

Attachment E: Hydrology and Water Quality Technical Report

1.0 Introduction

DesertXpress Enterprises, LLC XpressWest High-Speed Train Project (Project) entails construction and operation of a high-speed passenger train system between Apple Valley, California, and Las Vegas, Nevada. The Project was originally evaluated in the following documents (collectively referenced as the DesertXpress Environmental Impact Statement [EIS]):

- March 2009 *Draft Environmental Impact Statement and 4(f) Evaluation for the proposed DesertXpress High-Speed Passenger Train* (DesertXpress DEIS)
- April 2010 *Supplemental Draft Environmental Impact Statement and 4(f) Evaluation for the proposed DesertXpress High-Speed Passenger Train* (DesertXpress SEIS)
- March 2011 *Final Environmental Impact Statement and 4(f) Evaluation for the proposed DesertXpress High-Speed Passenger Train Victorville, California to Las Vegas, Nevada* (DesertXpress FEIS)

The Federal Railroad Administration (FRA) issued the Record of Decision DesertXpress High-Speed Passenger Train (DesertXpress ROD) in July 2011.

This technical report describes the potential changes to water resource impacts resulting from the Project modifications.

2.0 Methodology

Hydrological resources within the Project area have not substantially changed since publication of the DesertXpress EIS; the Mojave River is the primary water resource in the Project area and most other hydrologic features are ephemeral washes and ditches. Modified alignment, stations, and ancillary facilities would intersect or travel adjacent to these features. As such, changes to the affected environment for most topics pertaining to hydrology and water quality were easily assessed using publicly available information. These resources required minimal quantitative analysis; most of the discussion included herein is provided in qualitative terms.

Section 5.0 compares the quantity of aquatic features present in the modified Project footprint against the quantity of aquatic features identified in the DesertXpress EIS. Impacts are calculated in linear feet where water features would intersect temporary or permanent areas associated with the modified Project footprint. The following assumptions affected the quantification of aquatic features:

- **Available Engineering for the Project Alignment and Ancillary Facilities.** The DesertXpress EIS considered the permanent impact area (impacts related to operations) to be 37.5 feet from centerline and temporary impact area (impacts related to construction) to be 200 feet from centerline of the Preferred Alternative rail alignment. The modified Project footprint includes a detailed footprint outlining temporary and permanent impact areas along the modified Project alignment and ancillary facilities. Therefore, this assessment reviews the modified Project features outside of the original footprint assessed in the DesertXpress EIS.
- **Available Engineering for the Station and Maintenance Facility Sites.** Neither the DesertXpress EIS nor the Project modifications included detailed design of the Dale Evans Station and Operations, Maintenance, and Storage Facility (OMSF) site or the Warm Springs Station. Instead, the footprint for these two sites is based on the parcels acquired for the station and maintenance facilities. The

parcel size is anticipated to be larger than the footprint necessary to build the station and OMSF facilities. Therefore, impacts to water resources at the station and OMSF sites are likely to be overestimated. Impacts associated with these facilities will be quantified and mitigated for through the Clean Water Act (CWA) 404 permitting process.

- **Culverts and Drainage Design.** The modified Project will conduct hydrological analysis as part of the final design. This process was detailed in the DesertXpress EIS and remains valid. In addition, consistent with the DesertXpress EIS, the modified Project will commit to the installation of culverts where the rail corridor deviates from the Interstate (I)-15 freeway and the restoration of ephemeral streams (as required by Mitigation Measure HYD-5 from the DesertXpress EIS). Where the modified Project alignment travels within the I-15 freeway right-of-way (ROW), the Project's drainage crossings will match the location and hydraulic capacity of existing drainage crossings along the I-15 freeway.
- **Nationwide Permit Process.** The Project analyzed in the DesertXpress EIS incorporated the constraints of USACE Nationwide Permit (NWP) requirements to avoid impacts to ephemeral drainages. Thus, the DesertXpress EIS aquatic resource impacts were calculated with the assumption that impacts to ephemeral drainages would be avoided with implementation of the NWP design requirements. The modified Project design does not incorporate these NWP requirements because, as discussed in Section 3.1 and Section 5.7, the NWP process no longer applies to ephemeral drainages.

3.0 Regulatory Updates

The regulatory environment for hydrology and water quality is described in detail in the DesertXpress DEIS and DesertXpress FEIS. Below are changes to the regulatory environment since the issuance of the DesertXpress ROD.

3.1 CLEAN WATER ACT

Since publication of the DesertXpress FEIS, "Waters of the United States (U.S., WOTUS)" as defined by the CWA (33 CFR 328.3) have been redefined. In August 2015 (i.e., 2015 Rule) the Environmental Protection Agency (EPA) and USACE (together, the Agencies) redefined WOTUS under the CWA, replacing the 1986 definition of WOTUS and the Scalia Opinion, resulting from the 2006 Supreme Court case *Rapanos v. United States*. As a result of litigation over the 2015 Rule, the 2015 Rule currently applies in 22 states, including California, while the pre-existing regulations (i.e., 1986 Regulations) apply in 28 states, including Nevada.

However, in response to Executive Order (EO) 13778, Restoring the Rule of Law, Federalism, and Economic Growth by Reviewing the Waters of the U.S. Rule (February 28, 2017) the Agencies published a final rule (Federal Register Vol. 84, No. 204) to repeal the 2015 Rule and recodify the regulatory text that existed prior to the 2015 Rule. With this final rule, the Agencies implemented the 1986 Regulations, including applicable agency guidance and Supreme Court cases, nationwide. The reversion to the 1986 regulatory definition of WOTUS became effective on December 23, 2019 and changes the definitions of WOTUS back to the 1986 definition supplemented with the pre-2015 Supreme Court cases. This regulatory update does not affect the evaluation of impacts for the modified Project.

