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EXHIBIT J

Final Report Rail Transportation Economic Impact Evaluation & Planning
Wilber Smith and Associates, 2005

Final Report

Rail Transportation Economic Impact Evaluation & Planning

prepared for



Nye County
Department of Natural Resources
and Federal Facilities



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PLANNERS
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1. INTRODUCTION

1.1 Purpose of assessment

This assessment quantifies economic benefits that could accrue to the Nevada counties of Nye, Lincoln and Esmeralda from the construction of the Nevada Rail line and from its use by local industries for freight transportation.

The Department of Energy (DOE), Office of Civilian Radioactive Waste Management (OCRWM) is preparing National Environmental Policy Act (NEPA) documentation for the Nevada Rail waste transportation system. The counties of Nye, Esmeralda and Lincoln and the City of Caliente, Nevada are concurrently assessing the economic opportunity represented by the construction and operation of the rail line, particularly with regard to the potential of shared use by commercial freight traffic. The DOE has stated its intent to transport High-Level Waste (HLW) and Spent Nuclear Fuel (SNF) to a geologic repository at Yucca Mountain, Nevada via a 'mostly rail' transportation strategy. In Nevada, the DOE intends to construct a new rail line for this purpose, from an interchange point with the Union Pacific Railroad (UPRR) at Caliente, NV, through the counties of Lincoln and Nye, and adjacent to Esmeralda County, to the repository itself. The Caliente Corridor route, approximately 513 km (319 miles) in length, will be designed and constructed specifically for the safe and secure transportation of SNF and HLW. The rail line may also enable freight shipment by industries throughout the corridor, with attendant economic benefits to the communities, counties and state of Nevada.

The Nye County Department of Natural Resources and Federal Facilities is assessing the potential economic benefits of the Nevada Rail facility to the counties of Nye, Esmeralda and Lincoln. This study is prepared in response to Task 2 of Nye County's overall work plan. The project summarized in this study is Task 2 of three tasks. Separate studies will be prepared to address the results of the remaining tasks. The scope of work for Task 2 includes the following sub-tasks appearing in Table 1.

Table 1: Nye County Overall Work Plan Task 2 Work Elements

Subtask	Work Statement
2.1	Identify the availability and location of construction materials (aggregates, railroad ballast, water, etc.).
2.2	Identify the availability and location of construction support (workforce, equipment, commercial supplies, etc.).
2.3	Provide options for the location of work camps.
2.4	Provide options for developing access to work camps from existing roads.
2.5	Provide input on local desires for operations of the rail line, including common carriage use.
2.6	Provide the intended purpose (local desires) and location for rail sidings.
2.7	Provide input on economic factors that may affect alignment decisions.
2.8	Provide information on possible commodities that could be shipped on the rail line by local communities if the decision were made to allow common carriage use.
2.9	Provide input from the counties' perspective of the viability of this rail system to integrate with local needs and expectations for mass transit between rural communities along the corridor.

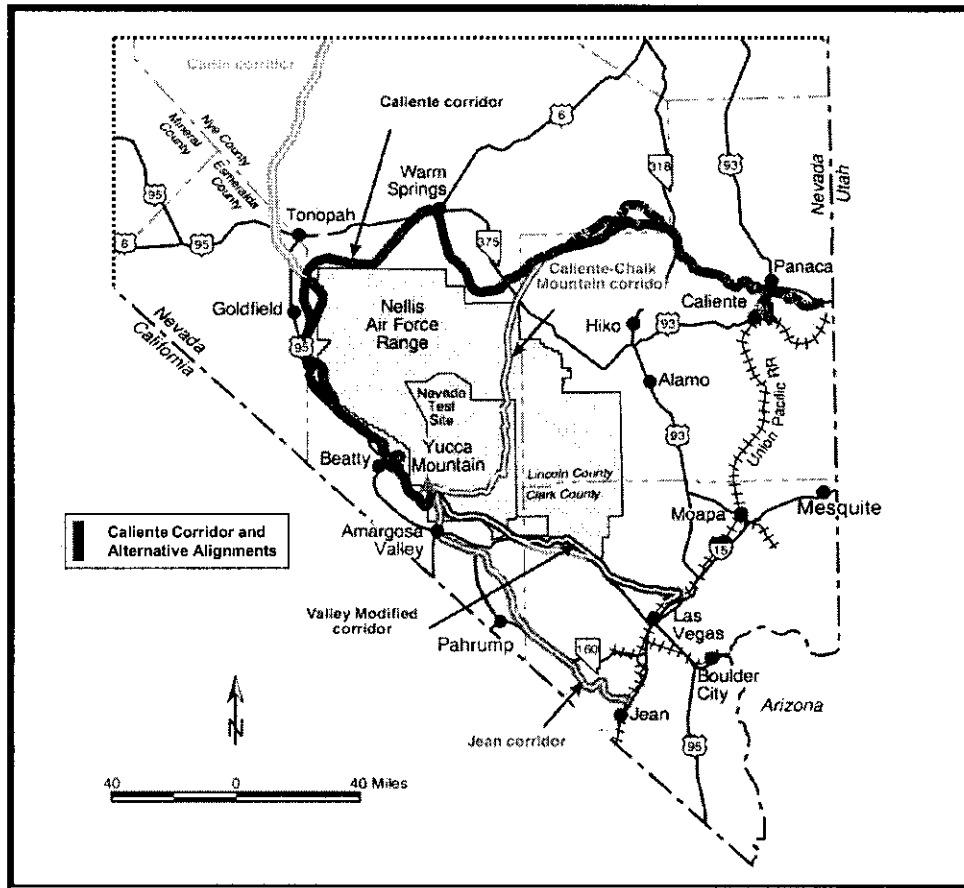
This study culminates the work defined in the preceding table. Whereas the DOE may use this information to evaluate the economic impacts and benefits to the state and local entities affected by Nevada Rail, the economic effects of construction depend on the procurement, sourcing and construction strategy being defined by DOE itself. Therefore, this study reflects an exchange of information with DOE and its consultants.

Because of the limited budget for this effort, and the fact that DOE is defining the Nevada Rail construction strategy, this assessment places limited analytic emphasis on subtasks 2.1 through 2.4 of the Task 2 scope. Instead, this assessment draws from work performed by Nye County staff to identify local stakeholders that may benefit from the presence of a new freight railroad, and estimates the immediate economic benefit the railroad may offer them and their communities. More detailed economic analysis of benefits throughout the corridor must be the subject of subsequent study.

Description of system and operations

The Caliente Corridor begins at an interchange point with the Union Pacific mainline near Caliente, Nevada, and then traverses west-northwest through Lincoln County. It enters the eastern border of Nye County, then re-enters Lincoln County at its upper western boundary. The route circumscribes the Nevada Test Site and Training Range, winding generally westward among several basins and ranges. Turning sharply south at the northwest corner of the Air Force range near Tonopah, the route passes close by the town of Goldfield. Although the proposed route itself does not enter Esmeralda County, six sections of land adjacent to the route are in Esmeralda County. The route then turns south-southeast, passing near the town of Beatty and Amargosa Valley, before entering the Nevada Test Site and the property of the proposed Geologic Repository. Along the corridor OCRWM has identified several alternative alignments, which are the subject of detailed assessment as part of DOE's ongoing Nevada Rail Draft Environmental Impact Statement (DEIS).

**Figure 1: OCRWM Nevada Rail Line
Caliente and Other Candidate Corridors**



Preliminary specifications for the Nevada Rail line call for a single-track mainline, with passing sidings to allow inbound and outbound trains to pass. At full operation there will be from three to five trains per week inbound to Yucca Mountain, and it is assumed that a similar number of empty trains will be operated outbound. DOE intends that these trains will exclusively transport HLW and SNF casks, accompanied by safety and security equipment and personnel, both to and from the repository.

A facility for the maintenance of waste transportation casks will be located at or adjacent to the repository. It is not yet clear whether this facility will also maintain rolling stock, motive power, or support the maintenance of right-of-way and track.

At Caliente, HLW and SNF shipments will be switched from the Union Pacific mainline to Nevada Rail. It has not yet been determined whether waste transportation trains will be operated exclusively on commercial railroads and switched directly to Nevada Rail, or whether waste shipments will be set out from mixed commercial freight consists at Caliente and picked up by Nevada Rail power for transport to the repository. The latter scenario necessitates a secure transfer facility at Caliente, and some facility for rolling stock storage and servicing.

1.2 Assumptions

The findings of this assessment are based on the following assumptions, consistent with information published by the Department of Energy, current descriptions of the Nevada Rail project, and discussions with DOE staff and stakeholders. The purpose of these assumptions is to provide parameters for the analysis of the economic impacts of Nevada Rail.

- **Mode:** The OCRWM strategy is for HLW and SNF to be transported to Yucca Mountain via 'mostly rail' – entailing construction of a new railroad in Nevada for this purpose.
- **Route:** OCRWM has selected the Caliente Corridor as the preferred route for the Nevada Rail facility.
- **Alignment:** The Caliente Corridor alignment and alternatives identified by OCRWM are the only alignments to be considered for assessing shared-use potential.
- **Implementation:** The Nevada Rail facility will be completed and operational for commencement of waste shipments during 2010.
- **Construction:** Completion of the Nevada Rail facility in advance of the repository will enable the railroad to be used for transportation of construction material and equipment.

- **Exclusivity:** Trains carrying OCRWM shipments, whether the casks are filled or empty, will operate via Nevada Rail exclusive of any other lading.
- **Schedule:** From 3 to 5 loaded trains will operate inbound to Yucca Mountain per week, and as many outbound, empty trains.
- **Speed:** Trains will be limited to an operating speed of 40 miles per hour on the Nevada Rail line.
- **Priority:** Regardless of other uses, OCRWM shipments will be the priority traffic using Nevada Rail.
- **Horizon:** OCRWM shipments to Yucca Mountain will continue for 24 years, through 2034.
- **Operation:** OCRWM has not determined the method by which operating services will be procured for Nevada Rail.
- **Business Case:** The Nevada Rail facility will be constructed, operated and maintained for the purpose of transporting HLW and SNF, and all capital and operational costs for waste transportation will be the responsibility of the federal government. For DOE's purposes, shared use is thus far ancillary to the fundamental business case for the railroad.

1.3 Methodology

1.4.1 Identification of stakeholders

The base data for identifying industries that might be served by shared use of the Nevada Rail line was the corridor business inventory prepared in support of Nye County's Preliminary Transportation Assessment Cooperative Agreement Task 1-A report. This information was supplemented by referrals from Nye County staff and outreach to representatives of government and business interests in each of the three counties.

1.4.2 Information collection

The principal sources of information for this assessment have been interviews with stakeholders throughout the three counties traversed by the Caliente Corridor, including elected officials, agency employees, representatives of corridor businesses, and consultants and academics who have performed related studies. Information regarding the Nevada Rail project has been obtained both via interviews with OCRWM staff and consultants, and from official published information regarding the project. Cost coefficients used for estimating transportation costs are domestic industry averages.

