Draft
Environmental Impact Report

Air Products Hydrogen Pipeline Project

City of Carson Project Case CUP 1089-18

State Clearinghouse No. SCH 2020059038

September 2020

Prepared by:

City of Carson

Community Development

701 East Carson Street

Carson, CA 90745

Prepared with the assistance of:

MRS Environmental, Inc.

1306 Santa Barbara Street

Santa Barbara, CA 93101

This Page Left Intentionally Blank

Table of Contents

List of Tables

List of Figures

List of Abbreviations and Acronyms

°F	Degrees Fahrenheit
AADT	Annual Average Daily Traffic
AB	Assembly Bill
ADT	Average Daily Traffic
AEP	Association of Environmental Professionals
AMM	Avoidance and Minimization Measure
ANSI	American National Standards Institute
API	American Petroleum Institute
ARC	American Carbon Registry
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATCM	CARB Airborne Toxic Control Measure
BACT	Best Available Control Technologies
bbl	Barrels (one barrel is 42 gallons)
bbls	Barrels
bbls/day	Barrels per day
BETX	Benzene, Ethylbenzene, Toluene, and Xylenes
BMP	Best Management Practices
BPD	Barrels Per Day
CAAA	Clean Air Act Amendments
CAAQS	California Ambient Air Quality Standards
CalARP	California Accidental Release Prevention Program
Caltrans	California Department of Transportation
CAP	Clean Air Plan
CAPCOA	California Air Pollution Control Officers Association
CAR	Climate Action Reserve
CARB	California Air Resources Board
CAS	Climate Action Strategy
CCA	California Coastal Act
CCAA	California Clean Air Act
CCC	California Coastal Commission
CCPS	Center for Chemical Process Safety
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CDTSC	California Department of Toxic Substances Control
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFC	California Fire Code
CFCs	Chlorofluorocarbons
CFR	Code of Federal Regulations
CH_4	Methane
CMP	Congestion Management Plan
CNDDB	California Natural Diversity Data Base
CNEL	Community Noise Equivalent Level
CNG	Compressed Natural Gas
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_{2e}	Carbon Dioxide Equivalent
CPUC	California Public Utilities Commission
CSFM	California State Fire Marshal

CVC	California Vehicle Code
CWA	Clean Water Act
dB	Decibel
dBA	A-Weighted Decibel
DPM	Diesel Particulate Matter
DPS	Distinct Population Segments
DTSC	Department of Toxic Substances Control
eGrid	Emissions & Generation Resource Integrated Database
EIA	U.S. EPA, Energy Information Administration
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
ERCs	Emission Reduction Credits
ERP	Emergency Response Plan
ERPG	Emergency Response Planning Guidelines
ESHA	Environmentally Sensitive Habitat Area
FERC	Federal Energy Regulatory Commission
FESA	Federal Endangered Species Act
FH	Flood Hazard
FHWA	Federal Highway Administration
GGRF	Greenhouse Gas Reduction Fund
GHG	Greenhouse Gases
gpm	Gallons per minute
GWP	Global Warming Potential
H_2S	Hydrogen Sulfide
HAP	Hazardous Air Pollutants
HARP	Hotspots Analysis and Reporting Program
HC	Hydrocarbons
HCFs	Hydrofluorocarbons
HCP	Habitat Conservation Plans
HHI	Health Hazard Index
HID	United Kingdom Health and Safety Executive Hazardous Installation Directorate
HMTA	Hazardous Materials Transportation Act
hr	Hour
HRA	Health Risk Analysis
hrs	Hours
IIPP	Injury and Illness Prevention Program
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standards
km	Kilometers
LACT	Lease Automatic Custody Transfer
lbs	Pounds
lbs/day	Pounds per day
LCFS	Low Carbon Fuel Standard
LDAR	Leak Detection and Repair
LOS	Level of Service
mmBTU	Million British Thermal Units
MMT	Million Metric Tons
mph	Miles Per Hour
MT/yr	Metric Tons Per Year
$MTCO_2E$	Metric Tons of Carbon Dioxide Equivalent
MW	Megawatts
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards

NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NGL	Natural Gas Liquids
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NOAA	National Oceanic and Atmospheric Administration Fisheries
NOP	Notice of Preparation
NO_X	Nitric Oxides
NPDES	National Pollutant Discharge Elimination System
NSPS	Federal New Source Performance Standards
O_3	Ozone
OPS	Office of Pipeline Safety
OSHA	Occupational Safety and Health Administration
PCE	Passenger Car Equivalent
PERP	CARB Portable Equipment Registration Program
PFCs	Perfluorocarbons
PHMSA	Pipeline and Hazardous Materials Safety Administration
PM	Particulate Matter
$PM_{2.5}$	Suspended Particulate Matter (aerodynamic diameter of $\leq$2.5 microns)
PM_{10}	Suspended Particulate Matter (aerodynamic diameter of $\leq$10 microns)
ppb	Parts per Billion
ppm	Parts Per Million
PRC	Public Resources Code
PSM	Process Safety Management
PTO	Permit to Operate
QRA	Quantitative Risk Assessment
RMP	Risk Management Plan
RPS	Renewable Portfolio Standard
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SF_6	Sulfur Hexafluoride
SIP	CARB State Implementation Plan
SO_2	Sulfur Dioxide
SPCC	Spill Prevention, Control and Countermeasure Plan
SWITRS	Statewide Integrated Traffic Records System
TAC	Toxic Air Contaminants
TIMS	Transportation Injury Mapping System
TPY	Tons Per Year
TQRA	Transportation Quantitative Risk Assessment
TT	Transportation Terminal
U.S. EPA	United States Environmental Protection Agency
UFC	Uniform Fire Code
UKHSE	United Kingdom Health and Safety Executive
USDOT	United States Department of Transportation
USFWS	United States Fish and Wildlife Service
UV	Ultraviolet
V/C	Volume to Capacity
VCS	Verified Carbon Standard
VERA	Voluntary Emission Reduction Agreements
VMT	Vehicle Miles Traveled

VOC	Volatile Organic Compounds
VRS	Vapor Recovery System
$\mu g/m^3$	Microgram Per Cubic Meter

This Page Left Intentionally Blank

Executive Summary

This Environmental Impact Report (EIR) has been prepared to address the environmental impacts associated with the proposed Air Products Hydrogen Pipeline Project. Air Products and Chemicals, Inc. (Air Products) ("the Applicant") proposes to utilize an existing 11.5-mile-long series of pipelines plus construct a new 0.5-mile pipeline segment to connect from the Air Products' existing hydrogen facility in the City of Carson to the World Energy Paramount Refinery (Paramount Refinery) in the City of Paramount, California. The existing 11.5-mile pipeline crosses the cities of Carson, Los Angeles, Long Beach, Lakewood, Bellflower, and Paramount in addition to an unincorporated part of the County of Los Angeles and land owned or controlled by the Port of Los Angeles and the Joint Ports Authority. The 0.5-mile of new pipeline would be located entirely within the City of Carson. Refer to Figure ES-1 for the Project Location.

The Air Products Carson Facility property is located on an 8.3-acre parcel zoned M-HD (Manufacturing, Heavy and Design Overlay) APN 7315-020-021, at 23300 Alameda Street in the City of Carson. Alameda Street runs along the western edge and East Sepulveda Boulevard runs along the southern edge of the proposed Project site. The proposed Project site is bounded on the eastern side by the Dominguez Channel, and a developed industrial area is situated to the immediate north. The Los Angeles River is located approximately 1.36 miles to the east.

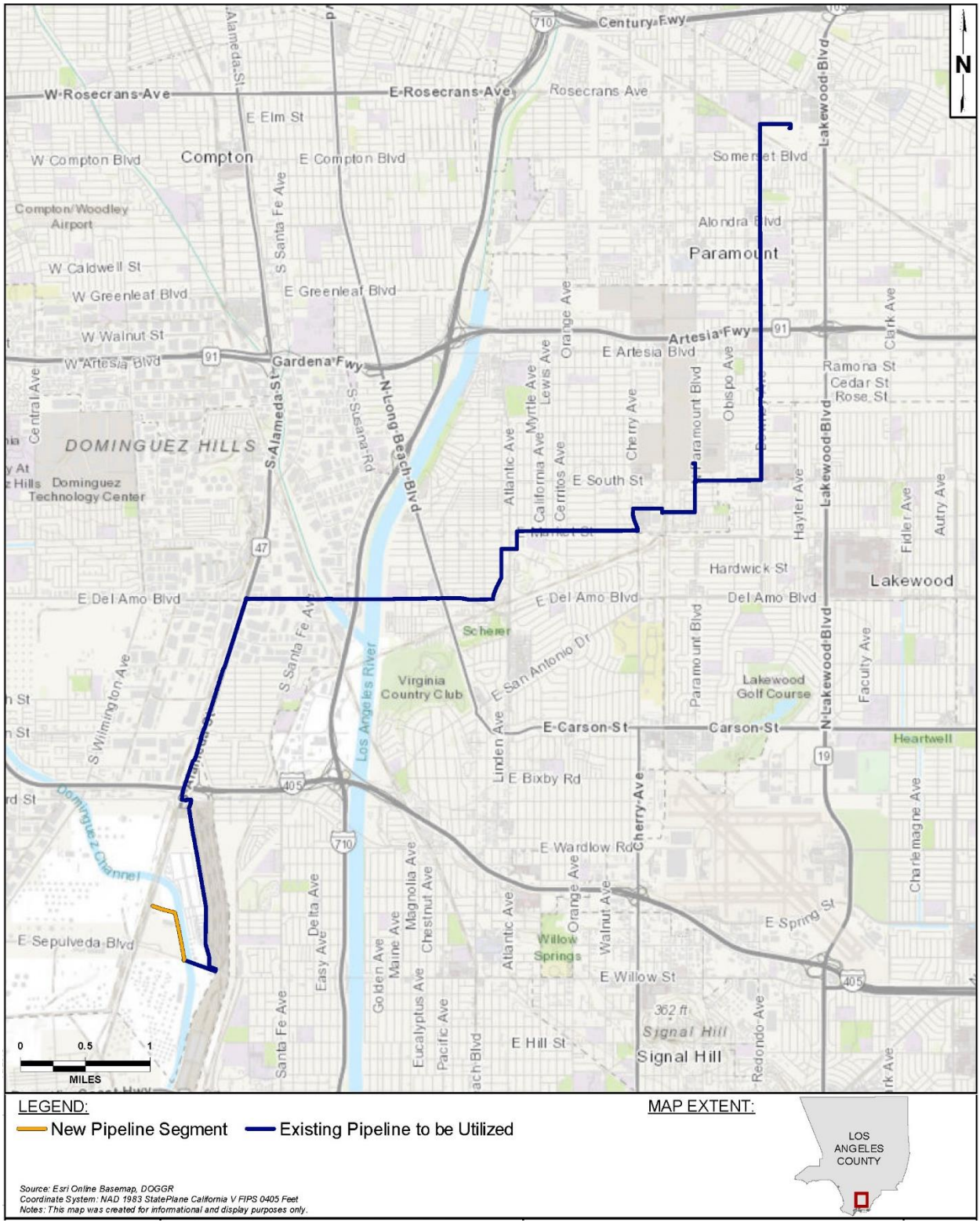
This EIR is an informational document that is being used by the general public and governmental agencies to review and evaluate the proposed Project. The reader should not rely exclusively on the Executive Summary as the sole basis for judgment of the proposed Project. Specifically, the EIR should be consulted for information about the environmental effects associated with the proposed Project and potential mitigation measures to address or minimize those effects.

The remainder of the Executive Summary consists of the following sections:

- An introduction, which discusses the regulatory oversight in the preparation of the EIR and public scoping process, and agency use of the EIR.
- A brief description of the proposed Project.
- A brief description of the Alternatives evaluated in detail in the EIR.
- A discussion of the environmental setting.
- A summary of key impacts of the proposed Project, alternatives, and cumulative development.
- A discussion of the Environmentally Superior Alternative.

Tables ES-1 through ES-4, located at the end of the Executive Summary, summarizes the impacts and mitigation measures for the proposed Project and provides a summary of the key cumulative impacts. The impacts and mitigation measures for the proposed Project are discussed in detail in Section 4.0 of the EIR.

Figure ES-1 Project Location



Source: Padre Associates Application

ES.1 Introduction

The purpose of the Executive Summary is to provide the reader with a brief overview of the proposed Project, the anticipated environmental effects, and the potential mitigation measures that could reduce the severity of the identified impacts. The reader should not, however, rely exclusively on the Executive Summary as the sole basis for judgment of the proposed Project.

Air Products and Chemicals Inc. filed an application with the City of Carson for a Conditional Use Permit for the proposed Project. The City of Carson, as Lead Agency under the California Environmental Quality Act (CEQA), determined that an EIR would be required as part of the permitting process for the proposed Project. The City's decision to prepare an EIR is documented in an Initial Study included in Appendix D of this EIR. The Initial Study, which consists of a checklist of possible effects on a range of environmental topics, found that the Project may have significant environmental impacts related to hazards and risk, and that a detailed analysis of an EIR is needed to further assess potential effects. The Initial Study defined the preliminary scope of the EIR's analysis, suggesting that risk would be the main topic to be addressed as having potentially significant and unavoidable impacts. While risk is the main topic of focus in this EIR, other issue areas are included in the body of the document as appropriate.

On May 21, 2020, the City, as the Lead Agency, issued a Notice of Preparation (NOP) to inform the general public and agencies that an EIR would be prepared for the proposed Project and to solicit comments on environmental issues to be addressed in the document. The public scoping comment period closed on July 21, 2020. Comments received in response to the NOP were used to further refine the scope of the analysis and the technical studies in this EIR. Written comments received in response to the NOP are provided in Appendix D with an indication of specific EIR sections where topics related to individual comments are addressed.

In addition to the City, there are a number of jurisdictions that would issue permits for this Project and would necessitate this EIR, once certified, for their actions. Table 1.2 in Section 1.0, Introduction, provides a listing of jurisdictions and their proposed actions. The City, as the CEQA lead agency, will act first on the proposed Project before any of the responsible agencies act on the Project. City decision-makers (Planning Commission and City Council) will use the EIR for decision-making regarding the proposed Project. If the proposed Project is approved by all required permitting agencies, the City would be responsible for reviewing and approving all pre-construction compliance plans and ensuring that the proposed Project modifications and operations are conducted in accordance with the permit conditions.

This DEIR is being circulated for public review for a period of 45 days as required by CEQA. Public agencies and members of the public are invited to provide written comments on the DEIR. The DEIR is available on the City of Carson's website at:
http://ci.carson.ca.us/CommunityDevelopment/HydrogenGas.aspx

All comments on the DEIR must be received no later than October 19, 2020, and should be directed to:

Max Castillo
Assistant Planner, City of Carson, Community Development Department, 701 East Carson Street, Carson, CA 90745
Office: (310) 952-1700 x1317
Mcastillo@carson.ca.us

ES.2 Description of Proposed Project

This section of the Executive Summary provides a brief description of the proposed Project. A complete description is provided in Section 2.0, Project Description, of this EIR.

The Carson to Paramount Hydrogen Gas Pipeline Project (proposed Project) would be constructed and operated by Air Products. The proposed Project would use local union labor, including ARB, Inc., to construct 0.5 miles of new pipeline within the City of Carson and connect this newly constructed segment with 11.5 miles of existing pipeline. The proposed Project would expand Air Products' existing pipeline network and provide a means of hydrogen distribution from its existing hydrogen production facilities located in Wilmington and Carson to its customers. Air Products proposes to utilize this pipeline route to connect Air Products with a new customer in the City of Paramount to support renewable bio-fuel production. Two new pipe connections would be required to connect segments of existing pipelines together along the 11.5-mile length. Air Products would also remove or replace existing manual valves and add an automatic shut-off valve (ASV) at one location along the pipeline route.

The proposed Project would eliminate the need for five to seven tanker trucks per day that currently deliver hydrogen to the Paramount Refinery to produce approximately 3,500 barrels of diesel and jet fuel per day from beef tallow and vegetable oils. The proposed Project would employ approximately 60 contractors for construction (local union workers when feasible), one new full-time job, and would increase City of Carson revenue (utility taxes, franchise fees, etc.).

The proposed Project route would initiate in the City of Carson and terminate in the City of Paramount. The Project route would traverse small portions of the City of Los Angeles and County of Los Angeles, as well as portions of the cities of Long Beach, Lakewood, and Bellflower. The site of the proposed Project is located within an area of industrial, commercial, and residential land uses. The proposed Project alignment is predominantly within an existing pipeline corridor, and the Project area is generally level and has been modified by urban development.

World Energy uses hydrogen to produce renewable biofuels (diesel and jet) for the transportation market at the Paramount Refinery. The Renewable Fuels Project approved in 2014 by the City of Paramount allowed the facility to convert up to 3,500 barrels per day of non-edible vegetable oils and beef tallow into renewable fuels, including aviation (jet), diesel, naphtha (gasoline), and fuel gas. World Energy uses hydrogen to produce "clean fuels." Hydrogen is used to reduce the level of sulfur and other undesired pollutants in various types of transportation fuels such as gasoline and diesel fuel. The pipeline network would increase the overall reliability of the hydrogen supply, thereby allowing the refinery to maximize production of clean fuels.

ES.3 Objectives of the Proposed Project

Pursuant to Section 15124(b) of the CEQA Guidelines, the description of the proposed Project is to contain "a clearly written statement of objectives" that would aid the lead agency in developing a reasonable range of alternatives to evaluate in the EIR and would aid decision makers in preparing findings and, if necessary, a statement of overriding considerations. The City of Carson is the lead CEQA agency responsible for preparing the EIR. The City of Carson decision-makers will consider the EIR for certification and the proposed Project for approval.

In addition, CEQA requires that the objective include the "underlying purpose of the project" and not narrowly craft the project objectives and thereby fail to reflect the fundamental purpose of the project.

The underlying purpose of the Project is to supply the Paramount Refinery with hydrogen.

The proposed Project objectives, as provided by the Applicant, are summarized as follows:

Air Products is requesting a Conditional Use Permit from the City of Carson to allow for the construction and operation of a hydrogen pipeline between Air Product's existing Carson Hydrogen Plant and the Paramount Refinery to facilitate the production of alternative fuels for use in Southern California.

The proposed Project objectives are summarized as follows:

- Extend the existing Air Products pipeline network to the Paramount Refinery to service an additional customer, World Energy, with hydrogen, and reduce truck trips by five to seven tanker trucks each day;
- Convert existing petroleum pipelines for 11.5-miles of the proposed route to hydrogen service which will reduce construction-related disruption to area residents and motorists;
- For construction-related activities utilize local union contractors where appropriate;
- Provide for the safe flow of up to seven million standard cubic feet per day (7 mmscfd) through the pipeline; and
- Support production of renewable bio-fuels production in Southern California.

ES.4 Description of Alternatives

Alternatives to the proposed Project were developed per CEQA Guidelines Section 15126.6.

Section 5.0, Environmental Analysis and Comparison of Alternatives, provides a complete description of all alternatives considered, including explanation for rejecting potential alternatives for further analysis. The following are the alternatives evaluated.

ES.4.1 No Project Alternative

Under the No Project Alternative, the Paramount Refinery would continue to receive liquified hydrogen by tanker truck, with associated hazards of hauling a flammable liquid on public roadways, as well as increased highway and local traffic. The existing pipelines, that are proposed under this proposed Project to be repurposed for hydrogen, could be used for the transport of crude oil or other materials, or would remain empty.

CEQA requires that the No Project Alternative be evaluated along with its impacts as part of the EIR (CEQA Guidelines Section 15126.6(e) (1)). The proposed Project objectives would not be met under the No Project Alternative.

ES.4.2 New Pipeline Alternative

This alternative would involve the construction of a new pipeline between portions of the Carson and Paramount route to transport hydrogen gas. The new pipeline segments would most likely follow city streets along a route determined by various factors such as land use availability, franchise agreement availability, construction limitations, and other issues including population density. However, there are no continuous areas of industrial land use between Carson and Paramount and review of the land use zoning for each local jurisdiction within two miles of the proposed pipeline route shows that there are large areas of residential land use between the two pipeline endpoints. The Figure 4.4-1 in Section 4.4, Land Use, shows the land use zoning for each local jurisdiction within two miles of the proposed pipeline route,

showing that there are large areas of residential land use between the two endpoints. Therefore, any new pipeline construction would occur within and adjacent to residential and public facility/school land uses similar to the proposed Project existing pipeline route.

There are potential routes that could utilize existing rights-of-ways (ROW) that could potentially reduce the population densities along the pipeline route (yet still passing through residential areas) and be able to access the Paramount Refinery. Possible routes would include the following:

- Los Angeles River and Powerlines ROW:
    - Utilization of the existing and proposed pipeline route from the Carson AP Plant to the Los Angeles River and Del Amo Blvd, and
    - Then install a new pipeline installed north along the Los Angeles River to just south of the 105 Freeway;
    - Install a new pipeline along the existing railroad/powerline corridor to the Paramount Refinery location.
- Los Angeles River, Residential and Powerline ROW
    - Utilization of the existing and proposed pipeline route from the Carson AP Plant to the Los Angeles River and Del Amo Blvd, and
    - Then install a new pipeline north along the Los Angeles River to just north of the 91 Freeway;
    - Install new pipeline east along the open ROW to the So Cal Edison Orange Street Station;
    - Install a new pipeline north along the open ROW north of the So Cal Edison Orange Street Station to just south of the 105 Freeway;
    - Install a new pipeline along the existing railroad/powerline corridor to the Paramount Refinery location.

Route lengths would include about 6.8 miles of new pipeline in addition to the new pipeline proposed as part of the proposed Project along with the existing pipelines from Carson to the Los Angeles River tie-in location. Construction activities for a new pipeline would include trenching within city streets or within ROWs with heavy equipment, which would require street closures, and potential utility service and traffic disruption either during day-time periods when traffic is heaviest, or during the night-time which would likely result in noise impacts to adjacent residential areas.

The use of a new pipeline could potentially reduce the severity of the significant risk impacts, however, this alternative has a number of speculative elements, including ROW acquisition and permitting.

ES.4.3 Pipeline Modifications Alternative

This alternative would involve the modification of multiple sections of the existing pipeline to allow for in-line inspection (smart-pigging) of portions of the pipeline to help ensure pipeline integrity. The existing pipeline proposed for the Project contains numerous bends and turns and such corners prevent the use of in-line inspections tools because the length of the tool requires straight sections of pipeline and requires that any turns in a pipeline to be gradual enough to allow the tool to pass through. As a result, this alternative would involve replacing certain sections of the existing pipeline, where feasible, to remove sharp bends and turns. Certain sections of the pipeline would be excavated, or “potholed”, to determine

areas of pipeline that could be replaced with straighter sections and/or sections with less sharp turns. The section or sections of modified pipeline could then be inspected with an in-line tool or smart pig. Smart pig inspections can provide data on pipeline thickness, corrosion, and other pipeline irregularities.

Because the pipeline is composed of multiple segments of different sizes, this alternative would only address the section of the pipeline that is 12-inches in diameter, and only that portion of the pipeline system would benefit from in-line testing. Inline inspection can only be conducted on pipeline segments of the same diameter. This section of the pipeline also runs closest to a number of schools and high-density residential populations. A pig launcher would be placed at the Tesoro East Hynes facility where the 12-inch pipeline begins and a pig catcher would be placed at the Paramount Refinery.

Pipeline modifications would involve the construction associated with modifications to portions of the pipeline along the existing 12-inch pipeline route as well as the installation of the new portion of the pipeline as under the proposed Project. An estimated 12 locations along the 12-inch section of pipeline between the existing Line 1150 from North Paramount to the Paramount Refinery are potential segment locations for pipeline modifications to allow for the use of an in-line inspection tool. Up to 12 locations along this segment of pipeline would require excavation within public streets to accomplish the necessary pipeline modifications.

This alternative may provide for reductions in risk and would not substantially increase impacts to air quality, and would meet the underlying purpose and objectives of the proposed Project by utilizing the current pipeline to transport hydrogen to the Paramount Refinery.

ES.4.4 Truck Transport from the Air Products Carson Facility Alternative

The truck transportation alternative would involve trucking of gaseous hydrogen from the Air Products Carson Facility to the Paramount Refinery. The Air Products Carson Facility does not currently produce hydrogen in liquid form; therefore, the hydrogen would be transported by trucks in gaseous form with tube trailers. The transportation distance would be similar to the proposed Project pipeline, approximately 11.5 miles. There are several potential routes that could be used by the truck from Carson to the Paramount Refinery; however, the most likely route would travel main roads and the 405, 710 and 105 freeways as follows:

- From Air Products Facility in Carson California north on Alameda St. to the 405 Freeway;
- 405 Freeway east to the 710 Freeway;
- North on the 710 Freeway to the 105 Freeway;
- East on the 105 Freeway to Lakewood Blvd.; and
- South on Lakewood Blvd. to the Paramount Refinery.

Approximately 35 trucks deliveries per day would be required to deliver 7 MMSCFD hydrogen with tube trailer trucks that can carry hydrogen at 7,500 pounds per square inch (psig). The trucking route is shown in Figure 5.4, a typical tube trailer is provided in Figure 5.5.

This alternative could reduce construction related impacts and would meet the proposed Project's underlying purpose of providing hydrogen from the Air Products Carson Facility to the Paramount Refinery.

ES.4.5 Hydrogen Generation Unit Alternative

Under this alternative current trucking of the liquified hydrogen to the Paramount Refinery would be replaced with onsite generation of hydrogen at the Paramount Refinery. This would involve the installation of a hydrogen plant at the Paramount Refinery location. There currently exists at the Paramount Refinery three 18,000-gallon hydrogen tanks, liquid hydrogen truck unloading facilities and associated piping to supply the existing 3,500 bpd renewable fuels pilot plant.

According to their websites, both the Applicant, Air Products, and the specialty gas vendor Praxair, offer hydrogen generation plant installation services. Air Products currently operates over 100 hydrogen plants worldwide (Air Products 2020). Praxair indicates they can provide installation of a hydrogen generation plant in plant size ranging from 9,000 scfd to 135 MMscfd (Praxair 2020).

This alternative would involve the onsite generation of hydrogen at the Paramount Refinery. This could be achieved through either the installation of a small, 7 MMSCFD plant or utilizing the hydrogen generation unit (at up to 50 MMSCFD), proposed as part of the expansion of the World Energy Paramount Petroleum Renewable Fuels Project, and currently undergoing a separate CEQA review with the City of Paramount.

The permitting and construction of a hydrogen plant could take a substantial amount of time, as indicated in the World Energy Renewable Fuels Project expansion application, which states that construction could take two to three years from permit issuance. This alternative assumes that, once either the Renewable Fuels Project hydrogen generation unit is completed or, if that project does not move forward, a smaller plant is built to satisfy the needs of the existing facility at the Paramount Refinery, then transportation of hydrogen would not continue and hydrogen trucking or the hydrogen pipeline would no longer be utilized.

In discussions with Air Products about this alternative it was expressed that there is not enough plot space at the Paramount Refinery to build both a “small” plant for today’s use as well as the “large” plant for the future use that is proposed as part of the expansion of the World Energy Renewable Fuels Project that is currently undergoing permitting. Also, Air Products indicated that if it built the “large” plant now, it would be unable to reduce production of hydrogen low enough to produce only the “small” amount of hydrogen currently needed. Air Products also asserts that to provide a short-term hydrogen “skid” mounted facility would require nine skid mounted plants to satisfy the current plant hydrogen needs and that the Paramount Refinery site does not have the plot space available on-site for this number of skid units. “Skid” mounted units are easier and quicker to install than building an entire plant as the units are already constructed and just brought to the site and hooked up. They are limited in size, however, and Air Products indicates that utilizing a large number of skid units connected together to satisfy the current needs may produce operational complexities.

This alternative produces a substantial and quantifiable reduction in risk impacts due to the elimination of the need for long-term transportation of hydrogen by producing it onsite. This alternative may produce long term benefits in terms of reduced risk and meets the underlying purpose of the Project by supplying hydrogen to the Paramount Refinery.

ES.5 Current Operations

The Paramount Refinery in the City of Paramount currently receives hydrogen delivered by tanker truck from the Praxair Facility located in Ontario, CA. Approximately five to seven trucks per day deliver liquid hydrogen from a distance of 45 miles one-way from the Praxair facility to the Paramount Refinery.

The Paramount Refinery has been in the process of converting operations from oil refining to renewable fuels since 2013. The World Energy Paramount Facility Renewable Fuels Project was approved by the City of Paramount (CUP 757) in 2014 to convert up to 3,500 barrels per day of non-edible vegetable oils and high-quality technical beef tallow into renewable jet and diesel fuel. The proposed Project would supplant existing truck deliveries of liquified hydrogen to the Refinery with gaseous hydrogen delivered by pipeline.

ES.6 Impacts of Proposed Project, Alternatives, and Cumulative Development

In the Impact Summary Tables (ES-1 through ES-4) at the end of this Executive Summary and throughout the EIR, impacts of the proposed Project and alternatives have been classified using the categories Class I, II, III, and IV as described below.

- Class I – Significant unavoidable adverse impacts for which the decisionmaker must adopt a statement of Overriding Considerations: These are significant adverse impacts that cannot be effectively avoided or mitigated. No measures could be taken to avoid or reduce these adverse effects to insignificant or negligible levels. Even after application of feasible mitigation measures, the residual impact would be significant.
- Class II – Significant environmental impacts that can be feasibly mitigated or avoided for which the decision maker must adopt Findings and recommended mitigation measures: These impacts are potentially similar in significance to those of Class I but can be reduced or avoided by the implementation of feasible mitigation measures. After application of feasible mitigation measures, the residual impact would not be significant.
- Class III – Adverse impacts found not to be significant for which the decision maker does not have to adopt Findings under CEQA: These impacts do not meet or exceed the identified thresholds for significance. Generally, no mitigation measures are required for such impacts.
- Class IV – Impacts beneficial to the environment.

The term “significance” is used in these tables and throughout this EIR to characterize the magnitude of the projected impact. For the purposes of this EIR, a significant impact is a substantial or potentially substantial change to resources in the local Project area or the area adjacent to the Project in comparison to the threshold of significance established for the resource or issue area.

These thresholds of significance are discussed by issue area in Section 4.0 of the EIR. For each impact, the applicable project phase has been identified as shown below.

- **Construction:** Impacts associated with construction activities.
- **Operations:** Impacts due to the operation of the proposed Project.

The remainder of this section provides a brief discussion of the Class I and II impacts identified for the proposed Project, the alternatives and cumulative development. A detailed listing of the impacts associated with the proposed Project can be found in the Impact Summary Tables. Sections 4.1 through 4.7 provide a comprehensive discussion of possible impacts of the proposed Project and discussions of the impacts associated with the cumulative development. Section 5.0, Alternatives, provides an analysis of the impacts of each selected alternative, compares the impacts of each alternative relative to the proposed Project, and identifies the Environmentally Superior Alternative.

ES.6.1 Impacts Associated with the Proposed Project

Hazardous Materials/Risk of Upset. One significant and unavoidable (Class I) impact was identified for the proposed Project (see Table ES-1) associated with an upset condition and release of hazardous materials into the environment (HM.2). In order to define a "significant hazard" under CEQA related to upset conditions, this EIR utilizes a quantitative approach to estimating risk levels and compares these to the baseline risk levels and the acceptability levels defined in other jurisdiction CEQA thresholds. The City of Carson does not currently have thresholds related to risk of upset for projects utilizing hazardous materials.

Risk levels for pipelines are essentially a constant value independent of the volume of hydrogen passed through the pipeline, assuming that the pressure levels are constant. This is different than trucking, as in the baseline exiting operations, where the risk linearly increases with increasing hydrogen volume transported as more trucks are needed with higher hydrogen usage, thereby increasing truck mileage. Risk levels from a pipeline are driven by the volume of hydrogen located within the pipeline whereas the risks for trucking are driven by the number of truck trips. For very minimal hydrogen volumes, as a pipeline would still be required to be full of hydrogen, trucking generally produces lower risks. But at a certain point, an increasing number of truck trips associated with an increasing volume of hydrogen transported generates more risk than a pipeline. This Project, with the hydrogen pipeline compared to the trucking associated with the baseline, is close to that crossover point.

Impacts associated with the Project operating at a pressure of 260 psia are similar to, if not somewhat greater than, those presented by the baseline trucking operations as the FN (frequency versus consequence) curves for both activities lie in a similar band within the FN curves shown in Figure 4.3-4 in Section 4.3 of this EIR. Therefore, a reduction in risk levels over the baseline is not apparent. As risks would not be reduced from the baseline operations, the impacts in the event of an upset condition would be significant.

Mitigation measure HM-2a requires that the pipeline be operated at a maximum pressure at any point in the pipeline of 160 psig, that the operator maintains operating pressure information, and that information of pipeline maintenance be reported to the City. Mitigation Measure HM-2b requires that the pipeline be monitored on an annual basis for any issues that could indicate increased rates of the loss of pipeline integrity. Mitigation Measure HM-2c requires that the pipeline continue to be pressure tested at a Maximum Allowable Operating Pressure (MAOP) to test pressure ratio of at least 3.0 to ensure pipeline integrity. The testing shall be performed annually for the first three years; subsequent tests may be relaxed to once every three to five years as per PHMSA requirements. Even with implementation of mitigation, impacts of HM.2 still fall in a range very similar to the baseline operations but would remain within the unacceptable region of the FN curves; potential impacts to people and the environment would be significant and unavoidable (Class I).

The significant but mitigable (Class II) impacts (see Table ES-2) identified for the proposed Project are related to construction activities and routine operations, as summarized below.

Hazardous Materials/Risk of Upset. In preparation of the proposed Project the Applicant prepared a Phase I Environmental Site Assessment (ESA) *Phase I Environmental Site Assessment Proposed Carson to Paramount Hydrogen Gas Pipeline Project, Carson, Los Angeles County, CA,* Padre Associates Inc. November 2018. The report notes that petroleum hydrocarbon containing soils have been identified by the Applicant during past pipeline repair excavation projects within the proposed Project pipeline corridor (Impact HM.4). The Phase I ESA recommended that a Phase II Site Assessment be completed for all areas with the potential to encounter contaminated soils during construction activities (completed September

2019). The Site Assessments also identified lead contaminated soils in excess of California Title 22 thresholds along approximately 1,100 linear feet of the proposed new pipeline segment. Review of the California Department of Toxic Substances Control (DTSC) Envirostor data base also documents the potential for hydrocarbon contaminated soil at the Air Products 23320 South Alameda Street facility from historical industrial activities.

Mitigation Measure HM-4a requires that a Contaminated Materials Management Plan (CMMP) be prepared and implemented for the duration of construction activities at the Project site. With the implementation of this mitigation measure, any contaminated materials would be required to be handled appropriately by existing regulations including SCAQMD rules; therefore, potential impacts due to contaminated soils would be less than significant with mitigation (Class II).

Transportation and Circulation. Normal operation of the pipeline would not interfere or conflict with existing transit, roadway, bicycle, or pedestrian activities. Operational impacts resulting from the proposed Project would be minimal, temporary, and infrequent and associated with any needed maintenance and repairs. During construction, and on a short-term basis, the proposed Project would have the potential to disrupt normal traffic and circulation on roadways and bicycle or pedestrian activities. The two areas of aboveground construction for the proposed Project are zoned for industrial uses and operate at low traffic volumes and a high level of service under existing conditions. Where existing sidewalks or roadways would be temporarily obstructed by pipeline construction activities (Impact T.1), alternative pedestrian and vehicle access routes would be developed and marked accordingly consistent with the Traffic Control Handbook and traffic control minimization measures proposed as part of the Project.

Mitigation Measure T-1 requires that alternative vehicle and pedestrian access be established during the construction phase. With implementation of this mitigation measure, potential impacts to vehicle and pedestrian access would be less than significant with mitigation (Class II).

Normal operation of the pipeline would not result in any change to emergency access or emergency response. Pipeline construction has the potential for temporary traffic disruption and may require the use of alternate traffic routes (Impact T.4). The applicant proposed traffic control measures, use of visual traffic control including signs, traffic cones, and flaggers would direct motorists and emergency responders to those alternate routes.

Mitigation Measure T-4 requires that emergency response providers in the vicinity of construction sites be given advance notice of the construction schedule and locations, road closures, and possible alternate routes. With implementation of this mitigation measure, potential impacts to emergency access would be less than significant with mitigation (Class II).

Tribal Cultural Resources. The proposed Project is not expected to cause a substantial change in the significance of a historical, archaeological, or tribal cultural resource. A records search from the South Central Coastal Information Center of the California Historical Resources Information System (SCCIC-CHRIS) did not identify any historical or archaeological resources along the proposed 0.5-mile pipeline in the City of Carson. In addition, the Phase I Archaeological Survey did not identify any archaeological resources along the same 0.5-mile pipeline. However, the SCCIC-CHRIS records search did identify four archaeological sites are recorded within 0.25-mile of the Project site. One site, CA-LAN-2682, is a protohistoric habitation site and cemetery approximately 618 feet west of the western end of the Project site. All visible human remains were removed in 1998; however, future excavation may expose additional human remains in any direction from the known burials. Given the proximity to CA-LAN-2682 there is a

possibility that unknown buried resources of historical or archaeological resources could occur within the Project site (Impact TC.1 and TC.3).

Mitigation Measure TC-1a requires the Project Applicant retains and compensates for the services of a Tribal monitor/consultant who is both approved by the Gabrieleño Band of Mission Indians-Kizh Nation Tribal Government and is listed under the NAHC's Tribal Contact list for the area of the Project location. Mitigation Measure TC-1b provides the protocol to be followed in the event that construction activities result in the discovery of a tribal cultural or archaeological resource. With implementation of these mitigation measures, potential impacts to historical, archaeological, and tribal cultural resources would be less than significant with mitigation (Class II).

As noted above, four archaeological sites are recorded within 0.25-mile of the proposed Project site. The CA-LAN-2682 site is a protohistoric habitation site and cemetery approximately 618 feet west of the western end of the Project site. Given the proximity to CA-LAN-2682 there is a possibility that unknown buried human remains could occur within the Project site.

Mitigation Measure TC-2 provides the protocol to be followed in the event that human remains are discovered during construction activities. With implementation of these mitigation measures, potential impacts to historical, archaeological, and tribal cultural resources would be less than significant with mitigation (Class II).

ES.6.2 Impacts Associated with the Alternatives

As discussed in Section ES.4 several alternatives to the proposed Project were evaluated that had the potential to reduce significant impacts. The relative impacts of each of these alternatives to the proposed Project are summarized below.

No Project Alternative

With the No Project Alternative, no new environmental impacts would occur. However, there would continue to be potential risk impacts of the ongoing trucking of liquified hydrogen from Ontario to Paramount.

New Pipeline Alternative

Air Quality. A new pipeline would involve the construction of additional portions of pipeline through urban areas as well as the installation of the new portion of the pipeline as in the proposed Project. The peak day construction emissions would be similar to the proposed Project peak day construction emissions as similar equipment requirements would be utilized for this alternative. The proposed Project analysis demonstrated less than significant for regional and local emissions (See Section 4.1, Air Quality). As emissions associated with construction would be less than the SCAQMD construction regional thresholds, impacts would be less than significant for regional emissions.

For localized impacts, the construction emissions associated with the pipeline modifications would be located at different locations and, in some cases, in close proximity to residences and receptors. Emissions levels are estimated to be above the localized thresholds for a 1 acre site located within 25 meters of a receptor, as per the SCAQMD lookup tables. The majority of these particulate matter (PM10) emissions are associated with fugitive dust (58% of PM10). The only watering mitigation in the CalEEMod analysis for the proposed Project was limiting vehicle speeds to 15 mph and watering 2x per day (for a 55% reduction). Without additional dust mitigation or diesel engine mitigation, impacts could be significant.

Mitigation Measure AQ-Alt1 would require Tier 4 final engines on all equipment greater than 50 hp along areas of the northern sections. Mitigation Measure AQ-Alt2 would require that the watering of all disturbed areas at least 3x per day along areas of the northern section. For the section of new pipeline located near the Carson Facility, the distances to receptors are large enough that the mitigation measures are not required. Implementation of these mitigation measures would reduce air quality impacts for this alternative to less than significant (Class II).

Climate Change/Greenhouse Gas Emissions. GHG emissions would occur from the construction activities associated with this alternative. GHG emissions are estimated to be 2,876 MT CO2e associated with the construction activities based on scaling from the proposed Project installed new pipeline length. Operational emissions would be the same as the proposed Project. As operational emissions and construction emissions amortized along with operational electrical use, would be less than the emissions associated with baseline trucking by 57 MTCO2e, the addition of this alternatives construction GHG emissions would still be less than significant (Class III).

Hazardous Materials/Risk of Upset. Risk of upset impacts for a new pipeline follow the same analysis as described for the proposed Project, with different route and population densities and with more new sections of pipeline, thereby reducing somewhat the failure frequency. For Impact HM.2, as discussed in Section 4.3, Hazardous Materials and Risk of Upset, there is the potential for a significant hazard associated with an upset condition.

Impacts associated with the alternative new pipeline project are marginally below those presented by the baseline trucking operations. The new pipeline presents lower risk levels than the proposed Project as it could be routed through areas of lower density and would have a lower failure rate than the proposed Project pipelines. Average density along the alternative pipeline route would average about 7,200 persons per square mile whereas the density along the proposed Project pipeline route would average about 10,150. There would be a marginal reduction in risk levels over the baseline but would remain in the unacceptable portion of the FN curves. The impacts in the event of an upset condition would therefore be significant.

Mitigation measures HM-2a, HM-2b and HM-2c would all be applicable to this alternative. Even with implementation of these mitigation measures, impacts related to HM.2 would remain potentially significant (Class I).

Impacts related to HM.1 (routine use of hazardous materials), HM.3 (impacts near schools), HM.5 (airport land use plans), HM.6 (emergency response plans) and HM.7 (wildland fires) would have similar impacts as the proposed Project. See Section 4.3, Risk of Upset. Impact HM.4 (hazardous materials sites) would be similar to the proposed Project and mitigation measure HM-4a related to a construction management plan to ensure proper handling and identification of contaminated soils, would be applicable.

Land Use. Land use impacts would be the same as the proposed Project. The route associated with this alternative would continue to traverse the same areas as in the proposed Project route. Land use impacts are expected to be less than significant (Class III).

Transportation and Circulation. Transportation impacts related to construction could be substantially more than the proposed Project since they would require pipeline construction through city streets. Those impacts are considered to be temporary during pipeline construction and would require similar measures to prevent traffic impacts as proposed by the Applicant and mitigation measures T.1 and T.4; therefore, transportation impacts would be less than significant (Class III). No additional impacts are expected.

Tribal Cultural Resources. Construction activities would be similar to the proposed Project with a substantially higher level of construction activity needed to construct a new pipeline. Although additional excavation would be needed, these would occur in previously disturbed areas, within existing roads or ROWs and are unlikely to contain any unknown cultural resources. Nevertheless, mitigation measures required under the proposed Project would also be required for this alternative. With implementation of MMs TC-1a, TC-1b, and TC-2, this potential impact would be less than significant with mitigation (Class II)

Other Issue Areas. This alternative would have similar impacts as those from the proposed Project and it is not expected that any additional impacts would occur on any of the other issues areas as discussed in Section 4.7 for the proposed Project.

Pipeline Modifications Alternative

Air Quality. Pipeline modifications would involve the construction of additional portions of the pipeline along the existing pipeline route as well as the installation of the new portion of the pipeline. Emissions would be associated with construction equipment, including backhoes, welding machines, asphalt paving and some fugitive dust emissions. Emissions associated with construction would be less than the SCAQMD construction thresholds as discussed in Section 5.0 , and therefore, impacts would be less than significant.

For localized impacts, the construction emissions associated with the pipeline modifications would be located at 12 different locations and, in some cases, in close proximity to residences at receptors. Impacts are also determined to be less than significant.

Operational emissions of the pipeline with modifications would be the same as the proposed Project except for occasional pigging operations, which would emit a nominal amount of emissions on an operational basis particularly as hydrogen is not a criteria or toxic pollutant. Therefore, for construction and operations, impacts for this alternative would be less than significant (Class III).

Climate Change/Greenhouse Gas Emissions. GHG emissions would occur from the construction activities associated with this alternative. GHG emissions are estimated to be 25 MT CO2e associated with the construction activities at all 12 sites. Emissions from the proposed Project would be similar to the emissions from this alternative and would be less than significant (Class III).

Hazardous Materials/Risk of Upset. Impacts associated with risk of upset for the Pipeline Modifications Alternative would be similar to the proposed Project. The test pressures used for the pipeline historically have ranged over 900 psig, which is a ratio of operating pressure to test pressure of 3.5 to 5.6 times from operating the pipeline at 260 and 160 psig respectively. The recommended test pressure ratio is 1.50 as per ASA B31.8 Code. Therefore, the hydrostatic testing as historically conducted on the pipeline is well above that required. Therefore, due to the large operating pressure to test pressure ratio and resulting factor of safety associated with the ratio, the failure frequency related to the pipeline would not be substantially enhanced the pipeline modifications associated with this alternative. This assumes the implementation of mitigation measures HM-2a, HM-2b and HM-2c, which require operations of the pipeline at 160 psig and monitoring of the pipeline for hydrogen-related metallurgical issues and continued pressure testing at a higher than required levels and frequencies. Impacts associated with risk of upset would therefore be similar to the proposed Project.

Land Use. Land use impacts would be the same as the proposed Project. The route is not proposed to be changed under this alternative so the pipeline would continue to traverse the same areas as in the proposed Project route. Land use impacts would still be less than significant (Class III).

Transportation and Circulation. Transportation impacts related to construction would be greater than those of the proposed Project due to construction activities in 12 different in-street locations. Those impacts are considered to be temporary during the retrofitting of the pipeline and would require similar measures to prevent traffic impacts as proposed by the Applicant. As such, impacts would be less than significant. No additional long-term impacts are expected beyond those of the proposed Project.

Tribal Cultural Resources. Construction activities would be similar to the proposed Project with a similar number and level of construction activity needed to fix pipeline corners and bends. However, the locations of the excavations would be expanded to include those areas needed to be retrofitted. Although additional excavation would be needed, these would occur in previously disturbed areas, within existing roads and are unlikely to contain any cultural resources. Nevertheless, mitigation measures required under the proposed Project would also be required for this alternative. With implementation of MMs TC-1a, TC-1b, and TC-2, this potential impact would be less than significant with mitigation (Class II)

Other Issue Areas. This alternative would have similar impacts as those from the proposed project and it is not expected that any additional impacts would occur in any of the other issues areas as discussed in Section 4.7 for the proposed Project.

Truck Transportation from the Air Products Carson Facility Alternative

Air Quality. Emissions associated with this alternative would be those emissions associated with truck transportation of hydrogen. Emissions associated with operations of trucks would be below the SCAQMD thresholds for this alternative. Localized thresholds are not applicable to on road sources of emissions and are therefore not addressed. As discussed in Section 5.0, impacts of this alternative on air quality would therefore be less than significant (Class III).

Climate Change/Greenhouse Gas Emissions. GHG emissions from this alternative would be associated with truck transportation of hydrogen. Emissions of GHG are estimated to be 434 MT CO2e per year. GHG emissions would be less than the SCAQMD thresholds and would be less than significant (Class III).

Hazardous Materials/Risk of Upset. The Truck Transportation Alternative addresses potential releases and consequences of the truck transportation of gaseous hydrogen. The release scenarios associated with truck transportation of gaseous hydrogen involve a release from a hydrogen tube trailer truck involved in an accident or an equipment malfunction. Impacts for this alternative would be similar or greater than those presented for the baseline or the proposed Project as the potential for explosions increases the potential number of persons impacted.

Due to the lower release frequency of larger sized spills, the risks of gaseous hydrogen trucking would be similar to the pipeline or liquid hydrogen trucking risks in the lower end of the FN curve. However, due to the higher potential for explosions due to the high-pressure gas, the risks of producing larger impact scenarios increases the risks of gaseous hydrogen trucking and the risks would be significant (Class I) and greater than the baseline or proposed Project operations.

Land Use. Truck transportation of all types of cargo occurs throughout the Los Angeles basin and it is contemplated in various land use plans and ordinances. Under this alternative, there would be no additional land use impacts similar to the proposed Project and potential impacts would still be less than significant (Class III).

Transportation and Circulation. This alternative would involve truck transportation from Carson to Paramount of 35 truck trips per day as opposed to the baseline number of an average of six trucks per day. An increase of 29 trucks per day on the Los Angeles roads and highways would not be significant,

with peak hour traffic involving generally only a single truck. Therefore, transportation and traffic impacts would be less than significant.

Tribal Cultural Resources. This alternative would not include any construction that could result in impacts to tribal cultural resources, and as such no additional mitigation would be needed. This alternative would have impacts that are less than significant to cultural and tribal resources (Class III).

Other Issue Areas. Other issue areas were found to have less than significant impacts for this alternative since there would be no new construction, and no effects are expected to aesthetics, agricultural resources, biological resources, geology, noise, population and housing, public services, recreation, and water resources.

Hydrogen Generation Unit Alternative

Air Quality. Hydrogen generation at the Paramount Refinery site would not produce additional operational emissions as the hydrogen would not be required to be produced at any other location and therefore the emissions associated with hydrogen production would be offset by reduced production elsewhere. As discussed in Section 4.1, Air Quality, worst case estimated emissions from operating a hydrogen plant at the Paramount Refinery would produce similar emissions, but at a different location. Localized emissions would occur at a distance from receptors but could still produce localized impacts. Based on previous analysis for the Carson Plant, regional and localized emissions would be less than significant.

Construction of a hydrogen plant at the Paramount Refinery would involve the use of construction equipment and deliveries of materials. The Air Products Carson Facility provides an upper estimate of the construction requirements associated with building a hydrogen plant and this project was examined in an EIR (City of Carson, June 1998, SCH97071078). As per the Carson Hydrogen Plant EIR, impacts from construction emissions would be above the SCAQMD regional thresholds. Although the Carson Facility is a substantially larger facility than would be required to supply hydrogen to the Paramount Refinery, peak day emissions would be similar as a worst-case and construction impacts could be potentially significant (Class I).

Note that the cumulative project, the expansion of the World Energy Renewable Fuels Project at the Paramount Refinery, is currently proposed and that construction of a hydrogen generation unit at the Paramount Refinery may already occur, which would involve a similar level of construction emissions.

Climate Change/Greenhouse Gas Emissions. Similar to air quality impacts above, for GHG emissions, hydrogen generation at the Paramount Refinery site would not produce additional GHG emissions as the hydrogen would not be required to be produced at any other location. Also, as the hydrogen used by the Paramount Refinery would be gaseous hydrogen, this alternative would produce fewer GHG emissions per unit of hydrogen than the baseline operations because less energy would be needed than is required to liquify the hydrogen and to transport the hydrogen. However, worst-case operations of a hydrogen plant would exceed the SCAQMD thresholds. As most of these emissions would be covered by the Cap-and-Trade program, GHG emissions increases would be less than significant.

Construction of the plant would take at most a year based on the Carson Plant EIR, with GHG emissions estimated to be less than 2,000 tons of CO2e, based on the equipment list from the 1998 EIR and an estimated year of construction. Construction emissions would be below the SCAQMD thresholds and, in combination with operational emissions, GHG impacts of this alternative would be less than significant (Class III).

Hazardous Materials/Risk of Upset. The risks associated with operating a hydrogen generation unit would involve the scenarios of leaks or ruptures of hydrogen from tanks and/or processing equipment. Studies associated with the impact zones from releases were performed by Quest for the proposed expansion of the Paramount Refinery Renewable Fuel Project, currently undergoing CEQA review. Impacts zones associated with the hydrogen facility were estimated to extend 415 feet for explosions and 414 feet for vapor cloud fires. The closest residences are located more than 500 feet from the proposed hydrogen facility location at the Paramount Refinery, with a plant nursey located within 430 feet of the hydrogen plant location. Therefore, risks would be minimal associated with the new hydrogen generation plant as impact zones would not extend to residential areas and would only affect low-density locations and no roadways.

In addition, the Paramount Refinery renewable fuel project currently at the Paramount Refinery has three hydrogen tanks, a truck unloading facility and associated piping. A hydrogen generation plant would not introduce greater risks than the current risks located at the Paramount Refinery related to hydrogen. Therefore, the risks of installation and operation of a hydrogen generation plant at the Paramount Refinery would be less than significant (Class III).

Land Use. This alternative would include construction and subsequent operation of a hydrogen plant within an existing facility zoned for such a use and with ongoing industrial uses. No land use impacts are expected for this alternative. Land use impacts would still be less than significant (Class III).

Transportation and Circulation. This alternative would incur more impacts that the proposed Project since it would require transporting materials and construction equipment and construction workers to the site. With the applicant proposed Avoidance and Minimization Measures (AMMs) to minimize traffic issues, impacts would be less than significant with mitigation (Class II).

Tribal Cultural Resources. This alternative would incur into similar cultural impacts as the proposed Project since it would require construction of a new hydrogen plant within the existing Paramount Refinery which would have minimal impacts since it is a previously disturbed and an industrially developed site. However, mitigation measures required under the proposed Project would also be required for this alternative. With implementation of MMs TC-1a, TC-1b, and TC-2, this potential impact would be less than significant with mitigation (Class II)

Other Issue Areas. Other issue areas were found to have less than significant impacts for this alternative, similar to the proposed Project, and no effects are expected to aesthetics, agricultural resources, biological resources, geology, noise, population and housing, public services, recreation, and water resources. Construction of a hydrogen plant within an existing Refinery would not have any additional impacts in other issue areas.

ES.6.3 Impacts Associated with the Cumulative Development

Section 15130(a)(1) of the CEQA Guidelines (14 CCR, Div. 6, Ch. 3) states that a "cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts." CEQA requires a discussion of the cumulative impacts of a project when the project's incremental effect is "cumulatively considerable" (14 CCR §15130(a)). Section 3.0 of this EIR provides a list of past, present, and probable future projects that could have cumulative effects with the proposed Project. Table ES-4 provides a summary of the proposed Project's cumulative effects. The significant cumulative effects identified in the EIR are summarized below.

Air Quality. Localized air quality impacts are generally restricted to an area within a few blocks from a project site. The localized impacts of construction would extend about 500 meters from those areas

where a new pipeline is being built. None of the cumulative projects would be constructed near enough to the proposed Project area for localized impacts to overlap, so there would be no construction localized impacts associated with cumulative projects. Similarly, the proposed Project would not have considerable emissions during operations and as such, no cumulative impacts are expected.

Climate Change/Greenhouse Gas Emissions. Emissions of GHG are a global issue and therefore all GHG emissions are cumulative and would contribute to global GHG emissions impacts. The thresholds as developed by the SCAQMD address cumulative impacts of GHG by determining a threshold whereby a project below the thresholds would, by definition, not have a cumulative impact. Since the proposed Project GHG emissions are less than significant, and actually produce a reduction in GHG emissions over the existing operations, cumulative GHG emissions would be less than significant.

Hazardous Materials/Risk of Upset. None of the projects listed in Section 3.0, Cumulative Scenario, (except the World Energy project) involve the use of hazardous materials and would therefore not contribute to the risks identified associated with the proposed Project pipeline. Some components of the cumulative project would involve construction and there is the potential for these to impact the pipeline once it is operating. However, the management systems in place for construction projects and "dig alerts" requirements effectively mitigation these potential impacts.

However, the proposed Project could overlap with the Metro West Santa Ana Branch Transit Corridor Project and create potential risk of upset issues (Impact HM.Cum1). The Metro project would intersect the proposed Project pipeline near the tie-in location at Paramount Refinery. Construction activities could impact the pipeline if sufficient coordination activities are not implemented which could result in potentially significant cumulative impacts.

Mitigation Measure HM-Cum1 requires coordination between the proposed Project and the Los Angeles County Metropolitan Transit Authority before any permit issuance. Implementation of MM HM-Cum1 will ensure overlapping design elements do not interfere with either Project or increase the potential for risk of upset issues. Impacts would be less than significant with mitigation (Class II).

The proposed expansion of the World Energy Renewable Fuels Project located at the Paramount Refinery is another cumulatively significant project relative to the proposed Project. This project is currently in the CEQA review phase of project permitting and would involve the expansion of the existing renewable fuels project (3,500 barrels per day, bpd) into a facility that could process about 25,000 bpd of refinery input for the development of bio-based transportation fuels.

A part of the expansion project is the development of a hydrogen generation unit that would be capable of supplying all of the hydrogen needs of the expansion of the World Energy Renewable Fuels Project. The use of an onsite hydrogen generation unit could reduce or eliminate the need to have a hydrogen pipeline (or trucks) transport hydrogen to the Paramount Refinery on a long-term basis. Interim use of the pipeline would allow for the supply of hydrogen to the Paramount Refinery while this cumulative project is being permitted and built. The reduction or elimination of the use of the pipeline after the completion of the expansion of the World Energy Renewable Fuels Project would eliminate the long-term risks identified as significant in Section 4.3, Risk of Upset. Risks would still remain significant but would be realized for a shorter period of time, thereby reducing the severity of the impact. Note that this is the same scenario as described under the onsite hydrogen generation alternative in Section 5.0, Alternatives. See Section 5.0, Alternatives, for further discussion of the impacts of this cumulative project.

Land Use. The proposed Project would not result in any land use impacts; therefore, the proposed Project would not have a cumulative effect on the land use plans and regulations of the City of Carson or any surrounding jurisdiction.

Transportation and Circulation. The potential traffic impacts from the proposed Project were evaluated for both construction and operations. Impacts to traffic during construction would be temporary in nature and would not have any potential cumulative effect when evaluated in conjunction with other neighboring projects. There is not expected to be any transportation impacts during operations that would have any potentially cumulative effect when considered with other neighboring projects. Therefore, the proposed Project would have a less than significant cumulative transportation impact.

Tribal Cultural Resources. According to CEQA cultural resources include historic properties (standing buildings or structures), historical and prehistoric archaeological sites, paleontological resources, and human remains inside or out of designated cemeteries. Grading and ground disturbing activities can significantly impact these non-renewable resources. Without mitigation, these resources would be destroyed through construction and urban expansion resulting in cumulative loss of cultural resources over time. However, applicable state and City laws and regulations, as discussed above, offer guidance for managing cultural resources, provide for preservation of significant natural and cultural resources, and direct mitigation through data recovery where avoidance is not possible.

The cumulative impact study area includes the immediate vicinity surrounding the proposed Project sites in the City of Carson, Long Beach, City of los Angeles, County of Los Angeles, Lakewood, Bellflower and the City of Paramount. There are no known projects of a scale and in a location that could add to cumulative impacts to cultural resources and no cumulative effects are expected to occur as a result of this or other projects in the area that would include any type of excavation or construction. In the event that other projects in the surrounding areas could have any potential impacts, it is expected that those projects would be appropriately mitigated as described above and therefore, would not incur in any cumulative impacts.

ES.7 Environmentally Superior Alternative

Section 5.0, Alternatives, provides an analysis of the impacts of each selected alternative, compares the impacts of each alternative to the proposed Project, and identifies the Environmentally Superior Alternative. Table 5.8 in Section 5.0, Alternatives, provides a relative comparison of the Class I, Class II, and Class III impacts of each alternative to the proposed Project by issue area and impact.

The onsite hydrogen production alternative would involve the installation of a hydrogen generation unit at the Paramount Refinery to supply the hydrogen needed at the Paramount Refinery instead of the transportation of hydrogen by truck or pipeline. This alternative assumes that a small hydrogen plant could be permitted and built to provide onsite hydrogen to the Paramount Refinery, or that the proposed hydrogen generation unit as part of the expansion of the World Energy Renewable Fuels Project is completed or, if that project does not move forward, a smaller plant is built to satisfy the needs of the existing facility at the Paramount Refinery, then transportation of hydrogen would cease.

The onsite hydrogen production alternative would have more traffic and potential cultural-tribal impacts than the proposed Project, due to the increased amount of construction. However, both of these impacts would be less than significant with mitigation. This alternative would generate a Class I, significant and unavoidable impacts due to the construction emissions associated with the construction of a hydrogen plant. However, these significant and unavoidable construction air quality impacts would be temporary. In addition, irrespective of the proposed Project, the expansion of the World Energy Renewable Fuels Project may occur anyway and incur those air quality impacts. The main advantage of this alternative is the elimination of the Class I, significant and unavoidable, risk of upset impact associated with the proposed Project through the elimination of the need to transport hydrogen, either by truck or pipeline.

The onsite hydrogen production alternative satisfies the underlying purpose of the Project by supplying hydrogen to the Paramount Refinery and eliminates the Class I risk of upset impact. However, this alternative would not meet the Applicant's objective of conversion of an existing pipeline system to hydrogen use, and also does not satisfy the objective to extend the hydrogen pipeline network to provide hydrogen to the Paramount Refinery. As noted above, the World Energy Renewable Fuels Project is currently undergoing permit review and environmental analysis for its expansion, and if approved, will take an additional 2-3 years to be constructed and accrue the environmental benefits mentioned. It is possible that during that time, the proposed pipeline Project could provide hydrogen to the Paramount Refinery, until and if, the expansion Project is approved and built. Although it is recognized that there may be limitations in meeting the objectives, delays in the timing and uncertainty in the permitting to this alternative, it has been selected as the environmentally superior alternative due to the long-term elimination of the risk of upset impact associated with the use of the proposed Project pipeline.

Table ES.1
Proposed Project CLASS I Impacts
Impacts That May Not Be Fully Mitigated to Less Than Significant Levels

(Impacts that must be addressed in a "statement of overriding consideration" if the project is approved in accordance with Sections 15091 and 15093 of the State CEQA Guidelines)

Impact #	Description of Impact	Phase	Mitigation Measure
HAZARDOUS MATERIALS AND RISK OF UPSET (Section 4.3)			
HM.2	The proposed Project would create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.	Construction or Operation	**HM-2a-Maximum Pressure Allowance.** The pipeline shall be operated at a maximum pressure at any point in the pipeline of 160 psia. The operator shall maintain operating pressure information that shall be made available upon request. Information on pipeline maintenance, including pressure testing and any direct assessments or any other pipeline issues, shall be reported to the City. **PLAN REQUIREMENTS and TIMING**: The Project Owner/Operator shall operate the pipeline at a maximum pressure at any point in the pipeline of 160 psia. Information on operating pressure and pipeline maintenance shall be documented and reported to the City. **MONITORING:** The City will work with the Owner/Operator to ensure the terms of this measure are met. **HM-2b-Testing and Monitoring for Hydrogen Issues**. The pipeline shall be monitored on an annual basis for any issues that could indicate increased rates of the loss of pipeline integrity, such as hydrogen-related embrittlement, through the use of in service inspection methods, corrosion-type coupons or other equivalent methods. The monitoring procedure shall be documented and available for inspection upon request. **PLAN REQUIREMENTS and TIMING**: The Project Owner/Operator shall monitor and inspect the pipeline annually for hydrogen issues. **MONITORING:** The City will work with the Owner/Operator to ensure the terms of this measure are met. **HM-2c-Pressure Testing.** The pipeline shall continue to be pressure tested at a MAOP to test pressure ratio of at least 3.0 to ensure pipeline integrity. In addition, the testing shall be performed at an annual basis for the first 3 years to ensure that no issues are introduced to the pipeline due to the use of hydrogen. Subsequent years tests may be relaxed to once every 3-5 years as per PHMSA requirements. **PLAN REQUIREMENTS and TIMING**: The Project Owner/Operator shall continue to pressure test the pipeline at a MAOP to test pressure ratio of at least 3.0 and perform testing per PHMSA requirements. **MONITORING:** The City will work with the Owner/Operator to ensure the terms of this measure are met.

Table ES.2
Proposed Project CLASS II Impacts
Impacts That Can Be Mitigated to Less Than Significant Levels

(Impacts that must be addressed in Findings that the mitigation measures would reduce the level of impact to insignificant in accordance with Sections 15091 of the State CEQA Guidelines)

Impact #	Description of Impact	Phase	Mitigation Measure
HAZARDOUS MATERIALS AND RISK OF UPSET (Section 4.3)			
HM.4	The Project could be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would it create a significant hazard to the public or the environment.	Construction	**HM-4-Contaminated Materials Management Plan.** A Contaminated Materials Management Plan (CMMP) should be prepared and implemented during the course of the construction activities planned at the Project Site. The CMMP should include maps illustrating areas of suspected or known soil contamination. The CMMP should also include the methods for identification of contaminated materials, and removal/disposal of contaminated materials and be consistent with South Coast Air Quality Management District (SCAQMD) rules for the handing of contaminated materials. **PLAN REQUIREMENTS and TIMING:** The Applicant shall prepare and submit a Contaminated Materials Management Plan and implement the plan requirements for duration of construction activities. **MONITORING:** The City will work with the Applicant to ensure the terms of this measure are met.
TRAFFIC AND CIRCULATION (Section 4.5)			
T.1	The Project would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities.	Construction and Operation	**T-1.** Alternative vehicle and pedestrian access would be established during construction. The Operator should provide a route specific traffic and circulation plan that provides safe access to sidewalks and other areas frequented by pedestrian during construction. **PLAN REQUIREMENTS and TIMING:** The Applicant shall prepare and submit a route specific traffic and circulation plan and implement the plan requirements for the duration of construction activities. **MONITORING:** The City will work with the Applicant to ensure the terms of this measure are met.
T.4	The Project may result in inadequate emergency access.	Construction	**T-4.** Emergency response providers in the vicinity of construction sites would be given advance notice of the construction schedule and locations, road closures, and possible alternate routes. **PLAN REQUIREMENTS and TIMING:** Prior to construction, the Applicant shall provide emergency response providers with advance notice of construction schedule and locations, road closures, and alternate routes. **MONITORING:** The City will work with the Applicant to ensure the terms of this measure are met.

Table ES.2
Proposed Project CLASS II Impacts
Impacts That Can Be Mitigated to Less Than Significant Levels

(Impacts that must be addressed in Findings that the mitigation measures would reduce the level of impact to insignificant in accordance with Sections 15091 of the State CEQA Guidelines)

Impact #	Description of Impact	Phase	Mitigation Measure
TRIBAL CULTURAL RESOURCES (Section 4.6)			
TC.1	The Project would not cause a substantial adverse change in the significance of a historical or archaeological resource as defined in §15064.5.	Construction	**TC-1a-Retain a Native American Monitor/Consultant:** The Project Applicant shall be required to retain and compensate for the services of a Tribal monitor/consultant who is both approved by the Gabrieleño Band of Mission Indians-Kizh Nation Tribal Government and is listed under the NAHC's Tribal Contact list for the area of the project location. This list is provided by the NAHC. The monitor/consultant will only be present on-site during the construction phases that involve ground disturbing activities. Ground disturbing activities are defined by the Gabrieleño Band of Mission Indians-Kizh Nation as activities that may include, but are not limited to, pavement removal, pot-holing or auguring, grubbing, tree removals, boring, grading, excavation, drilling, and trenching, within the project area. The Tribal Monitor/consultant will complete daily monitoring logs that will provide descriptions of the day's activities, including construction activities, locations, soil, and any cultural materials identified. The on-site monitoring shall end when the project site grading and excavation activities are completed, or when the Tribal Representatives and monitor/consultant have indicated that the site has a low potential for impacting Tribal Cultural Resources. **PLAN REQUIREMENTS and TIMING:** The Applicant shall retain and compensate for the services of a tribal monitor/consultant for the duration of ground-disturbing construction activities. **MONITORING:** The City will work with the Applicant to ensure the terms of this measure are met. **TC-1b- Unanticipated Discovery of Tribal Cultural and Archaeological Resources:** Upon discovery of any tribal cultural or archaeological resources, cease construction activities in the immediate vicinity of the find until the find can be assessed. All tribal cultural and archaeological resources unearthed by project construction activities shall be evaluated by the qualified archaeologist and tribal monitor/consultant approved by the Gabrieleño Band of Mission Indians-Kizh Nation. If the resources are Native American in origin, the Gabrieleño Band of Mission Indians-Kizh Nation shall coordinate with the landowner regarding treatment and curation of these resources. Typically, the Tribe will request preservation in place or recovery for educational purposes. Work may continue on other parts of the project while evaluation and, if necessary, additional protective mitigation takes place (CEQA Guidelines

Table ES.2
Proposed Project CLASS II Impacts
Impacts That Can Be Mitigated to Less Than Significant Levels

(Impacts that must be addressed in Findings that the mitigation measures would reduce the level of impact to insignificant in accordance with Sections 15091 of the State CEQA Guidelines)

Impact #	Description of Impact	Phase	Mitigation Measure
			Section15064.5 [f]). If a resource is determined by the qualified archaeologist to constitute a "historical resource" or "unique archaeological resource", time allotment and funding sufficient to allow for implementation of avoidance measures, or appropriate mitigation, must be available. The treatment plan established for the resources shall be in accordance with CEQA Guidelines Section 15064.5(f) for historical resources. **PLAN REQUIREMENTS and TIMING:** In the event of an unanticipated discovery during construction, the Applicant shall cease construction in the vicinity of the find until the find is assessed by the tribal monitor and a qualified archaeologist. **MONITORING:** The City will work with the Applicant to ensure the terms of this measure are met.
TC.2	The Project would not disturb any human remains, including those interred outside of dedicated cemeteries.	Construction	**TC-2- Unanticipated Discovery of Human Remains:** Upon discovery of human remains, the tribal and/or archaeological monitor/consultant will immediately divert work at minimum of 150 feet and place an exclusion zone around the discovery location. The monitor/consultant(s) will then notify the Tribe, the qualified lead archaeologist, and the construction manager who will call the coroner. Health and Safety Code 7050.5 dictates that any discoveries of human skeletal material shall be immediately reported to the County Coroner and excavation halted until the coroner has determined the nature of the remains. If the coroner recognizes the human remains to be those of a Native American or has reason to believe that they are those of a Native American, he or she shall contact, by telephone within 24 hours, the Native American Heritage Commission (NAHC) and PRC 5097.98 shall be followed. The discovery is to be kept confidential and secure to prevent any further disturbance. **PLAN REQUIREMENTS and TIMING:** In the event of an unanticipated discovery during construction, the Applicant shall cease construction in the vicinity of the find until the find is assessed by the tribal monitor and a qualified archaeologist. **MONITORING:** The City will work with the Applicant to ensure the terms of this measure are met.

Table ES.2
Proposed Project CLASS II Impacts
Impacts That Can Be Mitigated to Less Than Significant Levels

(Impacts that must be addressed in Findings that the mitigation measures would reduce the level of impact to insignificant in accordance with Sections 15091 of the State CEQA Guidelines)

Impact #	Description of Impact	Phase	Mitigation Measure
TC.3	The Project would not cause a substantial adverse change in the significance of a tribal cultural resource that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in PRC Section 5020.1(k), or one that is determined by the lead agency to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1.	Construction	Impact TC.3 requires the implementation of Mitigation Measures TC-1a and TC-1b above.

Table ES-3
Proposed Project CLASS III Impacts
Adverse but Not Significant Impacts

Impact #	Description of Impact	Phase	Mitigation Measures
AIR QUALITY AND GREENHOUSE GASES (Section 4.1)			
AQ.1	The proposed Project would not conflict with or obstruct implementation of the applicable air quality plan.	Construction or Operation	None Required
AQ.2	The proposed Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.	Construction or Operation	None Required
AQ.3	The proposed Project would not expose sensitive receptors to substantial pollutant concentrations.	Construction or Operation	None Required
AQ.4	The proposed Project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.	Construction or Operation	None Required
CLIMATE CHANGE AND GREENHOUSE GASES (Section 4.2)			
GHG.1	The proposed Project would not generate greenhouse gas emissions, either directly or indirectly, that would have a significant impact on the environment.	Construction or Operation	None Required
GHG.2	The proposed Project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	Construction or Operation	None Required
HAZARDOUS MATERIALS AND RISK OF UPSET (Section 4.3)			
HM.1	The proposed Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	Construction or Operation	None Required
HM.3	The proposed Project could emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	Construction or Operation	None Required

Table ES-3
Proposed Project CLASS III Impacts
Adverse but Not Significant Impacts

Impact #	Description of Impact	Phase	Mitigation Measures
HM.5	The proposed Project would not conflict with any airport land use plan and would not result in a safety hazard or excessive noise for people residing or working within two miles of a public, or public use, airport.	Construction or Operation	None Required
HM.6	The proposed Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	Construction or Operation	None Required
HM.7	The proposed Project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.	Construction or Operation	None required
LAND USE AND POLICY CONSISTENCY (Section 4.4)			
LU.1	The proposed Project would not physically divide a community.	Construction or Operation	None Required
LU.2	The proposed Project would not cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.	Construction or Operation	None Required **NOTE:** Due to the subjectivity of policy interpretation, it is the responsibility of the City decision makers to make the final determination regarding consistency issues as it relates to applicable City policies.
TRAFFIC AND CIRCULATION (Section 4.5)			
T.2	The proposed Project would not conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b).	Construction or Operation	None Required
T.3	The proposed Project may substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).	Construction or Operation	None Required

Table ES-4 Summary of Cumulative Impacts of Proposed Project

Air Quality (Section 4.1)
Localized air quality impacts are generally restricted to an area within a few blocks from a project site. The localized impacts of construction would extend about 500 meters from those areas where a new pipeline is being built. None of the cumulative projects would be constructed near enough to the proposed Project area for localized impacts to overlap, so there would be no construction localized impacts associated with cumulative projects. Similarly, the proposed Project would not have considerable emissions during operations and as such, no cumulative impacts are expected.
Climate Change/Greenhouse Gas Emissions (Section 4.2)
Emissions of GHG are a global issue and therefore all GHG emissions are cumulative and would contribute to global GHG emissions impacts. The thresholds as developed by the SCAQMD address cumulative impacts of GHG by determining a threshold whereby project below the thresholds would, by definition, not have a cumulative impact. Since the Proposed Project GHG emissions are less than significant, and actually produce a reduction in GHG emissions over the existing operations, cumulative GHG emissions would be less than significant.
Hazardous Materials and Risk of Upset (Section 4.3)
None of the projects listed in Section 3.0, Cumulative Scenario, involve the use of hazardous materials and would therefore not contribute to the risks identified associated with the proposed Project pipeline. Some components of the cumulative project would involve construction and there is the potential for these to impact the pipeline once it is operating. However, the management systems in place for construction projects and "dig alerts" requirements effectively mitigation these potential impacts. However, the proposed Project could overlap with the Metro West Santa Ana Branch Transit Corridor Project and create potential risk of upset issues (Impact HM.Cum1). The Metro project would intersect the proposed Project pipeline near the tie-in location at Paramount Refinery. Construction activities could impact the pipeline if sufficient coordination activities are not implemented which could result in potentially significant cumulative impacts. Mitigation Measure HM-Cum1 requires coordination between the proposed Project and the Los Angeles County Metropolitan Transit Authority before any permit issuance. Implementation of MM HM-Cum1 will ensure overlapping design elements do not interfere with either Project or increase the potential for risk of upset issues. Impacts would be less than significant with mitigation (Class II). The proposed expansion of the World Energy Renewable Fuels Project located at the Paramount Refinery is another cumulatively significant project relative to the proposed Project. This project is currently in the CEQA review phase of project permitting and would involve the expansion of the existing renewable fuels project (3,500 barrels per day, bpd) into a facility that could process about 25,000 bpd of refinery input for the development of bio-based transportation fuels. A part of the expansion project is the development of a hydrogen generation unit that would be capable of supplying all of the hydrogen needs of the expansion of the World Energy Renewable Fuels Project. The use of an onsite hydrogen generation unit could reduce or eliminate the need to have a hydrogen pipeline (or trucks) transport hydrogen to the Paramount Refinery on a long-term basis. Interim use of the pipeline would allow for the supply of hydrogen to the Paramount Refinery while this cumulative project is being permitted and built. The reduction or elimination of the use of the pipeline after the completion of the proposed expansion of the World Energy Renewable Fuels Project expansion would eliminate the long-term risks identified as significant in Section 4.3, Risk of Upset. Risks would still remain significant but would be realized for a shorter period of time, thereby reducing the severity of the impact. Note that this is the same scenario as described under the onsite hydrogen generation alternative in Section 5.0, Alternatives. See Section 5.0, Alternatives, for further discussion of the impacts of this cumulative project.
Land Use (Section 4.4)
The proposed Project would not result in any land use impacts; therefore, the proposed Project would not have a cumulative effect on the land use plans and regulations of the City of Carson or any surrounding jurisdiction.

