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Section I. Submittal Information (includes above information)

Submittal Description and Revision Summary for Entire Submittal:

This is the final submittal of Comparative Cost Estimates – Summary Report, Caliente Rail Corridor incorporating comments from the draft submittal.

Special Instructions

Section II. Data File Information (Add lines below if needed for additional files. Indicate "Last item" or "End of list" after last line used.)

Filename	Rev.	File Size	Description (File description and revision summary for file)	Application and Version/ Add-in or Extension and Version
T17_Cover.ppt	00	699 KB	Report cover for Comparative Cost Estimates, Caliente Rail Corridor-Summary Report – NRP-R-SYSW-ES-0004-00, Rev. 00	Microsoft Powerpoint 2003
T17_CRC_ComparativeCostEstimates_SummaryReportFinal_03July2007.doc	00	3,764 KB	Main text with all graphics – Comparative Cost Estimates, Caliente Rail Corridor-Summary Report – NRP-R-SYSW-ES-0004-00, Rev. 00	Microsoft Word 2003
T17_CRC_ComparativeCostEstimates_SummaryReportFinal_03July2007.pdf	00	888 KB	Scanned document with all graphics – Comparative Cost Estimates, Caliente Rail Corridor-Summary Report – NRP-R-SYSW-ES-0004-00, Rev. 00	Adobe Acrobat 7.0 Standard Version
T17_CRC_ComparativeCostEstimates_SummaryReportFinaReadonlyl_03July2007.doc	00	3,764 KB	Main text (Read Only) with all graphics – Comparative Cost Estimates, Caliente Rail Corridor-Summary Report – NRP-R-SYSW-ES-0004-00, Rev. 00	Microsoft Word 2003

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Section III. Metadata

☐ **GIS Metadata** All GIS data is preferred in ArcGIS9.1 UTM, NAD1983, Zone11, Feet.	Projection:
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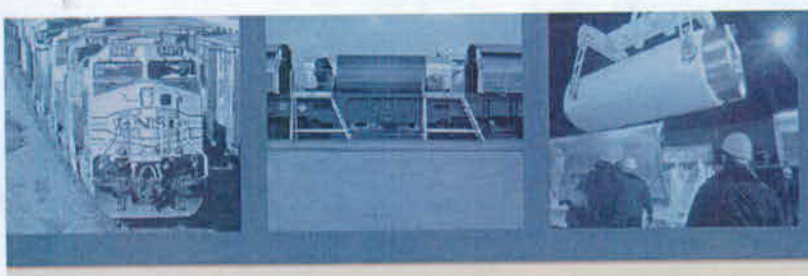

Comparative Cost Estimates
Caliente Rail Corridor
Summary Report

Task 17: Cost Estimating Support

Rev. 00

Document No. NRP-R-SYSW-ES-0004-00

07-00141

prepared by:

NEVADA RAIL PARTNERS

prepared for:

BECHTEL SAIC COMPANY, LLC

Nevada Rail Line Conceptual Design

Subcontract NN-HC4-00239

July 03, 2007

Comparative Cost Estimates
Caliente Rail Corridor
Summary Report

Task 17: Cost Estimating Support

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Nevada Rail Conceptual Design
Subcontract NN-HC4-00239
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Acronyms

BNSF	Burlington Northern Santa Fe
BSC	Bechtel SAIC Company, LLC
CAD	Computer-Aided Design
CMF	Cask Maintenance Facility
CRC	Caliente Rail Corridor
DOE	U.S. Department of Energy
EBS	Estimate Breakdown Structure
EOL	End-of-Line
MOW	Maintenance-of-Way
NRL	Nevada Rail Line
NRP	Nevada Rail Partners
ROW	Right-of-Way
UPRR	Union Pacific Railroad
YMP	Yucca Mountain Project

Executive Summary: Overview of the Caliente Rail Corridor Cost Estimate

SCOPE AND OBJECTIVE

This Nevada Rail Line (NRL) cost estimate tabulates quantities of identified features of the project and estimates the construction cost of these features. The estimate is developed from Nevada Rail Partners' (NRP) conceptual design documents for the Caliente Rail Corridor (CRC). [1] Conceptual design documents include: conceptual rail plan-and-profile drawings (based on the 5-foot contour mapping), *Route Sections and Structures, Caliente Rail Corridor* (NRP 2007d) drawings, *Facilities–Design Analysis Report, Caliente Rail Corridor* (NRP 2007b) and drawings, *Construction Plan, Caliente Rail Corridor* (NRP 2007a), and *Operations and Maintenance Report, Caliente Rail Corridor* (NRP 2007c).This Summary Report contains total costs for each segment and facility, but no unit prices or quantities.

