HYDROLOGY AND WATER QUALITY ASSESSMENT
FOR THE
SoCalGas
NORTH-SOUTH PROJECT
RIVERSIDE AND SAN BERNARDINO COUNTIES, CALIFORNIA

PREPARED FOR

SoCalGas
555 West 5th Street
Los Angeles, California 90013

PREPARED BY

Psomas
3 Hutton Centre Drive, Suite 200
Santa Ana, California 92707

July 2015

TABLE OF CONTENTS

Section **Page**

TABLES

EXHIBITS

1.0 INTRODUCTION

This Hydrology and Water Quality Assessment describes the existing hydrology and water quality conditions that may be affected by implementation of the SoCalGas North-South Project (hereinafter referred to as the "Proposed Project"). It also identifies the regulatory background, potential impacts from construction, operation, and maintenance of the Proposed Project on hydrology and water quality in the Proposed Project area. This assessment also incorporates the Applicant Proposed Measures (APMs) set forth in the Proponent's Environmental Assessment (PEA) filed with the CPUC in June 2014.

2.0 PROJECT DESCRIPTION AND LOCATION

The primary components of the Proposed Project include the construction and installation of a 36-inch-diameter natural gas transmission pipeline and the rebuilding of the Adelanto Compressor Station. The pipeline will be primarily constructed and installed within existing public and private rights-of-way. The Proposed Project also includes installation of additional pressure-limiting equipment at the Moreno, Whitewater, and Shaver Summit Pressure Limiting Stations and upgrades to the existing pressure-limiting equipment at the Desert Center Compressor Station.

The approximate 65-mile-long Proposed Project alignment begins at the Adelanto Compressor Station in the City of Adelanto and proceeds in a southerly direction through unincorporated San Bernardino County and the City of Victorville. The alignment then runs along Interstate 15 (I-15) through the Cajon Pass and the San Bernardino National Forest (SBNF) and terminates at the Moreno Pressure Limiting Station in the City of Moreno Valley (Exhibit 1).

3.0 ENVIRONMENTAL SETTING

3.1 CLIMATE AND PRECIPITATION

The Proposed Project spans several climatic regions, with the majority of the proposed alignment traveling through high desert, subalpine, and low desert environments. The proposed alignment begins at the existing Adelanto Compressor Station in the southern Mojave Desert, which is classified as the "high desert." The Mojave Desert experiences high aridity and low precipitation and a wide variation in temperature, with very hot summer months and cold winters. The average annual precipitation for the region is 5.52 inches, as measured at the Victorville Pump Point National Oceanic and Atmospheric Administration (NOAA) weather station in Victorville (WRCC 2014d).

The Proposed Project alignment then travels south into the SBNF where it encounters subalpine, mountainous terrain. This area is characterized by relatively wet conditions compared to the surrounding arid regions, with an average annual precipitation of 36.5 inches at the Lytle Creek Ranger Station NOAA weather station (WRCC 2014a). The majority of precipitation in this area falls during the winter months as rain or snow at higher elevations.

Continuing in a southerly direction, the Proposed Project alignment exits the SBNF and enters the San Bernardino Valley. This area is generally characterized by a Mediterranean climate with cool, wet winters and hot, dry summers. The annual average precipitation at the SBNF NOAA weather station in the city of San Bernardino is 16.1 inches (WRCC 2014c). Shortly before crossing from San Bernardino to Riverside County, the Proposed Project alignment travels southeast through the Box Spring Mountains into Moreno Valley where it meets the Moreno Valley Pressure Limiting Station. Moreno Valley is a semi-arid region also characterized by a Mediterranean climate.

Document Path: D:\Projects\2SOU154606_Adelanto_to_Moreno\MXD\HydrologyEx_Project_Location_20150518.mxd

Southern California Gas Company

Figure 1
Project Location

North-South Project

The Whitewater Pressure Limiting Station is located in a low desert environment characterized by hot, dry conditions with low levels of precipitation. The annual average precipitation in Palm Springs, located just south of the Whitewater Pressure Limiting Station, is 5.53 inches (WRCC 2014b). Unlike the other regions crossed by the Proposed Project alignment, which generally receive the majority of their precipitation in the winter months, there is no defined rainy season in this low desert region. Precipitation can fall during large-scale winter storms or local summer thunderstorms and rare larger summer storms (SARWQCB 1995).

The Shaver Summit Pressure Limiting Station and the Desert Center Compressor Station are located further east of the Whitewater Pressure Limiting Station in Riverside County. Like the Whitewater Pressure Limiting Station, these facilities are located in a hot, arid, low desert environment.

3.2 SURFACE WATER HYDROLOGY

3.2.1 Major Watersheds and Streams

The State Water Resources Control Board (SWRCB) has divided the State of California into nine hydrologic regions under the jurisdiction of nine Regional Water Quality Control Boards (RWQCBs). These regions are subdivided into Hydrologic Units (HUs). Each HU consists of an entire watershed or one or more major streams. HUs are further subdivided into hydrologic areas (HAs), which are subdivided into hydrologic subareas (HSAs).

The pipeline alignment portion of the Proposed Project would cross three watersheds or hydrologic units in two hydrologic regions: the Mojave Watershed (HU 802.00) in the Lahontan Hydrologic Region (RWQCB Region 6) as well as the Santa Ana River Watershed (HU 801.00) and the San Jacinto Valley Watershed (HU 802.21) in the Santa Ana Hydrologic Region (RWQCB Region 8).

The northernmost portion of the Proposed Project alignment is located in the Mojave River Watershed, which encompasses approximately 4,500 square miles. The Mojave River, which travels approximately 110 miles northeast from its headwaters in the San Bernardino Mountains to its terminus near Soda Lake, is the dominant surface hydrologic feature in the watershed. Winter precipitation in the San Bernardino Mountains provides spring recharge that feeds the Mojave River system. The Mojave River Watershed sits in an arid region with limited water resources. Groundwater is the primary source of water to the watershed. The Mojave River channel is typically dry except for intense storm events and in locations where geologic conditions results surface discharge of groundwater (LRWQCB 2002). The Mojave River Hydrologic Unit is under the jurisdiction of the Lahontan RWQCB, Region 6. The 1995 Water Quality Control Plan for the Lahontan Region designates beneficial uses and water quality objectives within the Mojave River Hydrologic Unit.

South of the Mojave Watershed, the Proposed Project alignment travels through the Santa Ana River Watershed. The Santa Ana River Watershed is approximately 1,946 square miles and is drained by the Santa Ana River and its tributaries. The surface water for the Santa Ana River originates in the San Bernardino Mountains and travels approximately 75 miles southwest to the Pacific Ocean (OCWD 2013). During the winter and spring months, the Santa Ana River is fed by winter storm and mountain snowmelt runoff from the San Bernardino Mountains. At other times of the year, base flow to the Santa Ana River is primarily derived from recycled water and groundwater discharge. There is little year-round natural perennial flow in the Santa Ana River. South of the City of San Bernardino, parts of the river are operated as a flood-control facility. The Santa Ana River Hydrologic Unit is under the jurisdiction of the Santa Ana RWQCB (i.e., Region 8). The Water Quality Control Plan for the Santa Ana Region (as amended

through 2008) designates beneficial uses and water quality objectives within the Santa Ana River Hydrologic Unit.

South of the Santa Ana River Watershed, the Proposed Project alignment crosses the northern portion of the San Jacinto Valley Watershed, which encompasses an area of approximately 766 square miles. This watershed is drained by the San Jacinto River and its tributaries, with drainage ultimately arriving at Lake Elsinore. Although hydrologically isolated from the Santa Ana River, the San Jacinto Valley Watershed is also under the jurisdiction of the Santa Ana RWQCB. The Water Quality Control Plan for the Santa Ana Region designates beneficial uses and water quality objectives within the San Jacinto Valley hydrologic unit.

The Whitewater Pressure Limiting Station is located in the Whitewater Watershed, which covers an area of approximately 1,854 square miles. The Whitewater River is a major hydrologic feature of this watershed. The river has its headwaters in the San Gorgonio Mountains and terminates in the Salton Sea. The Whitewater Watershed is a closed drainage basin that only loses water through infiltration or evaporation. The Colorado River Basin RWQCB (i.e., Region 7) has jurisdiction over the Whitewater River Hydrologic Unit. The Water Quality Control Plan for the Colorado River Basin (as amended through 2006) designates beneficial uses and water quality objectives within the Whitewater River Hydrologic Unit.

The Shaver Summer Pressure Limiting Station and Desert Center Compressor Station are located in the Chuckwalla Watershed, located northeast of the Salton Sea. The Chuckwalla Watershed covers an area of approximately 1,982 square miles. There are no perennial streams in the Chuckwalla Valley (DWR 2006). The Colorado River Basin RWQCB (i.e., Region 7), has jurisdiction over the Chuckwalla Valley Watershed. The Water Quality Control Plan for the Colorado River Basin designates beneficial uses and water quality objectives within the Chuckwalla hydrologic unit.

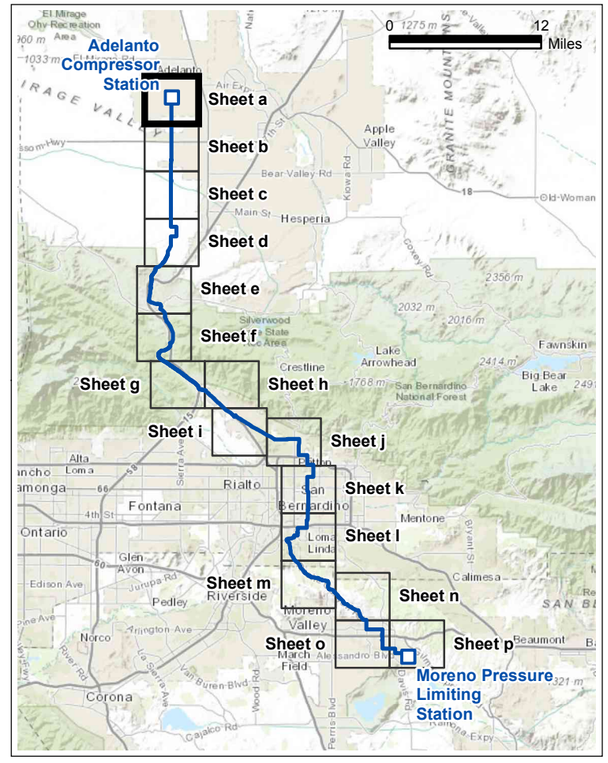
3.2.2 Waterbody Crossings

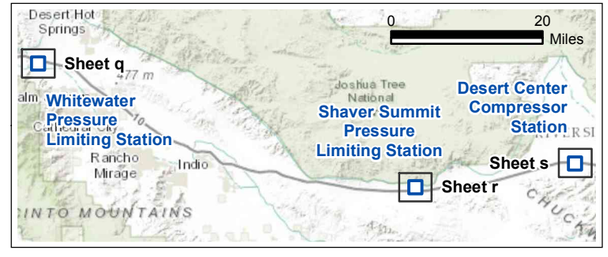
Examination of United States Geological Survey (USGS) topographic maps and satellite imagery of the land that the Proposed Project crosses indicates that the pipeline would cross one major river: the Santa Ana River (Exhibit 2). The Proposed Project alignment also crosses the California Aqueduct, City Creek, and Cajon Wash; several perennial streams; and approximately 300 intermittent drainage features such as ephemeral streams, creeks, washes and ditches. The Proposed Project alignment crosses just north of a percolation basin but does not cross any lakes or dry lake beds. The major waterbodies that the Proposed Project crosses are listed in Table 1.

Compressor/Pressure-Limiting Stations

Preferred Alignment

0 2,000 Feet





Southern California Gas Company

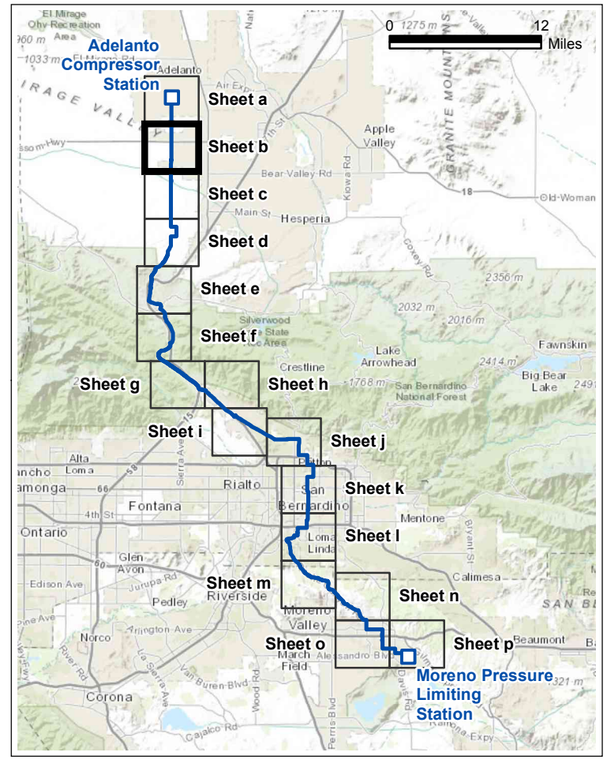
Exhibit 2a
USGS 7.5-Minute Topographic Quadrangle

North-South Project

Compressor/Pressure-Limiting Stations

Preferred Alignment

0 2,000 Feet



Southern California Gas Company

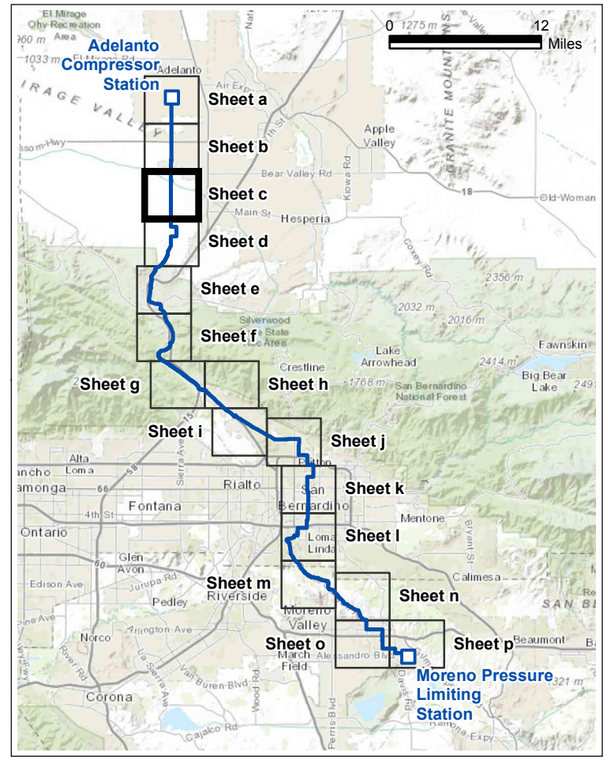
Exhibit 2b
USGS 7.5-Minute Topographic Quadrangle