Table ES-4 Summary of Cumulative Impacts of Proposed Project

Transportation and Circulation (Section 4.5)
The potential traffic impacts from the proposed Project were evaluated for both construction and operations. Impacts to traffic during construction would be temporary in nature and would not have any potential cumulative effect when evaluated in conjunction with other neighboring projects. There is not expected to be any transportation impacts during operations that would have any potentially cumulative effect when considered with other neighboring projects. Therefore, the Proposed Project would have a less than significant cumulative transportation impact.
Tribal Cultural Resources (Section 4.6)
According to CEQA cultural resources include historic properties (standing buildings or structures), historical and prehistoric archaeological sites, paleontological resources, and human remains inside or out of designated cemeteries. Grading and ground disturbing activities can significantly impact these non-renewable resources. Without mitigation, these resources would be destroyed through construction and urban expansion resulting in cumulative loss of cultural resources over time. However, applicable state and City laws and regulations, as discussed above, offer guidance for managing cultural resources, provide for preservation of significant natural and cultural resources, and direct mitigation through data recovery where avoidance is not possible. The cumulative impact study area includes the immediate vicinity surrounding the proposed Project sites in the City of Carson, Long Beach, City of los Angeles, County of Los Angeles, Lakewood, Bellflower, and the City of Paramount. There are no known projects of a scale and in a location that could add to cumulative impacts to cultural resources and no cumulative effects are expected to occur as a result of this or other projects in the area that would include any type of excavation or construction. In the event that other projects in the surrounding areas could have any potential impacts, it is expected that those projects would be appropriately mitigated as described above and therefore, would not incur in any cumulative impacts.

This Page Left Intentionally Blank

1.0 Introduction

This Environmental Impact Report (EIR) has been prepared to address the environmental impacts associated with the proposed Air Products Hydrogen Pipeline Project. Air Products and Chemicals, Inc. (Air Products) proposes to utilize an existing 11.5-mile-long series of pipelines plus construct a new 0.5-mile pipeline segment to connect from the Air Products' existing hydrogen facility in the City of Carson to the Paramount Refinery in the City of Paramount, California. The existing 11.5-mile pipeline crosses the cities of Carson, Los Angeles, Long Beach, Lakewood, Bellflower, and Paramount in addition to an unincorporated part of the County of Los Angeles and land owned or controlled by the Port of Los Angeles and the Joint Ports Authority. The 0.5-mile of new pipeline would be located entirely within the City of Carson. Refer to Figure 1-1 for the Project Location.

The Applicant is asking the City of Carson for a Conditional Use Permit (CUP) to proceed with construction and repurposing of the pipeline. This section is organized as follows:

1.1 Overview of Proposed Project

Figure 1-1 provides a vicinity map that shows the location of the existing and proposed pipeline. The proposed Project would construct 0.5 miles of new pipeline within the City of Carson and connect this newly constructed segment with 11.5 miles of existing pipeline, which would be repurposed for hydrogen distribution from its existing hydrogen production facilities located in Wilmington and Carson to the Paramount Refinery. Air Products proposes to utilize this pipeline route to connect Air Products with a new customer in the City of Paramount to support the renewable bio-fuel production. Two new pipe connections would be required to connect segments of existing pipelines together along the 11.5-mile length. Air Products would also remove or replace existing manual valves and add an automatic shut-off valve (ASV) at one location along the pipeline route.

The Project will eliminate the need for five to seven daily tanker trucks that currently deliver hydrogen to the Paramount Refinery to produce approximately 3,500 barrels of diesel and jet fuel per day from beef tallow and vegetable oils. The Project will employ approximately 60 contractors for construction, one new full-time job, and will increase City of Carson revenue (utility taxes, franchise fees, etc.).

The Project route will initiate in the City of Carson and terminate in the City of Paramount. The Project route will traverse small portions of the City of Los Angeles and County of Los Angeles, as well as portions of the cities of Long Beach, Lakewood, and Bellflower. The site of the proposed Project is located within an area of industrial, commercial, and residential land uses. The Project alignment is predominantly within an existing pipeline corridor, and the Project area is generally level and has been modified by urban development.

Most construction activities within the City of Carson would take place on private land either within or near the Air Products Carson Hydrogen Facility. This area is highly industrialized and much of the new pipeline segment would border the western bank of the Dominguez Channel. Segment One would consist of one-half mile of new pipeline from the Air Products Hydrogen Plant to join the existing pipeline. Segment Two of the pipeline is surrounded by industrial land as it follows the Union Pacific Railroad within

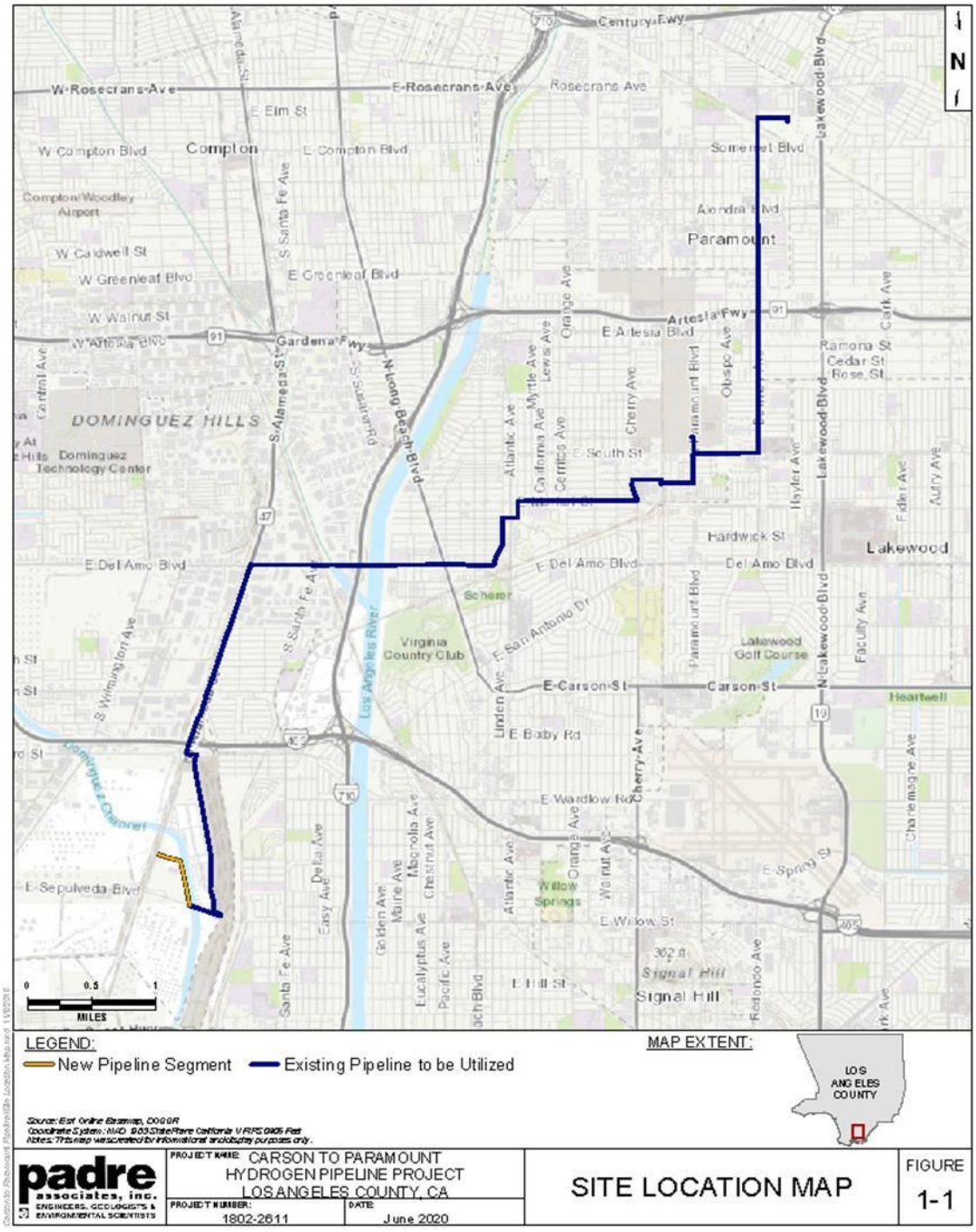
the City of Los Angeles. Segment Three follows Alameda Street (Highway 47) and is surrounded by single family residences to the east. Segment Four follows East Del Amo Boulevard and is surrounded by a residential area to the east as well as land used for industrial purposes. Segment Five crosses into an industrial area of an unincorporated part of Los Angeles County before crossing the Los Angeles River and under the 710 Freeway. After crossing into the City of Long Beach, the pipeline is surrounded by residential areas. Segment Six and Segment Seven are located within a mixed-use area within the City of Long Beach; there are residential, commercial, and industrial areas adjacent to the pipeline route. Once Segment Eight crosses into the City of Bellflower, the pipeline is bordered by a residential area. Segment Nine crosses into the City of Paramount with residential and commercial surroundings. The final segment, Segment Ten, also extends along residential and commercial areas before reaching an industrial zone at the Paramount Refinery. Refer to Figure 1-1 below for the Project Location.

The Project site is located within the Long Beach, California United States Geological Survey (USGS) 7.5Minute Series topographic quadrangle map. Specifically, the Project Site is located in an un-sectioned portion of the San Pedro Land Grant, Township 4 South, Range 13 West in the City of Carson in southern Los Angeles County. Elevation within the Project site is approximately 20 feet above mean sea level. Alameda Street runs along the western edge and East Sepulveda Boulevard runs along the southern edge of the Project site. The Project site is bounded on the eastern side by the Dominguez Channel, and a developed industrial area is situated to the immediate north. The Los Angeles River is located approximately 1.36 miles to the east.

Table 1.1 Project Planning Information

Project Information	
Project Title	Air Products Hydrogen Pipeline Project
Case Number	CUP 1089-18
Lead Agency	City of Carson, 701 E. Carson St. Carson, CA 90745
Contact Person	Max Castillo, Assistant Planner, City of Carson, Community Development Department, 701 East Carson Street, Carson, CA 90745 Office: (310) 952-1700 x1317 http://ci.carson.ca.us/CommunityDevelopment/HydrogenGas.aspx
Applicant	Air Products and Chemicals, Inc. 4000 MacArthur Boulevard Suite 420, East Tower Newport Beach, CA 92660
General Plan Designation and Zoning	The present land use and zoning is Industrial/Manufacturing, Heavy and Design Overlay/Heavy Industrial. M-HD.
Site Size	8.38 acres
Project Location	23300 Alameda Street, Carson, California 90810
Assessor's Parcel Numbers	APN 7315-020-021, APN 7315-020-019 (New pipeline)
Latitude and Longitude	Longitude 38, 48, 46; Latitude 118, 13, 55

Figure 1-1 Project Location



Source: Padre Associates Application.

1.2 The Environmental Impact Report Process

1.2.1 Purpose and Intended Uses of the Environmental Impact Report

The City as lead agency under CEQA determined that the proposed Project required the preparation of an EIR since the proposed Project could have significant environmental effects. The California Environmental Quality Act ("CEQA"), Public Resources Code sections 21000 et seq., requires that all state and local governmental agencies consider the environmental consequences of projects over which they have discretionary authority prior to taking action on those projects. This Draft Environmental Impact Report (DEIR) has been prepared to satisfy CEQA, and the State CEQA Guidelines, Title 14 of the California Code of Regulations, Chapter 3, Section 15000 et seq. An Environmental Impact Report (EIR) is a public informational document designed to provide decision makers and the public with an analysis of the environmental effects of a proposed Project, to indicate possible ways to reduce or avoid significant effects, and to describe reasonable alternatives to a project. An EIR must also disclose significant environmental impacts that cannot be avoided, growth-inducing impacts, effects not found to be significant, and significant cumulative impacts of past, present, and reasonably foreseeable probable future projects.

As an "informational document" (see Section 15121(a) of the CEQA Guidelines) the EIR is intended to inform the City, other public agencies with discretionary authority over aspects of the project, the general public, the local community and other organizations, entities and interested persons of the Project's scope, significant environmental effects, feasible measures to avoid or minimize the significant effects, and a reasonable range of feasible alternatives to the Project that would avoid or substantially lessen the significant effects. The environmentally superior alternative is selected as required by the California Environmental Quality Act (CEQA.). The State CEQA Guidelines, Section 15126 (e) (2), state that if the environmentally superior alternative is the No Project Alternative, then an environmentally superior alternative must be identified from among the other alternatives. While identification and disclosure of the environmentally superior alternative is required by CEQA, the lead agency is not required to approve the environmentally superior alternative.

Before any action may be taken on the proposed Project, the City of Carson, as lead agency under CEQA, must certify that it has reviewed and considered the information in the Final EIR (consisting of the Draft EIR, comments submitted during the Draft EIR public review period and responses to all comments) that it has exercised its independent judgment and analysis, and that the Final EIR has been completed in compliance with the requirements of CEQA. Certification of the Final EIR by the lead agency does not constitute approval or denial the proposed Project.

1.2.2 Agency Use of the EIR

As stated above, the City of Carson is the CEQA Lead Agency, in addition, there are a number of jurisdictions that would issue permits for this Project and would necessitate this EIR, once certified, for their actions. Table 1.2 below provides a listing of jurisdictions and their proposed actions. The City, as the CEQA lead agency, will act first on the Project before any of the responsible agencies act on the Project. City decision-makers (Planning Commission and City Council) will use the EIR for decision-making regarding the proposed Project. If the proposed Project is approved by all required permitting agencies, the City would be responsible for reviewing and approving all pre-construction compliance plans and ensuring that the proposed Project modifications and operations are conducted in accordance with the permit conditions.

Table 1.2 List of Anticipated Permits and Approvals

Agency	Permit/Approval	Regulated Activity	Authority
State of California Agencies			
Regional Water Quality Control Board	Storm Water Pollution Prevention Plan Approval	Storm water discharges during Project construction	Clean Water Act Porter-Cologne Water Quality Act
Local Agencies			
City of Carson	Conditional Use Permit, Construction Permit	New use, environmental review, and construction permit	City Code CEQA
City of Carson Public Works Dept.	Encroachment Permit, Addition to Pipeline Franchise Agreement	Work within public right-of-way	City Code
Los Angeles County Flood Control District	Temporary Use and Access	Modifications to existing pipe bridge crossing the Los Angeles River	County Code
Port of Los Angeles	Amendment to Franchise Agreement	Change in pipeline use	City Code
Joint Ports	Amendment to Master Joint Revocable Permit	Change in pipeline use	Joint Powers Authority Charter
City of Long Beach	Amendment to Franchise Agreement/ Construction Permit/ Encroachment Permit	Modification to existing Franchise Agreement, Work within public rights-of-way	City Code
City of Lakewood	Construction Permit	Piping Modification	City Code
City of Paramount	Construction Permit	Pipeline Tie-In	City Code
South Coast Air Quality Management District	Authority to Construct/Permit to Operate	Potential use of existing flare at the Carson Facility during two potential emergency relief scenarios.	Clean Air Act

Notes: CEQA = California Environmental Quality Act

1.2.3 Notice of Preparation and Initial Study

Air Products and Chemicals Inc. filed an application with the City of Carson for a Conditional Use Permit for the proposed Project. The City's decision to prepare an EIR is documented in an Initial Study included in Appendix D of this DEIR. The Initial Study, which consists of a checklist of possible effects on a range of environmental topics, found that the Project may have significant environmental impacts related to

hazards and risk, and that a detailed analysis of an EIR is needed to further assess potential effects. The Initial Study defined the preliminary scope of the EIR's analysis, suggesting that risk would be the main topic to be addressed as having potentially significant and unavoidable impacts. While risk is the main topic of focus on this EIR, other issue areas are included in the body of the document as appropriate. In addition, Section 4.7 provides a discussion of issue areas that were found not to have any impacts.

On May 21, 2020, the City, as the Lead Agency, issued a Notice of Preparation (NOP) to inform the general public and agencies that an EIR would be prepared for the proposed Project and to solicit comments on environmental issues to be addressed in the document. The public scoping comment period closed on July 21, 2020. Comments received in response to the NOP were used to further refine the scope of the analysis and the technical studies in this EIR. Written comments received in response to the NOP are provided in Appendix D with an indication of specific EIR sections where topics related to individual comments are addressed.

1.3 EIR Contents and Guide to the Reader

1.3.1 EIR Contents

The Draft EIR contains the following major sections:

Executive Summary – Provides an overview of the proposed Project, a summary of the significant impacts and associated mitigation measures identified for the Proposed Project.

Impact Summary Table – Provides a summary of the identified impacts for the proposed Project. The table also provides a summary of identified mitigation measures for each impact.

Section 1: Introduction – Provides an overview of the proposed Project evaluated in the EIR. The section also discusses agency use of the document and provides a summary of the contents of the EIR.

Section 2: Project Description – Provides objectives stated by Air Products for their Hydrogen Pipeline Project, and a detailed description of the Project.

Section 3: Cumulative Projects Description – Provides a description of the projects that have been included in the cumulative projects' analysis. The cumulative analysis contained in this document covers the cumulative impacts of past, present and reasonably foreseeable projects located in the vicinity of the proposed Project.

Section 4: Analysis of Environmental Issues – Describes the existing conditions found in the proposed Project area and vicinity and assesses the potential environmental impacts that could occur if the Proposed Project were implemented. These potential impacts are compared to various "Thresholds of Significance" (or significance criteria) to determine the severity of the impacts. Mitigation measures intended to reduce significant impacts are identified where feasible.

Section 5: Description of Alternatives/Environmentally Superior Alternative– Provides descriptions of the proposed alternatives that were considered and rejected for further analysis, and the Project alternatives selected to be evaluated in this document. It also provides an analysis of alternatives to the proposed Project that could lessen any identified significant impacts while still achieving most of the basic Project objectives. It also includes the impact analysis for the alternatives evaluated in the EIR. Finally, it

summarizes the environmental advantages and disadvantages of the alternatives compared to the proposed Project, and it identifies the environmentally superior alternative.

Section 6: Other CEQA-Mandated Sections – Discusses the significant irreversible environmental changes which would be caused by the proposed Project should it be implemented. The section also discusses the growth inducing impacts that may result from the proposed Project and known areas of controversy.

Section 7: Summary of Mitigation Measures and Mitigation Monitoring Program – Contains a listing of all identified mitigation measures that should be included as conditions of Project approval for Air Products Hydrogen Pipeline Project.

Section 8: List of EIR Preparers, Agencies and Individuals Consulted During EIR Preparation – Identifies and presents the qualifications of those who prepared the document. Lists reference materials used and persons contacted to prepare the document.

The EIR also contains a number of appendices that support the EIR and its analysis:

Appendix A- Project Description Design Data

Appendix B - Air Emission Calculations

Appendix C - Risk Assessment Calculations

Appendix D - Notice of Preparation, Initial Study, Comments, and Responses

These appendices are available in electronic format.

1.3.2 Thresholds of Significance

The California Environmental Quality Act requires that the EIR base its determination of whether or not a project impact is significant on adopted policies and standards, which serve as significance thresholds. The policies and standards applied by the EIR to serve as significance thresholds are derived for the most part from City policies (primarily in the City's adopted General Plan) and other adopted standards such as the Municipal Code. For some environmental issues, the EIR applies standards established by other regulatory agencies, such as the South Coast Air Quality Management District (in the case of air pollutant standards). For impacts related to certain public safety hazards associated with pipeline transport, this EIR uses the well-established significance criteria adopted by the County of Santa Barbara. These criteria have been found to be acceptable and utilized by various jurisdictions.

Appendix G of the State CEQA Guidelines provides a list of generic questions intended to guide lead agencies in determining what level of CEQA documentation is appropriate for a given project (e.g., a Negative Declaration or EIR). (These questions were used in the Initial Study presented in Appendix D.) The EIR follows the City's practice of using those questions as a framework for addressing project impacts in more detail with careful consideration given to specific pertinent policies adopted by the City or other relevant agencies. Each analytic section of the EIR identifies the significance thresholds used to assess impacts related to the specific environmental issue under consideration. The same significance thresholds are used again when the EIR evaluates the effectiveness of any mitigation measures or Project Alternatives to reduce or avoid potential impacts.

1.3.3 EIR Preparation and Certification Process

This DEIR is being circulated for public review for a period of 45 days as required by CEQA. Public agencies and members of the public are invited to provide written comments on the DEIR.

The DEIR (paper copy form) as well as the Final EIR will be available to the general public for review at these locations:

City of Carson Community Development Department
City of Carson Public Library

CD and paper copies of the DEIR may be obtained (free of charge) at the City of Carson Community Development Department.

The DEIR is also available on the City of Carson's website at:
http://ci.carson.ca.us/CommunityDevelopment/HydrogenGas.aspx

All comments on the DEIR must be received no later than October 19, 2020, and should be directed to:

Max Castillo
Assistant Planner, City of Carson, Community Development Department, 701 East Carson Street, Carson, CA 90745
Office: (310) 952-1700 x1317
Mcastillo@carson.ca.us

Upon completion of the 45-day review period, the City will review and prepare written responses to each comment as required by CEQA and the CEQA Guidelines. A Final EIR ('FEIR') will then be prepared, incorporating all of the comments received, written responses to received comments, and the DEIR, along with any changes to the DEIR that result from the comments received.

2.0 Proposed Project Description and Alternatives

Air Products and Chemicals, Inc. (Air Products) proposes to utilize an existing 11.5-mile-long series of pipelines plus construct a new 0.5-mile pipeline segment to connect from the Air Products' existing hydrogen facility in the City of Carson to the World Energy Paramount Facility (Paramount Refinery) Renewable Fuels Project in the City of Paramount, California. The existing 11.5-mile pipeline crosses the cities of Carson, Los Angeles, Long Beach, Lakewood, Bellflower, and Paramount in addition to an unincorporated part of the County of Los Angeles and land owned or controlled by the Port of Los Angeles and the Joint Ports Authority. The 0.5-mile of new pipeline would be located entirely within the City of Carson. Refer to Figure 2-1 for the Project Location.

2.1 Project Overview

The Carson to Paramount Hydrogen Gas Pipeline Project (proposed Project) would be constructed and operated by Air Products. The proposed Project would use local union labor, including ARB, Inc., to construct 0.5 miles of new pipeline within the City of Carson and connect this newly constructed segment with 11.5 miles of existing pipeline, expanding Air Products' existing pipeline network, and enabling it to provide means of hydrogen distribution from its existing hydrogen production facilities located in Wilmington and Carson to the Paramount Refinery. Air Products proposes to utilize this pipeline route to connect Air Products with a new customer in the City of Paramount to support renewable bio-fuel production. Two new pipe connections would be required to connect segments of existing pipelines together along the 11.5-mile length. Air Products would also remove or replace existing manual valves and add an automatic shut-off valve (ASV) at one location along the pipeline route. The Project would eliminate the need for five to seven daily tanker truck trips that currently deliver hydrogen. The Project would employ approximately 60 contractors for construction (local union workers when feasible), one new full-time job, and would increase City of Carson revenue (utility taxes, franchise fees, etc.). The Project route would initiate in the City of Carson and terminate in the City of Paramount at the Paramount Refinery. The Project route would traverse small portions of the City of Los Angeles and County of Los Angeles, as well as portions of the cities of Long Beach, Lakewood, and Bellflower.

The Paramount Refinery uses hydrogen to produce renewable biofuels (diesel and jet) for the transportation market. The Paramount Refinery currently receives liquid hydrogen via tanker truck with approximately five to seven daily tanker trucks per day. The Renewable Fuels Project approved in 2014 by the City of Paramount allowed the facility to convert up to 3,500 barrels per day of non-edible vegetable oils and beef tallow into renewable fuels, including aviation (jet), diesel, naphtha (gasoline), and fuel gas. World Energy uses hydrogen to produce "clean fuels." Hydrogen is used to reduce the level of sulfur and other undesired pollutants in various types of transportation fuels such as gasoline and diesel fuel.

2.2 Project Location

The proposed Project route would initiate in the City of Carson and would terminate in the City of Paramount. The site of the proposed Project is located within an area of industrial, commercial, and residential land uses. The Project alignment is predominantly within an existing pipeline corridor, and the Project area is generally level and has been modified by urban development.

Most construction activities within the City of Carson would take place in Segment 1 (see Table 2.1) on private land either within or near the Air Products Carson Hydrogen Facility. This area is highly industrialized and much of the new pipeline segment would border the western bank of the Dominguez

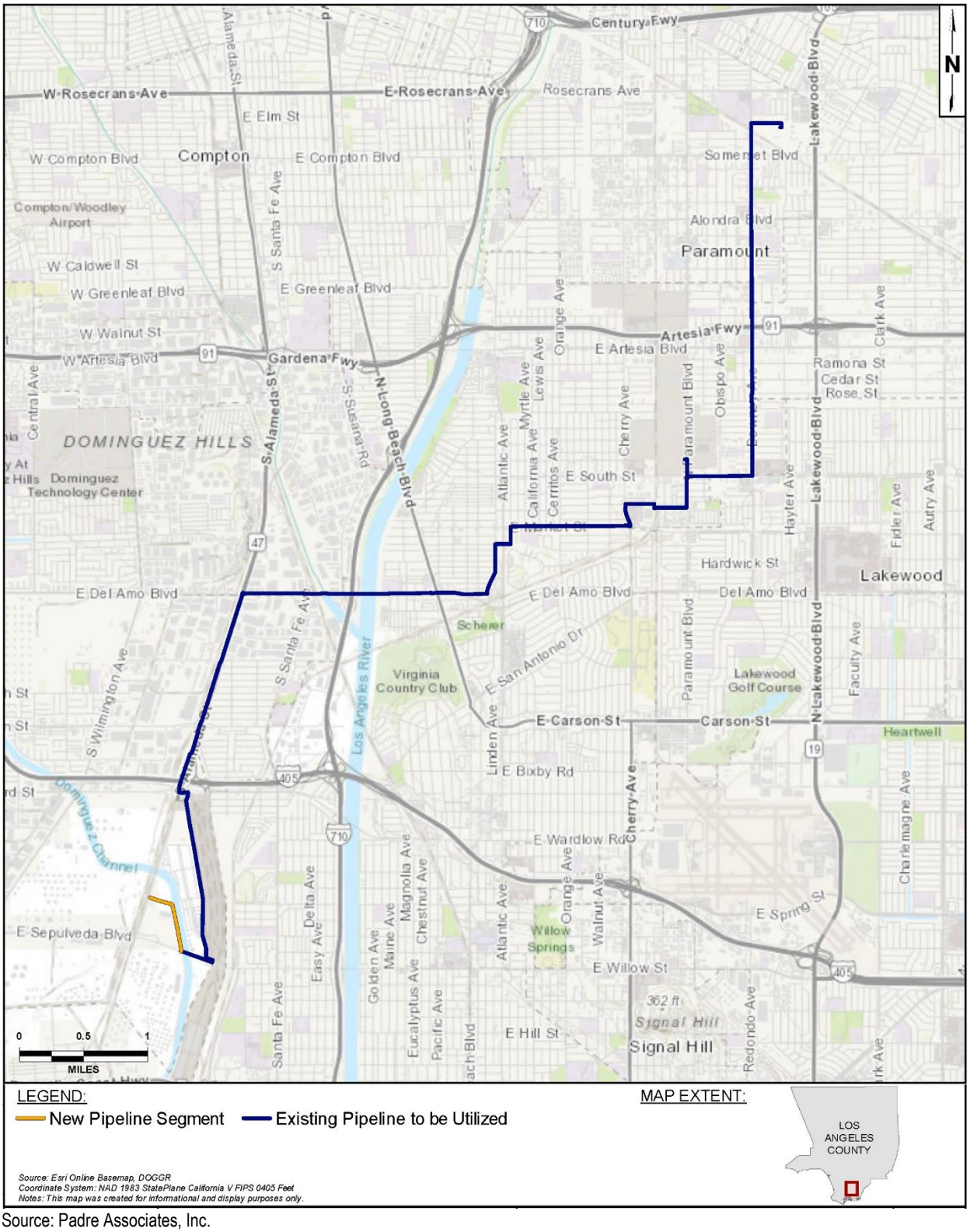
Channel. Segment 2 of the pipeline is surrounded by industrial land as it follows the Union Pacific Railroad within the City of Los Angeles. Segment 3 follows Alameda Street (Highway 47) and is surrounded by single-family residences to the east. Segment 4 follows East Del Amo Boulevard and is surrounded by a residential area to the east as well as land used for industrial purposes. Segment 5 crosses into an industrial area of an unincorporated part of Los Angeles County before crossing the Los Angeles River and under the 710 Freeway. After crossing into the City of Long Beach, the pipeline is surrounded by residential areas. Segment 6 and Segment 7 are located within a mixed-use area within the City of Long Beach; there are residential, commercial, and industrial areas adjacent to the pipeline route. Once Segment 8 crosses into the City of Bellflower, the pipeline is bordered by a residential area. Segment 9 crosses into the City of Paramount with residential and commercial surroundings. The final segment, Segment 10, also extends along residential and commercial areas before reaching an industrial zone at the World Energy Bio-fuels Facility. Table 2.1 provides a summary description of each of the proposed Project pipeline segments. Figure 2-1 provides a vicinity map that shows an overview of the existing and proposed pipeline route sections. Figures 2-2 through 2-11 provide aerial views of each of the proposed Project pipeline segments.

Table 2.1 Pipeline Segment Summary

Segment	Summary Description
1	One-half mile of new pipe will be constructed underground from the Air Products Hydrogen Plant to join with PP Line 3B on Sepulveda Boulevard. Limited construction within the roadway would occur using either trenching or horizontal boring techniques. The new pipe segment would connect to existing pipe owned by PP on the west side of the Dominguez Channel. PP existing pipe crosses the Dominguez channel using an existing pipe bridge on the south side of Sepulveda Boulevard.
2	The existing PP Line 4 will be utilized along the existing Union Pacific Railroad. There are no roadways within this industrial area located within the City of Los Angeles.
3	Segment 3 would begin under 223rd street to continue northbound on Alameda Street (Highway 47). This existing pipeline is PP Line 4, located on the western side of Alameda street. An ASV will be installed at the Dominguez pumping station. The surrounding area east of the pipeline is Lincoln Village, an area of single-family residences.
4	PP Line 4 extends on Alameda Street before turning east onto East Del Amo Boulevard. There is a residential area to the east of this segment but also includes industrial land uses.
5	PP Line 4, Segment 5 crosses from the City of Carson to an unincorporated part of Los Angeles County on East Del Amo Boulevard. The PP pipe is mounted on an existing pipe bridge crossing over the Los Angeles River. This segment also crosses under the 710 Freeway. The second half of the segment passes through a residential area, bordering Sutter and Adams.
6	Segment 6 extends through a residential area along Linden Avenue and then turns east to follow East Market Street. This occurs in a mixed-use area with a residential, commercial, and industrial area. The pipeline would utilize the existing PP Line 4.
7	The pipeline crosses through an industrial part of the City of Long Beach. There would be street level construction located on an alleyway on North Paramount Boulevard, North of South Street. The pipeline will tie into PP Line 1150. A manual valve will be replaced at an existing vault on South Street near Orizaba Avenue and would tie into PP Line 244. The adjacent area includes commercial and industrial uses. The pipeline extends on South Street within a residential and commercial area and turns North on Downey Avenue.
8	PP Line 244, Segment 2 extends along Downey Avenue and crosses over the border into the City of Bellflower, which borders Long Beach. This section would border a residential area.
9	This segment crosses from the City of Bellflower into the City of Paramount along Downey Avenue. There are residential and commercial areas within this segment of the pipeline route.
10	The final segment of the pipeline extends along residential and commercial areas on Downey Avenue. After crossing Pacific Electric Drive, the pipeline turns east onto a private access road at the World Energy bio-fuels Facility. Within the Paramount Refinery, the Air Products' pipeline will pass through a metering/pressure reduction station. A 10-inch diameter section of aboveground pipeline will then extend approximately 375 feet south and west and tie-in the proposed U-105 skid within the Paramount Refinery.

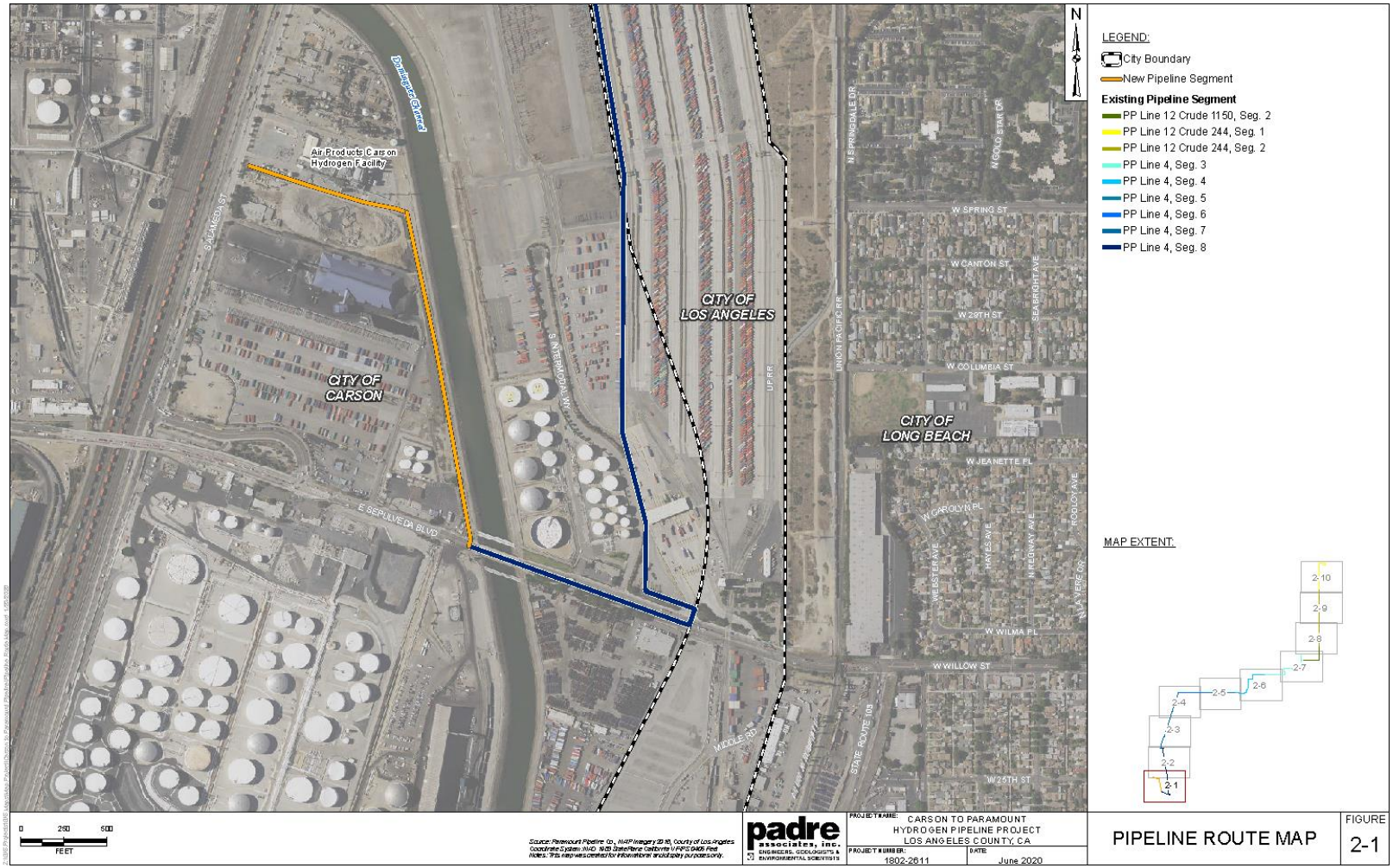
Notes: PP = Paramount Pipeline Source: Applicant/Padre Associates, Inc.

Figure 2-1 Vicinity Map



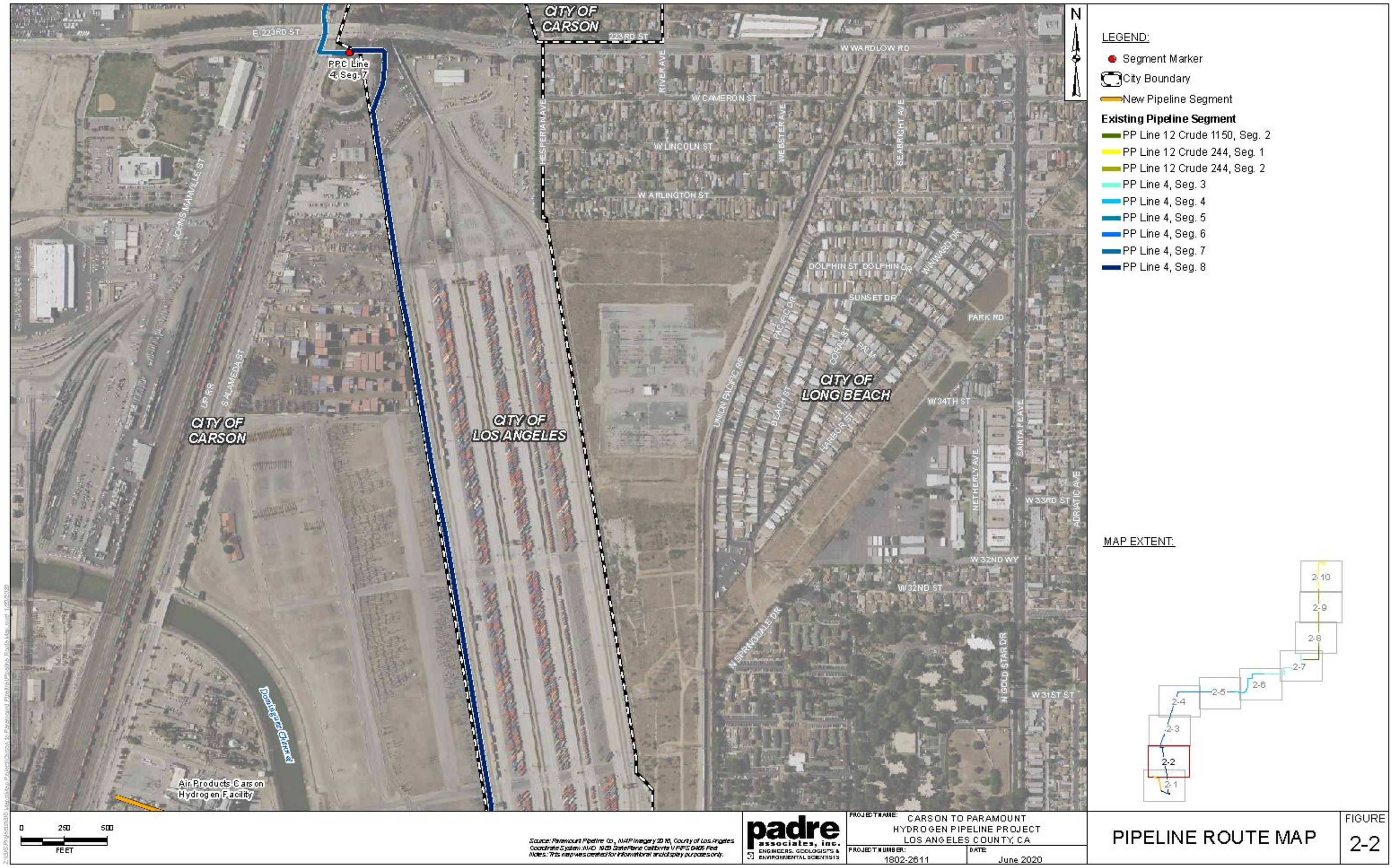
Source: Padre Associates, Inc.

Figure 2-2 Pipeline Segment 1 Aerial



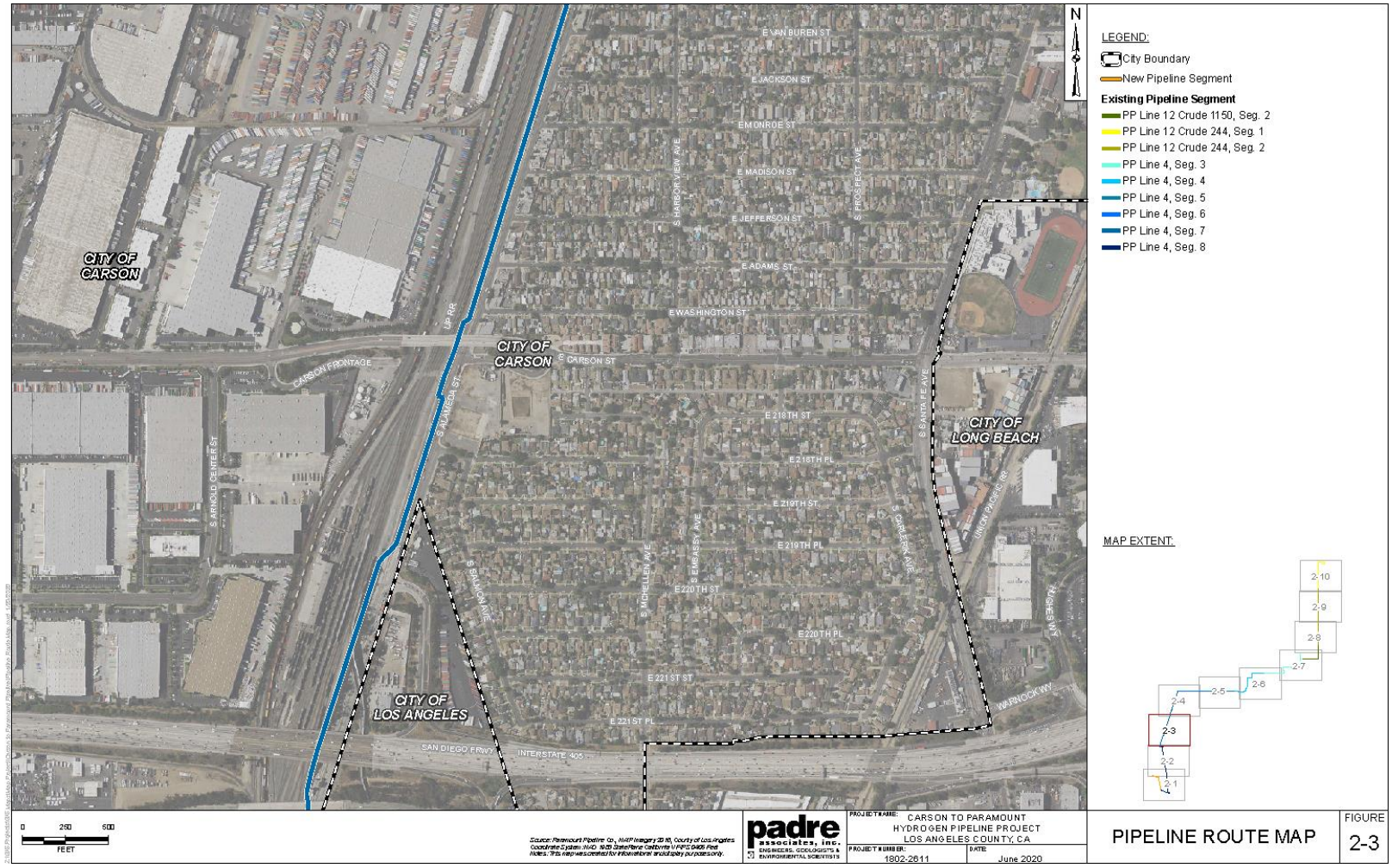
Source: Padre Associates, Inc.

Figure 2-3 Pipeline Segment 2 Aerial



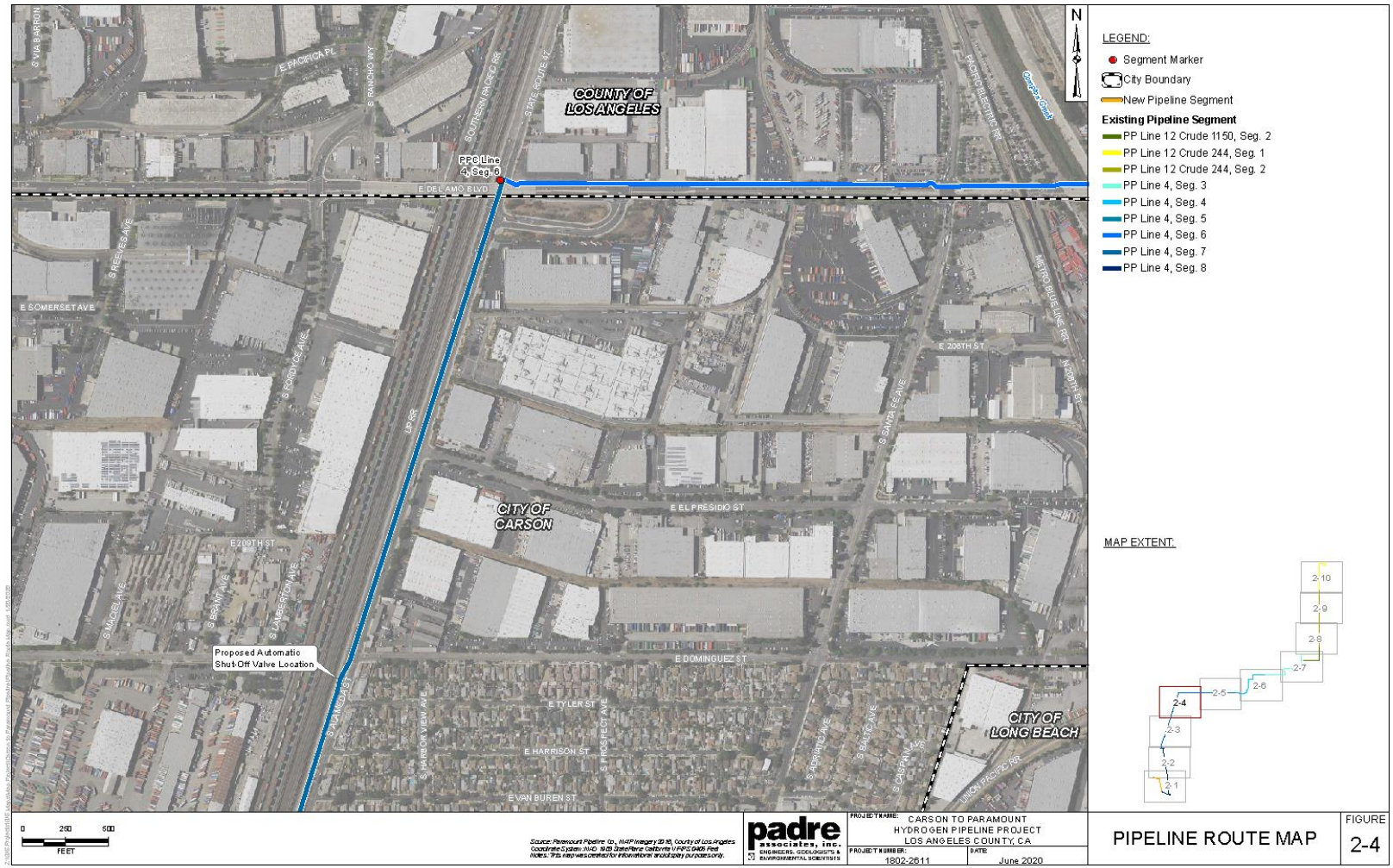
Source: Padre Associates, Inc.

Figure 2-4 Pipeline Segment 3 Aerial



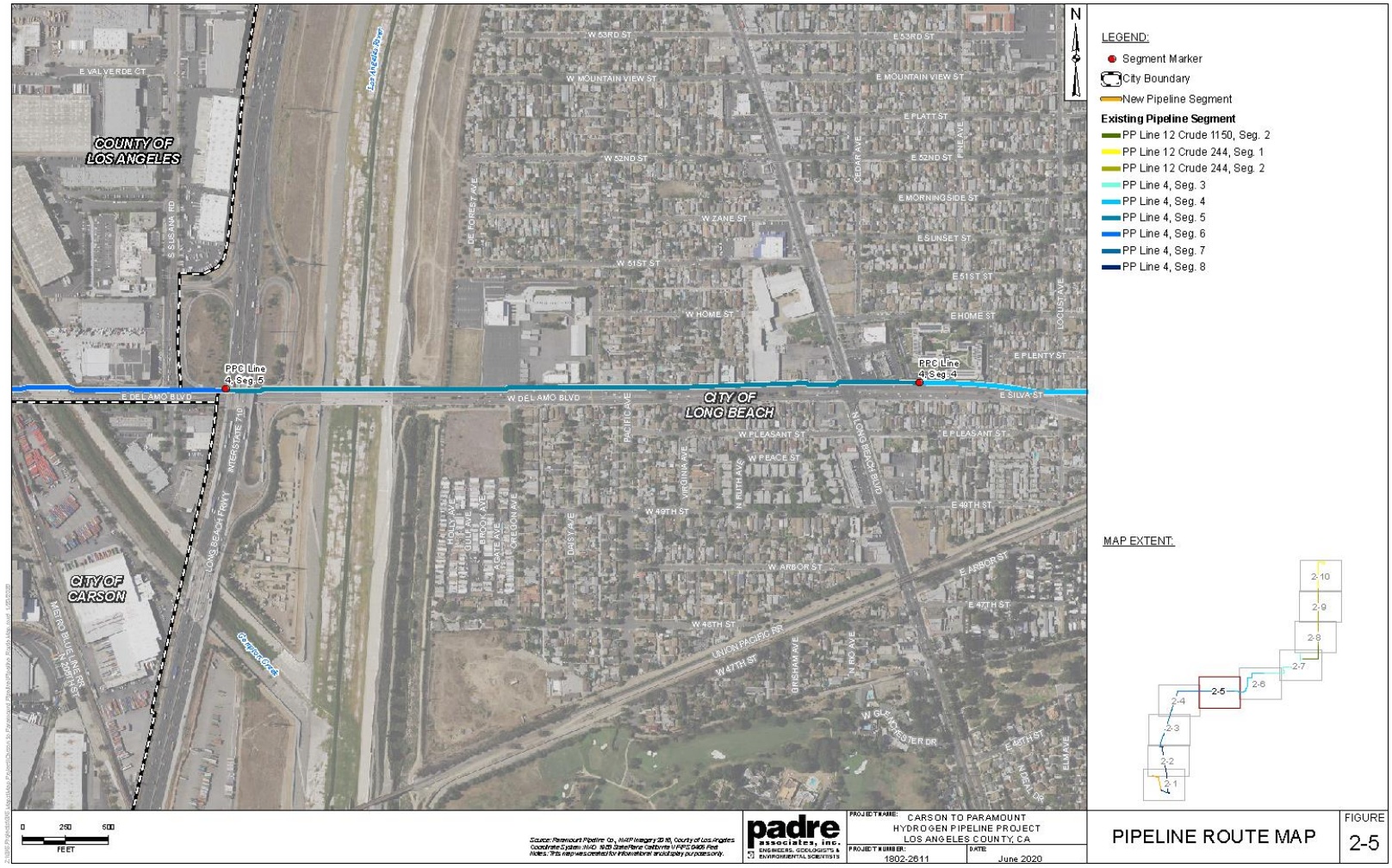
Source: Padre Associates, Inc.

Figure 2-5 Pipeline Segment 4 Aerial



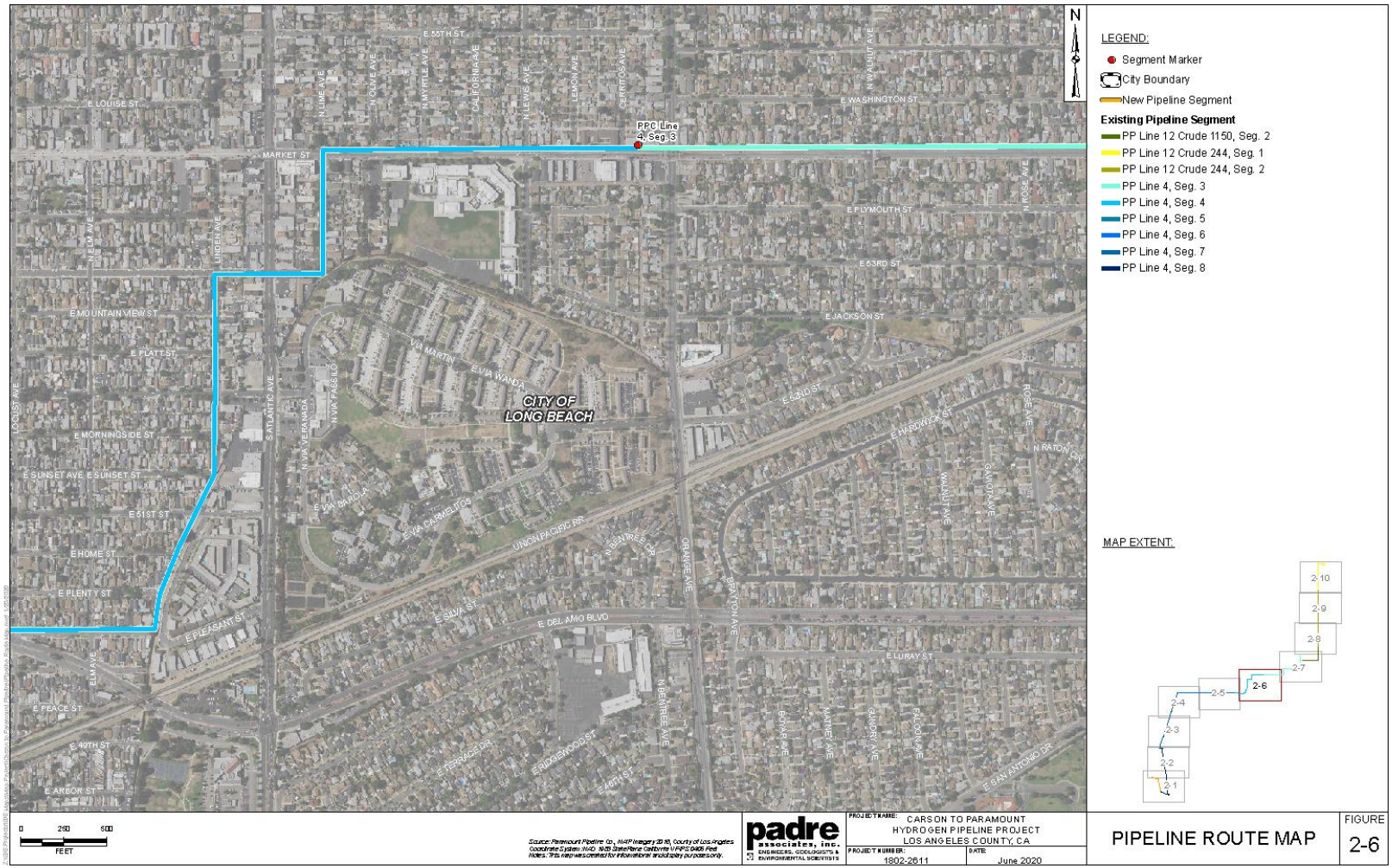
Source: Padre Associates, Inc.

Figure 2-6 Pipeline Segment 5 Aerial



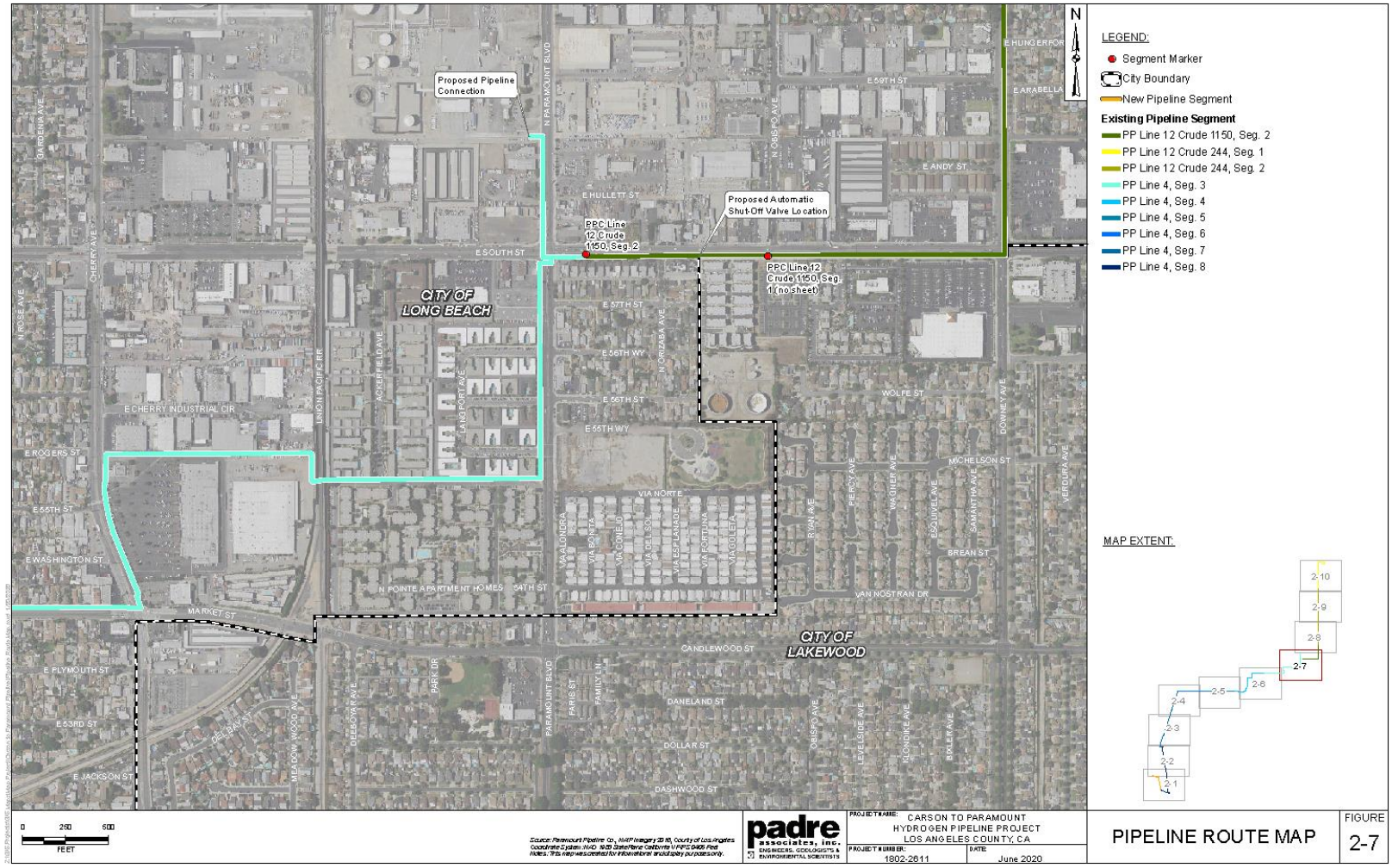
Source: Padre Associates, Inc.

Figure 2-7 Pipeline Segment 6 Aerial



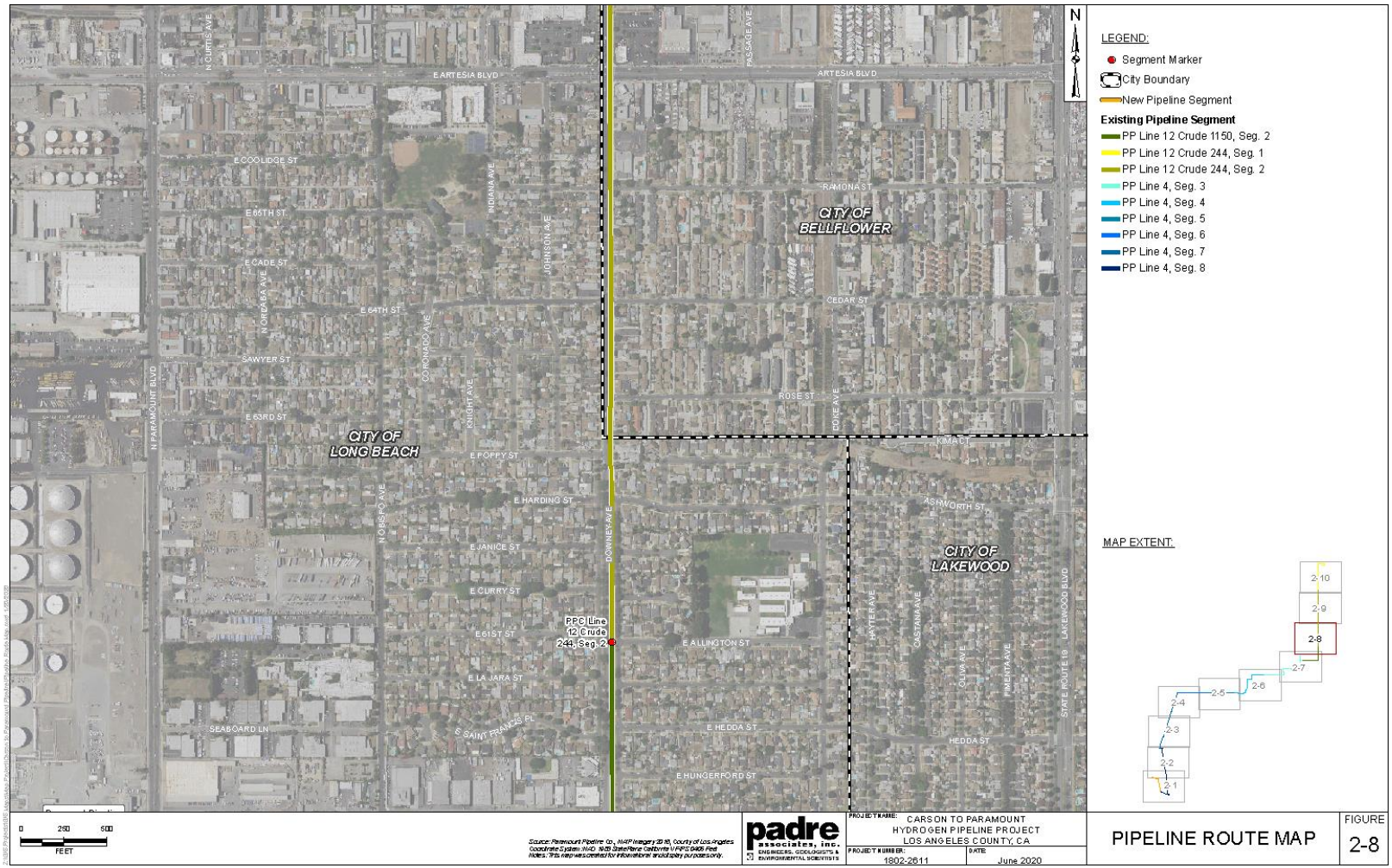
Source: Padre Associates, Inc.

Figure 2-8 Pipeline Segment 7 Aerial



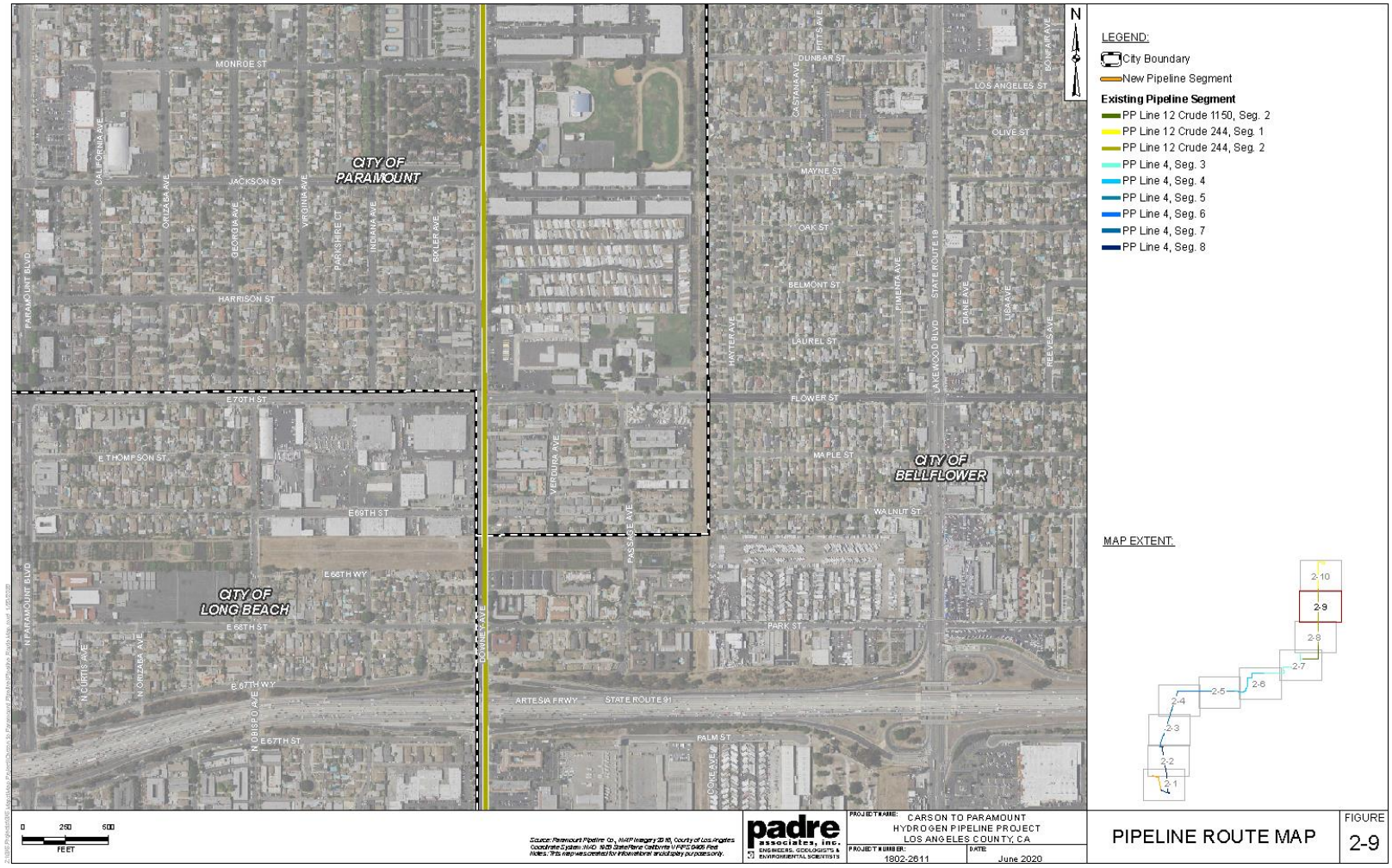
Source: Padre Associates, Inc.

Figure 2-9 Pipeline Segment 8 Aerial



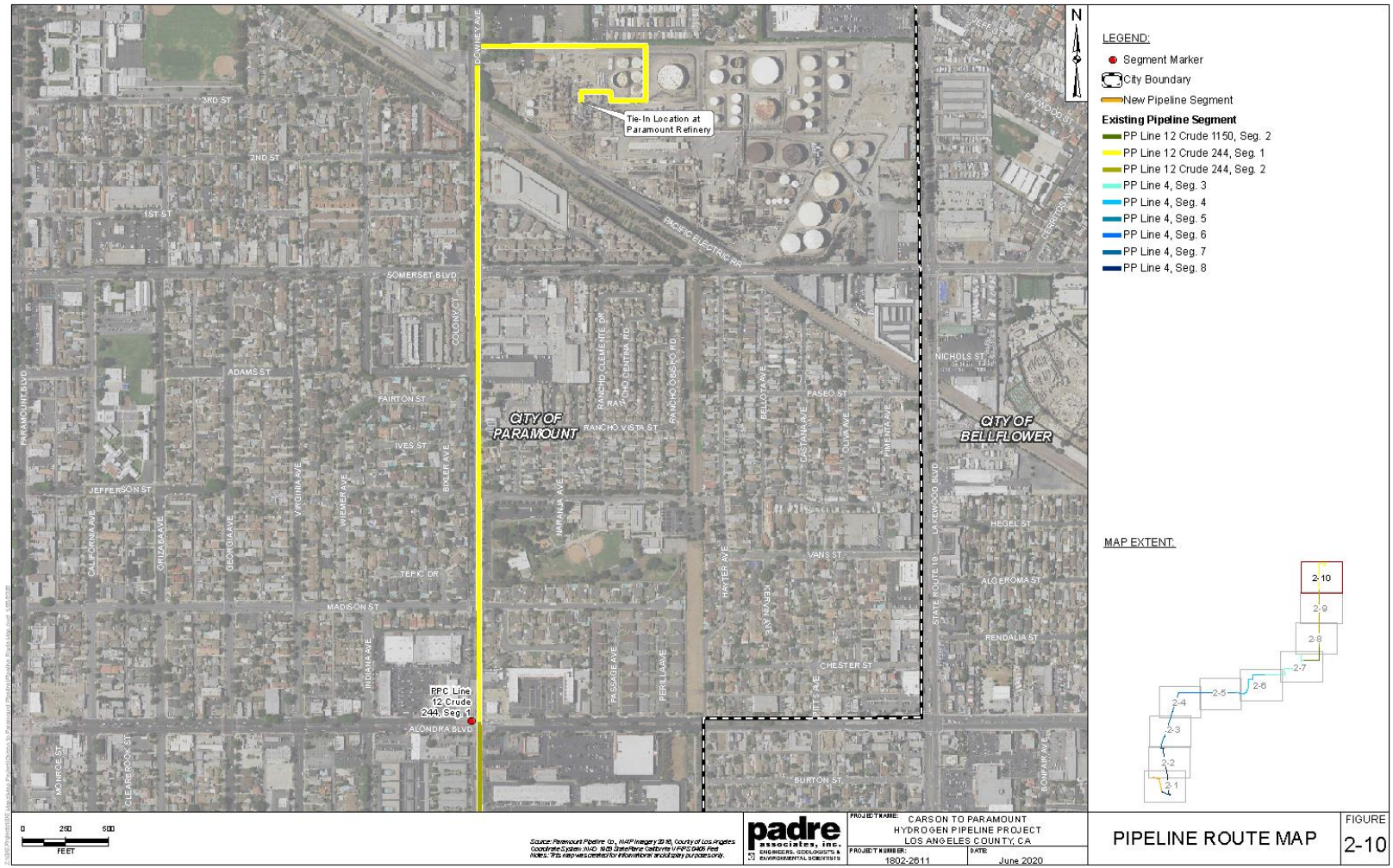
Source: Padre Associates, Inc.

Figure 2-10 Pipeline Segment 9 Aerial



Source: Padre Associates, Inc.

Figure 2-11 Pipeline Segment 10 Aerial



Source: Padre Associates, Inc.

2.3 Background and Historic Operations

The Air Products Carson Facility has been utilized for industrial uses since the 1960s. The pipeline corridor has been utilized as a railroad siding and later a pipeline corridor since at least the 1960s (Padre, 2018). The Paramount Refinery has been in the process of converting operations from oil refining to renewable fuels since 2013.

2.4 Current Operations

The Paramount Refinery in the City of Paramount currently receives hydrogen delivered by tanker truck from the Praxair Facility located in Ontario, CA. A range of 5 to 7 trucks per day (with an average of 6 trucks per day) deliver liquid hydrogen from a distance of 45 miles one-way from the Praxair facility to the Paramount Refinery.

2.5 Project Objectives

Pursuant to Section 15124(b) of the CEQA Guidelines, the description of the proposed Project is to contain "a clearly written statement of objectives" that would aid the lead agency in developing a reasonable range of alternatives to evaluate in the EIR and would aid decision makers in preparing findings and, if necessary, a statement of overriding considerations. The City of Carson is the lead CEQA agency responsible for preparing the EIR. The City of Carson decision-makers will consider the EIR for certification and the proposed Project for approval.

In addition, CEQA requires that the objective include the "underlying purpose of the project" and not narrowly craft the project objectives and thereby fail to reflect the fundamental purpose of the project.

The underlying purpose of the Project is to supply the Paramount Refinery with hydrogen.

The proposed Project objectives, as provided by the Applicant, are summarized as follows:

Air Products is requesting a Conditional Use Permit from the City of Carson to allow for the construction and operation of a hydrogen pipeline between Air Product's existing Carson facility and the Paramount Refinery to facilitate the production of alternative fuels for use in Southern California.

The objectives of the Project are as follows:

- Extend the existing Air Products pipeline network to the Paramount Refinery to service an additional customer, World Energy, with hydrogen, and reduce truck trips by five to seven tanker trucks each day;
- Convert existing petroleum pipelines for 11.5-miles of the proposed route to hydrogen service which will reduce construction-related disruption to area residents and motorists;
- For construction-related activities utilize local union contractors where appropriate;
- Provide for the safe flow of up to seven million standard cubic feet per day (7 mmscfd) of hydrogen through the pipeline; and
- Support production of renewable bio-fuels in Southern California.

2.6 Existing Pipeline

The existing 11.5-mile pipeline crosses the cities of Carson, Los Angeles, Long Beach, Lakewood, Bellflower, and Paramount in addition to an unincorporated part of the County of Los Angeles and land owned or controlled by the Port of Los Angeles and the Joint Ports Authority. Table 2.2 provides data on the existing pipeline segments locations, pipeline size, and pipeline wall thickness.

Table 2.2 Existing Pipeline Information

Location Description	Pipe Diameter Inches	Wall Thickness Inches
Line 3B – Sepulveda Blvd. to Intermodel Terminal	6/8	0.25
Line 4 – Intermodel Terminal to N. Paramount Blvd./South Street	6/8	0.18-0.25/0.25
Line 1150 – North Paramount Blvd. to South Street Vault	12	0.33
Line 244- South Street Vault to Paramount Refinery (Paramount)	12	0.33

Source: Applicant/Padre Associates, Inc.

Table 2-3 below provides additional details on each pipeline segment.

Table 2-3 Pipeline Segment Description Summary

Segment	Outside Diameter (inches)	Pipe Wall Thickness (inches)	Pipe Grade	Segment Length (feet)	Maximum Design Pressure (psig)*
New Air Products Carson Plant Site to Sepulveda Boulevard	8.625	0.322	API 5L X52	2,929	1,941
Existing Line 3B from Sepulveda Boulevard to Intermodal Terminal	6.625	0.280	API 5L Grade B	1,039	887
Existing Line 4 from Intermodal Terminal to North Paramount Boulevard/South Street	8.625 and 6.625	0.280 (6) and 0322 (8)	API 5L Grade B	39,792	887 and 784
Existing Line 1150 from North Paramount Boulevard to South Street Vault	12.750	0.330	API 5L Grade B	980	543
Existing Line 244 from South Street Vault to Paramount Refinery	12.750	0.330	API 5L Grade B	11,813	543

Notes: * = pounds per square inch (psig)
Source: Pipeline Safety Technical Report, EDM Services, Inc.

