Appendix D
Air Quality and Climate Change Background Information and Calculations

Appendix D

Air Quality and Climate Change Background Information and Calculations

D.1 Air Quality

D.1.1 Diesel Engine Rules

The EPA established a series of increasingly strict emission standards for new engines to reduce emissions from off-road diesel equipment. Locomotives and marine vessels are exempt from this rule. Manufacturers of off-road diesel engines would be required to produce engines meeting certain emission standards based on the model year the engine was manufactured under the following compliance schedule:

- Tier 1 standards were phased in from 1996 to 2000 (year of manufacture), depending on the engine horsepower (HP) category.
- Tier 2 standards were phased in from 2001 to 2006.
- Tier 3 standards were phased in from 2006 to 2008.
- Tier 4 standards, which likely will require add-on emissions control equipment to attain them, will be phased in from 2008 to 2015.

The EPA established a series of increasingly strict emissions standards for new engines to reduce emissions from on-road, heavy-duty diesel trucks by signing the Heavy-Duty Highway Rule in December 2000. Manufacturers are required to produce new diesel vehicles that meet PM and NO_X emission standards beginning with model year 2007 and phased-in between 2007 and 2010. The phase-in is based on a percent-of-sales basis: 50% from 2007 to 2009 and 100% in 2010 (U.S. Environmental Protection Agency 2000).

D.1.2 Criteria Air Pollutants

D.1.2.1 Ozone

Ozone is a respiratory irritant that can cause severe ear, nose, and throat irritation and that increases susceptibility to respiratory infections. It is also an oxidant that causes extensive damage to plants through leaf discoloration and cell damage. It can cause substantial damage to other materials as well, such as synthetic rubber and textiles.

Ozone is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. Ozone precursors—reactive organic gases (ROG) and nitrogen oxides (NO_X)—react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. The ozone precursors, ROG and NO_X, are mainly emitted by mobile sources and by stationary combustion equipment.

D.1.2.2 Hydrocarbons

Hydrocarbons are organic gases that are made up of hydrogen and carbon atoms. There are several subsets of organic gases, including ROGs and volatile organic compounds (VOCs). ROGs are defined by state rules and regulations; VOCs are defined by federal rules and regulations. Both ROGs and VOCs are emitted from the incomplete combustion of hydrocarbons or other carbon-based fuels, or as a product of chemical processes. The major sources of hydrocarbons are combustion engine exhaust, oil refineries, and oil-fueled power plants; other common sources are petroleum fuels, solvents, dry-cleaning solutions, and paint (through evaporation).

The health effects of hydrocarbons result from the formation of ozone. High levels of hydrocarbons in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen though displacement. Carcinogenic forms of hydrocarbons are considered toxic air contaminants. There are no separate health standards for ROGs, although some are also toxic; an example is benzene, which is both an ROG and a carcinogen.

D.1.2.3 Nitrogen Oxides

Nitrogen oxides (NO_X) are a family of highly reactive gases that are a primary precursor to the formation of ground-level ozone, and react in the atmosphere to form acid rain. Nitrogen dioxide (NO_2), often used interchangeably with NO_X, is a brownish, highly reactive gas that is present in all urban environments. The major human sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO_2 (U.S. Environmental Protection Agency 2010). The combined emissions of NO and NO_2 are referred to as NO_X and reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with ozone, the NO_2 concentration in a particular geographical area may not be representative of local NO_X emission sources.

Inhalation is the most common route of exposure to NO_2. Because NO_2 has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of the adverse health effects primarily depends on the concentration inhaled rather than the duration of exposure. An individual may experience a variety of acute symptoms, such as coughing, difficulty breathing, vomiting, headache, and eye irritation during or shortly after exposure. After a period of approximately 4–12 hours, an exposed individual may experience chemical pneumonitis or pulmonary edema with breathing abnormalities, cough, cyanosis, chest pain, and rapid heartbeat. Severe symptomatic NO_2 intoxication after acute exposure has been linked to prolonged respiratory impairment, with such symptoms as chronic bronchitis and decreased lung function (U.S. Environmental Protection Agency 2010).

D.1.2.4 Carbon Monoxide

Carbon Monoxide (CO) has little effect on plants and materials, but it can have significant effects on human health. CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Effects range from slight headaches to nausea to death.

Motor vehicles are the primary source of CO emissions in most areas. In the project area, high CO levels are of greatest concern during the winter, when periods of light winds combine with the formation of ground-level temperature inversions from evening through early morning. These

conditions trap pollutants near the ground, reducing the dispersion of vehicle emissions. Moreover, motor vehicles exhibit increased CO emission rates at low air temperatures.

Dramatic reductions in CO levels across California, including a 50% decrease in statewide peak CO levels between 1980 and 2004, have been witnessed during the past several decades, primarily due to requirements for cleaner vehicles, equipment, and fuels (California Air Resources Board 2004).

D.1.2.5 Particulate Matter

Particulates can damage human health and retard plant growth. They also reduce visibility, soil buildings and materials, and cause corrosion. Health concerns associated with suspended particulate matter focus on particles small enough to be drawn into the lungs when inhaled: PM10 (particles less than 10 microns in size) and PM2.5 (particles less than 2.5 microns in size).

Particulate emissions are generated by a wide variety of sources in the air quality study area, including agricultural activities, industrial operations, vehicles (e.g., dust suspended by vehicle traffic and construction equipment), and secondary aerosols (formed by reactions in the atmosphere).

D.1.2.6 Sulfur Oxides

Sulfur oxides (SO_X) are any of several compounds of sulfur and oxygen, of which the most relevant to air quality is sulfur dioxide (SO_2). SO_2 is produced by coal and oil combustion and such stationary sources as steel mills, refineries, and pulp and paper mills. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract. SO_2 is a respiratory irritant that causes the bronchioles to constrict with inhalation at 5 parts per million (ppm) or more. On contact with the moist mucous membranes, SO_2 produces sulfurous acid, which is a direct irritant. Concentration rather than duration of the exposure is an important determinant of respiratory effects. Exposure to high SO_2 concentrations may result in edema of the lungs or glottis and respiratory paralysis.

D.1.3 Toxic Air Contaminants

Toxic Air Contaminants (TACs) are non-criteria pollutants that can result in adverse human health effects. Unlike criteria pollutants, no ambient standards exist for TACs. Many pollutants are identified as TACs because of their potential to increase the risk of developing cancer or because of their acute or chronic health risks. For TACs that are known or suspected carcinogens, the California Air Resources Board (ARB) has consistently found that there are no levels or thresholds below which exposure is risk-free.

Individual TACs vary greatly in the risks they present. At a given level of exposure, one TAC may pose a hazard that is many times greater than another. TACs are identified and their toxicity is studied by the California Office of Environmental Health Hazard Assessment (OEHHA). TACs include air pollutants that can produce adverse human health effects, including carcinogenic effects, after short-term (acute) or long-term (chronic) exposure. Examples of TAC sources within the Mojave Desert Air Basin (MDAB) include industrial processes, dry cleaners, gasoline stations, paint and solvent operations, and fossil fuel combustion sources. For certain TACs, a unit risk factor can be developed to evaluate cancer risk. For acute and chronic health risks, a similar factor, called a Hazard Index, is used to evaluate risk.

D.2 Climate Change

D.2.1 Regulatory Setting

D.2.1.1 Federal

Massachusetts, et al. vs. U.S. Environmental Protection Agency (2007)

Twelve U.S. states and cities, including California, in conjunction with several environmental organizations, sued to force EPA to regulate GHGs as a pollutant pursuant to the Clean Air Act (CAA) in Massachusetts, et al. v. Environmental Protection Agency 549 US 497 (2007). The court ruled that the plaintiffs had standing to sue, GHGs fit within the CAA's definition of a pollutant, and the EPA's reasons for not regulating GHGs were insufficiently grounded in the CAA.

United States Environmental Protection Agency Endangerment Finding (2009)

In its "Endangerment Finding," the EPA Administrator found that GHGs, as described above, in the atmosphere threaten the public health and welfare of current and future generations. The Administrator also found that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare. Although the Finding of Endangerment does not place requirements on industry, it is an important step in EPA's process to develop regulation. This measure is a prerequisite to finalizing EPA's proposed GHG 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.

United States Environmental Protection Agency Mandatory Reporting Rule for Greenhouse Gas (2009)

Under the Mandatory Report Rule, suppliers of fossil fuels, manufacturers of vehicles and engines, and facilities that emit 25,000 MT or more per year of GHGs are required to report annual emissions to the EPA. The first annual reports for the largest emitting facilities, covering calendar year 2010, will be submitted to the EPA in 2011. The mandatory reporting rule does not limit GHG emissions but establishes a standard framework for emissions reporting and tracking of large emitters.

Update to Corporate Average Fuel Economy Standards (2009)

The 2009 Corporate Average Fuel Economy (CAFE) standards incorporate stricter fuel economy standards promulgated by the State of California into one uniform standard. Additionally, automakers are required to cut GHG emissions in new vehicles by roughly 25% by 2016. Federal agencies are presently developing higher standards for the 2017 to 2025 period.

United States Environmental Protection Agency Cause or Contribute Finding (2010)

In its "Cause or Contribute Finding" the EPA Administrator found that the combined emissions of these well-mixed GHG from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare. This step is a predecessor to subsequent action to require new vehicles to improve their efficiency to reduce GHG emissions.

United States Environmental Protection Agency Regulation of GHG Emissions under the Clean Air Act (2010–2012, ongoing)

Under the authority of the Clean Air Act, the EPA is beginning to regulate GHG emissions starting with large stationary sources. In 2010, EPA set GHG thresholds to define when permits under the New Source Review Prevention of Significant Deterioration (PSD) and Title V Operating Permit programs are required for new and existing industrial facilities. In 2012, EPA proposed a carbon pollution standard for new power plants.

D.2.1.2 State

Assembly Bill 1493—Pavley Rules (2002, amendments 2009)/Advanced Clean Cars (2011)

Known as "Pavley I," Assembly Bill (AB) 1493 standards are the nation's first GHG standards for automobiles. AB 1493 required ARB to adopt vehicle standards that will lower GHG emissions from new light duty autos to the maximum extent feasible beginning in 2009. Additional strengthening of the Pavley standards (referred to previously as "Pavley II," now referred to as the "Advanced Clear Cars" measure) has been proposed for vehicle model years 2017–2020. Together, the two standards are expected to increase average fuel economy to roughly 43 mpg by 2020 and reduce GHG emissions from the transportation sector in California by approximately 14%. In June 2009, EPA granted California's waiver request enabling the state to enforce its GHG emissions standards for new motor vehicles beginning with the current model year.

EPA and ARB are currently working together on a joint rulemaking to establish GHG emissions standards for 2017 to 2025 model year passenger vehicles. The Interim Joint Technical Assessment Report for the standards evaluated four potential future standards ranging from 47 to 62 mpg in 2025 (U.S. Environmental Protection Agency et al. 2010). The official proposal was released by both EPA and ARB on December 7, 2011, and was unanimously approved by both EPA and ARB on January 26, 2012 (California Air Resources Board 2012).

Global Warming Solutions Act of 2006 (Assembly Bill 32) (2006)

AB 32 codified California's GHG emissions target by requiring that the state's global warming emissions be reduced to 1990 levels by 2020. Since being adopted, ARB, the California Energy Commission (CEC), the California Public Utilities Commission (CPUC), and the Building Standards Commission have been developing regulations that will help meet the goals of AB 32 and Executive Order (EO) S-03-05. The Scoping Plan for AB 32 identifies specific measures to reduce GHG emissions to 1990 levels by 2020, and requires ARB and other state agencies to develop and enforce regulations and other initiatives for reducing GHGs. Specifically, the Scoping Plan articulates a key role for local governments, recommending they establish GHG reduction goals for both their municipal operations and the community consistent with those of the state (i.e., approximately 15% below current levels).

In March 2011, a San Francisco Superior Court enjoined the implementation of ARB's Scoping Plan, finding the alternatives analysis and public review process violated both the California Environmental Quality Act (CEQA) and ARB's certified regulatory program (*Association of Irritated Residents, et al. v. California Air Resources Board,* Case No. CPF-09-509562, March 18, 2011). In response to this litigation, ARB adopted the new CEQA document (*Final Supplement to the AB32 Scoping Plan Functional Equivalent Document*) on August 24, 2011. ARB staff re-evaluated the baseline in light of the economic downturn and updated the projected 2020 emissions to 545

$MMTCO_2e$. Two reduction measures (Pavley I and the Renewables Portfolio Standard [12–20%]) not previously included in the 2008 Scoping Plan baseline were incorporated into the updated baseline, further reducing the 2020 Statewide emissions projection to 507 $MMTCO_2e$. The updated forecast of 507 $MMTCO_2e$ is referred to as the AB 32 2020 baseline. Reduction of an estimated 80 $MMTCO_2e$ are necessary to reduce statewide emissions to the AB 32 target of 427 $MMTCO_2e$ by 2020, which is approximately 11% below existing business as usual (BAU) (2006–2008 average) and 21% below 2020 BAU (California Air Resources Board 2011).

Executive Order S-01-07: Low Carbon Fuel Standard (2007)

EO S-01-07 essentially mandates (1) that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10% by 2020, and (2) that a Low Carbon Fuel Standard (LCFS) for transportation fuels be established in California.[1]

Senate Bill 97 (2007)

Senate Bill (SB) 97 requires that the Office of Planning and Research (OPR) prepare guidelines to submit to the California Resources Agency regarding feasible mitigation of GHG emissions or the effects of GHG emissions as required by CEQA. The Natural Resources Agency adopted Amendments to the CEQA Guidelines for GHG emissions on December 30, 2009. On February 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. The adopted guidelines recommend quantification of GHG emissions, assessment of their significance, and adoption of feasible mitigation of GHG emissions when significant impacts are identified.

California Air Resources Board Mandatory Greenhouse Gas Reporting Rule (Title 17) (2007)

In December of 2007, ARB approved a rule requiring mandatory reporting of GHG emissions from certain sources, pursuant to AB 32. Facilities subject to the mandatory reporting rule must report their emissions either annually for large facilities or triennially for smaller facilities starting from 2010. In general the rule applies to facilities emitting more than 25,000 MT CO_2e in any given calendar year and electricity generating facilities with a nameplate generating capacity greater than 1 megawatt (MW) or emitting more than 2,500 MT CO_2e per year. Additional requirements apply to cement plants and entities that buy and sell electricity in the state.

Senate Bills 1078/107 and Executive Order S-14-08: Renewable Portfolio Standard (2008/2011)

SBs 1078 and 107, California's Renewable Portfolio Standard (RPS), obligates investor-owned utilities (IOUs), energy service providers (ESPs), and Community Choice Aggregations (CCAs) to procure an additional 1% of retail sales per year from eligible renewable sources until 20% is reached, no later than 2010. CPUC and CEC are jointly responsible for implementing the program.

[1] ARB approved the LCFS on April 23, 2009, and the regulation became effective on January 12, 2010 (California Air Resources Board 2011). The U.S. Fresno Federal District court ruled in December 2011 that the LCFS violates the Commerce Clause of the U.S. Constitution and issued an injunction preventing California from implementing the LCFS. ARB appealed this ruling in early January 2012. While the legal issues are being resolved, given the pending appeal by ARB, it is assumed for the time being that the LCFS will be ultimately implemented by 2020 as proposed. If the LCFS were ultimately to be blocked from implementation due to federal legal constraints, the significance determinations herein would not be affected because LCFS reductions do not alter those significance determinations.

California SB 2 X1 sets forth a longer range target of procuring 33% of retail sales by 2020. This bill passed the legislature on March 29, 2011, and was signed by Governor Brown on April 12, 2011. The Pacific Gas and Electric (PG&E) RPS-Eligible Procurement was 17.7% in year 2010, while the Statewide average for the three largest electrical suppliers (PG&E, Southern California Edison [SCE], and San Diego Gas and Electric [SDG&E]) was 17.9%.

California Cap-and-Trade (2010)

Pursuant to the directives of AB 32, ARB approved measures on December 16, 2010, to enact a GHG cap-and-trade program for the state of California. The California cap-and-trade program would create a CO_2 market system with a GHG emissions cap that will be decreased over time. Building on the data required by the 2007 California Mandatory GHG Reporting rule, only stationary sources that emit more than 25,000 MT of CO_2e per year would be affected by the cap-and-trade program. These sources include mostly large operations such as power plants, refineries, cement plants, hydrogen production facilities, and other large, stationary sources. Official rulemaking associated with achieving this emissions cap was adopted by January 1, 2011 and adopted the final cap-and-trade regulation and adaptive management plan on October 20, 2011. The program commenced in January 2012 and compliance is set to begin in January 2013.

D.2.2 Global Climate Change Overview

Increasing levels of GHGs in the atmosphere result in an increase in the temperature of the Earth's lower atmosphere, a phenomenon which is commonly referred to as global warming or *climate change*. Warming of the Earth's lower atmosphere induces a suite of additional changes including changes in: global precipitation patterns; ocean circulation, temperature, and acidity; global mean sea level; species distribution and diversity; and the timing of biological processes. These large-scale changes are collectively referred to as *global climate change*.

The Intergovernmental Panel on Climate Change (IPCC) has been established by the World Meteorological Organization and United Nations Environment Programme to assess scientific, technical, and socioeconomic information relevant to the understanding of climate change, its potential impacts, and options for adaptation and mitigation. As the leading authority on climate change science, their best estimates are that the average global temperature rise between 2000 and 2100 could likely range from 1.1 degrees Fahrenheit (°F) (assuming no increase in GHG emissions above 2000 levels) to 7.2°F (assuming substantial increase in GHG emissions) (Intergovernmental Panel on Climate Change 2007c). Large increases in global temperatures as high as 7.2°F could have massive deleterious impacts on natural and human environments.

Since the industrial revolution (approximately 1750), the concentration of CO_2 in the Earth's atmosphere has increased from 270 ppm to roughly 379 ppm. Atmospheric concentrations of methane (CH_4) and nitrous oxide (N_2O) have similarly increased since the beginning of the industrial age (Intergovernmental Panel on Climate Change 2007c). Over this same time period, global average surface temperature has increased by 1.1°F, global average sea level has increased by nearly 60 millimeters, and northern hemisphere snow cover (data available since 1920) has decreased by nearly 3 million square kilometers (Intergovernmental Panel on Climate Change 2007c). These recently recorded changes can be attributed with a high degree of certainty to increased concentrations of GHGs in the atmosphere (Intergovernmental Panel on Climate Change 2007c). Sinks of CO_2 (which remove, rather than emit, CO_2) include uptake by vegetation and dissolution into the ocean. Global GHG emissions greatly exceed the removal capacity of natural sinks. As a

result, concentrations of GHGs in the atmosphere are increasing (California Energy Commission 2006a).

GHGs are global pollutants, unlike criteria air pollutants (such as ozone precursors) and TACs. Criteria air pollutants and TACs, occur locally or regionally, and local concentrations respond to locally implemented control measures. The long atmospheric lifetimes of GHGs allow them to be transported long distances from sources and to become well-mixed, unlike criteria air pollutants, which typically exhibit strong concentration gradients away from point sources.

D.2.3 Description of Greenhouse Gases

The GHGs listed by the IPCC (2007a) (CO_2, CH_4, N_2O, hydrofluorocarbons [HFCs], perfluorinated carbons [PFCs], and sulfur hexafluoride [SF_6]) are discussed in this section in order of abundance in the atmosphere. California law and the CEQA Guidelines contain a similar definition of GHGs (Health and Safety Code 38505(g); California Code of Regulations, Title 14, Section 15364.5). Water vapor, the most abundant GHG, is not included in this list because its natural concentrations and fluctuations far outweigh its anthropogenic (human-made) sources.[2]

D.2.3.1 Carbon Dioxide

CO_2 is the most important anthropogenic GHG and accounts for more than 75% of all GHG emissions caused by humans. Its atmospheric lifetime of 50–200 years ensures that atmospheric concentrations of CO_2 will remain elevated for decades even after mitigation efforts to reduce GHG concentrations are promulgated (Intergovernmental Panel on Climate Change 2007a). The primary sources of anthropogenic CO_2 in the atmosphere include the burning of fossil fuels (including motor vehicles), gas flaring, cement production, and land use changes (including deforestation). Atmospheric CO_2 has increased from a pre-industrial concentration of 280 parts per billion (ppb) to 379 ppm in 2005 (Intergovernmental Panel on Climate Change 2007b).

D.2.3.2 Methane

CH_4, the main component of natural gas, is the second most abundant GHG and has a global warming potential (GWP, see *GHG Emissions Reporting* below) of 21 (Intergovernmental Panel on Climate Change 1996). Sources of anthropogenic emissions of CH_4 include growing rice, raising cattle, using natural gas, landfill outgassing, and mining coal (National Oceanic and Atmospheric Administration 2005). Atmospheric CH_4 has increased from a pre-industrial concentration of 715 ppb to 1,774 ppb in 2005 (Intergovernmental Panel on Climate Change 2007b).

D.2.3.3 Nitrous Oxide

N_2O is a powerful GHG, with a GWP of 310 (Intergovernmental Panel on Climate Change 1996). Anthropogenic sources of N_2O include agricultural processes (e.g., fertilizer application), nylon production, fuel-fired power plants, nitric acid production, and vehicle emissions. N_2O also is used in rocket engines, racecars, and as an aerosol spray propellant. In the United States more than 70% of N_2O emissions are related to agricultural soil management practices, particularly fertilizer

[2] Although water vapor plays a substantive role in the natural greenhouse effect, the change in GHGs in the atmosphere due to anthropogenic actions is enough to upset the radiative balance of the atmosphere and result in global warming.

application. N_2O concentrations in the atmosphere have increased 18% from pre-industrial levels of 270 ppb to 319 ppb in 2005 (Intergovernmental Panel on Climate Change 2007b).

D.2.3.4 Sulfur Hexafluoride

SF_6, a human-made chemical, is used as an electrical insulating fluid for power distribution equipment, in the magnesium industry, in semiconductor manufacturing, and also as a tracer chemical for the study of oceanic and atmospheric processes (U.S. Environmental Protection Agency 2006). In 2005, atmospheric concentrations of SF_6 were 5.6 parts per trillion (ppt) and steadily increasing in the atmosphere. SF_6 is the most powerful of all GHGs listed in IPCC studies, with a GWP of 23,900 (Intergovernmental Panel on Climate Change 1996).

D.2.3.5 Other High Global Warming Potential Gases

Emissions of HFCs and PFCs are primarily generated through industrial processes. Since the proposed project contains no major industrial processes, these are not included in this analysis. GHG Emissions Reporting.

To simplify reporting and analysis, GHGs are commonly defined in terms of GWP. The IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of CO_2e. The GWP of CO_2 is, by definition, 1. The GWP values used in this report are based on the IPCC Second Assessment Report (SAR) and United Nations Framework Convention on Climate Change (UNFCCC) reporting guidelines, and are defined in Table D-1. Although the IPCC Fourth Assessment Report (AR4) presents different GWP estimates, the current inventory standard relies on SAR GWPs to comply with reporting standards and for consistency with regional and national inventories (Intergovernmental Panel on Climate Change 2007a). The SAR GWPs are used in ARB's California inventory and AB 32 Scoping Plan estimates (California Air Resources Board 2010).

