

Supplemental Draft
Environmental Impact Statement and 4(f) Evaluation for
the proposed
DesertXpress High-Speed Passenger Train



Volume I: Report



U.S. Department
of Transportation
**Federal Railroad
Administration**

Prepared by:
USDOT Federal Railroad Administration
1200 New Jersey Ave SE
Washington, DC 20590

August 2010


**DESERTXPRESS HIGH-SPEED PASSENGER TRAIN
SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT
AND 4(F) EVALUATION**

Prepared by
USDOT Federal Railroad Administration

With Cooperating Agencies
**Bureau of Land Management
Surface Transportation Board
Federal Highway Administration
National Park Service**

Pursuant to:

National Environmental Policy Act (42 U.S.C. § 4332 et seq), and implementing regulations (40 C.F.R. Parts 1500-1508), 64 FR § 28545, 23 CFR §771, 65 FR § 33960, 49 C.F.R. § 1105; 49 U.S.C. § 303 (formerly Department of Transportation Act of 1966, Section 4(f)); National Historic Preservation Act (16 U.S.C. § 470); Clean Air Act as amended (42 USC §§ 7401 et seq. and 40 CFR Parts 51 and 93); the Endangered Species Act of 1973 (16 USC § 1531-1544); the Clean Water Act (33 USC § 1251-1387); and the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 USC § 4601)



**Joseph C. Szabo
Administrator
Federal Railroad Administration
U.S. Department of Transportation**

Date 8/25/10

Contact the following individual for additional information concerning this document:

Ms. Wendy Messenger
USDOT Federal Railroad Administration
1200 New Jersey Avenue S.E.
Washington, DC 20590
(202) 493-6396

Abstract: In March 2009, the Federal Railroad Administration published a Draft Environmental Impact Statement (EIS) for the DesertXpress High-Speed Passenger Train project. DesertXpress Enterprises Inc. proposes the construction and operation of a fully grade-separated, dedicated double track passenger-only railroad along an approximately 200-mile corridor, from Victorville, California to Las Vegas, Nevada. Following publication of the Draft EIS, DesertXpress Enterprises Inc. proposed several project modifications and additions to address substantive comments received during public and agency review of the Draft EIS and to reduce or avoid significant environmental effects. This Supplemental Draft EIS evaluates the environmental effects of the proposed project modifications and additions.

The proposed project modifications and additions include a new Victorville passenger station site option, a Barstow area rail alignment routing following I-15 from Lenwood through Yermo, a new rail alignment through the Clark Mountains near the Mojave National Preserve, new sites for maintenance and operation facilities in unincorporated Clark County, relocation of portions of the rail alignment in metropolitan Las Vegas from the immediate I-15 corridor to the Industrial Road/Dean Martin Drive

corridor, and other minor shifts in the rail alignment to avoid or reduce effects or improve operating characteristics of the rail service.

The proposed project modifications and additions do not in any way change the underlying purpose of, or need for the project. The need for a high-speed rail service system stems from several factors, including high and increasing travel demand with limited increases in capacity on Interstate-15 (I-15), constraints to the expansion of air travel, and frequent automobile accidents on the I-15 corridor. The DesertXpress high-speed passenger train would provide reliable and safe passenger rail transportation using proven high-speed rail technology that would be a convenient alternative to automobile travel on I-15 or air travel to and from Las Vegas, and that would add transportation capacity along the I-15 corridor.

Potential environmental impacts of the project modifications and additions include land use and community effects, conversion of grazing land, impacts on sensitive biological resources and wetlands, visual impacts in scenic areas of the Mojave Desert, impacts on historic properties and archaeological sites, impacts on parks and recreation resources, impacts to hydrological resources, air quality effects, noise, and effects on utility and public service providers. Mitigation measures and strategies are described to avoid or minimize potential impacts.

This Supplemental Draft EIS is being made available to the public in accordance with the National Environmental Policy Act for a public review and comment period ending October 18, 2010. Public hearings will be held as shown below.

Las Vegas Area

October 13, 2010

5:30 p.m.- 8:00 p.m

Hampton Inn Tropicana

SW Event Center B

4975 Dean Martin Drive

Las Vegas, NV 89118

Victorville/Barstow Area

October 14, 2010

5:30 p.m.- 8:00 p.m.

Lenwood Hampton Inn

Jackrabbit Room 1

2710 Lenwood Road

Barstow, CA 92311

Locations, dates, and times of hearings will also be posted on the Federal Railroad Administration Web Site (www.fra.dot.gov), and notice will be mailed to interested parties and published in newspapers of general circulation.

Comments on this Supplemental Draft EIS are due by October 18, 2010, and should be sent to the Federal Railroad Administration by mail addressed to:

Ms. Wendy Messenger
Federal Railroad Administration
1200 New Jersey Avenue S.E. MS-20
Washington, DC 20590
Attn: DesertXpress SDEIS

Comments on the Supplemental Draft DesertXpress High-Speed Train EIS must be received by FRA by October 18, 2010.

Visit the Federal Railroad Administration Web Site [www.fra.dot.gov] to view and download the Supplemental Draft and Draft EIS.

Printed copies of the Supplemental Draft and Draft EIS have been placed in the following locations:

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15011 Circle Drive
Victorville, CA 92395

Barstow Library
304 East Buena Vista
Barstow, CA 92311

Las Vegas Library
833 Las Vegas Blvd. N.
Las Vegas, NV 89101

Clark County Library
1401 Flamingo
Las Vegas, NV 89119



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- Appendix S-C Supplemental Hazardous Material Reports and Environmental Database Review for Frias Substation
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ES Executive Summary

ES-1 INTRODUCTION AND BACKGROUND

In March 2009, the Federal Railroad Administration (FRA) published a Draft Environmental Impact Statement (EIS) for the DesertXpress high-speed passenger rail project (project). The project entails the construction and operation of a privately financed interstate high-speed passenger train between Victorville, California and Las Vegas, Nevada. DesertXpress Enterprises, LLC (Applicant) proposes to a fully grade-separated, dedicated double track passenger-only railroad along an approximately 200-mile corridor that would generally follow the I-15 freeway. The project would also include construction of a passenger station in Victorville, California, a passenger station in Las Vegas, Nevada, a maintenance and operation facility in Victorville, an overnight maintenance and storage facility in the Las Vegas area and associated ancillary facilities needed to maintain and operate the proposed rail line.

Following publication of the Draft EIS, the project Applicant proposed several project modifications and additions to address substantive comments received during public and agency review of the Draft EIS and to reduce or avoid significant environmental effects. This Supplemental Draft EIS evaluates the environmental effects of these proposed modifications and additions.

ES-2 PURPOSE AND NEED

The purpose of the project is to provide reliable and safe passenger rail transportation using proven high-speed rail technology between Southern California (Victorville) to Las Vegas that is a convenient alternative to automobile travel on the Interstate-15 freeway (I-15), or air travel to and from Las Vegas, and that adds transportation capacity in the I-15 corridor.

The need for a high-speed rail service stems from several factors: high and increasing travel demand amidst lagging capacity on the I-15 corridor, frequent accidents in the I-15 corridor, and constraints to expansion of air travel. **Chapter 1.0, Purpose and Need**, of this Supplemental Draft EIS summarizes the purpose and need of the project. **Chapter 1.0, Purpose and Need**, of the Draft EIS provides a detailed discussion of the purpose and need of the project.

ES-3 ALTERNATIVES

The Draft EIS considered action alternatives categorized into two primary sets: Alternative A and Alternative B. These are based on potential alignment routings for the 200 mile corridor.

Alternative A consists primarily of rail alignment segments that would be within the **median** of the I-15 freeway.

Alternative B consists primarily of rail alignment segments that would be within the **fenced area** of the I-15 freeway, adjacent to automobile travel lanes.

In addition, the Draft EIS examined a third alignment option within the Las Vegas metropolitan area, **Option C**.

For analytical purposes, each of the alignments along the 200 mile corridor was divided into seven segments. **Figure ES-1** shows the location of the action alternatives. FRA organized the analysis in this manner to allow FRA and the cooperating agencies to “mix and match” various segments in composing a preferred alternative.

The action alternatives evaluated in the Draft EIS also included one of each of the following permanent physical facilities in addition to the rail alignment:

- **Victorville passenger station:** Two site options (Site 1 and Site 2) immediately west of the I-15 freeway were considered.
- **Victorville Operations, Maintenance, and Storage Facility (OMSF):** Two site options (OMSF 1 and OMSF 2) immediately west of the I-15 freeway were considered.
- **Maintenance of Way (MOW) facility:** One site option adjacent to the I-15 freeway near the community of Baker was considered.
- **Las Vegas area Maintenance and Storage Facility (MSF):** Three site options, Sloan Road MSF, Wigwam Avenue MSF, and Robindale Avenue MSF are under consideration.
- **Las Vegas area passenger station:** Four site options in Clark County/City of Las Vegas: Southern Station, Central Station A, Central Station B, and Downtown Station were considered.

In addition, two train technologies, each fully applicable to any set of the action alternatives, were considered in the Draft EIS: a diesel-electric multiple unit train (DEMU) or an electric multiple unit train (EMU). The two technology options would have similar right-of-way width requirements and largely the same construction footprint. However, the EMU option, as considered in the Draft EIS, also included overhead catenary wires and supports (located along the length of the rail alignment), three electrical substations (one at an OMSF, one at the MOW, and one at an MSF),

approximately seventeen transformers (each located on 4,000 to 5,000 square foot parcels at 10 mile intervals along the rail corridor), and three electrical utility connections from the existing electrical grid, one in Victorville, one in Baker, and one near Sloan.

Subsequent to the publication of the Draft EIS, the Applicant proposed several project modifications and additions to address substantive comments received during public and agency review of the Draft EIS and to reduce or avoid significant environmental effects. This Supplemental Draft EIS considers these proposed modifications and additions, which are summarized below and described in more detail in **Chapter 2.0, Alternatives**, of this Supplemental Draft EIS.

- **Victorville Station Site 3 (VV3):** An additional station site option is proposed immediately west of the I-15 freeway near the Dale Evans Parkway.
- **Victorville OMSF2:** The footprint of OMSF 2 has been reduced from 260 acres as analyzed in the Draft EIS to approximately 68 acres. The location of the facility is not changed.
- **Segment 2C:** Two alignments, side running and median, have been proposed within the I-15 freeway corridor through Lenwood and Barstow, for Segment 2
- **Segment 4C:** An additional alignment for Segment 4 has been proposed. Segment 4C is a similar alignment to Segment 4B as presented in the Draft EIS, but would travel north of planned solar energy projects and the Ivanpah Dry Lake bed before connecting back to the I-15 freeway corridor in the vicinity of Primm, Nevada.
- **Relocated Sloan MSF (RSMF):** A modified location for the Sloan MSF has been proposed approximately 9 miles south of Sloan Road and approximately 2 miles south of the Sloan Road MSF analyzed in the Draft EIS.
- **Frias Substation Site:** An additional electrical substation site has been proposed at the intersection of West Frias Avenue and South Dean Martin Drive in unincorporated Clark County, to provide electrical power in the event the EMU technology is selected.
- **Alignment Adjustment Areas (AAAs):** Eight minor modifications to the alignment locations analyzed in the Draft EIS have been proposed.
- **Wigwam Avenue MSF Modification:** A modification has been proposed to the Wigwam MSF to reorient the tail tracks from the south, rather than the north as evaluated in the Draft EIS. The size of the site is otherwise unchanged.
- **Profile Modification:** A modification has been proposed to the profile and width of a 1.3 mile portion of Segment 3B. The alignment is otherwise unchanged.

Figures S-ES-1 through S-ES-5 show the locations of the proposed project modifications and additions.

ES-4 SUMMARY OF ENVIRONMENTAL EFFECTS

Tables S-ES -1 through **S-ES 6** summarize by affected project segment the impacts of the project modifications and additions, including all permanent facilities, relative to their counterpart project components as well as the No Action Alternative.

Project modifications and additions evaluated in this Supplemental Draft EIS affect portions of and/or features along Segments 1 through 6. None of the project modifications affect any of the Las Vegas area stations (Southern, Central A, Central B, Downtown), Segment 7, nor the two technology options (DEMU and EMU), which were fully evaluated in the Draft EIS. Therefore, summary Tables S-ES-1 through S-ES-6 only presents impacts Segments 1 through 6. The information contained in the following tables is derived from the information, analysis and conclusions contained in this Supplemental Draft EIS, the Draft EIS, and supporting appendices.