There are two distinct, but related, objectives of the NRL cost estimating action: (1) provide a basis for the comparative analysis (a function of the rail alignment environmental impact statement) between alternative applications for constructing the NRL; for example, this includes comparing alternative alignments and comparing alternative facilities and (2) create an updated cost estimate for construction of an overall NRL transportation system. The major components of the estimate are listed in the table below. The estimate does not include costs associated with mitigation, ownership, operations, abandonment, rolling stock and casks, schedule-related costs, or Yucca Mountain Project program or nuclear material requirements.

SUMMARY OF ESTIMATE RESULTS

A summary of key values associated with the CRC Basis for Analysis cost estimate (alignment segments plus facilities plus soft costs) are listed below.

Alignment Construction including Excavation, Engineered Fill, Over/Underpass, Bridges, Drainage Structures and Water Requirements for Construction	$823,798,000
Trackwork	$478,690,000
Signals and Communications	$193,474,000
Other Costs	$4,965,000
Total Alignment Construction Costs	**$1,500,927,000**
Contingency	$360,221,000
Design & Engineering, Construction Management	$132,972,000
Program Management	$63,344,000
Right-of-Way (ROW) Acquisition	$4,299,000
Total Estimated Alignment Cost	**$2,061,763,000**
Facilities: UP Railroad Interchange Yard; CRC Staging Yard, EOLYard with Access Track and CMF Access Tracks, and CRC MOW Facilities	
Total Facilities Construction Cost	$89,849,000
Contingency and Mobilization	$29,651,000
Development Costs (Engineering, Construction Management; Geotechnical)	$7,190,000
Program Costs	$2,696,000
ROW Acquisition	$1,700,000
Total Facility Cost Estimate	**$131,086,000**
Total CRC Construction Phase Cost Estimate (2005 Dollars)	**$2,192,849,000**

[1] The term NRL is used to describe aspects of the cost estimation process that are not particular to a specific alignment, and the term CRC is used only where specifically applicable to the Caliente Rail Corridor.

1.1 THE DEVELOPMENT OF COST ESTIMATE FOR THE CALIENTE RAIL CORRIDOR

1.1.1 Objective

The primary objective of this cost estimate and methodology section is to document the methodologies and the practices that have been established for Nevada Rail Line (NRL) cost estimating efforts, as well as to articulate the content and organization of the cost estimating documentation.

1.1.2 Organization of Estimate

The conceptual design cost estimate has the following content and organization:

- Basis of Estimate – describes the technical approach used to develop the quantities and the estimate breakdown structure (EBS) used to identify appropriate work items for the estimate, including assumptions made. The EBS has been developed to coordinate with overall Yucca Mountain Project (YMP) practices, with certain modifications to reflect those items that have been identified during conceptual engineering work.
- Segment Estimates – describes the quantities and cost for each segment, detailing the limits of the segments, identification and locations of major structures, and other pertinent items. Included is an alignment map of all alternative segments within the conceptual design action.
- Facilities Estimates – presents estimates of the principal facilities and any alternates: Union Pacific (UPRR) interchange, Caliente Rail Corridor (CRC) staging yard, end-of-line (EOL) facility, and the CRC maintenance-of-way (MOW) headquarters and trackside facilities. Figure 1-A (page 1-5) illustrates the locations of these facilities. The cask maintenance facility (CMF), which may be co-located with the EOL facility, is not included in this estimate.
- Basis for Analysis Alignment and Facility Summary –tabulates cost estimate summaries of the basis for analysis segments and appropriate facilities. Establishes a baseline estimate for comparative analyses of alternatives.
- Unit Cost Data – presents representative back-up data from various relevant sources used to develop the major unit costs. The back up data presented is intended to provide representative values of appropriate typical construction cost.

