5.3 COMPARISON OF ALTERNATIVES

This section compares the proposed Project with the two alternatives carried forward for detailed analysis in this Final Supplemental Environmental Impact Statement (EIS) (the 2011 Steele City Alternative and the I-90 Corridor Alternative [see Section 5.2, Route Alternatives]) and the three identified No Action Alternative scenarios (Rail/Pipeline Scenario, Rail/Tanker Scenario, and Rail Direct to the Gulf Coast Scenario [see Section 5.1, No Action Alternative]). This comparison focuses on three categories of impacts: physical disturbance, greenhouse gas (GHG) emissions, and potential releases.

5.3.1 Physical Disturbance Impacts

Table 5.3-1 summarizes physical disturbance impacts of the proposed Project, the two alternatives, and the three No Action scenarios.

The 2011 Steele City Alternative would be approximately 21 miles shorter than the proposed Project and therefore would affect fewer acres of land during construction and operations. However, unlike the Steele City Alternative, the proposed Project route avoids the sensitive Nebraska Department of Environmental Quality (NDEQ)-identified Sand Hills Region, which includes extensive areas of soils susceptible to wind erosion and provides habitat for the American burying beetle (Nicrophorus americanus), which is federally listed as threatened. Compared to the proposed Project, this alternative would affect 14 additional species of wildlife. The 2011 Steele City Alternative would cross three fewer perennial waterbodies than the proposed Project, but would impact more wetlands. Overall, however, this alternative would cross many of the same rivers and waterbodies as the proposed Project route; therefore, this alternative would affect generally the same species of fish as the proposed Project.

The I-90 Corridor Alternative would be approximately 52 miles longer than the proposed Project and therefore would disturb more acres of land during construction. Despite being longer, the I-90 Corridor Alternative would require fewer acres of land in permanent easements, as it would share approximately 254 miles of the existing Keystone Pipeline right-of-way. The I-90 Corridor Alternative would cross 70 more miles of fossil-bearing formations than the proposed Project, and would have the potential to affect more paleontological resources. Like the proposed Project, the I-90 Corridor Alternative would also avoid the NDEQ-identified Sand Hills Region and would disturb even fewer linear miles of soils susceptible to wind erosion than the proposed Project. The I-90 Corridor Alternative would cross more perennial waterbodies, but would result in fewer wetland impacts than the proposed Project. Most notably, the I-90 Corridor Alternative would require two major crossings of the Missouri River: at Lake Francis Case Reservoir (an approximately 4,100-foot-long crossing) in South Dakota and at the Missouri National Recreational River (NRR) at the South Dakota/Nebraska border. The Missouri NRR was established by Congress to protect the natural, cultural, and recreational resources of two remaining free-flowing segments of the Missouri River in as natural a state as possible and to keep them available for the public. This NRR segment provides U.S. Fish and Wildlife Servicedesignated critical habitat for the federally threatened piping plover (Charadrius melodus) and habitat for the federally endangered least tern (Sternula antillarum). Additionally, this alternative would cross one important bird area that the proposed Project route would not. Impacts to the species within this area however would be similar to those affected by the proposed Project.

Table 5.3-1 Physical Disturbance Impacts Associated with New Construction and Operations for the Proposed Project and Alternatives

| | Status Quo Baseline | Proposed Project | 2011 Steele City Alternative | I-90 Corridor Alternative | No Action Rail/Pipeline Scenario | No Action Rail/Tanker Scenario | No Action Rail Direct to the Gulf Coast Scenario |
|--|------------------------|---------------------|---------------------------------|---------------------------------|--|--------------------------------------|---|
| New Pipeline Length (miles) | 0 | 875 | 854 | 927 | 17 | 32 | 0 |
| Number of New Aboveground Facilities | 0 | 73 | 71 | 77 | 33 | 33 | 19 |
| Length Co-located with Existing Keystone Pipeline (miles) | 0 | 0 | 0 | 254 | NA | NA | NA |
| NDEQ-Identified Sand Hills Region Crossed (miles) | 0 | 0 | 89 | 0 | 0 | 0 | 0 |
| New Highly Erodible Soil (Wind) Crossed (miles) | 0 | 73 | 115 | 36 | 0 | 0 | 0 |
| Perennial Waterbody Crossings | 0 | 56 | 53 | 61 | 1216 | 330 | 711 |
| Major Water Crossings ^a | 0 | 62 | 60 | 61 | 42 | 14 | 40 |
| Number of Shallow Wells in Proximity b | 0 | 113 | 97 | 42 | NA | NA | NA |
| New NHPAQ Crossed (miles) | 0 | 294 | 247 | 145 | NA | NA | NA |
| Wetland Affected during Construction (acres) | 0 | 262 | 544 | 223 | 193 | 351 | NQ ^c |
| Communities within 2 Miles | 0 | 17 | 16 | 37 | 350 | 182 | 669 |
| Construction (Temporary) Land Area Affected (acres) | 0 | 11,599 | 11,387 | 12,360 | 5,227 | 6,427 | 1,500 |
| Operations (Permanent) Land Area Affected (acres) | 0 | 5,309 | 43 | 46 | 5,103 | 6,303 | 1,500 |

