Chapter 3
Affected Environment and Environmental Consequences

This chapter describes the affected environment and analyzes the environmental consequences for each resource that the proposed line (Southern and Northern Rail Alternatives) and the No-Action Alternative could affect. This chapter also addresses the affected environment and potential environmental consequences of the associated Commercial Motor Vehicle (CMV) Facility.

The associated CMV Facility is not within the Surface Transportation Board's (Board) jurisdiction and does not require a license from the Board. However, Green Eagle Railroad (GER) and Puerto Verde Holdings (PVH) intend to construct and operate the proposed line and the associated CMV Facility, respectively, as a single port of entry for freight rail and CMV traffic between the United States and Mexico. Therefore, this Draft Environmental Impact Statement (EIS) analyzes the effects of constructing and operating the associated CMV Facility as well as the impacts associated with constructing and operating the proposed line. The Draft EIS provides the information needed by federal agencies that have or may have actions related to the proposed line and the associated CMV Facility and are participating in the EIS process, including the U.S. Coast Guard (USCG), the International Boundary and Water Commission (IBWC), the U.S. Army Corps of Engineers (USACE), and the U.S. Customs and Border Protection (CBP), as discussed in *Chapter 1, Section 1.4.4, Other Federal Agencies*.

The Board's Office of Environmental Analysis (OEA) determined the scope of this Draft EIS after scoping (see *Chapter 1, Section 1.4.5*, *Scoping Process).* For each resource area identified, OEA took the following steps to analyze potential impacts:

- Reviewed regulations and guidance relevant to each resource area, which are described in applicable sections.
- Defined a study area or study areas to analyze.
- Developed analysis approaches.
- Reviewed the current conditions of the resource in the relevant study area(s).
- Analyzed the potential impacts that the proposed line and the associated CMV Facility and No-Action Alternative would or could have on the resource.
- Identified mitigation related to the proposed line that would minimize or compensate for impacts, if warranted. *Chapter 4, Mitigation*, contains the complete list of mitigation measures.

As discussed in *Chapter 2, Proposed Action and Alternatives,* consistent with past practice, OEA determined that 2031—five years after the anticipated issuance of a final decision by the Board in this proceeding—would be the appropriate analysis year. OEA uses a five-year traffic projection because it allows enough time for the project to be implemented and ensures that any increase in traffic is related to the effects of the project and not changing market conditions. Anything beyond five years is speculative and not reasonably foreseeable. Therefore, for this Draft EIS, OEA used 2031 rail and truck traffic projections developed by GER.

OEA's analysis showed that the proposed line and the associated CMV Facility would have no impact or minimal impacts on the following resource areas: Topography, Geology, Soils, and Hazardous Waste

Sites; and Socioeconomics. The analyses for these resource areas are presented in **Appendix I** and **Appendix L,** respectively.

OEA reviewed the following resources and found that they are not present in the vicinity of the proposed line and the associated CMV Facility: water bodies protected under the Wild and Scenic Rivers Act (16 U.S.C. § 1271-1287); coastal barriers protected under the Coastal Barrier Resources Act 16 U.S.C. § 3501 *et seq.*); land funded by the Land and Water Conservation Fund Act (54 U.S.C. § 200302); National Marine Sanctuaries Act resources (16 U.S.C. § 1431 *et seq.*); essential fish habitat protected under the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 *et seq.*); and marine mammals protected under the Marine Mammals Protection Act (16 U.S.C. Ch. 31). These resources have no potential to be affected by the construction and operation of the proposed line and the associated CMV Facility and are not addressed any further in this Draft EIS.

3.1 Freight Rail Safety

OEA analyzed how operation of the proposed line (both the Southern and Northern Rail Alternatives) could affect freight rail safety, such as potential railway-related incidents including derailments and collisions. This section describes the affected environment and potential environmental consequences that could result from operation of the Southern or Northern Rail Alternatives or the No-Action Alternative. This section does not address the affected environment and potential environmental consequences of the associated CMV Facility because it has no potential to affect freight rail safety.

3.1.1 Approach

This subsection describes the approach OEA used to analyze effects on freight rail safety. The probability of a rail incident occurring depends, in part, on the number of trains that operate on a particular rail line.[1] OEA reviewed historic incidents, such as collisions, derailments, and spills that occurred on the 34-mile Eagle Pass Subdivision of the Union Pacific Railroad (UP) mainline (which includes the section of UP mainline between the existing Eagle Pass UP International Railroad Bridge (UP Rail Bridge) and approximate UP milepost 31) using data available from the Federal Railroad Administration (FRA) for the five most recent reporting years, 2019 to 2023 (FRA 2024c).[2] OEA then calculated the five-year average of these annual incident rates for UP and BNSF Railway Company, which are the two railroad companies that use the existing UP mainline in Maverick County. Annual incident rates are calculated as follows.

[1] This Draft EIS uses the term "incident" to refer to all accidents/incidents as defined in FRA regulations at 49 C.F.R. § 225.5. "Accident" means any collision, derailment, fire, explosion, act of God, or other event involving the operation of railroad on-track equipment (standing or moving) that results in damages greater than the current reporting threshold to railroad on-track equipment, signals, track, track structures, and roadbed. "Incident" means any event involving the movement of on-track equipment that results in a reportable casualty but does not cause reportable damage above the current threshold established for train accidents.

[2] The Eagle Pass Subdivision extends from Spofford, Texas, to the United States/Mexico border.

$$Annual\ Incident\ Rate = \frac{Incidents\ per\ Year}{Total\ Annual\ Million\ Train\ Mile}$$

Where: Train Mile = The movement of a train over a distance of one mile; and

$$\text{Annual Million Train Miles} = \frac{Trains\ per\ Day \times Distance \times 365\ Days}{One\ Million}$$

The systemwide number of incidents in the FRA database includes incidents that have occurred on all track types.[3] The safety record of railroads is often measured in terms of the number of incidents per million train miles. FRA determines systemwide million train miles annually by dividing the total train miles by railroad per year (sum of main track train miles and yard-switching miles) by one million.

OEA averaged the five years of incident rates for both UP and BNSF individually to determine a range of low and high annual incident rates for the No Action-Alternative and the build alternatives (see **Table 3.1-1)**.[4] OEA then calculated a range of incidents per year by applying the BNSF and UP incident rates defined above, to the million train miles under each alternative, resulting in incidents per year (see **Table 3.1-2**).

Lastly, OEA converted the data from "incidents per year" to "years between incidents" using the following formula (also shown in **Table 3.1-2**).

$$Years\ Between\ Incidents = \frac{1}{Incidents\ per\ Year}$$

In conducting the freight rail safety analysis, OEA considered the applicable regulatory and industry standards that railroads implement on their lines. FRA's Office of Railroad Safety regulates the safety of passenger and freight rail transportation. (49 C.F.R. Chapter II Parts 200 through 299). This includes the regulation of rail operations, track, signaling, and rolling stock (for example, locomotives and freight cars) for common carrier railroads.

The Federal Railroad Safety Act of 1970 granted FRA's Administrator rulemaking authority over all aspects of railroad safety. Subsequently, FRA issued regulations covering a range of critical safety railroad equipment, infrastructure, and procedures. It also established enforcement tools for railroad companies and employees who violate these regulations. FRA regulations specify minimum safety requirements for rolling stock, track, signals, operating practices, and transporting hazardous materials.

[3] Track types include Main, Yard, Siding, and Industry. Incidents at at-grade crossings are reported to FRA separately and are analyzed separately in *Section 3.2, Grade Crossing Safety.*

[4] A range is provided to account for the unknown mix of BNSF and UP trains on the UP mainline. The low rate in the range is the BNSF rate and the high rate in the range is the UP rate.

Like UP and BNSF, GER would be required to comply with all applicable laws and regulations governing the safe transport of hazardous materials. For example, the Hazardous Materials Transportation Act (HMTA) (49 U.S.C. 5101 *et seq*.) applies to the transportation of hazardous materials in commerce, including interstate and intrastate carriers. U.S. Department of Transportation (USDOT) regulations include requirements for shipping and packaging containers for hazardous materials, emergency response information, and training. FRA enforces USDOT regulations that require shippers to transport hazardous materials in rail cars specifically designed for safe transport. 49 C.F.R. Parts 171 through 180.

Also, U.S. Environmental Protection Agency (EPA) regulations (40 C.F.R. 300) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) govern incidents, spills, and other emergency releases of pollutants and contaminants to the environment.

In addition to FRA, individual states such as Texas oversee public safety, especially with respect to roadway/rail at-grade crossings. Several railroad associations also develop and establish standards and practices for the industry, including the Association of American Railroads (AAR), the American Short Line and Regional Railroad Association (ASLRRA), and the American Railway Engineering Maintenance-of-Way Association (AREMA).

More information on the regulatory environment for freight rail safety, including regulations pertaining to hazardous materials spills, can be found in **Appendix C**.

3.1.2 Affected Environment

The existing UP mainline crosses the Rio Grande River on the UP Rail Bridge and connects to UP's Clark's Park Yard, to the north of Eagle Pass, via approximately 4.2 miles of track that run through downtown Eagle Pass. As described in *Chapter 2, Section 2.2.1, Existing Eagle Pass Crossings*, an average of 19 trains per day operate on this rail line. Currently, two Class I Railroads—UP (track owner) and BNSF (via trackage rights)—operate on the Eagle Pass Subdivision of the UP mainline, including the portion located in Eagle Pass and Maverick County.

As explained above, the safety record of railroads is commonly measured in terms of the number of incidents per million train miles. The national incident rates for both UP and BNSF have fluctuated over the past five years as shown in **Table 3.1-1**. The annual UP incident rate ranged from 4.10 to 4.74, for a five-year average rate of 4.52 incidents per million train miles. The annual BNSF incident rate ranged from 1.78 to 2.72, for a five-year average rate of 2.21 incidents per million train miles (FRA 2024a).

Table 3.1-1. UP and BNSF 5-Year Incident Rates for the Eagle Pass Subdivision of the UP mainline

Incident Rates	2019	2020	2021	2022	2023	5-year Average
UP	4.69	4.10	4.37	4.74	4.72	4.52
BNSF	2.19	2.11	1.78	2.27	2.72	2.21

Source: FRA 2024a

There were seven reportable incidents on the Eagle Pass Subdivision of the UP mainline in the previous five full reporting years. None of those incidents occurred on the approximately 5 miles of track between Clark's Park Yard and the existing UP Rail Bridge, including the approximately 4 miles of track between the UP Rail Bridge and approximate UP milepost 31, where the proposed line would connect to the UP mainline. Of the reported incidents in the rest of the subdivision, five were caused by

derailment, one by a bridge fire, and one by "other impacts."[5] Three of these incidents happened on the UP mainline, and four in the rail yards. Two of the trains involved in these incidents were carrying hazardous materials. Of those two trains, one had a single railcar that released hazardous material due to the incident.[6] The median speed of trains involved in these incidents was 7.5 miles per hour, and only one train was traveling over 10 miles per hour at the time of the incident. There were no reported injuries, deaths, or evacuations anywhere on the Eagle Pass Subdivision of the UP mainline in the period considered (FRA 2024b).

3.1.3 Environmental Consequences

3.1.3.1 Southern Rail Alternative

Under the Southern Rail Alternative, the proposed line would connect to the UP mainline at approximate UP milepost 31 from the New Rail Bridge. Track mileage between the New Rail Bridge and approximate UP milepost 31 is about 1.3 miles.

Under the Southern Rail Alternative, the average number of trains per day would remain the same as under existing conditions (No-Action Alternative), while the number of train miles traveled would decrease. There would be a 69-percent reduction in the number of incidents per year, which would range from approximately 0.02 to 0.04. This would amount to one reportable incident every 25 to 50 years, as opposed to one reportable incident every 8 to 16 years under the No-Action Alternative (**Table 3.1-2**).

Additionally, GER proposes to use FRA Class III track for the Southern Rail Alternative, which would meet safety standards that would allow for freight speeds of up to 40 miles per hour, though OEA anticipates that trains would likely operate at approximately 15 miles per hour between the New Rail Bridge and approximate UP milepost 31. Higher classes of track, such as Class III track, require more frequent inspection and are maintained to more stringent construction tolerances to ensure they remain safe for the higher speeds permitted.

In the event of a release of hazardous materials, the impacts of the release would depend on many factors, including the type of material released; the number of rail cars involved; the volume of material released; the location of the incident in relation to inhabited or sensitive environmental areas; and the timing and effectiveness of local government and railroad emergency response plans.

Based on a review of past hazardous material releases along the Eagle Pass Subdivision of the UP mainline and considering the low operating speeds anticipated for the proposed line, OEA expects that hazardous materials releases resulting from rail incidents along the Southern Rail Alternative would be small. In addition, because the regulations described above specify immediate emergency response and cleanup operations for releases of hazardous materials, or substantial threats of releases, OEA expects that if a release of hazardous materials were to occur, it would involve a relatively short duration of exposure and would be contained quickly. This would minimize the potential for groundwater

[5] "Other impacts" is a miscellaneous category on FRA Form 54. In this case, the "other impact" was reported as a railcar that struck a train on an adjacent track.

[6] On February 23, 2020, BNSF reported that 1 pint of gasoline spilled from a railcar in Kinney County, Texas.

contamination, limit the extent of any soil contamination, and allow for the proper management of any surface water contamination.

In the event of a release of hazardous materials into the Rio Grande River, the American Water Infrastructure Act of 2018 (AWIA) requires that community drinking water systems serving over 3,300 people (in this case, Eagle Pass) have updated risk assessments and emergency response plans tailored to specific incidents. If a release were to occur on the Southern Rail Alternative during transportation, GER would be required to report it to a 911 operator to initiate the implementation of appropriate emergency response plans. 40 C.F.R. 355.42b. The community drinking water systems' emergency response plan would contain appropriate management actions depending on the materials involved and the resources affected. These might include, but would not necessarily be limited to, cleaning up the spill and temporarily restricting the use of the water body. Such measures would minimize the potential for long-term impacts through unrecognized soil or water contamination. If a contaminant poses a substantial threat to public health and local and state authorities do not act, the federal government has the authority to intervene to safeguard public health. 42 U.S.C. Chapter 6A, Subchapter XII, Part D.

Considering the existing regulatory requirements, OEA is not recommending mitigation for freight rail safety impacts.

Table 3.1-2. Number of Incidents per Alternative

	No-Action Alternative	**Southern Rail Alternative**	**Northern Rail Alternative**	**Percent Difference**
Calculated Million Train Miles				
	0.029	0.009	0.009	-69%
Number of Incidents per Year				
Low	0.06	0.02	0.02	-69%
High	0.13	0.04	0.04	-69%
Number of Years Between Incidents				
Low	16	50	50	-69%
High	8	25	25	-69%

3.1.3.2 Northern Rail Alternative

The length of the Northern Rail Alternative would be the same as the length of the Southern Rail Alternative. Therefore, the effects of the Northern Rail Alternative on freight rail safety would be the same as those of the Southern Rail Alternative. Considering the existing regulatory requirements, OEA is not recommending mitigation for freight rail safety impacts.

3.1.3.3 No-Action Alternative

Under the No-Action Alternative, the Board would deny authority for GER to construct and operate the proposed line. The proposed line and the associated CMV Facility would not be constructed. The existing UP mainline would remain in operation as it is today, and the number of trains per day would remain the same. Incidents per year would range from approximately 0.06 to 0.13 along the portion of track between the United States/Mexico border and approximate UP milepost 31, equivalent to 8 to 16 years between any reportable incident (see **Table 3.1-2**).

3.1.4 Conclusion

OEA has determined that both the Southern and the Northern Rail Alternatives would result in a reduction in the number of incidents per year in the study area, a beneficial impact on freight rail safety. The reduction in the number of incidents per year would be a consequence of the shorter distance (1.3 miles instead of approximately 4 miles) that trains would travel between the United States/Mexico border and approximate UP milepost 31 (where they would merge onto the existing UP mainline) when compared to existing conditions and the No-Action Alternative. Trains would operate at speeds below the proposed line's design speed, which would further reduce the likelihood of incidents.

While unlikely, a release of hazardous materials would be addressed through the laws and regulations administered by FRA and EPA that govern the safe transport of hazardous materials and emergency response actions by rail operators, and by local, state, and federal agencies. Therefore, OEA is not recommending mitigation for freight rail safety impacts.

3.2 Grade Crossing Safety

OEA analyzed how operation of the proposed line (both the Southern and Northern Rail Alternatives) could affect grade crossing safety, such as potential collisions between trains and vehicles or pedestrians at locations where a rail line and public roadway intersect at the same level, or "at grade." This section describes the affected environment and potential environmental consequences on safety at roadway/rail at-grade crossings that could result from the operation of the Southern or Northern Rail Alternatives and the No-Action Alternative. This section does not address the associated CMV Facility because it has no potential to affect grade crossing safety.

3.2.1 Approach

This subsection describes the approach OEA used to analyze effects on grade crossing safety at at-grade crossings. An at-grade crossing, as defined in 49 C.F.R. § 234.5, is "a location where a public highway, road, street, or private roadway, including associated sidewalks and pathways, crosses one or more railroad tracks at grade." In assessing grade crossing safety impacts, OEA considered applicable federal, state, and local regulations, including the requirements of the Federal Highway Administration (FHWA) and FRA, which both have jurisdiction over aspects of grade crossing safety under federal law.

Aside from crashes involving individuals trespassing on railroad tracks, most rail-related fatalities and injuries, including fatalities involving motor vehicles and pedestrians, occur at at-grade crossings (AAR 2022). Crashes can occur at at-grade crossings when vehicles or pedestrians attempt to cross the tracks at the same time as a passing train. Although such crashes are generally rare, they can result in damages, injuries, or fatalities when they do occur. FRA publishes statistics on the safety performance of more than 126,000 open public at-grade crossings in the United States (FRA 2024c). During the five-year period from 2019 to 2023, there were 9,108 crashes at public at-grade crossings, representing an average of 0.014 crashes per crossing per year, or approximately one crash per crossing every 69.5 years.[7]

[7] Unless otherwise specified, the term "crash" in this Draft EIS includes both train-vehicle and train-pedestrian crashes.

OEA defined the study area for the at-grade crossing safety analysis as the area including the seven existing operational public at-grade crossings along the UP mainline within the city of Eagle Pass, shown in **Figure 3.2-1**. To assess impacts on safety at those at-grade crossings, OEA estimated the probability of a crash occurring at each operational at-grade crossing based on FRA crash prediction methods using historical performance data and other site characteristics for each at-grade crossing. More information on the methodology OEA used to estimate impacts on at-grade crossing safety is provided in **Appendix D**.

OEA did not estimate safety performance at grade-separated crossings. There are existing grade-separated rail crossings in Eagle Pass across the following roadways: El Indio Highway; East Garrison Street; and North Veterans Boulevard. Grade-separated crossings are crossings where a roadway passes over or under a rail line via an overpass or underpass. Such crossings do not create a potential for crashes. OEA also did not estimate safety performance at private at-grade crossings, *i.e.*, at-grade crossings owned by landowners, because those account for very low traffic volumes and because there is insufficient data to support a quantitative analysis. There is one such at-grade crossing on the UP mainline just south of milepost 31, at the eastern end of Dr Gates Road.

3.2.2 Affected Environment

The seven at-grade crossings on the existing UP mainline in the study area are all urban crossings with paved, two-lane roadways. Traffic volumes at the crossings currently range from 1,489 to 6,073 vehicles per day. There is one mainline track at each of the crossings, except Crossing ID 764113R across Industrial Park Boulevard (the southernmost crossing in **Figure 3.2-1**), which has three yard tracks.[8] Existing warning devices at the crossings range from passive (such as signage) to active (such as flashing lights or flashing lights and gates) measures. There were no crashes reported at the seven at-grade crossings during the most recent five-year period (2019-2023) for which data are available.

During the 42-year period prior to 2019, FRA reports that 11 crashes occurred at the seven at-grade crossings, representing an average of 0.037 crashes per crossing per year. Six of these crashes resulted in at least one documented injury. No fatalities were reported.

As explained in **Appendix D**, across the seven at-grade crossings included in OEA's analysis, the average number of crashes expected to occur under current 2024 conditions is 0.01071 crashes per crossing per year, or approximately one crash every 95 years. This rate would change as conditions change. More train traffic likely would result in an increase in the average frequency of crashes when compared to existing 2024 conditions; less train traffic likely would result in fewer crashes.

3.2.3 Environmental Consequences

3.2.3.1 Southern Rail Alternative

Under the Southern Rail Alternative, the proposed line would handle all the through rail traffic currently using the existing UP mainline within the study area.[9]

[8] These tracks appear to terminate just south of the at-grade crossing.

[9] Only freight trains operate on the UP mainline between the UP Rail Bridge and Clark's Park Yard. Only freight trains would operate in 2031 as well under all alternatives considered.

Figure 3.2-1. Public At-Grade Crossing Study Area

Source: ArcGIS Online, NearMap

Both crossings along the Southern Rail Alternative (at U.S. 277 and Barrera Street) would be grade-separated. Operation of the Southern Rail Alternative would eliminate the risk of crashes at all existing public at-grade crossings in Eagle Pass. This would be a net beneficial impact on grade crossing safety. Therefore, no mitigation for grade crossing safety impacts needs to be considered.

3.2.3.2 Northern Rail Alternative

The impacts of the Northern Rail Alternative would be the same as those described above for the Southern Rail Alternative because both crossings along the Northern Rail Alternative (at U.S. 277 and Barrera Street) would be grade-separated.

3.2.3.3 No-Action Alternative

Under the No-Action Alternative, the Board would deny authority for GER to construct and operate the proposed line. The proposed line and the associated CMV Facility would not be constructed. Operations on the UP mainline in the study area would continue across all seven operational public at-grade crossings in Eagle Pass. By 2031, based on the projected growth in road traffic, vehicular traffic volumes would increase at these crossings. The increase in vehicular traffic would result in an increase in the number of vehicle crashes expected to occur. When compared to 2024 existing conditions, the predicted number of crashes across the seven public at-grade crossings in the study area would increase from an average of 0.01071 crashes per crossing per year in 2024 to an average of 0.01100 crashes per crossing per year in 2031, as explained in **Appendix D**. This represents approximately one crash every 93 years instead of one crash every 95 years under existing conditions.

3.2.4 Conclusion

OEA has determined that either the Southern Rail Alternative or the Northern Rail Alternative would result in a beneficial impact on grade crossing safety. Under either alternative, both crossings along the proposed line (at U.S. 277 and Barrera Street) would be grade-separated and the risk of crashes at all seven existing operational public at-grade crossings in Eagle Pass would be eliminated because all through freight traffic would relocate from the UP mainline to the proposed line. Therefore, no mitigation for grade crossing safety impacts needs to be considered.

3.3 Grade Crossing Delay

OEA analyzed how operation of the proposed line (both the Southern and Northern Rail Alternatives) could affect grade crossing delays, such as delays that drivers and pedestrians experience at locations where a rail line and public roadway intersect at the same level, or "at grade." This section describes the affected environment and potential environmental consequences on vehicular delay at roadway/rail at-grade crossings that could result from the Southern or Northern Rail Alternatives and the No-Action Alternative. This section does not address the affected environment and potential environmental consequences of the associated CMV Facility because it has no potential to affect grade crossing delays.

3.3.1 Approach

This subsection describes the approach OEA used to analyze effects on grade crossing delays at at-grade crossings. A regulatory definition of an at-grade crossing is provided in *Section 3.2.1, Approach*. Drivers traveling on roadways experience a delay at at-grade crossings whenever passing trains

temporarily block the crossings. For roads with low levels of vehicular traffic, the delay that drivers experience is approximately equal to the amount of time it takes the passing train to clear the crossing. This, in turn, depends on the length of the train and the speed at which it is moving. For busier roads with more vehicular traffic, delays at at-grade crossings can be made longer by the queue of vehicles waiting for the passing train to clear the crossing. The longest delays occur when a train passes through an at-grade crossing on a busy road during the hours of peak traffic. Long delays can also occur when a train stops unexpectedly due to a crash or breakdown while traversing an at-grade crossing; however, such events are relatively rare.

In assessing grade crossing delay impacts, OEA considered applicable federal, state, and local regulations for transportation, including the requirements of FHWA and FRA. OEA's practice is to quantify delay impacts for at-grade crossings on public roadways with an annual average daily traffic (AADT) of 2,500 or more vehicles. Because so few vehicles use crossings on lower-volume roadways, the average delay at those crossings is negligible. In characterizing traffic operations at at-grade crossings, OEA considered performance measures such as blocked crossing time per train, crossing delay per stopped vehicle, number of vehicles delayed per day, maximum vehicle queue length, average delay per vehicle in a 24-hour period, total vehicle delay per day, and level of service (LOS). LOS is a qualitative measure of motor vehicle traffic flow, indicated by letters from A to F, where A represents free flow conditions and F indicates extreme congestion. OEA estimates delay time using industry standard equations, as detailed in **Appendix D**.

The study area for at-grade crossing delay impacts is the same as the study area for at-grade crossing safety impacts. It consists of the seven existing, operational public at-grade crossings along the UP mainline in the city of Eagle Pass shown in *Section 3.2, Grade Crossing Safety, Figure 3.2-1*.

OEA did not estimate crossing delays at grade-separated crossings because such crossings do not result in delays. There are existing grade-separated rail crossings in Eagle Pass across the following roadways: El Indio Highway; East Garrison Street; and North Veterans Boulevard. OEA also did not estimate safety performance at private at-grade crossings because of very low traffic volumes at such crossings. There is one private at-grade crossing on the UP mainline just south of milepost 31, at the eastern end of Dr Gates Road. OEA did consider the impact of at-grade crossing delays on emergency vehicles.

3.3.2 Affected Environment

There is one mainline track at each of the seven operational public at-grade crossings in the study area, except Crossing ID 764113R across Industrial Park Boulevard (the southernmost crossing in *Section 3.2, Figure 3.2-1*), which has three yard tracks.

Of the seven operational at-grade crossings, four are on roads that currently exceed the 2,500 AADT threshold for consideration. They are Crossing IDs 764106F (Ferry Street); 912039X (2nd Street); 764107M (Quarry Street); and 764108U (Main Street). The estimated delay per vehicle over a 24-hour period at these crossings ranges from 23.8 to 25.1 seconds under existing 2024 conditions, with an average delay per vehicle of 24.6 seconds.

Gate down time represents the time it takes a train to pass through an at-grade crossing and thus represents a reasonable estimate of the delay that vehicles, including emergency vehicles, experience at at-grade crossings. One of the operational at-grade crossings in the study area (Crossing ID 764113R, Industrial Park Boulevard) does not have crossing gate infrastructure beyond signage. At this crossing, gate down time refers to the time vehicles are stopped at the crossing. For each at-grade crossing

considered in the delay analysis, the total gate down time is 144 minutes per day, or approximately 7.5 minutes per train.

In the absence of a nearby, viable grade-separated crossing, emergency vehicles must typically wait for the train to pass. Although a rare occurrence, an at-grade crossing can become blocked when a train comes to a stop before clearing the crossing. While also rare, it is possible that an emergency could occur at the same time that a stopped train blocks an at-grade crossing, which represents a potentially serious situation.

Under normal conditions, trains move steadily. According to AAR, railroads have operational procedures that they use to minimize the frequency of trains stopped at crossings, including the following (AAR 2024):

- Planning train schedules, inbound and outbound yard movements, and crew work schedules to minimize the time a train occupies an at-grade crossing.
- Adopting procedures to stop a train clear of a crossing to conduct legally required mechanical inspections.
- Extending sidings and constructing new sidings where trains can stop, resulting in fewer blocked crossings.
- Holding trains outside of crossings where vehicular traffic is substantial.
- Seeking to park trains outside of crossings when the crews have worked the maximum hours permitted.
- Considering the potential for blocked crossings on sidings when one train is stopped on a siding to let another train pass.
- Training dispatchers to use sidings, meeting and passing opportunities, and stopping points, resulting in fewer blocked crossings.
- Requiring crews to promptly alert dispatchers when crossings are blocked and giving dispatchers the authority to address the blocked crossing.
- Installing notification systems at crossings that notify dispatchers when crossings are blocked and testing the systems frequently to ensure that they work properly.

3.3.3 Environmental Consequences

3.3.3.1 Southern Rail Alternative

Under the Southern Rail Alternative, the proposed line would handle all through rail traffic currently using the existing UP mainline. All crossings along the Southern Rail Alternative would be grade-separated, with no potential for creating delays. Additionally, the removal of through rail traffic from the existing UP mainline as a result of the Southern Rail Alternative would eliminate delays at all seven existing operational public at-grade crossings in Eagle Pass (see **Table 3.3-1** for the delay changes to six of the seven at-grade crossings in the study area that would exceed the AADT threshold), including delays to emergency vehicles. This would be a net beneficial impact on grade crossing delays. Therefore, no mitigation for grade crossing delay impacts needs to be considered.

Additionally, there would be potential for two at-grade crossings along the existing UP mainline that were closed to vehicular traffic in 2022 (Crossing ID 764110V across Williams Street and Crossing ID

764105Y across Church Street) to be reopened because potential conflicts with rail traffic would be eliminated. This would increase traffic mobility throughout the downtown area of Eagle Pass.

3.3.3.2 Northern Rail Alternative

The impacts of the Northern Rail Alternative would be the same as those described above for the Southern Rail Alternative because all crossings would be grade-separated. No mitigation for at-grade crossing delay impacts needs to be considered.

3.3.3.3 No-Action Alternative

Under the No-Action Alternative, the Board would deny authority for GER to construct and operate the proposed line. The proposed line and the associated CMV Facility would not be constructed. Operations on the UP mainline in the study area would continue across all seven existing operational public at-grade crossings. By 2031, based on the projected growth in road traffic, vehicular traffic volumes would increase at these crossings. At six of the seven at-grade crossings in the study area, AADT would range from 2,504 to 6,976 vehicles per day, with an average of 3,779 vehicles per day. Only Crossing ID 764109B (Rio Grande Street) would be below the threshold. The estimated delay per vehicle over a 24-hour period would range from 24.0 to 25.5 seconds, with an average of 24.8 seconds. **Table 3.3-2** shows the average delay per vehicle that would occur under the No-Action Alternative for those six at-grade crossings.

Because the average number of trains per day would initially remain the same as under existing conditions, average gate down times and impacts on emergency would remain as described in *Section 3.3.2, Affected Environment*.

3.3.4 Conclusion

OEA has determined that both the Southern Rail Alternative and the Northern Rail Alternative would result in a beneficial impact on grade crossing delays. Under both alternatives, all crossings would be grade-separated, generating no delays, and delays (including emergency vehicle delays) at all seven existing public at-grade crossings in Eagle Pass would be eliminated because all through freight traffic would relocate from the UP mainline to the proposed line. Therefore, no mitigation for grade crossing delay impacts needs to be considered.

