of the total area of the corridor.

**Air Quality**

The proposed alternative would consist of widening the existing roadway, which would relieve traffic congestion and improve air quality; however, the proposed alternative is partially located within the PM10 nonattainment area. In addition, the proposed improvements for the alternative are likely to increase truck traffic.

**Traffic Noise**

There are eight residential parcels within the City of Socorro that are adjacent to Alternative 22.

4.4 Alternative 15 – Eastbound I-10 Frontage Roads

Alternative 15 would be the construction of a two-lane, eastbound frontage road along I-10. This alternative proposes to extend the existing I-10 eastbound frontage roads from their terminus at FM 1110 to O.T. Smith Road in Tornillo. This alternative is approximately 12.7 miles long. The ROW width is approximately 91 feet and would encompass approximately 140 acres (it is estimated that no additional ROW would be
required). See Map Sheet 4 through 7 of 7 (Attachment A) to view the corridor location. It is recommended that Alternative 15 be constructed with Alternative 16 (I-10 westbound frontage roads) to provide directional frontage roads on both sides of I-10.

Potentially affected environmental resources associated with the construction of the eastbound frontage road from FM 1110 to O.T. Smith Road are below, followed by a more detailed description.

- Water Resources
- Floodplains
- Biological Resources
- Agricultural Resources

**Water Resources**

Although there no NWI mapped features within the Alternative 15 corridor, aerial imagery analysis indicates some arroyos are present within the corridor.

**Floodplains**

Alternative 15 would impact approximately 12 acres within the 100-year floodplain, which is less than 20 percent of the total area of the corridor.

**Biological Resources**

The existing mapped EMST habitats located within the corridor are the Trans-Pecos: Desert Deep Sand and Dune Grassland, Trans-Pecos: Desert Deep Sand and Dune Shrubland, Trans-Pecos: Desert Wash Barren, Trans-Pecos: Desert Wash Shrubland, Trans-Pecos: Sand Dune, Urban High Intensity, and Urban Low intensity. The habitat threshold requiring additional coordination with TPWD per the 2013 MOU would be exceeded. Alternative 15 would be a new roadway located within existing TxDOT ROW, and per available TXNDD data, would be entirely within native habitat of the sand prickly-pear. Impacts to native habitat would occur.

**Agricultural Resources**

Alternative 15 would impact approximately 72 acres of land zoned as agricultural, which is more than 50 percent of the total area of the corridor. The agricultural land, based on current zoning data, is located within the existing I-10 ROW. Additional investigation would be needed to determine if this is considered agriculture land or TxDOT ROW.

4.5 Alternative 16 – Westbound I-10 Frontage Roads

Alternative 16 would be the construction of a two-lane westbound frontage road along I-10. This alternative proposes to extend the existing I-10 westbound frontage roads from their terminus at FM 1110 to O.T. Smith Road in Tornillo. This alternative is approximately 12.7 miles long. The ROW width is approximately 91 feet and the alternative corridor would encompass approximately 140 acres (it is estimated that no additional ROW would be required). See Map Sheet 4 through 7 of 7 (Attachment A) to view the corridor location. It is recommended that Alternative 16 be constructed with
Alternative 15 (I-10 eastbound frontage roads) to provide directional frontage roads on both sides of I-10.

Potentially affected environmental resources associated with the construction of a westbound frontage road from FM 1110 to O.T. Smith Road are below, followed by a more detailed description.

- Water Resources
- Floodplains
- Biological Resources
- Agricultural Resources

**Water Resources**
Although there no NWI mapped features within the Alternative 16 corridor, aerial imagery analysis indicates some arroyos are present within the corridor.

**Floodplains**
Less than 20 percent (12 acres) of corridor (140 acres) is located within the 100-year floodplain.

**Biological Resources**
The existing mapped ESMT habitats located within the corridor are Trans-Pecos: Desert Deep Sand and Dune Grassland, Trans-Pecos: Desert Deep Sand and Dune Shrubland, Trans-Pecos: Desert Wash Barren, Trans-Pecos: Desert Wash Shrubland, Trans-Pecos: Sand Dune, and Urban Low Intensity. The habitat threshold requiring additional coordination with TPWD per the 2013 MOU would be exceeded. The alternative would be a new roadway located within existing TxDOT ROW, and per available TXNDD data, is entirely within native habitat of the sand prickly-pear. Impacts to native habitat would occur.

**Agricultural Resources**
Alternative 16 would impact approximately 72 acres of land zoned as agricultural, which is more than 50 percent of the total area of the corridor. The current alignment of Alternative 16 impacts agricultural land adjacent to the I-10 roadway. Additional investigation would be needed to determine if this is actually agriculture land or TxDOT ROW.

### 4.6 Alternative 9 – Border Highway Extension

Alternative 9 is the beginning of the Border Highway Extension starting at Loop 375 and traversing generally south along Pan American Road, terminating north of the Rio Bosque Wetlands Park. The alternative is a proposed four-lane facility, which would include widening Pan American Road from Loop 375 to Southside Road and include a portion of roadway on new location south of Southside Road. Alternative 9 would generally parallel the Franklin Drain. Alternative 9 is approximately 1.76 miles long. The ROW width is approximately 286 feet and would encompass approximately 61 acres.
See Map Sheet 1 of 7 (Attachment A) to view the corridor location. It is recommended that Alternatives 9, 17, and 12 be constructed as one project, to create the northern section of the Border Highway Extension.

Potentially affected environmental resources and issues associated with the Border Highway Extension utilizing Pan American Road, from Loop 375 to Socorro Road are below and a description follows.

- Socio-Economic and Environmental Justice
- Cultural Resources
- Tigua Land
- Floodplains
- Biological Resources
- Hazardous Materials
- Air Quality

**Socio-Economic and Environmental Justice**
The USCB data shows that the percentages for both the minority and LEP populations are greater than the study area average (84.2 and 40.9 percent respectively); therefore, it can be concluded that the high minority and LEP populations would be within or adjacent to Alternative 9.

**Cultural Resources**
Alternative 9 crosses Tigua Ceremonial Land and Tigua Trust Land. The alternative also crosses NRHP-listed canals of the EPCWID1.

Adverse impacts to EPCWID1 may generally be avoided by spanning irrigation features rather than placing piers within or upon irrigation structures and by avoiding any impact to the function of the EPCWID1 system.

**Tigua Land**
The alternative crosses 11 Tigua Trust Land parcels and 7 Tigua Ceremonial Land parcels.

During coordination with the YDSP sovereign nation, conducted throughout the BHE PEL Study, the Tiguas mentioned the possibility of “land swapping” if a project were to require additional ROW from the YDSP. Planning-level decisions regarding agreements or mitigation strategies include activities and concepts that may be adopted or incorporated during the project-specific NEPA process. Coordination with the YDSP sovereign nation is documented in the BHE PEL Study Agency Coordination Technical Report (Appendix D).

**Floodplains**
Alternative 9 would impact approximately 7-acres within the 100-year floodplain, which is less than 20 percent of the total area of the corridor.
**Biological Resources**
The existing mapped ESMT habitats located within the corridor are Trans-Pecos: Desert Wash Grassland, Trans-Pecos: Riparian Shrubland, and Urban Low Intensity. The habitat threshold requiring additional coordination with TPWD for habitat per the 2013 MOU would be exceeded. Per available TXNDD data, the alternative is within the mapped range of the Pecos River Muskrat. Alternative 9 may potentially impact drainage features, which may provide suitable habitat for the species.