Emissions of SF_6 are generated through both industrial processes and electricity distribution. SF_6 emissions associated with project–related electricity consumption are included in the analysis herein.

Table D-1. Lifetimes and Global Warming Potentials of Several Greenhouse Gases

GHG	Global Warming Potential (100 years)	Lifetime (years)	2005 Atmospheric Abundance
CO_2 (ppm)	1	50–200	379
CH_4 (ppb)	21	9–15	1,774
N_2O (ppb)	310	120	319
SF_6 (ppt)	23,900	5.6	5.6

Sources: Intergovernmental Panel on Climate Change 1996, 2001:388–390.
ppm = parts per million.
ppb = parts per billion.
ppt = parts per trillion.

D.2.4 Impacts of Climate Change

Climate change is a complex phenomenon that has the potential to alter local climatic patterns and meteorology. Although modeling indicates that climate change will result globally and regionally in

sea level rise as well as in changes in climate and rainfall, among other effects, there remains uncertainty with regard to characterizing the precise *local* climate characteristics and predicting precisely how various ecological and social systems will react to any changes in the existing climate at the local level. Regardless of this uncertainty in precise predictions, it is widely understood that substantial climate change is expected to occur in the future, although the precise extent will take further research to define. According to the IPCC, the average global temperature rise between 2000 and 2100 could likely range from 1.1°F (assuming no increase in GHG emissions above 2000 levels) to 7.2°F (assuming substantial increase in GHG emissions) (Intergovernmental Panel on Climate Change 2007c).

Scientists believe the global changes resulting from GHG emissions will have unique and potentially severe impacts in the western United States and California. Current research efforts coordinated through ARB, CEC, California Environmental Protection Agency (CalEPA), the University of California system, and others are examining the specific changes to California's climate that will occur as the Earth's surface warms. Scientists believe that climate change could affect the natural environment in California in the following ways (among others):

- Rising sea levels along the California coastline, particularly in San Francisco and the Sacramento–San Joaquin River Delta, from ocean expansion.
- Extreme heat conditions, such as heat waves and very high temperatures, which could last longer and become more frequent.
- An increase in heat-related human deaths and infectious diseases and a higher risk of respiratory problems caused by deteriorating air quality.
- Reduced snow pack and streamflow in the Sierra Nevadas, affecting water supplies and winter recreation.
- Potential increase in the severity of winter storms, affecting peak streamflows and causing flooding.
- Changes in growing-season conditions that could affect California agriculture, causing variations in crop quality and yield.
- Changes in the distribution of plant and wildlife species because of changes in temperature, competition from colonizing species, changes in hydrologic cycles, changes in sea levels, and other climate-related effects.

These changes in California's climate and ecosystems are occurring at a time when California's population is expected to increase from 34 million to 59 million by 2040 (California Energy Commission 2006). As such, the number of people potentially affected by climate change, as well as the amount of anthropogenic GHG emissions expected to occur in the future, would occur in other parts of the world, with regional variations in the resources affected and vulnerability to adverse effects.

Construction Emission Calculations

CONSTRUCTION EMISSIONS SUMMARY

UNMITIGATED

POUNDS PER DAY

	ROG	NOx	CO	SO2	PM Total	PM10 Dust	PM10 Exhaust	PM2.5 Total	PM2.5 Dust	PM2.5 Exhaust	METRIC TONS TOTAL CO2	other	CO2e
Existing Condition													
No Project	12.40	94.41	54.63	0.01	15.03	10.46	4.57	6.34	2.19	4.15	1450.92	5.35	1467.17
Exceed Threhsolds?	*No*	*No*	*No*	*No*	*No*	--	--	*No*	--	--	--	--	*No*
Alternative 4B	12.82	97.53	57.03	0.01	15.33	10.59	4.74	6.53	2.21	4.32	5040.79	54.01	5094.85
Exceed Threhsolds?	*No*	*No*	*No*	*No*	*No*	--	--	*No*	--	--	--	--	*Yes*
Alternative 4C-2	12.82	97.53	57.03	0.01	15.75	11.00	4.74	6.59	2.27	4.32	5285.51	56.70	5342.29
Exceed Threhsolds?	*No*	*No*	*No*	*No*	*No*	--	--	*No*	--	--	--	--	*Yes*
Alternative 4C-3	23.54	223.66	112.07	0.12	32.57	21.00	11.57	14.57	4.36	10.21	8336.27	156.17	8492.52
Exceed Threhsolds?	*No*	*Yes*	*No*	*No*	*No*	--	--	*No*	--	--	--	--	*Yes*
Alternative 4C-4	12.82	97.53	57.03	0.01	17.51	12.76	4.74	6.86	2.54	4.32	7303.56	71.90	7375.70
Exceed Threhsolds?	*No*	*No*	*No*	*No*	*No*	--	--	*No*	--	--	--	--	*Yes*
Alternative 4C-5	23.54	223.66	112.07	0.12	32.57	21.00	11.57	14.57	4.36	10.21	6942.88	120.56	7063.52
Exceed Threhsolds?	*No*	*Yes*	*No*	*No*	*No*	--	--	*No*	--	--	--	--	*Yes*

MITIGATED

POUNDS PER DAY

	ROG	NOx	CO	SO2	PM Total	PM10 Dust	PM10 Exhaust	PM2.5 Total	PM2.5 Dust	PM2.5 Exhaust	METRIC TONS TOTAL CO2	other	CO2e
Existing Condition													
No Project	7.33	7.02	54.56	0.01	4.63	4.08	0.55	1.31	0.85	0.46	1432.83	4.93	1448.30
Exceed Threhsolds?	*No*	*No*	*No*	*No*	*No*	--	--	*No*	--	--	--	--	*No*
Alternative 4B	7.58	7.22	56.96	0.01	4.70	4.13	0.57	1.33	0.86	0.47	4981.16	53.00	5033.70
Exceed Threhsolds?	*No*	*No*	*No*	*No*	*No*	--	--	*No*	--	--	--	--	*Yes*
Alternative 4C-2	7.58	7.22	56.96	0.01	4.86	4.29	0.57	1.36	0.89	0.47	5218.52	55.43	5274.03
Exceed Threhsolds?	*No*	*No*	*No*	*No*	*No*	--	--	*No*	--	--	--	--	*Yes*
Alternative 4C-3	12.85	23.94	102.97	0.12	9.81	8.19	1.62	3.08	1.70	1.37	8224.79	152.47	8377.34
Exceed Threhsolds?	*No*	*No*	*No*	*No*	*No*	--	--	*No*	--	--	--	--	*Yes*
Alternative 4C-4	7.58	7.22	56.96	0.01	5.54	4.98	0.57	1.46	0.99	0.47	7107.33	64.80	7172.36
Exceed Threhsolds?	*No*	*No*	*No*	*No*	*No*	--	--	*No*	--	--	--	--	*Yes*
Alternative 4C-5	12.85	23.94	102.97	0.12	9.81	8.19	1.62	3.08	1.70	1.37	6840.08	117.63	6957.78
Exceed Threhsolds?	*No*	*No*	*No*	*No*	*No*	--	--	*No*	--	--	--	--	*Yes*

CONSTRUCTION CALCULATIONS BY ALTERNATIVE
No Project

Concurrent Activities	
# of pipe segments	1
# of wells	1
# of treatment segments	0

				UNMITIGATED PRE-SCALING								GREENHOUSE GASES					UNMITIGATED POST-SCALING								GREENHOUSE GASES			
				pounds per day								Metric tons per year					pounds per day								Metric tons per year			
WELL INSTALL		phase	days per phase	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exh	PM2.5 Dust	PM2.5 Exh	CO2 no pav1 or LCFS	CH4	N2O	CO2e	SCALING FACTOR	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exh	PM2.5 Dust	PM2.5 Exh	CO2 no pav1 or LCFS	CH4	N2O	CO2e
	off-road equipment	Well Install	176	3.75	30.42	14.30	0.00	0.00	1.29	0.00	1.19	493.015	0.5881	3.8920	497.5	100%	3.75	30.42	14.30	0.00	0.00	1.29	0.00	1.19	493.02	0.5881	3.8920	497.5
		Well Development	264	2.42	20.80	8.71	0.00	0.00	0.71	0.00	0.65	529.932	0.6322	4.1834	534.7	100%	2.42	20.80	8.71	0.00	0.00	0.71	0.00	0.65	529.93	0.6322	4.1834	534.7
				ROG	NOx	CO	SO2	PM10 Dust	PM10 Exh	PM2.5 Dust	PM2.5 Exh	CO2	non-CO2		CO2e		ROG	NOx	CO	SO2	PM10 Dust	PM10 Exh	PM2.5 Dust	PM2.5 Exh		non-CO2		CO2e
	on-road sources																											
	employee commute	Well Install	176	0.07	0.20	1.75	0.00	0.00	0.03	0.00	0.01	16.18	0.851576		17.0	100%	0.07	0.20	1.75	0.00	0.00	0.03	0.00	0.01	16.18	0.851576		17.0
		Well Development	264	0.03	0.10	0.87	0.00	0.00	0.01	0.00	0.01	12.13	0.638682		12.8	100%	0.03	0.10	0.87	0.00	0.00	0.01	0.00	0.01	12.13	0.638682		12.8
PIPELINE INSTALL																												
	off-road equipment	Intall - initial grading	160	0.24	2.31	0.7	0	0.46	0.08	0.1	0.07	20.3006	0.0242	0.1603	20.5	100%	0.24	2.31	0.70	0.00	0.46	0.08	0.10	0.07	20.30	0.0242	0.1603	20.5
		Install - trenching dust	160	0	0	0	0	10	0	2.09	0	0	0.0000	0.0000	-	100%	0.00	0.00	0.00	0.00	10.00	0.00	2.09	0.00	0.00	0.0000	0.0000	-
		Install - 2.5 day equipment	160	4.49	32.37	20.3	0	0	2.03	0	1.87	270.353	0.3225	2.1342	272.8	100%	4.49	32.37	20.30	0.00	0.00	2.03	0.00	1.87	270.35	0.3225	2.1342	272.8
		Install - 10 day equipment	160	1.21	7.19	3.52	0	0	0.33	0	0.3	66.9677	0.0799	0.5287	67.6	100%	1.21	7.19	3.52	0.00	0.00	0.33	0.00	0.30	66.97	0.0799	0.5287	67.6
	on-road sources																											
		employee commute	160	0.16	0.50	4.37	0.01	0.00	0.06	0.00	0.03	36.77	1.935400		38.7	100%	0.16	0.50	4.37	0.01	0.00	0.06	0.00	0.03	36.77	1.935400		38.7
		Material deliveries	160	0.02	0.51	0.12	0.00	0.00	0.03	0.00	0.02	5.27	0.277164		5.5	100%	0.02	0.51	0.12	0.00	0.00	0.03	0.00	0.02	5.27	0.277164		5.5
		No Project Total		12.40	94.41	54.63	0.01	10.46	4.57	2.19	4.15	1450.92	5.35		1467.17		12.40	94.41	54.63	0.01	10.46	4.57	2.19	4.15	1450.92	5.35		1467.17

CONSTRUCTION CALCULATIONS BY ALTERNATIVE

Alternative 4B

Concurrent Activities	FS
# of pipe segments	1
# of wells	1
# of treatment segments	0

UNMITIGATED PRE-SCALING

				pounds per day								Metric tons per year			
									PM10	PM2.5	PM2.5				
	on or off road	phase	days before scaling	ROG	NOx	CO	SO2	PM10 Dust	Exhaust	Dust	Exhaust	CO2 no pav1 or LCFS	CH4	N2O	CO2e
	offroad equipment		23	0.43	3.12	2.40	0.00	0.13	0.17	0.02	0.17	4.25	0.00	0.00	4.26
WELL INSTALL															
	off-road equipment	Well Install	176	3.75	30.42	14.30	0.00	0.00	1.29	0.00	1.19	493.0152808	0.5881	3.8920	497.5
		Well Development	264	2.42	20.80	8.71	0.00	0.00	0.71	0.00	0.65	529.9321115	0.6322	4.1834	534.7
	employee commute	Well Install	176	0.07	0.20	1.75	0.00	0.00	0.03	0.00	0.01	16.18	0.851576		17.0
		Well Development	264	0.03	0.10	0.87	0.00	0.00	0.01	0.00	0.01	12.13	0.638682		12.8
PIPELINE INSTALL															
	off-road equipment	Intall - initial grading	160	0.24	2.31	0.7	0	0.46	0.08	0.1	0.07	20.30061725	0.0242	0.1603	20.5
		Install - trenching dust	160	0	0	0	0	10	0	2.09	0	0	0.0000	0.0000	-
		Install - 2.5 day equipment	160	4.49	32.37	20.3	0	0	2.03	0	1.87	270.3533905	0.3225	2.1342	272.8
		Install - 10 day equipment	160	1.21	7.19	3.52	0	0	0.33	0	0.3	66.96765182	0.0799	0.5287	67.6
	employee commute		160	0.16	0.50	4.37	0.01	0.00	0.06	0.00	0.03	36.77	1.935400		38.7
	Material deliveries		160	0.02	0.51	0.12	0.00	0.00	0.03	0.00	0.02	5.27	0.277164		5.5
		Alternative 4B Total		12.82	97.53	57.03	0.01	10.59	4.74	2.21	4.32	1455.17	16.25		1471.43

UNMITIGATED POST-SCALING

				pounds per day								Metric tons per year			
									PM10	PM2.5	PM2.5				
	on or off road	phase	days after scaling	ROG	NOx	CO	SO2	PM10 Dust	Exhaust	Dust	Exhaust	CO2 no pav1 or LCFS	CH4	N2O	CO2e
	offroad equipment		660%	0.43	3.12	2.40	0.00	0.13	0.17	0.02	0.17	28.06	0.00	0.00	28.11
WELL INSTALL															
	off-road equipment	Well Install	405%	3.75	30.42	14.30	0.00	0.00	1.29	0.00	1.19	1996.75	2.3820	15.7628	2,014.9
		Well Development	405%	2.42	20.80	8.71	0.00	0.00	0.71	0.00	0.65	2146.27	2.5604	16.9431	2,165.8
	employee commute	Well Install	405%	0.07	0.20	1.75	0.00	0.00	0.03	0.00	0.01	65.53	3.448954		69.0
		Well Development	405%	0.03	0.10	0.87	0.00	0.00	0.01	0.00	0.01	49.15	2.586716		51.7
PIPELINE INSTALL															
	off-road equipment	Intall - initial grading	189%	0.24	2.31	0.70	0.00	0.46	0.08	0.10	0.07	38.35	0.0458	0.3028	38.7
		Install - trenching dust	189%	0.00	0.00	0.00	0.00	10.00	0.00	2.09	0.00	0.00	0.0000	0.0000	-
		Install - 2.5 day equipment	189%	4.49	32.37	20.30	0.00	0.00	2.03	0.00	1.87	510.75	0.6093	4.0320	515.4
		Install - 10 day equipment	189%	1.21	7.19	3.52	0.00	0.00	0.33	0.00	0.30	126.51	0.1509	0.9987	127.7
	employee commute		189%	0.16	0.50	4.37	0.01	0.00	0.06	0.00	0.03	69.47	3.656327		73.1
	Material deliveries		189%	0.02	0.51	0.12	0.00	0.00	0.03	0.00	0.02	9.95	0.523615		10.5
		Alternative 4B Total		12.82	97.53	57.03	0.01	10.59	4.74	2.21	4.32	5040.79	54.01		5094.85

CONSTRUCTION CALCULATIONS BY ALTERNATIVE

Alternative 4C-2

Concurrent Activities	
# of pipe segments	1
# of wells	1
# of treatment segments	0

UNMITIGATED PRE-SCALING

				pounds per day								Metric tons per year				
INITIAL GRADING	on or off road	phase	days before scaling	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM2.5 Dust	PM2.5 Exhaust	CO2 no pav1 or LCFS	CH4	N2O	CO2e	scaling factor
	offroad equipment		97	0.43	3.12	2.40	0.00	0.54	0.17	0.08	0.17	17.85	0.00	0.00	17.89	233.33%
WELL INSTALL																
	off-road equipment	Well Install	208	3.75	30.42	14.3	0	0	1E+00	0	1.19	583	1	5	588	353.63%
		Well Development	312	2.42	20.8	8.71	0	0	7.1E-01	0	0.65	626	1	5	632	353.63%
	on-road sources															
	employee commute	Well Install	208	0.07	0.20	1.75	0.00	0.00	0.03	0.00	0.01	19	1.006408		20	353.63%
		Well Development	312	0.03	0.10	0.87	0.00	0.00	0.01	0.00	0.01	14	0.754806		15	353.63%
PIPELINE INSTALL																
	off-road equipment	Intall - initial grading	180	0.24	2.31	0.7	0	0.46	0.08	0.1	0.07	23	0	0	23	189.14%
		Install - trenching dust	180	0	0	0	0	10	0	2.09	0	0	0	0	0	189.14%
		Install - 2.5 day equipment	180	4.49	32.37	20.3	0	0	2.03	0	1.87	304	0	2	307	189.14%
		Install - 10 day equipment	180	1.21	7.19	3.52	0	0	0.33	0	0.3	75	0	1	76	189.14%
	on-road sources															
	employee commute		180	0.16	0.50	4.37	0.01	0.00	0.06	0.00	0.03	41	2.177325		44	189.14%
	Material deliveries		180	0.02	0.51	0.12	0.00	0.00	0.03	0.00	0.02	6	0.311810		6	189.14%
		Alternative 4C-2 Total		12.82	97.53	57.03	0.01	11.00	4.74	2.27	4.32	1710	18.89		1729	

UNMITIGATED POST-SCALING

			pounds per day								Metric tons per year			
INITIAL GRADING	on or off road	phase	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM2.5 Dust	PM2.5 Exhaust	CO2 no pav1 or LCFS	CH4	N2O	CO2e
	offroad equipment		0.43	3.12	2.40	0.00	0.54	0.17	0.08	0.17	41.66	0.00	0.00	41.74
WELL INSTALL														
	off-road equipment	Well Install	3.75	30.42	14.30	0.00	0.00	1.29	0.00	1.19	2060	2	16	2079
		Well Development	2.42	20.80	8.71	0.00	0.00	0.71	0.00	0.65	2215	3	17	2235
	on-road sources													
	employee commute	Well Install	0.07	0.20	1.75	0.00	0.00	0.03	0.00	0.01	68	3.558915		71
		Well Development	0.03	0.10	0.87	0.00	0.00	0.01	0.00	0.01	51	2.669186		53
PIPELINE INSTALL														
	off-road equipment	Intall - initial grading	0.24	2.31	0.70	0.00	0.46	0.08	0.10	0.07	43	0	0	44
		Install - trenching dust	0.00	0.00	0.00	0.00	10.00	0.00	2.09	0.00	0	0	0	0
		Install - 2.5 day equipment	4.49	32.37	20.30	0.00	0.00	2.03	0.00	1.87	575	1	5	580
		Install - 10 day equipment	1.21	7.19	3.52	0.00	0.00	0.33	0.00	0.30	142	0	1	144
	on-road sources													
	employee commute		0.16	0.50	4.37	0.01	0.00	0.06	0.00	0.03	78	4.118184		82
	Material deliveries		0.02	0.51	0.12	0.00	0.00	0.03	0.00	0.02	11	0.589756		12
		Alternative 4C-2 Total	12.82	97.53	57.03	0.01	11.00	4.74	2.27	4.32	5285.51	56.70		5342.29

CONSTRUCTION CALCULATIONS BY ALTERNATIVE

Alternative 4C-3

Concurrent Activities	
# of pipe segments	1
# of wells	1
# of treatment segments	1

UNMITIGATED PRE-SCALING

			days before scaling	pounds per day ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM2.5 Dust	PM2.5 Exhaust	Metric tons per year CO2 no pav1 or LCFS	CH4	N2O	CO2e
INITIAL GRADING															
	offroad equipment		97	0.43	3.12	2.40	0.00	0.17	0.08	0.17		17.85	0.00	0.00	17.89
WELL INSTALL															
off-road equipment		Well Install	272	3.75	30.42	14.30	0.00	0.00	1.29	0.00	1.19	762	1	6	769
		Well Development	408	2.42	20.80	8.71	0.00	0.00	0.71	0.00	0.65	819	1	6	826
on-road sources															
	employee commute	Well Install	272	0.07	0.20	1.75	0.00	0.00	0.03	0.00	0.01	25	1.316072		26
		Well Development	408	0.03	0.10	0.87	0.00	0.00	0.01	0.00	0.01	19	0.987054		20
PIPELINE INSTALL															
off-road equipment		Intall - initial grading	300	0.24	2.31	0.70	0.00	0.46	0.08	0.10	0.07	38	0	0	38
		Install - trenching dust	300	0.00	0.00	0.00	0.00	10.00	0.00	2.09	0.00	0	0	0	0
		Install - 2.5 day equipment	300	4.49	32.37	20.30	0.00	0.00	2.03	0.00	1.87	507	1	4	512
		Install - 10 day equipment	300	1.21	7.19	3.52	0.00	0.00	0.33	0.00	0.30	126	0	1	127
on-road sources															
	employee commute		300	0.16	0.50	4.37	0.01	0.00	0.06	0.00	0.03	69	3.628875		73
	Material deliveries		300	0.02	0.51	0.12	0.00	0.00	0.03	0.00	0.02	10	0.519683		10
TREATMENT FACILITY															
off-road equipment		grading/excavation	22	4.04	32.73	17.27	0.00	10.00	1.53	2.09	1.41	37	0	0	38
		paving	45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0
		building construction	261	3.07	23.30	12.99	0.00	0.00	1.17	0.00	1.07	334	0	3	337
on-road sources															
	employee commute	grading/excavation	22	0.09	0.27	2.33	0.00	0.00	0.03	0.00	0.01	3	0.141929		3
		paving	45	0.21	0.64	5.53	0.01	0.00	0.08	0.00	0.03	13	0.689486		14
		building construction	261	0.05	0.17	1.46	0.00	0.00	0.02	0.00	0.01	20	1.052374		21
	material deliveries	uilding construction	261	3.04	64.34	14.41	0.09	0.00	3.72	0.00	3.12	1074	54		1127
	heavy duty truck hauling and deliveries	oil Hauling (grading)	22	0.00	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0	0.003811		0
		Concrete Delivery	1	0.15	3.09	0.69	0.00	0.00	0.18	0.00	0.15	0	0.010394		0
		Asphalt Delivery	1	0.07	1.54	0.35	0.00	0.00	0.09	0.00	0.07	0	0.005197		0
		Alternative 4C-3 Total		24	224	112	0	21	12	4	10	3873	86		3959