1.4.3 Quantifying economic benefits

The primary benefits of shared use of the Nevada Rail line are anticipated to be the improved economics of transportation available to industries that ship by rail instead of by truck. A survey of corridor businesses identified by the Nye County Department of Natural Resources and Federal Facilities yielded a short list of industries that could conveniently ship via rail, either from dedicated spurs or from team tracks proposed to serve Caliente, Tonopah, and Amargosa Valley. Scenarios for high, mid-range and low freight service were defined using the estimates of these industries' shipping volumes, in tonnage and carloads. Applying average shipping cost differentials and employment statistics yielded potential savings to on-line shippers, money available to increase staffing and production, and resultant employment and economic benefits to the three counties.

2. CONSTRUCTION BENEFITS

The discussion that follows is a summary of current DOE efforts with regard to the sourcing of construction materials and a workforce to build Nevada Rail. The DOE efforts are essentially duplicative of aforementioned Tasks 2.1 through 2.4 that were specified for this study. Per an agreement between DOE and Nye County, this study was to de-emphasize Tasks 2.1 through 2.4. There are two reasons for this. First, DOE has already covered much of this ground. Second, DOE was more desirous of the insight of this study's consultant team with regard to potential commercial uses of the rail line and even passenger service - areas in which DOE has done comparatively little. These items are discussed in the Sections 3 and 4 of this study.

What appears below is a brief presentation of what DOE has done relating to Tasks 2.1 through 2.4. Fuller discussions of these items will be available in the DOE's forthcoming DEIS for Nevada Rail¹.

2.1 Construction materials

Bechtel SAIC Company (BSC), the prime contractor for the DOE's ongoing DEIS, has retained a geotechnical consultant to identify deposits and sources of aggregates for rail line ballast, a hydrology consultant to identify water sources, and a conceptual design consultant to identify sources for rail, ties, tie plates and other manufactured materials for building rail track. Per BSC at the time of this writing, the efforts of the three specialist consultants are underway.

¹ The discussion is based on a conversation in December 22, 2004 with Richard Holder of BSC and Bill Garfield, consultant to BSC.

2.2 Construction workforce and equipment

BSC and its consulting team have not identified a workforce *per se* for the construction of Nevada Rail. The reason is BSC's assumption that the recruiting of the workforce will be the responsibility of the contractor assigned to build the line. BSC does recognize, however, that there may be workers in Nye, Lincoln, and Esmeralda Counties who might wish to participate in the construction of Nevada Rail. However, BSC expects that there would be few in the counties with skill sets specific to rail line construction and even fewer who have actual rail line construction experience, as no existing rail line is near the Nevada Rail route except in Caliente.

BSC likewise has not investigated sources for construction machinery in the counties. The reason is that BSC assumes that the contractors likely will bring their own heavy machinery with them to the construction site. While there may be opportunities for local machinery vendors to supply the project, BSC estimates these opportunities as minimal.

That said, this analysis recognizes that the grading of the rail line will be much like that required for road construction and may be an opportunity for local contractors.

2.3 Work camp location, function and activity

BSC is identifying where the work camps should be located, and has gone so far as to identify specific candidate locations. These work camps will be necessary for construction. Conceivably, they could provide rudimentary housing, a cooking facility, sanitary facilities, a medical facility, a laundry, a small market and some basic recreational amenities. An alternative to housing at the work camps, workers might be able to use in certain areas existing, available housing stock.

BSC has not done any detailed assessment of existing housing opportunities, as utilization of existing housing stock really depends on the construction strategy that the DOE finally adopts. For example, if DOE decides to compress the time frame for construction, labor requirements will intensify, and so, too, will the need for housing. At this point, however, BSC feels its current effort to identify work camp locations is sufficient for the DEIS. That noted, the current alignments to pass through or approach the communities of Caliente, Tonopah, Goldfield, and Beatty, and it is reasonable to assume that at least some workers would find available short term housing and amenities there.

2.4 Construction and work camp access

BSC is anticipating that the rail route will have access roads leading to it from local highways generally every 10 miles. BSC is looking at using existing roads to the maximum extent possible, and is considering new access roads only where needed. These roads will be used to bring construction materials and workers to the line. The

roads will remain following the construction of Nevada Rail to provide access for maintenance. BSC is not anticipating that the construction of a road parallel to the rail line would be needed. Further, BSC considers that such a road in itself would become a maintenance issue.

3. POTENTIAL SHARED USE

3.1 Existing freight markets

The report completed in January 2004 by the Nye County Board of Commissioners for Task 1A under the County's Cooperative Agreement with the US Department of Energy states among its conclusions that:

The Caliente and Carlin rail corridors, which have been identified by the DOE as the preferred proposed repository rail corridors, have no appreciable benefit to non-nuclear businesses presently located in the region that might consider becoming rail customers.

Nye County Board of Commissioners: Preliminary Transportation Assessment Cooperative Agreement Task 1A; Prepared for the U.S. Department of Energy under Cooperative Agreement DE-FC28-03RW12223; January 2004

One of the reasons for this finding is that one of the principal criteria for the candidate routes and alternative alignments was their remoteness from human habitation and commerce. Over most its distance, the Caliente Corridor ably satisfies this criterion.

Furthermore, shipment via rail is most efficient for businesses located near the rail line, particularly if their shipments are loaded and unloaded directly from rail cars. Intermediate transport via other modes to or from the rail line, and intermodal transfer impose additional costs that render rail transport decreasingly efficient for businesses located farther from the rail line.

Given these considerations, a new rail line in the Caliente Corridor will not offer broad commercial benefit to businesses throughout Nye, Esmeralda and Lincoln counties. It may, however, represent a more efficient means of freight transport for existing industries located in the immediate vicinity of the rail line. *These industries currently ship insufficient quantities to justify a stand-alone commercial rail operation.* It is possible that the efficiencies provided by rail will allow these existing industries to expand, if the Nevada Rail project allows for commercial use of the tracks.

In December 2004 the Nye County Department of Natural Resources and Federal Facilities completed an exhaustive survey of land uses and ownership over the entire Caliente rail route, in conjunction with the Task 1A report cited above. This survey included businesses that could be candidates for freight shipment via rail, and provided

a basis for the assessment of potential Nevada Rail freight markets. The Nye County survey includes all businesses that are sensitive to the actual alignment of the Nevada Rail route. Not all of these businesses ship freight of commodity types or in quantities that are economical for rail transportation. This assessment considers only businesses in the vicinity of the Caliente alignment and its alternatives that are likely to ship viable quantities of freight via rail. The industries considered were the ones that the study team believes have the potential to ship sufficient quantities to receive savings on transportation costs.

3.1.1 Information collection from existing shippers

In this task, the team was requested to "Provide information on possible commodities that could be shipped on the rail line by local communities if the decision were made to allow common carrier use." The task assumed that the railroad would be constructed, thus the direction was to determine potential users and traffic volumes. The team reviewed the Task 1A report and discussed our efforts with other contractors working for the DOE. As DOE has not yet determined whether or not it is in the best national interest to allow commercial use of the Caliente Corridor, no work has been undertaken to date on traffic studies by their consultants.

The Task 1A report identified a large number of potential shippers along the route. However, many of these industries do not ship quantities suitable for diversion to rail. A listing of likely shippers, presented as Appendix 1, thus includes best estimates of shipments likely to be diverted from truck to rail. Many of the shippers identified in the Nye County Task 1A report are included in the carload counts for team tracks at Caliente, Tonopah, and Amargosa Valley. ("Team track" and similar terms are defined on page 20.) It is assumed that the team track at Tonopah would be located to also serve customers in the Goldfield area. It was also assumed that the team track in Amargosa Valley would serve customers in the Beatty area.

Rail transportation is most effective in shipping large volumes of non-time-sensitive cargo long distances². The study therefore focused on customers that have the potential to ship 1,000 tons (the equivalent of 10 rail cars or about 50 trucks) or more per week. Shippers with smaller weekly amounts are assumed to continue to ship via truck. Occasionally, a customer may require a large one-time shipment (e.g. a large earth-moving machine); this type of shipment is assumed in the team track numbers.

The shipment quantities included in Appendix 1 were derived from in-person interviews with representatives of businesses between Yucca Mountain, Tonopah and Caliente. Additional telephone interviews were conducted with potential shippers as documented

² This is to say, the economic considerations of shipping larger volumes of bulk commodities over longer distances tend to favor rail over truck transportation.

below. Nye County staff and consultants also provided contact information. A number of potential customers were identified, mainly at the southernmost end of the alignment.

Key findings

- 1) The alignment between Tonopah and Yucca Mountain traverses territory that is very lightly populated, with limited industry.
- 2) The alignment between Tonopah and Caliente traverses territory that is essentially unpopulated, except for the nine-mile segment immediately north of Caliente along the former Pioche branch.
- 3) The numbers of car loadings identified do not appear on their own to support a private carrier. However, depending on how trackage use agreements are worked out with DOE, there is a potential for a carrier to cover the "above the rail" costs as a discrete business from the transport of HLW and SNF³.
- 4) If a coal-fired power plant is developed in the Dry Lake Valley area, the portion of the line from Caliente to the power plant has the potential to be self-sufficient.
- 5) The key for any of the respondents is whether or not their cost of transportation will be less if they use rail instead of shipping by truck.
- 6) Freight trains will have to operate at least twice a week to provide an acceptable level of service.
- 7) A minimum of three crews is an estimated requirement to transport a car from Caliente to Yucca Mountain and return. This assumes that operations and servicing are based near the midpoint of the rail line, such as near Tonopah.
- 8) Running maintenance and heavy repair facilities can be located at Caliente, Tonopah, Yucca Mountain, or some combination of all three.
- 9) The benefits of the railroad to Lincoln County are anticipated to arise from rail shipment by tenants of the planned industrial park, and employment created by an interchange between UPRR and the Yucca Mountain rail line. Railroad jobs would include equipment maintenance, track maintenance, operating crews and supervision. Ancillary benefits would include housing for out-of-town crews, retail to support the interchange, and the potential for additional industrial development along the alignment.

³ These costs are fuel, labor, equipment maintenance and leasing costs.

Summary of stakeholder interviews

The Study Team contacted a number of civic and business leaders along with potential shippers to develop our understanding of the potential for commercial railroad services along the Caliente Corridor. Many of the stakeholders noted the potential for the commercial rail service to allow their businesses to expand, but only if using rail will reduce their overall transportation costs.

Several comments noted that the area was originally developed due to gold and other heavy metal mining, and that the rail service could assist in the revitalization of the industry in the area. However, the last major mining effort, the Bullfrog Gold mine at Rhyolite, has been dormant since 2000, reportedly due to a depletion of the ore body. The team did not identify any large mines along the corridor that are currently in production. While some exploratory work is being conducted near Goldfield, to date no production plans are imminent. It is important to note that the operation of modern gold mines does not require significant rail service. Rail service can improve the efficiency of mining operations such as copper or base metals that require the ore to be shipped out for smelting, or the amount of final product a week is over 1,000 tons. Otherwise, modern mines only benefit from rail service for the occasional movement of mining equipment inbound, with the even less frequent inbound shipment of refining materials in tank cars. This type of service can be accommodated by the team tracks proposed along the route.

