

CHAPTER 2

PROPOSED ACTION AND ALTERNATIVES

This chapter describes the Proposed Action and Alternatives, including the No-Action Alternative, considered in SEA's environmental review of the Petition for Exemption before the Board. It also identifies and briefly discusses the Alternatives that were considered and eliminated from detailed analysis. The Alternatives discussed in this chapter include several Build Alternatives, a No-Build Alternative, and the No-Action Alternative.

- **Build Alternatives.** The Build Alternatives include the Proposed Action and other Alternatives that would require new rail line construction. The name of each Build Alternative (i.e., the Proposed Action, the Original Taylor Bayou Crossing, and Alternatives 1C, 2B, and 2D) is derived from the various proposed new rail alignments and includes both the proposed new rail line segment and the use of trackage rights over UP lines that BNSF either has or can obtain under the UP/SP merger decision. The segments of each Build Alternative that involve new rail line construction are referred to as the Build Segments of that Alternative.
- **No-Build Alternative.** The No-Build Alternative requires no new rail line construction. It would require BNSF to obtain trackage rights from UP over the Strang Subdivision to access the Bayport Loop. These are trackage rights that BNSF cannot obtain under the UP/SP merger decision and that UP has not granted in response to BNSF's request. BNSF would use the same trackage rights over existing UP lines that BNSF would use for the Proposed Action, although under this Alternative BNSF would need trackage rights over a smaller portion of the GH&H line than for the Build Alternatives.
- **No-Action Alternative.** Under the No-Action Alternative, the Applicants would not provide competitive rail service to the Bayport Loop, either by new construction or trackage rights. The shippers in the Bayport Loop would continue to be solely served by UP. The rail operations on the rail lines to and from the Bayport Loop in the Houston area would remain as they are today.

2.1 ALTERNATIVES DEVELOPMENT

Prior to filing the Petition for Exemption with the Board, the Applicants engaged in over two years of confidential negotiations to assemble a partnership to propose a build-out from the Bayport Loop. During that time, the Applicants also developed and investigated several potential alignments to meet the purpose and need of providing competitive rail service to the Bayport Loop. For the period prior to and during scoping, the potential routes for the new rail line construction are referred to as alignments. For the purposes of SEA's analysis of potential routes beyond the scoping process, SEA refers to the routes as Alternatives. The Applicants identified two general directional approaches to constructing the build-out. The first involved access from the west, utilizing trackage rights over the existing GH&H line that runs parallel to State Highway (SH) 3 near Ellington Field. This approach generated Alignments 1 and 2. The second approach involved access from the north, utilizing the existing PTR A rail line along the SH 225 corridor. The Applicants identified Alignments 3 and 4 as possible routes from the north.

However, after investigating the feasibility of this second approach, the Applicants identified legal impediments to utilizing the PTRA line in the SH 225 corridor. These impediments prevent the Applicants from being able to access the Build Segments of Alignments 3 and 4. The Applicants identified Alignment 1 as their Preferred Alternative in their filing with the Board, dated August 30, 2001.

The NEPA regulations require the agencies to consider a reasonable range of feasible Alternatives to the Proposed Action. However, NEPA does not require consideration of every conceivable variation of an Alternative. In this context, SEA undertook its own analysis of the alignments developed by the Applicants and of those Alternatives that arose during the scoping period. This included Alternatives and modifications suggested by agency and public comments. During the scoping period, SEA also worked with the Applicants to develop Alternatives that would address agency concerns over environmental issues. SEA analyzed all the Alternatives to determine whether they could be considered reasonable and feasible, and hence, appropriate for detailed analysis in this Draft EIS. SEA's analysis considered whether the Alternatives were feasible from an engineering and cost standpoint, whether they met the project's purpose and need, and what environmental issues they might involve. Section 2.2 describes the Alternatives that SEA considers reasonable and feasible and that are analyzed in detail in this Draft EIS. Section 2.3 describes the Alternatives that SEA eliminated from detailed study. These Alternatives have been dismissed from further analysis because they have been determined to be infeasible or because the agencies consider them to be environmentally inferior to other similar Alternatives under consideration.

2.2 ALTERNATIVES CONSIDERED IN SEA'S ENVIRONMENTAL REVIEW

This section provides a detailed description of each Alternative that SEA considered reasonable and feasible and met with the project's purpose and need. These Alternatives are shown in Figure 2.2-1.

2.2.1 Proposed Action (Applicants' Preferred Alternative)

The Proposed Action (see Figure 2.2-2) consists of construction of a new rail line from the Bayport Loop to an existing rail line that would allow the Applicants to provide competitive rail service to the petro-chemical industries in the Bayport Loop. The Proposed Action includes rail operations to and from the new line over trackage rights on UP's GH&H line and UP's East Belt, Terminal, Lafayette, and Baytown Subdivisions to the storage yard owned by CMC Railroad at Dayton, approximately 30 miles northeast of Houston. The Proposed Action now follows Alignment 1B, which crosses Taylor Bayou parallel to the Port Road and UP crossings of Taylor Bayou rather than the originally proposed Alignment 1 crossing (now referred to as the Original Taylor Bayou Crossing). The Applicants developed Alignment 1B because of concerns expressed by the National Marine Fisheries Service over an area of Essential Fish Habitat (EFH) associated with the Original Taylor Bayou Crossing. Alignment 1B affects less EFH than the Original Taylor Bayou Crossing. The proposed Build Segment would be approximately 12.8 miles long. This is the Applicants' preferred route.

Figure 2.2-1
Alternatives Considered in SEA's Environmental Review

Figure 2.2-2
Proposed Action - Applicants' Preferred Alternative

The Proposed Action involves BNSF's use of trackage rights to operate trains from CMC Dayton Yard, over UP's Baytown, Lafayette, Terminal, and East Belt Subdivisions and GH&H line to a proposed turnout onto a new rail line near Graham Siding, close to the most southerly portion of Ellington Field. Near the proposed turnout from the GH&H line, the Build Segment would enter the most southerly portion of Ellington Field, south of runway 35L, crossing through the Runway Protection Zone for runway 35L that the City purchased with a grant from the FAA. It would continue across a corner of the original Ellington Field property, which GSA deeded to the City as surplus land. After leaving the original property area it would proceed northeast between the location of the airfield's former perimeter fence and a 240-acre area that the City purchased to prevent residential development from encroaching on the airfield. The Proposed Action would continue to the northeast running parallel to runway 4/22 before crossing a NASA access road to Ellington Field. From the area outside the northeast perimeter of Ellington Field, the Build Segment would swing east towards the Baywood Country Club. Between the GH&H line and Red Bluff Road, the Build Segment would cross at-grade five private roads, including NASA's access road, which connects the Sonny Carter Training Facility and Neutral Buoyancy Laboratory (NBL) to Ellington Field, and four gravel access roads within the ExxonMobil and Tejas (now Kinder-Morgan) Gas oil and gas facilities. The Applicants propose to cross Space Center Boulevard using a grade-separated crossing, with the rail line elevated over the roadway. The Build Segment would cross Armand Bayou with a new fixed-span bridge, to the south of the Baywood Country Club and then cross Red Bluff Road using a grade-separated crossing, with the roadway elevated over the new proposed rail line. The line would then swing northeast towards the existing Bayport Rail Terminal and then go east and northeast towards the existing Bayport Loop and the Basell facility. Between Red Bluff Road and the Bayport Loop, the Build Segment would cross a spur track serving BOC Gas (formerly MG Industries), an entrance road to the North Equistar facility, the UP's Dart lead, the western Celanese perimeter road, and the entrance road to the Celanese North facility. A spur to serve North Equistar also would cross the UP's Dart lead.

Once inside the Bayport Loop, the Build Segment would run alongside the existing UP track and would cross the UP line ten times as it winds through the Bayport Loop. It would also cross the UP access road, Bay Area Boulevard, SH 146 access roads, the two LBC Houston entrance roads, Port Road, Old SH 146 (South Port Road), and two ATOFINA entrance roads. The Proposed Action follows Alignment 1B, which departs from the original Alignment 1 on Port Road, just south of the Lyondell facility, near the Dixie Chemical Plant. The Proposed Action would include construction of a 0.2-mile rail spur off the main alignment of the proposed new rail line near milepost 10.2 to improve shipper access. The spur would terminate before Bay Area Boulevard. The main alignment would parallel Port Road and swing east parallel with the road to cross Taylor Bayou using a fixed-span bridge that the Applicants would construct as part of the Proposed Action. It would then rejoin the original route of Alignment 1 before crossing the SH 146 access roads. The proposed new rail line would terminate near the ATOFINA facility located just east of SH 146.