Table 3.3-1. At-Grade Crossing Delay 2031 – Build Alternatives

											Change Compared to No-Action Conditions	
Crossing ID	**Projected 2031 AADT**	**Number of Roadway Lanes**	**Trains per Day**	**Train Speed (mph)**	**Train Length (feet)**	**Number of Stopped Vehicles Delayed per Day**	**Average Delay per Vehicle in 24-hour Period (seconds)**	**Total Delay in 24-hour Period (minutes)**	**Level of Service**	**Maximum Queue (vehicles)**	**Total Gate Down Time per Day (minutes)**	**Average Delay per Vehicle (seconds)**	**Level of Service**
Location: Eagle Pass, Texas													
764104S	2,696	2	19	15	9,300	0	0.0	0.0	A	0	0.0	-24.8	C to A
764106F	4,504	2	19	15	9,300	0	0.0	0.0	A	0	0.0	-25.5	C to A
912039X	3,106	2	19	15	9,300	0	0.0	0.0	A	0	0.0	-24.0	C to A
764107M	2,889	2	19	15	9,300	0	0.0	0.0	A	0	0.0	-24.5	C to A
764108U	6,976	2	19	15	9,300	0	0.0	0.0	A	0	0.0	-25.5	C to A
764113R	2,504	2	19	15	9,300	0	0.0	0.0	A	0	0.0	-24.7	C to A

Table 3.3-2. At-Grade Crossing Delay 2031 – No-Action Alternative

Street	**Crossing ID**	**Projected 2031 AADT**	**Number of Roadway Lanes**	**Trains per Day**	**Train Speed (mph)**	**Train Length (feet)**	**Number of Stopped Vehicles Delayed per Day**	**Average Delay per Vehicle in 24-hour Period (seconds)**	**Total Delay in 24-hour Period (minutes)**	**Level of Service**	**Maximum Queue (vehicles)**	**Total Gate Downtime per Day (minutes)**
Location: City of Eagle Pass, Texas												
5th Street	764104S	2,696	2	19	15	9,300	270	24.8	1,114.3	C	20	144
Ferry Street	764106F	4,504	2	19	15	9,300	452	25.5	1,914.2	C	34	144
2nd Street	912039X	3,106	2	19	15	9,300	312	24.0	1,242.4	C	24	144
Quarry Street	764107M	2,889	2	19	15	9,300	290	24.5	1,179.7	C	22	144
Main Street	764108U	6,976	2	19	15	9,300	700	25.5	2,964.8	C	53	144
Industrial Park Boulevard	764113R	2,504	2	19	15	9,300	251	24.7	1,030.8	C	19	144
Average		**3,779**						**24.8**				

3.4 Roadway Capacity

OEA analyzed how operation of the CMV Facility associated with the proposed line could affect roadway capacity (*i.e.*, the ability of a road network to handle vehicle traffic volumes). This section describes the affected environment and potential environmental consequences on roadway capacity that could result from operation of the associated CMV Facility. This section does not address the proposed line (either the Southern or the Northern Rail Alternative) because it has no potential to affect roadway capacity.

3.4.1 Approach

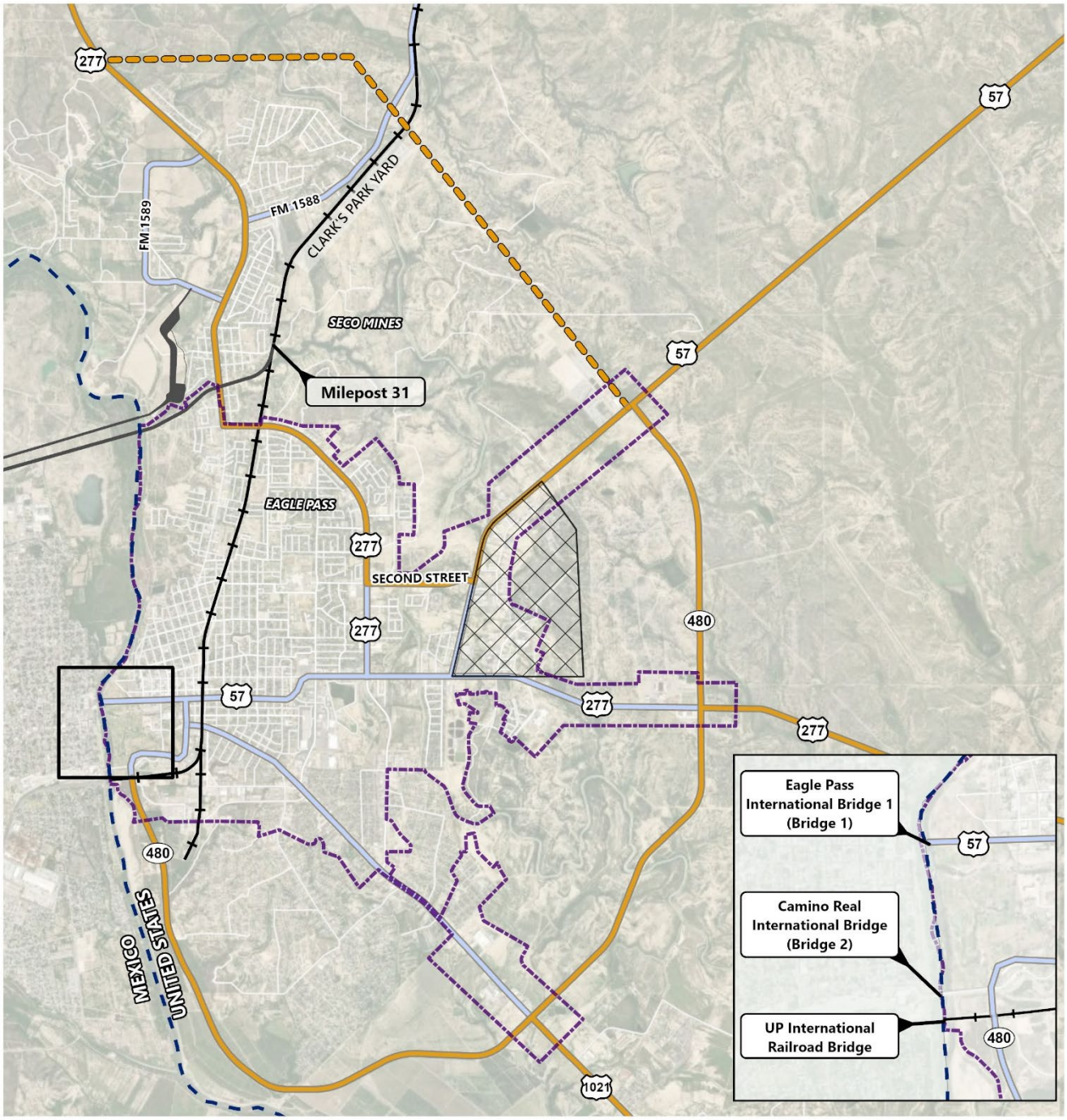
This subsection describes the approach OEA used to analyze effects on roadway capacity. The CMV Facility would not generate new truck traffic. Instead, it would relocate truck traffic between the United States and Mexico from the existing Camino Real International Bridge (Bridge 2) to the New Road Bridge. The trucks would travel to the same destinations as they do currently, but via different routes. **Figure 3.4-1** illustrates the road network in and around Eagle Pass. Currently, most inbound (Mexico to the United States) trucks crossing Bridge 2 travel to their destination via State Loop (SL) 480. From there, they can proceed to warehouses located along U.S. 57 east of downtown Eagle Pass (Warehouse Area on **Figure 3.4-1**); continue to points east via U.S. 277 or U.S. 57 eastbound; or continue to points north via U.S. 57 westbound, 2nd Street, and U.S. 277 northbound. Outbound trucks traveling to Mexico via Bridge 2 follow the same routes in reverse.

If the associated CMV Facility is constructed, after crossing the New Road Bridge, inbound trucks would continue along the proposed CMV Road and enter the public road network via Farm-to-Market Road (FM) 1589. By the time the associated CMV Facility would be operational, OEA understands that the Texas Department of Transportation (TxDOT) will have completed the planned northern section of SL 480 between U.S. 57 and U.S. 277, including an interchange at FM 1588. Therefore, OEA anticipates that after exiting the associated CMV Facility via FM 1589, trucks would turn left onto U.S. 277 northbound, then continue northward via U.S. 277 or travel to SL 480 via FM 1588 before continuing toward the warehousing area or points east via U.S. 57 and U.S. 277 (see **Figure 3.4-1**). OEA assumes that trucks would get to SL 480 via FM 1588 because it is the shortest and most direct route. Outbound trucks would follow the same routes in reverse.

Therefore, OEA anticipates that roadway capacity impacts would be concentrated at the intersections of U.S. 277 with FM 1589 and FM 1588 (see **Figure 3.4-2**), which would experience an influx of truck traffic that does not occur under current conditions and would not occur under the No-Action Alternative. Beyond these points, trucks would rejoin routes that they presently use and would continue to use under the No-Action Alternative. Impacts on these roads would be minimal and are addressed qualitatively.

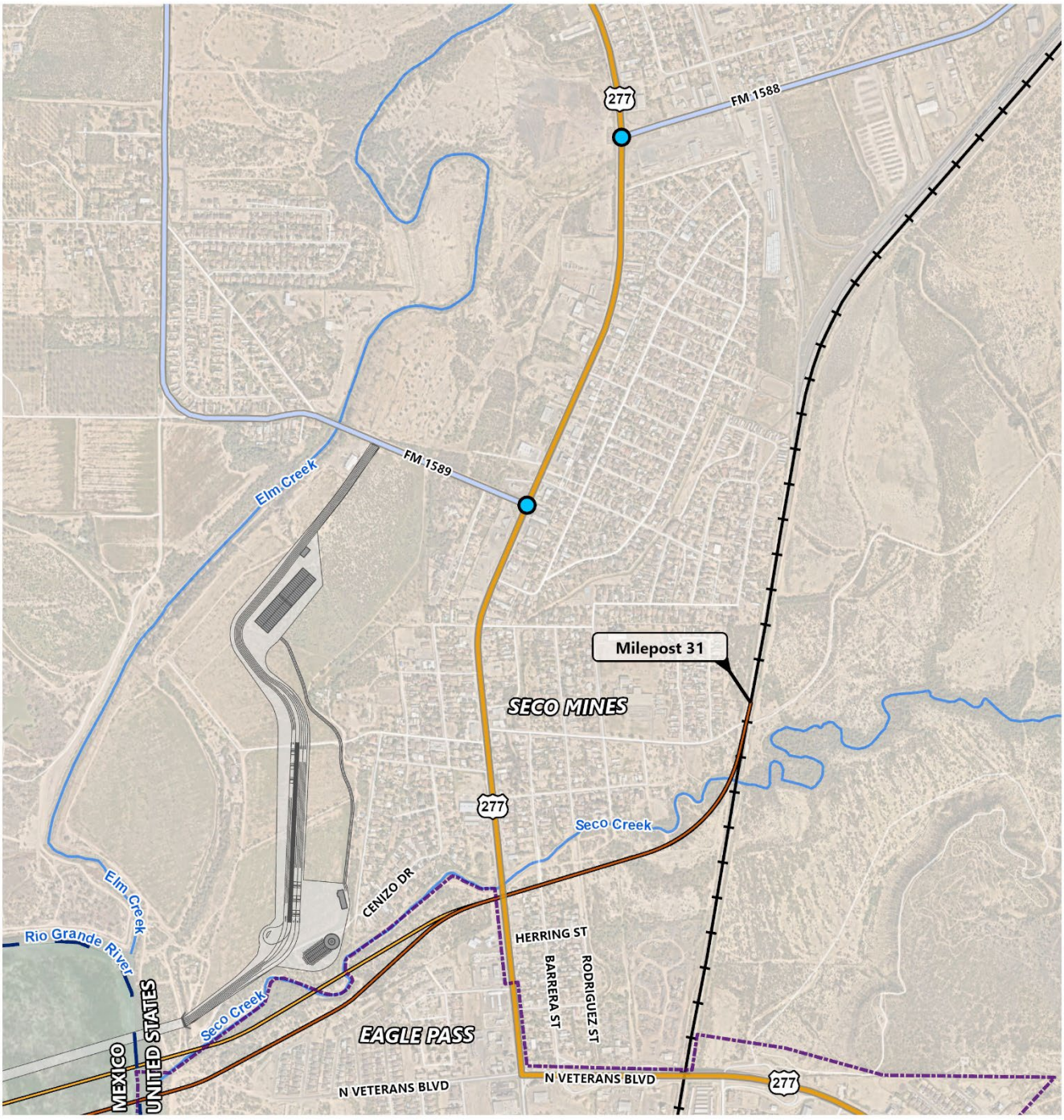
To assess impacts at the FM 1589 and FM 1588 intersections, OEA conducted a capacity analysis that evaluated delay, LOS, and queue length at both intersections. Each simulation was developed with Synchro/SimTraffic Version 11 using industry standard parameters and software settings. All simulation results reported in the evaluation are the average of five modeling runs for each scenario.

Figure 3.4-1. Eagle Pass Roadway Network



Source: ArcGIS Online, NearMap

Figure 3.4-2. Study Intersections



Source: ArcGIS Online, NearMap

LOS is used to describe different operating conditions that occur on a given intersection under various traffic volume loads. LOS is an indicator of travel speed, delay, and freedom to maneuver. LOS ranges from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. LOS is determined for the morning (a.m.) and evening (p.m.) peak hours when there is the most traffic. For both intersections, the peak traffic hours are 7:30-8:30 a.m. and 5:00-6:00 p.m.

LOS is reported differently for signalized (traffic light) and unsignalized (stop sign, or "stop-controlled") intersections. For signalized intersections, the analysis considers the operation of all traffic entering the intersection and the LOS designation is for overall conditions at the intersection. For unsignalized intersections, the analysis assumes that traffic on the main road is not affected by traffic on the side streets. Thus, the LOS designation is for the movement exiting the side street; it is typically the left turn out of the side street. See **Appendix E** for more details on OEA's intersection capacity analysis.

3.4.2 Affected Environment

3.4.2.1 Regional and Local Roads

U.S. 277

U.S. 277 connects Eagle Pass to Laredo to the southeast and Del Rio to the northwest, connecting to points throughout the United States to the north and west. U.S. 277 is a designated truck route (City of Eagle Pass 2022). North of FM 1589, U.S. 277 has a single lane in each direction, whereas between FM 1589 and just south of FM 1588, it expands to two lanes in each direction, with a fifth middle lane for left turns. Approximately one mile south of FM 1589, U.S. 277 splits between a business loop (Del Rio Boulevard) that heads south into downtown Eagle Pass, and a main trunk (N. Veterans Boulevard) that heads east and south.

U.S. 57

U.S. 57 serves as the main route connecting Eagle Pass and San Antonio and is a designated truck route north of 2nd Street (City of Eagle Pass 2022). It stretches for 100 miles northeast to Moore, Texas, before it merges with I-35. In Eagle Pass, east of its intersection with SL 480, U.S. 57 runs in a northeast-southwest direction before continuing east along E. Main Street and then E. Garrison Street, terminating at the Eagle Pass International Bridge 1 (Bridge 1). Near the intersection with SL 480, U.S. 57 is a four-lane highway.

SL 480

SL 480 is a two-lane road that connects to Bridge 2 and from there runs south, parallel to the Rio Grande River before turning to the east, looping around to intersect with U.S. 277 east of downtown Eagle Pass and terminating at U.S. 57 northeast of the city. SL 480 is a designated truck route (City of Eagle Pass 2022). TxDOT plans to extend SL 480 north of U.S. 57 to connect to U.S. 277 north of Eagle Pass. This extension involves constructing approximately 6 miles of new roadway to reach U.S. 277, with an interchange at FM 1588. It also includes widening travel lanes on U.S. 277, FM 1588, and U.S. 57 to add turn lanes and medians at the intersections with the newly constructed SL 480.

3.4.2.2 Study Intersections

U.S. 277 and FM 1589

FM 1589 is a two-lane, east-west loop that terminates at U.S. 277 in locations approximately 1.3 miles apart. The southern intersection of U.S. 277 and FM 1589 is unsignalized (stop sign only). At the southern intersection, U.S. 277 has designated 12-foot travel lanes in each direction, along with a center left-turn lane. The eastbound approach of FM 1589 to the intersection includes a left-turn lane and a 200-foot channelized right-turn lane. This approach is stop-controlled and features a north/south pedestrian crossing.

U.S. 277 and FM 1588

The intersection of U.S. 277 and FM 1588 is signalized (traffic light). U.S. 277's northbound approach to FM 1588 consists of two 12-foot lanes, including a through lane and a through/right-turn lane. The southbound approach has three 12-foot lanes, comprising two through lanes and one left-turn lane; the left-turn lane is exclusively a southbound left-turn lane for 200 feet, with the section prior serving as a center left/right-turn lane. FM 1588 terminates at U.S. 277 with a left-turn lane and a channelized[10] right-turn lane featuring a 200-foot bay. The intersection includes pedestrian crossings across U.S. 277 and FM 1588, and both feature pedestrian-activated walk signal buttons.

These intersections are predominantly used by passenger cars and commercial trucks. OEA assessed 2024 existing LOS at the study intersections as explained in more detail in **Appendix E**. **Table 3.4-1** summarizes the results of the LOS analysis for both study intersections. Overall, both intersections operate at LOS A, whereas the unsignalized intersection at U.S. 277 and FM 1589 operates at LOS B or C depending on the time of day. Delays and LOS for all approaches, as well as queue lengths, are provided in **Appendix E**.

Table 3.4-1. 2024 Level of Service at Study Intersections

	Delay (seconds)	**LOS**
U.S. 277 and FM 1589 (Unsignalized; LOS for FM 1589 Eastbound Movement)[1]		
AM Peak Hour	16.6	C
PM Peak Hour	11.1	B
U.S. 277 and FM 1588 (Signalized; Overall LOS)		
AM Peak Hour	7.7	A
PM Peak Hour	8.2	A

Note:
[1] As noted above, for an unsignalized (stop sign) intersection, the reported LOS is for the movement exiting the side street, in this case turning left from FM 1589 onto U.S. 277.

[10] Channelization means the roadway lane configuration necessary to safely move traffic on and off the highway. It allows motorists to move at different speeds and in potentially conflicting directions without colliding. Channelization is used on high volume highways and at high volume approaches (Oregon Department of Transportation n.d.).

3.4.3 Environmental Consequences

As noted above, operation of the CMV Facility would relocate truck traffic between the United States and Mexico from the existing Camino Real International Bridge (Bridge 2) to the New Road Bridge. The trucks would travel to the same destinations as they do currently, but via different routes.

3.4.3.1 Associated CMV Facility

The associated CMV Facility would cause an increase in truck traffic on FM 1589, FM 1588, and U.S. 277 between FM 1589 and FM 1588 by relocating all international truck traffic from Bridge 2 to the New Road Bridge and the associated CMV Facility. As explained in *Chapter 2, Section 2.3.3.4, Operation of the CMV Facility*, OEA anticipates that in 2031, the associated CMV Facility would process a total of approximately 289,067 inbound trucks and that approximately the same number of outbound trucks would travel through the facility to the New Road Bridge and Mexico.

As explained in **Appendix E**, based on an analysis of monthly CMV crossing data maintained by the City of Eagle Pass and CBP, this would amount to a daily average of 1,512 trucks passing through the associated CMV Facility (756 inbound and 756 outbound). These trucks would travel along the routes described above in *Section 3.4.1, Approach,* increasing traffic volumes at the study intersections when compared to existing conditions and the No-Action Alternative.

To evaluate the effects from this local increase in truck traffic volumes, OEA modeled operations at both study intersections, as detailed in **Appendix E**. **Table 3.4-2** shows the key results of this analysis. Delays and LOS for all approaches, as well as queue lengths, are provided in **Appendix E**.

Table 3.4-2. 2031 Level of Service at Study Intersections with CMV Facility

	Delay (seconds)	**LOS**
U.S. 277 and FM 1589 (Unsignalized; LOS for FM 1589 Eastbound Movement)[1]		
AM Peak Hour	50.2	F
PM Peak Hour	502.2	F
U.S. 277 and FM 1588 (Signalized; Overall LOS)		
AM Peak Hour	9.5	A
PM Peak Hour	10.3	B

Note:
[1] As noted above, for an unsignalized (stop sign) intersection, the reported LOS is for the movement exiting the side street, in this case turning left from FM 1589 onto U.S. 277.

Modeling showed that, while the intersection of U.S. 277 and FM 1588 would continue to operate at an overall LOS A or B, the eastbound movement of the intersection of U.S. 277 and FM 1589 would be LOS F, with very substantial delays. This would be due to trucks waiting to turn left onto U.S. 277. This is a common occurrence at unsignalized intersections where the stop-controlled approach experiences a large increase in traffic volumes and left-turning vehicles must wait for gaps in traffic on the main road (in this case, U.S. 277).

Additionally, construction of the associated CMV Facility would create a new intersection between the facility's exit road and FM 1589. OEA modeled operations at this new intersection. The analysis showed that while all movements at this intersection would operate at LOS A in the morning peak hour, two of the intersection's three movements would be LOS F in the evening peak hours, as shown in **Table 3.4-3**.

Table 3.4-3. 2031 LOS at Intersection of CMV Facility Exit Road and FM 1589

Movement	Delay (seconds)	LOS
AM Peak Hour		
FM 1589, Eastbound	2.9	A
FM 1589, Westbound	7.1	A
CMV Exit Road, Northbound	9.1	A
Overall	**5.2**	**A**
PM Peak Hour		
FM 1589, Eastbound	55.7	F
FM 1589, Westbound	3.9	A
CMV Exit Road, Northbound	258.7	F
Overall	**55.6**	**F**

Note:
[1] As noted above, for an unsignalized (stop sign) intersection, the reported LOS is for the movement exiting the side street, in this case turning left from FM 1589 onto U.S. 277.

Based on coordination with TxDOT, OEA anticipates that, given the adverse effect from the associated CMV Facility on the intersection at U.S. 277 and FM 1589, TxDOT would install a traffic signal to facilitate left turns. Therefore, OEA also modeled the effects of the associated CMV Facility as if the intersection of U.S. 277 with FM 1589 were signalized. The modeling shows that with a traffic signal, the intersection would operate at overall LOS B in both the morning and evening peak hours, with the eastern approach also operating at LOS B. This would have the additional effect of improving operation at the new intersection between the associated CMV Facility's exit road and FM 1589, which would operate at LOS A along all three movements (listed in **Table 3.4-3** above).

Finally, while the relocation of all cross-border truck traffic to the associated CMV Facility would increase traffic volumes on FM 1588 and FM 1589, it would also remove this traffic from the existing routes (which would continue to be used under the No-Action Alternative), particularly the southern segment of SL 480. Because of the location of the associated CMV Facility, trucks would have shorter distances to travel to reach U.S. 277 northbound, U.S. 57 eastbound, or the warehouse area to the east of the city than they do when crossing over Bridge 2. Therefore, there would be a reduction in the number of vehicle-miles traveled, with associated beneficial effects on air quality (see *Section 3.7, Air Quality*).

3.4.3.2 No-Action Alternative

Under the No-Action Alternative, the Board would deny authority for GER to construct and operate the proposed line. The proposed line and the associated CMV Facility would not be constructed. The approximately 289,067 inbound trucks and 289,067 outbound trucks projected to travel between the United States and Mexico in 2031 would continue to use Bridge 2 and the southern segment of SL 480 to reach their ultimate destinations. Other road traffic would increase across the entire road network as a result of local and regional demographic and economic conditions. However, by 2031, TxDOT will have completed work on the SL 480 northern connection between U.S. 57 and U.S. 277. This would increase traffic along FM 1588 and decrease traffic along U.S. 277.

Overall, modeling indicates that under the No-Action Alternative, the two study intersections would operate at the same LOS as, or better than, under existing conditions (see **Table 3.4-4**).

Table 3.4-4. 2031 No-Action Alternative Level of Service at Study Intersections

	Delay (seconds)	LOS
U.S. 277 and FM 1589 (Unsignalized; LOS for FM 1589 Eastbound Movement)[1]		
AM Peak Hour	11.7	B
PM Peak Hour	8.8	A
U.S. 277 and FM 1588 (Signalized; Overall LOS)		
AM Peak Hour	8.0	A
PM Peak Hour	8.2	A

Note:
[1] As noted above, for an unsignalized (stop sign) intersection, the reported LOS is for the movement exiting the side street, in this case turning left from FM 1589 onto U.S. 277.

3.4.4 Conclusion

OEA has determined that operation of the CMV Facility associated with the proposed line would result in the following adverse impacts on roadway capacity before any improvements by TxDOT: the intersection of U.S. 277 and FM 1589 (eastbound movement) would operate at LOS F in both the morning and evening peak hours; and the intersection of the CMV Facility's exit road and FM 1589 (northbound and eastbound) would operate at LOS F in the evening peak hour. However, OEA also determined that after TxDOT installs a traffic signal at the intersection of U.S. 277 and FM 1589, the same intersections would operate at LOS B or better.

3.5 Roadway Safety

OEA analyzed how operation of the associated CMV Facility could affect roadway safety, including potential roadway crashes. This section describes the affected environment and potential environmental consequences on roadway safety that could result from operation of the associated CMV Facility. This section does not address the proposed line (either the Southern Rail Alternative or the Northern Rail Alternative) because it does not have the potential to affect roadway safety.

3.5.1 Approach

This subsection describes the approach OEA used to analyze effects on public roadway safety. The analysis focuses on the potential for roadway crashes. Roadway crashes are events that involve one or more vehicles, pedestrians, and/or bicyclists and can result in damages, injuries, or fatalities when they occur. Statewide, there were 559,329 roadway crashes reported in 2023 in Texas, of which 3,867 involved at least one fatality. In Maverick County, there were 1,009 total crashes in 2023 and nine of those crashes involved at least one fatality (TxDOT 2023b). Pedestrian and bicycle crashes accounted for 8,516 of the total statewide crashes in 2023 and 903 of these crashes involved at least one fatality (TxDOT 2023c). Commercial vehicles (CMVs) were involved in 38,909 of the total crashes statewide in 2023, including 549 crashes that involved at least one fatality (TxDOT 2023a). Of the statewide total CMV crashes in 2023, 65 occurred in Maverick County and five of those crashes involved at least one fatality.

To assess roadway safety impacts in this Draft EIS, OEA followed the procedures laid out in the American Association of State Highway and Transportation Officials (AASHTO) Highway Safety Manual (HSM) to estimate the safety performance of road segments and intersections (FHWA 2010). The HSM presents the leading industry standard for quantitative safety analysis. FHWA has endorsed the HSM as a resource for performing predictive analyses related to roadway safety.

OEA's study area for roadway safety analysis consists of the four intersections and two road segments shown in **Figure 3.5-1** and listed in **Table 3.5-1**.

Table 3.5-1. Roadway Safety Analysis Intersections and Road Segments

ID	Intersection/Road Segment	Type
1	U.S. 277 at FM 1589	3-Leg Minor Road Stop-Controlled Intersections
2	U.S. 277 at Juanita Drive	
3	U.S. 277 at Rivera Drive	
4	U.S. 277 at FM 1588	3-Leg Signalized Intersection
5	U.S. 277 between Juanita Drive and Rivera Drive	5-Lane Urban Arterial (Road Segment)
6	U.S. 277 between Rivera Drive and FM 1588	

OEA estimated predicted crash frequency under 2024 existing conditions and 2031 conditions at intersections and road segments in the study area using the predictive methodology described in the HSM for TxDOT. **Appendix F** provides a step-by-step description of this methodology. The data used for the analysis included observed crash history from 2017 through 2023, various geometric and operational road characteristics, and AADT at each intersection and segment in the study area.[11] OEA used recent AADT data for existing conditions and projected AADT for 2031 conditions.

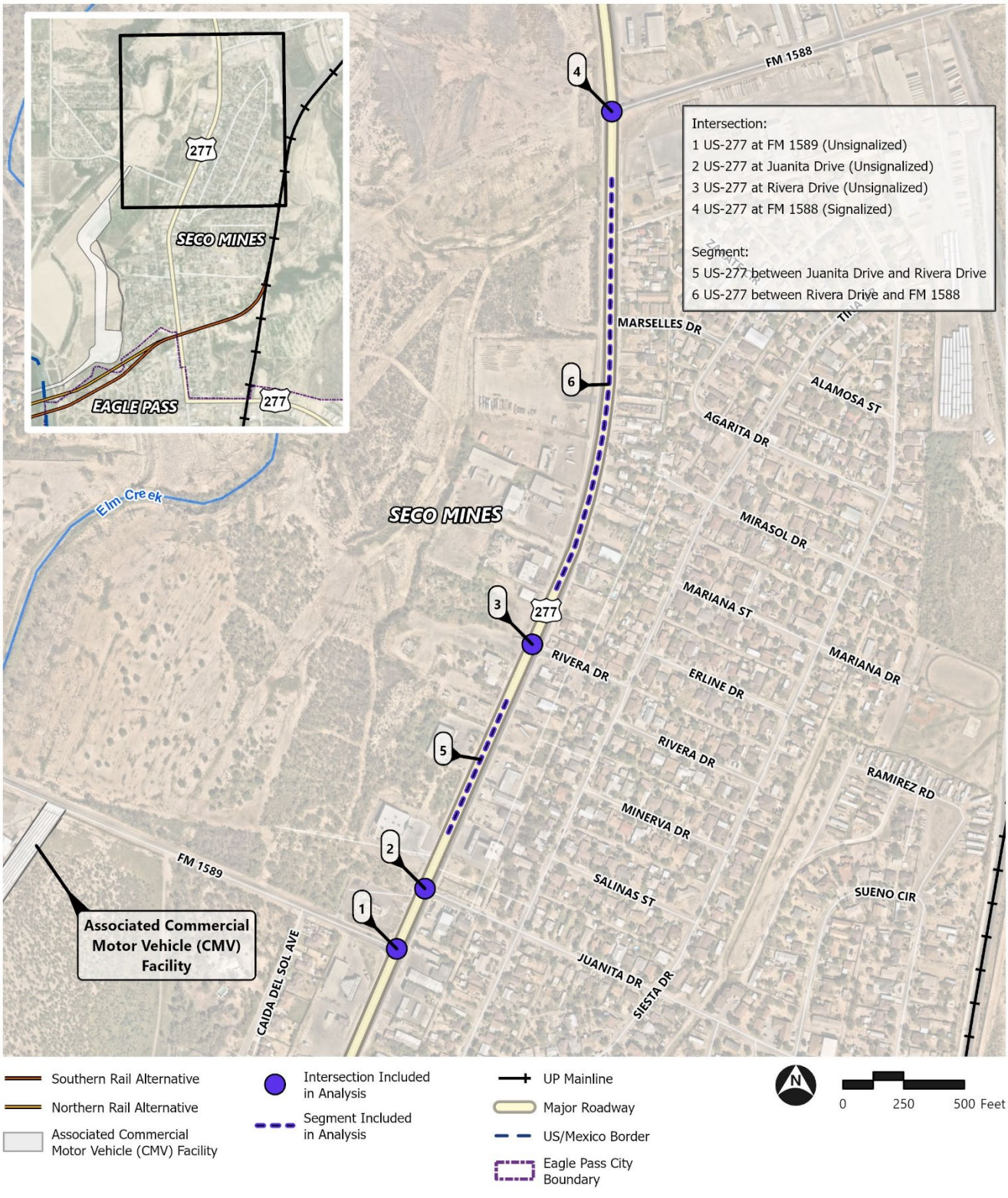
3.5.2 Affected Environment

Table 3.5-2 shows observed roadway crashes in the study area over the 2017 to 2023 period. OEA found that, according to TxDOT's Crash Records Information System (CRIS), a total of 75 crashes occurred in the study area between 2017 and 2023, most of which involved multiple vehicles (TxDOT 2024a). Altogether, the data indicate an observed average crash frequency of 10.7 crashes per year.

Table 3.5-3 shows 2024 AADT in the study area. The 2024 AADTs range from 1,244 to 23,437 vehicles per day. Based on these data, applying the methodology described in **Appendix F**, the total expected crash frequency under existing 2024 conditions is 10.3 in the study area, with the highest average expected crash frequency (3.2 crashes per year) at Intersection ID 4 (U.S. 277 and FM 1588) and the lowest average expected crash frequency (0.9 crashes per year) at Intersection ID 1 (U.S. 277 and FM 1589).