**Hazardous Materials**
There is one mapped industrial and hazardous waste (IHW) site, six RCRAG sites, and one LPST site adjacent to the corridor.

**Air Quality**
The proposed alternative would consist of widening the existing roadway which would relieve traffic congestion and improve air quality; however, the proposed alternative is partially located within the PM$_{10}$ nonattainment area. In addition, the proposed improvements for the alternative provides a nearby connection to a POE which would likely increase truck traffic.

### 4.7 Alternative 17 – Border Highway Extension

Alternative 17 is a continuation of the Border Highway Extension, beginning north of the Rio Bosque Wetlands Park (terminus of Alternative 9) and continuing southwest where it terminates along the Rio Grande in San Elizario at the San Elizario Wasteway No. 1. Alternative 17 would be a new location four-lane roadway and is approximately 5.3 miles long. It crosses Ysleta del Sur Pueblo lands before reconnecting with Alternative 12 just west of the San Elizario Historical District. The ROW width is approximately 286 feet and the alternative corridor would encompass approximately 184 acres. See Map Sheets 1 through 3 of 7 (Attachment A) to view the corridor location. It is recommended that Alternatives 9, 17, and 12 be constructed as one project, to create the northern section of the Border Highway Extension.

Potentially affected environmental resources and issues associated with Border Highway Extension along Rio Grande through the City of Socorro are below and a description follows.

- Community Resources
- Socio-Economic and Environmental Justice
- Cultural Resources
- Tigua Land
- Park Land
- Water Resources
- Drainage Features
- Floodplains
- Biological Resources
- Agricultural Resources
• Traffic Noise
• Border Access and Security

**Community Resources**
No potential impact to the neighborhood character within the corridor is anticipated; however, the corridor bisects Tigua property. The PEL process takes into consideration community needs and stakeholder input; however, more detailed design approaches and solutions would be determined during the NEPA and design phase of project development.

**Socio-Economic and Environmental Justice**
The USCB data shows that the percentages for both the minority and LEP populations are greater than the study area average (84.2 and 40.9 percent respectively); therefore, it can be concluded that the high minority and LEP populations would be within or adjacent to the corridor.

**Cultural Resources**
The alternative crosses Ysleta de Sur Pueblo Land, Tigua Ceremonial Land and Tigua Trust Land. The alternative crosses NRHP-listed canals of EPCWID1 and crosses the edge of the site of Tienda de Carbajal, a Recorded Texas Historic Landmark that is potentially NRHP eligible.

Adverse impacts to EPCWID1 may generally be avoided by spanning irrigation features rather than placing piers within or upon irrigation structures and by avoiding any impact to the function of the EPCWID1 system, as described below in **Drainage Features**.

**Tigua Land**
The alternative crosses 7 Tigua Property parcels, 48 Tigua Trust Land parcels, and 86 Tigua Ceremonial Land parcels.

During coordination with the YDSP sovereign nation, conducted throughout the BHE PEL Study, the Tiguas mentioned the possibility of "land swapping" if a project were to require additional ROW from the YDSP. Planning-level decisions regarding agreements or mitigation strategies include activities and concepts that may be adopted or incorporated during the project-specific NEPA process. Coordination with the YDSP sovereign nation is documented in the **BHE PEL Study Agency Coordination Technical Report** (Appendix D).

**Park Land**
While the Border Highway Extension is not anticipated to directly affect the Rio Bosque Wetlands Park, this portion of the proposed roadway would be adjacent to the park. During the BHE PEL Study, coordination with the Rio Bosque Wetlands Park and stakeholders was conducted throughout the study. On July 16, 2014, the Study Team gave a presentation on the BHE PEL Study to the Rio Bosque Partners meeting held at the University of Texas at El Paso. The presentation explained that the long range planning study is funded, while the proposed recommended alternatives are not. The
Rio Bosque Partners were specifically interested in the proposed Border Highway Extension due to its proximity to the park and potential connection to Loop 375 at Pan American Drive. The Study Team also explained that multi-modal alternatives, including bicycle and pedestrian paths (Alternative BP-2), are included in the Recommended Alternatives.

The Study Team answered questions posed by the Rio Bosque Partners regarding project cost, access, and mitigation. TxDOT explained that because the BHE PEL Study proposed recommendations are not funded, the implementation of most of these improvements would not be in the immediate future. It is not anticipated that the proposed Border Highway Extension would affect the current park’s planned access improvement project. The Study Team stated that it is TxDOT’s procedure to maintain or improve access when implementing roadway improvements. The Study Team explained that one of the main purposes of the BHE PEL Study was to document public issues and concerns so that the information is available for future studies. Mitigation due to environmental impacts to the Rio Bosque Park and park access considerations will be considered in the future once the project progresses into the next phase of project development. This coordination is documented in the *BHE PEL Study Agency Coordination Technical Report* (Appendix D).

**Water Resources**

Alternative 17 would impact more than 0.50 acres of NWI mapped features, located within the corridor. One lake feature is crossed (approximately 16 acres).

**Drainage Features**

There are three drainage features located within the corridor of the proposed alternative. These features and the linear feet of each within the corridor are listed in *Table 4*.

<table>
<thead>
<tr>
<th>Drainage Feature</th>
<th>Length of Impact (linear feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riverside Canal</td>
<td>976</td>
</tr>
<tr>
<td>Riverside Intercepting Drain</td>
<td>13,526</td>
</tr>
<tr>
<td>San Elizario Lateral</td>
<td>152</td>
</tr>
</tbody>
</table>

*Note: 1. Alternative 17 would cross this drainage feature three times, the estimated length of the impact includes all crossings.*

Potential impacts to the Riverside Intercepting Drain located within the corridor may occur. It is anticipated those features that are perpendicular to the alternative would be crossed using bridges or culverts. It is not known at this time how the drainage features horizontal to the alternative may be modified.
**Floodplains**

Alternative 17 would impact approximately 97 acres within the 100-year floodplain, which is more than 20 percent of the total area of the corridor.

**Biological Resources**

The existing mapped ESMT habitats located within the corridor are Row Crops, Trans-Pecos: Desert Wash Grassland, and Trans-Pecos: Riparian Shrubland. The habitat threshold requiring additional coordination with TPWD for habitat per the 2013 MOU would be exceeded. The alternative is a new location, and per available TXNDD data, the entire corridor is located within native habitat of the sand prickly-pear. Impacts to native habitat would occur.

**Agricultural Resources**

Alternative 17 would impact approximately 46 acres of agricultural land, which is less than 50 percent of the total area of the corridor.

**Traffic Noise**

There are 31 residential parcels within the cities of Socorro and El Paso and one park (Rio Bosque Park and Wetland Preserve) adjacent to the corridor of the proposed alternative.

**Border Security**

Existing points of access to the Rio Grande and maintenance roads adjacent to the U.S./Mexico International Border would need to be maintained to allow access for the International Boundary and Water Commission (IBWC) and U.S. Customs and Border Patrol.

### 4.8 Alternative 12 – Border Highway Extension

Alternative 12 is a continuation of the Border Highway Extension, beginning in San Elizario at the San Elizario Wasteway No. 1 (terminus of Alternative 17) and continuing generally south where it terminates at Middle Island Road (FM 76) (beginning of Alternative 13 Mod-Rev). Alternative 12 is a proposed four-lane facility and is approximately 9.6 miles long. This alternative crosses or parallels several drains and laterals. The ROW width is approximately 286 feet and would encompass approximately 325 acres. See Map Sheets 3 through 6 of 7 (Attachment A) to view the corridor location. It is recommended that Alternatives 9, 17, and 12 are constructed as one project, to create the northern section of the Border Highway Extension.