1.1.3 Basis of Estimate

Specific considerations and data inputs utilized in developing this cost estimate include:

- All costs shall be calculated and presented in terms of Year 2005 dollars without escalation.
- Established a cost-benchmark used by western, Class I railroads for track installation on existing roadbed. *(This is primarily based on UPRR and Burlington Northern Santa Fe Railroad [BNSF], and is supplemented with other railroad company data that is not as directly applicable, but still indicative.)*
- Established a cost-benchmark experienced by Nevada Department of Transportation for heavy civil earthwork associated with roadway grading. *(This has established unit costs for excavation of different soil types, and for the placement of engineered fills.)*
- Based estimated quantities on the basis for analysis and alternate alignments and profiles (15 May 2007) which were developed from the 5-foot contour mapping.

- Based facilities estimates on the facilities described in the *Facilities–Design Analysis Report, Caliente Rail Corridor* (Nevada Rail Partners [NRP] 2007b).
- Based earthwork quantities on computer-aided design (CAD) Inroads-produced earthwork volumes. Earthwork volumes are further defined by type of material (common, rippable, and drill and blast) based on geotechnical data provided by Bechtel SAIC Company, LLC (BSC), and appropriate cross section design for each material. Earthwork quantities also consider likely effects of swell and shrinkage on overall quantities.
- Earthwork cross sections have been refined based on material type, but are subject to further revision based on pending geotechnical investigations.
- Refined the concept of signals and communications to include the infrastructure necessary for construction-phase communications in the remote NRL alignment.
- Developed the approach for identifying and pricing the government costs that are additive to the actual construction contractor direct/indirect costs (e.g., the contractor bid price).

There are a number of specific cost estimating approaches, methodologies, and practices that influence a high percentage of the entire estimated cost of the CRC. These high-impact parameters have been established to-date as working models to support ongoing cost estimating efforts. These parameters have been subject to ongoing refinement since the Revision 0 *Comparative Cost Estimates, Caliente Rail Corridor* (27 June 2005), and in some cases may be refined further based on ongoing data collection. A summary of these parameters is listed below.

Major-Component, Quantity Take-Offs – The rail line quantities such as earthwork excavation and track work are derived directly from the CAD outputs overlaid on the 5-foot contour mapping. Major bridges are individually identified as cost components.

Secondary-Component, Quantity Take-Offs – Components such as culverts and soil stabilization are estimated on a per mile basis because data to support more detail has not yet been developed by the design process. Alignment drawings were reviewed in order to establish approximate scope of these items. The alignment allowance includes such items as access roads traffic maintenance, utility relocations, road relocation and revegetation. The earthwork allowance includes such items as clearing and grubbing, soil stabilization, scope protection, erosion control, and fencing.

Geotechnical Assessment – The surface area of the alignment has been assessed by geotechnical professionals using currently available data (provided to NRP on 7 June 2005); this does not include sub-surface investigations. This assessment supports a determination of the anticipated characteristics of excavation: common excavation, rock that can be ripped, and rock that must be drilled and blasted.

By utilizing this geotechnical data with Inroads CAD methods, estimates of the various types of earthwork were developed by engineer's station for the length of the alignments.

Excavation Cross-Sections – Common excavation cuts are conventional 2:1 side slopes. Rippable rock excavation cuts are conventional 1:1 side slopes. Drill & blast excavation cuts are 1/2:1 side slopes with 10-foot benches every 20 feet.

Earthwork Unit Costs – Recent State of Nevada heavy roadway cost-histories form the basis for the earthwork unit costs. The primary source of this data is the Nevada Department of Transportation, along with other secondary sources.

Quantities of place embankment and place excess excavation are shown on the estimate sheets. However, the cost of these items is included in other earthwork items and therefore not reported separately here.

Quantities of borrow and excess excavation also capture cost related to fill and cut imbalance and material haul considerations.

Water Costs – The costs related to procurement and distribution of water for earthwork and other construction phase uses have been analyzed in a separate report. This includes costs associated with the establishment of wells and the production and handling of water. It does not include costs for water rights or other items. Unit quantity requirements were established for each type of soil through consultation with local contractors. Actual water quantities were established for each project segment by applying the unit quantities to the earthwork volumes of the various types (including borrow requirements) and adjusting for the shrink and swell characteristics of the various material. The unit cost for water was determined by establishing a maximum water limit for the project and dividing this number by a reasonable well production rate to determine the maximum number of wells that could be needed.