Historical hydrotest data for the existing pipelines is shown in Table 2.4. Hydrotesting helps determine the condition of the pipeline and helps identify potential integrity issues. A hydrotest test would be performed after construction and before startup of the entire pipeline. Federal regulations (49 CFR Part 192) mandate hydrotesting of new gas pipelines before placing the line into operation. The pipeline will be tested at a pressure of 150% MAOP or 450 pounds per square inch (psig).

The pipeline has an average install date of 1941, with the average install date of the 6-8 inch segments of 1934 and the average install date of the 12 inch segments of 1955. About 4 miles of the pipeline was installed in 1920, 1.2 miles in 1930, 3 miles in 1952 and the remaining miles in 1958.

Table 2.4 Historical Hydrotesting Summary

CSFM#	Line Number	Line Size (inches)	Test Date	Test Pressure (psig)
1150	Lakewood Crude	12	August 10, 2015	942
244	12" Crude	12	August 20, 2015	942
217	Line 4	6/8	September 4, 2014	940
0222	Line 3B	6/8	September 4, 2014	940

Notes: CSFM = California State Fire Marshall; psig = pound per square inch.
Source: Applicant/Padre Associates, Inc.

2.7 New Pipeline Construction

Construction is estimated to take five months with two active construction areas, from the Air Products Carson Facility to Sepulveda Boulevard and on Paramount Boulevard in Long Beach to connect the two existing Paramount pipelines. Construction activities are discussed in Section 2.7.3 below.

2.7.1 Construction Personnel

Estimated construction personnel and timing requirements are listed in Table 2.5.

Table 2.5 Estimated Construction Personnel and Timing

Spread Type	Location(s)	Personnel	Timing
Pipeline Spread	Pipeline Construction and Carson Tie-In	20-40 people	20 weeks
Pipeline Connections	Dominguez Station, South Street	5-10 people	8 weeks
Station Crew	Paramount Facility Connection	5-10 people	8 weeks

Source: Applicant/Padre Inc.

2.7.2 Equipment and Staging Areas

Construction of the proposed Project may require staging areas for the storage of materials and equipment. Staging areas would be set up at the two main construction sites, the Carson Facility and the Paramount Refinery. Pipe sections and associated materials would be strung along the pipeline right of way as construction activities proceed. Construction equipment would include the following:

- Lowboy trucks and trailers;
- Cranes;
- Dump trucks;
- Welders;
- Pipe bending machine;
- Rubber tire backhoes;
- Track backhoes;
- Ditching machines;
- Water trucks; and

- Side boom tractors.

Construction materials would include:

- 40 foot externally coated pipe sections;
- Pipe fittings;
- Pipe valves;
- Meters and associated measurement equipment;
- Electrical and control equipment;
- Reinforcing steel and concrete;
- Aggregate base material (rock, gravel, sand, slurry) for backfill and road base;
- Asphalt for paving;
- Line signs;
- Fencing; and,
- Water for dust control and hydrostatic testing.

Water would be purchased from the local water agency.

2.7.3 Construction Methods

The following sections provide a summary on the steps involved for the construction of each pipeline segment. No horizontal directional drilling (HDD) drilling would be required. The proposed method for pipeline construction would be trenching to install the new section of pipeline.

Mobilization

Mobilization activities include the installation of temporary construction trailers and security fencing, material deliveries, and equipment deliveries to the Project site. Trucks and trailers would be used for mobilization activities.

The Contractor would notify Underground Service Alert (USA) who would provide notification to any service providers that could be impacted. The intent is to prevent damage to utilities and disruption in service to customers.

Equipment Fueling

Construction equipment refueling would take place along the right-of-way and would include the use of absorbent material to contain any over-filling. This material would also be available for emergency containment scenarios.

Right-of-Way Clearing

Minimal clearing activities are anticipated for the proposed Project. There is no vegetation present at either construction site along the route due to the developed nature of the area. There would be a cleared area along the pipe construction site which is barren and would require minimal grading. Any clearing that would occur would be minimized in area.

For landowner security, existing fences crossing the right-of-way would be braced, cut, and fitted with gates. The openings would be controlled during construction. Pre-existing fences would be replaced, and braces kept in place after construction.

Ditching

Typical ditches would be excavated using rubber-tired backhoes, ditching machines, and track backhoes and would be between five and six feet deep and three feet in width. Hand digging using "air-knife" and shovels would be used in the vicinity of substructures. Ditch spoils and contaminated soil suitable for backfilling at the site of origin will be used as such. Unsuitable materials would be disposed of offsite, in accordance with all applicable laws, ordinances, regulations and standards. Water trucks equipped with spray nozzles would be used for fugitive dust control.

Hauling and Stringing the Line Pipe

Line pipe will be transported to the pipeline right-of-way via trucks and trailers. If space allows, trucks would carry the line pipe along the right-of-way and side-boom tractors would unload the joints of pipe and place the pipe along the ditch line for eventual line-up and welding.

Pipe Bending, Fit Up, and Welding

A portable bending machine would be used in order to bend externally coated line pipe to fit the contours of the ditch. Prefabricated "shop" bends may be used in some sharp transition circumstances.

The pipe joints would be fitted together using either external or internal lineup clamps. The clamps are used in order to hold the ends of each pipe joint in position until 50 percent or more of the first welding pass is complete.

After fitting, the welding crew would apply remaining weld passes. Qualified welders would perform all field welding in accordance with Air Products specifications, American Petroleum Institute (API) Standard 1104 (Welding Pipelines and Related Facilities), and the Code of Federal Regulations (CFR) Title 49, Part 192. A minimum of one 20-pound dry chemical unit fire extinguisher would be included in each welding truck as a safety measure.

Weld Inspection

100% X-ray inspection will be performed on all welds during construction to confirm the integrity of all welds. Hydrotesting will be done to confirm the condition of the pipeline. Air Products will eliminate approximately ten valves along the existing the pipeline system. These valves will be replaced by welded pipe sections. The tests are designed to ensure that the pipe, fittings, and weld sections would maintain mechanical integrity without leakage or failure under normal operational pressures and pressures significantly higher than normal.

Circumferential Pipe Weld Joint Coating

Before delivery to the Project site, the new pipe would receive an external coat of fusion bonded epoxy (FBE) at the coating or pipe mill. The new pipeline segments will be 14 to 16 mils FBE coated. The purpose of these coatings is to protect the pipeline during operational corrosion. Existing portions of the pipeline are coated with Somastic asphalt mastic, cold tar, and Orange X-TRUCOAT.

An inspection of the length of the new pipe would be conducted to ensure integrity of the coating. A testing device known as a holiday detector would be used to locate any discontinuities in the coating by developing an electrical potential between the pipe and the electrode in contact with the outside coating.

This is to ensure that no moisture or electrical current would be able to reach the pipe. This process would take place over the length of the pipe prior to backfilling.

Line Lowering

Side-boom tractors would be used to lift and lower the pipe into the ditch, with the assistance of cradles with rubber rollers or padded slings to avoid damage to the external coating. The side booms would be spaced so that there would be no mechanical damage from the weight of unsupported pipe.

"Bell holes" would be dug at pipe joints to facilitate welding and joint coating access. These welds would occur after the pipe sat at its final elevation and alignment.

Backfilling and Compaction

In situations in which the native material is suitable for backfilling, it would be reused. Suitable material would have rounded rocks no greater than 0.75 inch in size in order to avoid damage to the pipe coating. If native material contained larger rocks, it could be either replaced with sand or other material or filtered through a standard screen for use. This type of material is necessary for padding and shading of the pipe which would fill to 12 inches above the pipe. Remaining material would then be placed on top, including unsuitable native material if it was not screened if it is appropriate for compaction.

Criteria for material suitability is dependent on area compaction requirements. Some uses, such as paved roadways, require material with greater structural integrity for greater compaction. Use of the proper backfill material, backfilling in lifts (approximately 12 to 18 inches at a time), use of compaction rollers and/or hydraulic tampers, use of sand cement slurry, and compaction testing would ensure that all trench locations are compacted in accordance with good engineering practices and local permit requirements.

As a safety precaution in areas with unrestricted access, trenches would be fenced, backfilled, or covered with steel plates at the end of each workday. Normal depth of cover for pipelines is three feet (36 inch) from grade to the top of the pipe.

2.7.4 Testing and Inspection

As noted above, welded pipeline sections would be inspected by X-ray during the construction process. All new circumferential welds would be inspected radiographically in accordance with API 1104 guidance which exceed 49 CFR 192 requirements that call for only a specified percentage of welds to be inspected. Prior to startup of the proposed Pipeline the line would be checked with a hydrotest, a pipeline assessment, a pipe joint inspection, and a coating survey.

Federal regulations (49 CFR Part 192) mandate hydrotesting of new gas pipelines before placing the line into operation. The pipeline will be tested at a pressure of 150% of the Maximum Allowable Operating Pressure (MAOP). The proposed Pipeline operating pressure is 300 pounds per square inch (psig), therefore, the hydrotest pressure check would be at 450 pounds (psig).

Permanent records for each hydrostatic test would be maintained with the following information: the location of each test segment, elevation profile, description of the facility, and the continuous pressure and temperature throughout the test. Pursuant to 49 CFR 192, deadweight testers would be used to verify the accuracy of pressure-recording devices and charts during the test.

2.7.5 Access and Traffic Management

Portions of the pipeline construction would occur within existing road rights-of-way in two locations along the pipeline. Permits from the agency with jurisdiction over the streets would be obtained. Traffic control would be provided in accordance with the Federal Highway Administration's Manual on Uniform Traffic Control Devices.

Landowners, permittees, and business owners along the right-of-way would be notified prior to the beginning of construction about construction activities that could affect their business or operations. Notification would be provided by mail and telephone. Tenants would be notified in person prior to construction activities. Other notification would include the placement of signs around the Project site prior to construction.

Emergency response providers around proposed construction sites would be given advanced notices of construction locations, road closures, and possible alternate routes. Schedules for necessary street parking closures would be published in advance of closure. Signage would be provided to direct traffic to detours. Ample notice would be given to affected parties for them to plan alternate transportation routes.

2.7.6 Other Protection Measures

The operator proposes the following measures to minimize the potential impact to existing substructures and other pipelines during construction:

- Coordination with owners of existing substructures;
- Use of pre-qualified, experienced construction contractor;
- Use of electronic line locators;
- Underground Service Alert;
- Pre-Excavation meetings;
- Extensive use of potholing; and
- Using only non-mechanical digging in the immediate vicinity of known substructures.

2.8 Receiving Facilities

The proposed Project pipeline would terminate at the former Paramount crude oil refinery located in the City of Paramount. The World Energy Paramount Facility (Paramount Refinery) Renewable Fuels Project was approved by the City of Paramount (CUP 757) in 2014 to convert up to 3,500 barrels per day of non-edible vegetable oils and high-quality technical beef tallow into renewable jet and diesel fuel. The proposed Hydrogen Pipeline Project is designed to replace existing truck deliveries of liquified hydrogen to the Paramount Refinery.

World Energy has recently applied to the City of Paramount to modify the existing CUP and allow for full conversion of the Refinery to produce biofuels with a capacity of 25,000 barrels per day. The proposed modifications would include a new Pretreat Unit, modifications to the existing Renewables Fuels Units, a new Renewable Fuels Unit, a new Hydrogen Generation Unit, a new Hydrogen Recovery Unit, a new Propane Recovery Unit, upgrades to the existing wastewater treatment system, a new Hydrogen Sulfide Recovery Unit, a second Sour Water Stripper, a new flare, modifications to the truck and rail loading/unloading racks, and new pipelines within the facility. In addition, some existing tanks would be upgraded/repaired and be permitted to handle different products (e.g., non-edible vegetable oils and

beef tallow) and would utilize two existing 55,000-barrel storage tanks at the Lakewood Tank Farm. Since the proposed Hydrogen Pipeline Project is designed to replace the existing truck deliveries of hydrogen that the Paramount Refinery receives, any environmental impacts associated with future modifications to the Paramount Refinery are not analyzed here, but will be analyzed in the CEQA document to be prepared for that proposed modification. The Paramount Refinery proposed modifications at the will be considered as part of the Cumulative Projects Section of the EIR.

2.9 Pipeline Safety Measures

Safety measures to minimize the potential for a release from the proposed Pipeline are discussed in the following sections.

2.9.1 Monitoring

The proposed Pipeline would be monitored 24 hours a day, 365 days a year from a control room facility. Potential abnormalities in pipeline operation would include leaks and changes in pressure. Operators would view live data from the pipeline meter stations, productions units, and automated leak detection systems. Field technicians would conduct routine patrols of the pipeline route with quarterly inspections at all insulating flanges, valve stations, above-ground piping and cased crossings. Patrols would include quarterly ground level patrol and routine presence on the right-of-way.

2.9.2 Leak Detection

The proposed Pipeline would include an online leak detection system that would continuously monitor the pipeline to detect leaks. The proposed Pipeline design includes actuated valves at the Carson Facility and at the Paramount Refinery and an automatic shutoff valve (ASV) at the existing Dominguez Pump Station along the pipeline. The ASV can be actuated automatically by the leak detection system and by the Supervisory Control and Data Acquisition (SCADA) system operators in the Carson/Wilmington and/or CSC (Houston) Control room. A SCADA system is a computerized system of pipeline communications and system control. An automatic de-inventory vent would be installed at the Carson Hydrogen Facility.

The SCADA online leak detection system would determine a potential leak location and size of the leak. The ASV would be closed to isolate sections of the pipeline and vent the pipeline line segment to the flare at the Carson Facility. The valve closure (s) and location (s) would depend on the location of the leak. The isolation and de-pressurization components can be actuated automatically, via the control room operator in Carson/Wilmington and/or the USA based Customer Service Center located in Pasadena, Texas.

A manual valve would be installed in an underground vault on South street near Orizaba Avenue. There would also be manual block valves located at each end of the pipeline. These are located within the Carson Facility and the Paramount Refinery. Manual valves can be closed by the pipeline technician within 10 minutes of notification.

2.9.3 Cathodic Protection

The existing pipelines are bonded electrically together using four rectifiers. The system is isolated from aboveground piping using insulated flanges in various locations. For the proposed Pipeline, the integrity of the cathodic protection (CP) system would be tested at 32 locations along the pipeline route. The CP system(s) that are responsible for protecting the existing pipelines consist of the following components:

- Four impressed current cathodic protection (ICCP) rectifiers;

- Four separate ground beds; and
- 32 test points along the pipeline route to check the effectiveness of the CP system.

As required by 49 CFR 192, the operator will inspect each of its CP rectifiers to ensure that the line is being adequately protected from external corrosion. The CP system will be tested at least once per calendar year by taking pipe to soil readings consistent with 40 CFR 192 requirements.

2.9.4 Visual Inspections

If any section of underground pipeline is exposed for any reason, it will be examined for evidence of external corrosion in accordance with 49 CFR 192. If active corrosion is found, the operator will investigate and determine the extent. Pipeline operators are required to maintain records of these U.S. Department of Transportation (USDOT) required inspections and the records are routinely reviewed by USDOT staff.

In addition, the operator will at least four times annually, and at intervals not exceeding 4.5 months between each patrol, inspect the surface conditions on or adjacent to each pipeline right-of-way. Methods of inspection may include walking, driving, flying, or other appropriate means of traversing the right-of-way.

2.9.5 One Call System

To minimize the potential for pipeline damage from other construction activities the operator would subscribe to the USA North underground service alert “one-call” system. The “one call” system is a toll-free number is available for contractors and others to use before they begin excavations. Once a contractor calls and identifies its proposed excavation location, the organization notifies the underground facility owners in the vicinity. The owners respond to these calls with personal communications with the excavator. Operators can then mark the location of their facilities on the ground, to minimize the risk of damage from other projects. The operator will respond to all USA queries in a timely manner, mark the exact location of the pipeline, and communicate with those responsible for the excavations. Participation in a one-call system meets the requirements for an operator's damage prevention program pursuant to 49 CFR 192 requirements.

2.9.6 Pipeline Markings

Federal regulations require the installation and maintenance of line marker posts such that the pipeline is readily identifiable. In addition to the required signage, the operator would install warning signs at each side of a road, railroad, or waterway crossings, and at fence lines across open property, crossings of other lines (e.g. irrigation, oil, gas, telephone, utilities) where practical, and where the line is above ground in areas accessible to the public. These practices are intended to prevent third party damage from excavation.

A polyethylene marker tape, marked with an appropriate warning and the 24-hour operator control center phone number, would be installed approximately two feet below the ground surface, over the top of the buried pipeline. The intent of this marker tape is to alert an excavator, who may not have followed the USA One-Call regulations, before damage is caused to the pipeline.

2.10 Pipeline Operations

The pipeline will be owned by Paramount Pipeline and operated by Air Products. Air Products will be responsible for all maintenance of the pipeline. Normal operating parameters are:

- Operating pressure approximately 260 psig; and
- Maximum daily throughput seven million cubic feet of hydrogen gas (MMSCFD).

The pipeline will transfer the hydrogen gas from the Air Products facility in Carson to the Paramount Facility. The proposed Project would replace the current delivery operation by truck.

Subpart N of 49 CFR 192, Qualification of Pipeline Personnel, prescribes the minimum requirements for operator qualification of individuals performing covered tasks on a pipeline facility. All Air Products staff would be trained and comply with these regulations.

2.10.1 Supervisory Control and Data Acquisition System

The proposed Pipeline segment would be remotely monitored and operated from Air Products' SCADA system operators in the Carson/Wilmington or CSC (Houston) Control room. These control centers are continuously staffed (24 hours per day, 365 days per year). The function of the SCADA system is the send instructions and receive data from Programmable Logic Controllers (PLCs) located at each facility along the pipeline.

The proposed Pipeline operations system is based on SCADA which will gather and analyze data from multiple sources along the pipeline. SCADA will continuously monitor pipeline operations and would send alerts to the controllers if any unusual pipeline conditions were to occur. All alarms would be recorded and logged in the control center. The SCADA system has regulated power and an uninterruptible power supply (UPS).

2.10.2 Emergency Response

Air Products has an existing Emergency Response Plan that specifies measures to be taken in various emergency scenarios. The Emergency Response Plan identifies the responsible parties for the incident command and supporting agencies/organizations. Air Products' maintenance and operations personnel are trained in the Incident Command System and gas release emergency response procedures. Air Products would conduct training drills with community first responders.

The operator estimates a ten-minute average response time to various locations to response to a potential leak and a personnel technician response time of one hour. The ASV would be monitored via the SCADA system and actuated in the event of a leak detection scenario.

All the Air Products SCADA systems have battery backup to address a power failure. The communication system operates on local independent remote terminal units (RTU's), and therefore will continue to operate as designed with a loss of communication.

2.10.3 Emergency Flare

The proposed pipeline would be connected to Air Products' existing local area medium-pressure hydrogen pipeline system. The proposed pipeline would operate at a lower pressure than the existing hydrogen pipeline system, which will be achieved via a pressure reduction system (e.g., valving, controls, etc.). To ensure the safe operation of the proposed pipeline, the proposed pipeline would be connected to the existing clean service flare at the Air Products Carson Facility. There are two emergency relief scenarios that could occur during the proposed pipeline operation that would need to be managed by the existing flare at the Carson Facility: 1) the pressure reduction system fails and medium pressure product uncontrollably flows into the lower pressure pipeline creating an over-pressurization that must be

relieved via the flare (until manual isolation can occur), and 2) a rupture or leak in the proposed pipeline is detected by the SCADA monitoring system and the system operator needs to relieve the pressure in the pipeline via the flare. Air Products has not identified any other potential flaring scenarios associated with the proposed pipeline at this time.

Air Products has submitted applications with the South Coast Air Quality Management District for modification of the existing flare system to allow for tie-in of these pressure reliefs to the plant flare header (Application No. 623039), to modify the existing Flare Monitoring and Recording Plan to account for the new potential flaring activities associated with the proposed pipeline (Application No. 623041), and to update the facility Title V permit accordingly (Application No. 623040).

2.11 Applicant Proposed Avoidance and Minimization Measures

The Applicant's application contained several Avoidance and Minimization Measures (AMMs) to minimize the Project's environmental impacts, as detailed below in Table 2-6. The Applicant would implement these measures during the design, construction and operation of the pipeline.

Table 2.6 Avoidance and Minimization Measure Summary

Issue Area	Measures
Air Quality	Fugitive dust mitigation measures: Water all active construction sites at least twice daily. Frequency should be based on the type of operation, soil, and wind exposure. Implement SCAQMD Rule 1166, including all notification/monitoring/management requirements. Reduce travel speeds of onsite vehicles on unpaved roads and surfaces within the pipeline trench construction area to 15 miles per hour. Cover inactive storage piles. Sweep streets if visible solid material is carried out from the construction site.
Biological Resources	Schedule ground-clearing activities prior to the initiation of nesting activity (April) or after fledging (August); or Conduct pre-construction surveys between February 15 and August 15 in potential raptor and bird nesting habitat to identify nest sites. If an active nest is observed within the vicinity of the Project site, contact California Department of Fish and Wildlife to establish the appropriate buffer around the nest tree. For identified raptors nests, a 350-foot buffer around the nest tree would be activated. Construction activities would be prohibited in the buffer zone until the young have fledged the nest.
Cultural Resources	A professional archaeologist and Native American monitor would be retained to monitor all Project related earth disturbances within the first 100 feet of the underground portion of the Project site. The area recommended for monitoring would start approximately 400 feet southeast of the intersection with South Alameda Street and where the Project site transitions from aboveground to underground. The area would continue east for 100 feet into the Air Products Carson Hydrogen Facility. At the commencement of Project construction, an archaeological monitor shall give all workers associated with earth-disturbing procedures an orientation regarding the probability of exposing cultural resources and directions as to what steps are to be taken if a find is encountered.

Table 2.6 Avoidance and Minimization Measure Summary

Issue Area	Measures
	The archaeologist shall have the authority to temporarily halt or redirect Project construction in the event that potentially significant cultural resources are exposed Based on monitoring observations and the actual extent of Project disturbance, the lead archaeologist shall have the authority to refine the monitoring requirements as appropriate (i.e., change to spot checks, reduce or increase the area to be monitored) in consultation with Air Products and the lead CEQA Agency. If human remains are unearthed, State Health and Safety Code Section 7050.5 requires that no further disturbance shall occur within that area until the County Coroner has made the necessary findings as to origin and disposition to be of Native American descent. The Coroner has 24 hours to notify the Native American Heritage Commission. The lead CEQA Agency and Air Products shall also be notified of any such find.
Geology and Soils	Engineering analysis for Project design would include recommended geotechnical engineering measures for ground shaking, liquefaction hazards, and expansive soils as necessary.
Hazardous and Hazardous Materials	Equipment refueling would be conducted away from waterway areas. Hazardous materials utilized for Project construction would be stored in their original containers within secure staging areas or storage containers. Spill containment and cleanup materials would be stored on-site for clean-up of spills during refueling or servicing of equipment. A Quantitative Risk Assessment (QRA) would be prepared and would discuss the safety and public risk issues associated with Project facilities. These discussions would include information regarding hydrogen gas, pipeline safety standards, incident statistics, and associated Project design considerations. The QRA will present a quantitative risk assessment of the likelihood and consequences of unintentional pipeline releases. A Phase II site assessment would be completed in areas along the proposed pipeline route identified with a high likelihood of encountering soil from current or historical petroleum transportation or refining activities. The objective of the Phase II site assessment activities would be to identify the areas of soil contamination where special worker protection and waste handling/disposal requirements would be required during pipeline construction activities. Air Products will comply with SCAQMD Rule 1166 which would dictate removal of any VOC-contaminated soil (50 ppm or greater) from site using end dumps provided by Waste Management and taken to a local, approved landfill for disposal (estimated to be less than 100 cy based on soil analytical data). A Contaminated Materials Management Plan (CMMP) would be prepared and implemented during the course of the construction activities planned at the Project site. The CMMP will include maps illustrating areas of suspected or known soil contamination. The CMMP will also include the methods for identification of contaminated materials, and removal/disposal of contaminated materials. A site-specific Health and Safety Plan would be developed for the protection of workers and the community during the handling of contaminated materials. The operator would establish a continuing educational program to enable the public, appropriate government organizations and persons engaged in excavation-related activities to recognize a hazardous gas pipeline emergency and to report it to the operator or the fire, police, or other appropriate officials.

Table 2.6 Avoidance and Minimization Measure Summary

Issue Area	Measures
	The contractor would notify Underground Service Alert at least 48 hours prior to excavation so that utilities can be marked and avoided during construction. The pipeline would operate at a pressure of 260 pounds per square inch gauge (psig) but wil be designed for a Maximum Allowable Operating Pressure (MAOP) of 300 psig. Ten manual valves would be removed and replaced by welded piping.
Hydrology and Water Quality	A SWPPP would be prepared for construction activities associated with the proposed Project. The SWPPP will aid in the determination of best management practices (BMPs) to prevent any pollution into the water bodies crossed by the Project site. All BMPs will be implemented to the extent feasible.
Noise	Equipment engine covers shall be in place and mufflers shall be in good working condition.
Public Services	The following measures would be taken to prevent damage to existing utilities and substructures: coordination with owners of existing substructures, use of prequalified experienced construction contractor, use of electronic line locators, pre-excavation meetings, extensive use of potholing, and non-mechanical digging in the immediate vicinity of known substructures. Solid waste generated during construction would be collected from the Project site and disposed in accordance with applicable regulations. Concrete and asphalt rubble generated by the Project would be appropriately recycled.
Traffic and Circulation	Traffic control measures would be implemented in accordance with the Work Area Traffic Control Handbook. These measures include appropriate visual traffic control including signs, traffic cones, and flaggers. These measures are intended to reduce hazards to both workers and motorists during construction. Warning signs would be installed prior to construction to notify through traffic of trucks entering and leaving the site and to allow commuters to plan for alternative routes. Alternative vehicle and pedestrian access would be established. Construction would be minimized during Holidays when feasible.

Source: Applicant/Padre Associates, Inc.

2.12 Regulatory Oversight

The City of Carson is the lead California Environmental Quality Act (CEQA) agency, Table 2.7 presents the anticipated permits and approvals required for construction and operation of the proposed Project.

Table 2.7 Regulatory Overview

Agency	Permit/Approval	Regulated Activity	Authority
State of California Agencies			
Regional Water Quality Control Board	Storm Water Pollution Prevention Plan Approval	Storm water discharges during Project construction	Clean Water Act
Local Agencies			
City of Carson	Conditional Use Permit, Construction Permit	New use, environmental review, and construction permit	City Code
City of Carson Public Works Dept.	Encroachment Permit,	Work within public right-of-way	City of Carson Public Works Dept.

Table 2.7 Regulatory Overview

Agency	Permit/Approval	Regulated Activity	Authority
Los Angeles County Flood Control District	Temporary Use and Access	Modifications to existing pipe bridge crossing the Los Angeles River	County Code
Port of Los Angeles	Amendment to Franchise Agreement	Change in pipeline use	City Code
Joint Ports	Amendment to Master Joint Revocable Permit	Change in pipeline use	Joint Powers Authority Charter
City of Long Beach	Amendment to Franchise Agreement/ Construction Permit/ Encroachment Permit	Modification to existing Franchise Agreement, Work within public rights-of-way	City Code
City of Lakewood	Construction Permit	Piping Modification	City Code
City of Paramount	Construction Permit	Pipeline Tie-In	City Code
South Coast Air Quality Management District	Authority to Construct/Permit to Operate	Potential use of existing flare at the Carson Facility during two potential emergency relief scenarios.	Clean Air Act

Source: City of Carson

2.13 References

Air Products. 2020. Company Hydrogen Services [online]: www.airproducts.com.

City of Paramount. 2020. Notice of Preparation of a Draft Subsequent Environmental Impact Report for Paramount Petroleum AltAir Renewable Fuels Project. May 2020.

Code of Federal Regulations, 49CFR192. 2011. Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards. October 2011.

Padre Associates, Inc. 2020. Project Description Proposed Carson to Paramount Hydrogen Pipeline Project. April 2020.

Padre Associates, Inc. 2018. Phase I Environmental Site Assessment Proposed Carson to Paramount Hydrogen Gas Pipeline Project. November 2018.

Padre Associates, Inc. 2018. Project Execution Plan for Carson to Paramount Hydrogen Gas Pipeline Project. December 2018.

PraxAir. 2020. Company Hydrogen Services [online]: www.praxair.com

US Department of Energy. 2013. Hydrogen Delivery Technical Team Roadmap. June 2013.

This Page Left Intentionally Blank

3.0 Cumulative Scenario

This section of the Environmental Impact Report (EIR) provides a summary of the methodology used to analyze cumulative impacts and a list of the projects included in the cumulative analysis.

3.1 Cumulative Methodology

Section 15130 of the California Environmental Quality Act (CEQA) Guidelines requires that a Supplemental Environmental Impact Report (SEIR) discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable. Section 15355 of the CEQA Guidelines defines "cumulative impacts" as two or more individual effects that, when considered together, are either considerable or compound other environmental impacts. Cumulative impacts are further described as follows:

- The individual effects may be changes resulting from a single project or a number of separate projects (CEQA Guidelines, Section 15355[a]).
- The cumulative impacts from several projects are the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time (CEQA Guidelines, Section 15355[b]).

Furthermore, according to State CEQA Guidelines Section 15130(a)(1):

> As defined in Section 15355, a "cumulative impact" consists of an impact that is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. An EIR should not discuss impacts which do not result in part from the project evaluated in the EIR.

In addition, as stated in the State CEQA Guidelines, Section 15064(h)(4):

> The mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed Project's incremental effects are cumulatively considerable.

The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great a level of detail as is provided for the effects attributable to the project alone. The discussion should be guided by the standards of practicality and reasonableness and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact (CEQA Guidelines Section 15130(b)).

The goal of the cumulative project analysis is to identify those reasonably foreseeable projects that could have spatial and temporal overlaps with the proposed Project. Projects with temporal overlaps include those that are planned to occur during the same timeframe as the proposed Project. Projects with spatial overlaps are those that would have impacts in the same area or on the same resources as those of the proposed Project (e.g., traffic that could affect the same roadways).

The area within which a cumulative effect can occur varies by issue area. For example, air quality impacts tend to disperse over a large area, while safety impacts are typically more localized. For this reason, the

geographic scope for the analysis of cumulative impacts must be identified for each issue area. The analysis of cumulative effects considers several variables including geographic (spatial) limits, time (temporal) limits, and the characteristics of the resource being evaluated. In addition, each of the cumulative projects has its own implementation schedule, which may or may not coincide or overlap with the proposed Project's schedule.

One of the main goals of the cumulative analysis was to determine if a significant adverse cumulative condition presently exists to which Project impacts could contribute, and then to determine if the incremental project-specific impact to the existing adverse cumulative conditions is cumulatively considerable. If the project would not result in a project-specific impact, then the project could not contribute to any existing adverse commutative impact that might exist. On the other hand, if a project-specific impact was found to be significant and unavoidable in a specific issue area, then in most cases this would mean that the cumulative impacts would be significant and unavoidable.

The cumulative impact analysis for each individual issue area is included in the respective discussions in Sections 4.1 through 4.6 of this EIR.

3.2 Cumulative Projects

In most cases, the EIR uses a list-based approach for assessing the potential for significant cumulative impacts. The discussion below provides a description of ongoing projects within the various jurisdictions the Air Products Hydrogen Pipeline traverses, as appropriate. Those include the City of Carson, City of Los Angeles, County of Los Angeles, City of Long Beach, City of Lakewood, City of Bellflower, and City of Paramount. Table 3-1 provides a list of the cumulative projects. Table 3-1 is located at the end of this chapter.

City of Carson

The City of Carson has a number of mixed-use commercial projects, residential projects, and industrial projects that are in the review process. The Prologis Dominguez Technology Center project consists of two industrial warehouses with office: Building 1 is 318,186 square feet with 41 dock doors; and Building 2 is 120,540 square feet with 17 dock doors. In addition, plans call for 43 truck/trailer parking, 514 passenger vehicle off-street parking, and 133,504 square feet landscape. The AL2 project consists of a 411,840-square-foot industrial warehouse with mezzanine, 101,600 square feet landscape, 65 dock doors, 100 truck/trailer parking, and 300 passenger vehicle off-street parking. There is also The District at South Bay, a high-end fashion mall on 157-acre site with approximately 1,601,500 square feet of regional commercial, general commercial and related uses, including outlet and entertainment uses, no more than 1,250 residential units, and 350 rooms total in two hotels. The Carol Kimmelman Athletic and Academic Campus Project site is approximately 87 acres within the existing 171-acre Links at Victoria Golf Course and adjacent tennis courts. The Kimmelman project includes three basic areas: (i) the Learning Center, (ii) the Tennis Center and (iii) the Soccer Center. The Tennis Center would include up to 62 tennis courts of varying sizes, a tennis exhibition court, player development building, tournament building, administration building, maintenance buildings, and other recreational amenities, and associated restroom and storage facilities. The Soccer Center would include up to eight soccer fields, two multi-use fields, maintenance buildings and associated restroom and storage facilities. The overall athletic and academic campus would include other recreational amenities for community use. Such amenities may include additional active recreational areas such as exercise areas, skateboarding facilities, and walk/running trails as well as passive recreational areas.

City of Los Angeles

There are no projects under review in the immediate vicinity of the Project within the City of Los Angeles that are likely to result in a cumulative impact.

County of Los Angeles

The Los Angeles County Metropolitan Transportation Authority (Metro) is evaluating a new light rail transit line that will connect southeast Los Angeles County to downtown Los Angeles utilizing a combination of abandoned Pacific Electric Right-of-Way and freight ROW. The proposed Project would serve the cities and communities of downtown Los Angeles, unincorporated Florence-Graham community of Los Angeles County, Vernon, Huntington Park, Bell, Cudahy, South Gate, Downey, Paramount, Bellflower, Cerritos, and Artesia. In addition, the project is expected to provide a direct connection to the Metro Green Line, Metro Blue Line, and the Los Angeles County regional transit network.

City of Long Beach

The City of Long Beach currently has a number of assisted living facility projects, mixed use commercial projects, and residential projects that are in the review process. There is also the Belmont Beach and Aquatics Center, a 125,500 square-foot pool complex, consisting of indoor and outdoor Olympic-sized pools, a competitive diving well, warm water pool for training and therapy, children's recreation pool, whirlpool spa, and a second spa for divers. In addition, plans call for 55,745 square feet of passive park and landscape area, a freestanding café, and restroom facilities. The City is also renovating the Long Beach Airport by adding new ticketing facilities, airlines operations offices, outbound carousel, TSA baggage security, restrooms, concessions area, car rental counters, and ground transportation plaza. The Uptown project included the addition of 4 new buildings consisting of 1 building made up of shipping containers 5,776 sf, 3 buildings designed with curtain wells and metal siding 4,159 sf, 4,858 sf, 3,354 sf, and the addition of 2,103 sf to an existing shopping center known as Harding Place. Expansion of shopping center will consist of new retail, restaurant, and office spaces. None of these projects are expected to have any cumulative impacts.

City of Lakewood

The Del Amo Boulevard and Lakewood Boulevard Intersection Improvements project consists of creating dual left-turn lanes at all four legs of the intersection and adding a bike lane to Del Amo Boulevard. The work includes: Reconstruct curb and gutter on the south side of Del Amo and both sides of Lakewood Blvd; Construct 6- to 8- foot wide sidewalks at all four corners of the intersection; Remove an existing median island on Del Amo; New pavement overlay on Del Amo and Lakewood Blvd.; install ADA compliant curb ramps at the intersection; catch basin relocations; widen a box culvert bridge at the LA County Flood Control District Channel; construct a 3-foot tall retaining wall topped with wrought iron fencing along the channel wall 300 feet east and west of Lakewood Blvd.; replace the existing shelter at the southeast corner of the intersection; traffic signal modifications; new signage and striping; relocate utility poles on the west side of the intersection; storm water quality treatment; replace landscaping; and relocate electrical utilities. Another ongoing project in the City of Lakewood is the Lakewood Stormwater and Runoff Capture Project at Mayfair Park. As a permittee under the NPDES Municipal Permit, the City must demonstrate that pollutant discharges from the watershed comply with applicable water quality goals, including total max daily loads, of the NPDES permit. The proposed project located at Mayfair Park would result in the design and construction of a facility to divert water from an adjacent urbanized concrete lined channel known as Clark Channel to fulfill its dual purpose of promoting water treatment and storage of runoff water and reducing the use of potable water for park purposes. This project is being implemented by the

City to incrementally meet its TMDL compliance while augmenting its local water supplies by using non-potable runoff water for irrigation.

City of Bellflower

The Downtown Bellflower Transit Oriented Development Mixed Use Project is proposed in two parcels: 1) Parcel A: Redevelopment of the existing vacant "Cosmopolitan Grocers" building with a new four (4) screen theater and retail commercial/restaurant land uses, and 2) Parcel B: Construction of a five (5) story, mixed-use, 91-unit condominium development with at-grade parking. Both Parcels A and B will be constructed concurrently and will be permitted separately.

City of Paramount

The expansion of the World Energy Renewable Fuels Project involves the conversion of the remainder of the Paramount crude oil refinery into a renewable fuels production facility, eliminating the refining of crude oil. The project modifications will include a new Pretreat Unit, modifications to the existing Renewables Fuels Units, a new Renewable Fuels Unit, a new Hydrogen Generation Unit, a new Hydrogen Recovery Unit, a new Propane Recovery Unit, upgrades to the existing wastewater treatment system, a new Hydrogen Sulfide Recovery Unit, a second Sour Water Stripper, a new flare, modifications to the truck and rail loading/unloading racks, and new pipelines within the facility. In addition, some existing tanks will be upgraded/repaired and be permitted to handle different products (e.g., non-edible vegetable oils and beef tallow). The Project also includes utilizing two existing 55,000-barrel storage tanks at the Lakewood Tank Farm.

Table 3-1 List of Cumulative Projects

Map Key #	Project Name	Description	Permit Status (as of June 2020)
City of Carson			
1	Prologis Dominguez Technology Center	▪ Two industrial warehouses with office ▪ Building 1 is 318,186 square feet with 41 dock doors ▪ Building 2 is 120,540 square feet with 17 dock doors ▪ 43 truck/trailer parking ▪ 514 passenger vehicle off-street parking ▪ 133,504 square feet landscape	Under Review
2	AL2	▪ 411,840-square-foot industrial warehouse with mezzanine ▪ 101,600 square feet landscape ▪ 65 dock doors ▪ 100 truck/trailer parking ▪ 300 passenger vehicle off-street parking	Under Construction
3	The District at South Bay	▪ High end fashion outlet mall on 157-acre site ▪ Approximately 1,601,500 square feet of regional commercial, general commercial and related uses, including outlet and entertainment uses, no more than 1,250 residential units, and 350 rooms total in two hotels.	Under Construction
4	Carol Kimmelman Athletic and Academic Campus Project	▪ The proposed project site is owned by the County of Los Angeles and is located at 340 Martin Luther King Jr. Street. ▪ The site is approximately 87 acres within the existing 171-acre Links at Victoria Golf Course and adjacent tennis courts. ▪ The proposed project includes three basic areas: (i) the Learning Center, (ii) the Tennis Center and (iii) the Soccer Center.	Under Review
County of Los Angeles			
5	Metro West Santa Ana Branch Transit Corridor Project	▪ A potential 19-mile new light rail transit line connecting southeast Los Angeles County to downtown Los Angeles utilizing a combination of abandoned Pacific Electric Right-of-Way and freight ROW.	
City of Long Beach			
6	Long Beach Airport Terminal Improvements	▪ 4100 Donald Douglas Drive ▪ New ticketing facilities, airlines operations offices, outbound carousel, TSA baggage security, restrooms, concessions area, car rental counters, and ground transportation plaza. ▪ 2,000 sf of new concession space	Under Construction
7	Douglas Park Northwest	▪ 3881 McGowen Street	Under Construction

Table 3-1 List of Cumulative Projects

Map Key #	Project Name	Description	Permit Status (as of June 2020)
		▪ Two-story executive office space, 3-percent skylights, secure concrete truck courts, dock-high and grade-level loading, LED lighting on sensors and 30- and 32-foot clear heights. ▪ Four buildings totaling 390,000 sf, ranging from 75,000 square feet to 135,000 sf	
8	Laserfiche Office Building	▪ 3535-3459 Long Beach Boulevard ▪ New 3-story creative office building with 100,000 gross sf and a 4-story parking garage. ▪ Also includes 5 residential townhomes which border the western side of the parking garage.	Under Construction
9	Riverdale	▪ 4747 Daisy Avenue ▪ New gated community consisting of 131 lots with 2 and 3-story homes.	Completed
10	Canvas	▪ Atlantic Avenue; from 56th Street to 60th Street ▪ Proposed interconnected, village-style mixed use project	Under Review
11	The Uptown	▪ 6151-6191 Atlantic Avenue ▪ Addition of 4 new buildings consisting of 1 building made up of shipping containers 5,776 sf, 3 buildings designed with curtain wells and metal siding 4,159 sf, 4,858 sf, 3,354 sf, and the addition of 2,103 sf to an existing shopping center known as Harding Place. ▪ Expansion of shopping center will consist of new retail, restaurant, and office spaces.	Entitlements Approved
12	Uptown Commons	▪ 6600-6630 Atlantic Avenue and 609-695 Artesia Boulevard ▪ Free-standing restaurant building with outdoor patio, two storage container/restaurant kiosks with outdoor patio, a free-standing restaurant with drive-through and patio, a free-standing bank with drive-up ATM, and a free-standing, ready -to-eat restaurant (coffee) building with drive-through and outdoor seating.	Under Review
City of Lakewood			
13	Del Amo Boulevard and Lakewood Boulevard Intersection Improvements	▪ Create dual-left turn lanes at all four legs of the intersection and add a bike lane to Del Amo Blvd. ▪ Slightly widen the intersection itself and a portion of Del Amo Blvd to accommodate the improvements. ▪ Reconstruct curb and gutter on the south side of Del Amo and both sides of Lakewood Blvd; Construct 6- to 8- foot wide sidewalks at	

Table 3-1 List of Cumulative Projects

Map Key #	Project Name	Description	Permit Status (as of June 2020)
		all four corners of the intersection; Remove an existing median island on Del Amo; New pavement overlay on Del Amo and Lakewood Blvd.; Install ADA compliant curb ramps at the intersection; Catch basin relocations; Widen a box culvert bridge at the LA County Flood Control District Channel; Construct a 3-foot tall retaining wall topped with wrought iron fencing along the channel wall 300 feet east and west of Lakewood Blvd.; Replace the existing shelter at the southeast corner of the intersection; Traffic signal modifications; New signage and striping; Relocate utility poles on the west side of the intersection; Storm water quality treatment; Replace landscaping; Relocate electrical utilities.	
14	Lakewood Stormwater and Runoff Capture Project at Mayfair Park	▪ The proposed project would result in the design and construction of a facility to divert water from an adjacent urbanized concrete lined channel known as Clark Channel to fulfill its dual purpose of promoting water treatment and storage of runoff water and reducing the use of potable water for park purposes. This project is being implemented by the city to incrementally meet its TMDL compliance while augmenting its local water supplies by using non-potable runoff water for irrigation.	
City of Bellflower			
15	Downtown Bellflower Transit Oriented Development Mixed Use Project	▪ The project is proposed in two parts: Parcel A & Parcel B. ▪ Parcel A: Redevelopment of the existing vacant "Cosmopolitan Grocers" building with a new four (4) screen theater and retail commercial/restaurant land uses. ▪ Parcel B: Construction of a five (5) story, mixed-use, 91-unit condominium development with at-grade parking.	
City of Paramount			
16	World Energy Renewable Fuels Project Expansion	▪ Continued conversion of the Paramount crude oil refinery into a renewable fuels production facility ▪ Project modifications will include a new Pretreat Unit, modifications to existing Renewable Fuels Unit, a new Renewable Fuels Unit, a new Hydrogen Generation Unit, a new Hydrogen Recovery Unit, a new Propane Recovery Unit, upgrades to existing wastewater treatment system, a new Hydrogen Sulfide Recovery Unit, a second Sour Water Stripper, a new flare, modifications to the truck	

Table 3-1 List of Cumulative Projects

Map Key #	Project Name	Description	Permit Status (as of June 2020)
		and rail loading/unloading racks, and new pipelines within the facility. ▪ Some existing tanks will be upgraded/repaired and be permitted to handle different products (e.g., non-edible vegetable oils and beef tallow). ▪ The Project also includes utilizing two existing 55,000-barrel storage tanks at the Lakewood Tank Farm.	

3.3 References

City of Bellflower. 2020. Downtown Bellflower Transit Oriented Development Mixed Use Project. Available at: https://ceqanet.opr.ca.gov/2020050144/8

City of Carson. 2019. Community Development. Planning: What's Happening in Development. Available at: http://ci.carson.ca.us/communitydevelopment/planningprojects.aspx

City of Lakewood. 2017. Del Amo Boulevard and Lakewood Boulevard Intersection Improvements. Available at: https://ceqanet.opr.ca.gov/2017051080/2

City of Lakewood. 2017. Lakewood Stormwater and Runoff Capture Project at Mayfair Park. Available at: https://ceqanet.opr.ca.gov/2017111036

City of Long Beach. 2020. Development Services: Development Projects Map. Available at: http://www.longbeach.gov/lbds/maps/

City of Paramount. 2020. Initial Study. Paramount Petroleum AltAir Renewable Fuels Project. May 2020.

Los Angeles County Metropolitan Transportation Authority. 2019. West Santa Ana Branch Transit Corridor. Available at: https://www.metro.net/projects/west-santa-ana/

This Page Left Intentionally Blank

4.1 Air Quality

The air quality section considers construction and operation related emissions of criteria pollutants, toxic air contaminants, and odors that could result from the proposed Project. Construction of the proposed Project would include site grading and earth moving, trenching for pipeline installation, and related transportation and mobile source emissions. Operation of the proposed Project has the potential for fugitive emissions from valves and connection points.

4.1.1 Environmental Setting

The Proposed Project is within the jurisdiction of the South Coast Air Quality Management District (SCAQMD), which encompasses 10,473 square miles, including the four-county South Coast Air Basin (the Basin) and the Riverside County portions of the Salton Sea Air Basin and the Mojave Desert Air Basin. The Basin, a subarea of SCAQMD jurisdiction, is bound by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The 6,745-square-mile Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties.

4.1.1.1 Meteorological Conditions

The climate in the Basin is characterized by sparse winter rainfall and hot summers tempered by cool ocean breezes. During the summer months, a warm air mass frequently descends over the cool, moist marine layer produced by the interaction between the ocean's surface and the lowest layer of the atmosphere.

The warm upper layer forms a cap, or inversion, over the cool marine layer and inhibits pollutants released into the marine layer from dispersing upward. In addition, light winds during summer further limit dispersion.

Sunlight triggers photochemical reactions that produce ozone, and this region experiences more days of sunlight than many other major urban areas in the nation due to climate, thereby increasing the potential for ozone formation.

Table 4.1-1 summarizes historical meteorological conditions in the Basin. Data readings were taken at the National Oceanic and Atmospheric Administration (NOAA) weather station at Los Angeles International Airport from 2001 until 2006.

Table 4.1-1 Historical Meteorological Data

Element	Average	Range
Highest temperature	93°F	84-101°F
Lowest temperature	40°F	36-43°F
Average temperature	58°F	55-63°F
Mean relative humidity	76%	75-77%
Days with heavy fog (visibility ≤ 0.25 miles)	25	15-35
Days with thunderstorms	3	0-10
Mean wind speed	7 mph	6.4-7.5 mph
Total precipitation	13.1 inches	5.03-18.8 inches
Snow, ice pellets, hail	None	None

Notes: F = Fahrenheit, mph = miles per hour.
Source: NOAA 2001-2006

4.1.1.2 Temperature and Rainfall

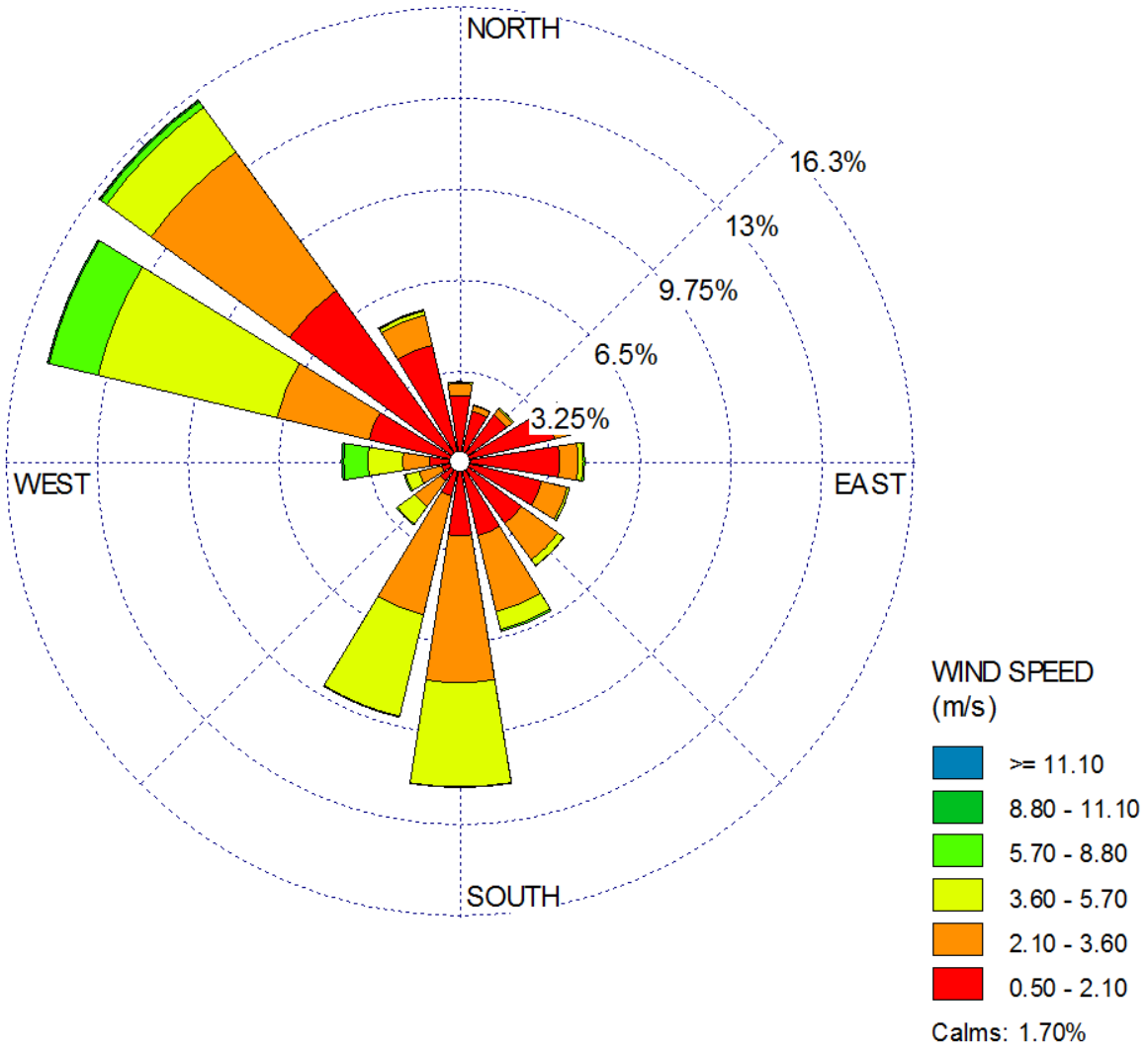
Temperature affects air quality in the region in several ways. Local winds are the result of temperature differences between the relatively stable ocean air and the uneven heating and cooling in the Basin from a wide variation in topography. Mean wind speed in the Basin is 7.5 miles per hour (mph). Temperature also significantly affects vertical mixing height and chemical and photochemical reaction times. Annual average temperatures throughout the Basin range from the low 40s in degrees Fahrenheit (°F) to the high 90s in °F. The coastal areas show little variation in temperature on a year-round basis due to the moderating effect of the marine influence. On average, September is the warmest month, while December and January are the coolest months of the year. Annual rainfall varies from a low of 5 inches to a high of 19 inches.

4.1.1.3 Wind Flow Patterns

Wind flow patterns play an important role in transporting air pollutants in the Basin. The winds flow from offshore and blow eastward during daytime hours. In summer, the sea breeze starts in mid-morning, peaking at 10 to 15 mph, and subsides after sundown. There is a calm period until approximately midnight, after which a land breeze commences from the northwest, typically becoming calm again around sunrise. In winter, wind flows in the same general patterns, except that wind speeds are slightly lower on average than summer wind speeds. This low wind-speed pattern is a major contributor to pollutant accumulation in the Basin. Normal wind patterns in the Basin are interrupted by unstable air accompanying passing storms during winter and infrequent strong northeasterly Santa Ana wind flows from the mountains and deserts north of the Basin. Figures 4.1-1 and 4.1-2 show wind rose data for Long Beach Airport, located approximately six miles east of the City of Carson and for the City of Pico Rivera, approximately 7 miles north east of the City of Paramount. A wind rose is a graphic representation of wind conditions (speed and direction) at a specific location.

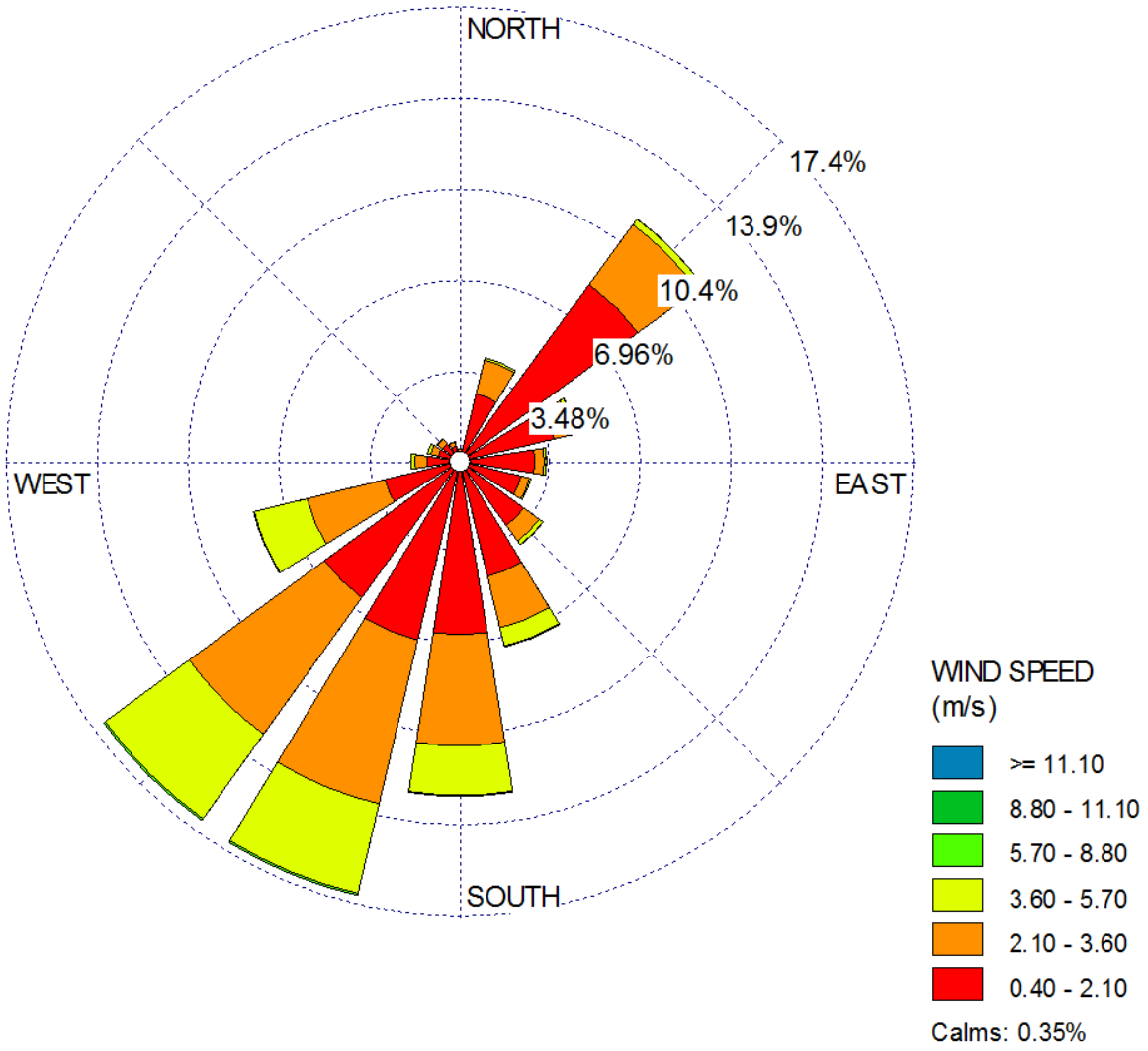
Long Beach Airport meteorological data indicates that predominant winds come from the north-west and the south. Pico Rivera meteorological data indicates that predominant winds come from primarily the south-west.

Figure 4.1-1 Wind Rose for Long Beach Airport Meteorological Station



Source: South Coast Air Quality Management District, 2012 to 2016 data set.

Figure 4.1-2 Wind Rose for City of Pico Rivera Meteorological Station



Source: South Coast Air Quality Management District, 2010 to 2016 data set.

4.1.1.4 Air Quality Monitoring

Air quality is determined by measuring ambient concentrations of air pollutants which are known to have adverse health effects. For regulatory purposes, state and national standards have been set for some of these air pollutants, which are referred to as "criteria pollutants." For most criteria pollutants, regulations and standards have been in effect, in varying degrees, for more than 25 years. The degree of air quality degradation for criteria pollutants is determined by comparing the ambient pollutant concentrations to health-based standards developed by government agencies. The current National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) for "criteria pollutants" are listed in Table 4.1-2.

Table 4.1-2 NAAQS and CAAQS Attainment Status for the South Coast Air Basin

Criteria Pollutant	Standard	Averaging Time	Designation[a]	Attainment Date[b]
1-Hour Ozone	NAAQS	1979 1-Hour (0.12ppm)	Nonattainment (Extreme)	2/6/2023 Originally 11/15/2010 (not attained)[c]
	CAAQS	1-Hour (0.09ppm)	Nonattainment	N/A
8-Hour Ozone[d]	NAAQS	1997 8-Hour (0.08ppm)	Nonattainment (Extreme)	6/15/2024
	NAAQS	2008 8-Hour (0.075 ppm)	Nonattainment (Extreme)	7/20/2032
	NAAQS	2015 8-Hour (0.070 ppm)	Nonattainment (Extreme)	8/3/2038
	CAAQS	8-Hour (0.070 ppm)	Nonattainment	Beyond 2032
CO	NAAQS	1-Hour (35ppm) 8-Hour (9 ppm)	Attainment (Maintenance)	6/11/2007 (attained)
	CAAQS	1-Hour (20ppm) 8-Hour (9 ppm)	Attainment	6/11/2007 (attained)
NO_2[e]	NAAQS	1 Hour (0.01 ppm)	Unclassifiable/Attainment	N/A (attained)
	NAAQS	Annual (0.053 ppm)	Attainment (Maintenance)	9/22/1988 attained
	CAAQS	1 Hour (0.18 ppm) Annual (0.030 ppm)	Attainment	---
SO_2[f]	NAAQS	1-Hour (75ppb)	Designation Pending	N/A (attained)
	CAAQS	24-Hour (0.14 ppm) Annual (0.03 ppm)	Unclassifiable/Attainment	3/19/1979 (attained)
PM10	NAAQS	1987 24-Hour (150 ug/m^3)	Attainment (Maintenance)[g]	7/26/2013 (attained)
	CAAQS	24-Hour (50 ug/m^3) Annual (20 ug/m^3)	Nonattainment	N/A
PM2.5[h]	NAAQS	2006 24-Hour (35 ug/m^3)	Nonattainment (Serious)	12/31/2019
	NAAQS	1997 Annual (15 ug/m^3)	Nonattainment	8/24/2016
	NAAQS	2012 Annual (12 ug/m^3)	Nonattainment (Serious)	12/31/2025
	CAAQS	Annual (12 ug/m^3)	Nonattainment	N/A
Lead	NAAQS	3-Month Rolling (0.15 ug/m^3)	Nonattainment (partial)[i]	12/31/2015
Hydrogen Sulfide(H_2S)	CAAQS	1-Hour (0.03ppm/42 ug/m^3)	Attainment	---
Sulfates	CAAQS	24-Hour (25 ug/m^3)	Attainment	---
Vinyl Chloride	CAAQS	24-Hour (0.01ppm/26 ug/m^3)	Attainment	---

Notes:
(a)U.S. EPA often only declares Nonattainment areas; everywhere else is listed as Unclassifiable/Attainment or Unclassifiable
(b)A design value below the NAAQS for data through the full year or smog season prior to the attainment date is typically required for attainment demonstration
(c)1-hour O3 standard (0.12 ppm) was revoked, effective June 15, 2005 ; however, the Basin has not attained this standard based on 2008-2010 data and is still subject to anti-backsliding requirements
(d)1997 8-hour O3 standard (0.08 ppm) was reduced (0.075 ppm), effective May 27, 2008; the revoked 1997 O3 standard is still subject to anti-backsliding requirements

(e)New NO2 1-hour standard, effective August 2, 2010; attainment designations January 20, 2012; annual NO2 standard retained
(f) The 1971 annual and 24-hour SO2 standards were revoked, effective August 23, 2010; however, these 1971 standards will remain in effect until one year after U.S. EPA promulgates area designations for the 2010 SO2 1-hour standard. Area designations are still pending, with Basin expected to be designated Unclassifiable /Attainment.
(g)Annual PM10 standard was revoked, effective December 18, 2006; 24-hour PM10 NAAQS deadline was 12/31/2006; SCAQMD request for attainment redesignation and PM10 maintenance plan was approved by U.S. EPA on June 26, 2013, effective July 26, 2013.
(h)Attainment deadline for the 2006 24-Hour PM2.5 NAAQS (designation effective December 14, 2009) is December 31, 2019 (end of the 10th calendar year after effective date of designations for Serious nonattainment areas). Annual PM2.5 standard was revised on January 15, 2013, effective March 18, 2013, from 15 to 12 µg/m3. Designations effective April 15, 2015, so Serious area attainment deadline is December 31, 2025.
(i) Partial Nonattainment designation – Los Angeles County portion of Basin only for near-source monitors. Expect redesignation to attainment based on current monitoring data.
Source: South Coast Air Quality Management District 2020 (Attainment Status February 2016).

Ambient air quality monitoring for criteria pollutants is conducted at numerous sites throughout California and the South Coast Air Quality Basin. The South Coast AQMD operates 39 permanent air monitoring stations (AMS) and 4 single-pollutant source impact Lead (Pb) air monitoring sites in the Basin and a portion of the Salton Sea Air Basin in Coachella Valley. This area includes Orange County and the non-desert portions of Los Angeles, Riverside and San Bernardino Counties (SCAQMD 2020). The nearest monitoring stations to the proposed Project are the Long Beach and Pico Rivera stations. Maximum concentration air monitoring data for the proposed Project area and the South Coast Basin for the year 2019 is shown in Table 4.1-3.

Table 4.1-3 SCAQMD 2019 Maximum Concentration Air Quality Data

Location	CO ppm[(a)])	Ozone ppm[(a)]		NO2 ppm[(a)]	SO2 ppm[(a)]	PM10 ug/m3[(a)]	PM2.5 ug/m3[(a)]	Lead ug/m3[(a)]
	1-hour	1-hour	8-hour	1-hour	1-hour	24-hour	24-hour	Monthly
South Coastal LA County	3.0	0.074	0.064	71.8	8.9	74	30.6	0.006
South Coast Air Basin	3.8	0.137	0.117	97.7	10.0	143	46.7	0.013

(a) Units: ppm = parts per million, ug/m3 = micrograms per cubic meter.
Source: SCAQMD 2020.

Carbon Monoxide (CO)

CO is a colorless and odorless gas formed by the incomplete combustion of fossil fuels. CO competes with oxygen, often replacing it in the blood, and reduces the blood's ability to transport oxygen to vital organs in the body. The ambient air quality standard for CO aims to protect persons whose medical condition already compromises the ability of their circulatory system to deliver oxygen.

Ozone (O3)

In addition to primary criteria pollutants, the SCAQMD monitors ozone at various locations throughout the district. Unlike primary criteria pollutants emitted directly from an emissions source, ozone is a secondary pollutant. Ozone is formed in the atmosphere through the photochemical reaction of sunlight with VOC, NOx, O2, and hydrocarbon materials. Ozone is a deep lung irritant, causing pulmonary function decrements and localized lung edema.

Nitrogen Dioxide (NO2)

NO2 is a brownish gas that is formed in the atmosphere through a rapid reaction of the colorless gas nitric oxide (NO) with atmospheric oxygen. NO is primarily formed by combustion. NO and NO2 are collectively referred to as nitrogen oxides (NOx). NO2 can cause respiratory irritation and airway constriction, making breathing difficult.

Sulfur Dioxide (SO2 or SOx)

SO2 is a colorless, pungent gas formed primarily by the combustion of sulfur-containing fossil fuels. Health effects of SO2 inhalation include acute respiratory symptoms and breathing difficulty.

Particulate Matter 10 (PM10)

PM10 is the coarse fraction of suspended particulate matter measuring 10 microns or less in diameter and includes a complex mixture of man-made and natural substances including sulfates, nitrates, metals, elemental carbon, sea salt, soil, organics, and other materials. Particulate matter is produced by wind-blown dust, combustion of wood or other fuels, and a range of other activities, both anthropogenic and natural, that produce dust or particulates. PM10 may have adverse health impacts because these microscopic particles can penetrate into the respiratory system. In some cases, the particulates themselves may cause actual damage to the alveoli of the lungs, or they may contain injurious absorbed substances.

Particulate Matter 2.5 (PM2.5)

The PM2.5 standard is a subset of the PM10 standard consisting of particulate matter measuring 2.5 microns or less in diameter. In addition to the health effects of PM10, PM2.5 exposure may also cause increased respiratory symptoms, disease, and decreased lung functions.

Lead

Lead is a heavy metal that in ambient air occurs as a lead oxide aerosol or dust. Since lead is no longer added to gasoline or to paint products, lead emissions have been reduced significantly in recent years.

4.1.2 Baseline Operational Emissions

The Paramount Refinery in the City of Paramount currently receives hydrogen delivered by tanker truck from the Praxair Facility located in Ontario, CA. An average of 6 trucks per day deliver liquid hydrogen from a distance of 45 miles one-way from the Praxair facility to the Paramount Refinery. An Air Quality Impact Assessment (AQIA) was prepared by the applicant, *Air Quality Impact Assessment for the Air Products Carson Pipeline Project (Trinity Consultants, July 2020)* to calculate the emissions of the proposed Project. The AQIA includes an analysis of the baseline trucking emissions using the EMFAC2017 model, the mobile source emissions are summarized in Tables 4.1-4 and 4.1-5 below.

Table 4.1-4 Baseline Mobile Source Emissions (Pounds per Day)

Activity	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Truck Emissions	0.29	6.71	1.06	0.02	0.24	0.16

Source: Trinity Consultants July 2020.

Table 4.1-5 Baseline Mobile Source Emissions (Tons per Year)

Activity	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Truck Emissions	0.05	1.22	0.19	0.003	0.04	0.03

Source: Trinity Consultants July 2020.

4.1.3 Regulatory Setting

4.1.3.1 Federal Authority

The EPA enforces the Federal Clean Air Act and the associated National Ambient Air Quality Standards (NAAQS) for CO, NO2, ozone, SO2, PM10, PM2.5, and lead. These air quality standards are concentrations above which the pollutant is known to cause adverse health effects. Table 4.1-2 provides the current attainment status from the SCAQMD for the NAAQS and California Ambient Air Quality Standards (CAAQS) for the South Coast Air Basin.

4.1.3.2 State Authority

California Air Resources Board: CARB is the state agency that: (1) establishes and enforces emission standards for motor vehicles, fuels, and consumer products; (2) establishes health-based air quality standards; (3) conducts research; (4) monitors air quality; (5) identifies and promulgates control measures for toxic air contaminants; (6) provides compliance assistance for businesses; (7) produces education and outreach programs and materials; and (8) oversees and assists local air quality districts that regulate most non-vehicular sources of air pollution. CARB approves the regional Air Quality Management Plans (AQMP) for incorporation into the State Implementation Plan (SIP) and is responsible for preparing those portions of the SIP related to mobile source emissions. CARB implements the California Clean Air Act (CCAA) requirements, regulating emissions from motor vehicles and setting fuel standards. The CCAA established ambient air quality standards for ozone, PM10, PM2.5, CO, NO2, SO2, lead, visibility-reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. California standards, the CAAQS, are generally stricter than national standards. The attainment status for the CAAQS is included in Table 4.1-2 above.

California Health and Safety Code § 44300 (AB2588) requires facilities that emit large quantities of criteria pollutants and any amount of non-criteria pollutants above defined thresholds to provide the local air district an inventory of toxic air contaminants. Such facilities may also be required to prepare a quantitative health risk assessment to address the potential health risks involved. The CARB and the SCAQMD will ensure implementation of these requirements for the oil field through various permitting, rules, and regulations.

The California Health and Safety Code mandates that the California Environmental Protection Agency (Cal/EPA) establish safe exposure limits for toxic, non-criteria air pollutants and identify the best available methods for their control (Sections 39650 et seq.). These laws also require that the rules for new emission sources for each air district include regulations establishing procedures to control the emission of these pollutants. The CARB California Toxic Emissions Factors (CATEF) database lists toxic air contaminants from some oil field operations. Cal/EPA has developed specific cancer potency estimates for assessing their related cancer risks at specific exposure levels. For non-cancer-causing toxic air pollutants, Cal/EPA established specific no-effects levels (known as reference exposure levels) for assessing the likelihood of producing health effects at specific exposure levels. Such health effects would be considered significant only when exposure exceeds these reference levels.

4.1.3.3 Local Authority SCAQMD

The SCAQMD is the regional agency responsible for the regulation and enforcement of federal, state, and local air pollution control regulations in the Basin. The SCAQMD operates monitoring stations in the Basin, develops and enforces rules and regulations for stationary sources and equipment, prepares emissions inventory and air quality management planning documents, and conducts source testing and

inspections. The SCAQMD AQMP includes control measures and strategies to be implemented to attain state and federal ambient air quality standards in the Basin. The SCAQMD then implements these control measures as regulations to control or reduce criteria pollutant emissions from stationary sources or equipment.

In addition, the SCAQMD receives and investigates odor complaints from residents.

The SCAQMD has rules and regulations that would apply to the proposed Project. These include the following along with a brief description of what the rule addresses:

- Rule 401. Visible Emissions: Restricts the level of opacity of discharged air contaminants;
- Rule 402. Nuisance - A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons; and,
- Rule 403. Fugitive Dust - requires the implementation of best available dust control measures (BACM) during active operations capable of generating fugitive dust.
- Rule 1166 and/or Rule 1466 related to contaminated soils.
- Rule 1118 related to the existing clean service flare at the Carson facility.

4.1.4 Significance Thresholds

Appendix G of the CEQA Guidelines provides these key questions to guide evaluation of impacts related to air quality. Does the Project:

- Conflict with or obstruct implementation of the applicable air quality plan?
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?
- Expose sensitive receptors to substantial pollutant concentrations?
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

The SCAQMD, in its role as the agency responsible for regulating air emissions locally, has developed detailed criteria to address air quality issues relevant to the regional air basin and which establish quantitative thresholds which address the CEQA Appendix G questions listed above. This EIR applies both the CEQA guidelines and the significance thresholds established by the SCAQMD to determine whether an impact is significant.

The SCAQMD makes significance determinations based on the maximum daily emissions during the proposed Project construction period, which provides a worst-case analysis of the construction emissions. Similarly, significance determinations for operational emissions are based on maximum daily emissions during the proposed Project operational phase.

To determine whether air quality impacts from the Proposed Project are significant, emissions are evaluated and compared to the SCAQMD regional air quality significance thresholds (see Table 4.1-6). If impacts exceed any of the criteria, they will be considered significant and all feasible mitigation measures will be identified and implemented to reduce significant impacts to the maximum extent feasible.

The SCAQMD has also developed a localized significance threshold methodology to evaluate the potential localized impacts of criteria pollutants from construction activities (SCAQMD 2007). The localized significance threshold methodology requires an analysis regarding whether emissions of specified criteria pollutants exceed ambient air quality standards at a sensitive receptor. SCAQMD defines sensitive receptors as offsite locations where persons may be exposed to the emissions from project activities. Receptor locations include residential, commercial, and industrial land use areas and any other areas where persons could be situated for an hour or more at a time. These other areas include parks, bus stops, and sidewalks but would not include building tops, roadways, or permanent bodies of water such as oceans or lakes. A list of sensitive receptors within a two-mile distance of the proposed Project spread is shown in Table 4.1-13 in Section 4.1-6 below.

Odors are considered significant if they produce a "nuisance". Odor significance for the SCAQMD is based on creating a nuisance as per Rule 402. Rule 402 states that "A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property." The SCAQMD has an established Public Nuisance Investigation Policies and Procedures to guide the SCAQMD inspectors in determining whether to issue a Notice of Violation (NOV) for a nuisance. The procedures direct SCAQMD investigators to interview complainants and observe, identify, or otherwise establish evidence of the emissions complained of. An NOV is issued if a "multiple complaint condition" is documented, defined as six or more complainants.

4.1.5 Project Impacts and Mitigation Measures

4.1.5.1 Construction Emissions

Use of heavy equipment and earth-moving operations during project construction generates fugitive dust and combustion emissions that may have substantial temporary impacts on local air quality. Fugitive dust emissions would result from land clearing, demolition, ground excavation, cut and fill operations, and equipment traffic over temporary roads. Combustion emissions, such as NOX, ROG and PM, are most significant when using diesel-fueled equipment, such as loaders, dozers, haul trucks, compressors, and generators. Sources of construction emissions for the proposed Project include:

- Fugitive dust from trenching for the pipeline spread;
- Construction equipment exhaust associated with pipeline trenching and excavation, foundation and piping work for installation of the pressure reduction valve skid and other pipeline connections;
- Worker automobile commuting; and,
- Delivery truck trips to the pipeline spread construction areas.

Table 4.1-6 SCAQMD Regional Air Quality Significance Thresholds

Mass Daily Thresholds[a]			
Pollutant	**Construction[b]**	**Operation[c]**	
NOx	100 pounds/day	55 pounds/day	
VOCs	75 pounds/day	55 pounds/day	
PM10	150 pounds/day	150 pounds/day	
PM2.5	55 pounds/day	55 pounds/day	
SOx	150 pounds/day	150 pounds/day	
CO	550 pounds/day	550 pounds/day	
Lead	3 pounds/day	3 pounds/day	
Toxic Air Contaminants (TACS) and Odor Thresholds			
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥10 in 1 million Cancer Burden >0.5 excess cancer cases (in areas ≥ 1 in million) Chronic and Acute Hazard Index ≥ 1.0 (Project increment)		
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402		
Ambient Air Quality Standards for Criteria Pollutants[d]			
NO_2	SCAQMD is in attainment: project is significant if it caused or contributes to an exceedance of the following attainment standards:		
	1 Hour Average	0.018 ppm (state)	
	Annual Arithmetic Mean	0.03 ppm (state) and 0.0534 ppm (federal)	
PM10	24-Hour Average	10.4 ug/m^3 (construction)[e] and 2.5 ug/m^3 (operation)	
	Annual Average	1.0 ug/m^3	
SO2	1-Hour Average	0.25 ppm (state) and 0.075 ppm (federal 99th %)	
	24-Hour Average	0.04 (state)	
Sulfate	24-Hour Average	25 ug/m^3 (state)	
CO	SCAQMD is in attainment: project is significant if it caused or contributes to an exceedance of the following attainment standards:		
	1-Hour Average	20 ppm (state) and 35 ppm (federal)	
	8-Hour Average	9.0 ppm (state/federal)	
Lead	30-Day Average	1.5 ug/m^3 (state)	
	Rolling 3-Month Average	0.15 ug/m^3 (federal)	

Notes:
(a) Source: SCAQMD CEQA Handbook 1993
(b) Construction thresholds apply to both the SCAQMD and Coachella Valley.
(c) For Coachella Valley, the mass daily thresholds for operation are the same as construction thresholds.
(d) Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.
(e) Ambient air quality threshold based on SCAQMD Rule 403.
Source: SCAQMD Revision April 2019.