Potentially affected environmental resources and issues associated with the Border Highway Extension from the City of San Elizario (terminus of Alternative 12) to FM 76 (beginning of Alternative 13 Mod-Rev) are below and a description follows.

- Socio-Economic and Environmental Justice
- Cultural Resources
- Tigua Land
• Drainage Features
• Biological Resources
• Agricultural Resources
• Traffic Noise
• Border Access and Security

Socio-Economic and Environmental Justice

The USCB data shows that the percentages for both the minority and LEP populations are greater than the study area average (84.2 and 40.9 percent respectively); therefore, it can be concluded that the high minority and LEP populations would be within or adjacent to Alternative 12.

During the public outreach effort made during the BHE PEL Study, individual coordination was held with the Adults and Youth United Development Association (AYUDA) to address their concerns to the residential area located along the Rio Grande in San Elizario that would be potentially impacted by the proposed Border Highway Extension. At the final public meeting, held in July 2014, the residents in this area expressed concern regarding impacts to their property (potential relocation and ROW acquisition) from the proposed Border Highway Extension. It was explained to these concerned residents that TxDOT would not be purchasing any ROW for the BHE PEL Study Recommended Alternatives, which include the Border Highway Extension. In general, once funding is identified for any of the recommended alternatives, the alternative will be further developed into a project and refined for additional study during the NEPA process. After the project is environmentally cleared, TxDOT would be able to proceed with the ROW acquisition or relocation process as needed. Acquisition and relocation assistance would be in accordance with the TxDOT Right-of-Way Acquisition and Relocation Assistance Program. Consistent with the USDOT policy, as mandated by the Uniform Relocation Assistance and Real Properties Acquisitions Act (URARPA), amended in 1987, TxDOT would provide relocation resources (including any applicable special provisions or programs) to all displaced persons without discrimination. The available structures must also be open to persons regardless of race, color, religion, or nationality and be within the financial means of those individuals affected. All property owners from whom property may be needed are entitled to receive just compensation for their land and property. Just compensation is based upon the fair market value of the property. TxDOT, through its Relocation Assistance Program, also provides payment and services to aid in movement to a new location.

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AYUDA is an association with the purpose to help improve the lives of El Paso county's low-income individuals and families living in non-incorporated areas known as: "colonias". Colonia in Spanish means "community" or "neighborhood". Specifically, a colonia is a residential area along the Texas-Mexico border that may lack some of the most basic living necessities, such as clean water, sewer systems, electricity, paved roads and safe and sanitary housing (http://www.ayuda-elpaso.org/about.html).
**Cultural Resources**

The alternative crosses NRHP-listed canals of EPCWID1 as well as Tigua Ceremonial Land and the Tigua Ceremonial Land Buffer.

Adverse impacts to EPCWID1 may generally be avoided by spanning irrigation features rather than placing piers within or upon irrigation structures and by avoiding any impact to the function of the EPCWID1 system, as described below in *Drainage Features*.

**Tigua Land**

The alternative crosses 227 Tigua Ceremonial Land parcels.

During coordination with the YDSP sovereign nation, conducted throughout the BHE PEL Study, the Tiguas mentioned the possibility of "land swapping" if a project were to require additional ROW from the YDSP. Planning-level decisions regarding agreements or mitigation strategies include activities and concepts that may be adopted or incorporated during the project-specific NEPA process. Coordination with the YDSP sovereign nation is documented in the *BHE PEL Study Agency Coordination Technical Report* (Appendix D).

**Drainage Features**

There are eight drainage features located within the corridor of the proposed alternative. These features and the linear feet of each within the corridor are listed in Table 5.

<table>
<thead>
<tr>
<th>Drainage Feature</th>
<th>Length of Impact (linear feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Elizario Lateral</td>
<td>287</td>
</tr>
<tr>
<td>Riverside Canal</td>
<td>13,347</td>
</tr>
<tr>
<td>Riverside Intercepting Drain</td>
<td>14,849</td>
</tr>
<tr>
<td>River Drain</td>
<td>5,135</td>
</tr>
<tr>
<td>Lee Moor Intercepting Drain</td>
<td>10,494</td>
</tr>
<tr>
<td>Island Main Later</td>
<td>310</td>
</tr>
<tr>
<td>Hansen Lateral</td>
<td>681</td>
</tr>
<tr>
<td>I-F Feeder Intercepting Drain</td>
<td>33</td>
</tr>
</tbody>
</table>

Note: 1. Alternative 12 would cross this drainage feature twice, the estimated length of the impact includes both crossings.

Potential impacts to a section of Riverside Intercepting Drain and Riverside Canal may occur within the corridor.

It is anticipated that those features that are perpendicular to the alternative would be crossed using bridges or culverts. It is not known at this time how the drainage features horizontal to the alternative may be modified.
**Biological Resources**

The existing mapped ESMT habitats located within the corridor are Orchard, Row Crops, Trans-Pecos: Desert Wash Grassland, Trans-Pecos: Riparian Barren, Trans-Pecos: Riparian Shrubland, Trans-Pecos: Riparian Woodland, and Urban Low Intensity. The habitat threshold requiring additional coordination with TPWD for habitat per 2013 MOU would be exceeded. Per available TXNDD data, the alternative is within the mapped range of the Pecos River Muskrat. Alternative 12 may potentially impact drainage features, which may provide suitable habitat for the species.

**Agricultural Resources**

Alternative 12 would impact approximately 197 acres of agricultural land, which is more than 50 percent of the total area of the corridor.

During the BHE PEL Study, individual stakeholder meetings, facilitated by the Texas A&M AgriLife Extension Service Office – Extension Agent, were held with the local farmers to address their concerns regarding alternatives for the proposed Border Highway Extension that would traverse through agricultural land and potentially divide parcels, as documented in the *BHE PEL Study Agency Coordination Technical Report* (Appendix D). Regional farmers and landowners expressed concern about the proposed Border Highway Extension bisecting single-owner parcels and destroying the agricultural integrity of the southwestern portion of the study area.

**Traffic Noise**

There are 84 residential parcels within the city of San Elizario and between the City of San Elizario and the Town of Fabens that are adjacent to Alternative 12.

**Border Security**

Existing points of access to the Rio Grande and maintenance roads adjacent to the U.S./Mexico International Border would need to be maintained to allow access for the International Boundary and Water Commission (IBWC) and U.S. Customs and Border Patrol.

### 4.9 Alternative 13 Mod-Rev – Border Highway Extension

Alternative 13 Mod-Rev is a continuation of the Border Highway Extension, beginning at FM 76 near the Town of Fabens (terminus of Alternative 12) and continuing south where it terminates at the Manuel F. Aguilera Highway near the Fabens International POE (future Tornillo-Guadalupe International POE). Alternative 13 Mod-Rev is a proposed four-lane facility and is approximately 4.3 miles long. The ROW width is approximately 286 feet and would encompass approximately 151 acres. See Map Sheets 6 through 7 of 7 (Attachment A) to view the corridor location. It is recommended that the northern portion of the Border Highway Extension be constructed first (Alternatives 9, 17, and 12), this southern portion should be constructed as traffic demand warrants in the future.
Potentially affected environmental resources and issues associated with the Border Highway Extension from FM 76 near the Town of Fabens (terminus of Alternative 12) to the Manuel F. Aguilera Highway are below and a description follows.