UNMITIGATED POST-SCALING

			SCALING FACTOR	pounds per day ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM2.5 Dust	PM2.5 Exhaust	Metric tons per year CO2 no pav1 or LCFS	CH4	N2O	CO2e
INITIAL GRADING															
	offroad equipment		233%	0.43	3.12	2.40	0.00	0.54	0.17	0.08	0.17	41.66	0.00	0.00	41.74
WELL INSTALL															
off-road equipment		Well Install	312%	3.75	30.42	14.30	0.00	0.00	1.29	0.00	1.19	2374	2.83	18.74	2396
		Well Development	312%	2.42	20.80	8.71	0.00	0.00	0.71	0.00	0.65	2552	3.04	20.15	2575
on-road sources															
	employee commute	Well Install	312%	0.07	0.20	1.75	0.00	0.00	0.03	0.00	0.01	78	4.101220		82
		Well Development	312%	0.03	0.10	0.87	0.00	0.00	0.01	0.00	0.01	58	3.075915		62
PIPELINE INSTALL															
off-road equipment		Intall - initial grading	125%	0.24	2.31	0.70	0.00	0.46	0.08	0.10	0.07	47	0.06	0.37	48
		Install - trenching dust	125%	0.00	0.00	0.00	0.00	10.00	0.00	2.09	0.00	0	0.00	0.00	0
		Install - 2.5 day equipment	125%	4.49	32.37	20.30	0.00	0.00	2.03	0.00	1.87	632	0.75	4.99	638
		Install - 10 day equipment	125%	1.21	7.19	3.52	0.00	0.00	0.33	0.00	0.30	157	0.19	1.24	158
on-road sources															
	employee commute		125%	0.16	0.50	4.37	0.01	0.00	0.06	0.00	0.03	86	4.526211		91
	Material deliveries		125%	0.02	0.51	0.12	0.00	0.00	0.03	0.00	0.02	12.3	0.648189		13
TREATMENT FACILITY															
off-road equipment		grading/excavation	155%	4.04	32.73	17.27	0.00	10.00	1.53	2.09	1.41	58	0.07	0.46	58
		paving	155%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0
		building construction	155%	3.07	23.30	12.99	0.00	0.00	1.17	0.00	1.07	518	0.62	4.09	523
on-road sources															
	employee commute	grading/excavation	155%	0.09	0.27	2.33	0.00	0.00	0.03	0.00	0.01	4	0.220099		4
		paving	155%	0.21	0.64	5.53	0.01	0.00	0.08	0.00	0.03	20	1.069229		21
		building construction	155%	0.05	0.17	1.46	0.00	0.00	0.02	0.00	0.01	31	1.631980		33
	material deliveries	uilding construction	155%	3.04	64.34	14.41	0.09	0.00	3.72	0.00	3.12	1665	83.26		1748
	heavy duty truck hauling and deliveries	oil Hauling (grading)	155%	0.00	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.1	0.005910		0.1
		Concrete Delivery	155%	0.15	3.09	0.69	0.00	0.00	0.18	0.00	0.15	0.3	0.016118		0.3
		Asphalt Delivery	155%	0.07	1.54	0.35	0.00	0.00	0.09	0.00	0.07	0.2	0.008059		0.2
		Alternative 4C-3 Total		24	224	112	0	21	12	4	10	8336	156		8493

MITIGATED POST SCALING

			ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM2.5 Dust	PM2.5 Exhaust	CO2 w/ LCFS	CH4	N2O	CO2e
INITIAL GRADING	offroad equipment		0.25	0.21	2.40	0.00	0.21	0.02	0.03	0.02	40.62	0.00	0.00	40.70
WELL INSTALL	off-road equipment		2.19	2.00	14.30	0.00	0.00	0.13	0.00	0.12	2351	2.80	18.56	2372
	off-road equipment		1.41	1.37	8.71	0.00	0.00	0.07	0.00	0.06	2527	3.01	19.95	2550
	employee commute		0.07	0.20	1.75	0.00	0.00	0.03	0.00	0.01	72	3.59		75
	employee commute		0.03	0.10	0.87	0.00	0.00	0.01	0.00	0.01	54	2.69		57
PIPELINE INSTALL	offroad equipment		0.14	0.15	0.70	0.00	0.18	0.01	0.04	0.01	47	0.06	0.37	47
	offroad equipment		0.00	0.00	0.00	0.00	3.90	0.00	0.82	0.00	0	0.00	0.00	0
	offroad equipment		2.62	2.13	20.30	0.00	0.00	0.20	0.00	0.19	626	0.75	4.94	632
	offroad equipment		0.71	0.47	3.52	0.00	0.00	0.03	0.00	0.03	155	0.18	1.22	156
	employee commute		0.16	0.50	4.37	0.01	0.00	0.06	0.00	0.03	79	3.96		83
	Material deliveries		0.01	0.09	0.05	0.00	0.00	0.00	0.00	0.00	12.13	0.61		13
TREATMENT FACILITY	offroad equipment		2.36	2.15	17.27	0.00	3.90	0.15	0.82	0.14	57	0.07	0.45	58
	offroad equipment		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0
	offroad equipment		1.79	1.53	12.99	0.00	0.00	0.12	0.00	0.11	513	0.61	4.05	518
	employee commute	grading/excavation	0.09	0.27	2.33	0.00	0.00	0.03	0.00	0.01	4	0.19		4
		paving	0.21	0.64	5.53	0.01	0.00	0.08	0.00	0.03	19	0.94		20
		building construction	0.05	0.17	1.46	0.00	0.00	0.02	0.00	0.01	29	1.43		30
	material deliveries	building construction	0.72	11.15	6.00	0.09	0.00	0.60	0.00	0.56	1640.13	82.01		1722
	heavy duty truck hauling and deliveries	Soil Hauling (grading)	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.01		0
		Concrete Delivery	0.03	0.54	0.29	0.00	0.00	0.03	0.00	0.03	0.30	0.02		0
		halt Delivery	0.02	0.27	0.14	0.00	0.00	0.01	0.00	0.01	0.15	0.01		0
		Alternative 4C-3 Total	13	24	103	0	8	2	2	1	8225	152		8377

CONSTRUCTION CALCULATIONS BY ALTERNATIVE

5 6 7

Alternative 4C-4

Concurrent Activities	
# of pipe segments	1
# of wells	1
# of treatment segments	0

UNMITIGATED PRE-SCALING

				pounds per day								Metric tons per year				
			days before scaling	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM2.5 Dust	PM2.5 Exhaust	CO2 no pav1 or LCFS	CH4	N2O	CO2e
INITIAL GRADING	on or off road	phase													
	offroad equipment		411	0.43	3.12	2.40	0.00	2.30	0.17	0.35	0.17	76	0	0	76
WELL INSTALL															
	off-road equipment	Well Install	208	3.75	30.42	14.30	0.00	0.00	1.29	0.00	1.19	583	1	5	588
		Well Development	312	2.42	20.80	8.71	0.00	0.00	0.71	0.00	0.65	626	1	5	632
	on-road sources														
	employee commute	Well Install	208	0.07	0.20	1.75	0.00	0.00	0.03	0.00	0.01	19	1.006		20
		Well Development	312	0.03	0.10	0.87	0.00	0.00	0.01	0.00	0.01	14	0.754806		15
PIPELINE INSTALL															
	off-road equipment	Intall - initial grading	240	0.24	2.31	0.70	0.00	0.46	0.08	0.10	0.07	30	0	0	31
		Install - trenching dust	240	0.00	0.00	0.00	0.00	10.00	0.00	2.09	0.00	0	0	0	0
		Install - 2.5 day equipment	240	4.49	32.37	20.30	0.00	0.00	2.03	0.00	1.87	406	0	3	409
		Install - 10 day equipment	240	1.21	7.19	3.52	0.00	0.00	0.33	0.00	0.30	100	0	1	101
	on-road sources														
	employee commute			0.16	0.50	4.37	0.01	0.00	0.06	0.00	0.03	0	0.000000		0
	Material deliveries			0.02	0.51	0.12	0.00	0.00	0.03	0.00	0.02	0	0.000000		0
			TOTAL ALL	12.82	97.53	57.03	0.01	12.76	4.74	2.54	4.32	1855	18		1872

UNMITIGATED POST-SCALING

				SCALING FACTOR	pounds per day								Metric tons per year			
					ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM2.5 Dust	PM2.5 Exhaust	CO2 no pav1 or LCFS	CH4	N2O	CO2e
INITIAL GRADING	on or off road	phase														
	offroad equipment			170%	0.43	3.12	2.40	0.00	2.30	0.17	0.35	0.17	129	0	0	129
WELL INSTALL																
	off-road equipment	Well Install		459%	3.75	30.42	14.30	0.00	0.00	1.29	0.00	1.19	2675	3	21	2699
		Well Development		459%	2.42	20.80	8.71	0.00	0.00	0.71	0.00	0.65	2875	3	23	2902
	on-road sources															
	employee commute	Well Install		459%	0.07	0.20	1.75	0.00	0.00	0.03	0.00	0.01	88	4.620706		92
		Well Development		459%	0.03	0.10	0.87	0.00	0.00	0.01	0.00	0.01	66	3.465529		69
PIPELINE INSTALL																
	off-road equipment	Intall - initial grading		274%	0.24	2.31	0.70	0.00	0.46	0.08	0.10	0.07	83	0	1	84
		Install - trenching dust		274%	0.00	0.00	0.00	0.00	10.00	0.00	2.09	0.00	0	0	0	0
		Install - 2.5 day equipment		274%	4.49	32.37	20.30	0.00	0.00	2.03	0.00	1.87	1112	1	9	1122
		Install - 10 day equipment		274%	1.21	7.19	3.52	0.00	0.00	0.33	0.00	0.30	275	0	2	278
	on-road sources															
	employee commute			274%	0.16	0.50	4.37	0.01	0.00	0.06	0.00	0.03	0	0.000000		0
	Material deliveries			274%	0.02	0.51	0.12	0.00	0.00	0.03	0.00	0.02	0	0.000000		0
					12.82	97.53	57.03	0.01	12.76	4.74	2.54	4.32	7304	72		7376

CONSTRUCTION CALCULATIONS BY ALTERNATIVE

Alternative 4C-5

Concurrent Activities	
# of pipe segments	1
# of wells	1
# of treatment segments	1

UNMITIGATED PRE-SCALING

				pounds per day								Metric tons per year			
			days before scaling	ROG	NOx	CO	SO2	PM10 Dust	10 Exha	M2.5 Dust	2.5 Exha	CO2 no pav1 or LCFS	CH4	N2O	CO2e
INITIAL GRADING		offroad equipment	97	0.43	3.12	2.40	0.00	0.54	0.17	0.08	0.17	17.85	0.00	0.00	17.89
WELL INSTALL															
	off-road equipment	Well Install	216	3.75	30.42	14.3	0	0	1.29	0	1.19	605.1	0.7	4.8	610.6
		Well Development	324	2.42	20.8	8.71	0	0	0.71	0	0.65	650.4	0.8	5.1	656.3
	on-road sources														
	employee commute	Well Install	216	0.07	0.20	1.75	0.00	0.00	0.03	0.00	0.01	19.9	1.045		20.9
		Well Development	324	0.03	0.10	0.87	0.00	0.00	0.01	0.00	0.01	14.9	0.784		15.7
PIPELINE INSTALL															
	off-road equipment	Intall - initial grading	200	0.24	2.31	0.7	0	0.46	0.08	0.1	0.07	25.4	0.0	0.2	25.6
		Install - trenching dust	200	0	0	0	0	10	0.00	2.09	0	0.0	0.0	0.0	0.0
		Install - 2.5 day equipment	200	4.49	32.37	20.3	0	0	2.03	0	1.87	337.9	0.4	2.7	341.0
		Install - 10 day equipment	200	1.21	7.19	3.52	0	0	0.33	0	0.3	83.7	0.1	0.7	84.5
	on-road sources														
	employee commute		200	0.16	0.50	4.37	0.01	0.00	0.06	0.00	0.03	46.0	2.419		48.4
	Material deliveries		200	0.02	0.51	0.12	0.00	0.00	0.03	0.00	0.02	6.6	0.346		6.9
TREATMENT FACILITY															
	off-road equipment	grading/excavation	22	4.04	32.73	17.27	0	10	1.53	2.09	1.41	37.2	0.0	0.3	37.5
		paving	45	0	0	0	0	0	0.00	0	0	0.0	0.0	0.0	0.0
		building construction	261	3.07	23.3	12.99	0	0	1.17	0	1.07	334.1	0.4	2.6	337.1
	on-road sources														
	employee commute	grading/excavation	22	0.09	0.27	2.33	0.00	0.00	0.03	0.00	0.01	2.7	0.142		2.8
		paving	45	0.21	0.64	5.53	0.01	0.00	0.08	0.00	0.03	13.1	0.689		13.8
		building construction	261	0.05	0.17	1.46	0.00	0.00	0.02	0.00	0.01	20.0	1.052		21.0
	material deliveries	building construction	261	3.04	64.34	14.41	0.09	0.00	3.72	0.00	3.12	1073.8	56.516		1130.3
	heavy duty truck hauling and deliveries	Soil Hauling (grading)	22	0.00	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.1	0.004		0.1
		Concrete Delivery	1	0.15	3.09	0.69	0.00	0.00	0.18	0.00	0.15	0.2	0.010		0.2
		Asphalt Delivery	1	0.07	1.54	0.35	0.00	0.00	0.09	0.00	0.07	0.1	0.005		0.1
		Alternative 4C-5 Total		24	224	112	0	21	12	4	10	3289	82		3371

UNMITIGATED POST-SCALING

			SCALING FACTOR	pounds per day								Metric tons per year			
				ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM2.5 Dust	PM2.5 Exhaust	CO2 no pav1 or LCFS	CH4	N2O	CO2e
INITIAL GRADING		offroad equipment	233%	0.43	3.12	2.40	0.00	0.54	0.17	0.08	0.17	41.66	0.00	0.00	41.74
WELL INSTALL															
	off-road equipment	Well Install	348%	3.75	30.42	14.30	0.00	0.00	1.29	0.00	1.19	2108	3	17	2127
		Well Development	348%	2.42	20.80	8.71	0.00	0.00	0.71	0.00	0.65	2266	3	18	2286
	on-road sources														
	employee commute	Well Install	348%	0.07	0.20	1.75	0.00	0.00	0.03	0.00	0.01	69	3.641		73
		Well Development	348%	0.03	0.10	0.87	0.00	0.00	0.01	0.00	0.01	52	2.730		55
PIPELINE INSTALL															
	off-road equipment	Intall - initial grading	185%	0.24	2.31	0.70	0.00	0.46	0.08	0.10	0.07	47	0	0	47
		Install - trenching dust	185%	0.00	0.00	0.00	0.00	10.00	0.00	2.09	0.00	0	0	0	0
		Install - 2.5 day equipment	185%	4.49	32.37	20.30	0.00	0.00	2.03	0.00	1.87	626	1	5	632
		Install - 10 day equipment	185%	1.21	7.19	3.52	0.00	0.00	0.33	0.00	0.30	155	0	1	157
	on-road sources														
	employee commute		185%	0.16	0.50	4.37	0.01	0.00	0.06	0.00	0.03	85	4.483		90
	Material deliveries		185%	0.02	0.51	0.12	0.00	0.00	0.03	0.00	0.02	12	0.642		13
TREATMENT FACILITY															
	off-road equipment	grading/excavation	100%	4.04	32.73	17.27	0.00	10.00	1.53	2.09	1.41	37	0	0	38
		paving	100%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0
		building construction	100%	3.07	23.30	12.99	0.00	0.00	1.17	0.00	1.07	334	0	3	337
	on-road sources														
	employee commute	grading/excavation	100%	0.09	0.27	2.33	0.00	0.00	0.03	0.00	0.01	3	0.142		3
		paving	100%	0.21	0.64	5.53	0.01	0.00	0.08	0.00	0.03	13	0.689		14
		building construction	100%	0.05	0.17	1.46	0.00	0.00	0.02	0.00	0.01	20	1.052		21
	material deliveries	building construction	100%	3.04	64.34	14.41	0.09	0.00	3.72	0.00	3.12	1074	56.516		1130
	heavy duty truck hauling and deliveries	Soil Hauling (grading)	100%	0.00	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0	0.004		0
		Concrete Delivery	100%	0.15	3.09	0.69	0.00	0.00	0.18	0.00	0.15	0	0.010		0
		Asphalt Delivery	100%	0.07	1.54	0.35	0.00	0.00	0.09	0.00	0.07	0	0.005		0
				24	224	112	0	21	12	4	10	6943	121		7064

MITIGATED POST SCALING

			ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM2.5 Dust	PM2.5 Exhaust	CO2 w/ LCFS	CH4	N2O	CO2e
INITIAL GRADING	offroad equipment		0.25	0.21	2.40	0.00	0.21	0.02	0.03	0.02	40.62	0.00	0.00	40.70
WELL INSTALL	off-road equipment		2.19	2.00	14.30	0.00	0.00	0.13	0.00	0.12	2087	2	16	2106
	off-road equipment		1.41	1.37	8.71	0.00	0.00	0.07	0.00	0.06	2243	3	18	2263
	employee commute		0.07	0.20	1.75	0.00	0.00	0.03	0.00	0.01	64	3.355122		67
	employee commute		0.03	0.10	0.87	0.00	0.00	0.01	0.00	0.01	48	2.516341		50
PIPELINE INSTALL	offroad equipment		0.14	0.15	0.70	0.00	0.18	0.01	0.04	0.01	47	0	0	47
	offroad equipment		0.00	0.00	0.00	0.00	3.90	0.00	0.82	0.00	0	0	0	0
	offroad equipment		2.62	2.13	20.30	0.00	0.00	0.20	0.00	0.19	620	1	5	626
	offroad equipment		0.71	0.47	3.52	0.00	0.00	0.03	0.00	0.03	154	0	1	155
	employee commute		0.16	0.50	4.37	0.01	0.00	0.06	0.00	0.03	78	4.131085		83
	Material deliveries		0.01	0.09	0.05	0.00	0.00	0.00	0.00	0.00	12	0.625960		13
TREATMENT FACILITY	offroad equipment		2.36	2.15	17.27	0.00	3.90	0.15	0.82	0.14	37	0	0	37
	offroad equipment		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0
	offroad equipment		1.79	1.53	12.99	0.00	0.00	0.12	0.00	0.11	331	0	3	334
	employee commute	grading/excavation	0.09	0.27	2.33	0.00	0.00	0.03	0.00	0.01	2	0.130799		3
		paving	0.21	0.64	5.53	0.01	0.00	0.08	0.00	0.03	12	0.635414		13
		building construction	0.05	0.17	1.46	0.00	0.00	0.02	0.00	0.01	18	0.969842		19
	material deliveries	building construction	0.72	11.15	6.00	0.09	0.00	0.60	0.00	0.56	1047	55.107975		1102
	heavy duty truck hauling and deliveries	Soil Hauling (grading)	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0	0.003716		0
		Concrete Delivery	0.03	0.54	0.29	0.00	0.00	0.03	0.00	0.03	0	0.010135		0
		heavy duty truck hauling and deliveries lt Delivery	0.02	0.27	0.14	0.00	0.00	0.01	0.00	0.01	0	0.005067		0
			13	24	103	0	8	2	2	1	6840	118		6958

URBEMIS CONSTRUCTION EMISSIONS ASSOCIATED WITH OFFROAD EQUIPMENT AND FUGITIVE DUST

		Pounds per Day								
		ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM2.5 Dust	PM2.5 Exhaust	CO2
Pipe Install	run as:									
Intall - initial grading	1/7/2013	0.24	2.31	0.7	0	0.46	0.08	0.1	0.07	279.72
Install - trenching dust	1/10/213					10		2.09		
Install - 2.5 day equipment	1/8/2013	4.49	32.37	20.3	0	0	2.03	0	1.87	3725.17
Install - 10 day equipment	1/9/2013	1.21	7.19	3.52	0	0	0.33	0	0.3	922.74
		ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM2.5 Dust	PM2.5 Exhaust	CO2
Well Install										
Well Install	1/7-1/8/2013	3.75	30.42	14.3	0	0	1.29	0	1.19	6175.64
Well Development	1/9-1/11/2013	2.42	20.8	8.71	0	0	0.71	0	0.65	4425.38
Treatment Facility										
		ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM2.5 Dust	PM2.5 Exhaust	CO2
paving										
0.25 day equipment		0.24	2.31	0.7	0	0	0.08	0	0.07	279.72
2.5 day equipment	1/5/2011	1.69	13.7	6.94	0	0	0.62	0	0.57	1659.39
10 day equipment	1/3/2011	2.58	16.64	9.32	0	0	1.07	0	0.99	18.51
paving		*4.51*	*32.65*	*16.96*	*0*	*0*	*1.77*	*0*	*1.63*	*1957.62*
Bldg Construction										
2.5 day equipment	1/7/2011	0.98	7.51	2.89	0	0	0.27	0	0.25	996.68
10 day equipment	1/4/2011	0.95	7.29	4.48	0	0	0.43	0	0.39	893.39
17 day equipment	1/6/2011	1.14	8.5	5.62	0	0	0.47	0	0.43	931.88
building construction		*3.07*	*23.3*	*12.99*	*0*	*0*	*1.17*	*0*	*1.07*	*2821.95*
grading										
2.5 day equipment	1/12/2011	0.9	6.87	4.52	0	0	0.37	0	0.34	767.22
10 day equipment	1/10/2011	3.14	25.86	12.75	0	10	1.16	2.09	1.07	2959.67
grading/excavation		*4.04*	*32.73*	*17.27*	*0*	*10*	*1.53*	*2.09*	*1.41*	*3726.89*

DAILY EMISSIONS FROM ON-ROAD SOURCES - CONSTRUCTION

These are per-unit (per well, per pipe segment, per treatment structure 1,000ft2) calcs. Emsisions herein are scaled for each alternative

grams to lbs conversion 0.002205
pounds to metric ton 0.0004536

Emission Factors

Emission factors (grams per mile) were obtained from EMFAC 2011 web-based tool
Road Dust was calculated using the AP-42 Paved Roads

UNMITIGATED	On-Road Exhaust Emissions Factors from EMFAC2011 (grams/mile)								Paved Road Dust (g/mile)	
	ROG	CO	NOx	CO2	(Pavley 1 +	PM10	PM2.5	SOx	PM10	PM2.5
Employee Commute	0.124	3.300	0.380	383.048	353.008	0.047	0.020	0.004	7.17E-06	1.76E-06
Material Deliveries	0.551	2.615	11.674	1645.663	1629.207	0.675	0.567	0.016	6.30E-05	1.55E-05
Heavy Duty Truck Hauling and Deliveries	0.551	2.615	11.674	1645.663	1629.207	0.675	0.567	0.016	6.30E-05	1.55E-05
	1	2	3	4	5	6	7	8	9	10	11	12

MITIGATED	On-Road Exhaust Emissions Factors from EMFAC2011 (grams/mile)								Paved Road Dust (lbs/mile)	
	ROG	CO	NOx	CO2	(Pavley 1 +	PM10	PM2.5	SOx	PM10	PM2.5
Employee Commute	0.12381903	3.30026	0.3798	383.0479	353.0077	0.0475	0.020207922	0.004	7.17E-06	1.76E-06
Material Deliveries	0.129865849	1.088775	2.02331	1620.885	1604.677	0.1097	0.100925037	0.015464	6.30E-05	1.55E-05
Heavy Duty Truck Hauling and Deliveries	0.129865849	1.088775	2.02331	1620.885	1604.677	0.1097	0.100925037	0.015464	6.30E-05	1.55E-05