New information from the analysis contained in this Supplemental Draft EIS is highlighted in the table.

Table S-ES-1 Comparison of Segment 1 Alternatives

Environmental Topic	Segment 1 Rail Alignment and Associated TCAs	Victorville Station Site 1	Victorville OMSF Site 1	Victorville Station Site 2	Victorville Station Site 3 (3A/3B)	Reduced Size Victorville OMSF Site 2	No Action Alternative
Land Use & Community Impacts							
<i>Compatibility with Adjacent Land Uses</i>	High within I-15 corridor, Low outside	Medium	Medium	High	High	High	High
<i>Compatibility with Land Use Plans</i>	High within I-15 corridor, Low outside	Medium-High	Medium-High	High, except for Low (residential)	High, except for Low (residential)	High, except for Low (residential)	High
<i>Number of housing units displaced</i>	0	0	0	0	0	0	Unknown
<i>Extent of community disruption/severance</i>	None expected	None expected	None expected	None expected	None expected	None expected	None expected
<i>Number of environmental justice (EJ) communities crossed by or within 1 mile of facilities</i>	Would cross 2 EJ census blocks (minority/poverty)	Within EJ census block (minority)	Within EJ census block (minority)	Within 1 mile of 2 EJ census blocks	Within 1 mile of 2 EJ census blocks	Within 1 mile of 1 EJ census block	Expected to be similar to Segment 1 rail alignment
Growth							
<i>Estimated permanent employment</i>	NA	361 to 463 permanent jobs in the Victorville Station and OMSF regardless of location					None expected
<i>Removal of obstacles to growth</i>	None expected	None expected	None expected	None expected	None	None expected	None expected
<i>Extent of effects to TOD potential</i>	Beneficial effect	Beneficial effect	Beneficial effect	Beneficial effect	Beneficial effect	Beneficial effect	None expected
<i>Extent of effects to economic vitality</i>	Construction period employment	Beneficial construction and operational employment effects similar for all station/OMSF sites					None expected
Farmlands & Agriculture							
<i>Acres of Directly Impacted Farmland</i>	0	0	0	0	0	0	0 expected

Environmental Topic	Segment 1 Rail Alignment and Associated TCAs	Victorville Station Site 1	Victorville OMSF Site 1	Victorville Station Site 2	Victorville Station Site 3 (3A/3B)	Reduced Size Victorville OMSF Site 2	No Action Alternative
Farmlands & Agriculture Cont'd							
<i>Acres of Indirectly Impacted Farmland</i>	0	0	0	0	0	0	0 expected
<i>Potential Severance of Grazing Allotment</i>	Yes; would traverse a BLM grazing allotment	All Victorville station/OMSF site options are on land identified as a grazing allotment but are immediately adjacent to I-15 freeway, minimizing severance potential					None expected
Utilities & Emergency Services							
<i>Exceed capacity of utility or service systems:</i>							
<i>Electricity and Gas</i>	No demand associated, unless EMU selected	No	No	No	No	No	Not expected
<i>Water Supply</i>	No demand associated	No	No	No	No	No	Not expected
<i>Sewage/Wastewater</i>	No demand associated	No	No	No	No	No	Not expected
<i>Stormwater</i>	Would require connections to existing and/or new facilities	New conveyances would be required at all station/maintenance sites in Victorville					Not expected
<i>Solid Waste</i>	No generation	No	No	No	No	No	Not expected
<i>Police Services</i>	No	No	No	No	No	No	Not expected
<i>Fire/Emergency Services</i>	New staff, equipment and facility	New staff, equipment and facility	(Assumed No)	New staff, equipment and facility	New staff, equipment and facility	(Assumed No)	Not expected

Environmental Topic	Segment 1 Rail Alignment and Associated TCAs	Victorville Station Site 1	Victorville OMSF Site 1	Victorville Station Site 2	Victorville Station Site 3 (3A/3B)	Reduced Size Victorville OMSF Site 2	No Action Alternative	
Utilities & Emergency Services Cont'd								
<i>Potential conflict with existing utility distribution systems</i>	Yes, but conflicts can be mitigated	Yes, but conflicts can be mitigated	Yes, but conflicts can be mitigated	Yes, but conflicts can be mitigated	Yes, but conflicts can be mitigated; VV3A requires approval of LADWP for long term parking in utility corridor	Yes, but conflicts can be mitigated	Assumed yes, and that conflicts can be mitigated	
Traffic & Transportation								
<i>Result in substantial traffic increases:</i>								
<i>Freeway Mainlines</i>		Between Victorville and I-40, traffic reduction associated with either DEMU or EMU levels of traffic would reduce freeway volumes and positively affect LOS						LOS would degrade from D to F between Victorville and I-40
<i>Station Area Intersections</i>	NA	Delays would worsen at 4 intersections (EMU and DEMU)	Same as Station Site 1	Delays would worsen at 2 intersections (EMU) Delays would worsen at 1 intersection (DEMU)	Delays would worsen at 3 intersections (EMU) Delays would worsen at 5 intersections (DEMU)	Same as Station Site 2	None expected	
Visual Resources								
<i>Extent of consistency with BLM VRM Objectives</i>	Somewhat consistent within I-15 corridor; not consistent outside I-15 corridor	All station and OMSF site options would be somewhat consistent						Consistent if impacts remain in existing corridor

Environmental Topic	Segment 1 Rail Alignment and Associated TCAs	Victorville Station Site 1	Victorville OMSF Site 1	Victorville Station Site 2	Victorville Station Site 3 (3A/3B)	Reduced Size Victorville OMSF Site 2	No Action Alternative
Visual Resources Cont'd							
<i>Effect to FHWA Visual Quality/Sensitivity With Project</i>	In I-15 corridor, quality would be reduced from moderate to low. Outside corridor, quality would be reduced from mod/high to mod/low	All station and OMSF site options would be somewhat consistent					Consistent if impacts remain in existing corridor
Cultural & Paleontological							
<i>Number of Eligible or Assumed Eligible Archaeological Resources Directly Affected</i>	16	2	5	1	7	5	Assumed to be same as Segment 1 - about 16
<i>Number of Eligible or Assumed Eligible Archaeological Resources Indirectly Affected</i>	0	0	0	0	0	0	Assumed to be same as Segment 1 - about 0
<i>Number of Historic Architectural Resources Directly/Indirectly Affected</i>	0	0	0	0	0	0	Assumed 0
Hydrology & Water Quality							
<i>Linear feet of impact to water resources</i>	2491	0	12	0	2257 (VV3A) 2075 (VV3B)	825	Assumed similar to Segment 1 - about 2490
<i>Acres within a 100-year floodplain</i>	2.8	13.5	1.9	0	0	0	Assumed similar to Segment 1 - about 2.8
<i>Result in substantial drainage pattern alteration</i>	No	No	No	No	Yes but can be mitigated	Yes but can be mitigated	Not expected

Environmental Topic	Segment 1 Rail Alignment and Associated TCAs	Victorville Station Site 1	Victorville OMSF Site 1	Victorville Station Site 2	Victorville Station Site 3 (3A/3B)	Reduced Size Victorville OMSF Site 2	No Action Alternative
Hydrology & Water Quality Cont'd							
<i>Estimated peak stormwater discharge (cubic feet/second)</i>	NA	227	Mostly unpaved; not quantified	243	275 (VV3A) 235 (VV3B)	Mostly unpaved; not quantified	NA
Geology & Soils							
<i>Expected likelihood of Surface Fault Rupture</i>	High	High	High	High	High	High	High
<i>Expected likelihood of ground shaking</i>	High	High	High	High	High	High	High
<i>Expected difficulty of excavation</i>	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
<i>Expected likelihood of landslides</i>	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Hazardous Materials							
<i>Number of properties of environmental concern</i>	0	0	0	0	0	0	0
Air Quality & Global Climate Change							
<i>Exceed a state or federal standard?</i>	No	No	No	No	No	No	Not expected
<i>Result in CO Hotspot?</i>	No	No	No	No	No	No	No
<i>Expected adverse construction period impact?</i>	No	No	No	No	No	No	No
Noise & Vibration							
<i>Expected number of impacts under FRA criteria</i>	3 for EMU, 4 DEMU	NA	NA	NA	NA	NA	None expected
<i>Expected number of severe impacts under FRA criteria</i>	0 for EMU, 1 for DEMU	NA	NA	NA	NA	NA	None expected
<i>Expected number of vibration impacts</i>	0	0	0	0	0	0	None expected

Environmental Topic	Segment 1 Rail Alignment and Associated TCAs	Victorville Station Site 1	Victorville OMSF Site 1	Victorville Station Site 2	Victorville Station Site 3 (3A/3B)	Reduced Size Victorville OMSF Site 2	No Action Alternative
Energy							
<i>Result in Significant Change in Energy Consumption?</i>		Analysis examined project as a whole, comparing DEMU, EMU, and No Action.					
Biological Resources							
<i>Impose Barrier to wildlife movement</i>	Yes, outside I-15 corridor	No	No	No	No	No	No new barriers
<i>Number of stream crossings</i>	24	0	0	2	1	2 (no change from DEIS)	No new crossings
<i>Sensitive plant community acreage affected</i>							
<i>Permanent</i>	0	0	0	0	0	0	Assumed 0
<i>Temporary</i>	0	0	0	0	0	0	Assumed 0
<i>Desert Tortoise habitat acreage affected</i>							
<i>Permanent</i>	159	93	92.4	114.5	205.5 (VV3A) 223.5 (VV3B)	195.2	0
<i>Temporary</i>	832.1	0	0	0	38.5 (VV3A) 40.8 (VV3B)	0	0
<i>Mohave Ground Squirrel habitat acreage affected</i>							
<i>Permanent</i>	198.5	85.1	22.6	105.2	205.5 (VV3A) 223.5 (VV3B)	339.7	0
<i>Temporary</i>	803.3	0	0	0	38.5 (VV3A) 40.8 (VV3B)	0	0
<i>Potential to result in direct mortality/loss/disturbance to:</i>							
<i>Mojave Fringe-toed Lizard</i>	Yes	No	No	No	No	No	No
<i>Nesting raptors/migratory birds</i>	Yes	No	No	No	No	No	No
<i>Banded Gila Monster</i>	No	No	No	No	No	No	No
<i>Burrowing Owls</i>	Yes	Yes	Yes	Yes	Yes	Yes	No

Environmental Topic	Segment 1 Rail Alignment and Associated TCAs	Victorville Station Site 1	Victorville OMSF Site 1	Victorville Station Site 2	Victorville Station Site 3 (3A/3B)	Reduced Size Victorville OMSF Site 2	No Action Alternative
Biological Resources Cont'd							
<i>Roosting Bats</i>	Yes, at bridge crossings	Yes, rock outcrops	No	No	No	No	No
<i>American Badger</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Desert Bighorn Sheep</i>	No	No	No	No	No	No	No
<i>Clark County MSHCP Covered Reptiles</i>	No	No	No	No	No	No	No
<i>Acres of Special Management Lands Lost</i>	0	0	0	0	No	0	0
Section 4(f)							
<i>Number of Section 4(f) properties used</i>							
<i>Park and Recreation</i>	0	0	0	0	0	0	0
<i>Cultural Resources</i>	2	0	0	0	0	0	0

Source: CirclePoint, 2010.