2.2.1.1 Proposed Action Construction

The Applicants estimate that construction of the proposed new rail line would last for approximately 16 to 21 months. The proposed new rail line would be constructed by, or on behalf of, the Applicants.

The proposed new rail line would be constructed on land either owned by the Applicants or to which they have or intend to secure access. The proposed typical right-of-way width would be 100 feet. Approximately 150 acres of land would be required for the proposed new rail line. Figure 2.2-3 shows a typical rail right-of-way.

The Applicants have indicated that construction of the railbed and roadbed would require approximately 325,000 cubic yards of fill material and 5,600 tons of lime. In addition, the track structure would require approximately 97,000 cubic yards of sub-ballast, 52,000 cubic yards of ballast, 47,000 railroad ties, 3,400 tons of rail, and other associated track materials such as tie plates, spikes, and anchors. The Applicants have stated that much of this material would be transported by rail to the construction site and staged along the line as construction proceeds.

Implementation of the Proposed Action would require construction of bridges to cross Taylor Bayou, Armand Bayou, Horsepen Bayou, Spring Gully, Big Island Slough, and several Harris County Flood Control District ditches. The Applicants have indicated that the majority of bridges could be constructed from pre-cast concrete slabs, which would be brought to the site. The route of the Proposed Action crosses several pipeline corridors and the Applicants have indicated that a number of land bridges would be constructed to cross these corridors. The land bridges would be constructed of concrete poured and cast in-place.

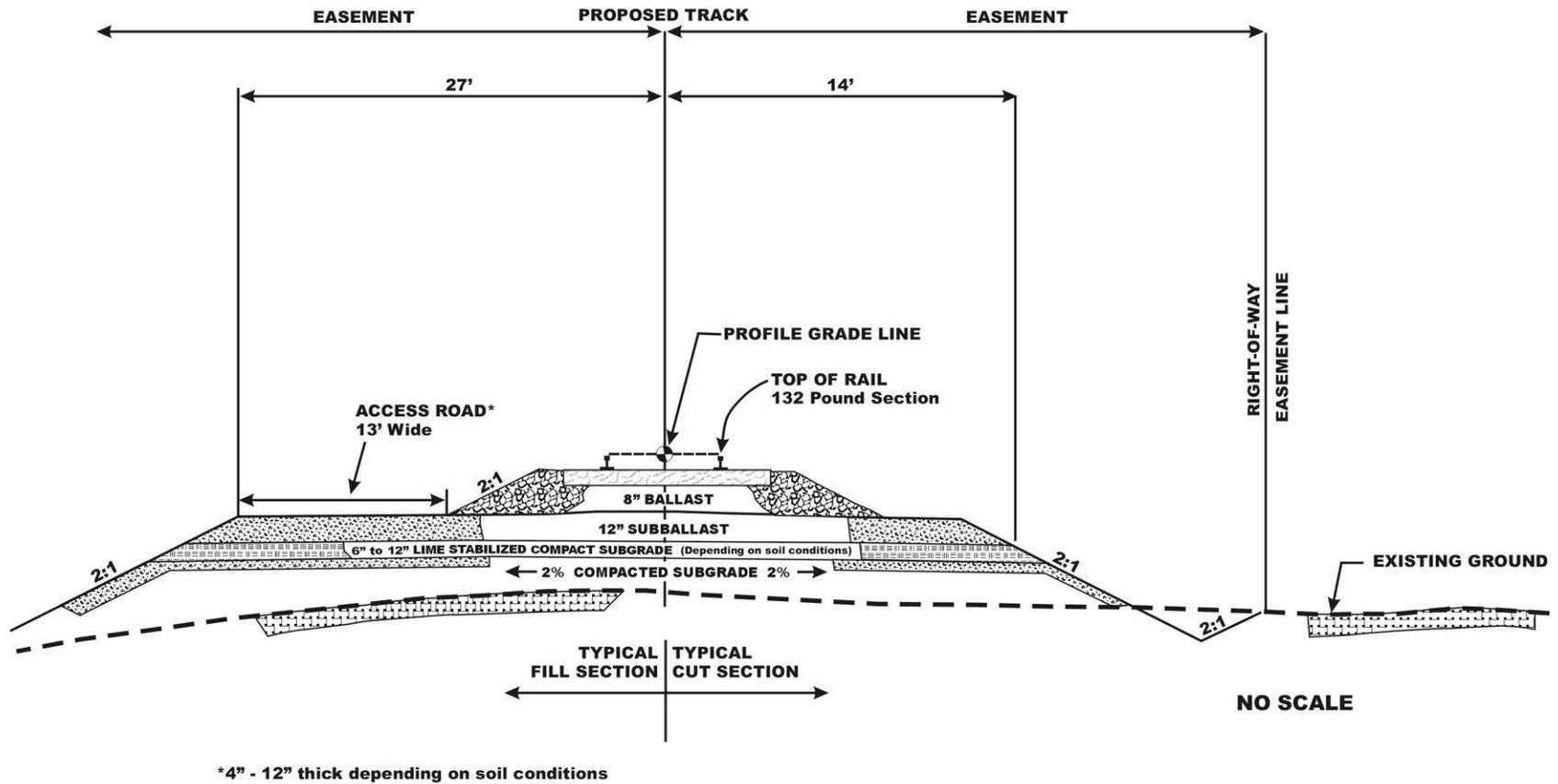
The Applicants have stated that the terrain in the project area is mostly flat and, therefore, cuts and fills during grading would be minor. The primary cut and fill activity would stem from the construction of the grade-separated crossing of Red Bluff Road, Space Center Boulevard, and the proposed bridge crossing of Armand Bayou. The Applicants have also stated that soil borrow and disposition activities would take place within the right-of-way, to the maximum extent possible, but that three borrow sites probably would be needed from outside sources.

2.2.1.2 Proposed Action Operations

BNSF would operate and maintain the proposed new rail line, pursuant to a contract with SJRL. BNSF would offer common carrier and contract service to all shippers located in the Bayport Loop and adjoining areas that could access the proposed new line. Initially, service would be provided to the facilities owned or accessed by ATOFINA, Basell, Equistar, and Lyondell. Service could be offered to several other facilities in the Bayport Loop that could access the proposed new rail line.

BNSF would serve the proposed new rail line by running trains from the CMC Dayton Yard, approximately 30 miles northeast of Houston, via trackage rights over UP's Baytown, Lafayette, Terminal, and East Belt Subdivisions and the GH&H line to the turnout point near Ellington Field where the proposed Build Segment would begin. BNSF trains would then operate over the

Figure 2.2-3€
Typical Cross-Section€



new line as far as the Bayport Rail Terminal. One industry roadswitcher would operate out of the Bayport Rail Terminal to provide service to the shippers in the Bayport Loop. BNSF trains would return over the same route to the CMC Dayton Yard. The CMC Dayton Yard would be used to gather empty (and any loaded) rail cars into a daily train destined for the Bayport Loop. The yard would also be used to switch loaded blocks of cars returning from the Bayport Loop into long-haul trains destined for receivers around the country. The CMC Dayton Yard is owned by the CMC Railroad, which currently handles storage-in-transit cars (mostly plastic pellet hopper cars) and switching for both BNSF and UP. BNSF currently has the use of approximately 1,500 car spaces in the yard, out of a total capacity of 3,000 car spaces.

The existing Bayport Rail Terminal, located to the east of Red Bluff Road and west of the Bayport Loop, would be accessed from the proposed new rail line. The exchange tracks at the Bayport Rail Terminal would be used to receive the daily inbound BNSF train and to stage the daily outbound train. The BNSF locomotives bringing the inbound empty rail cars would also power the outbound loaded cars. The Bayport Rail Terminal is a locally owned and operated rail enterprise that is unaffiliated with SJRL or BNSF. It currently provides a range of services, including rail car storage, switching, pre-trip car inspections, car repair, inbound staging, and outbound blocking. The Applicants have indicated that under the Proposed Action BRT would provide storage, gathering, and transfer services, seven days a week in support of the planned BNSF switching operations in the Bayport Loop. BRT would transfer outbound cars to the BRT exchange tracks when ordered by BNSF. BRT would also transfer inbound cars from storage and deliver the cars to designated BRT exchange tracks for pick-up by BNSF roadswitchers and subsequent delivery and spotting at Bayport Loop customer facilities. The Bayport Rail Terminal would provide the Applicants with a guaranteed minimum capacity of 600 car spaces. The Bayport Rail Terminal currently has the capacity to provide the 600 car spaces. Two hundred of these 600 car spaces would be accommodated in operational exchange/transfer tracks (approximately 12,800 feet of track). These spaces would be used for inbound and outbound trains, which may occupy the terminal at the same time. The Applicants have stated that the same crew and locomotives would be used for both the inbound and outbound trains.