On April 21, 2020, the Agencies published the Navigable Waters Protection Rule (2020 Rule) to streamline the definition of WOTUS, fulfilling EO 13778. The final Navigable Waters Protection Rule

became effective on June 22, 2020 and replaced the previous rule. The four aquatic resource categories defined as WOTUS under the 2020 Rule are as follows:

- Territorial seas and traditional navigable waters,
- Perennial and intermittent tributaries of those waters,
- Certain lakes, ponds, and impoundments, and
- Wetlands adjacent to jurisdictional waters.

Notably, the 2020 rule does not define ephemeral features that flow only in direct response to precipitation as jurisdictional WOTUS. As discussed in Section 5.7, by removing the jurisdictional status of ephemeral features, this regulatory update eliminated the Project's impact to WOTUS.

3.2 STATE WATER RESOURCES CONTROL BOARD

On April 2, 2019 the California State Water Resources Control Board (SWRCB) adopted the Water Quality Control Plans for Inland Surface Waters Enclosed Bays and Estuaries and Ocean Waters of California (Procedures). The adopted Procedures provide a state definition for wetlands, identify appropriate wetland delineation methodologies, and provide procedures for application submittal (including required information), and subsequent SWRCB review and approval of projects that would result in the discharge of dredge or fill material in Waters of the state. The Procedures become effective on May 28, 2020. Any application proposing to discharge fill or dredge material into Waters of the state that is received after the effective date must comply with the Procedures. This is applicable to the state of California 401 Certifications and Waste Discharge Requirements.

The change is not anticipated to affect potential impacts resulting from implementation of the modified Project. As stated in the DesertXpress DEIS, under CWA Section 401, applicants for a Federal license or permit to conduct activities that may result in the discharge of a pollutant into WOTUS must obtain certification from the state in which the discharge would originate (Lahontan Regional Water Quality Control Board in California and the Nevada Division of Environmental Protection in Nevada). All projects that have a Federal component and may affect the quality of the state's waters (including projects that require Federal agency approval, such as issuance of a CWA Section 404 permit) must also comply with CWA Section 401. This regulatory update does not affect the evaluation of impacts for the modified Project.

4.0 Affected Environment

The DesertXpress DEIS Section 3.8.3, DesertXpress SEIS Section 3.8.1, and DesertXpress FEIS Section 3.8.1.1 describe the affected environment for water resources. The DesertXpress DEIS Section 3.8.4.2 and DesertXpress SEIS Section 3.8.3 also describe the hydrological effects by individual Project component. The modified Project rail alignment follows the I-15 freeway corridor and generally encounters the same regions evaluated in the DesertXpress EIS. Therefore, the DesertXpress DEIS discussions of affected environment remain applicable to the modified Project footprint.

5.0 Effects Assessment

5.1 AQUATIC FEATURES WITHIN THE MODIFIED PROJECT FOOTPRINT

Overall, there is a higher quantity of water features recorded within the modified Project footprint relative to the DesertXpress EIS. However, the new water resources recorded within the modified

Project footprint are similar in classification and quality to resources mapped along the original Project corridor. Using the modified approach to design and analysis as described in Section 1.0, the direct permanent impacts are reported in this Reevaluation as higher for the Project modifications. The higher reported impacts to aquatic features are primarily due to the following factors:

- Impacts to aquatic features in the DesertXpress EIS were calculated based on a Project centerline, whereas the Project modifications include a detailed footprint outlining temporary and permanent impact areas.
- Project design in the DesertXpress EIS incorporated NWP maximum impact thresholds on WOTUS, whereas the modified Project does not incorporate these NWP limits, but instead imposes them as mitigation. As discussed in Section 3.1, the Project would no longer impact WOTUS and the NWP impact thresholds no longer apply.

Table 5.1-1 through Table 5.1-3 compare the aquatic resources within the modified Project footprint against the aquatic resources quantified in the DesertXpress EIS, separated by impact type and Project component. Five Project components—the rail alignment, Ivanpah Electrical Substation, Warm Springs Station, Dale Evans Station and OMSF site, and emergency crossovers—warrant further discussion because of the increase of reported water resources, as outlined below.

5.1.1 RAIL ALIGNMENT

The 2011 DesertXpress EIS Preferred Alternative included approximately 17,626 linear feet of permanent effects to water resources, whereas the 2020 modified Project footprint includes nearly 33,400 linear feet of permanent effects. While the footprint has shifted throughout the entire alignment, the most notable changes occur in Segment 1 and 5 where the Project footprint previously occurred on the west side of the I-15 freeway and is now on the east side of I-15 freeway. Segment 1 of the Preferred Alternative included nearly 5,000 linear feet of permanent effects to water resources and Segment 5 included no permanent effects to water resources. Based on the 2020 modified Project footprint, Segment 1 includes over 11,400 linear feet and Segment 5 includes over 11,000 linear feet of permanent effects to water resources. The exact quantity of linear feet impacted and the location of such impacts within the larger footprint is dependent upon final design and the implementation of mitigation measures.

The drainage features within the rail alignment were classified as “Riverine Ephemeral”.¹ While these specific features in Segments 1 and 5 were previously unevaluated in the DesertXpress DEIS, Riverine Ephemeral drainage features were evaluated for potential impacts resulting from implementation of the Preferred Alternative in other Segments, including station sites, temporary construction areas, and the rail alignment. These drainage features have the same classification and are similar in quality to those features previously evaluated in the DesertXpress EIS. Therefore, impacts to these features are not considered a new type of impact resulting from the Project modifications.