The list below is a summary of the interviews and information developed:

- 1) **Cind-R-Lite:** Contacted Andy Coop, Mine Manager (775-764-0915.). The study team estimated that this industry could generate around 20 carloads going to Riverside in Southern California each month. The shipments would depend on developing a large storage/retail site in Southern California.
- 2) **Farland Refinery Corp:** Contacted Pete Ipson (801-298-9866). There is no potential to revitalize the company's refinery in Tonopah, by virtue of rail haulage. The company is in the process of relocating the facility to another site located north of Warm Springs. There is potential for inbound loads of crude oil and outbound loads of refined product from a site approximately 100 miles east of Tonopah. The volume could be as much as 10 cars a day inbound, and 2 cars outbound daily, from a transloading facility at the Warm Springs summit on Highway 6. Twice a week service would be adequate for their needs. Farland would buy the crude on the spot market, thus the rail haul could be from any oil-producing region. They are currently receiving oil from western Canada. A major factor in their decision to use rail will be the initial infrastructure costs, which they understand will be over \$150,000.

- 3) **US Ecology:** Contacted Chadd Hyslop (208-331-8400). USE operates a plant in Idaho that receives over 300,000 tons annually by rail. The facility south of Beatty could accommodate this amount also. The material could come from any point in the US or Canada that is more than 500 miles away. He discussed the benefits in terms of increased employment in Nye County, and the ability to reduce truck traffic. Twice weekly service is acceptable to the company, at least at the conceptual level. The major concern is the ability to make the haul economically feasible considering the 310-routing from the mainline.
- 4) **D&H Mining:** Contacted David and Natalie Spicer (775-553-2459). D&H operates a landscape rock quarry located along the alignment north of Beatty. The company currently ships at most 2,000 tons a week by truck, but is aggressively marketing its product, and expects to be able to ship 100,000 tons annually by rail, if the freight rates are competitive with trucking. Twice weekly service is acceptable to the company, at least at the conceptual level. The major concern is the ability to make the haul economically feasible, considering the 310-mile routing from the mainline. It is also developing a bottled water product line, which would be shipped in boxcars to market, if the opportunity existed. Mr. Spicer is very optimistic about his ability to utilize the rail line, if shared use is allowed.
- 5) **Ponderosa Dairy:** Contacted Ed Goodhart (775-372-1300). The dairy ships in approximately 1,000 tons weekly of animal feed grains, such as corn, beet pellets, cottonseed, and others, via truck from a transload in Las Vegas. Rail would only be an option if it lowered the transportation costs.
- 6) **Metallic Goldfield Inc.:** Contacted Ed Devenyns (775-826-2463). The company currently has rights to a large potential mineral producing area east of Goldfield. Future explorations may develop a future ore body that would benefit from rail, although none is currently identified. Mr. Devenyns is concerned that the current alignment proposed passes through the Goldfield Mining District, and may preclude mining in the area. He wishes the line to be re-routed to the west of Goldfield.
- 7) **Natural Pozzolan of Nevada:** Contacted Dr. Steve Klomp (775-728-4432). Dr. Klomp is developing a large deposit of Pozzolan, a cement additive that extends the life and increases the strength of concrete, north of Caliente. He stated that a rail line would allow him to expand his market and operation significantly. Trucking the product to market is currently costing as much as \$75 per ton to Colorado, significantly higher than a comparable rail haul rate. The company could expand to over 300,000 tons annually if rail service were available. Dr. Klomp also believes that the product could be shipped to the

Yucca Mountain repository as a constituent in the sizable volumes of cement that will be mixed there.

- 8) **Nye County:** Contacted Commissioner Candice Trummell (775-209-3824). Ms. Trummell talked about the potential for the growth of the northern portion of Nye County if the rail line were open to commercial traffic.
- 9) **Esmeralda County:** Contacted George McCorkle and Robison Sidler (775-485-3419). The current alignment operates east of Goldfield, and actually never enters Esmeralda County. The county is working on a plan to relocate the Goldfield airport to a point west of the community, and develop a light industrial/manufacturing complex adjacent to the airport. Creation of the complex will also require the construction of housing and other supporting facilities that currently do not exist in the area that could generate inbound loads of construction materials. If light manufacturing is attracted to the area, the potential exists for inbound plastic pellets⁴ for plants using injection molding to create final plastic product.
- 10) **Lincoln County:** Contacted City of Caliente Mayor Kevin Phillips (775-726-3891). Caliente is working on the development of a small (60 acre) industrial park south of the community. The industrial park could be served by rail, if an interchange yard between the UPRR and the Yucca Mountain line were to be created. The community is actively marketing small companies that could relocate to Caliente from Las Vegas or Southern California.
- 11) **Lincoln County:** Contacted Mike Baughman, Intertech Services (775-883-2051). Lincoln County is working aggressively to attract new business from Southern California and Las Vegas to the area. Potential use of the rail line includes hay pellets from the Rachel area for export, cement additives from Pioche, and in the future, a coal fired power plant in the Dry Lake Valley where the Nevada Rail alignment crosses the alignment of the proposed Southwest Interstate power line and the Lincoln County Water Authority water line. The amount of coal delivered to a typical power plant is sufficient to support the rail line from Caliente to the Dry Lake Valley.

This study recognizes that there may be other potential rail shippers in the Amargosa Valley which the study team did not identify during the course of its investigation. Documenting the existence of such shippers will be a key task in any further study of Nevada Rail's commercial traffic potential.

⁴ Plastic in pellet form is produced at the refinery as the raw material for the manufacturing of plastic goods. It is often shipped to the manufacturing facility in 100-ton cars. The cars are also frequently used for on-site storage of the raw material.

3.1.2 Freight transportation demand

Appendix 1 presents three scenarios for freight shipments by businesses served by the Caliente Corridor. These low, medium and high scenarios correspond to the ranges of shipment quantities estimated for each potential shipper, and are summarized by commodity type in Table 2. The total quantities of material shipped for each commodity type annually are used to quantify potential benefits to the region served by the Caliente corridor.

Table 2: Nevada Rail Freight Transport Annual Demand Scenarios

Commodity	Low		Mid-Range		High	
	Tons	Carloads	Tons	Carloads	Tons	Carloads
Farm Products	40,000	400	50,000	500	60,000	600
Coal	---	---	---	---	2,079,840	20,798
Non-Metallic Minerals	100,000	1,000	150,000	1,500	300,000	3,000
Chemicals	33,698	337	50,546	505	67,395	674
Petroleum & Coal Products	165,867	1,659	248,801	2,488	331,734	3,317
Stone, Clay, Glass, Concrete	136,000	1,360	254,000	2,540	272,000	2,720
Waste and Scrap Materials	100,000	1,000	150,000	1,500	200,000	2,000
All Other Commodities	84,000	840	126,000	1,260	168,000	1,680
	659,565	6,596	1,029,347	10,293	3,478,969	34,789

It should be noted that the “high” scenario includes the coal-fired electric power plant planned to be located in the Dry Lake Valley. The above estimates of carloads and tons were derived from shipper comments and the study team’s professional opinion of the commercial rail traffic potential of Nevada Rail.

3.2 Potential new markets

Each of the counties that are the subjects of this study have identified opportunities for economic development that could be enhanced by the implementation and operation of the Nevada Rail and the geologic repository itself. The principal economic development strategies of these counties involve establishing industrial and business parks and attracting new businesses. The importance of the rail line to their development depends on the types of industries they attract, their scale, and proximity to the rail line.

3.2.1 Economic development initiatives

Lincoln County's 2003 Comprehensive Economic Development Strategy identifies several opportunities that may directly or indirectly benefit from the presence of a freight railroad. Industrial Parks are proposed in the vicinities of Alamo and Caliente, both of which are in early development and discussion with potential tenants. The Meadow Valley Industrial Park, in Caliente, may include such industries as recycling of plastics, tires and wood products, beverage bottling, trucking, and hay cubing, all of which could ship via rail. Among industries in their earliest stages is the development of Pinyon-Juniper biomass material as a feedstock for modular electrical generation plants. In addition, the City of Caliente is considering the potential of an intermodal transfer facility for goods being shipped to the geologic repository. Rail facilities in Caliente are planned to include a team track to serve industries distributed through the area.

Esmeralda County is sparsely populated, and has historically relied on mining and agriculture as its principal economic drivers. Its principal population center and county seat, Goldfield, is located close to the Caliente Corridor alignment where it traverses the western boundary of the Nellis Air Force Range. Development of a business park in Goldfield could be enhanced by the proximity of the Caliente Corridor and a dedicated spur. Alternately, a siding and team track in Tonopah could also serve Goldfield industries. While the main resource industry in Esmeralda County is mining, rail access is not necessarily a catalyst to its development, particularly for minerals such as gold, which is typically extracted on site. There are several initiatives to evaluate alternative uses of closed mining facilities, including re-processing of mine tailings, and use of open pits for sanitary landfills.

Nye County, as can be seen in Appendix 1, has the greatest number of industries of sufficient scale and close to the Caliente Corridor alignment that may benefit from shared use of the rail line. Industrial parks are also being planned for Nye County, at Tonopah and Amargosa Valley. The Round Mountain Mining Corporation operates a large gold mine in the Big Smoky Valley, north of Tonopah, an operation of sufficient scale that a rail line might serve it for the transport of chemicals, materials and equipment, transloaded at a team track in Tonopah.

3.2.2 Industries to serve repository or rail line

Given the scale of the Yucca Mountain repository, it is possible that any of the industrial parks in planning by Nye, Esmeralda or Lincoln counties could attract businesses focused on service to the repository itself or the Nevada Rail line. None of the counties yet has a complete sense of the types and scale of businesses that could develop around the repository, nor have they targeted candidates for location in their planned facilities.

An example of a resource industry that could serve the repository is Natural Pozzolan, a producer of additives to aid the curing of concrete. The repository itself is likely to be a large consumer of concrete products for the lining of storage drifts. Natural Pozzolan would be a likely local source for concrete additives.

3.3 Potential capital enhancements - locations of sidings and spurs

This study outlines the operating purpose of different siding types, and provides a conceptual location or locations for each type. The information is based on previous experience in developing freight railroad facilities, along with interviews with potential freight railroad customers.

Table 3 shows the difficulty of access for each potential customer. "Low" access difficulty indicates a facility that is along the main line, with little or no new track required to serve the customers. "Medium" indicates a facility that requires investment by the customer, and is not along the alignment. "High" indicates a facility that cannot be served by the current alignment, but could if the alignment was shifted, or a branch line was to be constructed. The commercial-use "Beatty Branch" alignment would start north of Beatty, roughly paralleling the route of Highway 95 for approximately 24 miles to a point north of Amargosa Valley. This branch would serve several of the potential major customers, such as US Ecology, Cind-R-Lite and the Ponderosa Dairy, as well as other potential customers in the region. However, extending the line to serve Pahrump directly would require an estimated additional 41 miles of track, or a total length of 65 miles from the Caliente Corridor. Such a distance, longer than the road haul distance from Las Vegas, is not economically viable. This assessment did not include conceptualization of the alignment for a Beatty Branch, or locations of customers along such a facility. The exact location of the alignment would be based on terrain, roadway access, constructability, and a detailed operating and customer study.