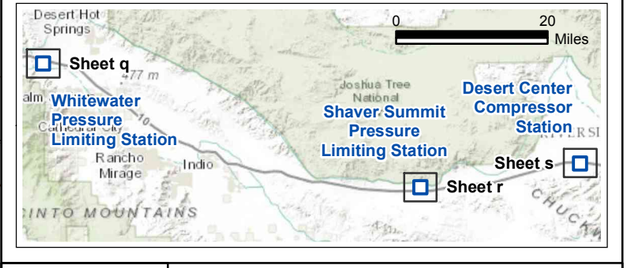
North-South Project

Compressor/Pressure-Limiting Stations

Preferred Alignment

0 2,000 Feet





Southern California Gas Company

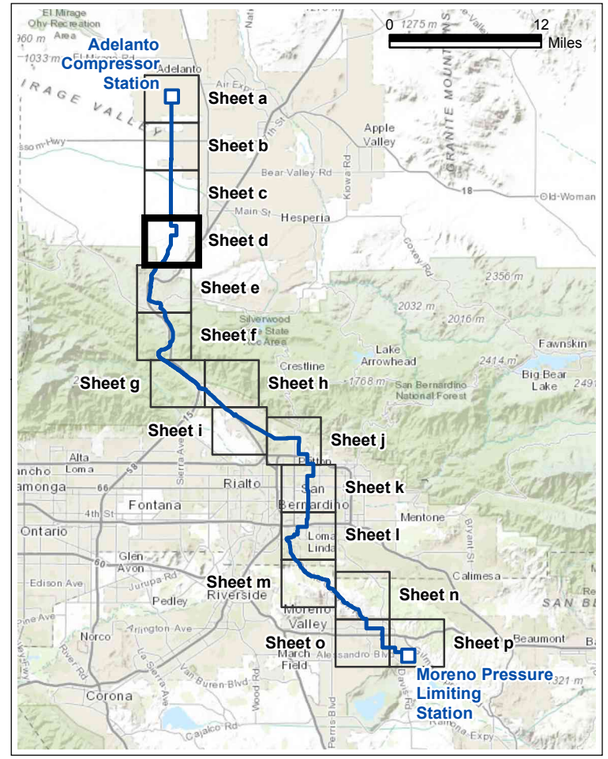
Exhibit 2c
USGS 7.5-Minute Topographic Quadrangle

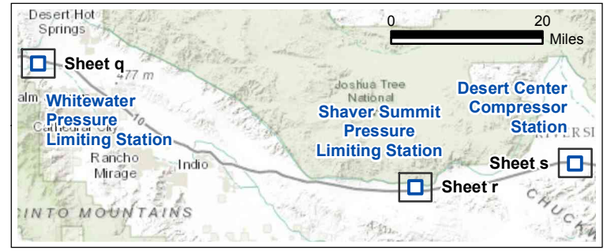
North-South Project

Compressor/Pressure-Limiting Stations

Preferred Alignment

0 2,000 Feet





Southern California Gas Company

Exhibit 2d
USGS 7.5-Minute Topographic Quadrangle

North-South Project

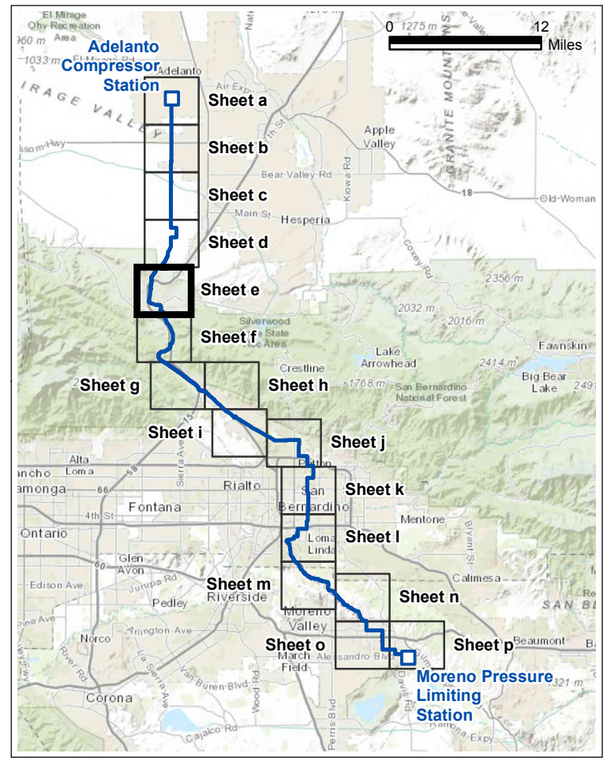
Baldy Mesa Quadrangle

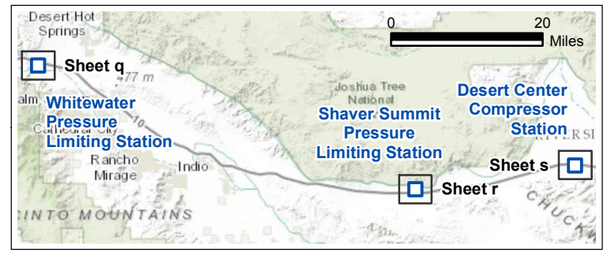
Cajon Quadrangle

Compressor/Pressure-Limiting Stations

Preferred Alignment

0 2,000 Feet





Southern California Gas Company

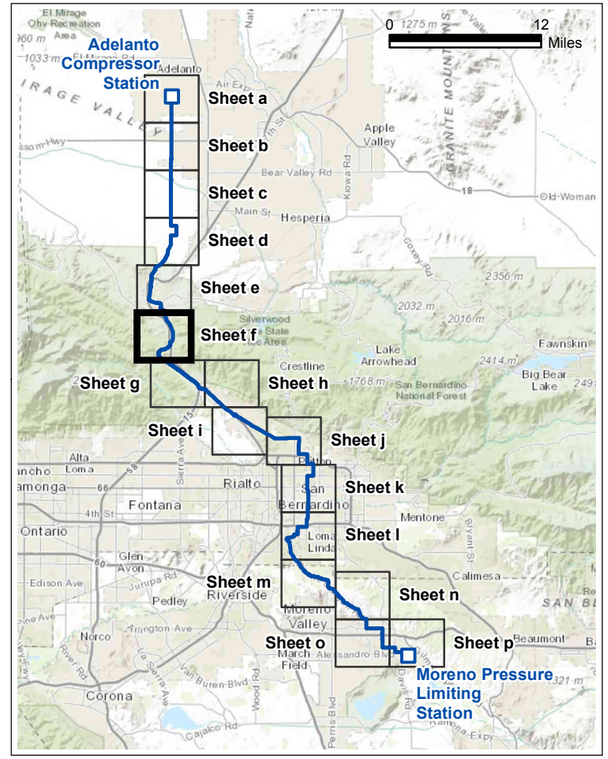
Exhibit 2e
USGS 7.5-Minute Topographic Quadrangle

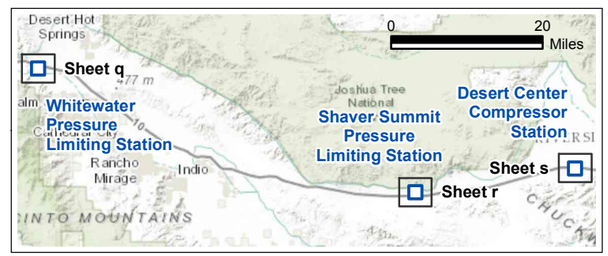
North-South Project

Compressor/Pressure-Limiting Stations

Preferred Alignment

0 2,000 Feet





Southern California Gas Company

Exhibit 2f
USGS 7.5-Minute Topographic Quadrangle

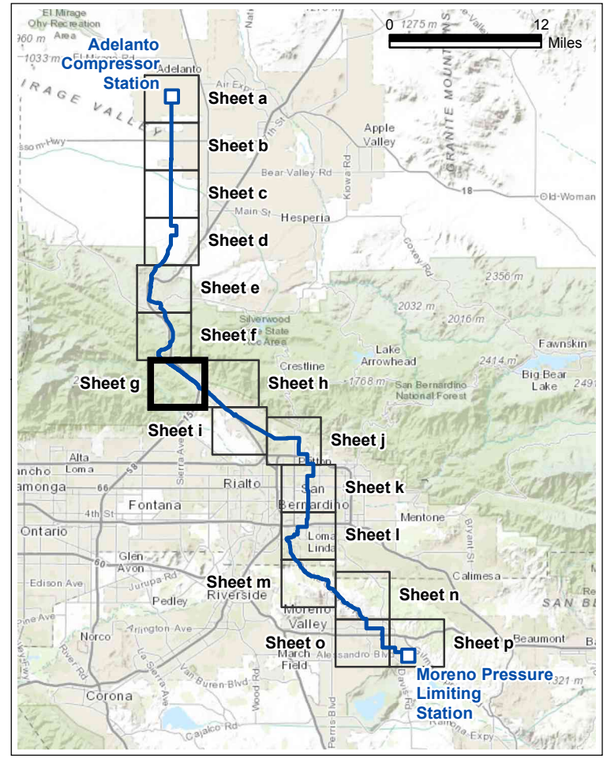
North-South Project

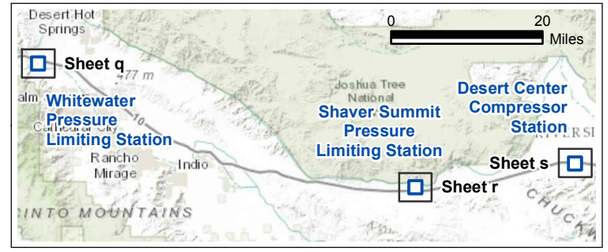
Compressor/Pressure-Limiting Stations

Preferred Alignment

N

0 2,000 Feet





Southern California Gas Company

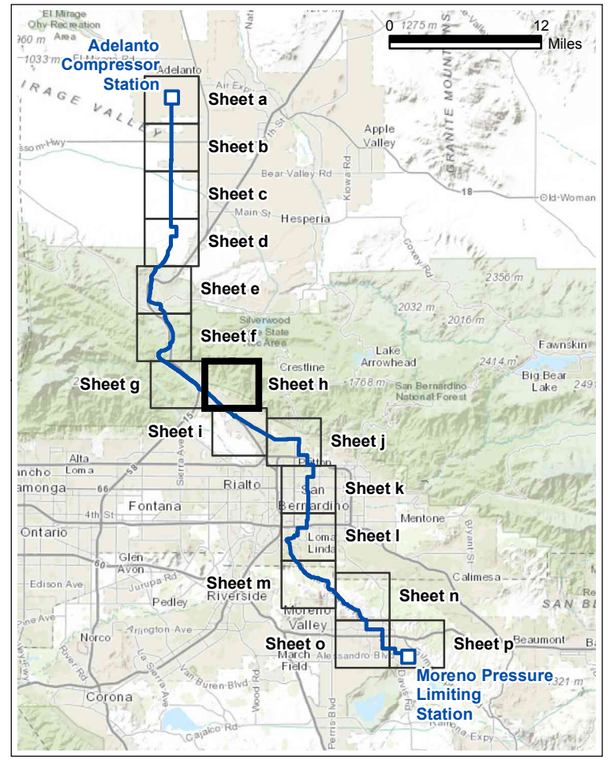
Exhibit 2g
USGS 7.5-Minute Topographic Quadrangle

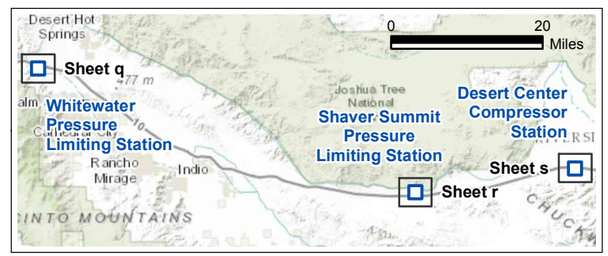
North-South Project

Compressor/Pressure-Limiting Stations

Preferred Alignment

0 2,000 Feet





Southern California Gas Company

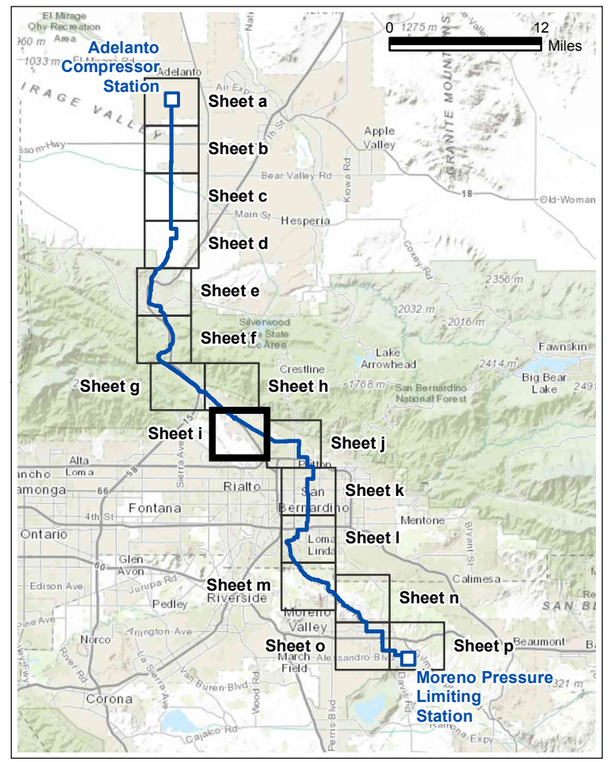
Exhibit 2h
USGS 7.5-Minute Topographic Quadrangle

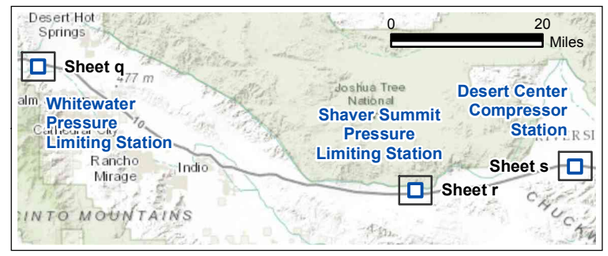
North-South Project

Compressor/Pressure-Limiting Stations

Preferred Alignment

0 2,000 Feet





Southern California Gas Company

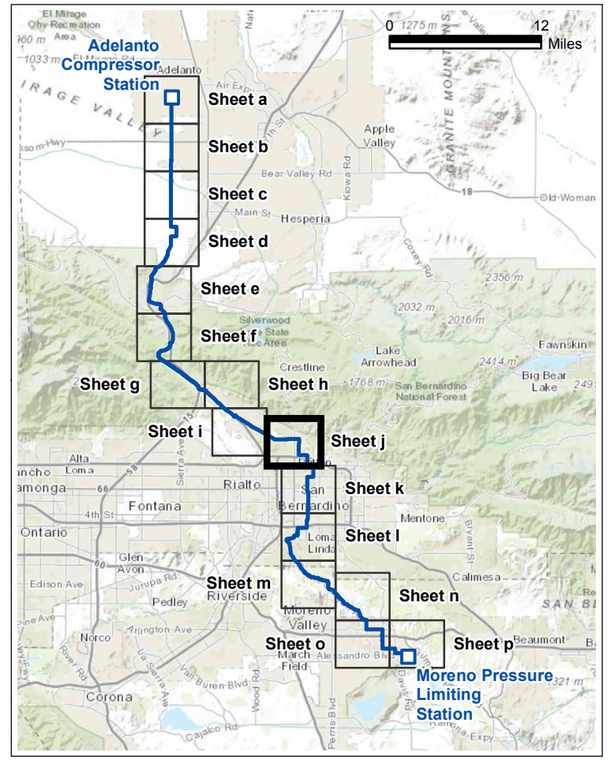
Exhibit 2i
USGS 7.5-Minute Topographic Quadrangle