Notes:

This table does not include Canadian impacts for pipeline alternatives or the No Action Alternative scenarios.

NA = not applicable

NQ = not quantified; insufficient design data

NDEQ = Nebraska Department of Environmental Quality

NHPAQ = Northern High Plains Aquifer

^a This is defined as channel crossings of waterbodies that delineate U.S. Geological Survey National Hydrography Dataset Level 4 (HUC4) Hydrologic Unit watershed basins.

^b A *shallow well* is defined as a well with a depth of 50 feet or less, but does not include wells with zero depth; *proximity* is defined as within a quarter mile of the centerline.

^c Specific facility footprints for this scenario are not known at this time. However, impacts would be generally similar to the other rail scenarios.

Overall, this alternative would cross many of the same rivers and waterbodies as the proposed Project route; therefore, this alternative would generally affect the same species of fish as the proposed Project.

As compared to the proposed Project, the No Action Alternative scenarios would affect fewer acres of land during construction, with correspondingly fewer disturbance-related impacts to most resources. Two of the scenarios would also require less permanent land during operations than the proposed Project, although the Rail/Tanker Scenario would require more land. In addition, contrasted with the proposed Project, all three scenarios would use rail transportation in some capacity. An increased number of unit trains along the scenario rail routes could affect communities through increased noise as well as congestion and delays where at-grade tracks cross roads.

In terms of total disturbance, the proposed Project would result in more temporary impacts along a relatively narrow corridor than any of the No Action Alternative scenarios. However, while the No Action scenarios would result in fewer acres of overall disturbance, permanent impacts would be more concentrated from the construction of the representative rail loading and off-loading terminals.

The Rail/Pipeline Scenario would take advantage of existing rail lines, existing crude oil pipelines, and the existing Cushing storage facility, and would require little if any new rail tracks. Because no major new construction would be needed along these existing segments, it is assumed that there would be little potential for impacts to other resources as a result of the increased rail traffic along the existing rail lines. However, the Rail/Pipeline Scenario would require the construction of two new or expanded rail terminals and crude oil storage facilities in Llovdminster, Saskatchewan; a new rail terminal in Epping, North Dakota; and seven new rail off-loading terminals in Stroud, as well as a new pipeline from the Stroud rail terminals to the existing Cushing tank farm and pipeline hub. Potential physical disturbance impacts from construction and operation of these new rail terminals and pipeline could include loss of vegetation and habitat, displacement of wildlife, and air and noise effects on sensitive human and animal receptors. Similar to the Rail/Pipeline Scenario, the Rail/Tanker Scenario would take advantage of existing rail lines and crude oil pipelines as well as the existing Cushing storage facility (for the crude oil from the Bakken), and would require little if any new rail tracks. The Rail/Tanker Scenario would require construction of new or expanded rail terminals and crude oil storage facilities in Lloydminster; a new, large rail off-loading facility and storage tanks as well as an expanded port in Prince Rupert, British Columbia; and a new Epping rail terminal and one new rail terminal and pipeline in Stroud. Potential physical disturbance impacts from the construction and operation of these new rail terminals and pipeline could include loss of vegetation and habitat, displacement of wildlife, and air and noise effects on sensitive human and animal receptors.