¹ Riverine Ephemeral features are defined in the following document: Cowardin, L.M., V. Carter, F.C. Golet & E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. USDI Fish & Wildlife Service, Biological Services Program. FWS/OBS-79/31. 103 pp

5.1.2 IVANPAH ELECTRICAL SUBSTATION AND UTILITY CORRIDOR

The Ivanpah Electrical Substation would include the construction of approximately eight miles of utility corridors located along existing roads. For the purposes of this analysis, a 25-foot wide area along the entire utility corridor was assumed to be subject to permanent impacts and a 175-foot wide area was assumed to be subject to temporary impacts. Based on these footprint widths, the Ivanpah Electrical Substation would have approximately 4,345 linear feet of permanent effects and nearly 24,700 linear feet of temporary effects to aquatic resources.

The size of the utility corridor is an overestimate of what would likely be constructed because these impacts were based on a linear footprint along the entire corridor. Permanent impacts would occur only in locations where the utility poles would be placed, which is a small footprint overall (less than one acre). The transmission lines would be elevated between the utility poles and would avoid physical effects. The exact number of linear feet impacted and the location of such impacts within the larger footprint is dependent upon final design and the implementation of mitigation measures.

The drainage features within this utility corridor were classified as Riverine Ephemeral. While these specific features were previously unevaluated in the DesertXpress EIS, Riverine Ephemeral drainage features were evaluated for potential impacts resulting from implementation of the Preferred Alternative in other Segments, including station sites, temporary construction areas, and rail alignment. These drainage features have the same classification and are similar in quality to those features previously evaluated in the DesertXpress EIS. Therefore, impacts to this feature are not considered a new type of impact resulting from the Project modifications.

5.1.3 WARM SPRINGS STATION

The Warm Springs Station area is approximately 109 acres and is bisected by an approximately 2,800-linear-foot drainage feature. The exact location of lead track, loop track, platforms, station, and maintenance facility within the station sites are not known at this time. The footprint total is a conservative estimate to allow for flexibility in final design and permitting. Based on a review of the conceptual design for the stations, FRA has concluded that the amount of permanent impacts to water resources will be less than estimated in this report. However, the exact number of linear feet impacted and the location of such impacts within the larger footprint is dependent upon final design and the implementation of mitigation measures.

The drainage feature that bisects the Warm Springs Station footprint is classified as Riverine Ephemeral that is greater than four feet in width with a desert wash scrub vegetation type. While this specific feature was previously unevaluated in the DesertXpress EIS, the type of feature (Riverine Ephemeral drainage greater than four feet in width) was evaluated in other portions of the DesertXpress EIS Preferred Alternative, including station sites, temporary construction areas, and rail alignment. This drainage feature is similar in classification and quality to those features previously evaluated and impacted in the DesertXpress EIS. Therefore, impacts to this feature are not considered a new type of impact resulting from the Project modifications.

5.1.4 DALE EVANS STATION AND OMSF SITE

The new Dale Evans Station and OMSF site is a combined facility adjacent to, and on the east side of, the I-15 freeway (directly across the I-15 freeway from Victorville Station 3B and OMSF 2). The Dale Evans Station and OMSF site is approximately 310 acres and could potential permanently impact

approximately 18,700 linear feet of water features. Similar to the Warm Springs Station, the exact location of lead track, loop track, platforms, and structures within the station sites are not known at this time. The 310-acre footprint is composed of the total parcel size where the station features (i.e., station platforms, loop tracks, associated buildings) could be located. It does not reflect the final footprint of permanent impacts that would result once the placement of those features is established during final design and avoidance and mitigation measures are applied. Based on a review of the conceptual design for the stations, FRA has concluded that amount of permanent impacts to water resources will be significantly less than estimated in this report. However, the exact number of linear feet impacted and the location of such impacts within the larger footprint is dependent upon final design and the implementation of mitigation measures.

The water features within the Dale Evans Station and OMSF site include a combination of Riverine Ephemeral drainages ranging in width and consisting of creosote bush scrub, which is consistent with the Victorville Station 3B and OMSF 2 facilities. These water features are within the same hydrographic basin as the water features evaluated in the DesertXpress DEIS for the Victorville Station 3B and OMSF 2, but are on the opposite side of I-15 freeway. These features all drain to the Bell Mountain Wash and then the Mojave River to the south.

When comparing the original and modified Dale Evans station locations, the modified Project footprint would have fewer impacts to Riverine Ephemeral water features possessing creosote bush scrub. The Dale Evans Station and OMSF site would impact water features types that were previously evaluated in the DesertXpress EIS and the type of features impacted occur throughout the Preferred Alternative alignment evaluated in the DesertXpress EIS. Because these drainage features are similar in classification and quality to those features previously evaluated in the DesertXpress EIS, impacts to these features are not considered a new type of impact resulting from the Project modifications.

5.1.5 EMERGENCY CROSSOVERS

The DesertXpress EIS assumed that emergency crossovers would be necessary to facilitate emergency vehicle access across the Project alignment, especially for median-running alignments. However, the DesertXpress EIS did not identify crossover locations. These locations have now been determined and the modified Project would include nine emergency crossovers located along the alignment: eight in California and one in Nevada. Collectively, these emergency crossovers account for 2,935 linear feet of permanent effects to water resources. These emergency crossovers range from one to eight acres in size and occur on both sides of I-15 freeway.

