

PRE-FEASIBILITY STUDY OF A PROSPECTIVE RAILROAD CONNECTING THE UINTA BASIN TO THE NATIONAL RAIL NETWORK

A SUBMISSION TO:

SEVEN COUNTY INFRASTRUCTURE COALITION

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ES.1 Executive Summary

Over the last decade the domestic oil industry has experienced an immense resurgence. Technological breakthroughs and advancements, combined with the repeal of the Federal ban on oil exports in 2015, have resulted in record domestic oil production. According to the US Energy Information Administration, since surpassing the previous monthly production record in November 2017, domestic oil production has continued to increase as of June 2018 to 10.9 million barrels per day (bpd), with many experts expecting that number to surpass 11 million bpd by late 2019. Most signs suggest that this trend is poised to continue. According to the International Energy Agency, worldwide demand for oil also will continue to grow over the next five years and the United States will supply most of the production to answer that growing demand.

While this significant growth has led to widespread exploration and development in select, domestic oil reserves, most notably in the Permian Basin, the Eagle Ford Group and the Bakken Formation, there still exists the need to support expanded production. One such example is the Uinta Basin. Despite substantial oil resources – estimated to be between 50-321 billion barrels – the geographically isolated Uinta Basin currently produces less than 90,000 bpd, the vast majority of which are transported to local refineries in Salt Lake City by truck at relatively high cost, resulting in major road congestion, safety issues, low efficiency and concerns that the production volumes are bumping up against these refineries' capacity to refine the oil.

Recognizing the intrinsic economic benefits of shipping large volumes of bulk commodities long distances, the Seven County Infrastructure Coalition (SCIC) contracted with a team led by R.L. Banks & Associates, Inc. (RLBA), to perform a pre-feasibility study examining the economic and operational feasibility of constructing and operating a railroad which would connect the Uinta Basin via one of three alignments with the national railroad network at one of two junctions in Colorado, as detailed later. This report is the culmination of that effort.

ES.2 Overview of Assignment

To better understand the transportation options available to Uinta Basin oil producers and other potential users of the prospective railroad, RLBA was asked to address several issues, including:

1. Determine commodities, volumes and destinations which could be expected to be shipped into or out of the Uinta Basin by rail if a rail transportation option existed;
2. Determine the cost to transport commodities between the Uinta Basin and a connection with the national rail system, given the results of the previous task, assuming the construction of the prospective railroad built on one of three previously identified rail alignments:
 - Myton/Leland Bench Area, UT - Rifle, CO, via Meeker Area;
 - Myton/Leland Bench Area, UT - Rifle, CO, via Piceance Creek and
 - Myton/Leland Bench Area, UT - Craig, CO.

3. Compare the rail transportation cost developed in the previous task to the cost of alternative transportation options to a connection with the national rail system, including:
 - Trucking between the Myton/Leland Bench Area and a rail transload facility at Price, UT, and
 - Pipelining between the Myton/Leland Bench Area and a rail transload facility at Price, UT;
4. Compare the cost to transport crude oil between the Uinta Basin and Salt Lake City area refineries via the five (three potential rail alignments, trucking/transloading and pipelining/transloading), alternative transportation options previously identified and trucking directly from the Myton/Leland Bench Area;
5. Determine the cost to transport commodities between the Uinta Basin and distant, national markets reached on the national rail system via the three, identified connections (Rifle, CO, Craig, CO and Price, UT) and
6. Offer recommendations based on the conclusions reached through the performance of the above-described tasks.

In the following sections this Executive Summary provides a synopsis of the methodologies, findings and conclusions regarding these tasks. Additional explanation and analysis is provided in the accompanying Final Report and supporting documentation.

ES.3 Conclusions Regarding Volume of Commodities Originating and Terminating in the Uinta Basin

To serve the needs of this study, RLBA developed forecasts of the number of carloads it believes are reasonable to assume would be carried by the prospective railroad during the period 2022 through 2044. To produce these forecasts, RLBA conducted multiple, extensive interviews with Uinta Basin producers/prospective rail shippers and receivers, prospective end users of Uinta Basin commodities, impacted railroads and other stakeholders. To best define the potential volumes, RLBA developed “Lower” and “Higher” forecasts in connection with crude oil and seven other commodities it believes might be hauled on that railroad. These forecasts yielded the following results.

Table ES-1
Estimated Annual Carloads Originating/Terminating in Uinta Basin, 2022-2044

Higher "Other Outbound" carload volumes in the 2022 Lower forecast are due to the prospective Leland Bench Uintah Advantage refinery which, if built and operated, would result in fewer Crude Oil and Total carloads moving over the subject railroad (please see section 2.9).

The carloads in the Higher forecast reflect assumptions made by RLBA consistent with a theme that decisions would be made which would result in actions that would be favorable to the prospective railroad's viability: the primary assumption made is that market conditions will enable and motivate Uinta Basin oil producers to extract no less than 350,000 bpd (roughly [REDACTED] rail carloads per year) on a consistent basis. The carloads in the Lower forecast reflect a more conservative adoption of the prospective railroad. Both forecasts reflect a 'ramp up' period in their early years, driven by gradually increased production of crude oil in the Uinta Basin and an assumed greater acceptance of the Uinta Basin's crudes at various refineries, primarily located in Gulf Coast states.

ES.4 Conclusions Regarding the Viability of a New Railroad along the Three, Proposed Alignments in Light of the Forecasted Volumes Originating and Terminating in the Uinta Basin

Transportation costs into and out of the Uinta Basin consist of two components: 1) the cost to transport commodities from the Uinta Basin to a connection with the national rail network or in the opposite direction, a component which would be addressed by the construction of the proposed railroad and 2) the cost to transport commodities from said connection with the national rail network to a final destination via the Class One railroad(s) or in the opposite direction, providing the connection to the national rail network.

To determine the first component, the cost to transport commodities between the Uinta Basin and the national rail network, RLBA determined the break-even rate – or the lowest rate which the prospective railroad could charge prospective Uinta Basin rail shippers and still not operate at a loss – in connection

with each of the three potential rail alignments. Specifically, RLBA: 1) developed an operating and maintenance plan appropriate to host the types and volumes of commodities identified by RLBA between the Myton/Leland Bench Area, UT, and the national rail network connection with either UP and/or BNSF at Rifle, CO, or Craig, CO, depending on the specific alignment; 2) employed an updated, initial capital cost required to build each route developed in previous studies, provided by Jones & DeMille Engineering, Inc.; 3) applied real world costing data to said operating and maintenance plans, and 4) determined what rate prospective Uinta Basin rail shippers would be charged to make the prospective railroad on each of the alignments viable.

The three alignments, collectively determined to be the most feasible out of over the 20 plus routes originally considered, included:

1. Myton/Leland Bench Area, UT - Rifle, CO, via Meeker Area, providing a connection to both Union Pacific (UP) and BNSF Railway (BNSF) via a 183.31-mile route (including 152.97 new-build miles¹), operating through predominately rolling hills and mountainous terrain;
2. Myton/Leland Bench Area, UT - Rifle, CO, via Piceance Creek, providing a connection to both UP and BNSF via a 185.13-mile route (including 154.80 new-build miles), operating through predominately rolling hills and mountainous terrain and
3. Myton/Leland Bench Area, UT - Craig, CO, providing a connection only to UP via a 157.27-mile route (including 126.93 new-build miles), operating through predominately rolling hills and flat terrain.

The application of the above-described methodologies yielded the results seen in table ES-2 regarding the Higher and Lower forecast volumes, respectively.

RLBA's results indicated that using the potential rail alignment to Craig would provide the lowest rates to shippers on the prospective railroad between the Myton/Leland Bench Area and a connection with the national rail network (in this case, at Craig, CO, with UP). It is important to note that this assessment does not consider or account for the cost which would be incurred by prospective Uinta Basin rail shippers to pay UP to transport commodities to and from Craig on the national rail system; it is simply the cost prospective shippers could expect to pay the prospective railroad to reach the national rail system from the Myton/Leland Bench Area.

Because the prospective railroad was assumed to handle the same amount of traffic regardless of alignment (all traffic in and out of the Uinta Basin area was assumed to have been loaded and off loaded in the Myton or Leland Bench Area), the cost savings associated with the Craig rail alignment can be attributed to: 1) the lower initial capital costs to construct the line, largely due to the shorter mileage, and 2) lower operating and maintenance costs on that route, again, largely due to its the shorter mileage and more favorable physical characteristics.

¹ All three alignments assume the integration of the existing Deseret Power Railroad.

Table ES-2
Rail Transportation Break-Even Rate per Carload and Barrel;
Myton/Leland Bench Area - Connection with the National Rail Network, Lower and Higher Volume Forecast, 2022-2044

Year	Rifle Via Meeker Area				Lower Rifle Via Piceance Creek				Craig			
	Expense	Carloads	Break Even Rate		Expense	Carloads	Break Even Rate		Expense	Carloads	Break Even Rate	
			Carload	Barrel			Carload	Barrel			Carload	Barrel
2022												
2023												
2024												
2025												
2026												
2027												
2028												
2029												
2030												
2031												
2032 +												
Average												
Year												
2022												
2023												
2024												
2025												
2026												
2027												
2028												
2029												
2030												
2031												
2032												
Average												

ES.5 Conclusions Regarding the Transportation Cost to Reach the National Rail Network across the Various Transportation Options Potentially Available in the Uinta Basin (Rail, Pipe and Truck)

To understand the full spectrum of transportation options potentially available to existing and prospective Uinta Basin shippers, RLBA compared the transportation rates of what were previously identified as the two most viable alternatives to the prospective railroad between the Myton/Leland Bench Area and a connection with the national rail network. These alternatives are:

1. Contracting a third party entity to truck crude oil to a rail transload facility at Price, UT, using rates developed by RLBA and
2. Constructing and operating a dedicated, crude oil pipeline to a rail transload facility at Price, UT, using rates developed by HDR, Inc. in previous studies.

This comparison yielded the following results.

**Table ES-3
Alternative Transportation Rate Comparison per Barrel;
Myton/Leland Bench Area - Connection with the National Rail Network**

RLBA's results indicated that in both the Higher and Lower forecasts, the prospective railroad, the UBRR, would provide the lowest transportation cost between the Myton/Leland Bench, UT area and a connection with the national rail network. These results were due to the fact that: 1) the high volumes of commodities estimated to ship via rail, including those other than crude oil, greatly amplify the superior economics of scale intrinsic to the rail mode, and 2) the additional cost of transloading or 'double handling' crude oil into railcars at the connection to the national rail network negatively impacts the competitiveness of non-rail transportation options. On the other hand, the rail mode offers economic development and other benefits to the Uinta Basin economy that are unlikely to be realized in the event a pipeline was constructed in the alternative. Specifically, the prospective railroad would be both more flexible (featuring the ability to transport multiple types of commodities in both directions and scalable (in that additional infrastructure could be added, as needed, at an economical cost), compared to a pipeline.

ES.6 Conclusions Regarding the Total Transportation Cost to Ship to National Markets

While important, determining the transportation cost between the Uinta Basin and the national rail network is only one of the two components of the true transportation cost into and out of the Uinta Basin. Once commodities have reached the national rail network, a Class One railroad – either UP or BNSF, depending on the junction location – must be engaged to perform final delivery. Because the Class Ones will handle Uinta commodities over the majority of the miles to/from distant markets, Class One rates likely will be the single largest cost component.

To determine the above-referenced Class One rates, RLBA estimated rates which prospective Uinta Basin rail shippers would have to pay to transport Uinta Basin commodities via UP and/or BNSF routings across the national rail system to eleven, target refineries identified as part of the study process. RLBA also estimated prospective rates on seven other commodities involving eleven potential destinations/origins. Additionally, RLBA calculated and included the cost associated with leasing rail cars to transport Uinta Basin commodities across the UBRB and the national rail system.

The application of this methodology yielded the following results, amended here to show only results regarding crude oil.

Table ES-4
Rail Transportation and Equipment Lease Rates per Barrel;
Connection with the National Rail Network - National Markets

RLBA's results indicated that the Class Ones' rates are greatly influenced by the length of haul between origins and destinations. The closer a candidate terminal is to each of the three potential connections to the national rail network, the lower the rates it would logically enjoy, generally because the haul lengths are shorter. In general, BNSF appears to be able to provide lower rates than UP to southeastern refineries, likely in part due to a shorter routing on BNSF, suggesting that the net benefits for prospective Uinta Base rail shippers of building the prospective railroad along one of the more expensive Rifle alignments may outweigh the lower construction and operating cost of the Craig option.

To offer a final opinion regarding what the total transportation cost which prospective Uinta Basin rail shippers might pay to ship via the prospective railroad between the Myton/Leland Bench Area and national markets, RLBA synthesized the following values, including:

1. The average annual break-even rate for each of three prospective rail alignments at both the Higher and Lower forecast volumes;
2. The estimated freight rate across the national system to the various identified destinations/originations and
3. The estimated equipment lease rates.

This comparison yielded the results shown on the next page, amended here to show only results regarding crude oil.

RLBA's results indicated that at the Higher forecast volume the Rifle via Meeker alignment, allowing for interchange with both UP and BNSF, offers prospective Uinta Basin rail shippers the lowest total rail transportation cost on all 33 identified shipping lanes. RLBA's results also indicate that at the Lower forecast volume the Rifle via Meeker alignment, allowing interchange with both UP and BNSF, offers prospective Uinta Basin rail shippers the lowest total rail transportation cost on 30 of the 33 identified shipping lanes (90%).

ES.7 Conclusions Regarding the Transportation Cost to Reach Salt Lake City Refineries across the Various Transportation Options Out of the Uinta Basin

While the primary objective of this study was to determine transportation rates/costs to distant markets, the Salt Lake City markets are currently, and figure to remain under any expansion scenario, a major market for Uinta Basin crude oil. As such, RLBA compared the cost of the various transportation options previously identified against the real world cost paid today to transport Uinta Basin crude oil to Salt Lake City via contract trucking. To do so, RLBA: 1) applied the same methodology to determine the costs incurred to reach national markets; 2) considered real world contract trucking rates as reported in a previous study performed by HDR, Inc., and 3) considered costs regarding a dedicated, crude oil pipeline to a rail transloading facility at Price, UT, developed in a previous study performed by HDR, Inc.

This methodology produced the results seen on Table ES-6.

Table ES-5
Rail Transportation and Equipment Lease Rate per Barrel;
Myton/Leland Bench Area - National Market, Lower and Higher Volume Forecasts

	Lower
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Table ES-6
Alternative Transportation Rate Comparison per Barrel;
Myton/Leland Bench Area - Salt Lake City Markets

RLBA's results indicated that at the Higher forecast volume estimates an all-rail routing assuming interchange with UP at Rifle, CO, provided the most competitive transportation cost. However, at the Lower forecast volume estimates the current practice of trucking directly to Salt Lake City offered the most competitive cost. Additionally, the estimated rate charged by UP to handle traffic from the most distant connection - the Craig, CO, interchange - negated any cost savings prospective Uinta Basin rail shippers would realize thanks to the lower construction, maintenance and operating costs associated with the Craig, CO, rail alignment. Not captured in RLBA's results is the cost to construct the required facilities to accept and handle railcars at Salt Lake City area refineries.

ES.8 Recommendations based on Conclusions

1. **Volumes** - To reiterate the importance and impact of the four challenges described earlier, the viability and competitiveness of the prospective railroad is directly related to the volumes of traffic which would be shipped over the line.
2. **Feasibility of the Proposed Railroad** - Assuming the forecasted volumes can be achieved, it appears that the proposed railroad can offer cost competitive transportation to prospective Uinta Basin rail shippers, as compared with the most practical identified transport alternatives. Beyond the immediate quantifiable monetary benefits, the proposed railroad also would offer more flexibility to transport into and out of the Uinta Basin secondary and tertiary commodities related to both crude oil extraction and other industries.
3. **Multiple Class One Connections** - The Class One rate estimation work conducted by RLBA suggests that the additional construction costs necessary to reach Rifle, CO, may be justified by the savings potentially realized by prospective Uinta Basin rail shippers due to the advantages of being served by two Class One carriers instead of being 'captive' to only one. To this point RLBA

Table ES-6
Alternative Transportation Rate Comparison per Barrl;
Myton/Leland Bench Area - Salt Lake City Markets

Item	Rail						Truck		Pipeline
	Rifle via Meeker		Rifle Via Piceance		Craig		Price	Salt Lake	Price
	Lower	Higher	Lower	Higher	Lower	Higher			
Rail Car Lease	\$ 0.64	\$ 0.64	\$ 0.64	\$ 0.64	\$ 0.71	\$ 0.71	\$ 0.54	\$ -	\$ -
Transport to National Network	\$ 2.33	\$ 1.44	\$ 2.37	\$ 1.47	\$ 1.81	\$ 1.11	\$ 3.00	\$ -	\$ -
Transload at National Network	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1.50	\$ -	\$ -
Union Pacific to Salt Lake City	\$ 1.68	\$ 1.68	\$ 1.68	\$ 1.68	\$ 2.42	\$ 2.42	\$ 0.77	\$ -	\$ -
BNSF Railway to Salt Lake City	\$ 1.71	\$ 1.71	\$ 1.71	\$ 1.71	\$ -	\$ -	\$ 0.77	\$ -	\$ -
Truck to Salt Lake City (HDR)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5.75	\$ -
Truck-Pipe-Rail-Pipe (HDR)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 6.11
Transload at Salt Lake City	\$ 1.50	\$ 1.50	\$ 1.50	\$ 1.50	\$ 1.50	\$ 1.50	\$ 1.50	\$ -	\$ -
Total via UP	\$ 6.16	\$ 5.26	\$ 6.20	\$ 5.29	\$ 6.44	\$ 5.74	\$ 7.31	\$ -	\$ -
Total via BNSF	\$ 6.19	\$ 5.29	\$ 6.23	\$ 5.32	\$ -	\$ -	\$ 7.32	\$ -	\$ -
Best Possible Total	\$ 6.16	\$ 5.26	\$ 6.20	\$ 5.29	\$ 6.44	\$ 5.74	\$ 7.31	\$ 5.75	\$ 6.11

RLBA's results indicated that at the Higher forecast volume estimates an all-rail routing assuming interchange with UP at Rifle, CO, provided the most competitive transportation cost. However, at the Lower forecast volume estimates the current practice of trucking directly to Salt Lake City offered the most competitive cost. Additionally, the estimated rate charged by UP to handle traffic from the most distant connection - the Craig, CO, interchange - negated any cost savings prospective Uinta Basin rail shippers would realize thanks to the lower construction, maintenance and operating costs associated with the Craig, CO, rail alignment. Not captured in RLBA's results is the cost to construct the required facilities to accept and handle railcars at Salt Lake City area refineries.

