Global Climate Change Evaluation

for the

J Street Drain Project
Ventura County, California

Submitted To:

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1.0 INTRODUCTION

This report presents an assessment of potential global climate change impacts associated with the proposed J Street Drain Project proposed by the Ventura County Watershed Protection District (District) in Ventura County, California. The J Street Drain is located within a Ventura County easement which includes the concrete channel, some box culverts under the roadways, and, south of Hueneme Road, an adjacent access road. The drain itself is located near the border between City of Oxnard and City of Port Hueneme. The proposed construction of the J Street Drain could potentially impact the land uses and roadways of both cities during construction activities.

The purpose of the proposed project is to provide flood protection to the 100-year flood level for the area surrounding J Street Drain. Protection from a 100-year flood is the standard set by the Federal Emergency Management Agency (FEMA) under the National Flood Insurance Program (NFIP). The need for such protection is evidenced by the studies that show the existing drain has the capacity to handle only a ten-year flood event without overtopping the channel. Without the increase in flood protection the local area would continue to be susceptible to flooding, as well as federal requirements to purchase flood insurance for properties within the 100-year flood zone defined by FEMA after they update existing flood maps for the project area in the future.

The proposed project involves converting the existing trapezoidal concrete channel into an open rectangular channel with a bottom approximately four feet deeper than the existing channel bottom. The existing trapezoidal channel would be widened and deepened to increase the capacity; the channel walls would be vertical with the top being an open channel. The existing box culverts under the street crossings and railroad crossing would be replaced by larger structures to improve flow conveyance. The existing concrete lining ends approximately 50 feet south of the Hueneme Drain Pump Station. Because the concrete lined portion of the channel invert would be lowered about 2.5 feet to create the required capacity, excavation would continue downstream towards the ocean. The finished invert would be daylighted via an earthen ramp to the lagoon at a 10:1 slope over a distance of up to 40 feet from the end of the existing concrete. A six- to eight-foot thick layer of four-ton rock riprap would be placed on the earthen ramp at the end of the concrete drain to dissipate energy flow.

The demolition of the existing drain and construction of the new, higher capacity drain would take place in phases. It is anticipated that the demolition and construction would start at the southern end of the drain, south of Hueneme Road and move northward in phases. The construction phases are anticipated as:

- Phase I–Downstream end of the Drain to north side of Hueneme Road (3430 lineal feet);
- Phase II–Hueneme Road to Pleasant Valley Road (2620 lineal feet);
- Phase III–Pleasant Valley Road to Yucca Street (4100 lineal feet); and
- Phase IV–Yucca Street to just north of Redwood Street (2680 lineal feet).

Each of these phases would occur independently rather than concurrently. A detailed description of construction activities required for the project is provided in Section 4.0. It is anticipated that maintenance of the reconstructed drain will be similar to the existing maintenance activities.

This evaluation addresses the potential for greenhouse gas emissions during construction and after full buildout of the project. The analysis provides an evaluation of the potential for adverse environmental impacts that the project may have on global climate change (GCC).

1.1 General Principles and Existing Conditions

Global climate change refers to changes in average climatic conditions on Earth as a whole, including temperature, wind patterns, precipitation and storms. Global temperatures are moderated by naturally occurring atmospheric gases, including water vapor, carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O), which are known as greenhouse gases (GHGs). These gases allow solar radiation (sunlight) into the Earth's atmosphere, but prevent radiative heat from escaping, thus warming the Earth's atmosphere. Gases that trap heat in the atmosphere are often called greenhouse gases, analogous to a greenhouse. GHGs are emitted by both natural processes and human activities. The accumulation of GHGs in the atmosphere regulates the Earth's temperature. Without these natural GHGs, the Earth's temperature would be about 61º Fahrenheit cooler (California Environmental Protection Agency 2006). Emissions from human

activities, such as electricity production and vehicle use, have elevated the concentration of these gases in the atmosphere.

GHGs have been at the center of a widely contested political, economic, and scientific debate surrounding GCC. Although the conceptual existence of GCC is generally accepted, the extent to which GHGs contribute to it remains a source of debate. The State of California has been at the forefront of developing solutions to address GCC. GCC refers to any significant change in measures of climate, such as average temperature, precipitation, or wind patterns over a period of time. GCC may result from natural factors, natural processes, and/or human activities that change the composition of the atmosphere and alter the surface and features of land.

Global climate change attributable to anthropogenic (human) emissions of GHGs (mainly CO_2, CH_4 and N_2O) is currently one of the most important and widely debated scientific, economic and political issues in the United States. Historical records indicate that global climate changes have occurred in the past due to natural phenomena (such as during previous ice ages). Some data indicate that the current global conditions differ from past climate changes in rate and magnitude.

The United Nations Intergovernmental Panel on Climate Change (IPCC) constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. The Panel concluded that a stabilization of GHGs at 400 to 450 parts per million (ppm) CO_2 equivalent concentration is required to keep global mean warming below 3.6º Fahrenheit (2º Celsius), which is assumed to be necessary to avoid dangerous climate change (Association of Environmental Professionals 2007).

State law defines greenhouse gases as any of the following compounds: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6) (California Health and Safety Code Section 38505(g).) CO_2, followed by CH_4 and N_2O, are the most common GHGs that result from human activity.

1.2 Sources and Global Warming Potentials of GHG

The State of California GHG Inventory performed by the California Air Resources Board (ARB), compiled statewide anthropogenic GHG emissions and sinks. It includes estimates for CO_2, CH_4, N_2O, SF_6, HFCs, and PFCs. The current inventory covers the years 1990 to 2008, and is summarized in Table 1. Data sources used to calculate this GHG inventory include California and federal agencies, international organizations, and industry associations. The calculation methodologies are consistent with guidance from the IPCC. The 1990 emissions level is the sum total of sources and sinks from all sectors and categories. The inventory is divided into seven broad sectors and categories in the inventory. These sectors include: Agriculture; Commercial; Electricity Generation; Forestry; Industrial; Residential; and Transportation.

When accounting for GHGs, all types of GHG emissions are expressed in terms of CO_2 equivalents (CO_2e) and are typically quantified in metric tons (MT) or millions of metric tons (MMT).

Table 1
STATE OF CALIFORNIA GHGS BY SECTOR

Sector	Total 1990 Emissions ($MMTCO_2e$)	Percent of Total 1990 Emissions	Total 2008 Emissions ($MMTCO_2e$)	Percent of Total 2008 Emissions
Agriculture	23.4	5%	28.06	6%
Commercial	14.4	3%	14.68	3%
Electricity Generation	110.6	26%	116.35	25%
Forestry (excluding sinks)	0.2	<1%	0.19	<1%
Industrial	103.0	24%	92.66	20%
Residential	29.7	7%	28.45	6%
Transportation	150.7	35%	174.99	37%
Recycling and Waste	Not available	Not available	6.71	1%
High GWP Gases	Not available	Not available	15.65	3%
Forestry Sinks	(6.7)		(3.98)	

GHGs have varying global warming potential (GWP). The GWP is the potential of a gas or aerosol to trap heat in the atmosphere; it is the "cumulative radiative forcing effect of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference

gas" (USEPA 2006). The reference gas for GWP is CO_2; therefore, CO_2 has a GWP of 1. The other main greenhouse gases that have been attributed to human activity include CH_4, which has a GWP of 21, and N_2O, which has a GWP of 310. Table 2 presents the GWP and atmospheric lifetimes of common GHGs.

Table 2
GLOBAL WARMING POTENTIAL AND ATMOSPHERIC LIFETIMES OF GHGs

GHG	Formula	100-Year Global Warming Potential	Atmospheric Lifetime (Years)
Carbon Dioxide	CO_2	1	Variable
Methane	CH_4	21	12 ± 3
Nitrous Oxide	N_2O	310	120
Sulfur Hexafluoride	SF_6	23,900	3,200

Human-caused sources of CO_2 include combustion of fossil fuels (coal, oil, natural gas, gasoline and wood). Data from ice cores indicate that CO_2 concentrations remained steady prior to the current period for approximately 10,000 years. Concentrations of CO_2 have increased in the atmosphere since the industrial revolution.

CH_4 is the main component of natural gas and also arises naturally from anaerobic decay of organic matter. Human-caused sources of natural gas include landfills, fermentation of manure and cattle farming. Human-caused sources of N_2O include combustion of fossil fuels and industrial processes such as nylon production and production of nitric acid.

Other GHGs are present in trace amounts in the atmosphere and are generated from various industrial or other uses.

The sources of GHG emissions, GWP, and atmospheric lifetime of GHGs are all important variables to be considered in the process of calculating CO_2e for discretionary land use projects that require a climate change analysis.