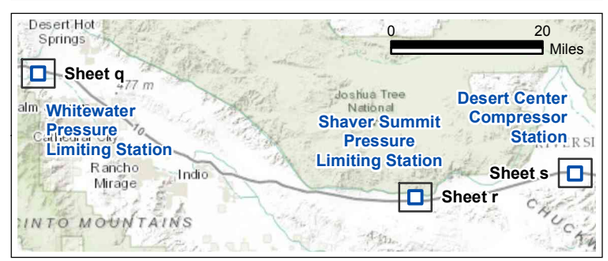
North-South Project

Compressor/Pressure-Limiting Stations

Preferred Alignment

0 2,000 Feet





Southern California Gas Company

Exhibit 2j
USGS 7.5-Minute Topographic Quadrangle

North-South Project

Compressor/Pressure-Limiting Stations

Preferred Alignment

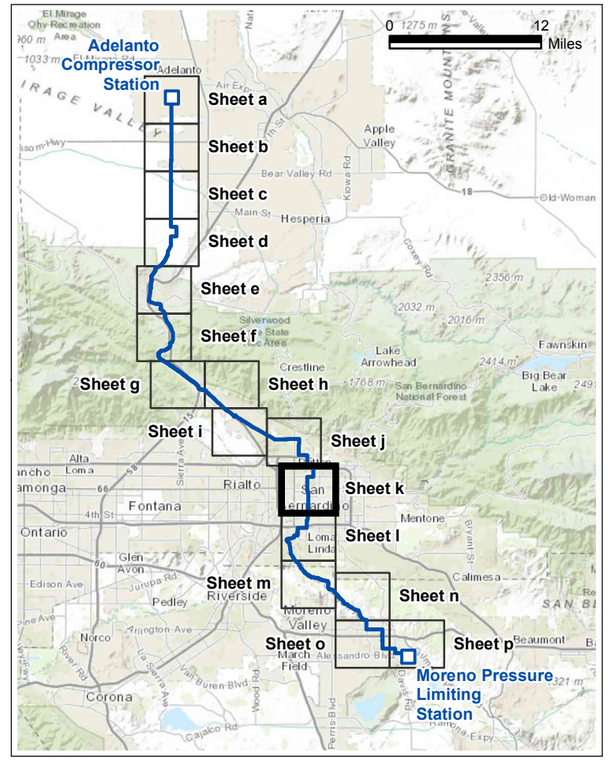
0 2,000 Feet

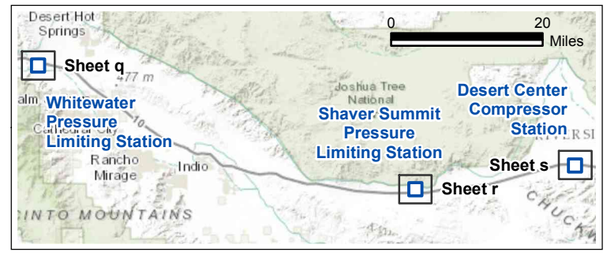
San Bernardino North Quadrangle

San Bernardino South Quadrangle

Harrison Mtn Quadrangle

Redlands Quadrangle





Southern California Gas Company

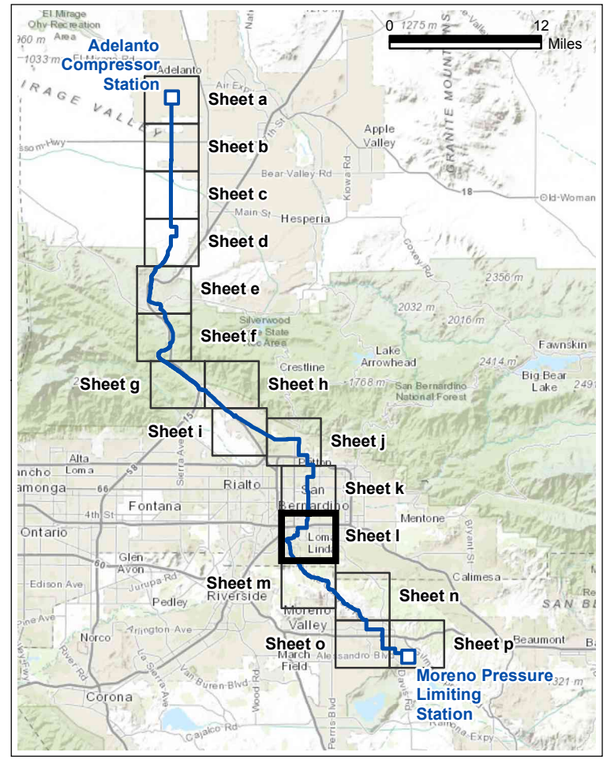
Exhibit 2k
USGS 7.5-Minute Topographic Quadrangle

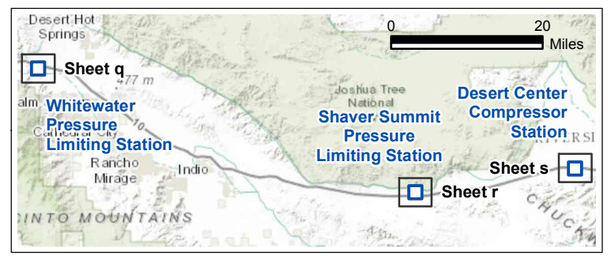
North-South Project

Compressor/Pressure-Limiting Stations

Preferred Alignment

0 2,000 Feet





Southern California Gas Company

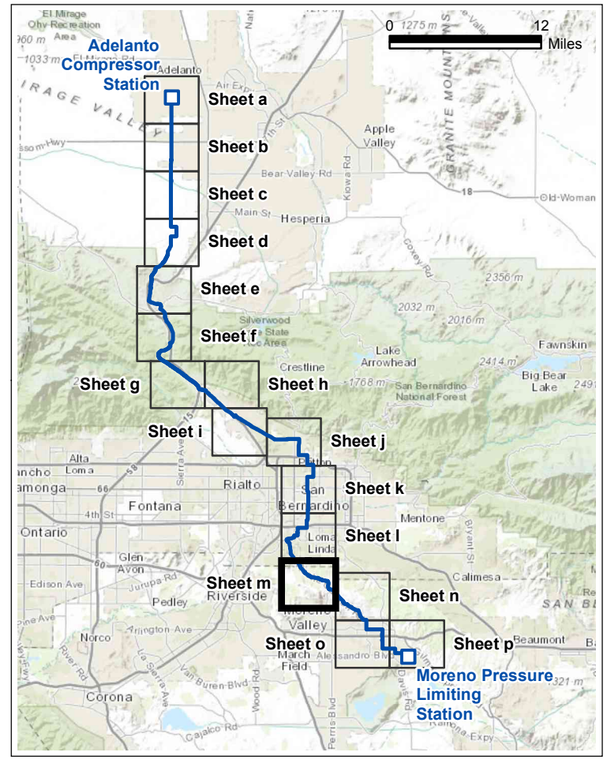
Exhibit 2l
USGS 7.5-Minute Topographic Quadrangle

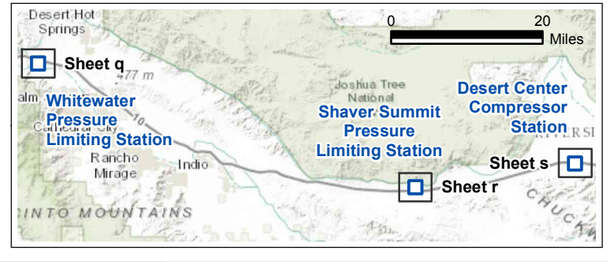
North-South Project

Compressor/Pressure-Limiting Stations

Preferred Alignment

0 2,000 Feet





Southern California Gas Company

Exhibit 2m
USGS 7.5-Minute Topographic Quadrangle

North-South Project

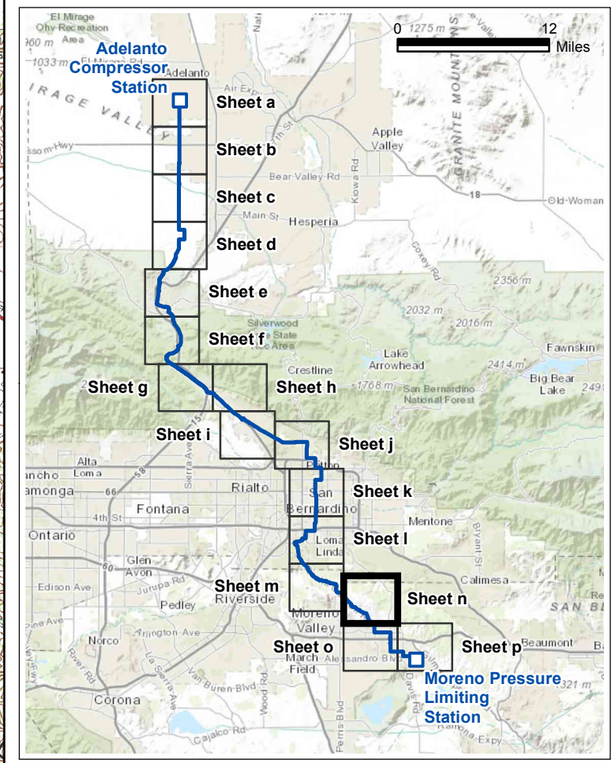
Redlands Quadrangle

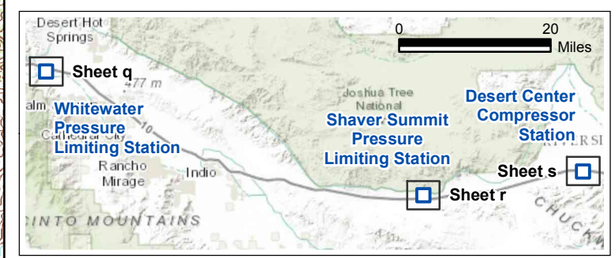
Sunnymead Quadrangle

Compressor/Pressure-Limiting Stations

Preferred Alignment

0 2,000 Feet





Southern California Gas Company

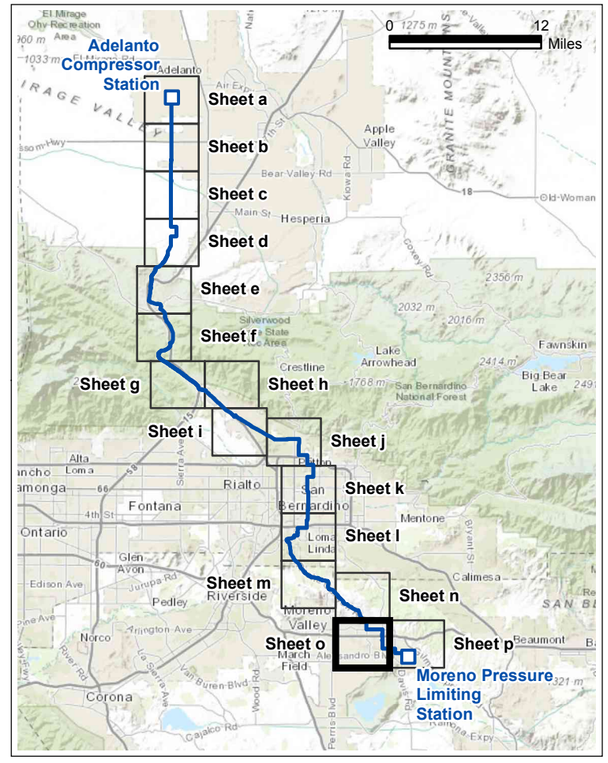
Exhibit 2n
USGS 7.5-Minute Topographic Quadrangle

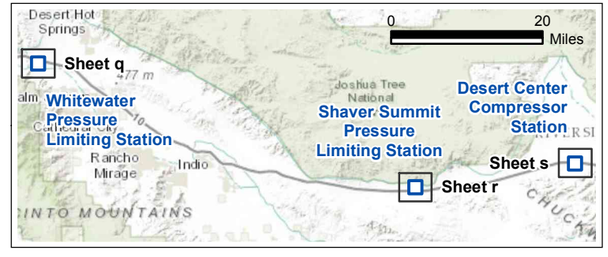
North-South Project

Compressor/Pressure-Limiting Stations

Preferred Alignment

0 2,000 Feet





Southern California Gas Company

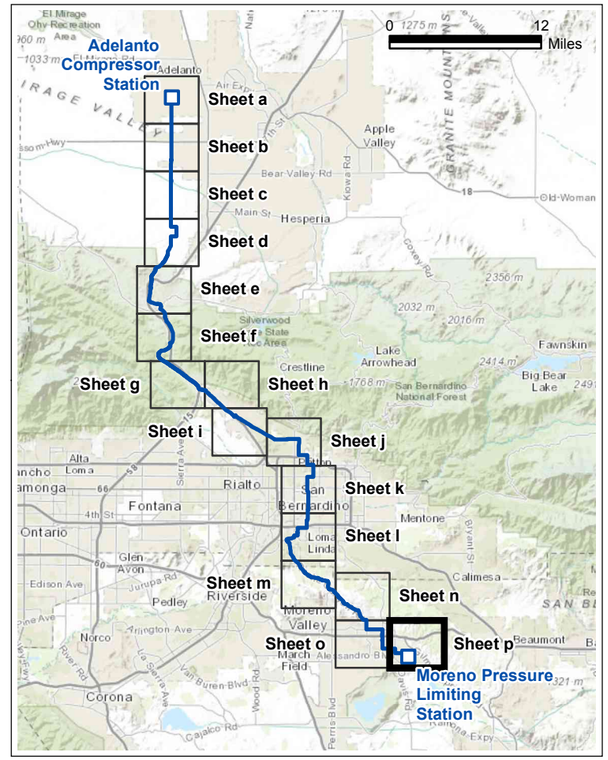
Exhibit 2o
USGS 7.5-Minute Topographic Quadrangle

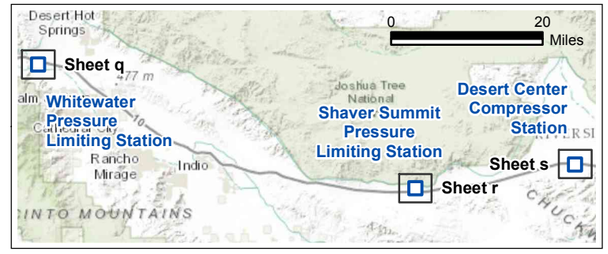
North-South Project

Compressor/Pressure-Limiting Stations

Preferred Alignment

0 2,000 Feet





Southern California Gas Company

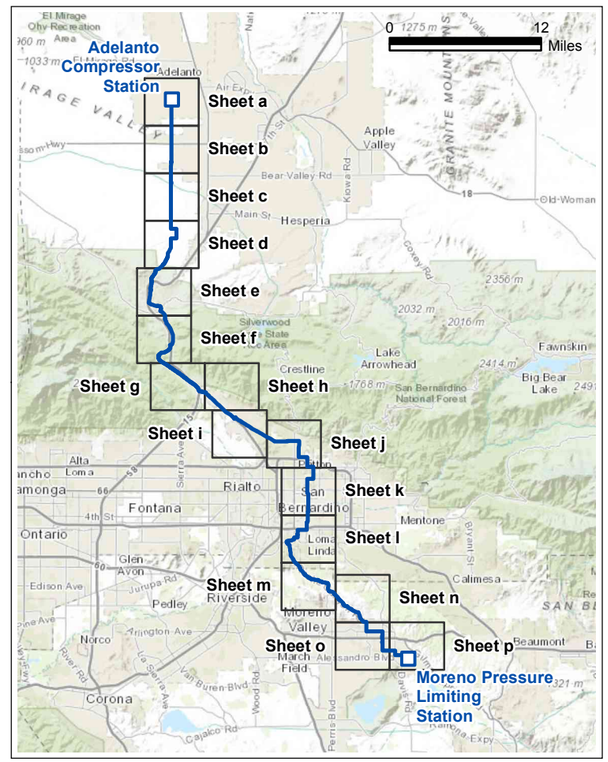
Exhibit 2p
USGS 7.5-Minute Topographic Quadrangle