Emission Calculations

Employee Commute

round-trip VMT is 40 miles per employee

						UNMITIGATED POUNDS PER DAY										**MITIGATED POUNDS PER DAY**									
Phase	sub-phase	# of employees	Round-trip VMT	Daily VMT	Days Per Phase	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exh	PM2.5 Dust	PM2.5 Exh	CO2	CO2 (with PAV1/LCFS)	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exh	PM2.5 Dust	PM2.5 Exh	CO2	CO2 (with PAV1/LCFS)
Pipe Install	all phases	15	40	600	1	0.16	0.50	4.37	0.0051	9.48E-06	0.0628	0.00	0.03	506.69	466.95	0.16	0.50	4.37	0.01	0.00	0.06	0.00	0.03	506.69	466.95
	# of employees = 100% of pieces of construction equipment																								
Wells	Well Install	6	40	240	1	0.07	0.20	1.75	0.0021	3.79E-06	0.0251	0.00	0.01	202.67	186.78	0.07	0.20	1.75	0.00	0.00	0.03	0.00	0.01	202.67	186.78
	Well Development	3	40	120	1	0.03	0.10	0.87	0.0010	1.90E-06	0.0126	0.00	0.01	101.34	93.39	0.03	0.10	0.87	0.00	0.00	0.01	0.00	0.01	101.34	93.39
	# of employees = 150% of pieces of construction equipment																								
Treatment Facility	grading/excavation	8	40	320	1	0.09	0.27	2.33	0.0027	5.06E-06	0.0335	0.00	0.01	270.23	249.04	0.09	0.27	2.33	0.00	0.00	0.03	0.00	0.01	270.23	249.04
	paving/concrete	19	40	760	1	0.21	0.64	5.53	0.0065	1.20E-05	0.0796	0.00	0.03	641.80	591.47	0.21	0.64	5.53	0.01	0.00	0.08	0.00	0.03	641.80	591.47
	building construction	5	40	200	1	0.05	0.17	1.46	0.0017	3.16E-06	0.0209	0.00	0.01	168.90	155.65	0.05	0.17	1.46	0.00	0.00	0.02	0.00	0.01	168.90	155.65
	# of employees = 125% of pieces of construction equipment																								

Material Deliveries

distance per delivery varies, based on PG&E Response (see "Construction" tab)
trips rounded up to nearest whole number

Phase		# of deliveries/day	Round-trip VMT	Daily VMT	Days Per Phase	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exh	PM2.5 Dust	PM2.5 Exh	CO2	CO2 (with PAV1/LCFS)	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exh	PM2.5 Dust	PM2.5 Exh	CO2	CO2 (with PAV1/LCFS)
Pipe Install	Material deliveries	1	20	20		0.02	0.51	0.12	0.00	0.00	0.03	0.00	0.02	72.56	71.84	0.01	0.09	0.05	0.00	0.00	0.00	0.00	0.00	71.47	70.75
Treatment Facility(building construction only)	Material deliveries	10	250	2,500		3.04	64.34	14.41	0.09	0.00	3.72	0.00	3.12	9070.17	8979.46	0.72	11.15	6.00	0.09	0.00	0.60	0.00	0.56	8933.60	8844.27
																24%	*17%*	*42%*	*98%*	*100%*	*16%*	*100%*	*18%*	*98%*	*98%*

Heavy Duty Truck Hauling and

distance per trip varies, based on PG&E Response (see "Construction" tab)
trips rounded up to nearest whole number

Phase		# of deliveries/day	Round-trip VMT	Daily VMT	Days Per Phase	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exh	PM2.5 Dust	PM2.5 Exh	CO2	CO2 (with PAV1/LCFS)	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exh	PM2.5 Dust	PM2.5 Exh	CO2	CO2 (with PAV1/LCFS)
Treatment Facility	Soil Hauling (grading)	2	1	2		0.00	0.05	0.01	0.00	0.00	0.00	0.00	0.00	7.26	7.18	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	7.15	7.08
	Concrete Delivery	5	24	120		0.15	3.09	0.69	0.00	0.00	0.18	0.00	0.15	435.37	431.01	0.03	0.54	0.29	0.00	0.00	0.03	0.00	0.03	428.81	424.52
	Asphalt Delivery	1	60	60		0.07	1.54	0.35	0.00	0.00	0.09	0.00	0.07	217.68	215.51	0.02	0.27	0.14	0.00	0.00	0.01	0.00	0.01	214.41	212.26
																24%	*17%*	*42%*	*98%*	*100%*	*16%*	*100%*	*18%*	*98%*	*98%*
																24%	*17%*	*42%*	*98%*	*100%*	*16%*	*100%*	*18%*	*98%*	*98%*
																24%	*17%*	*42%*	*98%*	*100%*	*16%*	*100%*	*18%*	*98%*	*98%*

Construction Schedule Information and Days per Phase

	Pipeline Installation			Wells			Phase Lengths (for MT calcs)		Treatment Facility			Phase Lengths (for MT calcs)		
FS	Ft. of Pipe	days of construction	segments per day	# of groundwater wells drilled	days of construction	concurrent wells per day	Well Install	Well Development	Square Feet of treatment facility Constructed	days of construction	concurrent 1000 sf activities	grading/excavation	paving/concrete	building construction
No Project	18,907	100	1	39	320	1	128	192		0	0	0	0	0
Alternative 4B	31,127	160	1	54	440	1	176	264		0	0	0	0	0
Alternative 4C-2	36,082	180	1	66	520	1	208	312		0	0	0	0	0
Alternative 4C-3	58,132	300	1	85	680	1	272	408	81,060	261	1	22	45	261
Alternative 4C-4	48,382	240	1	66	520	1	208	312		0	0	0	0	0
Alternative 4C-5	38,137	200	1	67	540	1	216	324	37,500	261	1	22	45	261
NEW														
No Project	18,907	100	1	45	360	1	144	216		0	0	0	0	0
Alternative 4B	58,805	300	1	219	1,740	1	696	1,044		0	0	0	0	0
Alternative 4C-2	68,245	340	1	233	1,860	1	744	1,116		0	0	0	0	0
Alternative 4C-3	72,507	360	1	265	2,120	1	848	1,272	125,705	261	1	22	45	261
Alternative 4C-4	132,631	660	1	303	2,420	1	968	1,452		0	0	0	0	0
Alternative 4C-5	70,664	360	1	233	1,860	1	744	1,116	37,500	261	1	22	45	261

Construction Information Used in Calculations

Phase		equipment	daily quantity	HP Rating	Hrs/Day (each)	Days
Pipe Installation						
(500 ft over 2.5 days)	Offroad	Excavator	1	168	12	2.5
		Backhoe	1	108	12	2.5
		Front-End Loader	1	175	12	2.5
		Motor Grader (to clear ROWs initial	0.1	200	12	0.25
		Bulldozer	1	357	12	2.5
		Water Truck	1	189	12	2.5
		Utility Potholing Machine	1	50	7	10
		Utility /Support/Welding Truck	1	250	7	10
		Jumping Jack Compactor (around v	1	7.5	7	10
		Vibratory Plate Compactor	1	10	7	10
		Trench Roller Compactor	1	25	7	10
		Generator	2	10	12	2.5
		Compressor	1	106	12	2.5
		HDPE Welding Machine	1	100	12	2.5
						70.25
			Number	**VMT per**	**Total VMT**	
	Onroad	Material Delivery	1	20	20	
		Employee Commute	15	40	600	
	Site Disturbance	Trenching	40	CYD		
		Site Disturbance	0.5	acres		
Groundwater Wells						
		equipment	**daily quantity**	**HP Rating**	**Hrs/Day (each)**	**Days**
Well Install	Offroad	Drill Rig	1	500	12	2
(per well)		Forklift	1	100	12	2
		Auxilliary Compressor	1	100	12	2
		Support Truck (Stake Truck)	1	300	12	2
			Number	**VMT per**	**Total VMT**	
	Onroad	employee commute	6	40	240	
		equipment	**daily quantity**	**HP Rating**	**Hrs/Day (each)**	**Days**
Well Development	Offroad	Development Rig	1	350	12	3
(per well)		Support Truck (Stake Truck)	1	300	12	3
	Onroad	employee commute	3	40	120	
Treatment Facility						
(per 1,000sf)						
		equipment	**daily quantity**	**HP Rating**	**Hrs/Day (each)**	**Days**
grading/excavation	Offroad	Motor Grader	1	174	6	10
		rubber tired dozer	1	357	6	10
		Backhoe	1	108	7	10
		Front-End Loader	1	175	12	2.5
		Utility /Support/Welding Truck	1	250	7	10
		water truck	1	189	8	10
			Number	**VMT per**	**Total VMT**	
	Onroad	employee commute	8	40	320	
		soil hauling trucks	2	1	2	
	Site Disturbance	Site Disturbance	0.5	acres		
		equipment	**daily quantity**	**HP Rating**	**Hrs/Day (each)**	**Days**
paving/concrete	Offroad	cement/mortar mixer	4	10	6	10
		paver	1	100	7	10
		roller	1	95	7	10
		Front-End Loader (with forks)	1	175	12	2.5
		Motor Grader (to clear ROWs initial	0.1	200	12	0.25
		Water Truck	1	189	12	2.5
		Chop Saw for Reinforcing Steel	1	5	7	10
		Concrete Saw	1	25	7	10
		Vibratory Plate Compactor	1	10	7	10
		Generators	2	10	12	2.5
		Utility /Support/Welding Truck	1	250	7	10
		tractor/loader/backhoe	1	108	7	10
			Number	**VMT per**	**Total VMT**	
	Onroad	employee commute	19	40	760	
		Concrete delivery trucks	5	24	120	
		Asphalt delivery trucks	1	60	60	
	Paving	Paving	0.125	acres		
		equipment	**daily quantity**	**HP Rating**	**Hrs/Day (each)**	**Days**
building construction	Offroad	crane	1	399	4	17
		forklift	2	145	6	17
		tractor/loader/backhoe	1	108	8	17
		Front-End Loader (with forks)	1	175	12	2.5
		Cutoff Saw or Demo Saw	1	5	7	10
		Concrete Saw	1	25	7	10
		Vibratory Plate Compactor	1	10	7	10
		Generators	2	10	12	2.5
		Utility /Support/Welding Truck	1	250	7	10
			Number	**VMT per**	**Total VMT**	
		employee commute	5	40	200	
		Material delivery trucks	10	250	2500	

OFFROAD Equipment Mitigation Reductions

Assume Unmitigated 2013 Equipment is Tier 2
Mitigation reductions assume Tier 4 FINAL Equipment used
Mitigated reductions for all equipment based on the lowest reduction from SCAQMD's Table II-E, available at:
http://www.aqmd.gov/ceqa/handbook/mitigation/offroad/MM_offroad.html

	NOX	ROG	PM
Percent Reductions	93%	42%	90%

Based on:

TABLE II - OFF-ROAD ENGINE EMISSION RATES & COMPARISON OF UNCONTROLLED TO TIERED RATES AND TIERED TO TIERED RATES

TABLE II-E
PERCENTAGE REDUCTION
FROM TIER 2 TO TIERS 3 & 4

Engine	Tier 2 to Tier 3			Tier 2 to Tier 4			
Size (hp)	NOx	ROG	PM	NOx (interim[1])	NOx (final[2])	ROG	PM
75 - 99	38%	38%	0%	53%	94%	50%	95%
100 - 174	39%	39%	0%	46%	94%	43%	93%
175 - 299	39%	39%	0%	68%	94%	43%	90%
300 - 600	38%	38%	0%	67%	93%	42%	90%

[1] Interim Limit Ends on 12-31-2014

[2] Final Limit Begins on 1-1-2015

2) Apply LCFS Reductions for diesel fuel used in OFFROAD equipment
Reductions based on Table ES-3, Page ES-9:
http://www.arb.ca.gov/fuels/lcfs/030409lcfs_isor_vol1.pdf

Year	LCFS Reduction	
2010	Reporting Period	
2011	0.25%	
2012	0.50%	
2013	1.00%	(construction start year)
2014	1.50%	
2015	2.50%	(operations start year)
2016	3.50%	
2017	5.00%	
2018	6.50%	
2019	8.00%	
2020	10.00%	

3) Fugitive Dust 61% reduction based on watering 2x daily (URBEMIS)

ONROAD MITIGATION
trucks > 2010

calendar 2013 and model yr 2010
EMFAC 2011
2013 Estimated Annual Emission Rates
EMFAC 2011 Vehicle Categories
San Bernardino COUNTY
Mojave Desert AIR BASIN
Mojave Desert AQMD

Area	CalYr	Season	Veh	Fuel	MdlYr	Speed	Pop	VMT	Trips	ROG_RUNE	ROG_RUNL	TOG_RUNE	CO_RUNEX	NOX_RUNE	CO2_RUNE	CO2_RUNE	PM10_RUN	PM10_PMT	PM10_PMI	PM2_5_RU	PM2_5_PM	PM2_5_PM	SOX_RUNE
						(Miles/hr)	(Vehicles)	(Miles/day)	(Trips/day)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)
San Bernar	2013	Annual	T7 tractor	DSL	2010	AllSpeeds	30.67764	7242.908	0	0.129866	0	0.147842	1.088775	2.023306	1620.885	1604.677	0.109701	0.036	0.06174	0.100925	0.009	0.02646	0.015464

	ROG	NOX	CO	PM10	PM2.5	CO2 w/o	CO2 w/
2010 and newer	0.13	2.02	1.09	0.21	0.14	1620.89	1604.68

Emissions from Initial Grading

Dust Emissions

Emission Factor from Table 2, CARB SIP Inventory Methods, Section 7

	EF (lbs PM10/acre)	PM2.5	
Alfalfa, hay/grain	1.68	0.252	http://www.arb.ca.gov/ei/areasrc/onehtm/one7-5.htm

daily acreage is based on typical 5 days for clear/grub for a 26 acre site (from Haley Aldrich)

dust emissions assumed to be the same as plowing and harvesting

Exhaust Emissions

EF converted from OFFROAD 2007 using the following equation:

EF in lbs/hp-hr = OFFROAD tons/day * 2000 pounds per ton / activity hours / avg horsepower

	acres		acres per day		
	FS	Scaled	FS	Scaled	scaling factor
No Project					
Alternative 4B	40	264	0.07692308	0.507692308	660%
Alternative 4C-2	168	392	0.32307692	0.753846154	233%
Alternative 4C-3	168	392	0.32307692	0.753846154	233%
Alternative 4C-4	713	1212	1.37115385	2.330769231	170%
Alternative 4C-5	168	392	0.32307692	0.753846154	233%

lbs/hp-hr

	HP	LF	hours of use per d	daily hp hrs	ROG	NOx	CO	SO2	PM10 Exhaust	CO2	CH4	N2O	PM2.5 Exhaust	lbs/acre PM10 Dust	lbs/acre PM2.5 Dust
tractor	150	0.7	8	840	7.05E-04	6.26E-03	4.44E-03	9.34E-06	3.05E-04	8.30E-01	6.36E-05	0.00E+00	3.04E-04	1.68	0.252
baler	75	0.58	8	348	6.89E-04	5.80E-03	4.21E-03	8.52E-06	3.58E-04	7.27E-01	6.21E-05	0.00E+00	3.58E-04	1.68	0.252
grader	174	0.41	8	570.72	7.46E-04	5.47E-03	4.20E-03	8.01E-06	3.02E-04	7.12E-01	6.73E-05	0.00E+00	3.01E-04	1.68	0.252
cutter	7.5	0.51	8	30.6	1.19E-03	7.45E-03	6.24E-03	1.59E-05	2.93E-04	1.02E+00	1.07E-04	0.00E+00	2.93E-04	1.68	0.252

lbs/day

	ROG	NOx	CO	SO2	PM10 Exhaust	CO2	CH4	N2O	PM2.5 Exhaust
tractor	5.92E-01	5.26E+00	3.73E+00	7.85E-03	2.56E-01	6.97E+02	5.34E-02	0.00E+00	2.55E-01
baler	2.40E-01	2.02E+00	1.47E+00	2.97E-03	1.25E-01	2.53E+02	2.16E-02	0.00E+00	1.24E-01
grader	4.26E-01	3.12E+00	2.40E+00	4.57E-03	1.72E-01	4.06E+02	3.84E-02	0.00E+00	1.72E-01
cutter	3.64E-02	2.28E-01	1.91E-01	4.87E-04	8.98E-03	3.13E+01	3.29E-03	0.00E+00	8.96E-03

Initial Grading

Pounds Per Day, FS

	FS acres	days	acres per day	hours per day	equipment	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM2.5 Dust	PM2.5 Exhaust	CO2	CH4	N2O
Alternative 4B	40	23	5	8	tractor	0.43	3.12	2.40	0.00	0.13	0.17	0.02	0.17	406.10	0.04	0.00
Alternative 4C-2	168	97	5	8	tractor	0.43	3.12	2.40	0.00	0.54	0.17	0.08	0.17	406.10	0.04	0.00
Alternative 4C-3	168	97	5	8	tractor	0.43	3.12	2.40	0.00	0.54	0.17	0.08	0.17	406.10	0.04	0.00
Alternative 4C-4	713	411	5	8	tractor	0.43	3.12	2.40	0.00	2.30	0.17	0.35	0.17	406.10	0.04	0.00
Alternative 4C-5	168	97	5	8	tractor	0.43	3.12	2.40	0.00	0.54	0.17	0.08	0.17	406.10	0.04	0.00

Metric Tons Per Year

	CO2	CH4	N2O	CO2e
Alternative 4B	4.25	0.00	0.00	4.26
Alternative 4C-2	17.85	0.00	0.00	17.89
Alternative 4C-3	17.85	0.00	0.00	17.89
Alternative 4C-4	75.77	0.01	0.00	75.92
Alternative 4C-5	17.85	0.00	0.00	17.89

scaling only for total emissions (GHGs and DPM). Daily assumed to be same regardless.

Pounds Per Day, SCALED

	SCALED acres	days	Scaling Factor	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM2.5 Dust	PM2.5 Exhaust	CO2	CH4	N2O
	264	152	660%	0.43	3.12	2.40	0.00	0.13	0.17	0.02	0.17	406.10	0.04	0.00
	392	226	233%	0.43	3.12	2.40	0.00	0.54	0.17	0.08	0.17	406.10	0.04	0.00
	392	226	233%	0.43	3.12	2.40	0.00	0.54	0.17	0.08	0.17	406.10	0.04	0.00
	1212	699	170%	0.43	3.12	2.40	0.00	2.30	0.17	0.35	0.17	406.10	0.04	0.00
	392	226	233%	0.43	3.12	2.40	0.00	0.54	0.17	0.08	0.17	406.10	0.04	0.00

Metric Tons Per Year

	CO2	CH4	N2O	CO2e
	28.06	0.00	0.00	28.11
	41.66	0.00	0.00	41.74
	41.66	0.00	0.00	41.74
	128.80	0.01	0.00	129.06
	41.66	0.00	0.00	41.74

Total Pounds Per Day, SCALED, MITIGATED

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM2.5 Dust	PM2.5 Exhaust	CO2	CH4	N2O
Alternative 4B	0.25	0.21	2.40	0.00	0.05	0.02	0.01	0.02	395.95	0.04	0.00
Alternative 4C-2	0.25	0.21	2.40	0.00	0.21	0.02	0.03	0.02	395.95	0.04	0.00
Alternative 4C-3	0.25	0.21	2.40	0.00	0.21	0.02	0.03	0.02	395.95	0.04	0.00
Alternative 4C-4	0.25	0.21	2.40	0.00	0.90	0.02	0.13	0.02	395.95	0.04	0.00
Alternative 4C-5	0.25	0.21	2.40	0.00	0.21	0.02	0.03	0.02	395.95	0.04	0.00

Total Metric Tons, FS

	CO2	CH4	N2O	CO2e
Alternative 4B	2.74E+01	2.59E-03	0.00E+00	2.74E+01
Alternative 4C-2	4.06E+01	3.84E-03	0.00E+00	4.07E+01
Alternative 4C-3	4.06E+01	3.84E-03	0.00E+00	4.07E+01
Alternative 4C-4	1.26E+02	1.19E-02	0.00E+00	1.26E+02
Alternative 4C-5	4.06E+01	3.84E-03	0.00E+00	4.07E+01

11/27/2011 10:37:43 PM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: G:\Sacramento\LGT-Air&Noise\Air\Hinkley GW Remediation SEIR 00898.10 (MDAQMD)\Calcs\URBEMIS\Cons - Pipe Install.urb924

Project Name: Hinkley GW - Pipe Install Daily

Project Location: San Bernadino County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 1/7/2013-1/7/2013 Active Days: 1	0.25	2.32	0.92	0.00	**20.00**	0.08	**20.08**	**4.18**	0.08	**4.25**	310.61
Mass Grading 01/07/2013-01/07/2013	0.25	2.32	0.92	0.00	20.00	0.08	20.08	4.18	0.08	4.25	310.61
Mass Grading Dust	0.00	0.00	0.00	0.00	20.00	0.00	20.00	4.18	0.00	4.18	0.00
Mass Grading Off Road Diesel	0.24	2.31	0.70	0.00	0.00	0.08	0.08	0.00	0.07	0.07	279.72
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.01	0.01	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.89

11/27/2011 10:37:43 PM

Time Slice 1/8/2013-1/8/2013 Active Days: 1	1.24	7.26	4.61	0.00	0.01	0.33	0.34	0.00	0.31	0.31	1,077.20
Mass Grading 01/08/2013-01/08/2013	1.24	7.26	4.61	0.00	0.01	0.33	0.34	0.00	0.31	0.31	1,077.20
Mass Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	1.21	7.19	3.52	0.00	0.00	0.33	0.33	0.00	0.30	0.30	922.74
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.03	0.06	1.08	0.00	0.01	0.01	0.01	0.00	0.00	0.01	154.46
Time Slice 1/9/2013-1/9/2013 Active Days: 1	**4.54**	**32.47**	**22.03**	**0.00**	0.01	**2.04**	2.05	0.00	**1.88**	1.88	**3,972.31**
Mass Grading 01/09/2013-01/09/2013	4.54	32.47	22.03	0.00	0.01	2.04	2.05	0.00	1.88	1.88	3,972.31
Mass Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	4.49	32.37	20.30	0.00	0.00	2.03	2.03	0.00	1.87	1.87	3,725.17
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.05	0.10	1.74	0.00	0.01	0.01	0.02	0.00	0.01	0.01	247.14
Time Slice 1/10/2013-1/10/2013 Active Days: 1	0.00	0.00	0.00	0.00	4.72	0.00	4.72	0.99	0.00	0.99	0.00
Mass Grading 01/10/2013-01/10/2013	0.00	0.00	0.00	0.00	4.72	0.00	4.72	0.99	0.00	0.99	0.00
Mass Grading Dust	0.00	0.00	0.00	0.00	4.72	0.00	4.72	0.99	0.00	0.99	0.00
Mass Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

Phase: Mass Grading 1/7/2013 - 1/7/2013 - Pipe Install - Initial Grading

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 1

11/27/2011 10:37:43 PM

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (200 hp) operating at a 0.61 load factor for 3 hours per day