Trackwork Unit Costs – Western railroad (UPRR and BNSF) cost-histories form the basis of the trackwork unit costs. Trackwork includes ballast, ties, rail, and turnouts. The current working unit cost for installed trackwork currently includes a premium over typical western rail installations to account for extraordinary costs for the CRC. These extra costs include the transport of track material ballast over the length of the CRC or, optionally, to open new on-alignment ballast quarries with their associated start-up costs and small-volume production characteristics.

Bridges – Bridges were identified by type and length. The total length by type is reported in each segment estimate. Bridge types were developed based on typical industry designs. Unit bridge costs at the conceptual design stage have been determined based on experience with construction costs for these or similar types of bridges built by Class 1 railroads and allowing for other considerations, such as no available geotechnical information, bridge heights and the remoteness of the project.

Communications and Signals – This specialized component of the CRC is represented by specific estimate line items in each segment developed on a per-mile basis.

Power Distribution Costs – The costs related to the installation of a power distribution system that would provide commercial-type electric power to the length of the line have also been included. The cost of this system is considered to be linear over the length of the line, and is included in the segment estimate as a per mile cost.

Construction Camps Costs – The costs related to the construction and operation of temporary camps for workers have also been included. The cost of these camps is considered to be linear over the length of the line, and is included in the segment estimate as a per-mile cost. Costs shown represent an upper bound cost, based on camps described in *Construction Plan, Caliente Rail Corridor* (NRP 2007a).

Unit Price Definition – The unit prices determined emulate the offered prices of a contractor that include direct and indirect costs of general and administrative and overhead expenses, taxes and insurance, and profit. The unit prices reflect the physical conditions of the CRC construction region and include costs associated with materials delivery to locations along the alignment. All prices are in Year 2005 dollars, without escalation.

Contingency – A contingency estimate allowance is allocated as an identified line item "below" the bottom line for each segment. The current working contingency is 20 percent for the CRC alignment, and 30 percent for facilities.

Project Implementation Costs – A dollar-allowance for costs including engineering, construction management, and administrative costs is allocated as an identified line item "below" the bottom line for

each segment. The current working allowance is 4 percent engineering, 4 percent construction management, and 3 percent administration.

Right-of-Way (ROW) – A dollar allowance for the cost of acquiring private land as necessary for the CRC alignment is included.

Shared-Use Sidings – The current conceptual design effort incorporates sidings that would support shared-use operations. Costs for these sidings are incorporated along with associated alignment segments, and are not identified as a distinct, shared-use line item. No other shared-use track or facilities have been considered.

There are specific aspects of potential costs that are not included in the current cost-estimating process. These include the following:

Mitigation – The cost estimate does not identify or price activities or "built facilities" that may be implemented as construction progresses to mitigate impacts.

Railroad Operations – The cost estimate does not identify or price the costs of operating the CRC over its projected lifetime. Operations and maintenance costs are presented in *Operations and Maintenance Report, Caliente Rail Corridor* (NRP 2007c).

Abandonment – The cost estimate does not identify activities associated with abandoning, physical removal, or institutional care-taking of the CRC after its service for spent nuclear fuel transport.

Rolling Stock and Casks – The cost estimate does not identify or price the initial procurement of locomotives, railcars (cask, buffer, escort), or casks.

Ownership – The cost estimate does not identify or price financial/accounting costs such as interest, taxes, and depreciation.

Nuclear Material Requirements – The cost estimate does not identify or price specialized facilities or activities associated with nuclear materials handling.

Schedule-Related Costs – If an extended construction schedule is adopted, additional costs would be incurred. These would include escalation, extended overhead costs, maintenance of constructed facilities not in use, and security.

YMP Program Requirements – This cost estimate does not identify or price specialized practices that may be required for program compliance such as Nevada Test Site construction procedures, existing YMP labor agreements, or DOE orders relating to specialized environmental requirements.