ES.8 Recommendations based on Conclusions

- Volumes** - To reiterate the importance and impact of the four challenges described earlier, the viability and competitiveness of the prospective railroad is directly related to the volumes of traffic which would be shipped over the line.
- Feasibility of the Proposed Railroad** - Assuming the forecasted volumes can be achieved, it appears that the proposed railroad can offer cost competitive transportation to prospective Uinta Basin rail shippers, as compared with the most practical identified transport alternatives. Beyond the immediate quantifiable monetary benefits, the proposed railroad also would offer more flexibility to transport into and out of the Uinta Basin secondary and tertiary commodities related to both crude oil extraction and other industries.
- Multiple Class One Connections** - The Class One rate estimation work conducted by RLBA suggests that the additional construction costs necessary to reach Rifle, CO, may be justified by the savings potentially realized by prospective Uinta Basin rail shippers due to the advantages of being served by two Class One carriers instead of being 'captive' to only one. To this point RLBA

estimates that BNSF Railway, the second Class One reached via a connection at Rifle, CO, in general, may offer lower rates to and from the distant locations which are markets for Uinta Basin commodities and sources of commodities consumed in the Uinta Basin. Furthermore, prospective Uinta Basin rail shippers might be able to leverage the two Class Ones against one another in negotiations to receive even more favorable rates than those estimated by RLBA. Similarly, shippers should be able to secure better service than would be the case if only one of those railroads provided service.

4. **Alignment Selection** - While the Craig rail alignment appears to be significantly less costly to both construct and operate than either Rifle alignment, the Craig alignment: 1) is generally farther from the markets for Uinta Basin commodities; 2) lacks a second Class One connection, and 3) is located at the end of relatively isolated UP branch line. As a result, the total rail transportation cost, the sum of the costs to reach the national rail network and then to ship over the national rail network, incurred by prospective Uinta Basin rail shippers would likely be higher using the Craig rail alignment, both to distant markets and Salt Lake City. As such, if the ultimate goal of constructing the prospective railroad is to advance the economic development of the Uinta Basin, it would appear as though the Rifle via Meeker Area rail alignment would be the most prudent selection.
5. **Salt Lake City** - The short haul length (by rail standards) to Salt Lake City makes an all-rail transportation option utilizing a combination of the prospective railroad and a Class One intrinsically less competitive, though potentially still feasible. If the prospective railroad can obtain the High forecast volumes, the economies of scale are such that rail may be the most cost competitive option. If said High forecast volumes cannot be obtained, the Salt Lake City market may not be competitive for rail. In either case, as regards the prospective railroad, RLBA would consider Salt Lake City to be a secondary market to more distant markets.

1.0 Introduction

Despite substantial known natural petroleum resources and record growth in the domestic oil industry, to date, oil production in the Uinta Basin region of northeastern Utah consistently remains substantially lower than that of similar, large oil plays across the United States – approximately 70,000 to 90,000 bpd. What's more, essentially all this production is transported almost entirely by truck to five small-to-midsize refineries located in the north Salt Lake City metro area. Despite significant national demand for the specific type of crude oil found in the Uinta Basin, producers in the Basin have been unable to find national markets willing to purchase their production at prices which would facilitate widespread economical oil extraction in the region.

Chief among the issues thwarting the penetration of Uinta Basin crude oil and other petroleum resources into national markets is the lack of sufficient transportation infrastructure to bring products to market. While a main line of the nation's largest railroad – Union Pacific – passes within 100 miles of the Uinta Basin, to date the rugged topography of the region has limited transportation options between the oil producers of the Uinta Basin and the national rail network to expensive, inefficient and publically burdensome trucks. These high costs have decreased significantly the profit margins Uinta Basin producers have realized on their products, often approaching a 17% discount. The aforementioned five Salt Lake City refineries - which currently constitute essentially the entire market for Uinta Basin crude oil – remain very aware of the constrained markets into which Uinta Basin producers can sell, manifesting that awareness by insisting on paying prices that represent a substantial discount to West Texas Intermediate (“WTI”), the primary onshore benchmark against which domestic U.S. oil prices are quoted.

As long as the transportation infrastructure into and out of the Uinta Basin remains status quo, discounted returns and constrained production capability can be expected to continue. As such, both public sector leaders and the managers of private sector oil production companies in the Uinta Basin are convinced of four things:

1. that Uinta Basin producers will remain both captive to the five refineries and perpetually captive to the discount that those refineries impose upon them unless and until something is done to significantly change the status quo;
2. that a significantly larger volume of oil is available and could be produced quickly if additional markets were available in which to sell Uinta Basin oil;
3. that there are a number of markets, both refineries and intermediate storage/blending locations, which would be receptive enough to the region's oil that not only would production in northeast Utah increase significantly, but those producers would be able to reduce significantly, if not eliminate, the discount to WTI (even in Salt Lake City) that is their fate so long as no alternatives exist by which to sell their oil; and
4. that the best option available to take advantage of the Uinta Basin's abundant oil and shale reserves is to construct a pipeline or railroad to connect the subject region with already-built transportation infrastructure ready to carry oil to distant markets.

In light of these revelations, it should not be surprising that public and private sector leaders in northeast Utah have spent the last several years examining the feasibility and economic viability of constructing and operating a pipeline to reach northeastern Utah. Indeed, a pipeline might well become the economic salvation sought by both public sector economic development leadership in northeast Utah and the oil producers on whom they hope to rely to achieve an improved economy in the region over the long term. That said, aside from its extremely high initial capital cost, the potential pipeline solution suffers from one major disadvantage, which is that a pipeline only can move one product in one direction at any one time. In contrast, a railroad could be used both to move oil and other commodities out of the region, and other commodities, significantly including materials to facilitate the drilling of oil and gas wells, into the region at the same time. Nor is a pipeline scalable in the sense that it can be expanded readily to handle more traffic.

Understanding the advantages inherent to railroads and disadvantages inherent to pipelines, the public sector, specifically the SCIC, in consultation with private sector producers, commissioned a team lead by R.L. Banks & Associates (RLBA), in association with Helios Group Inc., to conduct a pre-feasibility study to examine the potential viability of constructing a railroad on one of three potential alignments between the Uinta Basin and two different terminals, Rifle and Craig, Colorado. This report is the culmination of that effort.

1.1 Description of Assignment

To better understand the feasibility of the prospective railroad connecting the Uinta Basin with the national rail network, RLBA was asked to address several issues, including to:

1. Determine commodities, volumes and destinations which could be expected to be shipped into or out of the Uinta Basin by rail if a rail transportation option existed;
2. Determine the cost to transport commodities between the Uinta Basin and a connection with the national rail system, given the results of the previous task, assuming the construction of the prospective railroad built on one of three previously identified rail alignments:
 - Myton/Leland Bench Area, UT - Rifle, CO, via Meeker Area;
 - Myton/Leland Bench Area, UT - Rifle, CO, via Piceance Creek; and
 - Myton/Leland Bench Area, UT - Craig, CO.
3. Compare the rail transportation costs developed in the previous task to the cost of alternative transportation options to a connection with the national rail system, including:
 - a. Trucking between the Myton/Leland Bench Area and a rail transload facility at Price, UT; and
 - b. Piping between the Myton/Leland Bench Area and a rail transload facility at Price, UT;
4. Compare the cost to transport crude oil between the Uinta Basin and Salt Lake City area refineries via the five (three potential rail alignments, trucking/transloading, piping/transloading), al-

ternative transportation options previously identified and trucking direct from the Myton/Leland Bench Area;

5. Determine the cost to transport commodities between the Uinta Basin and markets reached on the national rail system via the three, identified connections (Rifle, CO, Craig, CO and Price, UT); and
6. Offer recommendations based on the conclusions reached through the performance of the above-described tasks.

1.2 RLBA Approach to the Scope of Work

To address these tasks, RLBA developed and applied a three-part approach, including:

1. Determining Potential Rail Traffic Volumes, Destinations and Origins;
2. Determining Costs to Reach a Connection with National Rail Network and
3. Determining Costs to Ship Across the National Rail Network to/from Distant Markets.

1.3 Approach Part 1 - Determining Potential Rail Traffic Volumes, Destinations and Origins

For any new build rail project in the Uinta Basin to be successful, there must be a clear and accurate understanding of the commodities and volumes likely to be transported out of or into the Uinta Basin. While crude oil is likely to constitute the majority of volume shipped on any prospective railroad in the Uinta Basin, the flexibility offered by rail affords opportunities to ship other commodities both related and not related to crude oil production which could greatly improve the economic feasibility of the prospective railroad. To determine both the volume of crude oil, as well as to identify and gauge the volumes of other commodities that could potentially ship via rail, RLBA undertook a two-step process. First, leveraging data supplied by the SCIC, RLBA compiled a comprehensive list of potential rail customers and other important stakeholders. RLBA then conducted both over-the-phone and on-site interviews with said potential customers and stakeholders to identify: 1) their potential interest in shipping via rail; 2) their anticipated rail volumes should a connection be built; 3) ideal origin/destination points of shipments via rail; 4) current trucking rates; and 5) any other relevant information. Second, RLBA took the information gathered from potential rail customers and stakeholders and developed a detailed volume forecast of commodities to be transported both into and out of the Uinta Basin in the event the prospective railroad was constructed.

The methodologies, findings and conclusions regarding this step are detailed in section 2 of this report. Additionally, conclusions regarding Task 1 (determination of commodities, volumes and destinations which could be expected to be shipped into and out of the Uinta Basin by rail if a rail transportation option was built) are also addressed in section 2 of this report.

1.4 Approach Part 2 - Determining Costs to Reach the National Rail Network

Transportation cost into and out of the Uinta Basin consist of two components: 1) the cost to transport commodities between the Uinta Basin and a connection with the national rail network, a component which would be addressed by the construction of the proposed railroad; and 2) the cost to transport commodities between this connection with the national rail network and a final destination/origin via the major national railroad(s) providing the connection to the national rail network.

Once the commodities and volumes potentially coming into and out of the Uinta Basin were understood, RLBA used this data to determine the cost to transport said commodities in and out of the Uinta Basin area on the prospective railroad – the first of the two components constituting the cost of transportation. To determine said transportation costs on the prospective railroad, RLBA undertook a two-step process. First, regarding each rail alignment option, RLBA developed an operating plan unique to the specific characterization of that alignment. Second, RLBA applied real world costing data to said operating plan, drawn from proprietary databases maintained by RLBA, to provide highly accurate cost estimations in connection with each rail option based on the characteristics of each potential alignment provided to RLBA. Beyond determining the transportation costs associated with the prospective railroad, these estimations also were used to compare transportation costs associated with alternative transportation options into and out of the Uinta Basin.

The methodologies, findings and conclusions regarding this step are detailed in section 3 of this report. Additionally, conclusions regarding Task 2 (determination of the cost to transport commodities between the Uinta Basin and a connection with the national rail system, assuming the construction of the prospective railroad entity), Task 3 (comparison of the rail transportation costs to the costs of alternative transportation options to/from a connection with the national rail system), and Task 4 (comparison of the costs to transport crude oil between the Uinta Basin and Salt Lake City), are also addressed in section 3 of this report.

1.5 Approach Part 3 - Determining Costs to Ship across the National Rail Network to/from Distant Markets

While important, determining the transportation cost between the Uinta Basin and the national rail network is only one of the two components of the true transportation cost into and out of the Uinta Basin. Once commodities have reached the national rail network, a major national railroad – either Union Pacific or BNSF Railway, depending on the junction location – must be engaged to perform final or interchange delivery. Because a major railroad will handle Uinta commodities for the majority of the trip to/from distant markets, a major railroad's rates likely will be the single largest cost component encountered by prospective rail shippers to and from the Uinta Basin.

The final 'piece of the puzzle' in determining the feasibility of a new rail line to the Uinta Basin is understanding what the major railroads – either Union Pacific or BNSF Railway – will charge to transport any material into or out of the western Colorado. Combining information from proprietary databases maintained by RLBA, industry leading third-party rate estimation software to which RLBA subscribes and real-world rail rate data maintained and provided by the Surface Transportation Board ("STB") – the fed-

eral entity tasked with economic oversight of the railroad industry – RLBA developed estimated shipping rates specific to the origins and destinations of the specific commodities potentially being shipped into and out of the Uinta Basin. Additionally, RLBA determined lease rates associated with the rail equipment required to ship Uinta Basin’s outbound and inbound freight commodities over the national rail network.

The methodologies, findings and conclusions regarding this step are detailed in section 4 of this report. Additionally, conclusions regarding Task 5 (determination of the costs to transport commodities between the Uinta Basin and distant markets) are also addressed in section 4 of this report.

1.6 The Prospective Railroad

For purposes of this report, RLBA has identified the prospective railroad as the “Uinta Basin Railroad” (herein referred to as the “UBRR”). It is assumed that the UBRR would open as a regulated, common carrier in 2022. Per the request of SCIC, this study focuses on a twenty year period spanning from the commencement of operations in 2022 until 2042.

There have been a variety of studies regarding the potential construction of a railroad in the Uinta Basin dating back to at least 1981. Most pertinent of these studies to RLBA’s work is the study entitled “Feasibility Report for the Isolated Empire Rail Project,” completed in 2001 by DMJM Harris (herein referred to as the “2001 DMJM Harris Study”). This study, among other things, considered 16 potential rail alignments between the Uinta Basin and a connection with the national rail network, ultimately recommending five alignments for further study. For purposes of this report, RLBA was instructed by SCIC to consider three of these five rail alignments. In part to support RLBA’s work, SCIC engaged a third party engineering firm, Jones & DeMille Engineering (herein “Jones & DeMille”), to provide updated conceptual level engineering plans and construction cost estimates in connection with each of the three alignments identified in the 2001 DMJM Harris Study and selected for inclusion in this study.

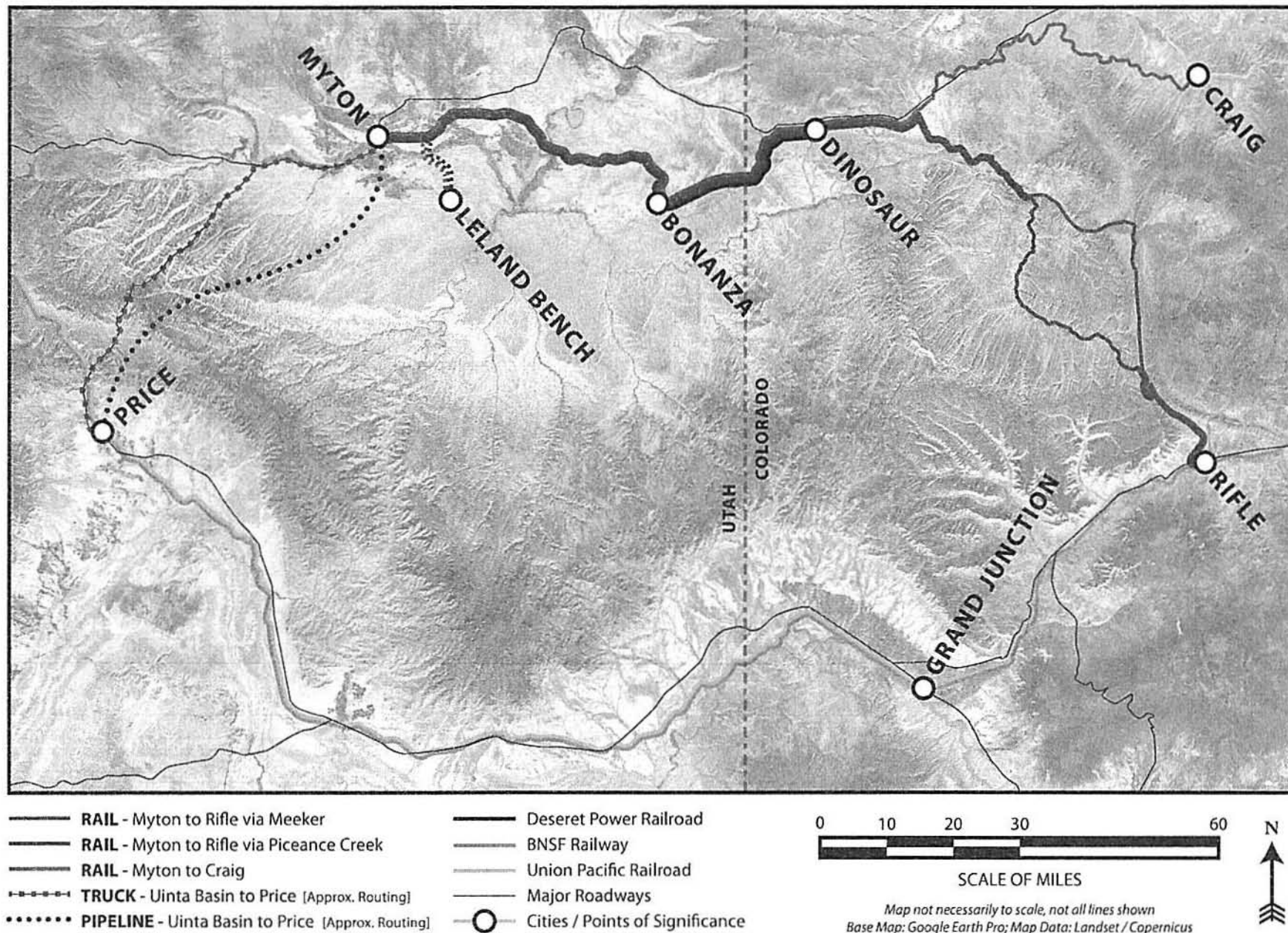
The following is a description of the important elements of these alignments, illustrated in Map 1-1.

1.7 Western Terminus - Uinta Basin

Through conversations with SCIC and interviews with various stakeholders it was determined that the western end of UBRR would be located in one of two (but not both) locations:

1. **Myton, UT** - A small community of approximately 600, located within the Uinta Basin along U.S. Routes 40 and 191. Due to its location on U.S. 40 and 191, Myton features reasonably developed road infrastructure. The community is an important hub for the Utah oil industry; the regional headquarters of Newfield Exploration Company, a leading crude oil producer in the region, is located in Myton. Additionally, Chevron Corporation’s Rangeley, CO – Salt Lake City, UT pipeline passes several miles to the south of Myton. Myton was identified as the western terminus in the 2001 DMJM Harris Study and
2. **Leland Bench, UT** - An unincorporated community approximately 12 miles southeast of Myton. Leland Bench currently features very limited road infrastructure and no industrial or rail infra-

Map 1-1
Map of Proposed Rail Alignments in the Uinta Basin



structure. However, Uintah Advantage (see section 2.9) has expressed interest in developing a refinery at Leland Bench. Additionally, Uintah Advantage has suggested land could be made available for the construction of rail facilities at the Leland Bench site at little or no cost to the railroad. As such, Leland Bench was identified as a potential alternate location as the western terminus of the UBRR by SCIC.