[11] The HSM recommends at least three to five years of observed crash data for analysis; however, due to the COVID-19 global pandemic and its impacts on traffic volumes, crash frequency, and user behavior, OEA opted to extend the study period to include three full years prior to the pandemic, for a total of seven complete calendar years of crash data.

Figure 3.5-1. Study Area Intersection and Segment Locations



Source: ArcGIS Online, NearMap

Table 3.5-2. Observed Roadway Crashes in Study Area (2017-2023)

ID	Intersection/Road Segment	Total Observed Crashes	Crashes per Year
1	U.S. 277 at FM 1589	9	1.28
2	U.S. 277 at Juanita Drive	11	1.57
3	U.S. 277 at Rivera Drive	12	1.71
4	U.S. 277 at FM 1588	26	3.71
5	U.S. 277 between Juanita Drive and Rivera Drive	4	0.57
6	U.S. 277 between Rivera Drive and FM 1588	13	1.86
Total		**75**	**10.7**

Table 3.5-3. 2024 AADT in Study Area

ID	Intersection Approach	AADT (vehicles/day)
1	U.S. 277	23,437
	FM 1589	3,300
2	U.S. 277	17,627
	Juanita Drive	2,107
3	U.S. 277	17,627
	Rivera Drive	1,244
4	U.S. 277	17,627
	FM 1588	4,869
5	-	17,627
6	-	17,627

3.5.3 Environmental Consequences

3.5.3.1 Associated CMV Facility

As explained in *Section 3.4, Roadway Capacity*, operation of the associated CMV Facility, although it would not in itself generate new truck traffic, would result in a change in truck traffic within the study area. The relocation of international truck traffic from the Camino Real International Bridge (Bridge 2) to the New Road Bridge would increase truck traffic on FM 1589, FM 1588, and U.S. 277.

Table 3.5-4 shows projected AADT in the study area in 2031 with the associated CMV Facility in operation. AADT for the year 2031 under the No-Action Alternative is provided for comparison.

Table 3.5-4. 2031 AADT in Study Area

ID	Intersection Approach	AADT with Associated CMV Facility (vehicles/day)	AADT Without Associated CMV Facility (vehicles/day)
1	U.S. 277	16,201	16,201
	FM 1589	5,529	3,675
2	U.S. 277	14,674	12,820
	Juanita Drive	2,347	2,347

ID	Intersection Approach	AADT with Associated CMV Facility (vehicles/day)	AADT Without Associated CMV Facility (vehicles/day)
3	U.S. 277	14,674	12,820
	Rivera Drive	1,386	1,386
4	U.S. 277	14,674	12,820
	FM 1588	7,059	5,427
5	-	14,674	12,820
6	-	14,674	12,820

In 2031, within the study area, traffic volumes would increase at all four intersections and along both road segments when compared to the No-Action Alternative. These increases would affect the potential for crashes. Using the methodology described in **Appendix F**, OEA estimated that the average expected crash frequency would increase from 7.8 crashes per year under the No-Action Alternative to 9.2 crashes per year with the associated CMV Facility in operation (**Table 3.5-5**).

Table 3.5-5. 2031 Expected Crashes per Year

ID	Intersection/Segment	Crash Frequency with Associated CMV Facility (crashes/year)	Crash Frequency Without Associated CMV Facility (crashes/year)
1	U.S. 277 at FM 1589	0.749	0.635
2	U.S. 277 at Juanita Drive	1.261	1.096
3	U.S. 277 at Rivera Drive	1.222	1.061
4	U.S. 277 at FM 1588	2.974	2.410
5	U.S. 277 between Juanita Drive and Rivera Drive	0.790	0.700
6	U.S. 277 between Rivera Drive and FM 1588	2.160	1.912
Total		**9.156**	**7.814**

The associated CMV Facility would result in an additional 1.35 crashes per year in the study area compared to the No-Action Alternative. The highest average expected crash frequency would be at Intersection ID 4 (U.S. 277 at FM 1588), with approximately 3.0 crashes per year. This would be an increase of 0.6 crashes compared to the No-Action Alternative. The lowest average expected crash frequency would be at Intersection ID 1 (U.S. 277 at FM 1589), with 0.7 crashes per year, representing an increase of 0.1 crashes compared to the No-Action Alternative.

3.5.3.2 No-Action Alternative

Under the No-Action Alternative, the Board would deny authority for GER to construct and operate the proposed line. The proposed line and the associated CMV Facility would not be constructed. Trucks traveling between the United States and Mexico would continue to use Bridge 2 and follow the current routes to their destinations. Other road traffic would increase across the entire road network as a result of local and regional demographic and economic conditions. However, by 2031, TxDOT is expected to have completed work on SL 480 (see *Section 3.4, Roadway Capacity*). This would remove traffic from U.S. 277 in the study area. Overall, AADT would decrease compared to existing conditions and expected crash frequency across the study area would decrease from an average of 10 crashes per year to

eight crashes per year. This would be two fewer crashes per year in the study area compared to existing conditions. The highest average expected crash frequency would be at Intersection ID 4 (U.S. 277 at FM 1588), with 2.4 crashes per year. This would be a reduction of 0.8 crashes compared to existing conditions. The lowest average expected crash frequency would be at Intersection ID 1 (U.S. 277 at FM 1589), with 0.6 crashes per year, which is a reduction of 0.2 crashes per year compared to existing conditions.

3.5.4 Conclusion

OEA has determined that operation of the CMV Facility associated with the Southern Rail Alternative and the Northern Rail Alternative would result in the following adverse impacts on roadway safety: compared to the No-Action Alternative, there would be an increase in the number of expected crashes per year (1.35 more crashes than under the No-Action Alternative in the entire study area), with the greatest increase at the intersection of U.S. 277 and FM 1588 (0.6 crashes per year).

OEA also determined that even so, the number of expected crashes per year would be less than under existing conditions because of the reduction in traffic volumes along U.S. 277 that would result from TxDOT's anticipated completion of SL 480 by 2031.

3.6 Noise and Vibration

OEA analyzed how construction and operation of the proposed line (both the Southern and Northern Rail Alternatives) and the associated CMV Facility could affect noise and vibration. Noise includes unwanted sound, and vibration includes potential disturbance and building damage. This section describes the affected environment and potential environmental consequences on noise and vibration that could result from the Southern and Northern Rail Alternatives, the associated CMV Facility, and the No-Action Alternative.

3.6.1 Approach

This subsection describes the approach OEA used to analyze effects on noise and vibration. **Appendix G** details well-established methods OEA used, as well as the applicable regulations, statutes, and guidelines that OEA followed.

OEA defined the study area for the noise and vibration analysis to be the area within approximately one-quarter mile to either side of the proposed line. Based on prior environmental reviews for rail construction activities, OEA determined that this study area distance is sufficient to identify potential noise and vibration impacts from the operation of the Southern or Northern Rail Alternative and the associated CMV Facility.

The study area also includes approximately one-half mile on either side of the existing UP mainline where trains would no longer regularly operate under the Southern or Northern Rail Alternative. The larger study area was used to determine the benefits, such as the number of receptors with reduced noise levels, that would result from eliminating locomotive horn soundings on that portion of the UP mainline.

3.6.1.1 Noise

When describing noise conditions, OEA used the following definitions:

A-weighted decibels (dBA): A measure of noise used to compare noise levels from various sources. A-weighting approximates the frequency response of human hearing.

Day-night average noise level (DNL): The energy-average of dBA sound levels over a 24-hour period. This includes a 10-decibel adjustment factor for noise between 10 p.m. and 7 a.m. to account for the greater sensitivity of most people to noise during the night, when ambient noise is typically lower. The nighttime adjustment effectively makes one nighttime event, such as a train passing by, equivalent to 10 similar events during the daytime.

Ambient noise: The sum of all noise from human and naturally occurring sources at a specific location over a specific time.

L_{eq}: The energy-average sound level. L_{eq} is a single value that is equivalent in sound energy to the fluctuating levels over a period. L_{eq} accounts for how loud noise events are, how long they last, and how many of them occur.

The Board's regulations for noise analysis (49 C.F.R. § 1105.7(e)(6)) include the following thresholds:

- An increase in noise exposure as measured by a DNL of 3 dBA or more;
- An increase to 65 DNL or greater.

If the estimated noise level increase at a location within the study area was either met or exceeded, OEA estimated the number of affected receptors (*e.g.*, schools, libraries, residences, retirement communities, and nursing homes) and estimated the increase in noise levels. OEA evaluated the Board's two thresholds (3 dBA increase, 65 DNL) separately to determine an upper limit of potential noise impact. However, research indicates that both thresholds must be met to cause an adverse noise impact (Coate 1999; STB 1998a). That is, noise levels would have to be greater than or equal to 65 DNL and increase by 3 dBA or more for an adverse noise impact to occur.[12] To further characterize the noise impacts, OEA followed Federal Transit Administration (FTA) impact guidance, which labels noise impacts as either "severe" or "moderate" (FTA 2018). OEA further determined that the FTA impact guidance should be used to determine which receptors warrant noise mitigation. OEA has sometimes used other approaches to determine when to recommend noise mitigation. However, given OEA's most recent precedent and the fact that the FTA impact guidance is used by other federal rail-related agencies, OEA applied the FTA "severe" and "moderate" labels to determine which receptors warrant noise mitigation for the build alternatives.

"Noise" is considered unwanted sound. Human perception of and response to a new noise source is based in part on how loud it is compared to existing/ambient noise levels. **Figure 3.6-1** shows typical community noise levels expressed in terms of DNL.

Noise from train operations is typically comprised of two components: wayside noise and horn noise. Wayside noise is generated by the operation of the train including the locomotive engine and wheel/rail sound. Horn noise is the sound of locomotive warning horns which are sounded at public at-grade crossings.

In accordance with 49 C.F.R. Parts 222 and 229, FRA requires locomotive engineers to sound their train horns at public roadway/rail at-grade crossings. FRA regulations require train engineers to sound their

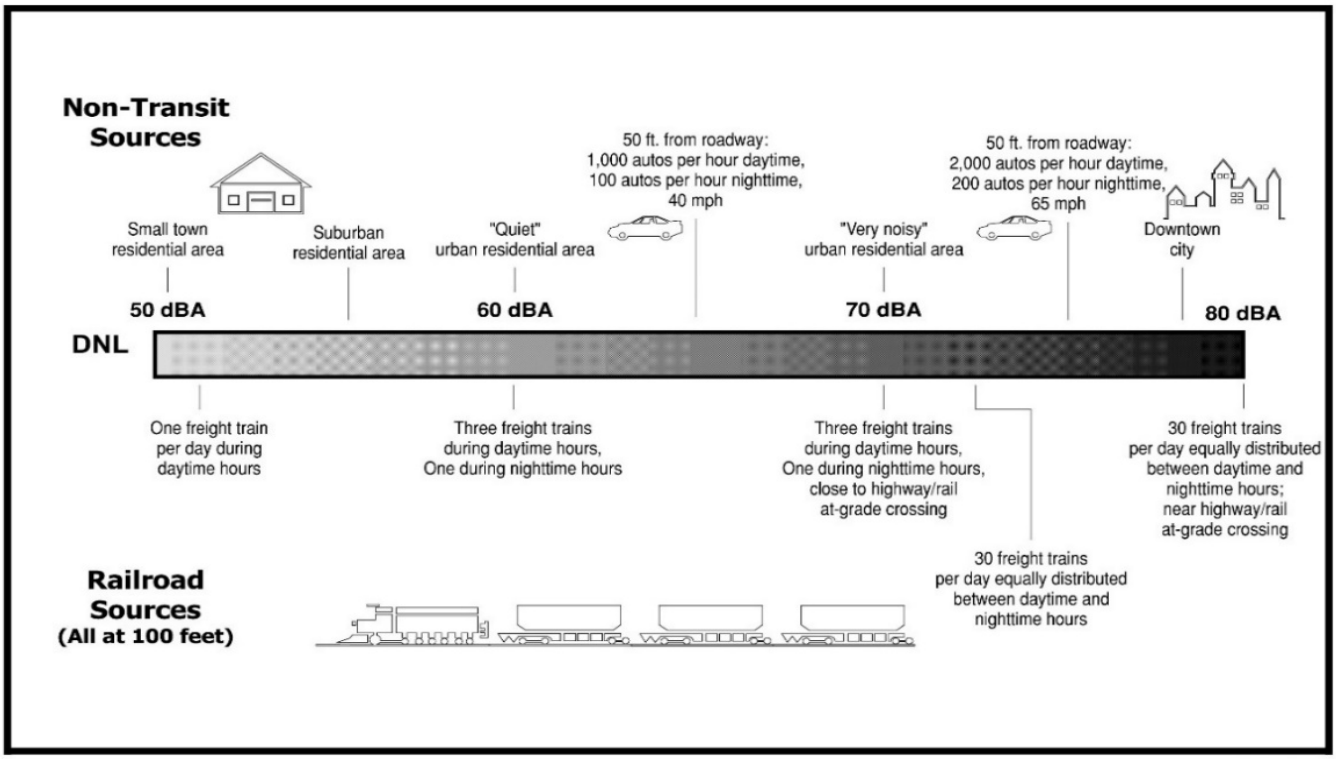
[12] Although the Board's regulations at 49 C.F.R. § 1105.7(e)(6) indicate that either an increase of 3 dBA or an increase to 65 dBA DNL would be an adverse impact, research indicates that both conditions must be met or exceeded for an adverse noise impact from rail operations to occur (Coate 1999; STB 1998).

horn for 15 to 20 seconds (not to exceed 25 seconds), using a long-long-short-long sounding pattern. Engineers may not sound the horn farther than a quarter of a mile from the crossing and must continue until the first locomotive has passed through the crossing. The horns must generate a sound level between 96 and 110 dBA (L_{max}) at a distance of 100 feet in front of the locomotive.[13] Although train horns are sounded for a relatively short time compared to the two minutes or more that it often takes for an entire freight train to pass by, horns generate substantially higher noise levels than wayside noise, so DNL values are generally higher at at-grade crossings than at wayside locations.

Federal Transit Administration "None," "Moderate," and "Severe" Impact Ranges

After applying the Board's noise thresholds for analysis (3 dBA increase, 65 DNL), OEA applied the FTA classifications of "none," "moderate," and "severe" impacts. Moderate impacts serve as an alert to project planners for potential adverse impacts and complaints from the community. Project-generated noise in the severe range is likely to cause a high level of community annoyance (FTA 2018).

Figure 3.6-1. Typical Noise Levels for Residential Areas



Source: EPA 1974

3.6.1.2 Vibration

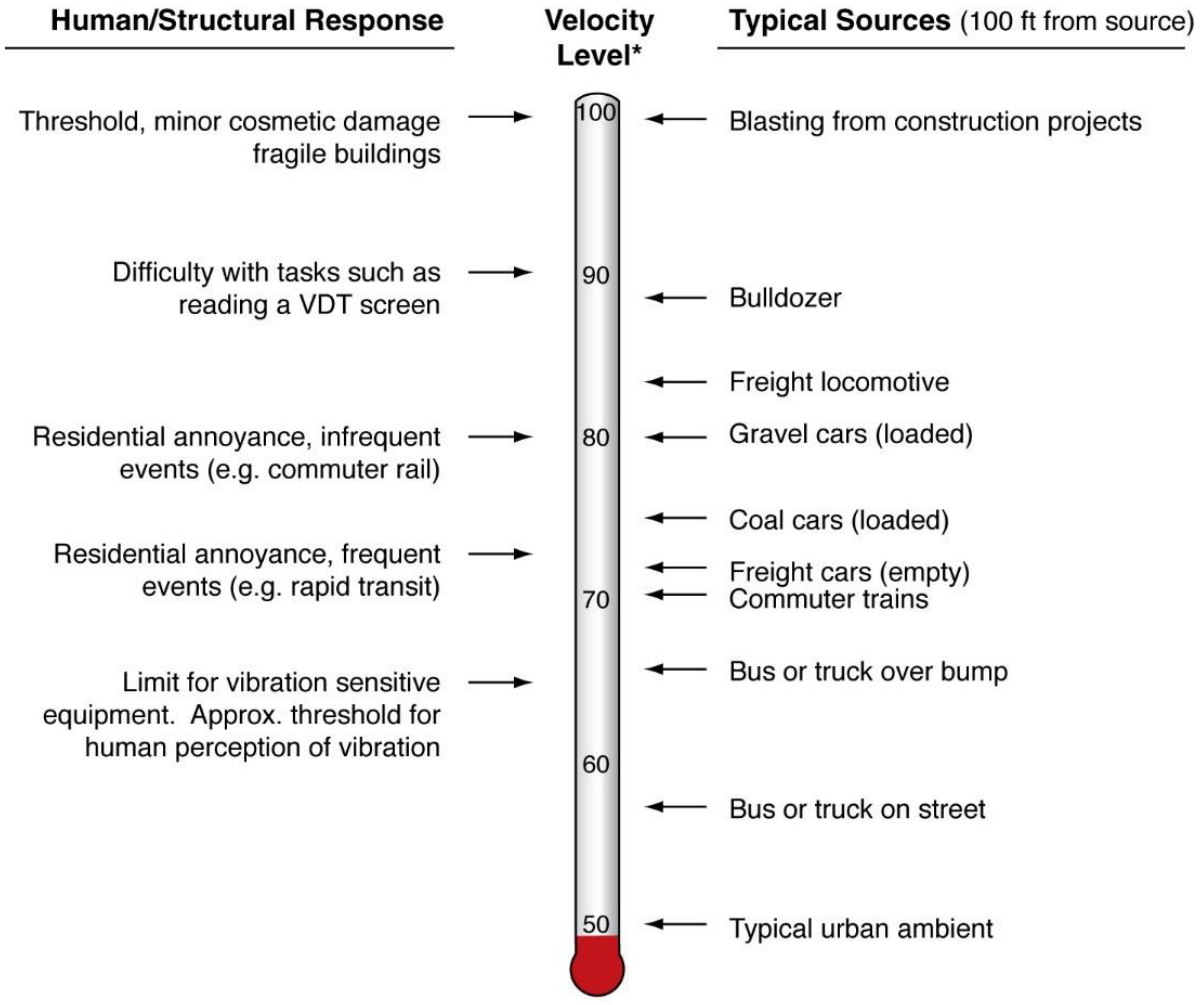
Ground-borne vibration is the oscillatory motion of the ground around an equilibrium position. Vibration can be a concern because it can annoy people and, if vibration levels are high enough, damage buildings and other structures. When evaluating annoyance, vibration is measured in terms of decibels with "VdB" used in place of dB to avoid confusing vibration decibels with sound decibels. With respect to annoyance, vibration as well as noise is generally evaluated for receptors because vibration can annoy people inside buildings such as schools, residences, libraries, nursing homes, hospitals, and places of

[13] L_{max} is the highest sound level measured during a single noise event.

worship. When evaluating potential damage to structures, vibration is measured in terms of the peak-particle velocity (PPV) in inches per second. Building damage thresholds are much higher than human annoyance thresholds. **Figure 3.6-2** illustrates typical human responses to vibration thresholds and levels from a range of typical sources.

Although federal regulations do not set thresholds for ground-borne vibration from train operations, FTA's *Transit Noise and Vibration Impact Assessment Manual* provides guidance on evaluating and assessing potential adverse vibration effects. Consistent with past cases, OEA used this manual as a guide in its vibration analysis (FTA 2018).

Figure 3.6-2. Typical Ground-Borne Vibration Levels



Source: FTA 2018

3.6.2 Affected Environment

OEA characterized the affected environment in the vicinity of the Southern and Northern Rail Alternatives as suburban residential. Existing noise sources include vehicular traffic on local roads and general human activity. Existing noise levels in the study area were computed as described in

Appendix G. **Figure 3.6-3** shows the existing ambient DNL contours (and receptors) in the study area. Existing noise levels in the vicinity of the associated CMV Facility are similar since population density and distances to roadways are similar.

The affected environment in the vicinity of the existing UP mainline would be characterized as urban/suburban. Existing noise sources include locomotive horn sounding at public at-grade crossings, wheel/rail interaction, vehicular traffic and general human activity. Existing noise levels in this area were computed as described in **Appendix G**. **Figure 3.6-4** shows the large population areas currently experiencing relatively high levels of wayside and locomotive horn noise from the 65 DNL contours along the existing UP mainline and U.S. 277.

Depending on the location and proximity to the UP mainline, existing noise levels are in the "suburban residential" to "very noisy urban residential" range of categories shown in **Figure 3.6-1** above.

3.6.3 Environmental Consequences

3.6.3.1 Southern Rail Alternative

Construction Noise

During the approximately 1.5-year construction period projected for the Southern Rail Alternative, noise levels and vibration would increase temporarily as a result of increased truck traffic and heavy equipment use. OEA anticipates that noise and vibration generated during construction of the proposed line would have minimal, if any, impacts to adjacent land uses. **Table 3.6-1** shows typical construction equipment noise levels and utilization factors (percentage of time used).

Table 3.6-1. Typical Construction Noise Levels

Equipment	Maximum Noise Level at 50 feet (L_{max}, dBA)	Utilization Factor (%)	Energy-Average Noise Level at 50 feet (L_{eq}, dBA)
Compactor	82	20	75
Crane	83	16	75
Dump Trucks	76	40	72
Front End Loaders	80	40	76
Road Grader	85	40	81
Rail Tamper	83	40	79
Rail Tensor/Stressor	82	50	79
Thermite Welder	74	40	70

Rail Operations Noise

To evaluate impacts from wayside noise from rail operations along the Southern Rail Alternative, OEA used Computer Aided Noise Abatement (CADNA) software to model the 65 DNL noise contours within the study area. Several thousand elevation ground points were input into the model as well as planned elevations for the embankment structure for the proposed line. Buildings were modeled to account for building shielding where rows of buildings function as noise barriers to block sound to a certain extent.

Figure 3.6-3. Study Area Existing Ambient Noise (DNL, dBA)

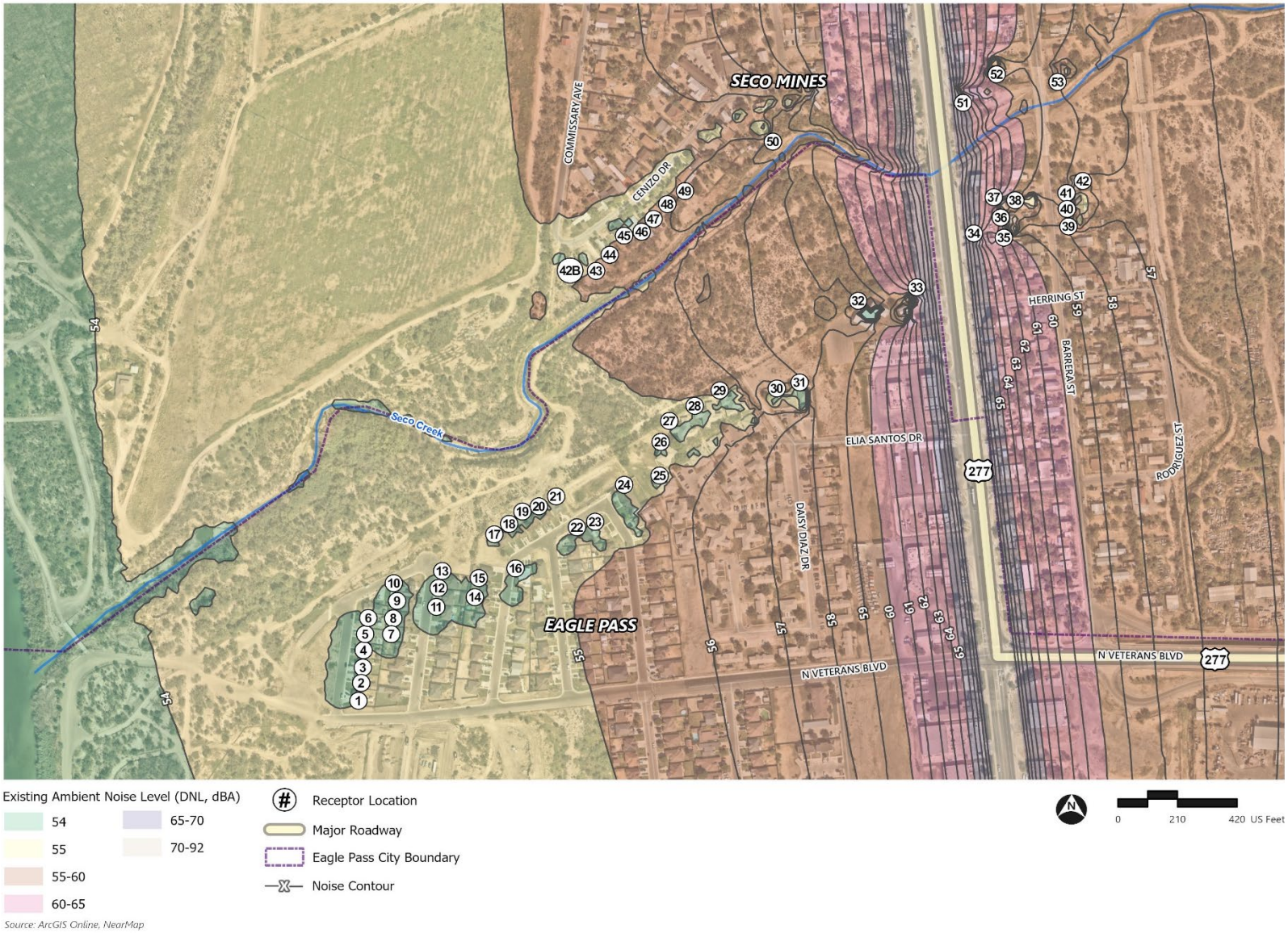
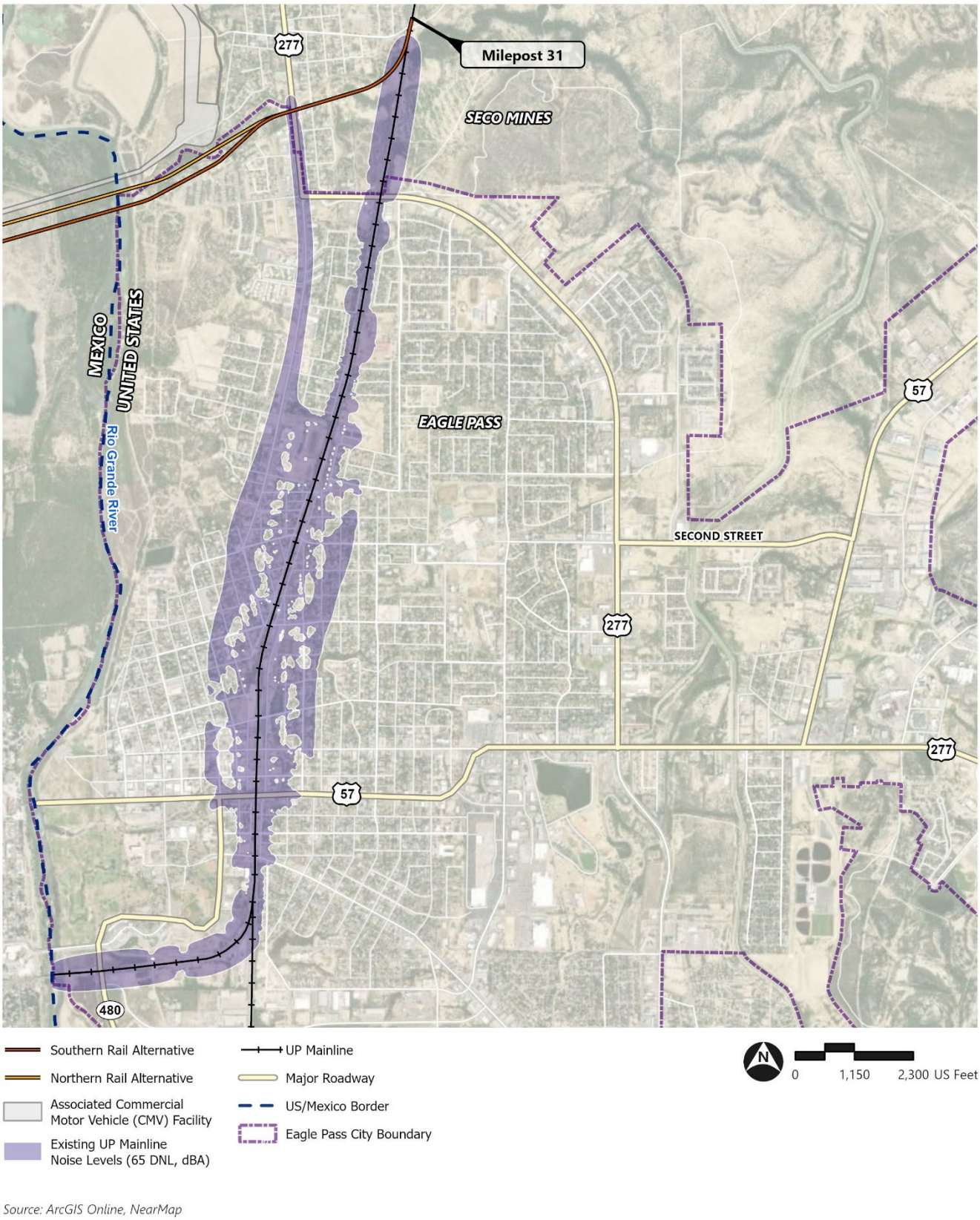


Figure 3.6-4. Existing UP Mainline Noise Contour



Source: ArcGIS Online, NearMap

The analysis used train operational information from GER, including locomotive length, rail car length, and overall train consist length.[14] Train consists operated by GER would be comprised of two 75-foot-long locomotives and 150 61-foot-long rail cars for an overall train length of 9,300 feet. OEA estimates that trains would operate at an average speed of 15 miles per hour (mph). Based on GER's forecasts, an average of 19 train passbys per day (per 24-hour period) would occur.

For the Southern Rail Alternative, GER stated that it intends to install 20-foot-high noise barriers on both sides of the tracks between the non-intrusive inspection (NII) facility and the western end of the Stormwater Channel Bridge (see *Chapter 2, Figure 2-3*), except on the Barrera Street Bridge and the U.S. 277 Bridge. GER stated that a comprehensive review and structural analysis indicated that installing noise barriers on the bridges would present significant challenges (Oct. 17, 2024, letter to OEA). OEA requested that GER provide information supporting this statement. In a letter to OEA dated October 30, 2024, GER provided a preliminary assessment to support its position on noise barriers on bridges. GER also stated that such noise barriers would need to be 23 feet high to ensure structural stability and appropriate clearances, increasing the challenge of constructing noise barriers across the bridges.

OEA then performed further noise analysis and determined that gaps in the noise barriers on the two bridges would cause severe noise impacts to three receptors in the vicinity of the Barrera Street Bridge from operation of the Southern Rail Alternative: Receptors 38, 41, and 42. The location of these receptors is shown on **Figure 3.6-5**.