Table S-ES-2 Comparison of Segment 2 Alternatives

Environmental Topic	Segment 2A/2B, 2A Rail Alignment and Associated TCAs (including AAAs 1-2)	Segment 2A/2B, 2B Rail Alignment and Associated TCAs (including AAAs 1-2)	Segment 2C (Side Running and Median Options) and Associated TCA	No Action Alternative
Land Use & Community Impacts				
<i>Compatibility with Adjacent Land Uses</i>	High within I-15 corridor, Low near Barstow, Low to medium near Yermo	High within I-15 corridor, High near commercial uses, Low near Barstow, Low near residential uses	High within I-15 corridor, Medium near commercial/industrial uses, Low near Barstow, Low near residential uses	High
<i>Compatibility with Land Use Plans</i>	High within I-15 corridor, Low outside	Medium-High	Medium-High	High
<i>Number of housing units displaced</i>	0	0	0	Unknown
<i>Extent of community disruption/severance</i>	Linear division through Lenwood and Yermo	Linear division through Lenwood	None Expected	None expected
<i>Number of environmental justice(EJ) communities crossed by or within 1 mile of facilities</i>	Within 1 mile of 4 EJ census blocks (minority/poverty)	Within 1 mile of 4 EJ census blocks (minority/poverty)	Would cross 2 EJ census blocks (minority/poverty)	Expected to be similar to Segment 1 rail alignment
Growth				
<i>Estimated permanent employment</i>	NA	NA	NA	None expected
<i>Removal of obstacles to growth</i>	None expected	None expected	None expected	None expected
<i>Extent of effects to TOD potential</i>	None	None	None expected	None expected
<i>Extent of effects to economic vitality</i>	Construction period employment	Construction period employment	Construction period employment	None expected
Farmlands & Agriculture				
<i>Acres of Directly Impacted Farmland</i>	3.37 acres	3.37 acres	0	0 expected
<i>Acres of Indirectly Impacted Farmland</i>	6.75 acres	6.75 acres	0	0 expected
<i>Potential Severance of Grazing Allotment</i>	No	No	No	None expected

Environmental Topic	Segment 2A/2B, 2A Rail Alignment and Associated TCAs (including AAAs 1-2)	Segment 2A/2B, 2B Rail Alignment and Associated TCAs (including AAAs 1-2)	Segment 2C (Side Running and Median Options) and Associated TCA	No Action Alternative
Utilities & Emergency Services				
<i>Exceed capacity of utility or service systems:</i>				
<i>Electricity and Gas</i>	No demand associated, unless EMU selected	No demand associated, unless EMU selected	No demand associated, unless EMU selected	Not expected
<i>Water Supply</i>	No demand associated	No demand associated	No demand associated	Not expected
<i>Sewage/Wastewater</i>	No demand associated	No demand associated	No demand associated	Not expected
<i>Stormwater</i>	Would require connections to new conveyance facilities	Would require connections to existing and/or new conveyance facilities	Would require connections to existing and/or new conveyance facilities	Not expected
<i>Solid Waste</i>	No generation	No generation	No generation	Not expected
<i>Police Services</i>	SBCPD concern of train derailment emergency	SBCPD concern of train derailment emergency	SBCPD concern of train derailment emergency	Not expected
<i>Fire/Emergency Services</i>	New staff, equipment and facility	New staff, equipment and facility	New staff, equipment and facility	Not expected
<i>Potential conflict with existing utility distribution systems</i>	Yes, but conflicts can be mitigated	Yes, but conflicts can be mitigated	Yes, but conflicts can be mitigated	Assumed yes, and that conflicts can be mitigated
Traffic & Transportation				
<i>Result in substantial traffic increases:</i>				
<i>Freeway Mainlines</i>	Between I-40 and the California-Nevada state line, traffic reduction associated with either DEMU or EMU levels of traffic would reduce freeway volumes and positively affect LOS			LOS would degrade from D to F between Victorville and I-40
<i>Station Area Intersections</i>	NA	NA	NA	None expected

Environmental Topic	Segment 2A/2B, 2A Rail Alignment and Associated TCAs (including AAAs 1-2)	Segment 2A/2B, 2B Rail Alignment and Associated TCAs (including AAAs 1-2)	Segment 2C (Side Running and Median Options) and Associated TCA	No Action Alternative
Visual Resources				
<i>Extent of consistency with BLM VRM Objectives</i>	Somewhat consistent in undeveloped and developed areas.	Somewhat consistent in undeveloped and developed areas.	Somewhat consistent in undeveloped and developed areas	Consistent if impacts remain in existing corridor
<i>Effect to FHWA Visual Quality/Sensitivity With Project</i>	In undeveloped areas, quality decreased from moderate/high to moderate. Low/moderate quality in developed areas.	In undeveloped areas, quality decreased from moderate/high to moderate. Near I-15, quality decreased from moderate to low.	At Barstow, disrupt visual unity. Near I-15 no substantial changes to existing low.	Consistent if impacts remain in existing corridor
Cultural & Paleontological				
<i>Number of Eligible or Assumed Eligible Archaeological Resources Directly Affected</i>	16	23	14	Assumed to be same as Segment 2C - about 14
<i>Number of Eligible or Assumed Eligible Archaeological Resources Indirectly Affected</i>	3	7	0	Assumed to be same as Segment 2C - 0
<i>Number of Historic Architectural Resources Directly/Indirectly Affected</i>	0	0	0	Assumed 0
Hydrology & Water Quality				
<i>Linear feet of impact to water resources</i>	1157	11,064	2344 (side running) 2342 (median running)	Assumed similar to Segment 2C- about 2340
<i>Acres within a 100-year floodplain</i>	12	22	11 (side running) 10 (median running)	Assumed similar to Segment 2C - about 11
<i>Result in substantial drainage pattern alteration</i>	No	No	No	Not expected
<i>Estimated peak stormwater discharge (cubic feet/second)</i>	NA	NA	No	NA

Environmental Topic	Segment 2A/2B, 2A Rail Alignment and Associated TCAs (including AAAs 1-2)	Segment 2A/2B, 2B Rail Alignment and Associated TCAs (including AAAs 1-2)	Segment 2C (Side Running and Median Options) and Associated TCA	No Action Alternative
Geology & Soils				
<i>Expected likelihood of Surface Fault Rupture</i>	High near Barstow, Low near Yermo.	High near Barstow, Low near Yermo.	High	High
<i>Expected likelihood of ground shaking</i>	High	High	High	High
<i>Expected difficulty of excavation</i>	Moderate	Moderate	Moderate	Moderate
<i>Expected likelihood of landslides</i>	Moderate near Barstow, Low near Yermo.	Moderate near Barstow, Low near Yermo.	Low	Moderate
Hazardous Materials				
<i>Number of properties of environmental concern</i>	4	6	5	0
Air Quality & Global Climate Change				
<i>Exceed a state or federal standard?</i>	No	No	No	Not expected
<i>Result in CO Hotspot?</i>	No	No	No	No
<i>Expected adverse construction period impact?</i>	No	No	No	No
Noise & Vibration				
<i>Expected number of impacts under FRA criteria</i>	57 for EMU, 77 for DEMU	60 for EMU, 83 for DEMU	60 for EMU, 139 for DEMU (side running) 80 for EMU, 127 for DEMU (median running)	None expected
<i>Expected number of severe impacts under FRA criteria</i>	31 for EMU, 41 for DEMU	35 for EMU, 46 for DEMU	33 for EMU, 48 for DEMU (side running) 0 for EMU, 22 for DEMU (median running)	None expected
<i>Expected number of vibration impacts</i>	19	23	0	None expected
Energy				
<i>Result in Significant Change in Energy Consumption?</i>	Analysis examined project as a whole, comparing DEMU, EMU, and No Action.			

Environmental Topic	Segment 2A/2B, 2A Rail Alignment and Associated TCAs (including AAAs 1-2)	Segment 2A/2B, 2B Rail Alignment and Associated TCAs (including AAAs 1-2)	Segment 2C (Side Running and Median Options) and Associated TCA	No Action Alternative
Biological Resources				
<i>Impose Barrier to wildlife movement</i>	No	No	No	No new barriers
<i>Number of stream crossings</i>	16	12	12	No new crossings
<i>Sensitive plant community acreage affected</i>				
<i>Permanent</i>	0	0	0	Assumed 0
<i>Temporary</i>	4.6 acres of Mesquite Shrubland	0	0	Assumed 0
<i>Desert Tortoise habitat acreage affected</i>				
<i>Permanent</i>	171	151	37.5 (side running) 37.4 (median running)	0
<i>Temporary</i>	700	548	101 (side running) 97.(median running)	0
<i>Mohave Ground Squirrel habitat acreage affected</i>				
<i>Permanent</i>	23	40	36 (side running) 36 (median running)	0
<i>Temporary</i>	863	319	89.1 (side running) 89.1 (median running)	0
<i>Potential to result in direct mortality/loss/disturbance to:</i>				
<i>Mojave Fringe-toed Lizard</i>	Yes, near Mojave River	No	Yes, near Mojave River (side running) No for median running	No
<i>Nesting raptors/migratory birds</i>	Yes	Yes	Yes (both options)	No
<i>Banded Gila Monster</i>	No	No	No (both options)	No
<i>Burrowing Owls</i>	Yes	Yes	Yes (both options)	No
<i>Roosting Bats</i>	Yes, in caves and mines	Yes, in caves and mines	No (both options)	No
<i>American Badger</i>	Yes	Yes	Yes (both options)	Yes

Environmental Topic	Segment 2A/2B, 2A Rail Alignment and Associated TCAs (including AAAs 1-2)	Segment 2A/2B, 2B Rail Alignment and Associated TCAs (including AAAs 1-2)	Segment 2C (Side Running and Median Options) and Associated TCA	No Action Alternative
Biological Resources Cont'd				
<i>Desert Bighorn Sheep</i>	No	No	No (both options)	No
<i>Clark County MSHCP Covered Reptiles</i>	No	No	No (both options)	No
<i>Acres of Special Management Lands Lost</i>	60.9 acres of Superior-Cronese Desert Tortoise Critical Habitat	60.9 acres of Superior-Cronese Desert Tortoise Critical Habitat	0	0
Section 4(f)				
<i>Number of Section 4(f) properties used</i>				
<i>Park and Recreation</i>	0	0	0	0
<i>Cultural Resources</i>	6	7	2	0

Source: CirclePoint, 2010.

Table S-ES-3 Comparison of Segment 3 Alternatives

Environmental Topic	Segment 3A Rail Alignment and Associated TCAs	Segment 3B Rail Alignment and Associated TCAs (with Profile Modification and AAA 3-6)	Baker Maintenance of Way Facility	No Action Alternative
Land Use & Community Impacts				
<i>Compatibility with Adjacent Land Uses</i>	High within I-15 corridor, Low outside	High within I-15 corridor, Low outside	High	High
<i>Compatibility with Land Use Plans</i>	High within I-15 corridor, Low outside	Medium-High	Medium-High	High
<i>Number of housing units displaced</i>	0	0	0	Unknown
<i>Extent of community disruption/severance</i>	None expected	None expected	None expected	None expected
<i>Number of environmental justice (EJ) communities crossed by or within 1 mile of facilities</i>	Would cross 3 EJ census blocks (minority and poverty)	Would cross 3 EJ census blocks (minority and poverty)	Outside any EJ census block	Expected to be similar to Segment 3A rail alignment
Growth				
<i>Estimated permanent employment</i>	NA	NA	8 employees	None expected
<i>Removal of obstacles to growth</i>	None expected	None expected	None expected	None expected
<i>Extent of effects to TOD potential</i>	None	None	None	None expected
<i>Extent of effects to economic vitality</i>	Construction period employment	Construction period employment	Beneficial construction and operational employment effects	None expected
Farmlands & Agriculture				
<i>Acres of Directly Impacted Farmland</i>	0	0	0	0 expected
<i>Acres of Indirectly Impacted Farmland</i>	0.3	0	0	0 expected
<i>Potential Severance of Grazing Allotment</i>	No, Adjacent to grazing lands	No, Adjacent to grazing lands	No, Adjacent to grazing lands	None expected
Utilities & Emergency Services				
<i>Exceed capacity of utility or service systems:</i>				
<i>Electricity and Gas</i>	No demand associated, unless EMU selected	No demand associated, unless EMU selected	No	Not expected
<i>Water Supply</i>	No demand associated	No demand associated	No	Not expected