The Applicant's application contained several Avoidance and Minimization Measures (AMMs) to minimize the Project's environmental impacts. The Applicant would implement these measures during the design, construction and operation of the pipeline. The AMMs to minimize potential air quality impacts from fugitive dust are:

- Water all active construction sites at least twice daily. Frequency should be based on the type of operation, soil, and wind exposure;
- Implement SCAQMD Rule 1166, including all notification/monitoring/management requirements.

- Reduce travel speeds of onsite vehicles on unpaved roads and surfaces within the pipeline trench construction area to 15 miles per hour;
- Cover inactive storage piles; and,
- Sweep streets if visible solid material is carried out from the construction site.

The AQIA prepared by the applicant calculated the construction emissions of the proposed Project. Construction emissions were estimate using the California Emissions Estimator Model (CalEEMod Version 2016.3.2) which is approved by the California Air Pollution Control Officers Association (CAPCOA, 2016) for all areas of California.

Emissions for truck delivery trips were also estimated in the proposed Project AQIA using the EMFAC model (EMFAC2017). The EMFAC model estimates the official emissions inventories of on-road mobile sources in California. The proposed Project is estimated to require approximately 2,640 feet of new pipeline to be delivered to the construction sites in sections. The AQIA assumed 12-foot pipeline sections and 60 pipeline sections per truck for a total of four truck trips necessary to deliver the proposed Project pipeline material. A worst-case delivery distance of 85 miles was used as the maximum distance from the pipeline spread area to the farthest edge of Los Angeles County because the delivery source in Los Angeles County has not yet been determined.

Input parameters for the AQIA analysis to the CalEEMod model are summarized in Table 4.1-7 and the construction equipment inputs in Table 4.1-8 below. The AQIA is included as Appendix B of this EIR.

Table 4.1-7 CalEEMod Model Input Summary

Input Parameter	Pipeline Spread	Automatic Shut Off Valve and Pipeline Connections (Valve Skid)	Paramount Refinery Connection
Project Location	Los Angeles County	Los Angeles County	Los Angeles County
Land Use Subtype	General Light Industry	General Light Industry	General Light Industry
Lot Acreage	0.18[(a)]	0.11	0.11
Construction Start Date	September 2, 2019	September 2, 2019	September 2, 2019
Construction Duration	20 weeks	8 Weeks	8 Weeks
Number of Construction Workers	30 workers	8 Workers	8 Workers
Fugitive Dust Mitigation	Twice Daily Watering and Limit Vehicle Speeds to 15mph in Construction Area	Twice Daily Watering and Limit Vehicle Speeds to 15mph in Construction Area	Twice Daily Watering and Limit Vehicle Speeds to 15mph in Construction Area

Notes:
(a) Lot acreage of pipeline spread determined by 0.5-mile pipeline spread and an assumed 1 yard wide trench.
Source: Trinity Consultants July 2020.

Table 4.1-8 CalEEMod Construction Equipment Input Summary

Equipment	Number	Hours/Day	Horsepower	Load
Pipeline Spread Site Preparation				
Cranes	2	6	231	0.29
Rubber Tired Dozers	2	4	247	0.4
Tractors/Loaders/Backhoes	2	4	97	0.37
Trenchers	2	6	78	0.5
Welders	8	4	46	0.45
Pipeline Spread Paving				
Cement and Mortar Mixers	4	6	9	0.56
Pavers	1	7	130	0.42
Rollers	1	7	80	0.38
Tractors/Loaders/Backhoes	1	7	97	0.37
Automatic Shut Off Valve and Pipeline Connections (Valve Skid)				
Cranes	1	4	231	0.29
Tractors/Loaders/Backhoes	1	4	97	0.37
Trenchers	1	4	78	0.5
Welders	4	6	46	0.45
Paramount Refinery Connections				
Cranes	1	4	231	0.29
Tractors/Loaders/Backhoes	1	4	97	0.37
Trenchers	1	4	78	0.5
Welders	4	6	46	0.45

Source: Trinity Consultants July 2020.

Tables 4.1-9 through 4.1-12 present construction emissions as estimated in the AQIA for unmitigated and mitigated emissions, respectively. Mitigated emissions totals reflect the application of the AMMs noted above for fugitive dust control.

Table 4.1-9 Construction Emissions without Mitigation (Pounds per Day)

Equipment	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Pipeline Spread	4.48	35.92	22.66	0.04	8.33	5.25
Pipe Delivery	0.36	8.45	1.34	0.02	0.30	0.20
Automatic Shutoff Valve and Pipeline Connections	1.79	11.15	9.46	0.02	0.75	0.65
Paramount Refinery Connections	1.79	11.15	9.46	0.02	0.75	0.65
Maximum Total Daily Emissions	**8.42**	**66.67**	**42.91**	**0.09**	**10.13**	**6.75**
Significance Threshold	75	100	550	150	150	55
Significant Impact?	**No**	**No**	**No**	**No**	**No**	**No**
Localized Threshold	-	142	7,558	-	158	93
Localized Significant Impact?	**-**	**No**	**No**	**-**	**No**	**No**

Source: Trinity Consultants July 2020. Localized thresholds based on 1 acre and 500 meters SRA #4.

Table 4.1-10 Construction Emissions with Mitigation (Pounds per Day)

	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Pipeline Spread	4.48	35.92	22.66	0.04	5.02	3.43
Pipe Delivery	0.36	8.45	1.34	0.02	0.30	0.20
Automatic Shutoff Valve and Pipeline Connections	1.79	11.15	9.46	0.02	0.75	0.65
Paramount Refinery Connections	1.79	11.15	9.46	0.02	0.75	0.65
Maximum Total Daily Emissions	**8.42**	**66.67**	**42.91**	**0.09**	**6.82**	**4.93**
Regional Significance Threshold	75	100	550	150	150	55
Regional Significant Impact?	**No**	**No**	**No**	**No**	**No**	**No**
Localized Threshold	-	142	7,558	-	158	93
Localized Significant Impact?	**-**	**No**	**No**	**-**	**No**	**No**

Source: Trinity Consultants July 2020. Localized thresholds based on 1 acre and 500 meters SRA #4.

Table 4.1-11 Construction Emissions without Mitigation (Tons per Year)

Equipment	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Pipeline Spread	0.19	1.56	0.98	0.002	0.36	0.23
Pipe Delivery	0.00	0.0004	0.00	0.00	0.00	0.00
Automatic Shutoff Valve and Pipeline Connections	0.04	0.22	0.19	0.00	0.02	0.01
Paramount Refinery Connections	0.04	0.22	0.19	0.00	0.02	0.01
Maximum Total Annual Emissions	**0.27**	**2.01**	**1.36**	**0.002**	**0.39**	**0.25**

Source: Trinity Consultants July 2020.

Table 4.1-12 Construction Emissions with Mitigation (Tons per Year)

Equipment	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Pipeline Spread	0.19	1.56	0.98	0.002	0.22	0.15
Pipe Delivery	0.00	0.00	0.00	0.00	0.00	0.00
Automatic Shutoff Valve and Pipeline Connections	0.04	0.22	0.19	0.00	0.02	0.01
Paramount Refinery Connections	0.04	0.22	0.19	0.00	0.02	0.01
Maximum Total Annual Emissions	**0.27**	**2.01**	**1.36**	**0.002**	**0.25**	**0.18**

Source: Trinity Consultants July 2020.

4.1.5.2 Operational Emissions

Operational emissions are those that result from the day-to-day activities occurring throughout the proposed Project. Operational emissions for the proposed Project consist of transporting hydrogen through a twelve-mile pipeline from the City of Carson to the Paramount Refinery. Under normal operations there would not be any emissions associated with the operation of the pipeline.

Under an upset situation, an emergency scenario would be the emergency flaring of hydrogen from the pipeline back through the Carson Flare system. According to permit Application No. 623039, flaring could be the result of one of the following scenarios:

- If the pipeline leak detection system detects a pipeline leak/rupture. The pipeline leak detection system uses differential pressure transmitters to calculate flowrates at predetermined points along the pipeline and an algorithm is used to monitor the turbulence in the gas flow to detect a leak. If a leak is detected, the pipeline feed valve is shut and the inventory in the pipeline is

directed through an associated valve to the flare header. The entire contents of the pipeline are assumed to depressurize to the flare.

- If the pipeline pressure exceeds the maximum allowable working pressure (MAWP). There will be three (3) PSVs that are on the pipeline (as required by DOT) that would be tied-in to the plant flare header that would lift/open if the pressure reduction control valve(s) (turning pressure down from the plant pressure of 850 psig to 160 psig) malfunctioned and allow an overflow of hydrogen into the pipeline.

Flaring emissions under each scenario are shown in Table 4.1-13. See Appendix B for detailed emissions calculations. Note that as the hydrogen in the pipeline has very minimal quantities of carbon and hydrocarbons (less than 10 ppm), emissions of VOC and CO are very low.

Table 4.1-13 Operational Emergency Flaring Emissions (pounds per day)

Scenario	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Pipeline Leak Blowdown Scenario	0.0	10.8	0.34	0.0	0.0	0.0
Pipeline Overflow Scenario	0.0	8.1	0.26	0.0	0.0	0.0

For regional emissions from the Air Products Carson Hydrogen Plant, the proposed Project would not result in a net increase in operational emissions from Hydrogen Plants in the region. The current Air Product Carson Hydrogen Plant operates to supply hydrogen to area users at south coast refineries. The current hydrogen use by the Paramount Refinery is supplied from Ontario, which under the proposed Project, would no longer be the supplier and therefore would no longer need to produce hydrogen for the Paramount Refinery, thereby causing a decrease in emissions in Ontario. This decrease would be offset by the additional production at the Air Products Carson Hydrogen Plant producing a net zero increase in regional emissions associated with the production of hydrogen. Since the current hydrogen source supplies liquid hydrogen by truck, and the proposed pipeline Project would provide gas, the production of the proposed Project gaseous hydrogen would actually take less energy, and therefore less emissions, than the current liquid hydrogen production. However, because the other sources would not be limited by permit to a reduced hydrogen production level, as a worst case, the estimated increase in emissions from the Air Products Carson Hydrogen Plant have been estimated based on the increase in reformer emissions at the Air Products Carson Hydrogen Plant. These emissions are included in Appendix B and shown in Table 4.1-14 below.

The proposed Project would also result in a decrease of operational emissions from mobile sources because the pipeline would replace existing transportation of hydrogen from other sources to the Paramount Refinery by truck. Baseline trucking emissions are presented in Table 4.1-3 and 4.1-4 and shown again in Table 4.1-14.

Table 4.1-14 Operational Emissions (pounds per day)

Scenario	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Worst-case Flaring Scenario (Pipeline Leak Blowdown)	0.00	10.82	0.34	0.00	0.00	0.00
Worst-case Air Products Carson Hydrogen Plant Emission Increase*	11.38	17.50	11.38	0.51	13.64	13.64
Total Project Emissions Increase	11.38	28.32	11.72	0.51	13.64	13.64
Existing Truck Emissions (Baseline)	0.29	6.71	1.06	0.02	0.24	0.16
Net Change in Emissions	11.09	21.61	10.66	0.49	13.40	13.48
SCAQMD Regional Operational Threshold	55	55	550	150	150	55
Exceed Regional Threshold?	No	No	No	No	No	No
SCAQMD Localized Operational Threshold	-	142	7558	-	38	23
Exceed Localized Threshold?	-	No	No	-	No	No

* Based on the 1998 EIR (City of Carson 1998) incremental increase of 7 mmscfd at the Air Products Carson Hydrogen Plant.

For localized emissions, because hydrogen production may increase at the Air Products Carson Hydrogen Plant, emissions may increase at the Air Products Carson Hydrogen Plant location. Emissions at the Air Products Carson Hydrogen Plant are associated with reformer emissions, fugitive emissions from process plant equipment, flaring events and on-road vehicles. As part of the effects of this proposed Project, only the reformer emissions may increase. Current operations at the Air Products Carson Hydrogen Plant may occasionally produce peak days that would be similar to the way the Air Products Carson Hydrogen Plant would operate if it was also supplying hydrogen to the Paramount Refinery under the proposed Project, and therefore peak day emissions may not change with the additional hydrogen production. However, as a worst case, peak day emissions were assumed to increase by an incremental amount at the reformer.

As part of the 1998 EIR, modeling was conducted using the plant permitted capacity. Modeling indicated that the localized impacts would be less than significant. Because the plant would be operating within the permitted capacity with this proposed Project, localized emissions would therefore be less than significant.

4.1.6 Impact Discussion

This section discusses the potential impacts of the proposed Project with the significance thresholds outlined in CEQA Guidelines Appendix G and the applicable SCAQMD air quality significance thresholds discussed in Section 4.1.3 above.

Impact #	Impact Description	Phase	Impact Classification
AQ.1	The proposed Project would not conflict with or obstruct implementation of the applicable air quality plan.	Construction or Operation	III

Tables 4.1-8 through 4.1-12 in Section 4.1.5.1 above show that the construction emissions of the proposed Project would be below SCAQMD regional significance thresholds for construction activities. Operational emissions are also shown to be below the significance thresholds. Therefore, because construction and operational emissions are below SCAQMD significance thresholds, the proposed

Project would not conflict with or obstruct the implementation of any air quality plan and potential impacts for Air Quality Impact 1 are **less than significant (Class III).**

Impact #	Impact Description	Phase	Impact Classification
AQ.2	The proposed Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.	Construction or Operation	III

Tables 4.1-8 through 4.1-12 in Section 4.1.5.1 indicate that the construction emissions of the proposed Project would be below SCAQMD regional significance thresholds for construction activities. A net decrease in mobile source emissions would be associated with the operational phase of the proposed Project due to a switch from trucking to pipeline transportation of the hydrogen. Therefore, as both construction and operational emissions are below applicable SCAQMD significance thresholds, the proposed Project would not result in a net increase of any criterial pollutant or exceed any air quality standard. The potential impacts for Air Quality Impact 2 are **less than significant (Class III).**

Impact #	Impact Description	Phase	Impact Classification
AQ.3	The proposed Project would not expose sensitive receptors to substantial pollutant concentrations.	Construction or Operation	III

Section 4.1.5 introduced the SCAQMD localized significance threshold analysis which is performed to estimate potential air quality impacts for emissions of CO, NO2, and particulates, both PM10 and PM2.5, associated with proposed projects. The SCAQMD localized significant thresholds utilize the allowable concentrations of pollutants combined with distances and construction or operational activities to calculate allowable emission rates for construction or operations of projects. The SCAQMD provides lookup tables which are specific for the source/receptor area in the South Coast Air Quality Basin as it also includes pollutant background and meteorological data specific to the area. Modeling can also be conducted to demonstrate compliance with the localized thresholds.

The SCAQMD localized significant thresholds lookup tables provide allowable emission data for distances from 25 to 500 meters from a proposed Project site. The project is located in an industrial area with the nearest residential area and sensitive receptor to the new pipeline construction area 0.47 miles away which is greater than the maximum distance of the significant tables of 500 meters. The closest distance from the Air Products Carson Hydrogen Plant to residential areas or sensitive receptors is more than 0.50 miles.

Construction emissions of the proposed Project would be below SCAQMD localized significance thresholds for all criteria pollutants as shown in Tables 4.1-9 and 4.1-10 including particulate matter (PM_{10} and $PM_{2.5}$). Operation of the Carson Facility would also be below the localized significance thresholds as shown in Table 4.1-14 as well as demonstrated in the 1998 EIR modeling analysis.

Therefore, as construction and operational emissions would be below SCAQMD localized significance thresholds, the proposed Project would not be expected to expose sensitive receptors to substantial pollutant concentrations. The potential impacts for Air Quality Impact 3 are **less than significant (Class III).**

Impact #	Impact Description	Phase	Impact Classification
AQ.4	The proposed Project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.	Construction or Development	III

As noted above, the construction and operational emissions for the proposed Project would be below SCAQMD significance thresholds and the nearest sensitive receptor is located outside the area of concern of the SCAQMD localized lookup tables for air quality impacts. The proposed Project is the operation of a hydrogen pipeline. Hydrogen is an odorless gas and would not be the potential source of odorous emissions in the event of a pipeline leak. Therefore, the potential for the proposed Project to result emissions, including odors, to adversely affect a substantial number of people is less than significant. Thus, the potential impacts for Air Quality Impact 4 **is less than significant (Class III).**

4.1.7 Cumulative Effects

For cumulative regional impacts, if a project demonstrates compliance with SCAQMD rules and regulations and thresholds, cumulative projects are considered less than significant. Because this Project would be below the regional thresholds, the cumulative impacts are considered less than significant.

Cumulative projects are listed in Section 3.0, Cumulative Scenario, and include commercial projects, residential projects, and industrial projects. Commercial projects would generate substantial emissions associated with construction, most likely exceeding the SCAQMD thresholds. Operational emissions associated with stationary industrial projects would be required to demonstrate compliance with SCAQMD rules and regulations and obtain offsets if stationary emissions exceed the SCAQMD thresholds. None of the cumulative projects described in Section 3.0 are substantial industrial projects except for the World Energy Renewable Fuels Project Expansion. This project would involve substantial construction and operational emissions that may exceed the SCAQMD thresholds, but operational emissions would be required to comply with SCAQMD rules and regulations, including requiring offsets, and therefore would be less than significant. As per the 1998 EIR for the Carson hydrogen Plant (City of Carson 1998), the operational emissions, both local and regional, were determined to be less than significant with mitigation. The World Energy project would most likely be similar. Therefore, as the project and the cumulative projects would comply with SCAQMD and be less than significant, the cumulative impacts would be less than significant.

For localized air quality impacts, none of the cumulative projects listed in Section 3.0, Cumulative Scenarios, would be constructed near the proposed Project area for localized impacts to overlap, so there would be no construction localized impacts associated with cumulative projects. Therefore, no cumulative localized impacts are expected.

4.1.8 References

NOAA. 2013. Historical Meteorological Data [online]: https://www.ncdc.noaa.gov/cdo-web/

SCAQMD. 2020. Attainment Status February 2016 [online]: http://www.aqmd.gov/home/air-quality/clean-air-plans.

SCAQMD. 2020. Air Quality Significance Thresholds April 2016 [online]: http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook.

SCAQMD. 2020. Air Quality Monitoring Data, Long Beach Station Wind Rose [online]: http://www.aqmd.gov/home/air-quality/meteorological-data/data-for-aermod.

SCAQMD. 2020. Air Quality Monitoring Data, Pico Rivera Station Wind Rose [online]: http://www.aqmd.gov/home/air-quality/meteorological-data/data-for-aermod.

SCAQMD. 2020. Air Quality Monitoring Data [online]: http://www.aqmd.gov/home/air-quality/current-air-quality-data.

Trinity Consultants, 2020. Air Quality Impact Assessment Air Products Carson Pipeline Project. July 2020.

This Page Left Intentionally Blank

4.2 Climate Change/Greenhouse Gas Emissions

This section describes environmental and regulatory settings related to climate change/greenhouse gases (GHG) and analyzes the proposed Project for any GHG impacts. This section discusses the setting and impacts associated with greenhouse gas emissions. Section 4.1, Air Quality discusses the setting and impacts associated with criteria and toxic pollutants.

4.2.1 Environmental Setting

Greenhouse gases (GHGs) are defined as any gas that absorbs infrared radiation in the atmosphere, including water vapor, carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), sulfur hexafluoride (SF6) and fluorocarbons. These GHGs lead to the trapping and buildup of heat in the atmosphere near the earth's surface, commonly known as the "greenhouse effect". The accumulation of GHGs in the atmosphere regulates the earth's temperature. Without natural GHGs, the earth's surface would be cooler. Emissions from human activities (anthropogenic emissions), such as vehicles and generation of electricity, has led to elevated concentrations of these gases in the atmosphere (IPCC 2014).

GHGs have varying global warming potential (GWP). The GWP is the potential of a gas or aerosol to trap heat in the atmosphere. Since GHGs absorb different amounts of heat, a common reference gas (CO2) is used to relate the amount of heat absorbed to the amount of the gas emissions, referred to as the "CO2 equivalent" (CO2e). The GWP is used to quantify GHG emissions by multiplying the different GWP of each GHG pollutant by the mass of that pollutant to arrive at a CO2e mass. The GWP of CO2 is defined as one, whereas the GWP of CH4, for example, is 25, meaning that CH4 absorbs 25 times as much heat, and therefore has 25 times greater impact on global warming per pound of emissions, as CO2.

Water vapor is the most abundant and variable GHG in the atmosphere and maintains a climate necessary for life. The main source of water vapor is evaporation from the oceans (approximately 85 percent). Other sources include evaporation from other water bodies, sublimation (change from solid to gas) from ice and snow, and transpiration from plant leaves (AEP 2007).

Carbon dioxide is an odorless, colorless GHG. Natural sources of CO2 include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungi; evaporation from oceans; and volcanic outgassing. Anthropogenic (human caused) sources of CO2 include burning of fuels, such as coal, oil, natural gas, and wood. Atmospheric global average CO2 concentrations are currently approximately 407 ppm, with levels increasing from 401 ppm in 2015 and 369 ppm in 2000 with a growth rate of between 2-3 ppm per year since 2012 (NOAA 2018).

Methane (CH4) gas is the primary component of natural gas used in homes and as discussed above, it has a GWP of approximately 25. Natural sources of CH4 arise from the decay of organic matter and from geological deposits known as natural gas fields, from which CH4 is extracted for fuel. Sources of decaying organic material include landfills and manure.

Nitrous oxide (N2O) is a colorless gas with a GWP of approximately 298 and is produced by microbial processes in soil and water, including reactions which occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (nylon production, nitric acid production) also emit N2O. It is used in rocket engines, as an aerosol spray propellant, and in race cars. During combustion, NOx (NOx is a generic term for mono-nitrogen oxides, NO and NO2) is produced as a criteria pollutant (see above) and is not the same as N2O. Very small quantities of N2O may be formed during fuel combustion by reaction of nitrogen and oxygen (API 2004).

Chlorofluorocarbons (CFCs) are gases formed synthetically by replacing all hydrogen atoms in CH4 or ethane with either chlorine and/or fluorine atoms. CFCs are nontoxic, nonflammable, insoluble, and chemically nonreactive in the troposphere (the level of air at the earth's surface). CFCs were first synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. CFCs destroy stratospheric ozone; therefore, legal production was stopped under the Montreal Protocol. Hydrofluorocarbons (HFCs) are synthetic man-made chemicals that are used as a substitute for CFCs in automobile air conditioners and refrigerants. Perfluorocarbons (PFCs) are used in aluminum production and in the semiconductor manufacturing industry. In general, fluorocarbons have a GWP of between 12 and 14,800.

Sulfur hexafluoride (SF6) is an inorganic, odorless, colorless, nontoxic, nonflammable gas which has the highest GWP of any gas at 22,800. Sulfur hexafluoride is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

Ozone (O3) is a greenhouse gas; however, unlike the other greenhouse gases, O3 in the troposphere is relatively short-lived and therefore is not global in nature. According to CARB, it is difficult to make an accurate determination of the contribution of ozone precursors (NOx and volatile organic compounds [VOCs]) to global warming (CARB 2006).

Table 4.2-1 shows a range of gasses that contribute to GHG warming with their associated global warming potential. The table also shows their estimated lifetime in the atmosphere and the range in global warming potential over 100 years.

Table 4.2-1 Global Warming Potential of Various Gases

Gas	Life in the Atmosphere (years)	100-year GWP (average)
Carbon Dioxide (CO2)	50-200	1
Methane (CH4)	12	25
Nitrous Oxide (N2O)	120	298
HFCs	1.5-264	12-14,800
Sulfur Hexafluoride (SF6)	3,200	22,800

Note: GWP = global warming potential
Source: EPA 40 CFR Part 98, Subpart A, Table A-1, dated Nov 29, 2013

4.2.1.1 Physical Setting

Fossil fuel combustion is responsible for most of the United States GHG emissions, and CO2 is the primary GHG. In 2016, U.S. GHG emissions totaled 6,511 million MTCO2e. This 2016 total represents a 2.4 percent increase since 1990. GHG emissions peaked at 7,351 million MTCO2e in 2007. In 2016, approximately 28 percent of GHG emissions were associated with transportation, approximately 28 percent were associated with electricity generation, and 22 percent were associated with industrial processes (EPA 2018).

To quantify the emissions associated with electrical generation, the resource mix for an area must be determined. The resource mix is the proportion of electricity that is generated from different sources. Electricity generated from coal or oil combustion produces greater GHG emissions than electricity generated from natural gas combustion due to coal and oil's higher carbon content. Electricity generated from wind turbines, hydroelectric dams or nuclear power is assigned zero GHG emissions. Although these sources have some GHG emissions associated with the manufacture of the wind generators, the mining

and enrichment of uranium or the displacement of forest areas for reservoirs, these emissions have not been included in the lifecycle analysis as they are assumed to be relatively small compared to the electricity generated. Estimates of nuclear power GHG emissions associated with uranium mining and enrichment range up to approximately 60 lbs/MWh, or approximately five percent of natural gas turbine GHG emissions (Canada 1998).

Detailed information on the power generation plants, their contribution to area electricity resource mix and their associated emissions have been developed by the U.S. Environmental Protection Agency (EPA) in a database called the Emissions & Generation Resource Integrated Database (eGRID). eGRID is a comprehensive inventory of environmental attributes of electric power systems and is developed from a variety of data collected by the U.S. EPA, Energy Information Administration (EIA), and Federal Energy Regulatory Commission (FERC). The most recent version was released in 2018 contains information as recent as 2016.

About half of the electricity in the United States is generated from coal, producing a U.S. GHG emissions level of about 1,222 pounds per mega-watt hour (lbs/MWh). The GHG emissions rate is lower for western states, primarily due to the increased use of hydroelectric and natural gas. The State of California has a GHG emission rate of approximately 661 lbs/MWh due to the contribution of hydroelectric, nuclear and renewable sources.

Southern California Edison's (SCE) GHG emission rate is lower than the California average due to its increase in the use of renewable energy sources. In 2017, 46% of electricity that SCE delivered to customers came from carbon-free resources, including biomass, geothermal, hydroelectric, solar and wind. In 2017 SCE's GHG emission rate was about 551 lbs /MWhr (Edison International 2017).

The GHG emission rate for electricity obtained from SCE is approximately 50 percent less than the rate associated with direct natural gas combustion due to the electricity resource mix, which includes non-GHG emission creating resources (hydroelectric and renewables).

With a population of 39.5 million (2017), California is the most populous state in the United States. In 2017, the State produced 424 MMTCO2e of GHG emissions (CARB 2019). Table 4.2-2 delineates State GHG emissions for the years 2010 through 2017.

Table 4.2-2 California GHG Emissions Inventory (million metric tons per year, MMTCO2e)

Source Category	2010	2011	2012	2013	2014	2015	2016	2017
Transportation	165.1	161.8	161.3	160.9	162.5	166.2	168.8	169.9
Electric Power	90.3	88.0	95.5	89.4	88.5	83.8	68.6	62.4
Industrial	91.5	90.2	91.1	93.7	94.0	91.5	89.5	89.4
Commercial & Residential	45.9	46.4	43.8	44.4	38.2	38.8	40.6	41.1
Agriculture	33.7	34.3	35.5	34.0	35.1	33.8	33.5	32.4
High GWP	13.5	14.5	15.5	16.8	17.7	18.6	19.3	19.9
Recycling & Waste	8.4	8.5	8.5	8.5	8.6	8.7	8.8	8.9
	448.4	443.7	451.2	447.7	444.6	441.4	429.1	424.0

Source: CARB California Greenhouse Gas Emission Inventory - 2019 Edition.

4.2.1.2 Current Operational Emissions

Section 4.1.2 discussed the current operational emissions from mobile sources associated with the existing transportation of hydrogen from other sources to the Paramount Refinery by truck. The proposed Project AQIA estimated the mobile source GHG emissions from the existing operations as summarized in Table 4.2-3 below.

Table 4.2-3 Baseline Mobile Source Emissions (Metric Tons per Year)

Activity	CO2	CH4	N20	CO2e
Truck Emissions	297	0.00	0.05	311

Source: Trinity Consultants July 2020.

4.2.2 Regulatory Setting

4.2.2.1 International

Kyoto Protocol

The Kyoto Protocol is a treaty made under the United Nations Framework Convention on Climate Change, which was signed on March 21, 1994. The Convention was the first international agreement to regulate GHG emissions. It has been estimated that if the commitments outlined in the Kyoto Protocol are met, global GHG emissions would be reduced by an estimated 5 percent from 1990 levels during the first commitment period from 2008 until 2012. However, while the U.S. is a signatory to the Kyoto Protocol, Congress has not ratified it; therefore, the U.S. is not bound by the Protocol's commitments.

Paris Agreement

At the 2015 United Nations Conference of the Parties (COP 21) in Paris, France, in 2015, Parties to the United Nations Framework Convention on Climate Change (UNFCCC) reached an agreement to combat climate change. The Paris Agreement's central aim is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century to below 2 degrees Celsius above pre-industrial levels, and to pursue efforts to limit the temperature increase to 1.5 degrees Celsius. The Paris Agreement requires all Parties to put forward their best efforts through "nationally determined contributions". As of the end of 2019, 187 Parties have ratified of the Agreement, out of the 197 Parties who attended to the Convention. In 2017 the United States stated they intended to withdraw from the Paris Agreement.

Climate Change Technology Program

In lieu of the Kyoto Protocol's mandatory framework, the U.S. has opted for a voluntary and incentive-based approach toward emissions reductions, known as the Climate Change Technology Program. This Program, is a multi-agency research and development coordination effort, led by the Secretaries of Energy and Commerce, who are charged with carrying out the President's National Climate Change Technology Initiative.

4.2.2.2 Federal Regulations

Clean Air Act

In the past, the U.S. EPA has not regulated GHG under the Clean Air Act. However, in 2007 the U.S. Supreme Court held that the EPA can, and should, consider regulating motor-vehicle GHG emissions. In Massachusetts v. Environmental Protection Agency, 12 states and cities, including California, in conjunction with several environmental organizations sued to force the EPA to regulate GHG as a pollutant pursuant to the Clean Air Act (U.S. Supreme Court No. 05-1120; 127 S.Ct. 1438 (2007)). The Court ruled that GHG fit within the Clean Air Act's definition of a pollutant and that the EPA's reason for not regulating GHG was insufficiently grounded.

40 CFR Section 98 specifies mandatory reporting requirements for several industries including certain downstream facilities that emit GHG and to certain upstream suppliers of fossil fuels and industrial GHG. For suppliers, the GHG emissions reported are the emissions that would result from combustion or use of the products supplied. The rule also includes provisions to ensure the accuracy of emissions data through monitoring, recordkeeping and verification requirements. The mandatory reporting requirements generally apply to facilities that produce more than 25,000 MTCO2e (or 10,000 MTCO2e for combustion and process source emissions).

U.S. EPA Methane Challenge Program

The U.S. EPA sponsors the Natural Gas STAR Methane Challenge Program, a voluntary program that encourages oil and natural gas companies to commit to and adopt cost-effective technologies and practices to improve operational efficiency and prevent emissions of CH4. The program defines protocols for CH4 control by oil and natural gas production companies that may operate many different facilities. Examples of cost-effective controls include recovering for beneficial use all associated gas produced from oil reservoirs and avoiding flaring when gas recovery is feasible.

4.2.2.3 State Regulations

Executive Order S-3-05

The 2005 California Executive Order S-3-05 established the following GHG emission-reduction goals for California:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

The Secretary of the California Environmental Protection Agency (CalEPA) is charged with coordinating oversight of efforts to meet these targets and formed the Climate Action Team to carry out the Executive Order. Emission reduction strategies or programs developed by the Climate Action Team to meet the emission targets are outlined in a March 2006 report (CalEPA 2006). The Climate Action Team also provided strategies and input to the CARB Scoping Plan.

Executive Order B-16-2012

The 2012 California Executive Order B-16-2012 directed that all State entities support and facilitate the rapid commercialization of zero-emission vehicles. The directive ordered State agencies to work with the Plug-in Electric Vehicle Collaborative and the California Fuel Cell Partnership to achieve by 2015 that the

State's major metropolitan areas would be able to accommodate zero-emission vehicles, each with infrastructure plans and streamlined permitting, and that by 2020:

- The State's zero-emission vehicle infrastructure would be able to support up to one million vehicles;
- The costs of zero-emission vehicles would be competitive with conventional combustion vehicles;
- Zero-emission vehicles would be accessible to mainstream consumers;
- There would be widespread use of zero-emission vehicles for public transportation and freight transport;
- Transportation sector greenhouse gas emissions would be falling as a result of the switch to zero-emission vehicles;
- Electric vehicle charging would be integrated into the electricity grid; and
- The private sector's role in the supply chain for zero-emission vehicle component development and manufacturing would be expanding.

And that by 2025:

- Over 1.5 million zero-emission vehicles would be on California roads, and their market share would be expanding;
- Californians would have easy access to zero-emission vehicle infrastructure;
- The zero-emission vehicle industry would be a strong and sustainable part of California's economy; and
- California's clean, efficient vehicles would annually displace at least 1.5 billion gallons of petroleum fuels.

The Executive Order directs that California target a reduction of greenhouse gas emissions from the transportation sector equaling 80 percent less than 1990 levels by 2050; and that California's state vehicle fleet increase the number of its zero-emission vehicles through the normal course of fleet replacement so that at least 10 percent of fleet purchases of light-duty vehicles be zero-emission by 2015 and at least 25 percent of fleet purchases of light-duty vehicles be zero-emission by 2020.

Executive Order B-30-15

Additionally, on April 29, 2015, Governor Brown issued Executive Order B-30-15 establishing "A new interim statewide greenhouse gas emission reduction target to reduce greenhouse gas emissions to 40 percent below 1990 levels by 2030 . . . in order to ensure California meets its target of reducing greenhouse gas emissions to 80 percent below 1990 levels by 2050."

Assembly Bill 1493

In 2002, the California legislature declared in AB 1493 (the Pavley regulations) that global warming was a matter of increasing concern for public health and the environment in the State. It cited several risks that California faces from climate change, including: reduction in the State's water supply; increased air pollution due to higher temperatures; harm to agriculture, and increase in wildfires; damage to the coastline; and economic losses caused by higher food, water, energy, and insurance prices. Furthermore, the legislature stated that technological solutions for reducing GHG emissions would stimulate California's economy and provide jobs. Accordingly, AB 1493 required the CARB to develop and adopt the nation's

first GHG emission standards for automobiles. The CARB responded by adopting CO2-equivalent fleet average emission standards. The standards would be phased in from 2009 to 2016, reducing emissions by 22 percent in the "near term" (2009 to 2012) and 30 percent in the "mid-term" (2013 to 2016), as compared to 2002 fleets.

The legislature passed amendments to AB 1493 in September 2009. Implementation of AB 1493 requires a waiver from the EPA, which was granted in June 2009.

Additional measures passed by the Legislature, Resolution 18-35 in September 2018, in response to notices of intended rulemaking by the National highway Transportation Safety Administration (NHTSA) and the EPA to weaken automobile fuel economy standards, adopted amendments to sections 1961.2 and 1961.3, Title 13 California Code of Regulations to ensure continued implementation of the more stringent automobile standards through the year 2025.

Assembly Bill 32

AB 32 codifies California's GHG 2020 emissions goal by requiring the State to reduce global warming emissions to year 1990 levels by 2020. It further directs the CARB to enforce the statewide cap that began phasing by 2012. AB 32 was signed and passed into law by Governor Arnold Schwarzenegger on September 27, 2006. Key milestones of AB 32 include:

- June 20, 2007 – Identification of "discrete early action GHG emission-reduction measures";
- January 1, 2008 – Identification of the 1990 baseline GHG emissions levels and approval of a Statewide limit equivalent to that level. Adoption of reporting and verification requirements concerning GHG emissions;
- January 1, 2009 – Adoption of a scoping plan for achieving GHG emission reductions;
- January 1, 2010 – Adoption and enforcement of regulations to implement the actions;
- January 1, 2011 – Regulatory adoption of GHG emission limits and reduction measures; and
- January 1, 2012 – GHG emission limits and reduction measures become enforceable.

Since the passage of AB 32, the CARB published the Proposed Early Actions to Mitigate Climate Change in California. This publication indicated that the issue of GHG emissions in CEQA and General Plans was being deferred for later action, so the publication did not discuss any early action measures generally related to CEQA or to land use decisions.

AB 32 addresses the results of these studies conducted by the Intergovernmental Panel on Climate Change (IPCC 2007, 2014) that examined a range of scenarios estimating an increase in globally averaged surface temperature and ocean rise by 2100 due to human causes.

SB-32

Senate bill 32 requires that there be a reduction in GHG emissions to 40% below the 1990 levels by 2030. The provisions of SB-32 were added to Section 38566 of the Health and Safety Code subsequent to the bill's approval. The bill went into effect January 1, 2017. SB-32 builds onto AB-32 which requires California to reduce greenhouse gas emissions to 1990 levels by 2020 and SB-32 continues that timeline to reach the targets set in Executive Order B-30-15. SB-32 provides another intermediate target between the 2020 and 2050 targets set in Executive Order S-3-05.

California Air Resources Board: 2008 Scoping Plan

On December 11, 2008, the CARB adopted the Scoping Plan as directed by AB 32 which proposes a set of actions designed to reduce overall GHG emissions in California. Measures identified in the Scoping Plan are being implemented in phases with Early Action Measures that have already been implemented. Measures include a cap-and-trade system, car standards, low carbon fuel standards, landfill gas control methods, energy efficiency, green buildings, renewable electricity standards, and refrigerant management programs.

The 2008 Scoping Plan provides an approach to reduce emissions to achieve the 2020 target and to initiate the transformations required to achieve the 2050 target. The 2008 Scoping Plan indicated that a 29 percent reduction below the estimated "business as usual" levels would be necessary to return to 1990 levels by 2020.

CARB underwent an extensive and rigorous process in developing and approving the Scoping Plan. Among other things, CARB considered several alternatives to achieve the mandated maximum technologically feasible and cost-effective reductions in GHGs and submitted its analyses and recommendations for peer review and public comment on many occasions.

Executive Order S-03-05 sets a goal that California emit 80 percent less GHGs in 2050 than it emitted in 1990. CARB's Scoping Plan, including the October 2013 Discussion Draft, provides additional direction and insight as to how it anticipates California would achieve the 2050 reduction goal in Governor Schwarzenegger's Executive Order S-03-05.

Scoping Plan 2011 Re-Approved Document

In August 2011, the initial Scoping Plan was re-approved by the CARB, and includes the Final Supplement to the Scoping Plan Functional Equivalent Document. In the 2011 re-approved Scoping Plan, CARB updated the projected business as usual (BAU) emissions based on current economic forecasts (i.e., as influenced by the economic downturn) and GHG-reduction measures already in place. The BAU projection for 2020 GHG emissions in California was originally, in the 2008 Scoping Plan, estimated to be 596 MMTCO2e. CARB subsequently derived an updated estimate of emissions in a 2013 Draft Discussion Document by considering the influence of the recent recession and reduction measures that are already in place. The revision estimates the year 2020 emissions at 507 MMTCO2e (as the BAU estimate).

The 2011 Re-Approved Scoping Plan concluded that achieving the 1990 levels by 2020 meant cutting approximately 16 percent, compared to the original 2008 Scoping Plan that estimated a 29 percent reduction (CARB 2011). The 2011 Scoping Plan sets forth the expected GHG emission reductions from a variety of measures, including the Pavley I automobile standards and the Renewables Portfolio Standard, neither of which were assumed in the 2008 Scoping Plan.

Scoping Plan 2014 First Update

AB -32 requires CARB to update the Scoping Plan every five years. CARB approved the first update to the Scoping Plan on May 22, 2014 with recommendations for a mid-term target (between 2020 and 2050) and sector-specific actions. The First Update addresses issues such as a revision to the GWP for gasses (to a 20 year instead of the 100-year timeframe), the establishment of a mid-term 2030 goal (of between 33-40% reduction over 1990 levels), and the development of post-2020 emissions caps related to Cap-and-Trade to reflect the establishment of a 2030 midterm target. This first revision also provides an update on climate science and a report on progress toward the 2020 target, including achievements of the 2008 and 2011 Scoping Plans, an update on the inventory of GHG emissions, and an update of the economy and its

potential effect on future emissions' forecasting. It also addresses post-2020 goals, including Executive Order S-3-05. The 2014 Scoping Plan Update concluded that achieving the 1990 levels by 2020 meant cutting approximately 15.3 percent, compared to the original 2008 Scoping Plan that estimated a 29 percent reduction.

Scoping Plan 2017 Update

CARB updated the Scoping Plan to address the strategy for achieving the 2030 GHG target in November 2017. The plan discusses economically and technically feasible actions for reduction of a 40% from 1990 levels of GHG emissions by 2030. The plan notes the path forward includes the ongoing and statutorily programs and the Cap and Trade Program along with AB398 which clarifies the Cap and Trade Program including designating the Program as the mechanism for reducing GHG emissions from petroleum refineries and oil and gas production in the Scoping Plan. The document concludes the Scoping Plan approach is to strengthen the major programs that have been successful to date and further integrate the efforts to reduce GHG emission and improve air quality.

California Senate Bill 1368

In 2006, the California legislature passed SB 1368, which requires the California Public Utilities Commission (CPUC) to develop and adopt a "greenhouse gases emission performance standard" by March 1, 2007, for private electric utilities under its regulation. The CPUC adopted an interim standard on January 25, 2007, requiring that all new long-term commitments for base load generation involve power plants that have emissions no greater than a combined cycle gas turbine plant. That level is established at 1,100 lbs/MWh of CO2. The California Energy Commission has also adopted similar rules.

Senate Bill 97 – CEQA: Greenhouse Gas Emissions

In August 2007, Governor Schwarzenegger signed into law SB 97 – CEQA: Greenhouse Gas Emissions with the purpose of expanding a coordinated policy for reducing greenhouse gas emissions under the CEQA framework by developing guidelines on how state and local agencies should analyze, and when necessary, mitigate greenhouse gas emissions. Specifically, SB 97 required the Office of Planning and Research (OPR), by July 1, 2009, to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA, including, but not limited to, effects associated with transportation or energy consumption. OPR would be required to periodically update the guidelines to incorporate new information or criteria established by the CARB pursuant to the California Global Warming Solutions Act of 2006. SB 97 also identifies a limited number of types of projects that would be exempt under CEQA from analyzing GHG emissions.

On January 7, 2009, OPR issued its draft CEQA guidelines revisions pursuant to SB 97. On March 16, 2010, the Office of Administrative Law approved the Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The Amendments became effective on March 18, 2010.

Office of Planning and Research Technical Advisory and Preliminary Draft CEQA Guidelines Amendments for Greenhouse Gas Emissions

Consistent with SB 97, on March 18, 2010, the CEQA Guidelines were amended to include references to GHG emissions. The amendments offer guidance regarding the steps lead agencies should take to address climate change in their CEQA documents. According to OPR, lead agencies should (1) determine if GHG may be generated by a proposed Project and, if so, quantify or estimate the GHG emissions by type and source; (2) assess if those emissions are cumulatively significant and (3) consider the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local

plan for the reduction or mitigation of GHG emissions. When assessing whether a project's effects on climate change are cumulatively considerable or not, even though its GHG contribution may be individually limited, the lead agency must consider the impact of the project when viewed in connection with the effects of past, current, and probable future projects. Lastly, if the lead agency determines that the GHG emissions from a proposed project are potentially significant, it must investigate ways to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact.

The Amendments do not identify a threshold of significance for GHG emissions, nor do they prescribe assessment methodologies or specific mitigation measures. The Preliminary Amendments maintain CEQA discretion for lead agencies to establish thresholds of significance based on individual circumstances.

The guidelines developed by OPR provide the lead agency with discretion in determining what methodology is used in assessing the impacts of greenhouse gas emissions in the context of a particular project. This guidance is provided because the methodology for assessing GHG emissions is expected to evolve over time. The OPR guidance also states that the lead agency can rely on qualitative or other performance-based standards for estimating the significance of GHG emissions.

California Air Resource Board Cap-and-Trade Regulation

CARB has implemented a cap-and-trade type program, as per the AB-32 directed Scoping Plan, applicable to specific industries that emit more than 25,000 MTCO2e annually. The AB 32 Scoping Plan identifies a Cap-and-Trade program as one of the strategies California would employ to reduce GHG emissions that cause climate change. Under cap-and-trade, an overall limit on GHG emissions from capped sectors would be established by the Cap-and-Trade program, and facilities subject to the cap would be able to trade permits (allowances) to emit GHGs. The program started on January 1, 2012, with an enforceable compliance obligation beginning with the 2013 GHG emissions for GHG emissions from stationary sources. The petroleum and natural gas systems sector is covered starting in 2013 for stationary and related combustion, process vents and flare emissions if the total emissions from these sources exceed 25,000 MTCO2e per year. Suppliers of Natural Gas and transportation fuels are covered beginning in 2015 for combustion emissions from the total volume of natural gas delivered to a non-covered entity or for transportation fuels.

CARB's rationale for adopting Cap-and-Trade was prominently noted by the Court of Appeals' opinion upholding the ARB Scoping Plan as follows:

The final scoping plan explains the Board's rationale for recommending a cap-and-trade program in combination with the so-called "complementary measures" by citing the rationale outlined by the market Advisory committee and quoting from the report of the economic and technology advancement advisory committee, in part, as follows: " A declining cap can send the right price signals to shape the behavior of consumers when purchasing products and services. It would also shape business decisions on what products to manufacture and how to manufacture them. Establishing a price for carbon and other GHG emissions can efficiently tilt decision-making toward cleaner alternatives. This cap and trade approach (complemented by technology-forcing performance standards) avoids the danger of having government or other centralized decision-makers choose specific technologies, thereby limiting the flexibility to allow other options to emerge on a level playing field... Complementary policies would be needed to spur innovation, overcome traditional market barriers ... and address distributional impacts from possible higher prices for goods and services in a carbon-constrained world" (AIR 206 Cal.App.4th at p. 1499).

Cap-and-Trade is designed to reduce the emissions from a substantial percentage of GHG sources (approximately 80 percent of GHG emissions would come under the program) within California through a market trading system. The system would reduce GHG emissions by reducing the available GHG "allowances" over time in the original bill up until the year 2020. In December 2018, the legislature adopted amendments to the cap-and-trade program that set major market rules after 2020 until 2030.

Facilities are required to obtain an "allowance", either through purchasing on auction or through freely allocated "industry assistance" allowances from CARB, for each MTCO2e of GHG they emit.

CARB issues the "industry assistance" allocations for free for a number of industries. These are based, in part, on a pre-defined "benchmark" of GHG emissions per unit of production. For the crude oil production sector, allowances are provided as a function of the amount of crude oil produced, thereby establishing, in effect, a level of efficiency regarding GHG emissions for that sector. Other sectors are also allocated allowances based on their own respective activities.

If an operation within the sector operates less efficiently than the specified "benchmark", thereby receiving an insufficient number of "free" allowances to cover their emissions, implementation of efficiency improvements or the purchase of additional allowances from the CARB auction would be required. Some availability of "offsets" is also included in the program, which can be obtained from specific, allowable offset programs, such as GHG reduction projects related to forestry, livestock, mine methane capture and ozone depleting chemicals. Offsets outside of these three options are not allowed at this time.

The first group of sectors began trading in allowances in 2012. That group includes the oil and gas sector as well as most stationary sources. A second group began the program in 2015, which included the transportation fuels sector.

For subsequent periods after the initial 2013 period, allowances are planned to be distributed freely through the "industry assistance" program or auctioned off. Industry assistance allowances would decrease each year as per a "cap adjustment factor". The cap adjustment factor would be approximately 2 to 3 percent annually through 2020. The total allowances allowed to be allocated each year (either freely allocated or auctioned) are limited by the defined allowance budget, which decreases each year through 2020. Current prices for carbon are about $15 per ton in 2018.

An operator is required to participate in the Cap-and-Trade program if its facility emits more than 25,000 MTCO2e annually. Annual reporting of GHG emissions is required under the CARB Mandatory Reporting Rule.

As only a limited number of allowances are issued, based on the original emissions estimates prepared by the CARB, and these allowances are reduced each year by a given percentage to achieve the year 2020 goals, any operator who commences operations after the Cap-and-Trade program is in effect would be required to obtain allowances from the given limited pool. Any increase in GHG emissions at a facility would therefore be allowed through a reduction in GHG emissions at some other location with the net GHG emissions statewide not increasing. This mechanism would serve to ensure that: the goals of AB 32 are achieved; that emissions statewide are reduced, even if local GHG emissions increase; and that, ultimately, emissions of GHG and atmospheric CO2 concentrations are stabilized, thereby reducing impacts. This produces, in effect, mitigation for this cumulative impact.

Note that GHG emissions produce no immediate, local health effects (such as criteria pollutants or ozone), and therefore GHG emissions reduced in another County, for example, could be used to offset the GHG emissions occurring at a project site.

SB 375 Sustainable Communities and Climate Protection Act of 2008

SB 375 supports the State's climate action goals to reduce GHG emissions through coordinated transportation and land use planning with the goal of more sustainable communities.

Under the Sustainable Communities Act, CARB sets regional targets for GHG emissions reductions from passenger vehicle use. In 2010, CARB established these targets for 2020 and 2035 for each region covered by one of the State's metropolitan planning organizations (MPO). CARB will periodically review and update the targets, as needed.

Each of California's MPOs must prepare a "Sustainable Communities Strategy" (SCS) as a part of its regional transportation plan (RTP). The SCS contains land use, housing, and transportation strategies that, if implemented, would allow the region to meet its GHG emission reduction targets. The Sustainable Communities Act also establishes incentives to encourage local governments and developers to implement the SCS or an alternative planning strategy (APS). Developers can get relief from certain environmental review requirements under CEQA if their new residential and mixed-use projects are consistent with a region's SCS (or APS) that meets the targets (see Cal. Public Resources Code §§ 21155, 21155.1, 21155.2, 21159.28.).

The Santa Barbara County Association of Governments (SBCAG) released their Final Sustainable Communities Strategy in August 2017 as part of their Regional Transportation Plan (RTP), and as an update to the 2013 plan. CARB provided approval of the 2013 Plan in November 2013, concluding that SBCAG's adopted SCS demonstrates that, if implemented, the region will achieve a 10.5 percent per capita vehicle greenhouse gas reduction in 2020 (passenger cars and trucks), and a 15.4 percent reduction in 2035, exceeding the established targets.

California Climate Action Registry General Reporting Protocol

The California Climate Action Registry is a program of the Climate Action Reserve and serves as a voluntary GHG registry. The Climate Action Reserve is a carbon offset registry for North America and establishes standards for carbon offset projects, including protocols and credits for CEQA compliance. The California Climate Action Registry was formed in 2001 when a group of chief executive officers, who were investing in energy efficiency projects that reduced their organizations' GHG emissions, asked the State to create a place to accurately report their emissions history. The California Climate Action Registry publishes a General Reporting Protocol, which provides the principles, approach, methodology, and procedures to estimate such emissions.

California Air Resource Board Mandatory Reporting Regulation

CARB approved a mandatory reporting regulation in December 2007, which became effective January 2009 (which appears at sections 95100-95133 of Title 17, California Code of Regulations), which requires the mandatory reporting of GHG emissions for specific industries emitting more than 10,000 - 25,000 MTCO2e depending on the process source type.

Resolution 18-52

Amendments to the regulation for the mandatory reporting of greenhouse gases were adopted on December 13, 2018. The update provides guidance for reporting for facilities with emissions below applicable reporting requirements and data requirements and calculation methods for certain emission devices.

Status of California GHG Reduction Efforts

The State is required to monitor the effectiveness of the state programs on an annual basis. According to the State report card for 2017, the State achieved reductions of 46 million MTCO2e (MMT) in 2015, with the primary contributors listed below:

- The Transportation Sector achieved reduction of 14.3 MMT of reductions in 2015 with a goal of about 49 MMT of reductions by 2020, primarily through the Pavley, low carbon fuel standard, tire pressure programs and ship electrification programs;
- Energy efficiency programs have produced reductions of 7.2 MMT in 2015;
- Appliance efficiency standards have achieved reductions of 4.7 MMT in 2015; and
- The Renewable Portfolio Standard program for power generation achieved a reduction of 6.9 MMT in 2015.

The Cap-and-Trade program was started in 2013 has a goal of post-2020 delivering 236 MMTCO2e cumulative GHG emissions reductions from 2021 through 2030.

Senate Bill 350

With the Clean Energy and Pollution Reduction Act of 2015 (SB 350), signed into law on October 7, 2015, California expanded the specific set of objectives to be achieved by 2030, with the following:

- To increase the Renewable Portfolio Standard (RPS) from 33 percent to 50 percent for the procurement of California's electricity from renewable sources; and
- To double the energy efficiency savings in electricity and natural gas end uses by retail customers.

AB-398 California Global Warming Solutions Act of 2006

AB-398, approved July 17, 2017 amended The California Global Warming Solutions Act of 2006 and extends the Cap and Trade Program from January 1, 2012 to December 31, 2030 and provides for a price ceiling and other measures to improve and provide additional banking allowance rules.

SB-100 California Renewables Portfolio Standard Program

SB-100, introduced in January 2017, would revise the California Renewables Portfolio Standard Program to state that the goal of the program is to achieve that 50% renewable resources target by December 31, 2026, and to achieve a 60% target by December 31, 2030. The bill states that it is the policy of the state that eligible renewable energy resources and zero-carbon resources supply 100% of retail sales of electricity to serve California end-use customers and 100% of electricity procured to serve all state agencies by December 31, 2045. The bill was signed by the Governor in September 2018.

Executive Order B-55-18

Governor Jerry Brown signed this Executive Order in September 2018 that sets a new statewide goal to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter. This goal supplements the existing statewide targets of reducing greenhouse gas emissions.

Short-Lived Climate Pollutant Reduction Strategy

In March 2017 CARB released the Short-Lived Climate Pollutant Reduction Strategy which identified the need to immediately reduce emissions of short-lived climate pollutants (SLCPs), which include black carbon (soot), methane (CH4), and fluorinated gases (F-gases, including hydrofluorocarbons, or HFCs). The plan outlines goals for reductions by 2030 for black carbon (50%), methane (40%), and HFCs (40%) and emission reduction actions that provide a wide array of climate, health, and economic benefits throughout the State.

4.2.2.4 Local Regulations

South Coast Air Quality Management District (SCAQMD)

SCAQMD regulation 2700 (amended June 4, 2010) stipulated a series of rules to address GHG emissions and climate change:

- Rule 2700 - provides definitions and the global warming potential for various gases pursuant to the regulation;
- Rule 2701 - established a voluntary program to encourage, quantify, and certify voluntary, high quality certified greenhouse gas emission reductions in the District; and
- Rule 2702 - created a Greenhouse Gas Reduction Program for greenhouse gas emission reductions in the District. The SCAQMD funds projects through contracts in response to requests for proposals or purchase reductions from other parties.

City of Carson

In 2017 the City of Carson adopted a Climate Action Plan (South Bay Cities, 2017) to:

- Understand the community GHG emissions that it now produces;
- Identify strategies at the local level that will result in GHG emissions reductions;
- Develop a plan to implement strategies; and
- Monitor and report progress toward climate change goals.

The plan provides a GHG inventory for the City of Carson, sustainability efforts, GHG forecasts, GHG reductions strategies and goals, and monitoring programs.

4.2.3 Significance Thresholds

Appendix G of the CEQA Guidelines provides these key questions to guide evaluation of impacts related to air quality. Does the Project:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The SCAQMD, in its role as the agency responsible for regulating air emissions locally, has developed detailed criteria to address air quality issues relevant to the regional air basin and which establish quantitative thresholds which address the CEQA Appendix G questions listed above. The SCAQMD threshold for GHG emissions is 10,000 metric tons per year CO_2e for industrial facilities. This EIR applies

both the CEQA guidelines and the significance thresholds established by the SCAQMD to determine whether an impact is significant.

4.2.4 Project Impacts

4.2.4.1 Construction Emissions

Section 4.1, Air Quality, provides a discussion on construction emissions which include GHG emissions from the following activities:

- Construction equipment exhaust associated with pipeline trenching and excavation, foundation and piping work for installation of the pressure reduction valve skid and other pipeline connections;
- Worker automobile commuting; and,
- Delivery truck trips to the pipeline spread construction areas.

The Air Quality Impact Assessment (AQIA) prepared by the applicant, *Air Quality Impact Assessment for the Air Products Carson Pipeline Project (Trinity Consultants, July 2020)* calculated the construction emissions of the proposed Project. As noted in Section 4.1.5.1 the AQIA used the CalEEMod and EMFAC models to estimate construction emissions for the proposed Project. Input parameters for the AQIA analysis to the CalEEMod model are summarized in Table 4.1-7 and the construction equipment inputs in Table 4.1-8, the AQIA is included as Appendix B of this EIR.

Tables 4.2-4 present the proposed Project construction emissions for the GHG gases carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O) and carbon dioxide equivalent (CO2e) as estimated in the AQIA. Note that the Avoidance and Minimization Measures (AMMs) discussed in Section 4.1.5.1 address fugitive dust control and therefore do not have an impact on GHG emissions.

Table 4.2-4 Construction GHG Emissions (Metric Tons per Year)

Equipment	CO2	CH4	N20	CO2e
Pipeline Spread	145	0.04	0.00	146
Pipe Delivery	1	0.00	0.00	1
Automatic Shutoff Valve and Pipeline Connections	24	0.00	0.00	25
Paramount Refinery Connections	24	0.00	0.00	25
Total Emissions	**196**	**0.05**	**0.00**	**197**

Source: Trinity Consultants July 2020. Numbers may not add due to rounding.

4.2.4.2 Operational Emissions

As discussed in Section 4.1.5.2, operational emissions are those that result from the day-to-day activities occurring throughout the proposed Project. Operational emissions for the proposed Project consist of transporting hydrogen through a twelve-mile pipeline from the City of Carson to the Paramount Refinery. Under normal operations there would not be any GHG emissions associated with the operation of the pipeline except for those associated with generating the electricity required to transport the hydrogen through the pipeline. The proposed Project would result in an increase in operational emissions from the Air Products Carson Hydrogen Plant due to an increase in the amount of hydrogen production, construction and electrical use. Table 4.2-5 summarizes the GHG emissions, including the baseline trucking emissions

Table 4.2-5 GHG Emissions (Metric Tons per Year)

Equipment	CO2	CH4	N20	CO2e
Worst-case Flaring Scenario (Pipeline Leak Blowdown)	4.94E-04	1.82E-06	1.59E-05	5.28E-03
Pipeline Electrical Emissions	-	-	-	35
Worst-case Carson Plant Emission Increase*	-	-	-	31,820
Amortized Construction	-	-	-	8
Proposed Project Emission Increase	4.94E-04	1.82E-06	1.59E-05	31,863
Existing Truck Emissions (Baseline)	-	-	-	311
Net GHG Emissions	-	-	-	31,552
SCAQMD Thresholds	-	-	-	10,000
Above the Thresholds?	-	-	-	Yes

Source: Trinity Consultants July 2020. Numbers may not add due to rounding.
* Based on combustion of 928 mmbtu/hr for the reformer at full load as per the 1998 EIR, with the fractional increase of 7 mmscfd with the project. See Appendix B.

Although the proposed Project would eliminate the production of hydrogen at other facilities, thereby producing a reduction in GHG emissions at other facilities, as a worst-case, the estimated Carson Plant increase in GHG emissions associated with the production of 7 mmscfd of hydrogen has been included.

The proposed Project AQIA estimated electrical GHG emissions with the CalEEMod model based on a maximum electricity use of 300 kilowatt hours per day and the model electrical utility emission factors for Southern California Edison as presented in Table 4.2-5. Also included in Table 4.2-5 are the emissions associated with emergency flaring assuming a single emergency flaring event per year.

4.2.5 Impact Discussion

This section discusses the potential impacts of the proposed Project with the significance thresholds outlined in CEQA Guidelines Appendix G and the applicable SCAQMD air quality significance thresholds discussed in Section 4.2.3 above.

Impact #	Impact Description	Phase	Impact Classification
GHG.1	The proposed Project would not generate greenhouse gas emissions, either directly or indirectly, that would have a significant impact on the environment.	Construction or Operation	III

Tables 4.2-5 shows that the amortized construction combined with the operational GHG emissions of the proposed Project would be above the SCAQMD significance threshold of 10,000 metric tons CO2e. The net increase of CO2e associated with the operational and amortized construction phase of the proposed Project are due primarily to the potential increase in GHG emissions at the Carson Plant associated with the production of the 7 mmscfd of hydrogen. Almost all of this increase would be due to the reformer emissions, which reforms natural gas. All natural gas supply in California is a part of the AB32 Cap and Trade Allowance that offsets the reduction to result in an emissions neutral GHG impact. Therefore, the GHG emissions impact is less than significant and impacts are **less than significant (Class III).**

Impact #	Impact Description	Phase	Impact Classification
GHG.2	The proposed Project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	Construction or Development	III

California's regulatory setting for GHG emissions ensures that most of the existing and foreseeable GHG sources are subject to one or more programs aimed at reducing GHG emission levels. Similarly, electricity in California is subject to the Renewable Portfolio Standard (as the RPS is codified pursuant to SB 350 & SB 100). The Cap and Trade incorporates emissions associated with all transportation fuels and the combustion of natural gas. California's GHG reduction strategies are working to achieve GHG reductions, and CARB has adopted the plan to maintain and continue reductions from all sectors of the economy beyond 2020 to 2030.

Given the oversight of project-related sources and progress of California's ongoing efforts to implement policies and a regulatory setting for reducing GHG emissions, the proposed Project is not likely to conflict with any applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions and would comply with the policies by utilizing construction-related diesel fuel and gasoline, and operational emissions associated with natural gas combustion, that are covered by the existing programs such as the Low Carbon Fuel Standard and (LCFS) and Cap-and-Trade.

Therefore, the proposed Project would not conflict with any applicable plan, policy or regulation including the City of Carson's Climate Action Plan to reduce the emissions of greenhouse gases. Therefore, impacts for GHG Impact 2 are **less than significant (Class III).**

4.2.6 Cumulative Effects

Emissions of GHG are a global issue and therefore all GHG emissions are cumulative and would contribute to global GHG emissions impacts. The thresholds as developed by the SCAQMD address cumulative impacts of GHG by determining a threshold whereby project below the thresholds would, by definition, not have a cumulative impact. Since the Proposed Project GHG emissions are less than significant, and actually produce a reduction in GHG emissions over the existing operations, cumulative GHG emissions would be less than significant.

4.2.7 References

AEP. 2007. Recommendations by the Association of Environmental Professionals (AEP) on How to Analyze Greenhouse Gas Emissions and Global Climate Change in CEQA Documents. Comment Draft. White Paper. March 2007.

American Petroleum Institute (API). 2004. Compendium of Greenhouse Gas Emissions Methodologies for The Oil and Gas Industry, February 2004.

CalEPA. 2017, State Agency Greenhouse Gas Reduction Report Card.

CARB. 2019. California GHG Emissions. [online]: https://ww3.arb.ca.gov/cc/inventory/data/data.htm. Access June 2020.

CARB 2006. Public Workshop to Discuss Establishing the 1990 Emissions Level and the California 2020 Limit and Developing Regulations to Require Reporting of Greenhouse Gas Emissions; December 1; Sacramento, CA.

CARB. 2008. Climate Change Proposed Scoping Plan; December 2008.

Canadian Nuclear Society (CNS). 1998. 19th Annual Conference. October 1998.

Edison International. 2017. 2017 Sustainability Report, June 2018

EPA 40 CFR Part 98, Subpart A, Table A-1, Global Warming Potentials, dated Nov 29, 2013

EPA. 2018. Inventory of US Greenhouse Gas Emissions and Sinks, 1990-2016, EPA 430-R-18-003, April 12, 2018

IPCC. 2007. Intergovernmental Panel on Climate Change. 2007. "Fourth Assessment Report". 2007

IPCC. 2014. Intergovernmental Panel on Climate Change. 2014. "Fifth Assessment Report". 2014

NOAA. 2018. [Online]: https://www.esrl.noaa.gov/gmd/ccgg/trends/

SCAQMD. 2020. Air Quality Significance Thresholds April 2016 [online]: http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook.

South Bay Cities. 2017. City of Carson Climate Action Plan. 2017.

Trinity Consultants, 2019. Air Quality Impact Assessment Air Products Carson Pipeline Project. April 2019, July 2020.

4.3 Hazardous Materials and Risk of Upset

This section describes environmental and regulatory settings related to hazardous materials and risk of upset; identifies hazardous materials and risk of upset impacts of the proposed Project and cumulative impacts from this and other projects in the region; and provides mitigation measures to reduce those impacts. A Pipeline Safety Technical Report*, Air Products Carson to Paramount Hydrogen Pipeline Project Pipeline Safety Technical Report,* prepared by the applicant and EDM Services Inc., was utilized in the preparation of this section, the report is included in Appendix C.

The proposed Project involves the use of an existing 11.5-mile-long series of pipelines plus construction of a new 0.5-mile pipeline segment to connect from the Air Products' existing hydrogen facility in the City of Carson to the Paramount Refinery World Energy Renewable Fuels Facility in the City of Paramount, California. The proposed Pipeline system would transport hydrogen gas. The existing 11.5-mile pipeline crosses the cities of Carson, Los Angeles, Long Beach, Lakewood, Bellflower, and Paramount in addition to an unincorporated part of the County of Los Angeles and land owned or controlled by the Port of Los Angeles and the Joint Ports Authority. The 0.5-mile of new pipeline would be located entirely within the City of Carson.

The proposed Project could pose risks to the public from a release of hydrogen gas in the event of a leak or rupture of the pipeline. If the hydrogen reached a combustible mixture along with enough energy to ignite the mixture, a fire or explosion could occur which could result in injuries or death to people in close proximity to the pipeline.

The analysis contained herein addresses potential releases and consequences of the transportation of hydrogen. The risks associated with transportation are specific to this project and depend on the population densities of the areas, the distances and routes of project components and the amount of materials moved. Therefore, this risk analysis is only applicable to the specific routes and material needs of this specific project and should not be used to determine the risks associated with other projects and the benefits or disadvantages of one mode of transportation compared to another.

4.3.1 Environmental Setting

The proposed Project would involve the use of existing out of service pipelines. Tis pipeline infrastructure is described in this environmental setting section. The impacts of using these pipelines are discussed in the impacts section, Section 4.3.4.

The current baseline operations involve the delivery of hydrogen to the Paramount Refinery by truck from the Praxair facility in Ontario. An average of 4-6 trucks per day deliver liquid hydrogen from a distance of 45 miles one-way from the Praxair facility to the Paramount Refinery. The baseline risks associated with this operation are discussed below.

4.3.1.1 Existing Pipeline Operation

The proposed pipeline route would utilize existing pipelines (with a new, short segment installed to connect to the existing Air Products Carson Hydrogen Plant) and would initiate in the City of Carson and would terminate in the City of Paramount. The site of the existing pipelines is located within an area of industrial, commercial, and residential land uses. The existing pipelines alignment is generally level terrain and has been modified by urban development. The existing pipeline segment locations are described in Section 2.0, Project Description.

The existing pipelines are currently empty and therefore do not present any hazardous material risks to the public.

4.3.1.2 Existing Trucking Operations Risk

Existing trucking operations involves the transport of liquid hydrogen from the Praxair facility to the Paramount Refinery. Transportation of hazardous materials on the highways and local roadways presented risks to the public if the material is released and impacts public areas or vehicles along highways. A risk assessment was conducted as part of this analysis to identify the level of risk that the current baseline trucking operations present in order to determine significance.

Risk Analysis

The development of a hazards assessment typically involves four major tasks that include the following:

- Identification of release scenarios,
- Determination of the consequences of each release scenario,
- Development of frequencies of occurrence for each release scenario that could impact the public, and
- Development of risk estimates (risk profiles, risk contours, risk matrix, etc.).

The inter-relationship and specific elements for each of these tasks are shown in Figure 4.3-1.

Each of these steps are described below in relation to the project.

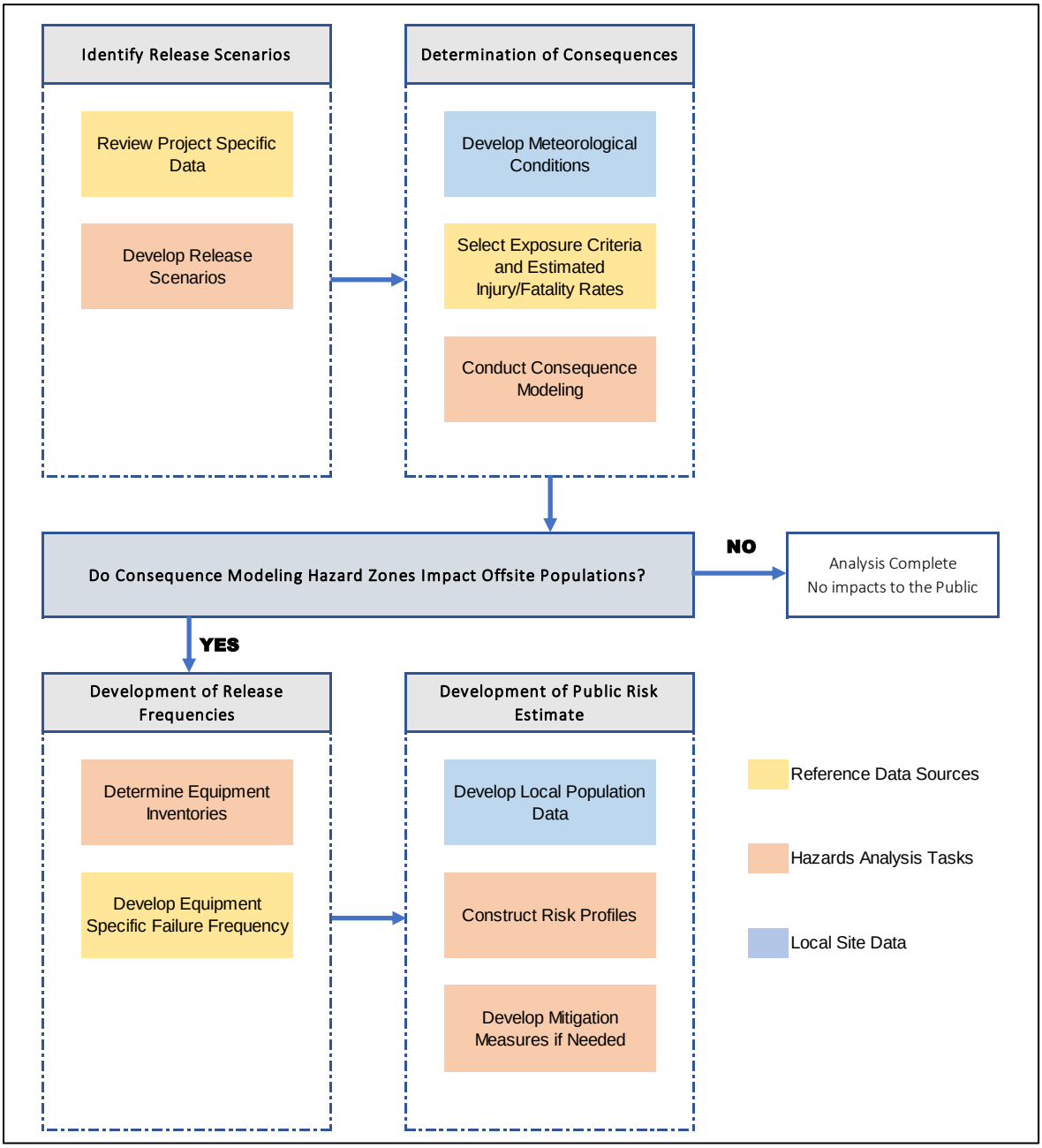
Hydrogen Gas Characteristics

Hydrogen gas is a diatomic gas with the molecular formula of H_2, a molecular weight of 2 and is colorless, odorless, and flammable. Hydrogen behaves substantially differently than hydrocarbons on release of containment under pressure. It is much lighter than air, and therefore can have a substantial buoyancy effect in air.

In order to increase the density of hydrogen for increased efficiency while transporting, hydrogen is often liquified. Liquefaction and transportation of hydrogen involves cooling the hydrogen gas to below about -423^{o}F and storing it in cryogenic insulated truck tanker vessels, Department of Transportation (DOT) tanker code MS-338. The hydrogen liquid must be delivered while maintaining at a temperature cold enough to remain a liquid as the trucks do not have the capability to refrigerate the materials at that low a temperature.

Release of cryogenic liquid hydrogen are very complicated. Releases can be highly turbulent and heavily influenced by buoyancy, with dispersion affected by: flashing, multi-phase flows, heat transfer, pool formation, ambient conditions (e.g., temperature, humidity, wind), ground effects, and obstacles/barriers. Extreme cold temperatures of liquid hydrogen can also condense or even freeze ambient air during spills (Sandia 2014). Some formation of liquid pools can form, with rapid vaporization, as well as vaporization from the releasing materials. Studies show that ground heat transfer effects and fast dissipation rates helped limit the size and duration of liquid hydrogen pools and flammable clouds even under controlled conditions (Sandia 2014). Other studies show that ignited liquid plumes rapidly produce jet fires (Hooker 2012), as is assumed in this analysis.

Figure 4.3-1 Steps Involved in Developing a Quantitative Risk Assessment



In addition, hydrogen has a very low ignition energy which means it can be ignited easily and may be ignited even by a static discharge. The Minimum Ignition Energy (MIE) is defined as the minimum energy that can ignite a mixture of a flammable material with air or oxygen; for hydrogen the MIE value is 0.019 millijoules (mJ), which is almost 20 time lower than natural gas, meaning that hydrogen can ignite almost 20 times more easily than natural gas.

These properties generally mean that hydrogen will generally not produce a flammable vapor cloud, particularly when the release is associated with an energetic event such as a vehicle accident or pipeline rupture and released hydrogen impacts will generally be due to thermal radiation from a jet fire.

Identification of Release Scenarios

The release scenarios associated with baseline truck transportation involve a release from the hydrogen tanker truck involved in an accident or an equipment malfunction. Releases could occur in a range of different sizes, depending on the characteristics of the release. Releases are generally defined by two different groups in this analysis: ruptures and leaks. Ruptures are defined as releases that occur rapidly and involve a release hole of about 6 inches or more. Leaks are releases from smaller holes, defined in this analysis as 1 inch in diameter. Modeling runs were performed to estimate the extent of impacts of the different releases. The Canary© model was used and incorporated a range of assumptions about the temperature, release direction, meteorological parameters and release duration. These are listed in Table 4.3.1.