1.3 Regulatory Framework

All levels of government have some responsibility for the protection of air quality, and each level (Federal, State, and regional/local) has specific responsibilities relating to air quality regulation. GHG emissions and the regulation of GHGs is a relatively new component of air quality.

1.3.1 National and International Efforts

International and Federal legislation have been enacted to deal with GCC issues. In 1988, the United Nations and the World Meteorological Organization established the IPCC to assess the scientific, technical, and socioeconomic information relevant to understanding the scientific basis for human-induced climate change, its potential impacts, and options for adaptation and mitigation. The most recent reports of the IPCC have emphasized the scientific consensus that real and measurable changes to the climate are occurring, that they are caused by human activity, and that significant adverse impacts on the environment, the economy, and human health and welfare are unavoidable.

In October 1993, President Clinton announced his Climate Change Action Plan (CCAP), which had a goal of returning GHG emissions to 1990 levels by the year 2000. This was to be accomplished through 50 initiatives that relied on innovative voluntary partnerships between the private sector and government aimed at producing cost-effective reductions in GHG emissions. On March 21, 1994, the United States joined a number of countries around the world in signing the United Nations Framework Convention on Climate Change (UNFCCC). Under the Convention, governments agreed to gather and share information on GHG emissions, national policies, and best practices; launch national strategies for addressing GHG emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of GCC. Recently, the United States Supreme Court declared in the court case of Massachusetts et al. vs. the Environmental Protection Agency et al., 549 C.S. 497 (2007) that the EPA does have the ability to regulate GHG emissions. In addition to the national and international efforts described above, many local jurisdictions have adopted climate change policies and programs.

Endangerment Finding. On April 17, 2009, EPA issued its proposed endangerment finding for GHG emissions. On December 7, 2009, the EPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the Clean Air Act:

> **Endangerment Finding:** The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases--carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)--in the atmosphere threaten the public health and welfare of current and future generations.
>
> **Cause or Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

The endangerment findings do not themselves impose any requirements on industry or other entities. However, this action is a prerequisite to finalizing the EPA's proposed greenhouse gas emission standards for light-duty vehicles, which were jointly proposed by EPA and the Department of Transportation's National Highway Safety Administration on September 15, 2009.

Mandatory GHG Reporting Rule. On March 10, 2009, in response to the FY2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110–161), EPA proposed a rule that requires mandatory reporting of greenhouse gas (GHG) emissions from large sources in the United States. The proposed rule would collect accurate and comprehensive emissions data to inform future policy decisions.

EPA is proposing that suppliers of fossil fuels or industrial greenhouse gases, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHGs submit annual reports to EPA. The gases covered by the proposed rule are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), sulfur

hexafluoride (SF_6), and other fluorinated gases including nitrogen trifluoride (NF_3) and hydrofluorinated ethers (HFE).

Corporate Average Fuel Economy Standards. The federal Corporate Average Fuel Economy (CAFE) standard determines the fuel efficiency of certain vehicle classes in the United States. In 2007, as part of the Energy and Security Act of 2007, CAFE standards were increased for new light-duty vehicles to 35 miles per gallon by 2020. In May 2009, President Obama announced plans to increase CAFE standards to require light-duty vehicles to meet an average fuel economy of 35.5 miles per gallon by 2016. On April 1, 2010, the U.S. Department of Transportation and the EPA established historic new federal rules that set the first-ever national greenhouse gas emissions standards and will significantly increase the fuel economy of all new passenger cars and light trucks sold in the United States. The standards set a requirement to meet an average fuel economy of 34.1 miles per gallon by 2016.

1.3.2 State Regulations and Standards

The following subsections describe regulations and standards that have been adopted by the State of California to address GCC issues.

Assembly Bill 32, the California Global Warming Solutions Act of 2006. In September 2006, Governor Schwartzenegger signed California AB 32, the global warming bill, into law. AB 32 directs the ARB to do the following:

- Make publicly available a list of discrete early action GHG emission reduction measures that can be implemented prior to the adoption of the statewide GHG limit and the measures required to achieve compliance with the statewide limit.
- Make publicly available a GHG inventory for the year 1990 and determine target levels for 2020.
- On or before January 1, 2010, adopt regulations to implement the early action GHG emission reduction measures.
- On or before January 1, 2011, adopt quantifiable, verifiable, and enforceable emission reduction measures by regulation that will achieve the statewide GHG emissions limit by

2020, to become operative on January 1, 2012, at the latest. The emission reduction measures may include direct emission reduction measures, alternative compliance mechanisms, and potential monetary and non-monetary incentives that reduce GHG emissions from any sources or categories of sources that ARB finds necessary to achieve the statewide GHG emissions limit.

- Monitor compliance with and enforce any emission reduction measure adopted pursuant to AB 32.

AB 32 required that by January 1, 2008, ARB would determine what the statewide GHG emissions level was in 1990, and approve a statewide GHG emissions limit that is equivalent to that level, to be achieved by 2020. ARB adopted its Scoping Plan in December 2008, which provided estimates of the 1990 GHG emissions level and identified sectors for the reduction of GHG emissions. The ARB has estimated that the 1990 GHG emissions level was 427 MMT net CO_2e (ARB 2007b). The ARB estimates that a reduction of 173 MMT net CO_2e emissions below business-as-usual would be required by 2020 to meet the 1990 levels (ARB 2007b). This amounts to a 15 percent reduction from today's levels, and a 30 percent reduction from projected business-as-usual levels in 2020 (ARB 2008a).

Senate Bill 97. Senate Bill 97, enacted in 2007, amends the CEQA statute to clearly establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. It directs the Governor's Office of Planning and Research (OPR) to develop draft CEQA guidelines "for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions" by July 1, 2009 and directs the Resources Agency to certify and adopt the CEQA guidelines by January 1, 2010.

The OPR published a technical advisory on CEQA and Climate Change on June 19, 2008. The guidance did not include a suggested threshold, but stated that the OPR has asked CARB to, "recommend a method for setting thresholds which will encourage consistency and uniformity in the CEQA analysis of greenhouse gas emissions throughout the state." The OPR does recommend that CEQA analyses include the following components:

- Identify greenhouse gas emissions
- Determine Significance
- Mitigate Impacts

In April, the OPR published its proposed revisions to CEQA to address GHG emissions. The amendments to CEQA indicate the following:

- Climate action plans and other greenhouse gas reduction plans can be used to determine whether a project has significant impacts, based upon its compliance with the plan.
- Local governments are encouraged to quantify the greenhouse gas emissions of proposed projects, noting that they have the freedom to select the models and methodologies that best meet their needs and circumstances. The section also recommends consideration of several qualitative factors that may be used in the determination of significance, such as the extent to which the given project complies with state, regional, or local GHG reduction plans and policies. OPR does not set or dictate specific thresholds of significance. Consistent with existing CEQA Guidelines, OPR encourages local governments to develop and publish their own thresholds of significance for GHG impacts assessment.
- When creating their own thresholds of significance, local governments may consider the thresholds of significance adopted or recommended by other public agencies, or recommended by experts.
- New amendments include guidelines for determining methods to mitigate the effects of greenhouse gas emissions in Appendix F of the CEQA Guidelines.
- OPR is clear to state that "to qualify as mitigation, specific measures from an existing plan must be identified and incorporated into the project; general compliance with a plan, by itself, is not mitigation."
- OPR's emphasizes the advantages of analyzing GHG impacts on an institutional, programmatic level. OPR therefore approves tiering of environmental analyses and highlights some benefits of such an approach.
- Environmental impact reports (EIRs) must specifically consider a project's energy use and energy efficiency potential.

On July 3, 2009 the California Natural Resources Agency published proposed amendment of regulations based on OPR's proposed revisions to CEQA to address GHG emissions. On that date, the Natural Resources Agency commenced the Administrative Procedure Act rulemaking process for certifying and adopting these amendments pursuant to Public Resources Code section 21083.05. Having reviewed and considered all comments received, on December 30, 2009, the Natural Resources Agency adopted the proposed amendments to the state CEQA guidelines in

the California Code of Regulations. The amendments were formally adopted on March 18, 2010.

Executive Order S-3-05. Executive Order S-3-05, signed by Governor Schwartzenegger on June 1, 2005, calls for a reduction in GHG emissions to 1990 levels by 2020 and for an 80 percent reduction in GHG emissions by 2050. Executive Order S-3-05 also calls for the California EPA (CalEPA) to prepare biennial science reports on the potential impact of continued GCC on certain sectors of the California economy. The first of these reports, "Our Changing Climate: Assessing Risks to California", and its supporting document "Scenarios of Climate Change in California: An Overview" were published by the California Climate Change Center in 2006.