- Drainage Features
- Floodplains
- Biological Resources
- Agricultural Resources
- Traffic Noise

**Drainage Features**

There are two drainage features located within the corridor of the proposed alternative. These features and the linear feet of each within the corridor are listed in **Table 6**.

**Table 6: Alternative 13 Mod-Rev Drainage and Irrigation Features**

<table>
<thead>
<tr>
<th>Drainage Feature</th>
<th>Length of Impact (linear feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fabens Drain</td>
<td>286</td>
</tr>
<tr>
<td>Island Farmers Drain</td>
<td>2,630</td>
</tr>
</tbody>
</table>

**Floodplains**

Alternative 13 Mod-Rev would impact approximately 26 acres within the 100-year floodplain, which is less than 20 percent of the total area of the corridor.

**Biological Resources**

The existing mapped ESMT habitat located within the corridor is Loamy Bottomland (Desert Shrub). The habitat threshold requiring additional coordination with TPWD for habitat per 2013 MOU would be exceeded. Per available TXNDD data, the alternative is within the mapped range of the sand prickly-pear. Alternative 13 may potentially impact drainage features, which may provide suitable habitat for the species.

**Agricultural Resources**

Alternative 13 Mod-Rev would impact approximately 127 acres of agricultural land, which is more than 50 percent of the total area of the corridor.

During the BHE PEL Study, individual stakeholder meetings, facilitated by the Texas A&M AgriLife Extension Service Office – Extension Agent, were held with the local farmers to address their concerns regarding alternatives for the proposed Border Highway Extension that would traverse through agricultural land and potentially divide parcels, as documented in the **BHE PEL Study Agency Coordination Technical Report (Appendix D)**. Regional farmers and landowners expressed concern about the proposed Border Highway Extension bisecting single-owner parcels and destroying the agricultural integrity of the southwestern portion of the study area.
**Traffic Noise**

There are two residential parcels near the Town of Fabens adjacent to Alternative 13 Mod-Rev.

### 4.10 Alternative I Mod Revised – Old Hueco Tanks Road

Alternative I Mod-Rev is a proposed two-lane roadway that would extend Old Hueco Tanks Road from North Loop Drive to the proposed Border Highway Extension. The sections of this extension between North Loop Drive and Alameda Avenue and between Loya Road and Southside Drive are new location roadways. The middle section of this extension, between Alameda Avenue and Loya Road, would include widening the existing Winn Road and Nevarez Road. The ROW width is approximately 80 feet and would encompass approximately 24 acres. Alt I Mod-Rev is approximately 2.4 miles long. See Map Sheet 1 of Attachment A to view the corridor location.

Potentially affected environmental resources and issues associated with the Old Hueco Tanks Road extension are below, followed by a more detailed description.

- Community Resources
- Socio-Economic and Environmental Justice
- Cultural Resources
- Tigua Land
- Drainage Features
- Floodplains
- Biological Resources
- Agricultural Resources
- Hazardous Materials
- Traffic Noise

**Community Resources**

The Vista del Prado #1 and Sunshine designated neighborhoods are adjacent to the corridor of the proposed alternative. The Valley South Subdivision and these areas may potentially be impacted by Alternative I Mod Revised. The PEL process takes into consideration community needs and stakeholder input; however, more detailed design approaches and solutions would be determined during the NEPA and design phase of project development.

**Socio-Economic and Environmental Justice**

The USCB data shows that the percentages for both the minority and LEP populations are greater than the study area average (84.2 and 40.9 percent, respectively); therefore, it can be concluded that the high minority and LEP populations would be within or adjacent to Alternative I Mod Revised.

**Cultural Resources**

The alternative crosses the Socorro Mission Historic District, the Mission Trail Historic District, canals of NRHP-listed EPCWID1; and the El Camino Real de Tierra Adentro
National Historic Trail. It is also adjacent to three archaeological sites; two of which are eligible and one potentially eligible for the National Register. On the east end, the alternative crosses one Tigua Ceremonial Land parcel.

Adverse impacts to EPCWID1 may generally be avoided by spanning irrigation features rather than placing piers within or upon irrigation structures and by avoiding any impact to the function of the EPCWID1 system, as described below in Drainage Features.

Coordination was conducted between TxDOT El Paso District, FHWA, TxDOT ENV, and the National Park Service (NPS) during the BHE PEL Study to discuss the El Camino Real de Tierra Adentro National Historic Trail, which is located within the study area along Socorro Road. The NPS shared their goal to preserve and develop the El Camino Real de Tierra Adentro National Historic Trail in written correspondence documented in the BHE PEL Study Agency Coordination Technical Report (Appendix D). TxDOT and FHWA have documented their intent to consider a bike and pedestrian national historic trail segment (as requested by the NPS) during the next phase of project development in the BHE PEL Study Environmental Constraints Report (Appendix B).

Tigua Land
The alternative crosses one Tigua Ceremonial Land parcel.

During coordination with the YDSP sovereign nation, conducted throughout the BHE PEL Study, the Tiguas mentioned the possibility of “land swapping” if a project were to require additional ROW from the YDSP. Planning-level decisions regarding agreements or mitigation strategies include activities and concepts that may be adopted or incorporated during the project-specific NEPA process. Coordination with the YDSP sovereign nation is documented in the BHE PEL Study Agency Coordination Technical Report (Appendix D).

Drainage Features
There are seven drainage features located within the corridor of the proposed alternative. These features and the linear feet of each within the corridor are listed in Table 7.

Table 7: Alternative I Mod-Rev Drainage and Irrigation Features

<table>
<thead>
<tr>
<th>Drainage Feature</th>
<th>Length of Impact (linear feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Side Feeder Lateral</td>
<td>89</td>
</tr>
<tr>
<td>Socorro Lateral</td>
<td>101</td>
</tr>
<tr>
<td>Juan de Herrera Branch Canal</td>
<td>105</td>
</tr>
<tr>
<td>Juan de Herrera Main Lateral</td>
<td>80</td>
</tr>
<tr>
<td>Franklin Drain</td>
<td>86</td>
</tr>
<tr>
<td>Franklin Canal</td>
<td>80</td>
</tr>
<tr>
<td>Middle Drain</td>
<td>87</td>
</tr>
</tbody>
</table>
It is anticipated that those features that are perpendicular to the alternative would be crossed using bridges or culverts. It is not known at this time how the drainage features horizontal to the alternative may be modified.

**Floodplains**

Alternative I Mod-Rev would impact approximately 3 acres within the 100-year floodplain, which is less than 20 percent of the total area of the corridor.

**Biological Resources**

The existing mapped ESMT habitats located within the corridor are, Row Crops, Trans-Pecos: Desert Wash Grassland, Trans-Pecos: Riparian Barren, Trans-Pecos: Riparian Shrubland, and Urban Low Intensity. The habitat threshold requiring additional coordination with TPWD for habitat per the 2013 MOU would be exceeded. The corridor is primarily a new location, and per available TXNDD data, is within the mapped range of the Pecos River Muskrat. Potential habitat is present within the corridor.

**Agricultural Resources**

Alternative I Mod-Rev would impact approximately 8 acres of agricultural land, which is more than 10 percent of the total area of the corridor.