Potential physical disturbance impacts from the Rail Direct to the Gulf Coast Scenario would be similar to those under the Rail/Pipeline Scenario, except rail impacts would extend along the entire routes to the Gulf Coast and no new terminal would be required in Stroud. Existing rail terminals and storage tanks would be used in the Gulf Coast area¹ for onward delivery to regional refineries.

5.3.2 Greenhouse Gas Impacts

5.3.2.1 Operation and Construction

Construction

Construction GHG emissions from both direct sources (e.g., clearing and open burning of vegetation during site preparation, operation of on-road vehicles transporting construction materials, and operation of construction equipment) and indirect sources (e.g., use of electricity) represent a small contribution to overall GHG emissions in all scenarios. The I-90 Corridor Alternative is longer than the proposed Project, and GHG emissions from construction of the I-90 Corridor Alternative would be similar but slightly more than that for the proposed Project. Along its entire route, the 2011 Steele City Alternative is shorter than the proposed Project, and GHG emissions from construction of the 2011 Steele City Alternative would be similar but slightly less than that for the proposed Project (see Table 5.3-2). For the construction phase of all three No Action scenarios, due to limited information about how rail facilities would be constructed, associated GHG emissions were not quantified. However, the GHG emissions associated with construction are expected to be negligible compared to the GHG emissions over the operational life of the No Action scenarios (see Table 5.3-2).

Operation

To facilitate comparison of GHG emissions across all alternatives for operational GHG emissions,² an assessment was made of GHG emissions for all alternatives along the entire route from Hardisty, Alberta, to the Gulf Coast (including pipelines in Canada and from Steele City to the Gulf Coast). GHG emissions from the two pipeline route alternatives would be similar in scale to those of the entire route encompassing the proposed Project. The direct emissions during the operation phase of the 2011 Steele City Alternative would be essentially the same as those generated by the entire route encompassing the proposed Project because they would have the same number of pump stations (41). The I-90 Corridor Alternative is expected to have similar but slightly higher GHG and air quality impacts during the operational phase.

¹ Unless otherwise specified, in this Final Supplemental EIS the Gulf Coast area includes coastal refineries from Corpus Christi, Texas, through the New Orleans, Louisiana, region. See Section 1.4, Market Analysis, for a description of refinery regions.

² All of the calculated GHG emissions stated in this section assume that the pumps along the pipeline alignment would operate at their full horsepower (hp) capacity (i.e., 6,500 hp per pump). This is a conservative assessment because in reality very few pumps would reach their rated motor hp. If it was assumed that the pumps would operate on average at 90 percent of their design condition loading and the variable speed drives would operate the pumps at part load on average 85 percent, an operating hp of 3,569 per pump would be obtained. In this instance, the GHG emissions for the proposed Project and alternative scenarios associated with the pumps would be of the order of 50 to 60 percent lower.

Table 5.3-2 Annual Greenhouse Gas Emissions from Crude Transport (Full Pathway)
Associated with the Proposed Project and Alternatives (per 100,000 bpd⁴)

| | Overall Keystone XL Route (Canadian, Proposed Project, and Southern) | Overall 2011 Steele City Segment Alternative Route (Canadian, Steele City Segment, and Southern) | Overall I-90 Corridor Alternative Route (Canadian, I-90, and Southern) | No Action Rail Direct to the Gulf Coast Scenario | No Action Rail/Pipeline Scenario | No Action Rail/Tanker Scenario |
|--|--|--|--|--|--|--------------------------------------|
| Construction (di | rect and indi | rect) | | | | |
| MTCO ₂ e/Year for Entire Construction period | 353,615 | 347,754 | 368,127 | NQ | NQ | NQ |
| % Difference from Proposed Project | NA | -1.7% | 4.1% | NA | NA | NA |
| Operation (direct | | | 1.170 | 1171 | 1171 | 1111 |
| MTCO2e/Year per 830,000 bpd | 3,123,859 | 3,123,844 | 3,211,946 | 4,428,902 | 4,364,611 | 3,991,472 |
| MTCO ₂ e/Year per 100,000 bpd | 376,369 | 376,367 | 386,981 | 533,603 | 525,857 | 480,900 |
| % Difference from Proposed Project | NA | 0.0% | 2.8% | 41.8% | 39.7% | 27.8% |

Notes:

All data include train emissions for return trips as well.