Table 5.1-1 Comparison of Direct Permanent Effects to Water Resources

Project Component	Linear Feet of Permanent Effect (2011)	Linear Feet of Permanent Effect (2020)*
Rail Alignment	17,626.5	33,388.5
Victorville Station (VV3)	2,075.0	N/A
Victorville OMSF (OMSF 2)	825.0	N/A
Dale Evans Station and OMSF Site	N/A	18,706.5
Las Vegas Station (southern Station)	0.0	N/A
Las Vegas MSF (Wigwam Ave MSF)	0.0	N/A
Warm Springs Station	N/A	2,838.9
Frias Substation**	50.0	515.3
Barstow Electrical Substation	N/A	1,046.1

Project Component	Linear Feet of Permanent Effect (2011)	Linear Feet of Permanent Effect (2020)*
Ivanpah Electrical Substation	N/A	4,344.5
Utility Corridor (Baker)	50.6	N/A
Southern California Edison Utility Corridor (Victorville)	223.4	N/A
California Maintenance of Way Facility	N/A	244.8
Paralleling Sites	N/A	351.0
Roadway Modifications	N/A	945.7
Emergency Crossovers	N/A	2,935.2
Total***	20,850.5	65,316.5

Notes:

'N/A' identifies Project components that were not proposed in either 2011 or 2020.

* 2020 permanent effects listed in the table are the total linear feet of water resources and is not representative of the permanent impacts once the final design and mitigation measures are applied.

** The Frias Substation Preferred Alternative footprint was rotated by 90 degrees as part of the modified Project footprint. The 465 linear feet of drainages that were once adjacent to the Frias Substation (and not subject to impacts) are now within the modified Project footprint.

***Totals generated prior to rounding and therefore may not add precisely.

Table 5.1-2 Comparison of Direct Temporary Effects to Water Resources

Project Component	Linear Feet of Temporary Effect (2011)	Linear Feet of Temporary Effect (2020)*
Rail Alignment	49,200.0	28,522.5
Southern California Edison Utility Corridor (Victorville)	233.8	N/A
Ivanpah Electrical Substation	N/A	24,684.6**
Utility Corridor (Baker)	52.5	N/A
Frias Substation***	0.0	77.9
Barstow Electrical Substation	N/A	83.8
Temporary Construction Areas	188.0	17,207.8
Total****	49,674.3	70,576.7

Notes:

'N/A' identifies Project components that were not proposed in either 2011 or 2020.

* 2020 temporary effects listed in the table are the total linear feet of water resources and is not representative of the temporary impacts once the final design and mitigation measures are applied.

**This total assumes eight miles of the utility corridor would be at ground level and that none of the water resources would be avoided through design. Based on the modified Project, the utility corridor would be adjacent to existing access roads. Temporary impacts associated with the Ivanpah Electrical Substation are expected to include staging areas, temporary construction areas, and wire pulling sites.

*** The Frias Substation Preferred Alternative footprint was rotated by 90 degrees as part of the modified Project footprint. The 78 linear feet of drainages that were once adjacent to the Frias Substation (and not subject to impacts) are now within the modified Project footprint.

**** Totals generated prior to rounding and therefore may not add precisely.

Table 5.1-3 Comparison of Direct Impacts to Water Resources by Project Segment

Alternative by Project Element	Linear Feet of Impacts to Water Resources (Permanent) (2011)	Linear Feet of Impacts to Water Resources (Permanent) (2020)*
Segment 1		
Alignment connecting to 2a/2b	2,491	N/A
Alignment connecting to 2C	2,259	N/A
Victorville Station Site 1	0	N/A

Alternative by Project Element	Linear Feet of Impacts to Water Resources (Permanent) (2011)	Linear Feet of Impacts to Water Resources (Permanent) (2020)*
Victorville Station Site 2	0	N/A
Victorville Station Site 3A	2,275	N/A
Victorville Station Site 3B	2,075	N/A
Victorville OMSF 1	12	N/A
Victorville OMSF 2	825	N/A
Alignment	N/A	11,421.6
Dale Evans Station and OMSF Site	N/A	18,706.5
<i>Total for Segment 1</i>	<i>9,937</i>	<i>30,128.2</i>
Segment 2		
Alignment 2A	1,157	N/A
Alignment 2B	11,064	N/A
Alignment 2C	2,344	N/A
Alignment	N/A	2,681.3
Barstow Electrical Substation	N/A	1,046.1
<i>Total for Segment 2</i>	<i>14,565</i>	<i>3,727.3</i>
Segment 3		
Alignment 3A	4,059	N/A
Alignment 3B	7,608	N/A
Baker Maintenance of Way Facility	0	N/A
Alignment	N/A	6,467.7
115 kV	274	N/A
Paralleling Sites	N/A	351.0
Emergency Crossovers	N/A	2,821.2
<i>Total for Segment 3</i>	<i>11,941</i>	<i>9,639.7</i>
Segment 4		
Alignment 4A	734	N/A
Alignment 4B	319	N/A
Alignment 4C	1,485	N/A
Alignment	N/A	1,635.4
Ivanpah Electrical Substation	N/A	4,344.5
California Maintenance of Way Facility	N/A	244.8
Roadway Modifications	N/A	877.9
<i>Total for Segment 4</i>	<i>2,538</i>	<i>7,102.7</i>
Segment 5		
Alignment 5A	0	N/A
Alignment 5B	0	N/A
Alignment	N/A	11,039.9
Emergency Crossover	N/A	114.1
Roadway Modifications	N/A	67.8
<i>Total for Segment 5</i>	<i>0</i>	<i>11,221.7</i>