The values advanced in this study regarding capital costs as well as operating and maintenance costs were developed assuming that the UBRR terminated in Myton. However, Jones & DeMille determined that the difference in construction cost to build the proposed railroad to either Myton or Leland Bench would be negligible. Specifically, it would cost approximately \$13 million more to build to Leland Bench – which correlates to an approximately 1.15% increase in the overall initial construction cost. To reach Leland Bench, the prospective rail alignment would remain largely the same as that to reach Myton, the only difference being that the alignment would turn due south in the vicinity of Randlett, UT to reach Leland Bench. RLBA also determined that, in general, the mileages and physical characteristics of the railroad to either Myton or Leland Bench would be comparable. As such, it reasonably can be assumed that the conclusions reached in the study are valid regardless of which location is ultimately selected as the railroad's terminus and, therefore, are used interchangeably throughout this report.

Regardless of which location is assumed to be the western terminus of the railroad, both would require substantial investment in both transportation and petroleum production-related infrastructure to adequately meet the needs of the proposed railroad. This study only considers the investment required to construct and operate the required rail infrastructure.

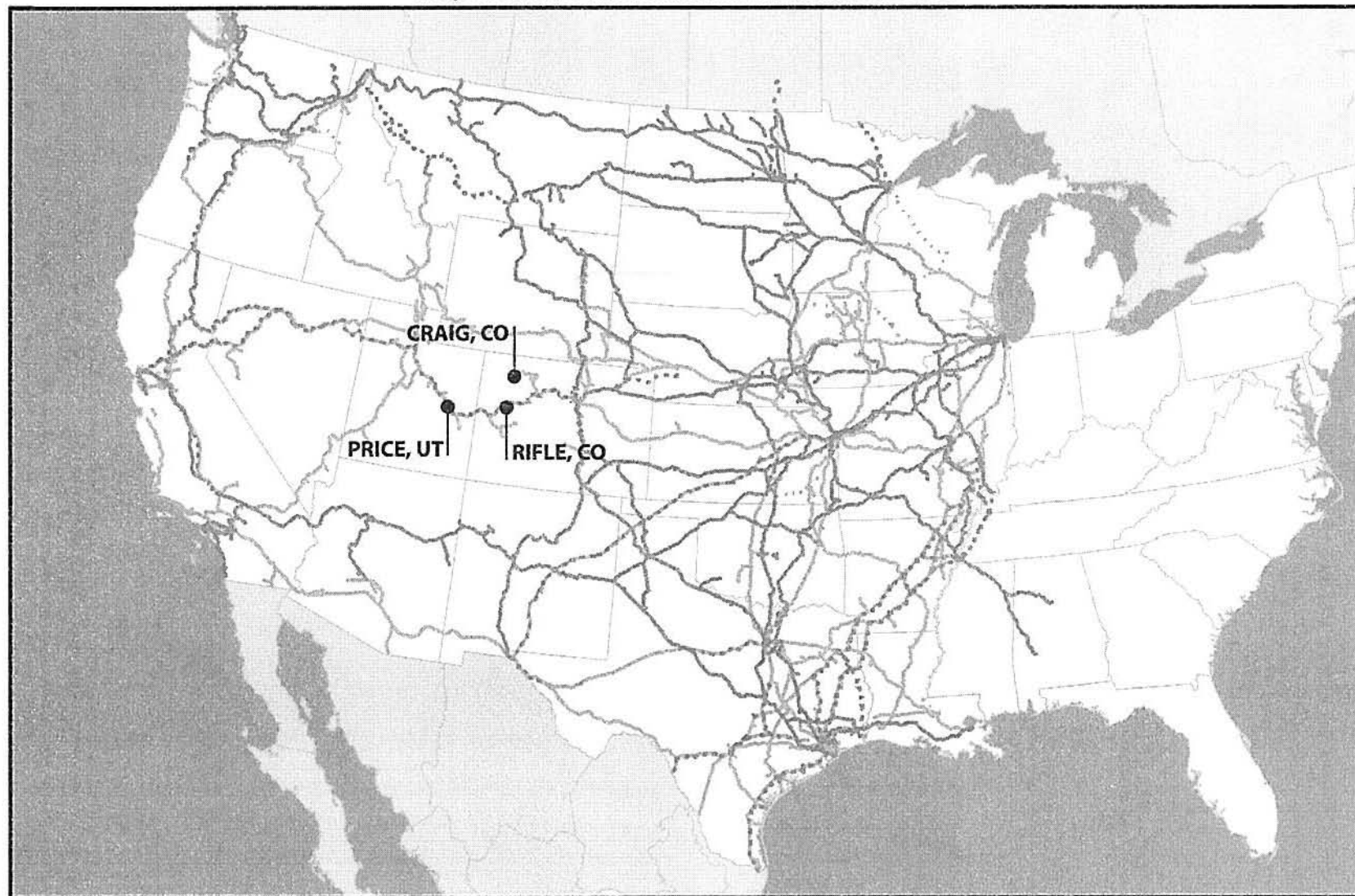
1.8 Eastern Terminus - Connection with the National Rail Network

The three, potential rail alignments ultimately selected by SCIC from the 2001 DMJM Harris Study all terminate at a connection with the national rail network at one of two locations. Depending on the location, the terminus would allow for a connection with the national rail network with one or two, major, national railroads – Class One railroads, as defined by the STB – either via Union Pacific or Union Pacific (herein referred to as the “UP”) and BNSF Railway (herein referred to as the “BNSF”). UP is the largest railroad in the United States in terms of revenue, operating a 32,100 mile network in 23 western states. BNSF is the second largest railroad in the United States in terms of revenue and UP's largest competitor, operating a 32,500 mile network in 28 western states. Their vast networks are illustrated in Map 1-2.

These two locations are:

1. **Rifle, CO** - A community of approximately 9,000, located along the UP Central Corridor. The Central Corridor is a secondary mainline extending between Denver, CO and Winnemucca, NV by way of Salt Lake City, UT. Previously the mainline of the Rio Grande & Western Railroad, and subsequently the Southern Pacific Transportation Company, since being acquired by Union Pacific in 1998, the majority of rail traffic on the line has been shifted to Union Pacific's original mainline through Wyoming. Today, the majority of traffic on this portion of the Central Corridor through Rifle consists of unit coal trains, limited general freight and Amtrak's California Zephyr. Of note, coal traffic volume on the line has been significantly and negatively impacted by the

Map 1-2
Map of Union Pacific and BNSF Railway Networks



- BNSF Railway
- BNSF Railway Trackage Rights
- Union Pacific Railroad
- Union Pacific Railroad Trackage Rights

0 100 200 300 600
SCALE OF MILES

Map not necessarily to scale, not all lines shown



national downturn in both coal production and consumption. Additionally, as part of the Union Pacific's acquisition of the line, BNSF retains the right to both operate trains over and to directly serve new railroads and select customers along the Central Corridor according to its representatives interviewed by the study team. As such, were the UBRR constructed to Rifle, Uinta Basin shippers would have the luxury of connecting with two, major railroads instead of one.

2. **Craig, CO** - A community of approximately 9,000, located along the UP Craig. The Craig Branch is a tertiary feeder line, connecting Craig with the aforementioned Central Corridor at Bond, CO, a distance of approximately 100 miles. Historically, the Craig Branch served an important coal producing territory, connecting several mines to power plants in Denver and beyond. However, much as on the larger Central Corridor, recent downturns in the national coal market have led to a significant reduction in the volume of coal being transported over the line. While coal still accounts for the majority of traffic on the line, there are some customers in the Craig area who receive general freight service. Importantly, unlike Rifle, BNSF does not have the ability to reach or serve customers or new railroads on the Craig Branch. If the UBRR were constructed to Craig, rail customers would have no alternative but to ship on UP.

Through conversations with SCIC and interviews with various stakeholders, RLBA determined that one of the driving forces behind the consideration of Rifle as one of the potential eastern termini of the UBRR was the desire to connect to both UP and BNSF instead of only with UP. Interviewed stakeholders repeatedly stated that connections to both railroads could result in significantly improved service and pricing. RLBA's extensive experience in railroad economics corroborates those expectations.

There are at least two major ways in which connections with any two Class One railroads are likely to result in lower railroad rates (transportation costs) and better service than a connection with only one railroad would yield. First, while UP is the largest railroad in the United States - which suggests that it reaches many of the destinations to which oil and other commodities found or mined in the Uinta Basin will be destined - there are destinations not directly accessed by UP but which are served by BNSF. What's more, BNSF may offer better, more direct routing to certain destinations served by both railroads, an advantage which could result in lower transportation rates paid by prospective Uinta Basin rail shippers. Second, there is the potential to create some price competition between UP and BNSF to and from those locations that are served directly by both, as well as those that are served by another railroad but which third party can and does interchange with both UP and BNSF. One would expect the presence of a second, major rail carrier to result in more vigorous price competition, again, resulting in prospective Uinta Basin rail shippers realizing lower rail transportation rates and therefore higher profits than would be the case in the event the UBRR connected with only one carrier.

1.9 Potential Alignments

The three rail alignments considered for the UBRR include:

1. **Myton/Leland Bench Area, UT - Rifle, CO via Meeker Area** - This alignment heads roughly due east from Myton/Leland Bench, crossing the Green River before connecting to the Deseret Power Railroad at Bonanza, UT (see section 1.11). The alignment continues along the existing Deseret

Power Railroad until Dinosaur, CO, then continues east to the Massadona, CO area, at which point the alignment heads south to White River City, CO. The alignment then follows the White River eastward to Meeker, CO, where the alignment heads south over the Rio Blanco Pass before arriving at Rifle, CO and a connection with the Union Pacific Central Corridor.

The total length of the alignment would be 183.31 miles (including 152.97 new-build miles), operating through predominately rolling hills and mountainous terrain. According to the 2001 DMJM Harris Study, the alignment “contains 9° curves and switchbacks to gain elevation, making the grade 2.5% for approximately nine miles. Other segments of the route are at 2.5% grade for 1 to 1.5 miles. The inbound 2.5% grade is the ruling grade for the route.” These characteristics suggest the alignment would be demanding, challenging, and therefore more expensive to construct, maintain and operate than a typical rail line.

2. **Myton/Leland Bench Area, UT - Rifle, CO via Piceance Creek** - This alignment heads roughly due east from Myton/Leland Bench, crossing the Green River before connecting to the Deseret Power Railroad at Bonanza, UT. The alignment continues along the existing Deseret Power Railroad until Dinosaur, CO, then continues east to the Massadona, CO area, at which point the alignment heads south to White River City, CO. The alignment then continues southeast along Piceance Creek before crossing Rio Blanco Pass, arriving at Rifle, CO and a connection with UP’s Central Corridor.

The total length of the alignment would be 185.13 miles (including 154.80 new-build miles), operating through predominately rolling hills and mountainous terrain. According to the 2001 DMJM Harris Study, the line “contains 9° curves and switchbacks to gain elevation, making the grade 2.5% for approximately nine miles. Other segments of the route are at 2.5% grade for 1 to 1.5 miles. The inbound 2.5% grade is the ruling grade for the route.” These characteristics suggest the alignment would be demanding, challenging and therefore more expensive to build, maintain and operate than a typical rail line.

3. **Myton/Leland Bench Area, UT - Craig, CO** - This alignment heads roughly due east from Myton/Leland Bench, crossing the Green River before connecting to the Deseret Power Railroad at Bonanza, UT. The alignment continues along the existing Deseret Power Railroad until Dinosaur, CO, then continues east, roughly paralleling U.S. Route 40 until reaching the Yampa River. The alignment then follows the Yampa River through Elk Springs Pass before arriving in Craig and a connection with UP’s Craig Branch.

The total length of the alignment would be 157.27 miles (including 126.93 new-build miles), operating through predominately rolling hills and flat terrain. According to the 2001 DMJM Harris Study, the line features “6° curves maximum. The ruling grade for this route is 2.0%, with most grades at 1.8% or less. The 2.0% sections occur at the Craig end of the route and just to the west of Elk Springs.” While presenting challenges to the operating and maintenance of the line, these characteristics are significantly less extreme than those observed on either Rifle alignment, resulting in likely lower costs to build, maintain and operate the line.

1.10 Shared Alignments

All three potential rail alignments share a common alignment between Myton and/or Leland Bench, UT and in the vicinity of Massadona, CO. At Massadona, CO, the two potential Rifle rail alignments turn southeast, continuing on the same, shared alignment, while the potential Craig rail alignment continues eastward on a unique alignment. The two potential Rifle rail alignments continue on a shared alignment between Massadona, CO and White River City, CO, before splitting, with one alignment heading southward towards Piceance Creek and the other continuing eastward towards Meeker, CO, before turning southward. The two alignments then rejoin in the vicinity of Rio Blanco Pass, where both again share the same alignment over the remainder of the distance to the end of the line/proposed interchange location at Rifle, CO.

1.11 Deseret Power Railroad

Built in 1983 and owned by Blue Mountain Energy, the Deseret Power Railroad (DPR) was constructed to transport coal between the Deserado Coal Mine outside of Dinosaur, CO, and the Bonanza Power Plant outside of Bonanza, UT. The integration of the DPR right-of-way would result in significant cost savings to the overall project. To that end, RLBA interviewed DPR management to, among other topics, determine the company's level of interest in cooperating with any effort to construct the proposed UBRR. While no specifics terms or requirements were discussed, in general the management of the DPR expressed a willingness to cooperate with any such efforts, assuming that: 1) the company's rail operations could continue unimpeded; 2) any required infrastructure improvements would be paid for the UBRR; and 3) some agreement was reached regarding the maintenance of the railroad.

As a result of the interview, this study reflected the assumption that approximately 32 route miles of the existing DPR right-of-way, between Bonanza, UT and Dinosaur, CO, would be integrated into the construction of the UBRR, regardless of which alignment was chosen. A unique feature of the DPR is the use of electric locomotives and an accompanying overhead catenary system, which limits overhead clearance on the railroad to 22 feet. RLBA determined that all railcars used to transport the commodities likely to be transported on the UBRR would not exceed this 22foot limit. As such, integration of the DPR would not negatively impact operations on the UBRR or vice versa. Given the preliminary nature of the discussions with DPR management, RLBA made no assumptions regarding the nature of any commercial arrangement or agreement involving potential use of the DPR. RLBA, however, did assume that all costs associated with infrastructure improvements on the DPR and all maintenance expense on the integrated portions of the DPR would be borne by the UBRR.

2.0 Approach Part 1 - Determining Potential Rail Traffic Volumes, Destinations and Origins

2.1 Summary of RLBA Approach

RLBA employed a two-step process to determine the potential rail traffic volumes, destinations and origins, including:

1. Conducting interviews with prospective Uinta Basin rail shippers and other stakeholders; and
2. Developing Higher and Lower forecast volumes.

2.2 Conducting Interviews with Prospective Uinta Basin Rail Shippers and Other Stakeholders

The foundation of the forecast volumes used in this report was a series of interviews conducted by RLBA based on a preliminary list assembled by SCIC. RLBA acknowledges the significant effort SCIC's Executive Director went through to contact those interviewed, to create an aggressive but efficient interview schedule and to attend and take notes during almost all of the interviews discussed below. The interviews are best understood as falling into three categories:

1. **Non Shipper, Stakeholder Informational Interviews** - These interviews were conducted at a higher and more generic level than the others. They were designed to familiarize RLBA staff with both the opportunities potentially available were a rail solution found to be viable as well as the potential challenges to such a rail solution, both now and in the future. These interviews were conducted during a relatively short time frame via individual conference calls, primarily in the week before May 6. Included among the entities interviewed were representatives of both UP and BNSF. There were 11 such interviews.
2. **Prospective Uinta Basin Rail Shipper Customer/Commodity Interviews** - These interviews largely took place during a single, intensive week between May 6 and May 11 and were conducted in person in Denver, CO, Vernal, UT, Salt Lake City, UT and the Houston, TX metropolitan area. Additional, follow up interviews to seek clarification of issues related to forecast volumes were conducted as necessary. The information gathered in these interviews proved the most critical to development of rail traffic volume forecasts. There were 14 such interviews.
3. **Prospective End User Interviews** - End user interviews were conducted in person by Marc Eckels, an independent consultant (see section 2.4) under contract to SCIC and took place in the Houston, TX metropolitan area during one week in the middle of June. These interviews were focused entirely on potential consumers of the Basin's crude oil, as RLBA decided during the course of the study that the end product would be enhanced by detailed discussions with potential purchasers of the Uinta Basin's oil since the oil has not had a chance to prove itself to most of its potential customers. There were 5 such interviews, covering 11 potential end user refineries.

A comprehensive list of the interview type, interview location, company interviewed, refinery location (where relevant) and the name of the individual interviewed, is included in Table 2-1.

While all three types of interviews provided valuable information, the interviews with prospective Uinta Basin rail shippers' customers formed the primary basis of the rail traffic volumes forecasted by RLBA. From the perspectives of methodology and approaches, the prospective Uinta Basin rail shipper interviews are best understood as falling into three categories, including:

**Table 2-1
List of Interviews Conducted by RLBA**

- 1. Prospective Uinta Basin Rail Shippers Currently Using Existing Rail Transportation Options**
- Consisting of prospective Uinta Basin rail shippers that are already transporting commodities to or from the Uinta Basin for their own account, in competition with other suppliers via trans-load between rail and truck. In this category, RLBA sought to understand the total volume of that commodity moving today by truck to or from the Basin and to understand how that volume might change in the future, especially if oil production increased significantly. Frac sand and steel pipe are excellent examples of commodities in this category.
- 2. Prospective Uinta Basin Rail Shippers Currently Not Using Rail** –Consisting of prospective customers that hope to generate or consume freight volume that would move by rail in the future.

Because of the more speculative nature of these prospects, RLBA used Higher and Lower forecasts, with Lower forecasts reflecting lower, later developing or no forecasted rail carloads and Higher forecasts reflecting the dates and volumes presented by the interviewee, translated into carloads.

3. **Prospective Uinta Basin Rail Shippers with Limited Traffic Volume Forecasting Ability** - Forecasts of conventional oil production were handled a third way that RLBA deemed more appropriate to the situation. More specifically, attempts to use a more conventional approach to forecasting potential use of the UBRR by crude oil producers would have been thwarted by the fact that producers don't tend to forecast as far into the future as required to support prospective railroad carloads and that production is distributed across a large number of producers. So, in the alternative, RLBA decided to discuss potential total Uinta Basin production with almost all of the largest producers currently in the Basin and to use the extremes manifest in their estimates to drive its Lower and Higher carload forecasts. Further detail on RLBA's Higher and Lower forecasts for each commodity can be found in the following sections.