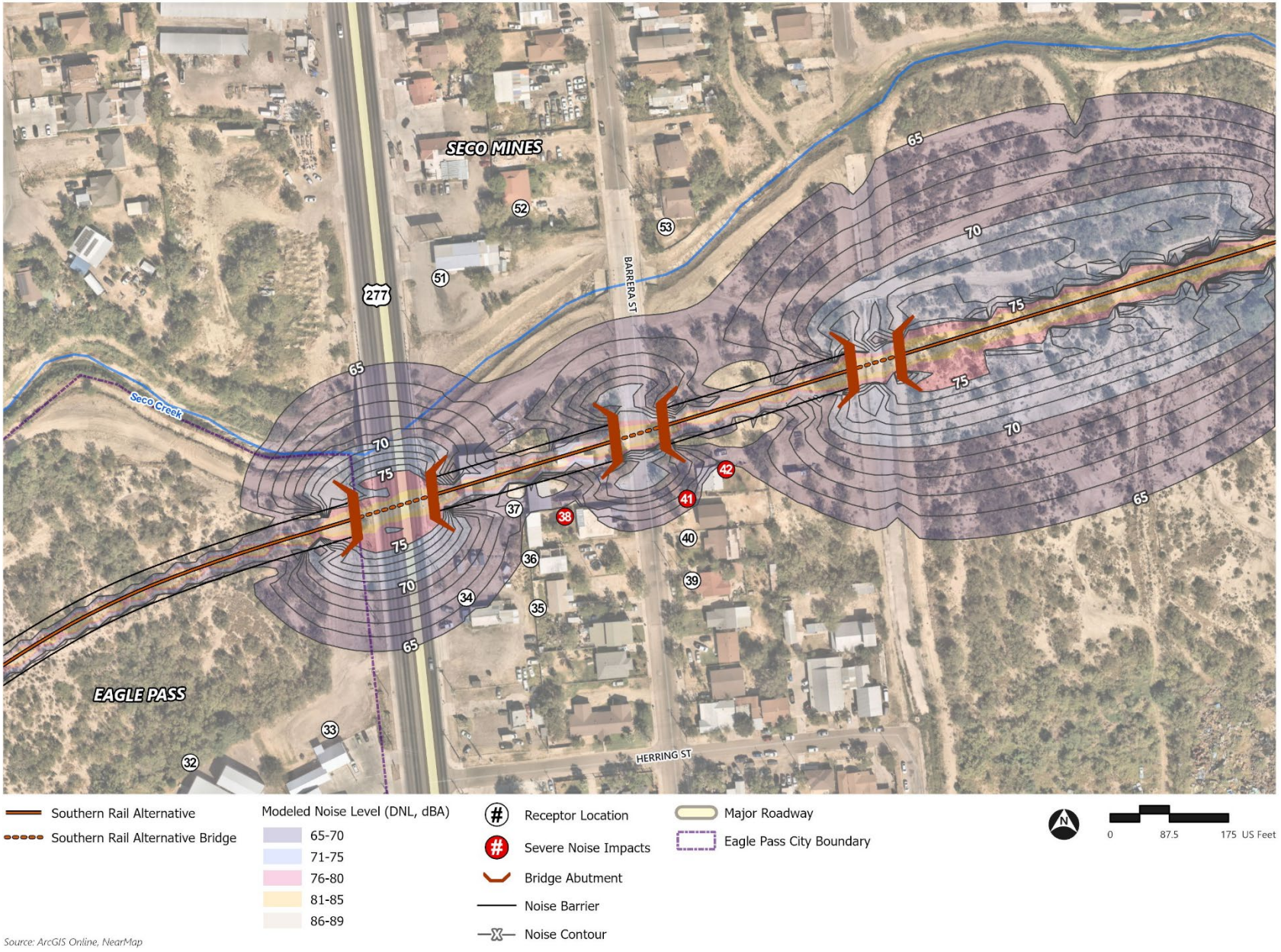
As explained in more detail in *Section G.5.2.2* of **Appendix G**, OEA thoroughly reviewed the information provided by GER and found that GER's preliminary assessment did not adequately support GER's concern about installing noise barriers on bridges. **Appendix G** discusses the acoustical specifications (length, height, sound absorption materials, barrier mass, etc.) applicable to the noise barriers that GER intends to install. OEA determined that noise barriers that adequately meet these specifications could feasibly and reasonably be installed across the bridges as well as along the rest of the proposed line. As explained in **Appendix G**, several companies manufacture noise barriers that have been successfully installed and used on rail and roadway bridges in numerous locations.

Given the above considerations and the severe noise impacts to three receptors that would result without noise barriers on the bridges, OEA preliminarily recommends mitigation requiring GER to install noise barriers on both sides of the proposed U.S. 277 and Barrera Street Bridges (**MM-Noise-01a**). OEA specifically requests comments on this issue. With fully extended noise barriers, no receptors would be included within the 65 DNL contour along the Southern Rail Alternative. Therefore, there would be no severe noise impacts. Further detail is provided in **Appendix G**.

Under the Southern Rail Alternative, UP and BNSF would no longer run through trains on the UP mainline south of milepost 31 (including over the UP Rail Bridge). The Southern Rail Alternative, therefore, would eliminate rail traffic in downtown Eagle Pass, except for an occasional local train. The shift to the Southern Rail Alternative would eliminate train horn and wayside noise in that densely populated area.

[14] "Train consist" refers to the length of a train including all locomotives and railcars.

Figure 3.6-5. Southern Rail Alternative Noise Contour with GER's Proposed Noise Barrier Design



OEA performed an analysis to determine how many receptors would experience noise reductions and by how much. First, OEA used CADNA to model noise levels along the UP mainline without any rail traffic on the line. This provided a baseline for comparison. Then, OEA determined the area within which wayside and horn noise from rail traffic on the UP mainline causes noise levels at least 5 dBA greater than the baseline noise. This area, shown in **Figure 3.6-6**, encompasses the receptors that would benefit from the elimination of rail traffic on the UP mainline. The computation methods are discussed in **Appendix G**.

There are 2,377 receptors in the noise reduction benefit area shown in **Figure 3.6-6**. Using CADNA, OEA determined that of these 2,377 receptors, 1,980 currently experience the equivalent of an FTA "severe" impact from existing rail operations on the UP mainline compared to what noise levels would be without these operations. With the elimination of rail operations on the UP mainline, the severe impacts to these 1,980 receptors would end.

Construction Vibration

Construction activities would generate ground-borne vibration. Pile driving for bridge construction could be the primary source of temporary construction vibration. Such vibration would be temporary and is not expected to cause structural damage to buildings, nor lasting and substantial annoyance.

Rail Operations Vibration

Vibration caused by passing trains is generally not high enough to cause damage to even the most susceptible buildings. From the Southern Rail Alternative, the calculated distance to the building damage vibration level is 5 feet from the tracks. There are no buildings located within 5 feet from the Southern Rail Alternative, so no building damage from vibration is anticipated. **Appendix G** provides further details on the vibration analysis methodology.

OEA also examined the potential for vibration annoyance impacts. The 80 VdB (human annoyance) vibration contour line would be 25 feet from the Southern Rail Alternative. No residences are located within this distance. Therefore, no adverse vibration annoyance impacts are anticipated.

3.6.3.2 Northern Rail Alternative

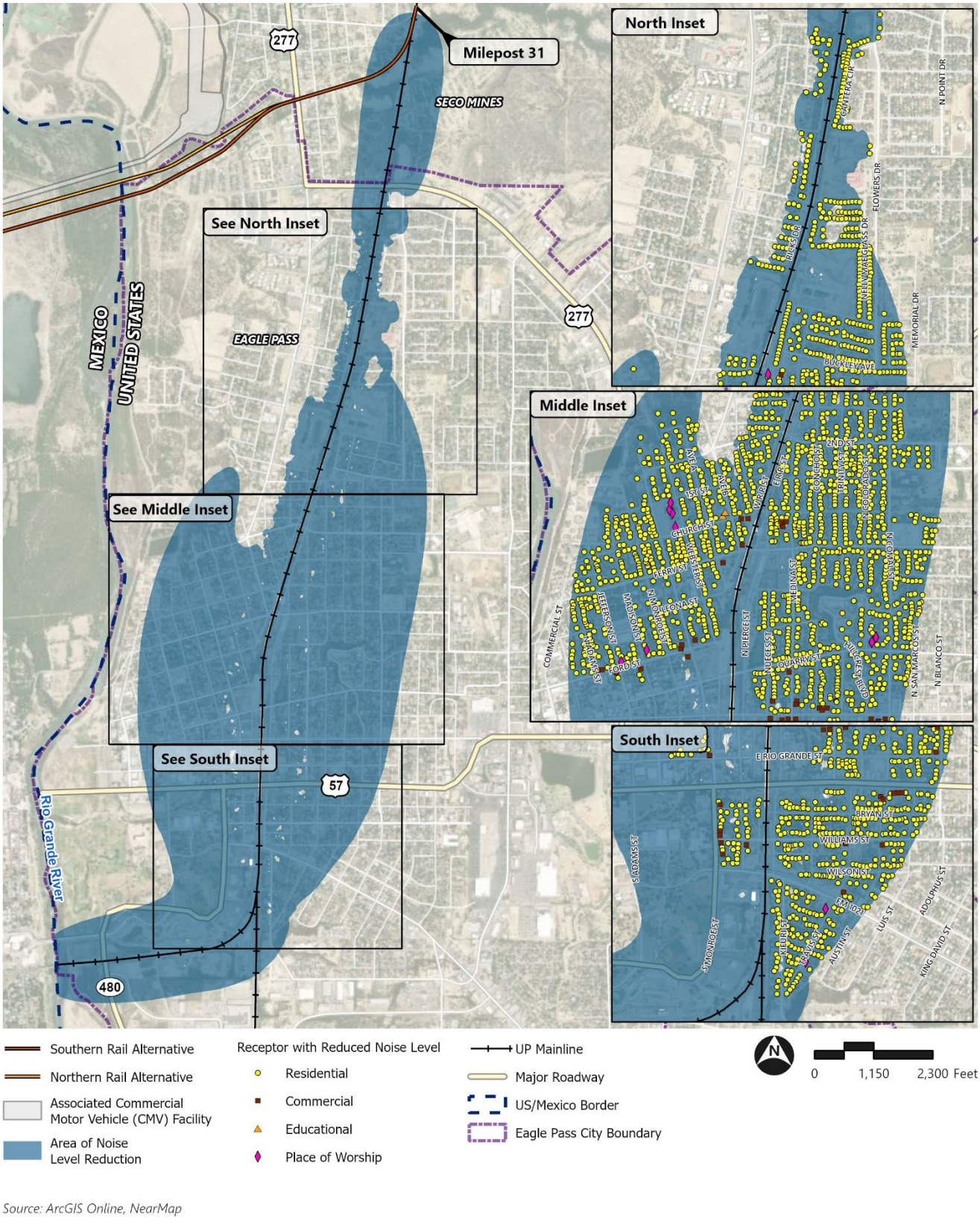
Construction Noise

OEA anticipates that the noise impacts resulting from construction of the Northern Rail Alternative would be the same as described above for the Southern Rail Alternative.

Rail Operations Noise

The train consist composition, speed, and number of passbys per day for the Northern Rail Alternative would be the same as that of the Southern Rail Alternative. OEA evaluated the impacts of the Northern Rail Alternative using the same methodology as used for the impacts of the Southern Rail Alternative.

Figure 3.6-6. UP Mainline Noise Contour Reduction and Benefited Receptors



Source: ArcGIS Online, NearMap

For the Northern Rail Alternative, similar to the Southern Rail Alternative, GER stated that it intends to install 20-foot-high noise barriers on both sides of the tracks between the NII facility and the Stormwater Channel Bridge (see *Chapter 2, Figure 2-4*), but raised concerns about installing barriers on the Barrera Street Bridge, the U.S. 277 Bridge, and the New Rail Bridge.[15] GER's justification for not having noise barriers on the bridges was the same as for the Southern Rail Alternative.

OEA's noise impact analysis determined that the lack of noise barriers on the three bridges would cause severe noise impacts from operation of the Northern Rail Alternative to nine receptors in the vicinity of the New Rail Bridge (Receptors 5, 6, 10, 13, 17, 18, 19, 20, and 21) and to three receptors in the vicinity of the Barrera Street Bridge (Receptors 38, 41, and 42). The affected receptors are shown on **Figure 3.6-7**.

As explained above for the Southern Rail Alternative, OEA thoroughly reviewed the information provided by GER and found that GER's preliminary assessment did not adequately support its concerns about installing noise barriers on bridges. Therefore, OEA preliminarily recommends mitigation requiring GER to install noise barriers on both sides of the proposed U.S. 277 and Barrera Street Bridges and along the south side of the New Rail Bridge to a point past the nearby residential development (**MM-Noise-01b)**.

OEA specifically requests comments on this issue. With noise barriers extended thus, no receptors would be included within the 65 DNL contour generated by the Northern Rail Alternative. Therefore, there would be no severe noise impacts. Further detail is provided in **Appendix G**.

The elimination of rail traffic from the UP mainline under the Northern Rail Alternative would reduce the noise impacts in Eagle Pass in the same way as under the Southern Rail Alternative, described above and shown in **Figure 3.6-6**.

Construction Vibration

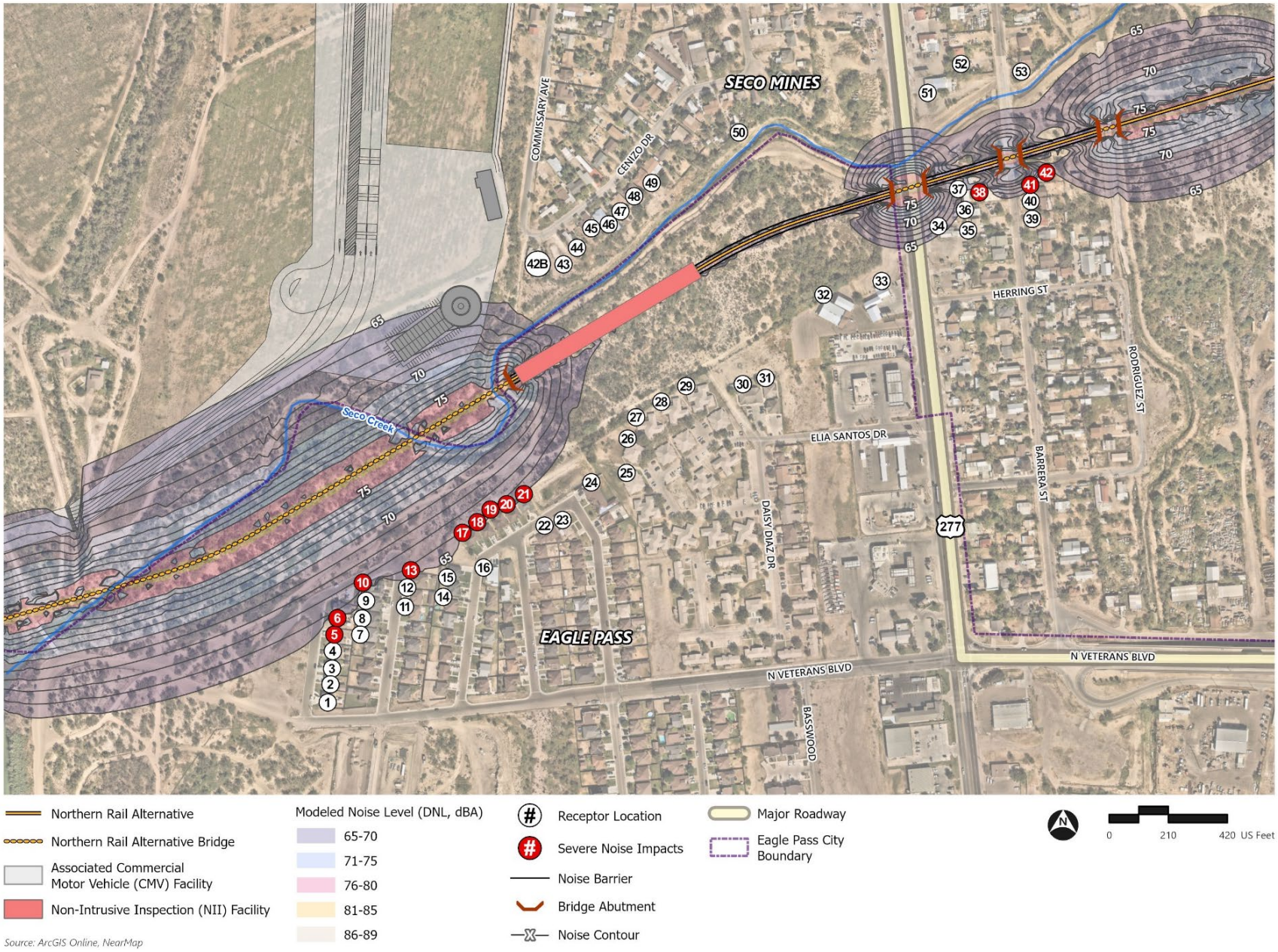
Vibration impacts from the construction of the Northern Rail Alternative would be the same as those described for the Southern Rail Alternative.

Rail Operations Vibration

Vibration impacts from the operation of the Northern Rail Alternative would be the same as those described for the Southern Rail Alternative.

[15] Under the Southern Rail Alternative, the New Rail Bridge would end well to the west of the nearest residential area (see *Chapter 2, Figure 2-3*). Therefore, there is no need to consider installing noise barriers on it. Conversely, under the Northern Rail Alternative, the New Rail Bridge would continue past the nearest residential area (see *Chapter 2, Figure 2-4*), warranting consideration of noise barriers along part of it given its proximity to residences.

Figure 3.6-7. Northern Rail Alternative Noise Contour with GER's Proposed Noise Barrier Design



3.6.3.3 Associated CMV Facility

Construction Noise

Noise generated by construction of the associated CMV Facility would be similar to that of the Southern Rail Alternative because of the similarities in equipment, schedules, and noise levels.

Operation Noise

OEA modeled noise characteristics for two different types of heavy trucks that operation of the associated CMV Facility would involve: 1) moving trucks and 2) idling trucks.

Moving Trucks

OEA modeled moving trucks using FHWA's Traffic Noise Model (TNM) Version 3.2. According to information provided by GER, 1,584 moving trucks would pass through the associated CMV Facility at approximately 10 mph during a 24-hour period, primarily during daytime hours. TNM calculated a noise level of 57 DNL at approximately 48 meters (157 feet) from the CMV Road. This result was later imported into the CADNA model for further noise analysis.

Idling Trucks

Trucks traveling from Mexico into the United States (approximately 792 trucks over a 24-hour period) would idle for approximately 11 minutes each in the six queue lanes at the associated CMV Facility. OEA assumed that the average number of trucks idling at the same time per hour over a 16-hour period would be approximately 50 trucks. OEA used measured heavy truck idling noise to model the effects of 50 trucks idling at the same time. This result was later imported into the CADNA model for further noise analysis. The 65 DNL contours generated by CADNA are shown in **Figure 3.6-8**.

There are no receptors within the 65 DNL contour; therefore, there would be no adverse noise impacts from the associated CMV Facility. It is likely that some truck noise would be audible at times at some receptor locations, but this noise would not be such as to constitute an adverse impact.

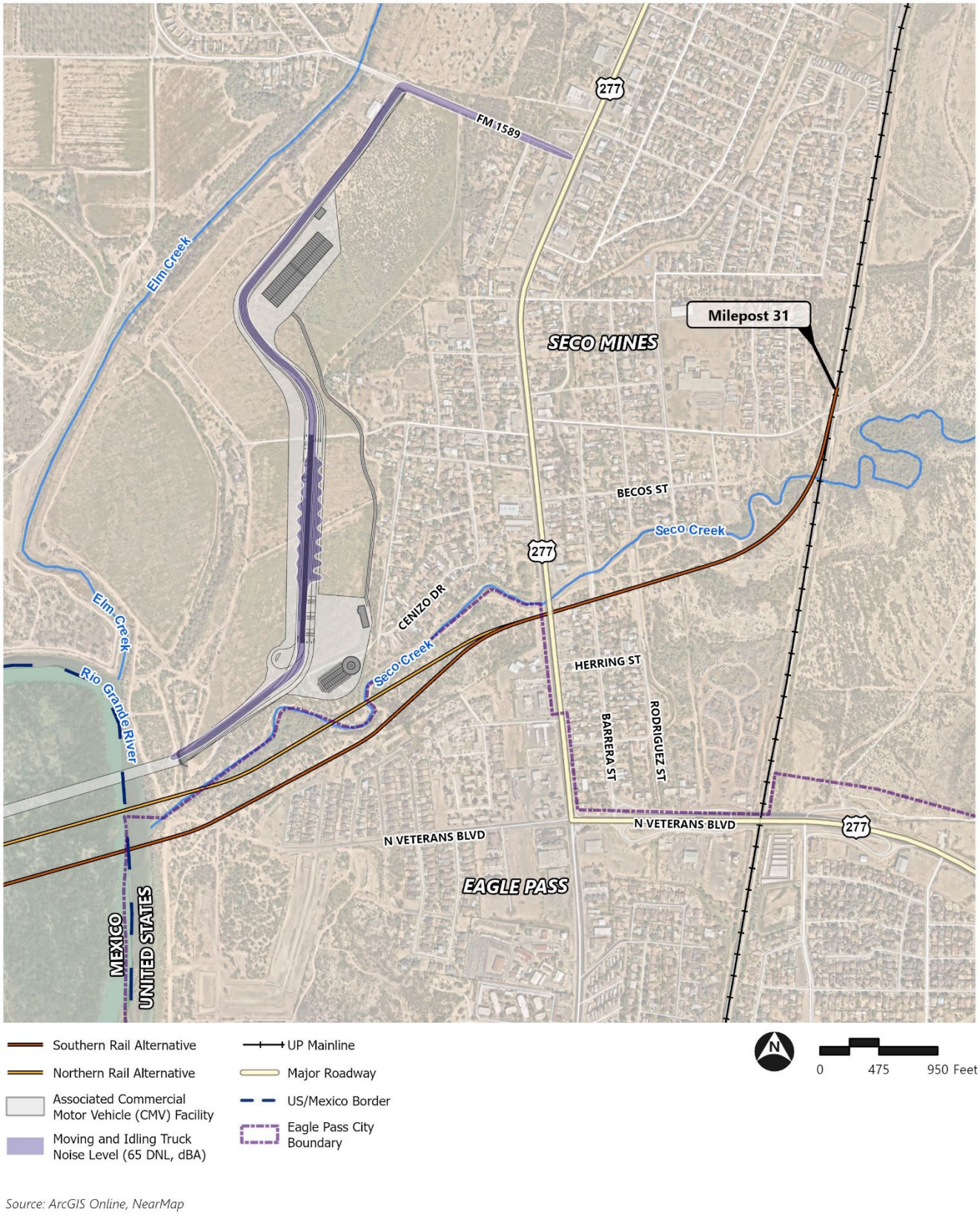
Construction Vibration

Vibration impacts from the construction of the associated CMV Facility would be similar to those described for the Southern and Northern Rail Alternatives.

Operation Vibration

No adverse vibration impacts from the operation of the associated CMV Facility are anticipated. Trucks do not generate substantial ground-borne vibration on paved, well-maintained roadways.

Figure 3.6-8. Moving and Idling Truck Noise Level Contour



Source: ArcGIS Online, NearMap

3.6.3.4 No-Action Alternative

Under the No-Action Alternative, the Board would deny authority for GER to construct and operate the proposed line. The proposed line and the associated CMV Facility would not be constructed. No new receptors would be severely impacted by either wayside or horn noise. Existing noise and vibration levels along the UP mainline would continue, including at the 1,980 receptors that now experience the equivalent of severe impacts.

3.6.4 Conclusion

OEA has determined that under the Southern Rail Alternative, with gaps in the noise barriers at the proposed U.S. 277 and Barrera Street Bridges, three receptors would be exposed to noise levels of 65 DNL or greater, with at least a 3 dBA increase. These receptors would have a severe FTA impact classification. Under the Northern Rail Alternative, with gaps in the noise barriers at the proposed U.S. 277 and Barrera Street Bridges and the lack of noise barriers on the New Rail Bridge, 12 receptors would be exposed to noise levels of 65 DNL or greater with at least a 3 dBA increase and would have a severe FTA impact classification. No receptors would be exposed to noise levels of 65 DNL or greater because of the associated CMV Facility.

Therefore, for the Southern Rail Alternative, OEA preliminarily recommends mitigation requiring GER to install noise barriers on both sides of the proposed U.S. 277 and Barrera Street Bridges (**MM-Noise-01a**). For the Northern Rail Alternative, OEA preliminarily recommends mitigation requiring GER to install noise barriers on both sides of the proposed U.S. 277 and Barrera Street Bridges and along the south side of the New Rail Bridge to a point past the nearby residential development (**MM-Noise-01b)**. With this mitigation, neither build alternative would have severe noise impacts. OEA is specifically requesting comments on this issue.

Currently 1,980 receptors experience the equivalent of an FTA "severe" impact from existing rail operations on the UP mainline compared to what noise levels would be without these operations. Elimination of rail operations on the UP mainline would end the severe impacts to these 1,980 receptors.

3.7 Air Quality

OEA analyzed how construction and operation of the proposed line (both the Southern and Northern Rail Alternatives) and the associated CMV Facility could affect air quality. Air quality is affected by the emissions of specific pollutants that EPA regulates to protect human health or that have a long-term impact on the environment, such as emissions of greenhouse gases (GHGs). This section describes the affected environment and potential environmental consequences that could result from the construction and operation of the Southern and Northern Rail Alternatives, the associated CMV Facility, and the No-Action Alternative.

3.7.1 Approach

This subsection describes the approach OEA used to analyze effects on air quality. OEA analyzed the potential impacts from criteria air pollutants and hazardous air pollutants (HAPs) emissions, as well as GHG emissions.

The regulatory framework for air quality analyses includes the Clean Air Act (CAA), as amended; the EPA guidelines; and the Board's environmental regulations. OEA's analysis included emissions data

generated from trucks, construction equipment, and idling at at-grade crossings. OEA defined the study area for air quality and greenhouse gas emissions as Maverick County, Texas, consistent with EPA's approach in regulating air quality under CAA.

The CAA amendments codify the approach for attainment of the National Ambient Air Quality Standards (NAAQS). The CAA requires EPA to set NAAQS (40 C.F.R. Part 50) for six criteria pollutants: carbon monoxide (CO), lead, nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), and sulfur dioxide (SO_2). NAAQS is based on human health criteria to protect public health (primary standards) and environmental criteria to prevent environmental and property damage and to protect public welfare (secondary standards). Table H-1 in **Appendix H** presents the current NAAQS.

EPA uses the term "*de minimis*" across a variety of contexts to describe impacts that are too small or trivial for consideration by regulatory authorities. Under EPA's Transportation Conformity (40 C.F.R. Part 93, Subpart A) and General Conformity (40 C.F.R. Part 93, Subpart B) regulations, federal agencies compare the total estimated annual criteria pollutant emissions from their projects to applicable *de minimis* emissions thresholds to determine whether additional analysis and consultation are appropriate. As explained in **Appendix H**, emissions related to projected increases in rail operations resulting from Board decisions are not subject to Transportation Conformity or General Conformity. Nevertheless, OEA has compared those emissions to the *de minimis* thresholds to contextualize the potential air quality impacts. The Board would exercise control over the construction of the proposed line; thus, emissions during construction are subject to a General Conformity Determination if emissions are estimated to exceed the *de minimis* thresholds.

The CAA establishes a list of federal lands with special air quality protections from major stationary sources (40 C.F.R. Part 52 Subpart 21, 40 C.F.R. Part 81). These areas primarily include national parks, wilderness areas, and monuments. OEA determined that there are no Class I areas within 100 kilometers (62 miles) of the air quality study area; therefore, OEA anticipates no effects on Class I areas from locomotives on the Southern or Northern Rail Alternatives.

OEA identified pollutants to consider and summarized their effects on human health and the environment based on EPA regulations and EPA databases. **Appendix H** describes various pollutants OEA analyzed and their potential effects on human health or the environment. These descriptions include criteria pollutants, HAPs, and GHGs. **Appendix H** also details how OEA's calculated potential emissions from the Southern and Northern Rail Alternatives, the associated CMV Facility, and the No-Action Alternative.

3.7.2 Affected Environment

Maverick County, Texas, is in attainment for all NAAQS.

3.7.3 Environmental Consequences

3.7.3.1 Southern Rail Alternative

Construction

OEA estimated emissions of criteria pollutants, GHGs, and HAPs for the Southern Rail Alternative's construction activities, presented in **Table 3.7-1**, despite Maverick County being an attainment area for all NAAQS. Table H-15 through H-18 of **Appendix H** show detailed calculations.

Table 3.7-1. Summary of Proposed Line Construction Emission Estimates for Rolling Year 1 (Year 1 Q1 – Q4)

Pollutant	Construction Activity Estimated Emissions (tons/year)	General Conformity *De Minimis* Thresholds[2] (tons/year)
Criteria Pollutants		
NO_X	0.90	100
VOC	0.05	100
PM_{10}	28.18	100
$PM_{2.5}$	2.85	100
SO_2	0.00	100
CO	0.24	100
Greenhouse Gases		
CO_2e[1]	527	-

NO_X = Oxides of Nitrogen; VOC = Volatile Organic Compounds; PM_{10} = Particulate Matter 10 microns or less in diameter; $PM_{2.5}$ = Particulate Matter 2.5 microns or less in diameter; SO_2 = Sulfur Dioxide; CO = Carbon Monoxide; CO_2e = Carbon Dioxide Equivalent.

Notes:

[1] CO_2e values were calculated using the 100-year potential global warming potential (GWP) values from Table A-1 in 40 C.F.R. 98.

[2] Maverick County is the only county within the study area and is in attainment for all NAAQS. The General Conformity *de minimis* thresholds are presented for informational and comparison purposes using the maintenance thresholds. EPA General Conformity *De Minimis* Tables (EPA 2024a).

The construction analysis determined that equipment emissions during the rolling year-long construction period with the highest emissions would be relatively small. OEA expects larger emissions of PM to result from earthwork activity and fugitive dust emissions. While not required, as Maverick County is in attainment for all NAAQS, PM emissions from fugitive dust would be minimized through the use of industry-standard control measures. OEA conservatively assumed that no control measures were used in its fugitive dust analysis. **Table 3.7-1** shows that the estimated construction emissions are below the General Conformity *de minimis* thresholds (as the study area is in attainment, these have been presented for informational and comparison purposes using the maintenance thresholds). In addition, OEA estimated HAPs emissions from rail line construction as well as total construction emissions (summarized in Table H-18 in **Appendix H**). Emissions from construction activities would be temporary and concentrated at the construction sites. Therefore, OEA is not recommending mitigation for these impacts.

Rail Operations

OEA expects that the Southern Rail Alternative would result in an overall net decrease in rail emissions of all analyzed air pollutants when compared to the No-Action Alternative. This net decrease in rail emissions is due to the decrease in travel distance as well as the reduced idling time at the border. OEA also projects that emissions would decrease at public at-grade crossings because all existing crossings on the UP mainline that fall within the study area would be closed under the Southern Rail Alternative.

Under existing conditions, inbound trains travel approximately 4 miles on the UP mainline from the United States/Mexico border to approximate UP milepost 31. Under the Southern Rail Alternative, trains would travel approximately 1.3 miles from the border to UP's Clark's Park Yard via the proposed line, which would connect with the UP mainline at approximate UP milepost 31. The Southern Rail

Alternative would also include new security technology to allow trains to be inspected without coming to a stop, reducing the idling time to zero minutes. Currently, locomotives idle for an average of seven minutes at the border, and this would continue under the No-Action Alternative. OEA projects that under the Southern Rail Alternative, emissions would decrease because of the elimination of idling time. Impacts would be beneficial. Therefore, no mitigation needs to be considered.

Table 3.7-3 below shows the total air emissions that would be associated with the Southern Rail Alternative, including individual emissions levels for locomotives and public at-grade crossings.

3.7.3.2 Northern Rail Alternative

Construction

OEA estimates that construction emissions from the Northern Rail Alternative would be the same as those from the Southern Rail Alternative. See **Table 3.7-1** and Tables H-15 through H-18 in **Appendix H**.