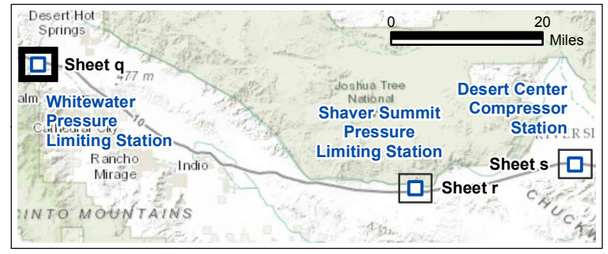
North-South Project

Compressor/Pressure-Limiting Stations

Preferred Alignment

0 2,000 Feet





Southern California Gas Company

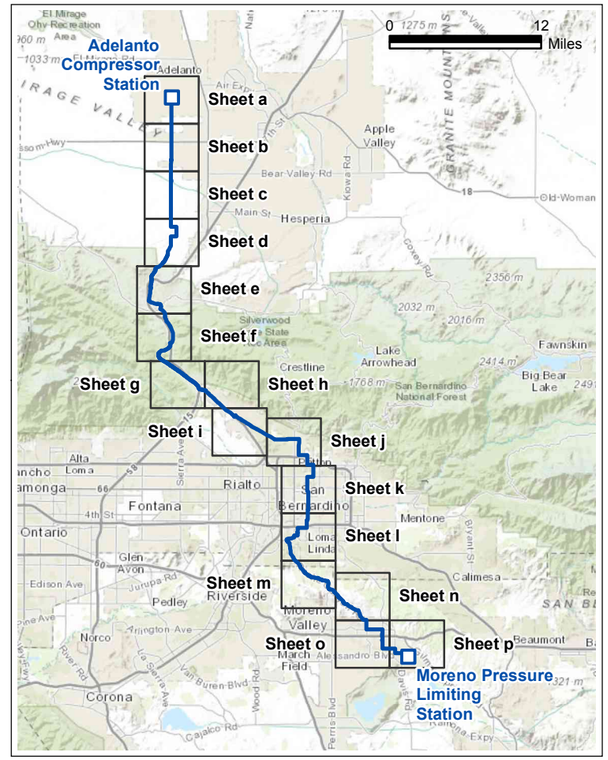
Exhibit 2q
USGS 7.5-Minute Topographic Quadrangle

North-South Project

Compressor/Pressure-Limiting Stations

Preferred Alignment

0 2,000 Feet



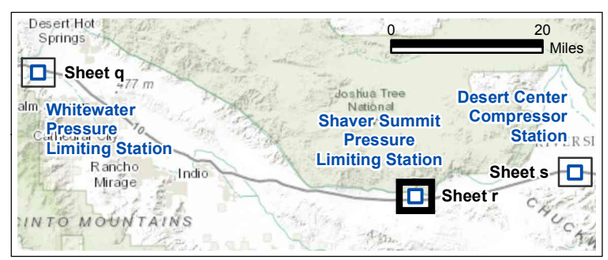


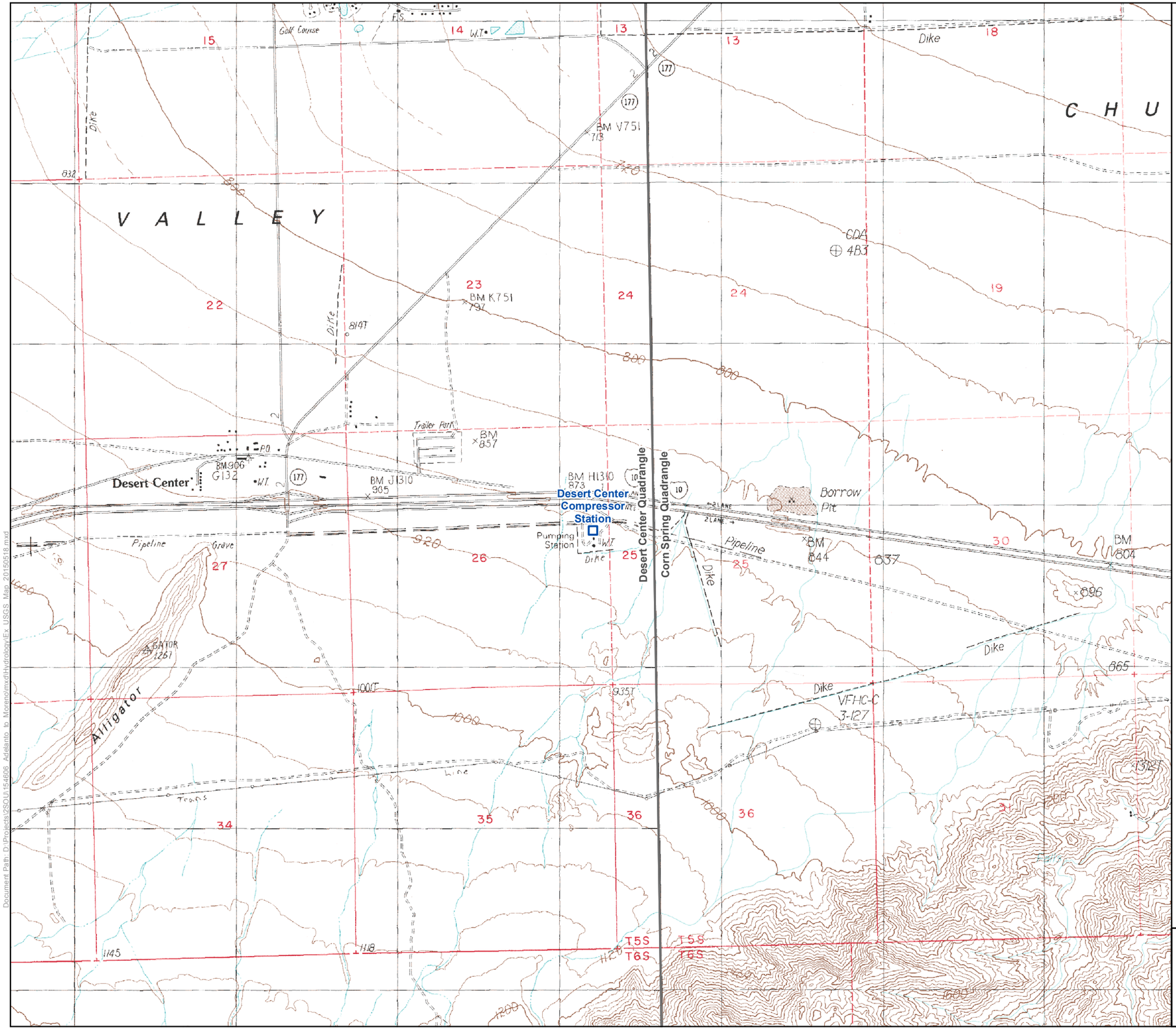
Exhibit 2r
USGS 7.5-Minute Topographic Quadrangle

North-South Project

Southern California Gas Company

(Rev: 5-18-2015 LEW) R:\Projects\SOU_SoCalGas\3SOU000401\Graphics\Hydrology\Ex3_USGS_Map_20150518.pdf

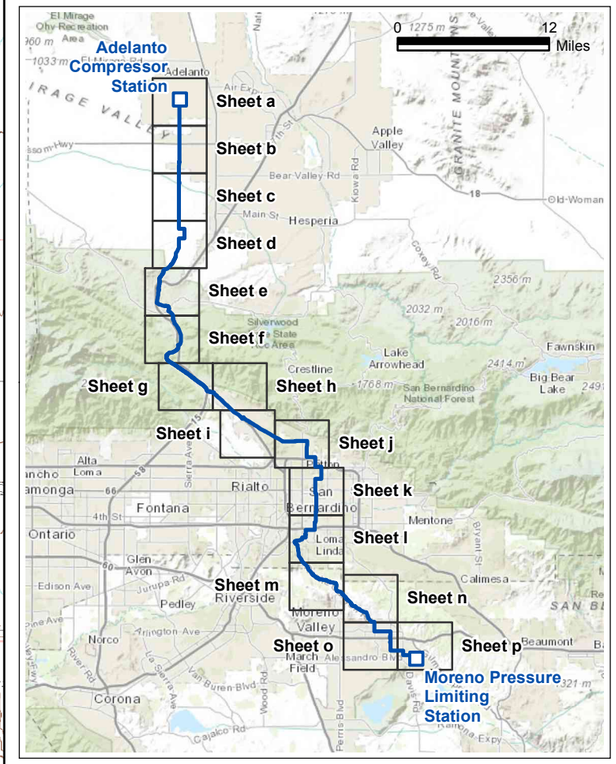
Document Path: D:\Projects\2SOU154696 Adelanto to Moreno\mxd\Hydrology\Ex_USGS_Map_20150518.mxd

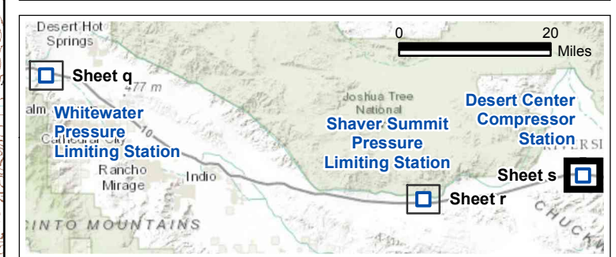


Compressor/Pressure-Limiting Stations

Preferred Alignment

0 2,000 Feet





Southern California Gas Company

Exhibit 2s
USGS 7.5-Minute Topographic Quadrangle

North-South Project

TABLE 1
MAJOR WATERBODIES CROSSED BY THE PROPOSED PROJECT

County/Hydrologic Region	Waterbody Name	Waterbody Type	State Water Quality Classification	Alignment, Approximate Mile Post
San Bernardino/ Lahontan (Region 6)	California Aqueduct	Perennial, controlled	Beneficial uses established; Impaired	AM-6 to AM-7
San Bernardino/Santa Ana (Region 8)	Cajon Wash	Perennial	Beneficial uses established	AM-22
San Bernardino/Santa Ana (Region 8)	City Creek	Perennial, upper reaches; Intermittent, lower reaches at the location of the Proposed Project crossing	Beneficial uses established; not all beneficial uses are supported	AM-41 to AM-42
San Bernardino/Santa Ana (Region 8)	Santa Ana River	Intermittent at the location of the Proposed Project crossing	Beneficial uses established; reaches downstream of the Proposed Project crossing are impaired	AM-42 to AM-43

The Proposed Project alignment would cross the California Aqueduct between Mile Posts AM-6 and AM-7 just south of Adelanto, California. The California Aqueduct is a concrete channel that conveys water from Northern California in the San Joaquin River-Sacramento River Delta south to Southern California.

The alignment crosses Cajon Wash just past Mile Post AM-22. Cajon Wash is a tributary to Lytle Creek, which flows between the San Gabriel and San Bernardino Mountains. Cajon Wash (also known as Cajon Creek) is in the Santa Ana River Hydrologic Unit, the Upper Santa Ana River Hydrologic Area (HA 801.50), and the Bunker Hill Hydrologic Subarea (HAS 801.52). The Proposed Project pipeline crosses Cajon Wash near Mile Post AM-22. The wash is a perennial creek characterized by braided bed morphology typical of alluvial channels and is bordered by riparian vegetation.

City Creek is a stream that originates in the San Bernardino Mountains and flows southwest into the Santa Ana River. City Creek is in the Santa Ana River Hydrologic Unit, the Upper Santa Ana River Hydrologic Area, and the Bunker Hill Hydrologic Subarea. Perennial flow is present over the majority of the stream channel. The Proposed Project pipeline crosses City Creek between Mile Post AM-41 and AM-42 in the City of San Bernardino. Warm Creek also originates in the San Bernardino Mountains and joins City Creek just upstream of its confluence with the Santa Ana River.

The Proposed Project pipeline crosses Reach 5 of the Santa Ana River between Mile Posts AM-43 and AM-44 in the Upper Santa Ana River Hydrologic Area and the Bunker Hill Hydrologic Subarea. In addition to storm water and tributary flow, Reach 5 of the Santa Ana River also receives recycled water inflows from the City of San Bernardino Water Reclamation Facility (SAWPA 2012). However, Reach 5 tends to be dry outside of storm flow events. The Reach 5 channel in primarily operated as a flood control facility (SARWQCB 1995, as amended through 2008).

Portions of the Proposed Project pipeline are located in valleys surrounded by mountain ranges including the San Bernardino and San Jacinto Mountains. These valleys can contain alluvial

outwash fans that drain the surrounding mountain areas. These features can become washes during seasonal precipitation events through which fast flowing water can temporarily travel.

The Proposed Project pipeline crosses the 100-year flood plains of the Santa Ana River. The Proposed Project pipeline also crosses the 100-year and 500-year flood plains of several smaller rivers and streams, including some that are tributary to the Santa Ana River. The 100-year and 500-year floods are defined as the flood events that have a recurrence interval of 1 percent and 0.2 percent, respectively, of being equaled or exceeded in any single year. Although the Proposed Project pipeline would be located within the 100-year flood zone, the pipeline would typically be buried at depths of 7 to 8 feet (or deeper where directional drilling would occur) and below the anticipated scour depths of the respective drainages.

3.2.3 Springs and Seeps

A comprehensive review was conducted to identify potential springs and seeps that may be present along the Proposed Project alignment and may be affected by the project. Sources reviewed included published reports and maps by the USGS and California Department of Water Resources (DWR) as well as shape files prepared by the United States Forest Service (USFS) depicting hydrologic features (including springs). The only information available was related to notations on topographic maps and the USFS.

The presence of springs was primarily limited to the San Gabriel and San Bernardino Mountains and Reche Canyon. With respect to the San Gabriel and San Bernardino Mountains, only two springs were noted within 2,000 feet of the Proposed Project alignment. The USFS shape files depicted an unnamed spring immediately east of Cajon Junction approximately 1,300 feet from the Proposed Project alignment. The USGS map and USFS shape files identify Blue Cut Spring located near the mouth of Lone Pine Canyon where it enters Cajon Canyon. Additional unnamed and named springs were noted beyond the 2,000-foot search area. Exhibit 3 depicts the springs noted in the vicinity of the Proposed Project in San Gabriel and San Bernardino Mountains.

For the Reche Canyon portion of the Proposed Project alignment, multiple unnamed and one named spring were noted within the 2,000-foot search area, as summarized in Table 2 and shown in Exhibit 4. The only notable spring was referred to as “Console Springs.” Water derived from Console Springs was apparently bottled and sold in local stores back in the early 1900s and continued until the owner died in the mid-1920s (Perry 2009). The current status of the spring is unknown.