NQ = not quantified; insufficient design data

 $MTCO_2e$ = metric tons of CO2 equivalents

NA = not applicable

bpd = barrels per day

All pipeline calculations assume that the pumps along the pipeline alignment operate at their full horsepower capacity (i.e., 6,500 hp per pump). This is a conservative assessment because in reality very few pumps will reach their established motor hp.

The I-90 Corridor Alternative would have one more pump station than the entire route encompassing the proposed Project. The 42 pump stations associated with this alternative would be located in the same e-GRID region as the entire route encompassing the proposed Project, but could generate slightly higher amounts of indirect GHG emissions from electricity consumption due to the slight increase in the number of pump stations (3.21 million metric tons of carbon dioxide equivalent (CO₂e); 3 percent higher than the entire route encompassing the proposed Project).

During operation of all No Action rail scenarios, the increased number of unit trains along the scenario routes would affect communities through elevated air emissions. During the operation of the Rail/Pipeline Scenario, GHGs would be emitted directly from the combustion of diesel

fuel in trains³ traveling approximately 1,903 to 2,008 miles from Lloydminster, Saskatchewan, to Stroud, Oklahoma, and 1,347 miles from Epping, North Dakota, to Stroud, Oklahoma, as well as for the return trips. Two railway routes were evaluated under the Rail/Pipeline Scenario from Lloydminster, Saskatchewan, to Stroud, Oklahoma: Canadian Pacific Rail Route (1,903 miles) and Canadian National Rail Route (2,008 miles). GHG impacts associated with the Canadian National Rail Route would have a similar but slightly greater regional/global GHG impact as compared to the Canadian Pacific Rail Route due to the longer route distance. The operation of diesel-fueled trains hauling Bakken crude to Epping, North Dakota, would also result in GHG emissions.

The total GHG emissions associated with construction and operation (direct and indirect) combined would be higher for each of the three scenarios than for the entire route encompassing the proposed Project (see Section 4.14, Greenhouse Gases and Climate Change).

- In aggregate, the total annual GHG emissions (direct and indirect) attributed to the Rail/Pipeline Scenario (approximately 4,364,611 metric tons CO₂e [MTCO₂e]) are about 40 percent greater than for the entire route encompassing the proposed Project (3,123,859 MTCO₂e).
- The total annual GHG emissions (direct and indirect) attributed to the Rail/Tanker Scenario (roughly 3,991,472 MTCO₂e) are approximately 28 percent greater than the entire route encompassing the proposed Project (3,123,859 MTCO₂e).
- The total annual GHG emissions (direct and indirect) attributed to Rail Direct to the Gulf Coast Scenario (approximately 4,428,902 MTCO₂e) is about 42 percent greater than for the entire route encompassing the proposed Project (3,123,859 MTCO₂e).

The GHG emission calculations for the Rail Direct to the Gulf Coast Scenario assume that dilbit and Bakken crude would be transported from Lloydminster, Saskatchewan, to Port Arthur, Texas, and then expected to be piped directly to nearby refineries. If other crude types such as railbit or bitumen are transported from Lloydminster to Port Arthur, the calculated GHG emissions are expected to increase slightly due to the slight increase in unit trains per day (i.e., reduced maximum load per rail car) and the additional emissions associated with barging the railbit or bitumen from Port Arthur to nearby refineries (instead of piping).

5.3.2.2 Western Canadian Sedimentary Basin Oil Sands Production Indirect Lifecycle Effects

In all of the Alternatives scenarios, the same daily capacity of 830,000 barrels per day (bpd) of transported Western Canadian Sedimentary Basin crude oil is assumed. Therefore, the indirect lifecycle emissions are expected to be the same for all Alternatives scenarios as compared to the proposed Project and as presented in section 4.14.3, Incremental Indirect Lifecycle Greenhouse Gas Emissions. This is based on the market analysis conclusion, as set forth in Section 1.4, Market Analysis, which reaffirms the conclusion of the Draft Supplemental EIS that approval or denial of any one crude oil transport project, including the proposed Project, is unlikely to

³ The use of liquefied natural gas (LNG) as a fuel source for trains is being developed and tested, with some media reports suggesting commercial application by 2016 to 2017. The use of LNG could reduce GHG emissions compared to the use of diesel fuel. The use of LNG has not been factored into the current GHG calculations and results.