Rail Operations

OEA estimates that rail emissions from operation of the Northern Rail Alternative would be the same as those of the Southern Rail Alternative. The same grade crossing benefits would occur. For more information, see **Table 3.7-3** below and Tables H-4 through H-12 in **Appendix H**.

3.7.3.3 Associated CMV Facility

Construction

OEA estimated emissions of criteria pollutants, GHGs, and HAPs for the associated CMV Facility construction activities, presented in **Table 3.7-2**, despite Maverick County being an attainment area for all NAAQS. OEA's analysis determined that equipment emissions during the rolling year-long construction period with the highest emissions would be relatively small. OEA expects larger emissions of PM to result from earthwork activity and fugitive dust emissions. While not required, as Maverick County is in attainment for all NAAQS, PM emissions from fugitive dust could be minimized through the use of industry-standard control measures. OEA conservatively assumed that no control measures were used in its fugitive dust analysis. **Table 3.7-2** shows that the estimated construction emissions are below the General Conformity *de minimis* thresholds (as the study area is in attainment, these have been presented for informational and comparison purposes using the maintenance thresholds). In addition, OEA estimated HAPs emissions from the associated CMV Facility's construction as well as total construction emissions in Table H-18 in **Appendix H**. Emissions from construction activities would be temporary and concentrated at the construction sites.

Table 3.7-2. Summary of Associated CMV Facility Construction Emission Estimates for Rolling Year 1 (Year 1 Q1 – Q4)

Pollutant	**Construction Activity Estimated Emissions (tons/year)**	**General Conformity *De Minimis* Thresholds[2] (tons/year)**
Criteria Pollutants		
NO_X	7.58	100
VOC	0.27	100

Pollutant	Construction Activity Estimated Emissions (tons/year)	General Conformity *De Minimis* Thresholds[2] (tons/year)
PM_{10}	51.41	100
$PM_{2.5}$	5.30	100
SO_2	0.01	100
CO	2.82	100
Greenhouse Gases		
CO_2e[1]	3,468	NA

NO_X = Oxides of Nitrogen; VOC = Volatile Organic Compounds; PM_{10} = Particulate Matter 10 microns or less in diameter; $PM_{2.5}$ = Particulate Matter 2.5 microns or less in diameter; SO_2 = Sulfur Dioxide; CO = Carbon Monoxide; CO_2e = Carbon Dioxide Equivalent.

Notes:

[1] CO_2e values were calculated using the 100-year potential global warming potential (GWP) values from Table A-1 in 40 C.F.R. 98.

[2] Maverick County is the only county within the study area and is in attainment for all NAAQS. The General Conformity *de minimis* thresholds are presented for informational and comparison purposes using the maintenance thresholds. EPA General Conformity *De Minimis* Tables (EPA 2024a).

Operation

OEA expects that the associated CMV Facility would likely result in an overall net decrease in truck emissions of all analyzed air pollutants compared to the No-Action Alternative. This net decrease in truck emissions would be due to the decrease in travel distance as well as a reduction in truck idling time resulting from a reduction in congestion at the border compared to existing conditions and the No-Action Alternative.

OEA estimated that annual vehicle miles traveled (VMT) related to the associated CMV Facility would be approximately 3,642,000 because it would create a shorter route from the United States/Mexico border for trucks to connect with FM 1589 and U.S. 277 to continue their inbound trips. Additionally, the associated CMV Facility would reduce average truck idling time at the border to an estimated 11 minutes. These two factors would result in a large projected decrease in truck emissions when compared to the No-Action Alternative, which would be beneficial.

Table 3.7-3 below shows the total air emissions that would be associated with the operation of the proposed line and the associated CMV Facility.

Table 3.7-3. Summary of Operations Emissions Estimates

Pollutant	Locomotive Emissions (tons/year)	At-Grade Crossings[1] (tons/year)	Truck VMT (tons/year)	Truck Idling[1] (tons/year)	Total Emissions[2] (tons/year)
Criteria Pollutants					
NO_X	-48	-0.01	-14	-3.61	-66
VOC	-1.94	-0.00	-0.34	-0.08	-2.36
PM_{10}	-1.21	-0.00	-0.06	-0.10	-1.37
$PM_{2.5}$	-1.18	-0.00	-0.05	-0.02	-1.25
SO_2	-0.04	-0.00	-0.05	-0.00	-0.09
CO	-11	-0.05	-11	-2.00	-23
Greenhouse Gases					
CO_2e[3]	-4,087	-11	-16,272	-944	-21,315
Hazardous Air Pollutants					
Acetaldehyde	-0.152	-0.000	-0.014	-0.003	-0.17
Acrolein	-0.031	-0.000	-0.002	-0.000	-0.03
Benzene	-0.044	-0.000	-0.001	-0.000	-0.04
1,3-Butadiene	-0.004	-0.000	-0.000	-0.000	-0.00
Ethyl Benzene	-0.007	-0.000	-0.003	-0.001	-0.01
Formaldehyde	-0.432	-0.000	-0.015	-0.004	-0.45
Naphthalene	-0.005	-0.000	-0.000	-0.000	-0.01
POM	-0.005	-0.000	-0.000	-0.000	-0.01

NO_X = Oxides of Nitrogen; VOC = Volatile Organic Compounds; PM_{10} = Particulate Matter 10 microns or less in diameter; $PM_{2.5}$ = Particulate Matter 2.5 microns or less in diameter; SO_2 = Sulfur Dioxide; CO = Carbon Monoxide; CO_2e = Carbon Dioxide Equivalent; POM = Polycyclic Organic Matter.

Notes:

[1] At-grade crossings and truck idling emissions results are barely measurable and do not show within 2 decimal places.

[2] Numbers may not add exactly due to rounding.

[3] CO_2e values were calculated using the 100-year potential global warming potential (GWP) values from Table A-1 in 40 C.F.R. 98.

3.7.3.4 No-Action Alternative

Under the No-Action Alternative, the Board would deny authority for GER to construct and operate the proposed line. The proposed line and the associated CMV Facility would not be constructed. Annual VMT under the No-Action Alternative would be 13,567,650 and truck idling time at the border would remain approximately 42 minutes. However, rail traffic could increase in the future on the existing rail lines in the study area under the No-Action Alternative due to changing market conditions, including general economic growth. Emissions quantifications under the No-Action Alternative are included in **Appendix H**.

3.7.4 Conclusion

OEA has determined that construction of the Southern Rail Alternative, the Northern Rail Alternative, and the associated CMV Facility would generate temporary emissions of criteria pollutants, HAPs, and GHGs. However, these emissions would be concentrated at the construction sites; they would cease when construction is complete. Moreover, the emissions of criteria pollutants would be below the *de minimis* thresholds (used for information only, as Maverick County is in attainment for all criteria pollutants).

OEA has also determined that, compared to the No-Action Alternative, operation of the Southern Rail Alternative, the Northern Rail Alternative, and the associated CMV Facility would result in a net reduction in both rail and truck emissions, as well as vehicle emissions at at-grade crossings, for all analyzed air pollutants. This reduction would be due to a decrease in train and truck VMT and idling times. Thus, the proposed line and the associated CMV Facility would result in a beneficial impact on air quality. Therefore, OEA is not recommending air quality mitigation for the proposed line.

3.8 Energy

OEA analyzed how construction and operation of the proposed line (both the Southern and Northern Rail Alternatives) and the associated CMV Facility could affect energy, such as the consumption of diesel fuel to operate trains and trucks. This section describes the affected environment and potential environmental consequences on energy that could result from the Southern and Northern Rail Alternatives, the associated CMV Facility, and the No-Action Alternative.

3.8.1 Approach

This subsection describes the approach OEA used to analyze effects on energy. The Board's regulations at 49 C.F.R. § 1105.7(e)(4) require consideration of whether a proposed action would result in an increase or decrease in overall energy efficiency. OEA focused its analysis on the effects on energy efficiency from operation of the proposed line and the associated CMV Facility. The regulations also require a description of the transportation of energy resources and recyclable commodities and the diversion of traffic of freight from rail to truck. However, the proposed line and the associated CMV Facility would not affect the transportation of energy resources or recyclable commodities and would not cause a diversion of traffic from rail to truck. Therefore, OEA did not evaluate those aspects.

For the energy analysis, OEA determined that diesel fuel would be the primary fuel source for rail and CMV operations. One gallon of diesel fuel is equivalent to approximately 144,945,000 joules, a unit of energy (U.S. Energy Information Administration 2023). OEA estimated changes in energy efficiency in

terms of million joules (MJ). Since energy usage is dependent on fuel consumption, which directly correlates to air quality, the estimated changes in energy efficiency were derived from the operational air emissions analysis conducted for air quality effects. See *Section 3.7, Air Quality*, for further information.

3.8.2 Affected Environment

3.8.2.1 Proposed Line

Currently, inbound trains that cross the United States/Mexico border via the UP Rail Bridge travel approximately 4 miles on the UP mainline to reach approximate UP milepost 31. Approximately 19 trains per day travel on this rail segment currently. Current operations require trains to stop and idle on the UP Rail Bridge at the United States/Mexico border to accommodate crew changes, as described in *Chapter 2, Section 2.2.1, Existing Eagle Pass Crossings*. Trains that currently operate on the UP mainline have approximately three locomotives, with two at the front and one at the rear. Diesel is the primary fuel source used by locomotives.

3.8.2.2 Associated CMV Facility

CMV traffic currently travels over Bridge 2 which is located west/southwest from the center of Eagle Pass. The only truck route that is near Bridge 2 is the southwest segment of the SL 480 loop that is directly south of Bridge 2 (City of Eagle Pass 2022). The SL 480 loop encompasses Eagle Pass and connects CMV traffic to its destinations, which are mostly located north and northeast of the city. Diesel is the primary fuel source used by CMVs.

3.8.3 Environmental Consequences

3.8.3.1 Southern Rail Alternative

The Southern Rail Alternative would be located north of Eagle Pass and connect to the UP mainline at milepost 31, which would eliminate rail traffic from downtown Eagle Pass, except for an occasional local train, as described in *Chapter 2, Section 2.3.2.5, Operations on the Proposed Line Under Both Build Alternatives*. Therefore, trains would travel a shorter distance (approximately 1.3 miles instead of approximately 4 miles) to connect to the UP mainline at milepost 31. In addition, crew changes would occur at UP's Clark's Park Yard instead of on the UP Rail Bridge at the United States/Mexico border, and inspections would be done in the NII facility, which would not require trains to stop to undergo inspection, thus reducing idling time to nearly zero.

Under the Southern Rail Alternative, energy usage would be approximately 24,331,380 MJ (approximately 167,866 gallons of diesel) due to the decrease in travel distance and idling time.

3.8.3.2 Northern Rail Alternative

The effects of the Northern Rail Alternative on energy would be similar to those of the Southern Rail Alternative described above. Differences in rail alignment length west of U.S. 277 compared to the Southern Rail Alternative are negligible. Therefore, energy usage would be essentially the same (approximately 24,331,380 MJ, or approximately 167,866 gallons of diesel) under the Northern Rail Alternative.

3.8.3.3 Associated CMV Facility

All CMV traffic would shift from Bridge 2 to the associated CMV Facility and New Road Bridge, which would be located north/northwest of Eagle Pass. Bridge 2 would be used exclusively for passenger vehicle traffic, as described in *Section 2.3.3, Associated CMV Facility*. As explained above, inbound and outbound CMV traffic generally travels through the north/northeast section of Eagle Pass. Relocating CMV traffic to the associated CMV Facility and the New Road Bridge would reduce CMV movement distances, except for southeastern and eastern movements. As described in Section *2.3.3, Associated CMV Facility,* the associated CMV Facility would be designed for "slow-roll" operations, which also would reduce idling times from 42 minutes to approximately 11 minutes. The energy efficiency for the associated CMV Facility would be approximately 74,014,560 MJ (approximately 510,640 gallons of diesel) due to lower fuel consumption from reduced travel distance and idling time.

The associated CMV Facility would result in a net increase in electricity consumption because the existing inspection facilities at Bridge 2 would remain in use for non-CMV traffic. However, the associated CMV Facility would connect to an existing transmission line near its exit to FM 1589. Therefore, OEA anticipates that the net increase in facility energy consumption would be negligible.

3.8.3.4 No-Action Alternative

Under the No-Action Alternative, the Board would deny authority for GER to construct and operate the proposed line. The proposed line and the associated CMV Facility would not be constructed. The UP Rail Bridge would operate as it does today. Energy usage for rail operations under the No-Action Alternative would be approximately 76,801,550 MJ for rail operations in 2031 (approximately 529,870 gallons of diesel).

Similarly, CMV traffic on Bridge 2 would operate as it does today. Energy usage under the No-Action Alternative for CMV operations would be approximately 276,713,840 MJ (approximately 1,909,095 gallons of diesel).

3.8.4 Conclusion

OEA has determined that the Southern and Northern Rail Alternatives and the associated CMV Facility would have a beneficial impact on energy efficiency. Reduced travel distances and idling times would decrease fuel consumption; therefore, energy usage would decrease and no mitigation for energy impacts from the proposed line needs to be considered.

3.9 Cultural Resources

OEA analyzed how construction and operation of the proposed line (both the Southern and Northern Rail Alternatives) and the associated CMV Facility could affect cultural resources, including above- and below-ground resources such as archaeological artifacts and historic properties. This section describes the affected environment and potential environmental consequences on cultural resources that could result from the Southern and Northern Rail Alternatives, the associated CMV Facility, and the No-Action Alternative.

3.9.1 Approach

This subsection describes the approach OEA used to analyze effects on cultural resources. The primary laws that govern the Board's consideration of cultural resources for the proposed line and the associated CMV Facility are National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA). 54 U.S.C. § 300101 *et seq*. As encouraged by Section 106 of NHPA regulations (54 U.S.C. § 306108), the Board is coordinating both NEPA and Section 106 compliance to prevent redundant reviews.

Under NHPA Section 106 regulations (36 C.F.R. Part 800), the Board is required to consider potential effects on historic properties that would result from authorization of the proposed line and the associated CMV Facility. Historic properties are those listed in or eligible for listing in the National Register of Historic Places (National Register), as defined by the regulations for implementing Section 106 (36 C.F.R. Part 60). Historic properties can include buildings and structures, precontact and historic archaeological sites, districts, objects, and landscapes, as well as properties of religious or cultural significance to tribes. The NEPA term *cultural resources* as used in this chapter is interchangeable with the Section 106 term *historic properties*.

To evaluate potential effects on cultural resources that would result from the Board's potential authorization of the proposed line and the associated CMV Facility, OEA conducted background research using available sources, including:

- Previously conducted Texas cultural surveys;
- Existing Texas state archaeological site records;
- National Register files;
- Texas state cultural and historic context documents;
- Historic mapping and aerial photography; and
- Texas Historic Sites Atlas and Texas Historical Commission (THC) Historic Resources Survey Library (updated 2/13/2024).

As explained in **Appendix A***, Agency and Tribal Consultation*, OEA initiated preliminary consultation with Tribal Historic Preservation Offices (THPOs), tribal governments, and the Texas State Historic Preservation Office (SHPO) on December 11, 2023, to inform them of the potential construction and operation of the proposed line and the associated CMV Facility and to solicit initial comments regarding potential effects on historic properties. OEA also conducted consultation meetings with representatives from the Texas SHPO, also known as the THC, on April 26 and August 30, 2024.

As a result of these initial meetings, OEA defined Areas of Potential Effects (APEs) in accordance with 36 C.F.R. Part 800 and 49 C.F.R. § 1105.8, and in coordination with the Texas SHPO. The APE for archaeological resources (below-ground APE) is approximately 108 acres and includes the footprint of the proposed line and the associated CMV Facility—within which all construction-related ground disturbance would be confined. The above-ground APE totaled approximately 195 acres—including the entirety of the below-ground APE; and a 150-foot buffer to account for potential visual, auditory, and other atmospheric effects that may occur to historic resources located beyond the limits of immediate ground disturbance.

In compliance with NEPA and Section 106 of the NHPA, OEA conducted surveys within the above- and below-ground APEs for historic properties in June, July, and October 2024. The purpose of the surveys was to locate, identify, and evaluate the significance of any historic and archaeological resources within

the APEs and to determine whether any of these resources were listed, or were potentially eligible for listing, in the National Register.

OEA developed the methods for above- and below-ground surveys in accordance with 36 C.F.R. § 800, as well as Texas state guidelines, for the identification of archaeological and historic resources. Additional detailed information on these methods can be found within the individual Section 106 reports that OEA provided to the SHPO, THPOs, tribal governments, and consulting parties.

3.9.2 Affected Environment

3.9.2.1 Above-Ground Resources

After an initial coordination meeting between the Texas SHPO and OEA, Texas SHPO requested comprehensive architectural surveys of the APE in accordance with Texas SHPO requirements to ensure the recordation and evaluation of any culturally significant historic resources that could potentially be impacted by the proposed line and the associated CMV Facility. The Texas SHPO requested that the historic architectural documentation and reports include high-resolution photographs, architectural descriptions, historical contexts, and an assessment of each identified resource's integrity and National Register eligibility potential. Additionally, the reports were to address the potential impacts on these resources and outline any necessary measures to avoid, minimize, or mitigate any impacts. OEA consulted with Texas Historic Sites Atlas and THC Historic Resources Survey Library to identify existing historic properties within the APE, prior to conducting the historic resources field survey. OEA identified no proposed National Register nominations, National Historic Landmarks, previously recorded individual properties nor districts listed on, or eligible for, the National Register of Historic Places, Historical Markers, Recorded Texas Historic Landmarks (RTHL), State Antiquities Landmarks (SAL), Historic Survey Areas, or Surveyed Resources within the above-ground APE.

OEA conducted a Phase I Historic Resources Survey in July 2024 within the above-ground APE. During this survey, OEA identified 16 historic resources that were 45 years or older. These included the UP mainline, two ranch houses, one agricultural property, one canal, two garages, and nine residences. OEA evaluated these properties for National Register eligibility. OEA found that all the properties appear to lack integrity, and none meet any of the National Register Criteria. Therefore, all the surveyed properties within the above-ground APE were recommended not eligible for the National Register. The Texas SHPO concurred with this finding on January 31, 2025.

3.9.2.2 Below-Ground Resources

After initial coordination meetings, Texas SHPO requested an archaeological survey of the footprint of the proposed line and the associated CMV Facility. Prior to conducting the archaeological survey, OEA performed background research through a review of the Texas Archaeological Sites Atlas. This investigation revealed that 10 previously recorded sites are located within a 0.62-mile (1-kilometer) radius of the below-ground APE, four of which intersect the below-ground APE. OEA performed a Phase I Archaeological Resources Survey of the below-ground APE in June, July, and October 2024. In addition to a complete pedestrian walkover of the below-ground APE, OEA investigated a total of 574 shovel test locations during the archaeological survey. Of this total, 416 shovel tests were negative for the presence of cultural materials; 157 could not be excavated and were recorded as "no dig;" and one shovel test was positive for cultural material. OEA identified no new archaeological sites as a result of the survey. The majority of the below-ground APE is located on upland terraces east of the Rio Grande

River, with approximately 5.9 acres located within the Federal Emergency Management Agency (FEMA)-mapped 100-year floodplain. Shovel testing conducted in the floodplain was halted due to impenetrable subsurface alluvial gravel (underground gravel deposited by rivers) which indicated the potential for deeply buried Holocene or Pleistocene deposits.[16]

Portions of four previously recorded archaeological sites, sites 41MV107, 41MV108, 41MV203, and 41MV277, are located within the below-ground APE and were revisited during the archaeological survey. Within the previously recorded site boundaries that fall within the below-ground APE, OEA encountered sterile (*i.e.*, no sign of human activity) silty clay subsoils between 35 and 55 centimeters (14 and 22 inches) below the surface, indicating that there is no potential for deeply buried archaeological deposits at these sites.

During the survey in June and July 2024, OEA primarily recovered artifacts from the surface at site 41MV203 and slightly expanded the boundaries of the site. In total, the data recovered through the archaeological survey did not provide significant information on precontact or historic lifeway patterns. Impacts resulting from modern informal refuse dumping and modern roadway improvements has diminished the integrity of both 41MV203 and 41MV277 within the below-ground APE. Site 41MV203 is recommended ineligible under Criterion D of the National Register, as it lacks integrity and significant data potential. The portions of sites 41MV107, 41MV108, and 41MV277 located within the below-ground APE lack integrity and significant data potential. These three sites continue well outside the boundaries of the below-ground APE, and since only a portion of these three sites could be investigated as part of the survey, their National Register eligibility recommendations should continue to be considered unknown under Criterion D. In areas of the below-ground APE located within the floodplain of the Rio Grande River, alluvial deposition indicates potential for deeply buried deposits. The Texas SHPO concurred with the findings of the archaeological survey on January 31, 2025.

3.9.3 Environmental Consequences

3.9.3.1 Southern and Northern Rail Alternatives and Associated CMV Facility

Construction

Construction of either the Southern or the Northern Rail Alternative and the associated CMV Facility would require clearing, grading, cutting, filling, grubbing, trenching, soil borings, utility installation, paving, and operation of heavy equipment that could adversely affect historic properties if any were present. All 16 identified above-ground resources within the APE are recommended as not-eligible for the National Register, and a finding of No Historic Properties Affected is appropriate. For below-ground resources, ground disturbance activities have the potential to displace, disturb, and change the nature of intact archaeological deposits and contexts. However, archaeological site areas previously identified within the below-ground APE lack integrity and significant data potential and do not contribute to the sites' overall National Register eligibility. Therefore, ground disturbance associated with the development of the proposed line and the associated CMV Facility would have no effect on any archaeological deposits within areas of the below-ground APE that are outside of the Rio Grande River floodplain.

[16] Deposits from the current geological period (Holocene, which began approximately 11,700 years ago) or the previous one (Pleistocene).

The archaeological survey verified that the onset of culturally sterile substrates (ground that does not have any signs of human activity) in non-floodplain contexts of the APE occurred between 35 and 55 centimeters below the surface. Since alluvial deposition in floodplains has the potential to bury archaeological deposits well below the reach of conventional shovel testing, OEA preliminarily recommends mitigation requiring GER to conduct additional archaeological surveys via deep mechanical trenching of floodplain areas in the APE prior to drilling piles for new bridge piers on the rail line to confirm the presence or absence of deeply buried deposits (**MM-Cultural-01**). OEA also preliminarily recommends mitigation requiring GER to provide a construction monitoring plan to OEA no later than 30 days prior to the start of construction of the proposed line and to abide by the provisions of the plan, including any revisions by OEA, during rail construction activities (**MM-Cultural-02**).

Rail Operations

There are no historic properties located within the APE. Therefore, OEA does not anticipate any effects from operation of the proposed line or the associated CMV Facility.

3.9.3.2 No-Action Alternative

Under the No-Action Alternative, the Board would deny authority for GER to construct and operate the proposed line. The proposed line and the associated CMV Facility would not be constructed. Any cultural resources within the APE would remain undisturbed.

3.9.4 Conclusion

OEA has determined that the Southern and Northern Rail Alternatives and the associated CMV Facility would have no effect on any National Register-eligible properties, as none are present. OEA identified and evaluated 16 historic architectural and four archaeological resources through comprehensive surveys of the APE. The cultural resources identified in the APE lack integrity and are considered Not Eligible for inclusion in the National Register.

Because alluvial deposition in floodplains has the potential to bury archaeological deposits below the reach of conventional shovel testing, OEA preliminarily recommends mitigation requiring GER to conduct additional archaeological surveys via deep mechanical trenching of floodplain areas in the APE prior to drilling piles for new bridge piers on the rail line to confirm the presence or absence of deeply buried archaeological deposits (**MM-Cultural-01**). OEA also preliminarily recommends mitigation requiring GER to provide a construction monitoring plan to OEA no later than 30 days prior to the start of construction of the rail line and to abide by the provisions of the plan, including any revisions by OEA, during rail construction activities (**MM-Cultural-02**).

3.10 Biological Resources

OEA analyzed how construction and operation of the proposed line (both the Southern and Northern Rail Alternatives) and the associated CMV Facility could affect biological resources, including wildlife and plant species and their habitats, communities and natural areas. This section describes the affected environment and potential environmental consequences on biological resources that could result from the Southern and Northern Rail Alternatives, the associated CMV Facility, and the No-Action Alternative.

3.10.1 Approach

This subsection describes the approach OEA used to analyze effects on biological resources. The study area for biological resources is the area GER surveyed for Waters of the United States, including Wetlands (see *Section 3.11.1.1, Surface Waters* and **Appendix J***, Figure 2*). This area encompasses both the terrestrial and the aquatic footprints of the proposed line and the associated CMV Facility. The resources considered include state and federally listed species (including critical habitat), other wildlife and plant communities, and natural areas in the study area (natural areas are those that are protected under federal or state law for the purpose of providing habitat for native vegetation, fish, and wildlife — such as wilderness areas, conservation areas, and easements). For its analysis, OEA used data from published reports, feasibility studies, regulatory agency documents, guidance manuals, discussions with resource personnel, aerial photographs, U.S. Geological Survey (USGS) topographic maps, field visits, and Geographic Information Systems (GIS) databases.

OEA also obtained and reviewed the U.S. Fish and Wildlife Service (USFWS) Official Species List from USFWS's online Information for Planning and Consultation (IPaC) system as well as the Texas Natural Diversity Database (TXNDD) Program Online Species Search Report to determine protected species that could occur in the study area (TNDD 2019; USFWS 2024a).

OEA performed field surveys to confirm baseline conditions, existing vegetation and wildlife presence, and protected species habitat on May 21 and 22, 2024. OEA conducted these surveys and participated in GER's separate survey to identify and map surface waters, including wetlands (GER's survey report is provided in **Appendix J**). Additionally, OEA performed a mussel survey between September 9 and 12, 2024, in the Rio Grande River in accordance with the 2024 USFWS and Texas Parks and Wildlife Department (TPWD) survey protocols (USFWS 2024b).

Under Section 7(c) of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. § 1531 *et seq*.), federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat. A Biological Assessment (BA) is typically prepared for "major construction activities," considered to be federal actions affecting the quality of the human environment. If a federal agency determines, based on a BA, that listed species and/or designated critical habitat may be affected by a proposed project, the agency is required to consult with the USFWS pursuant to 50 C.F.R. § 402.14. Additionally, USFWS recommends that candidate species, proposed species, and proposed critical habitat be addressed during consultation. OEA is currently consulting with USFWS in accordance with ESA Section 7 to assess the potential effects of construction and operation of the proposed line and the associated CMV Facility on federal species of concern: the federally endangered Texas hornshell (*Popenaias popeii*); the federally threatened piping plover (*Charadrius melodus*); the federally threatened rufa red knot (*Calidris anutus rufa*); the federally proposed endangered Mexican fawnsfoot (*Truncilla cognata*); the federally proposed endangered Salina mucket (*Potamilus metnecktayi*); and the federally proposed threatened monarch butterfly (*Danaus plexippus*).

OEA prepared a BA discussing potential effects on these species, included in **Appendix K** of this Draft EIS. The ongoing coordination effort also addresses the applicable requirements of the Fish and Wildlife Coordination Act (16 U.S.C. § 661 *et seq.*).

3.10.2 Affected Environment

3.10.2.1 Plant Communities

The study area is located on the northern edge of the city of Eagle Pass. It primarily consists of scrub-shrub vegetative habitat and agricultural fields, although the easternmost section of the proposed line would extend through some residential and commercial areas. Scrub-shrub upland areas are areas covered by woody vegetation generally less than 20 feet tall, typically where tree canopy was removed and the remaining vegetation consists of mostly woody shrubs and small trees (Center for Coastal Resources Management n.d.). Much of the study area has been altered by a variety of human activities.

The study area is partially within the Rio Grande Floodplain and Terraces Sub-ecoregion (31d) of the Southern Texas Plains Ecoregion (Griffith et al. 2007). Much of the more alluvial areas in this sub-ecoregion have been converted to irrigated cropland, mostly consisting of cotton, grain sorghum, and cool-season vegetables.[17]

The wetland survey that GER conducted, and that OEA participated in, evaluated approximately 217 acres to identify wetlands, streams, rivers, ponds, lakes, and drainage ditches. The survey identified two individual stream features within the study area (*i.e.*, the Rio Grande River [perennial] and Seco Creek [intermittent]). The survey also identified ditch and other erosional features and two distinct upland habitat types across the study area: a scrub-shrub upland community (approximately 112.7 acres, or 52 percent), and agricultural fields (approximately 105.5 acres, or 48 percent) (see **Appendix J**, *Figure 4*). The scrub-shrub upland community was concentrated along the banks of Seco Creek and the Rio Grande River, as well as along the perimeter of the study area. The agricultural lands, located north of Seco Creek, had evidence of sorghum production. However, extensive crop growth was absent, as fields appeared unmaintained at the time of the survey. The vegetation species identified within these areas are listed in **Table 3.10-1**. Both habitat types within the study area include dirt roads typically associated with agricultural and border security operations, as well as residential developments east of Del Rio Boulevard and one residence adjacent to the western boundary of the study area.

The proposed line would be located almost exclusively within the previously described scrub-shrub community, along the Rio Grande River and Seco Creek, which includes vegetation consisting primarily of honey mesquite, blackbrush acacia, Mexican palo verde, mealy false acacia, erect prickly-pear, buffel grass, upright prairie coneflower, common sunflower, and catclaws species.

The associated CMV Facility would be almost exclusively built on agricultural lands. As previously noted, the plant community in these areas consists almost entirely of herbaceous vegetation, including sorghum, buffel grass, silverleaf nightshade, and Bermuda grass. Based on observations during the wetland survey, the footprint of the associated CMV Facility also includes a small amount of vegetated riparian area along the Rio Grande River, with some trees and shrubs as well as herbaceous vegetation such as the invasive giant reed (*Arundo donax*).

[17] According to USGS, alluvial means deposits of clay, silt, sand, gravel, or other particulate material deposited by a stream or other body of running water.

Table 3.10-1. Vegetation Species Observed in the Study Area

Scrub-shrub: Tree Layer	
Honey Mesquite (*Prosopis glandulosa*)	
Scrub-shrub: Sapling Layer	
Honey Mesquite	Blackbrush Acacia (*Acacia rigidula*)
Mexican Palo-Verde (*Parkinsonia aculeata*)	Mealy False Acacia (*Vachellia farnesiana*)
Scrub-shrub: Herbaceous Layer	
Blackbrush Acacia (*Acacia rigidula*)	Erect Prickly-Pear (*Opuntia stricta*),
Buffel Grass (*Cenchrus ciliaris)*	Upright Prairie Coneflower (*Ratibida columnifera*)
Agricultural Lands: Herbaceous Layer	
Buffel Grass (*Cenchrus ciliaris)*	Silverleaf Nightshade (*Solanum elaeagnifolium*)
Bermuda Grass (*Cynodon dactylon*)	Sorghum (*Sorghum bicolor)*
Scrub-shrub: Adjacent to Rio Grande River and Seco Creek	
Common Sunflower (*Helianthus annuus*)	Common Rush (*Juncus effusus*)
Catclaws (*Senegalia spp.*)	Prickly Pear (*Opuntia spp.*)

3.10.2.2 Wildlife Habitat

Habitat types within the footprint of proposed line consist primarily of the previously described scrub-shrub community, as well as two waterways (Rio Grande River and Seco Creek) with some ditches and erosional features. Both habitat types, aquatic and terrestrial (or land-based), are largely altered by human activities.

As noted above, most of the associated CMV Facility's footprint would be on agricultural lands, which provide little habitat for wildlife other than herbaceous vegetation (*e.g.*, sorghum or grasses) that some wildlife may use for foraging.