Phase: Mass Grading 1/8/2013 - 1/8/2013 - Pipe Install - 2.5 day equipment

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Off Highway Trucks (250 hp) operating at a 0.57 load factor for 7 hours per day

1 Other General Industrial Equipment (50 hp) operating at a 0.51 load factor for 7 hours per day

2 Plate Compactors (8.5 hp) operating at a 0.43 load factor for 7 hours per day

1 Rollers (25 hp) operating at a 0.56 load factor for 7 hours per day

Phase: Mass Grading 1/9/2013 - 1/9/2013 - Pipe Install -10 day equipment and trenching

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 12 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 12 hours per day

2 Generator Sets (10 hp) operating at a 0.74 load factor for 12 hours per day

1 Rubber Tired Loaders (175 hp) operating at a 0.54 load factor for 12 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 12 hours per day

11/27/2011 10:37:43 PM

1 Welders (100 hp) operating at a 0.45 load factor for 12 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 12 hours per day

Phase: Mass Grading 1/10/2013 - 1/10/2013 - Pipe Install - Daily Trenching

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 40 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

3/27/2011 8:43:14 PM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\19551\Desktop\URBEMIS\Cons - Treatment Facility - Facility Construction.urb924

Project Name: Hinkely GW Remediation - Treatment Facility Construction

Project Location: San Bernadino County

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
2011 TOTALS (lbs/day unmitigated)	1.18	8.84	6.52	0.00	0.01	0.55	0.55	0.00	0.50	0.50	1,053.43

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 1/10/2011-1/10/2011 Active Days: 1	0.98	7.68	3.68	**0.00**	**0.01**	0.30	0.30	**0.00**	0.27	0.28	995.91
Mass Grading 01/10/2011-01/10/2011	0.98	7.68	3.68	0.00	0.01	0.30	0.30	0.00	0.27	0.28	995.91
Mass Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.95	7.62	2.67	0.00	0.00	0.29	0.29	0.00	0.27	0.27	872.09
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.03	0.06	1.02	0.00	0.01	0.00	0.01	0.00	0.00	0.01	123.82

Time Slice 1/11/2011-1/11/2011 Active Days: 1	1.14	8.57	5.69	**0.00**	**0.01**	**0.55**	**0.55**	**0.00**	**0.50**	**0.50**	1,017.21
Mass Grading 01/11/2011-01/11/2011	1.14	8.57	5.69	0.00	0.01	0.55	0.55	0.00	0.50	0.50	1,017.21
Mass Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	1.11	8.51	4.68	0.00	0.00	0.54	0.54	0.00	0.50	0.50	893.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.03	0.06	1.02	0.00	0.01	0.00	0.01	0.00	0.00	0.01	123.82
Time Slice 1/12/2011-1/12/2011 Active Days: 1	**1.18**	**8.84**	**6.52**	0.00	0.00	0.52	0.52	0.00	0.47	0.48	**1,053.43**
Mass Grading 01/12/2011-01/12/2011	1.18	8.84	6.52	0.00	0.00	0.52	0.52	0.00	0.47	0.48	1,053.43
Mass Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	1.15	8.80	5.75	0.00	0.00	0.51	0.51	0.00	0.47	0.47	960.57
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.02	0.04	0.76	0.00	0.00	0.00	0.01	0.00	0.00	0.00	92.87

Phase Assumptions

Phase: Mass Grading 1/10/2011 - 1/10/2011 - Construction - 10 day equipment

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Concrete/Industrial Saws (25 hp) operating at a 0.73 load factor for 7 hours per day

1 Crushing/Processing Equip (5 hp) operating at a 0.78 load factor for 7 hours per day

1 Off Highway Trucks (250 hp) operating at a 0.57 load factor for 7 hours per day

1 Plate Compactors (10 hp) operating at a 0.43 load factor for 7 hours per day

Phase: Mass Grading 1/11/2011 - 1/11/2011 - Construction - 17 day equipment

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Mass Grading 1/12/2011 - 1/12/2011 - Construction - 2.5 day equipment

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

2 Generator Sets (10 hp) operating at a 0.74 load factor for 12 hours per day

1 Tractors/Loaders/Backhoes (175 hp) operating at a 0.55 load factor for 12 hours per day

11/23/2011 11:06:48 AM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: G:\Sacramento\LGT-Air&Noise\Air\Hinkley GW Remediation SEIR 00898.10 (MDAQMD)\Calcs\URBEMIS\Cons - Well Install and Development 2013.urb924

Project Name: Hinkely GW Remediation - Well Install and Well Development

Project Location: San Bernadino County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 1/7/2013-1/8/2013 Active Days: 2	**3.77**	**30.47**	**15.16**	**0.00**	**0.01**	**1.29**	**1.30**	**0.00**	**1.19**	**1.19**	**6,299.21**
Mass Grading 01/07/2013-01/08/2013	3.77	30.47	15.16	0.00	0.01	1.29	1.30	0.00	1.19	1.19	6,299.21
Mass Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	3.75	30.42	14.30	0.00	0.00	1.29	1.29	0.00	1.19	1.19	6,175.64
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.03	0.05	0.87	0.00	0.01	0.00	0.01	0.00	0.00	0.01	123.57

Time Slice 1/9/2013-1/11/2013 Active Days: 3	2.44	20.82	9.14	0.00	0.00	0.71	0.71	0.00	0.65	0.65	4,487.16
Mass Grading 01/09/2013-01/11/2013	2.44	20.82	9.14	0.00	0.00	0.71	0.71	0.00	0.65	0.65	4,487.16
Mass Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	2.42	20.80	8.71	0.00	0.00	0.71	0.71	0.00	0.65	0.65	4,425.38
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.01	0.02	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	61.78

Phase Assumptions

Phase: Mass Grading 1/7/2013 - 1/8/2013 - Well Install

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Air Compressors (100 hp) operating at a 0.48 load factor for 12 hours per day

1 Bore/Drill Rigs (500 hp) operating at a 0.75 load factor for 12 hours per day

1 Forklifts (100 hp) operating at a 0.3 load factor for 12 hours per day

1 Off Highway Trucks (300 hp) operating at a 0.57 load factor for 12 hours per day

Phase: Mass Grading 1/9/2013 - 1/11/2013 - Well Development

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Bore/Drill Rigs (350 hp) operating at a 0.75 load factor for 12 hours per day

11/23/2011 11:06:48 AM

1 Off Highway Trucks (300 hp) operating at a 0.57 load factor for 12 hours per day

Operational Emission Calculations

OPERATIONS EMISSIONS SUMMARY

	UNMITIGATED											MITIGATED				
Existing	ROG	CO	NOx	SO2	PM10 Exhaust	PM2.5 Exhaust	PM10 Dust	PM2.5 Dust	CO2	other	CO2e	PM10 Dust	PM2.5 Dust	CO2	other	CO2e
Onroads	0.37	1.73	6.59	0.00	0.37	0.34	4.53	0.58	6.77	0.36	7.13	4.53	0.58	6.71	0.35	7.06
Maintence Fuel	-	-	-	-	-	-			-	-	-			-	-	-
Electricity	0.59	1.70	3.57	1.55	0.53	0.53	0.00	0.00	411.94	9.15	421.09			335.33	8.59	343.92
Existing	0.97	3.43	10.16	1.55	0.90	0.87	4.53	0.58	418.72	9.51	428.22	4.53	0.58	342.04	8.94	350.98
NP																
Onroads	0.13	0.92	4.69	0.00	0.10	0.10	4.53	0.58	7.23	0.38	7.61	4.53	0.58	7.05	0.37	7.43
Maintence Fuel	-															
Electricity	1.92	5.48	11.50	5.00	1.71	1.71	0.00	0.00	1,327.36	29.48	1,356.83			1,080.50	27.67	1,108.18
No Project	2.05	6.40	16.18	5.00	1.82	1.81	4.53	0.58	1,334.58	29.86	1,364.44	4.53	0.58	1,087.56	28.04	1,115.60
4B																
Plow and Harvest	9.64	60.15	84.26	0.13	4.57	4.57	36.04	5.41	229.53	0.02	229.93	14.05	2.11	223.79	0.02	224.18
Onroads	0.21	1.65	6.89	0.00	0.15	0.14	12.09	1.40	14.22	0.75	14.96	4.40	0.63	13.89	0.73	14.62
Maintence Fuel	-															
Electricity	2.80	8.02	16.80	7.30	2.50	2.50	0.00	0.00	1,940.34	43.09	1,983.44			1,579.49	40.45	1,619.94
Alternative 4B	12.65	69.81	107.95	7.43	7.23	7.21	48.13	6.81	2,184.09	43.86	2,228.33	18.45	2.74	1,817.17	41.20	1,858.74
4C-2																
Plow and Harvest	3.41	21.26	29.79	0.04	1.62	1.61	12.74	1.91	110.22	0.01	110.41	4.97	0.75	107.46	0.01	107.65
Onroads	0.20	1.61	6.74	0.00	0.15	0.14	11.83	1.37	12.95	0.68	13.63	4.30	0.62	12.65	0.67	13.31
Maintence Fuel	-															
Electricity	2.89	8.28	17.35	7.54	2.58	2.58	0.00	0.00	2,003.58	44.50	2,048.08			1,630.97	41.77	1,672.74
Alternative 4C-2	6.50	31.15	53.88	7.59	4.35	4.33	24.57	3.28	2,126.75	45.19	2,172.11	9.27	1.36	1,751.08	42.45	1,793.70
4C-3																
Plow and Harvest	3.41	21.26	29.79	0.04	1.62	1.61	12.74	1.91	110.22	0.01	110.41	4.97	0.75	107.46	0.01	107.65
Onroads	0.91	9.12	27.38	0.00	0.60	0.56	94.86	10.36	84.09	4.43	88.52	19.72	2.29	82.22	4.33	86.55
Maintence Fuel	0.04	0.20	0.42	0.00	0.02	0.02			367.57	0.03	370.91			358.38	0.03	361.64
Electricity	3.97	11.36	23.81	10.35	3.54	3.54	0.00	0.00	2,749.68	61.07	2,810.75			2,238.31	57.33	2,295.64
Alternative 4C-3	8.32	41.94	81.40	10.40	5.78	5.73	107.60	12.27	3,311.57	65.53	3,380.59	24.69	3.03	2,786.38	61.69	2,851.47
4C-4																
Plow and Harvest	2.48	15.49	21.70	0.03	1.18	1.18	9.28	1.39	170.47	0.01	170.75	3.62	0.54	166.21	0.01	166.48
Onroads	0.27	2.19	9.14	0.00	0.20	0.19	16.03	1.86	17.55	0.92	18.47	11.65	1.72	17.15	0.90	18.05
Maintence Fuel																
Electricity	3.56	10.19	21.37	9.29	3.18	3.18	0.00	0.00	2,467.33	54.80	2,522.13			2,008.47	51.44	2,059.91
Alternative 4C-4	6.32	27.87	52.20	9.32	4.56	4.54	25.31	3.25	2,655.35	55.73	2,711.35	15.27	2.26	2,191.83	52.35	2,244.45
4C-5																
Plow and Harvest	3.41	21.26	29.79	0.04	1.62	1.61	12.74	1.91	110.22	0.01	110.41	4.97	0.75	107.46	0.01	107.65
Onroads	0.74	8.75	20.27	0.00	0.44	0.41	106.81	11.41	85.61	4.51	90.12	5.84	0.84	83.73	4.41	88.14
Maintence Fuel	0.04	0.20	0.42	0.00	0.02	0.02			237.03	0.02	239.18			231.10	0.02	233.20
Electricity	2.83	8.10	16.98	7.38	2.53	2.53	0.00	0.00	1,960.15	43.53	2,003.68			1,595.61	40.87	1,636.48
Alternative 4C-5	7.02	38.31	67.46	7.42	4.60	4.56	119.55	13.32	2,393.01	48.07	2,443.39	10.80	1.58	2,017.91	45.30	2,065.47

EMISSIONS FROM ONROAD ACTIVITIES

VED
ROAD

Worker Trips

				Pounds Per Day				exhaust		dust						Metric Tons Per Year			
Alternative	Emission Factor Year	Daily VMT	Annual VMT	ROG	CO	NOx	SOx	PM10	PM2.5	PM10	PM2.5	CO2	LCFS)	Non-CO2	1 + LCFS)	CO2	Non-CO2	+ LCFS)	(Pavley 1 +
Existing	2011	25	6000	0.01	0.21	0.03	0.00	0.00	0.00	3.74	0.38	22.92	22.43	1.15	1.12	2.50	0.13	2.44	0.13
No Project	2015	25	6000	0.01	0.21	0.03	0.00	0.00	0.00	3.74	0.38	22.92	22.43	1.15	1.12	2.50	0.13	2.44	0.13
4B	2015	50	12000	0.02	0.42	0.05	0.00	0.00	0.00	7.48	0.77	45.84	44.87	2.29	2.24	4.99	0.26	4.88	0.26
4C-2	2015	50	12000	0.02	0.42	0.05	0.00	0.00	0.00	7.48	0.77	45.84	44.87	2.29	2.24	4.99	0.26	4.88	0.26
4C-3	2015	288	69120	0.09	2.40	0.30	0.00	0.00	0.00	43.10	4.41	264.05	258.43	13.20	12.92	28.74	1.51	28.13	1.48
4C-3 Ex-situ	2015	120	28800	0.04	1.00	0.13	0.00	0.00	0.00	17.96	1.84	110.02	107.68	5.50	5.38	11.98	0.63	11.72	0.62
4C-4	2015	50	12000	0.02	0.42	0.05	0.00	0.00	0.00	7.48	0.77	45.84	44.87	2.29	2.24	4.99	0.26	4.88	0.26
4C-5	2015	400	96000	0.12	3.34	0.42	0.00	0.00	0.00	59.86	6.13	366.73	358.94	18.34	17.95	39.92	2.10	39.07	2.06
4C-5 Ex-situ	2015	120	28800	0.04	1.00	0.13	0.00	0.00	0.00	17.96	1.84	110.02	107.68	5.50	5.38	11.98	0.63	11.72	0.62

Worker Trips -SCALED

				Pounds Per Day				exhaust		dust						Metric Tons Per Year			
Alternative	SCALING FACTOR	Daily VMT	Annual VMT	ROG	CO	NOx	SOx	PM10	PM2.5	PM10	PM2.5	CO2	LCFS)	Non-CO2	1 + LCFS)	CO2	Non-CO2	+ LCFS)	(Pavley 1 +
Existing	100%	25	6000	0.01	0.21	0.03	0.00	0.00	0.00	3.74	0.38	22.92	22.43	1.15	1.12	2.50	0.13	2.44	0.13
No Project	100%	25	6000	0.01	0.21	0.03	0.00	0.00	0.00	3.74	0.38	22.92	22.43	1.15	1.12	2.50	0.13	2.44	0.13
4B	146%	73	17549	0.02	0.61	0.08	0.00	0.00	0.00	10.94	1.12	67.04	65.61	3.35	3.28	7.30	0.38	7.14	0.38
4C-2	143%	72	17164	0.02	0.60	0.07	0.00	0.00	0.00	10.70	1.10	65.57	64.18	3.28	3.21	7.14	0.38	6.99	0.37
4C-3	145%	418	100242	0.13	3.48	0.44	0.00	0.00	0.00	62.51	6.40	382.93	374.80	19.15	18.74	41.69	2.19	40.80	2.15
4C-3 Ex-situ	155%	186	44662	0.06	1.55	0.19	0.00	0.00	0.00	27.85	2.85	170.61	166.99	8.53	8.35	18.57	0.98	18.18	0.96
4C-4	194%	97	23268	0.03	0.81	0.10	0.00	0.00	0.00	14.51	1.49	88.89	87.00	4.44	4.35	9.68	0.51	9.47	0.50
4C-5	143%	572	137214	0.18	4.77	0.60	0.00	0.00	0.00	85.56	8.76	524.17	513.03	26.21	25.65	57.06	3.00	55.85	2.94
4C-5 Ex-situ	100%	120	28800	0.04	1.00	0.13	0.00	0.00	0.00	17.96	1.84	110.02	107.68	5.50	5.38	11.98	0.63	11.72	0.62

Material Trips

				Pounds Per Day				exhaust		dust						Metric Tons Per Year			
Alternative	Emission Factor Year	Daily VMT	Annual VMT	ROG	CO	NOx	SOx	PM10	PM2.5	PM10	PM2.5	CO2	CO2 (Pavley 1 + LCFS)	Non-CO2	non-CO2 (Pavley 1 + LCFS)	CO2	Non-CO2	CO2 (Pavley 1 + LCFS)	non-CO2 (Pavley 1 + LCFS)
Existing	2011	240	2,880	0.36	1.52	6.57	0.00	0.37	0.34	0.79	0.19	786.23	784.26	39.31	39.21	4.28	0.23	4.27	0.22
No Project	2015	240	2880	0.13	0.71	4.66	0.00	0.10	0.10	0.79	0.19	869.09	847.37	43.45	42.37	4.73	0.25	4.61	0.24
4B	2015	240	2880	0.13	0.71	4.66	0.00	0.10	0.10	0.79	0.19	869.09	847.37	43.45	42.37	4.73	0.25	4.61	0.24
4C-2	2015	240	2472	0.13	0.71	4.66	0.00	0.10	0.10	0.79	0.19	869.09	847.37	43.45	42.37	4.06	0.21	3.96	0.21
4C-3	2015	240	1485	0.13	0.71	4.66	0.00	0.10	0.10	0.79	0.19	869.09	847.37	43.45	42.37	2.44	0.13	2.38	0.13
4C-3 Ex-situ	2015	240	2880	0.13	0.71	4.66	0.00	0.10	0.10	0.79	0.19	869.09	847.37	43.45	42.37	4.73	0.25	4.61	0.24
4C-4	2015	240	2472	0.13	0.71	4.66	0.00	0.10	0.10	0.79	0.19	869.09	847.37	43.45	42.37	4.06	0.21	3.96	0.21
4C-5	2015	240	1485	0.13	0.71	4.66	0.00	0.10	0.10	0.79	0.19	869.09	847.37	43.45	42.37	2.44	0.13	2.38	0.13
4C-5 Ex-situ	2015	240	2880	0.13	0.71	4.66	0.00	0.10	0.10	0.79	0.19	869.09	847.37	43.45	42.37	4.73	0.25	4.61	0.24

Material Trips - SCALED

				Pounds Per Day				exhaust		dust						Metric Tons Per Year			
Alternative	SCALING FACTOR	Daily VMT	Annual VMT	ROG	CO	NOx	SOx	PM10	PM2.5	PM10	PM2.5	CO2	CO2 (Pavley 1 + LCFS)	Non-CO2	non-CO2 (Pavley 1 + LCFS)	CO2	Non-CO2	CO2 (Pavley 1 + LCFS)	non-CO2 (Pavley 1 + LCFS)
Existing	100%	240	2880	0.36	1.52	6.57	0.00	0.37	0.34	0.79	0.19	786.23	784.26	39.31	39.21	4.28	0.23	4.27	0.22
No Project	100%	240	2880	0.13	0.71	4.66	0.00	0.10	0.10	0.79	0.19	869.09	847.37	43.45	42.37	4.73	0.25	4.61	0.24
4B	146%	351	4212	0.18	1.04	6.81	0.00	0.15	0.14	1.15	0.28	1270.98	1239.21	63.55	61.96	6.92	0.36	6.75	0.36
4C-2	143%	343	3536	0.18	1.02	6.66	0.00	0.15	0.14	1.12	0.28	1243.11	1212.03	62.16	60.60	5.81	0.31	5.66	0.30
4C-3	145%	348	2154	0.18	1.03	6.76	0.00	0.15	0.14	1.14	0.28	1260.41	1228.90	63.02	61.45	3.54	0.19	3.45	0.18
4C-3 Ex-situ	155%	372	4466	0.19	1.10	7.22	0.00	0.16	0.15	1.22	0.30	1347.76	1314.06	67.39	65.70	7.34	0.39	7.15	0.38
4C-4	194%	465	4793	0.24	1.38	9.03	0.00	0.20	0.19	1.52	0.37	1685.19	1643.06	84.26	82.15	7.87	0.41	7.68	0.40
4C-5	143%	343	2123	0.18	1.02	6.66	0.00	0.15	0.14	1.12	0.28	1242.20	1211.15	62.11	60.56	3.49	0.18	3.40	0.18
4C-5 Ex-situ	100%	240	2880	0.13	0.71	4.66	0.00	0.10	0.10	0.79	0.19	869.09	847.37	43.45	42.37	4.73	0.25	4.61	0.24

Waste Haul Trips

				Pounds Per Day				exhaust		dust						Metric Tons Per Year			
Alternative	Emission Factor Year	Daily VMT	Annual VMT	ROG	CO	NOx	SOx	PM10	PM2.5	PM10	PM2.5	CO2	CO2 (Pavley 1 + LCFS)	Non-CO2	non-CO2 (Pavley 1 + LCFS)	CO2	Non-CO2	CO2 (Pavley 1 + LCFS)	non-CO2 (Pavley 1 + LCFS)
Existing	2011	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No Project	2015	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4B	2015	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4C-2	2015	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4C-3	2015	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4C-3 Ex-situ	2015	424	5088	0.22	1.26	8.23	0.00	0.18	0.17	1.39	0.34	1,535.40	1,497.01	76.77	74.85	8.36	0.44	8.15	0.43
4C-4	2015	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4C-5	2015	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4C-5 Ex-situ	2015	424	5088	0.22	1.26	8.23	0.00	0.18	0.17	1.39	0.34	1,535.40	1,497.01	76.77	74.85	8.36	0.44	8.15	0.43

Waste Haul Trips - SCALED

				Pounds Per Day				exhaust		dust						Metric Tons Per Year			
Alternative	SCALING FACTOR	Daily VMT	Annual VMT	ROG	CO	NOx	SOx	PM10	PM2.5	PM10	PM2.5	CO2	CO2 (Pavley 1 + LCFS)	Non-CO2	non-CO2 (Pavley 1 + LCFS)	CO2	Non-CO2	CO2 (Pavley 1 + LCFS)	non-CO2 (Pavley 1 + LCFS)
Existing	100%	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No Project	100%	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4B	146%	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4C-2	143%	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4C-3	145%	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4C-3 Ex-situ	155%	658	7890	0.34	1.95	12.76	0.00	0.29	0.26	2.15	0.53	2381.04	2321.51	119.05	116.08	12.96	0.68	12.64	0.67
4C-4	194%	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4C-5	143%	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4C-5 Ex-situ	100%	424	5088	0.22	1.26	8.23	0.00	0.18	0.17	1.39	0.34	1535.40	1497.01	76.77	74.85	8.36	0.44	8.15	0.43