Environmental Topic	Segment 3A Rail Alignment and Associated TCAs	Segment 3B Rail Alignment and Associated TCAs (with Profile Modification and AAA 3-6)	Baker Maintenance of Way Facility	No Action Alternative
Utilities & Emergency Services Cont'd				
<i>Sewage/Wastewater</i>	No demand associated	No demand associated	No	Not expected
<i>Stormwater</i>	Would require connections to existing and/or new conveyance facilities	Would require connections to existing and/or new conveyance facilities	New conveyances would be required	Not expected
<i>Solid Waste</i>	No generation	No generation	No	Not expected
<i>Police Services</i>	No	No	No	Not expected
<i>Fire/Emergency Services</i>	New staff, equipment, and facility	New staff, equipment, and facility	New staff, equipment, and facility	Not expected
<i>Potential conflict with existing utility distribution systems</i>	Yes, but conflicts can be mitigated	Yes, but conflicts can be mitigated	Yes, but conflicts can be mitigated	Assumed yes, and that conflicts can be mitigated
Traffic & Transportation				
<i>Result in substantial traffic increases:</i>				
<i>Freeway Mainlines</i>	Between I-40 and the California-Nevada state line, traffic reduction associated with either DEMU or EMU levels of traffic would reduce freeway volumes and positively affect LOS		NA	LOS would degrade between I-40 and the Nevada state line
<i>Station Area Intersections</i>	NA	NA	NA	None expected
Visual Resources				
<i>Extent of consistency with BLM VRM Objectives</i>	Somewhat consistent in I-15 corridor. Not consistent near wilderness areas in Preserve.	Somewhat consistent in I-15 corridor. Not consistent near wilderness areas in the Mojave National Preserve.	High level of contrast with views from Preserve.	Consistent if impacts remain in existing corridor
<i>Effect to FHWA Visual Quality/Sensitivity With Project</i>	In Preserve, quality reduced from high to moderate. Outside Preserve, quality reduced from moderate/high to moderate.	In Preserve, quality reduced from high to moderate. Outside Preserve, quality reduced from moderate/high to moderate.	Consistent, as constructed near I-15 corridor.	Consistent if impacts remain in existing corridor

Environmental Topic	Segment 3A Rail Alignment and Associated TCAs	Segment 3B Rail Alignment and Associated TCAs (with Profile Modification and AAA 3-6)	Baker Maintenance of Way Facility	No Action Alternative
Cultural & Paleontological Resources				
<i>Number of Eligible or Assumed Eligible Archaeological Resources Directly Affected</i>	19	39 (1 fewer than unaltered Segment 3B)	0	Assumed to be same as Segment 3A - about 19
<i>Number of Eligible or Assumed Eligible Archaeological Resources Indirectly Affected</i>	6	9	0	Assumed to be same as Segment 3A - about 9
<i>Number of Historic Architectural Resources Directly/Indirectly Affected</i>	0	0	0	Assumed 0
Hydrology & Water Quality				
<i>Linear feet of impact to water resources</i>	4059	7608	0	Assumed similar to Segment 3A - about 4059
<i>Acres within a 100-year floodplain</i>	0	2.7	0	Assumed similar to Segment 3A - 0
<i>Result in substantial drainage pattern alteration</i>	No	No	No	Not expected
<i>Estimated peak stormwater discharge (cubic feet/second)</i>	NA	NA	NA	NA
Geology & Soils				
<i>Expected likelihood of Surface Fault Rupture</i>	High from Yermo to Baker, low from the east of Baker.	High from Yermo to Baker, low from the east of Baker.	High	High
<i>Expected likelihood of ground shaking</i>	Low/moderate from Yermo to Baker, moderate from the east of Baker.	Low/moderate from Yermo to Baker, moderate from the east of Baker.	Low/Moderate	High
<i>Expected difficulty of excavation</i>	Moderate	Moderate	Moderate	Moderate
<i>Expected likelihood of landslides</i>	Moderate	Moderate	Moderate	Moderate

Environmental Topic	Segment 3A Rail Alignment and Associated TCAs	Segment 3B Rail Alignment and Associated TCAs (with Profile Modification and AAA 3-6)	Baker Maintenance of Way Facility	No Action Alternative
Hazardous Materials				
<i>Number of properties of environmental concern</i>	2	2	0	0
Air Quality & Global Climate Change				
<i>Exceed a state or federal standard?</i>	No	No	No	Not expected
<i>Result in CO Hotspot?</i>	No	No	No	No
<i>Expected adverse construction period impact?</i>	No	No	No	No
Noise & Vibration				
<i>Expected number of impacts under FRA criteria</i>	0	0	0	None expected
<i>Expected number of severe impacts under FRA criteria</i>	0	0	0	None expected
<i>Expected number of vibration impacts</i>	0	0	0	None expected
Energy				
<i>Result in Significant Change in Energy Consumption?</i>	Analysis examined project as a whole, comparing DEMU, EMU, and No Action.			
Biological Resources				
<i>Impose Barrier to wildlife movement</i>	No	No	No	No new barriers
<i>Number of stream crossings</i>	105	117	1	No new crossings
<i>Sensitive plant community acreage affected</i>				
<i>Permanent</i>	0	84 acres of Joshua Tree Woodland; 2 acres of Mesquite Shrubland	0	Assumed 0
<i>Temporary</i>	0	194 acres of Joshua Tree Woodland; 13 acres of Mesquite Shrubland	0	Assumed 0

Environmental Topic	Segment 3A Rail Alignment and Associated TCAs	Segment 3B Rail Alignment and Associated TCAs (with Profile Modification and AAA 3-6)	Baker Maintenance of Way Facility	No Action Alternative
Biological Resources Cont'd				
<i>Desert Tortoise habitat acreage affected</i>				
Permanent	7.6	620	0	0
Temporary	40.9	1848	0	0
<i>Mohave Ground Squirrel habitat acreage affected</i>				
Permanent	0	0	0	0
Temporary	70.1	61.5	0	0
<i>Potential to result in direct mortality/loss/disturbance to:</i>				
<i>Mojave Fringe-toed Lizard</i>	No	No	No	No
<i>Nesting raptors/migratory birds</i>	No	Yes	Yes	No
<i>Banded Gila Monster</i>	No	Yes	No	No
<i>Burrowing Owls</i>	No	Yes	Yes	No
<i>Roosting Bats</i>	No	Yes, in caves and mines	No	No
<i>American Badger</i>	Yes	Yes	Yes	Yes
<i>Desert Bighorn Sheep</i>	No	Yes	No	No
<i>Clark County MSHCP Covered</i>	No	No	No	No
<i>Reptiles</i>				
<i>Acres of Special Management Lands Lost</i>	0	268.5 acres of Superior-Cronese Desert Tortoise Critical Habitat, 226 acres of Ivanpah Desert Tortoise Critical Habitat, 3.6 acres of Cronese ACEC.	0	0
Section 4(f)				
<i>Number of Section 4(f) properties used</i>				
<i>Park and Recreation</i>	0	0	0	0
<i>Cultural Resources</i>	7	8	0	0

Source: CirclePoint, 2010.

Table S-ES-4 Comparison of Segment 4 Alternatives

Environmental Topic	Segment 4A Rail Alignment and Associated TCAs	Segment 4B Rail Alignment and Associated TCAs	Segment 4C Rail Alignment and Associated TCAs	No Action Alternative
Land Use & Community Impacts				
<i>Compatibility with Adjacent Land Uses</i>	Low within the Preserve	Low	High within vacant and institutional land uses. Low within residential land uses. High within BLM Class M Lands, Low within BLM Class L Lands	High
<i>Compatibility with Land Use Plans</i>	High-Low	Medium-High	Medium-High	High
<i>Number of housing units displaced</i>	0	0	0	Unknown
<i>Extent of community disruption/severance</i>	None expected	None expected	None expected	None expected
<i>Number of environmental justice (EJ) communities crossed by or within 1 mile of facilities</i>	2	1	1	2
Growth				
<i>Estimated permanent employment</i>	NA	NA	NA	None expected
<i>Removal of obstacles to growth</i>	None expected	None expected	None expected	None expected
<i>Extent of effects to TOD potential</i>	None	None	None	None expected
<i>Extent of effects to economic vitality</i>	Construction period employment	Construction period employment	Construction period employment	None expected
Farmlands & Agriculture				
<i>Acres of Directly Impacted Farmland</i>	0	0	0	0 expected
<i>Acres of Indirectly Impacted Farmland</i>	0	0	0	0 expected
<i>Potential Severance of Grazing Allotment</i>	None	Yes; would traverse an allotment	Yes; would traverse an allotment	None expected

Environmental Topic	Segment 4A Rail Alignment and Associated TCAs	Segment 4B Rail Alignment and Associated TCAs	Segment 4C Rail Alignment and Associated TCAs	No Action Alternative
Utilities & Emergency Services				
<i>Exceed capacity of utility or service systems:</i>				
<i>Electricity and Gas</i>	No demand associated, unless EMU selected	No demand associated, unless EMU selected	No demand associated, unless EMU selected	Not expected
<i>Water Supply</i>	No demand associated	No demand associated	No demand associated	Not expected
<i>Sewage/Wastewater</i>	No demand associated	No demand associated	No demand associated	Not expected
<i>Stormwater</i>	Would require connections to existing and/or new facilities	Would require connections to new facilities	Would require connections to new facilities	Not expected
<i>Solid Waste</i>	No generation	No generation	No generation	Not expected
<i>Police Services</i>	No	No	No	Not expected
<i>Fire/Emergency Services</i>	New staff, equipment and facility	New staff, equipment and facility	New staff, equipment and facility	Not expected
<i>Potential conflict with existing utility distribution systems</i>	Yes, but conflicts can be mitigated	Yes, but conflicts can be mitigated	Yes, but conflicts can be mitigated	Assumed yes, and that conflicts can be mitigated
Traffic & Transportation				
<i>Result in substantial traffic increases:</i>				
<i>Freeway Mainlines</i>	Between I-40 and the California-Nevada state line, traffic reduction associated with either DEMU or EMU levels of traffic would reduce freeway volumes and positively affect LOS			LOS would degrade between I-40 and the Nevada state line
<i>Station Area Intersections</i>	NA	NA	NA	None expected

Environmental Topic	Segment 4A Rail Alignment and Associated TCAs	Segment 4B Rail Alignment and Associated TCAs	Segment 4C Rail Alignment and Associated TCAs	No Action Alternative
Visual Resources				
<i>Extent of consistency with BLM VRM Objectives</i>	Not consistent within and outside Clark Mountains.	Somewhat within and outside Clark Mountains.	Somewhat within and outside Clark Mountains.	Consistent if impacts remain in existing corridor
<i>Effect to FHWA Visual Quality/Sensitivity With Project</i>	Within Preserve, quality reduced from high to moderate. Moderate quality outside the Preserve.	Moderate quality in Clark Mountains. High quality outside Clark Mountains.	Moderate quality in and outside Clark Mountains.	Consistent if impacts remain in existing corridor
Cultural & Paleontological				
<i>Number of Eligible or Assumed Eligible Archaeological Resources Directly Affected</i>	7	8	10	Unknown
<i>Number of Eligible or Assumed Eligible Archaeological Resources Indirectly Affected</i>	1	1	3	Unknown
<i>Number of Historic Architectural Resources Directly/Indirectly Affected</i>	0	0	0	Assumed 0
Hydrology & Water Quality				
<i>Linear feet of impact to water resources</i>	734	319	1485	Likely substantial due to presence of wash in I-15 median
<i>Acres within a 100-year floodplain</i>	0	0	0	Assumed 0
<i>Result in substantial drainage pattern alteration</i>	No	No	No	Not expected
<i>Estimated peak stormwater discharge (cubic feet/second)</i>	NA	NA	NA	NA

Environmental Topic	Segment 4A Rail Alignment and Associated TCAs	Segment 4B Rail Alignment and Associated TCAs	Segment 4C Rail Alignment and Associated TCAs	No Action Alternative
Geology & Soils				
<i>Expected likelihood of Surface Fault Rupture</i>	High	High	Low	High
<i>Expected likelihood of ground shaking</i>	Low/Moderate	Low/Moderate	Moderate/High	High
<i>Expected difficulty of excavation</i>	Moderate	High	Moderate	Moderate
<i>Expected likelihood of landslides</i>	Moderate	High	Moderate	Moderate
Hazardous Materials				
<i>Number of properties of environmental concern</i>	1	0	0	0
Air Quality & Global Climate Change				
<i>Exceed a state or federal standard?</i>	No	No	No	Not expected
<i>Result in CO Hotspot?</i>	No	No	No	No
<i>Expected adverse construction period impact?</i>	No	No	Yes, but can be mitigated	No
Noise & Vibration				
<i>Expected number of impacts under FRA criteria</i>	0	0	0	None expected
<i>Expected number of severe impacts under FRA criteria</i>	0	0	0	None expected
<i>Expected number of vibration impacts</i>	0	0	0	None expected
Energy				
<i>Result in Significant Change in Energy Consumption?</i>	Analysis examined project as a whole, comparing DEMU, EMU, and No Action.			
Biological Resources				
<i>Impose Barrier to wildlife movement</i>	Yes, outside I-15	Yes, outside I-15	Yes, outside I-15	No new barriers
<i>Number of stream crossings</i>	29	42	48	No new crossings