Table 4.3.1 Release Modeling Parameters

Parameter	Value
Rupture Diameter	6" for rupture, 1" for leaks
Operating Pressure	25 psia (as per MC-338 specifications)
Flow Rate	Defined by modeling
Content Temperature	-423^{o}F
Release Angle	0^{o}
Wind Speed	Worst case 20 mph for jet fires
Ambient Humidity	70%
Ambient Air and Surface Temperature	70 ^{o}F
Tank Volume	10,250 gallons, average of range of tanker truck sizes as indicated by Applicant

Units: psia = pounds per square inch, ^{0}F – degrees Fahrenheit, mph= miles per hour.

The release angle defines the extent to which the release is angled from the horizontal. Releases could be a range of between vertical or horizontal depending on the type of truck accident or release. Therefore, a worst case of horizontal was utilized.

Wind speed has an impact on the downwind distances of impacts as well as the shape of the impact zones. Wind speeds of 20 mph verses zero wind speeds produce longer downwind distances but narrower impacts zones and based on rupture modeling for this analysis indicate an increase in impact area of about 30-50% with higher winds over no winds. For this analysis, it was assumed there would be higher winds thereby producing somewhat larger impact zones to be conservative.

Determine the Consequences Of Each Release Scenario

As hydrogen has a very low ignition energy, it was assumed that all releases would ignite immediately and therefore only jet fires were assumed to occur and produce impacts to the public. A jet fire is a high energy event that causes immediate impacts due to high levels of thermal radiation. Thermal radiation levels that could produce impacts were assumed to be the following, as per the California Department of Education (CDE) protocol (see Section 4.3.2.2).

- 12,000 Btu/ft^2-hr (37.7 kW/m2) – 100% mortality after 30 second exposure (CDE 2007).
- 8,000 Btu/ft^2–hr (25.1 kW/m2) – 50% mortality after 30 second exposure (CDE 2007), 100% serious injury.

- 5,000 Btu/ft^2-hr (15.7 kW/m2) – 1% mortality after 30 second exposure (CDE 2007), 50% serious injury.

The population densities are based on the US Census data (year 2010) for Census Tracts along the portions of the route that involves local roadways. For portions of the route that are along highways, historical data was utilized which indicate the percentage of accidents that result in a release of hazardous materials in combination with the probability that fatalities are realized. As the distance of jet fire impacts are less than 100 feet, it was assumed that all truck accidents that occur along highways have impacts are limited to the highway right-of-way (ROW).

Modeling was conducted using the Canary© model to estimate the effects of jet fires on the surrounding populations. Table 4.3.2 shows the results of the modeling. Modeling was assumed as a worst case to occur during a relatively windy period, thereby increasing the downwind effects. No adjustments were made for upwind or downwind release directions as there are many different potential release scenarios, and worst-case wind conditions were used for this analysis. Note that for both leaks and ruptures, the difference between the 12,000 btu/hr-ft^2 distance and the 5,000 btu/hr-ft^2 is small, ranging from 1 – 5 feet, meaning that generally, most persons exposed would be close to or within the high thermal radiation levels associated with the jet fire itself.

Table 4.3.2 Canary Modeling Results – Truck Releases

Scenario	Distance to 12,000 btu/ht-ft^2, (feet)	Distance to 8,000 btu/ht-ft^2, (feet)	Distance to 5,000 btu/ht-ft^2,(feet)
Rupture – 6”	81.6	82.1	86.7
Leak – 1”	26.5	27.0	27.3

Units: btu/ht-ft^2 = British thermal units heat per square foot.

Development of Frequencies Of Occurrence For Each Release Scenario That Could Impact The Public

Truck accident rates are based on studies on federal truck accident rates for trucks carrying hazardous materials. A study on the comparative risks of hazardous materials (HM) and non-HM transportation was conducted by Battelle for the Federal Motor Carrier Safety Administration (FMCSA) in 2001. The study calculated the risks associated with each category of hazardous material and analyzed data from the Hazardous Materials Information Resource System (HMIRS) database, and the Motor Carrier Management Information System (MCMIS) accident database.

In the FMCSA study, truck accident rates were developed for HM and non-HM truck transportation. HM shipments constituted approximately 5% of the total truck mileage. HM Class 3 (HM-3) includes flammable and combustible materials, the bulk of which was gasoline transported in cargo tanks. It was reported in the FMCSA study that 52% of the HM vehicles carried Class 3 flammable and combustible liquids and represented 56% of all of the impacts (1391 accidents). The accident rates were calculated as follows:

- Non-HM truck accident rate = 0.73 per million vehicle miles
- HM truck accident rate = 0.32 per million vehicle miles

The truck accident rates quoted are for accidents included in the MCMIS database, which include fatalities, significant injuries and tow-away accidents.

Analysis of the MCMIS data on accident type and release probability given an accident indicates that for accidents producing fatalities, release probabilities are high (about 40%) due most likely to the higher energy of accidents producing fatalities, such as rollovers, and that fatal accidents occur in about 1% of

accidents. Most other types of accidents have a lower rate of release probability, on the order of 5%. These combined produces a release probability given an accident of 5.4% (SBC 2019).

The MC-338 trucks, while cryogenic, are required by 49 CFR 178.338.4.e to have a shell thickness similar to that required by 49 CFR 178.348-2 for DOT-406 (gasoline) tanker trucks. Therefore, release probabilities and release size distributions for the liquid hydrogen tanker trucks are assumed to be similar to low-pressure hazardous material tanker trucks. An analysis has been conducted for Santa Barbara County (SBC 2019) of hazardous material releases recorded in the Hazardous Materials Incident Reporting System (HMIRS, maintained by DOT and the Pipeline and Hazardous Materials Safety Administration (PHMSA)) database for the years 1991 to 2015 for general tanker trucks. About 40% of releases were determined to be large/rupture releases and 60% were determined to be smaller/leak releases. These include releases due to both collisions and non-collisions.

Development of Risk Estimates

Risk estimates are generated from all the leak and rupture scenarios along each of the truck route segments. Appendix C provides a listing of each of these segments along with the corresponding failure frequency and the impacts based on the population densities within each census tract.

As the scenarios that could affect populations along local roadways would be jet fires, the impact of these events on persons located inside buildings would be nominal and therefore only persons outside are assumed to be impacted. This reduces the frequency of a release impacting persons. As per the National Human Activity Pattern Survey (NHAPS) publication (NHAPS 2001), 7.9% of persons are expected to be outside over a 24-hour average. For segments located near schools, the use of a 2 hours per day exposure, as per the CDE protocol, was used along with an additional hour to addresses pickup and drop-off (12.5%) and assumes, as a worst case, that schools are in session in some manner all year long.

For releases along the highways, historical data from PHMSA and the HMIRS database associated with fires from truck accidents are shown in the Table 4.3.3. This historical data indicates that 4.8% of gasoline truck accidents involving a release and subsequent fire could impact the public producing 1 or more fatalities. A range of 9 to 42 % of accidents causing a release and subsequent fire produce a fatality of any person, usually of the vehicle driver. As this data is based on U.S wide databases, and many of the releases in the database occurred in non-heavily urbanized areas along highways, an adjustment factor has been included to address the increased density of vehicles along the project highways in Los Angeles as opposed to those in the entire country. Los Angeles freeways are notoriously heavily used and the increased density of vehicles most likely would cause an increase in the probability that an accident and subsequent fire on these crowded freeways would cause a public fatality. This factor is based on a ratio of the Project route freeway AADT verses the average AADT for the larger urban areas in the country, which indicates a 2.55 times higher AADT along project freeways (FHWA 1998).

Note that there have been a number of accidents involving hydrogen trucks in the database, with no resulting public fatalities.

The results of the analysis are shown in the impact section plotted on an FN (frequency verses consequence) curve along with the proposed Project, which is a plot of the cumulative frequency of an event along with the number of fatalities.

Table 4.3.3 Historical Data on Truck Release Probabilities

Scenario	HMIRS	PHMSA	PHMSA	PHMSA	PHMSA	PHMSA	PHMSA
Years	1991-2015	1971-2019	1971-2019	1971-2019	1971-2019	1971-2019	1971-2019
Material	Gasoline	Gasoline (1203)	All Class 2.1 Materials	LPG[2]	MC331 trucks[3]	H2 Liquid	H2 Gas
Number of Releases	1,366	19,299	4,631	1,758	263	137	98
Number of Fires	252	700	361	80	54	5	0
Number of Fatalities[1]	106	192	33	10	5	0	3
Number of Public Fatalities	12	17	6	4	3	0	0
Fire with Any Fatalities %	42.1%	27.4%	9.1%	12.5%	9.3%	-	-
Fire with Only Public Fatalities %	4.8%	2.4%	0.1%	5.0%	5.6%	-	-
Serious Release %	37.3%	23.2%	8.2%	18.1%	26.6%	19.7%	3.1%

Class 2.1 materials are those classified as compressed flammable gas. Gasoline 1203 are those vehicles with a UN1203 placard. 1) includes fatalities of employees (usually the driver) and the public. 2) includes vehicles with UN1075, UN1011, UN1978 placards. 3) includes only those vehicles classified as MC331/330 tanker trucks.

4.3.2 Regulatory Setting

This section provides an overview of the Federal and State regulations on the operation of gas transmission pipeline systems. The Natural Gas Pipeline Safety Act of 1968 as amended (NGPSA) authorizes the United States Department of Transportation (DOT) to regulate pipeline transportation of natural (flammable, toxic, or corrosive) gas and other gases as well as the transportation and storage of liquefied natural gas (LNG).

The Federal Office of Pipeline Safety (OPS) designates portions of the regulatory authority with state agency partners and others at the Federal, state, and local level. The California Public Utilities Commission (CPUC) is the agency authorized to oversee intrastate gas pipeline facilities in California.

4.3.2.1 Federal Regulations

Gas pipelines are subject to the requirements of the Code of Federal Regulations (CFR) Title 49 Parts 190 through 192:

- 49CFR190 – Pipeline Safety Enforcement and Regulatory Procedures;
- 49CFR191 – Transportation of Natural Gas and Other Gas by Pipeline, Annual Reports, Incident Reports, and Safety Related Condition Reports; and,
- 49CFR192 – Transportation of Natural Gas and Other Gas by Pipeline, Minimum Federal Safety Standards.

49 CFR 190

This part prescribes procedures used by the Pipeline and Hazardous Materials Safety Administration (PHMSA) in the regulation of pipeline safety. The regulation outlines procedures for PMSHA regulators administrators for:

- Enforcement;
- Compliance Orders;
- Civil Penalties;

- Specific Relief;
- Criminal Penalties;
- Procedures for Adoption of Rules; and
- Cost Recovery for Design Review.

49 CFR 191

The section addresses the reporting requirements for pipeline operators including annual reporting of pipeline parameters such as diameter, age, length, material specification, and other physical properties. Section 49 CFR 191 also outlines the require reporting of the following:

- Incidents and accidents;
- Safety related conditions discovered as a result of a periodic or unscheduled inspection, and
- Procedures to be followed regarding the reduction of operating pressure should a safety related condition be discovered.

The regulation also requires a pipeline operator to file a report within 5 days of certain potential safety related conditions such as corrosion, pipeline movement, pipeline defects or damage, malfunctions and pressure anomalies, leaks, and other situations that could lead to an imminent hazard.

49 CFR Part 192

This part prescribes minimum safety requirements for pipeline facilities and the transportation of gas, including pipeline facilities and the transportation of gas. A summary of the section requirements includes:

- 49CRF192.1 – Provides the applicability and intent of the regulation;
- 49CRF192.3 – Defines the terms used within the regulation;
- 49CRF192.5 – Relates human exposure to the level of design, operation, and maintenance requirements of the regulation. Sets forth class locations relating to population density with more conservative design requirements for denser populated areas. Sets four classification areas as follows:
  - Class 1 – 10 or fewer buildings intended for human occupancy;
  - Class 2 – More than 10 but fewer than 46 buildings intended for human occupancy;
  - Class 3 – More than 46 buildings intended for human occupancy or where the pipeline is located within 100 yards of a building or an area occupied by 20 or more people five days a week for 10 weeks in any 12-month period; and
  - Class 4 – Location where buildings with four or more stories aboveground are present.
- 49CRF192.7 – Documents and safety standards incorporated into the regulation by reference including:
  - American Petroleum Institute (API);
  - American Gas Association Pipeline Research Council (PRCI);
  - American Society of Mechanical Engineers (ASME);
  - American National Standards Institute (ANSI);

  - American Society for Testing and Materials (ASTM);
  - Manufactures Standardization Society of the Valve and Fittings Industry (MSS); and
  - Plastic Pipe Institute (PPI).
- 49CFR192.8 to 192.13 – In depth pipeline descriptions and regulatory requirements;
- 49CRF192.14 – Outlines requirements for conversion of pipelines not previously in gas service to gas service, requirements include:
  - Review the design, construction, operation and maintenance records of the subject pipeline to determine the suitability for the intended gas service;
  - Where sufficient records do not exist, appropriate testing must be performed to determine the suitability for the intended gas service;
  - Visual inspection of the pipeline and right-of-way for defects and condition that might affect the serviceability of the pipeline;
  - Correction of defects found;
  - Testing necessary to establish the maximum operating pressure of the pipeline, record keeping; and
  - Notification of regulator of conversion of service prior to operation.
- 49CRF192.15 – Provides rules for regulator construction;
- 49CRF192.16 – Provides requirements for customer notification;
- Subpart B (49CRF192.51 to 49CFR192.65) – Sets forth the requirements for pipeline material selection and qualification of components.
- Subpart C (49CRF192.101 to 49CRF192.125) – Requirements for new pipelines, relocated pipelines, pipeline replacements and other changes to systems using steel, plastic, and copper pipe.
- Subpart D (49CRF192.141 to 49CRF192.203) – Provides the minimum requirements for design and qualification of pipeline components such as valves, fitting, inspection devices, taps, connections, anchors, vaults, regulator and relief devices, instrumentation and compressor stations.
- Subpart E (49CRF192.221 to 49CRF192.245) - Welding of steel pipeline requirements;
- Subpart F (49CRF192.271 to 49CRF192.287) – Joining of materials other than by welding methods;
- Subpart G (49CRF192.301 to 49CRF192.328) – General construction requirements for transmission and main pipelines;
- Subpart H (49CRF192.151 to 49CRF192.385) – Provides requirements for meters, regulators and service lines;
- Subpart I (49CRF192.451 to 49CRF192.491) – Corrosion control requirements;
- Subpart J (49CRF192.501 to 49CRF192.517) – Pipeline testing requirements including hydrotesting;
- Subpart K (49CRF192.551 to 49CRF192.557) – Minimum requirements for natural gas pipelines;
- Subpart L (49CRF192.601 to 49CRF192.631) – Pipeline operations;

- Subpart M (49CRF192.701 to 49CRF192.755) – Pipeline maintenance;
- Subpart N (49CRF192.801 to 49CRF192.809) – Standards for the qualifications for pipeline operator personnel;
- Subpart O (49CRF192.901 to 49CRF192.951) - Gas transmission integrity management; and
- Subpart P (49CRF192.1001 to 49CRF192.1015) - Gas pipeline integrity management.

Integrity Management Program - 49 CFR 192 Subpart O

In 2003, the OPS implemented the Integrity Management Program (IMP), described in 49 CFR 192 Subpart O. This regulation requires pipeline operators to assess, identify, and address the safety of pipeline segments that are located in areas where the consequences of a pipeline failure could be significant. These are called High Consequence Areas (HCAs).

Under the IMP, pipeline operators are required to; identify all segments of the pipeline that pass through a high consequence area, conduct a baseline assessment of the integrity of these segments, address any safety issues, reassess the integrity of the pipeline at intervals not to exceed 5 years, and establish performance measures to assess the program's effectiveness.

HCAs are defined as:

- Current Class 3 and 4 areas; or
- Any area with a potential impact radius (PIR) greater than 660 feet, or an impact circle that contains 20 or more buildings intended for human occupancy; or
- An "identified site" (for example; recreational or religious facilities, or other areas where high concentrations of the public may gather periodically).

The Pipelines and Informed Planning Alliance (PIPA) has recommended guidelines for safe distances from pipelines which are described in the 2010 document on Risk-Informed Land Use Planning. The PIR is a site-specific distance based on the pipeline contents, pressure, population and vicinity. The PIR is used to determine which pipeline segments fall within the HCA requirements.

4.3.2.2 State Regulations

Pipeline Regulations

The State of California is certified under 49 USC Subtitle VIII, Chapter 601, §60105 to oversee the Federal OPS requirements. The California (PUC) promulgated General Order No. 112-F, "State of California Rules Governing Design, Construction, Testing, Operation, and Maintenance of Gas Gathering, Transmission, and Distribution Piping Systems," which provide additional requirements for gas pipelines. The California State Fire Marshal has jurisdiction for hazardous liquid pipelines. The PUC guidelines enhance the Federal Regulations and are not intended to supersede them. The following provides a summary of General Order No. 112-F requirements:

- Subpart A (Sections 101 to 105) – General requirements and Hazard Consequence Analysis (HCA) guidelines;
- Subpart B (Sections 121-126) – DOT reporting requirements;
- Subpart C (Sections 141 to 145) – Construction and safety standards;
- Subpart D (Sections 161 to 162) – LNG;

- Subpart E (Sections 181 to 183) – Gas storage;
- Subpart F (Sections 201 to 202) – Petroleum gas vessel requirements;
- Subpart G (Sections 301 to 302) – Whistleblower protections;
- Appendix A – Additional vessel requirements, and,
- Appendix B – Gas leak or interruption regulations.

California Health and Safety Code

The California Health and Safety Code contains requirements pursuant to the handling, storage and transmission of hazardous materials:

- Division 20, Chapter 6.5, §25100-25249, Hazardous Waste Control;
- Division 20, Chapter 6.95, §25500, et seq. Hazardous Materials Management Plan and Community Right-to-Know and Hazardous Materials Release Response Plans and Inventory (Business Plan Program);
- Proposition 65 Compliance, H&SC §25249.5 et seq;
- H&SC §§25340-25392, Carpenter-Presley-Tanner Hazardous Substance Account Act; and
- H&SC §§25531-25541, Risk Management and Prevention Program.

Hazardous Materials Worker Safety

California Occupational Safety and Health (CALOSHA) Act requires that employers have an effective Injury and Illness Prevention Program (IIPP) which includes training and instruction on safe work practices. Additionally, the program should include a system for the employer to communicate with the employee with the aim of recognizing and reporting health and safety hazards.

California Department of Education

The California Department of Education (CDE), School Facilities Planning Division (SFPD) has established standards for use by Local Educational Agencies (LEAs) (i.e., school districts, county offices of education and charter school entities) in the selection of safe and educationally appropriate school sites (authority per Education Code section 17251). These standards have been adopted by the State Board of Education in the California Code of Regulations Title 5, Section 14010 – Standards for School Site Selection. Both locally funded and state funded new school sites, and land expansions of existing sites, must comply with these standards. CDE also requires that when seeking approval for new construction or modernization plans on existing school sites, LEAs certify that the project will not create nor substantially exacerbate an existing safety hazard, including those listed in Title 5 related to pipelines.

4.3.3 Significance Thresholds

4.3.3.1 California Environmental Quality Act (CEQA) Thresholds

CEQA Appendix G provides these key questions to guide evaluation of impacts related to hazardous materials and risk of upset. Does the Project:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?
- Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?
- Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

4.3.3.2 Public Safety and Risk of Upset Thresholds

To define the level of "significant hazard" as identified in the CEQA Appendix G thresholds above, a quantitative approach is utilized. The United States Federal and California State governments have not adopted individual risk thresholds. The California Department of Education (see above) and Santa Barbara County have established thresholds for public safety. The Santa Barbara County thresholds are quantitative in nature and have been used and accepted for projects subject to the CEQA including in the County of Los Angeles, the State of California State Lands Commission and Santa Barbara County.

Santa Barbara County adopted Public Safety Thresholds in August 1999. The County incorporated these thresholds into its Environmental Thresholds and Guidelines Manual (SBC 2015). The thresholds are based on a quantitative analysis of the risks of hazardous material releases from facilities and pipelines, and examine the consequences of releases in terms of fatalities and serious injuries and combine this with the frequencies of these respective scenarios to generate FN (frequency verses consequence) curves. The thresholds provide three zones — green, amber, and red — for guiding a determination of the acceptability of project impacts (see Figure 4.3-2). In addition, a Safety Element Supplement was adopted in February 2000 covering hazardous materials (SBC 2000). The Safety Element defines unacceptable risk in a manner that guides consistent and sound land-use decisions involving hazardous facilities. The Safety Element also defines criteria applicable to new development as well as to modifications to existing development if those modifications increase risk. The public safety thresholds do not address risk of environmental damage.

The County requires a Quantitative Risk Analysis (QRA) to be conducted on the potential for public exposure from projects that involve the storage or transport of hazardous materials. In order to determine the potential level of "significant hazard" from risk of upset events, the Project is evaluated against the Santa Barbara County's Potential Significance Classes for Risk (Table 4.3.4), and the Santa Barbara County Fatality and Injury Risk Thresholds (Figure 4.3-2).

Table 4.3.4 County of Santa Barbara Potential Significance Classes for Project Specific Risk

Impact Classification	Description
Class I Impacts	Class I applies to adverse impacts that the County considers unavoidable and significant (i.e., cannot be mitigated to insignificance via feasible measures). The County considers a societal risk spectrum that falls in the red or amber zones after application of all feasible mitigation to be unavoidable. Unreasonable risk shall be determined for each project individually, based on policies provided in the Safety Element and other relevant policies and codes. Lacking any such determination, project approval requires a statement of overriding considerations by the applicable authority, showing that the benefits of the proposed development exceed its adverse impacts to public safety.
Class II Impacts	Class II applies to adverse impacts that the County considers significant but avoidable through application of feasible mitigation (i.e., mitigation can render the impact to be insignificant). The County considers a societal risk spectrum that falls in either the red or amber zones to be a significant impact. Such risk is considered a Class II impact if application of feasible mitigation is sufficient to lower the risk spectrum so that it falls fully within the green zone.
Class III Impacts	Class III applies to adverse impacts that the County considers to be insignificant for purposes of complying with CEQA. The County considers a societal risk spectrum that falls completely in the green zone to be a Class III, insignificant impact to public safety and no mitigation is required for purposes of compliance with CEQA.

Source: Santa Barbara County Environmental Thresholds and Guidelines Manual, Revised 2018.

Occupational safety or risk for employees of the project is governed by OSHA standards and is considered to be 'voluntary' risk. Voluntary risk addresses exposure to potential hazards associated with an activity, such as driving a car, work activities and others, that is consciously undertaken by an individual and is evaluated according to different standards than those applied in assessing involuntary exposure. The public safety thresholds addressed under this EIR do not apply to occupational safety.

4.3.4 Project Impacts and Mitigation Measures

The proposed Project could pose risks to the public from an unintentional release of hydrogen gas from the pipeline. In the event of a hydrogen release, if the hydrogen reached a combustible mixture in the presence of an ignition source, a fire and/or explosion could occur which may result in injury or death. The Applicant prepared a Pipeline Safety Technical Report*, Air Products Carson to Paramount Hydrogen Pipeline Project Pipeline Safety Technical Report,* prepared by EDM Services Inc. (Appendix C), which includes a risk assessment analysis for the operation of the proposed Project pipeline. The EIR preparers also prepared a risk assessment utilizing some of the Applicant information to estimate the risk levels.

The Applicant's application contained several Avoidance and Minimization Measures (AMMs) to minimize the Project's environmental impacts. The Applicant would implement these measures during the design, construction and operation of the pipeline. The AMMs to minimize potential hazards and risk impacts are presented below:

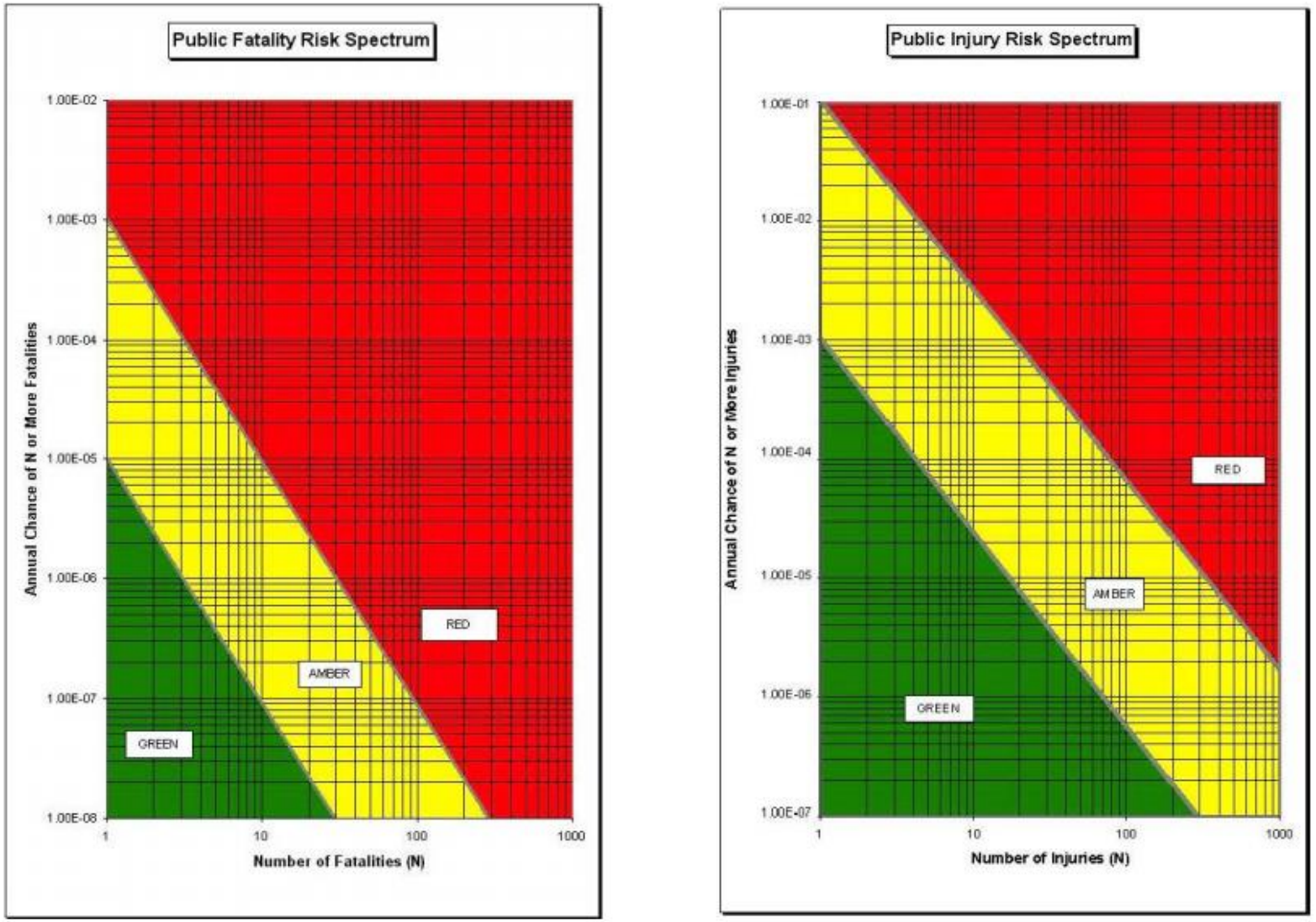
- Equipment refueling would be conducted away from waterway areas.
- Hazardous materials utilized for Project construction would be stored in their original containers within secure staging areas or storage containers.
- Spill containment and cleanup materials would be stored on-site for clean-up of spills during refueling or servicing of equipment.
- A Quantitative Risk Assessment (QRA) would be prepared and would discuss the safety and public risk issues associated with Project facilities. These discussions would include information regarding hydrogen gas, pipeline safety standards, incident statistics, and associated Project

design considerations. The QRA will present a quantitative risk assessment of the likelihood and consequences of unintentional pipeline releases.

- A Phase II site assessment would be completed in areas along the proposed pipeline route identified with a high likelihood of encountering soil from current or historical petroleum transportation or refining activities. The objective of the Phase II site assessment activities would be to identify the areas of soil contamination where special worker protection and waste handling/disposal requirements would be required during pipeline construction activities. Air Products will comply with SCAQMD Rule 1166 which would dictate removal of any VOC-contaminated soil (50 ppm or greater) from site using end dumps provided by Waste Management and taken to a local, approved landfill for disposal (estimated to be less than 100 cy based on soil analytical data).
- A Contaminated Materials Management Plan (CMMP) would be prepared and implemented during the course of the construction activities planned at the Project site. The CMMP will include maps illustrating areas of suspected or known soil contamination. The CMMP will also include the methods for identification of contaminated materials, and removal/disposal of contaminated materials.
- A site-specific Health and Safety Plan would be developed for the protection of workers and the community during the handling of contaminated materials.
- The operator would establish a continuing educational program to enable the public, appropriate government organizations and persons engaged in excavation-related activities to recognize a hazardous gas pipeline emergency and to report it to the operator or the fire, police, or other appropriate officials.
- Underground Service Alert. The contractor would notify Underground Service Alert at least 48 hours prior to excavation so that utilities can be marked and avoided during construction.
- The pipeline would operate at a pressure of 260 pounds per square inch gauge (psig) but will be designed for a Maximum Allowable Operating Pressure (MAOP) of 300 psig.
- Ten manual valves would be removed and replaced by welded piping.

The impacts are detailed below related to the CEQA Appendix G criteria along with additional QRA analysis following the Santa Barbara County thresholds.

Figure 4.3-2 Santa Barbara County Project Specific Fatality and Injury Risk Thresholds



Source: Santa Barbara County Environmental Thresholds and Guidelines Manual, Revised 2018.

Impact #	Impact Description	Phase	Impact Classification
HM.1	The proposed Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	Construction or Operation	Class III

The operations of the proposed Project pipeline system would not generate routine emissions of materials that could cause hazards to the public. Hydrogen is highly flammable but would remain inside the pipelines during routine operations and would have no impact on the public. Activities during construction would utilize some hazardous materials, such as fuels or welding gasses, but there would be no routine releases and there would be no impacts on the public. Therefore, there would be no impact for routine activities and the potential impacts for HM.1 are **less than significant (Class III).**

Impacts associated with accidental releases are discussed below.

Impact #	Impact Description	Phase	Impact Classification
HM.2	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.	Construction or Operation	Class I

In order to define a "significant hazard" under CEQA related to upset conditions, this EIR utilizes a quantitative approach to estimating risk levels and compares these to the baseline risk levels and the acceptability levels defined in other jurisdiction CEQA thresholds. The City of Carson does not currently have thresholds related to risk of upset for projects utilizing hazardous materials.

Identification of Release Scenarios

The release scenarios involve a release from the hydrogen pipeline due to a number of causes, from internal or external corrosion, third-party impact, earthquake, etc. Releases could occur in a range of different sizes, depending on the characteristics of the break. Release are generally defined by two different groups in this analysis: ruptures and leaks. Ruptures are defined as releases that occur rapidly and involve a release hole similar in size to the pipeline diameter. Leaks are releases from smaller holes, defined in this analysis as 1 inch in diameter. Modeling runs were performed to estimate the extent of impacts of the different releases. The Canary© model used and incorporated a range of assumptions about the temperature, release direction, meteorological parameters, and release duration. These are listed in Table 4.3.5.

The rupture diameter is a function of the location of the release, depending on whether the release occurs in the 12 inch or 6-8 inch portion of the pipeline. For the 6-8 inch portion of the pipeline, it was assumed to be an 8-inch diameter release as a worst case.

The release angle defines the extent to which the release is angled from the horizontal. Releases could be any angle ranging from vertical to horizontal. As the pipeline is buried, the release most likely would impinge on the surrounding earth cavity or angle upwards. Discussion with Quest (the makers of the Canary© software) indicate that studies have shown historically that release angles from pipeline gas releases range from between 10 – 20^{o} from horizontal. Therefore, a worst case of 10^{o} was utilized.

Table 4.3.5 Release Modeling Parameters

Parameter	Value
Rupture Diameter	8" for Segments from Carson to Tesoro Terminal 12" for Segments from Tesoro Terminal to Paramount
Operating Pressure	260 psig
Normal Flow Rate	7 MMSCFD
Content Temperature	70 ^{o}F
Release Angle	10^{o}
Wind Speed	Worst case 20 mph for jet fires
Humidity	70%
Air and Surface Temperature	70 ^{o}F
Release Locations	Assumed to occur at the midpoints of a segment with the remaining segments contributing to the release volume
Block valve actions	South street block valve was assumed to remain open
Duration of normal flow	The system was assumed to shut down and not continue feeding hydrogen to the pipeline within 5 minutes.

Units: psia = pounds per square inch, ^{0}F – degrees Fahrenheit, mph= miles per hour.

Wind speed has an impact on the downwind distances of impacts as well as the shape of the impact zones. Wind speeds of 20 mph verses zero wind speeds produce longer downwind distances but narrower impacts zones and based on rupture modeling for this analysis indicate an increase in impact area of about 30-50% with higher winds over no winds. For this analysis, it was assumed there would be higher winds thereby producing somewhat larger impact zones to be conservative.

A release from a pipeline is affected by the amount of pipeline that "feeds" the release. Large diameter and long sections of pipeline will empty through the rupture and allow for a release to continue for longer periods at higher release rates. For a 12-inch pipeline, lengths beyond about 5,000 feet generally do not contribute substantially to the peak release rate (defined in Canary© as the release rate averaged over the first 60 seconds). The peak release rate is used to define the impacts in this analysis. Shorter pipeline lengths, such as less than 1,000 feet, will empty quickly, thereby reducing the peak release rate and the size and duration of the jet fire. For this analysis, it was assumed that the release would occur at the midpoint of the 8-inch or 12-inch segments, with the remaining segments contributing to the release rate and duration. For the 8-inch new pipeline section, it was assumed that a release would occur at the midpoint of the new pipeline section and more than 15,000 feet of pipeline would contribute to the release (the distance to the Automatic Shutoff Valve (ASV) at the Dominguez location). For the 12-inch pipeline, it was assumed that the release would occur at the midpoint of the 12-inch section and that the pipeline volume from the release point back to the ASV at Dominguez would contribute to the release.

It was assumed that the manual block valve proposed for the south street station would remain open for the duration of the release. The ASV is assumed to close within 5 minutes.

The primary issue associated with the size and duration of a jet fire is the volume within the pipeline that rapidly depressurizes through the rupture and affects the peak release rate averaged over the first minute of the initial release. Therefore, for this analysis, the timing of the shutdown of the system (feed rates, ASV closing) feeding the pipeline is of less consequence than the volume within the pipeline. A 5-minute shutdown period was modeled as well as a 60-minute shutdown period. Both produced similar peak flow rates and associated impact zones for a jet fire due to the similar short-term peak release rates and jet fire sizes. Longer durations of shutdown, however, could produce secondary effects, such as building fires. Secondary effects are not examined in determining the consequences of releases in this analysis.

Determine the Consequences of Each Release Scenario

As hydrogen has a very low ignition energy, it was assumed that all releases would ignite immediately and therefore only jet fires were assumed to occur and produce impacts to the public. A jet fire is a high energy event that causes immediate impacts due to high levels of thermal radiation. A rupture could happen very quickly, catching nearby persons by surprise, and have substantial force as well as thermal impacts. Thermal radiation levels that could produce impacts were assumed to be the same as discussed above.

The population densities are based on the US Census data (year 2010) for Census Tracts along the pipeline route. Figure 4.3-3 shows the location of the pipeline route along with the closest schools and the census tracts. The pipeline route was broken into 20 different pipeline segments to correlate with the Census Tracts. Detailed information on lengths and population densities are provided in Appendix C. Census Tracts that listed no population or housing units, such as those in industrial areas, were assigned a low population density. Route segments that pass by schools have the school population added into the respective census tract population to account for the increased density of people in the area of the school.

Modeling was conducted using the Canary© model to estimate the effects of jet fires on the surrounding populations. Table 4.3.6 shows the results of the modeling. Modeling was assumed as a worst case to occur during a relatively windy period, thereby increasing the downwind effects. No adjustments were made for upwind or downwind release directions as there are many different potential release scenarios, and therefore the worst-case wind conditions were used for this analysis. Note that for both leaks and ruptures, the difference between the 12,000 btu/hr-ft^2 distance and the 5,000 btu/hr-ft^2 is small, ranging from 1 – 12 feet, meaning that generally, most persons exposed would be close to or within the high thermal radiation levels associated with the jet fire itself.

Table 4.3.6 Canary Modeling Results

Scenario	Distance to 12,000 btu/ht-ft^2, (feet)	Distance to 8,000 btu/ht-ft^2, (feet)	Distance to 5,000 btu/ht-ft^2, (feet)
8” Rupture	51	54	57
8” Leak	36	37	37
12” Rupture	88	94	100
12” leak	37	37	38

Units: btu/ht-ft^2 = British thermal units heat per square foot.

Development of Frequencies of Occurrence for Each Release Scenario That Could Impact the Public

The frequencies of occurrence of the release scenarios are based on the frequencies of natural gas pipeline releases developed from data compiled by PHMSA. Although the pipeline would be carrying hydrogen, very little data is available on hydrogen pipelines and associated accidents since there are many fewer hydrogen pipelines than natural pipelines. The use of data from the large natural gas transmission pipeline system in the United States provides a close approximation to that from a hydrogen pipeline. The accidents are summarized in Table 4.3.7.

Table 4.3.7 Accident Frequency Summary

Parameter	Value
US Gas transmission pipeline accidents, 2010-2018	780 accidents
US gas transmission system mileage, average, 2010-2018	298,218
Average Incident rate	0.29 incidents per 1,000 mile years
Fraction ruptures	117 incidents (15 %)
Number of total fatalities (employees and public)	18
Number of public fatalities	8 (all San Bruno in 2010)
Number of hydrogen incidents	1 (ignited)

Source: PHMSA 2020

The numbers presented in Table 4.3.6 represent those from the entire population of natural gas transmission pipelines in the United States. These include a range of different pipeline characteristics, including a range of ages, maintenance practices and sizes. Maintenance practices include the use of inline inspection tools (smart pigs), cathodic protection or other means to ensure pipeline integrity.

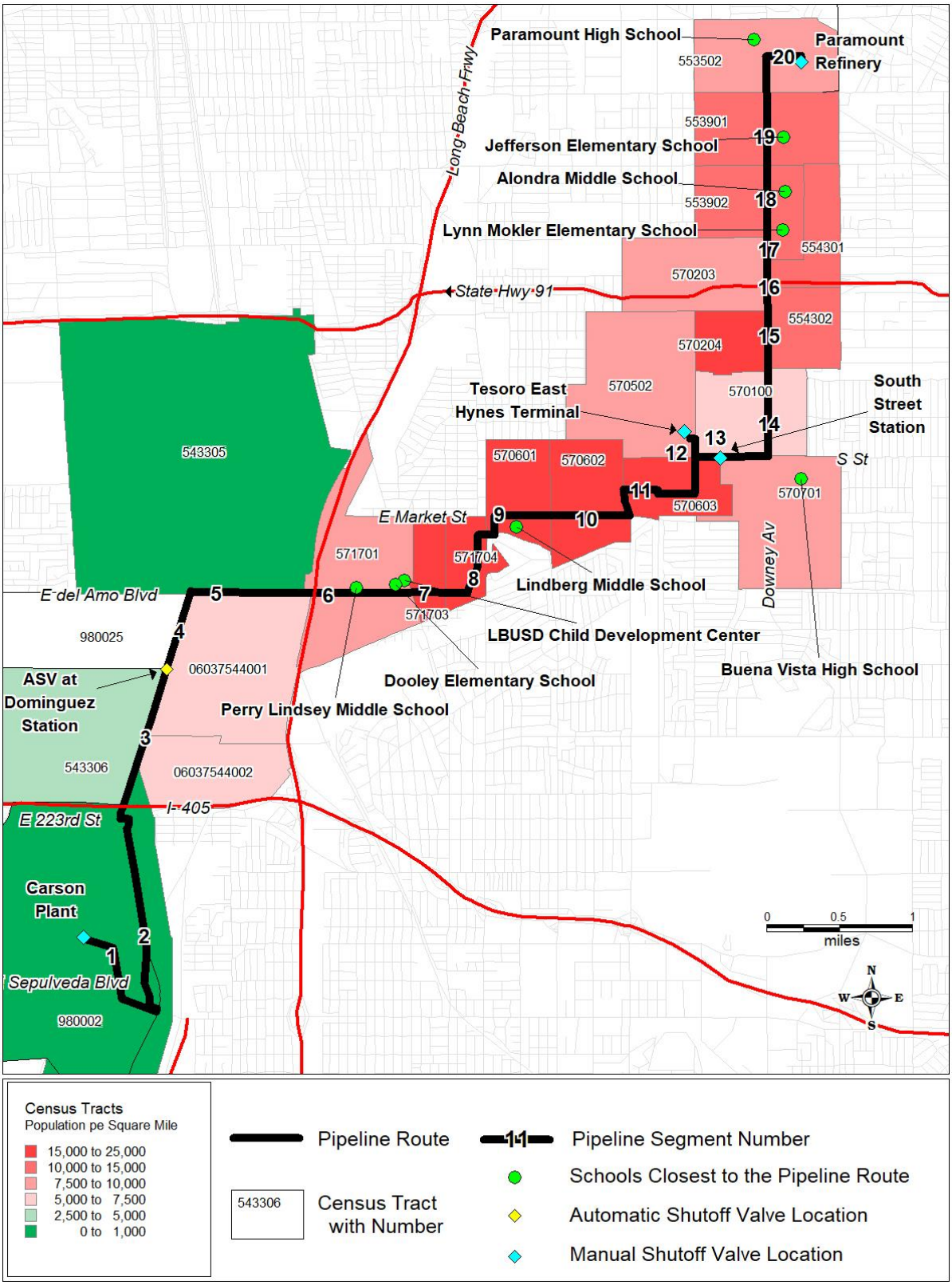
Because the Project proposes to utilize older pipelines (an average install date of 1941, with the average install date of the 6-8 inch segments of 1934 and the average install date of the 12 inch segments of 1955, with some installed as early as the 1920s), the issue of increased failure frequency of older pipelines is a potential concern. An analysis of factors related to pipeline failure rates (INGAA 2012) indicates that about 12% of gas transmission pipelines were installed before 1950 and it "*found some higher correlation between age and incident frequency based on the installation period*". The study examined incidents that occurred in the 2000-2009 period and found that some causes of failures, including external corrosion, girth welds, seam welds and stress corrosion cracking, had increased frequencies for the older pipeline groups. Of the 598 incidents on pipelines where age was able to be determined, about 128, or about 21% were associated with pipelines installed prior to 1950. This indicates an average increase in failure rates of about 1.78 over the general population for older pipelines.

Other studies on liquid pipelines (CSFM 1993) indicate that older pipelines have a higher failure rate by a factor of 2.77 times as high as the average failure rate of California liquid pipelines.

While there are other factors that could affect an increased frequency of older pipelines, such as the inability to conduct inline inspections, older pipelines most likely would exhibit some increase in failure rates over the average population of pipelines. An increased frequency of failures of 1.78 has therefore been incorporated into the failure rate analysis. This was applied to all segments of the pipeline except the portion closest to the Air Products Carson Plant, as it would be installed new.

There are two locations along the pipeline route where valves will be installed, and valves present a potential failure point as well. Failure frequencies for the segments of pipelines that have a valve were increased to account for the failure rates of valves. A valve failure frequency of 8.76×10^{-5} failures/valve-year was included as per Lees, WASH and Rijnmond (Lees 2012, WASH 1975, Rijnmond 1982).

Figure 4.3-3 Pipeline Route Census Tracts



Source: Google Maps and US Census Tract Data 2010. Note, only segment 1 is new pipeline.

Development of Risk Estimates

Risk estimates are generated from all of the leak and rupture scenarios along each of the 20 pipeline segments (one for each census tract). Appendix C provides a listing of each of these segments along with the corresponding failure frequency and the impacts based on the population densities within each census tract. Note that this is an approximation of the exposure as most of the pipeline is located within the roadways. Automobiles are considered to provide substantial protection from jet fires, even though some automobiles will have open windows and could still experience some effects. Therefore, as an approximation, it was assumed that the population densities as defined by the census data extend across all areas within the census tract, thereby encompassing persons walking along sidewalks (of which a higher density would be expected in areas with higher population density), persons in nearby residential areas located outside and persons within vehicles that could be affected.

Because the scenarios that could affect populations would be jet fires, the impact of these events on persons inside buildings would be nominal as people inside would be shielded from the thermal effects, and therefore only persons outside are assumed to be impacted. This reduces the frequency of a release impacting persons. As per the NHAPS publication (NHAPS 2001), 7.9% of persons are expected to be outside over a 24-hour average. For segments located near schools, the use of a 2 hours per day exposure, as per the CDE protocol, with an additional 1 hour per day for drop-off and pick-up, was used (12.5%).

The results of the analysis are shown in Figure 4.3-4. The results have similar conclusions as to those developed by the Applicant studies (EDM 2020). The analysis presented in Figure 4.3-4 differs from the Applicant studies primarily in the use of a higher failure frequency due to the age of the proposed Project pipelines, as well as incorporation of the census data-specific population densities and more conservative release modeling. However, in both analyses, the Applicant's and the risk assessment presented herein, the results demonstrate risk levels in the amber (unacceptable) region associated with a release during pipeline operations.

Human Reaction

The Applicant risk study (EDM 2020) presents data associated with incorporating a "human reaction factor" into the conditional probability of producing fatalities (and also serious injuries). The concept is that a high percentage of the population would move away from a fire and therefore would not suffer a fatality or serious injury. This factor reduces the FN curves by a substantial margin as the Applicant assumes that 80% of people would move away from the scenario and not result in fatalities.

The fraction of persons suffering a fatality if exposed to a jet fire used in this analysis are based historical data that already includes a fraction of some people moving away from a scenario. The fatality fractions are based, however, on scenarios which provide little time for reaction, such as sudden explosive blasts. Generally, risk assessments utilize this approach, including the CDE protocol, and do not implement an additional human reaction factor. There are a number of reasons why as discussed below:

- The application of the 80% human time reaction in the Applicants studies is applied to all of the radiation levels, including the highest level of 12,000 btu/hr-ft^2. This is a very high radiation level that almost approximates the area of the flame. According to the modeling analysis, the flame itself extends a substantial distance and encompasses 80-95% of the impact area, and generally anyone located within or near the flame would not be able to escape easily and would suffer a very high fatality rate.
- The flame length is substantial, depending on the scenario. A reaction time, as defined by the Green Book (Green Book 1992 pages 7, 33) is generally about 5 seconds, and that if clothing

combusts, the fatality rate would be 100% with no reaction time. Any areas in or near the flame would have very rapid impacts, including clothing ignition, and no reaction time should be allowed and fatality rates should be very high; 100%. As the spatial differences between these levels are small, with less than 12 feet separating the 12,000, 8,000 and 5,000 btu/hr-ft^2 exposure limits, an escape given the violent nature of a jet fire is doubtful.

- The use of a reaction time is not consistent with the CDE protocols, which specify the thresholds for thermal radiation and the corresponding fatality rates and do not incorporate a human reaction factor. Risk analysis developed by the Center for Chemical Process Safety (CCPS) also do not incorporate a human reaction factor into the CCPS example QRAs or discussions (CCPS 1989). Generally, QRAs do conservatively assume that any a human reaction factors are already incorporated into the fatality rates. By including both a reaction time and a fatality rate, this would under count impacts, thereby minimizing the effects. Many fatality rate estimates, such as probit equations, are based on historical studies on fatality rates and these incorporate a degree of a human reaction factor already as some of the individuals would move away from the flame and not be accounted for as a fatality.

- The high reduction level due to the human reaction to move away may be appropriate for pool fires or fires where there is some time for reactions. However, a hydrogen pipeline release most likely would not have a warning and would effectively be similar to an explosion, causing a substantial amount of surprise. The low ignition energy of hydrogen would ensure that any release would ignite almost immediately, thereby preventing persons from noticing a release and moving away. As stated in the Green Book (Green Book 1991 page 32), "*when a fire develops suddenly, without prewarning, such fire may obstruct possible escape routes. In these conditions, the exposure duration is the same as the fire itself*." and "*For very short fires, such as BLEVE-fireball, neither escape nor sheltering are taken into account*." Also, as per Lees (Lees 2012 page 1302), "*Human response to a fire event depends on (1) the nature of the event and (2) the awareness of the person. The event primarily considered in relation to burn injury is a fireball. Another sudden event may be a rapid growth in the size of a flare. Other types of event such as a pool fire are generally considered to occur more gradually and to allow more time for escape, though this may not always be so*." Any event which happens quickly, with a sudden burst of energy, such as a sudden growth of a flare or a sudden release and instantaneous fire from a hydrogen pipeline failure, would not be expected to allow for much reaction time.

Based on the reasons above, this risk analysis did not include an additional a human reaction factor in the analysis.

Impact determination

Risk levels for pipelines are essentially a constant value independent of the volume of hydrogen passed through the pipeline, assuming that the pressure levels are constant. This is different than trucking, as in the baseline exiting operations, where the risk linearly increases with increasing hydrogen volume transported as more trucks are needed with higher hydrogen usage, thereby increasing truck mileage. Risk levels from a pipeline are driven by the volume of hydrogen located within the pipeline whereas the risks for trucking are driven by the number of truck trips. For very minimal hydrogen volumes, as a pipeline would still be required to be full of hydrogen, trucking generally produces lower risks. But at a certain point, an increasing number of truck trips associated with an increasing volume of hydrogen transported generates more risk than a pipeline. This project, with the hydrogen pipeline compared to the trucking associated with the baseline, is close to that crossover point.

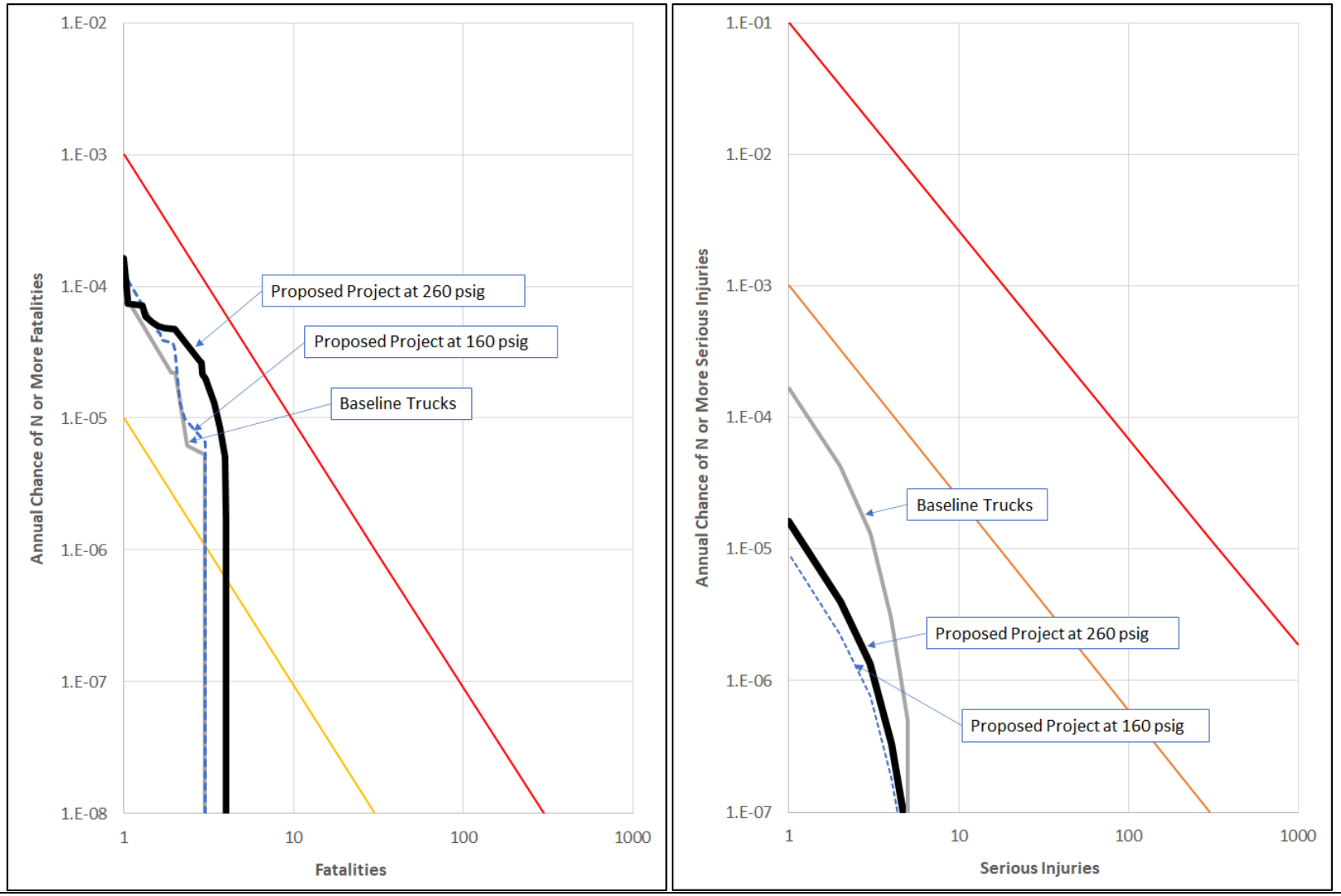
Impacts associated with the Project operating at a pressure of 260 psia are similar to, if not somewhat greater than, those presented by the baseline trucking operations as the FN curves for both activities lie in a similar band within the FN curves shown in Figure 4.3-4. Therefore, a reduction in risk levels over the baseline is not apparent. Because risks would not be reduced from the baseline operations, the impacts in the event of an upset condition would be **significant**.

Mitigation Options

Mitigation could take the form of reducing the impacts, by reducing the size of a release, or reducing the frequency of a release. Operating the pipeline at a lower pressure in order to reduce the size of the jet fires and decrease the potential for exposure is one possibility. Operating the pipeline at a lower pressure (such as 160 psi instead of 260 psi) would reduce the area of the jet fire by an average of about 35%. FN curve for operating the pipeline at a pressure of 160 psi is shown in Figure 4.3-4 and allows for a reduction in the severity of the significant impact. The Applicant has indicated that this is feasible.

A potential concern related to the use of non-hydrogen pipelines for hydrogen transportation is hydrogen embrittlement, which is a term indicating the presence of atomic hydrogen in carbon steel (permeability) that affects the pipeline toughness or ductility of the metal and can result in cracking or fissuring of the Metal (DOE 2005, Hafsi 2018, Xu 2012, Thompson 1977). It is not clear whether this pipeline could be susceptible to this phenomenon as it can be a function of the operating pressure, pressure changes over time, and the construction characteristics of the pipeline steel. However, monitoring of the pipeline for this issue would help to ensure that this is not an issue.

Figure 4.3-4 Project FN Curves –Fatalities and Serious Injuries



Another mitigation is the use of pressure testing at levels that are higher than standard requirements. The test pressures used for the pipeline historically have ranged over 900 psig, which is a ratio of operating pressure to test pressure of 3.5 – 5.6 (for 260 and 160 psig respectively). The recommended test pressure ratio is 1.50 as per ASA B31.8 Code (for a Class 2, 3, or 4 locations). Therefore, the hydrostatic testing as historically conducted on the pipeline is well above that required and this practice helps to ensure that the pipeline maintains sufficient margin of error to minimize failures.

Mitigation Measures

HM-2a ***Maximum Pressure Allowance****: The pipeline shall be operated at a maximum pressure at any point in the pipeline of 160 psia. The operator shall maintain operating pressure information that shall be made available upon request. Information on pipeline maintenance, including pressure testing and any direct assessments or any other pipeline issues, shall be reported to the City.*

HM-2b ***Testing and Monitoring for Hydrogen Issues****: The pipeline shall be monitored on an annual basis for any issues that could indicate increased rates of the loss of pipeline integrity, such as hydrogen-related embrittlement, through the use of in service inspection methods, corrosion-type coupons or other equivalent methods. The monitoring procedure shall be documented and available for inspection upon request.*

HM-2c ***Pressure Testing****: The pipeline shall continue to be pressure tested at a MAOP to test pressure ratio of at least 3.0 to ensure pipeline integrity. In addition, the testing shall be performed at an annual basis for the first 3 years to ensure that no issues are introduced to the pipeline due to the use of hydrogen. Subsequent years tests may be relaxed to once every 3-5 years as per PHMSA requirements.*

Impacts Remaining After Mitigation

Impacts of HM. 2 after the implementation of the lower pressure and the use of increased monitoring still fall in a range very similar to the baseline operations but would remain within the unacceptable region of the FN curves. Therefore, impacts are determined to be **potentially significant (Class I).**

Impact #	Impact Description	Phase	Impact Classification
HM.3	The proposed Project could emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	Construction or Operation	Class III

The pipeline construction activities would not be performed near any schools and therefore the construction activities associated with the project would be less than significant impacts related to schools.

The operational phase of the project would involve the operation of the hydrogen pipeline in close proximity to a number of schools. These are listed in Table 4.3.8. An estimated 17 schools would be located within ¼ mile of the proposed pipeline route with 5 schools having some portions of their properties in very close proximity to the pipeline, depending on the exact pipeline alignments. In order to address the risk levels to these schools, the California Department of Education (CDE) school siting risk protocol was utilized for the closest schools to determine the risk levels.

The CDE has developed an advisory protocol to assist Local Education Agencies in assessing the safety of locating schools within 1,500 feet of a pipeline. The acceptability of a new school or pipeline proposal is determined by an estimation of individual risk at the school site. If the estimated risk of fatality is less than one in a million years (1×10^{-6} per year), it is below the threshold of significance, and no significant safety hazard is predicted. If the estimated risk of fatality is greater than one in a million years, mitigation measures are required to reduce the risk to acceptable limits.

Table 4.3.8 Schools Along the Pipeline Route

School	Address	Closest Distance to Pipeline, Feet
Addams Elementary School	256 E. Plymouth Street, Long Beach	1,189
Alondra Middle School	16200 Downey Avenue, Paramount	< 30
Buena Vista High School	3717 Michelson Street, Lakewood	300
Capitan Raymond Collins Elementary School	6125 Coke Avenue, Long Beach	470
Creative Day Academy	8740 Ramona Street, Bellflower	1,723
Dooley Elementary School	5075 Long Beach Blvd. Long Beach	< 30
Harry Wirtz Elementary	8535 Contreras St., Paramount	386
Harte Elementary	1671 E. Phillips St., Long Beach	968
Jefferson Elementary School	8600 Jefferson Street, Paramount	335
LBUSD Child Development Center	5075 Long Beach Blvd. Long Beach	240
Lindberg Middle School	1022 E. Market Street, Long Beach	< 30
Lynn Mokler Elementary School	8571 Flower Street, Paramount	380
Paramount Alternative Education Center	3701 Michelson St., Lakewood	1,060
Paramount High School	14429 Downey Avenue, Paramount	< 30
Perry Lindsey Middle School	5075 Daisy Avenue, Long Beach	< 30
St. Athanasius Elementary	5369 Linden Ave., Long Beach	368
St. Pancratius Parish School	3601 St. Pancratius Place, Lakewood	564

Notes: the exact distance from the pipeline route to the closest point on the school property is estimated based on the distance from the roadway. The exact distance is a function of the pipeline alignment within the roadway.

The CDE protocol was developed to ensure that risks are calculated in a consistent manner. The methodology uses historic data to estimate the probability of a pipeline release, models to determine the consequences of a release, the probability of fatality for different exposures, and school attendance hours. These are combined to estimate the risk of fatality. The CDE protocols are provided in the Guidance Protocol for School Site Pipeline Risk Analysis, 2007 (CDE 2007). Although the protocol is developed for natural gas releases, it can easily be applied to hydrogen releases and the resulting risk levels used to determine significance under CEQA. The CDE protocol was applied to any school that would be located in very close proximity to the pipeline, and the analysis incorporated the increased failure rate of an older pipeline as discussed above as well as the assumption that the school operates year-round. The assessments demonstrated that the risk levels are acceptable under the CDE Risk Protocols with a Total Individual Risk/Individual Risk Criteria (TIR/IRC) ratio of 0.15, with a 1.0 TIR/IRC ratio being the CDE Protocol threshold. A copy of the CDE Protocol spreadsheet is included in the Attachment C. As the CDE Protocol indicates acceptability for the closest schools to the pipeline route, all of the other schools would present less risk. Therefore, risks to schools and the impacts of Hazardous Materials Impact 3 are **less than significant (Class III).**

Impact #	Impact Description	Phase	Impact Classification
HM.4	Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would it create a significant hazard to the public or the environment?	Construction or Operation	Class II

In preparation of the proposed Project the applicant prepared a Phase I Environmental Site Assessment (ESA), *Phase I Environmental Site Assessment Proposed Carson to Paramount Hydrogen Gas Pipeline Project, Carson, Los Angeles County, CA,* Padre Associates Inc. November 2018. The scope of the Phase I ESA was focused on the proposed Project new pipeline segment that would require ground disturbance and therefore potentially encounter contaminated soil. The Phase I ESA concluded that the Air Products Carson Facility has been in industrial use since the 1960s and the proposed Pipeline Corridor was utilized as a railroad siding and then a pipeline corridor also since the 1960s (Padre Associates Inc.). The report also notes that petroleum hydrocarbon containing soils have been identified by the applicant during past pipeline repair excavation projects within the proposed Project pipeline corridor.

The Phase I ESA recommended that a Phase II Site Assessment be completed for all areas with the potential to encounter contaminated soils during construction activities and that a Contaminated Materials Management Plan (CMMP) should be prepared and implemented during the course of the construction activities.

The report further recommends that the CMMP include maps of the areas of potential or known soil contamination, methods for identification of contaminated materials, removal and disposal procedures for those materials, and a site specific Health and Safety Plan for the protection of workers and the community during construction activities. The Site Assessments also identified lead contaminated soils in excess of California Title 22 thresholds along approximately 1,100 linear feet of the proposed new pipeline segment. Soil contaminated with petroleum hydrocarbon potentially could be found along 500 feet of pipeline along the Dominguez Channel. Soils with a lead concentration exceeding California Title 22 thresholds would need to be handled by HAZWOPER-trained workers and disposed of at a licensed Class I hazardous waste facility; petroleum hydrocarbon-containing soil must be disposed of at a licensed disposal/recycling facility.

Review of the California Department of Toxic Substances Control (DTSC) Envirostor data base also documents the potential for hydrocarbon contaminated soil at the Air Products 23320 South Alameda Street facility from historical industrial activities. As there is a potential for contaminated materials, impacts could be **significant**.

Mitigation Measures

HM-4a ***Construction Material Management Plan.*** *A Contaminated Materials Management Plan (CMMP) should be prepared and implemented during the course of the construction activities planned at the Project Site. The CMMP should include maps illustrating areas of suspected or known soil contamination. The CMMP should also include the methods for identification of contaminated materials, and removal/disposal of contaminated materials and be consistent with South Coast Air Quality Management District (SCAQMD) rules for the handing of contaminated materials.*

With the implementation of Mitigation Measure HM-4a, a CMMP, any contaminated materials would be required to be handled appropriately by existing regulations including SCAQMD rules. Therefore, the

potential impacts of the proposed Project posing a significant impact to the public from contaminated soils and Hazardous Materials Impact 4 are **less than significant with mitigation (Class II).**

Impact #	Impact Description	Phase	Impact Classification
HM.5	The proposed Project would not conflict with any airport land use plan and would not result in a safety hazard or excessive noise for people residing or working within two miles of a public, or public use, airport.	Construction or Operation	Class III

The proposed Project site for the new 0.5-mile segment of pipeline is not located within an airport land use plan or within two miles of a public airport. However, one segment of the pipeline route, Segment 6 along Linden Avenue, is located approximately 1.8 miles from Long Beach Airport. Segment 6 is a segment of existing Paramount Pipeline Company pipeline that would not require any construction activities for the proposed Project. The operation of the pipeline would not produce any noise during normal activities. Therefore, the proposed Project would not result in any impacts associated with excessive construction related noise or safety hazards within an airport land use plan or within two miles of a public, or public use, airport. Therefore, the potential impacts for HM.5 are **less than significant (Class III).**

Impact #	Impact Description	Phase	Impact Classification
HM.6	The proposed Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	Construction or Operation	Class III

Operation of the proposed Project pipeline would not affect emergency response or evacuation plans as most of the pipeline would be underground and any above ground portions such as valve boxes would not block access to emergency vehicles or emergency response. Construction of the proposed Project pipeline would be short term, approximately five months, and a Traffic Control Plan would be developed to provide for alternate traffic flow routes including routes for emergency response.

Therefore, the proposed Project would have a less than significant impact on any adopted emergency plans or evacuation plans and the potential impacts for HM.6 are **less than significant (Class III).**

Impact #	Impact Description	Phase	Impact Classification
HM.7	The proposed Project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.	Construction or Operation	Class III

The proposed Project pipeline route would be located in industrial, commercial, and residentially zoned areas. The Project areas are not adjacent to wildlands nor are they located on lands classified as very high fire hazard severity zones. People and structures in the proposed Project areas would not be at risk of loss, injury, or death involving wildland fires. Therefore, no impacts associated with wildland fires are expected and the potential impacts for HM.7 are **less than significant (Class III).**

4.3.5 Cumulative Effects

Cumulative projects are listed in Section 3.0, Cumulative Scenario. The projects listed are shown below for development projects and for the expansion of the Paramount Petroleum World Energy Renewable Fuels Project located within the City of Paramount.

4.3.5.1 Development Projects

As listed in Section 3.0. Cumulative Scenario, there are a number of projects that are proposed for areas near the proposed Project pipeline. None of these involve the use of hazardous materials and would therefore not contribute to the risks identified associated with the proposed Project pipeline. Some components of the cumulative project would involve construction and there is the potential for these to impact the pipeline once it is operating. However, the management systems in place for construction projects and "dig alerts" requirements effectively mitigate these potential impacts.

Impact #	Impact Description	Phase	Impact Classification
HM.Cum1	The proposed Project could overlap with LACMTS projects and create potential risk of upset issues.	Construction or Operation	Class II

The Metro West Santa Ana Branch Transit Corridor Project would intersect the proposed Project pipeline near the tie-in location at Paramount Refinery. Construction activities could impact the pipeline if sufficient coordination activities are not implemented. Coordination activities are required as part of permitting and construction design, including "dig alerts". However, as both projects could be in the design phase at the same time, lack of coordination could result in potentially significant cumulative impacts.

Mitigation Measures

HM-Cum1 ***Coordination with MTA.*** *As the proposed Project and the Los Angeles County Metropolitan Transit Authority are developing projects in the same area at the same time, coordination between these two projects shall be completed before any permit issuance, and clearance from the MTA shall be required prior to any permit issuance.*

With the implementation of Mitigation Measure HM-Cum1, coordination on the location of pipeline segments and associated support structures shall be coordinated with the MTA prior to any construction to ensure that overlapping design elements do not interfere with either project and increase the potential for risk of upset issues. With the implementation of HM-Cum1, impacts would be **less than significant with mitigation (Class II).**

4.3.5.2 World Energy Renewable Fuels Project Expansion

The expansion of the World Energy Renewable Fuels Project would be located at the Paramount Refinery and is currently in the CEQA review phase of project permitting. The City of Paramount has received an application, has released an initial study and NOP, and is in the process of developing an EIR for the project.

This cumulative project would involve the expansion of the existing renewable fuels project (3,500 barrels per day, bpd) into a facility that could process about 25,000 bpd of refinery input for the development of bio-based transportation fuels. Construction of the initial modifications to the Paramount Refinery to produce renewable fuels at the 3,500 bpd level occurred between 2014 and 2015, and the facility began producing Renewable Fuels in 2016.

A part of the expansion project is the development of a hydrogen generation unit that would be capable of supplying all of the hydrogen needs of the World Energy Renewable Fuels Project. The World Energy Renewable Fuels Project application to the City of Paramount indicates that the hydrogen unit "*would be installed to reduce or eliminate the need to use trucks to transport hydrogen for production use. An existing pipeline is also available to obtain interim increased hydrogen supply from an off-site source prior to*

construction of the hydrogen plant. Once the hydrogen plant is constructed, the pipeline may be used to ship excess hydrogen from the Hydrogen Generation Unit back into the supply market. A new natural gas supply pipeline would be installed to provide the feed and fuel to the Hydrogen Generation Unit."

The use of an onsite hydrogen generation unit could reduce or eliminate the need to have a hydrogen pipeline (or trucks) transport hydrogen to the Paramount Refinery on a long-term basis. Interim use of the pipeline would allow for the supply of hydrogen to the Paramount Refinery while this cumulative project is being permitted and built. The reduction or elimination of the use of the pipeline after the completion of the World Energy Renewable Fuels Project expansion would eliminate the long-term risks identified as significant in Section 4.3, Risk of Upset. Risks would still remain significant but would be realized for a shorter period of time, thereby reducing the severity of the impact. Note that this is the same scenario as described under the onsite hydrogen generation alternative in Section 5, Alternatives. See Section 5, Alternatives, for further discussion of the impacts of this cumulative project.

4.3.6 References

AGA 2012, Report to the NTSB on Historical and Future Development of Advanced In-Line Inspection Platforms for Use in Gas Transmission Lines, March 26, 2012.

CCPS. 1989, Guidelines for Chemical Process Quantitative Risk Analysis. American Institute of Chemical Engineers Center for Chemical Process Safety, New, York, 1989.

CDE 2007, Guidance Protocol for School Site Pipeline Risk Analysis, Prepared by URS Corporation, February 2007.

CSFM 1993, California State Fire Marshal, Hazardous Liquid Pipeline Risk Assessment Report.

DOE 2005, Department of Energy, Savanah River National Laboratory, Evaluation of Natural Gas Pipeline Materials for Hydrogen Service, January 2005.

EDM Services Inc. 2020. Air Products Carson to Paramount Hydrogen Pipeline Project, Pipeline Safety Technical Report. March 2020.

FHWA 1998, Our Nations Highways, Selected Facts and Figures, USDOT Federal Highway Administration

Green Book 1992, Methods for Determination of Possible Damage, CPR 16E.

Hafsi 2018, Hydrogen embrittlement of steel pipelines during transients, Procedia Structural Integrity Procedia 00 (2016) 000–000.

Hooker 2012, Experimental Releases Of Liquid Hydrogen, Symposium Series N0. 158, 2012 Crown Copyright.

INGAA 2012, The Role of Pipeline Age in Pipeline Safety, Prepared For The INGGA FOUNDATION, INC., by: John F. Kiefner and Michael J. Rosenfeld, November 8, 2012.

Lees, F.P. Loss Prevention In The Process Industries. Volumes 1 - 3. Butterworths, London. 2012.

NHAPS 2001, Journal of Exposure Analysis and Environmental Epidemiology (NHAPS 2001). The National Human Activity Patter Survey (NHAPS): A Resource for Assessing Exposure to Environmental Pollutants.

OGJ 2000, Oil and gas Journal, Hydrostatic Testing, July 31, 2000.

Padre Associates Inc. 2018. Phase I Environmental Site Assessment. Proposed Carson to Paramount Hydrogen Gas Pipeline Project, Carson, Los Angeles County, CA. November 2018.

PHMSA 2020, web access https://www.phmsa.dot.gov/data-and-statistics/pipeline/data-and-statistics-overview.

Public Utilities Commission. 2015. General Order No. 112-F, State of California Rules Governing Design, Construction, Testing, Operation, and Maintenance of Gas Gathering, Transmission, and Distribution Piping Systems. June 2015.

Rijnmond. 1982. "Risk Analysis Of Six Potentially Hazardous Industrial Objects In The Rijnmond Area, A Pilot Study." A report to the Rijnmond Public Authority, presented by COVO Steering Committee, 1982. D. Reidel Publishing Co., Dordrecht, Holland. A compilation of data on all types of equipment failure is provided. (Referred to as Rijnmond.).

Sandia 2014, Liquid Hydrogen Release and Behavior Modeling: State-of-the-Art Knowledge Gaps and Research Needs for Refueling Infrastructure Safety, SAND2014-18776, Unlimited Release, Oct 2014.

SBC 2000, Santa Barbara County Safety Element and Safety Element Supplement, 2000.

SBC 2015. Environmental Thresholds and Guidelines Manual. Revised July 2015. [online]: ttp://www.sbcountyplanning.org/permitting/ldpp/auth_reg/documents/Environmental%20Thresholds%20October%202008%20(Amended%20July%202015).pdf

SBC 2020, ExxonMobil Interim Trucking for the Santa Ynez Unit (SYU) Phased Restart Project Draft Supplemental Environmental Impact Report, April 2019.

Thompson 1977, Selection of structural materials for hydrogen pipelines and storage vessels, International Journal of Hydrogen Energy, Volume 2, Issue 2, 1977, Pages 163-173.

WASH-1400 (NUREG-75/014), United States Nuclear Regulatory Commission, October 1975. Referred to as WASH-1400. Provides data on human errors as well as equipment failures and is one of the most extensive sources of failure-on-demand estimates.

US Department of Energy. 2020. Safe Use of Hydrogen. 2020 [online]: https://www.energy.gov/eere/fuelcells/safe-use-hydrogen.

Xu 2012, Gaseous Hydrogen Embrittlement of Materials in Energy Technologies, Volume 2 in Woodhead Publishing Series in Metals and Surface Engineering 2012, Pages 526-561.

This Page Left Intentionally Blank

4.4 Land Use and Policy Consistency

This section describes land uses in the vicinity of the proposed Project area, the environmental and regulatory settings related to land use, and the potential land use impacts of the proposed Project. .