The other 400 spaces (approximately 25,600 feet of track) would be used for short-term storage of rail cars and for switching and operational services. The Applicants expect to store a minimum of two days worth of empty cars at BRT, along with some loaded cars, which may be stored until the shipper confirms a final destination or informs BNSF to place the cars in long-term storage. The 400 spaces would also be used to hold temporarily cars pending delivery to shippers in the Bayport Loop and to store cars that need minor repairs. Some minor repairs may be performed at BRT.

The Applicants have estimated that service to customers in the Bayport Loop would be provided by one switch locomotive assigned to local and switching work that would deliver empty cars to customers and pick up loaded cars for delivery back to the Bayport Rail Terminal.

The Applicants anticipate that they would operate, on average, two trains per day over the proposed new line. This would consist of one train in each direction with approximately 36 to 66 rail cars per train. The outbound train from the Bayport Rail Terminal would consist of an estimated two line-haul locomotives with 36 to 66 carloads (loaded rail cars) from the Bayport

Loop. The inbound train would consist of an estimated two line-haul locomotives with approximately 36 to 66 mostly empty rail cars, with some carloads containing miscellaneous commodities for the industries in the Bayport Loop. Therefore, an annual total of between 13,000 and 24,000 loaded, Bayport Loop rail cars would be hauled out of the Bayport Rail Terminal and a similar number of empties would make the return journey.

SEA analyzed the Board's waybill sample in order to assess the Applicants' rail traffic projections and to compare them with the current rail traffic in the Bayport Loop, which is handled solely by UP. The waybill sample is an annual sample of freight movements that originate and terminate on railroads in the United States. The waybill sample data shows that, on average, UP originated or terminated 129 carloads per day in the Bayport Loop in 1999 and 2000. A carload is defined as a loaded rail car containing a product. Because the waybill only accounts for loaded rail cars, it can be reasonably assumed that an equal number of empty rail cars also pass through the Loop each day, for a total of 258 cars. The waybill sample data show that the Applicants' projections of capturing between 36 and 66 carloads per day is reasonable because that would equate to between 28 and 51 percent of total Bayport Loop traffic.

Most of the shipments would consist of non-hazardous plastic pellets transported in covered hopper cars. The remainder would consist of chemicals transported in tank cars. The chemicals that the Applicants propose to transport include both liquids and compressed gases – some are flammable, others non-flammable. In addition, some of the materials are very toxic, others mildly toxic, and others are considered non-toxic. The list of chemicals that the Applicants propose to transport is included in Appendix D. As the Applicants have indicated, it is possible that Bayport Loop shippers may request BNSF to transport other chemicals. The Applicants estimate that the number of loaded tank cars containing hazardous materials operating under the Proposed Action would be between 1,500 and 7,000 annually. In developing this annual forecast of future hazardous materials carloads, the Applicants included approximately 2,500 carloads of glycols, because they are classified as hazardous materials by USEPA. However, glycols are not classified as hazardous materials by the U.S. Department of Transportation (USDOT) and hence do not appear on the waybill sample as hazardous materials carloads. The waybill sample shows that an annual average of 9,350 hazardous materials carloads originated or terminated in the Loop in 1999 and 2000. In order to assess the Applicants' projection of hazardous materials carloads against the waybill sample, SEA subtracted the 2,500 carloads of glycols from the Applicants' upper projection of 7,000 annual carloads to give a range of 1,500 to 4,500 annual carloads. When assessed against the waybill sample, this projection estimates that the Applicants would expect to capture between 16 and 48 percent of Bayport Loop hazardous materials traffic.

The Applicants have indicated that the majority of rail cars involved in the Proposed Action would be owned or leased by the shippers. Trains would operate at restricted speeds, not to exceed 20 miles per hour on the proposed new rail line.

SEA has determined, based on the waybill sample, that the Applicants' projections of rail traffic volume are reasonable and would generate an average of two trains per day under the Proposed Action. SEA also has determined that two trains per day on average is a reasonable projection of operations under the Proposed Action because there are no plans to connect with the Port of Houston Authority's (PHA) proposed Bayport Channel Container/Cruise Terminal (Bayport

Terminal) and PHA estimates that rail service would not occur until after 2012. The USACE, which prepared the Draft EIS for the proposed Bayport Terminal, considers the Bayport Loop Build-Out and the proposed Bayport Terminal to be two unconnected projects that have independent utility (i.e., they do not depend on each other for their feasibility). The Applicants have submitted a verified statement¹ (signed under penalty of perjury) that there are no plans to connect its proposed rail line with the proposed Bayport Terminal and have made no commitment to provide rail service to the proposed port facility from the proposed Bayport Loop Build-Out. The Applicants also have stated that their proposed rail line is designed for the movement and interchange activities of short chemical and hopper cars from the shippers in the Bayport Loop and that this would be incompatible with the movement of long double-stack container cars. Moreover, PHA plans to have PTRAs handle UP and BNSF trains from the proposed terminal to the Barbours Cut Container Terminal to generate full trains to send to the Ports of Los Angeles and Long Beach, California, and other destinations. Therefore, BNSF would have no incentive to operate intermodal trains through the Bayport Loop, which would interfere with the movement of more valuable petro-chemical traffic (ICC, 1995 and STB, 1998) from SJRL partners, when it could use the PTRAs line to access the proposed terminal more efficiently. Furthermore, with UP currently operating approximately ten trains per day in the Bayport Loop conducting switching operations at petro-chemical plants and the Applicants proposing to run switching operations through the Bayport Loop as well, running even some of the eight intermodal trains per day through the Loop would delay existing and proposed operations and likely lower the level of service provided to the petro-chemical shippers.

In addition, the PHA does not plan to connect to the new PTRAs line at the point where the Bayport Loop Build-Out would cross the new PTRAs line at Port Road. The connection would occur further south near Red Bluff Road. According to the Railroad Coordinator for the PHA, the PHA met with representatives of the railroad companies in the Houston area in December 1997 to present the proposed rail plans for the Bayport Terminal (Schiefelbein, 2002). Prior to that meeting, all rail conceptual design had been performed in isolation by PHA's marine terminal design consultants. They had not consulted with the railroad companies, nor had any railroad company reviewed the plans. Prior to the meeting, the PHA consultants had prepared conceptual plans showing rail access to the proposed Bayport Terminal along Port Road. However, when the railroad representatives reviewed these plans, they indicated that attempting to access the terminal along Port Road would create a continual operational conflict and interfere with UP's extensive industry switching operations. The railroads suggested, and PHA's conceptual plan designers accepted, the concept of accessing the Bayport Terminal from the south by continuing the proposed PTRAs track along UP's right-of-way to the vicinity of Red Bluff Road and building the terminal access track at that point. Once the railroads pointed out the operational difficulties of the original concept, it was dropped by PHA. Therefore, PHA has been considering the rail access for the proposed Bayport Terminal for a number of years and has always planned to access the facility by utilizing new tracks to be constructed in UP's right-of-way along SH 146.

¹ Verified Statement of Katie M. Farmer, General Director of Sales for Chemical Products, BNSF, April 25, 2002.

2.2.2 Original Taylor Bayou Crossing

The Applicants had originally proposed to cross Taylor Bayou using Alignment 1, at a location that the National Marine Fisheries Service later identified as containing EFH (see Figure 2.2-4). Alignment 1 would cross Port Road south of the Lyondell facility, near the Dixie Chemical Plant. It would continue east before turning south to parallel SH 146 and cross Taylor Bayou. The original Taylor Bayou crossing was replaced as the Applicants' preferred crossing by Alignment 1B, in order to reduce the effect on EFH.