California Code of Regulations Title 24. Although not originally intended to reduce greenhouse gas emissions, California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The GHG emission inventory was based on Title 24 standards as of October 2005; however, Title 24 was updated as of 2008 and standards began to be phased in summer 2009. Energy efficient buildings require less electricity, natural gas, and other fuels. Electricity production from fossil fuels and on-site fuel combustion (typically for water heating) results in greenhouse gas emissions. Therefore, increased energy efficiency results in decreased greenhouse gas emissions.

State Standards Addressing Vehicular Emissions. California Assembly Bill 1493 (Pavley) enacted on July 22, 2002, required the ARB to develop and adopt regulations that reduce greenhouse gases emitted by passenger vehicles and light duty trucks. Regulations adopted by ARB would apply to 2009 and later model year vehicles. ARB estimated that the regulation would reduce GHG emissions from light duty passenger vehicle fleet by an estimated 18% in 2020 and by 27% in 2030 (AEP 2007). In 2005, the ARB requested a waiver from EPA to enforce the regulation, as required under the Clean Air Act. The waiver was granted on June

30, 2009, and the state of California is implementing regulations to set forth greenhouse gas emission standards for vehicles. It is expected that the Pavley regulations will reduce GHG emissions from California passenger vehicles by about 22 percent in 2012 and about 30 percent in 2016, all while improving fuel efficiency and reducing motorists' costs.

Executive Order S-01-07. Executive Order S-01-07 was enacted by the Governor on January 18, 2007. Essentially, the order mandates the following: 1) that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020; and 2) that a Low Carbon Fuel Standard ("LCFS") for transportation fuels be established for California. It is assumed that the effects of the LCFS would be a 10% reduction in GHG emissions from fuel use by 2020. On April 23, 2009, ARB adopted regulations to implement the LCFS.

Senate Bill 375. Senate Bill 375 requires that regions within the state which have a metropolitan planning organization must adopt a sustainable communities strategy as part of their regional transportation plans. The strategy must be designed to achieve certain goals for the reduction of GHG emissions. The bill finds that GHG from autos and light trucks can be substantially reduced by new vehicle technology, but even so "it will be necessary to achieve significant additional greenhouse gas reductions from changed land use patterns and improved transportation. Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32." SB 375 provides that new CEQA provisions be enacted to "encourage developers to submit applications and local governments to make land use decisions that will help the state achieve its goals under AB 32," and that "current planning models and analytical techniques used for making transportation infrastructure decisions and for air quality planning should be able to assess the effects of policy choices, such as residential development patterns, expanded transit service and accessibility, the walkability of communities, and the use of economic incentives and disincentives."

2.0 POTENTIAL CLIMATE CHANGE IMPACTS TO PROJECT SITE

2.1 Existing Conditions

The J Street Drain is an existing concrete-lined channel that is designed to accommodate water during storm events. The project is designed to increase capacity of the existing channel to reduce flooding in residential and commercial areas of Oxnard and Port Hueneme, and to improve stormwater flow through the drain.

In addition to the drain capacity, the outlet of the drain is sometimes constrained by a sand berm that can reach over seven feet in height surrounding the Ormond Beach Lagoon. The sand berm hinders the direct flow path of the J Street Drain channel to the Pacific Ocean. The berm currently directs the water to the east, toward the Oxnard Industrial Drain (OID). If the berm does not open during a storm event, then storm water ponds in the Lagoon and can fill the drain to capacity as far as Hueneme Road, posing a flood risk to the Oxnard Wastewater Treatment Plant (OWWTP), residential, and commercial property even during minor storms.

Prior to 1992, the sand berm at the Ormond Beach Lagoon was periodically breached by the District. Bulldozers were used to create a discharge path directly to the ocean and prevent water and silt buildup in the channel. However, this practice ceased in 1992 due to environmental concerns and restrictions. Under existing conditions, natural breaching typically occurs when the surface water in the lagoon reaches an elevation of 7.5 to 8 feet above mean sea level (AMSL). However, the expected maximum water level in the lagoon is regulated by the lowest beach crest elevation (the height of the sand berm). Natural breaching takes place after the lagoon water level exceeds the height of the sand berm. Due to constant wind and wave action, the elevation across the sand berm is not uniform in space or constant in time and its maximum elevation is approximately 11.6 feet National Geodetic Vertical Datum of 1929 (NGVD) (14 feet North American Vertical Datum of 1988 [NAVD]). Due to the dynamic nature of the Lagoon and sand berm elevation, surface water elevation for natural breaching will likely vary. Therefore, natural breaching at the lagoon may not occur during a ten-year flood event (capacity of existing drain) in which case the project area would flood due to backwater effects.

2.2 Typical Adverse Effects

The Climate Scenarios Report (CCCC 2006), uses a range of emissions scenarios developed by the IPCC to project a series of potential warming ranges (i.e., temperature increases) that may occur in California during the 21st century. Three warming ranges were identified: Lower warming range (3.0 to 5.5 degrees Fahrenheit (ºF)); medium warming range (5.5 to 8.0 ºF); and higher warming range (8.0 to 10.5 ºF). The Climate Scenarios report then presents an analysis of the future projected climate changes in California under each warming range scenario.

According to the report, substantial temperature increases would result in a variety of impacts to the people, economy, and environment of California. These impacts would result from a projected increase in extreme conditions, with the severity of the impacts depending upon actual future emissions of GHGs and associated warming. These impacts are described below.

Public Health. Higher temperatures are expected to increase the frequency, duration, and intensity of conditions conducive to air pollution formation. For example, days with weather conducive to ozone (O_3) formation are projected to increase by 25 to 35 percent under the lower warming range and 75 to 85 percent under the medium warming range. In addition, if global background O_3 levels increase as is predicted in some scenarios, it may become impossible to meet local air quality standards. An increase in wildfires could also occur, and the corresponding increase in the release of pollutants including $PM_{2.5}$ could further compromise air quality. The Climate Scenarios report indicates that large wildfires could become up to 55 percent more frequent if GHG emissions are not significantly reduced.

Potential health effects from global climate change may arise from temperature increases, climate-sensitive diseases, extreme events, and air quality. There may be direct temperature effects through increases in average temperature leading to more extreme heat waves and less extreme cold spells. Those living in warmer climates are likely to experience more stress and heat-related problems (e.g., heat rash and heat stroke). In addition, climate sensitive diseases may increase, such as those spread by mosquitoes and other disease-carrying insects (such as malaria,

dengue fever, yellow fever, and encephalitis). This effect could occur in southern California in general and at the project site specifically.

Water Resources. A vast network of reservoirs and aqueducts capture and transport water throughout the State from northern California rivers and the Colorado River. The current distribution system relies on Sierra Nevada mountain snowpack to supply water during the dry spring and summer months. Rising temperatures, potentially compounded by decreases in precipitation, could severely reduce spring snowpack, increasing the risk of summer water shortages. In addition, if temperatures continue to rise more precipitation would fall as rain instead of snow, further reducing the Sierra Nevada spring snowpack by as much as 70 to 90 percent. The State's water resources are also at risk from rising sea levels. An influx of seawater would degrade California's estuaries, wetlands, and groundwater aquifers.

One of the purposes of the J Street Drain project is to improve stormwater flow and reducing potential flooding in the cities of Oxnard and Port Hueneme. The project would therefore alleviate potential flooding impacts in the event that global climate change affects the severity of storms and runoff.

Agriculture. Increased GHG and associated increases in temperature are expected to cause widespread changes to the agricultural industry, reducing the quantity and quality of agricultural products statewide. Significant reductions in available water supply to support agriculture would also impact production. Crop growth and development will change as will the intensity and frequency of pests and diseases. This effect would not impact the project because it is not an agricultural development.

Ecosystems/Habitats. Continued global warming will likely shift the ranges of existing invasive plants and weeds, thus alternating competition patterns with native plants. Range expansion is expected in many species while range contractions are less likely in rapidly evolving species with significant populations already established. Continued global warming is also likely to increase the populations of and types of pests. Continued global warming would also affect natural ecosystems and biological habitats throughout the State. The channel does

provide habitat for fish, including the endangered tidewater goby. Potential changes in global climate may have an effect on the fauna within the channel.

Wildland Fires. Global warming is expected to increase the risk of wildfire and alter the distribution and character of natural vegetation. If temperatures rise into the medium warming range, the risk of large wildfires in California could increase by as much as 55 percent, which is almost twice the increase expected if temperatures stay in the lower warming range. However, since wildfire risk is determined by a combination of factors including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the State. This effect could increase the potential for wildland fires in areas around the project site.