SUM - Pre Scale

				exhaust		dust						Metric Tons Per Year			
	ROG	CO	NOx	SOx	PM10	PM2.5	PM10	PM2.5	CO2	CO2 (Pavley 1 + LCFS)	Non-CO2	non-CO2 (Pavley 1 + LCFS)	CO2	Non-CO2	CO2 (Pavley 1 + LCFS)	non-CO2 (Pavley 1 + LCFS)
Existing	0.37	1.73	6.59	0.00	0.37	0.34	4.53	0.58	809.15	806.70	40.46	40.33	6.77	0.36	6.71	0.35
No Project	0.13	0.92	4.69	0.00	0.10	0.10	4.53	0.58	892.01	869.80	44.60	43.49	7.23	0.38	7.05	0.37
4B	0.14	1.13	4.71	0.00	0.10	0.10	8.27	0.96	914.94	892.23	45.75	44.61	9.72	0.51	9.50	0.50
4C-2	0.14	1.13	4.71	0.00	0.10	0.10	8.27	0.96	914.94	892.23	45.75	44.61	9.05	0.48	8.84	0.47
4C-3	0.60	6.08	17.98	0.00	0.40	0.36	64.02	6.98	3,647.65	3,557.86	182.38	177.89	56.25	2.96	55.00	2.89
4C-4	0.14	1.13	4.71	0.00	0.10	0.10	8.27	0.96	914.94	892.23	45.75	44.61	9.05	0.48	8.84	0.47
4C-5	0.63	7.01	18.09	0.00	0.40	0.36	80.78	8.69	3,750.34	3,658.37	187.52	182.92	67.43	3.55	65.94	3.47

SUM - Post Scale

				exhaust		dust						Metric Tons Per Year			
	ROG	CO	NOx	SOx	PM10	PM2.5	PM10	PM2.5	CO2	CO2 (Pavley 1 + LCFS)	Non-CO2	non-CO2 (Pavley 1 + LCFS)	CO2	Non-CO2	CO2 (Pavley 1 + LCFS)	non-CO2 (Pavley 1 + LCFS)
Existing	0.37	1.73	6.59	0.00	0.37	0.34	4.53	0.58	809.15	806.70	40.46	40.33	6.77	0.36	6.71	0.35
No Project	0.13	0.92	4.69	0.00	0.10	0.10	4.53	0.58	892.01	869.80	44.60	43.49	7.23	0.38	7.05	0.37
4B	0.21	1.65	6.89	0.00	0.15	0.14	12.09	1.40	1,338.02	1,304.82	66.90	65.24	14.22	0.75	13.89	0.73
4C-2	0.20	1.61	6.74	0.00	0.15	0.14	11.83	1.37	1,308.67	1,276.20	65.43	63.81	12.95	0.68	12.65	0.67
4C-3	0.91	9.12	27.38	0.00	0.60	0.56	94.86	10.36	5,542.75	5,406.26	277.14	270.31	84.09	4.43	82.22	4.33
4C-4	0.27	2.19	9.14	0.00	0.20	0.19	16.03	1.86	1,774.07	1,730.06	88.70	86.50	17.55	0.92	17.15	0.90
4C-5	0.74	8.75	20.27	0.00	0.44	0.41	106.81	11.41	4,280.89	4,176.24	214.04	208.81	85.61	4.51	83.73	4.41

Emissions from Electricity Consumption

Annual electricity consumption obtained from project applicant
Annual converted to daily assuming 365 operating days per year

VARIABLES AND CONSTANTS

lbs per MT	2204.62262
working days per year	240

Sources for emission factors:

eGRID 2012 CAMX Region for NOX, SOX, CH4, and N2O — http://www.epa.gov/cleanenergy/documents/egridzips/eGRID2012V1_0_year09_SummaryTables.pdf
Delucchi 2006 for ROG, CO, PM10, and PM2.5 for LA Region
PG&E report for CO2
SF6 based on 2008 statewide SF6 electricity emissions and 2008 electricity consumption

RPS Reductions assume linear increase in renewables from last reported year of 2010 until 2020

Electricity Emission Factors

Pollutant	ROG	NOx	CO	SOx	PM10	PM2.5	CO2	CH4	N2O	SF6
lbs per GWH	--	--	--	--	--	--	--	28.94	6.17	--
lbs per MWH	0.06989	0.4192	0.19996	0.1822	0.06239	0.06239	444.64	--	--	0.00031
lbs per KWH (no RPS)	0.00006989	0.0004192	0.00019996	0.0001822	0.00006239	0.00006239	0.44464	6.08E-04	1.91E-03	7.35E-03
lbs per KWH (RPS 33%, in 2020)	0.00005312	0.0003186	0.00015197	0.0001385	0.00004742	0.00004742	0.36195	4.62E-04	1.45E-03	7.35E-03
GWP	--	--	--	--	--	--	1	21	310	23900

-0.239977643

Emission Calculations

Annual

	Electricity (annual kwh)			Pounds Per Year										Metric Tons Per Year				
	Wells	Treatment Facility	Total	ROG	NOx	CO	SOx	PM10	PM2.5	CO2	CH4	N2O	SF6	CO2e	CO2	CH4	N2O	SF6	CO2e
Existing	2,042,501	0	2,042,501	142.75	856.22	408.42	372.14	127.43	127.43	908,178	1241.31	3906.69	1.5E+04	928,347	411.9	0.563	1.772	7E+00	421
No Project	6,581,323	0	6,581,323	459.97	2758.89	1316.00	1199.12	410.61	410.61	2,926,320	3999.73	12588.10	4.8E+04	2,991,309	1,327.4	1.814	5.710	2E+01	1,357
4B	6,973,263	0	6,973,263	487.36	2923.19	1394.37	1270.53	435.06	435.06	3,100,592	4237.93	13337.76	5.1E+04	3,169,451	1,406.4	1.922	6.050	2E+01	1,438
4C-2	7,286,815	0	7,286,815	509.28	3054.63	1457.07	1327.66	454.62	454.62	3,240,009	4428.49	13937.49	5.4E+04	3,311,965	1,469.6	2.009	6.322	2E+01	1,502
4C-3	7,316,211	2,385,491	9,701,702	678.05	4066.95	1939.95	1767.65	605.29	605.29	4,313,765	5896.11	18556.44	7.1E+04	4,409,566	1,956.7	2.674	8.417	3E+01	2,000
4C-4	7,316,211	0	7,316,211	511.33	3066.96	1462.95	1333.01	456.46	456.46	3,253,080	4446.35	13993.72	5.4E+04	3,325,326	1,475.6	2.017	6.347	2E+01	1,508
4C-5	6,522,532	740,000	7,262,532	507.58	3044.45	1452.22	1323.23	453.11	453.11	3,229,212	4413.73	13891.05	5.3E+04	3,300,928	1,464.7	2.002	6.301	2E+01	1,497

Daily

	Electricity (daily kwh)			Pounds Per Day										Metric Tons Per Day				
	Wells	Treatment Facility	Total	ROG	NOx	CO	SOx	PM10	PM2.5	CO2	CH4	N2O	SF6	CO2e	CO2	CH4	N2O	SF6	CO2e
Existing	8,510	0	8,510	0.59	3.57	1.70	1.55	0.53	0.53	3,784	5.17	16.28	6.3E+01	3,868	1.7	0.002	0.007	3E-02	2
No Project	27,422	0	27,422	1.92	11.50	5.48	5.00	1.71	1.71	12,193	16.67	52.45	2.0E+02	12,464	5.5	0.008	0.024	9E-02	6
4B	29,055	0	29,055	2.03	12.18	5.81	5.29	1.81	1.81	12,919	17.66	55.57	2.1E+02	13,206	5.9	0.008	0.025	1E-01	6
4C-2	30,362	0	30,362	2.12	12.73	6.07	5.53	1.89	1.89	13,500	18.45	58.07	2.2E+02	13,800	6.1	0.008	0.026	1E-01	6
4C-3	30,484	9,940	40,424	2.83	16.95	8.08	7.37	2.52	2.52	17,974	24.57	77.32	3.0E+02	18,373	8.2	0.011	0.035	1E-01	8
4C-4	30,484	0	30,484	2.13	12.78	6.10	5.55	1.90	1.90	13,554	18.53	58.31	2.2E+02	13,856	6.1	0.008	0.026	1E-01	6
4C-5	27,177	3,083	30,261	2.11	12.69	6.05	5.51	1.89	1.89	13,455	18.39	57.88	2.2E+02	13,754	6.1	0.008	0.026	1E-01	6

Unmitigated (no RPS, after SCALING, scaled to buildout numbers)

Annual

	electricity (annual kwh)		Total Electricity	Pounds Per Year										Metric Tons Per Year				
	Wells	Treatment Facility	(annual kwh)	ROG	NOx	CO	SOx	PM10	PM2.5	CO2	CH4	N2O	SF6	CO2e	CO2	CH4	N2O	SF6	CO2e
Existing	2,042,501	-	2,042,501	142.75	856.22	408.42	372.14	127.43	127.43	908,178	1241.31	3906.69	1.5E+04	928,347	411.9	0.563	1.772	7E+00	421
No Project	6,581,323	-	6,581,323	459.97	2758.89	1316.00	1199.12	410.61	410.61	2,926,320	3999.73	12588.10	4.8E+04	2,991,309	1,327.4	1.814	5.710	2E+01	1,357
4B	9,620,654	-	9,620,654	672.39	4032.98	1923.75	1752.88	600.23	600.23	4,277,727	5846.86	18401.42	7.1E+04	4,372,729	1,940.3	2.652	8.347	3E+01	1,983
4C-2	9,934,205	-	9,934,205	694.30	4164.42	1986.44	1810.01	619.80	619.80	4,417,145	6037.41	19001.15	7.3E+04	4,515,243	2,003.6	2.739	8.619	3E+01	2,048
4C-3	9,934,205	3,699,327	13,633,533	952.85	5715.18	2726.16	2484.03	850.60	850.60	6,062,014	8285.64	26076.86	1.0E+05	6,196,642	2,749.7	3.758	11.828	5E+01	2,811
4C-4	12,233,586	-	12,233,586	855.01	5128.32	2446.23	2228.96	763.25	763.25	5,439,542	7434.84	23399.18	9.0E+04	5,560,345	2,467.3	3.372	10.614	4E+01	2,522
4C-5	8,978,852	740,000	9,718,852	679.25	4074.14	1943.38	1770.77	606.36	606.36	4,321,390	5906.54	18589.25	7.1E+04	4,417,362	1,960.1	2.679	8.432	3E+01	2,004

Daily

	electricity (annual kwh)		Total Electricity	Pounds Per Day										Metric Tons Per Day				
	Wells	Treatment Facility	(annual kwh)	ROG	NOx	CO	SOx	PM10	PM2.5	CO2	CH4	N2O	SF6	CO2e	CO2	CH4	N2O	SF6	CO2e
Existing	8,510	-	8,510	0.59	3.57	1.70	1.55	0.53	0.53	3,784	5.17	16.28	6.3E+01	3,868	1.7	0.002	0.007	3E-02	2
No Project	27,422	-	27,422	1.92	11.50	5.48	5.00	1.71	1.71	12,193	16.67	52.45	2.0E+02	12,464	5.5	0.008	0.024	9E-02	6
4B	40,086	-	40,086	2.80	16.80	8.02	7.30	2.50	2.50	17,824	24.36	76.67	2.9E+02	18,220	8.1	0.011	0.035	1E-01	8
4C-2	41,393	-	41,393	2.89	17.35	8.28	7.54	2.58	2.58	18,405	25.16	79.17	3.0E+02	18,814	8.3	0.011	0.036	1E-01	9
4C-3	41,393	15,414	56,806	3.97	23.81	11.36	10.35	3.54	3.54	25,258	34.52	108.65	4.2E+02	25,819	11.5	0.016	0.049	2E-01	12
4C-4	50,973	-	50,973	3.56	21.37	10.19	9.29	3.18	3.18	22,665	30.98	97.50	3.7E+02	23,168	10.3	0.014	0.044	2E-01	11
4C-5	37,412	3,083	40,495	2.83	16.98	8.10	7.38	2.53	2.53	18,006	24.61	77.46	3.0E+02	18,406	8.2	0.011	0.035	1E-01	8

Mitigated (with RPS 33% by 2020)

Annual

	electricity (annual kwh)		Total Electricity	Pounds Per Year										Metric Tons Per Year				
	Wells	Treatment Facility	(annual kwh)	ROG	NOx	CO	SOx	PM10	PM2.5	CO2	CH4	N2O	SF6	CO2e	CO2	CH4	N2O	SF6	CO2e
Existing	2,042,501	-	2,042,501	108.49	650.74	310.41	282.84	96.85	96.85	739,280	943.42	2,969.17	15,021.18	758,214	335.3	0.428	1.347	7E+00	344
No Project	6,581,323	-	6,581,323	349.59	2,096.82	1,000.19	911.36	312.07	312.07	2,382,100	3,039.89	9,567.24	48,401.06	2,443,109	1,080.5	1.379	4.340	2E+01	1,108
4B	9,620,654	-	9,620,654	511.03	3,065.15	1,462.09	1,332.23	456.19	456.19	3,482,182	4,443.74	13,985.49	70,753.23	3,571,364	1,579.5	2.016	6.344	3E+01	1,620
4C-2	9,934,205	-	9,934,205	527.68	3,165.05	1,509.74	1,375.65	471.06	471.06	3,595,671	4,588.57	14,441.30	73,059.18	3,687,760	1,631.0	2.081	6.550	3E+01	1,673
4C-3	9,934,205	3,699,327	13,633,533	724.19	4,343.66	2,071.94	1,887.92	646.47	646.47	4,934,637	6,297.27	19,819.00	100,265.17	5,061,019	2,238.3	2.856	8.990	5E+01	2,296
4C-4	12,233,586	-	12,233,586	649.82	3,897.64	1,859.19	1,694.06	580.09	580.09	4,427,929	5,650.64	17,783.90	89,969.53	4,541,333	2,008.5	2.563	8.067	4E+01	2,060
4C-5	8,978,852	740,000	9,718,852	516.25	3,096.44	1,477.01	1,345.83	460.85	460.85	3,517,724	4,489.10	14,128.24	71,475.41	3,607,817	1,595.6	2.036	6.408	3E+01	1,636

Daily

	electricity (annual kwh)		Total Electricity	Pounds Per Day										Metric Tons Per Day				
	Wells	-	(annual kwh)	ROG	NOx	CO	SOx	PM10	PM2.5	CO2	CH4	N2O	SF6	CO2e	CO2	CH4	N2O	SF6	CO2e
Existing	8,510	-	8,510	0.45	2.71	1.29	1.18	0.40	0.40	3,080	3.93	12.37	6.3E+01	3,159	1.4	0.002	0.006	3E-02	1
No Project	27,422	-	27,422	1.46	8.74	4.17	3.80	1.30	1.30	9,925	12.67	39.86	2.0E+02	10,180	4.5	0.006	0.018	9E-02	5
4B	40,086	-	40,086	2.13	12.77	6.09	5.55	1.90	1.90	14,509	18.52	58.27	2.9E+02	14,881	6.6	0.008	0.026	1E-01	7
4C-2	41,393	-	41,393	2.20	13.19	6.29	5.73	1.96	1.96	14,982	19.12	60.17	3.0E+02	15,366	6.8	0.009	0.027	1E-01	7
4C-3	41,393	15,414	56,806	3.02	18.10	8.63	7.87	2.69	2.69	20,561	26.24	82.58	4.2E+02	21,088	9.3	0.012	0.037	2E-01	10
4C-4	50,973	-	50,973	2.71	16.24	7.75	7.06	2.42	2.42	18,450	23.54	74.10	3.7E+02	18,922	8.4	0.011	0.034	2E-01	9
4C-5	37,412	3,083	40,495	2.15	12.90	6.15	5.61	1.92	1.92	14,657	18.70	58.87	3.0E+02	15,033	6.6	0.008	0.027	1E-01	7

Emissions from diesel fuel in support equipment

Average Horsepower and g/hp-hr emission rates from URBEMIS2007 users guide:

http://urbemis.com/

brake specific fuel consumption (BSFC) and diesel fuel density from Table A2:

http://www.epa.gov/otaq/models/nonrdmdl/nonrdmdl2004/420p04009.pdf

grams per gallon emission factors:

http://www.theclimateregistry.org/downloads/2012/01/2012-Climate-Registry-Default-Emissions-Factors.pdf

Mitigated emissions includes only LCFS reductions for opening year 2015.

2.5% LCFS Reduction for Year 2015, based on: http://www.arb.ca.gov/fuels/lcfs/030409lcfs_isor_vol1.pdf

variables

7.1	lbs/gallon for diesel fuel	EPA 2004
453.59237	grams per pound	-
240	working days per year	-
1,000,000	grams per MT	
0.998	PM2.5/PM2.5 diesel fraction	

	2015	2040	weighted ef
Generator Sets	0.079	0.000	
Forklifts	0.064	0.000	
	0.072	0.000	0.025536
years	*25*	*45*	
		70	
	0.357143	0.642857	

Gallons to Horsepower-Hour conversion

	Value	Unit	
Brake Specific Fuel Consumption of Diesel Engines	0.051690141	gal/hp-hr	based on average of generator and forklift BSFC / 7.1 lbs per gallon for diesel fuel
Annual Diesel Consumption	1200	gal/year	from applicant
Annual Horsepower Equipment Usage	23215.25886	hp-hr	use for caclulations (gallons / BSFC)

Diesel Emission Factor		Unit	Source
CO2	10.21	kg CO2/gallon	Climate Registry 2012, diesel transport fuels
CH4	0.58	gram/gallon	Climate Registry 2012, construction/mining equip
N2O	0.26	gram/gallon	Climate Registry 2012, construction/mining equip

Emission Calculations

		BSFC for HP (EPA	g/hp-hr						g/gallon		
Equipment	URBEMIS default HP	nonroad)	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4	N2O
Generator	549	0.367	0.214	0.857	2.758	0.004	0.079	0.079	10210	0.58	0.26
Forklift	145	0.367	0.158	1.007	1.173	0.000	0.064	0.064	10210	0.58	0.26
	average	0.367	0.186	0.932	1.966	0.002	0.072	0.071	10210	0.58	0.26

UNMITIGATED

		Annual Fuel Consumption	Annual	Pounds Per Year						Metric Tons Per Year UNMITIGATED			SCALING	Pounds Per Year						Metric Tons Per Year UNMITIGATED				Metric Tons Per Year MITIGATED (LCFS)			
	Alternative	(gallons)	Hp-hrs	ROG	NOx	CO	SOx	PM10	PM2.5	CO2	CH4	N2O	FACTOR	ROG	NOx	CO	SOx	PM10	PM2.5	CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e
Per Year	Existing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	
	No Project	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	
	4B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	
	4C-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	
	4C-3	1,200	23215.26	9.520	47.701	100.596	0.107	3.659	3.652	237.028	0.013	0.006	155%	14.763	73.972	156.000	0.167	5.675	5.664	368	0	0	371	358	0	0	362
	4C-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	
	4C-5	1,200	23215.26	9.520	47.701	100.596	0.107	3.659	3.652	237.028	0.013	0.006	100%	9.520	47.701	100.596	0.107	3.659	3.652	237	0	0	239	231	0	0	233

		Pounds Per Day						Metric Tons Per Day				Pounds Per Day						Metric Tons Per Day				Metric Tons Per Day			
Per Day	Existing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	
	No Project	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	
	4B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	
	4C-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	
	4C-3	0.040	0.199	0.419	0.000	0.015	0.015	0.988	0.000	0.000	155%	0.062	0.308	0.650	0.001	0.024	0.024	1.53	0.00	0.00	1.545	1.49	0.00	0.00	1.507
	4C-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	
	4C-5	0.040	0.199	0.419	0.000	0.015	0.015	0.988	0.000	0.000	100%	0.040	0.199	0.419	0.000	0.015	0.015	0.99	0.00	0.00	0.997	0.96	0.00	0.00	0.972

MITIGATED

		Annual Fuel Consumption	Annual	Pounds Per Year						Metric Tons Per Year UNMITIGATED			SCALING	Pounds Per Year						Metric Tons Per Year MITIGATED (LCFS)				Tons Per Year			
	Alternative	(gallons)	Hp-hrs	ROG	NOx	CO	SOx	PM10	PM2.5	CO2	CH4	N2O	FACTOR	ROG	NOx	CO	SOx	PM10	PM2.5	CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e
Per Year	Existing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	
	No Project	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	
	4B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	
	4C-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	
	4C-3	1,200	23215.26	9.520	47.701	100.596	0.107	0.768	3.652	237.028	0.013	0.006	155%	14.763	73.972	156.000	0.167	1.191	5.664	368	0	0	371	358	0	0	362
	4C-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	
	4C-5	1,200	23215.26	9.520	47.701	100.596	0.107	0.768	3.652	237.028	0.013	0.006	100%	9.520	47.701	100.596	0.107	0.768	3.652	237	0	0	239	231	0	0	233

		Pounds Per Day						Metric Tons Per Day				Pounds Per Day						Metric Tons Per Day				Metric Tons Per Day			
Per Day	Existing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	
	No Project	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	
	4B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	
	4C-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	
	4C-3	0.040	0.199	0.419	0.000	0.003	0.015	0.988	0.000	0.000	155%	0.062	0.308	0.650	0.001	0.005	0.024	1.53	0.00	0.00	1.545	1.49	0.00	0.00	1.507
	4C-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	
	4C-5	0.040	0.199	0.419	0.000	0.003	0.015	0.988	0.000	0.000	100%	0.040	0.199	0.419	0.000	0.003	0.015	0.99	0.00	0.00	0.997	0.96	0.00	0.00	0.972

KWH information for wells

	annual kwh		
	FS	Scaled	source:
Existing	2,042,501	2,042,501	from FS and PGE pers comm
No Project	6,581,323	6,581,323	based on HP ratings in FS and PGE pers comm AND new buildout numbers (V11)
4B	6,973,263	9,620,654	based on HP ratings in FS and PGE pers comm AND new buildout numbers (V11)
4C-2	7,286,815	9,934,205	based on HP ratings in FS and PGE pers comm AND new buildout numbers (V11)
4C-3	7,316,211	9,934,205	based on HP ratings in FS and PGE pers comm AND new buildout numbers (V11)
4C-4	7,316,211	12,233,586	based on HP ratings in FS and PGE pers comm AND new buildout numbers (V11)
4C-5	6,522,532	8,978,852	based on HP ratings in FS and PGE pers comm AND new buildout numbers (V11)

KWH information from treatment facility

Existing	-		from FS and PGE pers comm
No Project	-		from FS and PGE pers comm
4B	-		from FS and PGE pers comm
4C-2	-		from FS and PGE pers comm
4C-3	2,385,491	3,699,327	from FS and PGE pers comm, scaled based on new buildout numbers
4C-4	-		from FS and PGE pers comm
4C-5	740,000	740,000	from FS and PGE pers comm

TOTAL

	FS	Scaled
Existing	2,042,501	2,042,501
No Project	6,581,323	6,581,323
4B	6,973,263	9,620,654
4C-2	7,286,815	9,934,205
4C-3	9,701,702	13,633,533
4C-4	7,316,211	12,233,586
4C-5	7,262,532	9,718,852