2.3 Developing Higher and Lower Forecast Volumes

The railroad industry is different from most other industries in two major ways: 1) it requires a small cost of materials relative to revenues earned to produce its outputs; and 2) it also requires a high capital investment relative to revenues. However, once a railroad achieves a break-even level of freight traffic, a surprisingly large percentage of incremental revenue drops to the "bottom line" as traffic is added and a railroad can become highly profitable when measured against just about any metric except return on invested capital. A common expression of this phenomenon is that the railroad industry is said to manifest extremely high operating leverage. As a result, for a railroad to succeed, it must attract and keep a significant volume of traffic on which it can charge competitive rates. The need to achieve and sustain a high volume of traffic and revenue is even more critical in the case of a railroad such as that investigated herein because the financial performance of the Uinta Basin Railroad will be tested further by the need to overcome the extremely high capital costs that are a necessary element of a railroad being constructed in excess of 126 miles.

As a consequence of the above, it is absolutely essential that the SCIC be provided one or more traffic volume and associated revenue forecasts in which it can repose confidence. Through the course of the study, RLBA determined there to be four significant potential challenges to the achievement of the projected volumes forecasted herein, including:

1. **Stability of the Future Price of Oil** - The World oil market has been anything but stable since 1973, and there is every reason to think that such volatility might continue. The viability of the UBRR is grounded on the assumption that oil markets will be stable or favorable, which is a reasonable assumption to make. However, a significant and long-term downturn in the price of WTI, particularly in the early years of the prospective railroad, could result in significant short-falls from the performance indicated herein;
2. **Barriers to Timely Construction of the UBRR** - There are risks that permits or financing as-

sociated with the UBRR might be denied or delayed significantly, to the point that prospective Uinta Basin rail shippers might seek alternative “take away” capability or divert investment dollars to other regions, thereby diverting or postponing volumes of crude oil and other commodities which otherwise might traverse the UBRR;

3. **Reluctance to Commit** - While the economics of the UBRR may be promising, the region’s producers might be reluctant or otherwise unable to make the commitments necessary to secure financing, even if such assurances are ultimately required to advance the project and;
4. **Unknown Demand** - The demand for Uinta Basin’s waxy crude, which is not well known outside of Utah, in large part due to lack of transportation infrastructure to ship product out of the Uinta Basin, may not be as readily accepted as initial indications would suggest. While there appear to be a large number of refineries at least prospectively interested in Uinta Basin crude, additional work should be undertaken to increase the likelihood that sufficient demand will manifest itself by the time the UBRR is about to be constructed. Ideally, that demand will manifest itself not only in interest expressed by out-of-state refineries that the Basin’s waxy crudes have been modeled successfully by the refineries, but also that the volumes desired are significant enough in total to consume the supply side at pricing at or near WTI taking into consideration the need to unload unit trains at or nearby refineries to keep rail transport costs to a minimum, and that arrangements already have been or can be made to provide sufficient heating to prevent the waxy crude from “setting up.”

In light of these challenges, to best define the potential volumes, RLBA developed forecasts of the carloads it believes are reasonable to assume would be carried by the prospective railroad during the period 2022 through 2034 (and every year beyond) were it built, managed and operated at a reasonable cost. More specifically, RLBA developed “Lower” and “Higher” forecasts in connection with crude oil and seven other commodities it believes might be hauled on that railroad in its early years.

A summary of estimated annual Higher and Lower forecasts of various commodities is shown in Table 2-2.

The carloads in the Higher forecast reflect assumptions made by RLBA consistent with a theme that decisions would be made that would result in actions that would be favorable to the prospective railroad’s viability. Primary among those favorable assumptions is that Basin oil producers will be able and motivated to extract, and market conditions will encourage the extraction of, no less 225,000 bpd on a consistent basis if the railroad is built and operated as presently envisioned. That threshold volume has been articulated by several major oil producers in the Basin even though it represents almost a tripling of recent production volumes there. The application of those assumptions results in a forecast of [REDACTED] carloads over the prospective railroad in its first full year, 2022, in the Higher case and [REDACTED] carloads hauled by that railroad in the Higher case in 2034 and beyond. As a sensitivity test, RLBA also developed a Lower case in which [REDACTED] carloads were forecast to be carried in 2022 and [REDACTED] were assumed to be hauled in 2034 and beyond.

Table 2-2
Estimated Annual Carloads Originating/Terminating in Uinta Basin 2022-2044

In both the Higher and Lower cases, railroad volumes were assumed to ramp up in the early years of the forecast, driven by increased production of crude oil in the Basin and the inputs that enable same, as well as greater and greater acceptance of the Basin's crudes at various refineries, primarily located in Gulf Coast states. Similarly, and perhaps more importantly, the viability of the prospective railroad is extremely dependent upon and sensitive to assumptions made about the ramp up rate and total production of crude oil in the Basin. Not only is crude oil by far the largest single commodity moved on the prospective railroad, but frac sand and steel pipe movements into the Uinta Basin, supporting the production of crude oil are obviously equally dependent upon how much oil is extracted in the Basin and are also significant contributors to the prospective railroad's viability.

2.4 Additional Study Contributions

To further assist in the study, the SCIC contracted with Marc Eckels, an experienced oil and gas consultant based in Park City, UT, to interview representatives of select refineries primarily in the Gulf Coast and discuss with them in detail, to the extent possible, the prospective interest of those refineries in the Basin's oil. After interviewing in person representatives of five companies operating eleven refineries believed to be possible consumers of Basin crudes, Mr. Eckels concluded that demand exists today for at least somewhere between 320,000 and 340,000 bpd of Basin oil.

Several caveats should be taken into consideration in digesting that forecast. First, and most importantly, the work performed by Mr. Eckels is not complete, as he was only able to meet with officials representing eleven of the nineteen refineries he originally targeted. It is the intent of Mr. Eckels to make a good faith effort to complete interviews with representatives of the remaining eight refineries. As such, the results of this report are subject to change pending the outcome of said interviews.

Second, although most of the representatives expressed few reservations about taking Basin crude, no large and sophisticated refinery is going to commit to actually adding new crude into its mix until it runs the characteristics of that crude through its proprietary model. And while there are several characteristics of the Basin's crude oil that should make it extremely attractive to many large refiners, most are still a long way from signing a contract committing them to taking significant volumes of Uinta Basin crude.

Additionally, the volumes of crude that the Basin's oil producers have been able to market have been highly constrained by the region's transportation infrastructure limitations, particularly the absence of a railroad or pipeline. These transportation limitations are the primary cause of the unique market factors present in the region. Regarding price, Mr. Eckels concluded that it was extremely likely that the refineries he targeted would be willing to pay no less than a small discount to WTI and that some refineries might be willing to pay either WTI or perhaps even a slight premium to it, depending upon their marketing objectives and other factors. It is important to note for the record that no refinery representative explicitly promised or suggested that Basin producers absolutely would realize WTI from that refinery or close to it. It is equally important to note that the individuals interviewed are or previously were crude traders and traders could not reasonably be expected to "tip their hand" or reduce their negotiating leverage by agreeing in advance to pay WTI parity. While representatives of most refineries did not provide indicative pricing relative to WTI, one offered an indication at a \$3 to \$5 discount to WTI. This discount would compare favorably to the one realized today by most major Basin producers, which recently has been in the neighborhood of WTI minus 17%.

2.5 Methodologies Used to Determine Potential Rail Traffic Volumes, Destinations and Origins

The following section provides a synopsis of the methodologies employed by RLBA to determine the potential rail traffic volumes, destinations and origins which would likely utilize the UBRR, if constructed.

2.6 Outbound Commodities

2.7 Crude Oil

RLBA employed separate assumptions about six, different factors to develop its Lower and Higher crude oil carload forecasts. Specifically, RLBA made assumptions about:

1. **Intermediate Term Crude Oil Production Potential** - Annual crude oil production in the Uinta Basin was assumed to be 225,000 bpd in the Lower forecast as a sensitivity test of the viability of the railroad hypothesized in this study. In contrast, a much higher figure, 350,000 bpd was employed in the Higher forecast, based on the oft-repeated pronouncements made by at least one of the leading oil producers in the Basin and other knowledgeable experts during interviews conducted in connection with this study effort;
2. **Volume of Production to Existing Salt Lake City Customers** - As regards the volume of total production destined to Salt Lake City refineries by truck and existing truck/rail transloading facilities after the prospective Uinta Basin railroad might become operational, 80,000 bpd was used

in the Lower forecast to approximate the volume that is usually destined to those five refineries largely by use of tanker trucks loaded in the Uinta Basin when the refineries are operating normally and the oil markets, likewise, are operating normally. In contrast, a lower figure, 40,000 bpd was assumed destined to the Salt Lake City refineries by truck in the Higher forecast. The lower truck diversion of crude oil to in-state refineries and away from potential new railroad haulage, results in a higher amount of crude available to be handled over the prospective railroad;

Although RLBA recognizes that its 40,000 bpd assumption of crude destined to the five in-state refineries would upset the status quo and could only come into play to the extent that long term supply contracts were not in place between Uinta Basin suppliers and the five refineries, RLBA, nevertheless believes that the lower diversion might arise for any one or more of at least three reasons. First, it might become less expensive to use the railroad to haul the oil to the Utah refineries than to continue to use trucks. Second, even if rail were not to prove less expensive to use than trucks to get to the five refineries, political pressure from the State of Utah and/or local governments, both in the Basin and between the Uinta Basin and refineries, might cause half of the volume to move by rail anyway because of the road congestion caused by the trucks, the safety and environmental issues caused by such extensive truck use and the maintenance costs incurred by Utah taxpayers to support continued use of the hundreds of daily truck movements necessary to handle the 80,000 bpd to those refineries. Finally, the oil producers in the Uinta Basin are fond of using the term “optionality” to describe their need to have optional markets other than Salt Lake City into which they can sell their oil if they are to expand production and escape from or improve upon the status quo WTI discount pricing they are currently forced to bear;

3. **Volume of Production Potentially Diverted to the Uintah Advantage Refinery (see section 2.9)** - It is difficult to argue that if the Uintah Advantage refinery comes into existence and consumes 40,000 bpd as forecast, it would be anything besides a big plus for oil producers in the Basin as they would immediately enjoy a decent sized, local consumer of their production and a refinery whose products would lower the overall cost of oil production by reducing the price of diesel oil products purchased locally while paying WTI or close to it. That said, the local consumption of Basin oil essentially translates into lower crude oil production available to be hauled on the prospective Uinta Basin Railroad to the extent the oil is refined into products consumed locally or not moved via the subject railroad. Therefore, in the Lower forecast, the refinery was assumed to be built and 40,000 bpd were diverted to that refinery although a lesser volume of products produced through the refinery were reflected in the Lower rail carload forecast, to capture refined products that would move by rail from the refinery; volumes that decline when Phase 2 of the project is assumed to come on line and result in an adjusted, refined product mix. In contrast, the Higher crude oil carload forecast reflects the assumption that the refinery is never completed and, therefore, no crude oil is diverted from local production into the local refinery and, likewise, no local refinery products are shipped via the subject railroad because the refinery was assumed to never be completed;
4. **Time Period of Production “Ramp Up” in Anticipation of the UBRR** - RLBA made assumptions about the year in which Basin oil production would begin to ramp up in anticipation of the prospective railroad’s imminent start-up. In the Lower forecast, RLBA assumed that crude oil

producers in the Basin would not start to ramp up their production until the railroad was built and scheduled to commence operations in 2022. In contrast, in the Higher forecast, RLBA assumed that crude oil producers in the Basin would not wait to start ramping up their production until the railroad was scheduled to commence operations and started ramping up in 2020 in anticipation of same so that they could advance their respective enhanced sales volumes as soon as possible. Although RLBA acknowledges that oil producers are unlikely to act in complete unison, the assumptions employed to represent this factor were applied as if all producers acted uniformly across both Lower and Higher crude oil production forecasts;

5. **Rate of Production “Ramp Up” in Anticipation of the UBRR** - The fifth variable taken into consideration in the crude oil production forecasts was the rate of increase in production once ramping up of production commenced. In both the Lower and Higher crude oil production forecasts, RLBA’s assumptions pivoted off of the net actual increase of [REDACTED] bpd that [REDACTED] drilling rigs accomplished in the 12 months between July 2016 and June 2017, or an increase of [REDACTED] bpd per month. RLBA’s Lower forecast reflects a doubling of the rig count to about [REDACTED] and a concurrent approximate doubling of the growth to ($[REDACTED] \text{ bpd} \times [REDACTED] =$) [REDACTED] bpd/month. Applying that rate of growth to [REDACTED] bpd growth in Basin bpd production inherent in the Lower forecast yields [REDACTED] months, which RLBA equated to four years in that forecast. While the tripling of the rig count may seem aggressive, that results in approximately the rig count in effect in the Basin in 2014. The Higher forecast incorporated the same approach but applied different numbers more appropriate to that scenario. Specifically, RLBA’s Higher forecast reflects a quadrupling of the rig count to [REDACTED] and a concurrent quadrupling of the rate of growth to ($[REDACTED] \text{ bpd} \times [REDACTED] =$) [REDACTED] bpd increase per month. Applying that rate of growth to the [REDACTED] bpd growth inherent in the 350,000 bpd overarching forecast in the Higher scenario equates to [REDACTED] months which, again, RLBA equated to four years. In other words, the ramp up period would be approximately the same in the two forecasts because the higher ramp up rate in the Higher forecast accomplished the ramp up to a higher ceiling in approximately the same time period as a slower ramp up to the Lower forecast production ceiling and
6. **Rate of Production After “Ramp Up” Period** - The sixth variable taken into consideration in the crude oil production forecasts was the rate of increase in production assumed once the initial ramping up period largely leveled off. In its Lower forecast, RLBA assumed a 1 % increase in production occurred each year as compared to that achieved in the previous year. In its Higher forecast, RLBA assumed a 2 % increase in production occurred each year as compared to that achieved in the previous year. RLBA believes that both assumptions are practical, achievable and, in fact, conservative (low) given the increases in production that have occurred in the last few years.

The application of these assumptions resulted in the following carload volumes and prospective destinations in the Higher and Lower forecasts, respectively.

Table 2-3
Crude Oil Carload Volumes, 2022-2042

Lower												
2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034 +

2.8 Shale Oil - Enefit

Enefit USA is the US subsidiary of a company based in Estonia that operates a mining enterprise in that country, using proprietary technology to mine shale there and turns it into heavy crude oil. After considering other geographic opportunities in which to expand its operations, the parent company elected to establish a US headquarters in Salt Lake City and make substantial investments both in property in the Uinta Basin as well as in commencing the permitting processes necessary to enable it to begin to mine shale in the Basin in the short-term.

In its Lower carload forecast, RLBA reflected the assumption that the project either stalled or never resulted in producing sufficient volumes to warrant inclusion in the subject forecast. Estimating when the permits might be obtained and production might commence is always challenging, but based on the interview RLBA had with the company's top U.S. executive its Higher forecast reflected the assumption that the plant would commence operations in mid-to-late 2025 and would generate approximately [REDACTED] carloads per year for three years, beginning in 2026, after which time volume would increase to a doubling of production, or [REDACTED] carloads per year, beginning in 2030.

The application of these assumptions results in the following carload volumes and prospective destinations in the Higher and Lower forecasts.

Table 2-4
Shale Oil Carload Volumes, 2022-2042

2.9 Refined Oil Products - Uintah Advantage

Uintah Advantage is the name of an organization seeking to develop a small refinery within the Uinta Basin. At [REDACTED] bpd, that refinery would represent a significant growth opportunity for crude oil producers in the Basin, approximately a [REDACTED]% increase over the [REDACTED] bpd now sent on average between Basin producers and Salt Lake City refineries. But, in contrast with the volume to Salt Lake City refineries, the Uintah Advantage refinery would provide a destination to which Basin crude oil producers always would enjoy a significant, competitive, geographic advantage and, presumably, WTI pricing or close to

it, as opposed to the heavy WTI discounts historically imposed by the Salt Lake City area refineries on Uinta Basin producers of crude. Although the refinery would consume ██████ barrels per day of Uinta oil produced locally, if built, it would not ship all of those barrels via the UBRR because approximately half of that volume would be consumed locally. So, the operation of the Uintah Advantage refinery, should it come into existence, would have the effect of limiting the volume of oil and refined oil products that would use the prospective railroad.

As a result of the above, the Lower forecast reflects the assumption that the Uintah Advantage refinery does come into existence and consumes ██████ barrels per day beginning in 2022 and continuing throughout the forecast period. That consumption translates into ██████ carloads of refined products assumed to be moved in roughly equal proportion to Houston, TX and Oakland, CA by rail through the year 2024, which date constitutes the assumed conclusion of Phase 1 of that project. Phase 2 of that project is assumed to commence in 2025 but results in a smaller volume of annual carloads, ██████, destined to the same locations but based on an assumed upgrading of the refinery to the production of higher-value commodities, which upgrade would have the effect of reducing the volume of products shipped by rail. In contrast, counterintuitively, the Higher forecast reflects the assumption that the local refinery is not built and a higher volume of locally-based crude oil production, therefore, is available to traverse the prospective railroad, equating to ██████ carloads annually.

The application of these assumptions results in the following carload volumes and prospective destinations in the Higher and Lower forecasts.

Table 2-5
Refined Oil Products Carload Volumes, 2022-2042

2.10 Sodium Bicarbonate

The Piceance Basin, somewhat north of Rifle, CO, contains North America's only known, significant deposits of nahcolite – a soft, colorless or white carbonate mineral with the composition of sodium bicarbonate. Sodium bicarbonate is used in a variety of products and industries including food and baking, personal care, pharmaceutical, animal nutrition, agriculture, pool and water treatment and industrial markets. Natural Soda, the second largest producer of sodium bicarbonate in North America, is currently the only company taking advantage of this world class resource as its major competitor uses non-natural ingredients. Natural Soda's operation is a sophisticated, reliable and efficient process for recovering pure, naturally-occurring, sodium bicarbonate from the largest known nahcolite deposits in the world. The plant's location could provide easy access to the prospective railroad via a to-be-constructed spur in the event economic and other factors resulted in the construction of the prospective railroad on an alignment that traversed the Piceance Creek Basin. The plant's production today is shipped both in bulk and in bags. All of the bagged materials move by truck. In contrast, the bulk material moves both via truck and truck-to-rail. It is important to note that this potential movement is the only shipment of significant size that has been identified to date that would originate or terminate on the prospective railroad in Colorado, although additional rail users may be identified once the route alignment issue is settled.