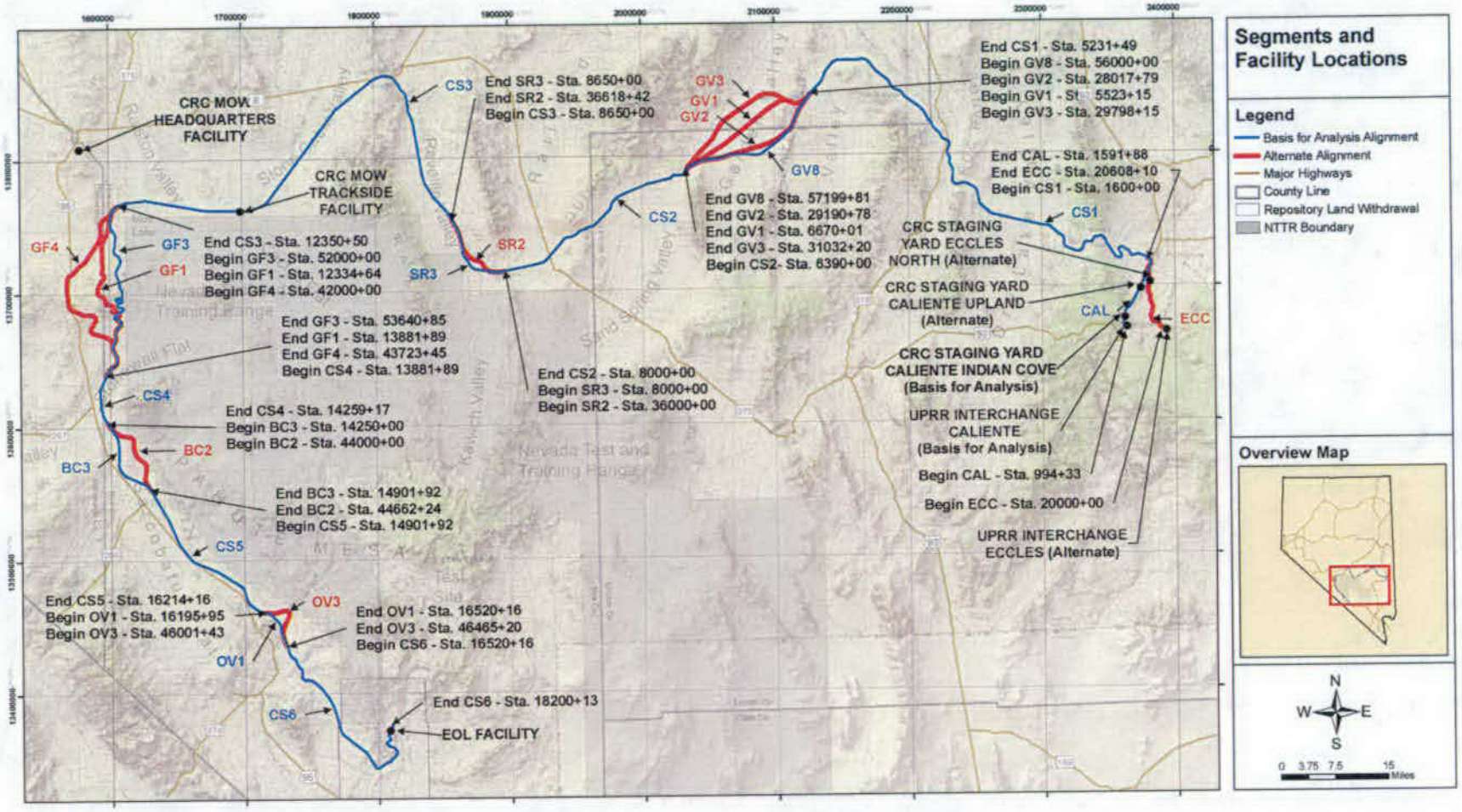

Figure 1-A. CRC Segments and Facility Locations

2.1 BASIS FOR ANALYSIS ALIGNMENT AND ALTERNATE SEGMENT ESTIMATES

The spreadsheet presented in this section include estimates for each of the Basis for Analysis[2] alignment and alternate segments as follows.