Alternative by Project Element	Linear Feet of Impacts to Water Resources (Permanent) (2011)	Linear Feet of Impacts to Water Resources (Permanent) (2020)*
Segment 6		
Alignment 6A-Southern Station	0	N/A
Alignment 6A-Central Station B	0	N/A
Alignment 6B-Southern Station	3,931	N/A
Alignment 6B-Central Station B	3,931	N/A
Alignment 6C	77	N/A
Las Vegas Southern Station	0	N/A
Las Vegas Central Station A	0	N/A
Las Vegas Central Station B	0	N/A
Las Vegas Downtown Station	0	N/A
Sloan Road MSF	0	N/A
Relocated Sloan Road MSF	0	N/A
Wigwam Avenue MSF	0	N/A
Robindale Avenue MSF	0	N/A
Frias Substation**	50	515.3
Alignment	N/A	142.6
Warm Springs Station	N/A	2,838.9
<i>Total for Segment 6</i>	<i>7,989</i>	<i>3,496.8</i>
Segment 7	0	N/A
Total****	20,850***	65,316.5

Notes:

'N/A' identifies Project components that were not proposed in either 2011 or 2020.

* 2020 permanent impacts listed in the table are the total linear feet of water resources and is not representative of the permanent impacts once the final design and mitigation measures are applied.

** The Frias Substation Preferred Alternative footprint was rotated by 90 degrees as part of the modified Project footprint. The 465 linear feet of drainages that were once adjacent to the Frias Substation (and not subject to impacts) are now within the modified Project footprint.

*** Total represents Preferred Alternative impacts from DesertXpress DEIS, not the sum of the column.

**** Totals generated prior to rounding and therefore may not add precisely.

5.2 WATER QUALITY

The DesertXpress EIS identified the following potential construction-period and operational water quality effects:

- Construction-period water quality effects would result from increased erosion and sedimentation during grading and excavation, as well as from accidental spills or improper storage of hazardous materials.
- Operational water quality effects would result from polluted stormwater runoff generated at the stations and maintenance facilities.

The modified Project would not change the DesertXpress EIS conclusions regarding water quality effects because it would not require new or substantially larger facilities and construction activities would occur within a similar area and scope. The DesertXpress EIS concluded that Mitigation Measures HYD-1 through HYD-4 would minimize adverse effects to hydrological resources during construction and

operation. These mitigation measures would still apply to the modified Project, which would not result in substantial changes in the evaluation of water quality impacts of the DesertXpress EIS.

5.3 ALTERATION OF EXISTING DRAINAGE PATTERNS

5.3.1 CONSTRUCTION

The DesertXpress EIS determined that Project construction would potentially alter drainage patterns through the exposure of soils susceptible to erosion during earthmoving activities. The Project modifications would require a slightly shorter construction period and less earthmoving activity since the overall Project footprint would be reduced. The reduction of the earthmoving activity would reduce the potential for construction activities to impact drainage patterns. Mitigation Measure HYD-2 would still be applied to reduce impacts on existing drainage patterns during construction. The reduced potential to impact to drainage patterns are considered a beneficial effect of the Project modifications.

5.3.2 OPERATION

ALIGNMENT AND ANCILLARY FEATURES

The DesertXpress EIS determined that the alignment would cross numerous ephemeral hydrological features between Apple Valley and Las Vegas. To avoid permanently altering water bodies along the alignment, the DesertXpress EIS developed Mitigation Measure HYD-5 to direct stormwater runoff from the trackway into existing drainage facilities along the I-15 freeway. The DesertXpress EIS also identified specific autotransformers locations that could alter drainage patterns in the area, and developed Mitigation Measure HYD-9 minimize these impacts.

Mitigation Measure HYD-5 would still apply to avoid altering water bodies along the modified alignment. The modified Project would no longer utilize autotransformers but would use the autotransformer sites identified in the DesertXpress EIS as temporary construction areas; Mitigation Measure HYD-9 would still be applied to reduce temporary impacts from these sites. Therefore, the modified Project would not change the DesertXpress EIS conclusions regarding effects on drainage patterns.

STATION SITES

The Las Vegas Central Station B and Wigwam Avenue MSF, considered as part of the Preferred Alternative in the DesertXpress EIS, were approximately 50 acres and did not impact aquatic features. The modified Project footprint eliminates these facilities and now includes the Warm Springs Station in Las Vegas.

The original Victorville Station 3B and OMSF 2 facilities were adjacent to, and on the west side of, the I-15 freeway. These two facilities were approximately 300 acres, and the DesertXpress DEIS reported that they would permanently impact approximately 2,900 linear feet of water resources previously defined as WOTUS. Notably, the Victorville Station 3B and OMSF 2 footprints encompassed approximately 83,000 linear feet of drainages. However, as described above, the 2011 Project incorporated design features that would limit permanent impacts to the NWP maximum impact thresholds.

The DesertXpress EIS determined the Las Vegas Station sites would avoid drainage impacts, although the VV3 and OMSF2 sites in Victorville would affect drainages contributing to nearby washes. The Warm Springs Station site contains an ephemeral wash and would thus potentially impact local drainage

patterns.² The Dale Evans Station and OMSF site would cross the same two washes impacted by the previous VV3 and OMSF2 sites evaluated in the DesertXpress EIS. Mitigation Measure HYD-5 would apply to minimize drainage impacts at the Warm Springs Station site, and Mitigation Measure HYD-5 would continue to apply to minimize drainage impacts at the Dale Evans Station and OMSF site. Therefore, the Project modifications would not change the DesertXpress EIS conclusions regarding drainage patterns.