Environmental Topic	Segment 4A Rail Alignment and Associated TCAs	Segment 4B Rail Alignment and Associated TCAs	Segment 4C Rail Alignment and Associated TCAs	No Action Alternative
Biological Resources Cont'd				
<i>Sensitive plant community acreage affected</i>				
<i>Permanent</i>	0.5 acres of Mesquite Shrubland	0	1.9 acres of Mesquite Shrubland	Assumed 0
<i>Temporary</i>	0	0	3.1 acres of Mesquite Shrubland	Assumed 0
<i>Desert Tortoise habitat acreage affected</i>				
<i>Permanent</i>	42.2	111.8	182.9	0
<i>Temporary</i>	371.7	500.3	490	0
<i>Mohave Ground Squirrel habitat acreage affected</i>				
<i>Permanent</i>	0	0	0	0
<i>Temporary</i>	0	0	0	0
<i>Potential to result in direct mortality/loss/disturbance to:</i>				
<i>Mojave Fringe-toed Lizard</i>	No	No	No	No
<i>Nesting raptors/migratory birds</i>	Yes	Yes	Yes	No
<i>Banded Gila Monster</i>	Yes	Yes	Yes	No
<i>Burrowing Owls</i>	Yes	Yes	Yes	No
<i>Roosting Bats</i>	Yes, in caves and mines	Yes, in caves and mines	Yes, in caves and mines	No
<i>American Badger</i>	Yes	Yes	Yes	Yes
<i>Desert Bighorn Sheep</i>	Yes	Yes	Yes	No
<i>Clark County MSHCP Covered Reptiles</i>	No	No	Yes	No
<i>Acres of Special Management Lands Lost</i>	20.4 acres of Ivanpah Desert Tortoise Critical Habitat, 13.8 acres of the Mojave National Preserve	0	0	0

Environmental Topic	Segment 4A Rail Alignment and Associated TCAs	Segment 4B Rail Alignment and Associated TCAs	Segment 4C Rail Alignment and Associated TCAs	No Action Alternative
Section 4(f)				
<i>Number of Section 4(f) properties used</i>				
<i>Park and Recreation</i>	1 (Mojave National Preserve)	0	0	0
<i>Cultural Resources</i>	0	0	0	0

Source: CirclePoint, 2010.

Table S-ES-5 Comparison of Segment 5 Alternatives

Environmental Topic	Segment 5A Rail Alignment and Associated TCAs	Segment 5B Rail Alignment and Associated TCAs	Sloan Road MSF	Relocated Sloan MSF (RMSMF)	No Action Alternative
Land Use & Community Impacts					
<i>Compatibility with Adjacent Land Uses</i>	High	High	High	High	High
<i>Compatibility with Land Use Plans</i>	Low near limited residential areas, Medium to high elsewhere	Low near limited residential areas, Medium to high elsewhere	Low	High within existing undeveloped, Low within residential areas	High
<i>Number of housing units displaced</i>	0	0	0	0	Unknown
<i>Extent of community disruption/severance</i>	None	None	None	None	None expected
<i>Number of environmental justice (EJ) communities crossed by or within 1 mile of facilities</i>	0	0	0	0	Expected to be similar to Segment 5A rail alignment
Growth					
<i>Estimated permanent employment</i>	None	None	154 to 251 jobs from the station/maintenance facility regardless of location		None expected
<i>Removal of obstacles to growth</i>	None expected	None expected	None expected	None expected	None expected
<i>Extent of effects to TOD potential</i>	None	None	None	None	None expected
<i>Extent of effects to economic vitality</i>	Slight adverse effects to Primm and Jean	Slight adverse effects to Primm and Jean	None	None	None expected
Farmlands & Agriculture					
<i>Acres of Directly Impacted Farmland</i>	None	None	None	None	0 expected
<i>Acres of Indirectly Impacted Farmland</i>	None	None	None	None	0 expected
<i>Potential Severance of Grazing Allotment</i>	None	None	None	None	None expected

Environmental Topic	Segment 5A Rail Alignment and Associated TCAs	Segment 5B Rail Alignment and Associated TCAs	Sloan Road MSF	Relocated Sloan MSF (RMSMF)	No Action Alternative
Utilities & Emergency Services					
<i>Exceed capacity of utility or service systems:</i>					
<i>Electricity and Gas</i>	No demand associated, unless EMU selected	No demand associated, unless EMU selected	No	No	Not expected
<i>Water Supply</i>	NA	NA	New conveyance systems would be required	New conveyance systems would be required	Not expected
<i>Sewage/Wastewater</i>	NA	NA	No	New conveyance systems would be required	Not expected
<i>Stormwater</i>	No	No	NA	NA	Not expected
<i>Solid Waste</i>	NA	NA	No	No	Not expected
<i>Police Services</i>	No	No	No	No	Not expected
<i>Fire/Emergency Services</i>	New staff, equipment and a new station	New staff, equipment and a new station	No	No	Not expected
<i>Potential conflict with existing utility distribution systems</i>	Yes, but conflicts can be mitigated	Yes, but conflicts can be mitigated	Unlikely, but any conflicts can be mitigated	Unlikely, but any conflicts can be mitigated	Assumed yes, and that conflicts can be mitigated
Traffic & Transportation					
<i>Result in substantial traffic increases:</i>					
<i>Freeway Mainlines</i>	DEMU or EMU options would reduce freeway volumes and positively affect LOS				LOS would degrade between Primm and Sloan
<i>Station Area Intersections</i>	NA	NA	NA	NA	None expected

Environmental Topic	Segment 5A Rail Alignment and Associated TCAs	Segment 5B Rail Alignment and Associated TCAs	Sloan Road MSF	Relocated Sloan MSF (RSMF)	No Action Alternative
Visual Resources					
<i>Extent of consistency with BLM VRM Objectives</i>	Consistent in Primm and Jean. Somewhat consistent elsewhere.	Consistent	Not consistent	Consistent	Consistent if impacts remain in existing corridor
<i>Effect to FHWA Visual Quality/Sensitivity With Project</i>	No change within Primm and Jean. Slight decrease in visual quality elsewhere.	No change within Primm and Jean. Slight decrease in visual quality elsewhere.	Minimal adverse change in visual quality	Minimal adverse change in visual quality	Consistent if impacts remain in existing corridor
Cultural & Paleontological					
<i>Number of Eligible or Assumed Eligible Archaeological Resources Directly Affected</i>	4	16	0	1	Assumed to be same as Segment 5A - 4
<i>Number of Eligible or Assumed Eligible Archaeological Resources Indirectly Affected</i>	2	10	0	0	Assumed to be same as Segment 5A - 2
<i>Number of Historic Architectural Resources Directly/Indirectly Affected</i>	0	0	0	0	Assumed 0
Hydrology & Water Quality					
<i>Linear feet of impact to water resources</i>	0	0	0	0	Assumed similar to Segment 5A - 0
<i>Acres within a 100-year floodplain</i>	0	0.9	0	0	Assumed similar to Segment 5A - 0
<i>Result in substantial drainage pattern alteration</i>	No	No	No	No	Not expected
<i>Estimated peak stormwater discharge (cubic feet/second)</i>	NA	NA	Unknown	Unknown	NA
Geology & Soils					
<i>Expected likelihood of Surface Fault Rupture</i>	None	None	None	None	High
<i>Expected likelihood of ground shaking</i>	Low to High	Low to High	Low to High	Low to High	High

Environmental Topic	Segment 5A Rail Alignment and Associated TCAs	Segment 5B Rail Alignment and Associated TCAs	Sloan Road MSF	Relocated Sloan MSF (RSMF)	No Action Alternative
Geology & Soils Cont'd					
<i>Expected difficulty of excavation</i>	Moderate	Moderate	Moderate	Moderate	Moderate
<i>Expected likelihood of landslides</i>	Moderate	Moderate	Moderate	Moderate	Moderate
Hazardous Materials					
<i>Number of properties of environmental concern</i>	0	0	0	0	0
Air Quality & Global Climate Change					
<i>Exceed a state or federal standard?</i>	No	No	No	No	Not expected
<i>Result in CO Hotspot?</i>	No	No	No	No	No
<i>Expected adverse construction period impact?</i>	No	No	No	No	No
Noise & Vibration					
<i>Expected number of impacts under FRA criteria</i>	0	0	0	0	None expected
<i>Expected number of severe impacts under FRA criteria</i>	0	0	0	0	None expected
<i>Expected number of vibration impacts</i>	0	0	0	0	None expected
Energy					
<i>Result in Significant Change in Energy Consumption?</i>	Analysis examined project as a whole, comparing DEMU, EMU, and No Action.				
Biological Resources					
<i>Impose Barrier to wildlife movement</i>	No	No	No	No	No new barriers
<i>Number of stream crossings</i>	49	49	1	0	No new crossings

Environmental Topic	Segment 5A Rail Alignment and Associated TCAs	Segment 5B Rail Alignment and Associated TCAs	Sloan Road MSF	Relocated Sloan MSF (RSMF)	No Action Alternative
Biological Resources Cont'd					
<i>Sensitive plant community acreage affected</i>					
Permanent	0	0	0	0	Assumed 0
Temporary	0	0	0	0	Assumed 0
<i>Desert Tortoise habitat acreage affected</i>					
Permanent	0.2	203.2	9.7 to 13.9	9.1	0
Temporary	8.7	685.6	0	11.4	0
<i>Mohave Ground Squirrel habitat acreage affected</i>					
Permanent	0	0	0	0	0
Temporary	0	0	0	0	0
<i>Potential to result in direct mortality/loss/disturbance to:</i>					
<i>Mojave Fringe-toed Lizard</i>	No	No	No	No	No
<i>Nesting raptors/migratory birds</i>	Yes	Yes	Yes	Yes	No
<i>Banded Gila Monster</i>	No	No	No	Yes	No
<i>Burrowing Owls</i>	No	Yes	No	Yes	No
<i>Roosting Bats</i>	No	Yes	No	No	No
<i>American Badger</i>	Yes	Yes	Yes	Yes	Yes
<i>Desert Bighorn Sheep</i>	No	No	No	No	No
<i>Clark County MSHCP Covered Reptiles</i>	Yes	Yes	Yes	Yes	No
<i>Acres of Special Management Lands</i>	0	0	0	0	0

Environmental Topic	Segment 5A Rail Alignment and Associated TCAs	Segment 5B Rail Alignment and Associated TCAs	Sloan Road MSF	Relocated Sloan MSF (RSMMSF)	No Action Alternative
Section 4(f)					
<i>Number of Section 4(f) properties used</i>					
<i>Park and Recreation</i>	0	0	0	0	0
<i>Cultural Resources</i>	0	4	0	0	0

Source: CirclePoint, 2010.