The Lower forecast reflects the assumption that the selected alignment of the subject railroad is too far from the plant to make service by the prospective railroad competitive, which would certainly be the case if the Craig alignment were chosen. In contrast, currently bulk material is moved by rail via a transload operation in Rifle, Colorado, which was served by Union Pacific prior to its acquisition of Southern Pacific. So, in addition to replacing higher truck costs with a direct-to-rail shipment at its plant, Natural Soda might benefit from the establishment of the prospective railroad, assuming that the railroad gained access directly also to BNSF at or near Rifle. That said, RLBA's Higher forecast employs the same number of carloads, approximately 100,000 annually, regardless of year, because even though the vast majority of current shipments are to markets distant enough from Colorado to make rail service competitive, a combination of customer convenience, shipment size and customer preference for bagged materials limits the upside potential to increase traffic from this rail shipper on the prospective rail line. The Higher forecast could prove to be too conservative in the long run given that the plant's production capability was doubled as recently as 2013. However, the executive interviewed by RLBA at Natural Soda indicated that the company did not have any plans under consideration to expand production further and, therefore, it was deemed prudent to not increase the carload forecast in the out years of this forecast.

The application of these assumptions results in the following carload volumes and prospective destinations in the Higher and Lower forecasts.

Table 2-6
Sodium Bicarbonate Carload Volumes, 2022-2042

2.11 Fly Ash - Enefit

As discussed above in the context of Shale Oil - Enefit, plans are proceeding to finish the permitting and commence construction of an shale oil mining operation in the Uinta Basin. Were the mining to commence along the scale of operations currently contemplated, the most valuable and voluminous commodity to be produced would be the shale oil described above. However, the mining operation also would yield a significant volume of fly ash as a byproduct of the mining of the shale. Consistent with the treatment of Shale Oil – Enefit, above, in its Lower forecast volumes, RLBA assumed that the plant would not commence operations during the forecast period. And, therefore, no rail carloads of Enefit fly ash are shown. In contrast, in its Higher forecast, RLBA forecasts that █ carloads of fly ash per year will be transported on the subject railroad during the first phase of the project, specifically, commencing in 2026 and ramping up through 2028. That forecast also reflects the assumption that that volume will double in 2029, commensurate with the assumed startup of the second phase of that operation. Destinations to which that fly ash might be delivered have not been identified, but are believed to be sufficiently distant from the Uinta Basin to make use of the prospective railroad economic.

2.12 Fly Ash - Deseret Power Electric Cooperative

Deseret Power Electric Cooperative (DPEC) provides electrical power to industries and residents in the Uinta Basin and parts of five states. Deseret's primary generating resource is the Bonanza Power Plant. As previously discussed, the Bonanza Power Plant is the western terminus and sole destination of Deseret Power Railroad (DPR), the right-of-way of which is presumed would be largely integrated into the UBRR. The amount of electricity generated by the power plant is relatively constant from year to year al-

though there are variations from the norm. As previously discussed in the context of the Fly Ash - Enefit carload forecast, generation of power from the use of coal results in a substantial volume of fly ash which today moves by truck from the plant to the Salt Lake City area, where it is transloaded to rail and moved in roughly equal proportion to markets in the Sacramento and Houston metropolitan areas. Historical volumes average approximately **████** carloads per year. This volume is set to continue until at least until 2030, by which time, as the result of an agreement between DPEC and the Environmental Protection Agency, the Bonanza Plant must install specific emission control equipment to continue operating. At this point, it is unknown if DPEC will install said equipment or decide, instead, to decommission the plant.

Beyond fly ash, DPR management suggested that, if built, the UBRR could serve to meet additional future transportation needs, including inbound heavy equipment and both periodic inbound (to the Bonanza Power Plant) and outbound (from the Deserado Mine) coal shipments. As a result, the carload forecasts employed in this analysis may potentially understate potential traffic volume available to the subject railroad associated with this prospective rail customer, although such uses are both too speculative and too far in the future to be appropriate to include in this study.

The application of these assumptions results in the following carload volumes and prospective destinations in the Higher and Lower forecasts.

**Table 2-7
Fly Ash Carload Volumes, 2022-2042**

2.13 Gilsonite

Gilsonite, also known as "uintahite," "asphaltum" and asphaltite, is a naturally occurring solid hydrocarbon and an extremely pure form of asphalt (or bitumen) with a relatively high melting temperature which, given its unique chemical properties and physical characteristics, gilsonite is particularly valuable in improving the performance of many critical materials and applications. Although the substance has been historically mined and its only large-scale production occurs in the Uinta Basin of Utah and Colo-

rado, resources are being discovered and mined more recently in other countries such as Colombia and Iran.

While the price of oil stimulates the production of gilsonite in any given year, ironically, oil production volumes in the Uinta Basin do not affect gilsonite production because it is not used in the Basin's oil production. Gilsonite is distributed to just about every state in the U.S., but the prospective railroad primarily would be involved in the export of gilsonite, with about equal volumes passing through Oakland, CA and Houston, TX. RLBA employed a constant volume of █ carloads annually in its Lower case forecast, commencing immediately and twice that amount, █ annual carloads, in every year of its Higher forecast. Those forecast volumes are in line with average relatively poor and good years, respectively.

The application of these assumptions results in the following carload volumes and prospective destinations in the Higher and Lower forecasts.

Table 2-8
Gilsonite Carload Volumes, 2022-2042

Year	Oakland, CA		Houston, TX		Total	
	Lower	Higher	Lower	Higher	Lower	Higher

2.14 Inbound Commodities

2.15 Frac Sand

Frac sand, particularly inbound from Wisconsin and Illinois, to support the development of oil and gas wells, is the largest inbound commodity identified thus far, and while it is not as significant as outbound crude oil to the potential viability of the subject railroad, it is projected to generate more carloads, by far, than any other commodity on the prospective railroad except crude oil.

The volume of frac sand and equated projected carloads are related to the total amount of oil produced

in the Uinta Basin forecast in a given year, not just the amount of crude oil or refined oil products that moves over the prospective railroad. Specifically, it is related to the projected oil production that underlies the Lower and Higher carload forecasts, namely 225,000 and 350,000 bpd, respectively, and grows proportionately as projected volumes ramp up to those amounts. Frac sand volumes in the Higher forecast, increase from [REDACTED] carloads in 2022 to [REDACTED] in 2024, constituting the ramp up period, before increasing by 1% per annum after that to [REDACTED] in 2034 and beyond. Similarly, frac sand volumes in the Lower forecast increase from [REDACTED] carloads in 2022 to [REDACTED] in 2026, constituting the ramp up period, before increasing by 1% per annum after that to [REDACTED] in 2034 and beyond.

Not captured in either the Lower or Higher carload forecasts are the volumes of frac sand which could be shipped via the UBRR in the event that gas exploration increased in the Uinta Basin. At this time, the prospect of such exploration remains too speculative to advance any volume forecast. However, it should be noted that if said exploration did occur, the carload volumes of frac sand advanced in the Higher forecast could potentially be understated, perhaps even significantly.

The application of these assumptions results in the following carload volumes and prospective originations in the Higher and Lower forecasts.

Table 2-9
Frac Sand Carload Volumes, 2022-2042

2.16 Steel Pipe

Steel pipe and other tubular products are significant and necessary contributors to modern oil production methods. Today, Colorado Tube and Pipe (CTAP) is the dominant supplier of such products into the Uinta Basin. Based on a telephone interview with its Senior Vice President, Operations, Quality Assurance and Technical Sales, RLBA believes that a very large share of inbound tubular products would be transported there via the UBRR, were it built. In fact, the individual interviewed volunteered that of the 12 supply yards in 8 states for which he is responsible, Vernal, UT (located in the Uinta Basin) is the only yard that is not rail-served. Instead, the Uinta Basin is generally supplied by yards CTAP operates in

Craig and Rifle, Colorado, exactly the two endpoints being studied in this report as possible junctions of the prospective railroad with one or more major railroads. CTAP would be strongly inclined to move the maximum amount of its products possible via the prospective railroad for a variety of reasons including economics. However, that would not translate into all of its volume due to customer preferences and the inability, so far, of the rail industry to provide sufficiently reliable service to make CTAP comfortable that its customers will not suffer stock outs due to failed deliveries by rail.

As was the case with several of the above-discussed commodities, the volume of tubular goods forecast to move via the UBRR is related to the total amount of oil production in the Uinta Basin. In the Higher case, the forecast equates to **1,000** carloads in 2022, rising steadily to **1,500** in 2024 and then more modestly to **1,200** carloads in 2034 and beyond. In the Lower case, the forecast equates to **500** carloads in 2022, rising steadily to **750** in 2026 and then more modestly to **500** carloads in 2034 and beyond.

The application of these assumptions results in the following carload volumes and prospective origins in the Higher and Lower forecasts.

**Table 2-10
Steel Pipe Carload Volumes, 2022-2042**

3.0 Approach Part 2 - Determination of Costs to Reach the National Rail Network

3.1 Summary of RLBA Approach

RLBA employed a three-step process to determine the cost to reach the national rail network, including:

1. Developing an Operating Plan Unique to Each Proposed UBRR Alignment;
2. Developing Costs Associated with Each Operating Plan for Each, Proposed UBRR Alignment and
3. Amending and Including the Initial Capital Investment to Build Each, Proposed UBRR Alignment.

3.2 Developing an Operating Plan Unique to Each Proposed UBRR Alignment

RLBA developed two operating plans in connection with each of the three, proposed alignments; one reflecting the Higher forecast volumes and another reflecting the Lower forecast volumes. These operating plans primarily reflected consideration of: 1) the volumes of freight forecasted to be shipped both inbound to and outbound from the Uinta Basin; and 2) the physical characteristics of the alignment. The operating plans were critical to the determination of the manpower, material, equipment and physical plants required to adequately support the movement of the forecasted volumes over the railroad. The specifics of each operating plan are defined in the following sections.

3.3 Developing Costs Associated with Each Operating Plan for Each, Proposed UBRR Alignment

The manpower, material, equipment and physical plant requirements of each operating plan were put into RLBA's short line costing model. This costing model draws on real world costing data drawn from proprietary databases maintained by RLBA to provide highly accurate cost estimations. The RLBA costing model considers six major inputs: the four major operating expense cost centers associated with railroad operations and capital expenses regarding Maintenance of Equipment and Maintenance of Way. For purposes of this study, RLBA defines each of these inputs as follows:

1. **Transportation** - Alternatively known as the as the Train and Engine (T&E) Department on a railroad, encompasses the manpower and material necessary to operate trains over the railroad;
2. **Equipment** - Alternatively known as the Mechanical Department, encompasses the manpower and materials required to maintain the rolling stock of a railroad. Equipment expenses captured in operating costs are considered "routine maintenance" costs and encompass the day-to-day upkeep and repair activity required to ensure that equipment is available to support railroad operations;
3. **Maintenance of Way (MOW)** - Alternatively known as the Engineering Department, encompasses the manpower and materials to maintain the physical plant of a railroad (i.e., the track structure, grading, bridges, road crossings and signals). MOW expenses captured in operating costs are considered "routine maintenance" costs and encompass the day-to-day upkeep and repair activity required to ensure that the track structure is available to support railroad operations;
4. **General and Administrative** - Spans several departments of most railroads, and encompasses the expenses other than those attributed to train operations or maintenance of a railroad's equipment or physical plant. These activities generally include 'back office' functions and the executives of the railroad and other departments such as Human Resources, Marketing, Legal etc.;
5. **Equipment Capital Expense (Capex)** - Also referred to as "Program Maintenance" encompasses the expenses to acquire railroad equipment (sometimes referred to as "Expansion Capital Expense") and the expenses to perform major overhauls or repairs to same with the goal of extend-

ing the useful life of the equipment, or the outright replacement of existing equipment (sometimes referred to as “Maintenance Capital Expense”) and

6. **Maintenance of Way (MOW) Capital Expense (Capex)** - Also referred to as “Program Maintenance” encompasses the expenses to build new railroad right of way and track structure and the expenses to preform major renewal projects with the goal of extending the useful life of the track structure or the outright replacement of existing railroad right of way and track structure (sometimes referred to as “Expansion Capital Expense”).

3.4 Amending and Including the Initial Capital Investment to Build Each Proposed UBRR Alignment

Conceptual engineering costs to construct each of the three, proposed UBRR alignments prepared by Jones & DeMille were integrated into the cost model. RLBA understands that: 1) Jones & DeMille was only engaged to prepare ‘high level’ estimates regarding the level of effort and associated cost to construct the three rail alignments; 2) information regarding the physical characteristics of the three proposed rail alignments through Colorado was largely based on a 2001 DMJM Harris Study; and 3) limited information was prepared regarding the physical characteristics of the shared alignment through Utah.

The Jones & DeMille cost estimates reflect the construction of a single track railroad, with no additional support infrastructure. As such, RLBA included additional costs to reflect, as necessary, additional infrastructure not captured in the conceptual costs developed by Jones & DeMille, including side and yard tracks, signal and train traffic control systems and maintenance facilities. The specific additional costs added by RLBA are defined in the following sections.

3.5 Comment Regarding Assumptions Regarding the Physical Characteristics of the Railroad

It is important to note that the physical characteristics of a specific railroad have wide reaching implications as to the level of effort and associated cost to both operate and maintain any railroad. As prepared, the Jones & DeMille conceptual engineering plans included limited, if any, specific physical characteristics regarding the three potential rail alignments. In the absence of specific information regarding the physical characteristics of the potential UBRR alignments, RLBA professionals were required to employ a significant amount of professional judgment and estimation in developing the costing information required by this assignment. Because of these limitations in the conceptual level engineering data, RLBA stresses that values advanced in this report are to be considered high level estimations; more accurate operating and maintenance cost estimations would require a much more detailed understanding of the physical characteristics and profile of the railroad.

3.6 Consideration of Institutional Arrangements

To determine a more exact estimate of the costs associated with the UBRR, RLBA considered three discrete institutional arrangements by which service could be provided on the UBRR:

1. A public entity, or a consortium of public entities, constructs the UBRR and leases or enters into an operating agreement regarding the new railroad with UP or BNSF to operate;
2. A public entity, or a consortium of public entities constructs the UBRR and leases or enters into an operating agreement regarding the new railroad with a short line to operate; and
3. A public entity, or a consortium of public entities, constructs the UBRR and creates a new railroad entity, thus operating the line itself.

These three arrangements represent the most likely methods by which the UBRR would operate, based on current standards and trends in the industry. It is important to note that in all three arrangements considered by RLBA, RLBA assumed that construction of the railroad would be the responsibility of SCIC, another public entity, or a consortium of public entities. While private/public partnerships (“3Ps”) are not unprecedented in the freight rail industry, there has never been such a partnership approaching the size and scope of the UBRR. Furthermore, given the generally conservative nature of the rail freight industry, RLBA believes any railroad which may eventually service the line has relatively little incentive to invest in the construction of the line, especially given the high associated capital costs projected and lack of current production levels sufficient to justify construction.

The following describes the pros and cons of each railroad institutional arrangement.

1. **Public entity(s) constructs the UBRR and leases or enters into operating agreement with UP or BNSF** - The most recognizable advantage of leasing the line directly to UP or BNSF is that such an agreement would eliminate the need for an additional railroad to transport freight to and from either Rifle or Craig, resulting in possible time and cost savings realized by both the carrier and its customers. Conversely, there are two significant problems with leasing the line to UP or BNSF. First, due to the significant size of the two railroads, the quality of service may not be up to that delivered by a much smaller customer-focused short line. Second, like all the major Class One railroads, UP and BNSF have continually emphasized investment in major, high-capacity main-lines over the last few decades, while at the same time aggressively reducing the number of branch lines along their systems, either by divesting operations to short lines or outright abandonment. As much was confirmed during conference calls with BNSF, during which representatives from the railroad stated their preference to service the UBRR via interchange with a Class Two or Class Three operator at Rifle;
2. **Public entity(s) constructs the UBRR and leases or enters into operating agreement with a short line operator** - The pros and cons of entering into an operating agreement with a short line operator are essentially the inverse of those associated with UP or BNSF operating the line. The hallmark of even the largest short line holding companies is customer service. Most short lines are headquartered along the rights-of-way they own or operate, allowing direct access to railroad managers by local customers and vice versa. Short lines are generally much more flexible to work with regarding such key commercial terms as service, billing and operating agreements, often working one-on-one with customers to tailor solutions to meet their individual needs. Additionally, many Class Ones, including UP and BNSF, enjoy working with short lines, to feed the larger

railroad traffic while leaving the more labor and cost intensive “last miles” to short line operators. The disadvantages of a short line operator in this situation are the potential loss of time and money associated with another party handling traffic between the Uinta Basin and either Rifle or Craig, although the above-mentioned flexibility and high level of customer service may more than offset these potential losses. As such, RLBA considers these disadvantages to be minimal given the improved customer service and general direction in which the industry has been heading regarding the role of short lines; and

3. **Public entity(s) constructs the UBRR and creates and operates a new railroad** - The most obvious advantage of this arrangement is that the public entity that built the line would enjoy total control over railroad operations and, as such, could ensure the railroad provided near optimal service to meet the needs of its customers. There are, however, several serious negative aspects to consider as well. First, acquiring the necessary manpower and equipment to operate the railroad would dramatically increase the initial capital investment, as well as expose the subject public entity(s) to additional financial and liability considerations. Secondly, significant effort would have to be made by the subject public entity(s) to assemble an experienced staff to stand up railroad operations. Both these issues would result in the subject public entity(s) committing huge resources to issues that are most likely well outside respective scope(s) and mission(s).

**Table 3-1
Third Party Operator Profit Margin, 2022-2042**

While all three methods have merits, RLBA believes the most practical option in this instance is to have a public entity(s) enter into an operating agreement or lease with an established short line operator. A short line operator should provide the ‘personalized’ servicing of Uinta Basin customers. This would allow the public entity to focus on its core function and mission with only an oversight role over rail operations, such as receiving regular reports and holding regular meetings with the carrier’s management. For purposes of this cost comparison exercise, RLBA assumed that all rail operations would be conducted by a third party, contract operator. Furthermore, it was assumed that the third party operator would expect to

realize a 15% profit margin above the operational expense associated with the operation of the railroad.

3.7 Explanation of Methodologies Used in Determining Costs to Reach the National Rail Network

The following section provides a synopsis of the methodologies employed by RLBA to determine the cost to reach the national rail system.

3.8 Operating Plan

In all three alignments, RLBA assumed that railroad operations on the UBRR were based at the western end of the railroad at either Myton or Leland Bench, hereafter, the “West End Yard.” Facilities at the western end of the railroad would include the UBRR’s primary yard facility, maintenance facilities and administrative offices. The only other major facilities on the railroad are located at the eastern end of the line at either Rifle or Craig, CO, respectively, hereafter the “East End Yard.” Facilities at the eastern end would include a second yard to facilitate interchange with UP and/or BNSF and a minor maintenance facility.