**Hazardous Materials**

One Municipal Solid Waste Landfill (MSWLF) site and one PST site are mapped adjacent to corridor. These sites could potentially impact construction within the corridor.

**Traffic Noise**

There are 117 residential parcels between the cities of Socorro and El Paso that are adjacent to the corridor of the proposed alternative.

### 4.11 Alternative L – New Socorro Connection

Alternative L is a proposed new location roadway originating at I-10, approximately 2 miles north of FM 1110, and generally following the southern City of Socorro limits to the proposed Border Highway Extension. This new location roadway would create a new link to I-10, North Loop Drive, Alameda Avenue, Socorro Road and the proposed Border Highway Extension. Alternative L is approximately 5.0 miles in length. The ROW width is approximately 168 feet and would encompass approximately 102 acres. Alternative L would cross the Franklin Canal and other laterals, as well as include a grade-separated crossing of the Union Pacific Railroad (UPRR). See Map Sheet 3 of Attachment A to view the corridor location.

Potentially affected environmental resources and issues associated with the new location arterial from I-10 to the proposed Border Highway Extension near the southern City of Socorro limits are below, followed by a more detailed description.

- Community Resources
Community Resources
The corridor of the proposed alternative intersects the Mission Trail Historic District. This area may potentially be impacted by the proposed alternative. The PEL process takes into consideration community needs and stakeholder input; however, more detailed design approaches and solutions would be determined during the NEPA and design phase of project development.

Socio-Economic and Environmental Justice
The USCB data shows that the percentages for both the minority and LEP populations are greater than the study area average (84.2 and 40.9 percent respectively); therefore, it can be concluded that the high minority and LEP populations would be within or adjacent to Alternative L.

Cultural Resources
The alternative would use land within the Mission Trail Historic District and crosses the El Camino Real de Tierra Adentro National Historic Trail. The alternative crosses canals of NRHP-listed EPCWID1, and crosses Tigua Ceremonial Land.

Adverse impacts to EPCWID1 may generally be avoided by spanning irrigation features rather than placing piers within or upon irrigation structures and by avoiding any impact to the function of the EPCWID1 system, as described below in Drainage Features.

Coordination was conducted between TxDOT El Paso District, FHWA, TxDOT ENV, and the National Park Service (NPS) during the BHE PEL Study to discuss the El Camino Real de Tierra Adentro National Historic Trail, which is located within the study area along Socorro Road. The NPS shared their goal to preserve and develop the El Camino Real de Tierra Adentro National Historic Trail in written correspondence documented in the BHE PEL Study Agency Coordination Technical Report (Appendix D). TxDOT and FHWA have documented their intent to consider a bike and pedestrian national historic trail segment (as requested by the NPS) during the next phase of project development in the BHE PEL Study Environmental Constraints Report (Appendix B).

Tigua Land
The alternative crosses 11 Tigua Ceremonial Land parcels.
During coordination with the YDSP sovereign nation, conducted throughout the BHE PEL Study, the Tiguas mentioned the possibility of “land swapping” if a project were to require additional ROW from the YDSP. Planning-level decisions regarding agreements or mitigation strategies include activities and concepts that may be adopted or incorporated during the project-specific NEPA process. Coordination with the YDSP sovereign nation is documented in the BHE PEL Study Agency Coordination Technical Report (Appendix D).

**Water Resources**

Alternative L would impact more than 0.50 acres of NWI mapped features, located within the total corridor area of 102 acres. Alternative L would cross one freshwater pond (1.5 acres).

**Drainage Features**

There are 11 drainage features located within the corridor of the proposed alternative. These features and the linear feet of each within the corridor are listed Table 8.

<table>
<thead>
<tr>
<th>Drainage Feature</th>
<th>Length of Impact (linear feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clint Lateral</td>
<td>294</td>
</tr>
<tr>
<td>Dolan Drain</td>
<td>176</td>
</tr>
<tr>
<td>Franklin Canal</td>
<td>175</td>
</tr>
<tr>
<td>Mesa Drain</td>
<td>182</td>
</tr>
<tr>
<td>Mesa Spur Drain</td>
<td>169</td>
</tr>
<tr>
<td>Middle Drain</td>
<td>169</td>
</tr>
<tr>
<td>River Drain</td>
<td>181</td>
</tr>
<tr>
<td>Rodriquena Lateral</td>
<td>176</td>
</tr>
<tr>
<td>Salatral Lateral</td>
<td>202</td>
</tr>
<tr>
<td>San Elizario Lateral</td>
<td>195</td>
</tr>
<tr>
<td>Ysleta Lateral</td>
<td>201</td>
</tr>
</tbody>
</table>

It is anticipated that those features that are perpendicular to the alternative would be crossed using bridges or culverts. It is not known at this time how the drainage features horizontal to the alternative may be modified.

**Biological Resources**

The existing mapped ESMT habitats located within the corridor are Row Crops, Trans-Pecos: Desert Deep Sand and Dune Grassland, Trans-Pecos: Desert Wash Grassland, Trans-Pecos: Riparian Barren, Trans-Pecos: Riparian Shrubland, Trans-Pecos: Sand Dune, and Urban Low Intensity. The habitat threshold requiring additional coordination with TPWD for habitat per the 2013 MOU would be exceeded. The alternative is primarily a new location, and per available TXNDD data, the corridor is within the mapped range of Pecos River Muskrat. Alternative L may impact drainage features, which may provide suitable habitat for the species.
**Agricultural Resources**

Alternative L would impact approximately 58 acres of agricultural land, which is more than 50 percent of the total area of the corridor.

**Traffic Noise**

There are 61 residential parcels within the cities of Socorro and San Elizario that are adjacent to the Alternative L.

### 4.12 Alternative N – FM 1110 Widening

Alternative N would consist of the widening and realignment of FM 1110 between I-10 and North Loop Drive. Alternative N is approximately 1.2 miles long. The ROW width is approximately 122 feet and would encompass approximately 9 acres (including existing ROW). See Map Sheet 4 of 7 (Attachment A) to view the corridor location. It is recommended that Alternative N and F be constructed as one project since the components for these alternatives represents the realigned FM 1110.

Potentially affected environmental resources associated with realignment and widening from FM 1110 between I-10 and North Loop Drive are below, followed by a more detailed description.

- Community Resources
- Socioeconomic and Environmental Justice
- Agricultural Resources

**Community Resources**

No potential impact to the neighborhood character within the corridor is anticipated; however, the corridor is near the San Lorenzo cemetery and may potentially impact this site. The PEL process takes into consideration community needs and stakeholder input; however, more detailed design approaches and solutions would be determined during the NEPA and design phase of project development.

**Socio-Economic and Environmental Justice**

The USCB data shows that the percentage for the LEP population is greater than the study area average of 40.9 percent; therefore, it can be concluded that the high LEP population would be within or adjacent to Alternative N.

**Agricultural Resources**

Alternative N would impact approximately 2.5 acres of agricultural land, which is more than 10 percent of the total area of the corridor.

### 4.13 Alternative F – FM 1110 Realignment

Alternative F would include the realignment of FM 1110 between North Loop Drive and the proposed Border Highway Extension, utilizing the existing Herring Road. Alternative
F is approximately 4.0 miles long and would cross the Franklin Canal. The ROW width is approximately 122 feet and would encompass approximately 79 acres. See Map Sheet 4 of 7 (Attachment A) to view the corridor location. It is recommended that Alternatives N and F are constructed as one project because these alternatives represent the new FM 1110 alignment.