2.2.3 Alternative 1C

This Alternative is almost the same as the Proposed Action. However, it has a modification designated Alternative 1C (see Figure 2.2-5). After consulting with the FAA and the City of Houston, SEA requested that the Applicants develop Alternative 1C to address two issues associated with Ellington Field. The Proposed Action passes through the Runway Protection Zone at the southern end of Runway 35L and it would run between the 240 acres of land owned by the City of Houston and the airfield. The FAA helped the City of Houston fund the acquisition of land for the RPZ that was not already part of the original air field property. GSA deeded the former Ellington Air Force Base to the City of Houston in 1984 and the City renamed it Ellington Field. The FAA has stated that the City, as primary owner of Ellington Field, would have to request that the FAA change the ALP to accommodate the Proposed Action and release the affected airport property. The City's concern, expressed during the scoping period, involved the potential of the Proposed Action to limit the utility of the 240 acres for aeronautical use and the potential to limit revenue prospects for the land (City of Houston, 2002). Subsequent to the scoping process and the selection of Alternatives for detailed analysis in the DEIS, the Houston Airport System commissioned a Draft Site Suitability Analysis for the Ellington Field Master Plan Update (Leigh Fisher Associates, 2002). According to the Draft Site Suitability Analysis, the City of Houston purchased the 240 acres of land on the southeastern side of the airport to prevent residential development from encroaching any further upon the airport. The Draft Site Suitability Analysis indicates that Ellington Field has approximately 700 acres available for development. The analysis recommends that based on projected aviation activity, "up to 50 acres should be reserved to accommodate growth in a generation aviation." The analysis states that approximately 45 acres were reserved for general aviation immediately north of the existing T-hangars and west of the traffic control. Additional land is available on the north edge of the airport if needed. The analysis indicates that the area labeled as the "Southeast Ellington Field Area," which encompasses the 240 acres, is the closest to residential development of all the Ellington Field development areas. Therefore, it recommends office and light industrial uses for the land closest to the residential area and heavier industrial development closer to the airport. It also indicates that the area closest to the airport could have airfield access if desired and, therefore aviation and/or aviation industrial uses would be appropriate. However, based on the aviation forecast and the recommendation to use other areas for aviation use, it does not appear reasonably foreseeable that the southeast Ellington Field area would be used for aviation use.

Alternative 1C avoids these issues and consists of a two-mile modification of the Proposed Action from its turnout on the GH&H line to the Boeing facilities and the NASA Neutral Buoyancy Lab on Space Center Boulevard. The turnout for Alternative 1C is located on the

**Figure 2.2-4
Original Taylor Bayou Crossing**

**Figure 2.2-5
Alternative 1C**

GH&H line just south of the Proposed Action turnout. Alternative 1C parallels the Proposed Action to the southeastern corner of the Ellington Field fence line and does not encroach on the Runway Protection Zone for runway 35L. It then continues northeast towards the Boeing and NASA facilities and turns northwest to rejoin the Proposed Action before it crosses the NASA access road to Ellington Field. Construction of this Alternative would include running over the top of and alongside a pipeline corridor located between the southeast corner of Ellington Field and the northwest boundary of Sylvan Rodriguez Park. The total length of new construction under this Alternative from the GH&H line to the Bayport Loop would be approximately 13.1 miles. Operation of this Alternative would be the same as the Proposed Action, with trains operating from the CMC Dayton Yard, over the Baytown, Lafayette, Terminal, and East Belt Subdivisions and the GH&H line, onto the new rail line and into the Bayport Loop.

2.2.4 Alternative 2B

This Alternative involves the construction of a new 13.8-mile rail line (see Figure 2.2-6). The Applicants developed Alternative 2B to address the issues associated with the originally proposed Alternative 2's crossing of land owned by the Deer Park School District, which is reserved for potential school facility development, and proximity (approximately 750 feet) to a major residential neighborhood (Alternative 2 is depicted further below in Figure 2.3.1). In addition, Alternative 2 would not accommodate a grade-separated crossing of Space Center Boulevard due to the close proximity of the intersection of Space Center Boulevard, Genoa-Red Bluff Road, and Jana Lane and the flood-prone characteristics of the site that preclude construction of an underpass. Further, the proposed Alternative 2 grade-separated crossing of Red Bluff Road near the intersection with Genoa-Red Bluff Road would be difficult and costly to construct. Under Alternative 2B, the Build Segment would leave the GH&H line on the north side of Beltway 8 (Sam Houston Parkway) and run under Beltway 8. The route would run parallel to the east side of Beltway 8 to Genoa-Red Bluff Road. It would then run east alongside Genoa-Red Bluff Road and turn south before reaching the City of Houston's Southeast Water Treatment Plant. The alignment would then turn east across the grounds of the Water Treatment Plant, passing to its south. It would then continue east, crossing Space Center Boulevard using a proposed grade-separated crossing to join the same route as the Proposed Action to the northeast of Ellington Field. This Alternative would then follow the same route as the Proposed Action through the Bayport Loop to reach the ATOFINA plant located east of SH 146. Operation of this Alternative would be the same as the Proposed Action.

2.2.5 Alternative 2D

This Alternative involves the construction of a new 13.4-mile rail line (see Figure 2.2-7). The Applicants developed Alternative 2D for the same reasons as Alternative 2B and to avoid businesses, residences, and churches along Genoa-Red Bluff Road, to minimize conflicts with Harris County's proposed expansion of Genoa-Red Bluff Road, and to avoid the City of Houston's 96-inch water main and a gas main that parallels Genoa-Red Bluff Road. The Applicants have identified this Alternative as their preferred alignment among Alternatives 2B and 2D. Under this Alternative, the Build Segment would depart from the GH&H line on the north side of Beltway 8 (Sam Houston Parkway) and run under Beltway 8. The route would run parallel to the east side of Beltway 8 to a point approximately 1,500 feet southwest of Genoa-Red

**Figure 2.2-6
Alternative 2B**

**Figure 2.2-7
Alternative 2D**

Bluff Road, where it would swing east and parallel Genoa-Red Bluff Road for approximately one mile. The alignment would pass between two cells of a closed construction/demolition material landfill site and then swing southeast for approximately 1,000 feet to pass the City of Houston's Southeast Water Treatment Plant on its south side. The alignment would then turn east across the grounds of the Water Treatment Plant. It would then continue east, crossing Space Center Boulevard using a proposed grade-separated crossing to join the same route as the Proposed Action to the northeast of Ellington Field. This Alternative would then follow the same route as the Proposed Action through the Bayport Loop to reach the ATOFINA plant located east of SH 146.

Operation of this Alternative would be the same as the Proposed Action.

2.2.6 No-Build Alternative

In addition to analyzing the reasonable and feasible Alternatives described above, and consistent with the requirement in the NEPA regulations to consider Alternatives outside the legal jurisdiction of the lead agency (40 CFR 1502.14(c)), the Board has analyzed an Alternative involving BNSF's use of trackage rights over UP's lines in the SH 225 and SH 146 corridors to reach the shippers in the Bayport Loop. This Alternative would involve operating from the CMC Dayton Yard over the Baytown, Lafayette, Terminal, and East Belt Subdivisions, and continuing over UP's Strang Subdivision and Bayport Loop Industrial Lead, respectively in the SH 225 and SH 146 corridors. This Alternative would also involve operating over UP's lines within the Bayport Loop to access shippers and the Bayport Rail Terminal. There would be no new rail construction associated with this Alternative. This Alternative is designated as the "No-Build Alternative" in this EIS.

The UP/SP merger decision did not grant trackage rights to BNSF over UP's lines into the Bayport Loop or over the Bayport Loop itself, and UP has stated publicly that it will not grant trackage rights to BNSF unless BNSF provides full compensation for lost revenue. The Board's decision in the UP/SP merger case² directs UP and BNSF to negotiate terms for build-in or build-out arrangements, but it does not direct the parties to negotiate trackage rights over UP's Strang Subdivision, Bayport Industrial Lead, and Bayport Loop. In this proceeding, the Board does not have the authority to grant trackage rights over these lines or to force BNSF and UP to negotiate trackage rights. Notwithstanding the unforeseeable likelihood of this event, SEA believes that it is necessary to analyze this Alternative not only because of the NEPA regulations, but also in response to several requests made during scoping, for comparative purposes relative to the No-Action Alternative and the Build Alternatives, and because of efforts by BNSF to open negotiations on trackage rights with UP.³ UP has stated publicly that it will not grant trackage rights unless BNSF provides full compensation for UP's lost revenue. To date, BNSF and UP

² Decision No. 95 in STB Finance Docket No. 32760.

³ In addition, even if SEA did not analyze this Alternative and the two railroads reached an agreement, SEA would not review the environmental effects of the agreement, because the Board typically exempts from NEPA review actions that only involve trackage rights agreements.

have not reached an agreement on compensation and BNSF cannot operate over the Strang Subdivision.

2.2.7 No-Action Alternative

NEPA regulations require analysis of a No-Action Alternative to provide the decision-maker with a basis for comparison to a proposal. Under the No-Action Alternative, the Applicants would not gain rail access to the Bayport Loop, either by new construction or trackage rights. The operation of an average of two trains per day, projected under the Proposed Action, would not be realized. UP would continue to solely serve the petro-chemical plants in the Bayport Loop. The No-Action Alternative consists of the existing situation where UP transports rail cars over its lines between the Bayport Loop and Strang Yard, which is approximately one and one-half miles north of the Bayport Loop.