4.4.1 Environmental Setting

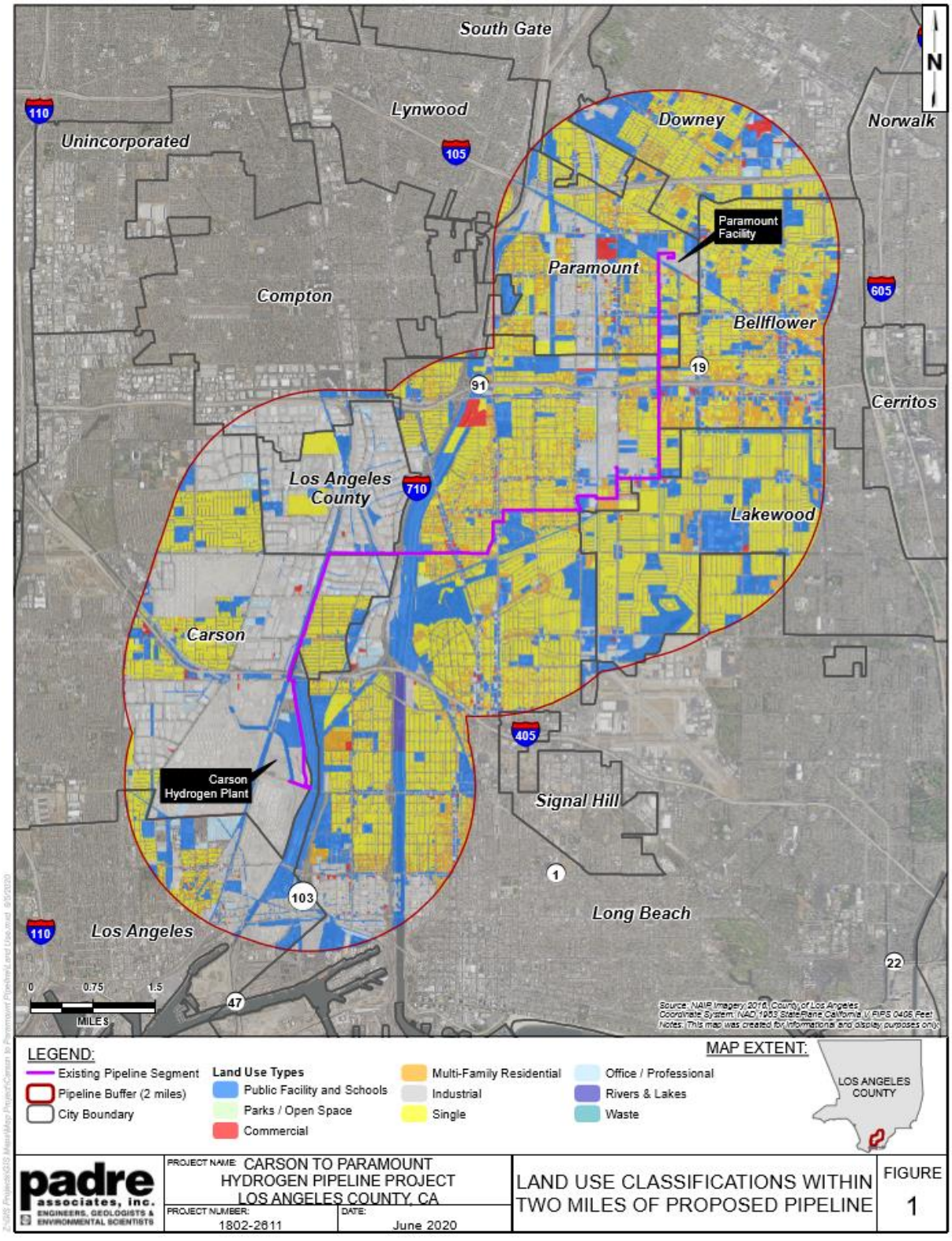
This section describes the environmental setting of the proposed Project, including the existing land uses within the Project area and zoning designated by each jurisdiction crossed by the proposed pipeline segments. The existing 11.5-mile pipeline crosses the cities of Carson, Los Angeles, Long Beach, Lakewood, Bellflower, and Paramount in addition to an unincorporated part of the County of Los Angeles and land owned or controlled by the Port of Los Angeles and the Joint Ports Authority. The 0.5-mile of new pipeline would be located entirely within the City of Carson.

4.4.1.1 Existing Land Uses

The proposed Project would consist of a pipeline route from the Air Products' hydrogen facility in the City of Carson to the Paramount Refinery in the City of Paramount. The Project area is generally level and has been modified by urban development. The site of the proposed Project is located within an area of industrial, commercial, and residential land uses. The pipeline route would primarily extend within established utility routes utilizing private corridors and public roadways. Aboveground construction would occur within the City of Carson and the City of Long Beach; all areas of construction for the proposed Project are zoned for industrial uses. The 0.5-mile of new pipeline would be located entirely within the City of Carson. The portion of the Project site that would experience most of the construction activities currently exists as a developed industrial facility.

Most construction activities within the City of Carson would take place in Segment One on private land either within or near the Air Products Carson Hydrogen Facility. This area is highly industrialized and much of the new pipeline segment would border the western bank of the Dominguez Channel. Segment Two of the pipeline is surrounded by industrial land as it follows the Union Pacific Railroad within the City of Los Angeles. Segment Three follows Alameda Street (Highway 47) and is surrounded by single-family residences to the east. Segment Four follows East Del Amo Boulevard and is surrounded by a residential area to the east as well as land used for industrial purposes. Segment Five crosses into an industrial area of an unincorporated part of Los Angeles County before crossing the Los Angeles River and under the 710 Freeway. After crossing into the City of Long Beach, the pipeline is surrounded by residential areas. Segment Six and Segment Seven are located within a mixed-use area within the City of Long Beach; there are residential, commercial, and industrial areas adjacent to the pipeline route. Once Segment Eight crosses into the City of Bellflower, the pipeline is bordered by a residential area. Segment Nine crosses into the City of Paramount with residential and commercial surroundings. The final segment, Segment Ten, also extends along residential and commercial areas before reaching an industrial zone at the Paramount Refinery. Existing land use classifications within two miles of the proposed pipeline are shown below in Figure 4.4-1.

Figure 4.4-1 Land Use Classifications Within Two Miles of Proposed Pipeline



Source: Padres Associates, Inc. 2020.

Figures 2-1 through 2-11 in Section 2.0, Project Description, provide the following maps for the proposed Project:

- Figure 2-1 – Vicinity Map;
- Figure 2-2 – Pipeline Segment One;
- Figure 2-3 – Pipeline Segment Two;
- Figure 2-4 – Pipeline Segment Three;
- Figure 2-5 – Pipeline Segment Four;
- Figure 2-6 – Pipeline Segment Five;
- Figure 2-7 – Pipeline Segment Six;
- Figure 2-8 – Pipeline Segment Seven;
- Figure 2-9 – Pipeline Segment Eight;
- Figure 2-10 – Pipeline Segment Nine; and,
- Figure 2-11 – Pipeline Segment Ten.

4.4.1.2 Proposed Project Zoning

The zoning for the proposed Project route includes the following:

City of Carson

- Heavy Manufacturing with Design Overlay (MH-D);
- Light Manufacturing with Design Overlay (ML-D); and,
- Heavy Manufacturing (MH).

City of Los Angeles

- Heavy Manufacturing with Design Overlay (MH-D).

County of Los Angeles

- Heavy Manufacturing; and,
- Open Space.

City of Long Beach

- Public Right-of-Way (PR);
- Institutional (I);
- Single Family Residential, standard lot (R-1-N);
- Community Commercial Automobile-Oriented (CCA);
- Community Commercial (CCN);
- Moderate-density Multiple Residential (R-4-R);
- Two-family Residential, standard lot (R-2-N);
- Low-density Multi-family Residential, small lot (R-3-S);

- Medium Industrial (MI);
- Light Industrial (IL);
- General Industrial (IG);
- Planned Development Residential (PDMF);
- Multi-family Residential (MFR); and,
- General Commercial (C-4).

City of Bellflower

- Medium Density Residential (R-2);
- General Commercial (CG);
- Specific Plan (SP);
- Open Space (OS); and,
- Multiple Residential (R-3).

City of Paramount

- Medium Density Residential (R-2);
- Multifamily Residential (R-M);
- Light Manufacturing (M-1);
- General Commercial (C-3);
- Single Family Residential (R-1);
- Commercial Manufacturing (C-M;)
- Planed Development with Performance Standards (PD-PS); and,
- Heavy Manufacturing (M-2).

4.4.1.3 Sensitive Receptors

Sensitive receptors are locations in which the occupants are more susceptible to the effects of noise and pollutants. The City of Carson recognizes residences, public and private school/preschool classrooms, churches, hospitals, and elderly care facilities as sensitive receptors. Table 4.1-13 in Section 4.1, Air Quality, lists the sensitive receptors within two miles of the proposed Project pipeline Segment One. Table 4.3.7 in Section 4.3, Hazardous Materials and Risk of Upset, lists the sensitive school receptors along the proposed pipeline route.

4.4.2 Regulatory Setting

This subsection presents a summary of the key land use regulations that would be applicable to the proposed Project. Due to the fact that most of the proposed Pipeline route already exists and the new pipeline segment (Segment One) would be located entirely in the City of Carson, this section focuses on applicable land use regulations of the City of Carson.

4.4.2.1 Local Regulations

City of Carson

Carson General Plan

The California Government Code requires each city and county to have a planning agency and to develop a General Plan providing a comprehensive, long-term plan for its physical development. The current General Plan consists of four units, each containing multiple elements, as well as two elements not included within a unit. Below is a summary of the elements and the date of adoption:

- Unit 1- Land Use, Open Space, Public Services & Facilities, and Recreation Elements (1982);
- Unit 2 – Circulation Element and Bicycle Facilities Section (1981);
- Unit 3 Safety, Seismic Safety, and Noise Elements (1981);
- Unit 4 Historic Preservation, Fine Arts, Conservation, and Scenic Highways Elements (1981);
- Housing Element (1981) (1989) (2002); and,
- Air Quality Element (1994).

Land Use Element

The Land Use Element within the Carson General Plan identifies land use designations and locations and a general description of the uses permitted in each land use category. The Land Use Element also identifies objectives, policies, and programs that guide zoning, subdivision, and public works decisions.

The Land Use Element identifies the incompatible land use issue as "*Incompatible land uses immediately adjacent to one another, such as residential and industrial uses, may significantly hinder the health of a community. Uses should be appropriately buffered or incompatibilities addressed through re-designation of uses in the area*". As such the goal of Land Use Element Goal LU-7 is for adjacent land uses to be compatible with one another (City of Carson 2004). Two policies under Goal LU-7 apply to the proposed Project:

- Policy LU - 7.4 Through the discretionary review process, ensure that the siting of any land use which handles, generates, and/or transports hazardous substances will not negatively impact existing sensitive receptor land uses; and,
- Policy LU - 7.5 Monitor existing uses, and carefully review all new proposals to expand intensive commercial and industrial uses.

Conditional Use Permit

The proposed Project will require a Conditional Use Permit (CUP) pursuant to the City of Carson Municipal Code Section 9172.21. The City of Carson Planning Commission provides review of an CUP application

and makes a determination on a proposed project based on the following criteria (Code Section 9172.21.D):

- The proposed use and development will be consistent with the General Plan;
- The site is adequate in size, shape, topography, location, utilities, and other factors to accommodate the proposed use and development;
- There will be adequate street access and traffic capacity;
- There will be adequate water supply for fire protection;
- The proposed use and development will be compatible with the intended character of the area;
- Such other criteria as are specified for the particular use in other Sections of this Chapter; and,
- If the Commission finds that any adverse effects will occur as a result of the proposed use and development, such effects must be found to be justified by the benefits to the public interest which will occur as a result of such use and development.

4.4.3 Significance Thresholds

Appendix G of the CEQA Statute and Guidelines provides the following thresholds for determining the potential environmental impact of a proposed project regarding land use. Appendix G asks would the proposed Project:

- Physically divide and established community; or
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

Section 4.4.4 discusses potential Project impacts in relation to these CEQA Appendix G thresholds.

4.4.4 Project Impacts and Mitigation Measures

Impact #	Impact Description	Phase	Impact Classification
LU.1	The proposed Project would not physically divide a community.	Construction or Operation	III

The proposed Project pipeline would traverse the City of Carson, City of Los Angeles, County of Los Angeles, City of Long Beach, City of Lakewood, City of Bellflower, and City of Paramount. The proposed Project site is located within heavily disturbed areas, such as industrial corridors, residential areas, and developed road rights-of-way. The proposed Project would utilize 11.5 miles of existing pipeline, and approximately 0.5 miles of new pipeline would be constructed within the City of Carson. The 0.5-mile of new pipeline would be constructed underground along an unpaved utility corridor existing along the Dominguez Channel, which has concrete banks on both sides. Aboveground construction would also occur in the City of Long Beach in an area zoned for industrial uses. The proposed pipeline would predominately be located underground, and the two segments requiring aboveground construction, Segment One and Segment Seven, are located in existing industrial land use locations. The proposed Project will not alter existing land uses on the proposed Project pipeline route and will not expand outside of the current existing pipeline right of way. Therefore, the proposed Project would not result in a significant land use

impact due to the physical division of an established community. Potential impacts for Land Use 1 would be **less than significant (Class III).**

Impact #	Impact Description	Phase	Impact Classification
LU.2	The proposed Project would not cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.	Construction or Operation	III

The proposed pipeline route would primarily extend within established utility routes utilizing private corridors and public roadways. All areas of construction for the proposed Project are zoned for industrial uses, therefore, the proposed Project pipeline would be consistent with the zoning and existing land uses in the area.

Land Use Policy LU - 7.4

- LU-7.4; Through the discretionary review process, ensure that the siting of any land use which handles, generates, and/or transports hazardous substances will not negatively impact existing sensitive receptor land uses.

The City of Carson is processing the proposed Project CUP, CUP1089-18, in coordination with the environmental analysis contained in this EIR. The Air Quality and Hazardous Materials and Risk of Upset sections of the EIR reviewed potential impacts to sensitive receptor land uses and provided mitigation measures for those impacts where applicable. Therefore, through the discretionary CUP review and CEQA environmental review processes, the proposed Project is consistent with Land Use Policy LU 7.4

Land Use Policy LU - 7.5

- LU-7.5; Monitor existing uses, and carefully review all new proposals to expand intensive commercial and industrial uses.

As noted above for LU-7.4, the proposed Project is under review by the CUP and CEQA processes. Those reviews include an assessment of existing land uses and land use zoning designations. The proposed Project is consistent with the existing industrial use of the Project site and would not expand the existing commercial and industrial land uses in the Project site area. Therefore, the proposed Project is consistent with Land Use Policy LU-7.5.

The proposed Project is consistent with the site land use and zoning designations, consistent with applicable Land Use Policies, and the environmental review of the Project contains mitigation measures to address any potential environmental impacts. Therefore, the proposed Project would not conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. Potential impacts for Land Use 2 would be **less than significant (Class III).**

4.4.5 Cumulative Effects

The proposed Project would not result in any land use impacts; therefore, the proposed Project would not have a cumulative effect on the land use plans and regulations of the City of Carson or any surrounding jurisdiction.

4.4.6 References

City of Carson. 2004. City of Carson General Plan. Adopted October 11, 2004. http://ci.carson.ca.us/content/files/pdfs/planning/CityofCarsonGeneralPlan.pdf.

Padre Associates, Inc. 2019. Project Execution Plan, Proposed Carson to Paramount Hydrogen Gas Pipeline Project. September 2019.

Padre Associates, Inc. 2020. Land Use Along Pipeline Route. June 2020.

4.5 Transportation and Circulation

This section discusses existing transportation and circulation conditions in the proposed Project area and along the proposed pipeline route. This section will evaluate impacts of the proposed Project on existing and future transportation systems in the Project area.

4.5.1 Environmental Setting

This subsection describes the environmental setting for transportation and circulation within the proposed Project area.

The proposed Project would involve the construction of 0.5-mile of new pipeline within the City of Carson. The segment of new pipe would connect with 11.5 miles of existing pipeline, expanding Air Products' existing pipeline network. Air Products proposes to utilize this pipeline route to connect Air Products with a new customer in the City of Paramount to support renewable bio-fuel production. The Project would eliminate the need for six daily tanker truck trips that currently deliver hydrogen, thereby reducing local traffic.

The existing 11.5-mile pipeline crosses the cities of Carson, Los Angeles, Long Beach, Lakewood, Bellflower, and Paramount in addition to an unincorporated part of the County of Los Angeles and land owned or controlled by the Port of Los Angeles and the Joint Ports Authority; see Figure 2-1 for a vicinity map. The proposed pipeline route would primarily extend within established utility routes utilizing private corridors and public roadways. The proposed pipeline route would run along the following roads and rights-of-way:

- Sepulveda Boulevard;
- Union Pacific Railroad;
- 223rd Street;
- Alameda Street (Highway 47);
- East Del Amo Boulevard;
- Linden Avenue;
- East Market Street;
- North Paramount Boulevard;
- South Street; and
- Downey Avenue.

The proposed Project would cross three bodies of water: the Dominguez Channel in Carson (Segment One), the Compton Creek in Long Beach (Segment Four), and the Los Angeles River in Long Beach (Segment Five). The pipeline alignment would also cross under the 710 Freeway (Segment Five). Refer to Table 2.1 for a description of the pipeline segments and Figures 2-2 through 2-11 for aerial views of the proposed pipeline segments.

4.5.1.1 Existing Circulation System

The existing street network within the City of Carson is essentially a modified grid system of north/south and east/west roadways. The primary north/south roadways are Figueroa Street, Broadway, Main Street, Avalon Boulevard, Central Avenue, Wilmington Avenue, Alameda Street, and Santa Fe Avenue. The primary east/west streets are Alondra Boulevard, Gardena Boulevard, Artesia Boulevard, Albertoni Street, Walnut Street, Victoria Street, University Drive, Del Amo Boulevard, Carson Street, 223rd Street, Sepulveda Boulevard and Lomita Boulevard. The current Carson Master Plan of Streets was adopted in 1981 as part of the City's General Plan and is shown on Figure 4.5-1. The Master Plan of Streets designates roadways as one of five street classifications, according to function. The five classifications are: (1) Local Streets, (2) Collector Streets, (3) Secondary Highways, (4) Major Highways, and (5) State Highways and Freeways.

Local Streets

Local streets principally provide vehicular, pedestrian, and bicycle access to property abutting the public right-of-way. Cross sections of local streets vary, depending on the abutting land uses, parking requirements, street trees, and other considerations. Where both sides of the street are served equally in residential areas, the common right-of-way width for a local street is from 48 feet to 60 feet with a 36- to 40-foot pavement width.

In commercial and industrial areas, a minimum pavement width of 40 feet is necessary. In industrial areas, consideration of the predominant type of trucking, and whether or not maneuvering of trailers must be provided, may require a pavement width of 44 feet or more. Local streets can be expected to carry less than 1,500 vehicles per day. All other streets in Carson not otherwise classified are local streets.

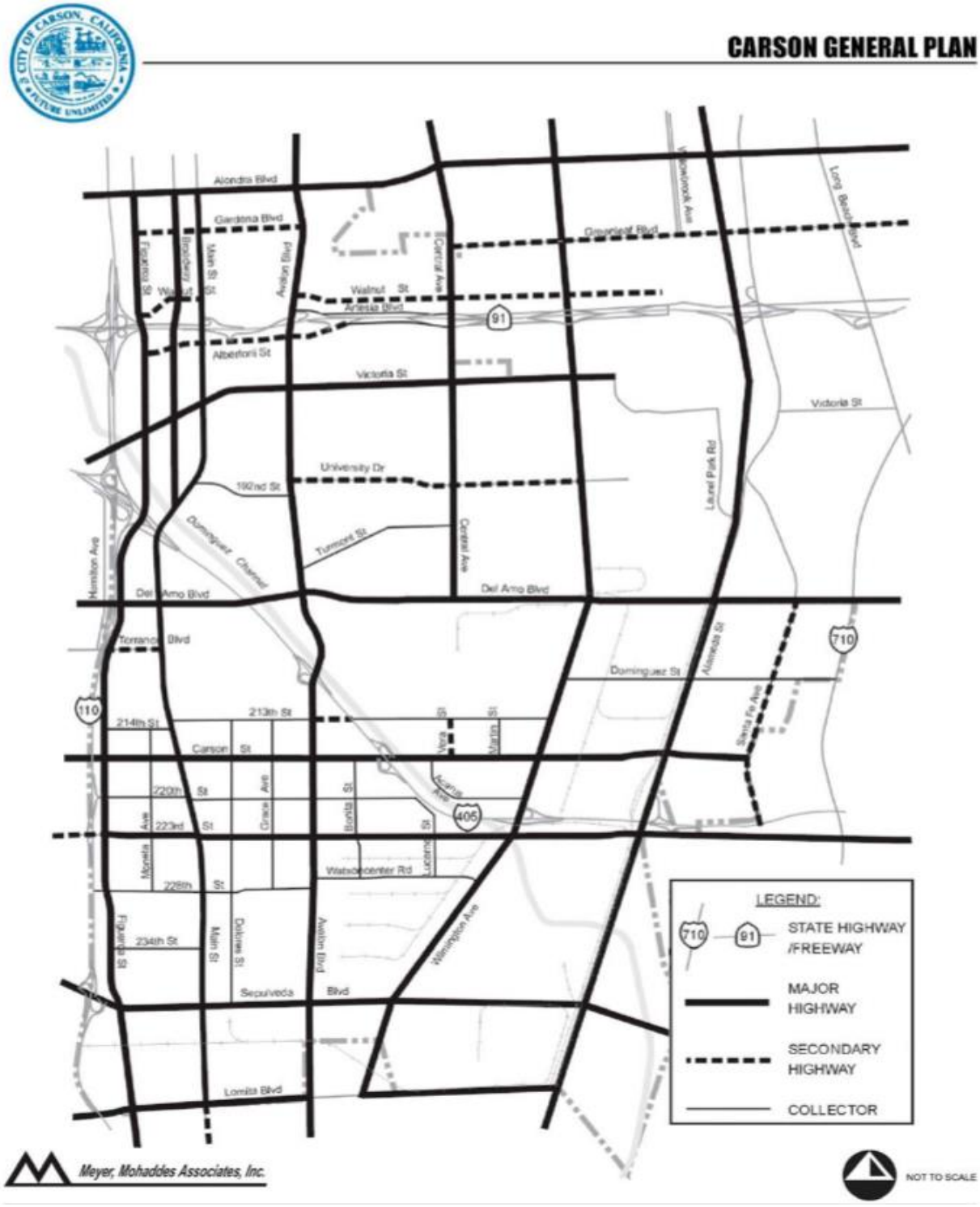
Collector Streets

The collector street is intended to serve as an intermediate route to handle traffic between local streets and arterials. In addition, collector streets provide access to abutting property. Collector streets are anticipated to carry traffic volumes between 2,000 to 5,000 vehicles per day, but some carry as many as 10,000 vehicles per day. A collector street may have one or two through lanes in each direction and curb parking is often provided. The primary function of the collector street is to collect vehicles from the local street system and transport them to the arterial system as efficiently as possible. Collector streets in Carson require a minimum right-of-way width of 60 feet.

Secondary Highways

Secondary highways are similar to major highways in function. They connect traffic from collectors to the major freeway system. They move large volumes of automobiles, trucks and buses, and link principal elements within the City to other adjacent regions. These streets also handle intra-city trips in other adjacent regions. These roadways carry approximately 10,000 to 25,000 vehicles per day. Four to six through lanes are provided along with single or double left-turn lanes at major signalized intersections. Curb parking is often prohibited during peak periods. Secondary highways in Carson require a minimum right-of-way of 80 ft.

Figure 4.5-1 Carson Master Plan of Streets



Source: City of Carson General Plan Transportation and Infrastructure Element. 2004.

4.5.1.2 Truck Routes

The City of Carson has many trucks on its streets due to the types of industrial and commercial uses in the City. There are no specific counts of trucks as opposed to other types of vehicles on City streets, but it is estimated that trucks make up 10-25% of the vehicles over 24 hours. The volume of trucks, the impacts of truck traffic on land uses, and the conflict between trucks and other vehicles are major issues for the City.

The City of Carson has designated truck routes and truck parking zones where vehicles in excess of three tons may travel and park. These routes and parking zones are shown in Figure 4.5-2, Carson Truck Routes. The purpose of regulating truck routes and truck parking zones is to provide access for large trucks on streets designed to accommodate them and to protect residential streets from unwanted truck traffic.

Sepulveda Boulevard and Alameda Street are both listed as approved truck routes. Air Products' Carson Facility is the initiation point for the proposed pipeline as well as one of the sites of construction. The Carson Facility is accessed by East Sepulveda Boulevard and South Alameda Street.

Major Highways

Major highways function to connect traffic from collectors to the major freeway systems as well as to provide access to adjacent land uses. They move large volumes of automobiles, trucks and buses, and link principal elements within the City to other adjacent regions. These facilities typically handle inter-city vehicular trips in the magnitude of 25,000 or more vehicles per day. Typically, curb parking is prohibited during peak periods. Raised medians to separate opposing flows are typical and access control, (i.e., driveways and minor intersecting streets) is often minimized. Separate left-turn lanes at major signalized intersections are required with double left-turn lanes often provided. Separate right-turn lanes, which may also serve as bus loading areas, are provided at locations where warranted by high turn volumes. Major highways in Carson require rights-of-way of 100 feet or more.

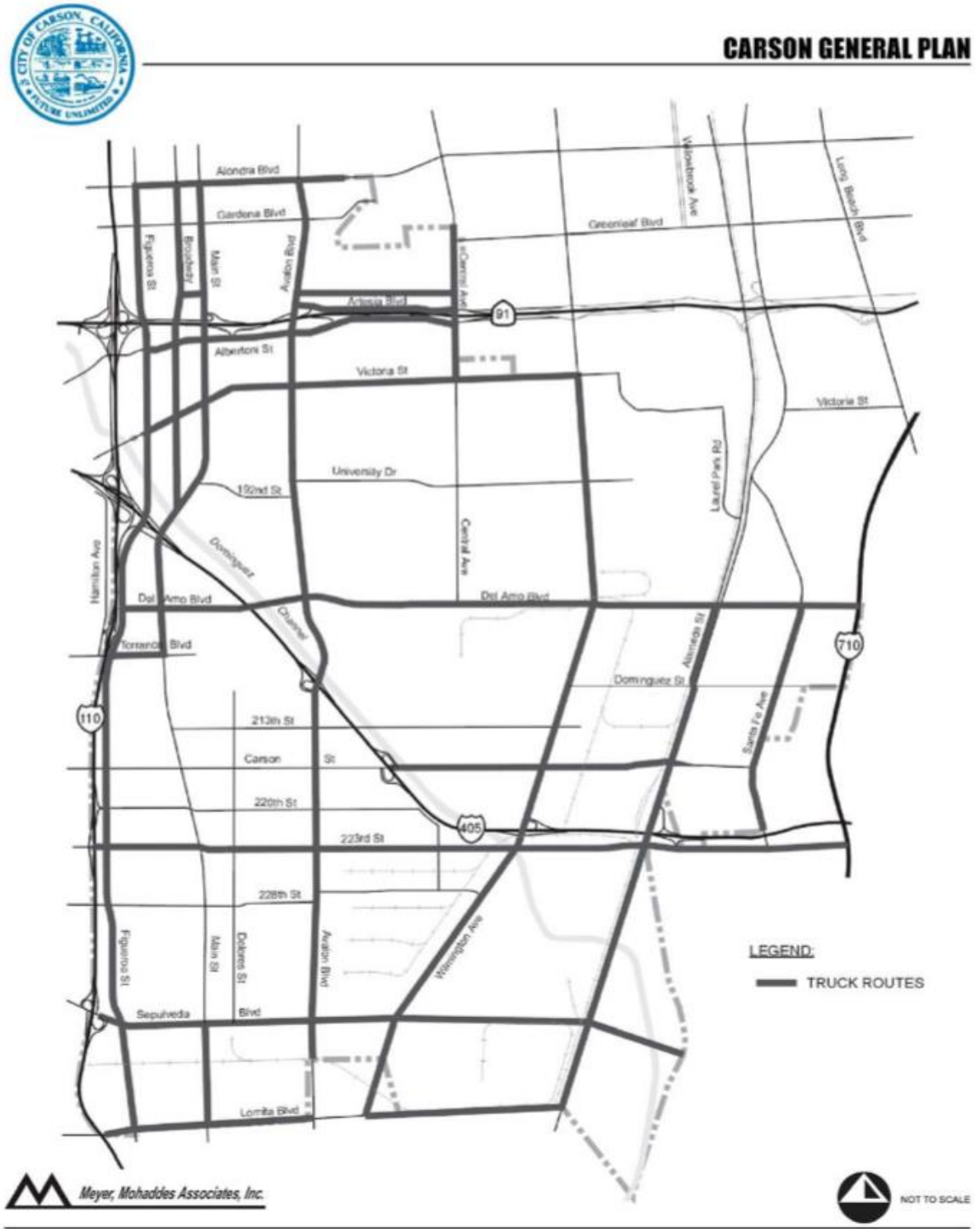
State Highways and Freeways

Freeways are controlled access, high-speed roadways with grade-separated interchanges intended to expedite movement between distant areas in the region. Planning, design, construction, and maintenance of freeways in California are the responsibility of the Department of Transportation (Caltrans). As a result, they fall outside of the jurisdiction of the City of Carson. The freeway system serving the City of Carson includes the Artesia Freeway (SR-91), Long Beach Freeway (I-710), San Diego Freeway (I-405) and the Harbor Freeway (I-110). Alameda Street became State Highway 47.

Streets in Industrial Areas

There are certain collectors that serve industrial areas, including the entrance, interior and loop streets, which generate high traffic volumes by employees during peak hours. Additionally, these streets accommodate industrial truck loading and unloading. Therefore, these industrial streets should provide minimum right-of-way of 84 ft, with the exception of minor interior industrial streets with less traffic flow, such as industrial cul-de-sacs, which should provide a minimum right-of-way of 64 ft.

Figure 4.5-2 Carson Truck Routes



Source: City of Carson General Plan Transportation and Infrastructure Element. 2004.

4.5.1.3 Existing Traffic Operations Analysis

Level of Service (LOS) terms are used to qualitatively describe prevailing conditions and their effect on traffic. The LOS concept denotes any one of a number of differing combinations of operating conditions that may take place as a roadway is accommodating various traffic volumes. The LOS is related to the volume-to-capacity ratio (V/C). To determine the V/C ratio, the average daily traffic volume on a particular roadway link is divided by the link capacity. There are six defined Levels of Service, A through F, which describe conditions ranging from "ideal" to "worst" as defined in Table 4.5.1.

Table 4.5.1 Level of Service Descriptions

Level of Service	Description	Volume to Capacity Ratio
A	Excellent operation. All approaches to the intersection appear quite open, turning movements are easily made, and nearly all drivers find freedom of operation.	0 - 0.60
B	Very good operation. Many drivers begin to feel somewhat restricted within platoons of vehicles. This represents stable flow. An approach to an intersection may occasionally be fully utilized and traffic queues start to form.	0.61 – 0.70
C	Good operation. Occasionally drivers may have to wait more than 60 seconds, and backups may develop behind turning vehicles. Most drivers feel somewhat restricted.	0.71 – 0.80
D	Fair operation. Cars are sometimes required to wait more than 60 seconds during short peaks. There are no long-standing traffic queues. This level is typically associated with design practice for peak periods.	0.81 – 0.90
E	Poor operation. Some long-standing vehicular queues develop on critical approaches to intersections. Delays may be up to several minutes.	0.91 – 1.00
F	Forced flow. Represents jammed conditions. Backups from locations downstream or on the cross street may restrict or prevent movement of vehicles out of the intersection approach lanes; therefore, volumes carried are not predictable. Potential for stop and go type traffic flow.	Over 1.01

Source: Highway Capacity Manual, Special Report 209, Transportation Research Board, Washington, D.C., 1985 and Interim Materials on Highway Capacity, NCHRP Circular 212, 1982. Source: City of Carson General Plan Transportation and Infrastructure Element. 2004.

Aboveground construction for the proposed Project would be limited to roadways in the City of Carson and the City of Long Beach. Construction within the City of Carson would occur on privately owned land at the Air Products' Carson Facility and connect to existing PP pipe on East Sepulveda Boulevard on the West side of the Dominguez channel. There would be no construction in the right-of-way for the Dominguez channel due to the use of an existing pipeline and pipe bridge. Aboveground construction in the City of Long Beach would occur on the West side of North Paramount Boulevard near the intersection with South Street. The two areas of aboveground construction for the proposed Project are zoned for industrial uses and operate at low traffic volumes and a high level of service under existing conditions. Table 4.5.2 provides the LOS for these two proposed Project construction areas.

Table 4.5.2 Traffic Data for Above Ground Construction Sites on Pipeline Route

City	Segment	ADT	LOS AM	LOS PM
Carson	Sepulveda Boulevard – Alameda and Intermodal	23,473	A	A
Long Beach	South Street and North Paramount Boulevard	28,000	A	B
LOS = Level of Service				

Source: Long Beach General Plan 2013, Carson Traffic Engineering Daily Traffic Volumes 2014.

Transit Facilities

Public transportation in the City of Carson is provided primarily by the Carson Circuit, Torrance Transit, and the Los Angeles County Metropolitan Transportation Authority (MTA) bus lines. There is also limited service from Long Beach Transit and Gardena Municipal Bus Lines.

Railroads

Segment Two of the proposed pipeline would utilize existing Paramount Petroleum LLC. (PP) Line 4 along the existing Union Pacific Railroad. There are no roadways within this industrial area located within the City of Los Angeles.

The Union Pacific Railroad is currently utilized by industrial land uses in the City of Paramount and typically carries three local freight trains in each direction daily to the container loading areas at the ports of Long Beach and Los Angeles. Trains operating along the Alameda Corridor now transport freight from the Port of Los Angeles to the rail yards located south of Downtown Los Angeles. The railroad rights of ways within the City that are currently operational, largely serve local businesses.

Bicycle and Pedestrian Facilities

The Project route is not designated for recreational use. The proposed Project route would cross the Los Angeles River Bicycle Path along East Del Amo Boulevard in the City of Carson. Construction activities would not be located in the vicinity of bicycle or pedestrian facilities. Aboveground construction within the cities of Carson and Long Beach would occur on land zoned for industrial uses.

4.5.2 Regulatory Setting

This subsection summarizes the federal, state, and local laws, regulations, and standards that govern traffic and transportation resources in the proposed Project area.

4.5.2.1 Federal Regulations

Federal Highway Administration

The Manual on Uniform Traffic Control Devices (MUTCD) defines the standards used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public traffic. The MUTCD is published by the Federal Highway Administration (FHWA) under 23 Code of Federal Regulations (CFR), Part 655, Subpart F.

The MUTCD, which has been administered by the FHWA since 1971, is a compilation of national standards for all traffic control devices, including road markings, highway signs, and traffic signals. It is updated periodically to accommodate the nation's changing transportation needs and address new safety technologies, traffic control tools and traffic management techniques.

4.5.2.2 State Regulations

The following Statewide regulations apply to the movement of heavy trucks and transport of crude oil and other hazardous materials on public freeways:

- California Vehicle Code (CVC), Division 6, Chapter 7; Division 14.8; and, Division 15 all include regulations pertaining to the licensing, size, weight, and load of commercial vehicles operated on State highways and the safe operation of vehicles (California, 2018);
- California Streets and Highway Code, Divisions 1 and 2, Chapters 3 and 5 includes regulations for the care and protection of State and county highways as well as provisions for the issuance of written roadway permits (California, 2018); and,
- California Street and Highway Code Sections 670 through 695 set forth the provisions for Caltrans issuance of roadway permits including, but not limited to, permits for roadway encroachment during truck transportation and delivery and permits for any load that exceeds Caltrans weight, length, or width standards for public roadways (California, 2018).

California Office of Planning and Research, California Environmental Quality Act (CEQA)

The CEQA Guidelines discuss use of the LOS methodology described in Section 4.5.1.3 for transportation analyses in CEQA documents. In response to Senate Bill 743, in December 2018, the California Natural Resources Agency certified and adopted CEQA Guideline updates that implement changes to the methodology used to assess traffic impacts in CEQA documents. The Guidelines require an alternative to LOS for evaluating transportation impacts by enhancing or replacing the typical LOS analysis with a vehicle miles travelled (VMT) analysis. These changes include elimination of auto delay, LOS, and other similar measures of vehicular capacity or traffic congestion as a basis for determining significant impacts. The CEQA Guidelines update states that "A lead agency may elect to be governed by the provisions of this section immediately. Beginning on July 1, 2020, the provisions of this section shall apply statewide." (CEQA Guidelines §15064.3 (d)).

CEQA Section 15064.3

This update to CEQA, effective December 28, 2018, codifies a switch from Level of Service (LOS) to Vehicle Miles Traveled (VMT) as metric for transportation impact analysis.

This section describes specific considerations for evaluating a project's transportation impacts. Generally, vehicle miles traveled is the most appropriate measure of transportation impacts. For the purposes of this section, "vehicle miles traveled" refers to the amount and distance of automobile travel attributable to a project. Other relevant considerations may include the effects of the project on transit and non-motorized travel. Except as provided in subdivision (b)(2) below (regarding roadway capacity), a project's effect on automobile delay shall not constitute a significant environmental impact.

Section 15064.3 (b) provides the criteria for analyzing transportation impacts:

- (1) Land Use Projects. Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high-quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact;

- (2) Transportation Projects. Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact. For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. To the extent that such impacts have already been adequately addressed at a programmatic level, such as in a regional transportation plan EIR, a lead agency may tier from that analysis as provided in Section 15152;
- (3) Qualitative Analysis. If existing models or methods are not available to estimate the vehicle miles traveled for the particular project being considered, a lead agency may analyze the project's vehicle miles traveled qualitatively. Such a qualitative analysis would evaluate factors such as the availability of transit, proximity to other destinations, etc. For many projects, a qualitative analysis of construction traffic may be appropriate; and,
- (4) Methodology. A lead agency has discretion to choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household or in any other measure. A lead agency may use models to estimate a project's vehicle miles traveled and may revise those estimates to reflect professional judgment based on substantial evidence. Any assumptions used to estimate vehicle miles traveled and any revisions to model outputs should be documented and explained in the environmental document prepared for the project. The standard of adequacy in Section 15151 shall apply to the analysis described in this section.

The Governor's Office of Planning and Research, *Technical Advisory on Evaluating Transportation Impact in CEQA* with the new VMT requirement states the following; "For the purposes of this section, 'vehicle miles traveled' refers to the amount and distance of automobile travel attributable to a project." Here, the term "automobile" refers to on-road passenger vehicles, specifically cars and light trucks (2018). Heavy duty delivery trucks such as those required to deliver the pipeline and heavy equipment for the proposed Project, would not be considered in the evaluation of VMT impacts under the requirements of CEQA Guidelines §15064.3.

California Department of Transportation Encroachment Permits and Transportation Permits

The California Department of Transportation (Caltrans) is responsible for the oversight of state highways, inter-city rail services, and public-use airports within California. An encroachment permit must be obtained from Caltrans for all work done within a state highway ROW. In addition, Caltrans has the discretionary authority to issue special permits for the movement of vehicles/loads exceeding statutory limitations on the size, weight, and loading of vehicles contained in Division 15 of the California Vehicle Code. Maximum limitations are generally as follows: width = 102 inches, height = 14 ft, length = 75 ft, weight = 80,000 pounds. Requests for permits to exceed any of these limitations requires completion of a Transportation Permit application (Caltrans 2019).

Congestion Management Program

In June 1990, Proposition 111 was passed in California, which mandated that each county with 50,000 or more residents develop a Congestion Management Program (CMP). AB 2419 was later passed in 1996, which allowed counties to opt out of the CMP if the majority of local governments adopt resolutions to do so. The congestion management process is intended to use travel demand reduction and operational management strategies to provide for safe and effective integrated management and operation of a multimodal transportation system.

Section 660 of the California Streets and Highways Code

Section 660 of the California Streets and Highways Code requires that "any tower, pole, pole line, pipe, pipeline, fence, billboard, stand or building, or any structure, object of any kind or character not particularly mentioned in [this] section, or special event, which is in, under, or over any portion of the State highway rights of way" requires an encroachment permit issued by the California Department of Transportation (Caltrans) (Caltrans2015).

4.5.2.3 Local Regulations

City of Carson

Carson General Plan – Transportation and Infrastructure Element

As a component of the City of Carson General Plan, the Transportation and Infrastructure Element document outlines transportation and associated policies and describes the future circulation system needed to support the goals of the Land Use Element. Goals and policies applicable to the proposed Project include:

- Goal TI-1: Minimize impacts associated with truck traffic through the City, as well as at truck parking locations;
- Policy TI-1.5: Require that all new construction or reconstruction of streets or corridors that are designated as truck routes, accommodate projected truck volumes and weights; and,
- Policy TI-2.1: Require that new projects not cause the Level of Service for intersections to drop more than one level if it is at Level A, B, or C, and not drop at all if it is at D or below, except when necessary to achieve substantial City development goals.

City of Long Beach

Long Beach General Plan – Mobility Element

- LU Policy 1-10: In addition to analyzing project and plan impacts on Levels of Service and Stop Delay, analyze Vehicle Miles Traveled consistent with the State's guidelines.
- MOG Policy 13-3: Minimize potential conflicts between trucks and pedestrian, bicycle, transit, and vehicle access and circulation on streets with truck travel.

City of Paramount

Paramount General Plan – Transportation Element

The following policies underscore the City's recognition that the maintenance of a comprehensive circulation system is critical to the City's economic well-being:

- Transportation Element Policy 1: The City of Paramount will increase the efficiency of the local street system by reducing the conflicts associated with through traffic;
- Transportation Element Policy 2: The City of Paramount will close selected local streets along major arterials to improve through circulation and to eliminate through traffic impacts on local streets; and,

- Transportation Element Policy 4: The City of Paramount will continue to develop and implement a designated system of truck routes as a means to keep industrial traffic out of residential neighborhoods.

4.5.3 Significance Thresholds

CEQA Environmental Thresholds

Significance criteria are based on the CEQA Guidelines Appendix G checklist. An impact is considered significant if the project would:

a. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

b. Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b) related to VMT?

c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

d. Result in inadequate emergency access?

4.5.4 Project Impacts and Mitigation Measures

The proposed pipeline route would mostly utilize private corridors and public roadways. The pipeline alignment would cross the cities of Carson, Los Angeles, Long Beach, Lakewood, Bellflower, and Paramount in addition to an unincorporated part of the County of Los Angeles and land owned or controlled by the Port of Los Angeles and the Joint Ports Authority.

Aboveground construction for the proposed Project would be limited to roadways in the City of Carson and the City of Long Beach. Carson construction would occur on privately owned land at the Air Products' Carson Facility and connect to existing pipeline on East Sepulveda Boulevard on the West side of the Dominguez channel. There would be no construction in the right-of-way for the Dominguez channel due to the use of existing pipeline and pipe bridge. Aboveground construction in the City of Long Beach would occur on the West side of North Paramount Boulevard near the intersection with South Street.

Pipeline construction may result in temporary traffic delays adjacent to or within roadways because temporary lane closures and traffic control may be necessary. The Applicant's application contained several Avoidance and Minimization Measures (AMMs) to minimize the Project's environmental impacts. The Applicant would implement these measures during the design, construction, and operation of the pipeline. The following AMMs were provided to minimize potential transportation and circulation impacts:

- Traffic control measures would be implemented in accordance with the Work Area Traffic Control Handbook. These measures include appropriate visual traffic control including signs, traffic cones, and flaggers. These measures are intended to reduce hazards to both workers and motorists during construction;
- Warning signs would be installed prior to construction to notify through traffic of trucks entering and leaving the site and to allow commuters to plan for alternative routes;
- Alternative vehicle and pedestrian access would be established; and,

- Construction would be minimized during Holidays when feasible.

Impact #	Impact Description	Phase	Impact Classification
T.1	The project would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities.	Construction or Operation	II

Operational impacts resulting from the proposed Project would be minimal, temporary and infrequent and associated with any needed maintenance and repairs. Normal operation of the pipeline would not interfere or conflict with existing transit, roadway, bicycle, or pedestrian activities.

The two areas of aboveground construction for the proposed Project are zoned for industrial uses and operate at low traffic volumes and a high level of service under existing conditions (see Table 4.5.2). No roadways would be closed to all through traffic during construction activities. Although the Project route crosses the Los Angeles River Bicycle Path along East Del Amo Boulevard in the City of Carson, there would be no impact to the bicycle path. Where existing sidewalks or roadways would be temporarily obstructed by pipeline construction activities, alternative pedestrian and vehicle access routes would be developed and marked accordingly consistent with the Traffic Control Handbook and traffic control minimization measures proposed as part of the Project. During construction, and on a short-term basis, the proposed Project would have the potential to disrupt normal traffic and circulation on roadways and bicycle or pedestrian activities which would be inconsistent with existing transportation and circulation plans, ordinances and policies. Therefore, potential impacts for Transportation and Circulation 1 could be **significant.**

Mitigation Measures

T-1 *Alternative vehicle and pedestrian access would be established during construction. The Operator should provide a route specific traffic and circulation plan that provides safe access to sidewalks and other areas frequented by pedestrian during construction.*

Impacts Remaining After Mitigation

With implementation of the recommended mitigation measure, potential impacts for Transportation and Circulation 3 would be considered **less than significant with mitigation (Class II).**

Impact #	Impact Description	Phase	Impact Classification
T.2	The project would not conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b).	Construction or Operation	III

Normal operation of the pipeline would result in minimal and infrequent impacts to transportation and circulation in the proposed The proposed Project would not result in an increase in on-road passenger vehicle miles traveled (VMTs), which as noted in Section 4.5.2.2 above, is the intent of this CEQA 15064.3 (b) significance criteria. In addition, proposed Project is expected to reduce truck trips by six tanker trucks each day. The two areas of aboveground construction for the proposed Project are zoned for industrial uses and operate at low traffic volumes and a high LOS (see Table 4.5.3). The short-term impact of construction delivery trucks would not be expected to present a significant impact to those LOS

classifications. Potential impacts for Transportation and Circulation T.2 would be **less than significant (Class III).**

Impact #	Impact Description	Phase	Impact Classification
T.3	The project may substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).	Construction or Operation	III

The proposed Project does not involve a change to the existing roadways, circulation or traffic patterns. The proposed Project delivery trucks and construction equipment would be of temporary and short-term duration; therefore, the proposed Project would not introduce a new incompatible use to the project area. As the proposed Project does not alter current roadways or circulation and does not introduce a new incompatible use, therefore Transportation and Circulation T.3 would be **less than significant (Class III).**

Impact #	Impact Description	Phase	Impact Classification
T.4	The project may result in inadequate emergency access.	Construction or Operation	II

Normal operation of the pipeline would not result in any change to emergency access or emergency response. Pipeline construction has the potential for temporary traffic disruption and may require the use of alternate traffic routes. The applicant proposed traffic control measures, use of visual traffic control including signs, traffic cones, and flaggers would direct motorists and emergency responders to those alternate routes. Consistent with the Traffic Control Handbook, alternative routes for motorists and emergency vehicles would be identified that may be used to avoid construction areas. Therefore, the proposed Project could have a significant effect on emergency response by paramedic, fire, ambulance, and police vehicles. Therefore, impacts to Transportation and Circulation T.4 could be **significant.**

Mitigation Measures

T-4 *Emergency response providers in the vicinity of construction sites would be given advance notice of the construction schedule and locations, road closures, and possible alternate routes.*

Impacts Remaining After Mitigation

With implementation of the recommended mitigation measure, potential impacts for Transportation and Circulation 4 would be considered **less than significant with mitigation (Class II).**

4.5.5 Cumulative Effects

The potential traffic impacts from the proposed Project were evaluated for both construction and operations. Impacts to traffic during construction would be temporary in nature and would not have any potential cumulative effect when evaluated in conjunction with other neighboring projects. There is not expected to be any transportation impacts during operations that would have any potentially cumulative

effect when considered with other neighboring projects. Therefore, the Proposed Project would have a less than significant cumulative transportation impact.

4.5.6 References

City of Carson Traffic Engineering. 2014. Daily Traffic Volumes [PDF]. Retrieved from http://ci.carson.ca.us/content/files/pdfs/ENGINEERING/traffic_engineering/Carson%20Daily%20Traffic%20Volumes%202014.pdf

City of Carson. 2004. Transportation and Infrastructure Element. City of Carson General Plan. Retrieved from http://ci.carson.ca.us/content/files/pdfs/planning/generalplan/Chapter%204_Transportation.pdf

City of Long Beach. 2013. City of Long Beach General Plan Mobility Element. Adopted October 15, 2013.

City of Paramount, 2007. Final Paramount General Plan. Adopted August 7, 2007. Available at: http://www.paramountcity.com/home/showdocument?id=2538

4.6 Tribal Cultural Resources

This section describes the environmental and regulatory settings related to tribal cultural resources, identifies potential impacts to historical, cultural, or archaeological resources of significance to California Native American tribes that would result from the proposed Project, and provides mitigation measures to reduce those impacts to a level of insignificance. The analysis in this section is based on the Phase I Archaeological Survey completed by Padre Associates, Inc. in November 2018.

4.6.1 Environmental Setting

The proposed Project site is located on the Torrance Plain, an alluvial coastal plain extending north from present-day Los Angeles and Long Beach Harbors (Reagan, 1915). The Torrance Plain is a predominantly level landscape characterized by marshy lakes and wetland areas, which historically has been subjected to frequent flooding from the nearby Los Angeles River, as well as from other channelized streams such as Dominguez Sough and Compton Creek. Except for two prominences, Dominguez Hill at 179 feet above sea level and Palos Verdes Hill at 1400 feet above sea level, the Torrance plain is featureless and reaches a maximum elevation of 35 to 40 feet above mean sea level.

Vegetation is presently sparse within the Project site, primarily due to development. Historically, marshy soils and lake shores in the area would have supported growths of Alder (Alnus rhombifolia), Willow (Salix spp.), Rushes (Juncus spp.), Cottonwood (Populus trichocarpa), Bulrushes (Scirpus spp.), and Cat-tail (Typha spp.). To the north of the Project site, canyons and drainages within the higher elevations of Palos Verdes Hills are dominated by scrub brush and Valley and Coastal Live Oak (Quercus spp.). Cactus (Cholla, Prickly Pear), Toyon, Yucca, Coastal Sagebrush and Sugarbrush (Rhus Ovata) occur along arid slopes receiving more direct sun. The Project site is located within the coastal plain, an area which, prior to development, supported a wide variety of grasses (Deergrass, Giant Rye Grass, Pepper Grass), Buckwheat, Sagebrush and Chia and, from the historical period onward, localized groves of Eucalyptus and other non-indigenous trees and shrubs (Butler, 1974; Curtis, 1959; Bates, 1963).

4.6.1.1 Archaeological Context

The following summary of the prehistory of the Los Angeles Basin, which can be included within the broader, regional patterns of southern California prehistory, is based on Byrd and Raab (2007), which is in turn based upon Erlandson and Colten's (1991) division of the Late Holocene into Early, Middle and Late subdivisions.

Pleistocene (Pre-9600 cal. B.C.)

Traditional models of California prehistory suggest that the state's first inhabitants, at times referred to as the 'Paleo-Indians', were highly mobile bands of large game hunters who ranged across North America during the terminal phases of the last Ice Age (Fagan, 2003; Moratto, 1984; Wallace, 1978). However, physical evidence for Paleo-Indian occupation of Southern California, particularly for coastal areas, remains scant. When the last Ice Age, known as the Wisconsin, began to wane around 10,000 to 8,000 cal. B.C., the resulting changes in climate are thought to have triggered far-reaching cultural responses in California as prehistoric populations sought to cope with the onset of warmer, drier conditions. In the state's interior desert regions, rivers and lakes that were once fed by the wetter climatic conditions of the Pleistocene began to shrink or vanish altogether. For those who relied upon these lacustrine and riverine environments for subsistence, in particular those cultures subsumed under the heading of the broader Western Pluvial Lakes Tradition, these climatic changes necessitated shifts in subsistence strategy and

settlement patterns, which included exploiting a wider range of plant and animal species and migrations to regions with more favorable conditions, such as the Southern California coast (Byrd and Raab, 2007).

Early Holocene (c. 9600 cal. B.C. – 5600 cal. B.C.)

After the initial settlement of peoples from the interior regions, coastal groups began to adapt to marine environments and incorporated shellfish and saltwater fish into their diets, particularly after post-Pleistocene sea-level rise created estuaries and bays out of formerly perched areas. In this context, shellfish are interpreted as a dietary staple, supplemented by vegetal resources that included several types of nuts and grasses. Hunting and fishing were also practiced, but as a subsistence strategy were given less focus than resources located within the tidal zone (Byrd and Raab, 2007). Radiocarbon evidence shows occupation of the coastal region of Southern California occurred sometime between ca. 8000 and 7000 cal. B.C. (Byrd and Raab, 2007).

Middle Holocene (5600 cal. B.C. – 1650 cal. B.C.)

The Middle Holocene has been traditionally seen as a time of transition, during which Early Holocene cultural adaptations were gradually modified into forms that are recognizable during the Late Holocene. Across much of central and Southern California, Millingstone cultures appeared around 6000 to 5000 cal. B.C. This adaptation focused on the collection and processing of small plant seeds such as acorn and chia, and the hunting of a variety of small and medium-sized mammals (Byrd and Raab, 2007). The mano and metate, long utilized for the processing of seeds, were gradually replaced with the mortar and pestle during this period. This adaptive strategy, referred to as the Millingstone Horizon, is viewed as remaining relatively unchanged for several thousand years. Typical reconstructions of Middle Holocene occupations on the mainland have emphasized sizeable semi-sedentary populations that were established around resource-rich coastal bays and estuaries (Byrd and Raab, 2007).

Today, Middle Holocene occupation of the mainland region is recognized as considerably more diverse than initially posited. For example, Middle Holocene sites have been documented in inland settings, while considerable variability is recognized in adaptive strategies throughout the region. In addition, evidence has emerged of geographically expansive trade networks and spheres of cultural interaction, linking Southern California with a vast region of the American West during the Middle Holocene (Byrd and Raab, 2007).

At some point during this period, one or more waves of Uto-Aztecan-speaking peoples migrated from the Great Basin across Southern California, settling along the coast and eventually colonizing the southern Channel Islands. The movement of these people across Southern California is thought to have displaced resident groups, creating a distinctive “Shoshonean wedge” (Kroeber, 1925).

Late Holocene (1650 cal. B.C. – cal. A.D. 1769)

The generally accepted models for this period indicate that the Late Holocene was a time of emergence for the cultural patterns and tribal groups that would later be observed by early Euro-American explorers and settlers (Byrd and Raab, 2007). Sometime after cal. A.D. 500, the bow and arrow appeared, replacing the throwing spear or atl-atl as the preferred instrument of hunting and warfare. In the interior regions, ceramics were adopted sometime after A.D. 1000. Recent research has revealed that this period has more complex and dynamic regional and local patterns of change than was previously thought (Byrd and Raab, 2007). For example, cultural change may have been rapid rather than gradual, and periods of cultural stress were not limited to post-contact times but occurred during the prehistoric era as well.

Although marine resources remained extremely important during the late Holocene, major shifts took place in subsistence practices, settlement patterns, and the organization of labor. During this period, hunter-gatherers in Southern California focused increasingly on smaller resources that generally occurred in greater amounts, often referred to as resource intensification (Byrd and Raab, 2007).

Late Holocene settlement patterns are characterized by comparatively large residential camps that were linked to numerous ephemeral satellite sites. Site types include major residential bases, residential camps, resource procurement areas, and limited activity sites. The smaller sites were non-randomly distributed short-term encampments, some of which were dedicated to specialized subsistence tasks (Byrd and Raab, 2007).

4.6.1.2 Ethnographic Context

The proposed Project site is located within the ethnographic territory of the Tongva people. Prior to contact with Europeans, Tongva lands encompassed the greater Los Angeles Basin and three of the Channel Islands (San Clemente, San Nicholas, and Santa Catalina). On the mainland, Tongva territory reached as far as Topanga Creek and the San Gabriel Mountains to the north, Lytle Creek to the east, and Aliso Creek in the south (Bean and Smith, 1978; Kroeber, 1925). The Tongva are at times referred to as Gabrieleño or Fernandeño, which are Spanish terms used to refer to indigenous persons who were baptized at or residing within Mission San Gabriel (Gabrieleño) and Mission San Fernando (Fernandeño). It was to these missions that most native peoples living on the coastal plains and valleys of southern California were taken.

The Tongva spoke a variant of the indigenous Takic language, which derives from the broader Uto-Aztecan stock. The Tongva are believed to have migrated into southern California from the Great Basin between 1,000 and 3,000 years ago and have been associated by other researchers with the phenomenon known as the “Takic Wedge” (Bean and Smith, 1978). Tongva societal organization was patrilineal and centered around non-localized clans in a typical, Takic pattern. The Tongva established large, permanent villages in the fertile lowlands along rivers and streams and along the coast, with numerous, smaller settlements spread throughout their territory (Bean and Smith, 1978).

The Tongva subsistence economy, like most indigenous cultures in California, was based on hunting and gathering. However, the richness and sheer variety of ecological resources that were available to the Tongva enabled them to surpass many other indigenous groups in terms of population size and material wealth. Vegetal and faunal resources, already abundant on the mainland in this part of California, were bolstered even further by an extensive array of marine resources along the coast and offshore islands. Predominant food sources included acorns, which were a staple, supplemented by sage seeds (Chia), roots and tubers, berries, yucca, deer, rabbit, waterfowl, reptiles, freshwater fish, and a host of marine species that included shellfish, saltwater fish, dolphin, and seal (Bean and Smith, 1975; Kroeber, 1925; McCawley, 1996). In addition, the Tongva’s control of Santa Catalina Island, which contains a large source of high-quality soapstone or steatite, afforded them a pivotal role as crafters and distributors of this relatively uncommon and sought-after material.

A typical Tongva house consisted of a domed, circular structure with thatching of tule, fern or carrizo. In coastal and island environments where doorways opened seaward to avoid the north wind, Tongva houses could be quite large - with some estimates ranging as high as sixty feet in diameter. Some examples of Tongva houses and are said to have been sufficient to accommodate three or four families (Harrington, 1942; Johnston, 1962; Costanso, 1911). Other structures commonly found in villages included sweathouses, menstrual huts, and a ceremonial enclosure known as a yuva’r. The Tongva village closest to the Project site occupied an area near present-day 239th Street and Utility Street, and is referred to in

ethnographic literature as Suangna, which means 'place of the skies'. Suangna served as the political center for a cluster of smaller villages and its chief was the political leader for these associated villages in addition to his own (Bean and Smith, 1975).

At the time of Spanish contact, the basis of Tongva religious life was the Chinigchinich cult, centered on the last of a series of heroic mythological figures. According to the Tongva, Chinigchinich first appeared to them as a spectral deity or evanescent vision who set the future course of tribal law and institutions and taught them how to dance. After delegating powers and responsibilities to certain persons, Chinigchinich is said to have created a new race of people from the mud, instructing these new people in the new life-ways. He later withdrew into heaven, where he administered rewards to the faithful and punishment to the disobedient. When the Spanish first arrived in Gabrieleño territory, they found that the belief in Chinigchinich had spread to neighboring non-Tongva groups such as the Luiseno, Ipai-Tipai, Cupeno, and Juaneno, and that the religious movement had at some point intertwined with a pre-existing toloache cult (Bean and Smith, 1975).

4.6.1.3 Historical Context

Contact and Mission Periods (A.D. 1542 – 1820)

The first European account of the area that would become the County of Los Angles was by Portuguese navigator Joao Rodrigues Cabrilho (Juan Rodriguez Cabrillo, in Spanish), who led a Spanish expedition along the California coast in 1542. When Cabrillo first arrived in San Pedro Bay, the Tongva campfires along the coastline are said to have been so numerous that he was inspired to name the area Baya de los Fumos, or "Bay of the Smokes". Spain's presence in the region would be intermittent for the next 200 years (Chartkoff and Chartkoff, 1984).

Gaspar de Portolá led the first land expedition in 1769, accompanied by Fray Junípero Serra, marking the beginning the establishment of California missions and subsequent European and Mexican occupation. A later land expedition led by Juan Bautista de Anza De Anza departed from the Tubac Presidio, south of present-day Tucson, Arizona on January 8, 1774. Guided by a Gabrieleño named Sebastian Tarabal, the de Anza expedition arrived at Mission San Gabriel Arcangel on March 22, 1774. De Anza would mount another expedition on October 23, 1775, this one being composed primarily of colonists, which arrived at Mission San Gabriel Arcangel in January 1776. The first of the missions to be established was Mission San Diego de Alcala in 1769, followed by 20 others between 1769 and 1822. The missions nearest the Project site are Mission San Gabriel Arcangel, founded in 1771 and located approximately 16.7 miles northeast, and Mission San Fernando Rey de Espana, founded in 1797 and located approximately 34.3 miles northwest.

On September 4, 1781, Alta California governor Felipe de Neve granted the first settlement in the region, Nuestra Senora La Reina de Los Angeles, or the Pueblo de Los Angeles, with a vast territory covering 28 square miles.

Rancho and Mexican Periods (A.D. 1820 – 1850)

The Rancho and Mexican Period was an era of extensive interior land grant development and exploration by American fur trappers west of the Sierra Nevada. In 1821, Mexico declared independence from Spain and a year later, California became a Mexican Territory. After the secularization of the missions in 1834, lands were gradually transferred to private ownership via a system of land grants (Hoover, 1990).

The Project site is located within lands encompassed by the former Rancho San Pedro, a land concession granted in 1784 by King Carlos III of Spain to Juan Jose Dominguez, a Spanish soldier who had accompanied

the Portola expedition and later aided Father Junipero Serra with the founding of numerous missions throughout Alta California (Gillingham, 1961). Rancho San Pedro was originally seventeen Spanish leagues (75,000 acres) in size and included present-day Los Angeles harbor, San Pedro, the entire Palos Verdes peninsula, Torrance, Redondo Beach, Manhattan Beach, Carson, Compton, Gardena, and portions of Long Beach and Paramount. Although Dominguez's original grazing permission amounted to 75,000 acres, this concession did not represent an actual land title. An official land title was not granted until 1822, when the Mexican government "re-granted" 48,000 acres to Juan Jose's nephew and heir, Cristobal Dominguez. Cristobal died soon after the Mexican validation of the rancho, and his three sons inherited the lands and constructed adobe residences for their families. In 1823, Manuel Dominguez, Juan Jose's eldest son, married Maria Engracia de Cota. Manuel would go on to lead a successful career in cattle-raising and later served in a variety of elected and appointed offices in Los Angeles.

Following the Bear Flag Revolt in 1846, John C. Frémont and his troops marched through the Santa Clara River Valley and crossed into the San Fernando Valley near the present alignment of the Sierra Highway (Impact Sciences, 2010). A minor military engagement during the Mexican-American War took place in an area adjacent to the San Pedro Rancho., U.S. Navy Captain William Mervine led a force of 285 American marines, sailors and bear flaggers led occupied the Dominguez adobe (3.87 miles north of the Project site) on the night of October 6, 1846 (Bancroft et al., 1886; Bauer, 1976). During the battle, known as the Battle of Dominguez Rancho, the American force engaged a smaller force of Mexican militia led by Captain Jose Antonio Carrillo and General Jose Maria Flores, but was repelled by musket fire and a four-pound brass cannon which the Mexican force had hidden in vegetation. American casualties were light, with estimates of the dead ranging from as little as 4 to as many as 12, with about as many wounded. The fallen American troops were later buried on Isla de los Muertos in San Pedro Bay (Bancroft et al., 1886). Hostilities between the American and Mexican troops ended with the signing of the Treaty of Cahuenga on January 13, 1847 (Walker, 1999). President Polk signed the Treaty of Guadalupe Hidalgo in 1848, marking the formal transfer of the territory to the United States. California was recognized as a state in September 1850.

Americanization Period (A.D. 1850-present)

With the discovery of gold in 1848 at Sutter's Mill and the completion of the transcontinental railroad in 1869, thousands of settlers began immigrating to California. The County of Los Angeles was established on February 18, 1850, as one of 27 counties established in the months prior to California attaining statehood. Of the numerous ranchos extant in California at the start of the American Period, many were sold or otherwise acquired by American settlers and investors, with the clear majority being subdivided into agricultural parcels or towns.

Rancho San Pedro, which at this time already had the distinction of being one of the oldest grants in California, gained the additional distinction of being the very first to win a patent from the United States. As required by the Land Act of 1851, a claim for Rancho San Pedro was filed with the Public Land Commission in 1852, and a patent for 43,119 acres was granted to Manuel Dominguez and signed by President James Buchanan on December 18, 1858. Throughout this time, Los Angeles was expanding as a center of trade and agriculture (Cleland, 1941, 1918; Guinn, 1915; Robinson, 1939; McWilliams, 1973). A formal postal service was established in 1851, followed by stagecoach and steamship lines connecting San Francisco and San Pedro Harbor with Los Angeles. That same year, the two roads leading from Los Angeles to San Pedro were officially designated as public highways.

During the late 1860s, several years of severe drought brought an end to large scale cattle-ranching in the area. With water scarce, area ranchers, including the Dominguez family, were forced to invest large sums of money in feed to support their herds. To sustain the increased costs of ranching, many families resorted to heavy mortgages or loans from private backers with large cash reserves. Ultimately, many ranchos were

sold or partitioned when the mortgages foreclosed. On the Dominguez Rancho, a switch was made to sheep. The sheep grazing had a profound effect on native vegetation, which had already been severely degraded by years of cattle grazing. Soon, the willows, alders and cottonwoods were gone, replaced with annual grasses and introduced species such as mustard.

To satisfy debts and various claims, Pedro Dominguez sold a large portion of his family's rancho in 1867, which was then subdivided into what is now the City of Compton. The Los Angeles and San Pedro railroad was constructed in 1870 on land provided by Manuel Dominguez, prompting a new era of land development and competing railroad companies (Gillingham, 1961; Guinn, 1911; Hoyt, 1953; Dumke, 1944). With the death of Don Manuel Dominguez in 1882, the Dominguez Rancho was resurveyed and distributed to his six daughters. A land dispute between the Dominguez and Sepulveda families, which had begun as early as 1817, evolved into lawsuits over the next several decades before finally being resolved in 1882 and the Rancho was partitioned into seventeen parcels. At this time, the Sepulveda family was awarded 31,629 acres known as Rancho de los Palos Verdes, which would later become the city of Palos Verdes Peninsula, as well as portions of the cities of Torrance and San Pedro. In 1887, 13 streets were dedicated to the County of Los Angeles, many of which remain active thoroughfares in the present day. Included among these were Tomlinson Street (Normandie Avenue), Victoria Street, Dominguez Street, Carson Street, Los Angeles Street, Dolores Street, Wilmington Street (223rd Street), Ocean Street (228th Street), and Rocha Street (Sepulveda Boulevard).

At the turn of the century, the Carson area remained a dry and dusty land with little vegetation, a result of nearly a century of overgrazing. The Dominguez Water Company, a subsidiary of Dominguez Estates Company, formed in 1911 to support expanding agriculture and the proposed development of what would later become the city of Torrance. Heavy flooding in 1914-1916 resulted in the inundation of the Dominguez Slough and Watson Lakes area, with extensive damage to farms and crops in the area. Over the next few decades, local industry continued to develop in the area that would later become the city of Carson, beginning with Shell Oil at Dominguez Hill, and the subsequent installation of utilities by Southern California Edison and Southern California Gas Company. Soon, a flourishing commercial district began to establish itself along Carson Street and Avalon Boulevard. By the time of the outbreak of World War II, virtually all the Carson City area was developed (Jerrills, 1972).

The postwar years were a time of rapid urbanization, with an emphasis on residential, commercial, and 'clean' industrial development. Farming was phased out in all areas except Dominguez Hill, and dairies were replaced with tract housing and shopping centers. With the completion of the Harbor-San Diego Freeways and the commencement of large-scale landfill operations to free up more developable land in the Dominguez Slough area, the city began to assume its present-day configuration and the City of Carson was finally incorporated in 1968 (Jerrills, 1972).

4.6.1.4 Cultural Resources within the Project Vicinity

Records Search

On September 4, 2018, Padre ordered an expedited records search from the South-Central Coastal Information Center of the California Historical Resources Information System (SCCIC-CHRIS) at California State University, Fullerton. Padre received the records search results on September 9, 2018. The records search included a review of all recorded historic-era and prehistoric archaeological sites within a 0.25-mile radius of the Project site, as well as a review of known cultural resource surveys and technical reports. During the records search, the following sources were consulted:

- SCCIC base maps, USGS 7.5-minute series topographic quadrangles for the Project, and other historic maps;
- Pertinent survey reports and archaeological site records were examined to identify recorded archaeological sites and historic-period built-environment resources (such as buildings, structures, and objects) within or immediately adjacent to the Project; and
- The California Department of Parks and Recreation's California Inventory of Historic Resources (1991) and the Office of Historic Preservation's Historic Properties Directory (2007), which combines cultural resources listed on the California Historical Landmarks, California Points of Historic Interest, and those that are listed in or determined eligible for listing in the NRHP or the CRHR.

Results

The records search identified 22 previous cultural resources studies within 0.25-mile of the Project site. One study (LA-04512), a cultural resources inventory completed for the City of Carson Community Planning Department in 1977, is described as covering all "undeveloped portions of the city (Eggers, 1977). A survey coverage map for this study indicates that the entire Project site was "55-85 percent surveyed" (Eggers, 1977).

The records search did not identify any previously recorded archaeological sites within the Project site; however, four archaeological sites are recorded within 0.25-mile of the Project site (Table 4.6.1).

Specifically, the records search located CA-LAN-2682, a protohistoric habitation site and cemetery approximately 618 feet west of the western terminus of the Project site. CA-LAN-2682 was encountered in September 1998 during "subsurface excavation for replacement of existing underground utility lines" within the ARCO Refinery (Bonner, 2000). A summary report states that "when hand excavations were complete in early November 1998, all visible human remains had been removed to the satisfaction of both the archaeological team and the Native American monitors. However, future excavation may expose additional human burials. It is possible that both burial levels may extend further in any or all directions from the portion that was exposed" (Bonner, 2000).

Table 4.6.1 Records Search Results

Site No.	Author, Year	Description
CA-LAN-2682	McDowell and Bonner, 1998	Protohistoric habitation site and cemetery
CA-LAN-2942H	Paniagua, 2000	Wooden posts
P-19-186868	Martin and Self, 2003	KMEP Carson Terminal
P-19-187085	Elder, 1989	Mojave Road

Source: SCCIC, 2018.

Phase I Archaeological Survey Report

On October 10, 2018, Padre Archaeologist Matt Seger surveyed the proposed 0.5-mile pipeline corridor for archaeological resources. The route was surveyed within five meters from the centerline on each transect; the existing valves, valve boxes, pump station facilities, and the canal along the proposed route limited the survey in instances to transecting directly within the proposed centerline. The route was surveyed intensively in its entirety and special attention was paid to areas of exposed soils. The west-east segment of the line contained almost no ground visibility being almost entirely composed of gravel landscaping ballast and asphalt. In contrast, the north-south segment along the canal had ground visibility

of approximately 75 to 80 percent and consisted of exposed and extremely disturbed silty loam. Padre did not observe any archaeological resources during the survey.

Native American Outreach

The Project is subject to the provisions of Assembly Bill (AB) 52, which amends CEQA (PRC § 21080.3.1) to require lead agencies to consult with California Native American tribes and to consider the effects of a project on tribal cultural resources. Formal government-to-government tribal consultation pursuant to AB 52 was conducted by the City of Carson with the Gabrieleño Band of Mission Indians – Kizh Nation.

4.6.2 Regulatory Setting

This subsection summarizes the federal, state, and local laws, regulations, and standards that address the management and protection of cultural resources as applies to the proposed Project. The California Environmental Quality Act (CEQA) requires consideration of a project's impacts on significant historical and archaeological resources (Public Resources Code [PRC] 21000 et seq.). Significant impacts on such resources are to be avoided or mitigated to less than significant levels. Other state laws govern actions affecting cemeteries and human remains.

4.6.2.1 Federal Regulations

National Historic Preservation Act (54 U.S.C. Section 300101, et seq.)

Passed in 1966, the National Historic Preservation Act (NHPA) established a program for the preservation of historic properties, cultural resources, and ecological resources. Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties, which are those listed or eligible for listing on the National Register of Historic Places (NRHP). Historic properties may be sites, buildings, structures, districts, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association. The law also established the Advisory Council on Historic Preservation (ACHP) and the State Historic Preservation Officer (SHPO) system to oversee Section 106 reviews and to administer other responsibilities for federal/state preservation. As amended in 1992, the law allows for a Tribal Historic Preservation Officer (THPO) to assume all or any part of the functions of the SHPO.

To be eligible for listing on the NRHP, a property must meet at least one of the following criteria:

- Is associated with events that have made a significant contribution to the broad patterns of our history;
- Is associated with the lives of persons significant in our past;
- Embodies the distinctive characteristics of a type, period or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction; and,
- Has yielded, or may be likely to yield, information important in history or prehistory.

National Environmental Policy Act (42 USC Sections 4321 to 4347)

The National Environmental Policy Act (NEPA) was enacted in 1969 to (i) encourage harmony between people and the environment, (ii) promote efforts to prevent or eliminate damage to the environment, (iii) enrich the understanding of the ecological systems and natural resources of the US, and (iv) establish a Council on Environmental Quality (CEQ). NEPA requires federal agencies to assess the environmental

effects of their proposed actions prior to making decisions. The environment is understood to include natural, cultural, and social values. NEPA is more inclusive of the evaluation of cultural resources than Section 106, as the evaluation is not focused on effects on historic properties.

American Indian Religious Freedom Act (42 U.S.C. 1996 and 1996a)

The American Indian Religious Freedom Act (AIRFA) was passed in 1978 and established a national policy to protect the rights of Native Americans and other indigenous groups to exercise their traditional religions by accessing traditional sites and using and possessing sacred objects during worship. Federal agencies issuing permits are required to comply with this act if Native Americans identify issues arising from a proposed project regarding their right to exercise traditional religious practices, such as access to traditional worship and gathering places.

Archaeological Resources Protection Act (12 U.S.C. 470aa to 470mm)

Passed in 1979, the Archaeological Resources Protection Act (ARPA) was crafted in response to difficulties managing public lands and preventing looting of archaeological sites under the authority of the Antiquities Act of 1906. The ARPA provides for the protection of archaeological resources greater than 100 years old on federal land from vandalism and unauthorized collecting. Financial and incarceration penalties for convicted violators are substantially increased. The act also provides guidance on appropriate archaeological documentation and artifact curation. As amended, the ARPA requires federal departments to plan for and schedule archaeological surveys to account for resources located on their land. The ARPA also requires that archaeological investigations undertaken on federal lands be conducted under a permit.

Native American Graves Protection and Repatriation Act (25 U.S.C. 3001 to 3013)

Passed in 1990, the Native American Graves Protection and Repatriation Act (NAGPRA) provides for the protection and appropriate repatriation of Native American graves, funerary objects, and "objects of cultural patrimony" found on federal land. The act also establishes the procedures for determining the ownership of Native American human remains, funerary objects, and other sacred objects under federal jurisdiction, including those in museums. The act unequivocally establishes that Native American human remains, grave goods, sacred objects, and objects of cultural patrimony are the inalienable property of their descendants.

4.6.2.2 State Regulations

The Office of Historic Preservation (OHP) is the governmental agency primarily responsible for the statewide administration of the historic preservation program in California. The mission of the Office of Historic Preservation and the State Historical Resources Commission, in partnership with the people of California and governmental agencies, is to "preserve and enhance California's irreplaceable historic heritage as a matter of public interest so that its vital legacy of cultural, educational, recreational, aesthetic, economic, social, and environmental benefits will be maintained and enriched for present and future generations." The Office of Historic Preservation's responsibilities include:

- Identifying, evaluating, and registering historic properties;
- Ensuring compliance with federal and state regulatory obligations;
- Cooperating with traditional preservation partners while building new alliances with other community organizations and public agencies;
- Encouraging the adoption of economic incentives programs designed to benefit property owners; and,

- Encouraging economic revitalization by promoting a historic preservation ethic through preservation education and public awareness and, most significantly, by demonstrating leadership and stewardship for historic preservation in California.

California Environmental Quality Act (PRC Section 21000, et seq.)

CEQA Statute and Guidelines include procedures for identifying, analyzing, and disclosing potential adverse impacts to historical resources, which include all resources listed in or formally determined eligible for the National Register of Historic Places (NRHP), the California Register of Historical Resources (CRHR), or local registers. CEQA further defines a "historical resource" as a resource that meets any of the following criteria:

1) A resource listed in, or determined eligible for listing in, the NRHP or CRHR per PRC Section 5024.1;

2) A resource listed in a local register of historical resources, as defined in PRC Section 5020.1(k), unless the preponderance of evidence demonstrates that it is not historically or culturally significant;

3) A resource identified as significant (i.e., rated 1-5) in a historical resource survey meeting the requirements of PRC Section 5024.1(g) (Department of Parks and Recreation Form [DPR] 523), unless the preponderance of evidence demonstrates that it is not historically or culturally significant; or

4) Any object, building, structure, site, area, place, record or manuscript, which a lead agency determines to be historically significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military or cultural annals of California, provided the determination is supported by substantial evidence in light of the whole record. Generally, a resource is considered "historically significant" if it meets the criteria for listing on the CRHR (PRC Section 21084.1 and CEQA Guidelines Section 15064.5(a)).