Terrestrial habitat in the study area has been degraded by agricultural activities, illegal dumping, and various actions associated with border security efforts, which include recently installed fencing along the Rio Grande River and regular patrols using all-terrain vehicles (ATVs), trucks, and airboats on the Rio Grande River. While these terrestrial areas provide some habitat and resources for birds and other wildlife, the overall habitat is fragmented and impacted by human activities.

Aquatic habitat in the Rio Grande River within the study area has been degraded due to sedimentation. Silt, clay, and sand are the dominant substrates within the study area (see below for further aquatic habitat discussion). Additionally, water withdrawals and pollution (*e.g.*, salinity, nutrients, fecal coliform bacteria, and heavy metals) from agricultural, urban, and industrial sources in the watershed have contributed to both a decrease in water quality and quantity (Griffith et al. 2007). When observed during the survey, Seco Creek, which is an intermittent stream,[18] had little to no flow. Seco Creek has

[18] Seco Creek is technically a "stream" according to USGS classification (USGS 2024a).

little riparian vegetation, has been channelized in areas, is deeply incised, and is largely surrounded by impervious surfaces.

3.10.2.3 ESA-Listed Species and Critical Habitat

OEA obtained an official list of federally protected or proposed species and their critical habitat that may occur in the study area using the IPaC system (see **Appendix K**). The list identified six federally threatened, endangered, or candidate species. These species include the endangered Texas hornshell; the threatened rufa red knot; the threatened piping plover; the proposed endangered Salina mucket ; the proposed endangered Mexican fawnsfoot; and the proposed threatened monarch butterfly. According to IPaC, two of the species, the rufa red knot and piping plover, only need to be considered for effect determination if the proposed project is wind-related and within the species' migratory route. The Salina mucket was believed to have been extirpated entirely from Texas until 2003, when the species was rediscovered upstream of Lake Amistad, which is more than 50 miles upstream of the study area. This is the only known population of this species. Additionally, OEA found no specimens of this species during the mussel survey of the study area and suitable habitat for this species is not present in the study area due to extensive sedimentation. Therefore, the rufa red knot, the piping plover, and the Salina Mucket are not considered further in this Draft EIS.

Critical habitat is defined by USFWS as the "… specific areas within the geographic area, occupied by the species at the time it was listed, that contain the physical or biological features that are essential to the conservation of endangered and threatened species and that may need special management or protection," (USFWS 2017). Of the ESA-listed species that may occur in the project area piping plover is the only species with designated critical habitat; however, the study area does not overlap with piping plover critical habitat. Critical habitat has been proposed for the Texas hornshell, Mexican fawnsfoot, Salina mucket, rufa red knot, and monarch butterfly. Only the proposed critical habitat for the Texas hornshell and Mexican fawnsfoot overlap with the study area.

3.10.2.4 State Listed Species

The TXNDD Program Online Species Search listed the following species in or near the study area as threatened in Texas: Mexican fawnsfoot; black bear (*Ursus americanus*); Texas tortoise (*Gopherus berlandieri*); speckled chub (*Macrhybopsis aestivalis*); Proserpine shiner (*Cyprinella proserpina*); Tamaulipas shiner (*Notropis braytoni*); Rio Grande shiner (*Notropis jemezanus*); Rio Grande darter (*Etheostoma grahami*); and headwater catfish (*Ictalurus lupus*). The TXNDD Program Online Species Search listed the ocelot (*Leopardus pardalis*) as endangered in the state. Mexican fawnsfoot, which is a federally proposed endangered species, is addressed in the ESA-listed species section and will not be addressed further in this section.

The black bear and ocelot have large territorial ranges that could include the city of Eagle Pass and surrounding area, which means that these species may travel through the study area on occasion. However, as previously discussed, there is a lot of human activity within this habitat, which makes it unsuitable as breeding and rearing habitat for these two species.

The Texas tortoise prefers dry scrub and grassland habitat, which are found in the study area. The preferred food of the Texas tortoise are succulent plants such as the prickly pear, which is also present in the study area (TPWD n.d.).

Based on the Fishes of Texas Project Database, there is no suitable habitat for the Proserpine shiner and headwater catfish in the study area (Hendrickson et al. 2015). These two species are restricted to spring-

fed tributaries and spring-runs, which are not present in the study area. Suitable habitat for the Rio Grande darter requires riffles with gravel and rubble often associated with spring-fed tributaries, which are not present in the study area. The other fish species (*i.e.*, speckled chub, Tamaulipas shiner, and Rio Grande shiner) may be present in the study area, as they are known to inhabit the Rio Grande River's main channel.

3.10.2.5 Bald and Golden Eagles

OEA did not identify suitable nesting habitat for bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*) in the study area.

3.10.2.6 Migratory Birds

IPaC identified the following migratory birds as possibly occurring in the study area: American golden-plover (*Pluvialis dominica*); Brownsville curve-billed thrasher (*Toxostoma curvirostre oberholseri*); Chihuahuan raven (*Corvus cryptoleucus*); chimney swift (*Chaetura pelagica*); eastern meadowlark (*Sturnella magna*); lesser yellowlegs (*Tringa flavipes*); long-billed curlew (*Numenius americanus*); orchard oriole (*Icterus spurius*); and painted bunting (*Passerina ciris*). Of these nine species, IPaC identified only the following five species as likely to be present in the study area during breeding season: Brownsville curve-billed thrasher; Chihuahuan raven; chimney swift; orchard oriole; and painted bunting.

3.10.2.7 Natural Areas

OEA identified no natural areas in the vicinity of the proposed line or the associated CMV Facility using the USGS Protected Areas Database of the United States (USGS 2024b).

3.10.3 Environmental Consequences

3.10.3.1 Southern Rail Alternative

Plant Communities

Construction of the Southern Rail Alternative, including construction of the bridge piers, abutments, and embankments, would impact approximately 15.3 acres of scrub-shrub vegetation. Equipment staging during construction would impact an additional approximately 11.7 acres that would be revegetated once construction is completed. As part of the USFWS conservation, minimization, and mitigative measures for the protection of the federally protected species (see *ESA-Listed Species and Critical Habitat* below), GER would be required to comply with EO 13112 on invasive species, minimizing the risk of introducing such species as a result of maintenance activities for the proposed line.

Wildlife Habitat

Construction of the Southern Rail Alternative could result in some temporary and permanent impacts to terrestrial wildlife habitat through clearing land, earthmoving, constructing the railbed, and laying rail. Construction activities, such as land clearing and earthmoving, could result some minor mortality or to temporary or permanent displacement. The Southern Rail Alternative and its associated embankment and fencing may block some wildlife movement, but the unfenced open area under the New Rail Bridge extending eastward approximately 900 feet from the Rio Grande River's edge to the end of the bridge at

the NII facility would provide access to the river. In addition, as stated by GER (July 8, 2024, letter to OEA), culverts under the tracks along the embankment would provide openings for wildlife to pass through (see *Chapter 2, Figure 2-3*). Fencing and the embankment may also reduce the risk of train strikes to wildlife. Overall, OEA anticipates that the Southern Rail Alternative would have negligible impacts on terrestrial wildlife.

Construction of the Southern Rail Alternative would impact aquatic wildlife habitat. While some habitat is present in Seco Creek, the stream's water quality and quantity appear to be impacted by human activities. There is considerably more aquatic habitat in the Rio Grande River. While no in-water piers are planned on the U.S. side of the river, there would be one in-water pier and a temporary embankment (or jetty) for use during construction on the Mexican side (see **Figure 3.10-1**).

Although OEA's mussel survey in the study area found degraded aquatic habitat due to sedimentation, OEA found a small number of mussels, including the Mexican fawnsfoot, to be present. Construction activities and structures on the Mexican side of the Rio Grande River could temporarily adversely impact water quality and river geomorphology on the U.S. side of the river. Additionally, in the event that unusually high rainfall causes breeches in the siltation fencing required by the permitting requirements of the Texas Pollutant Discharge Elimination System (TPDES), construction activities on land adjacent to the river could cause runoff and impact water quality in the Rio Grande River.

In the longer term, as discussed in *Section 3.1, Freight Rail Safety*, OEA expects that in the event of a release of hazardous materials resulting from rail incidents along the Southern Rail Alternative, the amount released would be small. GER would be required to comply with all applicable laws and regulations governing the safe transport of hazardous materials such as the HMTA (49 U.S.C. 5101 *et seq*.) and USDOT regulations that include requirements for shipping and packaging containers for hazardous materials, emergency response information, and training. EPA regulations (40 C.F.R. 300) under CERCLA govern incidents, spills, and other emergency releases of pollutants and contaminants to the environment (see also *Section 3.1, Freight Rail Safety,* and **Appendix C**). With the regulations in place, impacts from any spills on biological resources would be minimized. If any release of hazardous materials were to occur, it would involve a relatively short duration of exposure and would be contained quickly.

The USFWS conservation, minimization, and mitigative measures for the protection of the federally protected species (see *ESA-Listed Species and Critical Habitat* below) would also minimize impacts on other species and their habitats.

ESA-Listed Species and Critical Habitat

Mussel Species

Any impacts on mussel species and their habitat would be temporary and minor. Land clearance and related construction activities may cause some short-term increases in turbidity and sedimentation in the Rio Grande River. As noted above, unusually high rainfall may cause breeches in the siltation fencing required by TPDES permitting). The temporary bridge or jetty on the Mexican side could physically cover or crush any mussels on that side of the river, as well as result in increased sedimentation and temporarily altered flows in the river. These changes could impact mussels on the U.S. side of the river. Sedimentation could adversely impact suitable habitat for the Texas hornshell and Mexican fawnsfoot by filling in the interstitial spaces between the cobble/gravel substrate and riffles, and reducing spawning habitat. The greatest potential impact from increased sedimentation would occur during the mussels' spawning periods (March through August) and shortly thereafter. Other potential construction-

related water quality impacts could include contaminants from construction equipment, such as leaked or spilled hydraulic fluid and/or spilled gasoline or diesel from equipment refueling activities. These accidental events can occur despite proper planning and oversight.

In addition to the temporary water quality impacts from construction, a small amount of in-stream habitat would be altered permanently by the bridge pier on the Mexican side of the Rio Grande River. This pier, although limited in size, could alter the hydrology and channel morphology on the U.S. side of the river, resulting in potential impacts to existing habitat. These impacts could include bank erosion, disruption of natural sediment transport (scour and aggregation), thermal changes (changes in water volumes and flow rates can influence water temperatures), disruption of nutrient cycling (alter natural nutrient cycling processes due to changes in sediment and water flow), and potential debris accumulation.

As explained above, OEA expects that in the event of a release of hazardous materials resulting from rail incidents along the Southern Rail Alternative, the amount released would be small and addressed through compliance with existing regulations. In general, OEA expects that any release would cause a relatively short exposure and would be contained quickly.

OEA is consulting with USFWS to address impacts to these species. To ensure compliance with Section 7 of the ESA, OEA preliminarily recommends mitigation requiring GER to implement the conservation, minimization, and mitigative measures developed with USFWS for the protection of the federally listed or proposed threatened and endangered species that could be affected by the rail line (**MM-Biological-01**).

With these measures in place, OEA determined that the Southern Rail Alternative *may affect, is not likely to adversely affect* the Texas hornshell and *is not likely to jeopardize* the Texas fawnsfoot. OEA did not find the Texas hornshell or suitable habitat for it during the mussel survey. The Texas fawnsfoot has been observed in the study area. With USFWS measures in place, potential impacts would not be such as to appreciably reduce the likelihood of the species' survival and recovery. OEA has also determined that the Southern Rail Alternative *would not adversely modify* the proposed critical habitat for the Texas hornshell and Mexican fawnsfoot because they would not result in a direct or indirect alteration that appreciably diminishes the value of the critical habitat for both the survival and recovery of these proposed species.

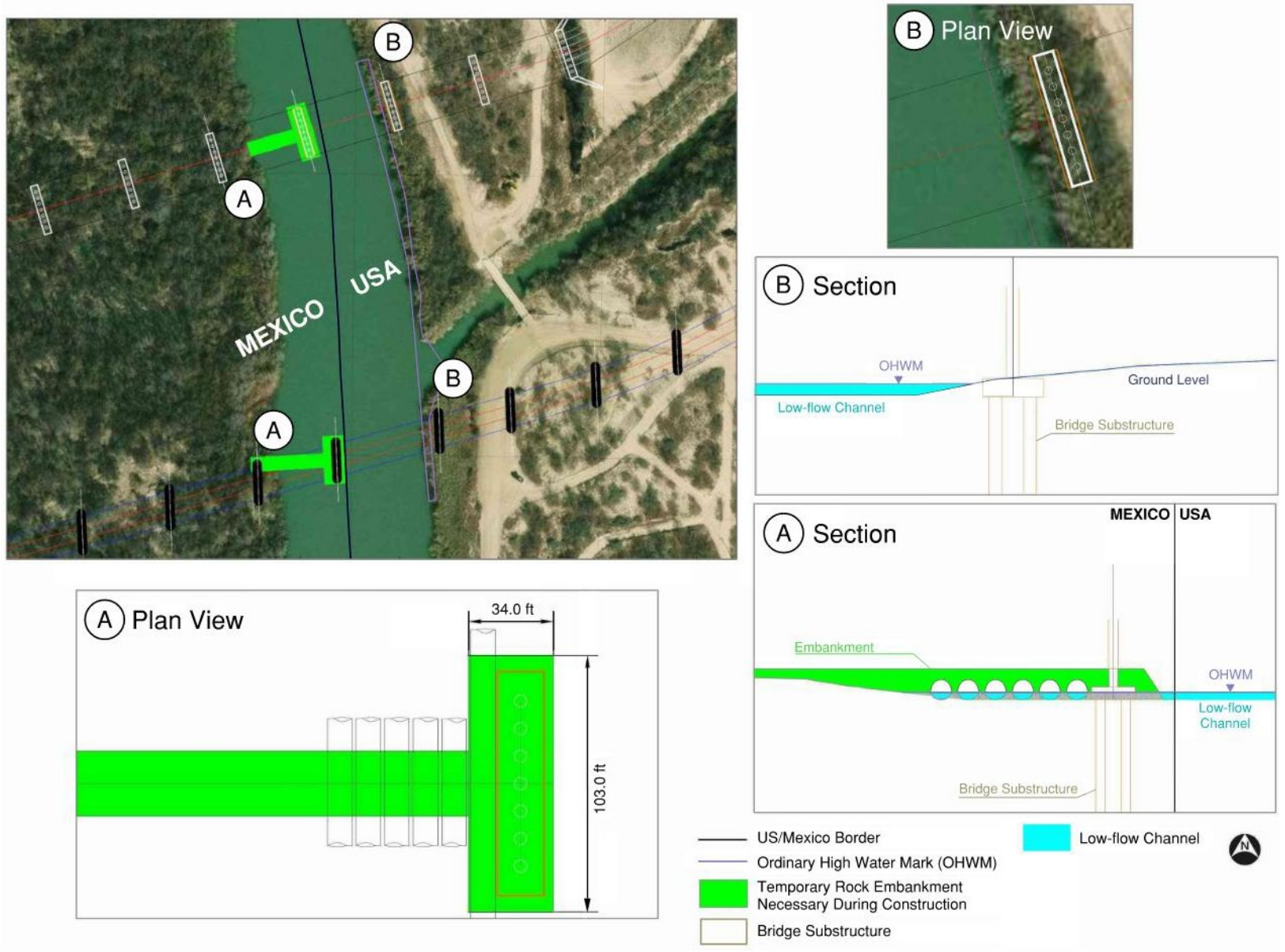
Monarch Butterfly

Potential construction-related impacts to the monarch butterfly primarily would be the loss of nectar-producing plants for adults migrating through the area. OEA observed monarch butterflies feeding on common sunflowers (*Helianthus annuus*) during a site visit in May 2024. The study area lacks milkweed species essential for breeding; therefore, this critical life stage likely would not be impacted.

OEA anticipates that impacts to the monarch butterfly from operation of the proposed line would be minor and primarily limited to strikes by trains and vehicles. Vehicle strikes would not considered "take" by the USFWS under the 4(d) Rule for this species being proposed by USFWS (USFWS n.d.).[19]

[19] The proposed rule for listing the monarch butterfly as threatened under the ESA includes protective regulations under section 4(d) of the ESA (a 4(d) rule). A 4(d) rule is a tool in the ESA for protecting threatened species by providing protective regulations deemed "necessary and advisable to provide for the conservation of" threatened species.

Figure 3.10-1. GER's Conceptual Design of Rail and Roadway Bridges for Southern Rail Alternative



There could also be a small loss of feeding habitat due to routine maintenance of vegetation along the proposed line through mechanical cutting and/or use of herbicides.

OEA has determined that, with the recommended mitigation outlined above (**MM-Biological-01**), construction and operation of the proposed line is ***not likely to jeopardize*** the monarch butterfly. While some adverse impacts are likely to occur, these impacts would not appreciably reduce the likelihood of both the survival and recovery of this species.

State-Listed Species

Construction of the Southern Rail Alternative would have little to no effect on the black bear or ocelot, because the habitat in the study area is unsuitable for the critical life stages (breeding and rearing of juveniles) of these species. The Southern Rail Alternative also would have little to no effect on the Proserpine shiner, headwater catfish, and Rio Grande darter because suitable habitat for these species is absent from the study area.

OEA found suitable habitat in the study area for the Texas tortoise, speckled chub, Tamaulipas shiner, and Rio Grande shiner. Therefore, the Southern Rail Alternative could impact these species. Impacts would be similar to those described above for ESA species and the USFWS conservation, minimization, and mitigative measures for those species would also contribute to minimizing impacts on state-listed species and their habitat.

Bald and Golden Eagles

There is no suitable nesting habitat for the bald or golden eagle in the Study Area. Construction and operation of the proposed line have no potential to affect these species.

Migratory Birds

The Southern Rail Alternative may impact the Brownsville curve-billed thrasher, Chihuahuan raven, chimney swift, orchard oriole, and painted bunting. These species may occur in the study area during breeding season, and suitable breeding and nesting habitat for these species is present. The Southern Rail Alternative could affect these species through the loss or disturbance of breeding and nesting habitat.

To reduce potential impacts and comply with the Migratory Bird Treaty Act (MBTA) (16 U.S.C. § 703-712), OEA preliminarily recommends mitigation requiring that GER clear vegetation in preparation for construction of the proposed line before or after the breeding bird nesting season to avoid inadvertent removal of active nests (*i.e.*, nesting adults, young, or eggs); or, if clearing is required during the nesting season, that GER consult with OEA and USFWS on appropriate nest survey methods for that area prior to any clearing or construction activities (**MM-Biological-02**).

Natural Areas

Construction of the Southern Rail Alternative would not impact any natural areas because none exist in the study area.

3.10.3.2 Northern Rail Alternative

OEA anticipates that the impacts on biological resources (including plant communities, wildlife habitat, ESA-listed species and critical habitat, state-listed species, Bald and Golden Eagles, migratory birds and natural areas) resulting from construction and operation of the Northern Rail Alternative would be the

same as described above for the Southern Rail Alternative. The Northern Rail Alternative would allow for slightly more wildlife movement in comparison to the Southern Rail Alternative because of the longer New Rail Bridge under this alternative (approximately 2,100 feet from the Rio Grande River's edge to the end of the bridge at the NII facility) and correspondingly shorter embankment capable of blocking wildlife movements. The same preliminary mitigation recommended above for the Southern Rail Alternative would apply to the Northern Rail Alternative if that alternative is authorized and built.

3.10.3.3 Associated CMV Facility

Plant Communities

Construction of the associated CMV Facility would impact approximately 40 acres mostly comprised of agricultural land containing remnants of sorghum production with various grasses. OEA does not expect construction of the associated CMV Facility to impact any rare plants or unique vegetative communities.

Wildlife Habitat

OEA expects construction of the associated CMV Facility to result in negligible impacts to wildlife, particularly to terrestrial species. Land clearing and earthmoving activities could result in temporary and permanent impacts through direct mortality or displacement. Some wildlife access to the Rio Grande River may be blocked by the associated CMV Facility and its perimeter fencing, although most of this access is already blocked by recently installed fencing and deterrent wiring (*e.g.*, razor wire). Wildlife habitat within the study area is primarily comprised of agricultural land that offer little habitat for wildlife. Impacts on aquatic habitat from the New Road Bridge would be similar to those of the New Rail Bridge, described in *Section 3.10.3.1, Southern Rail Alternative, Wildlife Habitat*, above.

ESA-Listed Species and Critical Habitat

Impacts to ESA-listed species and critical habitat resulting from construction of the associated CMV Facility are anticipated to be the same as described above for the Southern and Northern Rail Alternatives. The same USFWS conservation, minimization, and mitigative measures for the protection of the federally protected species (see *Section 3.10.3.1, Southern Rail Alternative, ESA-Listed Species and Critical Habitat* above), would apply.

State-Listed Species

OEA anticipates impacts to state-listed species resulting from construction and operation of the associated CMV Facility to be the same as those described for the Southern Rail and Northern Rail Alternatives.

Bald and Golden Eagles

There is no suitable nesting habitat for the bald or golden eagle in the Study Area. Construction and operation of the associated CMV Facility have no potential to affect these species.

Migratory Birds

OEA anticipates impacts to migratory birds from construction and operation of the associated CMV Facility to be the same as those described for the Southern Rail and Northern Rail Alternatives. The

Board lacks jurisdiction to require mitigation for the associated CMV Facility. However, PVH would be required to comply with the MBTA, which would minimize impacts on migratory bird species.

Natural Areas

The associated CMV Facility would not impact any natural areas because none exist in the study area.

3.10.3.4 No-Action Alternative

Under the No-Action Alternative, the Board would deny authority for GER to construct and operate the proposed line. The proposed line and the associated CMV Facility would not be constructed. There would be no impacts on biological resources.

3.10.4 Conclusion

OEA has determined that the Southern and Northern Rail Alternatives and the associated CMV Facility would have negligible to minor impacts on plant communities and wildlife habitat. To ensure compliance with Section 7 of the ESA, OEA is preliminarily recommending mitigation requiring GER to implement the conservation, minimization, and mitigative measures developed with USFWS for the protection of the federally listed or proposed threatened and endangered species that could be affected by the rail line (**MM-Biological-01**). With these measures, OEA has determined that the Southern and Northern Rail Alternatives and the associated CMV Facility (1) *may affect, not likely to adversely affect* the Texas hornshell (federally endangered); (2) are *not likely to jeopardize* the Mexican fawnsfoot (proposed federally endangered) and the monarch butterfly (proposed federally threatened); and (3) *would not adversely modify* proposed critical habitat for the Texas hornshell and Mexican fawnsfoot.

OEA has determined that the Southern and Northern Rail Alternatives and the associated CMV Facility may impact some state-listed species, including the Texas tortoise, speckled chub, Tamaulipas shiner, and Rio Grande shiner. Additionally, they may impact five species of migratory birds (the Brownsville curve-billed thrasher, Chihuahuan raven, chimney swift, orchard oriole, and painted bunting). OEA's preliminarily recommended mitigation for federally listed or proposed species (**MM-Biology-01**) would also contribute to minimizing impacts on state-listed species and their habitat.

To ensure compliance with the MBTA, OEA preliminarily recommends mitigation requiring GER to clear vegetation in preparation for construction of the rail line before or after the breeding bird nesting season to avoid inadvertent removal of active nests (*i.e.*, nesting adults, young, or eggs); or, if clearing is required during the nesting season, that GER consult with OEA and USFWS on appropriate nest survey methods for that area prior to any clearing or construction activities (**MM-Biological-02**).

3.11 Water Resources

OEA analyzed how construction and operation of the proposed line (both the Southern and Northern Rail Alternatives) and the associated CMV Facility could affect water resources, which include surface waters, floodplains and groundwater. This section describes the affected environment and potential environmental consequences on water resources that could result from the Southern and Northern Rail Alternatives, the associated the CMV Facility, and the No-Action Alternative.

3.11.1 Approach

This subsection describes the approach OEA used to analyze effects on water resources. For its analysis, OEA used the following sources:

3.11.1.1 Surface Waters

USACE and state environmental departments administer Sections 404 and 401 of the Clean Water Act (CWA), 33 U.S.C. § 1341 and 33 U.S.C. § 1344, which regulate fill discharges into waters of the U.S., including wetlands. Wetlands are defined in 33 C.F.R. § 328.3(a)(4) as "… those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Executive Order (EO) No. 11990, *Protection of Wetlands*, discourages direct or indirect support of new construction impacting wetlands wherever there is a practicable alternative (The White House 1997a). OEA used available topographic surveys, GIS elevation data, and field surveys to identify, characterize, and map water resources within the area depicted in **Figure 3.11-1**.

GER conducted field surveys of approximately 217 acres, which included land where permanent and temporary disturbances are planned for the construction of the proposed line and the associated CMV Facility, including construction staging areas and stormwater management facilities.[20] OEA participated in the field survey to independently verify GER's identification and mapping of surface waters, including wetlands.

Water quality is enforced at the state level based on standards set by both the state and the EPA. TPDES permits are also issued at the state level with EPA approval to control pollutants generated during construction when land disturbance exceeds 1 acre. OEA assessed impacts from both construction and operation of the proposed line and the associated CMV Facility based on assumptions, data, and regulatory requirements.

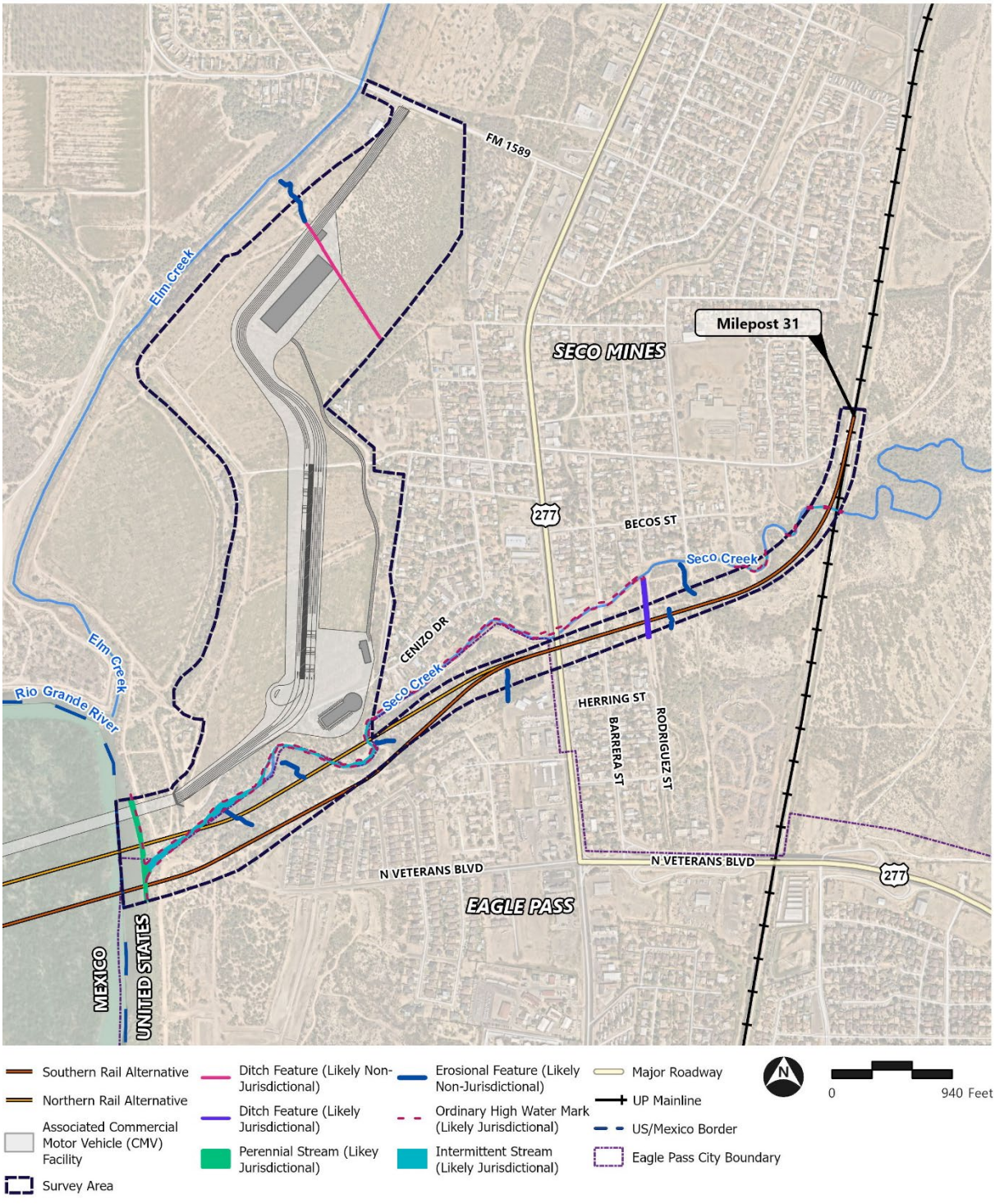
OEA quantified potential impacts to surface waters using conservative assumptions for the temporary and permanent limits of disturbance for construction of the proposed line and the associated CMV Facility. Conservative assumptions may tend to overstate potential environmental impacts.

3.11.1.2 Floodplains

A floodplain is an area of land that is susceptible to being inundated by floodwaters from riverine flooding or other sources of flooding. EO No. 11988, *Floodplain Management*, requires federal agencies to "… avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative," (The White House 1977b).

[20] The area GER surveyed included only the eastern shoreline of the Rio Grande River and excluded the approximately 4 acres of open water to the west, up to the border with Mexico. The survey area, as shown in **Figure 3.11-1** below, includes these 4 acres.

Figure 3.11-1. Surface Waters Within the Survey Area



Source: ArcGIS Online, NearMap, GER

FEMA has primary federal jurisdiction over the administration of EO No. 11988 and its guidance (44 C.F.R. Part 9; EO No. 13690, *Federal Flood Risk Management Standard*). In addition, IBWC has authority for the bed and bank of the international stretch of the Rio Grande River under the 1944 Water Treaty between Mexico and the United States, as well as responsibility under the 1970 Boundary Treaty Article IV, to ensure that construction projects do not obstruct the normal flow or flood flows of the Rio Grande River.

To evaluate potential impacts on floodplains, OEA compared the footprint of the proposed line and the associated CMV Facility to floodplain mapping published by FEMA and mapping provided by GER. FEMA typically maps the 100-year floodplain (1 percent annual chance base flood) at points along a stream where the contributing drainage area is generally 1 square mile or larger.

FEMA has mapped the 100-year floodplain for both the Rio Grande River and Seco Creek as an approximate Zone A floodplain, indicating approximate boundaries without a base flood elevation (BFE) that are typical in watersheds where there is little or no development. BFE is the elevation that water is anticipated to reach during a 100-year flood event. The lack of a determined BFE makes it challenging to analyze the potential impacts of a project within a Zone A floodplain since it is not known how high the water can get.

These floodplain boundaries were last updated by FEMA when the Maverick County Flood Insurance Rate Maps were issued on April 4, 2011. Because the FEMA boundaries are approximate, as noted above, GER conducted floodplain boundary mapping that included an estimated BFE and an associated flood boundary for the Rio Grande River and Seco Creek based on more current topographic data.

Prior to any construction, the local floodplain administrator, as well as FEMA and IBWC, would require GER to provide more detailed design plans and hydrologic and hydraulic modeling to ensure that the proposed line and the associated CMV Facility do not adversely affect the floodplain under the City of Eagle Pass Code of Ordinances, Section 13.5; FEMA regulations, 44 C.F.R. 65.6 and 65.12; and IBWC Directive SD.II.01031-M-1-H.