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Table 3: Type of Spur by Customer

Customer	Location	Type of Track	Mode of Access	Difficulty of Access	Comments/Notes
Caliente Team Track	Caliente	Team Track	Along Main Line	Low	Also includes carloads to the Caliente Industrial Park.
Tonopah Team Track	Tonopah	Team Track	Along Main Line	Low	Assumes a location that serves both Tonopah and Goldfield
Amargosa Valley Team Track	Amargosa Valley	Team Track	Beatty Branch	High	Assumes location at south end of Beatty Branch that serves both Beatty and Amargosa Valley
Natural Pozzolan	Pioche	Industrial Spur	10 mile truck haul to Main Line	Medium	Spur track with movable loader at lower levels of shipping, loading tippie as business grows.
Cind-R-Lite	Amargosa Valley	Industrial Spur	15 mile truck haul to Beatty Branch	High	Spur track with movable loader at lower levels of shipping, loading tippie as business grows.
US Ecology	Amargosa Valley	Industrial Spur	Beatty Branch	High	Spur track with container handling area at end.
D&H Mining	Beatty	Industrial Spur	Along Main Line	Low	Spur track with movable loader at lower levels of shipping, loading tippie as business grows.
Farland Refinery Corp	Willow Pass	Industrial Spur	50 mile truck haul to main line	Medium	Inbound crude and outbound transfer racks.
Ponderosa Dairy	Amargosa Valley	Team Track	20 mile truck haul to Beatty Branch	High	Movable loader/unloader as part of Team Track facilities, truck access.

Track types

Passing track: A passing track is a double-ended track that is used to allow trains headed in different directions to pass each other. Passing tracks should be located to minimize delays to trains, but are rarely long enough to permit trains to pass without one train stopping. For the Caliente Corridor service, passing tracks of 4,000 feet in length appear to be sufficient. This length will allow two commercial freight trains to pass without extra switching. The commercial trains are expected to average 60 cars in length. This is based on the estimated commercial service frequency of twice a week service for the low estimate, three times a week for the mid-range and daily for the high service level. The commercial trains are expected to be significantly longer than DOE container trains. Each passing track should also have a short (less than 1,000 feet) single ended track at one end for use by maintenance-of-way forces or to temporarily store malfunctioning equipment. Passing tracks should be located approximately every 30 miles to minimize delays between opposing trains. This study did not look at the exact locations of the passing tracks. The exact location and number of passing tracks will be based on terrain, roadway access, constructability, and a detailed operating study.

Team track: A team track is a short (1,000 feet or less) track off of a passing track that is available for use by any customer. The track can be either single or double ended. Team tracks normally have a paved area where trucks can access the freight cars, along with a loading dock for transferring machinery or pallets, and a small pit for augers to unload grain or other small, free-flowing commodities. The study assumed a team track at Caliente, Tonopah (which also would serve customers around Goldfield) and at the south end of the line between Beatty and the Amargosa Valley. As was the case of passing tracks, this study did not look at the exact locations of the team tracks. The exact location and number of team tracks will be based on terrain, roadway access, constructability, and a detailed operating study.

Industry spur: An industry spur is a track off either the main line or a passing track that is devoted to a single customer. Industry spurs are normally single ended and vary in size and length depending on the needs of the individual customer. The supporting infrastructure also varies with the type and amount of commodity being shipped at the site. Crude oil requires loading racks with flexible pipes and steam lines to allow unloading during the winter months. Landscape rock could be loaded via a front-end loader with a level area along side the tracks for smaller shipments, to pass through loading tipples for larger amounts. Industrial spurs would be needed in the Caliente Industrial Park, near Panaca for Natural Pozzolan, Warm Springs for Farland Refining, north of Beatty for D&H Mining. This study did not define exact locations for industry spurs, which would be based on terrain, roadway access, constructability, and a detailed operating study.

Branch line: A branch line is a rail line off of the main line that serves one or more shippers. Branch lines typically are longer than industrial spurs. The study identified the need for the Beatty Branch, a 24-mile line running from Beatty south to the Amargosa Valley to serve US Ecology, Cind-R-Lite and Ponderosa Dairy. This study did not look at a precise alignment for this branch.

Loading/unloading loop: A loading/unloading loop is a track off of the main line or a passing track that is used for the loading or unloading of unit trains⁵. The infrastructure on a loading/unloading loop must be of sufficient size to load/unload the train within 72 hours or less. This type of facility would be required if the Dry Lake Valley power plant is constructed, and might also be necessary to support the 'High' demand estimates for Natural Pozzolan, D&H Mining, US Ecology and Cind-R-Lite.

This analysis does not include cost calculations for improvements to support commercial freight service on Nevada Rail. The cost requirements would be the subject of a more detailed analysis. Funding sources would be discussed at that time. Conceivably, federal sources could be used to build a branch line, like the assumed Beatty Branch, with commercial operations supporting the ongoing maintenance needs of the branch.

3.4 Passenger operations

County officials were queried regarding the viability of the Nevada Rail system to integrate with local needs and expectations for mass transit between rural communities along the corridor. Conversations with local officials indicated that the concept was included in this study to ensure that all potential use options are considered. The study team's efforts were based on the assumption that the line was in place, and that DOE will permit civilian passenger service along the route. What follows is a brief discussion of the challenges and benefits of passenger service along the Caliente Corridor, including capital and operating costs, ridership and subsidy requirements. Findings reflect the experience of a number of passenger rail feasibility studies over the past years for clients across the United States.

3.4.1 Intercity rail

This analysis considers the ridership and costs of implementing an intercity passenger rail service operating between Beatty, Goldfield, Tonopah and Caliente – a distance of approximately 300 miles. The service would operate three round trips per day. At an average speed of 50 mph, the trip would take six hours one way. The discussion that follows considers the ridership, revenue and costs of this service.

5 A "Unit Train" is a train that shuttles between a single shipper (such as a mine) and receiver (such as a power plant). The elimination of intermediate terminals and switching provides the railroad will significant operating savings. However, the train must be of sufficient size (normally 60 cars or more) to realize the savings.

Ridership

Passenger rail ridership is normally estimated as a percentage of the travel market. In heavily developed corridors, with significant traffic, commuter rail with a high service level of multiple trains operating during peak work hours over distances of 20 to 80 miles can attract between 5 and 9 percent of the market. Intercity rail, with fewer frequencies traveling longer distances, typically earns far less a share of the travel market. Nationwide, passenger rail attracts less than 1 percent of the market.

As noted, a key factor in determining ridership is the number of trains a day, or headways. A service with one train a day is not viable in today's travel market, simply because it does not provide enough flexibility for riders to make it an attractive option. A reasonable minimum number of daily trains in each direction to provide a corridor service is three – basically, a morning, mid-day and evening schedule of service. To provide three departures a day, a fleet of at least eight self-powered vehicles would be required. This assumes that a train set makes a single one-way trip a day, with a spare sets for routine maintenance cycles. Even such a service level, which is comparable to Amtrak/Caltran's sponsored San Joaquin service between Oakland/Sacramento and Fresno (with distances that are similar to a Beatty-Caliente passenger service), would be unlikely to attract more than a handful of riders per day.

A review of Journey to Work data compiled from the U.S. Census for 2000 indicates that there are 20 work trips from the general Tonopah area to the general Beatty area, and 4 work trips from the general Caliente area and the general Beatty area per day. This calculates to 24 home-to-work round trips or 48 one-way trips per day. This study assumes that these trips would occur mostly on weekdays. However, not all trips occur every weekday. For this analysis, 80 percent, or 38 trips are assumed to occur every weekday. Assuming at best a 1 percent mode share, there is less than 1 work trip per day could be attracted to an intercity passenger rail service between Beatty and Caliente. While the data above does not include leisure, student, mid-day or weekend travel, it is unlikely that these markets could significant boost ridership, which for this analysis is considered statistically insignificant.

Capital costs

Capital costs for the service will be for self-propelled Diesel Multiple Unit (DMU) train sets, stations, and a support facility in Tonopah. DMU train sets are assumed, as they are more cost effective than traditional locomotive-hauled train sets in light passenger density corridors. Station costs include a platform, parking, passenger shelter, and a station track allowing trains to 'layover" (be stored), as required (depending on schedules, some trains may layover overnight at the ends of the line at Beatty and Caliente). The station costs do not include the construction costs for access from Beatty, Goldfield and Tonopah town centers. Depending on the alignment finally

selected, the centers of these communities would be from about 3 to 10 miles from the rail line. The support facility in Tonopah would perform fueling and cleaning, running maintenance, major overhauls, and the federally mandated inspections of the rolling stock. These capital costs total to \$54 million, as summarized in Table 4.

Table 4: Capital Costs for Passenger Service

Item	Cost Each	Number Required	Total Cost
Train Set ⁶	\$ 4,500,000	8	\$ 36,000,000
Stations ⁷	\$ 1,500,000	4	\$ 6,000,000
Maintenance and Storage Facility ⁸	\$ 12,000,000	1	\$ 12,000,000
Total Estimated Capital Costs:			\$ 54,000,000

Operating costs

To estimate costs, this analysis looked to unit costs experienced by passenger rail operations and made adjustments as necessary to fit the profit of a passenger service operating on between Beatty and Caliente.

The Metrolink commuter rail system in Los Angeles pays about \$41 per train mile for its operations on its lines. This figure includes crew expenses, maintenance of way, maintenance of equipment, insurance, and administrative costs. When considering a Beatty-Caliente passenger service, the \$40 per train mile figure can be discounted, as insurance liability costs (a function of ridership) would be minimal and maintenance way expenses of the rail line will be the responsibility of the DOE. Estimated new operating costs appear in Table 5. For this analysis, a \$25 per train mile operating cost is assumed.

⁶ A train set is defined as a two car Diesel Multiple Unit (DMU) train, with capacity for approximately 120 riders.

⁷ Caliente, Tonopah, Goldfield and Beatty. Assumes 200' platform, parking, restrooms, a passenger shelter, and a station track for layovers, as needed.

⁸ Assumes a maintenance shop building capable of housing 2 train sets, with inspection pits, fueling, cleaning and running maintenance, and storage tracks.

Table 5: Operating Costs for Passenger Service

Trips Per Day	Cost Per Mile	Miles Per Day	Daily Cost	Annual Cost	Revenue ⁹	Subsidy
1	\$25	600	\$15,000	\$5,475,000	N/A	\$5,475,000
2	\$25	1,200	\$30,000	\$10,950,000	N/A	\$10,950,000
3	\$25	1,800	\$45,000	\$16,425,000	N/A	\$16,425,000

Thus the total subsidy for three daily round trips between Beatty and Caliente would be \$16.4 million per year, with negligible offsetting revenue.