The CRHR is a listing of State of California resources that are significant within the context of California's history, and includes all resources listed in or formally determined eligible for the NRHP. In addition, properties designated under municipal or county ordinances are also eligible for listing in the CRHR. A historic resource must be significant at the local, state, or national level under one or more of the following four criteria defined in the California Code of Regulations Title 14, Chapter 11.5, Section 4850:

- It is associated with events or patterns of events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States (Criterion 1); or
- It is associated with the lives of persons important to local, California, or national history (Criterion 2); or
- It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values (Criterion 3); or
- It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation (Criterion 4).

A cultural resource's significance must be demonstrated under one of the CRHR criterion described above, and it must retain its historic integrity. Cultural resources integrity is determined using the CRHR's seven aspects of integrity: location, design, setting, materials, workmanship, feeling, and association. The CRHR

criteria are tied to CEQA, as any resource that meets the above criteria and retains its integrity is considered to be an historical resource under CEQA.

The Historical Landmarks and Records Commission (HLRC) is an advisory body established to consider and recommend to the Board of Supervisors local historical landmarks defined to be worthy of registration by the State of California Department of Parks and Recreation, either as "California Historical Landmarks" or as "Points of Historical Interest" and may consider and comment for the Board on applications relating to the NRHP. Criteria for designation, including significance and access and provision for maintenance, shall be as specified in state law, including the California Public Resources Code, or in regulations and interpretations of the State Historical Resources Commission.

The following sections of California state law pertain to historical resources as treated under CEQA.

PRC Section 21083.2

This section of the PRC states that, if the lead agency determines the project may have a significant effect on an historical resource, as defined in PRC Section 21084.1, or a unique archaeological resource, as defined herein, an environmental impact report shall be prepared to assess those resources. Once assessed as such, non-historic and non-unique resources shall not be considered during the CEQA review process. If it can be demonstrated that a project will cause damage to a historical or unique archaeological resource, reasonable efforts should be taken to preserve the resource in place. If in-place preservation is not possible, the lead state agency may require mitigation measures. This PRC section provides guidance for appropriate avoidance treatments and mitigation measures, as well as limits on the cost of those actions.

A “unique archaeological resource” is defined in subsection (g) as an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, it has a high probability to meet one of the following criteria:

1) Contains information needed to answer important scientific research questions, and that there is a demonstrable public interest in that information;

2) Has a special and particular quality such as being the oldest or best example of its type; or

3) Is directly associated with a scientifically recognized important prehistoric or historic event or person.

PRC Section 21084

This PRC section identifies guidelines to list classes of projects as exempt from CEQA review. Further it states that no project that may cause a substantial adverse change in the significance of a historical resource, as specified in Section 21084.1, shall be exempted from review.

PRC Section 21084.1

This section of the PRC equates a substantial adverse change in the significance of a historical resource with a significant effect on the environment. A “historical resource” is defined as any resource listed in, or determined to be eligible for listing in, the CRHR, the NRHP, or a local register of historical resources, as defined in PRC Section 5020.1(k). In addition, any resource deemed significant pursuant to criteria set forth in PRC Section 5024.1(g), is presumed to be historically or culturally significant for purposes of this section, unless the preponderance of the evidence demonstrates that the resource is not historically or culturally significant.

California Code of Regulations (CCR) Section 15064.5. Determining the Significance of Impacts on Archaeological and Historical Resources

This section of the California Code of Regulations (CCR) provides guidelines for the implementation of CEQA with respect to archaeological, paleontological, and historical resources. This section also provides examples of substantial adverse changes to cultural resources and mechanisms for avoiding or mitigating them. It also provides guidance on the procedures to follow upon the discovery of Native American human remains and grave offerings or the unanticipated/accidental discovery of cultural resources during construction.

State Historical Resource Preservation Laws

The following sections of California state law concern cultural resources; their implementation is not contingent upon a CEQA review process.

Historical Resources

PRC Sections 5020 to 5024 and Section 5024.6. These sections of the PRC establish the State Historical Resources Commission and specify the respective responsibilities of the Commission and the SHPO (established under the federal NHPA). Types of historical resources and levels of significance are defined, as well. Further, Section 5024 requires state agencies to maintain an inventory of, and create a management plan for, all historical resources under their authority.

PRC Section 5024.1. This section of the PRC establishes the CRHR and defines the criteria by which resources may be assessed for listing. Certain properties previously listed on other registers are automatically included in the CRHR. Other properties, such as those recognized under the California Points of Historical Interest program, may be nominated for inclusion in the CRHR.

A resource, as either an individual property or a contributor to a historic district, may be listed in the CRHR if the State Historical Resources Commission determines that it meets one or more of the following criteria:

1) It is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

2) It is associated with the lives of persons important in our past;

3) It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

4) It has yielded, or may be likely to yield, information important in prehistory or history.

In addition, the CRHR includes the following:

1) California properties formally determined eligible for, or listed in, the NRHP.

2) State Historical Landmark No. 770 and all consecutively numbered state historical landmarks following No. 770. For state historical landmarks preceding No. 770, the office shall review their eligibility for the CRHR in accordance with procedures to be adopted by the Commission.

3) Points of historical interest that have been reviewed by the office and recommended for listing by the Commission for inclusion in the CRHR in accordance with criteria adopted by the Commission.

PRC Sections 6254(r) and 6254.10. These sections of the California Public Records Act of 1968 (codified in PRC Sections 6250-6270.7) were enacted to protect archaeological sites from unauthorized excavation, looting, or vandalism. Section 6254(r) explicitly authorizes government agencies to withhold information from the public relating to Native American graves, cemeteries, and sacred places maintained by the Native American Heritage Commission (NAHC) or any other agency. Section 6254.10 specifically exempts from disclosure requests for records that relate to archaeological site information and reports maintained by or in the possession of the Department of Parks and Recreation or any other local or state agency, including the records that an agency obtains through a consultation process with a Native American tribe.

California Penal Code Section 622.1/2. This section of the Penal Code declares that willfully injuring, disfiguring, defacing, or destroying objects of historic or archaeological interest or value located on public or private land is a misdemeanor with no specific punishment prescribed. Lawful landowners are specifically excluded.

California Penal Code, Section 623. This section of the Penal Code indicates that any person, other than the owner and without prior written permission of the owner, who intentionally and knowingly disturbs or alters any archaeological evidence of prior occupation in any cave or removes any material from a cave is guilty of a misdemeanor punishable by imprisonment in the county jail not exceeding one year, or by a fine not exceeding $1,000, or by both such imprisonment and fine. “Material” includes archaeological items including, but not limited to, petroglyphs, pictographs, basketry, human remains, tools, beads, pottery, projectile points, or remains of historical activities found in any cave.

Native American Historical, Cultural, and Sacred Sites

PRC Sections 5097.91 to 5097.97. These sections of the PRC establish the NAHC, whose duties include the inventory of places of religious or social significance to Native Americans and the identification of known graves and cemeteries of Native Americans. These regulations also require state and local agencies to cooperate with the NAHC in carrying out their duties with regard to Native American resources. Section 5097.97 specifically empowers the NAHC to conduct investigations with regard to potential irreparable damage to Native American sacred places and burial sites, or access to those, up to and including requesting legal action from the State Attorney General.

PRC Section 5097.98. This PRC section specifies procedures to be followed upon the discovery of Native American human remains, including the provision that the landowner ensure that activity with the potential to cause damage to the remains cease in the immediate vicinity of the discovery until the inspection and consultation process, described in the section, is complete. Any actions taken by the landowner to comply with this section and with the requests of the descendant(s) are exempt from the requirements of CEQA and the California Coastal Act of 1976.

PRC Sections 5097.99 and 5097.991. These sections of the PRC establish that the unlawful removal, collection, or possession of Native American artifacts or human remains taken from a Native American grave or cairn is a felony punishable by imprisonment in the state prison. Native American remains and associated grave artifacts need to be repatriated in accordance with California policy.

Health and Safety Code, Sections 7050.5 and 7052. Section 7050.5 defines procedures for the discovery and treatment of human remains. In the event of a discovery of human remains outside a dedicated cemetery, all ground disturbance must cease, and the county coroner must be notified. If the coroner determines, or has reason to believe, that the remains are those of a Native American, the coroner then must contact the NAHC by telephone within 24 hours. Section 7052 establishes a felony penalty for mutilating, disinterring, or otherwise disturbing human remains, except under the authority of law.

California NAGPRA (Health and Safety Code Sections 8010 to 8030). The California Native American Graves Protection and Repatriation Act of 2001 was enacted to provide state policy consistent with the federal NAGPRA of 1990. The law was written to ensure that all California Native American human remains and cultural materials are treated with dignity and respect. It extends policy coverage to California tribes that are not federally recognized but that are known to the NAHC. The act also establishes and defines the duties of a State Repatriation Oversight Commission and establishes penalties and enforcement procedures for use by the Commission.

Senate Bill 18: Tribal Consultation Guidelines

Passed in 2004, SB-18 requires local governments to meaningfully consult with tribal representatives concerning the potential impacts of proposed general plans, or amendments to general plans, on resources of significance to the tribe(s). SB-18 expands the consultation process to include tribes that are not federally recognized and acknowledges the need to better protect traditional tribal cultural places on both public and private lands. If any permits are required from a county or local municipality during the construction or operations of the proposed project, consultation under SB-18 may be required, insofar as the conditions of those permits vary from established general plans.

Assembly Bill 52: Tribal Cultural Resources

Passed in 2014, AB-52 was enacted to provide greater protection for tribal cultural resources and sacred sites and involvement of California Native American tribes (including non-federally recognized tribes) in the protection of those resources identified under existing law (PRC Sections 21073 and 21080.3.1(a)). This bill amends CEQA and establishes a new category of resources, called "tribal cultural resources," that are defined with reference to tribal cultural values in addition to scientific and archaeological values when determining impacts and mitigation (see Section 4.4.4). The bill requires timely and meaningful consultation under a new process between California Native American tribal governments and lead agencies. All projects being considered under CEQA must include such consultation, as specified in AB-52.

As amended by AB-52, CEQA recognizes that tribal cultural resources constitute a particular type of cultural or historical resources and form part of the environment. The law recognizes that California Native American tribes have special expertise in regard to their tribal history and practices, and that, therefore, affiliated tribal representatives should be consulted for environmental assessments to identify resources of significance to the tribes. AB-52 § 1(a)(9) also states that "a substantial adverse change to a tribal cultural resource has a significant effect on the environment."

As defined in PRC Section 21074 and further refined in CEQA Appendix G: Environmental Checklist Form,

(a) tribal cultural resources are either of the following:

1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:

    a) Included in, or determined to be eligible for inclusion in, the CRHR.

    b) Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.

2) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this

paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

(b) A cultural landscape that meets the criteria of subdivision (a) is a tribal cultural resource to the extent that the landscape is geographically defined in terms of the size and scope of the landscape (PRC Section 21704 (b)).

(c) A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a "nonunique archaeological resource" as defined in subdivision (h) of Section 21083.2 may also be a tribal cultural resource if it conforms with the criteria of subdivision (a) (PRC Section 21704 (c)).

4.6.2.3 Local Regulations

The Los Angeles County Board of Supervisors adopted the historic preservation ordinance on September 1, 2015. This ordinance is applicable only to the unincorporated territory of the County. The purpose of the historic preservation ordinance is to:

- Enhance and preserve the County's distinctive historic, architectural, and landscape characteristics that are part of the County's cultural, social, economic, political, and architectural history;
- Foster community pride in the beauty and noble accomplishments of the past as represented by the County's historic resources;
- Stabilize and improve property values in and around the County's historic resources, and enhance the aesthetic and visual character and environmental amenities of these historic resources;
- Recognize the County's historic resources as economic assets and encourage and promote the adaptive reuse of these historic resources;
- Further establish the County as a destination for tourists and as a desirable location for businesses; and to
- Specify significance criteria and procedures for the designation of landmarks and historic districts and provide for the ongoing preservation and maintenance of these landmarks and historic districts.

Los Angeles County Historical Landmarks and Records Commission

The Historical Landmarks and Records Commission (HLRC) is an advisory body established to consider and recommend to the Board of Supervisors local historical landmarks defined to be worthy of registration by the State of California Department of Parks and Recreation, either as "California Historical Landmarks" or as " Points of Historical Interest" and may consider and comment for the Board on applications relating to the NRHP. Criteria for designation, including significance and access and provision for maintenance, shall be as specified in state law, including the California Public Resources Code, or in regulations and interpretations of the State Historical Resources Commission.

City of Long Beach

The City of Long Beach's current Municipal Code includes several provisions that directly reference historic preservation, and additional provisions that impact historic preservation efforts in the City.

Historic Preservation Program

P.1.1 The City shall comply with City, State, and Federal historic preservation regulations to ensure adequate protection of the City's cultural, historic, and archaeological resources.

City of Paramount

The Resource Management Element of the Paramount General Plan focuses on four key issue areas: cultural resources (historic and archaeological), ecological resources (plant and animal life), natural resources (air, water, and minerals), and open space resources used for recreation.

Cultural Resource Management. Should archaeological or paleontological resources be encountered during excavation and grading activities, all work would cease until appropriate salvage measures are established. Appendix K of the California Environmental Quality Act (CEQA) Guidelines will be followed for excavation monitoring and salvage work that may be necessary. Salvage and preservation efforts will be undertaken pursuant to Appendix K requirements outlined in CEQA.

4.6.3 Significance Thresholds

CEQA Environmental Thresholds

Significance criteria are based on the CEQA Guidelines Appendix G checklist. An impact is considered significant if the project would:

- Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?
- Disturb any human remains, including those interred outside of dedicated cemeteries?
- Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:
    - Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or
    - A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?

Generally, intact cultural and historic deposits are considered significant. Severely disturbed or mixed deposits often are not considered significant but may have educational value. Human remains and associated goods are accorded special consideration, even when fragmentary and are considered significant.

4.6.4 Project Impacts and Mitigation Measures

This section discusses the potential impacts of the proposed Project with the significance thresholds outlined in CEQA Guidelines Appendix G above. Project-specific impacts include direct and indirect impacts. Direct impacts result from land modification directly and immediately caused by the construction, landscaping, operation, or maintenance of a facility. Indirect impacts also occur as a result of a specific project, but do not result from intentional ground disturbance. Common indirect impacts include erosion, unauthorized artifact collecting, and vandalism.

The Applicant's application contained several Avoidance and Minimization Measures (AMMs) to minimize the Project's environmental impacts. The Applicant would implement these measures during the design, construction, and operation of the pipeline. The following AMMs were provided to minimize potential impacts to tribal cultural resources:

- A professional archaeologist and Native American monitor would be retained to monitor all Project related earth disturbances within the first 100 feet of the underground portion of the Project site. The area recommended for monitoring would start approximately 400 feet southeast of the intersection with South Alameda Street and where the Project site transitions from aboveground to underground. The area would continue east for 100 feet into the Air Products Carson Hydrogen Facility;
- At the commencement of Project construction, an archaeological monitor shall give all workers associated with earth-disturbing procedures an orientation regarding the probability of exposing cultural resources and directions as to what steps are to be taken if a find is encountered;
- The archaeologist shall have the authority to temporarily halt or redirect Project construction in the event that potentially significant cultural resources are exposed. Based on monitoring observations and the actual extent of Project disturbance, the lead archaeologist shall have the authority to refine the monitoring requirements as appropriate (i.e., change to spot checks, reduce or increase the area to be monitored) in consultation with Air Products and the lead CEQA Agency; and,
- If human remains are unearthed, State Health and Safety Code Section 7050.5 requires that no further disturbance shall occur within that area until the County Coroner has made the necessary findings as to origin and disposition to be of Native American descent. The Coroner has 24 hours to notify the Native American Heritage Commission. The lead CEQA Agency and Air Products shall also be notified of any such find.

Impact #	Impact Description	Phase	Impact Classification
TC.1	The Project would not cause a substantial adverse change in the significance of a historical or archaeological resource as defined in §15064.5.	Construction or Operation	II

A records search from the South Central Coastal Information Center of the California Historical Resources Information System (SCCIC-CHRIS) did not identify any historical or archaeological resources along the proposed 0.5-mile pipeline in the City of Carson. In addition, the Phase I Archaeological Survey did not identify any archaeological resources along the same 0.5-mile pipeline. However, the SCCIC-CHRIS records search did identify four archaeological sites are recorded within 0.25-mile of the Project site. One site, CA-LAN-2682, is a protohistoric habitation site and cemetery approximately 618 feet west of the western end of the Project site. All visible human remains were removed in 1998; however, future excavation may

expose additional human remains in any direction from the known burials. Given the proximity to CA-LAN-2682 there is a possibility that unknown buried resources of historical or archaeological resources could occur within the Project site, therefore, the potential impacts for Tribal Cultural Resources 1 could be **significant.**

Mitigation Measures

TC-1a ***Retain a Native American Monitor/Consultant:*** *The Project Applicant shall be required to retain and compensate for the services of a Tribal monitor/consultant who is both approved by the Gabrieleño Band of Mission Indians-Kizh Nation Tribal Government and is listed under the NAHC's Tribal Contact list for the area of the project location. This list is provided by the NAHC. The monitor/consultant will only be present on-site during the construction phases that involve ground disturbing activities. Ground disturbing activities are defined by the Gabrieleño Band of Mission Indians-Kizh Nation as activities that may include, but are not limited to, pavement removal, pot-holing or auguring, grubbing, tree removals, boring, grading, excavation, drilling, and trenching, within the project area. The Tribal Monitor/consultant will complete daily monitoring logs that will provide descriptions of the day's activities, including construction activities, locations, soil, and any cultural materials identified. The on-site monitoring shall end when the project site grading and excavation activities are completed, or when the Tribal Representatives and monitor/consultant have indicated that the site has a low potential for impacting Tribal Cultural Resources.*

TC-1b ***Unanticipated Discovery of Tribal Cultural and Archaeological Resources:*** *Upon discovery of any tribal cultural or archaeological resources, cease construction activities in the immediate vicinity of the find until the find can be assessed. All tribal cultural and archaeological resources unearthed by project construction activities shall be evaluated by the qualified archaeologist and tribal monitor/consultant approved by the Gabrieleño Band of Mission Indians-Kizh Nation. If the resources are Native American in origin, the Gabrieleño Band of Mission Indians-Kizh Nation shall coordinate with the landowner regarding treatment and curation of these resources. Typically, the Tribe will request preservation in place or recovery for educational purposes. Work may continue on other parts of the project while evaluation and, if necessary, additional protective mitigation takes place (CEQA Guidelines Section15064.5 [f]). If a resource is determined by the qualified archaeologist to constitute a "historical resource" or "unique archaeological resource", time allotment and funding sufficient to allow for implementation of avoidance measures, or appropriate mitigation, must be available. The treatment plan established for the resources shall be in accordance with CEQA Guidelines Section 15064.5(f) for historical resources.*

Impacts Remaining After Mitigation

With implementation of the recommended mitigation measures, potential impacts for Tribal Cultural Resources 1 would be considered **less than significant with mitigation (Class II).**

Impact #	Impact Description	Phase	Impact Classification
TC.2	The Project would not disturb any human remains, including those interred outside of dedicated cemeteries.	Construction or Operation	II

As noted above, four archaeological sites are recorded within 0.25-mile of the proposed Project site. The CA-LAN-2682 site is a protohistoric habitation site and cemetery approximately 618 feet west of the western end of the Project site. Given the proximity to CA-LAN-2682 there is a possibility that unknown buried human remains could occur within the Project site. Therefore, the proposed Project's potential impact to human remains during construction could be **significant**.

Mitigation Measures

TC-2 ***Unanticipated Discovery of Human Remains:*** *Upon discovery of human remains, the tribal and/or archaeological monitor/consultant will immediately divert work at minimum of 150 feet and place an exclusion zone around the discovery location. The monitor/consultant(s) will then notify the Tribe, the qualified lead archaeologist, and the construction manager who will call the coroner. Health and Safety Code 7050.5 dictates that any discoveries of human skeletal material shall be immediately reported to the County Coroner and excavation halted until the coroner has determined the nature of the remains. If the coroner recognizes the human remains to be those of a Native American or has reason to believe that they are those of a Native American, he or she shall contact, by telephone within 24 hours, the Native American Heritage Commission (NAHC) and PRC 5097.98 shall be followed. The discovery is to be kept confidential and secure to prevent any further disturbance.*

Impacts Remaining After Mitigation

With implementation of the recommended mitigation measures, potential impacts for Tribal Cultural Resources 2 would be considered **less than significant with mitigation (Class II).**

Impact #	Impact Description	Phase	Impact Classification
TC.3	The Project would not cause a substantial adverse change in the significance of a tribal cultural resource that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in PRC Section 5020.1(k), or one that is determined by the lead agency to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1.	Construction or Operation	II

The proposed Project is not expected to cause a substantial adverse change in the significance of a tribal cultural resource. No tribal cultural resources were identified along the proposed 0.5-mile pipeline in the City of Carson. However, as discussed for Impact TC.1 above, given the proximity to CA-LAN-2682 there is a possibility that unknown buried resources of historical or archaeological resources could occur within the Project site, therefore, the potential impacts for Tribal Cultural Resources 3 could be **significant.**

Mitigation Measures

With the implementation of Mitigation Measures TC-1a and TC-1b above, potential impacts for Tribal Cultural Resources 3 would be considered **less than significant with mitigation (Class II).**

4.6.5 Cumulative Effects

According to CEQA cultural resources include historic properties (standing buildings or structures), historical and prehistoric archaeological sites, paleontological resources, and human remains inside or out of designated cemeteries. Grading and ground disturbing activities can significantly impact these non-renewable resources. Without mitigation, these resources would be destroyed through construction and urban expansion resulting in cumulative loss of cultural resources over time. However, applicable state and City laws and regulations, as discussed above, offer guidance for managing cultural resources, provide for preservation of significant natural and cultural resources, and direct mitigation through data recovery where avoidance is not possible.

The cumulative impact study area includes the immediate vicinity surrounding the proposed Project sites in the City of Carson, Long Beach, City of los Angeles, County of Los Angeles, Lakewood, Bellflower and the City of Paramount. There are no known projects of a scale and in a location that could add to cumulative impacts to cultural resources and no cumulative effects are expected to occur as a result of this or other projects in the area that would include any type of excavation or construction. In the event that other projects in the surrounding areas could have any potential impacts, it is expected that those projects would be appropriately mitigated as described above and therefore, would not incur in any cumulative impacts.

4.6.6 References

Long Beach, 2010. 2030 General Plan: Historic Preservation Element. Adopted June 22, 2010. Available at: www.longbeach.gov/globalassets/lbds/media-library/documents/planning/advance/general-plan/final-long-beach-historic-preservation-element_6-22-2010

Padre Associates, Inc. 2018. Phase I Archaeological Survey. Prepared for Air Products and Chemicals, Inc. November 2018.

Paramount, 2007. Final Paramount General Plan. Adopted August 7, 2007. Available at: http://www.paramountcity.com/home/showdocument?id=2538

4.7 Other Issue Areas Found to Have Less Than Significant Impacts

This section discusses the environmental issue areas that would have less than significant impacts due to construction and operation of the proposed Project. The following issue areas are discussed: Aesthetics/Visual Resources, Agricultural Resources, Biological Resources, Geology Processes/Geological Hazards, Noise, Population and Housing, Public Services, Recreation, Water Resources, and Wildfire. These issue areas do not warrant a detailed discussion based upon the nature of the Project and/or its location.

4.7.1 Aesthetics/Visual Resources

The proposed Project would not be located within any designated scenic vistas or resources, and there are no state-designated scenic highways that would be crossed by the new or existing pipeline. Aboveground construction for the proposed Project would be limited to roadways in the City of Carson and the City of Long Beach, and at the pipeline terminus within the World Energy Paramount Refinery in the City of Paramount. Two new pipe connections would be required to connect segments of existing pipelines together along the 11.5-mile length. Air Products would also remove or replace existing manual valves and add an automatic shut-off valve (ASV) at one location along the pipeline route.

Carson construction would occur on privately owned land at the Air Products Facility and connect to an existing pipeline on East Sepulveda Boulevard on the West side of the Dominguez Channel. There would be no construction in the right-of-way for the Dominguez Channel due to the use of existing pipeline and pipe bridge. Aboveground construction in the City of Long Beach would occur on the West side of North Paramount Boulevard near the intersection with South Street. Visible construction at these sections of the pipeline would be on a limited timeframe and in industrialized areas. Therefore, no impacts associated with scenic vistas, highways, or visual resources are expected to result from the proposed Project.

The proposed Project is not expected to degrade the visual character of the area due to the limited timeframe of aboveground construction and the industrialized zoning of most construction areas, in addition to the pipeline predominately being underground. The Project would not conflict with any regulations governing scenic quality. Construction equipment and materials for the new pipeline segment would be contained within the Air Products Facility in Carson, a low-traffic and highly industrialized area. Visibility of this area would be limited to drivers on East Sepulveda Boulevard for an expected 20 weeks during the construction period. Construction for the pipeline connection on North Paramount Boulevard in Long Beach, zoned General Industrial, is expected to last eight weeks. Therefore, impacts to the visual character of the site and its surroundings are anticipated to be less than significant.

Normal operation of the pipeline would not require new sources of illumination except if needed during limited nighttime construction. However, nearly all construction and maintenance would be conducted during daylight hours. As a result, impacts associated with substantial light or glare are anticipated to be less than significant. Therefore, the proposed Project would not result in an impact to aesthetics or visual resources and does not warrant further discussion.

4.7.2 Agricultural Resources

The proposed Project route would initiate in the City of Carson and terminate in the City of Paramount. The pipeline route would traverse the City of Carson, City of Los Angeles, County of Los Angeles, City of Long Beach, City of Lakewood, City of Bellflower, and City of Paramount. The pipeline alignment largely utilizes established utility routes following private corridors and public roadways through highly urbanized

areas and is therefore not located on any land zoned for agricultural or forestry uses. The proposed pipeline route would cross through land zoned for industrial, commercial, and residential uses, and all areas of construction for the Project are zoned for industrial uses. Therefore, the proposed Project would not result in an impact to agricultural resources and does not warrant further discussion.

4.7.3 Biological Resources

The proposed Project site is located within heavily disturbed areas, such as industrial corridors, residential areas, and developed road rights-of-way. Approximately 0.5 miles of new pipeline will be constructed as part of the Project within the City of Carson. Air Products proposes to utilize existing pipeline(s) owned by Paramount Pipeline (PP) for the remainder of the approximately 11.5-mile pipeline route. One new pipe connection would be required to connect segments of existing pipelines together. Air Products would also remove approximately ten existing manual valves, install one manual valve, and add one automatic shutoff valve (ASV) at locations along the pipeline route.

The majority of the Project alignment is within existing industrial corridors and urban areas. The Project alignment will cross the Dominguez Channel, Compton Creek, and Los Angeles River using existing pipelines on existing pipeline bridges. One-half mile of new pipe will be constructed underground along an unpaved utility corridor existing along the Dominguez Channel, which has concrete banks on both sides.

Project activities will not result in the diversion or obstruction of the natural flow; or change the bed, channel, or bank (including vegetation associated with the stream or lake) of a river or stream; or use material from a streambed. Generally, developed areas provide habitat of minimal value for plant and wildlife species. Most of the pipeline would be located underground, and the two segments requiring street-level construction, Segment 1 and Segment 7, support very little to no vegetation. Segment 1 contains the only non-paved area along the alignment. All areas of construction for the proposed Project are zoned for industrial uses. No rare, endangered, or threatened species are expected to be found in the Project area. The proposed pipeline would not interfere with wetlands. The pipeline is designed not to affect the function of any drainage systems and water runoff grades encountered along the pipeline route. Project activities will not result in a direct or indirect impact to areas that support aquatic, riparian, and/or wetland habitats. The Dominguez Channel, Compton Creek, and Los Angeles River within the Project area are concrete lined with minimal habitat value to species. Project activities will not result in direct or indirect impacts to ephemeral streams, herbaceous vegetation, woody vegetation, and woodlands.

Potential impacts from stormwater runoff during construction activities will be addressed through implementation of a Stormwater Pollution Prevention Plan (SWPPP). The utility corridor is level and will be returned to pre-project conditions. The project may only affect existing urban landscaping. No native vegetation is proposed to be removed as part of the Project.

The following measures are applicant proposed measures to be implemented to reduce the potential for impacts to biological resources (nesting birds): Schedule ground-clearing activities prior to the initiation of nesting activity (April) or after fledging (August); or Conduct pre-construction surveys between February 15 and August 15 in potential raptor and bird nesting habitat to identify nest sites. If an active nest is observed within the vicinity of the Project site, contact California Department of Fish and Wildlife to establish the appropriate buffer around the nest tree. For identified raptors nests, a 350-foot buffer around the nest tree would be activated. Construction activities would be prohibited in the buffer zone until the young have fledged the nest.

The Project does not propose use of water from streams or structures that would use excessive amounts of water. The Project will convert 11.5 miles of existing pipelines currently in crude oil service to hydrogen gas service. Hydrogen gas is lighter than air and would not pose a potential spill risk to waterways or habitat areas.

The Biological Resources analysis included a query of the CNDDB of the Long Beach and South Gate USGS 7.5-mile quadrangles. The CNDDB query resulted in 31 special-status species that could be present within the Project alignment. Of the 31 special-status species, 11 are located in the immediate vicinity of the Project alignment:

Plant Species

- Coulter's saltbush (Atriplex coulteri)- extirpated
- Parish's brittlescale (Atriplex parishii)- extirpated
- Prostrate vernal pool navarretia (Navarretia prostrata)- presumed extirpated
- California Orcutt grass (Orcuttia californica)- extirpated
- Lyon's pentachaeta (Pentachaeta lyonia)- presumed extirpated

Wildlife Species

- Southern California legless lizard (Anniella stebbinsi)- extant
- Western tidal-flat tiger beetle (Cicindela gabbii)- extirpated
- Western yellow-billed cuckoo (Coccyzus americanus occidentalis)- extirpated • Monarch butterfly (Danaus plexippus)
- Pacific pocket mouse (Perognathus longimembris pacificus)- extirpated
- Coast horned lizard (Phrynosoma blainvillii)- presumed extirpated.

Of these species, only two are extant or presumed extant: Monarch butterfly and Southern California legless lizard. There is no suitable habitat for either species in or around the pipeline route.

As discussed above, Project activities are not anticipated to result in a significant impact to biological resources. Therefore, the proposed Project would not result in an impact to biological resources and does not warrant further discussion.

4.7.4 Geology Processes/Geological Hazards

The Newport-Inglewood and San Andreas fault zones have the greatest potential to impact the proposed Project site based on their proximity to the alignment and potential maximum ground acceleration. The nearest active fault is the Newport-Inglewood fault, located one mile north of the Project site. The Project site lies outside of the Alquist-Priolo Earthquake Hazard zone for the Newport-Inglewood fault, and the proposed Project area is not crossed by any active or potentially active fault.

State and federal regulations are available to minimize the impacts associated with pipeline rupture. The proposed Project would be constructed to specifications more stringent than those required by the U.S. Department of Transportation (USDOT) Office of Pipeline Safety (OPS) to ensure safety, including USDOT pipeline safety regulations (49 CFR 192). In order to further reduce the risk of damage to the pipeline, Air

Products is proposing that all new circumferential welds would be inspected. This exceeds the USDOT requirements for transporting gaseous products (see 49 CFR 192). See Section 4.3, Hazardous Materials and Risk of Upset, for more details. Engineering analysis for Project design would include recommended geotechnical engineering measures for ground shaking, liquefaction hazards, and expansive soils as necessary. The pipeline would also include two automatic shutoff valve stations, which would reduce the quantity of hydrogen released in the event of a leak from the system. Compliance with state and federal regulations regarding pipeline safety would reduce the impacts from ground movement on the pipeline to less than significant.

The construction of the pipeline is planned so that the installed pipe would be covered, the ground compacted, and the surface restored to standard condition or better such that no erosion or ground degradation would ensue. Land stripped of vegetation would be replanted; pavement would be replaced, etc. The finished pipeline route would be properly engineered to impede erosion of soils due to wind, water, or traffic. The Project site does not contain slopes over five percent. A Storm Water Pollution Prevention Plan (SWPPP) would be prepared, and implemented during construction of the pipeline; the SWPPP identifies sources of sediment and other pollutants that affect quality of storm water discharges and describes best management practices (BMPs) that would be implemented to reduce sediment and other pollutants in storm water. Therefore, the proposed Project would not impact topsoil erosion.

Normal operation of the pipeline would not involve water disposal. Activities during construction that would involve the use of water are: (1) dust control practices and (2) hydrostatic testing of the pipeline. These activities would be organized to avoid water runoff and contamination. Water used for fugitive dust control and street washing, as a supplement to sweeping, would be limited to that necessary for the task to avoid unnecessary runoff. A SWPPP would be prepared for construction activities associated with the proposed Project. Used hydrostatic test water would be sent to the Paramount Refinery for treatment or discharge, or alternatively discharged onsite, in accordance with applicable laws, ordinances, and regulations (LORS). Therefore, no impacts associated with disposal of water to soil are expected.

No historical or paleontological resources or unique geologic features have been identified along the route of the proposed pipeline. However, as with all projects requiring excavation, the unearthing of cultural remains would require a halt to construction activities in that particular area, while an archaeological assessment of the remains is completed. None are expected since the route line of the proposed pipeline is situated in heavily disturbed industrial and transportation areas. See Section 4.6, Tribal Cultural Resources, for more details. As a result, there is expected to be no impact to paleontological resources. Therefore, the proposed Project would not result in an impact to geology processes/geological hazards and does not warrant further discussion.

4.7.5 Noise

The proposed Project is not expected to generate a substantial or permanent increase in noise levels, and there are no sensitive receptors within 500 feet of any construction area. Construction would occur for approximately 20 weeks within the Air Products Facility in Carson, and the disturbance corridor would typically be confined to an area approximately 40 to 50 feet in width and the 0.5-mile of new construction. Construction activities in Long Beach would occur for approximately 8 weeks and would be confined to a smaller area around the connection site with the same disturbance corridor width. Construction would mainly take place during daylight hours in order to reduce construction-related noise. The industrial zoning of all construction areas would allow for nighttime construction; however, it would be minimal. To further reduce noise, equipment engine covers shall be in place and mufflers shall be in good working condition.

The Federal Noise and Land Compatibility Matrix adopted by the City of Carson's General Plan considers noise ranging from 50-70 dB to be acceptable for industrial and manufacturing land uses, while 70-75 dB is considered conditionally acceptable. The construction area within the City of Long Beach for the pipeline connection is zoned primarily industrial and is not to exceed 65 dB. The pipeline should not produce any noise during normal operation; minimal noise would be associated with any needed maintenance or repairs and associated vehicle travel. As a result, the proposed Project is not expected to significantly impact ambient noise levels in the Project area and impacts related to noise are expected to be less than significant.

Normal operation of the pipeline would not generate vibrations. Ground-born vibration and ground-born noise levels from construction activities are expected to be minimal and temporary. Some ground vibrations may be associated with trenching, and boring activities. The perception threshold for ground-born vibration is a velocity of 0.01 inches per second. The Federal Transit Administration's 2006 Noise and Vibration Manual lists the threshold distance in feet for various types of construction equipment. For example, the feet to threshold distance could range from 11 feet (ft) to 711 ft for a small bulldozer or a pile driver, respectively. The use of a pile driver is unlikely for the pipeline Project's associated construction activities; the more likely range for the perceived vibration threshold would extend from 11 ft to 190 ft for a vibratory roller. There are no sensitive receptors within 500 ft of any construction area. Therefore, no impacts from ground vibrations are expected to result from the proposed Project.

None of the construction sites for the proposed Project are located within an airport land use plan or within the vicinity of a private airstrip. All areas of construction for the proposed Project are zoned for industrial uses. However, one segment of the pipeline route, Segment 6 along Linden Avenue, is located approximately 1.8 miles from Long Beach Airport. Segment 6 is a segment of existing Paramount Pipeline LLC (PP) pipeline that would not require construction activities for the Project. Therefore, the segment of pipe located within the vicinity of an airport land use plan is not expected to have any impacts on the nearby airport. As a result, no impact to airports is expected to result from the Project. Therefore, the proposed Project would not result in an impact to noise levels in the Project area and does not warrant further discussion.

4.7.6 Population and Housing

The proposed pipeline route would be located within urban areas that have been previously developed. Construction and operation of the proposed Project would not involve the relocation of individuals, impact housing or commercial facilities, or change the distribution of the population. The proposed Project would use local union labor from the existing labor pool in the Southern California area, including ARB, Inc., to construct 0.5 miles of new pipeline within the City of Carson and connect this newly constructed segment with 11.5 miles of existing pipeline, expanding Air Products' existing pipeline network. Air Products proposes to utilize this pipeline route to connect Air Products with a new customer in the City of Paramount to support renewable bio-fuel production. Since no population growth or reduction is expected to arise from the proposed Project, the housing needs are not expected to change as well. Therefore, the Project would not result in an impact to population and housing and does not warrant further discussion.

4.7.7 Public Services

The proposed Project would not result in an increased demand for public services in the long-term. The Project would not result in the need for new or physically altered governmental facilities. No new commercial or residential development would occur as a result of the Project, nor would there be an

increase in population in the Project area. An increase in existing police or fire resources is not expected from either the construction activities or the operation of the pipeline system.

The Los Angeles County Fire Department (LACoFD) provides fire protection and emergency services for the Project alignment, including all six cities and Los Angeles County; the City of Long Beach is also protected by the City of Long Beach Fire Department. LACoFD is trained to respond to hazardous material spills and injuries. See Section 4.3, Hazardous Materials and Risk of Upset, for more details.

Police protection within the cities included in this Project is provided by the Los Angeles Police Department (LAPD), the Long Beach Police Department (LBPD), the LA County Sherriff, and California Highway Patrol (CHP). The LAPDs jurisdiction covers the Project site in Carson, Los Angeles, Lakewood, Bellflower and Paramount. The LBPD covers the Project site areas in Long Beach.

Four school districts encompass the proposed 12-mile pipeline alignment: (1) Los Angeles Unified School District (LAUSD), (2) Bellflower Unified School District (BUSD), (3) Paramount Unified School District (PUSD), and (4) Long Beach Unified School District (LBUSD). There are six schools adjacent to the pipeline alignment and one school located 800 feet from the proposed pipeline route. Along the proposed route there are three elementary schools, two middle schools, and two high schools. The schools are associated with LBUSD and PUSD and are located in the cities of Lakewood, Long Beach, and Paramount.

Construction of the proposed Project would not result in closures of main access routes along the pipeline alignment. Emergency response providers near the proposed route would be notified in advance of exact construction locations, road closure schedules, and potential alternate routes. Traffic safety procedures would be implemented to avoid disruption to fire protection or police protection services during construction of the pipeline; see Section 4.5, Transportation and Circulation, for more details. Vandalism, theft of construction materials and equipment, and burglary would be of potential concern during the construction of the proposed Project. Emergency response times from these local stations depend on where patrol vehicles are in relation to an emergency call at the facility. Therefore, the proposed Project would not result in a significant impact to public services and does not warrant further discussion.

4.7.8 Recreation

The Project route primarily extends within established utility routes utilizing private corridors and public roadways. All construction activities associated with the proposed Project would be within roadway and utility rights-of-way and would not interfere with use of existing recreational facilities; all areas of construction for the Project are zoned for industrial uses. The proposed Project does not include recreational facilities or their construction, and the Project route is not designated for recreational use. The Project route would cross the Los Angeles River Bicycle Path along East Del Amo Boulevard within the City of Carson; however, there would be no impact to the bicycle path. In addition, the proposed Project would not result in changes in population or population densities which could impact recreational facilities. Therefore, the proposed Project would not result in an impact to recreation along the Project route or surrounding community and does not warrant further discussion.

4.7.9 Water Resources

Construction and operation of the proposed Project would not significantly affect surface water or ground water in the Project vicinity, nor would it conflict with plans regarding water quality control or groundwater management. The pipeline would be designed to have no effect on the function of surface drainage, roadway drainage, culverts, and drainage channels along the route. The proposed Project would cross three bodies of water: the Dominguez Channel in Carson, the Los Angeles River in Long Beach, and

Compton Creek in Long Beach. The Project would utilize existing pipes within existing pipeline bridges to cross the Dominguez Channel and the Los Angeles River. There is no water involved in normal operation of the pipeline. As a result, there would be no substantial impact on water quality standards, groundwater supply, or drainage patterns. Therefore, the pipeline is not expected to impact hydrology and water quality.

Normal operation of the proposed pipeline would not impact runoff or stormwater drainage in the Project area. However, there is potential for construction-related stormwater runoff to impact hydrology and water quality in the Dominguez Channel and the Los Angeles River. As mentioned in Section 4.7.4, activities during construction that would involve the use of water are: (1) dust control and (2) hydrostatic testing. These activities would be organized to avoid water runoff and contamination. Water used for fugitive dust control and street washing, as a supplement to sweeping, would be limited to that necessary for the task to avoid unnecessary runoff. A SWPPP would be prepared for construction activities associated with the proposed Project. Used hydrostatic test water would be sent to the Paramount Refinery for treatment or discharge, or alternatively discharged onsite, in accordance with applicable laws, ordinances, and regulations (LORS). Therefore, construction-related impacts to stormwater drainage systems and runoff are expected to be less than significant.

The proposed pipeline Project has no flood, tsunami, or seiche potential. There would be no risk of flooding, either on or offsite, due to an increase in surface runoff. Therefore, there would be no impact associated with flood hazard zones. Therefore, the proposed Project would not result in an impact to water resources and does not warrant further discussion.

4.7.10 Wildfire

The Project route would initiate in the City of Carson and would terminate in the City of Paramount, California. The proposed pipeline would traverse the City of Los Angeles, County of Los Angeles, City of Long Beach, City of Lakewood, and City of Bellflower. The Project area is not located in or near state responsibility areas or lands classified as very high fire hazard severity zones. The alignment would cross industrial, commercial, and residential areas that have been previously developed; there is no significant risk due to slope or downstream flooding as a result of post-fire slope instability or drainage changes. The proposed Project would not require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, or power lines, that could exacerbate fire risk. Therefore, the proposed Project would not result in an impact related to wildfire and does not warrant further discussion.

4.7.11 References

City of Carson. 2004. City of Carson General Plan. Adopted October 11, 2004. http://ci.carson.ca.us/content/files/pdfs/planning/CityofCarsonGeneralPlan.pdf.

Code of Federal Regulations, 49CFR192. 2011. Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards. October 2011.

Federal Transit Administration. 2006. Noise and Vibration Manual.

Padre Associates, Inc. 2020. Project Description, Proposed Carson to Paramount Hydrogen Pipeline Project. April 2020.

Padre Associates, Inc. 2019. Project Execution Plan, Proposed Carson to Paramount Hydrogen Gas Pipeline Project. September 2019.

5.0 Environmental Analysis and Comparison of Alternatives

CEQA Section 15126.6, requires an Environmental Impact Report (EIR) to describe a reasonable range of alternatives to a project or to the location of a project which could feasibly attain its basic objectives and evaluate the comparative merits of the alternatives. This section discusses a range of alternatives to the proposed Project, including the "No Project Alternative".

State CEQA Guidelines Section 15126.6 requires a description of:

> *"...a range of reasonable alternatives to the project, or to the location of a project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project and evaluate the comparative merits of the alternatives*". " and

Alternatives carried forward for analysis

> "...*shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project*"

and would attain the basic project objectives. The EIR must explain the rationale for selecting the alternatives to be discussed, identify those that were not carried forward because they were infeasible, and briefly explain why these were not carried forward. The "environmentally superior" alternative to the Project must be identified and discussed. If the environmentally superior alternative is the No Project Alternative, the EIR must identify an additional "environmentally superior" choice among the other project alternatives.

Alternatives must meet most of the project objectives, including addressing the "underlying purpose of the project" (15124). In addition, an EIR should not exclude an alternative from detailed consideration merely because it would impede to some degree the attainment of the project objectives. An EIR should define the alternative analysis around a reasonable definition of "underlying purpose" and need not study alternatives that cannot achieve that basic goal.

In defining feasibility of alternatives, and pursuant to the State CEQA Guidelines, the following considerations were taken into account: site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site (or the site is already owned by the proponent) [CEQA Guidelines Section 15126.6(f)(1)].

As presented below, a variety of alternatives to the proposed Project were considered to determine alternatives which might produce fewer significant impacts or reduce the severity of those significant impacts compared to the proposed Project, including the No Project Alternative. Possible alternatives were assessed as to whether they would satisfy the following:

- The alternative is feasible (capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors (CEQA Guidelines §15364);
- The alternative would avoid or substantially lessen any of the potentially significant impacts of the proposed Project; and
- The alternative would attain most of the basic objectives of the project.

As some alternative's advantages or disadvantages might not be readily apparent, any alternative that shows the potential for reducing impacts was analyzed for all issue areas.

This section is organized as follows:

- **Section 5.1:** Comparison Methodology
- **Section 5.2:** Alternatives Considered and Environmental Impacts Discussion of Alternatives
- **Section 5.3:** Alternative Comparison Summary
- **Section 5.4**: Environmentally Superior Alternative Discussion

5.1 Comparison Methodology

The California Environmental Quality Act (CEQA) does not provide specific direction regarding the methodology for comparing alternatives. Each project must be evaluated for the issues and impacts that are most important, which will vary depending on the project type and the environmental setting. Issue areas that are generally given more weight in comparing alternatives are those with longer-term impacts (e.g., air quality and risk of upset). Impacts that are short-term (e.g., construction-related impacts) or those that are easily mitigable to less than significant levels are generally considered to be less important. For this particular Project, it was determined that a significant and unavoidable impact would occur in the Hazards and Risk of Upset issue area; all other issue areas were found to have impacts that were either less than significant with mitigation or less than significant.

This comparison is designed to satisfy the requirements of CEQA Guidelines Section 15126.6(d), Evaluation of Alternatives, which state:

"The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed."

In accordance with CEQA Guidelines Section 15126.6(d) as presented above, this EIR provides sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed Project. If the environmentally superior alternative is the No Project Alternative, CEQA requires identification of an environmentally superior alternative from among the other alternatives [CEQA Guidelines Section 15126.6(e)(2)].

The objectives of the Project as defined by the applicant are included here for reference in this analysis:

- Extend the existing Air Products pipeline network to the Paramount Refinery to service an additional customer, World Energy, with hydrogen, and reduce truck trips by five to seven tanker trucks each day;
- Convert existing petroleum pipelines for 11.5-miles of the proposed route to hydrogen service which will reduce construction-related disruption to area residents and motorists;
- For construction-related activities utilize local union contractors where appropriate;

- Provide for the safe flow of up to seven million standard cubic feet per day (7 mmscfd) through the pipeline; and
- Support production of renewable bio-fuels in Southern California.

The following methodology was used to compare alternatives in this SEIR:

- **Identification of Alternatives and Determination of Environmental Impacts.** A range of alternatives were identified and considered for this alternative's analysis. Those alternatives were then considered to determine if they were able to reduce the level of impact in the Hazards and Risk of Upset, which was the only issue area found to be significant and unavoidable for the proposed Project. The environmental impacts of the alternatives are discussed below as appropriate for each alternative. The discussion provides as detailed an analysis as merited based on the feasibility of the alternative and the level of impact it could generate. The environmental impacts of the proposed Project were identified in Sections 4.1 through 4.7.
- **Comparison of Proposed Project with Alternatives.** Section 5.3 presents a comparison of the significant and unavoidable (Class I) and significant but mitigable (Class II) impacts that could occur with the proposed Project and the selected alternatives.
- **Identification of the Environmentally Superior Alternative.** Based upon the analysis conducted as part of the analysis, the environmentally superior alternative is selected as required by CEQA in Section 5.4.

Alternatives to the proposed Project discussed include the following:

- No Project alternative;
- Transportation by rail;
- Transportation by other existing pipelines;
- Transportation with a new pipeline;
- Truck transportation from the Air Products facility in Carson;
- Pipeline modifications; and
- On-site Hydrogen generation.

5.3 Alternatives Description and Analysis

In accordance with State CEQA Guidelines Section 15126.6(d) as presented above, this section contains a description of the alternatives considered and an analysis of the environmental impacts of the alternatives, which provides enough detail and substantial evidence to allow for a comparison with the proposed Project.

5.3.1 No Project Alternative

Under the No Project Alternative, the proposed Project would not proceed. If disapproval of the proposed Project would result in predictable actions by others, such as the proposal for another project, CEQA requires that the No Project consequence/s should be discussed (CEQA Guidelines Section 15126.6(e)(3)(B)). Under the No Project Alternative, the Lead Agency should analyze what would reasonably be expected to occur in the foreseeable future if a proposed Project was not approved (Guidelines Section 15126.6(e)(3)(C)).

World Energy currently receives liquefied hydrogen at its Paramount Refinery by tanker truck from a third-party supplier located in Ontario, CA. Under a no project scenario, the Paramount Refinery would continue to receive hydrogen by tanker truck, with associated hazards of hauling a flammable liquid on public roadways, as well as increased highway and local traffic. The existing pipelines, that are proposed under this proposed Project to be repurposed for hydrogen, could be used for the transport of crude oil or other materials or would remain idle.

With the No Project Alternative, no new environmental impacts would occur. However, there would continue to be potential risk impacts of the ongoing trucking of liquified hydrogen from Ontario to Paramount. The level of risk is depicted in Figure 5.2 under baseline trucks.

As described in Section 3.0, Cumulative Projects, World Energy, as part of their expansion of the Paramount Petroleum Renewable Fuels Project is proposing to build a hydrogen generation unit at the Paramount Refinery to supply hydrogen to the Paramount Refinery expanded renewable fuel project. This cumulative project could reasonably be expected to take any of the following pathways:

1. Construction of the full cumulative project with a hydrogen generation unit supplying all of the hydrogen needed at the Paramount Refinery.
2. Construction and operation of the cumulative project without the installation of the hydrogen generation unit with hydrogen supplied by others, or
3. The cumulative project is not built and continued operation of the current, existing smaller renewable fuels project at the Paramount Refinery with hydrogen supplied by others, most likely trucking.

Under scenario #1 with the No Project Alternative, the hydrogen needs of the Paramount Refinery would be met by the new hydrogen generation unit as part of the cumulative project and the transportation of liquid hydrogen by truck from Ontario would cease.

For scenarios #2 and #3, the hydrogen would continue to be delivered by others, either by truck or other methods.

The No Project Alternative would not meet the objectives of the proposed Project to transport hydrogen from the Air Products facility in the City of Carson to the Paramount Refinery by pipeline, but would continue to meet the underlying purpose of the Project, which is to provide a hydrogen supply to the Paramount Refinery.

5.3.2 Rail Transportation

Under this alternative liquified hydrogen would be transported via rail from various potential locations including the Praxair Facility in Ontario or the Air Products Facility in Sacramento. The Praxair Facility in Ontario is the location where hydrogen is currently being transported via truck. Hydrogen transportation via rail would require the liquid hydrogen be loaded into insulated cryogenic rail tankers. Dependent on the length of travel, transporting hydrogen in cryogenic vessels has the potential for the cryogenic hydrogen to heat up, which can cause the pressure in the container to rise and leading to potential releases of hydrogen or safety issues.

Currently, no industrial gas suppliers in the Los Angeles basin area have the capability to deliver liquified hydrogen by rail including the Praxair Facility in Ontario (Air Products 2020). Hydrogen transportation by rail has been considered in the past but has been determined to not be commercially feasible as documented in a US Department of Energy report in 2013. The report, *Hydrogen Delivery Technical Team*

Roadmap, dated June 2013, documents that only 4.6% of the hydrogen transported in the United States is moved by rail. The report further states "…hydrogen fuel is transported today by three modes: regional pipeline networks, on commercial roadways using cryogenic liquid cargo trailers, and on commercial roadways using high-pressure gaseous tube trailers. Rail, barge, and ship travel are also potential transport modes, but they are not in commercial use today" (US Department of Energy 2013).

Therefore, because transportation of hydrogen by rail has not been shown to be feasible in the Los Angeles basin area and no current industrial gas suppliers are utilizing rail transportation for hydrogen, this alternative is not considered to be feasible. Therefore, this alternative has been dropped from further consideration.

5.3.3 Other Existing Pipelines

The proposed Project would use approximately 11.5 miles of existing pipeline owned by Paramount Pipeline LLC, a subsidiary of World Energy. Under the proposed Project, only 0.5 miles of new pipeline would be constructed to connect to existing pipelines, which would be located within an existing pipeline corridor owned by Marathon Petroleum Company LP adjacent to the Dominguez Channel, and beneath Sepulveda Boulevard. The area of new pipeline construction is an industrial zone with no nearby residences or other sensitive receptors.

This alternative would involve the use of other existing pipelines to transport the hydrogen between the Air Products Carson Facility and the Paramount Refinery. One existing pipeline with the potential to meet the proposed Project requirements is a pipeline that runs northward on Paramount Boulevard from the Tesoro Terminal to Artesia Boulevard and then east to Downey Avenue. This pipeline is a six-inch pipeline and does not connect with the existing 12-inch pipeline on Downey Avenue (proposed as part of this Project). Therefore, this alternative would require the installation of a pipeline vault at the intersection of Artesia Boulevard and Downey Avenue or within the adjacent commercial developments.

Another potential existing pipeline option is the above line from Paramount Boulevard to Artesia Boulevard, then another segment from Artesia Boulevard to Somerset Boulevard on Paramount, then over to the Paramount Refinery. It is not clear from the available data if the existing pipelines on the last segments are available; however, those additional segments could be newly installed. Both of the existing pipelines identified under this alternative would require significant construction along City streets, in major intersections, and or within commercial developments. These construction impacts would be greater than the proposed Project and would generate more air quality and greenhouse gas impacts. In addition, these routes do not travel through less populated areas and would therefore present a similar level of risk of upset as the proposed Project. There are no other available pipelines owned by Air Products or Paramount Pipeline that connect the Carson area to the Paramount Refinery.

This alternative would meet the goal of the proposed Project to transport hydrogen from the Air Products Carson Facility to the Paramount Refinery. However, this alternative has greater construction, air quality, GHG, and land use impacts than the proposed Project as well as having a similar risk of upset impact and would provide minimal if any environmental advantages over the proposed Project. Therefore, this alternative has been dropped from further consideration.

5.3.4 New Pipeline

This alternative would involve the construction of a new pipeline between portions of the Carson and Paramount route to transport hydrogen gas. The new pipeline segments would most likely follow city streets along a route determined by various factors such as land use availability, franchise agreement

availability, construction limitations, and other issues including population density. However, there are no continuous areas of industrial land use between Carson and Paramount and review of the land use zoning for each local jurisdiction within two miles of the proposed pipeline route shows that there are large areas of residential land use between the two pipeline endpoints. The Figure 4.4-1 in Section 4.4, Land Use, shows the land use zoning for each local jurisdiction within two miles of the proposed pipeline route, showing that there are large areas of residential land use between the two endpoints. Therefore, any new pipeline construction would occur within and adjacent to residential and public facility/school land uses similar to the proposed Project existing pipeline route.

There are potential routes that could utilize existing rights-of-ways (ROW) that could potentially reduce the population densities along the pipeline route (yet still passing through residential areas) and be able to access the Paramount Refinery. Possible routes would include the following:

- Los Angeles River and Powerlines ROW:
    - Utilization of the existing and proposed pipeline route from the Carson AP Plant to the Los Angeles River and Del Amo Blvd, and
    - Then install a new pipeline installed north along the Los Angeles River to just south of the 105 Freeway;
    - Install a new pipeline along the existing railroad/powerline corridor to the Paramount Refinery location.
- Los Angeles River, Residential and Powerline ROW
    - Utilization of the existing and proposed pipeline route from the Carson AP Plant to the Los Angeles River and Del Amo Blvd, and
    - Then install a new pipeline north along the Los Angeles River to just north of the 91 Freeway;
    - Install new pipeline east along the open ROW to the So Cal Edison Orange Street Station;
    - Install a new pipeline north along the open ROW north of the So Cal Edison Orange Street Station to just south of the 105 Freeway;
    - Install a new pipeline along the existing railroad/powerline corridor to the Paramount Refinery location.

Route lengths would include about 6.8 miles of new pipeline in addition to the new pipeline proposed as part of the proposed Project along with the existing pipelines from Carson to the Los Angeles River tie-in location. Construction activities for a new pipeline would include trenching within city streets or within ROWs with heavy equipment, which would require street closures, and potential utility service and traffic disruption either during day-time periods when traffic is heaviest, or during the night-time which would likely result in noise impacts to adjacent residential areas.

This alternative has a number of speculative elements, including ROW acquisition and permitting. However, as the use of a new pipeline could potentially reduce the severity of the significant risk impacts, as well as providing full disclosure to the decision makers, the new pipeline alternative was analyzed below for each issue area.

5.3.4.1 Air Quality

A new pipeline would involve the construction of additional portions of pipeline through urban areas as well as the installation of the new portion of the pipeline as in the proposed Project. Emissions would be associated with construction equipment, including backhoes, welding machines, asphalt paving and some fugitive dust emissions. Emissions were estimated using the CalEEMod program for construction activities associated with the proposed Project, which would also involve the installation of new pipeline segments. The peak day construction emissions would be similar to the proposed Project peak day construction emissions as similar equipment requirements would be utilized for this alternative. The proposed Project analysis demonstrated less than significant for regional and local emissions (See Section 4.1, Air Quality).

As emissions associated with construction would be less than the SCAQMD construction regional thresholds, impacts would be less than significant for regional emissions.

For localized impacts, the construction emissions associated with the pipeline modifications would occur at different locations and, in some cases, in close proximity to residences and sensitive receptors. The SCAQMD localized threshold lookup tables were used to determine localized significance of the construction emissions. Only the onsite emissions are used to estimate the emissions for localized impacts, i.e. only the fugitive dust and off-road equipment. See Table 5.1 for a summary of the emissions.

Table 5.1 New Pipeline Alternative Peak Daily Emissions, lbs/day

Equipment	VOC	NO_X	CO	SOx	PM_{10}	$PM_{2.5}$
New Pipeline Alternative with Mitigation: total emissions	8.4	66.7	42.9	0.09	6.8	4.9
New Pipeline Alternative with proposed Project Mitigation: local[1]	4.3	35.8	21.2	0.04	4.7	3.3
Regional Significance Threshold	75	100	550	150	150	55
Regional Significant Impact?	No	No	No	No	No	No
Localized Threshold		57	585		4.0	3.0
Localized Significant Impact?	No	No	No	No	**Yes**	**Yes**

Localized thresholds for SRA #4 - South Los Angeles County Coastal, assuming a 1 acre site and 25m from receptors.
1) Max local emissions are associated with either the site preparation phase or the re-paving phase and only includes onsite equipment (fugitive dust and off-road equipment).

For localized emissions, the emissions levels are estimated to be above the localized thresholds for a one-acre site located within 25 meters of a receptor, as per the SCAQMD lookup tables. The majority of these PM emissions are associated with fugitive dust (58% of PM_{10}).

Note that this analysis does not include any Tier 4 engines. Tier 4 compliant engines significantly reduce emissions of particulate matter (PM) and oxides of nitrogen (NO_x). The PM fugitive dust mitigation in the CalEEMod analysis for the proposed Project was limiting vehicle speeds to 15 mph and watering 2x per day (for a 55% reduction). Without additional dust mitigation or diesel engine mitigation, impacts could be potentially **significant**.

Mitigation Measures

AQ-Alt1 ***Tier 4 Engines****: The construction alternative of the installation of a new pipeline shall utilize Tier 4 final engines on all equipment greater than 50 hp along areas of the northern sections (not the 0.5 miles nearest the Carson Plant).*

AQ-Alt2 ***Fugitive Dust****: The construction alternative of the installation of a new pipeline shall utilize watering of all disturbed areas at least 3x per day along areas of the northern sections (not the 0.5 miles nearest the Carson Plant).*

Impacts Remaining After Mitigation

For the section of new pipeline located near the Carson Plant, the distances to receptors are large enough that the mitigation measures are not required. For construction activities that occur close to receptors, the mitigation is needed to reduce impacts to below the SCAQMD localized thresholds. Impacts after the implementation of the clean diesel engines and more frequent watering are shown in Table 5.2. Impacts are determined to be below the localized thresholds and therefore be **less than significant with mitigation (Class II).**

Table 5.2 New Pipeline Alternative Peak Daily Emissions- Mitigated, lbs/day

Equipment	VOC	NO_X	CO	SOx	PM_{10}	$PM_{2.5}$
New Pipeline Alternative with proposed Project Mitigation: local[1]	1.9	8.2	24.1	0.04	2.8	1.7
Regional Significance Threshold	75	100	550	150	150	55
Regional Significant Impact?	No	No	No	No	No	No
Localized Threshold		57	585		4.0	3.0
Localized Significant Impact?	No	No	No	No	No	No

Localized thresholds for SRA #4 - South Los Angeles County Coastal assuming a 1 acre site and 25 m from receptors.
1) Max local emissions are associated with either the site preparation phase or the re-paving phase and only includes onsite equipment (fugitive dust and off-road equipment).

5.3.4.2 Greenhouse Gases

GHG emissions would occur from the construction activities associated with this alternative. GHG emissions are estimated to be 2,876 MT CO2e associated with the construction activities based on scaling from the proposed Project installed new pipeline length. Operational emissions would be the same as the proposed Project. As project emissions, construction amortized along with operational electrical use, would be less than the emissions associated with baseline trucking by 57 MTCO2e, the addition of this alternatives construction GHG emissions would still be **less than significant (Class III)**.

5.3.4.3 Risk of Upset

Risk of upset impacts for the new pipeline alternative follow the same analysis as described for the proposed Project, with different route and population densities and with more new sections of pipeline, thereby reducing somewhat the failure frequency. For Impact HM.2, as discussed in Section 4.3, Risk of Upset, there is the potential for a significant hazard associated with an upset condition. In order to define a "significant hazard" under CEQA related to upset conditions, this section utilizes the same approach to estimating the risks from pipeline operations as that discussed in Section 4.3, Risk of Upset. The relative sections are discussed below.

Identification of Release Scenarios

The release scenarios involve a release from the hydrogen pipeline due to a number of causes, from internal or external corrosion, third-party impact, earthquake, etc. Releases could occur in a range of different sizes, depending on the characteristics of the break. Releases are generally defined by two different groups in this analysis: ruptures and leaks. This is the same approach as outlined in Section 4.3,

Risk of Upset. The Canary© model used and incorporated a range of assumptions about the temperature, release direction, meteorological parameters, and release duration to estimate the release scenarios. These are listed in Section 4.3, Risk of Upset, and utilize the same assumptions about pipeline sizes and other relevant operating and release characteristics.

Determine the Consequences of Each Release Scenario

As hydrogen has a very low ignition energy, it was assumed that all releases would ignite immediately and therefore only jet fires were assumed to occur and produce impacts to the public. A jet fire is a high energy event that causes immediate impacts due to high levels of thermal radiation. A rupture could happen very quickly, catching nearby persons by surprise, and have substantial force as well as thermal impacts. Thermal radiation levels that could produce impacts were assumed to be the same as those identified in Section 4.3, Risk of Upset.

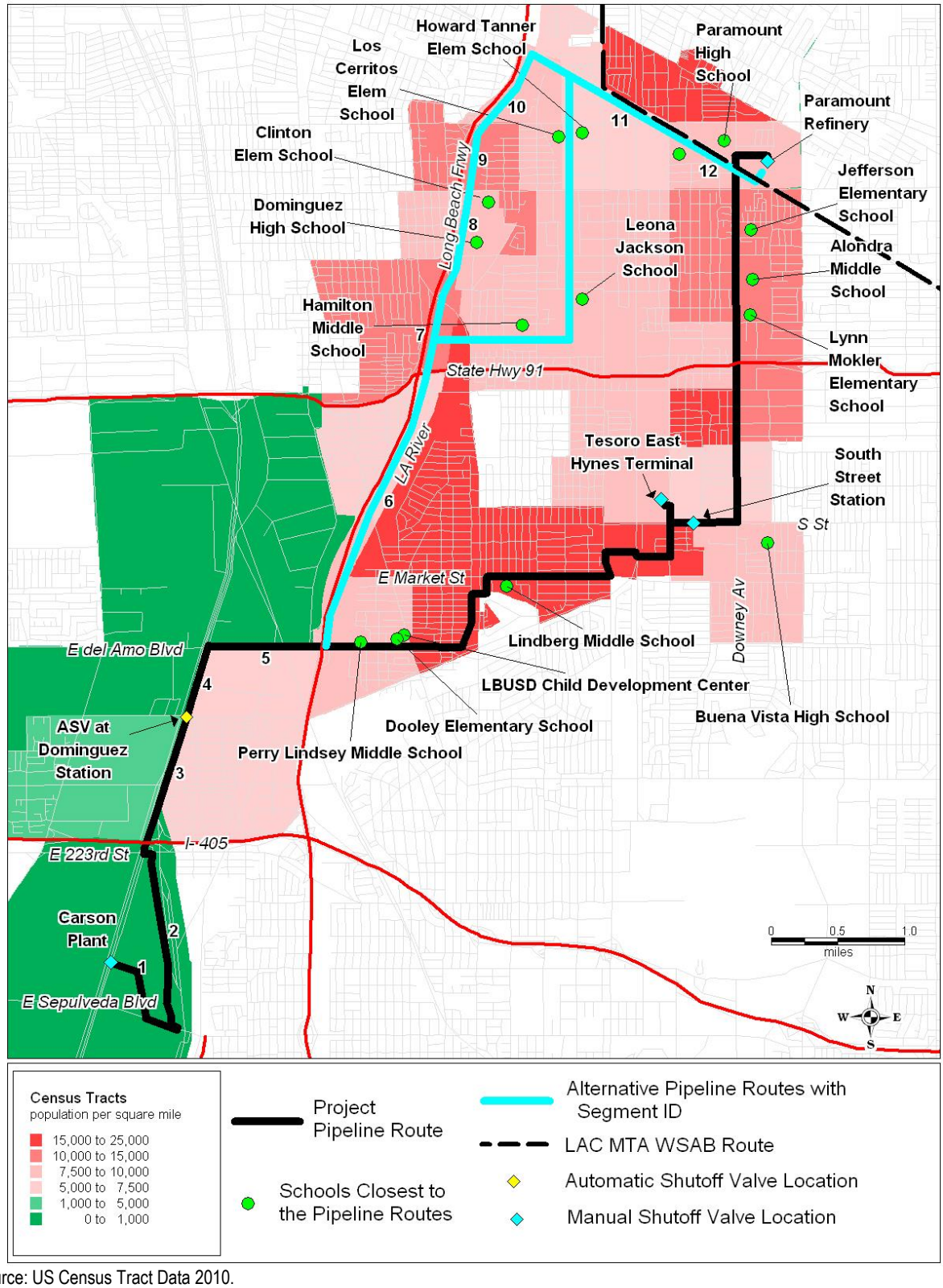
The population densities are based on the US Census data (year 2010) for Census Tracts along the alternative pipeline route. Figure 5.1 shows the location of the pipeline route along with the closest schools and the census tracts. The pipeline route was broken into different pipeline segments to correlate with the Census Tracts. Detailed information on lengths and population densities are provided in Appendix C. Census Tracts that listed no population or housing units, such as those in industrial areas, were assigned a low population density. Route segments that pass by schools have the school population added into the respective census tract population to account for the increased density of people in the area of a school.

Modeling was conducted using the Canary© model to estimate the effects of jet fires on the surrounding populations. The impact distances used for this alternative analysis are the same ones presented in Section 4.3, Risk of Upset.

Development of Frequencies of Occurrence For Each Release Scenario That Could Impact The Public

The frequencies of occurrence of the release scenarios are based on the frequencies of natural gas pipeline releases developed from data compiled by PHMSA. Although the pipeline would be carrying hydrogen, very little data is available on hydrogen pipelines and associated accidents since there are many fewer hydrogen pipelines than natural pipelines. The use of data from the large natural gas transmission pipeline system in the United States provides a close approximation to that from a hydrogen pipeline.

Figure 5.1 Pipeline Route Census Tracts – New Pipeline Alternative



Source: US Census Tract Data 2010.

The numbers presented in Section 4.3, Risk of Upset, represent those from the entire population of natural gas transmission pipelines in the United States. Corrections or adjustments have been made to account for an older pipeline use only for those existing segments and not for the new segments, as discussed in Section 4.3, Risk of Upset.

There is a single location at the Dominguez Station along the pipeline route where a valve will be installed, and valves present a potential failure point. Failure frequencies for the segments of pipelines that have a valve were increased to account for the failure rates of valves. A valve failure frequency of 8.76×10^{-5} failures/valve-year was included as per Lees, WASH and Rijnmond (Lees 2012, WASH 1975, Rijnmond 1982).

Development of Risk Estimates

Risk estimates are generated from all of the leak and rupture scenarios along each of the pipeline segments (one for each census tract). Appendix C provides a listing of each of these segments along with the corresponding failure frequency and the impacts based on the population densities within each census tract. Note that this is an approximation of the exposure as some of the pipeline would be located within the roadways. Automobiles are considered to provide substantial protection from jet fires, even though some automobiles will have open windows and could still experience some effects. In addition, along this alternative route within the 200-foot-wide ROWs, it was assumed that the pipeline would be installed near the edges of the ROW as a worst case. Installation along the middle of the ROW would reduce the potential impacts on nearby residences, but could limit the use of the ROW for other projects. Therefore, as an approximation, it was assumed that the population densities as defined by the census data extend across all areas within the census tract, thereby encompassing persons walking along sidewalks (of which a higher density would be expected in areas with higher population density), within ROWs, persons in nearby residential areas located outside and persons within vehicles that could be affected.

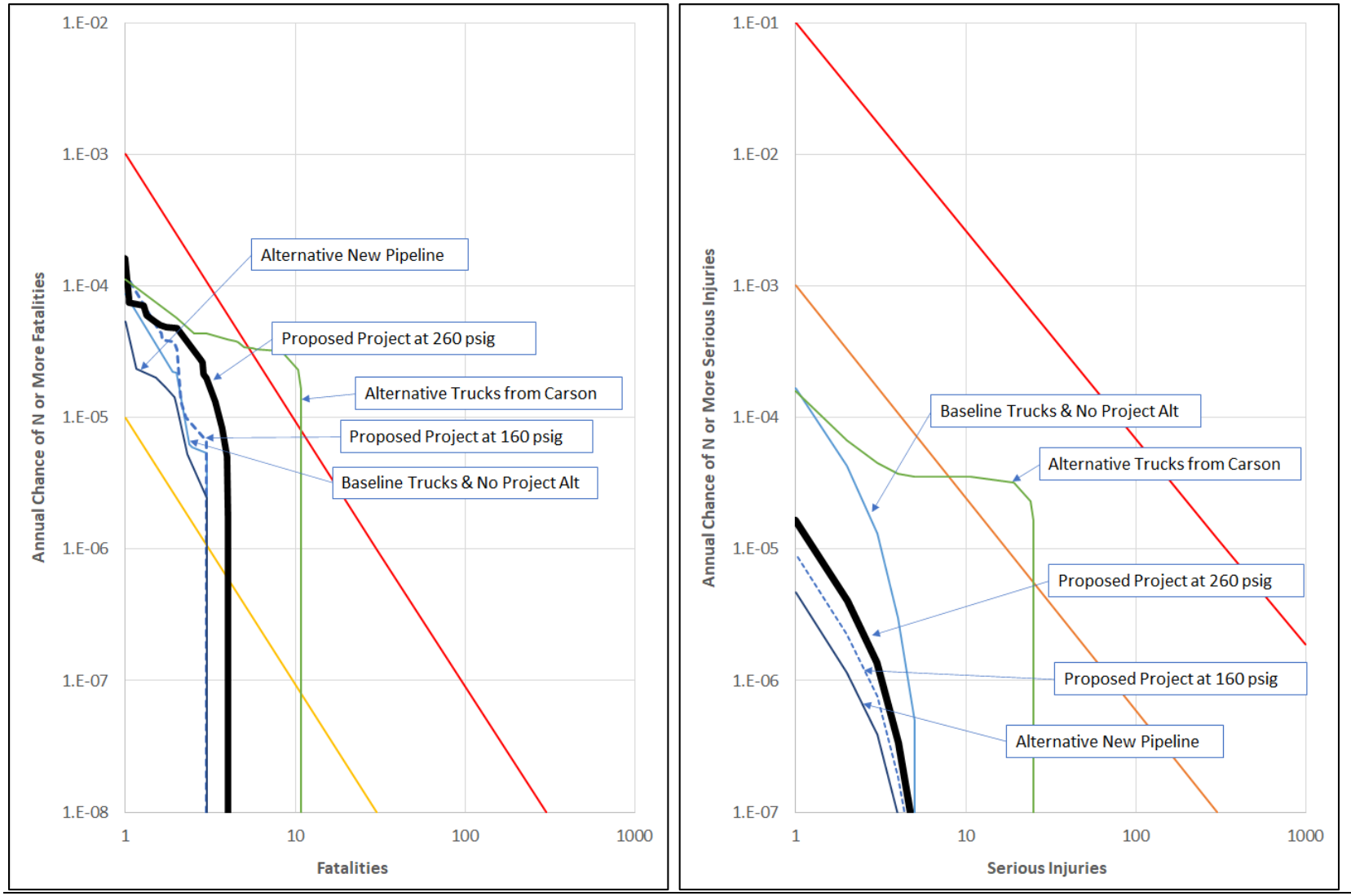
As the scenarios that could affect populations would be jet fires, the impact of these events on persons inside buildings would be nominal as people inside would be shielded from the thermal effects, and therefore only persons outside are assumed to be impacted. This reduces the frequency of a release impacting persons. As per the NHAPS publication (NHAPS 2001), 7.9% of persons are expected to be outside over a 24-hour average. For segments located near schools, the use of a 2 hours per day exposure, as per the CDE protocol, with an additional 1 hour per day for drop-off and pick-up, was used (12.5%).

Based on the reasons discussed in Section 4.3, Risk of Upset, this risk analysis did not include an additional a human reaction factor in the analysis.

Impact determination

Impacts associated with the alternative new pipeline project are marginally below those presented by the baseline trucking operations as the FN curves shown in Figure 5.2. The new pipeline presents lower risk levels than the proposed Project as it could be routed through areas of lower density and would have a lower failure rate that the proposed Project pipelines. Average density along the alternative pipeline route would average about 7,200 persons per square mile whereas the density along the proposed Project pipeline route would average about 10,150. There would be a marginal reduction in risk levels over the baseline but would remain in the unacceptable portion of the FN curves. The impacts in the event of an upset condition would therefore be **significant**.

Figure 5.2 Alternative FN Curves – Fatalities and Serious Injuries



Mitigation Options

Mitigation could take the form of reducing the impacts, by reducing the size of a release, or reducing the frequency of a release. The alternative assumes operations of the pipeline at a lower pressure in order to reduce the size of the jet fires and decrease the potential for exposure. Operation of the pipeline at lower pressures than 160 psig was determined by the Applicant to not be feasible and was therefore not addressed.

Mitigation measures HM-2b and HM-2c would be applicable to this alternative. HM-2a is mitigation related to operating at 160 psig which is already assumed as part of this alternative.