5.4 FLOOD FLOW IMPEDEMENT

The DesertXpress EIS determined that portions of alignment and ancillary facilities would traverse areas with a one percent annual chance of experiencing flooding, which could impede or redirect flood flows. Most of the one percent annual chance floodplain boundaries have not changed since publication of the DesertXpress EIS; however, alignment and ancillary facilities in Segment 6 would encounter modified floodplains that have been reduced since publication of the DesertXpress EIS.^{3,4} The Dale Evans Station and OMSF site would not encounter designated one percent annual chance floodplains, but the Warm Springs Station would overlap with a one percent annual chance floodplain that was not previously evaluated.

The modified Project would not substantially change the DesertXpress EIS conclusions regarding flood flows because potential floodplain effects associated with these facilities would not substantially differ from the type of impacts evaluated in the DesertXpress EIS. Additionally, Mitigation Measures HYD-6 and HYD-7 would still be required to minimize impacts. The Project modifications would not change the DesertXpress EIS conclusions regarding flood flow impediment.

5.5 ADDITIONAL SOURCES OF STORMWATER RUNOFF

5.5.1 CONSTRUCTION

The DesertXpress EIS determined that Project construction could introduce new sources of polluted stormwater runoff through the release of construction-related chemicals, especially from temporary construction areas. The reduction of the overall Project footprint would allow for a slightly shorter construction period and a reduction in the use of construction-related chemicals. Reduction of the intensity of the construction activities during the period would reduce the potential for chemical releases by shortening the amount and time chemicals would be stored and used within the construction footprint. Mitigation Measures HYD-2, HYD-3, and HYD-4 would still be applied to reduce impacts from chemical releases during construction. The reduced risk of construction-period chemical releases is considered a beneficial impact of the Project modifications.

5.5.2 OPERATION

The DesertXpress EIS determined that new impervious surfaces at the station and maintenance facilities could produce increased stormwater runoff. The alignment trackway itself would not produce a

² Clark County Planning Commission. 2019. *Enterprise Land Use Plan – Map 3 Surface Hydrology*. May 13, 2019. <https://www.clarkcountynv.gov/comprehensive-planning/land-use/Documents/EC-03-SurfaceH2o-17x11.pdf>

³ California Department of Water Resources. 2019. *Best Available Maps: 100-Year Floodplains, FEMA Effective*. <http://gis.bam.water.ca.gov/bam/>

⁴ Legal Services Corporation. 2019. *Flood Zone Lookup*. <https://www.lsc.gov/flood-zone-lookup>

considerable amount of runoff due to the track ballast permeability. The DesertXpress EIS also stated that the Project would not result in considerable losses of groundwater recharge area since there are numerous other locations in the watersheds for groundwater recharge to occur that would not be affected by the Project. The modified Project would not change the DesertXpress EIS conclusions regarding polluted runoff because the quantity of impervious surface areas included in the modified Project would not substantially differ from the surface areas evaluated in the DesertXpress EIS. Therefore, the Project modifications would not result in substantial changes in the evaluation of stormwater runoff as identified in the DesertXpress EIS.

5.6 REDUCTION IN GROUNDWATER AVAILABILITY

As stated in the DesertXpress EIS, implementation of Mitigation Measure HYD-10 would require water supply for construction, operation, and maintenance activities be obtained from existing water purveyors instead of surface or groundwater resources. The modified Project would still implement Mitigation Measure HYD-10 to reduce impacts to groundwater availability. Therefore, the Project modifications would not result in substantial changes in the evaluation of groundwater availability as identified in the DesertXpress EIS.

5.7 WATERS OF THE UNITED STATES

This section assesses impacts to WOTUS (including wetlands). As part of the CWA Section 404 permitting process for the original Project, six formal jurisdictional delineation reports were prepared for the Death Valley area, the Cuddeback Lakes watershed, the Ivanpah Valley area, the Jean Dry Lake area, the Las Vegas watershed, and the Roach Dry Lake area. These reports were submitted to the USACE in July 2010 and included as appendices to the DesertXpress FEIS. The delineation reports investigated the presence of wetlands and other waters potentially subject to USACE regulation under CWA Section 404.

The DesertXpress DEIS determined that the alignment would cross numerous ephemeral hydrological features between Apple Valley and Las Vegas. Table 5.7-1 compares the construction-period (temporary) and operational (permanent) effects to WOTUS between the Preferred Alternative and 2020 modified Project footprint. However, as described in Section 3.1, the Navigable Waters Protection Rule decategorized ephemeral drainages as WOTUS. Because the Project corridor only contains ephemeral drainages, the modified Project would no longer result in WOTUS impacts. Mitigation Measure HYD-5 would still apply to reduce hydraulic impacts where the modified Project alignment and ancillary facilities encounter ephemeral drainages.

Table 5.7-1 Comparison of 2011 and 2020 Impacts to WOTUS Resources

	Permanent Impacts to ephemeral drainages	Temporary Impacts to ephemeral drainages	# of Water Features	Wetland Impacts (acres)
Preferred Alternative (2011)	5.96 acres	0.20 acres	300	0
Modified Project Footprint (2020)*	9.99 acres	3.68 acres	589	0

*Impact totals may be refined based upon further Project design and coordination with the USACE through the CWA 404 permitting process.

6.0 Mitigation Measures

The following mitigation measures established in the DesertXpress DEIS would avoid adverse effects to water resources. Revisions to the original MMs (General Mitigation Measures) are included as ~~strikeout~~ underline following the applicable measure.