3.4.2 Tourist rail option

The other potential service option is to create a historical or tourist-oriented service along a small portion of the route. Successful tourist operations require a large population base to draw from and proximity to an interstate highway, and they are complements to other tourist activities in the area. Few tourist operations are strongly profitable, and most rely heavily on a volunteer labor force to survive. A comparison may be made to the Nevada Northern Railroad in Ely. Starting with a donation of a complete shop and extensive collection of historic equipment, and a larger population base, it relies heavily on volunteers, requires an annual subsidy and constant fund raising to survive. Any tourist operation along the Caliente Corridor would face developing its own shop facilities, equipment fleet, and volunteer pool. Overcoming these challenges does not appear to be feasible at this time.

4. ECONOMIC BENEFITS

In general, investment in a freight transportation system generates a series of economic benefits to the region it serves:

- **Direct Economic Effects** accrue from immediate cost reductions to the businesses that use the transportation system, and the operation of the railroad itself. Reduced transportation costs enable existing businesses to increase production, operations, employment, sales, and development, and may attract new businesses to the region.
- **Indirect Economic Effects** are those that accrue to suppliers of services, goods and materials obtained by the businesses that expand or relocate in response to the benefits of the transportation investment.

⁹ Ridership (and thus revenue) was statically non-existent.

- **Induced Economic Effects** encompass increased spending by the employees of expanded and relocated businesses for basic goods and services.

These benefits accrue in the event of shared use of the Nevada Rail facility to serve local freight customers, whether they are shipping their own freight or are shipping goods and materials to support the repository. Additional benefits specific to freight rail service arise from the reduction of highway traffic due to the diversion of freights from truck to rail. These benefits include reduced congestion, shorter travel time, and improved highway safety. The benefits are clearly of importance to the counties of Nye, Lincoln and Esmeralda and others through which truck-borne HLW and SNF shipments would pass on Nevada highways.

4.1 Direct economic effect: savings to local shippers

Shared use of the new Nevada Rail line may enable local shippers to extend their reach into markets in and beyond Nevada, and to take advantage of economies of scale as their unit production and operating costs decrease. Operated efficiently and responsively, the railroad may enable shippers to plan their production and shipment more accurately, and to reduce inventory costs. Additional economic benefit will result from new businesses locating in the vicinity of the rail line, and the new jobs they create. The availability of efficient freight transportation may enhance the development of planned industrial parks in Caliente, Tonopah and Amargosa Valley.

The principal direct economic benefits of the Nevada Rail line estimated by this study are those accruing to existing and potential new or revived businesses located near the rail line. Of these, some businesses would be able to realize transportation cost savings by diverting all of their shipments from truck to rail. Other businesses, such as precious metal mining operations, process raw material on site and are less likely to ship raw product (ore) via rail.

Given the volumes of freight estimated from on-line shippers in section 3.1.2, a first-order estimate of the immediate economic benefit of the Nevada Rail line to contiguous industries may be calculated, using benchmark transportation cost data. The American Association of State Highway and Transportation Officials, in its 2002 "Freight Rail Bottom Line Report" applied average costs per ton-mile from the year 2000 for shipment of all commodities via freight rail and via trucking, to demonstrate the value of rail system investment to shippers of all commodities, nationwide. The AASHTO study valued the cost of truck shipment at \$0.080 per ton-mile, and rail shipment at \$0.024 per ton-mile. These generalized costs are used to assess the value of shipments of all commodities from industries that would be served by the Nevada Rail line in the Caliente Corridor.

The industries identified in section 3.1 currently ship or receive commodities via truck that could be shipped by rail. The shipments estimated in section 3.1 represent volumes of freight that would be diverted from shipment by truck to rail. Assuming that shipments associated with each of the industries identified in section 3.1.2 travel a minimum of 500 miles, over both Nevada Rail and connecting commercial railroads, the resultant proportionate rail and trucking costs may be estimated, and proportionate annual shipping cost savings may be derived, as shown in Table 6.

Table 6: Estimated Annual Savings to Nevada Rail Freight Shippers

		Freight Demand Scenario		
		Low	Mid-Range	High
Annual Shipments	(Tons)	659,565	1,029,347	3,478,970
Assumed Minimum Shipping Distance	(Miles)	500	500	500
Truck Shipping Cost / Ton-Mile	\$0.080	\$ 26,382,600	\$ 41,173,880	\$ 139,158,800
Rail Shipping Cost / Ton-Mile	\$0.024	\$ 7,914,780	\$ 12,352,164	\$ 41,747,640
Estimated Annual Savings:	70%	\$ 18,467,820	\$ 28,821,716	\$ 97,411,160

4.2 Direct economic effect: new employment

The new employment attributable to the implementation of the railroad would include the jobs associated with its operation and maintenance, and the jobs created by the expansion of existing businesses served by the railroad, and by the location or start-up of new businesses to be served by the railroad.

4.2.1 New employment associated with commercial freight railroad operations

As OCRWM has not yet defined an operating plan for the Nevada Rail, the employment benefit that would accrue to Nye, Lincoln and Esmeralda Counties from rail operations for the transportation of HLW and SNF cannot be estimated with any certainty. These operations may generate jobs within the counties, but may also be procured in such a manner that operating crews and staff are resident elsewhere. It is possible, however, to estimate the number of jobs associated with the operation of commercial freight trains in a shared-use scenario, assuming that commercial freight is operated and managed discretely from the HLW and SNF traffic.

Appendix 2 illustrates estimates of employment and compensation sized to the freight traffic scenarios forecast for the industries that would be served by the railroad. Table 7 summarizes the employment and compensation estimated for each scenario.

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Table 7: Estimated New Railroad Employment

Low Service Scenario (Wednesday and Saturday Service)				
Railroad Occupation	FTE	Annual Wage	40% Benefit	Annual Compensation
General Manager	1	\$ 80,000	\$ 32,000	\$ 112,000
Manager Operating Practices	1	\$ 60,000	\$ 24,000	\$ 84,000
Accounting Clerk	1	\$ 30,000	\$ 12,000	\$ 42,000
Train Crew (Engineer and Conductor)	3	\$ 55,000	\$ 22,000	\$ 231,000
Locomotive Electrician	1	\$ 35,000	\$ 14,000	\$ 49,000
Locomotive Mechanic	1	\$ 35,000	\$ 14,000	\$ 49,000
Total Employment:	8	Total Compensation:		\$ 567,000

Mid-Range Service Scenario (Monday, Wednesday and Friday Service)				
Railroad Occupation	FTE	Annual Wage	40% Benefit	Annual Compensation
General Manager	1	\$ 80,000	\$ 32,000	\$ 112,000
Manager Operating Practices	1	\$ 60,000	\$ 24,000	\$ 84,000
Accounting Clerk	1	\$ 30,000	\$ 12,000	\$ 42,000
Train Crew (Engineer and Conductor)	5	\$ 55,000	\$ 22,000	\$ 385,000
Locomotive Electrician	1	\$ 35,000	\$ 14,000	\$ 49,000
Locomotive Mechanic	1	\$ 35,000	\$ 14,000	\$ 49,000
Total Employment:	10	Total Compensation:		\$ 721,000

High Service Scenario (Daily Service)				
Railroad Occupation	FTE	Annual Wage	40% Benefit	Annual Compensation
General Manager	1	\$ 80,000	\$ 32,000	\$ 112,000
Manager Operating Practices	1	\$ 60,000	\$ 24,000	\$ 84,000
Accounting Clerk	1	\$ 30,000	\$ 12,000	\$ 42,000
Train Crew (Engineer and Conductor)	9	\$ 55,000	\$ 22,000	\$ 693,000
Locomotive Electrician	1	\$ 35,000	\$ 14,000	\$ 49,000
Locomotive Mechanic	1	\$ 35,000	\$ 14,000	\$ 49,000
Total Employment:	14	Total Compensation:		\$ 1,029,000

New employment associated with freight railroad operations is estimated to range from 8 to 13 jobs, with a corresponding direct economic benefit to the three counties of \$567,000 to \$952,000.

4.2.2 New employment associated with corridor businesses

Estimated new employment associated with businesses to be served by shared use of Nevada Rail includes jobs created among existing industries and potential new or revived businesses, including those that would use team tracks in Tonopah, Amargosa Valley and Caliente.

The immediate economic benefit of the Nevada Rail line is expressed as the savings in shipping costs attributed to industries that ship more than 1,000 tons per week, and that are located near the Caliente Corridor rail alignment. Additional benefit is attributed to industries that would ship less than 1,000 tons per week, using team tracks in Caliente, Tonopah, or the Amargosa Valley. The overall estimated savings in shipping costs is allocated as a function of the proportionate tonnage shipped or received by each county, as shown in Table 8. This distribution varies among the low, mid-range and high scenarios, particularly as a result of including the coal-fired Dry Lake Valley Power Plant in the 'high' scenario.

Table 8: Distribution of Estimated Annual Savings Among Counties

County	Freight Demand Scenario					
	Low		Mid-Range		High	
Lincoln	20.0%	\$ 3,696,001	19.2%	\$ 5,543,999	70.3%	\$ 68,427,526
Nye	79.4%	\$ 14,659,819	80.2%	\$ 23,109,717	29.5%	\$ 28,759,634
Esmeralda	0.6%	\$ 112,000	0.6%	\$ 168,000	0.2%	\$ 224,000

These estimates are presented to give a sense of the order of magnitude and relative distribution of savings to local industries that shipment via Nevada Rail may enable.

These economies to local shippers can be translated into other direct economic benefits, in particular the creation of new jobs. A true input-output analysis, quantifying the effect of investment in specific industries and the resultant economic benefits, is beyond the scope of this study. However, the employment value of the projected annual transportation savings can be estimated based again on the assumed minimum shipping distance of 500 miles. If it is assumed that 60 per cent of the estimated annual transportation savings is translated directly into wages and salaries for new employment, the amounts available to support new jobs are as indicated in Table 9.

Table 9: Distribution of Estimated Annual Employment Income Among Counties

County	Freight Demand Scenario		
	Low	Mid-Range	High
Lincoln	\$ 2,217,601	\$ 3,326,399	\$ 41,056,516
Nye	\$ 8,795,891	\$ 13,865,830	\$ 17,255,780
Esmeralda	\$ 67,200	\$ 100,800	\$ 134,400

These estimated amounts to support new employment may be converted to numbers of new jobs by assessing the average annual wages paid in each of the three counties. The State of Nevada, Department of Employment, Training & Rehabilitation publishes the results of its Nevada Occupational Employment Statistics (OES) Wage survey on its web site, providing wage estimates for more than 800 occupations by area and industry (<http://detr.state.nv.us/lmi/data/wages/TOC000.htm>). Rather than determining the specific types of employment that might be generated by shared use of the railroad and their applicable wage levels, we use an average wage for all employment in each of the three counties – Nye, Lincoln and Esmeralda – weighted by the numbers of people employed in each of those county, as shown in Table 10.