Table S-ES-6 Comparison of Segment 6 Alternatives

Environmental Topic	Segment 6A Rail Alignment and Associated TCAs	Segment 6B Rail Alignment and Associated TCAs (with AAAs 7-8)	Segment 6C Rail Alignment and Associated TCAs	Wigwam MSF Modification	Robindale MSF	Frias Substation	No Action Alternative
Land Use & Community Impacts							
<i>Compatibility with Adjacent Land Uses</i>	High near undeveloped and commercial/industrial uses, Low near residential uses	High near undeveloped and commercial/industrial uses, Low near residential uses	High near undeveloped and commercial/industrial uses, Low near residential uses	Medium to High	Medium	Medium to High	High
<i>Compatibility with Land Use Plans</i>	Low near residential areas, Medium to high elsewhere*	Low near residential areas, Medium to high elsewhere*	Low near residential areas, Medium to high elsewhere	Medium to High	Low	Medium within residential areas, High within Business & Design and Research land uses	High
<i>Number of housing units displaced</i>	0	0	0	0	1	0	Unknown
<i>Extent of community disruption/severance</i>	None	None	Division through Sloan	None	None	None	None expected
<i>Number of environmental justice (EJ) communities crossed by or within 1 mile of facilities</i>	Would cross 4 EJ census blocks (minority and poverty)	Would cross 4 EJ census blocks (minority and poverty)	Would cross 2 EJ census blocks (minority and poverty)	0	0	0	Expected to be similar to Segment 6A rail alignment
Growth							
<i>Estimated permanent employment</i>	None	None	None	154 to 251 jobs from the station/MSF regardless of location	154 to 251 jobs from the station/MSF regardless of location	None	None expected
<i>Removal of obstacles to growth</i>	None	None	None	None	None	None	None expected

Environmental Topic	Segment 6A Rail Alignment and Associated TCAs	Segment 6B Rail Alignment and Associated TCAs (with AAAs 7-8)	Segment 6C Rail Alignment and Associated TCAs	Wigwam MSF Modification	Robindale MSF	Frias Substation	No Action Alternative
Growth Cont'd							
<i>Extent of effects to TOD potential</i>	None	None	None	None	None	None	None expected
<i>Extent of effects to economic vitality</i>	Construction Period Employment	Construction Period Employment	Construction Period Employment	Beneficial construction and operational employment effects similar for all station/ OMSF sites	Beneficial construction and operational employment effects similar for all station/ OMSF sites	Construction Period Employment	None expected
Farmlands & Agriculture							
<i>Acres of Directly Impacted Farmland</i>	None	None	None	None	None	None	None expected
<i>Acres of Indirectly Impacted Farmland</i>	None	None	None	None	None	None	None expected
<i>Potential Severance of Grazing Allotment</i>	None	None	None	None	None	None	None expected
Utilities & Emergency Services							
<i>Exceed capacity of utility or service systems:</i>							
<i>Electricity and Gas</i>	No demand associated, unless EMU selected	No demand associated, unless EMU selected	No demand associated, unless EMU selected	No	No	No	Not expected
<i>Water Supply</i>	No	No	No	No	No	No	Not expected
<i>Sewage/Wastewater</i>	No	No	No	No	No	No	Not expected
<i>Stormwater</i>	No	No	No	No	No	No	Not expected
<i>Solid Waste</i>	No	No	No	No	No	No	Not expected
<i>Police Services</i>	No	No	No	No	No	No	Not expected

Environmental Topic	Segment 6A Rail Alignment and Associated TCAs	Segment 6B Rail Alignment and Associated TCAs (with AAAs 7-8)	Segment 6C Rail Alignment and Associated TCAs	Wigwam MSF Modification	Robindale MSF	Frias Substation	No Action Alternative
Utilities & Emergency Services Cont'd							
<i>Fire/Emergency Services</i>	New staff, equipment and a new station	New staff, equipment and a new station	New staff, equipment and a new station	No	No	None expected	Not expected
<i>Potential conflict with existing utility distribution systems</i>	Yes, but conflicts can be mitigated	Yes, but conflicts can be mitigated	Yes, but conflicts can be mitigated	Yes, but conflicts can be mitigated	Yes, but conflicts can be mitigated	Yes, but conflicts can be mitigated	Assumed yes, and that conflicts can be mitigated
Traffic & Transportation							
<i>Result in substantial traffic increases:</i>							
<i>Freeway Mainlines</i>	DEMU and EMU options would reduce freeway volumes and positively affect LOS						LOS would degrade between Sloan and I-215
<i>Station Area Intersections</i>	NA	NA	NA	NA	NA	NA	None expected
Visual Resources							
<i>Extent of consistency with BLM VRM Objectives</i>	Somewhat consistent in undeveloped southern portions, consistent elsewhere.	Somewhat consistent in undeveloped southern portions, consistent elsewhere.	Consistent	Consistent	Consistent	Somewhat consistent near residential areas	Consistent if impacts remain in existing corridor
<i>Effect to FHWA Visual Quality/Sensitivity With Project</i>	No change	No change	No change	No change	No change	No change	Consistent if impacts remain in existing corridor
Cultural & Paleontological							
<i>Number of Eligible or Assumed Eligible Archaeological Resources Directly Affected</i>	1	0	19	0	0	0	Assumed to be same as Segment 6A - 1

Environmental Topic	Segment 6A Rail Alignment and Associated TCAs	Segment 6B Rail Alignment and Associated TCAs (with AAAs 7-8)	Segment 6C Rail Alignment and Associated TCAs	Wigwam MSF Modification	Robindale MSF	Frias Substation	No Action Alternative
Cultural & Paleontological Cont'd							
<i>Number of Eligible or Assumed Eligible Archaeological Resources Indirectly Affected</i>	0	1	4	0	0	0	Assumed to be same as Segment 6A - 0
<i>Number of Historic Architectural Resources Directly/Indirectly Affected</i>	0	0	0	0	0	0	Assumed 0
Hydrology & Water Quality							
<i>Linear feet of impact to water resources</i>	0	0	77	0	0	50	Assumed similar to Segment 6A - 0
<i>Acres within a 100-year floodplain</i>	0.8 to 12.6	23	3.7 to 4.2	1.7 to 2.1	0	0	Assumed similar to Segment 6A - up to 12.6
<i>Result in substantial drainage pattern alteration</i>	No	No	No	No	No	No	Not expected
<i>Estimated peak stormwater discharge (cubic feet/second)</i>	NA	NA	NA	Unknown	Unknown	Unknown	NA
Geology & Soils							
<i>Expected likelihood of Surface Fault Rupture</i>	None	None	None	None	None	None	High
<i>Expected likelihood of ground shaking</i>	Low to Moderate	Low to Moderate	Low to Moderate	Low to Moderate	Low to Moderate	Low	High
<i>Expected difficulty of excavation</i>	High	High	High	High	High	High	Moderate
<i>Expected likelihood of landslides</i>	Moderate	Moderate	Low to Moderate	Moderate	Low to Moderate	Low	Moderate

Environmental Topic	Segment 6A Rail Alignment and Associated TCAs	Segment 6B Rail Alignment and Associated TCAs (with AAAs 7-8)	Segment 6C Rail Alignment and Associated TCAs	Wigwam MSF Modification	Robindale MSF	Frias Substation	No Action Alternative
Hazardous Materials							
<i>Number of properties of environmental concern</i>	6	6	3	0	0	0	0
Air Quality & Global Climate Change							
<i>Exceed a state or federal standard?</i>	No	No	No	No	No	No	Not expected
<i>Result in CO Hotspot?</i>	No	No	No	No	No	No	No
<i>Expected adverse construction period impact?</i>	No	No	No	No	No	Yes, but can be mitigated	No
Noise & Vibration							
<i>Expected number of impacts under FRA criteria</i>	358 for EMU, 268 for DEMU	371 for EMU, 303 for DEMU	0	0	0	0	None expected
<i>Expected number of severe impacts under FRA criteria</i>	0	13 for EMU, 37 for DEMU	0	0	0	0	None expected
<i>Expected number of vibration impacts</i>	0	0	0	0	0	0	None expected
Energy							
<i>Result in Significant Change in Energy Consumption?</i>	Analysis examined project as a whole, comparing DEMU, EMU, and No Action.						
Biological Resources							
<i>Impose Barrier to wildlife movement</i>	No	No	Yes	No	No	No	No new barriers
<i>Number of stream crossings</i>	16 to 18	16 to 18	26 to 27	1	1	0	No new crossings

Environmental Topic	Segment 6A Rail Alignment and Associated TCAs	Segment 6B Rail Alignment and Associated TCAs (with AAAs 7-8)	Segment 6C Rail Alignment and Associated TCAs	Wigwam MSF Modification	Robindale MSF	Frias Substation	No Action Alternative
Biological Resources Cont'd							
<i>Sensitive plant community acreage affected</i>							
Permanent	0	0	0	0	0	4.6 acres of Mojave Creosote habitat	Assumed 0
Temporary	0	0	0	0	0		0
<i>Desert Tortoise habitat acreage affected</i>							
Permanent	40.2	38	78.2	3	8.8	0	0
Temporary	116.6	116.6	329.2	0	0	0	0
<i>Mohave Ground Squirrel habitat acreage affected</i>							
Permanent	0	0	0	0	0	0	0
Temporary	0	0	0	0	0	0	0
<i>Potential to result in direct mortality/loss/disturbance to:</i>							
Mojave Fringe-toed Lizard	No	No	No	No	No	No	No
Nesting raptors/migratory birds	No	Yes	Yes	No	No	No	No
Banded Gila Monster	No	No	No	No	No	No	No
Burrowing Owls	No	Yes	Yes	No	No	Yes	No
Roosting Bats	No	Yes	Yes	No	No	No	No
American Badger	Yes	Yes	Yes	Yes	Yes	No	Yes
Desert Bighorn Sheep	No	No	No	No	No	No	No

Environmental Topic	Segment 6A Rail Alignment and Associated TCAs	Segment 6B Rail Alignment and Associated TCAs (with AAAs 7-8)	Segment 6C Rail Alignment and Associated TCAs	Wigwam MSF Modification	Robindale MSF	Frias Substation	No Action Alternative
Biological Resources Cont'd							
<i>Clark County MSHCP Covered Reptiles</i>	Yes	Yes	Yes	Yes	Yes	No	No
<i>Acres of Special Management Lands Lost</i>	0	0	0	0	0	0	0
Section 4(f)							
<i>Number of Section 4(f) properties used</i>							
<i>Park and Recreation</i>	0	0	0	0	0	0	0
<i>Cultural Resources</i>	0	0	2	0	0	0	0

Source: CirclePoint, 2010.

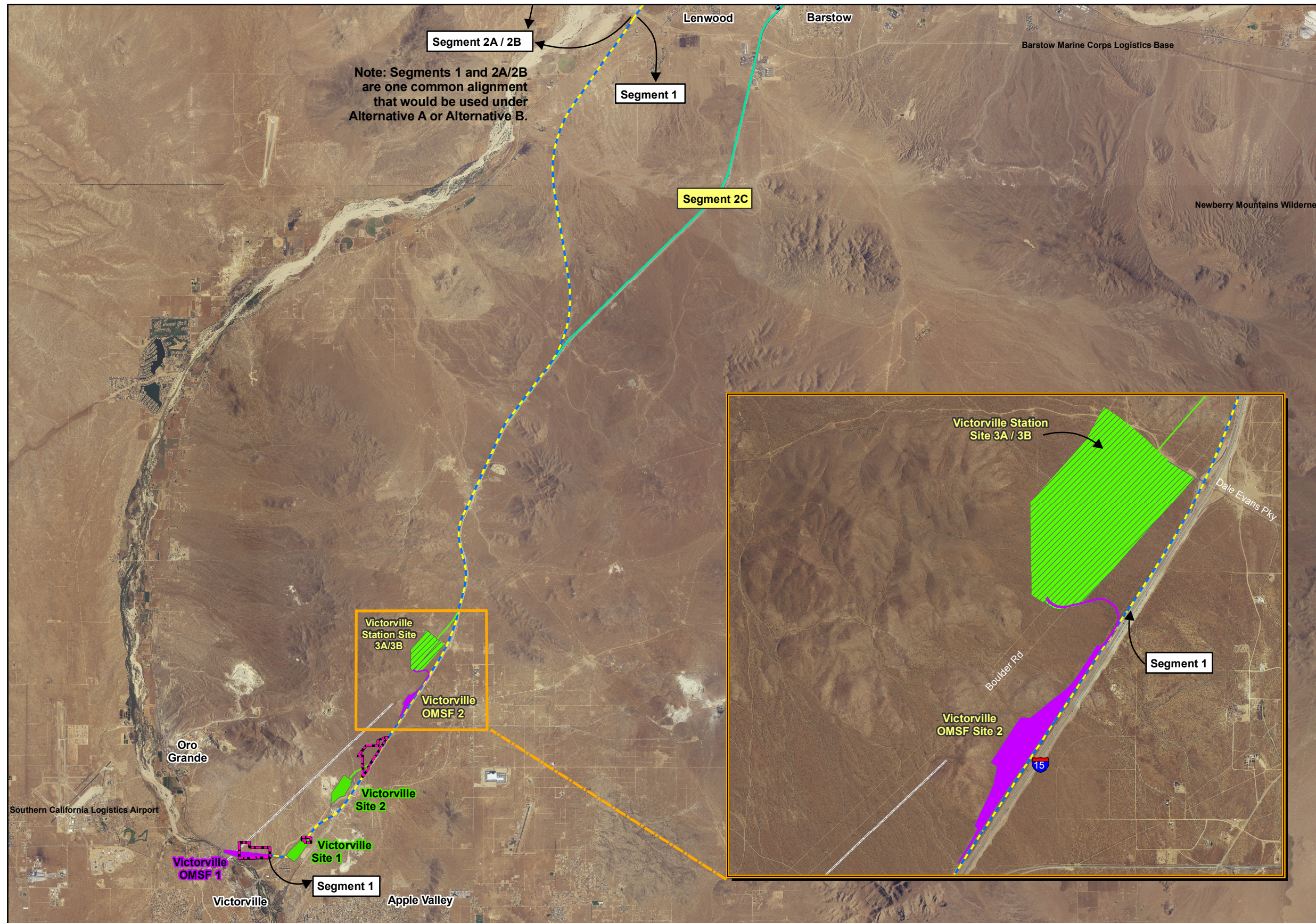
ES-5 AVOIDANCE AND MINIMIZATION OF ADVERSE EFFECTS

As currently planned, the DesertXpress Project would avoid and minimize many potential adverse environmental effects. **Chapter 3**, includes in each topic area a discussion of mitigation measures and strategies. In addition, design and construction practices have been identified that would be employed as the DesertXpress project is developed further in the final design phase and construction stages. Key aspects of the design practices include, but are not limited to the following:

- Minimize impact footprint and associated direct impacts to farmlands, parklands, biological, and water resources through maximum use of existing transportation corridors.
- Increase safety and circulation and potentially reduce air pollution and noise impacts through use of grade separation at road crossings.
- Placement of the majority of the DesertXpress alignment within existing highway and railroad rights-of-way, to reduce the need for additional right-of-way and minimize potential impacts to agricultural resources and other natural resources.
- Cooperate with regulatory agencies to develop acceptable specific design and construction standards for stream crossings, including but not limited to maintaining open surface (bridged versus closed culvert) crossings, infrastructure setbacks, erosion control measures, sediment-controlling excavation/fill practices, and other best management practices.
- Fully lined tunnels with impermeable material to prevent infiltration of groundwater or surface waters.