Rising Sea Levels. Rising sea levels, more intense coastal storms, and warmer water temperatures will increase the threat to the State's coastal regions. Under the high warming scenario, sea level is anticipated to rise 22 to 35 inches by 2100. A sea level rise of this magnitude would inundate coastal areas with salt water, accelerate coastal erosion, threaten levees and inland water systems, and disrupt wetlands and natural habitats.

One of the objectives of the project is to implement a Beach Elevation Management Plan for the Ormond Beach Lagoon, which would allow for breaching of the sand berm to facilitate drainage from the lagoon out to sea. Should sea levels rise, Ormond Beach Lagoon may be affected by natural breaching of the sand berm, and by infiltration of sea water into the drain. Because of the design of the project to increase the capacity of the J Street Drain, it is anticipated that the project will alleviate impacts to the extent possible.

3.0 CLIMATE CHANGE SIGNIFICANCE CRITERIA

According to the California Natural Resources Agency[1], "due to the global nature of GHG emissions and their potential effects, GHG emissions will typically be addressed in a cumulative impacts analysis." According to Appendix G of the CEQA Guidelines, the following criteria may be considered to establish the significance of GHG emissions:

Would the project:

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

As discussed in Section 15064.4 of the CEQA Guidelines, the determination of the significance of greenhouse gas emissions calls for a careful judgment by the lead agency, consistent with the provisions in Section 15064. Section 15064.4 further provides that a lead agency should make a good-faith effort, to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of GHG emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to:

(1) Use a model or methodology to quantify greenhouse gas emissions resulting from a project, and which model or methodology to use. The lead agency has discretion to select the model or methodology it considers most appropriate, provided it supports its decision with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use; and/or

(2) Rely on a qualitative analysis or performance based standards.

Section 15064.4 also advises a lead agency to consider the following factors, among others, when assessing the significance of impacts from greenhouse gas emissions on the environment:

[1] California Natural Resources Agency, Initial Statement of Reasons for Regulatory Action, Proposed Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gases Pursuant to SB 97. July 2009.

(1) The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;

(2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and

(3) 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 greenhouse gas emissions.

The California Air Pollution Control Officers Association (CAPCOA) recommended a threshold of 900 metric tons of CO_2e emissions as a threshold below which no further evaluation would be required, and no significant impact would occur (CAPCOA 2008). Lead agencies have utilized this threshold as an initial screening threshold to determine whether further evaluation is required.

To date, Ventura County has not adopted specific quantitative thresholds of significance for GHGs. The County has reviewed thresholds and approaches for evaluating significance based on guidance issued by the South Coast Air Quality Management District, the Bay Area Air Quality Management District, and the San Joaquin Valley Air Pollution Control District, but has not implemented any of the approaches used by these agencies.

In their evaluation of significance of GHG emissions uncer CEQA, the SCAQMD staff has established a GHG CEQA Significance Threshold Working Group. Members of the working group include government agencies implementing CEQA and representatives from various stakeholder groups that will provide input to the SCAQMD staff on developing GHG CEQA significance thresholds.

On December 5, 2008, the SCAQMD Governing Board adopted the staff proposal for an interim GHG significance threshold for projects where the SCAQMD is lead agency. On September 28, 2010, the SCAQMD recommended a threshold of 10,000 metric tons of CO_2e emissions annually for industrial projects. Given the nature of the project as a temporary construction

project, for the purpose of this document, the significance of impacts has been evaluated based on the SCAQMD's interim threshold for industrial projects of 10,000 metric tons of CO2e.
In addition to Ventura County guidance, the White House Council on Environmental Quality (CEQ) has also issued draft guidance directing Federal agencies on consideration of the effects of GHG emissions in NEPA documents. The CEQ indicated that the environmental analysis and documents in the NEPA process should provide the decision maker with information on (1) the GHG emissions effects of a proposed action and alternatives; and (2) the relationship of climate change effects to a proposed action or alternatives, including the relationship to proposed design, environmental impacts, mitigation, and adaptation measures. The draft guidance indicated that if a proposed action would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of CO_2e GHG emissions on an annual basis, agencies should conduct a qualitative and quantitative analysis of GHG impacts. The CEQ does not propose this level as an indicator of a threshold of significant effects, but rather as an indicator of the minimum level of GHG emissions that may warrant some description in the NEPA analysis.

The analysis contained within this Technical Report provides the recommended evaluation under both CEQA and NEPA. Because the SCAQMD's interim threshold of 10,000 metric tons of CO2e per year for industrial projects is more stringent than the CEQ's guideline of 25,000 metric tons of CO2e per year, the SCAQMD's threshold was utilized.

The SCAQMD also recommends that, to evaluate the Project's contribution of GHG emissions over a project lifetime (assumed to be 30 years), the project's construction GHG emissions be amortized over a 30-year period. The amortization approach has been followed in this analysis to assess the potential significance of construction emissions.

4.0 GREENHOUSE GAS INVENTORY

4.1 Construction Greenhouse Gas Emissions

The main source of GHG emissions associated with the proposed J Street Drain Project is generated from combustion of fossil fuels in construction equipment. Construction GHG emissions were calculated using the URBEMIS Model, Version 9.2.4. The URBEMIS Model contains the most recent emission factors from the ARB's EMFAC2007 and OFFROAD models. Model outputs are provided in Appendix A. The URBEMIS Model provides estimates of CO_2 emissions only; to estimate emissions of CH_4 and N_2O, the relative emission rates from combustion of diesel fuel were used to derive conversion factors. The CO_2-equivalent emissions were calculated by multiplying the emissions of GHG by their global warming potential, and then summing the emissions.

Table 3
ESTIMATED CONSTRUCTION GHG EMISSIONS
J STREET DRAIN PROJECT

Construction Phase	Total Emissions per Phase, metric tons[1]			
	CO_2	CH_4	N_2O	CO_2e
Phase I	6,206	0.35	0.16	6,262
Phase II	5,968	0.34	0.15	6,022
Phase III	5,866	0.34	0.15	5,920
Phase IV	5,864	0.34	0.15	5,918
Total CO_2e Emissions, metric tons				**24,122**
Amortized CO_2e Emissions, metric tons				**804**

[1]Metric tons are calculated by dividing the total short tons by a factor of 1.1023

As shown in Table 3, amortized construction emissions would contribute 804 metric tons annually to the lifetime of the project (30 years). The emissions would be below the SCAQMD's annual threshold for industrial projects of 10,000 metric tons of CO_2e, and, when amortized, would be below the CAPCOA recommended threshold of 900 metric tons of CO_2e emissions.

4.2 Operational Greenhouse Gas Emissions

Operational impacts associated with the Project would be associated with ongoing maintenance activities. It is anticipated that maintenance of the reconstructed drain will be similar to the existing maintenance activities.

In order to programmatically address District maintenance activities, a Final Program Environmental Impact Report (EIR) for Environmental Protection Measures for the Ongoing Routine Operations and Maintenance Program was certified in May 2008. The Environmental Projection Measures for the Ongoing Routine Operations and Maintenance Program proposed by the District aim to reduce the current administrative process to comply with agreements and permits necessary for the maintenance activities at the District's facilities. Currently, many of the District's facility maintenance activities occur in drainages, watercourses, creeks, basins, and water bodies where such activities are regulated by several state and federal agencies. Typical maintenance activities include sediment removal and vegetation control to maintain capacity within the facility. The modification to the bed, bank, and/or vegetation in a natural drainage (and certain man-made drainages) is regulated by the California Department of Fish and Game (CDFG) under Section 1600 et seq. of the Fish and Game Code, by the US Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act, and by the Regional Water Quality Control Board (RWQCB) under Section 401 of the Clean Water Act.

In the EIR, GHG emissions attributable to operation and maintenance activities were evaluated. The main source of emissions associated with operation and maintenance activities was attributable to mobile combustion sources (vehicles). It was estimated that operation and maintenance activities would contribute 23.04 metric tons per year of CO2e from light-duty vehicles and 44.30 metric tons per year of CO2e from heavy duty vehicles, for a total of 67.34 metric tons per year. Operation and maintenance activities for the J Street Drain project would be included in this estimate. Maintenance activities associated with the proposed J Street Drain would be similar to the activities currently taking place for the existing drain maintenance. Beach grooming would be a new task associated with maintenance activities and would likely occur twice per year. Because beach grooming is performed infrequently and does not involve

substantial vehicles or equipment, it is not anticipated that additional vehicles or activities associated with beach grooming would increase GHG emissions substantially. Therefore, no new GHG impacts would result from the proposed drain maintenance activities during project operation.