With the expectation of sodium bicarbonate produced by Natural Soda at a location north of Rifle (only in the Higher forecast scenarios) and fly ash produced at the Bonanza Power Plant, all outbound traffic on the railroad was assumed to originate at the West End Yard, where commodities were assumed to be loaded onto railcars via privately owned and operated transloading facilities located adjacent to West End Yard. Due to the preliminary status of the UBRR project, no information regarding the location of potential shipper’s facilities was available to consider. The cost to transport commodities to the transloading facilities and load on railcars is not reflected in this study. Conversely, RLBA further assumed that all inbound traffic on the railroad would be received via interchange at the East End Yard and transloaded off of rail at West End Yard for final disposition. Again, the cost of transporting inbound commodities to their final destinations, likewise, is not reflected in this study.

Because the vast majority of rail traffic is either loaded or unloaded at West End Yard and interchanged or received from interchange at East End Yard, operations on the UBRR are relatively simple. The vast majority of trains were assumed to traverse the entire length of the line. Train crews are assumed based out of West End Yard. Due to Federal law limiting the number of hours a crew member can work, it is assumed that train crews spend the night at a local hotel near East End Yard before returning back to their base on an inbound train and vice versa.

3.9 Transportation

Transportation costs primarily consist of two, major components, labor and fuel. To determine these costs on the UBRR, RLBA developed a per-train cost associated with each of the most prominent train types on the UBRR. Because of the simplistic nature of UBRR operations, trains on the line can be categorized into four types:

1. **Loaded Unit Trains** - The majority of trains on the UBRR are unit trains – or trains consisting entirely of a single commodity loaded at a single location and destined to a single location, thus

resulting in significant cost and time savings. There are four types of unit trains on the UBRR: 1) outbound, loaded unit oil trains (consisting of both crude oil and shale oil carloads); 2) outbound, loaded unit refined oil product trains (only in Lower forecast); 3) inbound, loaded unit frac sand trains; and 4) inbound, loaded unit steel pipe trains. Side track length on the UP Central Corridor between Salt Lake City and Denver limits trains on the UBRR to 6,200 feet in length. This makes the maximum train length on the UBRR 95 cars. To maximize equipment utilization and efficiency, for the purposes of this study, RLBA assumed that outbound, unit crude trains were held at West End Yard until a full, 95-car train was ready to interchange with the UBRR's Class One partner.

2. **Empty Unit Trains** - Because unit trains are designed to handle a single commodity, the majority of unit trains, including those on the UBRR, would return to their point of origin empty, at which point they are assumed to be reloaded with this commodity. Because of the simplistic nature of the UBRR's operations, RLBA assumed that every loaded unit train resulted in a corresponding empty unit train, consisting of the same number of cars. The four types of empty unit trains on the UBRR include: 1) inbound, empty unit oil trains; 2) inbound, empty unit refined oil product trains (Lower forecast only); 3) outbound, empty unit frac sand trains and 4) outbound, empty unit steel pipe trains.
3. **Outbound, Loaded, Manifest Trains** - As opposed to unit trains, manifest trains consist of cars containing a variety of commodities and freight car types, from one or more origins, bound to a number of different destinations. These cars are brought from their various origins to a yard and assembled into a single manifest train. Once a manifest train reaches its destination yard, the cars are disassembled and delivered to their respective destinations. On the UBRR, manifest trains handle commodities which do not project enough volume to warrant dedicated, unit trains, including: 1) outbound sodium bicarbonate, 2) outbound fly ash and 3) outbound gilsonite. To maximize equipment utilization and efficiency, for the purposes of this study, RLBA assumed that manifest trains were held at West End Yard until a full, 95-car train was ready to interchange with the UBRR's Class One partner. Like unit trains, outside of yard facilities manifest trains are ultimately transiting from one terminus of the UBRR to the other. However, unlike unit trains, manifest trains make periodic stops to pick up loads of fly ash from the Bonanza Power Plant in Bonanza, UT, as well as loads of sodium bicarbonate from Natural Soda. Additionally, outbound, loaded manifest trains require additional time in West End Yard to collect the various cars and assemble them into a single train consisting of bunches of cars "blocked" by final destination region. At the East End interchange, the train was assumed delivered to the UBRR's Class One partner in the same manner as a unit train.
4. **Inbound, Empty, Manifest Trains** - While the nature of manifest traffic means that most such trains are carrying both loaded and empty railcars, all inbound traffic on the UBRR is handled by unit trains (frac sand and steel pipe). As such, the only manifest traffic on the UBRR consists of empty cars returning to West End Yard to be reloaded. Consistent with its treatment of empty unit trains, RLBA assumed that every outbound loaded manifest train resulted in a corresponding inbound empty manifest train. At the East End interchange, the train was assumed to be received from the UBRR's Class One partners in the same manner as a unit train. However, these trains

require additional time once arriving at West End Yard to disassemble the train and deliver the cars to specific locations to be reloaded.

Table 3-2
UBRR Number of Trains by Type, 2022-2042

To determine the per train cost of each of these four types of trains, RLBA: 1) developed train physical characteristics; 2) determined unit costs of labor and fuel; 3) completed rudimentary performance simulations to determine train performance; and 4) applied unit costs based on train performance.

RLBA's train performance calculations were based on the conceptual level engineering data provided by Jones & DeMille, which, due to the 'high level' nature of the data, required a significant amount of professional estimation by RLBA professionals. Because of the aforementioned limitation in the conceptual level engineering data, RLBA stresses that these train performance and resulting per-train cost amounts are to be considered high level estimates. More accurate train costs would require a much more detailed understanding of the physical characteristics and profile of the railroad.

**Table 3-3
Per Train Cost by Train Type on the UBRR**

3.10 Equipment

RLBA assumed that all railroad cars traversing the UBRR are privately owned or leased by shippers and, as such, no railroad cars beyond those required to support railroad maintenance are owned or operated by the carrier. The cost to lease railcars borne by shippers was included as a separate line item outside of the short line model but included in the transportation option cost comparison detailed in section 4.6 of this report.

RLBA assumed that the UBRR owns, operates and maintains its own locomotives on all trains operated over the railroad. UBRR locomotives on outbound trains were assumed to be removed at East End Yard and attached to inbound trains to complete the return trip to West End Yard. Due to the scale of UBRR operations, RLBA elected to assume that the UBRR provides its own locomotives. It should be noted that an alternative arrangement known as "run-through power," in which the Class One railroad interchanging with a short line railroad provides its locomotive to said short line at a price, is commonly employed and also could be realistically employed in the situation of the UBRR as it improves locomotive utilization, reduces costs and improves service.

RLBA further assumed that the main locomotive on the UBRR are GE ES44AC locomotives, built new for the UBRR, supplemented by rebuilt, EMD SD40-3 locomotives. The ES44AC is a 4,400 horsepower locomotive commonly found in mainline service on major heavy haul railroads around the country, including UP and BNSF. The SD40-3 is a 3,300 horsepower upgraded version of the SD40-2 locomotive, originally built between 1972 and 1989. A highly popular and reliable locomotive, the SD40-3 is a completely rebuilt locomotive regularly assigned to secondary or back up service. Both locomotives are compliant with current environmental regulations.

Based on the aforementioned simulations performed, RLBA determined that five, ES44AC locomotives (three on the front of the train, two on the rear of the train but controlled remotely) would be required to successfully power a 95-car loaded train between West End Yard and Rifle, while four, ES44AC locomo-

tives (two on the front of the train, two on the rear of the train) would be required to successfully power a 95-car loaded train between West End Yard and Craig. While unloaded trains are significantly lighter than their loaded counterparts, to ensure that locomotive utilization is maximized, all the locomotives used on a loaded train were assumed by RLBA to return on the accompanying empty train. In such cases on empty trains to/from Rifle, three locomotives are required to power the train over the railroad, while the other two locomotives are hauled dead in tow ("DIT"). On empty trains to/from Craig, two locomotives are required to power the train over the railroad, while the other two locomotives are hauled DIT.

**Table 3-4
Locomotive Requirements of the UBRR, 2022-2042**

Locomotive maintenance costs were calculated by considering per-locomotive unit costs reported by Class One railroads. While locomotive maintenance costs are generally lower on short line railroads, equipment and operations on the UBRR more closely resemble that of a Class One mainline, and, as such, Class One costs were deemed more appropriate. RLBA used a value of \$~~1,000,000~~ annually per unit.

3.11 Maintenance of Way

The level of routine maintenance activity required on UBRR is primarily driven by the physical condition the railroad is to be maintained to and the level of traffic expected to operate over the line. RLBA determined that the railroad should be maintained to Class 3 Track Class Standards, as defined by the Federal Railroad Administration, thus allowing for a maximum safe operating speed of 40 MPH by freight trains. While not specifically required by Class 3 Track Class Standards, RLBA also assumed that the new-build portions of the railroad would feature 136-pound continuously welded rail and concrete, cross ties, materials considered industry standards on heavily used railroads. RLBA assumed that the track on the Desert Power Railroad portion of the line, 32 miles, which was assumed to be integrated into all three, rail alignments, would consist of the track materials currently installed, which is understood to be 136-pound continuously welded rail and wooden cross ties.

RLBA assumed that the majority of routine maintenance activities would be addressed by a full time,

MOW Department employed by the UBRR or its contractor. To adequately perform the routine maintenance activities on the UBRR as defined above, RLBA determined that a labor force of 28 employees would be required on either Rifle rail alignment and 25 employees would be required on the Craig rail alignment, assuming the Higher forecast volumes. The shorter length of the Craig alignment, and therefore, lower maintenance requirements, explains the difference in the labor requirements across the proposed rail alignments. A labor force of 22 employees would be required on either Rifle rail alignment, as well as the Craig rail alignment assuming Lower forecast volumes were realized. The lower annual carloads, and thus tonnage over the line, in the Lower forecast volumes makes a full second section gang unnecessary in those scenarios.

In addition to the maintenance activities performed by the UBRR MOW Department, RLBA assumed that certain specialty tasks and services were performed by third-party contractors on a regular basis. These services include: 1) periodic weed spraying along the right-of-way; 2) third party bridge inspection and bridge maintenance plan development and recommendations; 3) periodic ballast cleaning (ballast is a layer of crushed rock, which both stabilizes the track structure and provides proper drainage); and 4) ultrasonic rail flaw detection inspections. The outsourcing of these activities is consistent with current industry practices on a railroad of similar size and scope as the UBRR.

RLBA's estimated routine maintenance cost calculations were based on the conceptual level engineering data provided by Jones & DeMille, which, due to the 'high level' nature of such data, required a significant amount of professional estimation by RLBA professionals as well as the employment of a contingency factor. Because of such limitations in the conceptual level engineering data, RLBA stresses that these maintenance costs are to be considered high level estimations. More accurate maintenance costs would require a much more detailed understanding of the physical characteristics and profile of the railroad.

3.12 General and Administrative

Because General and Administrative (G&A) activities encompass the non-transportation aspects of a rail operation (i.e., Marketing, Law, etc.), the level of manpower associated with G&A is not directly impacted by the length of a railroad or the volume of trains operating over a railroad, as are the other major cost centers. Instead, G&A manpower is driven largely by the number of customers doing business with the railroad (marketing and accounting considerations) and the number of employees employed by the railroad (human resources). As such, RLBA determined that in the Higher forecast scenarios, the UBRR would require a G&A work force of 25 employees, regardless of alignment. In the Lower forecast scenarios, the UBRR would require a work force of 17, again, regardless of alignment.

In addition to the G&A staff, RLBA assumed that a number of specialty tasks and services were performed by third-party contractors on a regular or as-needed basis, as appropriate. These services include: 1) legal services (specifically, supporting the activity of the General Counsel's office); 2) rail accident clean-up and repair services; 3) office services; 4) train crew services, including managing efforts to contact and inform train crew members of upcoming assignments, overnight lodging at the East End Yard for crews coming off duty, and transportation to and from trains as required and 5) IT services (including both in offices and the field). The outsourcing of these activities is consistent with current industry practices on a railroad of similar size and scope as the UBRR.

3.13 Equipment Capital Expenses

RLBA assumed that new locomotives were purchased as traffic volume levels warranted. Locomotives were assumed to have a useful life of 25 years, after which they would be sold and replaced. The cost to perform major overhaul or upgrade work to all UBRR locomotives was captured in the locomotive maintenance operating cost. The only capital expense associated with equipment relates to the periodic acquisition of new locomotives as traffic volumes on the railroad demand. RLBA assumed that the capital cost of such acquisitions would be amortized over a 25-year period.

3.14 Maintenance of Way Capital Expenses

Typically, renewal programs, or program maintenance activities, are designed to be performed in an on-going, cyclical nature. Only a small portion of the railroad, on which the target material has reached the end of its useful life, is addressed during a specific program year. On a typical railroad, installed materials along a railroad are at various points along their respective useful life cycles and, therefore, renewal programs are, at least theoretically, always on-going on some portion of the railroad to replace material at the end of its useful life. Because the majority of all three rail alignments would be new-build construction (the exception being the 32 miles of the Deseret Power Railroad which RLBA assumed to be integrated into the route), and because the tonnage shipped over the line gradually increases during the ramp-up period, the physical track structure of the UBRR would require significantly less than typical renewal over the first ten years of the railroad and essentially no renewal at all on the new-build portions of the railroad over the first seven years. As a result, RLBA assumed that program maintenance of the UBRR would consist of three discrete periods, including:

1. **2022 – 2028** - during this period, RLBA assumed that program maintenance activities on UBRR operations are limited to the approximately 32 miles of line which consist of the Deseret Power Railway, which existed prior to the construction of the UBRR and, thus requires regular asset renewal. During this period the material on the rest of the railroad, which was installed new, does not require any sort of replacement program;
2. **2029 – 2031** - during this period, 1) surfacing, 2) some track replacement (starting with curved track on areas with high vertical grades, thus incurring the most wear and tear from passing trains), 3) grade crossing; and 4) turnout renewal programs begin along the entire railroad; and
3. **2032 and Beyond** - during this period, 1) cross tie, and 2) structure renewal programs begin along the entire railroad.

RLBA's program maintenance calculations were based on the conceptual level engineering data provided by Jones & DeMille, which, due to the 'high level' nature of the data, required a significant amount of professional estimation by RLBA professionals. Because of limitations in the conceptual level engineering data, RLBA stresses that these maintenance costs are to be considered high level estimates. More accurate costs would require a much more detailed understanding of the physical characteristics and profile of the railroad.

3.15 Initial Construction Costs

Initial construction costs, as prepared by Jones & DeMille, were accepted 'as-is' by RLBA. Additionally, certain physical characteristic elements of the three, alignments developed by Jones & DeMille also were accepted by RLBA, specifically, route miles and, to some extent, the general terrain types of the three routes.

**Table 3-5
Physical Characteristic Assumptions of UBRR Alignments Provided by
Jones & DeMille Engineering, Inc.**

3.16 Additional Initial Construction Costs Determined by RLBA

RLBA determined that additional infrastructure items would be required to begin rail operations on the UBRR beyond the construction costs developed by Jones & DeMille, as these costs only reflected the assumption of a single track railroad. These additional items include:

1. Structures - RLBA determined instances in which bridges would be required beyond the major river crossings identified by Jones & DeMille, either over minor waterways or over physical features over which a fill would be impractical;
2. Grade Crossings - RLBA determined instances in which the alignment crossed a road at grade, with a distinction made between major, 'improved' crossings featuring active crossing protection (cross gates and bells) and minor, 'unimproved crossings, featuring passive crossing protection (warning signs only);

3. Siding and MOW Tracks - RLBA assumed that a signal-controlled, 8,000 foot siding would be constructed every 20 miles, to allow trains to pass one another. Additionally, a MOW track was constructed at each siding, to allow MOW equipment to either be stored or temporarily moved on to so that trains might pass on the main track;
4. Train Traffic Control System - RLBA assumed that train movement on the line would be governed by a Centralized Traffic Control (CTC) system, a modern automated system which allows a dispatcher to remotely control signals and switching trains, and thus, train movements, from a single location;
5. Positive Train Control (PTC) - RLBA assumed the new railroad would built with PTC, a federally mandated safety system which, given the volumes and type of traffic moving over the UBRR, would be required by law to be installed on the railroad;
6. Yard Facilities - RLBA determined an approximation of the linear footage of yard track which would be required at both ends of the railroad to temporarily store both loaded and empty trains between trips over the railroad. No effort was made to identify or determine the cost to acquire real estate underlying said facilities but, as previously stated, Uinta Advantage has indicated a willingness to provide real estate in the Leland Bench area at little or no cost to the railroad and
7. Maintenance and Office Facilities - RLBA estimated the cost to build a central facility at West End Yard, at which all locomotive maintenance and general administrative activities required to manage the entire operation would be performed. No effort was made to identify or determine the cost to acquire real estate underlying said facilities.

RLBA determined costs specific to both the Higher and Lower forecast volume scenarios. Regardless of the volume scenario, RLBA assumed that the railroad was built to handle the maximum volume forecasted under each scenario. The physical infrastructure of the railroad was not 'scaled up' to match the increasing volumes experienced during the 'ramp-up' period of the Higher and Lower forecasts. To be consistent with the initial construction cost developed by Jones & DeMille, a 30% contingency was added to construction budgets developed in connection with the above improvements regarding the additional initial construction cost determined by RLBA.

Table 3-6
Additional Initial Construction Costs Determined by RLBA

3.17 Financing of Initial Construction Costs

Given the large capital investment required to construct the UBRR within any of the three proposed rail alignments, RLBA assumed that construction of the railroad would be financed through the issuing of bonds. Specifically, RLBA assumed that the entire cost to construct the UBRR would be financed with capital generated from issuing 30-year bonds, yielding an assumed 3.13%, the published yield on a 30-year bond as reported by the U.S. Department of the Treasury as of May 1st, 2018.

Table 3-7
Annual Average Initial Capital Debt Servicing Obligation of the UBRR

3.18 Feasibility of the UBRR

Using the above-described cost assumptions, RLBA determined what it has characterized as the 'annual cost obligation' associated with each of the three, potential rail alignments, assuming both the Higher and Lower volume forecasts. For purposes of this study, RLBA defines annual cost obligation as the sum of the following four values:

1. Annual Operating and Maintenance (O&M) and capital expense costs to operate the UBRR;
2. A 15% profit margin (based on O&M costs) paid to the contract short line operator assumed to operate the UBRR;
3. A 30% contingency applied to the O&M cost, capital expense cost and short line operator profit margin; and
4. Annual debt servicing obligation, assuming the entire construction cost of the railroad was financed with 30-year bonds with a 3.13% yield.

This comparison yielded the following results.