The following mitigation measures established in the DesertXpress EIS would avoid adverse effects hydrology and water quality:

- Mitigation Measure HYD-1: Incorporate Site-Specific Permanent Water Quality Treatment Devices
- Mitigation Measure HYD-2: Implement Construction-Related Best Management Practices
- Mitigation Measure HYD-3: Comply with the National Pollutant Discharge Elimination System Construction General Permit
- Mitigation Measure HYD-4: Implement Spill Prevention, Control, and Countermeasure Plan
- Mitigation Measure HYD-5: Proper Design of Drainage Systems
- Mitigation Measure HYD-6: Reduce Encroachment into the 100-Year Floodplain
- Mitigation Measure HYD-7: No Storage of Construction Equipment or Materials within the 100-Year Floodplain
- ~~Mitigation Measure HYD-8: Minimize Impact of OMSF 2 on Water Resources~~
- Mitigation Measure HYD-9: Minimize Impacts of Temporary Construction Areas ~~Autotransformers 7 and 11~~ on Water Resources
- Mitigation Measure HYD-10: Minimize Impacts on Water Availability

Mitigation Measure HYD-1: Incorporate Site-Specific Permanent Water Quality Treatment Devices

To protect water quality ~~the Applicant~~ DesertXpress Enterprises, LLC shall install permanent water quality treatment devices that comply with state and local requirements, as applicable, to meet water quality objectives. Examples of water quality best management practices (BMPs) may include a vegetated swale, traction sand traps, or settling basin to help remove sediments and nutrients. Such BMPs shall be sized properly and designed by a registered professional engineer and shall not allow untreated stormwater runoff to reach the Mojave River or any washes along the alignment, including those washes in the urbanized area of Las Vegas.

Mitigation Measure HYD-2: Implement Construction-Related Best Management Practices (BMPs)

~~the Applicant~~ DesertXpress Enterprises, LLC shall initiate construction activities with the installation of erosion control BMPs. Within design-build plans, ~~the Applicant~~ DesertXpress Enterprises, LLC shall identify specifications of BMPs for grading and erosion control that are necessary to reduce erosion and sedimentation. These BMPs shall be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable. Standard erosion control measures, such as management, structural, and vegetative controls, shall be implemented for all construction activities that expose soil. BMPs to be implemented as part of this mitigation measure may include, but are not limited to, the following measures:

Temporary erosion control measures that would apply to construction of the stations, maintenance facilities and the rail (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover) shall be employed to control erosion from disturbed areas. Grass or other vegetative cover shall be established on the construction site as soon as possible after disturbance. To avoid the spread or introduction of

invasive species, non-native seeds or vegetation will not be used. Erosion in disturbed areas shall be controlled by grading so that direct routes for conveying runoff to drainage channels are eliminated.

The general contractors and subcontractors conducting the work shall construct or implement, regularly inspect, and maintain the BMPs in design-build Project plans. Some methods of Construction BMPs for rail installation that shall be included in the Project are:

- Install erosion control material consisting of silt fences along the outside limits of construction ~~on both sides of the disturbance corridor for track construction;~~
- Clear the construction area of brush and vegetation;
- Strip any topsoil and transport it to stockpile for use in the restoration of temporary Project disturbances;
- Excavate material as required to extend any culverts using good quality material as fill and transport poor quality material to stockpile;
- Place quality fill material to establish the subgrade;
- Install the sub-ballast on the subgrade, composed of crushed rock that has sufficient strength to withstand settling from loads;
- Place standard rail ties, made of wood or concrete, on the sub-ballast, then place the rail on the ties, and anchor the rail to the ties; Bring in ballast and dump ballast rock between and along the sides of the track; and
- Use a tamper to raise the track and tamp the ballast beneath the ties.

Mitigation Measure HYD-3: Comply with the National Pollutant Discharge Elimination System (NPDES) Construction General Permit

~~the Applicant~~ DesertXpress Enterprises, LLC shall obtain coverage under the NPDES Construction General Permit. Most construction projects that disturb one acre of land or more are required to obtain coverage under the NPDES Construction General Permit, which require the property owner to file a Notice of Intent to discharge stormwater and to prepare and implement a stormwater pollution prevention plan (SWPPP). Implementing the requirements in the NPDES Construction General Permit will reduce or eliminate construction-related water quality effects. ~~the Applicant~~ DesertXpress Enterprises, LLC shall ensure that construction activities comply with the conditions in this permit, which will require preparation of a stormwater pollution prevention plan (SWPPP), implementation of BMPs identified in the SWPPP, and monitoring to ensure that effects on water quality are minimized.

~~the Applicant~~ DesertXpress Enterprises, LLC shall implement the SWPPP. The implementation of the SWPPP in the ~~design-build~~ Project design plans will reduce the likelihood that stormwater will carry any spilled contaminants to water channels and reduce construction related impacts.

Mitigation Measure HYD-4: Implement Spill Prevention, Control, and Countermeasure Plan

Prior to beginning any construction activity, ~~the Applicant~~ DesertXpress Enterprises, LLC shall develop a spill prevention, control, and countermeasure plan (SPCCP) to prevent accidental releases of chemicals that are stored on site and measures to use in the case of a spill. The BMPs described in this plan shall apply to construction activities and operation activities.

~~the Applicant~~ DesertXpress Enterprises, LLC shall implement appropriate hazardous material management practices identified in the SPCCP to reduce the potential for chemical spills or releases of contaminants, including any non-stormwater discharge to drainage channels. If a spill occurs, cleanup,

containment, and response measures in the SPCCP shall be implemented by ~~the Applicant~~ DesertXpress Enterprises, LLC.

The Federal reportable spill quantity for petroleum products, as defined at 40 CFR 110, is any oil spill that (1) violates applicable water quality standards, (2) causes a film or sheen upon or discoloration of the water surface or adjoining shoreline, or (3) causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines.