TABLE 2
LIST OF SPRINGS IN PROXIMITY TO PROPOSED PIPELINE

Spring Name	Location (Township:Range:Section)*	Distance To Pipeline (Feet)
Unnamed	SW1/4 of T03NR06WSec26	1,300
Blue Cut Spring	SW1/4 of T02NR06WSec12	750
Unnamed	SW1/4 of T02SR03WSec18	1,100
Console Spring	NW1/4 of T02SR03WSec20	250
Unnamed	NW1/4 of T02SR03WSec20	200
Unnamed	NE1/4 of T02SR03WSec28	400
* San Bernardino Base and Meridian		

Spring
Compressor/Pressure Limiting Station
Preferred Alignment
2000' Buffer

0 4,000 Feet

0 12 Miles

Adelanto Compressor Station
Moreno Pressure Limiting Station
Whitewater Pressure Limiting Station
Shaver Summit Pressure Limiting Station
Desert Center Compressor Station

Sharpless Spring
Chowder Spring
unnamed 17
Mojave Spring
Lone Pine Spring
Blue Cut Spring
Sugarpine Spring
Keenbrook Springs
Keenbrook Springs
Middlemen Spring
Lower Lytle Creek Spring
Bonita Spring

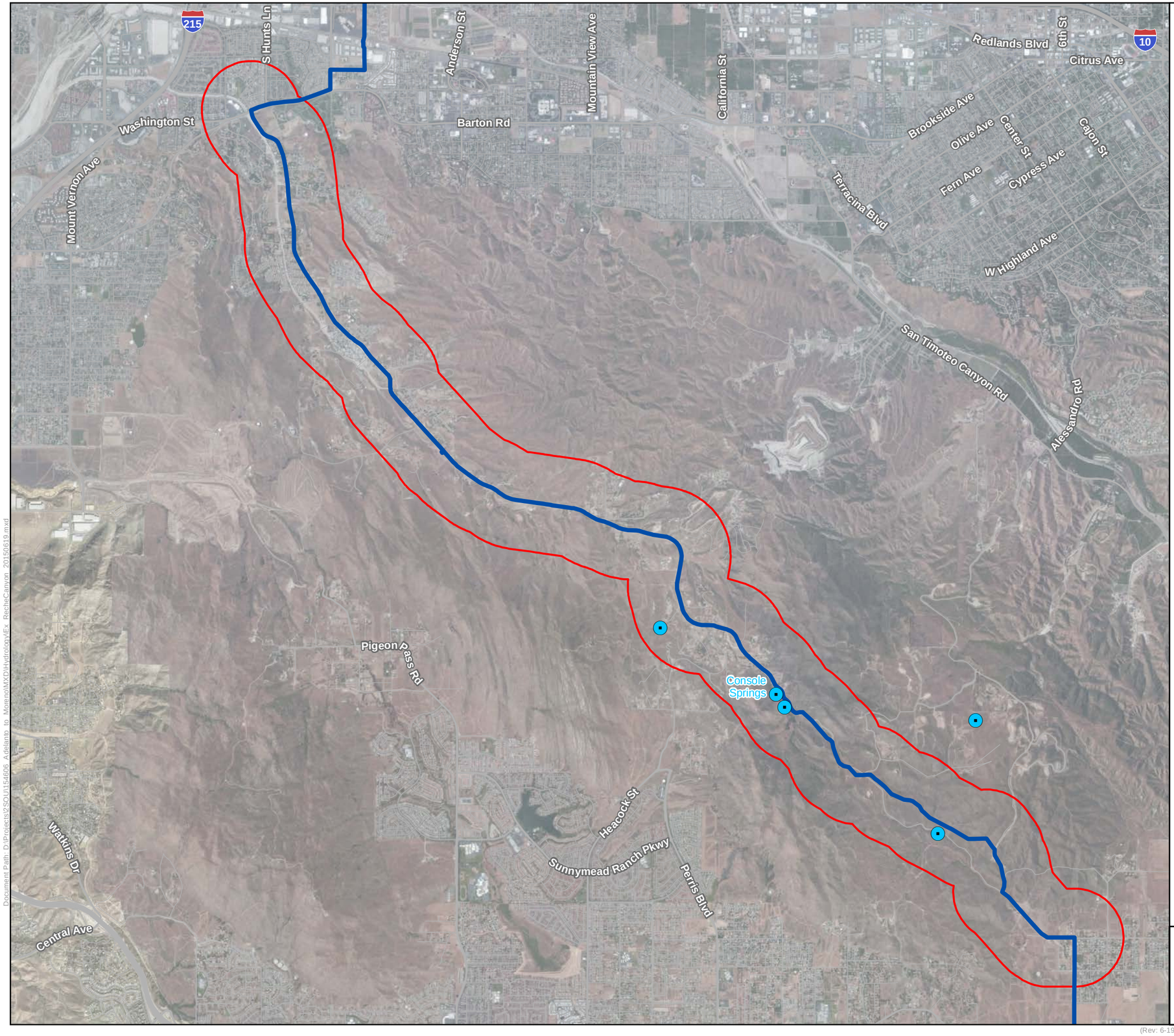
Southern California Gas Company

Exhibit 3
Springs in Cajon Pass Area

North-South Project

Document Path: D:\Projects\SOU\154606 Adelanto to Moreno\MXD\Hydrology\Ex CajonPass 20150619.mxd

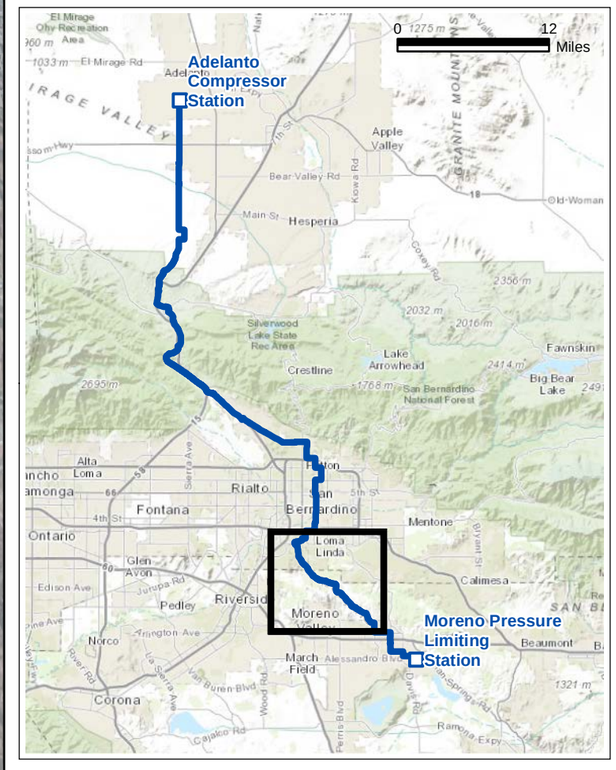
(Rev: 6-19-2015WAD) R:\Projects\SOU_SoCalGas\3SOU000401\Graphics\Hydrology\Ex3_Springs_CajonPass_20150619.pdf



Spring
Compressor/Pressure Limiting Station
Preferred Alignment
2000' Buffer

N

0 4,000 Feet



Southern California Gas Company

Exhibit 4
Springs in Reche Canyon Area

North-South Project

Document Path: D:\Projects\2SOU\154686_Adelanto_to_Moreno\MXD\Hydrology\Ex_RecheCanyon_20150619.mxd

(Rev: 6-19-2015WAD) R:\Projects\SOU_SoCalGas\3SOU000401\Graphics\Hydrology\Ex4_Springs_RecheCanyon_20150619.pdf

A review of water quality data available from the USGS National Water Information System revealed no information was available for any springs within 2,000 feet of the Proposed Project alignment (USGS 2015).

Prior to implementation of the Proposed Project, the Applicant will request authorization from landowners to test and document the baseline condition, yield, and water quality of any springs being used as permitted water supplies within 200 feet of the pipeline construction right-of-way. Testing of springs may also be necessary for any public water supply springs located within 400 feet of the pipeline construction right-of-way.

3.2.4 Water Quality

Water quality in the Proposed Project area is variable, as the alignment travels through both remote mountain terrain and populated areas. Water quality within the watersheds crossed by the Proposed Project alignment is influenced by natural and artificial sources including soil erosion; discharges from wastewater treatment plants; storm water runoff; groundwater discharge; agriculture; recreational activities; and, in the upper portions of the watersheds, flora and fauna. None of the major bodies crossed by the Proposed Project alignment are listed on the United States Environmental Protection Agency's (USEPA's) approved 2010 303(d) list of impaired waterbodies as listed by the SWRCB in its 2010 Integrated Report. However, each of the two hydrologic regions crossed by the Proposed Project alignment contains 303(d)-listed impaired waterbodies. The water quality of waterbodies located downstream of the Proposed Project area may be impacted by the Proposed Project. The water quality of the major waterbodies that would be crossed by the Proposed Project alignment is discussed below.

Beneficial uses for Cajon Wash are included in Table 3. City Creek is not listed on the 303(d) list, but the 2010 Integrated Report lists it as a Category 2 Waterbody. Category 2 Waterbodies support some (but not all) of their California beneficial uses and have other uses that are not assessed or there is a lack of sufficient information to be assessed. Beneficial uses for City Creek are included in Table 3. Pollutants in City Creek include metals, selenium and chloride (SWRCB 2010).

Water quality data for Reach 5 of the Santa Ana River is limited due to lack of flow. Reach 5 is considered a Category 2 Waterbody due the presence of pesticides interfering with the core beneficial use of Aquatic Life Support (SWRCB 2010). The Santa Ana Region Basin Plan lists the beneficial uses for Reach 5 of the Santa Ana River in Table 4. (SARWQCB 1995). Reach 4 of the Santa Ana River, immediately downstream of Reach 5, is listed on the 303(d) list as containing pathogens from nonpoint sources (SWRCB 2010), with a total maximum daily load (TMDL) scheduled completion date of 2019 for this pollutant. Portions of the Santa Ana River further downstream are also listed on the 303(d) list with pollutants including pathogens, metals, and indicator bacteria (SWRCB 2010). A TMDL for pathogens derived from dairies was established in Reach 3 of the Santa Ana River in 2007.

TABLE 3
WATER BODY BENEFICIAL USE DESIGNATIONS

	Beneficial Use									
Upper Santa Ana River Basin	**MUN**	**AGR**	**GWR**	**REC-1**	**REC-2**	**WARM**	**COLD**	**WILD**	**RARE**	**SPWN**
Santa Ana River										
Reach 5: San Jacinto Fault in San Bernardino to Seven Oaks Dam	X*	X	X	X3	X	X		X	X	
Other Streams Draining to Santa Ana River (Mountain Reaches)										
Cajon Wash	X		X	X	X		X	X	X	
City Creek	X	X	X	X	X		X	X	X	X

MUN: Municipal and Domestic Supply; AGR: Agricultural Supply; GWR: Groundwater Recharge; REC-1: Water Contact Recreation; REC-2: Non-Contact Water Recreation; WARM: Warm Freshwater Habitat; COLD: Cold Freshwater Habitat; WILD: Wildlife Habitat; RARE: Rare, Threatened, or Endangered Species; SPWN: Spawning, Reproduction, and Development

X: Present or Potential Beneficial Use; 3 – Access prohibited in some portions by San Bernardino County Flood Control.

*: MUN applies upstream of Orange Avenue (Redlands); downstream water is exempt from MUN.
Source: SARWQCB, 1995.

The Santa Ana Basin Plan defines the beneficial use abbreviations as the following (SARWQCB 1995):

- **Municipal and Domestic Supply (MUN):** Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.
- **Agricultural Supply (AGR):** Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, and support of vegetation for range grazing.
- **Groundwater Recharge (GWR):** Uses of water for natural or artificial recharge of groundwater for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.
- **Water Contact Recreation (REC-1):** Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, whitewater activities, fishing, or use of natural hot springs.
- **Non-Contact Water Recreation (REC-2):** Uses of water for recreational activities involving proximity to water, but not normally involving body contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tide pool and marine life study, hunting, sightseeing, and aesthetic enjoyment in conjunction with the above activities.
- **Warm Freshwater Habitat (WARM):** Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
- **Cold Freshwater Habitat (COLD):** Uses of waters that support coldwater ecosystems that may include, but are not limited to, preservation and enhancement of aquatic habitats, vegetation, fish and wildlife, including invertebrates.
- **Wildlife Habitat (WILD):** Uses of water that support wildlife habitats including, but not limited to, preservation and enhancement of vegetation and prey species used by waterfowl and other wildlife.

- **Rare, Threatened, or Endangered Species (RARE):** Uses of water that support habitats necessary for the survival and successful maintenance of plant or animal species designated under state or federal law as Rare, Threatened, or Endangered.
- **Spawning, Reproduction and Development (SPWN):** Uses of waters that support high quality aquatic habitats necessary for reproduction and early development of fish and wildlife.

3.3 GROUNDWATER RESOURCES

The Proposed Project lies within the Transverse Ranges and selected Peninsular Ranges and Desert Hydrogeologic provinces (see Belitz et al. 2003). The Transverse Ranges and selected Peninsular Ranges Hydrogeologic Province includes 33 groundwater basins and 167 watersheds that consist of the following principal aquifer types: bedrock aquifers and basin-fill alluvial aquifers. The Desert Hydrogeologic Province includes 96 groundwater basins and 110 watersheds. The boundary with the Transverse Ranges and selected Peninsular Ranges Province is primarily defined by groundwater basin boundaries that delineate the San Gabriel and San Bernardino Mountains, which are part of the Transverse Ranges and selected Peninsular Ranges Province, from groundwater basins that are a part of the Desert Province. The primary groundwater basins traversed by the project in the Transverse Ranges and selected Peninsular Ranges Province are the Upper Santa Ana Valley Groundwater Basin (DWR 8-2) and the San Jacinto Groundwater Basin (DWR 8-5). The primary groundwater basin traversed by the project in the Desert Hydrogeologic Province is the Upper Mojave River Valley Groundwater Basin (DWR 6-42). Exhibit 5 presents the various groundwater basins/sub-basins in the vicinity of the Proposed Project.

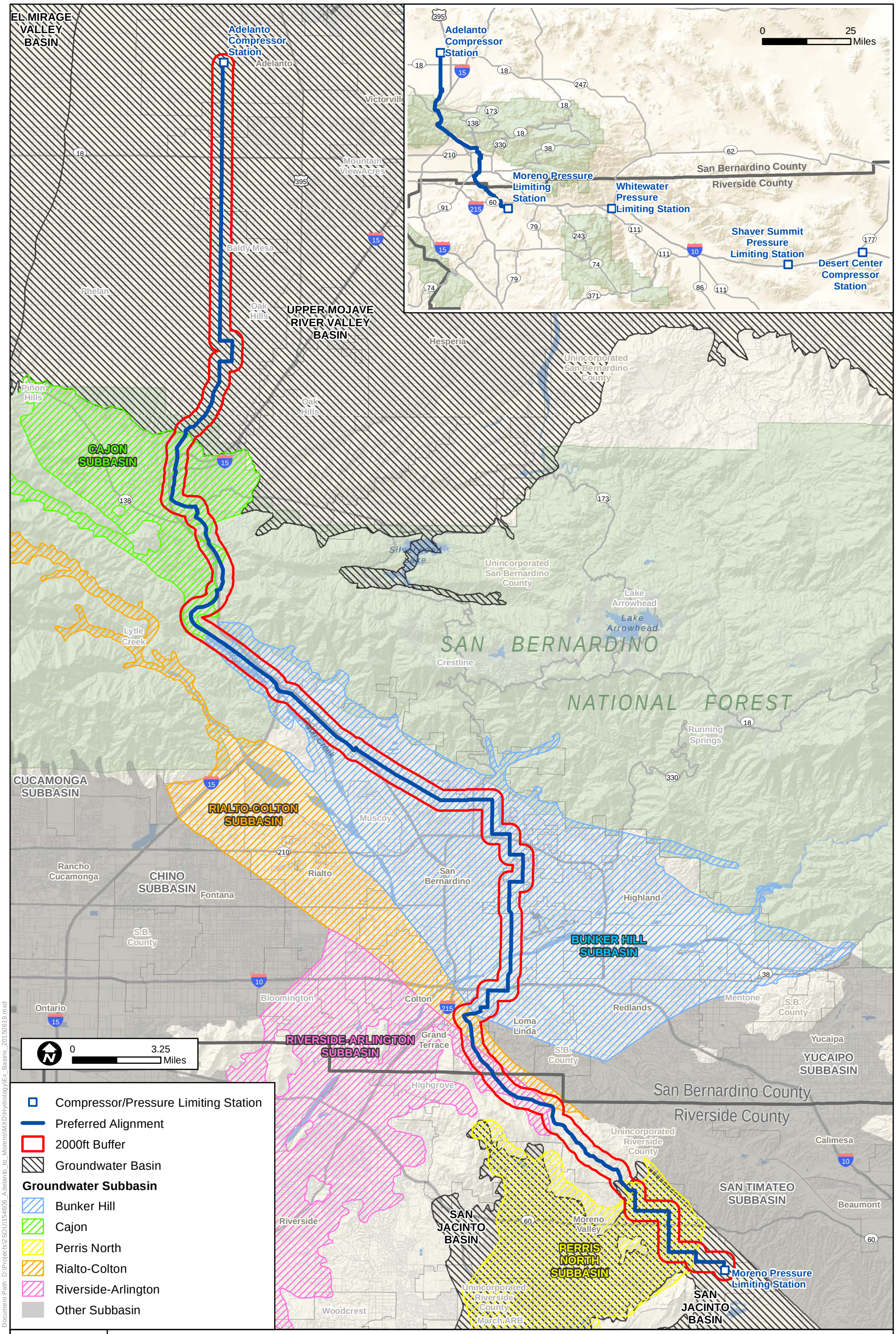
3.3.1 Aquifers and Groundwater Basins

The San Jacinto Groundwater Basin is bound by the San Jacinto Mountains on the east; the San Timoteo Badlands on the northeast; the Box Mountains on the north; the Santa Rosa Hills and Bell Mountain on the south; and unnamed hills on the west. The basin is comprised primarily of sediments that have filled valleys and underlying canyons incised into crystalline basement rock. The valley fill deposits are generally divided into younger and older alluvium. Maximum depths of valley fill reach about 900 feet in the western and northern parts of the basin, but may exceed 5,000 feet in the eastern part of the basin (DWR 2006).