Table 3-8
Annual UBRR Cost Obligations, 2022-2042

Year	Rifle Via Meeker Area		Rifle Via Piceance Creek		Craig	
	Lower	Higher	Lower	Higher	Lower	Higher

RLBA's cost model suggests that in both the Higher and Lower forecast volumes, total annual cost obligations of the UBRR would be the lowest utilizing the Craig alignment. This is due to three reasons:

1. **Lower Initial Construction Cost** - The Craig alignment requires 26.04 fewer miles of new-build track as compared to the Rifle via Meeker Alignment, resulting in a cost savings of \$319.2 million on the new-build construction cost alone;
2. **Less Equipment and Infrastructure Required** - Because the Craig alignment is both shorter and enjoys more benign physical characteristics than either Rifle alignment, the Craig alignment requires less equipment and infrastructure. This most noticeably manifests itself in the number of locomotives required to successfully operate the railroad, as trains operating over the Craig alignment require one less locomotive than those operating over the Rifle alignment.
3. **Lower Operating and Maintenance Costs** - Because the Craig alignment is both shorter and features more benign physical characteristics compared to either Rifle alignment, it requires a shorter amount of time for trains of any kind to transit that alignment, resulting in both fuel and train crew labor savings. Additionally, and for the same rationale, fewer MOW crews are required to adequately maintain the railroad.

3.19 'Break-Even' Transportation Rate on the UBRR

Once the annual cost obligation of each proposed alignment was determined to assess the feasibility of the UBRR as a competitive transportation option linking the Uinta Basin with the national rail network, RLBA determined the 'break even' rate on the UBRR. For purposes of this study, RLBA defines the 'break even' rate as the lowest rate which the URR could charge prospective Uinta Basin rail shippers and not operate at a loss. This value was determined by dividing the annual cost obligation by the total number of estimated annual carloads originating/terminating (including all carloads of all commodities, not limited

to crude oil) in the Uinta Basin. Because almost all rail traffic on the UBRR originates and/or terminates at either Myton or Leland Bench, carload totals remain the same within both the Higher and Lower forecasts regardless of which potential rail alignment is considered.

This comparison yielded the results shown on Table 3-9.

3.20 Lower Forecast Volume Scenarios Cash Flow upon Start Up

Theoretically, and all things being equal, for the projected volumes to move over the UBRR the transportation rates offered by the UBRR must be equal to, or, ideally, lower – a concept frequently characterized as a ‘competitive rate’ – than the transportation rates offered by the next best alternative transport option between the Uinta Basin and the national rail network. While transportation costs likely aren’t the only consideration a shipper would weigh when selecting a transportation option – quality of service also would likely be a factor – it is probably fair to assume it would be the single most important consideration. With this in mind, it should be noted that before the completion of the ramp up period in carload volume in the Lower forecast scenarios, the breakeven rate on the UBRR regardless of alignment may be so high as to no longer be competitive against trucking, which would presumably be the next and only alternative in the event the UBRR is constructed. (SCIC is also considering a pipeline but it is the understanding of RLBA that either a railroad or pipeline would be built, but not both. Please see section 3.21). These high rates, assuming the Lower forecast volumes, may necessitate that the UBRR offer a rate lower than that which would allow the railroad to ‘break even,’ thus the railroad would operate cash flow negative for a period of time up upon the initial ramp up of UBRR commercial operations. This is only an issue in the Lower forecast volume scenarios; carloads are such that under the forecasted volumes in the Higher forecast, the UBRR would be able to offer competitive rates and achieve a positive cash flow immediately upon commencement of operations.

3.21 Comparing the UBRR to Alternative Transport Options between the Uinta Basin and the National Rail Network

To quantitatively determine what, if any, transportation cost benefit the UBRR may provide to prospective Uinta Basin rail shippers, RLBA attempted to ‘compare’ the transportation rates of what were previously identified as the two most viable alternatives to the prospective railroad between the Myton and Leland Bench Area on the west end of the railroad and a connection with the national rail network on the east end. The values advanced below should not be considered direct comparisons of the actual transportation cost which could be achieved assuming volumes projected in either the Lower or Higher forecast. In actuality, limitations inherent to both alternatives (described below in greater detail) would preclude either from achieving the necessary capital to transport the volumes projected by RLBA.

These alternatives included:

1. **Trucking and Transloading-to-Rail Between the Uinta Basin and Price, UT** - This alternative reflects the assumption that one or more third-party trucking entities would be engaged to transport crude oil from well sites in the Uinta Basin to truck-to-rail transloading facilities in the vicinity of Price, UT, a community of approximately 9,000 located on the Union Pacific Central

Table 3-9
Rail Transportation Break-Even Rate per Carload and Barrel;
Myton/Leland Bench Area - Connection with the National Rail Network, 2022-2044

Corridor, approximately 225 miles west of Rifle. Price was selected as the terminus due to the fact that much of the Uinta Basin crude oil previously shipped out of the state of Utah by rail has been transloaded and shipped from facilities in the Helper, Price and Wellington area. RLBA assumed that transloading occurs at a hypothetical, unnamed transloading facility near Price. Values related to trucking and transloading costs under this alternative were developed by RLBA team member, Helios Group, Inc., based on data collected during stakeholder interviews and proprietary information maintained by Helios Group.

As referenced above, it is important to note that RLBA does not believe that it is practical or reasonable to assume that the truck-to-rail transloading alternative realistically could move the volumes of traffic projected in the later years of either the Lower or Higher forecast. Research suggests that the maximum volume of crude oil moved by truck from the Uinta Basin to rail transloading facilities peaked at 2,000 bpd. This value represents only approximately 1% and 2% of the daily production projected in the Lower and Higher forecasts, respectively, beyond 2034, nor does it include any volume associated with the other commodities coming into and out of the Uinta Basin. Increasing transloading volume beyond 2,000 bpd is unlikely due to: 1) the challenging, mountainous characteristics of the road connecting the Uinta Basin and the Price area; 2) hazardous driving conditions on said roads during winter months and 3) the inability to expand or improve existing roads, due to, among other factors, said roads passing through the Ashley National Forest. As such, the values advanced in this study are provided only to attempt to quantify the potential transportation cost-benefit the UBRR may provide to prospective Uinta Basin rail shippers

2. **Piping and Transloading-to-Rail Between the Uinta Basin and Price, UT** - This alternative reflects the assumption of the construction and operation of a dedicated, 70,000 bpd crude oil pipeline between Myton, UT and the aforementioned Price River Terminal, at which crude oil would transload from pipe to rail. Values associated with this alternative were determined by subtracting RLBA Team-developed transloading and rail shipping costs from a baseline, all-in, per barrel cost, developed previously and independently of this study by HDR, Inc. in 2017, as part of a study entitled "Uinta Basin Oil Pipeline Study."

As with the truck-to-rail transloading alternative, it is important to note that, as currently defined, the pipe-to-rail alternative also could not realistically move the volumes of traffic projected in the later years of either the Lower or Higher forecast. The 70,000 bpd crude oil pipeline defined in the HDR study could only handle approximately 45% and 20% of the daily production projected in the Lower and Higher forecasts, respectively, beyond 2034, nor does it include any volume associated with the other commodities coming into and out of the Uinta Basin. Since a pipeline cannot be 'scaled up' if oil volumes increase beyond its capacity, a proposed pipeline would need to be larger than the version previously investigated. This is particularly true in light of the fact that previous studies determined that there is not enough available right-of-way for a second pipeline to be constructed along the same corridor. As such, the values advanced in this study are provided only to attempt to quantify the potential transportation cost-benefit the UBRR may provide to prospective Uinta Basin rail shippers.

To provide a fair comparison between the UBRR and the above-described transportation alternatives, RLBA included a pro-rated value to capture the cost of leasing a railcar in which to ship commodities between the Uinta Basin and a connection with the national rail network (rail car leasing costs are addressed in more depth in section 4.6).

This comparison yielded the following results.

Table 3-10
Alternative Transportation Rate Comparison per Barrel;
Myton/Leland Bench Area - Connection with the National Rail Network

RLBA's results indicated that in both the Higher and Lower forecast, the UBRR would provide the lowest transportation cost between the Myton/Leland Bench, UT, area and a connection with the national rail network. These results were due to the fact that: 1) the high volumes of commodities estimated to ship via rail, including those other than crude oil, greatly amplify the superior economics of scale intrinsic to rail; and 2) the additional cost of transloading or 'double handling' crude oil into railcars at the connection to the national rail network negatively impacts the competitiveness of non-rail transportation options.

While transportation cost is the most important factor in the determination of a particular transportation option's competitiveness, it is not the only consideration. The flexibility that a railroad provides in comparison to a pipeline – the ability to transport multiple types of commodities, in both directions – offers a significant non-monetary service advantage over a pipeline. The next best alternative as regards cost, which can only transport one type of commodity, in a single direction at a time. This flexibility was cited by several prospective Uinta Basin rail shippers whom expressed a preference towards a rail connection serving the Uinta Basin rather than a pipeline. Additionally, unlike a pipeline which essentially cannot be significantly altered or expanded upon, a rail option would be relatively 'scalable,' in that additional infrastructure could be added as needed, at an economical cost.

3.22 Comparing the UBRR to Alternative Transport Options between the Uinta Basin and Salt Lake City

While the primary objective of this study was to determine transportation rates/costs to distant markets, the Salt Lake City markets are currently, and figure to remain under any expansion scenario, a major, market for Uinta Basin crude oil. As such, RLBA compared the cost of the various transportation options previously identified against the real world cost paid today to transport Uinta Basin crude oil to Salt Lake City via contract trucking. RLBA considered six transportation options, including:

1. **All Rail Between the Uinta Basin and Salt Lake City, UT** - Considering the three prospective rail alignments address earlier in this report;
2. **Trucking and Transloading-to-Rail between the Uinta Basin and Salt Lake City, UT via Price, UT** - As addressed earlier in this report;
3. **Piping and Transloading-to-Rail between the Uinta Basin and Salt Lake City, UT via Price, UT** - As addressed earlier in this report; and
4. **All Truck between the Uinta Basin and Salt Lake City, UT** considering the current, real world cost to transport crude oil from a central location in the Uinta Basin (defined as Myton, UT to facilitate a fair comparison to transport cost of the other options) directly to Salt Lake City, UT refineries. These costs were developed in conjunction with Mr. Eckels.

This comparison yielded the following results.

Table 3-11
Alternative Transportation Rate Comparison per Barrel;
Myton/Leland Bench Area - Salt Lake City Markets

	Rail			Truck	Pipeline
	Rifle via Meeker	Rifle Via Piceance	Craig		

UP and BNSF rates to Salt Lake City represent an average of all estimated rates to all Salt Lake City area refineries

RLBA's results indicated that at the High forecast volume estimates, an all-rail routing assuming interchange with Union Pacific at Rifle, CO, provided the most competitive transportation cost. However, at the Low forecast volume estimates, the current practice of trucking directly to Salt Lake City offered the most competitive cost. Not captured in RLBA's results is the cost to construct the required facilities to accept and handle railcars at Salt Lake City area refineries, nor the cost to the taxpayers of Utah to maintain U.S. Route 40 (and associated routes between the Uinta Basin and Salt Lake City), which are not reflected in the trucking rates.

4.0 Approach Part 3 - Determination of Costs to Ship across the National Rail Network to/from Distant Markets

4.1 Summary of RLBA Approach

RLBA employed a two-step process to determine the cost to ship across the national rail network to/from distant markets, including:

1. Determining Estimated Freight Rates across the National Rail Network;
2. Determining Rail Equipment Lease Rates and
3. Determining the 'All-In' Transportation Cost across the National Rail Network.

4.2 Determining Estimated Freight Rates across the National Rail Network

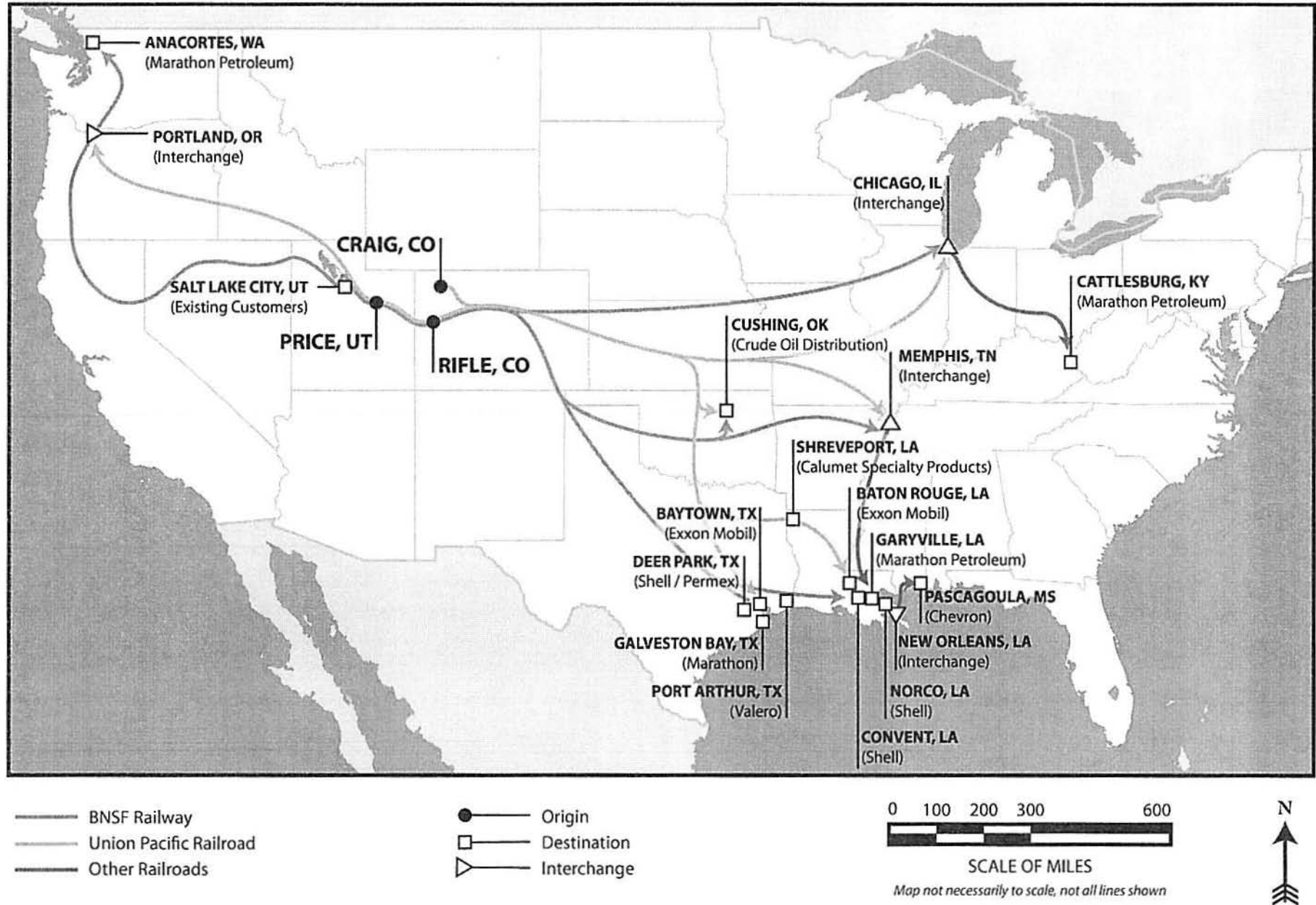
The national network (UP and BNSF) rail rates are particularly important to prospective Uinta Basin rail shippers and the viability of the UBRR because said rates are likely to be the single largest transportation cost component involved in moving Uinta Basin commodities to/from markets/sources. These rates, and those on the other seven commodities, also are important because they influence the rates which the UBRR would be able to charge on its portion of the overall rail haul and, thus, influence the economic feasibility of the UBRR.

Estimated rates which prospective Uinta Basin rail shippers might pay to transport Uinta Basin crude oil via UP routings and BNSF routings across the national rail system to eleven target refineries were determined by RLBA from both proposed eastern termini – Rifle, CO and Craig, CO – as well as the proposed terminus of the two previously identified alternative transport options – Price, UT. At the request of SCIC, RLBA also provided estimated rates to the closest railhead to Cushing, OK. Finally, RLBA estimated prospective rates on seven other commodities involving eleven potential destinations (of shale oil, refined oil products, etc.) and four potential origins (of frac sand and pipe), also from Rifle, CO, Craig, CO and Price, UT.

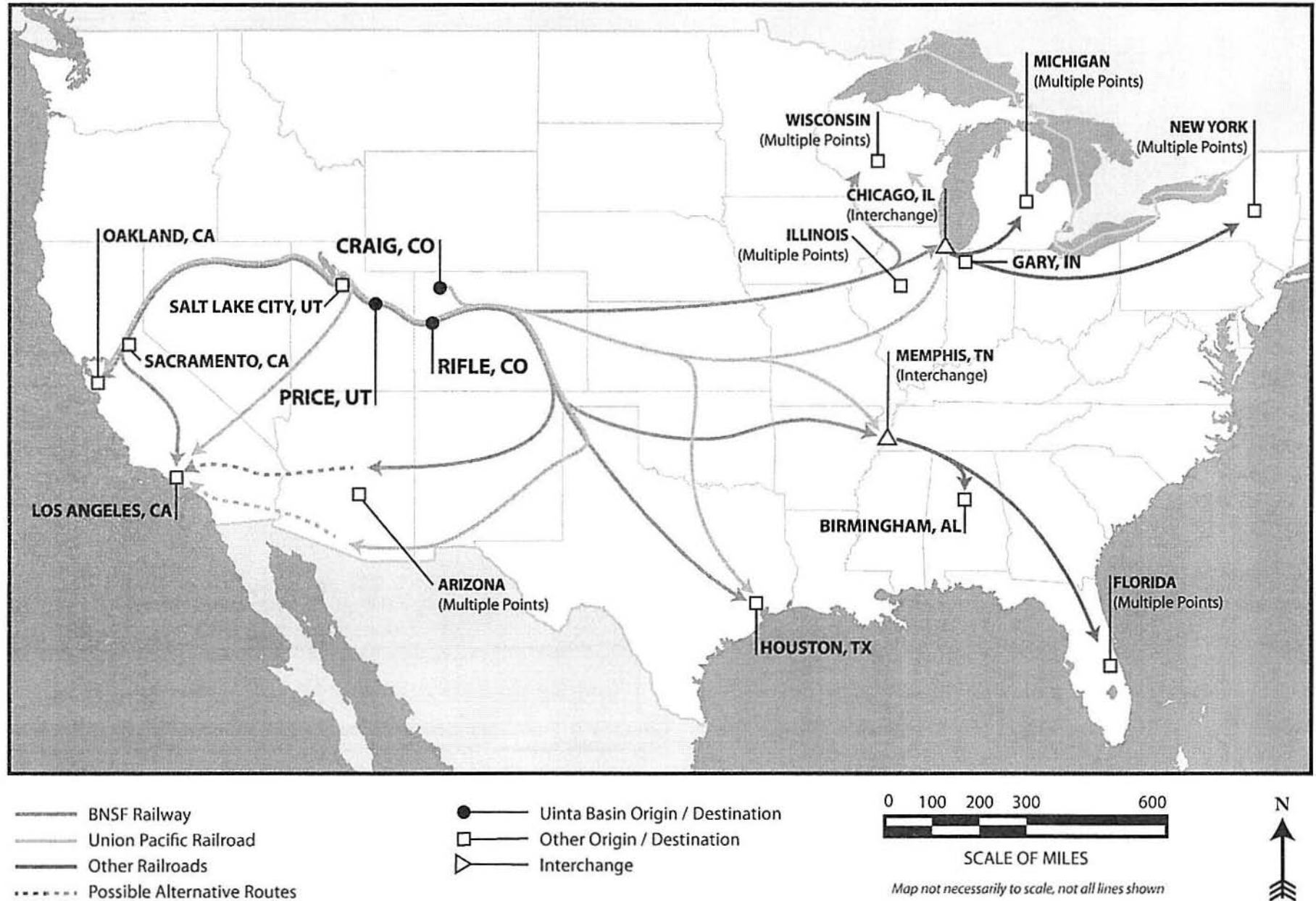
The rates which either UP or BNSF may charge prospective Uinta Basin shippers are determined by five factors which are briefly described below.