According to UP, all Bayport Loop rail cars are stored in Strang Yard until UP has enough cars to assemble a train that would travel west on its Strang Subdivision in the SH 225 corridor (UP, 2002). Strang Yard also accommodates rail cars from the industries along SH 225 and UP probably runs about six trains per day out of Strang Yard to other yards in the Houston area or to final destinations. The Bayport Loop cars are added to cars from other shippers in the area to form full trains that then depart from Strang Yard.

The loaded plastic pellet hopper cars from the Loop that are destined for storage are transported from Strang Yard to either Galveston or Spring Yard, depending on capacity constraints at those locations. Loaded plastic pellet cars may spend several weeks in storage until they are sold and require transport to a final destination. In addition, UP creates destination trains on five days per week that travel directly to long distance destinations outside Houston from Strang Yard without passing through any other Houston yards. Cars from the Bayport Loop are added to these trains. Outbound shipments destined for the north move from Strang Yard to North Little Rock and shipments destined for New Orleans move from Strang Yard to Livonia. On weekdays, UP normally operates four designated outbound chemical trains westbound from Strang Yard over the Strang Subdivision to Manchester Junction and beyond. UP transports most of the remaining Bayport Loop hazardous materials carloads to either Englewood Yard or Settegast Yard, where they are formed into trains destined for customers around the country.

UP uses Englewood Yard for storage of empty rail cars and some loaded cars that are bound for the Bayport Loop. These rail cars are added to trains and transported to Strang Yard, where they are broken up and delivered to the industries in the Loop.

For the purpose of clarity in this EIS and because of the diffused nature of the Bayport Loop traffic beyond Strang Yard, SEA has limited analysis of the No-Action Alternative to the route from the Bayport Loop to Strang Yard, except for the hazardous materials transport analysis. Once rail cars enter Strang Yard and are switched onto trains bound for multiple destinations, the Bayport Loop traffic becomes diffused and difficult to analyze. However, SEA has analyzed the hazardous materials carloads from the Bayport Loop to Tower 85, because these cars can be traced over this route with a higher level of certainty. As explained in Sections 3.4 and 3.5, grade crossing delay and safety and noise impacts cannot be traced beyond Strang Yard in a meaningful

way because those analyses are dependent on more than just tracing the route of the Bayport Loop cars. Those analyses depend on following an entire train from one point to another and in this case the Bayport Loop train can be traced from the Bayport Loop to Strang Yard.

Under the No-Action Alternative, the USACE would not issue a permit for impacting waters of the United States or wetlands, the USCG would not issue a permit for construction of rail bridges across Armand and Taylor Bayous, and no state or local permits would be issued.

2.3 ALIGNMENTS AND ALTERNATIVES ELIMINATED FROM DETAILED STUDY

This section describes the alignments and Alternatives that were eliminated from further consideration because they were deemed unreasonable or infeasible. These Alternatives are shown in Figure 2.3-1. In accordance with the NEPA regulations (40 CFR 1502.14(a)) this section includes the rationale for SEA's elimination of certain alignments and Alternatives from further consideration and detailed environmental review.

2.3.1 Alignment 1A

The Applicants developed Alignment 1A to address concerns expressed by Texas Parks and Wildlife Department (TPWD) over natural resource issues at the Proposed Action crossing of Armand Bayou. Alignment 1A departed from the Proposed Action at its crossing of Space Center Boulevard and turned northeast to cross Genoa-Red Bluff Road. It then swung east and passed to the north of the Baywood Country Club before crossing Red Bluff Road by means of a grade-separated crossing. Alignment 1A then continued east to the Bayport Rail Terminal, where it rejoined the Proposed Action. The Applicants indicated that this alignment is not feasible because it would require the construction of a single grade separation for Genoa-Red Bluff Road and Red Bluff Road. The Applicants have stated that the size of this grade-separated crossing would make it economically infeasible and a highway/rail at-grade crossing would conflict with the City of Pasadena's plans to accommodate growth in traffic by extending Genoa-Red Bluff Road to the north/northeast to connect with Fairmont Parkway. This Alternative would also require an additional grade separation for Genoa-Red Bluff Road west of the Exxon Plant. This Alternative also would impact the City of Pasadena's long-term plans to extend Center Street south to connect to Genoa-Red Bluff Road west of the Exxon Plant. Additionally, this Alternative could adversely impact Pasadena's plans for the existing industrial park and for an outdoor amphitheater.

2.3.2 Alignment 2

Alignment 2 would have involved construction of a new 13-mile rail line leaving the former GH&H rail line at the Beltway 8 underpass. The route would have run parallel to the east side of Beltway 8 to Genoa-Red Bluff Road. It would then have run east, passing to the north of Ellington Field, through land owned by the Deer Park School District and then to the north of Baywood Country Club to Red Bluff Road. It would have then continued east to join the Proposed Action into the Bayport Loop. This alignment may have involved taking several businesses and would have passed within approximately 200 feet of residences and other

Figure 2.3-1
Alignments Eliminated from Further Study

businesses, and approximately 300 feet of a church located along Genoa-Red Bluff Road. This alignment is considered infeasible for the same reasons as Alignment 1A.

2.3.3 Alignment 2A

The Applicants developed Alignment 2A to address concerns expressed by TPWD over the crossing of Armand Bayou by the Proposed Action. It diverted from Alignment 2 near the gas plant on Genoa-Red Bluff Road. Alignment 2A then swung northeast to cross Red Bluff Road further north than Alignment 2. It then turned southeast and rejoined Alignment 2 to the west of the Bayport Rail Terminal. This alignment is considered infeasible for the same reasons as Alignments 1A and 2.

2.3.4 Alignment 2C

The Applicants developed Alignment 2C to address the issues associated with Alignment 2's crossing of land owned by the Deer Park School District. It diverted from Alignment 2 by turning southeast after passing the City of Houston's Southeast Water Treatment Plant. It then swung east to run along the southern perimeter of the land owned by the Deer Park School District and joined the same route as the Proposed Action to the north of Clear Lake City, near the Tejas Gas Plant. This alignment then followed the same route as the Proposed Action through the Bayport Loop to reach the ATOFINA plant located east of SH 146. SEA was going to analyze Alignment 2C in detail as an Alternative in the EIS. However, subsequent to the issuance of the Final Scope, the Applicants' on-going preliminary engineering indicated that the grade separation at Space Center Boulevard would be infeasible because of the curvature of the track at that crossing and the approaching grade that would be necessary to cross the road. The lack of a grade-separated crossing does not render Alignment 2C infeasible. However, when compared to the Alternatives that the EIS analyzes in detail, it is environmentally inferior because it would result in an at-grade crossing at Space Center Boulevard, run close to an additional number of homes, and come closer to the endangered Texas prairie dawn than any other Alternative.

2.3.5 Alignment 3

Alignment 3 was initially included in the Applicants' environmental background document and involved an 11.6-mile route from the PTRA rail lines in the SH 225 corridor to the north of the Bayport Loop. As determined by the Applicants prior to filing and confirmed by SEA during the scoping process, the Applicants cannot obtain trackage rights over the PTRA, from which Alternative 3 would be constructed, because of legal impediments prohibiting BNSF from using the PTRA tracks to provide service to the Bayport Loop.

The PTRA track was constructed in a right-of-way now owned by UP. While BNSF is a partner in the PTRA, the legal agreement (dated November 10, 1995) between UP, SP and the PHA prevents BNSF from using the PTRA track to provide service to the Bayport Loop. A copy of the agreement can be found in Appendix C. The agreement also allows the PTRA to build a rail line alongside the UP line in the SH 146 corridor, to access the proposed Bayport Terminal, but expressly forbids access from such a line to the industries in the Bayport Loop or elsewhere

along the right-of-way. The agreement states that if the Port of Houston attempts to establish rail service to those industries, it shall void all rights to operate over the UP right-of-way. The agreement was executed to ensure that the PHA would not oppose the UP/SP merger. The provisions of this agreement were restated in a trackage rights agreement between UP and the PHA (dated June 26, 2000). This agreement can also be found in Appendix C.

The rail turnout would have been located west of Underwood Road on the eastern side of the City of Deer Park. The route ran south across Spencer Road and Fairmont Parkway, which would have both required grade-separated crossings, and then turned east to approach the Bayport Loop from the Equistar facilities.