ES-6 PUBLIC AND AGENCY INVOLVEMENT

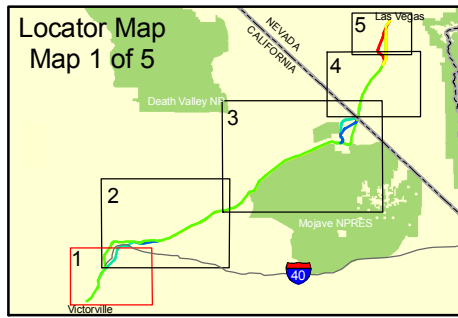
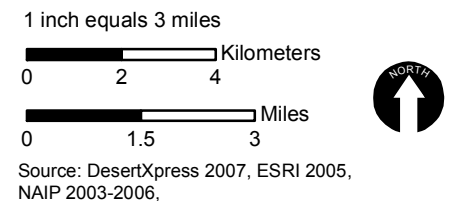
This Draft EIS has been prepared with extensive public and agency involvement, which is summarized in **Chapter 4.0, Comments and Coordination**.

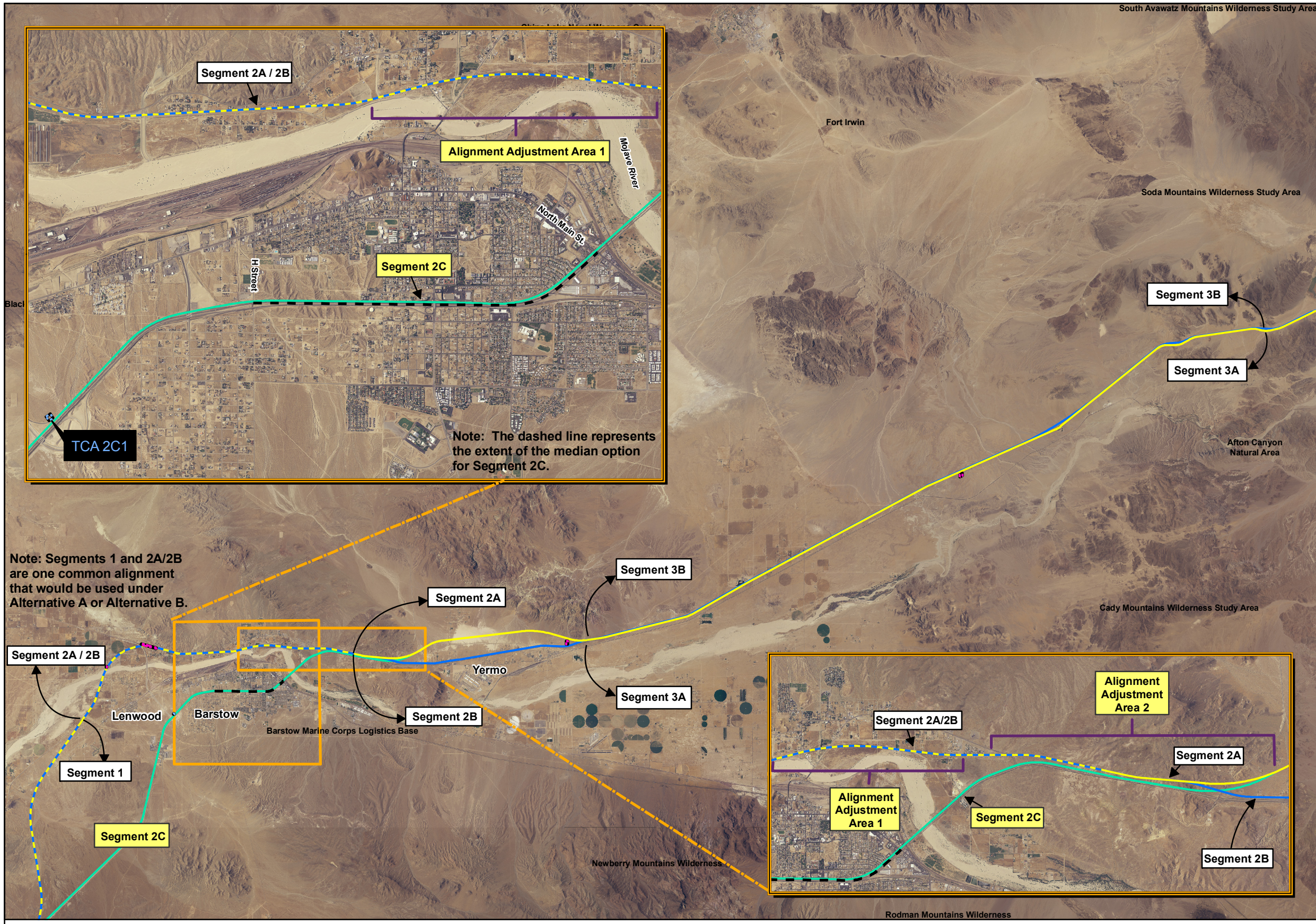


Legend

- DesertXpress Alignments**
- Alternative A
 - Alternative B
 - Common Alignment used under Alternative A or Alternative B
 - Additional Alignment Modifications

- Ancillary Facility Sites**
- Project Modifications and Additions
 - Modified Station Site Option - Victorville Station Site 3A/3B
 - Station Options
 - Maintenance Facility Site Options
 - Temporary Construction Area (TCA) Site Options
 - Modified Temporary Construction Area (TCA) Site Options
 - Autotransformer Site Options (EMU Option Only)
 - Electric Utility Corridor (EMU Option Only)
 - Alignment Adjustment Areas

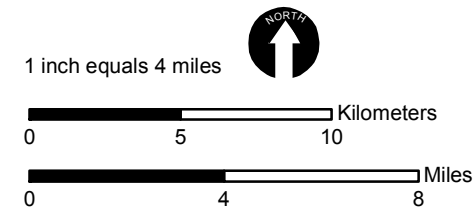




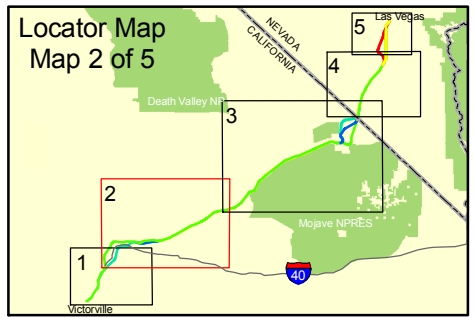
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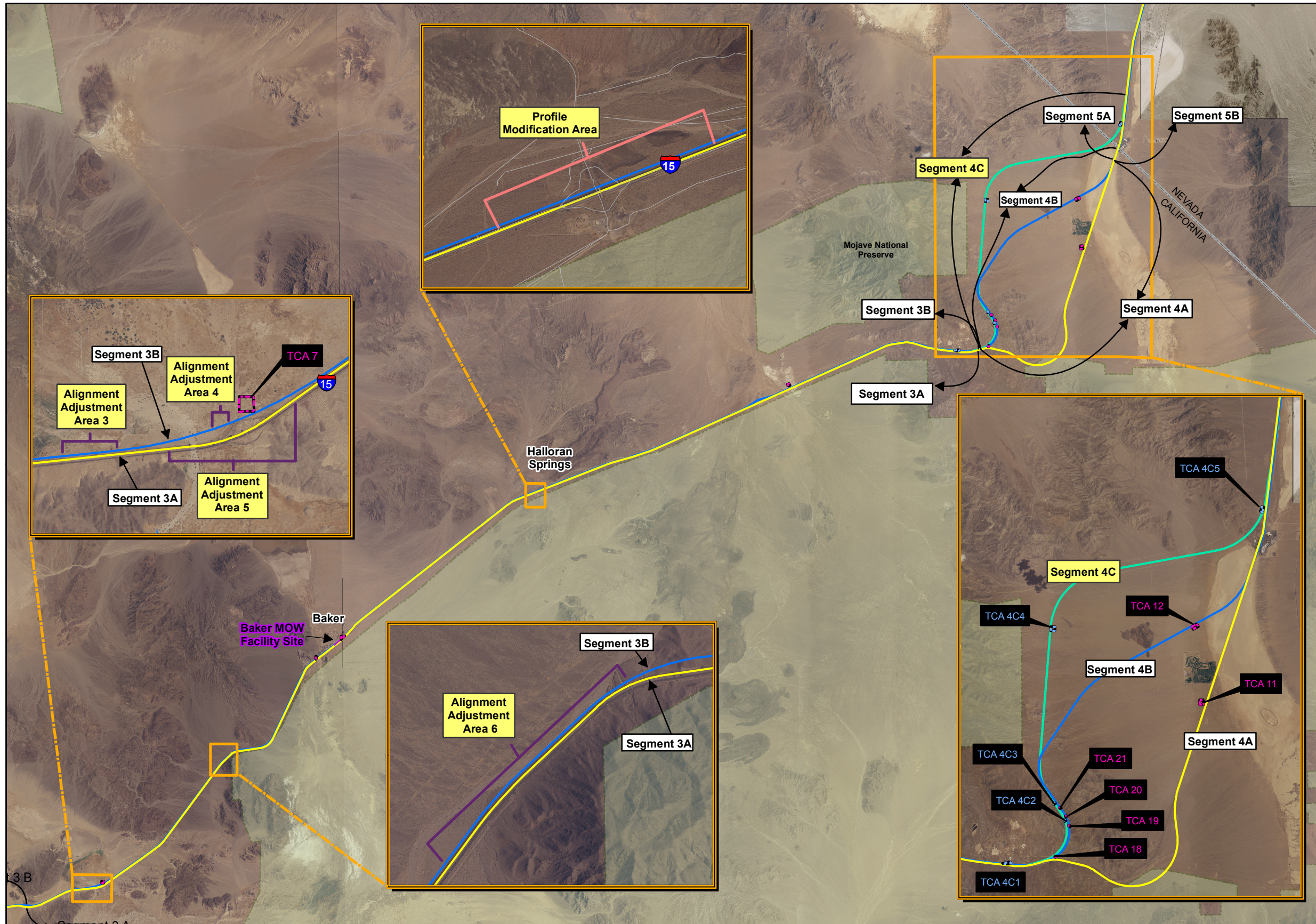
- DesertXpress Alignments**
- Alternative A
 - Alternative B
 - Common Alignment used under Alternative A or Alternative B
 - Additional Alignment Modifications

- Ancillary Facility Sites**
- Project Modifications and Additions
 - Station Options
 - Maintenance Facility Site Options
 - Temporary Construction Area (TCA) Site Options
 - Modified Temporary Construction Area (TCA) Site Options
 - Autotransformer Site Options (EMU Option Only)
 - Electric Utility Corridor (EMU Option Only)
 - Alignment Adjustment Areas