1. **Demand for Products** - Demand for the products and raw materials being sold in the economy determine the demand for rail transportation, as is the case with all modes of transportation. Hence, rail transportation is referred to as a 'derived-demand industry' in economics circles. At the individual rail customer level, this translates into the amount (barrels, tons or carloads) of product or raw material which a freight generator thinks it can sell or purchase and then ship. The volume of a customer's demand provides the customer with some leverage in its rate negotiation with a railroad.
2. **Profit Goals of the Railroad** - Profit goals of a railroad determine the degree to which it exercises its market power to mark-up its cost per carload to the rate which it feels will maximize its profitability. RLBA evaluated the profit goals of BNSF and UP, the railroads with which the Uinta

Map 4-1
Proposed National Destinations and Routings for Uinta Basin Crude Oil



Map 4-2
Proposed National Origins/Destinations and Routings for Other Uinta Basin Commodities



Basin traffic would be interchanged, by reviewing estimated revenue/variable cost (R/VC) ratios of the railroads. R/VC ratios are a common metric by which railroads measure the profitability of individual shipments.

3. **Cost Per Carload** - A railroad's cost to transport a carload is the baseline against which the profitability of a given carload is measured by a railroad. The average cost per carload is calculated in terms of long-term variable costs, which include the costs of items such as: owning and maintaining mainline track network and switching yards, owning and maintaining locomotives and rail cars and recruiting and paying its workforce. The extent to which such costs are allocated against a given carload is determined by the number of times the railroad must switch (handle) it during the course of its trip, its length of haul and its weight.
4. **Alternative Transportation Options** - A shipper's access to competing transport options is the most important factor in attempting to manage the level of rates charged by a railroad. In addition to securing access to competing carriers at a specific location, such as Rifle, CO or Price, UT, access to transport options includes a customer's ability to shift production and raw material sourcing among multiple facilities and vendors to leverage shipping volumes and carrier competition at those locations where feasible. RLBA considered the specific location level of access in its rate analysis by producing prospective rates which reflected assumed routings via two competing rail carriers, BNSF and UP. RLBA also evaluated modal competitive options (truck and pipeline) between the Uinta Basin and Price, UT.
5. **Level of Service** - The level of service required by a customer can influence the rate charged by a railroad because it might impact a railroad's cost of providing service. The most prominent level of service element is the frequency (daily vs. Monday – Wednesday – Friday) with which a customer's facility is switched by a railroad. Daily service might require a railroad to incur overtime on a crew while the three-day-a-week service could be accomplished within a crew's normal eight-hour day. Where a customer relies upon a railroad to provide rail cars into which it loads its product, the ability of the railroad to reliably provide a sufficient supply of rail cars is a metric on which customers measure a railroad's level of service. For purposes of determining prospective rates, RLBA assumed that daily service would be provided at the Uinta Basin locations and that a sufficient supply of rail cars would be provided by railroads to move the commodities which would require railroad-supplied equipment.

The application of this methodology yielded the following results.

Table 4-1
Rail Transportation Rate per Carload and per Barrel, Oil;
Connection with the National Rail Network - National Markets

Per Carload

Table 4-2
Rail Transportation Rate per Carload, Other Commodities;
Connection with the National Rail Network - National Markets

	Union Pacific	BNSF Railway
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Red highlight indicates the highest rate and green, the lowest rate, to each destination listed above

Railroad rates are greatly influenced by the length of haul between origins and destinations. Twelve of the thirteen target refineries are located to the southeast and east (in Kentucky, Louisiana, Mississippi and Texas) of the three candidate terminal/junction locations (Craig, CO; Price, UT and Rifle, CO). Another target refinery is located in Anacortes, WA, to the northwest (opposite direction) of most candidate terminals. The closer a candidate terminal is to those southeastern and south-central states, the lower the rates it would logically enjoy, generally because the lengths of haul are shorter. This is the case with the prospective Uinta Basin crude oil rates, resulting in the following findings:

1. **Rifle, CO** - Produces the lowest rates of the three candidate terminals on the Uinta Basin crude oil to the twelve target refineries. Prospective rates via UP and its connections (UP routings) are \$[redacted] - [redacted] lower than rates from Craig, CO. Prospective rates via BNSF and its connections (BNSF routings) suggest that the spread between Rifle and Craig rates has the potential to be larger - in the range of \$[redacted] - [redacted]. As would be expected, prospective rates on Uinta Basin crude oil from Rifle, CO are lower than from Price, UT because Price is farther from the twelve target refineries: \$[redacted] - [redacted] via UP routings and generally \$[redacted] - [redacted] lower via BNSF routings.
2. **Price, UT** - Produces the lowest rates to the target refinery in Anacortes, WA. The prospective rates are at least \$[redacted] lower than the rates from next closest candidate terminal, Rifle, CO, via BNSF and UP routings. This is not surprising because Price, UT is significantly closer to Anacortes, WA.
3. **Prospective rates on the seven, non-crude oil Uinta Basin commodities** generally display the same pattern as illustrated above: commodities moving to or from destinations and origins located in the South, Southeast and East find the lowest rates at Rifle, CO while those located in the West and Northwest find the lowest rates at Price, UT.

4. **Comparison of BNSF routings with UP routings at Rifle, CO and Price, UT** - Indicates that most BNSF routings produce shorter lengths of haul than UP routings. For instance, BNSF's operating mileages between Rifle, CO and four of the target refineries in Texas are between 168 and 332 miles shorter than UP's. This is largely because BNSF's mainline network provides a shorter, more direct route between the candidate terminals and the Gulf Coast region of Texas, Louisiana and Mississippi. The shorter mainline network routing provides BNSF with a somewhat lower operating cost structure to many of the target refineries, which has resulted in lower rates in RLBA's analysis.

4.3 Explanation of Methodology Used in Determining Estimated Freight Rates across the National Rail Network

The rates presented by RLBA in this analysis are characterized as "prospective rates" because they are estimates of rates which a rail shipper might achieve through negotiations with BNSF and UP or through access to BNSF and UP rate tariffs. They have been developed by RLBA's lane-by-lane analysis of the following data available through RSII Logistics' USRail rail rate and traffic analysis software, a third-party rail rate and costing software employed by RLBA:

1. Long-term variable costs per carload which the railroads would incur in transporting unit trains or individual carloads across their lines;
2. Benchmark Revenue/Variable Cost (R/VC) ratios calculated from government databases on a commodity-specific and car-type specific basis;
3. Operating miles and
4. Average revenue per car for individual commodities hauled on BNSF and UP.

As previously mentioned, R/VC ratio is another key element which RLBA considered in determining prospective Class I rail rates in its analysis. RLBA reviewed R/VC benchmarks regarding each lane which it generated with RSI's US Rail Impact tool. US Rail Impact's R/VC benchmarks are developed from RSI's analysis of revenues and variable costs by commodity and equipment (rail car) type which appear in a database maintained by the U.S. Surface Transportation Board (STB).

4.4 Union Pacific Rates

RLBA considered R/VC's on crude oil rates found in a current UP tariff which apply on shipments from Utah in manifest train service. Manifest train service is general freight train service in which one carload to 30 or 40 carloads of crude might be shipped as part of a larger train hauling various commodities. RLBA found rates in the tariff which apply to destinations relevant to this study, such as Louisiana, Mississippi and Texas and entered them into the US Rail Impact tool to calculate their R/VC's (profit margins). While not directly applicable to unit train service in which Uinta Basin crude would be transported, these R/VC's provided another set of benchmarks against which RLBA tested the appropriateness of its prospective crude oil rates.

4.5 BNSF Railway Rates

This analysis reflects the assumption that rail shippers and public officials would be able to convince BNSF to establish Price, UT and Rifle, CO as stations on its network. Both locations already are stations on UP. BNSF's willingness to publish competing rates and services at existing UP stations will be either tempered or encouraged by a variety of factors, including its existing commercial relationships with producers, marketers, other rail shippers and transload operators at existing BNSF stations which are proximate to the candidate terminals. Wellington, UT (BNSF) and Price, UT (UP) are only six miles apart. Parachute, CO (BNSF) and Rifle, CO (UP) are fifteen miles apart. Such concerns might be overcome, of course, by the prospect of significant amounts of new traffic.

4.6 Determining Rail Equipment Lease Rates

Freight rates charged by the railroads are only one of the two rail-related charges which a rail customer commonly must pay if the serving railroad does not provide rail cars and the shipper must acquire them, generally by leasing. Railroads generally do not provide tank cars, such as those which would be required to transport Uinta Basin Crude, shale oil and refined oil products, due to the wide variety of specifications (capacity, lining, pressure, loading/unloading fixtures, etc.) required to safely carry a wide variety of commodities and the volatility in demand for such cars. Covered hopper cars, such as those required to transport frac sand, sodium bicarbonate and fly ash, are predominantly provided by the shippers as well. Class I railroads have frac sand-capable cars in their fleets but most of the frac sand shipments observed in RLBA's research moved in shipper-leased (private) rail cars.

This gives rise to equipment (rail car) lease costs which, generally, must be borne directly by the shipper who tenders the freight at origin, such as a Uinta Basin crude oil marketer. Lease costs are commonly thought of in terms of an average equipment cost per load and effectively become an add-on to the freight rate paid by the rail shipper (lessee). Rail equipment lease costs also are borne – indirectly - by a rail receiver such as a prospective Uinta Basin rail customer who supplies frac sand arriving by rail. The price which said prospective customer pays for a carload of frac sand typically will include the supplier's average cost of leasing the fleet of covered hopper cars in which the frac sand is transported.

With that in mind, RLBA determined the following estimates of the average private equipment costs per carload (lease cost per carload) by each of the commodity groups and traffic lanes in the analysis.

Table 4-3
Equipment Lease Rate Per Carload and per Barrel, Crude Oil;
Connection with the National Network - National Markets

Table 4-4
Equipment Lease Rate per Carload, Other Commodities;
Connection with the National Rail Network - National Markets

Destination	Commodity	Union Pacific			BNSF Railway	
		Craig CO	Rifle CO	Price MT	Price	MT

Red emphasis indicates highest rate, green emphasis indicates lowest rate

4.7 Explanation of the Methodology Used in Determining Rail Equipment Lease Rates

RLBA estimated the total equipment cost per carload of traffic moving over the UBRB destined to thirteen target refineries as a group – so they all have the same five values - because RLBA assumed that the oil marketer (shipper) likely would sell and ship its crude to multiple refineries over the course of a year or years based on changing market conditions. Such an approach would take advantage of the flexibility afforded by rail transportation to switch among multiple markets and would maximize the utilization of its leased tank car fleet. The different equipment utilization rates in each target refinery lane were captured by calculating a weighted average transit time in connection with all thirteen lanes by weighting the transit time in each lane by the annual carloads (high-end) in each lane. With regard to crude oil shipments to the refineries in Salt Lake City, the transits across the four destinations were nearly identical and the projected volumes to each were assumed to be equal, so the same five equipment costs per carload appear regarding each of the four refineries.

The equipment cost per carload for crude oil and frac sand shipments reflect equipment utilization, which results from the faster round-trip transit times afforded by equipment operating in 100-car unit trains, as opposed to single or multiple-car blocks in regular manifest freight trains, where total transit time is inflated as cars are switched into and out of trains headed in the correct direction. Unit train service has been assumed throughout the UBRB operating plan as it typically provides faster transit times and average load-to-load times than does manifest train service. The cars in a unit train remain together during the trip from load-out to refinery and avoid delays associated with being switched from one train to another at intermediate rail yards.

4.8 Determining the 'All-In' Transportation Cost across the National Rail Network

To provide an estimate of the total cost to ship across the national rail system, RLBA combined the estimated freight rates and equipment lease rates developed above into a single value. The application of this methodology yielded the following results as regards crude oil.

Table 4-5
Rail Transportation and Equipment Lease Rate per Carload, Other Commodities;
Connection with the National Rail Network - National Markets

	Union Pacific	BNSF Railway

**Equipment lease rate included in freight rate*

Red highlight indicates the highest rate and green, the lowest rate, to each destination listed above

Table 4-6
Rail Transportation and Equipment Lease Rate per Carload and per Barrel, Crude Oil;
Connection with the National Rail Network - National Markets

5.0 Conclusion

The following section addresses the ultimate conclusions reached by RLBA.

5.1 Total Rail Cost to Ship Uinta Basin Commodities on the Proposed UBRR

To offer a final opinion regarding what the total transportation cost which prospective Uinta Basin rail shippers might pay to ship via the UBRR between the Myton/Leland Bench, UT Area and national markets, RLBA synthesized the following values, described in detail earlier in this report, including:

1. The average annual break even rate for each of three prospective rail alignments at both the Higher and Lower forecast volumes;
2. The estimated freight rate across the national system to the various, identified destinations; and
3. The estimated equipment lease rates.

This comparison yielded the following results.

Table 5-1
Rail Transportation and Equipment Lease Rate per Carload;
Myton/Leland Bench Area - National Markets
Assuming Lower Volume Forecast

Table 5-2
Rail Transportation and Equipment Lease Rate per Carload;
Myton/Leland Bench Area - National Markets
Assuming Higher Volume Forecast

Table 5-3
Rail Transportation and Equipment Lease Rate per Barrel, Crude Oil;
Myton/Leland Bench Area - National Markets
Lower and Higher Volume Forecasts

RLBA's analysis suggests the following conclusions:

1. Assuming the Higher forecast volume, the Rifle via Meeker alignment, allowing for interchange with both UP and BNSF, offers prospective Uinta Basin rail shippers the lowest total rail transportation cost on all 33 identified shipping lanes;
2. Assuming the Higher forecast volume, the Rifle via Piceance Creek alignment, allowing for interchange with both UP and BNSF, offers prospective Uinta Basin rail shippers the highest cost on 25 of the 33 identified shipping lanes (76%);
3. Assuming the Higher forecast volume, the Craig alignment, allowing for interchange with UP, offers prospective Uinta Basin rail shippers the highest cost on 8 of the 33 identified shipping lanes (24%);
4. Assuming the Lower forecast volume, the Rifle via Meeker alignment, allowing for interchange with both UP and BNSF, offers prospective Uinta Basin rail shippers the lowest total rail transportation cost on 30 of the 33 identified shipping lanes (90%);
5. Assuming the Lower forecast volume, the Rifle via Piceance Creek alignment, allowing for interchange with either UP or BNSF, offers prospective Uinta Basin rail shippers the highest cost on 24 of the 33 identified shipping lanes (73%) and
6. Assuming the Lower forecast volume, the Craig alignment, allowing for interchange with UP, offers prospective Uinta Basin rail shippers the lowest cost on 3 of the 33 identified shipping lanes (10%) and the highest cost on 9 of the 33 identified shipping lanes.

Given that the ultimate goal of the UBRR is to provide prospective Uinta Basin rail shippers with the lowest cost transportation option between the Uinta Basin and national markets, it would appear that the Rifle via Meeker Area rail alignment would be the most prudent selection.

5.2 Recommendations

1. **Volumes** - To reiterate the importance and impact of the four challenges described earlier, the viability and competitiveness of the prospective railroad is directly related to the volumes of traffic which would be shipped over the line.
2. **Feasibility of the Proposed Railroad** - Assuming the forecasted volumes can be achieved, it appears that the proposed railroad can offer cost competitive transportation to prospective Uinta Basin rail shippers, as compared with the most practical identified transport alternatives. Beyond the immediate quantifiable monetary benefits, the proposed railroad also would offer more flexibility to transport into and out of the Uinta Basin secondary and tertiary commodities related to both crude oil extraction and other industries.

3. **Multiple Class One Connections** - The Class One rate estimation work conducted by RLBA suggests that the additional construction costs necessary to reach Rifle, CO may be justified by the savings potentially realized by prospective Uinta Basin rail shippers due to the advantages of being: 1) a shorter length of haul, and 2) served by two Class One carriers instead of being 'captive' to one. To this point, RLBA estimates that BNSF, a "second" Class One reached via a connection at Rifle, CO, in general, may offer lower rates to and from the distant locations which are markets for Uinta Basin commodities and sources of commodities consumed in the Uinta Basin. Furthermore, prospective Uinta Basin rail shippers might be able to leverage the two Class Ones against one another in negotiations to receive even more favorable rates than those estimated by RLBA. Similarly, shippers should be able to secure better service than would be the case if only one of those railroads provided service.
4. **Alignment Selection** - While the Craig rail alignment appears to be significantly less costly to construct and operate than either Rifle alignment, the Craig alignment: 1) is generally farther from the markets for Uinta Basin commodities; 2) lacks a second Class One connection; and 3) is located at the end of relatively isolated Union Pacific branch line. As a result, the total rail transportation cost, the sum of the cost to reach the national rail network and then to ship over the national rail network to prospective Uinta Basin rail shippers ultimately would likely be higher using the Craig rail alignment, both to distant markets and Salt Lake City. As such, if the ultimate goal of constructing the prospective railroad is to advance the economic development of the Uinta Basin, it would appear as though the Rifle via Meeker Area rail alignment would be the most prudent selection.
5. **Salt Lake City** - The short length of haul (by rail standards) to Salt Lake City makes an all-rail transportation option utilizing a combination of the prospective railroad and a Class One intrinsically less competitive than shipments to/from more distant markets, though potentially still feasible. If the prospective railroad can obtain or even approach the Higher forecast volumes, the economies of scale are such that rail may be the most cost competitive option. If the Higher forecast volumes cannot be achieved or approached, the Salt Lake City market may not be competitive for rail. In either case, as regards the prospective railroad, RLBA would consider Salt Lake City to be a secondary market to the more distant markets.