2.3.6 Alignment 4

Alignment 4 was also included in the Applicants' environmental background document and involved a build-out from the Bayport Loop to the north. This route would have tied into the existing PTRA rail line on the west side of La Porte near the Strang Yard. As determined by the Applicants prior to filing and confirmed by SEA during the scoping process, the Applicants cannot obtain trackage rights over the PTRA line, from which Alignment 4 would be constructed, because of the legal impediments, described above for Alignment 3, prohibiting BNSF from using the PTRA tracks to provide service to the Bayport Loop. This 8.5-mile route would have required grade-separated crossings of Spencer Road and Fairmont Parkway as well as an additional 1.5-mile connecting track to the Equistar facilities located to the west of the Bayport Loop.

2.3.7 Construction of New Rail Line in SH 225 Corridor to Access Alignments 3 or 4

The construction and operation of a new rail line along an alignment in the SH 225 corridor to reach Alignments 3 or 4 would involve operating over existing trackage between the CMC Dayton Yard and an undefined turnout onto new trackage near Tower 30, Harrisburg Junction, and Manchester Junction. The Applicants had previously considered the possibility of such an alignment, but were unable to develop a reasonable and feasible route. This alignment was also raised in a public comment submitted during scoping. SEA studied the area along the SH 225 corridor to independently verify the Applicants' conclusions. The existing rail lines in that vicinity pass through land that is developed with residential, commercial, and industrial uses. Construction of a new rail line in this area could cause greater impacts to residential areas than any of the other Alternatives. Construction of a new rail line in this corridor would also require the relocation of several miles of pipeline and existing UP tracks in order to create enough space in the right-of-way for a new line. In addition, the proposed alignment would need to cross under SH 225 near the Shell Oil plant, alongside the existing UP and PTRA lines. The SH 225 grade-separated crossing does not contain enough space to accommodate another rail line. Therefore, it would need to be redesigned and reconstructed. This would cause substantial disruption to road traffic on SH 225, although the Applicants have indicated that it might be possible to rebuild the bridge columns without disrupting traffic. SEA concluded that due to the engineering challenges and the environmental impacts that would be more substantial than the impacts of those Alternatives already under consideration, this Alternative should not be analyzed in detail.

A modification of this Alternative was also raised in a public comment submitted during scoping and involved a new rail line between the Build Segment of Alternative 4 and SH 146. However, this Alternative is infeasible for the reasons mentioned above and for the same reasons as Alternatives 3 and 4. In addition, there are several engineering challenges along the proposed alignment, including pipelines and electricity lines that limit the available right-of-way to a point where it becomes infeasible to construct a new rail line.

2.3.8 Construction of New Rail Line Along Fairmont Avenue

This alignment was raised in a public comment submitted during scoping and involved construction and operation of a new rail line using a new Beltway 8 - Fairmont Avenue alignment. This alignment would have followed the original Alignment 2, continued north across Genoa-Red Bluff Road, run east along Fairmont Parkway, and run south on Red Bluff Road until it reached one of the other alignments. This alignment may have required taking a number of businesses and would have adversely affected the entrances and exits for a large shopping center, adversely affected turning movements across Fairmont Parkway, and may have had adverse noise effects to sensitive receptors. Therefore, SEA determined that this alignment should not be analyzed in detail in the EIS.

2.3.9 Rate Negotiation with Union Pacific

This Alternative was raised in public comments submitted during scoping and involved negotiations between Bayport Loop shippers and UP for lower shipping rates. However, this suggestion does not meet the purpose and need of the Proposed Action, which is to provide competitive rail service to the Bayport Loop. Negotiations between the Bayport Loop shippers and UP already occur on a regular basis as contracts come up for renewal.

2.4 COMPARISON OF THE ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION AND ALTERNATIVES

NEPA regulations require a comparison of the environmental impacts of the proposal and the Alternatives, in order to sharply define the issues and provide a clear basis for choice among options. This section compares the environmental impact of the Proposed Action and Alternatives, including the No-Action Alternative, based on the information and analysis presented in Chapter 3, Affected Environment, and Chapter 4, Environmental Consequences. Table 2.4-1 provides an overview of the comparison.

2.4.1 Rail Operations and Rail Operations Safety

2.4.1.1 Rail Operations

Under the Build Alternatives, the operation of two trains per day over the Build Segments would have little impact upon rail operations because only one train would be operating at a time on the line. The Applicants' proposed trains from the Bayport Loop may be required to wait until one or more UP trains clear the line before they could move onto the GH&H line (from the proposed new rail line). The operation of an additional two trains per day is not expected to interfere with

Table 2.4-1
Comparison of the Environmental Impacts of the
Proposed Action and Alternatives

	No-Action	Proposed Action	Original Taylor Bayou Crossing	1C	2B	2D	No-Build
Rail Operations	△	○	○	○	○	○	○
Rail Operations Safety	△	○	○	○	○	○	○
Hazardous Materials Transportation Safety	△	○	○	○	○	○	○
Pipeline Safety	△	○	○	○	○	○	○
Grade Crossings							
Traffic Delay	△	○	○	○	○	○	○
Traffic Safety	△	○	○	○	○	○	○
Noise	△	○	○	○	○	○	○
Climate and Air Quality	△	○	○	○	○	○	○
Water Resources							
Groundwater	△	○	○	○	○	○	-
Floodplains	△	○	○	○	○	○	-
Surface Water	△	◐	◐	◐	◐	◐	○
Wetlands	△	◐	◐	◐	◐	◐	○
Biological Resources							
Plant Communities	△	◐	◐	◐	◐	◐	○
Fish and Wildlife Resources	△	○	○	○	○	○	○
Protected Species	△	○	○	○	○	○	-
Topography	△	○	○	○	○	○	-
Geology	△	-	-	-	-	-	○
Soils	△	○	○	○	○	○	-
Land Use							
Land Use	△	○	○	○	○	○	-
Coastal Zone Management	△	-	-	-	-	-	-
Prime farmlands	△	○	○	○	○	○	-

△ No Change - No Impact ○ Negligible Impact ◐ Moderate Impact ● Significant Impact

Table 2.4-1 (continued)
Comparison of the Environmental Impacts of the
Proposed Action and Alternatives

	No-Action	Proposed Action	Original Taylor Bayou Crossing	1C	2B	2D	No-Build
Socioeconomics							
Demographics, Employment, and the Economy	△	○	○	○	○	○	-
Public Services	△	-	-	-	-	-	-
Recreation	△	○	○	○	○	○	-
Aesthetics	△	○	○	○	○	○	-
Energy	△	○	○	○	○	○	○
Hazardous Materials/Waste Sites	△	-	-	-	-	-	-
Cultural Resources	△	-	-	-	-	-	-
Navigation	△	○	○	○	○	○	-
Environmental Justice							
Noise	△	○	○	○	○	○	○
Hazardous Materials Transportation	△	○	○	○	○	○	○
Grade Crossings	△	○	○	○	○	○	○
Section 4(f) Evaluation	△	○	○	○	○	○	-

△ No Change - No Impact ○ Negligible Impact ◐ Moderate Impact ● Significant Impact

operations on the lines between the Build Segments and the CMC Dayton Yard because of the capacity of those lines and their ability to absorb normal fluctuations in train traffic of two or more trains per day. Overall impacts relative to current conditions are expected to be minimal. Operation of an additional two trains per day under the No-Build Alternative would have a negligible impact on rail operations on the existing UP lines. The No-Action Alternative would not change existing rail operations.

2.4.1.2 Rail Operations Safety

The Build Alternatives and the No-Build Alternative would have negligible impacts on rail operations safety. The impacts from the additional two trains per day would be negligible because of the slow train speeds on the Build Segments, the small increase in train traffic, and the safety measures in place. The No-Action Alternative would have no adverse impacts on rail operations safety.

2.4.2 Hazardous Materials Transportation Safety

There would be negligible impacts on hazardous materials transportation safety from all of the Alternatives, including the No-Action Alternative. All of the Alternatives, including the No-Action Alternative, have low risks associated with the transportation of hazardous materials, given that the amount of hazardous materials that would be transported is relatively small and train speeds would generally be low. Almost all of the project area is already exposed to the risks associated with the transportation of hazardous materials with the exception of small areas around the Build Segments, which are currently not exposed to risks from rail transported hazardous materials. These areas would be newly exposed to a low risk.