Maintenance and Operations Sources of Emissions by Alternative

		Total Before Scaling		Total After Scaling	
Alternative	Activities	daily	annual	Daily	Annual
Existing	Worker Commute (VMT/day)	25	6,000	25	6,000
	Ethanol Deliveries (VMT/day)	240	2,880	240	2,880
	Electricity Consumption (kwh/yr)	8,510	2,042,501	8,510	2,042,501
No Project	Worker Commute(VMT/day)	25	6,000	25	6,000
	Ethanol Deliveries (VMT/day)	240	2,880	240	2,880
	Electricity Consumption (kwh/yr)	27,422	6,581,323	27,422	6,581,323
Alternative 4B	Worker Commute (VMT/day)	50	12,000	73	17,549
	Ethanol Deliveries(VMT/day)	240	2,880	300	4,212
	Electricity Consumption (kwh/yr	29,055	6,973,263	42,491	10,197,856
Alternative 4C-2	Worker Commute (VMT/day)	50	12,000	72	17,164
	Ethanol Deliveries (VMT/day)	240	2,472	300	3,536
	Electricity Consumption (kwh/yr)	30,362	7,286,815	43,428	10,422,673
Alternative 4C-3	Worker Commute (Ex-Situ) (VMT/day)	120	28,800	186	44,662
	Material Deliveries (Ex-Situ) (VMT/day)	240	2,880	372	4,466
	Worker Commute (VMT/day)	288	69,120	418	100,242
	Ethanol Deliveries (VMT/day)	240	1,485	300	2,154
	Treatment Residue Disposal (VMT/day)	424	5,088	658	7,890
	Ex-Situ Diesel Fuel (gallons/yr)	5	1,200	8	1,861
	Electricity Consumption (kwh/yr)	40,424	9,701,702	58,625	14,069,994
Alternative 4C-4	Worker Commute(VMT/day)	50	12,000	97	23,268
	Ethanol Deliveries(VMT/day)	240	2,472	300	4,793
	Electricity Consumption (kwh/yr)	30,484	7,316,211	59,109	14,186,259
Alternative 4C-5	Worker Commute (Ex-Situ) (VMT/day)	120	28,800	120	28,800
	Material Deliveries (Ex-Situ) (VMT/day)	240	2,880	240	2,880
	Worker Commute (VMT/day)	400	96,000	572	137,214
	Ethanol Deliveries (VMT/day)	240	1,485	300	2,123
	Treatment Residue Disposal (VMT/day)	424	5,088	424	5,088
	Ex-Situ Diesel Fuel (gallons/yr)	5	1,200	5	1,200
	Electricity Consumption (kwh/yr)	30,261	7,262,532	43,252	10,380,413

Hinkley Re-entrained Fugitive Dust Analysis

PAVED ROADS

Methodology

Calculation Methodology: USEPA AP-42, Paved Roads, Section 13.2.1, Revised January 2011

http://www.epa.gov/ttn/chief/ap42/ch13/index.html

Precipitation Days (Western Regional Climate Center, average of multiple stations in project area) (see below for averaging)

http://www.wrcc.dri.edu/summary/Climsmsca.html

Vehicle Weight on roadways, from CARB Entrained Paved Road Dust Methodology:

http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s0201.pdf

Emission Factor Calculations

$$E_{ext} = [\ k\ (sL)^{0.91} \times (W)^{1.02}\ ]\ (1 - P/4N)$$

Pollutant	Variables					
	k	sL	W	P	N	EF
PM_{10}	0.0022	0.6	3.4	20	365	0.0047
$PM_{2.5}$	0.00054	0.6	3.4	20	365	0.0012

E = particulate emission factor (lbs of particulate matter/VMT)	--
k = particle size multiplier (lb/VMT)	*(default)*
sL = roadway silt loading (g/m2)	*(0.6, from AP-42 (see below))*
W = average weight of vehicles on the road (tons)	*3.4 tons, based on CARB's SIP inventory*
P = number of wet days with at least 0.254mm of precipitation	*(annual days at Barstow station)*
N = number of days in the averaging period	*(default)*

Silt Loading (sL)

ADT Volume	sL Value	
<500	0.6	
500 - 5,000	0.2	
5,000 - 10,000	0.06	
>10,000	0.03	
>10,000	0.015	limited access (aka freeway)

from table 13.2.1-2 from AP-42, "ubiquitous baseline g/m2"

Precipitation days > 0.01inches or 0.254mm (P)

Station:(040519)

BARSTOW 20 days http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca0519

Hinkley Re-entrained Fugitive Dust Analysis

UNPAVED ROADS

Methodology

Calculation Methodology: USEPA AP-42,Unpaved Roads, Section 13.2.2, Revised November 2006

http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s0202.pdf

Precipitation Days (Western Regional Climate Center, Barstow)

http://www.wrcc.dri.edu/summary/Climsmsca.html

Mitigation, from Western Regional Air Partnership (WRAP) Fugtive Dust Handbook, September 7, 2006:
http://www.wrapair.org/forums/dejf/fdh/content/FDHandbook_Rev_06.pdf

Emission Factor Calculations

Equation used is for vehicles traveling on publicly acessible roads, dominated by light duty vehicles:

$$E = \frac{k\,(s/12)^a (S/30)^d}{(M/0.5)^c} - C \qquad (1b)$$

Pollutant		Variables								
		k	s	a	S	c	d	M	E (lb/VMT)	overall reduction
Unmitigated	PM_{10}	1.8	4.3	1.0	25	0.2	0.5	0.5	0.58880	
	$PM_{2.5}$	0.18	4.3	1.0	25	0.2	0.5	0.5	0.05888	
Mitigated	PM10	1.8	4.3	1.0	15	0.2	0.5	0.5	0.16813	-71%
	PM2.5	0.18	4.3	1.0	15	0.2	0.5	0.5	0.01681	-71%

Silt Loading and soil moisture defaults in URBEMIS

E = size-specific emission factor (lb/VMT) - PM10	--
k = particle size multiplier (lb/VMT)	*(default)*
s = surface material silt content (%)	*(URBEMIS default)*
a =	*(default for public road)*
S = mean vehicle speed (mph)	*25 mph unmitigated per design features*
c	*(default for public road)*
d =	*(default for public road)*
M = surface material moisture content (%)	*(default)*

Reductions:

Natural Mitigation:

Equation 2, Section 13.2.2, page 13.2.2-7, based on number of days with measurable (more than 0.254 mm [0.01 inch]) precipitation

Eext = E[(365 - P) / 365]

		reduction	
Precip days	20		http://www.wrcc.dri.edu/cgi-bin/cliGCStP.pl?ca0519
PM10	0.557	5%	
PM2.5	0.056	5%	

Mitigation:

1) water 2x daily — 61% — Table 6-6 of: http://www.wrapair.org/forums/dejf/fdh/content/FDHandbook_Rev_06.pdf

2) limit speeds to 10 mph

ONROAD EMISSION FACTOR SUMMARY

•Worker Trips

(LDA, LDT1, LDT2, MDV)

On-Road Exhaust Emissions Factors from EMFAC2011 (grams/mile)

	ROG	TOG	CO	NOx	CO2	CO2 (Pavley 1 + LCFS)	PM10	PM2.5	SOx
2011	0.14115	0.175572772	3.783467751	0.474578	415.8645	407.0276381	0.002975	0.00267	0
2013	0.103628	0.131428642	2.983907249	0.373958	415.2909	385.9777295	0.002313	0.002085	0
2014	0.087541	0.112843451	2.64861929	0.334374	415.8451	376.4925157	0.002091	0.001893	0
2015	0.073322	0.096308826	2.358010675	0.297991	412.4551	361.0907024	0.001924	0.001749	0
2016	0.062129	0.083215525	2.112740174	0.268317	412.8208	348.9936438	0.001823	0.001665	0

On-road Dust Emission Factors, Paved Roads (lbs/mile)

	PM10	PM2.5
2011	0.00327	0.000797808
2013	0.00327	0.000798059
2014	0.00325	0.0007985
2015	0.00326	0.000799169
2016	0.00326	0.00079942

On-road Dust Emission Factors, Unpaved Roads (lbs/mile)

	PM10	PM2.5
2011	0.58880	0.058880
2013	0.58880	0.058880
2014	0.58880	0.058880
2015	0.58880	0.058880
2016	0.58880	0.058880

•Materials and Waste Hauling Trips

(T7 Tractor)

On-Road Exhaust Emissions Factors from EMFAC2011 (grams/mile)

	ROG	TOG	CO	NOx	CO2	CO2 (Pavley 1 + LCFS)	PM10	PM2.5	SOx
2011	0.688285	0.783560596	2.874923585	12.40992	1485.948	1482.232766	0.696018	0.640336	0
2013	0.550838	0.627086833	2.615357419	11.67354	1645.663	1629.206667	0.577551	0.531347	0
2014	0.333267	0.379399513	1.645595801	10.70137	1652.983	1628.188104	0.290735	0.267476	0
2015	0.236485	0.269220297	1.343339871	8.80536	1642.56	1601.495708	0.197363	0.181574	0
2016	0.170318	0.193893735	1.171931813	7.323027	1639.363	1581.98502	0.148008	0.136167	0

On-road Dust Emission Factors, Paved Roads (lbs/mile)

	PM10	PM2.5
2011	0.028579	0.007014727
2013	0.028579	0.007014727
2014	0.028579	0.007014727
2015	0.028579	0.007014727
2016	0.028579	0.007014727

Emissions from Agricultural Plowing and Harvesting

Dust Emissions

Emission Factor from Table 2, CARB SIP Inventory Methods, Section 7	EF (lbs PM10/acre)
Alfalfa, hay/grain	1.68

Exhaust Emissions

EF converted from OFFROAD 2007 using the following equation:

EF in lbs/hp-hr = OFFROAD tons/day * 2000 pounds per ton / activity hours / avg horsepower

Harvesting and Plowing

						Pounds Per Day, FS											Metric Tons Per Year			
Rip and Discing	FS acres	days	acres per day	hours per day	equipment	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM2.5 Dust	PM2.5 Exhaust	CO2	CH4	N2O	CO2	CH4	N2O	CO2e
Alternative 4B	40	12	3	8	tractor	0.59	5.26	3.73	0.01	5.46	0.26	0.82	0.26	697.41	0.05	0.00	3.89	0.00	0.00	3.90
Alternative 4C-2	168	52	3	8	tractor	0.59	5.26	3.73	0.01	5.46	0.26	0.82	0.26	697.41	0.05	0.00	16.35	0.00	0.00	16.38
Alternative 4C-3	168	52	3	8	tractor	0.59	5.26	3.73	0.01	5.46	0.26	0.82	0.26	697.41	0.05	0.00	16.35	0.00	0.00	16.38
Alternative 4C-4	713	219	3	8	tractor	0.59	5.26	3.73	0.01	5.46	0.26	0.82	0.26	697.41	0.05	0.00	69.40	0.01	0.00	69.51
Alternative 4C-5	168	52	3	8	tractor	0.59	5.26	3.73	0.01	5.46	0.26	0.82	0.26	697.41	0.05	0.00	16.35	0.00	0.00	16.38

			Pounds Per Day, SCALED											Metric Tons Per Year			
SCALED acres	days	Scaling Factor	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM2.5 Dust	PM2.5 Exhaust	CO2	CH4	N2O	CO2	CH4	N2O	CO2e
264	81	660%	0.59	5.26	3.73	0.01	5.46	0.26	0.82	0.26	697.41	0.05	0.00	25.70	0.00	0.00	25.74
392	121	233%	0.59	5.26	3.73	0.01	5.46	0.26	0.82	0.26	697.41	0.05	0.00	38.16	0.00	0.00	38.22
392	121	233%	0.59	5.26	3.73	0.01	5.46	0.26	0.82	0.26	697.41	0.05	0.00	38.16	0.00	0.00	38.22
1212	373	170%	0.59	5.26	3.73	0.01	5.46	0.26	0.82	0.26	697.41	0.05	0.00	117.97	0.01	0.00	118.16
392	121	233%	0.59	5.26	3.73	0.01	5.46	0.26	0.82	0.26	697.41	0.05	0.00	38.16	0.00	0.00	38.22

						Pounds Per Day, FS														
Harvest	FS acres	days	acres per day	hours per day	equipment	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM2.5 Dust	PM2.5 Exhaust	CO2	CH4	N2O	CO2	CH4	N2O	CO2e
Alternative 4B		60			tractor, baler, cutter	8.68E-01	7.51E+00	5.38E+00	1.13E-02		4.37E-01		4.36E-01	1.13E+03	9.51E-02	0.00E+00	30.88	0.00	0.00	30.94
Alternative 4C-2		60			tractor, baler, cutter	8.68E-01	7.51E+00	5.38E+00	1.13E-02		4.37E-01		4.36E-01	1.13E+03	9.51E-02	0.00E+00	30.88	0.00	0.00	30.94
Alternative 4C-3		60			tractor, baler, cutter	8.68E-01	7.51E+00	5.38E+00	1.13E-02		4.37E-01		4.36E-01	1.13E+03	9.51E-02	0.00E+00	30.88	0.00	0.00	30.94
Alternative 4C-4		60			tractor, baler, cutter	8.68E-01	7.51E+00	5.38E+00	1.13E-02		4.37E-01		4.36E-01	1.13E+03	9.51E-02	0.00E+00	30.88	0.00	0.00	30.94
Alternative 4C-5		60			tractor, baler, cutter	8.68E-01	7.51E+00	5.38E+00	1.13E-02		4.37E-01		4.36E-01	1.13E+03	9.51E-02	0.00E+00	30.88	0.00	0.00	30.94

			Pounds Per Day, SCALED											Metric Tons Per Year			
SCALED acres	days	Scaling Factor	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM2.5 Dust	PM2.5 Exhaust	CO2	CH4	N2O	CO2	CH4	N2O	CO2e
264	60	660%	8.68E-01	7.51E+00	5.38E+00	1.13E-02	0.00E+00	4.37E-01	0.00E+00	4.36E-01	1.13E+03	9.51E-02	0.00E+00	30.88	0.00	0.00	30.94
392	60	233%	8.68E-01	7.51E+00	5.38E+00	1.13E-02	0.00E+00	4.37E-01	0.00E+00	4.36E-01	1.13E+03	9.51E-02	0.00E+00	30.88	0.00	0.00	30.94
392	60	233%	8.68E-01	7.51E+00	5.38E+00	1.13E-02	0.00E+00	4.37E-01	0.00E+00	4.36E-01	1.13E+03	9.51E-02	0.00E+00	30.88	0.00	0.00	30.94
1212	60	170%	8.68E-01	7.51E+00	5.38E+00	1.13E-02	0.00E+00	4.37E-01	0.00E+00	4.36E-01	1.13E+03	9.51E-02	0.00E+00	30.88	0.00	0.00	30.94
392	60	233%	8.68E-01	7.51E+00	5.38E+00	1.13E-02	0.00E+00	4.37E-01	0.00E+00	4.36E-01	1.13E+03	9.51E-02	0.00E+00	30.88	0.00	0.00	30.94

	Operations, Total Pounds Per Day, FS											Total Metric Tons, FS			
	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM2.5 Dust	PM2.5 Exhaust	CO2	CH4	N2O	CO2	CH4	N2O	CO2e
Alternative 4B	1.46	12.77	9.11	0.02	5.46	0.69	0.82	0.69	1832.20	0.15	0.00	34.78	0.00	0.00	34.84
Alternative 4C-2	1.46	12.77	9.11	0.02	5.46	0.69	0.82	0.69	1832.20	0.15	0.00	47.24	0.00	0.00	47.32
Alternative 4C-3	1.46	12.77	9.11	0.02	5.46	0.69	0.82	0.69	1832.20	0.15	0.00	47.24	0.00	0.00	47.32
Alternative 4C-4	1.46	12.77	9.11	0.02	5.46	0.69	0.82	0.69	1832.20	0.15	0.00	100.28	0.01	0.00	100.45
Alternative 4C-5	1.46	12.77	9.11	0.02	5.46	0.69	0.82	0.69	1832.20	0.15	0.00	47.24	0.00	0.00	47.32

	Operations, Total Pounds Per Day, SCALED											Total Metric Tons, FS			
	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM2.5 Dust	PM2.5 Exhaust	CO2	CH4	N2O	CO2	CH4	N2O	CO2e
Alternative 4B	1.46	12.77	9.11	0.02	5.46	0.69	0.82	0.69	1832.20	0.15	0.00	5.66E+01	4.56E-03	0.00E+00	5.67E+01
Alternative 4C-2	1.46	12.77	9.11	0.02	5.46	0.69	0.82	0.69	1832.20	0.15	0.00	6.90E+01	5.51E-03	0.00E+00	6.92E+01
Alternative 4C-3	1.46	12.77	9.11	0.02	5.46	0.69	0.82	0.69	1832.20	0.15	0.00	6.90E+01	5.51E-03	0.00E+00	6.92E+01
Alternative 4C-4	1.46	12.77	9.11	0.02	5.46	0.69	0.82	0.69	1832.20	0.15	0.00	1.49E+02	1.16E-02	0.00E+00	1.49E+02
Alternative 4C-5	1.46	12.77	9.11	0.02	5.46	0.69	0.82	0.69	1832.20	0.15	0.00	6.90E+01	5.51E-03	0.00E+00	6.92E+01

	Total Pounds Per Day, SCALED, MITIGATED											Total Metric Tons, FS			
	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM2.5 Dust	PM2.5 Exhaust	CO2	CH4	N2O	CO2	CH4	N2O	CO2e
Alternative 4B	0.85	0.84	9.11	0.02	2.13	0.07	0.32	0.07	1786.39	0.14	0.00	5.52E+01	4.44E-03	0.00E+00	5.53E+01
Alternative 4C-2	0.85	0.84	9.11	0.02	2.13	0.07	0.32	0.07	1786.39	0.14	0.00	6.73E+01	5.38E-03	0.00E+00	6.74E+01
Alternative 4C-3	0.85	0.84	9.11	0.02	2.13	0.07	0.32	0.07	1786.39	0.14	0.00	6.73E+01	5.38E-03	0.00E+00	6.74E+01
Alternative 4C-4	0.85	0.84	9.11	0.02	2.13	0.07	0.32	0.07	1786.39	0.14	0.00	1.45E+02	1.13E-02	0.00E+00	1.45E+02
Alternative 4C-5	0.85	0.84	9.11	0.02	2.13	0.07	0.32	0.07	1786.39	0.14	0.00	6.73E+01	5.38E-03	0.00E+00	6.74E+01

	NOX	ROG	PM	CO2	
MM Percent Reductions	93%	42%	90%		TIER 4 FINAL OFFROAD EXHAUST
			61%		DUST
				1%	LCFS, 2013
				2.5%	LCFS, 2015
				0.000453592	lbs to MT

Health Risk Assessment

Hinkley Agriculture Plowing and Harvesting HRA Calcs

Methods

DPM through inhalation patyhway only
ALL PM10 exhaust from equipmnet assumed to be DPM.
DPM emissions remain constant over 9/40/70 year time frame, assuming no future turnover in fleet and reduction ir
Methodology based on Cancer Risk and Hazard Quotient procedures in:
Attachment 1 of CAPCOA, July 2009. Health Risk Assessments for Proposed Land Use Projects
http://www.capcoa.org/wp-content/uploads/downloads/2010/05/CAPCOA_H
Breathing Rates,Exposure Frequency, and Exposure Duration based on: Assessment and Stochastic Analysis"
OEHHA September 2000 Guidance "Technical Support Document for Exposure Assessment an
http://oehha.ca.gov/air/hot_spots/finalStoc.html

HRA CALCS

180.42607 1 g/sAERSCREEN 1-hr Concentration at 1,000 ft (300 meters), nearest home (see AERSCREEN output)

	actual g/s unmitigated	annual conversion	annual concentration (Ci)
Alternative 4B	0.00067634	0.1	0.012202944
Alternative 4C-2	0.000821331	0.1	0.014818952
Alternative 4C-3	0.000821331	0.1	0.014818952
Alternative 4C-4	0.001750177	0.1	0.031577752
Alternative 4C-5	0.000821331	0.1	0.014818952

UNMITIGATED

	4B	4C-2	4C-3	4C-4	4C-5
Cancer Risk (per million) =	3.89	4.72	4.72	10.06	4.72
Si	1.1	1.1	1.1	1.1	1.1
Ci	0.012203	0.014819	0.014819	0.031578	0.014819
DBR	302	302	302	302	302
A	1	1	1	1	1
EF	350	350	350	350	350
ED	70	70	70	70	70
AT	25550	25550	25550	25550	25550
Chronic Hazard Quotient (noncancer chronic inhalation) =	0.00244	0.00296	0.00296	0.00632	0.00296
Ci	0.012203	0.014819	0.014819	0.031578	0.014819
RELi	5	5	5	5	5

MITIGATED

	actual g/s unmitigated	annual conversion	annual concentration (Ci)
Alternative 4B	0.000068	0.1	0.001220294
Alternative 4C-2	0.000082	0.1	0.001481895
Alternative 4C-3	0.000082	0.1	0.001481895
Alternative 4C-4	0.000175	0.1	0.003157775
Alternative 4C-5	0.000082	0.1	0.001481895

	4B	4C-2	4C-3	4C-4	4C-5
Cancer Risk (per million) =	0.39	0.47	0.47	1.01	0.47
Si	1.1	1.1	1.1	1.1	1.1
Ci	0.001220	0.001482	0.001482	0.003158	0.001482
DBR	302	302	302	302	302
A	1	1	1	1	1
EF	350	350	350	350	350
ED	70	70	70	70	70
AT	25550	25550	25550	25550	25550
Chronic Hazard Quotient (noncancer chronic inhalation) =	0.00024	0.00030	0.00030	0.00063	0.00030
Ci	0.001220	0.001482	0.001482	0.003158	0.001482
RELi	5	5	5	5	5

Health Risk Assessment
Agricultural Plowing and Harvesting
AERSCREEN/AERMOD INPUTS

AERSCREEN inputs for Periodic Plowing and Harvesting Operations

Source Type	Area			
emissions rate	1	g/s		
Source height	5	m	SCAQMD LST Methodology, Table 2-1:	http://aqmd.gov/ceqa/handbook/LST/Method_final.pdf
length larger side	1033.62	m		
length smaller side	1033.62	m		
initial vertical dimension	1.4		SCAQMD LST Methodology, Table 2-1:	http://aqmd.gov/ceqa/handbook/LST/Method_final.pdf
urban/rural setting?	R			
min distance to ambient air	1m (default)			
NO2 Chemistry	1	no chem or pollutant		
max distance to probe	5000m	default		
discrete receptors	N			
flagpole receptors	N			
source elevation	0	default	F	
min temperature	259.82	k	8	http://www.wrcc.dri.edu/cgi-bin/cliGCStT.pl?ca0521
max temp	319.26	k	115	http://www.wrcc.dri.edu/cgi-bin/cliGCStT.pl?ca0521
min wind speed	0.5	m/s default		
anemometer height	10	m default		
Surface characteristics				
single user specified values:				
albedo	0.22		for Palm Springs	http://www.aqmd.gov/smog/metdata/AERMOD_Table2.html
Bowen Ratio	1.5		for Palm Springs	http://www.aqmd.gov/smog/metdata/AERMOD_Table2.html
surface roughness	0.509		for Palm Springs	http://www.aqmd.gov/smog/metdata/AERMOD_Table2.html
receptor height above ground	1.5	m		

area calc		scaled acreage	m2	each side (sqrt of m2) (**model the smallest area**)
	Alternative 4B	264	1068370.10	**1034**
	Alternative 4C-2	392	1586367.72	1260
	Alternative 4C-3	392	1586367.72	1260
	Alternative 4C-4	1212	4904789.98	2215
	Alternative 4C-5	392	1586367.72	1260
				(use smallest area)