The EIR identified climate action strategies that will reduce GHG emissions to the extent possible. These measures include discrete early action measures proposed by the ARB to reduce GHG emissions in their Scoping Plan (ARB 2008), as well as measures identified in the AEP White Paper (AEP 2007). The ARB discrete early action measures and AEP climate action strategies that are relevant to operational emissions associated with operation and maintenance activities for the J Street Drain, as identified in the EIR, include the following:

- Implementation of the Low Carbon Fuel Standard. This standard will be implemented state-wide through fuels programs regulated by the ARB.
- Reduction of HFC-134a emissions from non-professional servicing of motor vehicle air conditioning systems. Vehicle maintenance is conducted by County automotive professionals, and employees are prohibited from servicing District vehicles.
- Diesel anti-idling provisions that limit motor vehicle idling to 5 minutes or less from commercial vehicles. The ARB has promulgated a rule that applies to commercial vehicles.
- Alternative fuels: the ARB is evaluating requirements to require the use of 1 to 4 percent biodiesel in California fuels, and evaluating increasing the use of ethanol in fuels.
- Achieve a statewide goal of 50 percent recycling. Recycling of construction waste is currently mandated by the County's Integrated Waste Management Division (Ordinance 4357) and is a requirement of all contracts for operation and maintenance work within Ventura County.

The J Street Drain project will continue the existing implementation with these climate action measures and will reduce GHGs to the extent feasible.

5.0 CONCLUSIONS

Emissions of GHGs were evaluated for both construction and operation of the J Street Drain Project. The main source of emissions associated with the project would be construction activities. The BEMP would increase operational emissions slightly over existing conditions, but the increase would remain below 900 metric tons of CO2e. Emissions from construction would be below the SCAQMD's interim threshold of 10,000 metric tons of CO_2e annually for industrial projects, and, when amortized, would be below the CAPCOA recommended threshold of 900 metric tons of CO_2e emissions. Global climate change impacts would be less than significant.

6.0 REFERENCES

Association of Environmental Professionals. 2007. *Recommendations by the Association of Environmental Professionals (AEP) on How to Analyze Greenhouse Gas Emissions and Global Climate Change in CEQA Documents*. June.

California Air Pollution Control Officers Association. 2008. *CEQA and Climate Change – Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act.* January.

California Air Resources Board. 2007a. EMFAC2007 Emissions Model.

California Air Resources Board. 2007b. *Staff Report, California 1990 Greenhouse Gas Emissions Level and 2020 Emissions Limit.*

California Air Resources Board. 2008. *Climate Change Scoping Plan*. December.

California Climate Action Registry General Reporting Protocol, Version 3.1. 2009. January.

California Climate Change Center (CCCC). 2006. *Our Changing Climate, Assessing the Risks to California: A Summary Report from the California Climate Change Center*. July.

California Coastal Commission (CCC). 2006. *Discussion Draft – Global Warming and the California Coastal Commission*. December 12.

California Department of Water Resources. 2006. *Progress on Incorporating Climate Change into Management of California's Water Resources*. July.

California Energy Commission. 2004. *California Statewide Residential Applicance Saturation Study*. Prepared by KEMA-XENERGY, Itron, and RoperASW. CEC Report 300-00-004. June.

California Energy Commission. 2006. *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004.* December.

California Energy Commission. 2007. *The Role of Land Use in Meeting California's Energy and Climate Change Goals.* CEC-600-2007-008-SD. June.

United Nations Framework Convention on Climate Change. 2006. *Greenhouse Gas Emissions Data, Predefined Queries, Annex I Parties – GHG total without LULUCF (land-use, land-use change and forestry).* http://unfccc.int/ghg_emissions_data/predefined_queries/items/3841.php.

U.S. EPA. 2006. *The U.S. Inventory of Greenhouse Gas Emissions and Sinks: Fast Facts.* www.epa.gov/climatechange/emissions/downloads06/06FastFacts.pdf.

Ventura County Watershed Protection District. 2008. *Final Program Environmental Impact Report (EIR) for Environmental Protection Measures for the Ongoing Routine Operations and Maintenance Program*. May.

Appendix A

Greenhouse Gas Emission Calculations

2/2/2011 5:14:04 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Urbemis\Urbemis 9.2.2\Projects\J Street Drain.urb924

Project Name: J Street Drain

Project Location: Ventura County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2012 TOTALS (tons/year unmitigated)	3.22	25.88	12.85	0.00	6.27	1.27	7.55	1.31	1.17	2.48	3,383.23
2012 TOTALS (tons/year mitigated)	3.22	25.88	12.85	0.00	2.46	1.27	3.73	0.51	1.17	1.69	3,383.23
Percent Reduction	0.00	0.00	0.00	0.00	60.86	0.00	50.59	60.77	0.00	32.10	0.00
2013 TOTALS (tons/year unmitigated)	3.16	24.65	12.99	0.00	6.27	1.25	7.53	1.31	1.15	2.47	3,457.21
2013 TOTALS (tons/year mitigated)	3.16	24.65	12.99	0.00	2.46	1.25	3.71	0.51	1.15	1.67	3,457.21
Percent Reduction	0.00	0.00	0.00	0.00	60.86	0.00	50.72	60.77	0.00	32.34	0.00
2014 TOTALS (tons/year unmitigated)	2.75	20.71	11.39	0.00	4.71	1.01	5.72	0.99	0.93	1.92	3,251.94
2014 TOTALS (tons/year mitigated)	2.75	20.71	11.39	0.00	1.85	1.01	2.86	0.39	0.93	1.32	3,251.94
Percent Reduction	0.00	0.00	0.00	0.00	60.81	0.00	50.04	60.70	0.00	31.19	0.00
2015 TOTALS (tons/year unmitigated)	2.62	19.24	11.61	0.00	4.71	0.95	5.66	0.99	0.87	1.86	3,326.10

2015 TOTALS (tons/year mitigated)	2.62	19.24	11.61	0.00	1.85	0.95	2.80	0.39	0.87	1.26	3,326.10
Percent Reduction	0.00	0.00	0.00	0.00	60.81	0.00	50.61	60.69	0.00	32.18	0.00
2016 TOTALS (tons/year unmitigated)	2.35	16.26	10.91	0.00	7.86	0.79	8.66	1.64	0.73	2.37	3,206.49
2016 TOTALS (tons/year mitigated)	2.35	16.26	10.91	0.00	3.08	0.79	3.87	0.64	0.73	1.37	3,206.49
Percent Reduction	0.00	0.00	0.00	0.00	60.89	0.00	55.32	60.82	0.00	42.15	0.00
2017 TOTALS (tons/year unmitigated)	2.28	14.95	11.18	0.00	7.81	0.76	8.58	1.63	0.70	2.33	3,259.63
2017 TOTALS (tons/year mitigated)	2.28	14.95	11.18	0.00	3.06	0.76	3.82	0.64	0.70	1.34	3,259.63
Percent Reduction	0.00	0.00	0.00	0.00	60.89	0.00	55.48	60.81	0.00	42.57	0.00
2018 TOTALS (tons/year unmitigated)	2.06	12.98	10.58	0.00	4.83	0.63	5.47	1.01	0.58	1.59	3,194.86
2018 TOTALS (tons/year mitigated)	2.06	12.98	10.58	0.00	1.89	0.63	2.53	0.40	0.58	0.98	3,194.86
Percent Reduction	0.00	0.00	0.00	0.00	60.82	0.00	53.78	60.70	0.00	38.53	0.00
2019 TOTALS (tons/year unmitigated)	2.00	12.05	10.98	0.00	4.83	0.61	5.45	1.01	0.56	1.57	3,269.01
2019 TOTALS (tons/year mitigated)	2.00	12.05	10.98	0.00	1.89	0.61	2.51	0.40	0.56	0.96	3,269.01
Percent Reduction	0.00	0.00	0.00	0.00	60.81	0.00	53.99	60.70	0.00	39.01	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