2.4.3 Pipeline Safety

Construction of the Build Alternatives would have a minimal impact on pipeline safety. Construction of roads and rail lines over pipeline corridors occurs routinely following established engineering practices and all of the pipelines have been identified in the project area. Most pipeline accidents that are the result of construction activities occur when the construction crew did not check for the presence of a pipeline before digging. There are small differences in the potential increase or decrease in impacts on pipelines among the Build Alternatives because of differences in the number of pipelines crossed or the length of pipeline located adjacent to the proposed right-of-way. There would be no impacts associated with rail construction for the No-Build and No-Action Alternatives, because no construction would be required. Operation of any of the Alternatives would have a minimal impact on pipeline safety because of the very low likelihood that rail operations would damage a pipeline and the low probability that serious consequences would result even if such damage were to occur.

2.4.4 Grade Crossing Delay and Safety

2.4.4.1 Grade Crossings–Traffic Delays

Under the Build Alternatives and the No-Build Alternative, the level of service (LOS) would remain at the highest levels (A or B) for all grade crossings except one grade crossing that would remain at LOS C under all Alternatives. In addition, one additional grade crossing on the No-Build Alternative would have a LOS C. The increase in average grade crossing delay per vehicle would average less than 0.5 seconds for the Build Alternatives and the No-Build Alternative and, thus, would be negligible. Because no new construction or changes in rail operations would occur with the No-Action Alternative, there would be no increase in delay at grade crossings.

2.4.4.2 Grade Crossings–Traffic Safety

Under the Build Alternatives and the No-Build Alternative, estimated increases in predicted accident frequency would be negligible for all highway/rail at-grade crossings. Thus, there would be a negligible impact on traffic safety at grade crossings. The No-Action Alternative would not increase the accident frequency at existing grade crossings because no new construction or changes in rail operation would occur.

2.4.5 Noise and Vibration

The increase in rail traffic along existing rail lines of two trains per day over the Build Alternatives and the No-Build Alternative would result in a minimal increase in noise impacts. The Build Alternatives and the No-Build Alternative would increase noise levels by 2 dBA or less and would add approximately 190 to 230 noise-sensitive receptors to a baseline of approximately 1,319 to 1,392 currently affected receptors within the 65_{L_{dn}} noise contour. In general, an increase in noise level of less than 3 dBA from a baseline of 65 dBA L_{dn} is not considered adverse for railroad noise. There would be no noise impacts from operations along the Build Segments because the noise contour from an average of two trains per day would extend to approximately 20 feet to each side of the track and there are no noise-sensitive receptors within that distance. Construction noise would temporarily affect recreational activities. No construction or construction noise would occur at night. The No-Action Alternative would not increase the number of sensitive receptors affected by railroad noise. None of the Alternatives would have vibration impacts.

2.4.6 Climate and Air Quality

The climate and air quality impacts of the Build Alternatives would be minimal. Even using conservative assumptions (that produce higher emissions estimates), the estimated increase in air emissions from rail construction and operation and associated grade-crossing delays are small relative to other existing sources in the area and would conform to the State Implementation Plan (SIP). The increase in emissions for the No-Build Alternative would be less than for the Build Alternatives primarily because emissions associated with construction would be avoided. No increase in emissions would result from the No-Action Alternative.

2.4.7 Water Resources

2.4.7.1 Groundwater

Groundwater impacts from the Build Alternatives would be negligible. Excavation might increase the chance of groundwater impacts if the upper limit of the aquifer were to be reached. Spills of hazardous material during construction of the Build Alternatives could cause the impacts to be larger than for the other Alternatives, but the potential for spills is low and the spills would be small. Thus, the overall impact of the Build Alternatives is low, but slightly greater than for the No-Action and No-Build Alternatives. The No-Build and No-Action Alternatives would not result in any effects on groundwater.

2.4.7.2 Floodplains

All of the Build Alternatives would have similar portions of new rail line within the 100-year and 500-year floodplains. The length of new rail line in the floodplain would be somewhat less for Alternatives 2B and 2D than the other Build Alternatives, but SEA concludes that this difference in length would not cause a notable difference in the relative impact of these two Alternatives. Additionally, none of the Build Alternatives would exacerbate flooding, although each would cause disturbance to approximately 32 acres of the 100-year floodplain. This disturbance in the

floodplain would have a negligible impact because most of the acreage would not be permanently modified, but would be spanned with bridges. In addition, the proposed drainage channels and floodplain crossings would be designed to manage stormwater flows. Therefore, the Build Alternatives all would have negligible impacts. The No-Build and No-Action Alternatives would have no impact on floodplains in the project area because they would not involve rail line construction.

2.4.7.3 Surface Waters

Impacts on surface waters from the construction of the Build Alternatives would be moderate, and greater than the No-Build or No-Action Alternatives, because the Build Alternatives would cross (via bridges) nine jurisdictional surface water bodies and six non-jurisdictional drainage channels. The Build Alternatives also have an increased chance of habitat loss and a temporary increase in total suspended solids and other pollutants (such as metals, phosphorus, and nitrogen compounds) due to bridge and culvert construction. The potential for hazardous materials incidents impacting surface waters is also greater for the Build Alternatives. Alternatives 2B and 2D would have slightly less impact during construction than the Proposed Action or Alternative 1C because they do not cross Horsepen Bayou or an unnamed non-jurisdictional surface water body at the north end of Ellington Field. Impacts from operation of the Build Alternatives would be negligible. The No-Build Alternative would have no construction-related impacts on surface waters. Impacts from operation would be minimal and similar to the Build Alternatives, although different surface waters would be affected. There would be no increase in impacts on surface waters from the No-Action Alternative above those that already exist.

2.4.7.4 Wetlands

The Build Alternatives could directly impact some wetland areas in the right-of-way and indirectly impact others near the construction footprint. The Build Alternatives would disturb approximately 2.84 acres of jurisdictional and about 4.22 acres of non-jurisdictional wetlands. The Build Alternatives would also cause the permanent loss of some wetlands from placement of fill materials. The Original Taylor Bayou Crossing would impact more jurisdictional wetlands, including about 0.18 acres more of gilgai habitat and about 0.77 acres more of tidal marsh. Thus, their impact on wetlands would be greater than for the No-Build and No-Action Alternatives and would be considered moderate. The No-Build Alternative would have a negligible impact on wetlands due to the slightly increased probability of a hazardous materials release. The No-Action Alternative would not increase impacts on wetlands.

2.4.8 Biological Resources

2.4.8.1 Plant Communities

All of the Build Alternatives would have a moderate impact on plant communities due to impacts during the construction phase. None of the Build Alternatives would affect protected plant communities, but there would be some impacts during construction on remnant coastal prairie and riparian forests east of Ellington Field and along waterways. Additionally, vegetation along the right-of-way would need to be cleared and some plant communities would be fragmented

during construction. Once construction was completed, operations and maintenance are expected to have only a minor impact on plant communities for the Build Alternatives. The No-Build Alternative would have a negligible impact on plant communities due to a slightly increased probability of a hazardous materials release. The No-Action Alternative would not affect plant communities.

2.4.8.2 Fish and Wildlife Resources Including EFH

The Build Alternatives would have negligible impacts on these resources. Construction of any of the Build Alternatives would result in fragmented habitats and a disruption to wildlife movements. Construction impacts on EFHs would be minor or negligible. Similarly, the impacts from operations and maintenance of the Build Alternatives and No-Build Alternative would be negligible, resulting from potential hazardous materials releases or wildlife fatality caused by train movements. Fish and wildlife resources, including EFH, would not experience increased effects under the No-Action Alternative.

2.4.8.3 Protected Species

The Texas prairie dawn flower, which is a Federally-listed endangered species, is found near portions of the right-of-way for the Build Alternatives. Construction of the Build Alternatives would not have an adverse effect on the Texas prairie dawn. Operation and maintenance of the Build Alternatives would have the potential for negligible impacts resulting from herbicide drift or a hazardous materials spill. The No-Build Alternative and the No-Action Alternative would not harm or have an adverse impact on any Federal or state protected species.

2.4.9 Topography, Geology and Soils

Construction of the Build Alternatives would have negligible impacts on topography and soils along the proposed right-of-way. Due to the flat natural topography, most of the proposed rail line would be constructed at or near the natural grade with only small areas requiring depressions to be filled or higher areas to be reduced. Construction of the Build Alternatives would have no impact on geology. The No-Build and No-Action Alternatives would have no impacts on topography, geology, and soils, because they would not involve new rail line construction.