Note that, in regards to HM-2c (coordination with MTD) a portion of this alternative route would overlap with the proposed Los Angeles County MTD West Santa Ana Branch Transit Corridor (WSAB) near the intersection with Paramount Blvd and Rosecrans Ave and therefore there is a higher probability of conflicts with the WSAB cumulative project than with the proposed Project. Under the proposed Project, the WSAB only crosses the pipeline route and the pipeline is an existing line.

Impacts Remaining After Mitigation

Impacts after the implementation of the lower pressure and the use of increased monitoring fall below the baseline operations but would remain within the unacceptable region of the FN curves. Therefore, impacts are determined to be **potentially significant (Class I).**

Impacts related to HM.1 (routine use of hazardous materials), HM.3 (impacts near schools), HM.5 (airport land use plans), HM.6 (emergency response plans) and HM.7 (wildland fires) would have similar impacts as the proposed Project. See Section 4.3, Risk of Upset.

Impact HM.4 (hazardous materials sites) would be similar to the proposed Project and mitigation measure HM-4a related to a construction management plan to ensure proper handling and identification of contaminated soils, would be applicable.

5.3.4.4 Land Use

Land use impacts would be the same as the proposed Project. The route associated this alternative would continue to traverse the same areas as in the proposed Project route. Land use impacts are expected to be less than significant.

5.3.4.5 Transportation

Transportation impacts related to construction could be substantially more than the proposed Project since they would require pipeline construction through city streets. Those impacts are considered to be temporary during pipeline construction and would require similar measures to prevent traffic impacts as proposed by the Applicant, therefore, transportation impacts would be less than significant. No additional impacts are expected.

5.3.4.6 Cultural-Tribal Resources

Construction activities would be similar to the proposed Project with a substantially higher level of construction activity needed to construct a new pipeline. Although additional excavation would be needed, these would occur in previously disturbed areas, within existing roads or ROWs and are unlikely to contain any unknown cultural resources. Nevertheless, mitigation measures required under the

proposed Project would also be required for this alternative. Inclusion of MMs TC-1, TC-2, TC-3a and TC-3b would mitigate this potential impact to be less than significant.

5.3.4.7 Other Issue Areas

This alternative would have similar impacts as those from the proposed Project and it is not expected that any additional impacts would occur on any of the other issues areas as discussed in Section 4.7 for the proposed Project.

5.3.5 Pipeline Modifications

This alternative would involve the modification of multiple sections of the existing pipeline to allow for in-line inspection (smart-pigging) of portions of the pipeline to help ensure pipeline integrity. The existing pipeline proposed for the Project contains numerous bends and turns and such corners prevent the use of in-line inspections tools because the length of the tool requires straight sections of pipeline and requires that any turns in a pipeline to be gradual enough to allow the tool to pass through. As a result, this alternative would involve replacing certain sections of the existing pipeline, where feasible, to remove sharp bends and turns. Certain sections of the pipeline would be excavated, or "potholed", to determine areas of pipeline that could be replaced with straighter sections and/or sections with less sharp turns. The section or sections of modified pipeline could then be inspected with an in-line tool or smart pig. Smart pig inspections can provide data on pipeline thickness, corrosion, and other pipeline irregularities.

Because the pipeline is composed of multiple segments of different sizes, this alternative would only address the section of the pipeline that is 12-inches in diameter, and only that portion of the pipeline system would benefit from in-line testing. Inline inspection can only be conducted on pipeline segments of the same diameter. This section of the pipeline also runs closest to a number of schools and high-density residential populations. A pig launcher would be placed at the Tesoro East Hynes facility where the 12-inch pipeline begins and a pig catcher would be placed at the Paramount Refinery.

Pipeline modifications would involve the construction associated with modifications to portions of the pipeline along the existing 12-inch pipeline route as well as the installation of the new portion of the pipeline as under the proposed Project. An estimated 12 locations along the 12-inch section of pipeline between the existing Line 1150 from North Paramount to the Paramount Refinery are potential segment locations for pipeline modifications to allow for the use of an in-line inspection tool. Up to 12 locations along this segment of pipeline would require excavation within public streets to accomplish the necessary pipeline modifications. These locations are shown in Figure 5.3.

This alternative has been retained for analysis because it may provide for reductions in risk, provides for full disclosure of well-known pipeline maintenance operations and would not substantially increase impacts to air quality, and would meet the underlying purpose and objectives of the proposed Project by utilizing the current pipeline to transport hydrogen to the Paramount Refinery.

5.3.5.1 Air Quality

Pipeline modifications would involve the construction of additional portions of the pipeline along the existing pipeline route as well as the installation of the new portion of the pipeline. Emissions would be associated with construction equipment, including backhoes, welding machines, asphalt paving and some fugitive dust emissions. Emissions are estimated using the CalEEMod emission factors for construction activities and the emission factors for asphalt off gassing. Emissions are shown in Table 5.3 assuming that

the additional pipeline modifications would occur at the same time as the proposed Project new pipeline segment installations.

Figure 5.3 Pipeline Modification Locations

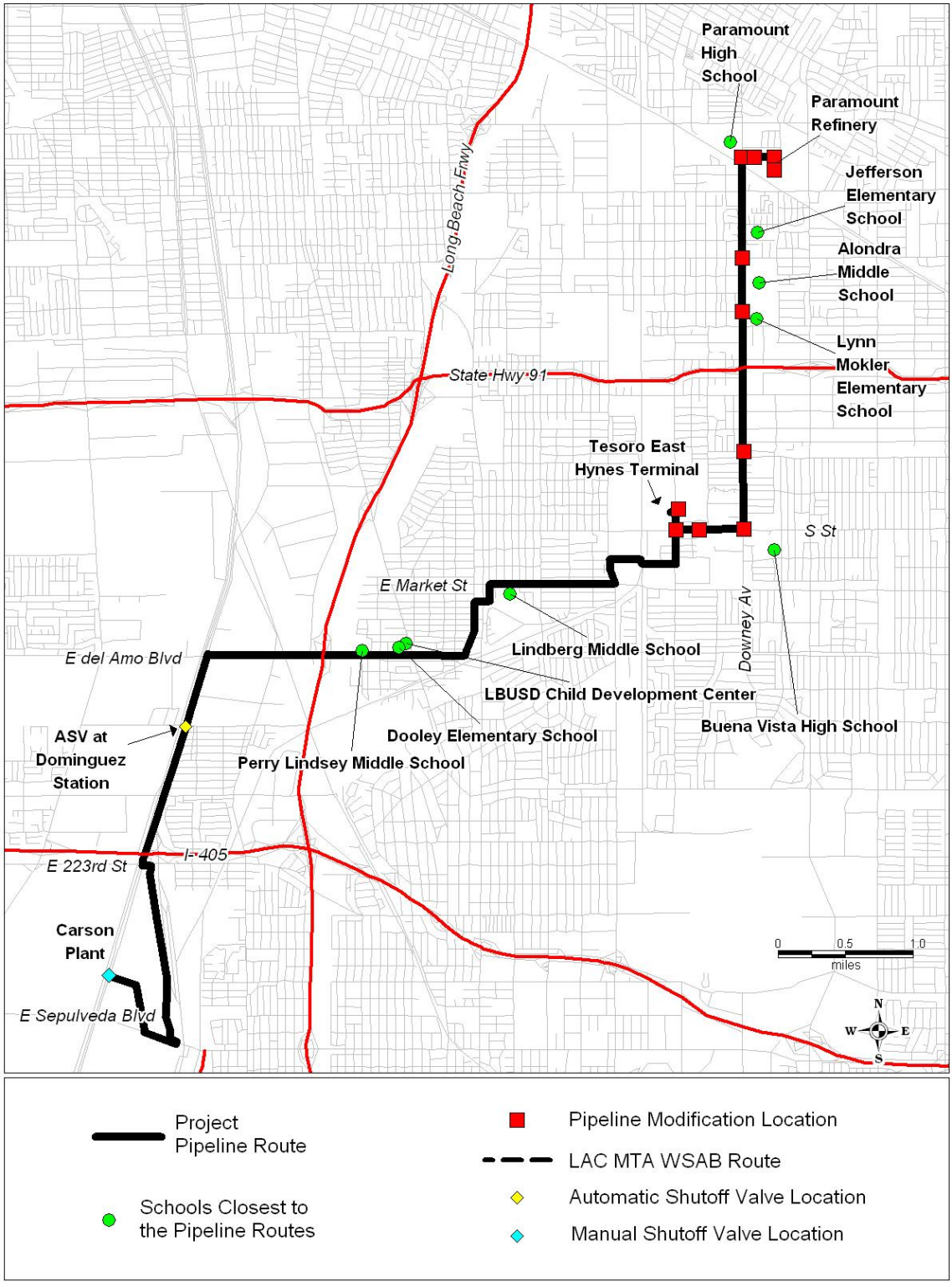


Table 5.3 Peak Daily Emissions, lbs/day

Equipment	VOC	NO_X	CO	SOx	PM_{10}	$PM_{2.5}$
Total Alternative Project Emissions	1.55	13.44	6.42	0.01	1.87	1.84
Project Total Daily Emissions	8.42	66.67	42.91	0.09	6.82	4.93
Combined Emissions	9.97	56.35	73.09	0.10	8.69	6.77
Regional Significance Threshold	75	100	550	150	150	55
Regional Significant Impact?	No	No	No	No	No	No
Per-site emissions	0.13	1.12	0.53	0.00	0.16	0.15
Localized Threshold		57	585		4	3
Localized Significant Impact?	No	No	No	No	No	No

Localized thresholds for SRA #4 - South Los Angeles County Coastal for a 1 acre site located 25 meters from receptors.

Emissions associated with construction would be less than the SCAQMD construction thresholds, and therefore, impacts would be less than significant.

For localized impacts, the construction emissions associated with the pipeline modifications would occur at 12 different locations and, in some cases, in close proximity to residences at receptors. The SCAQMD localized threshold lookup tables were used to determine significance of the construction emissions at each site. Impacts are also determined to be less than significant.

Operational emissions of the pipeline with modifications would be the same as the proposed Project except for occasional pigging operations, which would emit a nominal amount of emissions on an operational basis particularly as hydrogen is not a criteria or toxic pollutant. Therefore, for construction and operations, impacts for this alternative would be **less than significant (Class III)**.

5.3.5.2 Greenhouse Gases

GHG emissions would occur from the construction activities associated with this alternative. GHG emissions are estimated to be 25 MT CO2e associated with the construction activities at all 12 sites. Emissions from the proposed Project would be similar to the emissions from this alternative and would be **less than significant (Class III)**.

5.3.5.3 Risk of Upset

As some portions of the pipelines proposed to be used are older, in-line inspection of these pipelines may help to identify pipeline integrity issues and prevent pipeline failures. Although the pipelines are proposed to be pressure tested consistent with PHMSA requirements for maintaining pipeline integrity, use of in-line inspection tools (such as smart pigs) may allow for early identification of integrity issues and a potential reduction in failure frequencies. As part of the response to the San Bruno incident in 2010, PHMSA proposed additional rules to require more detailed integrity management programs for pipelines. They indicate that:

> *Regulators and operators agree that improving ILI* [in-line inspection] *methods as an alternative to hydrostatic testing is better for risk evaluation and management of pipeline safety. …. ILI testing can obtain data along a pipeline not otherwise obtainable via other assessment methods, although this method also has certain limitations. …. Promoting the use of ILI technologies, combined with further research and development by PHMSA as well as stakeholders to make ILI testing more accurate, is expected to drive innovation in pipeline integrity testing technologies*

that leads to improved safety and system reliability through better data collection and assessment. (Federal Register /Vol. 84, No. 190 /Tuesday, October 1, 2019 /Rules and Regulations)

An article in Oil and Gas Journal (OGJ 2000) indicated that "*in-line inspection is usually preferable to hydrostatic testing*". However, there were a number of lessons learned in this study including:

- The test-pressure-to-operating-pressure ratio measures the effectiveness of the pressure test;
- The higher the ratio of test pressure to operating pressure, the more confidence one can have in the serviceability of a pipeline;
- The use of an appropriate in-line-inspection tool is always to be preferred to hydrostatic testing if there is sufficient confidence in the ability of the tool to find the defects of significance; and,
- If a hydrostatic test can be successfully accomplished without the failure of any defect, the likelihood of a pressure reversal (failure of the pipeline after the test due to test induced changes to the pipe) will be extremely small. It is the tests in which numerous failures occur that have the highest probabilities of reversals.

The test pressures used for the pipeline historically have ranged over 900 psig, which is a ratio of operating pressure to test pressure of 3.5 to 5.6 times from operating the pipeline at 260 and 160 psig respectively. The recommended test pressure ratio is 1.50 as per ASA B31.8 Code (for a Class 2, 3, or 4 locations). Therefore, the hydrostatic testing as historically conducted on the pipeline is well above that required and will help to ensure that the pipeline maintains sufficient margin of error to minimize failures.

The PHMSA code regulation for hydrogen pipeline integrity management as described by DOT regulation 192 subpart O (ASME B31.8s) allows for either in-line inspections or pressure tests at a 5 year minimum frequency, (or direct assessment (e.g. excavation) at a minimum 7 year frequency).

Therefore, due to the large operating pressure to test pressure ratio and resulting factor of safety associated with the ratio, the failure frequency related to the pipeline would not be substantially enhanced by modifications that would allow for in-line inspection. This assumes the implementation of mitigation measures HM-2a, HM-2b and HM-2c, which require operations of the pipeline at 160 psig and monitoring of the pipeline for hydrogen-related metallurgical issues and continued pressure testing at a higher than required levels. Impacts associated with risk of upset would therefore be similar to the proposed Project.

5.3.5.4 Land Use

Land use impacts would be the same as the proposed Project. The route is not proposed to be changed under this alternative so the pipeline would continue to traverse the same areas as in the proposed Project route. Land use impacts would be less than significant.

5.3.5.5 Transportation

Transportation impacts related to construction would be greater than those of the proposed Project due to construction activities in 12 different in-street locations. Those impacts are considered to be temporary during the retrofitting of the pipeline and would require similar measures to prevent traffic impacts as proposed by the Applicant. As such, impacts would be less than significant. No additional long-term impacts are expected beyond those of the proposed Project.

5.3.5.6 Cultural-Tribal Resources

Construction activities would be similar to the proposed Project with a similar number and level of construction activity needed to fix pipeline corners and bends. However, the locations of the excavations would be expanded to include those areas needed to be retrofitted. Although additional excavation would be needed, these would occur in previously disturbed areas, within existing roads and are unlikely to contain any cultural resources. Nevertheless, mitigation measures required under the proposed Project would also be required for this alternative. Inclusion of MMs TC-1, TC-2, TC-3a and TC-3b would mitigate this potential impact to be less than significant.

5.3.5.7 Other Issue Areas

This alternative would have similar impacts as those from the proposed Project and it is not expected that any additional impacts would occur in any of the other issues areas as discussed in Section 4.7 for the proposed Project.

5.3.6 Truck Transportation from the Air Products Carson Facility

The truck transportation alternative would involve trucking of gaseous hydrogen from the Air Products Carson Facility to the Paramount Refinery. The Air Products Carson Facility does not currently produce hydrogen in liquid form; therefore, the hydrogen would be transported by trucks in gaseous form with tube trailers. The transportation distance would be similar to the proposed Project pipeline, approximately 11.5 miles. There are several potential routes that could be used by the truck from Carson to the Paramount Refinery; however, the most likely route would travel main roads and the 405, 710 and 105 freeways as follows:

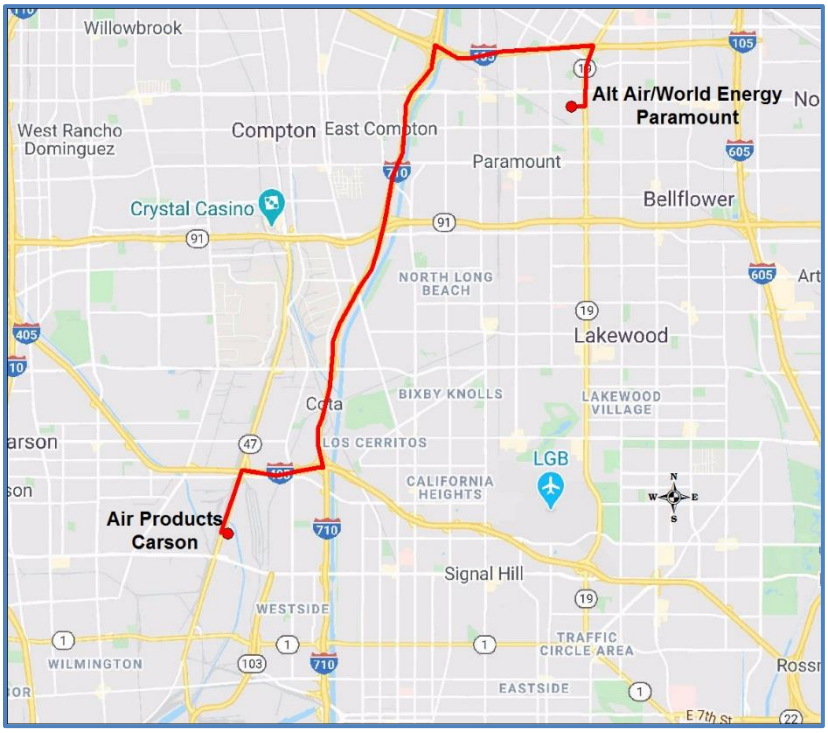
- From Air Products Facility in Carson California north on Alameda St. to the 405 Freeway;
- 405 Freeway east to the 710 Freeway;
- North on the 710 Freeway to the 105 Freeway;
- East on the 105 Freeway to Lakewood Blvd.; and
- South on Lakewood Blvd. to the Paramount Refinery.

Approximately 35 trucks deliveries per day would be required to deliver 7 MMSCFD hydrogen with tube trailer trucks that can carry hydrogen at 7,500 pounds per square inch (psig). The trucking route is shown in Figure 5.4, a typical tube trailer is provided in Figure 5.5.

This alternative could reduce construction related impacts and would meet the proposed Project's underlying purpose of providing hydrogen from the Air Products Carson Facility to the Paramount Refinery.

Below is a discussion of the impacts associated with each of the pertinent issue areas.

Figure 5.4 Trucking Alternative Route



Source: Google Maps 2020.

Figure 5.5 Trucking Tube Trailer

Source: Air Products 2019.

5.3.6.1 Air Quality

Emissions associated with this alternative would be those emissions associated with truck transportation of hydrogen. Truck emissions are estimated using EMFAC2014 for T7 trucks with trailers. Emissions are listed in Table 5.4.

Table 5.4 Trucking from Carson Peak Daily Emissions, lbs/day

Equipment	VOC	NO_X	CO	SOx	PM_{10}	$PM_{2.5}$
Truck Transportation	0.09	5.99	0.38	0.02	0.03	0.03
Regional Significance Threshold	55	55	550	150	150	55
Regional Significant Impact?	No	No	No	No	No	No

Emissions associated with operations of trucks would be below the SCAQMD thresholds for this alternative. Localized thresholds are not applicable to on road sources of emissions and are therefore not addressed. Impacts of this alternative on air quality would therefore be **less than significant (Class III)**.

5.3.6.2 Greenhouse Gases

GHG emissions from this alternative would be associated with truck transportation of hydrogen. Annual GHG emissions were calculated from EMFAC2014 emissions factors assuming a T7 tractor with trailer and the number of truck trips and the round-trip distance. Emissions of GHG are estimated to be 434 MT CO2e per year. GHG emissions would be less than the SCAQMD thresholds and would be **less than significant (Class III)**.

5.3.6.3 Risk of Upset

Unlike the baseline truck transportation of liquid hydrogen, this alternative addresses potential releases and consequences of the truck transportation of gaseous hydrogen. Note that the risks associated with truck transportation depend on the population densities of the areas through which the trucks travel, the distance the truck travels and the amount of materials moved, which defines the number of truck trips needed. Therefore, the risks are different for different trucking scenarios and this risk analysis is only applicable to the specific routes and materials needed for this specific Project.

A risk analysis was prepared for this alternative utilizing the approach specified in the Risk of Upset Section 4.3 for the existing truck transportation with some modifications to address frequencies and release characteristics of high-pressure hydrogen gas trucks. The components of the risk analysis are discussed below.

Identification of Release Scenarios

The release scenarios associated with truck transportation of gaseous hydrogen involve a release from a hydrogen tube trailer truck involved in an accident or an equipment malfunction. Releases could occur in a range of different sizes, depending on the characteristics of the release. Releases are generally defined by two different groups in this analysis: ruptures and leaks. Ruptures are defined as releases that occur rapidly and involve a release hole large enough to produce rapid loss of the entire tube contents, or about 3 inches or more. Leaks are releases from smaller holes, defined in this analysis as 1 inch in diameter. Modeling runs were performed to estimate the extent of impacts of the different releases. The Canary© model was used and incorporated a range of assumptions about the temperature, release direction, meteorological parameters and release duration. These are listed in Table 5.5.

Table 5.5 Truck Tube Trailers Release Modeling Parameters

Parameter	Value
Rupture Diameter	3" for rupture, 1" for leaks
Operating Pressure	7,500 psig
Flow Rate	Defined by modeling
Content Temperature	70°F
Release Angle	0°
Wind Speed	Worst case 20 mph for jet fires
Ambient Humidity	70%
Ambient Air and Surface Temperature	70 °F
Tank Volume	3x3 array of composite tubes, 30" diameter, 20' long 750 gallon volume per tube

Units: psia = pounds per square inch, ^{0}F – degrees Fahrenheit, mph= miles per hour.

The release angle defines the extent to which the release is angled from the horizontal. Releases could be a range of between vertical or horizontal depending on the type of truck accident or release. Therefore, a worst case of horizontal was utilized.

Wind speed has an impact on the downwind distances of impacts as well as the shape of the impact zones. Wind speeds of 20 mph versus zero wind speeds produce longer downwind distances but narrower impacts zones and based on rupture modeling for this analysis indicate an increase in impact area of about 30-50% with higher winds over no winds. For this analysis, it was assumed there would be higher winds thereby producing somewhat larger impact zones to be conservative.

Determine the Consequences of Each Release Scenario

As hydrogen has a very low ignition energy, it was assumed that all releases would ignite immediately. However, as the tube trailers in the event of a rupture release would release their contents very rapidly, within a few seconds, there is the possibility that within the first second or so of the release, ignition would not occur and, as the entire contents are released so rapidly, a vapor cloud could form resulting in an explosion. Therefore, both jet fires and explosions were assumed to occur and produce impacts to the public. A jet fire is a high energy event that causes immediate impacts due to high levels of thermal radiation. Thermal radiation levels that could produce impacts were assumed to be the same as that specified in Section 4.3.

For explosions, which could occur with a very rapid release associated with a rupture, the damage criteria are as below:

- 1 psi over pressure – 1 % fatality, 10% injury;
- 3 psi over pressure – 10% fatality, 50% injury (CDE 2007); and,
- 5 psi over pressure – 100% fatality.

As most of the persons affected would be located within other automobiles, the effects of explosions on persons within automobiles was assumed to be similar to the effects of persons within buildings, with damage due to glass breakage and debris.

The population densities are based on the US Census data for Census Tracts along the portions of the route that involves local roadways. For portions of the route that are along highways, historical data was utilized which indicate the percentage of accidents that result in a release of hazardous materials in combination with the probability that fatalities are realized. Because the distance of jet fire impacts are

less than 100 feet, it was assumed that all truck accidents producing jet fires that occur along highways have impacts that are limited to the highway ROW and affect only nearby vehicles.

Modeling was conducted using the Canary© model to estimate the effects of jet fires and explosions on the surrounding populations. Table 5.6 and 5.7 show the results of the modeling. Modeling for jet fires was assumed as a worst case to occur during a relatively windy period, thereby increasing the downwind effects. No adjustments were made for upwind or downwind release directions for jet fires as there are many different potential release scenarios, and worst-case wind conditions were used for this analysis.

Table 5.6 Canary Modeling Results – Truck Releases Jet Fires

Scenario	Distance to 12,000 btu/ht-ft2, ft	Distance to 8,000 btu/ht-ft2, ft	Distance to 5,000 btu/ht-ft2, ft
Rupture – 6"	127	129	130
Leak – 1"	60	61	62

Units: btu/ht-ft2,ft = British thermal units heat per square foot.

Table 5.7 Canary Modeling Results – Truck Releases Explosion

Scenario	Distance to 5 psi, ft	Distance to 3 psi, ft	Distance to 1 psi, ft
Rupture – 6"	68	126	383

Units: btu/ht-ft2,ft = British thermal units heat per square foot.

The distribution between jet fires and explosions was assumed to be equal, with 50% of rupture releases producing a jet fire and 50% of rupture releases producing an explosion.

Development of Frequencies of Occurrence For Each Release Scenario That Could Impact The Public

Truck accident rates are based on studies on federal truck accident rates for trucks carrying hazardous materials, as discussed in Section 4.3, Risk of Upset. Tube trailers, however, are built more robustly than the cryogenic tank trailers used for liquid hydrogen. Thin skinned tanks, such as those used for cryogenic transport, are utilized for other combustible or flammable fluids, which are designed with maximum pressures on the order of 25 psig. Tube trailers, like trailers used for propane or other compressible flammable gasses, are built to withstand much higher pressures and therefore have greater structural integrity and are more difficult to puncture and cause a resulting larger release. The probability of a tube trailer sustaining a rollover, for example, with only minor leaks, is greater than that of a liquid hydrogen truck with a low-pressure liquid tank, which would most likely rupture given a rollover scenario. Therefore, although the probability of a release given an accident may be similar, the distribution of release sizes for tube trailers versus liquid tanks would be different, with a lower fraction of releases producing larger releases for tube trailers.

An examination of the PHMSA database for highway vehicle releases of flammable gasses (DOT type 2.1) indicates that there have been 6,063 incidents involving flammable gasses since 1971, with about 263 of these documented to involve MC331 or MC330 trucks (those used to transport propane) with 26.6% of these incidents producing a "serious release". This is less than the estimated probability of a large release from a hydrogen liquid tank trailer due to the thicker and more robust design of the hydrogen gas tube trailer.

Development of Risk Estimates

Risk estimates are generated from all the leak and rupture scenarios along each of the truck route segments. Appendix C shows a listing of each of these segments along with the corresponding failure frequency and the impacts based on the population densities within each census tract.

Because the scenarios that could affect populations along local roadways could be jet fires, the impact of jet fire events on persons inside would be nominal and therefore only persons outside are assumed to be impacted. This reduces the frequency of a release that could impact persons. As per the National Human Activity Pattern Survey (NHAPS) publication (NHAPS 2001), 7.9 % of persons are expected to be outside over a 24-hour average. For segments located near schools, the use of a 2 hours per day exposure, as per the CDE protocol, with an additional hour for pickup and drop-off, was used (12.5 %) and assumes, as a worst case, that schools are in session in some manner all year long.

For explosion impacts, the effects are assumed to affect all persons located within the impact areas.

For releases along the highways, historical data from PHMSA associated with fires from MC331 truck accidents were utilized to estimate that 5.6% of hazardous material truck accidents involving a release and subsequent fire could impact the public producing 1 or more fatalities. This probability was also increased as discussed in Section 4.3, for the increased density of vehicles along area highways in Los Angeles.

The results of the analysis are shown in Figure 5.2 plotted on an FN (frequency versus consequence) curve along with the proposed Project, which is a plot of the cumulative frequency of an event along with the number of fatalities.

Impacts for this alternative would be similar or greater than those presented for the baseline or the project as the potential for explosions increases the potential number of persons impacted.

Due to the lower release frequency of larger sized spills, the risks of gaseous hydrogen trucking would be similar to the pipeline or liquid hydrogen trucking risks in the lower end of the FN curve. However, due to the higher potential for explosions due to the high-pressure gas, the risks of producing larger impact scenarios increases the risks of gaseous hydrogen trucking and the risks would be **significant (Class I)** and greater than the baseline or proposed Project operations.

5.3.6.4 Land Use

Truck transportation of all types of cargo occurs throughout the Los Angeles basin and it is contemplated in various land use plans and ordinances. Under this alternative, there would be no additional land use impacts similar to the proposed Project.

5.3.6.5 Transportation

This alternative would involve truck transportation from Carson to Paramount of 35 truck trips per day as opposed to the baseline number of six trucks per day. An increase of 29 trucks per day on the Los Angeles roads and highways would not be significant, with peak hour traffic involving generally only a single truck. Therefore, transportation and traffic impacts would be less than significant.

5.3.6.6 Cultural-Tribal Resources

This alternative would not include any construction that could result in impacts to cultural resources, and as such no additional mitigation would be needed. This alternative would have impacts that are less than significant to cultural and tribal resources.

5.3.6.7 Other Issue Areas

Other issue areas were found to have less than significant impacts for this alternative since there would be no new construction, and no effects are expected to aesthetics, agricultural resources, biological resources, geology, noise, population and housing, public services, recreation, and water resources.

5.3.7 Hydrogen Generation Unit

Under this alternative current trucking of the liquified hydrogen to the Paramount Refinery would be replaced with onsite generation of hydrogen at the Paramount Refinery. This would involve the installation of a hydrogen plant at the Paramount Refinery location. There currently exists at the Paramount Refinery three 18,000-gallon hydrogen tanks, liquid hydrogen truck unloading facilities and associated piping to supply the existing 3,500 bpd renewable fuels pilot plant.

According to their websites, both the Applicant, Air Products, and the specialty gas vendor Praxair, offer hydrogen generation plant installation services. Air Products currently operates over 100 hydrogen plants worldwide (Air Products 2020). Praxair indicates they can provide installation of a hydrogen generation plant in plant size ranging from 9,000 scfd to 135 MMscfd (Praxair 2020).

This alternative would involve the onsite generation of hydrogen at the Paramount Refinery. This could be achieved through either the installation of a small, 7 MMSCFD plant or utilizing the hydrogen generation unit (at up to 50 MMSCFD), proposed as part of the expansion of the World Energy Paramount Petroleum Renewable Fuels Project, and currently undergoing a separate CEQA review with the City of Paramount.

The permitting and construction of a hydrogen plant could take a substantial amount of time, as indicated in the World Energy Renewable Fuels Project expansion application, which states that construction could take two to three years from permit issuance. This alternative assumes that, once either the Renewable Fuels Project hydrogen generation unit is completed or, if that project does not move forward, a smaller plant is built to satisfy the needs of the existing facility at the Paramount Refinery, then transportation of hydrogen would not continue and hydrogen trucking or the hydrogen pipeline would no longer be utilized.

In discussions with Air Products about this alternative it was expressed that there is not enough plot space at the Paramount Refinery to build both a “small” plant for today’s use as well as the “large” plant for the future use that is proposed as part of the expansion of the World Energy Renewable Fuels Project that is currently undergoing permitting. Also, Air Products indicated that if it built the “large” plant now, it would be unable to reduce production of hydrogen low enough to produce only the “small” amount of hydrogen currently needed. Air Products also asserts that to provide a short-term hydrogen “skid” mounted facility would require nine skid mounted plants to satisfy the current plant hydrogen needs and that the Paramount Refinery site does not have the plot space available on-site for this number of skid units. “Skid” mounted units are easier and quicker to install than building an entire plant as the units are already constructed and just brought to the site and hooked up. They are limited in size, however, and Air Products indicates that utilizing a large number of skid units connected together to satisfy the current needs may produce operational complexities.

This alternative produces a substantial and quantifiable reduction in risk impacts due to the elimination of the need for long-term transportation of hydrogen by producing it onsite. As this alternative may produce long term benefits in terms of reduced risk and meets the underlying purpose of the Project by supplying hydrogen to the Paramount Refinery, additional analysis has been presented below. In addition, because the expansion of the Paramount Petroleum Renewable Fuels Project cumulative project includes an onsite hydrogen generation facility (see Section 3.0, Cumulative Projects, and the No Project Alternative discussion above), additional analysis is included in order to provide full disclosure.

5.3.7.1 Air Quality

Hydrogen generation at the Paramount Refinery site would not produce additional operational emissions as the hydrogen would not be required to be produced at any other location and therefore the emissions associated with hydrogen production would be offset by reduced production elsewhere. As a worst case, Section 4.1, Air Quality, examines the estimated emissions from operating a hydrogen plant at the levels needed to supply hydrogen to the Paramount Refinery. This alternative would produce similar emissions, but at a different location. Localized emissions would occur at a distance from receptors but could still produce localized impacts. Table 5.8 shows the estimated emissions from a 7 mmscfd hydrogen plant.

Table 5.8 Hydrogen Plant Operational Emissions

Equipment	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Worst-case Plant Emissions	11.38	17.50	11.38	0.51	13.64	13.64
SCAQMD Regional Operational Threshold	55	55	550	150	150	55
Exceed Regional Threshold?	No	No	No	No	No	No
SCAQMD Localized Operational Threshold	-	68	1180	-	7	3
Exceed Localized Threshold?	-	No	No	-	**Yes**	**Yes**

Plant operating at 7 mmcfd based on 1998 EIR (City of Carson 1998). Localized thresholds based on 1 acre site and 100 meters from receptors, operations.

The 1998 EIR (City of Carson 1998) for the Carson Plant utilized modeling to indicate that the Carson Plant would not exceed the localized thresholds at the maximum ground level concentration for a hydrogen plant of 96 mmscfd (as defined in the 1998 EIR), as opposed to the 7 mmscfd in this alternative. Modeling provides a more accurate assessment than lookup tables, due to sources being point sources which have buoyancy and therefore a substantial reduction in ground level concentrations over the SCAQMD look-up tables (which assume all area sources). Therefore, the localized impacts of a smaller hydrogen plant would be less than significant.

Because the hydrogen used by the Paramount Refinery would be gaseous hydrogen, this alternative would produce fewer emissions per unit of hydrogen than the baseline operations because less energy would be needed since the hydrogen would not have to be liquified or transported to the Paramount Refinery.

Construction of a hydrogen plant at the Paramount Refinery would involve the use of construction equipment and deliveries of materials. The Carson Air Products Hydrogen Plant provides an upper estimate of the construction requirements associated with building a hydrogen plant and this project was examined in an EIR (City of Carson, June 1998, SCH97071078). The Carson facility was sized as a 96 MMSCFD facility which was estimated to take about 1 year to construct. Construction tasks included site preparation, foundation and civil construction, equipment erection, piping and electrical installation, insulation and painting and other building construction. Equipment needs included forklifts, dozers, air compressors, welding machines, cranes, etc. Most system equipment was built offsite and transported to

the facility for final assembly. As per the Carson Hydrogen Plant EIR, impacts from construction emissions would be above the SCAQMD regional thresholds and the localized thresholds. Although the Carson Plant is a substantially larger facility than would be required to supply hydrogen to the Paramount Refinery, peak day emissions would be similar as a worst-case and construction impacts could be **potentially significant (Class I).**

Note that the cumulative project, the expansion of the World Energy Paramount Renewable Fuels Project at the Paramount Refinery, is currently proposed and that construction of a hydrogen generation unit at the Paramount Refinery may already occur, which would involve a similar level of construction and operational emissions. The World Energy cumulative project would be required to comply with the SCAQMD rules and regulations, including offsets for any emissions that exceed the regional thresholds, thereby ensuring that cumulative air quality emissions on a regional basis would be less than significant. Note that the 1998 Carson hydrogen Plant EIR indicated a similar outcome for the Carson plant operations, with emissions that were less than significant with mitigation.

5.3.7.2 Greenhouse Gases

Similar to air quality impacts above, hydrogen generation at the Paramount Refinery site would not produce additional GHG emissions as the hydrogen would not be required to be produced at any other location. Also, as the hydrogen used by the Paramount Refinery would be gaseous hydrogen, this alternative would produce fewer GHG emissions per unit of hydrogen than the baseline operations because less energy would be needed since the hydrogen would not have to be liquified and transported to the site. Similar to the proposed Project as discussed in Section 4.2, GHG, the GHG emissions from the operation of the hydrogen plant under this alternative, if other plant reductions are not included, would exceed the SCAQMD GHG thresholds. However, because the source of the emissions would be natural gas reformed in the hydrogen plant reformer that is part of the Cap and Trade program and therefore would offset the GHG emissions with required Cap and Trade program allowances, impacts would be less than significant.

Construction of the plant would take at most a year based on the Carson Plant EIR, with GHG emissions estimated to be less than 2,000 tons of CO2e, based on the equipment list from the 1998 EIR (City of Carson 1998) and an estimated year of construction. This would be below the SCAQMD thresholds and GHG impacts of this alternative would be **less than significant (Class III).**

5.3.7.3 Risk of Upset

The risks associated with operating a hydrogen generation unit would involve the scenarios of leaks or ruptures of hydrogen from tanks and/or processing equipment. Studies detailing the impact zones from releases were performed by Quest for the World Energy Paramount Renewable Fuels Project, currently undergoing CEQA review. Impacts zones associated with the hydrogen facility were estimated to extend 415 feet for explosions and 414 feet for vapor cloud fires. The closest residences are located more than 500 feet from the proposed hydrogen facility location at the Paramount Refinery, with a plant nursey located within 430 feet of the hydrogen plant location. Therefore, risks would be minimal associated with the new hydrogen generation plant as impact zones would not extend to residential areas and would only affect low-density locations and no roadways.

In addition, the existing World Energy Renewable Fuels Project has three hydrogen tanks, a truck unloading facility and associated piping at the Paramount Refinery. A hydrogen generation plant would not introduce greater risks than the current risks located at the Paramount Refinery related to hydrogen.

Therefore, the risks of installation and operation of a hydrogen generation plant at the Paramount Refinery would be **less than significant (Class III)**.

5.3.7.4 Land Use

This alternative would include construction and subsequent operation of a hydrogen plant within an existing facility zoned for such a use and with ongoing industrial uses. No land use impacts are expected for this alternative.

5.3.7.5 Transportation

This alternative would incur more impacts that the proposed Project since it would require transporting materials and construction equipment and construction workers to the Paramount Refinery for the construction of the hydrogen plant. For construction of the Carson Hydrogen Plant (City of Carson 1998), traffic trips totaled 100 workers and an average of 11 truck trips per day and concluded that the overall contribution to traffic impacts would be negligible in terms of level-of-service. For a VMT analysis, all of the construction trips would be temporary and not associated with a development project, and therefore would be less than significant (see Section 4.5 Transportation and Circulation). With the applicant proposed Avoidance and Minimization Measures (AMMs) to minimize traffic issues, impacts would be less than significant.

5.3.7.6 Cultural-Tribal Resources

This alternative would incur into similar cultural impacts as the proposed Project since it would require construction of a new hydrogen plant within the existing Paramount Refinery which would have minimal impacts since it is a previously disturbed and an industrially developed site. However, mitigation measures required under the proposed Project would also be required for this alternative. Inclusion of MMs TC-1, TC-2, TC-3a and TC-3b would mitigate this potential impact to be less than significant.

5.3.7.7 Other Issue Areas

Other issue areas were found to have less than significant impacts for this alternative, similar to the proposed Project, and no effects are expected to aesthetics, agricultural resources, biological resources, geology, noise, population and housing, public services, recreation, and water resources. Construction of a hydrogen plant within an existing Refinery will not have any additional impacts in other issue areas.

5.4 Alternative Comparison Summary

Table 5.8 provides a comparison of each of the alternatives to the proposed Project for each of the pertinent issue areas based on the discussion above. Section 5.5 summarizes this comparison and discusses the Environmentally Superior Alternative.

Table 5.9 Alternatives Comparison

Issue Area	Proposed Project	No Project	Pipeline Modifications	Truck Transport	Hydrogen Generation
Air Quality	Class III	Class III	Class III	Class III	**Class I***
GHG	Class III	Class III	Class III	Class III	Class III
Hazardous Materials	**Class I**	**Class I**	**Class I**	**Class I**	Class III
Land Use	Class III	Class III	Class III	Class III	Class III
Transportation	Class III	Class III	Class III	Class III	Class III
Tribal	Class II*	Class III	Class II*	Class III	Class II*
Other	Class III	Class III	Class III	Class III	Class III

*Associated with the construction phase of the project or alternative only. Class III for operations.

5.5 Environmentally Superior Alternative Discussion

This section summarizes the environmental advantages and disadvantages associated with the proposed Project and the alternatives evaluated above. Based upon this discussion, the environmentally superior alternative is selected as required by CEQA. The State CEQA Guidelines, Section 15126.6(e)(2), state that if the environmentally superior alternative is the No Project Alternative, then the next most environmentally preferred alternative from among the other alternatives must also be identified.

CEQA does not provide specific direction regarding the methodology of comparing alternatives and the proposed Project. Each Project must be evaluated for the issues and impacts that are most important; this will vary depending on the project type and the environmental setting. Issue areas with significant and unavoidable (Class I) long-term impacts are generally given more weight in comparing alternatives. Impacts that are short-term (e.g., construction-related impacts) or those that are mitigable to less than significant levels are generally considered to be less important.

The advantages and disadvantages of each of the alternatives are discussed below compared to the proposed Project. Because the rail transportation and the other existing pipelines alternatives were determined to be infeasible or not provide any benefits, they are not discussed further.

It should be noted that the proposed Project and all of the alternatives could be affected by the proposed expansion of the World Energy Renewable Fuels Project at the Paramount Refinery, a cumulative project that is currently undergoing CEQA review and permitting. This expansion would allow for the supply of hydrogen to the Paramount Refinery onsite, similar to the onsite hydrogen generation alternative discussed above. However, under the proposed Project, the pipeline may continue to operate even after the completion of the expansion of the World Energy Renewable Fuels Project and its ancillary hydrogen plant.

No Project Alternative: The No Project Alternative would involve the continuation of trucking of liquid hydrogen from Ontario. Under the No Project Alternative, in combination with the proposed expansion of the World Energy Renewable Fuels Project at the Paramount Refinery, transportation of hydrogen by truck would most likely cease if the proposed expansion of the World Energy Renewable Fuels Project and its ancillary hydrogen generation unit is permitted and built. If the expansion of the Renewable Fuels Project does not move forward, trucking of liquid hydrogen would most likely continue to supply hydrogen to the Paramount Refinery.

The No Project Alternative and continued trucking of hydrogen liquid would eliminate the construction-related air quality impacts associated with the proposed Project's new pipeline segment installations, as well as potential traffic and cultural-tribal impacts associated with construction. However, neither of these impacts were determined to be significant and unavoidable. Risk of upset impacts associated with the trucking of hydrogen liquid was found to be similar to the proposed mitigated Project, which was determined to be significant and unavoidable, Class I. Because there are no assurances that the expansion of the World Energy Renewable Fuels Project would go forward, truck transportation of hydrogen may continue indefinitely under the No Project Alternative. As such, the No Project Alternative was not found to be environmentally superior over the proposed Project.

New Pipeline: The new pipeline alternative would involve installation of substantial portions of new pipeline in a different alignment than the proposed Project, which would utilize existing pipeline segments. This alternative would have more air quality impacts than the proposed Project, as well as traffic and potential cultural-tribal impacts, due to the increased amount of construction associated with the installation of substantially more pipeline through multiple jurisdictions. However, these impacts were determined to be less than significant. Due to the possible route being located through lower population density areas (along the Los Angeles River and along existing open ROWs) and that more of the pipeline would be made from newer pipe, thereby lowering the frequency of releases, this alternative would reduce the severity of the risk of upset impacts over the proposed Project. The proposed Project has a significant and unavoidable impact associated with risk of upset, and this alternative would have an advantage over the proposed Project by reducing the severity of the significant impact. However, this alternative has a number of speculative elements, including ROW acquisition and permitting, which are unknown at this time. Therefore, this alternative has not been selected as the environmentally superior alternative.

Trucking from Carson: The trucking from Carson alternative would involve the transportation of gaseous hydrogen by truck from the Air Products Carson facility to the Paramount Refinery. Trucking of gaseous hydrogen requires substantially more trucks than trucking of liquid hydrogen, and that combined with the release characteristics of high-pressure gaseous hydrogen, increases the potential risk of upset associated with this alternative over the proposed Project. Because this alternative does not provide any reduction in the severity of risk of upset impacts over the proposed Project, it has not been selected as the environmentally superior alternative.

Pipeline Modifications: The pipeline modifications alternative would involve modifications to sections of the existing pipeline to allow for in-line inspection and potentially enhanced maintenance activities. This alternative would generate more air quality impacts than the proposed Project, as well as traffic and potential tribal impacts, due to the increased amount of construction associated with the installation of and modification to multiple segments of the existing pipeline. However, these impacts were determined to be less than significant. The proposed mitigated Project would allow for enhanced pipeline testing through the increased test pressure to operating pressure ratios, which would be similar in benefits as the potential advantages of in-line inspections. In addition, studies have shown that pressure testing at high ratios is an effective means of pipeline integrity evaluation and maintenance. Therefore, the advantages of this alternative over the proposed mitigated Project are not apparent and this alternative has not been selected as the environmentally superior alternative.

Onsite Hydrogen Production: This alternative would involve the installation of a hydrogen generation unit at the Paramount Refinery to supply the hydrogen needed at the Paramount Refinery instead of the transportation of hydrogen by truck or pipeline. This alternative assumes that a small hydrogen plant could be permitted and built to provide onsite hydrogen to the Paramount Refinery, or that the proposed

hydrogen generation unit as part of the expansion of the World Energy Renewable Fuels Project is completed or, if that project does not move forward, a smaller plant is built to satisfy the needs of the existing facility at the Paramount Refinery, then transportation of hydrogen would cease.

This alternative would have more traffic and potential cultural-tribal impacts than the proposed Project, due to the increased amount of construction. However, both of these impacts would be less than significant with mitigation. This alternative would generate a Class I, significant and unavoidable impacts due to the construction emissions associated with the construction of a hydrogen plant. However, these significant and unavoidable construction air quality impacts would be temporary. In addition, irrespective of the proposed Project, the expansion of the World Energy Renewable Fuels Project may occur anyway and incur those air quality impacts. The main advantage of this alternative is the elimination of the Class I, significant and unavoidable, risk of upset impact associated with the proposed Project through the elimination of the need to transport hydrogen, either by truck or pipeline.

This alternative satisfies the underlying purpose of the Project by supplying hydrogen to the Paramount Refinery and eliminates the Class I risk of upset impact. However, this alternative would not meet the Applicant's objective of conversion of an existing pipeline system to hydrogen use, and also does not satisfy the objective to extend the hydrogen pipeline network to provide hydrogen to the Paramount Refinery. As noted above, the World Energy Renewable Fuels Project is currently undergoing permit review and environmental analysis for its expansion, and if approved, will take an additional 2-3 years to be constructed and accrue the environmental benefits mentioned. It is possible that during that time, the proposed pipeline Project could provide hydrogen to the Paramount Refinery, until and if, the expansion Project is approved and built. Although it is recognized that there may be limitations in meeting the objectives, delays in the timing and uncertainty in the permitting to this alternative, it has been selected as the environmentally superior alternative due to the long-term elimination of the risk of upset impact associated with the use of the proposed Project pipeline.

5.6 References

Air Products 2020, Communication with Air Products email. Eric Snelling, July 14, 2020

Air Products 2020, website access July 2020, http://www.airproducts.com/Products/Gases/supply-options/onsite-gas-generation/hydrogen-gas-generation-systems.aspx

CDE 2007, Guidance for Protocol for School Site Risk Analysis, Volume 1 Section 1

City of Carson 1998, Air Products and Chemicals, Inc. Hydrogen Facility and Specialty Gas Plant FEIR, prepared by Environmental Audit, Inc. June 1998

Lees, F.P. Loss Prevention In The Process Industries. Volumes 1 - 3. Butterworths, London. 2012.

NHAPS 2001, The National Human Activity Pattern Survey (NHAPS)

OGJ 2000, Hydrostatic Testing-1: Pressure ratios key to effectiveness; in-line inspection complements. July 31, 2000

PraxAir 2020, Website access July 2020, https://www.praxair.com/gases/buy-compressed-hydrogen-gas-or-liquid-hydrogen/?tab=supply-options

Rijnmond. 1982. "Risk Analysis Of Six Potentially Hazardous Industrial Objects In The Rijnmond Area, A Pilot Study." A report to the Rijnmond Public Authority, presented by COVO Steering Committee,

1982. D. Reidel Publishing Co., Dordrecht, Holland. A compilation of data on all types of equipment failure is provided. (Referred to as Rijnmond.)

US Department of Energy 2013, Hydrogen Delivery Technical Team Roundup, June 2013, USDRIVE

WASH-1400 (NUREG-75/014), United States Nuclear Regulatory Commission, October 1975. Referred to as WASH-1400. Provides data on human errors as well as equipment failures, and is one of the most extensive sources of failure-on-demand estimates.

This Page Left Intentionally Blank

6.0 Other CEQA Related Requirements

This section of the EIR addresses other CEQA related requirements. These include the following (1) identification of significant environmental effect which cannot be avoid if the proposed Project is implemented, and (2) evaluation of the proposed Project's related growth-inducing effects. The following sections evaluate the proposed Project considering these requirements. The last part of this section identifies the issue areas where impacts were found to be less than significant as part of the scoping process.

6.1 Significant Environmental Effects Which Cannot be Avoided if the Project is Implemented

Impact HM.2: One significant and unavoidable (Class I) impact was identified for the proposed Project associated with an upset condition and release of hazardous materials into the environment. In order to define a "significant hazard" under CEQA related to upset conditions, this EIR utilizes a quantitative approach to estimating risk levels and compares these to the baseline risk levels and the acceptability levels defined in other jurisdiction CEQA thresholds. The City of Carson does not currently have thresholds related to risk of upset for projects utilizing hazardous materials.

Risk levels for pipelines are essentially a constant value independent of the volume of hydrogen passed through the pipeline, assuming that the pressure levels are constant. This is different than trucking, as in the baseline exiting operations, where the risk linearly increases with increasing hydrogen volume transported as more trucks are needed with higher hydrogen usage, thereby increasing truck mileage. Risk levels from a pipeline are driven by the volume of hydrogen located within the pipeline whereas the risks for trucking are driven by the number of truck trips. For very minimal hydrogen volumes, as a pipeline would still be required to be full of hydrogen, trucking generally produces lower risks. But at a certain point, an increasing number of truck trips associated with an increasing volume of hydrogen transported generates more risk than a pipeline. The proposed Project, with the hydrogen pipeline compared to the trucking associated with the baseline, is close to that crossover point.

Impacts associated with the proposed Project operating at a pressure of 260 psia are similar to, if not somewhat greater than, those presented by the baseline trucking operations as the FN (frequency versus consequence) curves for both activities lie in a similar band within the FN curves shown in Figure 4.3-4 in Section 4.3, Risk of Upset. Therefore, a reduction in risk levels over the baseline is not apparent. As risks would not be reduced from the baseline operations, the impacts in the event of an upset condition would be significant.

Available Mitigation: Mitigation could take the form of reducing the impacts, by reducing the size of a release, or reducing the frequency of a release. Mitigation measure HM-2a requires that the pipeline be operated at a maximum pressure at any point in the pipeline of 160 psig, that the operator maintains operating pressure information, and that information of pipeline maintenance be reported to the City. Operating the pipeline at a lower pressure (such as 160 psi instead of 260 psi) would reduce the area of the jet fire by an average of about 35%. FN curve for operating the pipeline at a pressure of 160 psi is shown in Figure 4.3-4 in Section 4.3, Risk of Upset, and allows for a reduction in the severity of the significant impact.

Mitigation Measure HM-2b requires that the pipeline be monitored on an annual basis for any issues that could indicate increased rates of the loss of pipeline integrity, such as hydrogen embrittlement. This is a

potential concern related to the use of non-hydrogen pipelines for hydrogen transport; however, monitoring required under MM HM-2b would mitigate this issue.

Mitigation Measure HM-2c requires that the pipeline continue to be pressure tested at a Maximum Allowable Operating Pressure (MAOP) to test pressure ratio of at least 3.0 to ensure pipeline integrity. The hydrostatic testing as historically conducted on the pipeline is well above that required, as discussed in Section 4.3, Risk of Upset. The testing shall be performed annually for the first three years; subsequent tests may be relaxed to once every three to five years as per PHMSA requirements.

Even with implementation of mitigation, impacts of HM.2 still fall in a range very similar to the baseline operations but would remain within the unacceptable region of the FN curves; in the event of a release from the pipeline associated with an upset condition, Project impacts could be significant and unavoidable (Class I).

6.2 Growth Inducement

Section 15126.2(d) of the CEQA requires that EIRs provide a discussion of the growth-inducing impacts of the proposed project. Growth-inducing impacts could be caused by projects that foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Growth-inducing impacts can also be caused by removing obstacles to population growth such as an expansion of a wastewater treatment plant. Growth-inducing impacts can result from population increases that require the construction of new community services facilities.

In general terms, a project may induce spatial, economic, or population growth in a geographic area if it meets any of these four criteria:

- Removal of an impediment to growth (e.g., establishment of an essential public service or the provisions of new access to an area);
- Economic expansion or growth (e.g., changes in revenue base, employment expansion);
- Establishment of a precedent-setting action (e.g., an innovation, a change in zoning or general plan amendment approval); or
- Development or encroachment in an isolated area or one adjacent to open space (being different from an “infill” type of project).

Should a project meet any one of the above listed criteria, it can be considered growth inducing. The impacts of the proposed Project are evaluated below with regard to these four growth-inducing criteria.

6.2.1 Removal of an Impediment to Growth

The proposed Project would not result in the establishment of an essential public service nor would it provide new access to a previously inaccessible area. The proposed Project would not be responsible for, nor contribute to, the expansion of utility services into a previously unserved area or an under-served area. Water for construction of the proposed Project would be purchased from the local water authority and obtained via hydrant. As a result, the proposed Project would not cause significant growth inducement under this criterion.

6.2.2 Economic Expansion or Growth

Economic growth is evaluated to the extent that it would relate directly or indirectly to a physical impact on the environment. Economic growth could occur in the area during construction of the proposed

Project. The proposed Project would employ approximately 60 contractors for construction. Construction is expected to last twenty weeks for the new pipeline construction and Carson tie-in and eight weeks for the Paramount Facility connection and pipeline connections at Dominguez Station and South Street, which could produce some short-term economic growth. The proposed Project would use local union labor from the existing labor pool in the Southern California area, including ARB, Inc. Therefore, no growth in hotel services would be expected to occur.

The pipeline would replace liquid hydrogen brought in by truck (approximately 5-7 trucks per day) that is currently utilized at the Paramount Refinery World Energy Bio-fuels Facility. The proposed Project would include the creation of one new full-time job and will increase City of Carson revenue (utility taxes, franchise fees, etc.) by approximately $60,000 per year. In addition, World Energy has proposed and expansion of their ongoing efforts to process biofuels at the Paramount Refinery. Such efforts, if approved, would result in substantial additional production of hydrogen within the Paramount Refinery. That hydrogen production would result in the potential obsolescence of the proposed pipeline Project. In addition, World Energy has expressed a desire to export hydrogen if their expansion project is approved, and if a surplus of hydrogen is achieved. This could result in some efforts to transport hydrogen from the Paramount Refinery through the proposed pipeline Project in reverse flow. However, the pipeline Project as proposed does not contemplate bi-directional flow and additional environmental review and permitting would have to be conducted to allow for that to occur. Given the limited increase in local expenditures associated with the proposed Project, the economic growth associated with the pipeline operations would not be significant from an economic standpoint under CEQA.

6.2.3 Precedent-Setting Action

The purpose of the proposed Project is to expand Air Products' existing pipeline network to connect Air Products with a new customer in the City of Paramount, who uses hydrogen to produce renewable biofuels (biodiesel and biojet) for the transportation market. Under the proposed Project, a new 0.5-mile pipeline segment would be constructed within the City of Carson and connected to 11.5 miles of existing pipeline. The existing pipeline crosses portions of the cities of Carson, Los Angeles, Long Beach, Lakewood, Bellflower, and Paramount as well as an unincorporated part of County of Los Angeles and land owned or controlled by the Port of Los Angeles and the Joint Ports Authority. Two new pipe connections would be required to connect segments of existing pipelines together along the 11.5-mile length, and Air Products would also remove or replace existing manual valves and add an automatic shut-off valve (ASV) at one location along the pipeline route. The proposed Project would eliminate the need for 5-7 tanker trucks that currently deliver hydrogen to the World Energy Facility. The pipeline would transfer a maximum of seven (7) million cubic feet of hydrogen gas each day (MMSCFD). The proposed Project would not result in a change in zoning or general plan amendment approval. Therefore, the proposed Project would not be a precedent-setting action that would create significant growth inducing impacts.

6.2.4 Development of Open Space

Development of open space is considered growth inducing when it encroaches upon urban-rural interfaces or in isolated localities. All construction activities for the proposed Project would occur on land zoned for industrial uses. The proposed Project would not involve the development of any open space. Therefore, the Project would not cause new encroachment upon current open spaces.

6.3 Effects Found Not to be Significant

As discussed in Section 1.0, Introduction, the City of Carson, as lead agency under CEQA, determined than an EIR would be required as part of the permitting process for the proposed Project. In compliance with CEQA Guidelines, the City solicited public and agency input through distribution of a Notice of Preparation (NOP) and a public scoping meeting and conducted an independent analysis of possible project impacts. Sections 4.1 through 4.6 provide an analysis of the proposed Project for those issues areas that were anticipated to have possible significant impacts. Section 4.7 provides a discussion of the following issue areas where the scoping process determined no significant impacts would occur:

- Aesthetics/Visual Resources;
- Agricultural Resources;
- Biological Resources;
- Geology Processes/Geological Hazards;
- Noise;
- Population and Housing;
- Public Services;
- Recreation;
- Water Resources; and
- Wildfire

7.0 Mitigation Monitoring and Reporting Program

This section provides the Mitigation Monitoring and Reporting Program (MMRP) for the proposed Project. The City of Carson, as the CEQA Lead Agency, would have the responsibility of ensuring that implementation of required mitigation as identified in this Environmental Impact Report (EIR) occurs as intended if the proposed Project (or an alternative) is approved. As the Applicant and Project proponent, Air Products would be responsible for implementing all applicable measures, including the adopted mitigation measures and conditions of project approval, as well as conditions imposed in any permits or regulations administered by other responsible agencies.

The Applicant's application contained Avoidance and Minimization Measures (AMMs) to minimize the Project's environmental impacts in a manner consistent with applicable rules and regulations (see the lists provided in each environmental issue area section). The Applicant proposes to implement these AMMs during the design, construction, and operation of the proposed Project in order to avoid or minimize potential environmental impacts. City approval would be based upon the Applicant adhering to the proposed Project as described in this document, including the AMMs, as well as any adopted mitigation measures identified by this EIR.

The MMRP for the proposed Project (or alternative) establishes the approach to implementing the mitigation measures identified in this EIR. If the project is approved and the MMRP described below is adopted by the City, a detailed Environmental Quality Assurance Program (EQAP) would be developed, as described in Section 7.2 below. The EQAP would describe compliance monitoring roles and responsibilities and would be the mechanism whereby the City would implement the MMRP.

MMRP tables are presented in Section 4.0, Environmental Analysis of the Proposed Project, at the end of each issues area (Sections 4.1 thorough 4.6) and are repeated in Section 7.5. These tables, along with the full text of the mitigation measures themselves, are central elements of the MMRP. Monitoring of compliance with the specified mitigation measures would be implemented throughout construction and operations.

7.1 Authority for the Mitigation Monitoring and Reporting Program

As the Lead Agency under the California Environmental Quality Act (CEQA), the City of Carson is required to adopt a program for monitoring and reporting on the implementation of mitigation measures if the proposed Project or an alternative is approved. The MMRP would be used to ensure that the adopted mitigation measures are implemented as defined in this EIR. This Lead Agency responsibility originates in Public Resources Code Section 21081.6(a) (Findings) and the CEQA Guidelines Sections 15091(d) (Findings) and 15097 (Mitigation Monitoring or Reporting).

7.2 Organization of the EQAP

If the proposed Project (or an alternative) is approved, the City would compile the Final MMRP and include it in the agency decision documents, as adopted. The EQAP serves as a self-contained guide for implementing the MMRP throughout project construction and operations. The EQAP shall be prepared according to procedures established by the City of Carson Community Development, Planning Division paid for by the Applicant, and submitted for review and approval by the City Planning Division. The EQAP shall include the following:

1. All conditions and mitigation measures imposed on this project and the impacts they are mitigating separated by issue area.
2. A plan for coordination and implementation of all measures and any additional plans and programs required therein.
3. A description of all measures the Applicant will take to assure compliance, including field monitoring, data collection, management and coordination of all field personnel and feedback to field personnel and affected agencies.
4. A contractor to carry out the EQAP shall be selected by the City Planning Division. The contractor(s) will be under contract and responsible to the City, with all costs to be funded by the Applicant. The EQAP contractor shall appoint at least one On-site Environmental Coordinator (OEC) responsible for overall monitoring, but shall employ as many qualified specialists as necessary, as determined by the Planning Division, to oversee specific mitigation areas. In addition, the OEC has the authority and ability to ensure compliance with all project conditions and to stop work in an emergency.
5. Contractor feedback responsibilities shall include status reports (as specified in EQAP) to be prepared throughout the construction and operation of the proposed Project. These shall include status of development, status of conditions, incidents of non-compliance and their results and any other pertinent or requested data.

The EQAP shall also provide for any appropriate procedures not specified in the conditions of approval to be carried out if they are necessary to avoid environmental impacts.

7.3 Mitigation Compliance Responsibility

The responsibility for implementing adopted mitigation measures rests with the Applicant, unless otherwise specified in the measure, for the life of the Project. As Lead Agency under CEQA, the City of Carson is responsible for monitoring an approved project to ensure that required mitigation measures are implemented. The purpose of the MMRP is to document that the mitigation measures required by the City are implemented and that mitigated environmental impacts are reduced to the level identified in the EIR.

When a mitigation measure requires that a study or plan be developed during the design or pre-construction phase of the project, the Applicant must submit the final study or plan to the City for review and approval. Any study or plan that requires approval of the City must allow time for adequate review.

7.4 General Monitoring Procedures

7.4.1 Environmental Monitors and County Inspectors

Various permit conditions of approval, and plan requirements will require implementation (1) prior to the start of construction (such as project final design review and plan development), and (2) during construction and operations. The City and its EQAP contractor are responsible for integrating the mitigation monitoring procedures into the construction and operation processes in coordination with the Applicant for City issued permits. To oversee the monitoring procedures and to ensure success, the assigned EQAP OEC(s) must be onsite during construction activity having the potential to create a significant environmental impact or other impact for which mitigation is required. Likewise, the EQAP

OEC(s) and agency Inspectors will be onsite to ensure compliance with their respective authorities during construction and operations.

7.4.2 Operations and Construction Personnel

A key element in the success of mitigation and mitigation monitoring is the full cooperation of project personnel and supervisors, during both construction and operations. Successful implementation of many of the mitigation measures requires specific actions and behaviors on the part of the supervisors or crews working for the Applicant on the project. To ensure success, the following actions would be taken:

- Specific procedures to be followed by construction and operations contractor companies engaged to do their respective work would be written into their contracts with the Applicant. Procedures to be followed by construction and operations personnel would be written into an agreement that all construction and operation personnel would be asked to sign, denoting consent to the procedures regardless if Applicant staff or contractor.
- A Worker Environmental Awareness Program would be conducted to inform and train construction and operations personnel about the requirements of the monitoring program (as detailed in the EQAP). The OEC(s) would verify that each crew member received the required training.
- A written summary of mitigation monitoring procedures would be provided to construction and operations supervisors for all mitigation measures requiring their respective attention.

7.4.3 General Reporting Procedures

A checklist will be developed and maintained by the City EQAP contractor to track all mitigation measure requirements, including timing. The EQAP OEC(s) will note any problems that may occur and take appropriate action to rectify the problems. Consolidated reports will be prepared by the City EQAP OEC(s) documenting construction activities, compliance activities observed across issue areas, notification of compliance issues by the Applicant, any issues and their resolution, and photographs of relevant activities and conditions. These reports would be generated on an as needed basis based upon the activities that are occurring.

The Applicant is to provide the City with written reports of the Project, which shall include progress of construction, resulting impacts, mitigation implemented, and all other noteworthy elements of the Project. These reports would be generated on an as needed basis based upon the activities that are occurring and based upon the reporting schedule provided in the EQAP.

The public is allowed access to records and reports used to track the monitoring program. Monitoring records and reports will be made available for public inspection by the City or its designee on request.

7.5 Mitigation Monitoring Tables

The Applicant's application contained several Avoidance and Minimization Measures (AMMs) to minimize the Project's environmental impacts. The Applicant would implement these measures during the design, construction, and operation of the pipeline.

Table 7.5.1 Avoidance and Minimization Measure Summary

Issue Area	Measures
Air Quality	Fugitive dust mitigation measures: Water all active construction sites at least twice daily. Frequency should be based on the type of operation, soil, and wind exposure. Implement SCAQMD Rule 1166, including all notification/monitoring/management requirements. Reduce travel speeds of onsite vehicles on unpaved roads and surfaces within the pipeline trench construction area to 15 miles per hour. Cover inactive storage piles. Sweep streets if visible solid material is carried out from the construction site.
Biological Resources	Schedule ground-clearing activities prior to the initiation of nesting activity (April) or after fledging (August); or Conduct pre-construction surveys between February 15 and August 15 in potential raptor and bird nesting habitat to identify nest sites. If an active nest is observed within the vicinity of the Project site, contact California Department of Fish and Wildlife to establish the appropriate buffer around the nest tree. For identified raptors nests, a 350-foot buffer around the nest tree would be activated. Construction activities would be prohibited in the buffer zone until the young have fledged the nest.
Cultural Resources	A professional archaeologist and Native American monitor would be retained to monitor all Project related earth disturbances within the first 100 feet of the underground portion of the Project site. The area recommended for monitoring would start approximately 400 feet southeast of the intersection with South Alameda Street and where the Project site transitions from aboveground to underground. The area would continue east for 100 feet into the Air Products Carson Hydrogen Facility. At the commencement of Project construction, an archaeological monitor shall give all workers associated with earth-disturbing procedures an orientation regarding the probability of exposing cultural resources and directions as to what steps are to be taken if a find is encountered. The archaeologist shall have the authority to temporarily halt or redirect Project construction in the event that potentially significant cultural resources are exposed Based on monitoring observations and the actual extent of Project disturbance, the lead archaeologist shall have the authority to refine the monitoring requirements as appropriate (i.e., change to spot checks, reduce or increase the area to be monitored) in consultation with Air Products and the lead CEQA Agency. If human remains are unearthed, State Health and Safety Code Section 7050.5 requires that no further disturbance shall occur within that area until the County Coroner has made the necessary findings as to origin and disposition to be of Native American descent. The Coroner has 24 hours to notify the Native American Heritage Commission. The lead CEQA Agency and Air Products shall also be notified of any such find.
Geology and Soils	Engineering analysis for Project design would include recommended geotechnical engineering measures for ground shaking, liquefaction hazards, and expansive soils as necessary.
Hazardous and Hazardous Materials	Equipment refueling would be conducted away from waterway areas. Hazardous materials utilized for Project construction would be stored in their original containers within secure staging areas or storage containers.

Table 7.5.1 Avoidance and Minimization Measure Summary

Issue Area	Measures
	Spill containment and cleanup materials would be stored on-site for clean-up of spills during refueling or servicing of equipment. A Quantitative Risk Assessment (QRA) would be prepared and would discuss the safety and public risk issues associated with Project facilities. These discussions would include information regarding hydrogen gas, pipeline safety standards, incident statistics, and associated Project design considerations. The QRA will present a quantitative risk assessment of the likelihood and consequences of unintentional pipeline releases. A Phase II site assessment would be completed in areas along the proposed pipeline route identified with a high likelihood of encountering soil from current or historical petroleum transportation or refining activities. The objective of the Phase II site assessment activities would be to identify the areas of soil contamination where special worker protection and waste handling/disposal requirements would be required during pipeline construction activities. Air Products will comply with SCAQMD Rule 1166 which would dictate removal of any VOC-contaminated soil (50 ppm or greater) from site using end dumps provided by Waste Management and taken to a local, approved landfill for disposal (estimated to be less than 100 cy based on soil analytical data). A Contaminated Materials Management Plan (CMMP) would be prepared and implemented during the course of the construction activities planned at the Project site. The CMMP will include maps illustrating areas of suspected or known soil contamination. The CMMP will also include the methods for identification of contaminated materials, and removal/disposal of contaminated materials. A site-specific Health and Safety Plan would be developed for the protection of workers and the community during the handling of contaminated materials. The operator would establish a continuing educational program to enable the public, appropriate government organizations and persons engaged in excavation-related activities to recognize a hazardous gas pipeline emergency and to report it to the operator or the fire, police, or other appropriate officials. The contractor would notify Underground Service Alert at least 48 hours prior to excavation so that utilities can be marked and avoided during construction. The pipeline would operate at a pressure of 260 pounds per square inch gauge (psig) but wil be designed for a Maximum Allowable Operating Pressure (MAOP) of 300 psig. Ten manual valves would be removed and replaced by welded piping.
Hydrology and Water Quality	A SWPPP would be prepared for construction activities associated with the proposed Project. The SWPPP will aid in the determination of best management practices (BMPs) to prevent any pollution into the water bodies crossed by the Project site. All BMPs will be implemented to the extent feasible.
Noise	Equipment engine covers shall be in place and mufflers shall be in good working condition.
Public Services	The following measures would be taken to prevent damage to existing utilities and substructures: coordination with owners of existing substructures, use of prequalified experienced construction contractor, use of electronic line locators, pre-excavation meetings, extensive use of potholing, and non-mechanical digging in the immediate vicinity of known substructures.

Table 7.5.1 Avoidance and Minimization Measure Summary

Issue Area	Measures
	Solid waste generated during construction would be collected from the Project site and disposed in accordance with applicable regulations. Concrete and asphalt rubble generated by the Project would be appropriately recycled.
Traffic and Circulation	Traffic control measures would be implemented in accordance with the Work Area Traffic Control Handbook. These measures include appropriate visual traffic control including signs, traffic cones, and flaggers. These measures are intended to reduce hazards to both workers and motorists during construction. Warning signs would be installed prior to construction to notify through traffic of trucks entering and leaving the site and to allow commuters to plan for alternative routes. Alternative vehicle and pedestrian access would be established. Construction would be minimized during Holidays when feasible.

Source: Applicant/Padre Associates, Inc.

The following tables present the monitoring and reporting plan requirements for the mitigation measures identified in the environmental analysis sections of this EIR (see Sections 4.1 through 4.6), by issue area.

Table 7.5.2 Mitigation Monitoring and Reporting Plan

MM #	MM Title	Monitoring/ Reporting Action	Timing & Method of Verification	City Responsibility	Applicant Responsibilities
Hazardous Materials and Risk of Upset					
HM-2a	Maximum Pressure Allowance	Maximum operating pressure at any point in the pipeline of 160 psia.	During Operation	City reviews information on pipeline operating pressure and pipeline maintenance.	Operate the pipeline at a max. pressure at any point in the pipeline of 160 psia. Maintain information on operating pressure. Report information on pipeline maintenance to City.
HM-2b	Testing and Monitoring for Hydrogen Issues	Monitor pipeline annually for any issues that could indicate increased rate of the loss of pipeline integrity.	During Operation	City reviews information on pipeline monitoring procedure and inspections.	Monitor and inspect pipeline annually for hydrogen issues. Document pipeline monitoring procedure.
HM-2c	Pressure Testing	Pressure test pipeline at a MAOP to test pressure ratio of at least 3.0. Perform testing per PHMSA requirements.	During Operation	City monitors compliance.	Continue to pressure test the pipeline at a MAOP to test pressure ratio of at least 3.0. Perform testing per PHMSA requirements.
HM-4a	Contaminated Materials Management Plan	Prepare and implement a Contaminated Materials Management Plan.	During Construction	City review and approval. City staff to monitor implementation.	Prepare and submit a Contaminated Materials Management Plan.

Table 7.5.2 Mitigation Monitoring and Reporting Plan

MM #	MM Title	Monitoring/ Reporting Action	Timing & Method of Verification	City Responsibility	Applicant Responsibilities
					Implement plan requirements for construction period.
Transportation and Circulation					
T-1	Alternative Vehicle and Pedestrian Access	Prepare and implement a route specific traffic and circulation plan for alternative vehicle and pedestrian access.	During Construction	City reviews and approves the traffic and circulation plan. City monitors implementation.	Prepare and submit a route specific traffic and circulation plan. Implement plan requirements for the construction period.
T-4	Emergency Response Access	Identify alternative routes and notify emergency response providers.	Prior to and During Construction	City monitors compliance.	Provide emergency response providers with advance notice of construction schedule and locations, road closures, and alternate routes.
Tribal Cultural Resources					
TC-1a	Retain a Native American Monitor/Consultant	Retain an approved tribal monitor/ consultant on-site during construction to complete daily monitoring logs.	During Construction	City monitors compliance.	Retain and compensate for the services of a tribal monitor/consultant for the duration of ground-disturbing construction activities.
TC-1b	Unanticipated Discovery of Tribal Cultural and Archaeological Resources	Retain tribal monitor and qualified archaeologist on-site during construction period. Follow CEQA Guidelines Section 15064.5(f) if required.	During Construction	City monitors compliance.	Cease construction in the vicinity of the find until find is assessed by archaeologist and tribal monitor. Comply with any additional mitigation.
TC-2	Unanticipated Discovery of Human Remains	Divert work. Notify the Tribe, the qualified lead archaeologist, the construction manager, and the County Coroner.	During Construction	City monitors compliance.	Divert work and establish exclusion zone around discovery location. Report to County Coroner. Follow PRC 5097.98 if required.

This Page Left Intentionally Blank

8.0 List of Preparers and Contacts

This Environmental Impact Report (EIR) was prepared by the City of Carson (City) Community Development Department, Planning Division staff, with assistance from MRS Environmental, Inc. under contract to the City. Substantial information was also provided by the Applicant. Information provided by the Applicant was reviewed by the City prior to inclusion in the EIR.

The Applicant and their consultants were not directly involved in preparation of the environmental analyses in the Draft EIR but did review of the portion of Section 2.0 covering the Project Description. The Applicant also provided several technical studies as part of their application. These studies were all peer reviewed by the City and their consultants, and many of the studies were updated by the Applicant based upon the City peer review. The Applicant also provided additional technical information in response to information requests by the City during the preparation of the EIR. The Appendices provide the final technical reports submitted by the Applicant.

The City's Community Development Department, Planning Division also coordinated with the South Coast Air Quality Management District (SCAQMD) on the air quality and climate change/greenhouse gas sections of the EIR.

The following persons associated with the City's Community Development Department, Planning Division were directly involved in preparing the EIR:

Max Castillo, Assistant Planner
Alvie Betancourt, Planning Manager

The following persons were contacted in preparing this EIR, in addition to those listed above:

Jillian Wong, South Coast Air Quality Management District
Lijin Sun, South Coast Air Quality Management District
Bhaskar Chandan, South Coast Air Quality Management District
Thomas Lee, South Coast Air Quality Management District
Andy Salas, Gabrieleno Band of Mission Indians - Kizh Nation

MRS Environmental, Inc. staff and involved in the preparation of the EIR included the following:

Company (Affiliation)	Key Contributors	Responsibilities
MRS Environmental, Inc (prime contractor)	John Peirson, Jr., BA	Hazardous Materials and Risk of Upset
	Gregory Chittick, BS, MS	Project Alternatives Hazardous Materials and Risk of Upset
	Luis Perez, BA, MA	EIR Project Manager
	Dean Dusette, BA	Project Description Air Quality Climate Change and Greenhouse Gas Emissions Hazardous Materials and Risk of Upset
	Nicole Trezza, BS	Land Use Transportation and Circulation Tribal Cultural Resources

This Page Left Intentionally Blank