2012	3.22	25.88	12.85	0.00	6.27	1.27	7.55	1.31	1.17	2.48	3,383.23
Mass Grading 01/01/2012-12/31/2013	2.57	21.66	10.03	0.00	6.27	0.95	7.22	1.31	0.87	2.18	2,959.33
Mass Grading Dust	0.00	0.00	0.00	0.00	6.26	0.00	6.26	1.31	0.00	1.31	0.00
Mass Grading Off Road Diesel	2.45	20.18	8.97	0.00	0.00	0.89	0.89	0.00	0.82	0.82	2,603.78
Mass Grading On Road Diesel	0.11	1.45	0.52	0.00	0.01	0.05	0.06	0.00	0.05	0.05	283.38
Mass Grading Worker Trips	0.02	0.03	0.53	0.00	0.00	0.00	0.01	0.00	0.00	0.00	72.16
Trenching 02/01/2012-12/31/2013	0.09	0.67	0.49	0.00	0.00	0.04	0.04	0.00	0.04	0.04	82.18
Trenching Off Road Diesel	0.09	0.67	0.47	0.00	0.00	0.04	0.04	0.00	0.04	0.04	78.51
Trenching Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.68
Asphalt 03/01/2012-12/31/2013	0.56	3.55	2.33	0.00	0.00	0.29	0.29	0.00	0.27	0.27	341.72
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.55	3.53	2.17	0.00	0.00	0.29	0.29	0.00	0.27	0.27	319.44
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.15
Paving Worker Trips	0.00	0.01	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.13

2013	3.16	24.65	12.99	0.00	6.27	1.25	7.53	1.31	1.15	2.47	3,457.21
Asphalt 03/01/2012-12/31/2013	0.63	3.99	2.75	0.00	0.00	0.32	0.32	0.00	0.29	0.29	408.24
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.61	3.97	2.58	0.00	0.00	0.32	0.32	0.00	0.29	0.29	381.62
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.57
Paving Worker Trips	0.00	0.01	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.06
Mass Grading 01/01/2012-12/31/2013	2.44	19.97	9.71	0.00	6.27	0.89	7.17	1.31	0.82	2.13	2,959.33
Mass Grading Dust	0.00	0.00	0.00	0.00	6.26	0.00	6.26	1.31	0.00	1.31	0.00
Mass Grading Off Road Diesel	2.33	18.67	8.75	0.00	0.00	0.85	0.85	0.00	0.78	0.78	2,603.78
Mass Grading On Road Diesel	0.10	1.28	0.47	0.00	0.01	0.05	0.06	0.00	0.04	0.05	283.38
Mass Grading Worker Trips	0.01	0.03	0.50	0.00	0.00	0.00	0.01	0.00	0.00	0.00	72.17
Trenching 02/01/2012-12/31/2013	0.09	0.68	0.54	0.00	0.00	0.04	0.04	0.00	0.04	0.04	89.63
Trenching Off Road Diesel	0.09	0.68	0.51	0.00	0.00	0.04	0.04	0.00	0.04	0.04	85.62
Trenching Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.01

2014	2.75	20.71	11.39	0.00	4.71	1.01	5.72	0.99	0.93	1.92	3,251.94
Mass Grading 01/01/2014-12/31/2015	2.18	16.98	8.63	0.00	4.71	0.74	5.44	0.98	0.68	1.66	2,828.83
Mass Grading Dust	0.00	0.00	0.00	0.00	4.70	0.00	4.70	0.98	0.00	0.98	0.00
Mass Grading Off Road Diesel	2.08	15.83	7.78	0.00	0.00	0.69	0.69	0.00	0.64	0.64	2,476.84
Mass Grading On Road Diesel	0.09	1.12	0.42	0.00	0.01	0.04	0.05	0.00	0.04	0.04	283.83
Mass Grading Worker Trips	0.01	0.02	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	68.16
Trenching 02/01/2014-12/31/2015	0.08	0.58	0.49	0.00	0.00	0.03	0.03	0.00	0.03	0.03	81.90
Trenching Off Road Diesel	0.08	0.58	0.46	0.00	0.00	0.03	0.03	0.00	0.03	0.03	78.23
Trenching Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.66
Asphalt 03/01/2014-12/31/2015	0.49	3.15	2.27	0.00	0.00	0.25	0.25	0.00	0.23	0.23	341.21
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.48	3.14	2.14	0.00	0.00	0.25	0.25	0.00	0.23	0.23	319.44
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.63
Paving Worker Trips	0.00	0.01	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.14

2015	2.62	19.24	11.61	0.00	4.71	0.95	5.66	0.99	0.87	1.86	3,326.10
Asphalt 03/01/2014-12/31/2015	0.54	3.48	2.69	0.00	0.00	0.27	0.27	0.00	0.25	0.25	407.63
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.53	3.47	2.54	0.00	0.00	0.27	0.27	0.00	0.25	0.25	381.62
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.95
Paving Worker Trips	0.00	0.01	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.06
Mass Grading 01/01/2014-12/31/2015	2.00	15.19	8.39	0.00	4.71	0.65	5.36	0.98	0.60	1.58	2,828.84
Mass Grading Dust	0.00	0.00	0.00	0.00	4.70	0.00	4.70	0.98	0.00	0.98	0.00
Mass Grading Off Road Diesel	1.91	14.19	7.62	0.00	0.00	0.61	0.61	0.00	0.56	0.56	2,476.84
Mass Grading On Road Diesel	0.08	0.98	0.38	0.00	0.01	0.04	0.05	0.00	0.03	0.04	283.83
Mass Grading Worker Trips	0.01	0.02	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	68.17
Trenching 02/01/2014-12/31/2015	0.08	0.57	0.53	0.00	0.00	0.03	0.03	0.00	0.03	0.03	89.63
Trenching Off Road Diesel	0.08	0.57	0.51	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.62
Trenching Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.01

2016	2.35	16.26	10.91	0.00	7.86	0.79	8.66	1.64	0.73	2.37	3,206.49
Mass Grading 01/01/2016-12/31/2017	1.85	13.09	8.19	0.00	7.86	0.57	8.43	1.64	0.52	2.16	2,780.57
Mass Grading Dust	0.00	0.00	0.00	0.00	7.85	0.00	7.85	1.64	0.00	1.64	0.00
Mass Grading Off Road Diesel	1.77	12.19	7.47	0.00	0.00	0.53	0.53	0.00	0.49	0.49	2,427.45
Mass Grading On Road Diesel	0.07	0.88	0.34	0.00	0.01	0.03	0.04	0.00	0.03	0.03	284.74
Mass Grading Worker Trips	0.01	0.02	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	68.38
Trenching 02/01/2016-12/31/2017	0.07	0.46	0.49	0.00	0.00	0.02	0.02	0.00	0.02	0.02	82.47
Trenching Off Road Diesel	0.07	0.46	0.47	0.00	0.00	0.02	0.02	0.00	0.02	0.02	78.78
Trenching Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.69
Asphalt 03/01/2016-12/31/2017	0.42	2.71	2.24	0.00	0.00	0.20	0.20	0.00	0.19	0.19	343.44
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.42	2.69	2.12	0.00	0.00	0.20	0.20	0.00	0.19	0.19	320.66
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.57
Paving Worker Trips	0.00	0.01	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.21

2017	2.28	14.95	11.18	0.00	7.81	0.76	8.58	1.63	0.70	2.33	3,259.63
Asphalt 03/01/2016-12/31/2017	0.47	2.97	2.63	0.00	0.00	0.22	0.22	0.00	0.20	0.20	407.43
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.46	2.96	2.50	0.00	0.00	0.22	0.22	0.00	0.20	0.20	380.40
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.05
Paving Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.98
Mass Grading 01/01/2016-12/31/2017	1.73	11.54	8.03	0.00	7.81	0.52	8.33	1.63	0.48	2.11	2,762.86
Mass Grading Dust	0.00	0.00	0.00	0.00	7.80	0.00	7.80	1.63	0.00	1.63	0.00
Mass Grading Off Road Diesel	1.65	10.74	7.37	0.00	0.00	0.49	0.49	0.00	0.45	0.45	2,411.99
Mass Grading On Road Diesel	0.07	0.78	0.31	0.00	0.01	0.03	0.04	0.00	0.03	0.03	282.93
Mass Grading Worker Trips	0.01	0.02	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	67.94
Trenching 02/01/2016-12/31/2017	0.07	0.44	0.53	0.00	0.00	0.02	0.02	0.00	0.02	0.02	89.34
Trenching Off Road Diesel	0.07	0.44	0.51	0.00	0.00	0.02	0.02	0.00	0.02	0.02	85.35
Trenching Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00