Table 10: Weighted Average 2004 Wage in Three Nevada Counties

County	Average Annual Wage among All Jobs	Number Employed	Total Wages
Lincoln	\$ 19,340	1,060	\$ 20,500,400
Nye	\$ 18,730	14,320	\$ 268,213,600
Esmeralda	\$ 13,930	400	\$ 5,572,000
Total:		15,780	\$ 294,286,000

Weighted Average 2004 Annual Wage for all Three Counties: **\$ 18,649**

Source: Nevada 2004 Occupational Employment and Wages; Nevada Department of Employment, Training & Rehabilitation

If it is assumed that employees of these industries are paid an average benefit representing 40 per cent of the basic annual wage, or \$7,460, the total average annual compensation per employee is \$26,109.

Table 11 shows how dividing this calculated average annual compensation into the estimated total new employment income for each of the three counties yields an

estimate of the number of new jobs created as an effect of shared use of the Nevada Rail system. Table 11 also indicates the proportionate increase in the numbers of persons employed in each county, and in the three counties overall, over the numbers of persons employed in 2004, cited in Table 10.

Table 11: Estimated New Non-Railroad Employment

County	Freight Demand Scenario		
	Low	Mid-Range	High
Lincoln	85 (+8.0%)	127 (+12.0%)	1,573 (+148.4%)
Nye	337 (+2.4%)	531 (+3.7%)	661 (+4.6%)
Esmeralda	3 (+0.6%)	4 (+1.0%)	5 (+1.3%)
Total:	424 (+2.7%)	662 (+4.2%)	2,239 (+14.2%)

4.2.3 Aggregate new employment

Combining the new jobs and compensation estimated for railroad and non-railroad employment yields estimates of total new jobs and compensation resulting from shared use of the Nevada Rail line, as shown in Table 12.

Table 12: Total Employment and Compensation

County	Freight Demand / Service Scenario					
	Low		Mid-Range		High	
	Jobs	Compensation	Jobs	Compensation	Jobs	Compensation
Lincoln	85	\$ 2,217,601	127	\$ 3,326,399	1,573	\$ 41,056,516
Nye	337	\$ 8,795,891	531	\$ 13,865,830	661	\$ 17,255,780
Esmeralda	3	\$ 67,200	4	\$ 100,800	5	\$ 134,400
Railroad (not specific to county)	8	\$ 567,000	10	\$ 721,000	13	\$ 1,029,000
Total:	432	\$ 11,647,692	672	\$ 18,014,030	2,252	\$ 59,475,696

Total new employment among the Nye, Lincoln and Esmeralda counties as a direct effect of shared use of the Nevada Rail line is estimated to range from 432 to 2,252

jobs, with a corresponding annual economic benefit to the three counties between 11 million and 60 million dollars annually.

4.3 Indirect and induced effects

The calculation of specific indirect and induced effects accruing to each industry served by the freight railroad are beyond the scope of this study. Accurate assessment of these effects typically involves the calculation of multipliers for specific industries, which are then used to determine subsequent monetary benefits for each unit invested in that industry. Whereas national average multipliers may be used, the population density and economic activity of Nye, Lincoln and Esmeralda counties would likely be well skewed away from the national data on which such averages are based. Rather than misrepresent the actual economic potential of the railroad or impose layers of assumptions, this calculation is left to more detailed subsequent study.

4.4 Benefits of freight traffic diversion

Diverting freight traffic normally carried by trucks to trains results in benefits to highway system users, particularly in the reduction of congestion, travel time and accidents.

To calculate the diversion of freight volumes from truck to rail, the freight demand scenarios in Appendix 1 are applied to the estimated proportions of freight currently shipped via truck that would be diverted to rail. Assuming an average weight of 20 tons per truckload across all commodities, the annual freight transportation demand of the subject industries is converted to truckloads, and doubled to include both loaded and unloaded truck trips. Applying the diversion factors yields the numbers of trucks that would no longer use the highways, corresponding to the low, mid-range and high freight demand scenarios depicted in Appendix 1. These calculations are shown in Appendix 3, and summarized in Table 13.

Table 13: Truckloads Diverted to Rail

Interval	Freight Demand Scenario		
	Low	Mid-Range	High *
Daily	158	204	311
Weekly	954	1,276	1,934
Monthly	4,136	5,529	8,382
Annually	49,631	79,197	107,763

* 'High' scenario does not include Dry Lake Valley coal-fired power plant (Lincoln County).

Calculating reductions in projected highway congestion, travel time and accident rates is the subject of more detailed assessment than the scope of this study allows. Instead, the volumes of freight traffic diverted from truck to rail may be compared with the volumes of truck traffic generated by corridor industries in the absence of the option to ship freight via the Nevada Rail line. This comparison yields a sense of the significant reductions in the probabilities of delay, congestion and accidents attributable to the presence of heavy trucks on Nevada highways, as shown in Table 14.

Table 14: Proportionate Reduction in Delay, Congestion and Accidents Related to Heavy Trucks

Interval	Freight Demand Scenario		
	Low	Mid-Range	High *
Total Truck Trips	65,957	102,935	139,913
Diverted Truck Trips	49,631	79,197	107,763
% Reduction	75%	74%	77%

* 'High' scenario does not include Dry Lake Valley coal-fired power plant (Lincoln County).

Because of the accompanying increase in rail traffic, there is a corresponding increase in the probability of delay and accident on the rail line. Table 15 compares national average accident rates for freight shipment via truck with those for the Union Pacific and Burlington Northern Santa Fe railroads. These data illustrate that the accident rate per million ton-miles for rail is significantly lower than those for shipment via truck.

Table 15: Comparison of Accident Rates for Freight Shipment via Truck and Rail

Shipment Mode	Accidents Per Ton-Miles of Rural Travel		% Improvement for Rail	
	Fatality Rates	Injury Rates	Fatality Rates	Injury Rates
Rail	0.0001	0.002	---	---
Truck: Rural Interstate	0.0007	0.0040	- 86%	- 50%
Truck: Other Rural Arterial	0.0027	0.0157	- 96%	- 87%
Truck: Other Rural Road	0.0020	0.0118	- 95%	- 83%

Source: State of Washington Department of Transportation – Benefits of Freight Rail (2001). The figures cited above are national statistics.

5. OTHER OPPORTUNITIES

Construction and operation of Nevada Rail may offer substantial benefits to the counties of Nye, Lincoln and Esmeralda beyond those of the transportation capacity it offers local shippers. In particular, the business case for the rail line is the Federal government's mandate to safely ship SNF and HLW to Yucca Mountain over a period of 24 years. The federal government will be funding the operation of this service and maintenance of the railroad, whether there is shared use by local freight or not. The affected units of Nevada state and local government should derive as much benefit from this business case as they can. Greater involvement in DOE's process of project definition, specification and procurement may enable the three counties, as well as other counties and the State of Nevada, to contribute to decisions that are key to their economies. While more discussion with OCRWM is required to clearly articulate their process and the potential for local involvement, this analysis suggests areas in which the counties may pursue greater participation and derive greater economic benefit.

5.1 OCRWM Nevada Rail procurement process

The Office of Civilian Radioactive Waste Management follows a prescribed process in defining and implementing large procurements. For the transportation of SNF and HLW to Yucca Mountain, these acquisitions include:

- The Nevada Rail line, from the interchange point with the Union Pacific main line to the Geologic Repository;
- The facilities for maintenance of OCRWM rolling stock and the Nevada Rail line;
- The dedicated rolling stock which will transport the SNF and HLW from their temporary storage sites over commercial railroads and Nevada Rail;
- Transportation services from temporary storage sites to the Geologic Repository, either continuously or with a transfer from commercial railroads and Nevada Rail; and
- Maintenance and management of the Nevada Rail line.

While these components of the OCRWM transportation system have been studied and discussed at length, DOE has not openly articulated their acquisition strategy for any of them. OCRWM has defined a time line and critical path, based on the assumption that shipment of SNF and HLW will start in 2010. Still, the transportation system implementation plan requires strategies for all these elements, and perhaps more, including definition of DOE's own ongoing role in the operation and maintenance of the rail line.

This analysis suggests that the counties of Nye, Lincoln and Esmeralda jointly assess the total OCRWM transportation program, and identify decisions in which the counties jointly have a stake or the opportunity for economic benefit. These key DOE decisions include, but are not limited to:

- Alternative alignment selection,
- Operating plan (both dedicated HLW/SNF trains and local freight),
- Safety and Security plans,
- Locations of passing sidings,
- Locations of spurs,
- Function and configuration of interchange and yard facilities at Caliente,
- Function and configuration of facilities to maintain all transportation infrastructure/equipment other than HLW/SNF casks,
- Relationship of Nevada rail procurement/operations with DOE national transportation/procurement strategy,
- Plan for operating, maintaining and managing the Nevada Rail line for HLW and SNF shipments,
- Construction and activation planning.

Once these decisions are identified, the counties together could engage the DOE directly with the goal of maximizing the consequent opportunities for local business, residents, and workers.

5.1.1 Purpose and need for rail line

The OCRWM is engaged in a project-specific EIS for the Nevada Rail line, within the Caliente corridor. The EIS process will help the OCRWM define the preferred specific alignments in the corridor for construction. An essential part of the EIS is articulation of a statement of purpose and need for the railroad. Criteria and weighting factors will be based on the statement of purpose and need, and decisions will be analyzed in their context.

Economic benefit from Nevada Rail can be maximized for affected units of local and State government only if their interests are incorporated in the purpose and need for the system. Otherwise, the rail line may be configured, built and operated to optimally transport HLW and SNF, but not to benefit local economies. The involvement of the three counties in OCRWM's definition of the purpose and need for Nevada Rail will enable them to incorporate their interests and influence subsequent decisions.

5.1.2 Local business preferences

In addition to the potential benefits of freight transportation capacity offered by the railroad, there are likely numerous opportunities for participation by local businesses in the line's planning, construction operation and maintenance. Line grading is one example. Housing may be another. Although these opportunities have not been researched by BSC (see Section 2), it is reasonable to assume that they exist. A policy to maximize the opportunities for existing and new local businesses should be articulated in DOE's acquisition plans, project specifications, and proposal evaluation procedures.

The three counties should work with DOE to define all support functions for Geologic Repository and transportation that represent commercial/institutional opportunities for the affected units of local and State government, including maintenance, administration, planning, material and service supply, safety and security, emergency response, communications, and utilities.

The three counties should further work with DOE and the General Services Administration to define procurement processes and selection criteria that maximize opportunity for local businesses to benefit from construction and operation of Nevada Rail.

5.2 Line ownership

To date, determinations regarding ownership and operational responsibility for Nevada Rail have resided with DOE, resulting in assumptions and scenarios that involve DOE and commercial suppliers, without considering roles for State and local authorities. The three counties, as well as other counties and the State of Nevada, may be able to realize significant benefit via an active role in ownership and operations, consistent with state and federal statutes. Such roles may further enable DOE to reduce their responsibility, staffing and cost for stewardship and oversight of the rail line.