2.1.1 Basis for Analysis Segments

Segment	Total Construction Cost	Basis for Analysis	Alternative Segment
CAL – Caliente	$71,627,000	X	
ECC - Eccles	$148,072,000		X
CS1 – Common Segment 1	$476,810,000	X	
GV1 – Garden Valley 1	$126,193,000		X
GV2 – Garden Valley 2	$120,403,000		X
GV3 – Garden Valley 3	$108,818,000		X
GV8 – Garden Valley 8	$154,127,000	X	
CS2 – Common Segment 2	$153,379,000	X	
SR2 – South Reveille 2	$82,597,000		X
SR3 – South Reveille 3	$80,297,000	X	
CS3 – Common Segment 3	$348,374,000	X	
GF1 – Goldfield 1	$202,881,000		X
GF3 – Goldfield 3	$231,458,000	X	
GF4 – Goldfield 4	$249,445,000		X
CS4 – Common Segment 4	$31,100,000	X	
BC2 – Bonnie Claire 2	$96,861,000		X
BC3 – Bonnie Claire 3	$74,895,000	X	
CS5 – Common Segment 5	$130,576,000	X	
OV1 – Oasis Valley 1	$43,207,000	X	
OV3 – Oasis Valley 3	$58,592,000		X
CS6 – Common Segment 6	$265,913,000	X	

[2] Throughout this and other NRP reports, the phrase "basis for analysis" is used to provide a frame of reference for NRP's evaluations of the alignment's construction engineering and operational characteristics. Except for the *Operations and Maintenance Report, Caliente Rail Corridor* (NRP 2007c), NRP reports provide data for all alignment segments so that consideration of other alternative alignment segment combinations may be accomplished.

3.1 FACILITIES ESTIMATES

The following tables present cost estimates for the following facilities:

UPRR Interchange Yard	Total Construction Cost	Basis for Analysis	Alternative Facilities
Caliente	$9,195,000	X	
Eccles	$15,701,000		X
CRC Staging Yard			
Caliente Indian Cove	$28,537,000	X	
Eccles North	$28,537,000		X
Caliente Upland	$28,537,000		X
EOL Facility with CMF co-located	$75,028,000	X	
CRC MOW			
Headquarters Facility	$4,846,000	X	
Trackside Facility	$13,480,000	X	

4.1 BASIS FOR ANALYSIS SUMMARY ESTIMATE

This section presents a summary of the estimate of the basis for analysis and a summary of estimates of the selected configuration of the UPRR interchange, CRC staging yard, and EOL facility with CMF co-located and CRC MOW facilities.

Other potential alignment configurations would include preferred alignment "common segments" as well as one or more alternatives from the alternate alignments (replacing the corresponding segment). As can be seen from the segments map (Figure 1-A), a great number of permutations of possible alignment configurations exist. Given the great number of possibilities, no attempt was made to produce a summary for each possible (except for the preferred) alignment.

The Basis for Analysis includes the following segments:

- CAL - Caliente
- CS1 – Common Segment 1
- GV8 – Garden Valley 8
- CS2 – Common Segment 2
- SR3 – South Reveille 3
- CS3 – Common Segment 3
- GF3 – Goldfield 3
- CS4 – Common Segment 4
- BC3 – Bonnie Claire 3
- CS5 – Common Segment 5
- OV1 – Oasis Valley 1
- CS6 – Common Segment 6

The Basis for Analysis includes the following facilities:

- UPRR Interchange Yard – Caliente Indian Cove Staging Yard
- EOL Facility with CMF co-located
- MOW Headquarters Facility
- MOW Track Side Facility

The Grand Total Cost: $2,192,849,000 (330.7 miles)

No Unit Prices are included in this Summary Report

6.0 References and Applicable Documents

NRP. 2007a. *Construction Plan, Caliente Rail Corridor*. Las Vegas, NV: NRP. NRP-R-SYSW-CP-0008-03, Rev. 03, 15 May 2007.

_____. 2007b. *Facilities–Design Analysis Report, Caliente Rail Corridor*. Las Vegas, NV: NRP. NRP-R-SYSW-FA-0001-03, Rev. 03, 15 May 2007.

_____. 2007c. *Operations and Maintenance Report, Caliente Rail Corridor*. Las Vegas, NV: NRP. NRP-R-SYSW-OM-0001-03, Rev. 03, 15 May 2007.

_____. 2007d. *Route Sections and Structures–Typical Concepts of Structural Features*. Las Vegas, NV: NRP. NRP-R-SYSW-TY-0001-03, Rev. 03, 15 May 2007.

Shannon & Wilson, Inc. 2005. *Ballast Sourcing Cost Analysis, Phase 1, Caliente Rail Corridor, Yucca Mountain Project, Nevada*. Seattle: Shannon & Wilson, Inc. 18 February 2005.