The Proposed Project traverses four sub-basins in the Upper Santa Ana Valley Groundwater Basin. The sub-basins are the Riverside-Arlington Sub-basin (primarily in Reche Canyon), the Rialto-Colton Sub-basin, located at the southern edge of the Upper Santa Ana Valley Groundwater Basin as the Proposed Project pipeline exits Reche Canyon; the Bunker Hill Sub-basin, and the Cajon Sub-basin located in the northern portion of Cajon Pass. The individual sub-basins are discussed below.

The Riverside-Arlington Sub-basin underlies part of the Santa Ana River Valley in northwest Riverside County and southwest San Bernardino County. This sub-basin is bound by impermeable rocks of Box Springs Mountains on the southeast, Arlington Mountain on the south, La Sierra Heights and Mount Rubidoux on the northwest, and the Jurupa Mountains on the north. The northeast boundary is formed by the Rialto-Colton fault, and a portion of the northern boundary is a groundwater divide beneath the city of Bloomington. Groundwater in the sub-basin is found chiefly in alluvial deposits. Quaternary age alluvial deposits in the sub-basin consist of sand, gravel, silt, and clay deposited by the Santa Ana River and its tributaries (DWR, 2006).

The Rialto-Colton Sub-basin underlies a portion of the upper Santa Ana Valley in southwestern San Bernardino County and northwestern Riverside County. This sub-basin is bounded by the



Document Path: D:\Projects\2SOU\154606_Adelanto_to_Moreno\MXD\Hydrology\Ex_Basins_20150619.mxd

Groundwater Basin/Subbasin data derived from West San Jacinto Groundwater Management Area 2013 Annual Report Prepared by Eastern Municipal Water District May 2014

Southern California Gas Company

Exhibit 5

Groundwater Basins/Subbasins

North-South Project

(Rev: 6-19-2015 WAD) R:\Projects\SOU_SoCalGas\3SOU000401\Graphics\Hydrology\Ex5_Groundwater Basins.pdf

San Gabriel Mountains on the north, the San Jacinto fault on the east, the Box Spring Mountains on the south, and the Rialto-Colton fault on the west. Groundwater in the Rialto-Colton Sub-basin can be found in alluvial deposits consisting of gravel, sand, silt, and clay. Holocene age alluvial deposits are found beneath the current courses of Lytle and Cajon Creeks along the eastern part of the sub-basin, and the Santa Ana River, which crosses the southern part of the sub-basin (DWR 2006).

Bunker Hill Sub-basin consists of the alluvial materials that underlie the San Bernardino Valley. This sub-basin is bound by contact with consolidated rocks of the San Gabriel Mountains, the San Bernardino Mountains, the Crafton Hills, and several faults. The southern boundary is the Banning Fault; the eastern boundary is the Redlands Fault; the San Andreas Fault is roughly the northern boundary; the Glen Helen Fault abuts the northwest boundary; and the southwestern boundary is the San Jacinto Fault (DWR 2006). The water-bearing material in the sub-basin consists of Holocene and Pleistocene age alluvial deposits of sand, gravel, and boulders interspersed with deposits of silt and clay. The water-bearing material has been divided into upper and lower aquifers. In the central part of the sub-basin, a poorly permeable clay layer separates the aquifers, creating confined conditions in the lower aquifer under about 25 square miles of the valley. Maximum thickness of the upper aquifer is approximately 350 feet, and maximum thickness of the lower aquifer is approximately 650 feet (DWR 2006).

The Cajon Sub-basin underlies Cajon Valley and Lone Pine Canyon, mostly in Cajon Pass, which is the boundary between the San Gabriel and San Bernardino Mountains. This sub-basin is bound by the Upper Mojave River Valley Groundwater Basin on the north along a surface drainage divide and the Bunker Hill Sub-basin of the Upper Santa Ana Valley Groundwater Basin on the south. The sub-basin is bound by impermeable rocks of the San Gabriel Mountains on the west and the San Bernardino Mountains on the east. The chief water-bearing material in the Cajon Sub-basin is alluvium. Holocene age alluvium consists of relatively unweathered sand, silt, and gravel deposited in active creek beds. Older Pleistocene age alluvium is found as alluvial fan deposits derived from the bordering mountains (DWR 2006).

The Upper Mojave River Valley Groundwater Basin underlies an elongated north-south valley, with the Mojave River flowing (occasionally) through the valley from the San Bernardino Mountains on the south, northward into the Middle Mojave River Valley Groundwater Basin at the town of Helendale. The groundwater basin is bounded on the north by a roughly east-west line from basement rock outcrops near Helendale to those in the Shadow Mountains. The southern boundary is the contact between Quaternary sedimentary deposits and unconsolidated basement rocks of the San Bernardino Mountains. The basin is bounded on the southeast by the Helendale fault and on the east by basement exposures of the mountains surrounding Apple Valley (DWR 2006). The two primary water-bearing units in the Mojave River Valley Basin system consist of regional Pliocene and younger alluvial fan deposits (fan unit) and of overlying Pleistocene and younger river channel and floodplain deposits, which have been called the floodplain unit, or the floodplain aquifer. Other potential, but not regionally significant, water-bearing units include older alluvium, old fan deposits, old lake and lakeshore deposits, and dune sand deposits. Water-bearing deposits in this basin are predominantly unconfined, though some perched water appears near Adelanto (DWR 2006).

The Project alignment is predominantly underlain by basin-fill alluvial aquifers and bedrock aquifers that are comprised of unconsolidated sand and gravel with varying amounts of silt and clay alluvial material and fractured bedrock, respectively. Aquifers in the two hydrogeologic provinces, particularly aquifers composed of unconsolidated alluvial materials, can be near to the surface in wetland areas, relatively porous, and have high hydraulic conductivities. These characteristics can make these aquifers susceptible to surface-based contamination (Planert and Williams 1995).

The Project alignment would cross the Santa Ana River Basin, which provides important water supply functions. The Santa Ana Basin provides two-thirds of the water supply needed for non-potable and potable public uses in the watershed (USGS 2013). Recharge to the basin is highly seasonal and comes primarily from runoff from the San Bernardino and San Gabriel Mountain Ranges, as well as from water imported from the Colorado River and Northern California sources for irrigation (USGS 2015).

The Proposed Project pipeline would not cross any USEPA-designated sole-source aquifers. Sole-source aquifers are groundwater basins that supply at least 50 percent of the drinking water in the area overlying the aquifer and have no alternative drinking water source(s) available that could physically, legally, and economically supply all drinking water needed.

California has implemented a wellhead protection program by implementing a Drinking Water Source Assessment and Protection Program (DWSAP) by requiring a DWSAP for each completed municipal well. No groundwater protection areas have been identified or designated.

3.3.2 Groundwater Depth

San Jacinto Groundwater Basin

The Proposed Project crosses one groundwater sub-basin within the San Jacinto Groundwater Basin (Eastern Municipal Water District, 2014) and includes the Perris North Sub-basin (see Exhibit 5). Water level data collected by various agencies as part of a Cooperative Well Measuring Program and compiled by Watermaster Support Services (2015) indicates the depth to groundwater beneath the Proposed Project alignment in the Perris North Sub-basin varies from 200 feet in the northern part of the Perris North Sub-basin to approximately 90 feet near the Proposed Project terminus in the San Jacinto Valley.

Upper Santa Ana Valley Groundwater Basin (USAVGWB)

The Proposed Project crosses four groundwater sub-basins within the USAVGWB and they include the Riverside-Arlington Sub-basin in the south through Reche Canyon, the Rialto-Colton Sub-basin in the southern part of the USAVGWB north of Reche Canyon, the Bunker Hill Sub-basin in the middle to north, and the Cajon Sub-basin in the Cajon Pass (see Exhibit 5). The San Bernardino Valley Water Conservation District (SBVWCD) indicated (SBVWCD, 2011) that groundwater levels within the Bunker Hill Sub-basin ranges from less than 53 feet to well over 400 feet in depth. It appears that the majority of the Proposed Project pipeline route will transect areas where the regional groundwater table is well over 100 feet in depth. However, as the pipeline traverses the Sub-basin margins (at the south end and in Reche Canyon and northwestern edge of the Bunker Hill Sub-basin) depth to groundwater could be less than 53 feet.

The Cajon Sub-basin underlies Cajon Valley and Lone Pine Canyon mostly in Cajon Pass (DWR, 2006). The chief water-bearing material alluvium consisting of unweathered sand, silt, and gravel deposited in the active creek beds, No information was available regarding depth to groundwater however the area is transected by the San Andreas fault zone and springs have been noted along the trace of the fault zone (DWR, 2006). Correspondingly, shallow groundwater may be encountered in some areas.

Upper Mojave River Valley Groundwater Basin

The Proposed Project crosses the southern portion of the Upper Mojave River Valley Groundwater Basin from near where I-15 exists the San Bernardino Mountains north to Adelanto (see Exhibit 5). Data published by Teague et al. (2014) indicates that the regional depth to groundwater varies from 800 feet near the junction of the I-15 and Highway 395 to approximately

200 feet in depth at the northern terminus of the Proposed Project pipeline near Adelanto, California.

Non-Designated Groundwater Basin Areas

The Proposed Project will traverse some non-designated groundwater basins where groundwater may be encountered at shallow depths. These areas include Reche Canyon (located between the San Jacinto Groundwater Basin and the Upper Santa Ana Valley Groundwater Basin) and areas adjacent to the Cajon Sub-basin. No information on depth to groundwater is currently available in these areas, however, it is expected that shallow groundwater may be encountered in selected areas depending on localized conditions.

3.3.3 Groundwater Quality

Groundwater quality varies among the sub-basins. All of these basins are generally influenced by shallow aquifer recharge sources, both from urban land use and precipitation runoff events from the mountain foothills. In the Santa Ana Basin, the USGS (Hamlin et al. 2002) sampled groundwater wells in the inland basin (west of the San Gabriel and San Bernardino Mountains). The water had higher concentrations of calcium and bicarbonate, and lower concentrations of chloride and sulfate than the coastal region. This calcium-bicarbonate composition reflects the higher quality of the recharge that originates from the San Gabriel and San Bernardino Mountains.

A number of industrial and municipal sites are characterized by federal, state, and local databases as having hazardous materials on site and/or having historic or recent discharge of potentially hazardous waste in the range of the Proposed Project alignment. Several of these sites have the potential to be sources of contamination to surface water and/or groundwater. This is discussed further in the Hazards and Hazardous Material Technical Study being prepared for the Proposed Project.

4.0 REGULATORY SETTING

4.1 FEDERAL

4.1.1 Water Pollution Control Act (Clean Water Act)

The Federal Water Pollution Control Act Amendments were enacted in 1972. As amended in 1977, this law became commonly known as the Clean Water Act (CWA). The Act established basic guidelines for regulating discharges of pollutants into “waters of the United States.” The CWA requires that States adopt water quality standards to protect public health; to enhance the quality of water resources; and to ensure implementation of the CWA.

- **Section 401.** Section 401 of the CWA requires an applicant for a federal permit (such as for the construction or operation of a facility that may result in the discharge of a pollutant) to obtain certification of those activities from the state in which the discharge originates. This process is known as the Water Quality Certification (WQC) for the Proposed Project. For projects in southeastern San Bernardino County, the Santa Ana RWQCB issues the Section 401 WQC. For projects in eastern Riverside County, the Colorado River RWQCB issues the Section 401 WQC.
- **Section 402.** Section 402 of the CWA established the National Pollution Discharge Elimination System (NPDES) to control water pollution by regulating point sources that discharge pollutants into “waters of the United States.” For the State of California, the USEPA has authorized the SWRCB permitting authority to implement the NPDES program. In general, the SWRCB issues two storm water NPDES general permits: one for

industrial discharges and one for construction activities. The Phase II Rule, which became final on December 8, 1999, expanded the existing NPDES program to address storm water discharges from construction sites that disturb land equal to or greater than one acre.

- **Section 404.** Section 404 of the CWA established a permitting program to regulate the discharge of dredged or filled material into "waters of the United States." The definition of "waters of the United States" includes wetlands adjacent to national waters. This permitting program is administered by the U.S., Army Corp of Engineers (USACE) and is enforced by the USEPA. The Biological Technical Report for the Proposed Project discusses in detail the USACE jurisdictional features impacted by Project implementation.
- **Section 303(d).** Under Section 303(d) of the CWA, the SWRCB is required to develop a list of water quality limited segments for jurisdictional "waters of the United States." The RWQCBs are responsible for establishing TMDLs and TMDL priority rankings as well as for developing action plans to improve water quality of waterbodies included on the 303(d) list. The most recent 303(d) List of Water Quality Limited Segments approved by the USEPA is from the 2010 Integrated Report. This document references the 2010 list. The list includes pollutants causing impairment to receiving waters or, in some cases, the condition leading to impairment. The 303(d) list status and receiving water impairments for major waterbodies crossed by the Project alignment are discussed in above.

4.1.2 Safe Drinking Water Act

Under the Safe Drinking Water Act (SDWA) [Public Law 93-523] of 1974, the USEPA regulates contaminants of concern to domestic water supply. Contaminants of concern relevant to domestic water supply are defined as those that pose a public health threat or that alter the aesthetic acceptability of the water. These types of contaminants are regulated by the USEPA primary and secondary Maximum Contaminant Levels (MCLs) that are applicable to treated water supplies delivered to the distribution system. MCLs and the process for setting these standards are reviewed triennially. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources: rivers, lakes, reservoirs, springs, and ground water wells. The SDWA authorizes three EPA ground water protection activities: the Underground Injection Control (UIC) regulatory program, the Sole Source Aquifer (SSA) designation program, and the Source Water Assessment and Protection (SWP) program, which includes Wellhead Protection. The Proposed Project does not involve underground injection, does not cross any designated SSA, and does not involve the construction and operation of a public water supply well, which would require a Drinking Water Source Assessment and Protection Program evaluation.