2018	2.06	12.98	10.58	0.00	4.83	0.63	5.47	1.01	0.58	1.59	3,194.86
Mass Grading 01/01/2018-12/31/2019	1.63	10.32	7.90	0.00	4.83	0.45	5.28	1.01	0.41	1.42	2,771.71
Mass Grading Dust	0.00	0.00	0.00	0.00	4.82	0.00	4.82	1.01	0.00	1.01	0.00
Mass Grading Off Road Diesel	1.56	9.59	7.29	0.00	0.00	0.42	0.42	0.00	0.39	0.39	2,419.72
Mass Grading On Road Diesel	0.06	0.72	0.29	0.00	0.01	0.03	0.04	0.00	0.02	0.03	283.83
Mass Grading Worker Trips	0.01	0.02	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	68.16
Trenching 02/01/2018-12/31/2019	0.06	0.35	0.48	0.00	0.00	0.02	0.02	0.00	0.02	0.02	81.90
Trenching Off Road Diesel	0.06	0.35	0.46	0.00	0.00	0.02	0.02	0.00	0.02	0.02	78.23
Trenching Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.66
Asphalt 03/01/2018-12/31/2019	0.37	2.30	2.19	0.00	0.00	0.17	0.17	0.00	0.15	0.15	341.25
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.36	2.29	2.10	0.00	0.00	0.17	0.17	0.00	0.15	0.15	319.44
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.67
Paving Worker Trips	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.14

2019	2.00	12.05	10.98	0.00	4.83	0.61	5.45	1.01	0.56	1.57	3,269.01
Asphalt 03/01/2018-12/31/2019	0.41	2.54	2.60	0.00	0.00	0.18	0.18	0.00	0.17	0.17	407.67
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.40	2.53	2.49	0.00	0.00	0.18	0.18	0.00	0.17	0.17	381.62
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00
Paving Worker Trips	0.00	0.01	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.05
Mass Grading 01/01/2018-12/31/2019	1.53	9.17	7.85	0.00	4.83	0.41	5.25	1.01	0.38	1.39	2,771.71
Mass Grading Dust	0.00	0.00	0.00	0.00	4.82	0.00	4.82	1.01	0.00	1.01	0.00
Mass Grading Off Road Diesel	1.46	8.50	7.28	0.00	0.00	0.39	0.39	0.00	0.36	0.36	2,419.72
Mass Grading On Road Diesel	0.06	0.66	0.27	0.00	0.01	0.02	0.03	0.00	0.02	0.02	283.83
Mass Grading Worker Trips	0.01	0.01	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	68.16
Trenching 02/01/2018-12/31/2019	0.06	0.34	0.52	0.00	0.00	0.02	0.02	0.00	0.02	0.02	89.63
Trenching Off Road Diesel	0.06	0.34	0.51	0.00	0.00	0.02	0.02	0.00	0.02	0.02	85.62
Trenching Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.01

Phase Assumptions

Phase: Mass Grading 1/1/2012 - 12/31/2013 - Phase 1 Grading

Total Acres Disturbed: 7.8

Maximum Daily Acreage Disturbed: 2

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 449.76

Off-Road Equipment:

1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Off Highway Tractors (267 hp) operating at a 0.65 load factor for 8 hours per day

6 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 8 hours per day

4 Pumps (53 hp) operating at a 0.74 load factor for 8 hours per day

2 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 1/1/2014 - 12/31/2015 - Phase II Grading

Total Acres Disturbed: 6

Maximum Daily Acreage Disturbed: 1.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 450.48

Off-Road Equipment:

1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Off Highway Tractors (267 hp) operating at a 0.65 load factor for 8 hours per day

6 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 8 hours per day

4 Pumps (53 hp) operating at a 0.74 load factor for 8 hours per day

2 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 1/1/2016 - 12/31/2017 - Phase III Grading

Total Acres Disturbed: 9.41

Maximum Daily Acreage Disturbed: 2.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 450.48

Off-Road Equipment:

1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8 hours per day

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1 Crawler Tractors (147 hp) operating at a 0.64 load factor for 8 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

6 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 8 hours per day

4 Pumps (53 hp) operating at a 0.74 load factor for 8 hours per day

2 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 1/1/2018 - 12/31/2019 - Phase IV Grading

Total Acres Disturbed: 6.15

Maximum Daily Acreage Disturbed: 1.54

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 450.48

Off-Road Equipment:

1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8 hours per day

1 Crawler Tractors (147 hp) operating at a 0.64 load factor for 8 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

6 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 8 hours per day

4 Pumps (53 hp) operating at a 0.74 load factor for 8 hours per day

2 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 2/1/2012 - 12/31/2013 - Phase 1 Trenching

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

Phase: Trenching 2/1/2014 - 12/31/2015 - Phase II Trenching

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

Phase: Trenching 2/1/2016 - 12/31/2017 - Phase III Trenching

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

Phase: Trenching 2/1/2018 - 12/31/2019 - Phase IV Trenching

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

Phase: Paving 3/1/2012 - 12/31/2013 - Phase 1 Paving

Acres to be Paved: 7.9

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

2 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

2 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

1 Sweepers/Scrubbers (91 hp) operating at a 0.68 load factor for 8 hours per day

Phase: Paving 3/1/2014 - 12/31/2015 - Phase II Paving
Phase II Paving
Acres to be Paved: 6

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

2 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

2 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

1 Sweepers/Scrubbers (91 hp) operating at a 0.68 load factor for 8 hours per day

Phase: Paving 3/1/2016 - 12/31/2017 - Phase III Paving

Acres to be Paved: 9.41

Off-Road Equipment:

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1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

2 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

2 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

1 Sweepers/Scrubbers (91 hp) operating at a 0.68 load factor for 8 hours per day

Phase: Paving 3/1/2018 - 12/31/2019 - Phase IV Paving

Acres to be Paved: 6.15

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

2 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

2 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

1 Sweepers/Scrubbers (91 hp) operating at a 0.68 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

2012	3.22	25.88	12.85	0.00	2.46	1.27	3.73	0.51	1.17	1.69	3,383.23
Mass Grading 01/01/2012-12/31/2013	2.57	21.66	10.03	0.00	2.45	0.95	3.40	0.51	0.87	1.38	2,959.33
Mass Grading Dust	0.00	0.00	0.00	0.00	2.44	0.00	2.44	0.51	0.00	0.51	0.00
Mass Grading Off Road Diesel	2.45	20.18	8.97	0.00	0.00	0.89	0.89	0.00	0.82	0.82	2,603.78
Mass Grading On Road Diesel	0.11	1.45	0.52	0.00	0.01	0.05	0.06	0.00	0.05	0.05	283.38
Mass Grading Worker Trips	0.02	0.03	0.53	0.00	0.00	0.00	0.01	0.00	0.00	0.00	72.16
Trenching 02/01/2012-12/31/2013	0.09	0.67	0.49	0.00	0.00	0.04	0.04	0.00	0.04	0.04	82.18
Trenching Off Road Diesel	0.09	0.67	0.47	0.00	0.00	0.04	0.04	0.00	0.04	0.04	78.51
Trenching Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.68
Asphalt 03/01/2012-12/31/2013	0.56	3.55	2.33	0.00	0.00	0.29	0.29	0.00	0.27	0.27	341.72
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.55	3.53	2.17	0.00	0.00	0.29	0.29	0.00	0.27	0.27	319.44
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.15
Paving Worker Trips	0.00	0.01	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.13

2013	3.16	24.65	12.99	0.00	2.46	1.25	3.71	0.51	1.15	1.67	3,457.21
Asphalt 03/01/2012-12/31/2013	0.63	3.99	2.75	0.00	0.00	0.32	0.32	0.00	0.29	0.29	408.24
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.61	3.97	2.58	0.00	0.00	0.32	0.32	0.00	0.29	0.29	381.62
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.57
Paving Worker Trips	0.00	0.01	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.06
Mass Grading 01/01/2012-12/31/2013	2.44	19.97	9.71	0.00	2.45	0.89	3.35	0.51	0.82	1.34	2,959.33
Mass Grading Dust	0.00	0.00	0.00	0.00	2.44	0.00	2.44	0.51	0.00	0.51	0.00
Mass Grading Off Road Diesel	2.33	18.67	8.75	0.00	0.00	0.85	0.85	0.00	0.78	0.78	2,603.78
Mass Grading On Road Diesel	0.10	1.28	0.47	0.00	0.01	0.05	0.06	0.00	0.04	0.05	283.38
Mass Grading Worker Trips	0.01	0.03	0.50	0.00	0.00	0.00	0.01	0.00	0.00	0.00	72.17
Trenching 02/01/2012-12/31/2013	0.09	0.68	0.54	0.00	0.00	0.04	0.04	0.00	0.04	0.04	89.63
Trenching Off Road Diesel	0.09	0.68	0.51	0.00	0.00	0.04	0.04	0.00	0.04	0.04	85.62
Trenching Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.01