Potentially affected environmental resources and issues associated with the realignment of FM 1110 between N. Loop Drive and the proposed Border Highway Extension are below, followed by a more detailed description.

- **Community Resources**
- **Socio-Economic and Environmental Justice**
- **Cultural Resources**
- **Tigua Land**
- **Drainage Features**
- **Floodplains**
- **Biological Resources**
- **Agricultural Resources**
- **Traffic Noise**

**Community Resources**
Various schools are near the corridor and may potentially be impacted by Alternative F; however, no impact to designated neighborhoods is anticipated. The PEL process takes into consideration community needs and stakeholder input; however, more detailed design approaches and solutions would be determined during the NEPA and design phase of project development.

**Socio-Economic and Environmental Justice**
The USCB data shows that the percentages for the minority population is greater than the study area average of 84.2 percent; therefore, it can be concluded that the high minority population would be within or adjacent to Alternative F.

**Cultural Resources**
The alternative crossed NRHP-listed canals of EPCWID1, the NRHP-listed Franklin Canal, and Tigua Ceremonial Land.

Adverse impacts to EPCWID1 may generally be avoided by spanning irrigation features rather than placing piers within or upon irrigation structures and by avoiding any impact to the function of the EPCWID1 system, as described below in *Drainage Features*.

**Tigua Land**
The alternative crosses six Tigua Ceremonial Land parcels.

During coordination with the YDSP sovereign nation, conducted throughout the BHE PEL Study, the Tiguas mentioned the possibility of “land swapping” if a project were to require additional ROW from the YDSP. Planning-level decisions regarding agreements
or mitigation strategies include activities and concepts that may be adopted or incorporated during the project-specific NEPA process. Coordination with the YDSP sovereign nation is documented in the *BHE PEL Study Agency Coordination Technical Report* ([Appendix D](#)).

**Drainage Features**

There are nine drainage features located within the corridor of the proposed alternative. These features and the linear feet of each within the corridor are listed in [Table 9](#).

<table>
<thead>
<tr>
<th>Drainage Feature</th>
<th>Length of Impact (linear feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unnamed Drain</td>
<td>122</td>
</tr>
<tr>
<td>Clint Lateral</td>
<td>178</td>
</tr>
<tr>
<td>Franklin Canal</td>
<td>122</td>
</tr>
<tr>
<td>Green Lateral</td>
<td>1,982</td>
</tr>
<tr>
<td>Mesa Drain</td>
<td>242</td>
</tr>
<tr>
<td>Middle Drain¹</td>
<td>122</td>
</tr>
<tr>
<td>River Drain</td>
<td>122</td>
</tr>
<tr>
<td>River Spur Drain</td>
<td>134</td>
</tr>
<tr>
<td>Salatral Lateral</td>
<td>185</td>
</tr>
</tbody>
</table>

Note: 1. Alternative F would cross this drainage feature twice, the estimated length of the impact includes both crossings.

Potential impacts to Green Lateral exist within the corridor. It is anticipated those features that are perpendicular to the alternative would be crossed using bridges or culverts. It is not known at this time how the drainage features horizontal to the alternative may be modified.

**Floodplains**

Alternative F would impact approximately 4.14 acres within the 100-year floodplain, which is less than 20 percent of the total area of the corridor.

**Biological Resources**

The existing mapped ESMT habitats located within the corridor are Row Crops, Trans-Pecos: Desert Wash Grassland, Trans-Pecos: Riparian Barren, Trans-Pecos: Riparian Shrubland, and Urban Low Intensity. The habitat threshold requiring additional coordination with TPWD for habitat per the 2013 MOU would be exceeded. The corridor is an existing roadway and a new location. Per available TXNDD data, the corridor is within the mapped range of the Pecos River Muskrat and the sand prickly pear with minimal habitat present within the corridor. Impacts to agricultural habitat within the corridor would occur.
Agricultural Resources
Alternative F would impact approximately 44 acres of agricultural land, which is more than 50 percent of the total area of the corridor.

Traffic Noise
There are eight residential parcels within the cities of San Elizario and Clint and two schools (San Elizario Lorenzo G. Loya Primary and San Elizario Sambrano Elementary) adjacent to the corridor of the proposed alternative.

4.14 Alternative P – New I-10 Connection

Alternative P is a proposed new location, four-lane roadway beginning at I-10 and terminating at the proposed Border Highway Extension. The proposed roadway would begin at I-10 and traverse west, crossing North Loop Drive, the UPRR, Alameda Avenue, Socorro, and eventually connecting to the proposed Border Highway Extension. Alternative P would provide new access to I-10, North Loop Drive, Alameda Avenue, and Socorro Road, providing improved access to farming communities between San Elizario and Fabens. Alternative P is approximately 4.5 miles in length and would cross the Franklin Canal and other laterals, include a grade-separated crossing of the UPRR, and include a new interchange with I-10. The ROW width is approximately 138 feet and would encompass approximately 65 acres. See Map Sheet 4 of 7 (Attachment A) to view the corridor location.

Potentially affected environmental resources associated with the new location arterial from I-10 to the proposed Border Highway Extension mid-way between Clint Cutoff Road and Fabens Drive are below, followed by a more detailed description.

- Cultural Resources
- Tigua Land
- Drainage Features
- Floodplains
- Biological Resources
- Agricultural Resources

Cultural Resources
The alternative crosses the individually listed Franklin Canal as well as structures of NRHP-listed EPCWID1. The alternative overlaps Tigua Ceremonial Land.

Adverse impacts to EPCWID1 may generally be avoided by spanning irrigation features rather than placing piers within or upon irrigation structures and by avoiding any impact to the function of the EPCWID1 system, as described below in Drainage Features.

Tigua Land
The alternative crosses 11 Tigua Ceremonial Land parcels.
During coordination with the YDSP sovereign nation, conducted throughout the BHE PEL Study, the Tiguas mentioned the possibility of “land swapping” if a project were to require additional ROW from the YDSP. Planning-level decisions regarding agreements or mitigation strategies include activities and concepts that may be adopted or incorporated during the project-specific NEPA process. Coordination with the YDSP sovereign nation is documented in the BHE PEL Study Agency Coordination Technical Report (Appendix D).

Drainage Features
There are eight drainage features located within the corridor of the proposed alternative. These features and the linear feet of each within the corridor are listed in Table 10.

<table>
<thead>
<tr>
<th>Drainage Feature</th>
<th>Length of Impact (linear feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clint Extension</td>
<td>145</td>
</tr>
<tr>
<td>Clint Lateral</td>
<td>1,003</td>
</tr>
<tr>
<td>Franklin Canal</td>
<td>139</td>
</tr>
<tr>
<td>Mesa Drain</td>
<td>138</td>
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<tr>
<td>Middle Drain</td>
<td>139</td>
</tr>
<tr>
<td>River Drain</td>
<td>139</td>
</tr>
<tr>
<td>Riverside Intercepting Drain</td>
<td>138</td>
</tr>
<tr>
<td>Salatral Lateral</td>
<td>138</td>
</tr>
</tbody>
</table>

It is anticipated that those features that are perpendicular to the alternative would be crossed using bridges or culverts. It is not known at this time how the drainage features horizontal to the alternative may be modified.

Floodplains
Alternative P would impact approximately 3 acres within the 100-year floodplain, which is less than 20 percent of the total area of the corridor.