The three counties should define and assess DOE procurement options that will enable affected units of local and State government to participate as more than recipients of ancillary benefits from Nevada Rail, including:

- State ownership of the rail line;
- Joint county (JPA¹⁰/state entity) ownership;
- Creation of new public entities for operation ('port authority,' special-purpose corporation, public-private partnership);

¹⁰ Joint Powers Authority, also known as an Interlocal agreement.

- Determination of procurement strategy - DB-M¹¹, DBOM¹², etc.
- Determination of operating entity - contracted; concessioned to state/joint counties; state/joint counties railroad; belt railroad/transit agency models; etc.

The fundamental assumption of this activity is that the Federal government is going to finance transport of HLW and SNF over the next 24 years. This assessment should find ways to direct as much of the federal investment as possible into the local economy.

It is worth mentioning that a commercial freight rail operation on the line implies a common carrier obligation specified by federal law. The obligation requires the freight carrier to provide transportation services on a non-discriminatory basis to all shippers willing and capable of paying the freight rates. The obligation will conceivably outlive the HLW and SNF shipments. When this happens, the full burden of covering maintenance of way expenses will fall to the line's owner (this analysis assumes that the maintenance costs of the line to that point will be paid by the Federal government and the HLW / SNF shippers). This is to say that the owner will inherit the full burden of the common carrier obligation.

If line revenues from the remaining shippers are insufficient to cover the maintenance of way costs, the owner may seek to increase rates. If the owner cannot do this, it can seek permission from the U.S. Surface Transportation Board to discontinue service and eventually abandon the line. If Nye, Esmeralda, and Lincoln Counties were to seek ownership of the line, they should investigate further the responsibilities attendant with assumption of the common carrier obligation.

One ownership strategy might be for the counties to start planning to draw new rail shippers to the rail line by means of an economic development program aimed at both increasing employment and the line's total revenue base. With increased freight rail revenues, the absorption of the future maintenance of way costs in a post HLW / SNF shipment world would become less potentially challenging.

5.3 Operations

To assure that benefits to local businesses and economies are maximized, the three counties should work directly with DOE to define a shared-use operating plan, including location and configuration of sidings and spurs; fleet sizing; type and amount of motive power; train scheduling, train control, signaling and communication, and operational integration between HLW/SNF and commercial freight.

¹¹ Design, Build and Maintain

¹² Design, Build, Operate and Maintain

The operational assessment should further assess:

- Interim operating strategies in the event Nevada Rail is not completed and commissioned in time to initiate shipments to the repository;
- Means in which the Nevada Rail line may be employed to help accelerate construction of the repository, the railroad, or other installations; and
- Strategies for response and recovery in the event of service interruptions, system failure, natural disasters, etc.

5.4 Alternative institutional models

The existing relationships among the three counties may not enable them to make best use of their resources and interests in dealing with the DOE. Greater cooperation, alignment and institutional weight may help the counties in future participation with the DOE and with the State of Nevada. Embedded in such a structure must be an algorithm for distribution of costs/efforts/benefits. We suggest that the three counties discuss the advantages and disadvantages of greater institutional affiliation, and if appropriate, assess and decide on an organization of legitimate legal standing to represent their joint interests. The three counties should assess such alternative institutional forms, including a state legislated agency, a Joint Powers Authority (Interlocal agreement), among others.

6. CONCLUSION

The foregoing analysis has responded to the items specified in the Scope of Work for this study.

6.1 Construction benefits

The analysis summarized work now underway by DOE consultants pertaining to the construction of the line. BSC, the prime planning and design contractor for the OCRWM, has retained consultants to identify deposits and sources for rail line ballast, water sources, and commercial sources for rail, ties, tie plates and other manufactured materials for building rail track. These consultants' efforts are in progress, and as yet have not yielded any information applicable to this study.

BSC has not identified a workforce for the construction of Nevada Rail, citing that workforce recruitment will be the responsibility of the contractor assigned to build the line. BSC expects that there would be few firms or individuals in the counties with skill sets specific to rail line construction and even fewer who have actual rail line construction experience.

BSC likewise has not investigated sources for construction machinery in the counties, assuming that construction contractors will bring their own heavy machinery with them to the construction site. BSC estimates that opportunities for local machinery vendors are minimal. This analysis does believe, however, that opportunities for the grading of the line may exist for local contractors.

Notwithstanding the preliminary findings of DOE's contractors regarding rail line construction, the counties of Nye, Lincoln and Esmeralda should work with DOE to be given first consideration for the provision of materials and services. As the site of the Caliente Corridor, the counties should be completely informed on the commercial opportunities related to its construction and be given every opportunity and sufficient lead time to develop economically feasible responses.

6.2 Potential shared use

Elected officials, agency staff, development authority staff, and individual business operators throughout the corridor expressed enthusiasm for the shared use of the Nevada Rail line for commercial freight transportation. Four communities (Caliente, Tonopah, Goldfield and Amargosa Valley) are planning business parks and hope that direct rail access can enhance their parks' attractiveness to new businesses. Numerous industries contiguous to the rail line could feasibly ship freight via rail if the option was available.

Beyond the business parks, this analysis quantified the commercial traffic potential that could be attracted to or induced by commercial rail operation on the Caliente Corridor. The study assumed a range of rail traffic scenarios, with a mid-range showing 1 million tons, or about 10,000 rail carloads of traffic per year, assuming that the rates for rail service were competitive with trucking from Las Vegas.

The study did not find a compelling reason for initiation of intercity or commuter passenger rail service on the Caliente Corridor, nor did it find potential for a tourist railroad use of the line.

6.3 Economic benefits

Based on the freight rail traffic analysis, the analysis indicates that there will be sizable transportation cost savings to shippers in Nye, Esmeralda, and Lincoln Counties related to the commercial use of the Nevada Rail line. These savings will enable these industries to make investments to increase productivity, expand into new markets, and increase employment. The commercial railroad itself will be the source of new jobs. The fact that the rail line will be operated for at least 24 years underscores the fact that it should provide economic benefit to the affected counties and the state.

It is logical to anticipate that the new employment directly attributable to the commercial freight rail operation will lead to still other indirect and induced effects. Jobs at a railroad headquarters in Tonopah, for example, will mean more groceries purchased at local supermarkets. New employment at industries throughout the corridor will generate economic benefit for local service and retail businesses. Furthermore, diversions of freight now traveling by truck to rail will benefit the counties and the State of Nevada by reducing delays, congestion, and accidents on the highway system.

6.4 Other Opportunities

There are many areas pertaining to the implementation and operation of Nevada Rail that provide opportunities for Nye, Lincoln, and Esmeralda Counties to benefit. However, freight operations to serve local industries need to be defined among the purposes of the line, or these opportunities may be denied or overlooked. As OCRWM engages in alternative alignment selection, construction planning, and rail operations planning, the three counties need to be recognized as stakeholders, and have a voice in decisions that will affect their economies. To reap the greatest reward, the counties would serve themselves well by working together to identify where their opportunities and benefits lie and pursuing them directly with DOE.

This analysis has shown that even for a low level of commercial freight activity on the rail line, there are substantial benefits to shippers and residents in all three counties. Consequently, it seems reasonable that the counties involve themselves directly with DOE to ensure that a viable commercial freight rail operation, contributing to the bottom line of local shippers and increasing local payrolls, can be established.

Appendix 1

Existing Businesses Served by Caliente Corridor
Estimated Rail Freight Shipments

Estimated Rail Freight Shipments by Existing Businesses Served by Caliente Corridor

Low Estimate

Customer	Commodity	Estimated Tonnage			Estimated Carloads			Originating Station	Destination Station	
		Day	Week	Month	Year	Day	Week			Month
Caliente Team Track	General Carloads	88	615	2,667	32,000	1	6	27	320	Caliente
Tonopah Team Track	General Carloads	22	154	667	8,000	0	2	7	80	Tonopah
Amargosa Valley Team Track	General Carloads	22	154	667	8,000	0	2	7	80	Amargosa Valley
Natural Pozzolan	Concrete Additive	274	1,923	8,333	100,000	3	19	83	1,000	USA
Cind-R-Lite	Landscape Rock	99	692	3,000	36,000	1	7	30	360	Yucca Mountain
US Ecology	Class 1 Disposal	274	1,923	8,333	100,000	3	19	83	1,000	500 miles +
	Reagents	7	48	208	2,500	0	0	2	25	500+
D&H Mining	Bottled Water	99	692	3,000	36,000	1	7	30	360	Beatty
	Landscape Rock	274	1,923	8,333	100,000	3	19	83	1,000	Beatty
Farland Refinery Corp	Crude Oil	638	3,190	13,822	165,867	6	32	138	1,659	US/Canada
	Petrochemicals	120	600	2,600	31,198	1	6	26	312	Warm Springs
Ponderosa Dairy	Animal Feed	110	769	3,333	40,000	1	8	33	400	Warm Springs
Totals		2,027	12,683	54,963	659,565	20	127	549	6,596	Midwest/TX

Estimated Rail Freight Shipments by Existing Businesses Served by Caliente Corridor

Mid-Range Estimate

Customer	Commodity	Estimated Tonnage				Estimated Carloads				Originating Station	Destination Station
		Day	Week	Month	Year	Day	Week	Month	Year		
Caliente Team Track	General Carloads	132	923	4,000	48,000	1	9	40	480	500 miles +	Caliente
Tonopah Team Track	General Carloads	33	231	1,000	12,000	0	2	10	120	500 miles +	Tonopah
Amargosa Valley Team Track	General Carloads	33	231	1,000	12,000	0	2	10	120	500 miles +	Amargosa Valley
Natural Pozzolan	Concrete Additive	411	2,885	12,500	150,000	4	29	125	1,500	Pioche	USA
Cind-R-Lite	Landscape Rock	148	1,038	4,500	54,000	1	10	45	540	Yucca Mountain	Riverside, Ca
US Ecology	Class 1 Disposal	411	2,885	12,500	150,000	4	29	125	1,500	500 miles +	Beatty
	Reagents	10	72	313	3,750	0	1	3	38	500+	Beatty
D&H Mining	Bottled Water	148	1,038	4,500	54,000	1	10	45	540	Beatty	So Cal/AZ
	Landscape Rock	548	3,846	16,667	200,000	5	38	167	2,000	Beatty	So Cal/AZ
Farland Refinery Corp	Crude Oil	638	3,190	13,822	248,801	6	32	138	2,488	US/Canada	Warm Springs
	Petrochemicals	120	600	2,600	46,796	1	6	26	468	Warm Springs	USA
Ponderosa Dairy	Animal Feed	137	962	4,167	50,000	1	10	42	500	Midwest/TX	Amargosa Valley
Totals		2,769	17,901	77,569	1,029,347	24	178	776	10,294		

Estimated Rail Freight Shipments by Existing Businesses Served by Caliente Corridor