3.11.1.3 Groundwater

OEA used the National Resources Conservation Service (NRCS) Web Soil Survey to estimate near-surface groundwater depths, which are based on existing soils mapped within the footprint of the proposed line and the associated CMV Facility. Identification of deeper principal aquifers was based on the USGS Hydrologic Investigations Atlas of the United States, which describes the location, extent, and geologic and hydrologic features of the major aquifers of the U.S.

3.11.1.4 Navigation

OEA used the following methods to evaluate the impacts of the proposed line and the associated CMV Facility on navigation. OEA reviewed documents, maps, and data from the USCG, USACE, and IBWC to identify navigable waterways. OEA then assessed the impacts on navigation of those waterways from the New Rail Bridge and New Road Bridge crossings, considering the bridge designs and construction and maintenance methods provided by GER.

Approval of bridge crossings over navigable waters is required by the USCG, USACE, and IBWC under the following authority:

- USCG is responsible for approving the location and plans of bridges being constructed across navigable waters of the U.S. and international bridges under the Rivers and Harbors Act of 1899

(33 U.S.C. §§ 401 *et seq*.); the General Bridge Act of 1946 (33 U.S.C. § 525); and the International Bridge Act of 1972 (33 U.S.C. §§ 535a, 535b, 535c, 535e, 535f, 535g, and 535h). GER/PVH would need to obtain a Section 401 Certification from the state of Texas as part of the requirements of the General Bridge Act of 1946. Section 401 Certification protects water quality within the state.

- USACE is responsible for activities that may affect navigable waters of the U.S., pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. § 403). Section 10 requires that any entity proposing to perform work in, under, or over navigable waters obtain a Section 10 permit from USACE prior to commencing the activity. Issuance of a Section 10 permit by USACE would require a Section 401 Certification by the state of Texas.
- IBWC has authority for the bed and bank of the international stretch of the Rio Grande River under the 1944 Water Treaty between Mexico and the United States, as described in *Section 3.11.1.2, Floodplains*.

3.11.2 Affected Environment

3.11.2.1 Surface Waters

OEA participated in GER's survey of approximately 217 acres on May 22, 2024 (see **Appendix J**) to independently verify GER's identification and mapping of surface waters, including wetlands. No wetlands were identified during this survey; however, other waters of the U.S. were identified and mapped. The mapped waters of the U.S., which would require verification of jurisdiction by USACE, include the Rio Grande River, Seco Creek, and a ditch feature toward the eastern end of the proposed line under both build alternatives. Several other ditch and erosional features were mapped and identified as not likely to be under the jurisdiction of USACE. The identified jurisdictional surface waters are shown in **Figure 3.11-1**.

The impaired water segment closest to the proposed line and the associated CMV Facility is located downstream of Eagle Pass International Bridge 1 (Segment 2304_07).[21] The Eagle Pass Waterworks intake, which supplies drinking water to Eagle Pass from the Rio Grande River, is located 1.5 miles downstream of the proposed line.

3.11.2.2 Floodplains

In general, the area around the Rio Grande River and Seco Creek is susceptible to either localized or riverine flooding. Localized flooding occurs during heavy rainfall where poor drainage exists and water ponds temporarily. Riverine flooding, also associated with rainfall, occurs when water from a river or stream overflows and spills out into adjacent low-lying dry land. Riverine flooding can result in debris movement and erosion due to higher flowing velocities, particularly at bridges, culverts, or changes in slope.

The proposed line and the associated CMV Facility are adjacent to the Rio Grande River, which has a broad terraced floodplain. Furthermore, the proposed line under either build alternative runs parallel to

[21] Water segment generally refers to a discrete section of a water body, such as a river, stream, lake, or coastal area, that is studied or managed as a unit. These segments are often delineated for the purpose of monitoring water quality, hydrological studies, and resource management. Impaired waters are waters that do not meet the water quality standards set by the CWA.

Seco Creek, which flows southwest through a steep valley from U.S. 277 to the Rio Grande River. Upstream of U.S. 277, Seco Creek is a shallower channelized system that runs through commercial and residential properties. Several ditch and erosional features run along the Seco Creek corridor and drain runoff to the creek.

Public records since 1975 indicate five occurrences of notable flooding of the Rio Grande River, and in one instance, Elm Creek to the north of the associated CMV Facility, due to storm-related excess rainfall. It is likely that flooding also occurred in Seco Creek, associated with the flooding of the Rio Grande River; however, no specific records of it flooding were found. Examples include:

- The City of Eagle Pass received over 17 inches of rainfall from June 14 to 15, 2013 (National Weather Service n.d.).
- On the Rio Grande River at the Eagle Pass Waterworks intake 1.5 miles downstream of the proposed line, floodwaters rose 17.7 feet during the same event (National Oceanic and Atmospheric Administration (NOAA) 2024).
- Other notable flood events on the Rio Grande River include a rise in floodwater of 35.1 feet in July 2010 from Hurricane Alex; 35.0 feet in August 1998 from Hurricane Charley; 18.4 feet in April 1990; and 32.5 feet in July 1975 (NOAA 2024).

FEMA notes that flooding in the Rio Grande River is fed by a drainage basin of approximately 127,000 square miles, which is enhanced by tropical storms that occasionally move inland along the Rio Grande River or through northern Mexico.

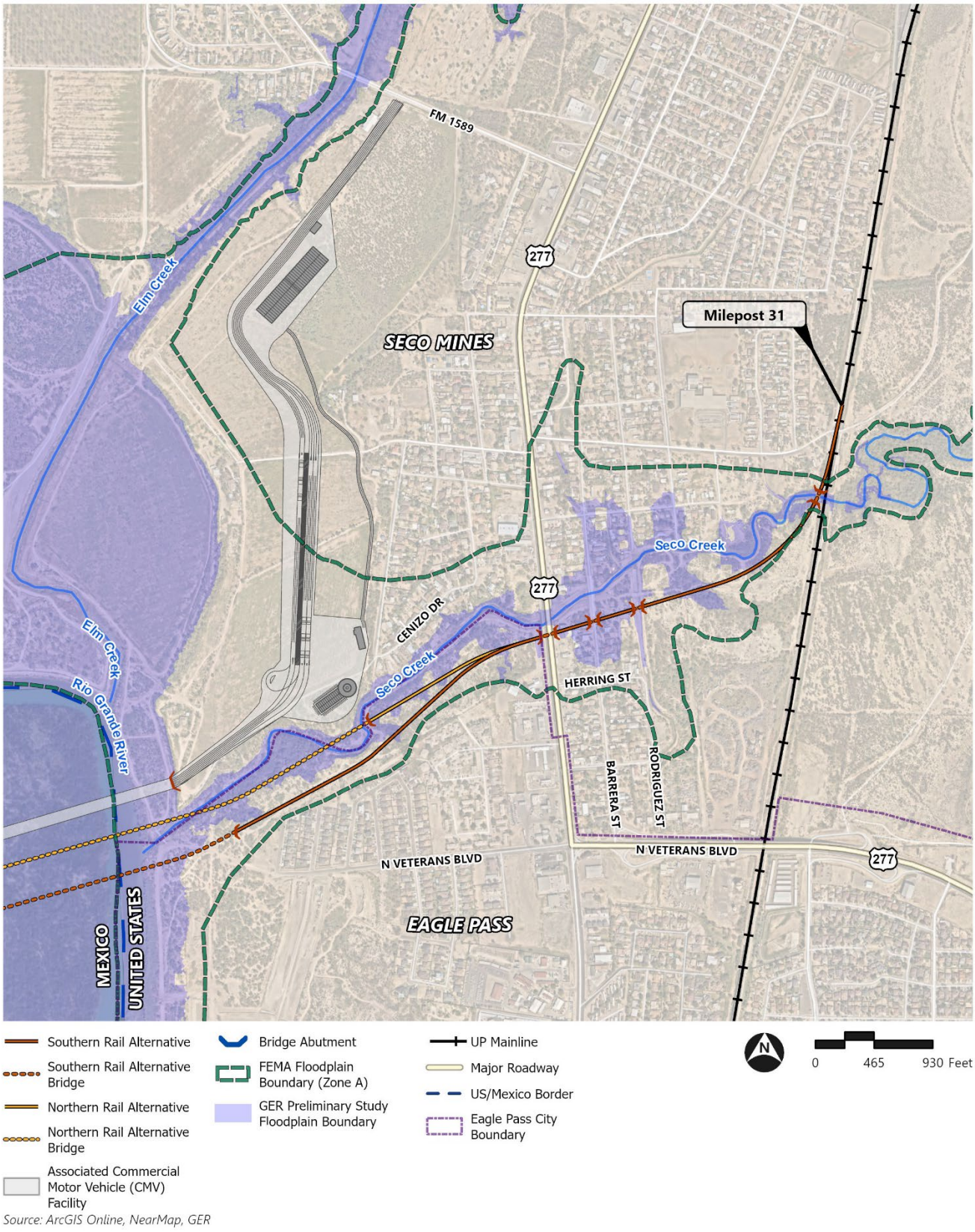
As noted above, the current FEMA floodplain is an approximate Zone A floodplain, with no BFE identified. Therefore, GER developed an estimated BFE and floodplain boundary for planning purposes (**Figure 3.11-2)**. GER estimated that, for the Rio Grande River, BFE adjacent to the proposed line and the associated CMV Facility range from 725.5 to 727.5 feet. Due to the scale of the Rio Grande River as compared to Seco Creek, OEA assumed that the Rio Grande River BFE is higher than Seco Creek's, and thus provides for a more conservative analysis than the flooding generated in Seco Creek from its local watershed. Therefore, the BFE of 725.5 feet, at the confluence of Seco Creek and the Rio Grande River, was used as the flood elevation for the extent of Seco Creek.

GER would need to further develop its floodplain mapping to be compliant with FEMA and IBWC standards, as well as local standards. GER's hydrologic and hydraulic modeling would be reviewed and approved for both existing conditions and build conditions to ensure that future BFEs are within allowable tolerances. However, OEA determined that GER's estimated BFE is reasonable for purposes of characterizing the affected environment in this Draft EIS because the proposed line would be elevated on bridges and an embankment at an elevation of 740 to 746 feet, which is at least 14.5 feet above GER's estimated BFE.

3.11.2.3 Groundwater

Groundwater exists in aquifers and water tables. An aquifer is a layer of permeable rock or soil underground that holds water, while a water table is the upper boundary of that saturated zone, essentially marking the line between where the ground is saturated with water (below the water table) and where it is not (above the water table). The water table represents the top of an aquifer, not the aquifer itself. Individual principal aquifers extend under several states and rely on a broad area for recharge. Principal aquifers are important for public drinking water, wildlife, agriculture, livestock, and non-agricultural uses (including industrial, thermoelectric power generation, mining, and commercial), but account for only a small amount of the total water use.

Figure 3.11-2. FEMA-Mapped 100-Year Floodplain and GER-Estimated 100-Year Flood Elevations and Floodplain Boundary



Source: ArcGIS Online, NearMap, GER

These aquifers are separated by aquitards, or less-permeable geological formations that restrict the flow of water. The proposed line and the associated CMV Facility overlay the aquitards separating two principal aquifers, the Carrizo-Wilcox Aquifer to the southeast and the Edwards-Trinity Aquifer to the north.

Near the Rio Grande River, shallow groundwater flows unevenly through various types of loosely packed soils that function more like fragmented, unmapped water tables than a consolidated aquifer. The depth to near-surface groundwater at the proposed line and the associated CMV Facility is typically more than 6 feet. Groundwater is supported via the infiltration of precipitation within the recharge area, which for near-surface groundwater is typically the same as the watershed for the waterbody draining the area. Seco Creek has a watershed of approximately 8 square miles, which drains surface runoff to Seco Creek and its tributaries and supports the groundwater recharge, via infiltration, within the same footprint. The proposed line, excluding the New Rail Bridge over the Rio Grande River, is entirely within the Seco Creek watershed. The associated CMV Facility, excluding the New Road Bridge, is within the Elm Creek watershed.

Groundwater can be reduced via the pumping of groundwater to the surface for use in agriculture, residential and commercial uses. There are no publicly recorded groundwater wells near the proposed line. One groundwater well is located approximately 1,800 feet west of the associated CMV Facility.

3.11.2.4 Navigation

The proposed line under either build alternative and the associated CMV Facility would require approval of bridge crossings over navigable waters from USCG, USACE, and IBWC.

Only the Rio Grande River is listed as navigable by the USACE and USCG, the federal agencies responsible for determining navigability for the purposes of federal regulation (USACE 2011). USACE regulations classify navigable waters as "… waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce," (USACE 2011).

At the location of the New Rail Bridge and New Road Bridge, the Rio Grande River ranges from approximately 220 to 270 feet wide and is considered navigable between the Zapata-Webb county line upstream (northwest) to the point of intersection of the Texas-New Mexico state line and Mexico. The Rio Grande River is not currently used for commercial navigation but is used for recreational activities by small motorized and non-motorized vessels (*e.g.*, canoes, kayaks, etc.). The nearest boat launch to the proposed line and the associated CMV Facility is located approximately 2 miles south. Operation Lone Star, launched by Texas Governor Greg Abbott in 2021 in an effort to reduce illegal migration, has intermittently restricted water activities to Texas National Guard use (Office of the Texas Governor 2023; García 2024).

3.11.3 Environmental Consequences

3.11.3.1 Southern Rail Alternative

Construction

Surface Waters

There are no wetlands within the footprint of the Southern Rail Alternative. The Rio Grande River, Seco Creek, and a ditch feature east of Barrera Street are the only surface water features within the footprint of the Southern Rail Alternative likely to be confirmed by the USACE as jurisdictional. Additionally, the intake for the Eagle Pass Waterworks is located approximately 1.5 miles downstream on the Rio Grande River from the New Rail Bridge. The border between Mexico and the United States generally runs in the middle of the river. The New Rail Bridge would not involve placing any structures on the U.S. side of the Rio Grande River. One pier would be located in the Rio Grande River on the Mexican side of the border. All other piers would be outside of the channel banks. GER would construct the one pier that would lie within the Rio Grande River in Mexico using access from the Mexican shoreline, which would involve temporary fill in the riverbed from the shoreline to the pier. Construction of this pier would also involve installing a temporary jetty in the river, also entirely on the Mexican side.

The Southern Rail Alternative's location, high in the Seco Creek valley, would avoid direct impacts to Seco Creek. However, it could cause indirect impacts due to soil erosion during construction, especially during rainfall events.

The Southern Rail Alternative would cross the existing ditch feature, located east of Barrera Street, using a bridge structure. Therefore, there would be no impacts to the ditch feature regardless of whether USACE determines that it is jurisdictional.

In short, construction of the Southern Rail Alternative could result in short-term localized and downstream water quality impacts. During construction, ground disturbance could lead to erosion of sediments, which would flow downslope into low-lying areas and eventually into the Rio Grande River and Seco Creek. Construction activities on the Mexican side of the Rio Grande River, briefly described above, would contribute to these impacts. However, GER would be required to obtain a TPDES permit and associated Stormwater Pollution Prevention Plan (SWPPP) prior to construction. These permits would require installation of erosion and sediment controls, such as silt fence, sediment traps, and stabilization of soils during the construction phase. Appropriate monitoring and corrective actions would also be required to ensure that erosion and sediment control practices are in place in accordance with the permit plans. As a result of these regulatory requirements, OEA expects that construction of the Southern Rail Alternative would cause minimal water quality impacts and is not recommending any mitigation.

Floodplain

The Southern Rail Alternative's New Rail Bridge and most of the proposed line would be within the FEMA-mapped floodplain. However, as shown in **Figure 3.11-2,** GER's estimated BFE results in a floodplain boundary that has a smaller footprint than the FEMA-mapped floodplain. Most of the proposed line and its associated fill would be outside the floodplain mapped by GER.

The New Rail Bridge and proposed line would be elevated above GER's estimated BFE. To satisfy FEMA and IBWC regulatory requirements, the New Rail Bridge would be elevated so that the bottom of the horizontal support beams would be at least 1 meter above the BFE. Therefore, the only encumbrance within the floodplain would be the vertical support piers for the bridge and the embankment where it would run through low-lying ground identified as the floodplain south of Seco Creek (see **Figure 3.11-2**).

According to information provided in its response to Information Request #1, GER proposes to design culverts within the railbed to, at a minimum, pass the predicted 25-year flood flow and ensure that the 100-year BFE would not increase by more than 1 foot at any culvert location (Oct. 17, 2024, letter to OEA). This would maintain existing drainage from the south to Seco Creek, which would otherwise be disconnected by the construction of the Southern Rail Alternative.

FEMA requires that any increase in flood elevation between existing conditions and proposed conditions be coordinated with the local floodplain administrator and that analysis be provided to demonstrate that flood elevations do not increase by more than 1 foot (City of Eagle Pass Code of Ordinances, Section 13.5; 44 C.F.R. 60.3). IBWC separately requires that flood elevations do not increase by more than 6 inches (IBWC 2023).

Prior to any rail construction, GER would need a local floodplain development permit (City of Eagle Pass Code of Ordinances, Section 13.5), a Conditional Letter of Map Revision (CLOMR) from FEMA, and a permit from IBWC. Following construction, GER would need approval of a Letter of Map Revision from FEMA to verify that the proposed line meets the conditions approved in the CLOMR. 44 C.F.R. 65.6.

The required FEMA and IBWC approvals would ensure that there are minimal effects on the floodplain during construction of the Southern Rail Alternative. GER proposes to build a temporary bridge on the Mexican side of the riverbed and floodplain to facilitate construction of the New Rail Bridge (see *Section 3.10, Biological Resources*). IBWC would require GER to design and maintain the temporary bridge so as not to increase flood elevations or scour (erosion of the streambed or bank material by flowing water around a bridge's foundation) in the event of a flood.

Considering the regulatory requirements outlined above, OEA expect that impacts of the Southern Rail Alternative on the floodplain would be minimal and is not recommending any mitigation.

Groundwater

Impacts to groundwater can result from water withdrawals or changes in aquifer recharge areas. GER has not proposed to use groundwater for the construction of the Southern Rail Alternative. GER proposes clearing, which would involve removing topsoil or unsuitable material, to a maximum depth of 6 inches. This would not come close to the water table, which is more than 6 feet below.

Construction of the Southern Rail Alternative would alter infiltration and recharge characteristics and permanently reduce or impede infiltration due to surface soil compaction. Also, to support the New Rail Bridge, GER would drill piles up to 65 feet deep for five concrete piers located on land between the bridge abutment near the NII facility and the Rio Grande River shoreline. Each pier would create approximately 85 feet by 20 feet (or 1,600 square feet) of impervious surface. There would be 8 similar piers on the Mexican side of the border.

However, the footprint of the Southern Rail Alternative (including embankment and bridge piers on both sides of the border) would be small compared to the total aquifer recharge area. The U.S. side of the

proposed line has a total footprint of less than 0.03 square miles, whereas the watershed and groundwater recharge area for Seco Creek is approximately 8 square miles. Therefore, the Southern Rail Alternative would minimally disrupt rainfall infiltration, especially as it relates to the deep groundwater, which is primarily supported by water from the Rio Grande River. OEA is not recommending mitigation for impacts on groundwater.

Navigation

OEA anticipates that construction of the Southern Rail Alternative would not affect navigation on the Rio Grande River. Any impacts related to the construction of the New Rail Bridge's single in-water pier on the Mexican side of the border, including the installation of a temporary jetty, would be short-term.

Rail Operations

Surface Waters

OEA anticipates that operation of the Southern Rail Alternative would have minimal impact to surface waters. Stormwater runoff from the New Rail Bridge and railbed would move stormwater and potentially low concentrations of pollutants to the Rio Grande River and Seco Creek. The primary pollutants that would cause degradation to surface waters are sediment, nutrients, pesticides, salt, and heavy metals.

As discussed in *Section 3.1, Freight Rail Safety*, OEA expects that in the event of a release of hazardous materials resulting from rail incidents along the Southern Rail Alternative, the amount released would be small. GER would be required to comply with all applicable laws and regulations governing the safe transport of hazardous materials such as the HMTA (49 U.S.C. 5101 *et seq*.) and USDOT regulations that include requirements for shipping and packaging containers for hazardous materials, emergency response information, and training. Also, EPA regulations (40 C.F.R. 300) under CERCLA govern incidents, spills, and other emergency releases of pollutants and contaminants to the environment. With the regulations in place, impacts from any spills would be minimized (see also *Section 3.1, Freight Rail Safety*, and **Appendix C**). In general, OEA expects that if a release of hazardous materials were to occur, it would involve a relatively short duration of exposure and would be contained quickly.

Regarding the municipal water supply intake in the Rio Grande River, the American Water Infrastructure Act of 2018 requires that community drinking water systems serving over 3,300 people, such as that of Eagle Pass's, have updated risk assessments and emergency response plans tailored to specific incidents. If a release were to occur, GER would be required to report it to a 911 operator to initiate the implementation of appropriate emergency response plans. 40 C.F.R. 355.42b. The community drinking water systems' emergency response plan would contain appropriate management actions depending on the materials involved and the resources affected. These might include, but would not necessarily be limited to, cleaning up the spill and temporarily restricting the use of the water body. Such measures would minimize the potential for long-term impacts through unrecognized soil or water contamination. If a contaminant poses a substantial threat to public health and local and state authorities do not act, the federal government has the authority to intervene to safeguard public health. 42 U.S.C. Chapter 6A, Subchapter XII, Part D.

Considering the existing regulatory requirements for immediate emergency response and cleanup operations and the protection of municipal water supplies, OEA is not recommending mitigation for potential hazardous materials releases in surface waters.

Floodplain

The impacts of the Southern Rail Alternative on the floodplain are those described under *Construction* above. Rail operations on the proposed line under the Southern Rail Alternative would not result in additional impacts to the floodplain.

Groundwater

Impacts to groundwater typically occur from water withdrawals, changes in aquifer recharge areas, or excavation of the landscape, which may draw down the surficial water table. GER is not proposing to withdraw groundwater to operate the Southern Rail Alternative.

Navigation

OEA anticipates that operation of the Southern Rail Alternative would not affect navigation on the Rio Grande River. The New Rail Bridge would have one in-water pier, which would be on the Mexican side of the border. No pier would be on the U.S. side. The single pier on the Mexican side would not impede the type of navigational activities that occur on the Rio Grande River (recreational and border policing).

3.11.3.2 Northern Rail Alternative

Construction

OEA anticipates that the groundwater and navigation impacts resulting from construction of the Northern Rail Alternative would be mostly the same as described above for the Southern Rail Alternative. However, more of the Northern Rail Alternative would be located within GER's estimated floodplain boundary. Therefore, GER's design includes a greater portion of the Northern Rail Alternative (approximately 1,500 feet between the NII facility and the river) to be on a bridge, which would minimize fill impacts to the floodplain (see *Chapter 2, Figure 2-4*). As a result, most of the Northern Rail Alternative and its associated fill would be outside the floodplain. Therefore, OEA expects that impacts on the floodplain would be minimal and is not recommending any mitigation.

The Northern Rail Alternative would also cause greater disturbance to Seco Creek during construction because it would cross the creek in multiple locations between the Rio Grande River and U.S. 277, whereas the Southern Rail Alternative does not. The required construction materials and equipment in the Seco Creek valley and its floodplain would increase the likelihood of adverse effects on the Seco Creek floodplain in the event of a flood during construction. However, this would be temporary.

Rail Operations

OEA anticipates that the groundwater and navigation impacts resulting from operation of the Northern Rail Alternative would be the same as described above for the Southern Rail Alternative.

OEA anticipates that impacts from operation of the Northern Rail Alternative on surface waters and the floodplain would be minimal. The Northern Rail Alternative would cross Seco Creek in several locations, which would create a risk for debris jams, streambed and bank erosion, and ground saturation. The New Rail Bridge, including the portions of it spanning Seco Creek, would be subject to a Nationwide Permit, per OEA's meeting with USACE on December 19, 2024. Compliance with the permit requirements described above for the Southern Rail Alternative would minimize potential adverse impacts.

3.11.3.3 Associated CMV Facility

Construction

OEA anticipates that the impacts on surface waters and groundwater from construction of the associated CMV Facility would be the same as described above for the Southern Rail Alternative, without the potential impacts to Seco Creek, since the associated CMV Facility would be located on an elevated terrace to the north. While FEMA has mapped the 100-year floodplain in a way that encompasses the associated CMV Facility footprint, as noted above, this mapping is approximate. Based on GER's floodplain mapping, the associated CMV Facility would be entirely outside the floodplain (see **Figure 3.11-2**). Furthermore, the elevation of the associated CMV Facility would be higher than the adjacent north and south areas within the FEMA floodplain and, therefore, the floodwaters would flow around the site rather than over it. The further floodplain analysis that would be required by FEMA and IBWC, as described above for the Southern Rail Alternative, would provide a refined BFE and confirm that the associated CMV Facility is outside of the 100-year floodplain. Therefore, OEA anticipates no floodplain impacts from the construction of the associated CMV Facility.

Operation

OEA anticipates that impacts on water resources resulting from operation of the associated CMV Facility would be minimal. The associated CMV Facility would create an increase in impervious cover within the watershed, and thus an increase in stormwater runoff and transport of fine-grained sediment and other pollutants from commercial motor vehicles. Stormwater management facilities would collect and drain runoff pursuant to TPDES permit requirements, thereby minimizing potential adverse effects.

3.11.3.4 No-Action Alternative

Under the No-Action Alternative, the Board would deny authority for GER to construct and operate the proposed line. The proposed line and the associated CMV Facility would not be constructed. There would be no impacts on surface waters, floodplains, water quality, groundwater, or navigation.

3.11.4 Conclusion

OEA has determined that construction of the Southern Rail Alternative, or the Northern Rail Alternative, and the associated CMV Facility could result in short-term, localized and downstream water quality impacts due to ground disturbance, with the Northern Rail Alternative causing greater disturbance to Seco Creek than the Southern Rail Alternative, because it would cross the creek in multiple locations between the Rio Grande River and U.S. 277. Construction activities on the Mexican side of the Rio Grande River could lead to erosion of sediments into the Rio Grande River and Seco Creek. However, GER and PVH would have to comply with TPDES permit requirements and the associated SWPPP, which would minimize these impacts. Therefore, OEA is not recommending mitigation for construction-related impacts on water quality.

In the event of a hazardous materials release resulting from rail incidents during operation of the Southern or Northern Rail Alternative, compliance with existing emergency response and cleanup regulations would minimize impacts. Therefore, OEA is not proposing any hazardous materials transport mitigation.

OEA determined that part of the Southern and Northern Rail Alternatives would be constructed within the 100-year floodplains of the Rio Grande River and Seco Creek. However, GER would design the

proposed line in compliance with regulations governing construction in the floodplain, resulting in minimal impacts. Therefore, OEA is not recommending any floodplain mitigation. OEA determined that construction of the associated CMV Facility would take place outside the floodplain, resulting in no impact.

OEA also determined that compaction and pavement associated with construction of the Southern Rail Alternative, the Northern Rail Alternative, and the associated CMV Facility would reduce groundwater recharge. However, the size of the altered area would be very small compared to the size of the overall watershed, resulting in minimal impacts. No groundwater withdrawals would be needed to operate the Southern or Northern Rail Alternative, or the associated CMV Facility. Therefore, OEA is not recommending mitigation for groundwater impacts.

3.12 Land Use

OEA analyzed how construction and operation of the proposed line (both the Southern and Northern Rail Alternatives) and the associated CMV Facility could affect land use, which involves parcels' designation and suitability for residential, industrial, agricultural and other uses. This section describes the affected environment and potential environmental consequences on land use that could result from the Southern and Northern Rail Alternatives, the associated CMV Facility, and the No-Action Alternative.

3.12.1 Approach

This subsection describes the approach OEA used to analyze effects on land use. OEA's analysis addressed effects on zoning as well as land use in the vicinity of the proposed line under either build alternative and the associated CMV Facility. "Land use" describes the human use of the land and represents the economic and cultural activities (*e.g.*, agricultural, residential, industrial, mining, and recreational uses) that are practiced at a given place. "Zoning" refers to the designation by a locality of the type of land uses that are permissible within a given area (often called zones or zoning districts) along with specific rules and requirements applying to these uses.

OEA's analysis considered consistency with existing zoning designations and land uses as well as with available land use plans. Maverick County does not currently have a land use plan or zoning map in place. Eagle Pass has a zoning map and an outdated land use map.

Eagle Pass and Maverick County are not located in Texas's designated coastal zone; therefore, coastal zone management requirements are not applicable. OEA identified no parks or recreation areas that have the potential to be affected by the construction and operation of the proposed line and the associated CMV Facility. Therefore, this section does not address recreation or recreational areas.

The Farmland Protection Policy Act (FPPA) (7 U.S.C. Part 658) is intended to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. As explained in **Appendix I**, the footprint of the associated CMV Facility contains prime farmland. However, the NRCS considers the location as "land already in urban development;" therefore, FPPA does not apply (Sep. 17, 2024, letter to OEA).

OEA used the following sources for the land use analysis:

- City of Eagle Pass Zoning Ordinance and Zoning Map (City of Eagle Pass, Texas n.d.);

- City of Eagle Pass Future Land Use Map (City of Eagle Pass, Texas 1996);
- Parcel data from the Maverick County Appraisal District (Maverick County Appraisal District n.d.); and
- Windshield surveys and publicly available aerial photography.

The study area for land use includes:

- From west to east, the area from the United States/Mexico border in the Rio Grande River to approximately UP milepost 31 east of U.S. 277, within which GER would construct the proposed line under either build alternative, along with immediately adjacent areas to the north and south (proposed line study area); and
- The footprint of the associated CMV Facility and adjacent areas approximately bounded by Elm Creek to the west; FM 1589 to the north; U.S. 277 to the east; and Seco Creek to the south (associated CMV Facility study area).

OEA anticipates no effects beyond the study area because of distance and intervening buildings, roadways, or landscape features. The study area and its surroundings are shown in **Figure 3.12-1**.

OEA's analysis considered the following potential effects:

- Zoning and land use conversion and displacements (whether construction and operation of the proposed line and the associated CMV Facility would require or cause changes in zoning and land use, or displacement of homes or businesses).
- Severance of contiguous properties (whether construction and operation of the proposed line and the associated CMV Facility would require severing a piece of land from a larger contiguous tract).
- Curtailment or constraint of access to property (whether construction and operation of the proposed line and the associated CMV Facility would impede or eliminate access to or movement within an adjacent property).

3.12.2 Affected Environment

3.12.2.1 Proposed Line

Zoning

A portion of the proposed line study area within Eagle Pass is within a One-Family Residential (R2) zoning district that extends south along the Rio Grande River from Seco Creek (Eagle Pass city line) to north of Paso Del Rio Boulevard. Other Eagle Pass zoning districts east of the R2 zoning district include Duplex Residential (R3) and, close to U.S. 277, Neighborhood Business (B1). There are no formal zoning designations outside the city of Eagle Pass.

Land Use

West of U.S. 277, the study area for the proposed line consists of undeveloped land owned by GER along Seco Creek and, to the south, a development consisting of recently built, single-family residences (No. 1 on **Figure 3.12-1**).

Figure 3.12-1. Land Uses and Zoning Near the Proposed Line and the Associated CMV Facility

Source: ArcGIS Online, NearMap, City of Eagle Pass

Just east of this development are two older housing complexes subsidized by the U.S. Department of Agriculture (USDA) and U.S. Department of Housing and Urban Development (HUD), respectively: the Enrique Montalvo Riverside Manor (No. 2) and the Elia Santos Development (No.3). North of Seco Creek, there are single-family residential parcels along Cenizo Drive (No. 4). Fronting both sides of U.S. 277 are commercial uses, such as fast-food restaurants and automobile service stations.