4.1.3 Executive Order 11988 "Floodplain Management" and the Federal Emergency Management Agency

Under Executive Order 11988 "Floodplain Management", the Federal Emergency Management Agency (FEMA) is responsible for managing floodplain areas. FEMA administers the National Flood Insurance Program to provide subsidized flood insurance to communities that comply with FEMA regulations limiting development in floodplains. FEMA issues Flood Insurance Rate Maps (FIRMs) that identify which land areas are subject to flooding. The design standard for flood protection is established by FEMA, with the minimum level of flood protection for new development determined to be the 1-in-100 annual exceedance probability (i.e., the 100-year flood event).

4.2 STATE

4.2.1 Porter-Cologne Water Quality Control Act

The Porter-Cologne Act of 1967 (*California Water Code,* Section 13000 et seq.) is directed primarily towards the control of water quality. The Porter-Cologne Act provides for protection of the quality of all "waters of the State" for use and enjoyment by the people of California. It further provides that all activities that may affect the quality of "waters of the State" shall be regulated to obtain the highest water quality that is reasonable, considering all demands being made and to be made on those waters. The Porter-Cologne Act also establishes provisions for a statewide program for the control of water quality, recognizing that "waters of the State" are increasingly influenced by interbasin water development projects and other statewide considerations, and that factors such as precipitation, topography, population, recreation, agriculture, industry, and economic development vary regionally in the state. The Porter-Cologne Act establishes the SWRCB and its nine RWQCBs as the principal state agencies responsible for control of water quality. As such, each regional board is required to formulate and adopt a Basin Plan, which designates beneficial uses and establishes water quality objectives to protect these beneficial uses. The Project alignment travels through areas under the jurisdiction of the Lahontan, Santa Ana, and Colorado River Basin RWQCBs. Beneficial uses and water quality objectives for these areas are established by the 1995 (as amended through 2015) Water Quality Control Plan for the Lahontan Region; the 1995 (as amended through 2011) Water Quality Control Plan for the Santa Ana River Basin; and the 1993 (as amended through 2006) Water Quality Control Plan for the Colorado River Basin-Region 7.

4.2.2 Construction General Storm Water Permit

Under Section 402 of the CWA, construction-related storm water discharges to surface waters are regulated through the NPDES program. The California SWRCB has been delegated the authority by the USEPA to oversee the NPDES program through the RWQCBs. Under this authority, the SWRCB has developed a general permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities Order No. 2012-0006-DWQ (Construction General Permit). Construction of the Proposed Project pipeline would disturb an area greater than one acre; therefore, the Proposed Project must receive coverage under the Construction General Permit. The Proposed Project area is under the jurisdiction of the Lahontan, Santa Ana, and Colorado River Basin RWQCBs. These three RWQCBs will therefore require notification of the Proposed Project's intention to carry out activities under the Construction General Permit. Operation under the Construction General Permit would require preparation of a Storm Water Pollution Prevention Plan (SWPPP).

4.2.3 Dewatering and Other Low Threat Discharges Permit

The RWQCBs have developed general permits and waste discharge requirements (WDRs) of dewatering water and other low threat discharges to surface waters (See Table 4). Under these permits, pollutant concentrations of dewatering discharge must not cause or threaten to cause pollution, contamination, or nuisance. Effluent limitations set forth by the permits include local and federal requirements pursuant to the CWA. To obtain coverage under these permits, a notice of intent would need to be submitted to the RWQCBs where discharges will be planned to occur, which may include Lahontan, Santa Ana, and Colorado River Basin RWQCBs.

TABLE 4
EXISTING ORDERS/PERMITS FOR LOW THREAT DISCHARGES BY REGION

Region	Order/NPDES No.	Title
Colorado*	R7-2009-0300/CAG997001	General Waste Discharge Requirements (WDRs) and General National Pollutant Discharge Elimination System (NPDES) Permit for Low Threat Discharges to Surface Waters within the Colorado River Basin Region
Lahontan	R6T-2014-0049/CAG996001	Waste Discharge Requirements and National Pollutant Discharge Elimination System General Permit for Limited Threat Discharges to Surface Waters
Santa Ana	R8-2015-0004/CAG998001	General Waste Discharge Requirements for Discharges to Surface Waters that pose an Insignificant (De Minimis) Threat to Water Quality
* The permit expired on November 18, 2014. However, it likely would still be in effect until the Board issues an updated permit.		

Potential constituents of concern (LRWQCB, 2014) include but are not limited to:

1. Construction Dewatering – sediments, turbidity, construction materials, and total petroleum hydrocarbons.

2. Hydrostatic testing of new pipelines – scale, corrosion products, total petroleum hydrocarbons, erosion products, residuals from pipe manufacturing and/or storage and transport.

The actual WDRs vary by order as well as the water body in which the discharge may occur.

4.2.4 California Fish and Game Code, Sections 1600–1603

Under this statute, the California Department of Fish and Wildlife (CDFW) must be notified in the event that the Proposed Project would conduct any activities that may:

- Substantially divert or obstruct the natural flow of any river, stream or lake;
- Substantially change or use any material from the bed, channel or bank of, any river, stream, or lake; and/or
- Deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream or lake.

Streams are defined under this statute as any body of water that flows at least periodically and supports fish or other aquatic life, including past and present support of riparian vegetation. Any project that would result in adverse impacts to rivers, streams, or lakes must obtain a Streambed Alternation Agreement from the CDFW. The Biological Technical Report for the Proposed Project discusses in detail the CDFW jurisdictional features impacted by Project implementation.

4.3 LOCAL

The Proposed Project pipeline would cross several regional and local water districts. Among the mandates of these entities is to ensure long-term public water supply through protection of surface water and groundwater resources. During implementation of the Proposed Project, these entities

would be coordinated with to ensure compliance with established groundwater management plans and, if necessary, to obtain permits for encroachment on water district easements.

4.3.1 County of Riverside

Riverside County Floodplain Management Ordinance 458

Riverside County is a participating community in the National Flood Insurance Program (NFEP) and is therefore required by FEMA to adopt a floodplain management ordinance in order to make the purchase of flood insurance available to citizens of the county. The intent of this ordinance is to ensure that any new construction and/or substantial improvement within a mapped floodplain is done in a manner that reduces damage to the public and property, as well as to discourage new development within floodways. The Riverside County Flood Control and Water Conservation District's (RCFCWCD's) Floodplain Management Section is responsible for implementing the County's Floodplain Management regulation and portions of the NFEP regulations.

Pursuant to Ordinance 458, Section 4 (Administration), unless it complies with all applicable requirements of the ordinance, no structure shall be constructed, located, or substantially improved; no land shall be graded, filled, or developed; and no permit or approval shall be granted. As relevant to the Proposed Project, per Section 6 (Construction Standards) of Ordinance 458, proposed developments within a mapped floodplain area must meet the following criteria: be designed or modified and adequately anchored to prevent flotation, collapse, or lateral movement of the structure; be constructed with materials resistant to flood damage; be constructed by methods and practices that minimize flood damages; and be constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

Riverside County Drainage Area Management Plan, Santa Ana Region (National Pollutant Discharge Elimination System Permit No. CAS 618003)

Discharges from the municipal separate sewer system (MS4) under the jurisdiction of the County of Riverside are covered under NPDES Permit No. CAS 618003. As part of this permit, the County of Riverside, together with co-permittees, submitted a Drainage Area Management Plan to the Santa Ana RWQCB. The Drainage Area Management Plan outlines programs and policies, including Best Management Practices (BMPs), aimed at achieving Water Quality Standards for Receiving Waters. The Drainage Area Management Plan contains policies and BMPs that apply to new developments that create 10,000 square feet or more of impervious surface collectively over the entire project site. These new developments are required to develop project-specific Water Quality Management Plans. The primary objective of the Water Quality Management Plan is to ensure that the land use approval process conducted by the co-permittees will minimize pollutant loads in urban runoff.

4.3.2 County of San Bernardino

San Bernardino County Flood Control District

The San Bernardino County Flood Control District (SBCFCD) was enacted under California State legislation in 1939. The District developed an extensive network of flood-control facilities, including dams, conservation basins, channels, and storm drains. These facilities are designed to intercept and convey flood flows through and away from major developed areas in the County. The SBCFCD's primary functions are flood protection on major streams, water conservation, and storm drain construction. If applicable, encroachment permits for flood-channel crossings or any work within the District's right-of-way will need to be obtained from the SBCFCD.

Areawide Urban Storm Water Runoff (National Pollutant Discharge Elimination System Permit No. CAS618036)

Together with co-permittees, San Bernardino County participates in an areawide urban storm water runoff management program covered under NDPES Permit No. CAS618036. This permit regulates the discharge of pollutants in urban runoff from non-agricultural human source from the MS4s under the jurisdiction or responsibility of the co-permittees. This permit requires that co-permittees ensure that all non-co-permittee construction sites that are greater than one acre file a Notice of Intent with the SWRCB for coverage under the State's Construction General Permit. Co-permittees must also ensure that the erosion and sediment control plans approved incorporate appropriate erosion and sediment control BMPs and that the runoff from new development projects do not cause a nuisance to adjoining or downstream properties in stream channels to the maximum extent practicable. The permit also outlines potential water quality impacts that should be considered as part of the California Environmental Quality Act (CEQA) evaluation. New developments that create 10,000 square feet or more of impervious surface collectively over the entire project site are required to develop project-specific Water Quality Management Plans. The Water Quality Management Plans must include BMPs for source control, pollution prevention, site design, Low Impact Design (LID) implementation (where feasible), structural treatment-control BMPs, and control measures for any listed pollutant to an impaired waterbody on the 303(d) list.

County of San Bernardino 2007 General Plan

In accordance with the *County of San Bernardino 2007 General Plan,* the potential impact of a project's construction on storm water runoff should be considered during CEQA review. This review should consider the potential for discharging storm water pollutants from areas of material storage, vehicle or equipment fueling or maintenance, waste handling, hazardous materials storage, and other outdoor work areas. The review should also consider the potential for the discharge of storm water to affect beneficial uses of receiving waters and/or change the flow velocity of storm water runoff volume so as to cause environmental harm or significant increases in erosion on the project site or surrounding areas.

5.0 SIGNIFICANCE CRITERIA

The Proposed Project is subject to both NEPA and CEQA compliance. There is no set criteria for evaluation of impacts under NEPA so the significance criteria used to evaluate impacts involving hydrology and water quality are based on criteria listed in Appendix G of the State CEQA Guidelines (14 CCR 15000 et seq.) and federal Executive Order 11988 entitled "Floodplain Management." A significant impact would occur if the project would:

a) Violate any water quality standards or waste discharge requirements.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted).

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.

e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.

f) Otherwise substantially degrade water quality.

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows.

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.

j) Expose people or structures to inundation by seiche, tsunami, or mudflow.

k) Conflict with Federal Executive Order 11988 regarding avoidance of adversely impacting floodplains wherever possible.

6.0 IMPACT ANALYSIS

As noted above, the Proposed Project is subject to both NEPA and CEQA compliance. The boxes in the chart below have been checked accordingly to characterize the level of significance for each CEQA criterion and compliance with federal Executive Order 11988. The rationale for the anticipated significance levels is provided below the chart in each of the corresponding sections. Where applicable, a discussion of impacts relative to NEPA is provided.

Would the project:	Potentially Significant Impact	Less Than Significant with Applicant Proposed Measures (APMs) Incorporated	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?	☐	☒	☐	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☒	☐	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☒	☐	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☒	☐	☐

Would the project:	Potentially Significant Impact	Less Than Significant with Applicant Proposed Measures (APMs) Incorporated	Less Than Significant Impact	No Impact
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
f) Otherwise substantially degrade water quality?	☐	☒	☐	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☒	☐
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☒	☐
k) Conflict with Federal Executive Order 11988 regarding avoidance of adversely impacting floodplains?	☐	☐	☒	☐

a) Would the project violate any water quality standards or waste discharge requirements?

Less than Significant Impact with Applicant Proposed Measures Incorporated. Construction activities for the Proposed Project that could potentially have adverse effects on water quality include excavation and trenching activities; cleanup and vegetation maintenance activities that utilize cleaners, solvents, pesticides, and/or herbicides (if improperly applied); grading activities associated with establishing access roads; trenching (or construction of trenchless crossings); unintentional release of drilling fluids; and discharge of dewatered groundwater or hydrostatic testing water. Due to the proximity of the Project alignment to waterbodies at certain points, construction could result in excess levels of sediment or other pollutants in storm water runoff from the construction sites. Because it would disturb an area greater than one acre, the Proposed Project would have to obtain coverage under the Construction General Permit issued by the RWQCBs with jurisdiction over the various Proposed Project areas. As a requirement of this permit, a Project-specific SWPPP would be developed for the Proposed Project. The SWPPP would outline measures that would be taken to either prevent pollutants and authorized non-storm water discharges from contaminating storm water or to reduce the pollutants to levels that do not exceed the numeric action levels established in the Construction General Permit or the water quality objectives of the applicable Basin Plan. BMPs that would be implemented as part of the SWPPP are identified below. Additionally, APM-HYDRO-1 would be implemented to minimize potential impacts related to water quality during construction.

A primary water quality concern is the release of excess sediment loads to receiving waterbodies, particularly if construction activities within or adjacent to surface waters and ephemeral washes

occur during rain events. Various construction techniques would be utilized when the Proposed Project pipeline is required to cross under riparian areas, including case boring, slick boring, and directional drilling. These techniques, which are outlined below, would be implemented in such a way as to minimize or prevent release of excess sediment or pollutants to waterbodies. Additionally, APM-HYDRO-2 would be implemented to reduce the potential of contamination by unintentional spills, refueling, storage, servicing, or maintenance of equipment within 100 feet of any waterbodies, wetlands, or other sensitive environmental areas.

Construction related discharges, including those from dewatering activities, could impact water quality if released directly into receiving waters. High volume, high velocity discharges have the potential to increase soil erosion and scour and therefore result in release of sediment into waterbodies. Erosion- and sediment-control measures would be implemented as outlined in APM-HYDRO-3 to address potential impacts related to erosion and scour resulting from dewatering activities.

Directional drilling may be used when construction of the Proposed Project pipeline requires crossing certain waterbodies and drainages. This technique is often chosen to minimize impacts to surface waterbodies. However, operation of directional drilling equipment could result in the accidental release of non-hazardous bentonite drilling fluid (i.e., a mixture of clay and water) to the ground surface through porous media or fractures (referred to as a “frac-out”). Typically, if drilling fluid finds its way to the ground surface, it would be contained (for example using sand bags or straw bales) and would be pumped into a tank or back to the drill site. After the bore is completed, any excess material would be removed from the site and either reused by the drilling contractor as backfill or disposed of at an appropriate facility. In cases where surface water is present, release of drilling fluid can cause short-term yet significant increases in surface water turbidity and impacts to aquatic organisms. This potentially significant impact to water quality would be mitigated to a less than significant level through implementation of APM-HYDRO-4.

Additionally, unintentional spills or releases of petroleum products used to fuel construction vehicles or equipment or other hazardous materials (such as those used during construction) could have an adverse impact on water quality. As such, fueling of vehicles or equipment that occurs within areas of the SBNF, shall be conducted according to the requirements of the SBNF. When construction activities occur near waterbodies and/or groundwater (outside of the SBNF), there is also the risk that hazardous materials could leak into surface water or shallow groundwater. All hazardous materials would be placed in containers, handled, transported, and disposed of in accordance with state and federal regulations. Additionally, implementation of the SWPPP would require the Construction Contractor to implement hazardous waste containment and management measures (e.g., drip pans under vehicles, installation of containment berms around refueling areas, proper labeling/packaging and transport of fuels/lubricants, and housekeeping measures). In addition to APM-HYDRO-2, additional APMs are provided by the Project Applicant in association with the Hazards and Hazardous Materials Assessment for the Proposed Project to address spill prevention and containment.