2014	2.75	20.71	11.39	0.00	1.85	1.01	2.86	0.39	0.93	1.32	3,251.94
Mass Grading 01/01/2014-12/31/2015	2.18	16.98	8.63	0.00	1.84	0.74	2.58	0.39	0.68	1.06	2,828.83
Mass Grading Dust	0.00	0.00	0.00	0.00	1.83	0.00	1.83	0.38	0.00	0.38	0.00
Mass Grading Off Road Diesel	2.08	15.83	7.78	0.00	0.00	0.69	0.69	0.00	0.64	0.64	2,476.84
Mass Grading On Road Diesel	0.09	1.12	0.42	0.00	0.01	0.04	0.05	0.00	0.04	0.04	283.83
Mass Grading Worker Trips	0.01	0.02	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	68.16
Trenching 02/01/2014-12/31/2015	0.08	0.58	0.49	0.00	0.00	0.03	0.03	0.00	0.03	0.03	81.90
Trenching Off Road Diesel	0.08	0.58	0.46	0.00	0.00	0.03	0.03	0.00	0.03	0.03	78.23
Trenching Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.66
Asphalt 03/01/2014-12/31/2015	0.49	3.15	2.27	0.00	0.00	0.25	0.25	0.00	0.23	0.23	341.21
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.48	3.14	2.14	0.00	0.00	0.25	0.25	0.00	0.23	0.23	319.44
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.63
Paving Worker Trips	0.00	0.01	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.14

2015	2.62	19.24	11.61	0.00	1.85	0.95	2.80	0.39	0.87	1.26	3,326.10
Asphalt 03/01/2014-12/31/2015	0.54	3.48	2.69	0.00	0.00	0.27	0.27	0.00	0.25	0.25	407.63
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.53	3.47	2.54	0.00	0.00	0.27	0.27	0.00	0.25	0.25	381.62
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.95
Paving Worker Trips	0.00	0.01	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.06
Mass Grading 01/01/2014-12/31/2015	2.00	15.19	8.39	0.00	1.84	0.65	2.49	0.39	0.60	0.98	2,828.84
Mass Grading Dust	0.00	0.00	0.00	0.00	1.83	0.00	1.83	0.38	0.00	0.38	0.00
Mass Grading Off Road Diesel	1.91	14.19	7.62	0.00	0.00	0.61	0.61	0.00	0.56	0.56	2,476.84
Mass Grading On Road Diesel	0.08	0.98	0.38	0.00	0.01	0.04	0.05	0.00	0.03	0.04	283.83
Mass Grading Worker Trips	0.01	0.02	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	68.17
Trenching 02/01/2014-12/31/2015	0.08	0.57	0.53	0.00	0.00	0.03	0.03	0.00	0.03	0.03	89.63
Trenching Off Road Diesel	0.08	0.57	0.51	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.62
Trenching Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.01

2016	2.35	16.26	10.91	0.00	3.08	0.79	3.87	0.64	0.73	1.37	3,206.49
Mass Grading 01/01/2016-12/31/2017	1.85	13.09	8.19	0.00	3.07	0.57	3.64	0.64	0.52	1.16	2,780.57
Mass Grading Dust	0.00	0.00	0.00	0.00	3.06	0.00	3.06	0.64	0.00	0.64	0.00
Mass Grading Off Road Diesel	1.77	12.19	7.47	0.00	0.00	0.53	0.53	0.00	0.49	0.49	2,427.45
Mass Grading On Road Diesel	0.07	0.88	0.34	0.00	0.01	0.03	0.04	0.00	0.03	0.03	284.74
Mass Grading Worker Trips	0.01	0.02	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	68.38
Trenching 02/01/2016-12/31/2017	0.07	0.46	0.49	0.00	0.00	0.02	0.02	0.00	0.02	0.02	82.47
Trenching Off Road Diesel	0.07	0.46	0.47	0.00	0.00	0.02	0.02	0.00	0.02	0.02	78.78
Trenching Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.69
Asphalt 03/01/2016-12/31/2017	0.42	2.71	2.24	0.00	0.00	0.20	0.20	0.00	0.19	0.19	343.44
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.42	2.69	2.12	0.00	0.00	0.20	0.20	0.00	0.19	0.19	320.66
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.57
Paving Worker Trips	0.00	0.01	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.21

2017	2.28	14.95	11.18	0.00	3.06	0.76	3.82	0.64	0.70	1.34	3,259.63
Asphalt 03/01/2016-12/31/2017	0.47	2.97	2.63	0.00	0.00	0.22	0.22	0.00	0.20	0.20	407.43
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.46	2.96	2.50	0.00	0.00	0.22	0.22	0.00	0.20	0.20	380.40
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.05
Paving Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.98
Mass Grading 01/01/2016-12/31/2017	1.73	11.54	8.03	0.00	3.06	0.52	3.57	0.64	0.48	1.12	2,762.86
Mass Grading Dust	0.00	0.00	0.00	0.00	3.04	0.00	3.04	0.64	0.00	0.64	0.00
Mass Grading Off Road Diesel	1.65	10.74	7.37	0.00	0.00	0.49	0.49	0.00	0.45	0.45	2,411.99
Mass Grading On Road Diesel	0.07	0.78	0.31	0.00	0.01	0.03	0.04	0.00	0.03	0.03	282.93
Mass Grading Worker Trips	0.01	0.02	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	67.94
Trenching 02/01/2016-12/31/2017	0.07	0.44	0.53	0.00	0.00	0.02	0.02	0.00	0.02	0.02	89.34
Trenching Off Road Diesel	0.07	0.44	0.51	0.00	0.00	0.02	0.02	0.00	0.02	0.02	85.35
Trenching Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00

2018	2.06	12.98	10.58	0.00	1.89	0.63	2.53	0.40	0.58	0.98	3,194.86
Mass Grading 01/01/2018-12/31/2019	1.63	10.32	7.90	0.00	1.89	0.45	2.34	0.40	0.41	0.81	2,771.71
Mass Grading Dust	0.00	0.00	0.00	0.00	1.88	0.00	1.88	0.39	0.00	0.39	0.00
Mass Grading Off Road Diesel	1.56	9.59	7.29	0.00	0.00	0.42	0.42	0.00	0.39	0.39	2,419.72
Mass Grading On Road Diesel	0.06	0.72	0.29	0.00	0.01	0.03	0.04	0.00	0.02	0.03	283.83
Mass Grading Worker Trips	0.01	0.02	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	68.16
Trenching 02/01/2018-12/31/2019	0.06	0.35	0.48	0.00	0.00	0.02	0.02	0.00	0.02	0.02	81.90
Trenching Off Road Diesel	0.06	0.35	0.46	0.00	0.00	0.02	0.02	0.00	0.02	0.02	78.23
Trenching Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.66
Asphalt 03/01/2018-12/31/2019	0.37	2.30	2.19	0.00	0.00	0.17	0.17	0.00	0.15	0.15	341.25
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.36	2.29	2.10	0.00	0.00	0.17	0.17	0.00	0.15	0.15	319.44
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.67
Paving Worker Trips	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.14

2019	2.00	12.05	10.98	0.00	1.89	0.61	2.51	0.40	0.56	0.96	3,269.01
Asphalt 03/01/2018-12/31/2019	0.41	2.54	2.60	0.00	0.00	0.18	0.18	0.00	0.17	0.17	407.67
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.40	2.53	2.49	0.00	0.00	0.18	0.18	0.00	0.17	0.17	381.62
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00
Paving Worker Trips	0.00	0.01	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.05
Mass Grading 01/01/2018-12/31/2019	1.53	9.17	7.85	0.00	1.89	0.41	2.30	0.40	0.38	0.78	2,771.71
Mass Grading Dust	0.00	0.00	0.00	0.00	1.88	0.00	1.88	0.39	0.00	0.39	0.00
Mass Grading Off Road Diesel	1.46	8.50	7.28	0.00	0.00	0.39	0.39	0.00	0.36	0.36	2,419.72
Mass Grading On Road Diesel	0.06	0.66	0.27	0.00	0.01	0.02	0.03	0.00	0.02	0.02	283.83
Mass Grading Worker Trips	0.01	0.01	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	68.16
Trenching 02/01/2018-12/31/2019	0.06	0.34	0.52	0.00	0.00	0.02	0.02	0.00	0.02	0.02	89.63
Trenching Off Road Diesel	0.06	0.34	0.51	0.00	0.00	0.02	0.02	0.00	0.02	0.02	85.62
Trenching Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.01

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 1/1/2012 - 12/31/2013 - Phase 1 Grading

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 1/1/2014 - 12/31/2015 - Phase II Grading

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

2/2/2011 5:14:05 PM

The following mitigation measures apply to Phase: Mass Grading 1/1/2016 - 12/31/2017 - Phase III Grading

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 1/1/2018 - 12/31/2019 - Phase IV Grading

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%