If a spill is reportable, a superintendent shall notify appropriate agencies and the contractor will need to take action to contact any other appropriate safety and clean-up crews to ensure the SPCCP is followed. A written description of reportable releases shall be submitted to the appropriate agency. This submittal shall include a description of the release, including the type of material and an estimate of the amount spilled, the date of the release, an explanation of why the spill occurred, and a description of the steps taken to prevent and control future releases. The release shall be documented on a spill report form.

Mitigation Measure HYD-5: Proper Design of Drainage Systems

Most of the rail segments would not result in a large amount of impervious surface that could concentrate and redirect stormwater flow causing onsite erosion. Runoff from the rail alignment would be captured and directed to existing designated drainage features. Where necessary, DesertXpress Enterprises, LLC shall redesign and resize the existing drainage facilities to accommodate the potential increase in runoff along the rail alignment. The rail alignment shall connect with and mirror the existing culverts along the I-15 freeway. Where ~~the rail alignment deviates~~ design features deviate from the I-15 freeway and existing drainage facilities, ~~the Applicant~~ DesertXpress Enterprises, LLC shall install culverts at natural drainage features.

However, the stations and maintenance facilities would have parking lots that could concentrate and redirect stormwater flows. In order to determine the adequate size of drainage facilities, the total increase in impervious surface of the design of the facilities shall be included in a Rational Method calculation (a way of calculating flow intensity) to determine the increase in peak storm discharges resulting from the Project. The 100-year, 24-hour storm event shall be used to determine the appropriate size of drainage facilities needed for the Project. Drainage facilities shall retain flows and not contribute to additional flows in the Mojave River or other streams and washes such that post-Project stormwater flow does not exceed per-Project flow rates. This could be achieved with several detention basins.

Drainage facilities for both the rail alignment and station and maintenance facilities will need to be sized accordingly to handle adequate flow. It is important to note that when a culvert is used, the footprint of the rail will need to be reinforced with rip-rap, and the culvert will need to be large enough to handle the 100-year 24-hour storm flow so on-site flooding can be avoided. Other drainage features such as bridge crossings will need to be designed to avoid increases to the size of the floodplain or obstruct waterways during flood events.

~~Virgin Trains USA shall create either a new ephemeral drainage or restore, where feasible, through the reestablishment of former ephemeral drainages to compensate for temporary construction impacts to Waters of the U.S.~~

In addition to all the above mitigation measures, ~~the Applicant~~ DesertXpress Enterprises, LLC shall also be required to comply with all applicable conditions and mitigation requirements that result from the CWA Section 404 permit and Section 401 Certification.

Mitigation Measure HYD-6: Reduce Encroachment into the 100-Year Floodplain

When ~~Preferred Alternative~~ modified Project features are located within the 100-year floodplain, ~~the Applicant~~ DesertXpress Enterprises, LLC shall elevate the base elevation of rail and stations, including maintenance facilities or relocate them within the facility footprint ~~or APE~~ to avoid any impact. Portions of the rail alignment may utilize track support columns that are located within ~~in~~ the 100-year floodplain. Specific engineering plans and modeling, using Hydraulic Engineering Centers-River Analysis System (HEC-RAS), or similar, shall be completed by a registered professional engineer during the design-build process. Design-build Project plans shall incorporate all feasible recommendations of the HEC-RAS analysis. ~~the Applicant~~ DesertXpress Enterprises, LLC shall not increase surface water elevations within the 100-year floodplain.

Mitigation Measure HYD-7: No Storage of Construction Equipment or Materials within the 100-Year Floodplain

~~The Applicant~~ DesertXpress Enterprises, LLC shall not store construction equipment or materials within the limits of influence that are located in areas of the 100-year floodplain ~~so as to avoid redirecting in a manner that would redirect~~ 100-year flood flows that could cause structural damage or pose a safety risk to workers.

Mitigation Measure HYD-8: Minimize Impact of OMSF 2 on Water Resources

~~During the design-build process for Segment 1, the Victorville OMSF tracks and facilities shall be designed by the Applicant to avoid or bridge over the two small washes that feed into the Bell Mountain Wash.~~

- **Mitigation Measure HYD-8 was specific to the Victorville Station 3B and OMSF 2 tracks and facilities, which are no longer under consideration.**

Mitigation Measure HYD-9: Minimize Impacts of Temporary Construction Areas ~~Autotransformers 7 and 11~~ on Water Resources

During the design-build process for Segment 3, ~~the Applicant~~ DesertXpress Enterprises, LLC shall locate temporary construction areas at the locations of autotransformers 7 and 11 analyzed in the DesertXpress EIS within the limits of influence to avoid Telephone Wash and Kali Ditch, respectively, and to avoid other water resources.

Mitigation Measure HYD-10: Minimize Impacts on Water Availability

~~The Applicant~~ DesertXpress Enterprises, LLC shall obtain water from existing commercially available water sources during construction. ~~The Applicant~~ DesertXpress Enterprises, LLC shall not develop new groundwater wells or surface water impoundments without ~~subsequent environmental review as well as~~ Federal, state and local permits as appropriate and legally required.

6.1.1 ADDITIONAL MITIGATION MEASURES

In addition to the mitigation measures described in this section, the biological resources mitigation measures listed below would result in the protection of water resources. Refer to the Biological Resources Technical Report for the full text of these mitigation measures.

- Mitigation Measure BIO-1: Conduct Mandatory Environmental Awareness Training Program
- Mitigation Measure BIO-3: Conduct Construction Monitoring

- Mitigation Measure BIO-5: Confine Construction Equipment to a Designated Work Zone (Including Access Roads) at Each Project Site
- Mitigation Measure BIO-19: Construct Exclusion Fencing, Culverts to Sustain Hydrologic Function, and Provide Wildlife Crossings

This page intentionally left blank