Biological Resources
The existing mapped ESMT habitats located within the corridor are Orchard, Row Crops, Trans-Pecos: Desert Deep Sand and Dune Grassland, Trans-Pecos: Desert Wash Grassland, Trans-Pecos: Riparian Shrubland, and Urban Low Intensity. The habitat threshold requiring additional coordination with TPWD for habitat per the 2013 MOU would be exceeded. The corridor is a new location, and per available TXNDD data, is within the mapped range of the Pecos River Muskrat and sand prickly-pear. The habitat of the muskrat is minimal. Potential habitat for the prickly-pear is present within the corridor.

Agricultural Resources
Alternative P would impact approximately 51 acres of agricultural land, which is more than 50 percent of the total area of the corridor.
### 4.15 Alternative R Mod – Fabens South Connection

Alternative R Mod is a proposed new location, four-lane roadway beginning at I-10 and terminating at Middle Island Road (the proposed Border Highway Extension). Alternative R Mod would begin at I-10 at FM 793 and traverse southwest, intersect Alameda Avenue and Island Tornillo Road, and cross the UPRR. Alternative R Mod is approximately 5.2 miles in length. The ROW width is approximately 138 feet and would encompass approximately 82 acres. See Map Sheet 6 of 7 (Attachment A) to view the corridor location.

Potentially affected environmental resources and issues associated with the new location arterial from I-10 at FM 793 to the proposed Border Highway Extension are below, followed by a more detailed description.

- **Cultural Resources**
- **Water Resources**
- **Drainage Features**
- **Floodplains**
- **Biological Resources**
- **Agricultural Resources**
- **Hazardous Materials**

**Cultural Resources**
The alternative crosses canals and drainage components of NRHP-listed EPCWID1.

Adverse impacts to EPCWID1 may generally be avoided by spanning irrigation features rather than placing piers within or upon irrigation structures and by avoiding any impact to the function of the EPCWID1 system, as described below in **Drainage Features**.

**Water Resources**
Per NWI data, there are no impacts to NWI mapped features within the alternative. Aerial imagery analysis indicates that some arroyos are present within the corridor.

**Drainage Features**
There are eight drainage features located within the corridor of the proposed alternative. These features and the linear feet of each within the corridor are listed in **Table 11**.
Table 11: Alternative R Mod Drainage and Irrigation Features

<table>
<thead>
<tr>
<th>Drainage Feature</th>
<th>Length of Impact (linear feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unnamed lateral</td>
<td>142</td>
</tr>
<tr>
<td>Alamo Alto Drain</td>
<td>138</td>
</tr>
<tr>
<td>Arroyo</td>
<td>202</td>
</tr>
<tr>
<td>Fabens Drain</td>
<td>138</td>
</tr>
<tr>
<td>Fabens Waste Channel</td>
<td>162</td>
</tr>
<tr>
<td>Hansen Lateral</td>
<td>138</td>
</tr>
<tr>
<td>Tornillo Canal</td>
<td>139</td>
</tr>
<tr>
<td>Tornillo Intercepting #2 Drain</td>
<td>138</td>
</tr>
</tbody>
</table>

It is anticipated that those features that are perpendicular to the alternative would be crossed using bridges or culverts. It is not known at this time how the drainage features horizontal to the alternative may be modified.

**Floodplains**

Alternative R-Mod would impact approximately 3 acres within the 100-year floodplain, which is less than 20 percent of the total area of the corridor.

**Biological Resources**

The existing mapped ESMT habitats located within the corridor are Orchard, Row Crops, Trans-Pecos: Desert Deep Sand and Dune Grassland, Trans-Pecos: Desert Deep Sand and Dune Shrubland, Trans-Pecos: Desert Wash Barren, Trans-Pecos: Desert Wash Grassland, Trans-Pecos: Riparian Shrubland, Trans-Pecos: Sand Dune, and Urban Low Intensity. The habitat threshold requiring additional coordination with TPWD for habitat per the 2013 MOU would be exceeded. The corridor is primarily a new location, and per available TXNDD data, is within the mapped range of the sand prickly-pear. Potential habitat is present within the corridor.

**Agricultural Resources**

Alternative R-Mod would impact approximately 73 acres of agricultural land, which is more than 50 percent of the total area of the corridor.

**Hazardous Materials**

One MSWLF site is mapped adjacent to corridor and one PST site is within the corridor. These sites could potentially impact construction within the corridor.

**4.16 Bike & Pedestrian Alternative 1**

Alternative BP-1 proposes to provide a bicycle/pedestrian connection from proposed Border Trails along Old Hueco Tanks Road and Horizon Boulevard to El Paso Rural County Transit stop for Routes 30, 40, and 84, terminating at North Loop Drive. See Map Sheets 1 and 2 of 7 (Attachment A) to view the corridor location.
Potentially affected environmental resources associated with the bike/pedestrian connection from the proposed border trails along Old Hueco Tanks Road and Horizon Boulevard to El Paso Rural County Transit are below and a description follows.

- **Cultural Resources**

**Cultural Resources**
The alternative crosses a NRHP-listed EPCWD1 canal and passes by the NRHP-eligible Pena House near the intersection of Alameda Avenue and Horizon Boulevard.

Adverse impacts to EPCWD1 may generally be avoided by spanning irrigation features rather than placing piers within or upon irrigation structures and by avoiding any impact to the function of the EPCWD1 system.

**4.17 Bike & Pedestrian Alternative 2 – Footbridge Connection**

Alternative BP-2 proposes to provide a bicycle/pedestrian footbridge connection to Rio Bosque Park from a parking lot across the Riverside Canal from the park. The parking lot would be accessed from Socorro Road. See Map Sheet 2 of 7 (Attachment A) to view the corridor location.

Potentially affected environmental resources associated with the bike/pedestrian footbridge connection form Rio Bosque Wetlands Park across Socorro Road are below and a description follows.

- **Cultural Resources**
- **Tigua Land**
- **Biological Resources**

**Cultural Resources**
The alternative crosses Tigua Ceremonial Land and canals of NRHP-listed EPCWD1. The alternative intersects the Mission Trail Historic District and the El Camino Real de Tierra Adentro National Historic Trail.

Adverse impacts to EPCWD1 may generally be avoided by spanning irrigation features rather than placing piers within or upon irrigation structures and by avoiding any impact to the function of the EPCWD1 system.

Coordination was conducted between TxDOT El Paso District, FHWA, TxDOT ENV, and the National Park Service (NPS) during the BHE PEL Study to discuss the El Camino Real de Tierra Adentro National Historic Trail, which is located within the study area along Socorro Road. The NPS shared their goal to preserve and develop the El Camino Real de Tierra Adentro National Historic Trail in written correspondence documented in the BHE PEL Study Agency Coordination Technical Report (Appendix D). TxDOT and FHWA have documented their intent to consider a bike and pedestrian national historic trail segment (as requested by the NPS) during the next phase of
project development in the *BHE PEL Study Environmental Constraints Report* (Appendix B).

**Tigua Land**
The alternative crosses two Tigua Ceremonial Land parcels.

During coordination with the YDSP sovereign nation, conducted throughout the BHE PEL Study, the Tiguas mentioned the possibility of "land swapping" if a project were to require additional ROW from the YDSP. Planning-level decisions regarding agreements or mitigation strategies include activities and concepts that may be adopted or incorporated during the project-specific NEPA process. Coordination with the YDSP sovereign nation is documented in the *BHE PEL Study Agency Coordination Technical Report* (Appendix D).