2.4.10 Land Use

The Build Alternatives would have negligible impacts on land use. The Proposed Action would cross the Runway Protection Zone (RPZ) for runway 35L at Ellington Field, but the FAA has determined that there is no airspace conflict. If requested by the City of Houston, which owns Ellington Field, the FAA has to decide whether to approve a change to the Airport Layout Plan to allow the Proposed Action to cross two edges of the airport and to release the land in the RPZ, the FAA has to decide whether to release the affected airport property from the City of Houston's obligations under the grants that the FAA gave the City to purchase the land. The land in the southeast corner of the airport that the Proposed Action would cross was deeded to the City by the General Services Administration (GSA) as surplus land. The surplus land has a deed restriction that requires the FAA to determine whether a non-aviation use would have an adverse

effect on the airport. The Proposed Action would also run between Ellington Field and a 240-acre parcel of land that the City of Houston purchased to prevent residential encroachment on Ellington Field. The City is considering a mix of light industrial, heavy industrial, and office uses for this 240-acre parcel as it develops a master plan for Ellington Field. The Proposed Action and Alternative 1C would parallel runway 4/22. [FAA initially indicated that the Instrument Landing System (ILS) for runway 22 could be degraded while trains use the track parallel to the runway. The Applicants conducted a glide slope evaluation study which concluded that neither the Proposed Action nor Alternative 1C would adversely impact the ILS or the glide slope. The FAA reviewed the study and concurred with this conclusion.]

The No-Build and No-Action Alternatives would have no adverse impacts on land use.

2.4.10.1 Coastal Zone Management

The USACE is coordinating evaluation of the Proposed Action and Alternatives to ensure compliance with the Texas Coastal Management Program. The USACE will forward the Applicants' materials to the Coastal Coordination Council of the Texas GLO. Based on its review, SEA expects the Proposed Action and all Alternatives to be consistent with the Texas Coastal Management Program.

2.4.10.2 Prime Farmlands

The Build Alternatives would have negligible impacts on prime farmlands because of the small acreage of prime farmland that would be affected. The No-Build and No-Action Alternatives would have no impacts on prime farmland.

2.4.11 Socioeconomics

2.4.11.1 Demographic and Employment

The Build Alternatives are expected to have greater (but still negligible) impacts on the local economy than the No-Action or No-Build Alternatives. The Build Alternatives could create a small number of temporary new construction jobs and generate up to \$80 million in construction-related expenditures, but most of this would be absorbed by the local economy and would not have long range effects. The effects associated with Alternative 2B would differ from the other Build Alternatives because it could displace several businesses along Genoa-Red Bluff Road. However, the overall effects would be negligible. The No-Build Alternative would not involve construction and would have no impacts on the local economy. The No-Action Alternative would not impact the local economy.

2.4.11.2 Public Services

The Proposed Action and Alternatives, including the No-Action Alternative, would not affect public services in the communities in the project area. The Proposed Action and Alternatives would not cause an influx of people into the area for construction jobs and would not generate the need for additional emergency services.

2.4.11.3 Recreation

Construction of the Proposed Action would have short term and minor visual impacts on Sylvan Rodriguez Park. Alternative 1C would have a slightly higher visual impact due to its closer proximity to the park. Recreational activities at the Baywood Country Club would also be affected temporarily by the Build Alternatives because of construction noise associated with the construction of the grade separation of Red Bluff Road. Construction activities also would temporarily affect Armand and Taylor Bayous. The No-Build and No-Action Alternatives would not cause any increase in noise or visual impacts on recreational opportunities.

2.4.11.4 Aesthetics

The Build Alternatives would cause minor impacts on the view in areas where no rail lines were previously built. The impacts would be greatest, although still minor, for Alternative 1C because of its closer proximity to Sylvan Rodriguez Park and residences on the west side of Clear Lake City. The Build Alternatives would also alter, although only negligibly, the views in the Armand and Taylor Bayous. No aesthetic impacts would result from the No-Build and No-Action Alternatives.

2.4.12 Energy

The Build Alternatives could have a small but negligible impact on the pipeline transport of energy resources. This is due to potential short-term effects on pipeline corridors during construction because of temporary delays in service that might be necessary for excavation and encasement activities. The Build Alternatives would not affect any of the active oil and gas wells in the project area, but could have negligible effects on high voltage wires because four of the wires in the Bayport Loop might require elevation at certain locations to improve vertical clearance for the proposed rail line. There would be no effect on the transport of energy resources or recyclable commodities by the Proposed Action and Alternatives. There would also be no energy changes or impacts due to truck-to-rail diversions from the Proposed Action and Alternatives.

Operation of any of the Build Alternatives or the No-Build Alternatives, which are of similar length, is likely to increase diesel fuel consumption. SEA considers that the potential increase in fuel consumption would have a negligible effect on energy resources. The Build Alternatives and No-Build Alternatives would have a negligible effect on energy resource consumption due to grade crossing delays.

Under the No-Action Alternative, there would be no change in existing conditions and, therefore, no impacts on energy resources beyond those that exist today. There would be no change in the transport of energy resources or recyclable commodities and no appreciable change in diesel fuel use.

2.4.13 Hazardous Materials/Waste Sites

Alternative 2D would pass between two cells of the closed Hughes Landfill, which contains construction and demolition waste. Excavation and relocation of landfill materials, if required, would not cause an adverse impact. No adverse impacts associated with other documented or undocumented hazardous materials/waste sites were identified. The No-Build and No-Action Alternatives would not impact hazardous materials/waste sites.

2.4.14 Cultural Resources

Along the route for the Build Alternatives, no prehistoric sites were found and only one historic site was located. However, this site did not qualify for the National Register of Historic Places (NRHP) and did not require further investigation. The Texas Historical Commission concurred with SEA's finding of no historic properties affected. The No-Build and No-Action Alternatives would not involve construction and, therefore, would not cause any adverse effects on historic properties. Consultation with Indian tribes was not required under Section 106 of the NHPA because the project has no adverse effects to historic properties. Nevertheless, SEA did contact seven tribes with Areas of Concern in the Houston area. Several tribes expressed no concern over the Proposed Action and Alternatives and several tribes could not be reached. These tribes were added to the distribution list to receive the Notice of Availability of the Draft EIS.

2.4.15 Navigation

The Build Alternatives would cause negligible short-term impacts on navigation on Armand and Taylor Bayous during bridge construction. No adverse impact is expected from operation and maintenance of the bridges due to the limits currently placed on navigation by pre-existing bridges. No bridge construction would occur under the No-Build and No-Action Alternatives and, therefore, there would be no impacts on navigation.

2.4.16 Environmental Justice

2.4.16.1 Noise

SEA determined that train horn noise levels would increase for environmental justice populations near the Build Alternatives and the No-Build Alternative. However, while several environmental justice populations near grade crossings would be exposed to 65 A-weighted decibels (dBA) Day-Night Average Noise Level (L_{dn}) as a result of the Build Alternatives and No-Build Alternative, none would be exposed to an increase of more than 2 dBA L_{dn} or more. Consequently, the increase in noise levels that would result from the Build Alternatives and No-Build Alternative would not be adverse. No change in railroad noise levels would result from the No-Action Alternative.

2.4.16.2 Hazardous Materials Transportation

SEA determined that there would be low risk from hazardous materials transportation for the Proposed Action and Alternatives. Several environmental justice populations fall within the

zone that would be evacuated in the event of a hazardous materials release. However, SEA has determined that the risk from hazardous materials transportation is low, and therefore, the impact is negligible. The No-Build Alternative and the No-Action Alternative would also have a negligible impact on environmental justice groups, due to the low risk associated with hazardous materials transportation.

2.4.16.3 Grade Crossings

Environmental justice populations are located near the majority of existing grade crossings for all Alternatives. However, SEA has determined that the delay and safety impacts would be negligible. Thus, all of the Alternatives, including the No-Action Alternative, would have negligible grade crossing delay and safety impacts for environmental justice populations.

2.4.17 Section 4(f) Evaluation

FAA and USCG are cooperating agencies in the preparation of this EIS and are required to complete a Section 4(f) evaluation under the USDOT Act of 1966. Three potential Section 4(f) resources could be impacted by the Build Alternatives. These are Sylvan Rodriguez Park and the streambeds of Armand and Taylor Bayous. Alternative 1C would be located approximately 300 feet from the boundary of Sylvan Rodriguez Park. Construction of Alternative 1C would have negligible constructive use impacts on Sylvan Rodriguez Park in the form of temporary noise and aesthetic affects. No land would be directly taken from the park.

Each of the Build Alternatives would cross Armand Bayou at the same location, close to pipeline and transmission wire easements and gas well access roads. The proposed bridge over Armand Bayou would not impair the quality of this Section 4(f) resource.

Each of the Build Alternatives, except for the Original Taylor Bayou Crossing, would cross Taylor Bayou at the same location on the boundary of the Bayport Industrial District, close to existing rail and road bridges and a transmission wire crossing. The proposed bridge over Taylor Bayou would not impair the quality of this Section 4(f) resource.