significantly impact the rate of extraction in the oil sands, or the continued demand for heavy crude oil at refineries in the United States.⁴

5.3.3 Potential Risk and Safety

Similar to the GHG emissions comparison, to facilitate comparison of potential risk and safety across all alternatives a comparison was made for all alternatives along the entire route from Hardisty, Alberta, to the Gulf Coast (including pipelines in Canada and from Steele City to the Gulf Coast). Compared to the proposed Project, the two major pipeline route alternatives would have similar potential release impacts (see Table 5.3-3). Both the I-90 Corridor and the 2011 Steele City alternative routes would begin at the same border crossing as the proposed Project (near Morgan, Montana) and end at the same location as the proposed Project (near Steele City, Nebraska); as such, the pipelines in Canada north of the border crossing and the pipelines south of Steele City down to the Gulf Coast would be identical for all three overall pipeline routes. In addition, both of these major route alternatives would require aboveground facilities that are similar to those of the proposed Project; therefore, potential releases impact areas would be generally similar. However, the I-90 Corridor Alternative would cross the Lake Francis Case Reservoir, where a potential spill could have significant detrimental impacts.

The three No Action Alternative scenarios (Rail/Pipeline, Rail/Tanker, and Rail Direct to the Gulf Coast) differ from the proposed Project in that they would use alternative modes of transportation to deliver crude oil to refinery markets in the Gulf Coast rather than just a pipeline (although two of the three scenarios include pipelines as part of their respective delivery system). Potential risk and safety concerns of these alternative modes differ from the proposed Project in terms of the types of impacts that could result, so it is more difficult to do a direct comparison.

Crude oil transportation by the Rail/Pipeline and Rail/Tanker Scenarios would generally differ from the proposed Project in the following ways:

- Crude oil releases during rail transportation would be limited to the crude oil volume contained within individual railcars, which would limit the total volume of crude oil that could potentially impact groundwater relative to the proposed Project. This is offset to at least some extent by the increased statistical likelihood of spills associated with these alternative modes of crude oil transport relative to pipelines.
- Releases associated with crude oil loading/unloading of rail cars at new facilities near Lloydminster, Canada; Epping, North Dakota; Stroud, Oklahoma; and Port Rupert, British Columbia, would likely typically occur within contained areas or to the ground surface, making the releases more readily identifiable and easier to respond to and clean up at the terminals themselves. Results of this analysis are discussed further in Section 5.1.3, Potential Risk and Safety under the No Action Alternative Scenarios.

_

⁴ The Draft Supplemental EIS estimated how oil sands production would be affected by long-term constraints on pipeline capacity (if such constraints resulted in higher transportation costs) if long-term West Texas Intermediate-equivalent oil prices were less than \$100. The Draft Supplemental EIS also estimated a change in GHG emissions associated with such changes in production. The additional data and analysis included in this Final Supplemental EIS provide greater insights into supply costs and the range of prices in which pipeline constraints that would be most likely to impact production. If West Texas Intermediate-equivalent prices fell to around approximately \$65 to \$75 per barrel, if there were long-term constraints on any new pipeline capacity and if such constraints resulted in higher transportation costs, then there could be a more substantial impact on oil sands production levels. This is discussed further in Section 1.4, Market Analysis, Subsection 1.4.5.4, Implications for Production.

Table 5.3-3 Potential Releases Impacts (Full Pathway) Associated with the Proposed Project and Alternatives

| | Proposed Project Route (Canadian, Proposed Project, and Southern) | 2011 Steele City Alternative Route (Canadian, Steele City Segment, and Southern) | I-90 Corridor Alternative Route (Canadian, I- 90, and Southern) | No Action Rail/Pipeline Scenario | No Action Rail/Tanker Scenario | No Action Rail Direct to the Gulf Coast Scenario | |
|--|---|--|--|--|--------------------------------------|--|-----------------------|
| | | | | | | Option 1 ^e | Option 2 ^e |
| Miles for Transport (Overall Route) | 1,938 | 1,917 | 1,990 | 3,902 | 14,014 | 4,624 | 5,375 |
| Ton-miles of Transport ^d (billions) | 85.5 | 84.6 | 87.9 | 120.5 | 346.6 | 119.1 | 148.5 |
| Releases per Year per Octillion Ton-miles | 0.00543 | 0.00543 | 0.00543 | 2.44 | 0.795 | 3.22 | 3.06 |
| Releases per Year ^{a,b} | 0.46 | 0.46 | 0.48 | 294 | 276 | 383 | 455 |
| Barrels Released per Year c | 518 | 513 | 533 | 1,227 | 4,633 | 1,335 | 1,606 |