High Estimate

Customer	Commodity	Estimated Tonnage			Estimated Carloads			Originating Station	Destination Station		
		Day	Week	Month	Year	Day	Week			Month	Year
Caliente Team Track	General Carloads	175	1,231	5,333	64,000	2	12	53	640	500 miles +	Caliente
Tonopah Team Track	General Carloads	44	308	1,333	16,000	0	3	13	160	500 miles +	Tonopah
Amargosa Valley Team Track	General Carloads	44	308	1,333	16,000	0	3	13	160	500 miles +	Amargosa Valley
Natural Pozzolan	Concrete Additive	822	5,769	25,000	300,000	8	58	250	3,000	Pioche	USA
Cind-R-Lite	Landscape Rock	197	1,385	6,000	72,000	2	14	60	720	Yucca Mountain	Riverside, Ca
US Ecology	Class 1 Disposal	548	3,846	16,667	200,000	5	38	167	2,000	500 miles +	Beatty
	Reagents	14	96	417	5,000	0	1	4	50	500+	Beatty
D&H Mining	Bottled Water	197	1,385	6,000	72,000	2	14	60	720	Beatty	So Cal/AZ
	Landscape Rock	548	3,846	16,667	200,000	5	38	167	2,000	Beatty	So Cal/AZ
Farland Refinery Corp	Crude Oil	1,000	5,000	21,665	331,734	10	50	217	3,317	US/Canada	Warm Springs
	Petrochemicals	240	1,200	5,200	62,395	2	12	52	624	Warm Springs	USA
Ponderosa Dairy	Animal Feed	164	1,154	5,000	60,000	2	12	50	600	Midwest/TX	Amargosa Valley
Totals		3,993	25,528	110,615	1,399,129	38	255	1,106	13,991		
Dry Lake Valley Power Plant*	Coal	4,000	20,000	86,660	2,079,840	40	200	867	20,798	Western USA	Dry Lake Valley
Totals**		7,993	45,528	197,275	3,478,969	78	455	1,973	34,790		

* Inbound coal traffic, estimated at two 110-car unit trains weekly, triples the estimated car load, and is shown separately from the remainder of the estimate.

** Loaded cars only are shown. There will be an equal amount of returning empty cars on the railroad.

Appendix 2
Commercial Railroad Employment Requirements

Commercial Railroad Employment Requirements

Wednesday and Saturday Service to Customers

Schedule	Job #	Start	Finish	Work Type	Engineer	Conductor
Monday	1	Tonopah	Caliente	Line Haul	1	1
Tuesday	1	Caliente	Tonopah	Line Haul	1	1
Wednesday	1	Tonopah	Tonopah	Beatty Turn	1	1
Thursday	1	Tonopah	Caliente	Line Haul	1	1
Friday	1	Caliente	Tonopah	Line Haul	1	1
Saturday	1	Tonopah	Tonopah	Beatty Turn	1	1

Occupation	FTE	Rate	Benefits Load	Annual Labor Cost
General Manager	1	\$ 80,000	0.4	\$ 112,000
Manager Operating Practices	1	\$ 60,000	0.4	\$ 84,000
Accounting Clerk	1	\$ 30,000	0.4	\$ 42,000
12 starts (6 engineer-6 conductor) a week	3	\$ 55,000	0.4	\$ 231,000
Locomotive Electrician	1	\$ 35,000	0.4	\$ 49,000
Locomotive Mechanic	1	\$ 35,000	0.4	\$ 49,000
	8			\$ 567,000

Commercial Railroad Employment Requirements

Monday / Wednesday / Friday Service to Customers

Schedule	Job #	Start	Finish	Work Type	Engineer	Conductor
Monday	1	Tonopah	Caliente	Line Haul	1	1
Tuesday	1	Caliente	Tonopah	Line Haul	1	1
Wednesday	1	Tonopah	Tonopah	Beatty Turn	1	1
Thursday	1	Tonopah	Caliente	Line Haul	1	1
Friday	1	Caliente	Tonopah	Line Haul	1	1

Schedule	Job #	Start	Finish	Work Type	Engineer	Conductor
Monday	2	Tonopah	Tonopah	Beatty Turn	1	1
Tuesday	2	Tonopah	Caliente	Line Haul	1	1
Wednesday	2	Caliente	Tonopah	Line Haul	1	1
Thursday	2					
Friday	2	Tonopah	Tonopah	Beatty Turn	1	1

Occupation	FTE	Rate	Benefits Load	Annual Labor Cost
General Manager	1	\$ 80,000	0.4	\$ 112,000
Manager Operating Practices	1	\$ 60,000	0.4	\$ 84,000
Accounting Clerk	1	\$ 30,000	0.4	\$ 42,000
18 starts (9 engineer-9 conductor) a week	5	\$ 55,000	0.4	\$ 385,000
Locomotive Electrician	1	\$ 35,000	0.4	\$ 49,000
Locomotive Mechanic	1	\$ 35,000	0.4	\$ 49,000
	10			\$ 721,000

Commercial Railroad Employment Requirements

Daily Service to Customers

Schedule	Job #	Start	Finish	Work Type	Engineer	Conductor
Sunday						
Monday	1	Tonopah	Caliente	Line Haul	1	1
Tuesday	1	Caliente	Tonopah	Line Haul	1	1
Wednesday	1	Tonopah	Caliente	Line Haul	1	1
Thursday	1	Caliente	Tonopah	Line Haul	1	1
Friday	1	Tonopah	Tonopah	Beatty Turn	1	1
Saturday						

Schedule	Job #	Start	Finish	Work Type	Engineer	Conductor
Sunday	2	Tonopah	Caliente	Line Haul	1	1
Monday	2	Caliente	Tonopah	Line Haul	1	1
Tuesday	2	Tonopah	Tonopah	Beatty Turn	1	1
Wednesday	2	Tonopah	Tonopah	Beatty Turn	1	1
Thursday	2	Tonopah	Tonopah	Beatty Turn	1	1
Friday						
Saturday						

Schedule	Job #	Start	Finish	Work Type	Engineer	Conductor
Sunday	3	Caliente	Tonopah	Line Haul	1	1
Monday	3	Tonopah	Tonopah	Beatty Turn	1	1
Tuesday	3	Tonopah	Caliente	Line Haul	1	1
Wednesday	3	Caliente	Tonopah	Line Haul	1	1
Thursday						
Friday						
Saturday	3	Tonopah	Caliente	Line Haul	1	1

Occupation	FTE	Rate	Benefits Load	Annual Labor Cost
General Manager	1	\$ 80,000	0.4	\$ 112,000
Manager Operating Practices	1	\$ 60,000	0.4	\$ 84,000
Accounting Clerk	1	\$ 30,000	0.4	\$ 42,000
30 starts (15 engineer-15 conductor) a week	9	\$ 55,000	0.4	\$ 693,000
Locomotive Electrician	1	\$ 35,000	0.4	\$ 49,000
Locomotive Mechanic	1	\$ 35,000	0.4	\$ 49,000
	14			\$ 1,029,000

Appendix 3
Estimated Diversion of Freight from Truck to Rail

Estimated Diversion of Freight from Truck to Rail

Low Estimate

Customer	Commodity	Annual Tonnage	Equivalent Truck Trips	% Diverted From Truck	Estimated Number of Diverted Trucks			
					Day	Week	Month	Year
Caliente Team Track	General Carloads	32,000	3,200	50%	4	31	133	1,600
Tonopah Team Track	General Carloads	8,000	800	100%	2	15	67	800
Amargosa Valley Team Track	General Carloads	8,000	800	100%	2	15	67	800
Natural Possolan	Concrete Additive	100,000	10,000	100%	27	192	833	10,000
Cind-R-Lite	Landscape Rock	36,000	3,600	50%	5	35	150	1,800
US Ecology	Class 1 Disposal	100,000	10,000	50%	14	96	417	5,000
	Reagents	2,500	250	50%	0	2	10	125
D&H Mining	Bottled Water	36,000	3,600	50%	5	35	150	1,800
	Landscape Rock	100,000	10,000	50%	14	96	417	5,000
Farland Refinery Corp	Crude Oil	165,867	16,587	100%	64	319	1,382	16,587
	Petrochemicals	31,200	3,120	100%	12	60	260	3,120
Ponderosa Dairy	Animal Feed	40,000	4,000	75%	8	58	250	3,000
Totals:		659,567	65,957		157	954	4,138	49,632

Mid-Range Estimate

Customer	Commodity	Annual Tonnage	Equivalent Truck Trips	% Diverted From Truck	Estimated Number of Diverted Trucks			
					Day	Week	Month	Year
Caliente Team Track	General Carloads	48,000	4,800	50%	7	46	200	2,400
Tonopah Team Track	General Carloads	12,000	1,200	100%	3	23	100	1,200
Amargosa Valley Team Track	General Carloads	12,000	1,200	100%	3	23	100	1,200
Natural Possolan	Concrete Additive	150,000	15,000	100%	41	288	1,250	15,000
Cind-R-Lite	Landscape Rock	54,000	5,400	50%	7	52	225	2,700
US Ecology	Class 1 Disposal	150,000	15,000	50%	21	144	625	7,500
	Reagents	3,750	375	50%	1	4	16	188
D&H Mining	Bottled Water	54,000	5,400	50%	7	52	225	2,700
	Landscape Rock	200,000	20,000	50%	27	192	833	10,000
Farland Refinery Corp	Crude Oil	248,801	24,880	100%	64	319	1,382	24,880
	Petrochemicals	46,800	4,680	100%	12	60	260	4,680
Ponderosa Dairy	Animal Feed	50,000	5,000	75%	10	72	313	3,750
Totals:		1,029,351	102,935		203	1,275	5,529	76,198

High Estimate

Customer	Commodity	Annual Tonnage	Equivalent Truck Trips	% Diverted From Truck	Estimated Number of Diverted Trucks			
					Day	Week	Month	Year
Caliente Team Track	General Carloads	64,000	6,400	50%	9	62	267	3,200
Tonopah Team Track	General Carloads	16,000	1,600	100%	4	31	133	1,600
Amargosa Valley Team Track	General Carloads	16,000	1,600	100%	4	31	133	1,600
Natural Possolan	Concrete Additive	300,000	30,000	100%	82	577	2,500	30,000
Cind-R-Lite	Landscape Rock	72,000	7,200	50%	10	69	300	3,600
US Ecology	Class 1 Disposal	200,000	20,000	50%	27	192	833	10,000
	Reagents	5,000	500	50%	1	5	21	250
D&H Mining	Bottled Water	72,000	7,200	50%	10	69	300	3,600
	Landscape Rock	200,000	20,000	50%	27	192	833	10,000
Farland Refinery Corp	Crude Oil	331,734	33,173	100%	100	500	2,167	33,173
	Petrochemicals	62,395	6,240	100%	24	120	520	6,240
Ponderosa Dairy	Animal Feed	60,000	6,000	75%	12	87	375	4,500
Totals:		1,399,130	139,913		310	1,935	8,382	107,763