Source: DesertXpress 2007, ESRI 2005, NAIP 2003-2006,



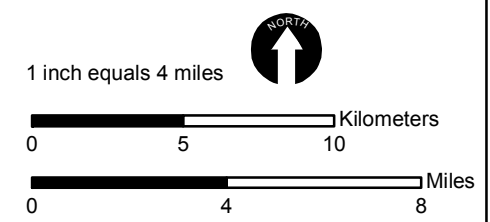


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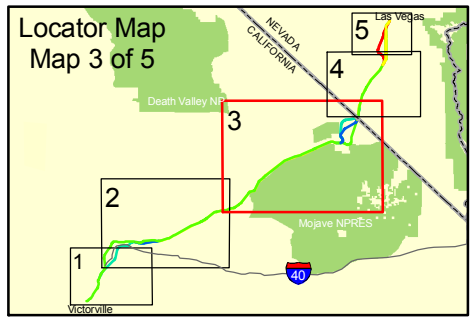
- Faults and Earth Fissures**
- Fault
 - Overall outline of fissure area

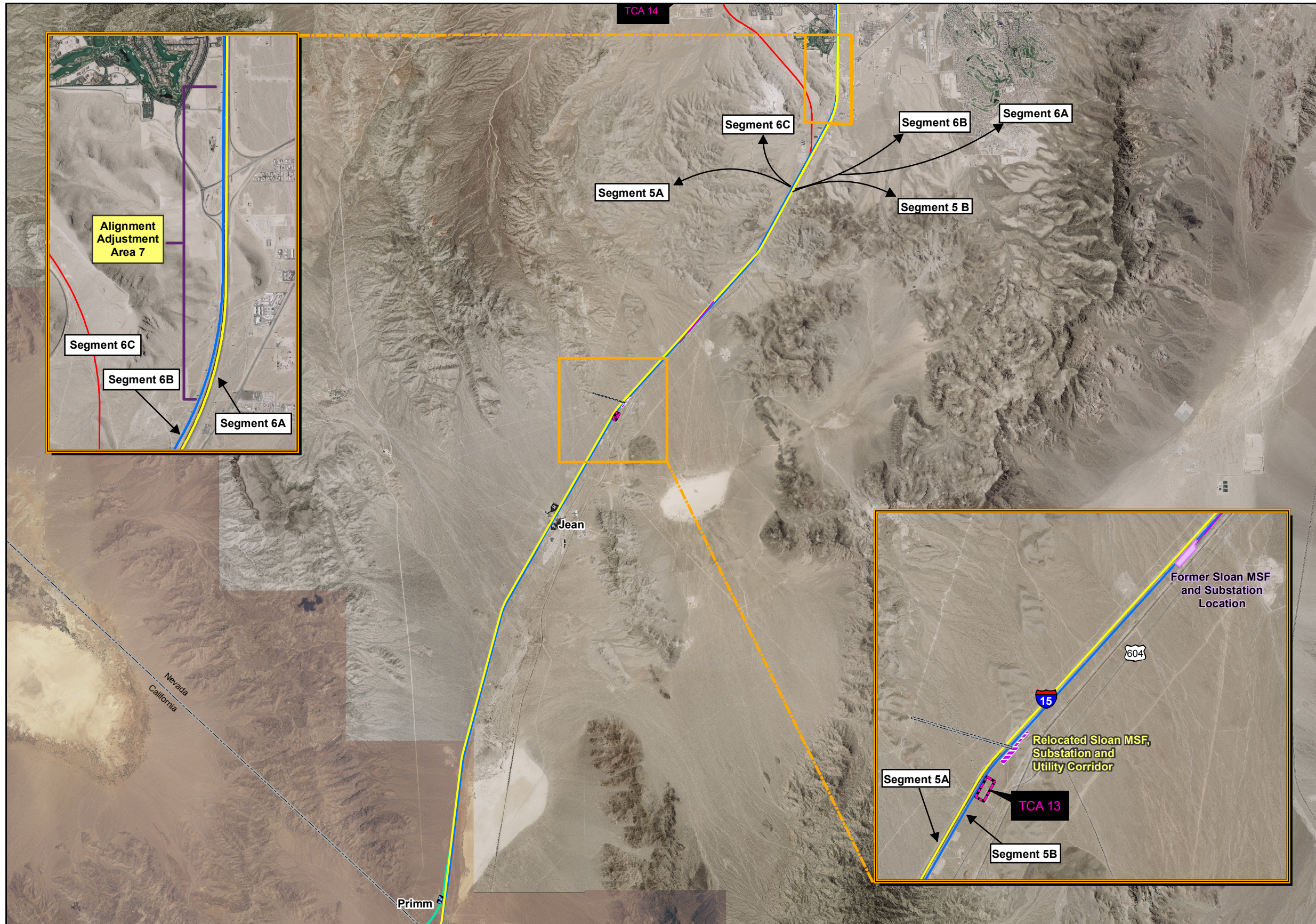
- DesertXpress Alignments**
- Alternative A
 - Alternative B
 - Common Alignment used under Alternative A or Alternative B
 - Additional Alignment Modifications

- Ancillary Facility Sites**
- Text Project Modifications and Additions
 - Station Options
 - Maintenance Facility Site Options
 - Temporary Construction Area (TCA) Site Options
 - Modified Temporary Construction Area (TCA) Site Options
 - Autotransformer Site Options (EMU Option Only)
 - Electric Utility Corridor (EMU Option Only)
 - Alignment Adjustment Areas



Source: Bell and Price 1992, NV Bureau of Mines & Geology 1996, CA Division of Mines & Geology 2000, DesertXpress 2007, ESRI 2005, NAIP 2003-2006, US Census Bureau

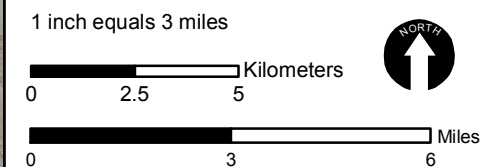




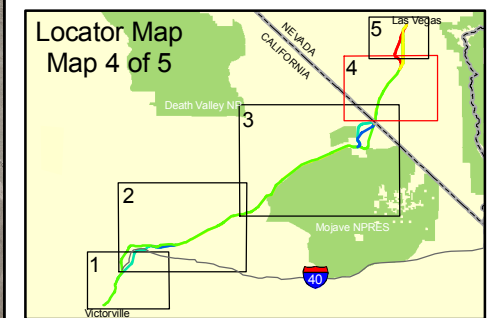
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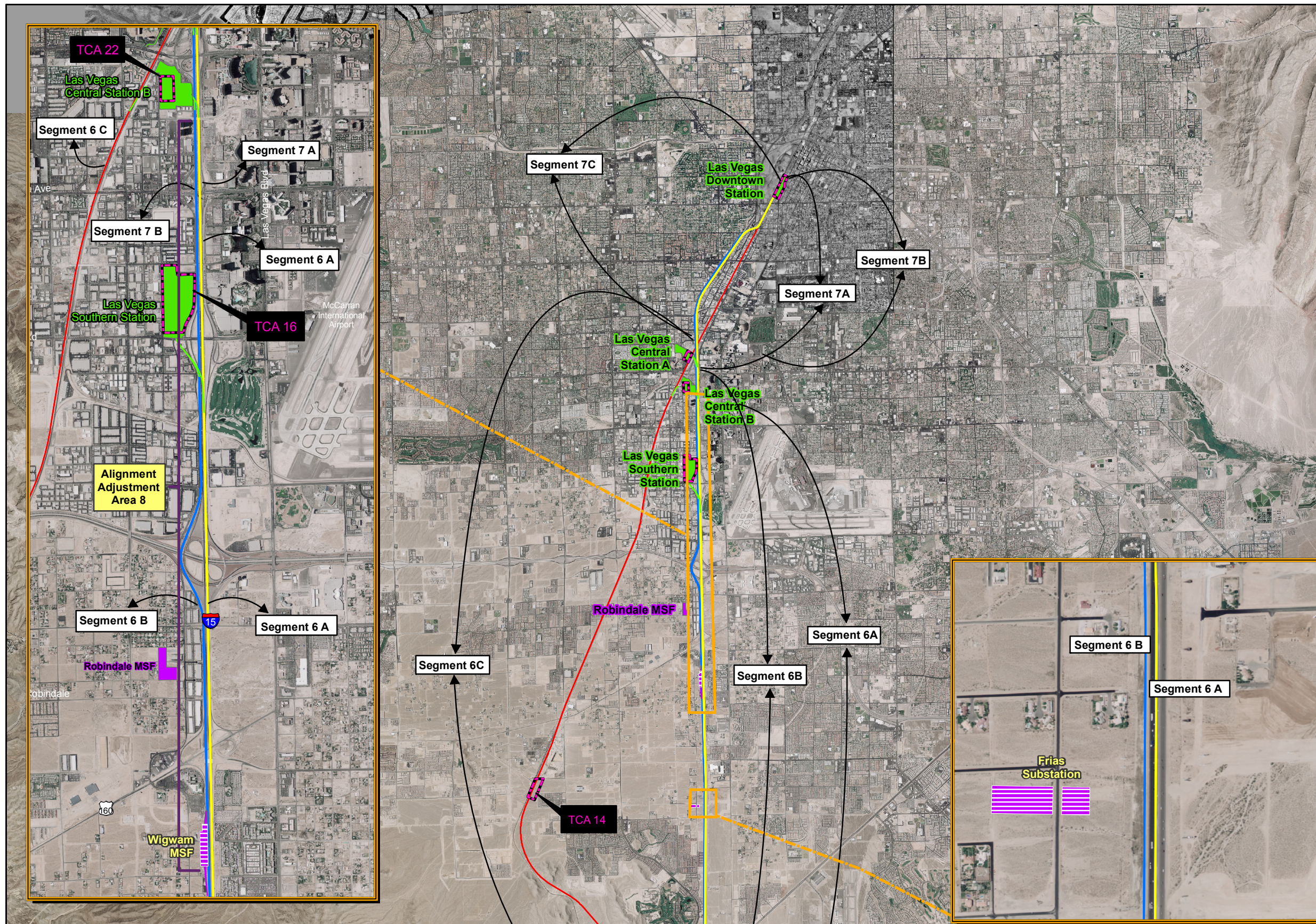
- DesertXpress Alignments**
- Alternative A
 - Alternative B
 - Common Alignment used under Alternative A or Alternative B
 - Additional Alignment Modifications

- Ancillary Facility Sites**
- Project Modifications and Additions
 - Station Options
 - Maintenance Facility Site Options
 - Relocation Sloan MSF / Substation Site Option
 - Temporary Construction Area (TCA) Site Options
 - Modified Temporary Construction Area (TCA) Site Options
 - Autotransformer Site Options (EMU Option Only)
 - Electric Utility Corridor (EMU Option Only)
 - Alignment Adjustment Areas



Source: CirclePoint 2008, ESRI 2005, DesertXpress 2007, NAIP and DOQQ Imagery



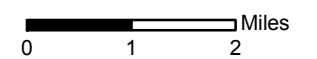
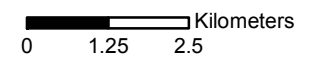


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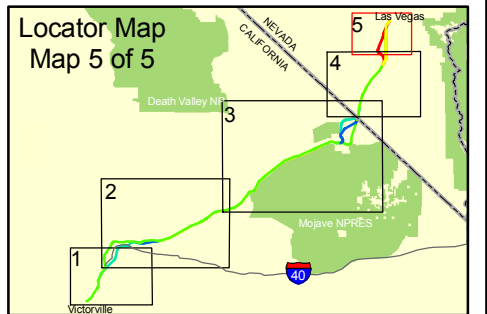
- DesertXpress Alignments**
- Alternative A
 - Alternative B
 - Common Alignment used under Alternative A or Alternative B
 - Additional Alignment Modifications

- Ancillary Facility Sites**
- Station Options
 - Maintenance Facility Site Options
 - Frias Substation and Wigwam MSF Modifications
 - Temporary Construction Area (TCA) Site Options
 - Modified Temporary Construction Area (TCA) Site Options
 - Autotransformer Site Options (EMU Option Only)
 - Electric Utility Corridor (EMU Option Only)
 - Alignment Adjustment Areas

1 inch equals 2 miles



Source: CirclePoint 2008, ESRI 2005, DesertXpress 2007, NAIP and DOQQ Imagery



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