Note: Octillion = 1,000,000,000,000,000,000,000,000

^a A 16-inch diameter U.S. crude pipeline spill frequency was calculated and used to determine releases per year for pipeline; U.S. spill frequencies were calculated and used for all other alternatives.

^b Releases per Year = (16-inch U.S. crude pipeline spill frequency * total pipeline ton-miles) + (U.S. rail spill frequency * total rail ton-miles) + (U.S. marine spill frequency * total rail ton-miles) + (U.S. truck spill frequency * total truck ton-miles)

^c Barrels Released per Year = (average 16-inch U.S. crude pipeline barrels (bbl) released * total pipeline ton-miles) + (average rail bbl released * total rail ton-miles) + (average marine bbl) released * total rail ton-miles) + (average truck bbl released * total truck ton-miles)

^d Ton-miles of Transport = short tons per year * miles for transport

^e The Option 1 route goes through Lloydminster, while Option 2 routes through Fort McMurray.

The incident⁵ data presented in Table 5.3-3 use spill frequency data to forecast release statistics. To facilitate comparison across all alternatives, releases are estimated for the overall crude oil shipping route from Hardisty, Alberta, to the Gulf Coast. Refer to Section 5.1, No Action Alternatives, for a discussion of the costs associated with the crude oil transportation scenarios.

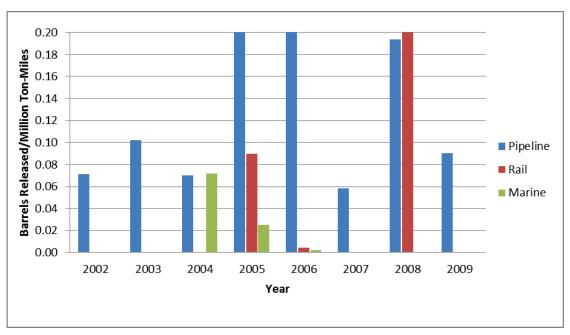
Historical rail incident data were analyzed to evaluate potential releases associated with rail transport in the United States. The results help provide insight into what could potentially occur with respect to spill volume, incident cause, and incident frequency for the No Action Alternative scenarios that involve rail transport. In addition, rail incident frequencies were compared to frequencies for other modes of transport (i.e., pipeline, marine) to provide insight when comparing alternatives. Although the product to be transported by the proposed Project is crude oil, incidents for petroleum products were also analyzed to provide a comparison to a larger dataset and a higher volume transported.

Overall, pipeline transport has the highest number of barrels released per ton-mile and barrels released per barrels transported for crude oil (Figures 5.3.3-1 and 5.3.3-2). Conversely, overall, rail transport has the highest number of reported releases per ton-mile compared to marine or pipeline transport for crude oil and the highest number of releases per barrel transported. Comparing the number of incidents per ton-miles reported between 2002 and 2009, rail transport had the highest incident frequency for crude oil of all modes of transport, and pipelines have a higher incident frequency than marine.

A projection of injury and fatality frequencies onto the crude oil transport volume for the proposed Project was also done, indicating a higher frequency of injuries and fatalities for the No Action scenarios as compared to the proposed Project (Figure 5.3.3-3). Adding 830,000 bpd to the yearly transport mode volume indicates potentially an additional 49 injuries and six fatalities for the No Action rail scenarios compared to one additional injury and no fatalities for the proposed Project on a yearly basis