**Biological Resources**
The habitat threshold requiring additional coordination with TPWD for habitat per the 2013 MOU would be exceeded. The alternative is a new location, and per available TXNDD data, is within the mapped range of Pecos River Muskrat. Impacts within the corridor would be minimal.

### 4.18 Bike & Pedestrian Alternative 3 – Rio Grande Border Trails

Alternative BP-3 would provide a bicycle/pedestrian connection from proposed border trails along the Rio Grande to Socorro Road for improved access to the Socorro Entertainment Center. See Map Sheet 2 of 7 (Attachment A) to view the corridor location.

Potentially affected environmental resources associated with the bike/pedestrian connection from the proposed border trails to Socorro Road are below and a description follows.

- Cultural Resources
- Tigua Land
- Biological Resources
- Agricultural Resources

**Cultural Resources**
The alternative crosses through Ysleta del Sur Pueblo land and the NRHP-listed drainage components of EPCWID1.

Adverse impacts to EPCWID1 may generally be avoided by spanning irrigation features rather than placing piers within or upon irrigation structures and by avoiding any impact to the function of the EPCWID1 system.
**Tigua Land**
The alternative crosses 17 Tigua Property parcels, 17 Tigua Trust Land parcels, and 17 Tigua Ceremonial Land parcels.

During coordination with the YDSP sovereign nation, conducted throughout the BHE PEL Study, the Tiguas mentioned the possibility of “land swapping” if a project were to require additional ROW from the YDSP. Planning-level decisions regarding agreements or mitigation strategies include activities and concepts that may be adopted or incorporated during the project-specific NEPA process. Coordination with the YDSP sovereign nation is documented in the *BHE PEL Study Agency Coordination Technical Report* (Appendix D).

**Biological Resources**
The habitat threshold requiring additional coordination with TPWD for habitat per MOU would be exceeded. The alternative is a new location, and per available TXNDD data, is within the mapped range of the Pecos River Muskrat. Impacts within the corridor would be minimal.

**Agricultural Resources**
Alternative BP-3 would impact approximately 0.5 acres of agricultural land, which is more than 10 percent of the total area of the corridor.

4.19 Bike & Pedestrian Alternative 4 – Route 84 Bus Stop Connection

Alternative BP-4 proposes to provide an additional bicycle/pedestrian connection from proposed bike trail in San Elizario to the current El Paso County Rural Transit Route 84 Bus Stop 5 along Socorro Road. See *Map Sheet 3 of 7 (Attachment A)* to view the corridor location.

A potentially affected environmental resource associated with the bike/pedestrian connection from the proposed bike trail to Route 84 Bus Stop 5 along Socorro Road is below, followed by a description.

- Cultural Resources

**Cultural Resources**
The alternative is adjacent to the NRHP-listed San Elizario Historic District and to Presidio Chapel of San Elizario. The alternative would cross drains of the NRHP-listed EPCWID1.

Adverse impacts to EPCWID1 may generally be avoided by spanning irrigation features rather than placing piers within or upon irrigation structures and by avoiding any impact to the function of the EPCWID1 system.
4.20 Bike & Pedestrian Alternative 5 – Manuel F. Aguilera Highway

Alternative BP-5 proposes to provide an additional bicycle/pedestrian connection from the future Tornillo-Guadalupe International POE to the current El Paso County Rural Transit Route 40 Stop 5 along the Manuel F. Aguilera Highway. See Map Sheet 7 of Attachment A) to view the corridor location.

Potentially affected environmental resources associated with the bike/pedestrian connection from the Fabens International POE (future Tornillo-Guadalupe International POE) to Route 40 Stop 5 along the Manuel F. Aguilera Highway are below, followed by a description.

- Cultural Resources
- Drainage Features
- Floodplains
- Agricultural Resources

**Cultural Resources**
The alternative crosses the NRHP-listed canals of EPCWID1.

Adverse impacts to EPCWID1 may generally be avoided by spanning irrigation features rather than placing piers within or upon irrigation structures and by avoiding any impact to the function of the EPCWID1 system, as described below in **Drainage Features**.

**Drainage Features**
There are seven drainage features located within the corridor of the proposed alternative. These features and the linear feet of each within the corridor are listed in **Table 12**.

**Table 12: Bike and Pedestrian Alternative 5 Drainage and Irrigation Features**

<table>
<thead>
<tr>
<th>Drainage Feature</th>
<th>Length of Impact (linear feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alamo Alto Drain</td>
<td>41</td>
</tr>
<tr>
<td>Upper Tornillo Drain</td>
<td>46</td>
</tr>
<tr>
<td>Tornillo Intercepting #2 Drain</td>
<td>57</td>
</tr>
<tr>
<td>Tornillo Canal</td>
<td>59</td>
</tr>
<tr>
<td>Fabens Waste Channel</td>
<td>57</td>
</tr>
<tr>
<td>unnamed lateral</td>
<td>36</td>
</tr>
<tr>
<td>Island Drain</td>
<td>41</td>
</tr>
</tbody>
</table>

Note: 1. Alternative BP-5 would cross this drainage feature twice, the estimated length of the impact includes both crossings.

It is anticipated that those features that are perpendicular to the alternative would be crossed using bridges or culverts. It is not known at this time how the drainage features horizontal to the alternative may be modified.
Floodplains

Alternative BP-5 would impact approximately 0.28 acres within the 100-year floodplain, which is less than 20 percent of the total area of the corridor.

Agricultural Resources

Alternative BP-5 would impact approximately 3.4 acres of agricultural land, which is more than 10 percent of the total area of the corridor.

5.0 CONCLUSION

This inventory and preliminary evaluation of the potentially affected social, economic, and natural environment in the study area will provide the baseline information to be used in further project development efforts and environmental studies during the NEPA phase. The affected resources described in this report were examined at the planning level of analysis using information that was reasonably attainable; extensive stakeholder, agency, and tribal/sovereign nation coordination, and public involvement. Documentation on stakeholder, agency, and tribal/sovereign nation coordination, including the four Technical Work Group meetings is included in the BHE PEL Study Agency Coordination Technical Report (Appendix D). The public involvement efforts and documentation of all comments received is included in the BHE PEL Study Public Involvement (Appendix E). All environmental resources described in this report will be re-examined at a project-specific level of analysis during any future studies.

The information provided in this report about the affected environmental resources is based on a broad, planning-level analysis of the study area. This document should serve as a starting point for more detailed, project-level environmental analyses.
Attachment A

BHE Affected Environment – Environmental Resources Maps
LEGEND

- BHE Study Area
- Major Arterial
- Minor Arterial
- Roadway Alternative
- Non-Roadway Alternative
- El Camino Real de Tierra Adentro
- UP RR
- Fabens Airport
- Cemetery
- Historical Marker
- National Register Property
- Hospital
- Library
- Civic Facility
- Bus Route (Existing)
- Bike Route (Existing)
- Bike Route (Proposed)
- Future Bus Rapid Transit Corridor
- Schools
- Place of Worship
- Fire
- Police
- Mission Trail Historic District
- Ysella del Sur Pueblo (Tigua) Property
- Tigua Trust Land
- Tigua Trust Land Buffer
- Tigua Ceremonial Land
- Tigua Ceremonial Land Buffer
- Port of Entry
- Park
- Potential Grade Separations
- NRHP District
- Canals/Laterals/Drains
- 100-Year Floodplain

BHE Recommended Alternatives and Environmental Resources
Sheet 5 of 7

El Paso County, Texas