To the east, the proposed line study area encompasses commercial uses adjacent to U.S. 277 and the northern end of a single-family residential neighborhood (No. 5) centered on Barrera Street, between North Veterans Boulevard to the south and Seco Creek to the north. To the east, this neighborhood is bounded by Rodriguez Street and a large, concrete-lined stormwater channel (No. 6). Past the stormwater channel, the proposed line study area includes undeveloped land to the east (No. 7) up to the existing UP mainline. GER owns part of the proposed line's future right-of-way east of U.S. 277, but several parcels within this future right-of-way are under different ownership. Most of the parcels not owned by GER are undeveloped; three of the parcels, located just east of U.S. 277, have one building each. Two of the buildings are small light industrial buildings; the other is a one-story residence (see **Figure 3.12-2**).

3.12.2.2 Associated CMV Facility

The associated CMV Facility study area is located entirely in the unincorporated community of Seco Mines, Maverick County, west of U.S. 277 and south of FM 1589. According to Maverick County Appraisal District data, the future footprint of the associated CMV Facility is classified as tillable irrigated land (TI) or native brushland (RB) for taxation purposes. Field surveys and aerial imagery indicate that the area is currently used for agricultural purposes. GER owns part of the property.

Two residential parcels are located in the associated CMV Facility study area, to the west of the associated CMV Facility footprint. GER owns one of these parcels (No. 8). GER does not own the other (No. 9). Further west, there is a triangle-shape agricultural field (No. 10), extending to Elm Creek. A commercial use (No. 11), consisting of a small warehouse and storage yard connecting to FM 1589, is near the future exit of the associated CMV Facility.

Two unpaved roads traverse the footprint of the associated CMV Facility in an east-west direction: the western, unpaved section of Ritchie Road and an unnamed road (No. 12). To the east, Ritchie Road becomes a paved street that connects to U.S. 277. These two roads connect to other unpaved roads that run along the western and eastern perimeters of the site (No. 13). Ritchie Road provides access to the residential parcels owned by GER mentioned above.

The area of Seco Mines east of the associated CMV Facility's footprint, between Commissary Avenue to the west, U.S. 277 to the east, Seco Creek to the south, and FM 1589 to the north, is developed mostly with single-family housing and, along U.S. 277, commercial and light industrial uses.

3.12.3 Environmental Consequences

3.12.3.1 Southern Rail Alternative

Zoning and Land Use Conversion, and Displacements

West of U.S. 277, construction of the Southern Rail Alternative would convert land that is currently undeveloped and zoned for residential (R2) use to a transportation use, requiring GER to file with the

City of Eagle Pass for a zoning amendment from R2 to Industrial.[22] East of U.S. 277, GER is planning to acquire 25 parcels to construct the Southern Rail Alternative. These include the three parcels mentioned above, which each have one building. The two buildings closest to U.S. 277 are small light industrial buildings and the other building facing Barrera Street is a one-story residence. These three buildings, illustrated in **Figure 3.12-2**, would be displaced by the Southern Rail Alternative.

The other parcels needed to construct the Southern Rail Alternative east of U.S. 277 are currently undeveloped and would be converted to a transportation use. OEA is not recommending mitigation for the displaced buildings because the Board would not be involved in any of the land acquisitions that would be required.

Severance of Contiguous Properties

Construction and operation of the Southern Rail Alternative would not sever any contiguous properties.

Curtail or Constrain Access to Properties

The Southern Rail Alternative would not permanently curtail or constrain access to any properties. While the proposed line would be largely fenced, fencing would stop south of the connection with the existing UP mainline and no existing rail crossings would be fenced, including the private crossing at Dr Gates Road (No. 14). This crossing currently provides access to a large property east of the existing UP mainline. Construction and operation of the Southern Rail Alternative would not affect access to this property.

During construction of the U.S. 277 and Barrera Street Bridges, partial and complete road closures (as described in *Chapter 2, Section 2.3.2.4, Construction of the Line Under Both Build Alternatives*) could temporarily constrain access to the adjacent properties. However, the closures would be short (days for partial lane closures and hours for total road closures) and construction planning would identify alternative routes. Any adverse effects on access to adjacent properties would be negligible.

3.12.3.2 Northern Rail Alternative

The effects of the Northern Rail Alternative would be the same as those described for the Southern Rail Alternative above.

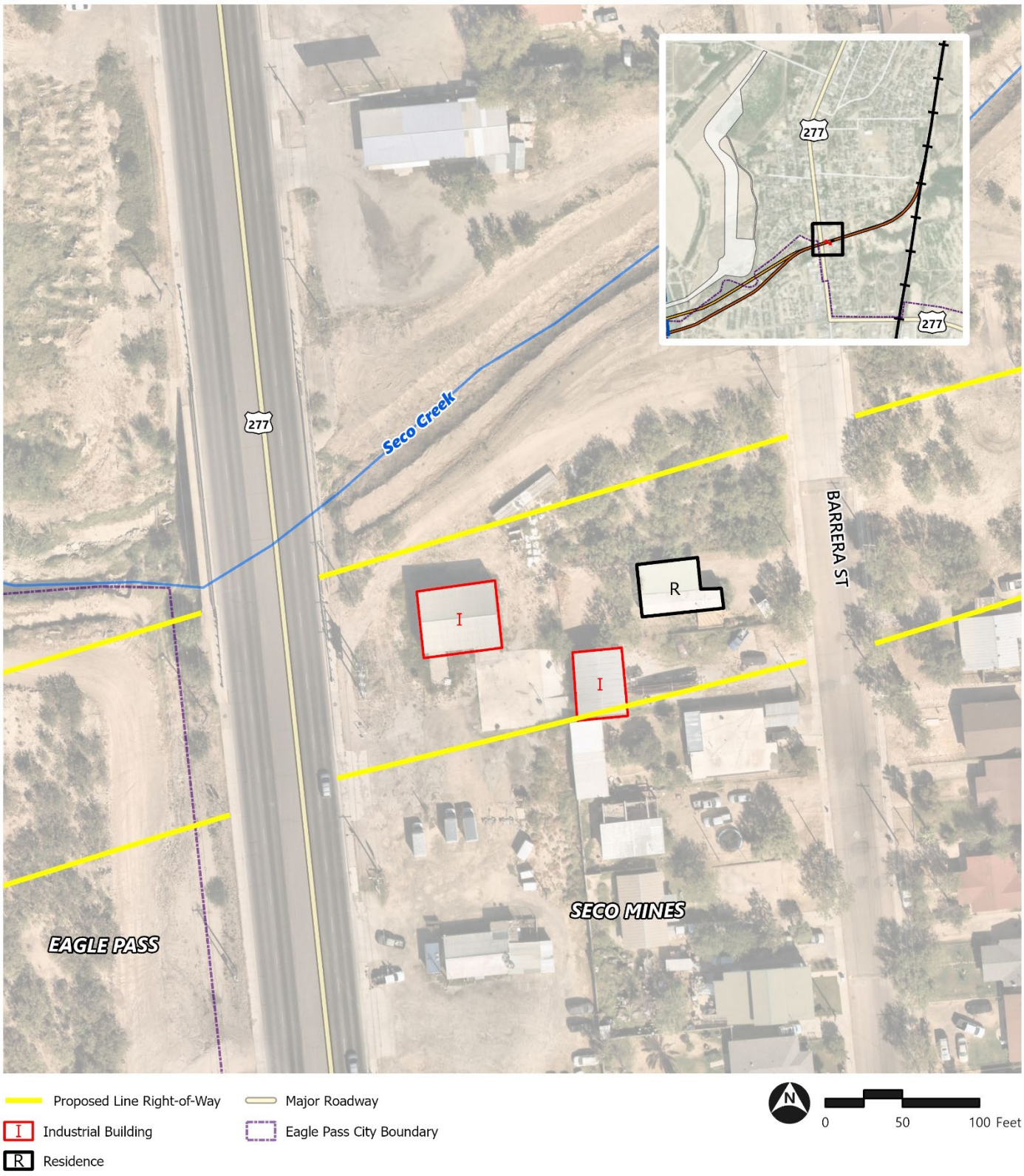
3.12.3.3 Associated CMV Facility

Zoning and Land Use Conversion, and Displacement

The associated CMV Facility would be located in Maverick County, which, as noted above, does not have a zoning map. Construction of the associated CMV Facility would require land acquisition and result in land use conversion. PVH owns much of the land needed to construct the facility. However, PVH would have to acquire two large parcels in the east-central part of the associated CMV Facility's footprint. The land on which PVH would build the associated CMV Facility is currently used for agriculture. This land would need to be converted to a transportation use.

[22] While the proposed line is a transportation use, the district encompassing the existing UP mainline is zoned Industrial. Therefore, OEA assumes that the same zoning designation would apply to the proposed line.

Figure 3.12-2. Property Displacements



Source: ArcGIS Online, NearMap

As NRCS explained in its letter to OEA dated September 17, 2024, although some of the affected land consists of prime farmland, it is located in an area that NRCS considers "already in urban development." Therefore, FPPA does not apply and there would be no loss of protected farmland.

Severance of Contiguous Properties

Construction of the associated CMV Facility would not sever any contiguous properties.

Curtail or Constrain Access to Properties

Construction of the associated CMV Facility would require closing the two east-west unpaved roads that currently cross the site, including the unpaved portion of Ritchie Road. Elimination of this access may constrain access to the two residential parcels located near the western edge of the site (No. 8 and No. 9). However, in a letter to OEA dated September 4, 2024, GER stated that PVH would maintain access from the north (from FM 1589) via an upgraded perimeter road running just outside the facility's fence.

3.12.3.4 No-Action Alternative

Under the No-Action Alternative, the Board would deny authority for GER to construct and operate the proposed line. The proposed line and the associated CMV Facility would not be constructed. Land use in the study area would remain as it is currently.

3.12.4 Conclusion

OEA has determined that the Southern and Northern Rail Alternatives would require partial rezoning by the City of Eagle Pass to construct the proposed line. GER would file with the City to rezone an existing Residential zoning district to Industrial. Constructing the proposed line under either alternative would displace two businesses and one residence not currently owned by GER. OEA is not recommending mitigation for the displaced buildings as the Board would not be involved in the land acquisition process. Construction of the associated CMV Facility would result in the conversion of land currently used for agriculture to a transportation use. NRCS indicated to OEA that although some of the affected land consists of prime farmland, it is located in an area that NRCS considers "already in urban development;" therefore, the FPPA does not apply and there would be no loss of protected farmland.

3.13 Visual Quality

OEA analyzed how construction and operation of the proposed line (both the Southern and Northern Rail Alternatives) and the associated CMV Facility could affect visual resources — the qualitative character of a landscape that is routinely visible to people living or working in a community. This section describes the affected environment and potential environmental consequences on visual resources that could result from the Southern and Northern Rail Alternatives, the associated CMV Facility, and the No-Action Alternative.

3.13.1 Approach

This subsection describes the approach OEA used to analyze effects on visual quality. To assess visual impacts, OEA identified key observation points (KOPs). KOPs are locations from which people would be able to see the proposed line or the associated CMV Facility within the landscape if they were constructed. OEA considered the following factors in selecting the KOPs: public accessibility and

proximity of residential areas. In addition, in selecting the KOPs, OEA also considered locations where views would include the most noticeable elements of the proposed line and the associated CMV Facility, such as the NII facility and noise barriers for the proposed line, and the Central Targeting Tower for the associated CMV Facility.

OEA selected four KOPs for analysis, the locations of which are shown in **Figure 3.13-1** below. OEA documented and characterized each KOP based on site visits and photographs. OEA then used GIS data and computer-aided design (CAD) drawings, which GER provided, to develop a three-dimensional model and create conceptual computer renderings. OEA used these conceptual computer renderings from the KOPs to determine if the construction of the proposed line and the associated CMV Facility would noticeably impact the visual quality of the KOPs. Renderings showing minimal visual impacts or no impacts are available in **Appendix M**.

3.13.2 Affected Environment

3.13.2.1 Proposed Line

The affected environment in the vicinity of the proposed line under either the Southern or Northern Rail Alternative is characterized by a blend of natural landscapes and low-density residential and commercial development. The terrain is relatively flat, and the buildings are mainly single-story residential and commercial buildings that mostly blend in with the surrounding landscape.

3.13.2.2 Associated CMV Facility

GER would construct the associated CMV Facility in a flat, undeveloped farmland area consisting of minimal plantings or any other discernable visual characteristics. The affected area is bordered to the north by FM 1589 and to the west and south by the existing natural features of Elm Creek, Seco Creek, and the Rio Grande River. The affected environment east of the associated CMV Facility consists of an unpaved service road at the edge of the property with a natural vegetative buffer and local residential streets adjacent. Further east, the affected environment transitions to a mix of single-family residential houses. These neighborhoods consist primarily of single-story residences.

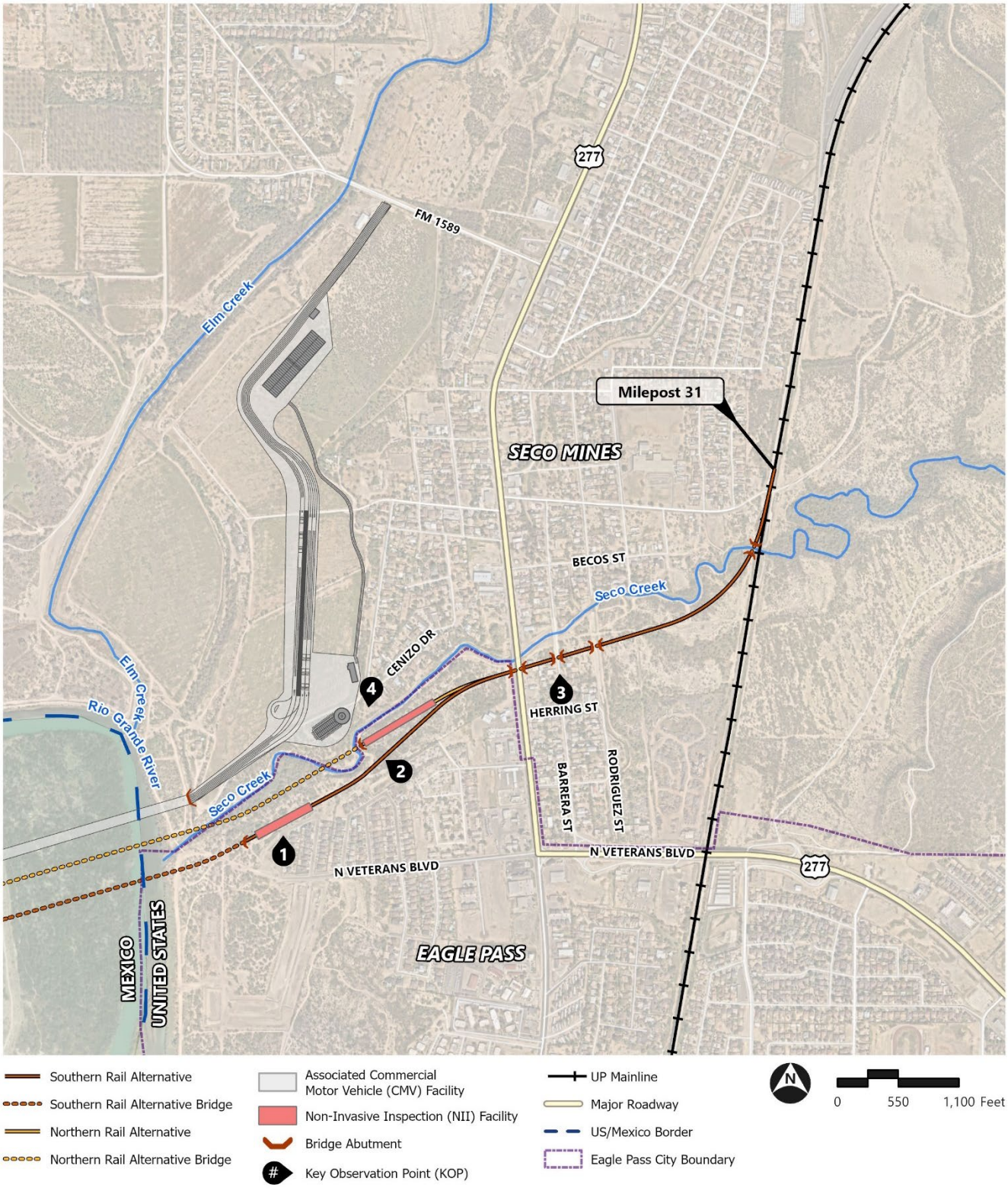
3.13.3 Environmental Consequences

3.13.3.1 Southern Rail Alternative

Construction

Construction activities for the Southern Rail Alternative would temporarily introduce heavy equipment and associated vehicles such as bulldozers, graders, scrapers, and trucks into the viewshed. Depending on location, viewers could see staging areas with temporary field offices, temporary parking for construction workers, and equipment and materials storage areas, which would add industrial-looking elements into the viewsheds. Additional construction effects include:

Figure 3.13-1. Key Observation Point Locations



Source: ArcGIS Online, NearMap

- Increased fugitive dust in the viewshed: Construction activities involving heavy equipment use, soil and material transport, construction staging areas, and land clearing in the right-of-way and along public roadways would create fugitive dust.[23]
- Vegetation removal: GER would remove vegetative cover on hillsides and flat areas, including grassland areas, shrubs, and mature trees, to construct the Southern Rail Alternative. Vegetation improves visual quality and helps screen the built features in the landscape.
- Local residents' views: While most of the construction would occur on vacant land with existing buffers, such as vegetation or fences, a small number of local residents would see project-related construction activities occurring adjacent to homes that have no visual obstruction.

Rail Operations

The Southern Rail Alternative would introduce permanent built horizontal and vertical elements into a landscape that is currently a blend of natural features and residential and commercial development. The new permanent elements would include freight trains operating on the proposed line, the NII facility, noise barriers, embankments, and bridge piers and culverts. Introducing these elements into the existing landscape would have impacts on visual quality.

KOP 1

The existing visual quality of KOP 1 is flat and horizontal with minimal vertical elements. The wide asphalt roadway in the foreground and the expansive sky guides the eye to the undeveloped fields of grasses and trees. The linear tree line, roughly 500 feet away in the undeveloped field, blends with the rooflines of the three homes visible (see **Figure 3.13-2**).

Figure 3.13-2. KOP 1 Pre-Construction

[23] Fugitive dust refers to particulate matter that enters the atmosphere without first passing through a stack or duct designed to direct or control its flow.

The Southern Rail Alternative would introduce a large structure (the NII facility) approximately 220 feet from KOP 1, that would block views of the undeveloped fields. The NII facility would interrupt the middle ground view and would eliminate the softer horizontal line that was created by the vegetation, but it would not significantly impede views of the sky. The Southern Rail Alternative would be north of the KOP, so no new shadows would be cast when the sun is positioned south of the KOP (see **Figure 3.13-3)**. The NII facility would be taller than the surrounding structures. While GER proposes to reestablish native tree plantings where possible and as appropriate to help screen the proposed line from adjacent viewsheds, the Southern Rail Alternative would dominate the visual quality of KOP 1. The facility must be located on a straight stretch of track and for this reason, could not be shifted any significant distance eastward or westward given the alignment of the Southern Rail Alternative. Because of its size, the NII facility cannot be effectively screened or camouflaged. Therefore, OEA determined that there is no reasonable and feasible mitigation to recommend that would reduce the impact of the NII facility on KOP 1.

Figure 3.13-3. KOP 1 After Construction of the Southern Rail Alternative (Approximately 220 Feet from Viewpoint)

KOP 2

The existing visual quality of KOP 2 is flat and horizontal with the majority of the vertical elements directly in the foreground blocking nearly half the view of the horizon line (see **Figure 3.13-4**). The view is dominated by natural features, such as the grove of trees on the horizon line, with minimal built features directly visible other than the residences and the utility pole in the foreground.

The Southern Rail Alternative would introduce a horizontal built element into a relatively flat landscape approximately 300 feet from KOP 2, as shown in **Figure 3.13-5**. GER would construct a noise barrier in the middle ground that would replace the soft features previously provided by the landscape. The foreground would remain undisturbed. Although the noise barrier would not be taller than the surrounding houses, and GER proposes to reestablish native tree plantings where possible and as appropriate to help screen the proposed line from adjacent viewsheds, the Southern Rail Alternative would dominate the visual quality of KOP 2. The height and location of the noise barriers are driven by

the need to adequately attenuate noise and cannot be reduced without losing effectiveness. Therefore, OEA has determined that there is no reasonable and feasible mitigation to recommend that would reduce the impact of the noise barrier on KOP 2.

Figure 3.13-4. KOP 2 Pre-Construction

Figure 3.13-5. KOP 2 After Construction of the Southern Rail Alternative (Approximately 300 Feet from Viewpoint)

KOP 3

KOP 3 is located along a residential street characterized by a blend of residential and utility elements (see **Figure 3.13-6**). Utility poles and overhead wires are repetitive vertical and horizontal elements that create a rhythm and guide the viewer's gaze along the length of the street. A mix of two and a half-story and one-story residential houses line either side of the road. Trees interspersed along the sidewalks contribute to the visual greenery and provide a natural contrast to the otherwise urban setting. Street elements, including trash bins and signage, indicate routine residential activity. Overall, the visual character of the KOP reflects a residential street with a balance of natural and built elements.

The Southern Rail Alternative would introduce a built horizontal element into a landscape that includes various horizontal and vertical elements (see **Appendix M**, *Figure M-3)*. KOP 3 would be approximately 350 feet from the embankment. While it would be taller than the surrounding structures, the New Rail Bridge and noise barrier would not dominate the visual quality of KOP 3. The existing trees along the street would help to screen and minimize the visual impacts under the Southern Rail Alternative. In addition, the two and a half-story residential houses would act as a buffer.

Figure 3.13-6. KOP 3 Pre-Construction

KOP 4

The visual quality of KOP 4 is defined by a contrast of natural and built elements in a semi-rural setting (see **Figure 3.13-7**). The foreground features a grayish asphalt road, transitioning into two unpaved paths diverging from a central point. The path on the left is bordered by a residential structure on one side and a chain-link fence on the other. In contrast, the path on the right is flanked on both sides by mature trees with irregular canopies which suggests a more natural and less developed environment. Vegetation density increases along the peripheries of both paths, dominated by scrubby bushes and tree species indicative of dry or semi-arid conditions. The middle ground and background are characterized by vegetation, reinforcing the rural quality and screening views to the west of the street, with a balance built and natural elements.

The Southern Rail Alternative would introduce a horizontal, hard-edged element into the background (see **Appendix M,** *Figure M-4*). KOP 4 would be approximately 880 feet from the noise barrier. Due

to its distance from the viewer and the change in topography, the proposed line and noise barrier would not interrupt the horizon line. Therefore, the Southern Rail Alternative would not dominate the visual quality of KOP 4.

Figure 3.13-7. KOP 4 Pre-Construction

3.13.3.2 Northern Rail Alternative

Construction

Impacts to the visual quality of the area during construction of the Northern Rail Alternative would be similar to those of the Southern Rail Alternative.

Rail Operations

Impacts to the visual quality of the area during operation of the Northern Rail Alternative would be similar to the impacts from the Southern Rail Alternative. However, variations in the alignment and structure of the Northern Rail Alternative would affect KOP 1 and KOP 2 differently than the Southern Rail Alternative (described previously).

KOP 1

As described above, the existing visual quality of KOP 1 is flat and horizontal with minimal vertical elements (see **Figure 3.13-2** above). The Northern Rail Alternative would introduce built elements into an area that previously consisted of natural elements. KOP 1 would be approximately 550 feet from the New Rail Bridge. The horizontal rail line and the spacing of the vertical piers of the New Rail Bridge would still allow views of the natural elements around Seco Creek (see **Appendix M**, *Figure M-5*). Freight trains moving on the New Rail Bridge would create a temporary horizontal line and interrupt the existing horizon line, as shown in **Appendix M**, *Figure M-6*. But this would be temporary. Therefore, the Northern Rail Alternative would not dominate the visual quality of KOP 1.

KOP 2

As described previously, the existing visual quality of KOP 2 is flat and horizontal with most of the vertical elements directly in the foreground blocking nearly half the view of the horizon line (see **Figure 3.13-4** above). The Northern Rail Alternative would introduce built elements into a mostly natural landscape. KOP 2 would be approximately 690 feet from the New Rail Bridge. The distance away from the viewer and the spacing of the New Rail Bridge's vertical piers would allow views of the natural features along Seco Creek. To the east of the KOP, the height of the noise barrier and the proposed line's embankment would alter the visual quality by blocking views to the north of Seco Creek (see **Figure 3.13-8** and **Figure 3.13-9**). The NII facility for the Northern Rail Alternative would also be located to the right of the viewer, outside the range of the photo and would also block the view to the north. Therefore, while GER proposes to reestablish native tree plantings where possible and as appropriate to help screen the proposed line from adjacent viewsheds, the Northern Rail Alternative would still dominate the visual quality of KOP 2. This visual impact is the result of the Northern Rail Alternative's alignment and geometry; the NII facility could not be shifted eastward, as it needs to sit on a straight stretch of track. Therefore, OEA has determined that there is no reasonable and feasible mitigation to recommend that would reduce the impact of the Northern Rail Alternative on KOP 2.

KOP 3 and KOP 4

The Northern Rail Alternative's impact on KOP 3 and KOP 4 would be similar to that of the Southern Rail Alternative's, described above. KOP 3 would be at the same distance from the Northern Rail Alternative as it would be from the Southern Rail Alternative. KOP 4 would be a little closer to the Norther Rail Alternative (550 feet compared to 880 feet for the Southern Rail Alternative), but this is not enough to make a difference in the visual impact.

Figure 3.13-8. KOP 2 After Construction of the Northern Rail Alternative, Without Train Traffic (Approximately 690 Feet from Viewpoint)

Figure 3.13-9. KOP 2 After Construction of the Northern Rail Alternative, with Train Traffic (Approximately 690 Feet from Viewpoint)

3.13.3.3 Associated CMV Facility

Construction

Impacts to the visual quality of the area during construction of the associated CMV Facility would be similar to the impacts from construction of the proposed line under either of the build alternatives.

Operation

The associated CMV Facility would include four buildings on site with parking lots, lighting and other infrastructure required for operations as depicted in *Chapter 2, Figure 2-2*. The buildings would be connected by a service road with roadway lighting that runs along the eastern edge of the site adjacent to the residential neighborhood. The entire facility would be enclosed by a chain-link fence. Visibility of the associated CMV Facility from the existing local roadway to the east ranges from 30 to over 400 feet, depending on the density of the existing vegetation buffer and proposed new plantings.

The associated CMV Facility would also include the New Road Bridge that would connect to the facility's multi-lane roadway and continue to FM 1589 to the north. Inspection buildings along this roadway, as well as trucks, lighting and other infrastructure, could be visible from the approximately 11 homes west of the facility. The New Road Bridge, which would cross the Rio Grande River roughly 60 feet above the water line, would have two piers on U.S. land and none in the water. The introduction of this built element could adversely affect the visual quality for recreationists using the Rio Grande River.

KOPs 1, 2, and 3

The associated CMV Facility would not be visible from KOPs 1, 2, and 3.

KOP 4

As described previously, KOP 4's visual quality consists of flat, vacant, and undeveloped land with low-lying vegetative cover. The foreground shows the natural vegetative buffer between the local residential street and the undeveloped land (see **Figure 3.13-7** above).

The associated CMV Facility would introduce new vertical and horizontal elements into the middle ground and background of a currently flat landscape. Portions of buildings, light poles, fences, and other elements could be visible through the existing line of vegetation that separates the associated CMV Facility from the existing local roadway. As the existing dirt road shown in **Appendix M**, *Figure M-7* would be closed, vegetation could grow and fill in the space, screening the view from KOP 4. Therefore, the associated CMV Facility would not dominate the visual quality of KOP 4.

3.13.3.4 No-Action Alternative

Under the No-Action Alternative, the Board would deny authority for GER to construct and operate the proposed line. The proposed line and the associated CMV Facility would not be constructed. There would be no impacts on visual quality.

3.13.4 Conclusion

OEA has determined that construction of the Southern Rail Alternative, the Northern Rail Alternative, and the associated CMV Facility would have temporary visual impacts due the introduction of heavy equipment and associated vehicles, increased fugitive dust, and vegetation removal.

OEA has determined that, while GER proposes to reestablish native tree plantings where possible and as appropriate to help screen the proposed line from adjacent viewsheds, the Southern Rail Alternative would dominate the visual quality of two of the four KOPs included in OEA's analysis: KOP 1 and KOP 2. The Northern Rail Alternative would dominate the visual quality of KOP 2. OEA has determined that there is no reasonable and feasible mitigation to recommend that would reduce impacts on KOP 1 and KOP 2 because these impacts are caused by aspects of the proposed line (*e.g.*, location of the NII facility and height of the noise barriers) that cannot practically be changed. The associated CMV Facility would not dominate the visual quality of any of the four KOPs.

3.14 Other Impacts

OEA evaluated information from other agencies and organizations about past, present, and reasonably foreseeable future projects and actions that might have impacts that could combine with the impacts of the proposed line and the associated CMV Facility.

Using publicly available data and resources from the Maverick County Planning Department, USACE, CBP, IBWC, TxDOT, and other publicly available sources, OEA researched past, present, and reasonably foreseeable future projects and actions that could result in impacts that would interact with impacts from the Southern and Northern Rail Alternative and the associated CMV Facility.

OEA was unable to find any projects that have impacts that might overlap with the impacts from the proposed line and the associated CMV Facility because all potentially developable area around the proposed line and the associated CMV Facility is already developed.

3.15 Short-Term Uses of the Environment Versus Long-Term Productivity

NEPA requires agencies to consider the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity (42 U.S.C. § 4332). Short-term uses of the environment for the construction of the proposed line and the associated CMV Facility would include the following temporary impacts from construction activities and equipment, a described in the previous sections of this chapter: impacts to noise and vibration levels (*Section 3.6.3, Environmental Consequences*); to air quality (*Section 3.7.3, Environmental Consequences*); to vegetation and wildlife (*Section 3.10.3, Environmental Consequences*); to water quality (*Section 3.11.3, Environmental Consequences*); and to visual quality (*Section 3.13.3, Environmental Consequences*). These impacts would stop when construction is complete.

In the long-term, operation of the proposed line and the associated CMV facility would reroute all through trains and trucks that currently use the existing international bridges in Eagle Pass to the proposed New Rail Bridge and New Road Bridge, which would reduce the distance traveled by trains and trucks to reach their respective destinations. This would result in beneficial impacts on freight rail safety (*Section 3.1.3, Environmental Consequences*)*;* grade crossing safety and delay (*Sections 3.2.3 and 3.3.3, Environmental Consequences);* air quality (*Section 3.7.3, Environmental Consequences*); and energy (*Section 3.8.3, Environmental Consequences*). It would also eliminate existing severe noise impacts experienced by 1,980 receptors near the UP mainline south of milepost 31 (*Section 3.6.3, Environmental Consequences*). With the mitigation that OEA is preliminarily recommending to address potential impacts on noise, biological resources, and cultural resources (See *Chapter 4, Mitigation*), long-term adverse impacts would be avoided or minimized.

3.16 Irreversible and Irretrievable Commitment of Resources

NEPA requires agencies to address any irreversible and irretrievable commitments of federal resources which would be involved in the proposed agency action, should it be implemented (42 U.S.C. § 4332). As explained in *Section 1.2, Purpose and Need*, construction and operation of the proposed line and CMV Facility is not a project proposed or sponsored by the federal government. No federal resources would be irreversibly and irretrievably committed to implement this project.