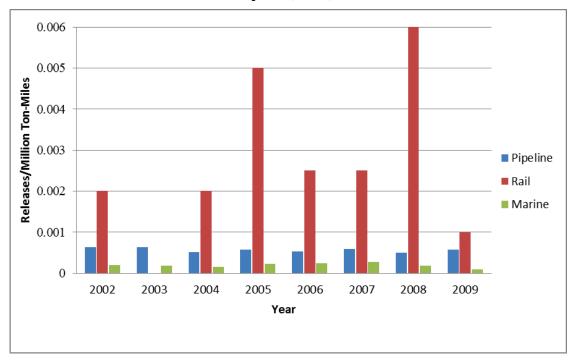
In contrast to the number of releases, more fires and explosions were reported for crude oil pipelines between January 2002 and July 2012 than for rail transport (Figure 5.3.3-4). For crude oil transport, there were fewer reported injuries and fatalities resulting from rail fires and explosions than from pipeline fires. Marine fire and explosion data were not readily available for this report.

⁵ The terms *incident* and *accident* can be used interchangeably or with specified definitions in various agency reports and databases. For the purposes of this report, the term *incident* has been selected for consistency.



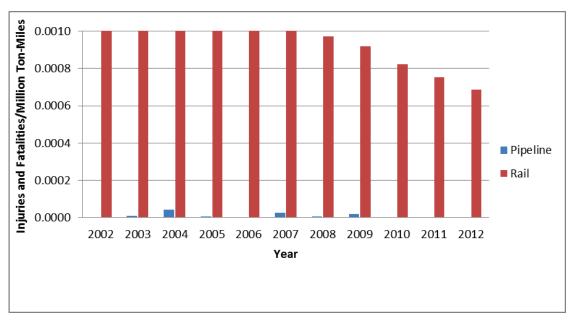
Note: The vertical axis (barrels released per million ton-miles) was adjusted to show the lower reported values. The highest reported value is the 2008 rail value (2.75 barrels released per million ton-miles).

Figure 5.3.3-1 Number of Barrels Released per Million Ton-Miles Transported, Crude Oil: Pipeline, Rail, and Marine



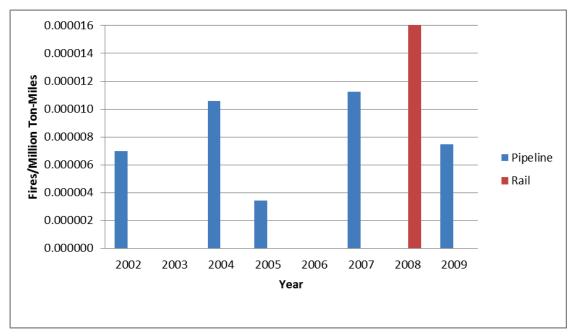
Note: The vertical axis (releases per million ton-miles) was adjusted to show the lower reported values. The highest reported value is the 2008 rail value (0.0114 barrels released per million ton-miles).

Figure 5.3.3-2 Number of Releases per Million Ton-Miles Transported, Crude Oil: Pipeline, Rail, and Marine



Notes: The vertical axis (injuries and fatalities per million ton-miles) was adjusted to show the lower reported values. The highest report value is the 2002 rail value (0.005367 injuries and fatalities per million ton-miles). Pipeline ton-miles are for all petroleum products. Frequencies for pipelines are reported based on available data between 2002 and 2009.

Figure 5.3.3-3 Number of Injuries and Fatalities per Million Ton-Miles Transported:
Petroleum Pipeline and Class I Rail



Notes: The vertical axis (fires per million ton-miles) was adjusted to show the lower reported values. The highest reported value is the 2008 rail value (2.86 fires per million ton-miles). Incident data for marine fires are not available.

Figure 5.3.3-4 Number of Fires per Million Ton-Miles Transported, Crude Oil: Pipeline and Rail

5.3.4 Agency Preferred Alternatives

As described above, alternatives were developed and assessed based on information provided in the Presidential Permit application and supplemental submittals related to the application, information provided by the cooperating agencies, public comments received in the scoping process and on the Draft Supplemental EIS, and information obtained from research of relevant available information conducted by the Department and its third-party contractor.

Consistent with CEQ regulations, and the Department's regulations and authority, the Final Supplemental EIS identifies alternatives before the decisionmaker for determination of whether or not the application serves the National Interest pursuant to the President's Executive Order 13337. The Final Supplemental EIS does not specify a Departmental preference between these two alternatives because no final United States position has been established on the application before the Department. These alternatives are:

- the No Action Alternative; and
- the Proposed Project.