The Proposed Project could also result in the spread of contaminated water, particularly if construction activities take place in close proximity to known contaminated sites and if contaminated surface water and/or groundwater from these sites is encountered. Dewatering discharge may require testing if dewatering occurs in proximity to sites with known groundwater contamination. Implementation of APM-HYDRO-3 would reduce potential impacts related to contaminated groundwater from dewatering activities to a less than significant level.

Discharge of waters used for hydrostatic testing would also be required. If released directly into receiving waters, this discharge could alter chemical or biological properties of the water, thereby resulting in an adverse impact. Impacts are less likely if discharge is released to dry stream beds or dry ground surface where the water would have time to percolate and evaporate. Where

possible, water used for testing in one pipeline segment would be reused for the next section of pipe (e.g., dust control). Hydrostatic testing water would be discharged in accordance with applicable WDR and/or NPDES permits and federal, state, and local regulations and in a manner designed to minimize erosion and to conserve the use of potable water.

Operation and maintenance of the Proposed Project pipeline is not associated with the risk of release of sediment or pollutants to receiving waters. Storm water runoff from impervious surfaces that would be created at the existing compressor stations and pressure limiting stations have the potential to cause increased volume and velocity of storm water flows that could enhance erosion, scour, and downstream sediment transport; however, these effects would be highly localized and minor, as they would occur in arid settings characterized by episodic/ephemeral flows and would affect a negligible fraction of the watersheds. Additionally, BMPs outlined in the project-specific SWPPP would be implemented to contain storm water flows from these sites.

b) Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?

Less than Significant Impact with APMs Incorporated. There is the potential for groundwater to be encountered during trenching and excavation activities associated with Proposed Project construction. If necessary, groundwater would be pumped out and discharged in accordance with applicable local ordinances and Waste Discharge Requirements. The amount of groundwater discharged would have minimal effects on local aquifers because any effects would be temporary and localized in nature and the groundwater would most likely consist of perched groundwater or localized groundwater conditions. Operation and maintenance of the Proposed Project is not anticipated to require water from groundwater sources.

Erosion and sediment control during construction of the Proposed Project would require the use of water to stabilize soil and control dust. Hydrostatic testing of pipeline segments prior to operation would also require water from local sources. Approximately 290,000 gallons of water would be used per day during pipeline construction for dust control, grading operations, trench compaction, and equipment and street washing. Water would also be required to conduct hydrostatic testing of the pipeline prior to operation. Hydrostatic testing of the Adelanto to Moreno pipeline would require approximately 7,000,000 to 10,500,000 gallons of water. Total overall water use would be approximately 108,000,000 gallons. Although much of the water is anticipated to be obtained from municipal or surface water sources (e.g., hydrants and aqueducts) and reused when practicable, some groundwater may also be used, especially in locations where surface water sources are not available or feasible. Assuming that 10 percent of the total water used during construction would be obtained from groundwater sources, the Proposed Project would deplete local groundwater resources by up to 10.8 million gallons. Although this only represents a small fraction of local groundwater supplies, APM-HYDRO-5 would be implemented to reduce this potentially significant impact to a less than significant level.

c) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

Less than Significant with APMs Incorporated. Surface disturbances associated with pipeline construction could temporarily alter existing drainage patterns, particularly where open cut and waterbody crossings are necessary. In these areas, drainage courses would be returned to their original configuration, substrate would be replaced, and banks would be stabilized and re-vegetated as necessary; however, potentially significant short-term drainage-related impacts

would occur at these locations. As discussed in Section 3, jurisdictional waters permits would be obtained from the USACE (per Section 404 of the CWA), the RWQCB (per Section 401 of the CWA), and the CDFW Streambed Alteration Agreement (Section 1602 of the *California Fish and Game Code*). APMs have been included in the PEA and additional measures will be provided in the Biological Technical Report for the Proposed Project to reduce potentially significant impacts at waterbody crossings to a less than significant level.

Construction of the Proposed Project components at the compressor stations and pressure limiting stations would slightly increase the amount of impervious surfaces in the Proposed Project areas; however, the amount of new construction in these areas would be minor and would result in negligible expansions beyond the existing site boundaries. No drainage features would be impacted at these locations.

Operational conditions of the Proposed Project would consist of subsurface natural gas transmission via the pipeline, unstaffed operation of several aboveground appurtenant structures, and routine maintenance and repair activities. Operational activities would not alter drainage patterns in the Proposed Project area.

d) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

Less than Significant Impact with APMs Incorporated. Construction of the Proposed Project would not result in increased runoff, as there are no impervious surfaces associated with installation of the pipelines. During construction, there could be a minor alteration of drainage patterns due to the spoils adjacent to the trenches; however, due to the temporary nature of the areas being exposed, this is considered less than significant. The Project Applicant shall would ensure that the right-of-way would be restored upon completion of the Proposed Project.

At the Adelanto Compressor Station, a minor increase in impervious surfaces would occur as a result of the new compressor station turbines and appurtenant facilities; however, this increase would be minor and would not increase runoff from the otherwise unpaved site.

e) Would the project create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?

Less than Significant Impact. As discussed above, the Proposed Project is not anticipated to generate significant quantities of increased runoff. During construction, local drainage patterns would be altered in the vicinity of the various construction sites; however, no long-term impacts related to increased runoff are anticipated.

f) Would the project otherwise substantially degrade water quality?

Less than Significant Impact with APMs Incorporated. As discussed above, a number of APMs have been developed to address potentially significant impacts related to storm water quality, accidental spills during construction, dewatering, hydrostatic test water discharge, surface water contamination during directional boring, and alteration of drainage patterns during pipeline construction. Implementation of these measures and adherence to biological permitting requirements and revegetation measures would reduce water quality impacts associated with the Proposed Project to a less than significant level.

g) Would the project place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

No impact. The Proposed Project would not include the placement of housing within a 100-year flood hazard area. No impacts would occur.

h) Would the project place within a 100-year flood hazard area structures which would impede or redirect flood flows?

No impact. The Proposed Project would not result in the placement of any aboveground structures within a 100-year flood hazard area. No impacts would occur.

i) Would the project expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

Less than Significant Impact. The Proposed Project would not be located near existing levees or dams. As discussed above, the Proposed Project would not impede or redirect flood flows. Discharges of water used during construction and hydrostatic testing would not be of sufficient volume to cause flooding that could result in significant injury or death of people or loss of structures. As such, impacts would be less than significant.

j) Inundation by seiche, tsunami, or mudflow?

Less than Significant Impact. The Proposed Project would not be located in an area at risk of seiches or tsunamis. Because of the proximity to waterbodies and floodplains, construction equipment could be exposed to inundation in the event of the mudflow. However, safe work practices outlined by a project-specific Health and Safety Plan would require that workers leave the construction site if conditions appeared conducive to floods or mudflows. Impacts would be less than significant.

k) Conflict with Federal Executive Order 11988 regarding avoidance of adversely impacting floodplains wherever possible?

Less than Significant Impact with APMs Incorporated. The Proposed Project pipeline crosses the 100-year flood plains of the Santa Ana River and several smaller rivers and streams, including some that are tributary to the Santa Ana River. The 100-year floods are defined as the flood events that have a recurrence interval of 1 percent of being equaled or exceeded in any single year. Although the Proposed Project pipeline would be located within the 100-year flood zone, the pipeline would typically be buried at depths of 7 to 8 feet (or deeper where directional drilling would occur) and below the anticipated scour depths of the respective drainages. Therefore, impacts to floodplains have been avoided to the greatest extent practicable.

7.0 APPLICANT PROPOSED MEASURES

APM-HYDRO-1 **Construction Storm Water Pollution Prevention Plan.** Southern California Gas Company (SoCalGas) shall demonstrate compliance under California's General Permit for Storm Water Discharges Associated with Construction Activity by s by submitting a Notice of Intent SWRCB. A project-specific construction Storm Water Pollution Prevention Plan (SWPPP) will be prepared by SoCalGas. A copy of the current SWPPP shall be kept at the project site and be available for review on request. The SWPPP shall use SoCalGas Best

Management Practices (BMPs) which are standard practices for SoCalGas construction activities.

APM-HYDRO-2 **Equipment Maintenance and Refueling Near Sensitive Areas.** To reduce the potential of contamination by spills, no refueling, storage, servicing, or maintenance of equipment (including washdown activities) will be performed within 100 feet of any waterbodies, wetlands, or other sensitive environmental areas. Additionally, all refueling or servicing will be done with absorbent material or drip pans underneath equipment to contain spilled fuel or fluids. Any fluids drained from the machinery during servicing will be collected in leak-proof containers and taken to an appropriate disposal or recycling facility. If such activities result in spillage or accumulation of a product on the soil, the contaminated soil will be assessed and disposed of properly. Under no circumstances shall contaminated soils be added to a spoils pile.

APM-HYDRO-3 **Dewatering.** Prior to construction, SoCalGas will determine if an individual discharge permit is required for dewatering at any of the Proposed Project sites. SoCalGas will prepare a dewatering plan that will be implemented during dewatering activities. The plan may include information such as the location of tanks and pumps;; the anticipated discharge point; erosion control measures; and monitoring procedures to comply with permit conditions if required.

APM-HYDRO-4 **Frac-Out Contingency Plan.** SoCalGas will prepare Frac-Out Contingency Plan that will both reduce the potential for an accidental release of non-hazardous bentonite drilling fluid (i.e., a mixture of clay and water) to the ground surface through porous media or fractures (known as frac-out) to occur and minimize any negative impact should a frac-out occur during directional drilling activities. The plan will include specific measures for monitoring frac-out, for containing and removing drilling mud, and for notifying agency personnel.

APM-HYDRO-5 **Water Reuse Plan.** SoCalGas will develop a water reuse plan to minimize the use of potable water during hydrostatic testing of the newly constructed pipeline. Water will be reused during the testing process to the extent practicable or used as part of the construction water use that is anticipated for the project, for example, for dust control or soil compaction.

8.0 REFERENCES

Belitz, K., Dubrosvsky, N.M., Burow, K., Jurgens, B, and Johnson, T., 2003. Framework for a Ground-Water Quality Monitoring and Assessment Program for California. *U.S. Geological Survey Water-Resources Investigation Report 03-4166.* Reston, VA: USGS.

County of San Bernardino. 2007. *County of San Bernardino 2007 General Plan.* Prepared by URS Corporation. Last amended July 18, 2013. Accessed via http://cms.sbcounty.gov/lus/Planning/GeneralPlan.aspx.

California Department of Water Resources (DWR). 2006. Upper Santa Ana Valley Groundwater Basin (DWR 8-5), San Jacinto Groundwater Basin (DWR 8-5), and Upper Mojave River Groundwater Basin (DWR 6-42). *California's Groundwater Bulletin 118.* Sacramento, CA: DWR.

Colorado River Basin Regional Water Quality Control Board (CRBRWQCB). 1993 (as amended through 2006). *Colorado River Basin Water Quality Control Plan*. Palm Desert, CA: CRBRWQCB.

Eastern Municipal Water District. 2014. *West San Jacinto Groundwater Management Area – 2013 Annual Report*. May 2014.

Hamlin, S., K. Belitz, S. Kraja, and B. Dawson. 2002. *Ground-Water Quality in the Santa Ana Watershed, California: Overview and Data Summary, Water-Resources Investigations Report 02-4243.* Sacramento, CA: USGS, National Water Quality Assessment Program.

Lahontan Regional Water Quality Control Board (LRWQCB). 2014. Waste Discharge Requirements and National Pollutant Discharge Elimination System General Permit for Limited Threat Discharges to Surface Waters – Order No. R6T-2014-0049, NPDES Permit No. CAG996001.

———. 1995 (as amended through 2015). *Water Quality Control Plan for the Lahontan Region*. South Lake Tahoe, CA: LRWQCB.

Orange County Water District (OCWD). 2013. Santa Ana River Watershed. Fountain Valley, CA: OCWD. http://www.ocwd.com/Environment/SantaAnaRiverWatershed.aspx.

Perry, N., 2009. *The Changing Land of Many Hills: A History of Reche Canyon.* San Bernardino, CA: California State University, San Bernardino.

Planert, M and J. Williams. 1995. *Groundwater Atlas of the United States for California and Nevada* (USGS, Publication No. HA 730-B). Reston, VA: USGS. http://pubs.usgs.gov/ha/ha730/ch_b/index.html.

Riverside County Flood Control and Water Conservation District (RCFCWCD). 2014 (last amended). Ordinance No. 458 (as amended through 458.14): An Ordinance of the County of Riverside Regulating Special Flood Hazard Areas and Implementing the National Flood Insurance Program. Riverside, C: RCFCWCD. http://rcflood.org/downloads/Ordinance_458_14.pdf.

San Bernardino Valley Water Conservation District (SBVWCD). 2015. *2014-2015 Engineering Investigation of the Bunker Hill Basin*, March 2015.

———. 2011. *Engineering Investigation of the Bunker Hill Basin, 2010-2011*, March 2011.

Santa Ana Regional Water Quality Control Board (SARWQCB). 1995 (as amended through 2011). *Water Quality Control Plan, Santa Ana Basin.* Riverside, CA: SARWQCB.

Santa Ana Watershed Project Authority (SAWPA). 2012. *2011 Annual Report of Santa Ana River Water Quality, Final Report*. Riverside, CA: SAWPA.

State Water Resources Control Board (SWRCB). 2010 (April). 2010 Integrated Report (Clean Water Act Section 303(d) List/305(b) Report) – Statewide. http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml.

Teague, N.F., Stamos, C.L., House, S.F., and Clark, D.A. 2012. *Regional Water Table (2012) in the Mojave River and Morongo Groundwater Basins, Southwestern Mojave Desert, California*, Plate1. USGS Scientific Investigations Report 2014-5XXX.

United States Geological Survey (USGS). 2015 (May 8, page last modified). National Water Information System: Web Interface: USGS 11062000 Lytle C NR Fontana CA. Reston, VA: USGS. http://waterdata.usgs.gov/ca/nwis/dv?cb_00060=on&format=html&begin_date=1918-10-01&end_date=2008-10-23&site_no=11062000&referred_module=sw.

———. 2013 (January 15, last modified). Ground Water – Inland Santa Ana Basin Subunit. Reston, VA: USGS. http://ca.water.usgs.gov/user_projects/sana_nawqa/gw_inland_sus.html.

Water Master Support Services, 2015. *Cooperative Well Measuring Program covering the Upper Santa Ana River Watershed, the San Jacinto Watershed, and the Santa Margarita Watershed - Fall 2014*. January 2015. Prepared in cooperation with Western Municipal Water District and San Bernardino Water Conservation District.

Western Region Climate Center (WRCC). 2014a. Lytle Creek Range Stn, California (045218) Period of Record Monthly Climate Summary. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca5218.

———. 2014b. Palm Springs, California (046635) Period of Record Monthly Climate Summary. Accessed May 18, 2014. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?caplms+sca

———. 2014c. San Bernardino, California (047723) Period of Record Monthly Climate Summary. Accessed May 18, 2014. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7723

———. 2014d. Victorville, California (04325) Period of Record Monthly Climate Summary. Accessed May 18, 2014. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?cavict+sca.