Emission Rate calc:

		PM10 pounds/year (scaled)	grams/year	grams/second
Unmitigated	Alternative 4B	47.02	21329.07117	0.00067634
	Alternative 4C-2	57.10	25901.49366	0.000821331
	Alternative 4C-3	57.10	25901.49366	0.000821331
	Alternative 4C-4	121.68	55193.57524	0.001750177
	Alternative 4C-5	57.10	25901.49366	0.000821331
Mitigated	Alternative 4B	4.70	2132.907117	6.7634E-05
	Alternative 4C-2	5.71	2590.149366	8.21331E-05
	Alternative 4C-3	5.71	2590.149366	8.21331E-05
	Alternative 4C-4	12.17	5519.357524	0.000175018
	Alternative 4C-5	5.71	2590.149366	8.21331E-05

3.2808	feet per meter
43560	ft2 per acre
453.59237	g per lb
31536000	seconds per year

```
**BEE-Line Software: BEEST for Windows (Version 9.90a) data input file
**  Model: AERMOD.EXE     Input File Creation Date: 6/29/2012  Time: 5:44:47 PM
** ECHO


CO STARTING
CO TITLEONE Hinkley Plow and Harvest Ops
CO MODELOPT CONC FLAT SCREEN FASTAREA
CO AVERTIME 1
CO POLLUTID OTHER
CO RUNORNOT RUN
CO FINISHED

SO STARTING
SO ELEVUNIT METERS
SO LOCATION SOURCE AREA -516.81 -516.81 0.
SO SRCPARAM SOURCE 9.36E-07 5.000 1033.62 1033.62 0 1.4
SO SRCGROUP ALL
SO FINISHED

RE STARTING
RE DISCCART 1. 0.
RE DISCCART 25. 0.
RE DISCCART 50. 0.
RE DISCCART 75. 0.
RE DISCCART 100. 0.
RE DISCCART 125. 0.
RE DISCCART 150. 0.
RE DISCCART 175. 0.
RE DISCCART 200. 0.
RE DISCCART 225. 0.
RE DISCCART 250. 0.
RE DISCCART 275. 0.
RE DISCCART 300. 0.
RE DISCCART 325. 0.
RE DISCCART 350. 0.
RE DISCCART 375. 0.
RE DISCCART 400. 0.
RE DISCCART 425. 0.
RE DISCCART 450. 0.
RE DISCCART 475. 0.
RE DISCCART 500. 0.
RE DISCCART 525. 0.
RE DISCCART 550. 0.
RE DISCCART 575. 0.
RE DISCCART 600. 0.
RE DISCCART 625. 0.
RE DISCCART 650. 0.
RE DISCCART 675. 0.
RE DISCCART 700. 0.
RE DISCCART 725. 0.
RE DISCCART 750. 0.
RE DISCCART 775. 0.
RE DISCCART 800. 0.
RE DISCCART 825. 0.
RE DISCCART 850. 0.
RE DISCCART 875. 0.
RE DISCCART 900. 0.
RE DISCCART 925. 0.
RE DISCCART 950. 0.
RE DISCCART 975. 0.
RE DISCCART 1000. 0.
RE DISCCART 1025. 0.
RE DISCCART 1050. 0.
RE DISCCART 1075. 0.
RE DISCCART 1100. 0.
RE DISCCART 1125. 0.
RE DISCCART 1150. 0.
RE DISCCART 1175. 0.
RE DISCCART 1200. 0.
RE DISCCART 1225. 0.
RE DISCCART 1250. 0.
RE DISCCART 1275. 0.
RE DISCCART 1300. 0.
```

RE DISCCART 1325. 0.
RE DISCCART 1350. 0.
RE DISCCART 1375. 0.
RE DISCCART 1400. 0.
RE DISCCART 1425. 0.
RE DISCCART 1450. 0.
RE DISCCART 1475. 0.
RE DISCCART 1500. 0.
RE DISCCART 1525. 0.
RE DISCCART 1550. 0.
RE DISCCART 1575. 0.
RE DISCCART 1600. 0.
RE DISCCART 1625. 0.
RE DISCCART 1650. 0.
RE DISCCART 1675. 0.
RE DISCCART 1700. 0.
RE DISCCART 1725. 0.
RE DISCCART 1750. 0.
RE DISCCART 1775. 0.
RE DISCCART 1800. 0.
RE DISCCART 1825. 0.
RE DISCCART 1850. 0.
RE DISCCART 1875. 0.
RE DISCCART 1900. 0.
RE DISCCART 1925. 0.
RE DISCCART 1950. 0.
RE DISCCART 1975. 0.
RE DISCCART 2000. 0.
RE DISCCART 2025. 0.
RE DISCCART 2050. 0.
RE DISCCART 2075. 0.
RE DISCCART 2100. 0.
RE DISCCART 2125. 0.
RE DISCCART 2150. 0.
RE DISCCART 2175. 0.
RE DISCCART 2200. 0.
RE DISCCART 2225. 0.
RE DISCCART 2250. 0.
RE DISCCART 2275. 0.
RE DISCCART 2300. 0.
RE DISCCART 2325. 0.
RE DISCCART 2350. 0.
RE DISCCART 2375. 0.
RE DISCCART 2400. 0.
RE DISCCART 2425. 0.
RE DISCCART 2450. 0.
RE DISCCART 2475. 0.
RE DISCCART 2500. 0.
RE DISCCART 2525. 0.
RE DISCCART 2550. 0.
RE DISCCART 2575. 0.
RE DISCCART 2600. 0.
RE DISCCART 2625. 0.
RE DISCCART 2650. 0.
RE DISCCART 2675. 0.
RE DISCCART 2700. 0.
RE DISCCART 2725. 0.
RE DISCCART 2750. 0.
RE DISCCART 2775. 0.
RE DISCCART 2800. 0.
RE DISCCART 2825. 0.
RE DISCCART 2850. 0.
RE DISCCART 2875. 0.
RE DISCCART 2900. 0.
RE DISCCART 2925. 0.
RE DISCCART 2950. 0.
RE DISCCART 2975. 0.
RE DISCCART 3000. 0.
RE DISCCART 3025. 0.
RE DISCCART 3050. 0.
RE DISCCART 3075. 0.
RE DISCCART 3100. 0.
RE DISCCART 3125. 0.
RE DISCCART 3150. 0.

RE DISCCART 3175. 0.
RE DISCCART 3200. 0.
RE DISCCART 3225. 0.
RE DISCCART 3250. 0.
RE DISCCART 3275. 0.
RE DISCCART 3300. 0.
RE DISCCART 3325. 0.
RE DISCCART 3350. 0.
RE DISCCART 3375. 0.
RE DISCCART 3400. 0.
RE DISCCART 3425. 0.
RE DISCCART 3450. 0.
RE DISCCART 3475. 0.
RE DISCCART 3500. 0.
RE DISCCART 3525. 0.
RE DISCCART 3550. 0.
RE DISCCART 3575. 0.
RE DISCCART 3600. 0.
RE DISCCART 3625. 0.
RE DISCCART 3650. 0.
RE DISCCART 3675. 0.
RE DISCCART 3700. 0.
RE DISCCART 3725. 0.
RE DISCCART 3750. 0.
RE DISCCART 3775. 0.
RE DISCCART 3800. 0.
RE DISCCART 3825. 0.
RE DISCCART 3850. 0.
RE DISCCART 3875. 0.
RE DISCCART 3900. 0.
RE DISCCART 3925. 0.
RE DISCCART 3950. 0.
RE DISCCART 3975. 0.
RE DISCCART 4000. 0.
RE DISCCART 4025. 0.
RE DISCCART 4050. 0.
RE DISCCART 4075. 0.
RE DISCCART 4100. 0.
RE DISCCART 4125. 0.
RE DISCCART 4150. 0.
RE DISCCART 4175. 0.
RE DISCCART 4200. 0.
RE DISCCART 4225. 0.
RE DISCCART 4250. 0.
RE DISCCART 4275. 0.
RE DISCCART 4300. 0.
RE DISCCART 4325. 0.
RE DISCCART 4350. 0.
RE DISCCART 4375. 0.
RE DISCCART 4400. 0.
RE DISCCART 4425. 0.
RE DISCCART 4450. 0.
RE DISCCART 4475. 0.
RE DISCCART 4500. 0.
RE DISCCART 4525. 0.
RE DISCCART 4550. 0.
RE DISCCART 4575. 0.
RE DISCCART 4600. 0.
RE DISCCART 4625. 0.
RE DISCCART 4650. 0.
RE DISCCART 4675. 0.
RE DISCCART 4700. 0.
RE DISCCART 4725. 0.
RE DISCCART 4750. 0.
RE DISCCART 4775. 0.
RE DISCCART 4800. 0.
RE DISCCART 4825. 0.
RE DISCCART 4850. 0.
RE DISCCART 4875. 0.
RE DISCCART 4900. 0.
RE DISCCART 4925. 0.
RE DISCCART 4950. 0.
RE DISCCART 4975. 0.
RE DISCCART 5000. 0.

```
RE FINISHED

ME STARTING
ME SURFFILE "C:\Users\19551\Desktop\AQ GHG models\dispersion models\AERSCREEN\assorted files\AERSCREEN.SFC" FREE
ME PROFFILE "C:\Users\19551\Desktop\AQ GHG models\dispersion models\AERSCREEN\assorted files\AERSCREEN.PFL" FREE
ME SURFDATA  11111 2010
ME UAIRDATA  22222 2010
ME PROFBASE 0.0 METERS
ME FINISHED

OU STARTING
OU RECTABLE 1 FIRST
OU MAXTABLE 1 50
OU PLOTFILE 1 ALL FIRST "C:\Users\19551\Desktop\AQ GHG models\dispersion models\AERSCREEN\assorted files\Hinkley DPM plow and harvest_20
OU RANKFILE 1       10      "C:\Users\19551\Desktop\AQ GHG models\dispersion models\AERSCREEN\assorted files\AERSCREEN.FIL"
OU SUMMFILE "C:\Users\19551\Desktop\AQ GHG models\dispersion models\AERSCREEN\assorted files\Hinkley DPM plow and harvest_2010_OTHER
OU FILEFORM EXP
OU FINISHED


 BEE-Line AERMOD "BEEST" Version ****


 Input File - C:\Users\19551\Desktop\AQ GHG models\dispersion models\AERSCREEN\assorted files\Hinkley DPM plow and harv
           est_2010_OTHER.DTA
Output File - C:\Users\19551\Desktop\AQ GHG models\dispersion models\AERSCREEN\assorted files\Hinkley DPM plow and harv
           est_2010_OTHER.LST
  Met File - C:\Users\19551\Desktop\AQ GHG models\dispersion models\AERSCREEN\assorted files\AERSCREEN.SFC


 ***********************************
 *** SETUP Finishes Successfully ***
 ***********************************

 *** AERMOD - VERSION  11103 ***   *** Hinkley Plow and Harvest Ops                    ***      06/29/12
                    ***                                          ***      17:44:49
                                                                    PAGE   1
 **MODELOPTs:  NonDFAULT CONC                        FLAT
          NOCHKD    FASTAREA  SCREEN

                        ***    MODEL SETUP OPTIONS SUMMARY      ***
 ------------------------------------------------------------------

 **Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
 **NO GAS DEPOSITION Data Provided.
 **NO PARTICLE DEPOSITION Data Provided.
 **Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
 **Model Uses NO WET DEPLETION.  WETDPLT  =  F

 **Model Uses RURAL Dispersion Only.

 **Model Allows User-Specified Options:
       1. Stack-tip Downwash.
       2. Model Assumes Receptors on FLAT Terrain.
       3. Use Calms Processing Routine.
       4. Use Missing Data Processing Routine.
       5. No Exponential Decay.

 **Other Options Specified:
       NOCHKD   - Suppresses checking of date sequence in meteorology files
       FASTAREA - Use hybrid approach to optimize AREA sources
                  (formerly TOXICS option)
       SCREEN   - Use screening option
 which forces calculation of centerline values

 **Model Assumes No FLAGPOLE Receptor Heights.

 **Model Calculates  1 Short Term Average(s) of:   1-HR

 **This Run Includes:      1 Source(s);      1 Source Group(s); and     201 Receptor(s)

 **The Model Assumes A Pollutant Type of:  OTHER
```

```
**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
      Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
      Model Outputs Tables of Overall Maximum Short Term Values (MAXTABLE Keyword)
      Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
      Model Outputs External File(s) of Ranked Values (RANKFILE Keyword)
      Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

      NOTE: Option for EXPonential format used in formatted output result files (FILEFORM Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                    m for Missing Hours
                                    b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =     0.00 ;  Decay Coef. =    0.000    ;  Rot. Angle =     0.0
           Emission Units = GRAMS/SEC                     ;  Emission Rate Unit Factor =   0.10000E+07
           Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =      3.5 MB of RAM.

**Input Runstream File:        Hinkley DPM plow and harvest_2010_OTHER.DTA
**Output Print File:          Hinkley DPM plow and harvest_2010_OTHER.LST

**File for Summary of Results:   C:\Users\19551\Desktop\AQ GHG models\dispersion models\AERSCREEN\assorted files\Hinkley DPM plow
 *** AERMOD - VERSION  11103 ***   *** Hinkley Plow and Harvest Ops                          ***       06/29/12
                     ***                                          ***       17:44:49
                                                                     PAGE   2
**MODELOPTs:  NonDFAULT CONC                        FLAT
         NOCHKD    FASTAREA  SCREEN


                              *** AREA SOURCE DATA ***

         NUMBER EMISSION RATE  COORD (SW CORNER)  BASE     RELEASE  X-DIM     Y-DIM    ORIENT.    INIT.   URBAN  EMISSION RATE
  SOURCE      PART. (GRAMS/SEC      X       Y     ELEV.    HEIGHT  OF AREA   OF AREA   OF AREA     SZ     SOURCE  SCALAR VARY
    ID        CATS.  /METER**2)   (METERS) (METERS) (METERS) (METERS) (METERS)  (METERS)   (DEG.)  (METERS)           BY
 ------------------------------------------------------------------------------

 SOURCE         0  0.93600E-06   -516.8   -516.8    0.0     5.00  1033.62  1033.62     0.00     1.40    NO
 *** AERMOD - VERSION  11103 ***   *** Hinkley Plow and Harvest Ops                          ***       06/29/12
                     ***                                          ***       17:44:49
                                                                     PAGE   3
**MODELOPTs:  NonDFAULT CONC                        FLAT
         NOCHKD    FASTAREA  SCREEN


                           *** SOURCE IDs DEFINING SOURCE GROUPS ***

 GROUP ID                              SOURCE IDs



  ALL      SOURCE     ,
 *** AERMOD - VERSION  11103 ***   *** Hinkley Plow and Harvest Ops                          ***       06/29/12
                     ***                                          ***       17:44:49
                                                                     PAGE   4
**MODELOPTs:  NonDFAULT CONC                        FLAT
         NOCHKD    FASTAREA  SCREEN

                             *** DISCRETE CARTESIAN RECEPTORS ***
                            (X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
                                        (METERS)

    (     1.0,      0.0,      0.0,      0.0,      0.0);       (    25.0,      0.0,      0.0,      0.0,      0.0);
    (    50.0,      0.0,      0.0,      0.0,      0.0);       (    75.0,      0.0,      0.0,      0.0,      0.0);
    (   100.0,      0.0,      0.0,      0.0,      0.0);       (   125.0,      0.0,      0.0,      0.0,      0.0);
    (   150.0,      0.0,      0.0,      0.0,      0.0);       (   175.0,      0.0,      0.0,      0.0,      0.0);
    (   200.0,      0.0,      0.0,      0.0,      0.0);       (   225.0,      0.0,      0.0,      0.0,      0.0);
    (   250.0,      0.0,      0.0,      0.0,      0.0);       (   275.0,      0.0,      0.0,      0.0,      0.0);
    (   300.0,      0.0,      0.0,      0.0,      0.0);       (   325.0,      0.0,      0.0,      0.0,      0.0);
    (   350.0,      0.0,      0.0,      0.0,      0.0);       (   375.0,      0.0,      0.0,      0.0,      0.0);
    (   400.0,      0.0,      0.0,      0.0,      0.0);       (   425.0,      0.0,      0.0,      0.0,      0.0);
```

(450.0, 0.0, 0.0, 0.0, 0.0); (475.0, 0.0, 0.0, 0.0, 0.0);
(500.0, 0.0, 0.0, 0.0, 0.0); (525.0, 0.0, 0.0, 0.0, 0.0);
(550.0, 0.0, 0.0, 0.0, 0.0); (575.0, 0.0, 0.0, 0.0, 0.0);
(600.0, 0.0, 0.0, 0.0, 0.0); (625.0, 0.0, 0.0, 0.0, 0.0);
(650.0, 0.0, 0.0, 0.0, 0.0); (675.0, 0.0, 0.0, 0.0, 0.0);
(700.0, 0.0, 0.0, 0.0, 0.0); (725.0, 0.0, 0.0, 0.0, 0.0);
(750.0, 0.0, 0.0, 0.0, 0.0); (775.0, 0.0, 0.0, 0.0, 0.0);
(800.0, 0.0, 0.0, 0.0, 0.0); (825.0, 0.0, 0.0, 0.0, 0.0);
(850.0, 0.0, 0.0, 0.0, 0.0); (875.0, 0.0, 0.0, 0.0, 0.0);
(900.0, 0.0, 0.0, 0.0, 0.0); (925.0, 0.0, 0.0, 0.0, 0.0);
(950.0, 0.0, 0.0, 0.0, 0.0); (975.0, 0.0, 0.0, 0.0, 0.0);
(1000.0, 0.0, 0.0, 0.0, 0.0); (1025.0, 0.0, 0.0, 0.0, 0.0);
(1050.0, 0.0, 0.0, 0.0, 0.0); (1075.0, 0.0, 0.0, 0.0, 0.0);
(1100.0, 0.0, 0.0, 0.0, 0.0); (1125.0, 0.0, 0.0, 0.0, 0.0);
(1150.0, 0.0, 0.0, 0.0, 0.0); (1175.0, 0.0, 0.0, 0.0, 0.0);
(1200.0, 0.0, 0.0, 0.0, 0.0); (1225.0, 0.0, 0.0, 0.0, 0.0);
(1250.0, 0.0, 0.0, 0.0, 0.0); (1275.0, 0.0, 0.0, 0.0, 0.0);
(1300.0, 0.0, 0.0, 0.0, 0.0); (1325.0, 0.0, 0.0, 0.0, 0.0);
(1350.0, 0.0, 0.0, 0.0, 0.0); (1375.0, 0.0, 0.0, 0.0, 0.0);
(1400.0, 0.0, 0.0, 0.0, 0.0); (1425.0, 0.0, 0.0, 0.0, 0.0);
(1450.0, 0.0, 0.0, 0.0, 0.0); (1475.0, 0.0, 0.0, 0.0, 0.0);
(1500.0, 0.0, 0.0, 0.0, 0.0); (1525.0, 0.0, 0.0, 0.0, 0.0);
(1550.0, 0.0, 0.0, 0.0, 0.0); (1575.0, 0.0, 0.0, 0.0, 0.0);
(1600.0, 0.0, 0.0, 0.0, 0.0); (1625.0, 0.0, 0.0, 0.0, 0.0);
(1650.0, 0.0, 0.0, 0.0, 0.0); (1675.0, 0.0, 0.0, 0.0, 0.0);
(1700.0, 0.0, 0.0, 0.0, 0.0); (1725.0, 0.0, 0.0, 0.0, 0.0);
(1750.0, 0.0, 0.0, 0.0, 0.0); (1775.0, 0.0, 0.0, 0.0, 0.0);
(1800.0, 0.0, 0.0, 0.0, 0.0); (1825.0, 0.0, 0.0, 0.0, 0.0);
(1850.0, 0.0, 0.0, 0.0, 0.0); (1875.0, 0.0, 0.0, 0.0, 0.0);
(1900.0, 0.0, 0.0, 0.0, 0.0); (1925.0, 0.0, 0.0, 0.0, 0.0);
(1950.0, 0.0, 0.0, 0.0, 0.0); (1975.0, 0.0, 0.0, 0.0, 0.0);
(2000.0, 0.0, 0.0, 0.0, 0.0); (2025.0, 0.0, 0.0, 0.0, 0.0);
(2050.0, 0.0, 0.0, 0.0, 0.0); (2075.0, 0.0, 0.0, 0.0, 0.0);
(2100.0, 0.0, 0.0, 0.0, 0.0); (2125.0, 0.0, 0.0, 0.0, 0.0);
(2150.0, 0.0, 0.0, 0.0, 0.0); (2175.0, 0.0, 0.0, 0.0, 0.0);
(2200.0, 0.0, 0.0, 0.0, 0.0); (2225.0, 0.0, 0.0, 0.0, 0.0);

**MODELOPTs: NonDFAULT CONC FLAT
NOCHKD FASTAREA SCREEN

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

(2250.0, 0.0, 0.0, 0.0, 0.0); (2275.0, 0.0, 0.0, 0.0, 0.0);
(2300.0, 0.0, 0.0, 0.0, 0.0); (2325.0, 0.0, 0.0, 0.0, 0.0);
(2350.0, 0.0, 0.0, 0.0, 0.0); (2375.0, 0.0, 0.0, 0.0, 0.0);
(2400.0, 0.0, 0.0, 0.0, 0.0); (2425.0, 0.0, 0.0, 0.0, 0.0);
(2450.0, 0.0, 0.0, 0.0, 0.0); (2475.0, 0.0, 0.0, 0.0, 0.0);
(2500.0, 0.0, 0.0, 0.0, 0.0); (2525.0, 0.0, 0.0, 0.0, 0.0);
(2550.0, 0.0, 0.0, 0.0, 0.0); (2575.0, 0.0, 0.0, 0.0, 0.0);
(2600.0, 0.0, 0.0, 0.0, 0.0); (2625.0, 0.0, 0.0, 0.0, 0.0);
(2650.0, 0.0, 0.0, 0.0, 0.0); (2675.0, 0.0, 0.0, 0.0, 0.0);
(2700.0, 0.0, 0.0, 0.0, 0.0); (2725.0, 0.0, 0.0, 0.0, 0.0);
(2750.0, 0.0, 0.0, 0.0, 0.0); (2775.0, 0.0, 0.0, 0.0, 0.0);
(2800.0, 0.0, 0.0, 0.0, 0.0); (2825.0, 0.0, 0.0, 0.0, 0.0);
(2850.0, 0.0, 0.0, 0.0, 0.0); (2875.0, 0.0, 0.0, 0.0, 0.0);
(2900.0, 0.0, 0.0, 0.0, 0.0); (2925.0, 0.0, 0.0, 0.0, 0.0);
(2950.0, 0.0, 0.0, 0.0, 0.0); (2975.0, 0.0, 0.0, 0.0, 0.0);
(3000.0, 0.0, 0.0, 0.0, 0.0); (3025.0, 0.0, 0.0, 0.0, 0.0);
(3050.0, 0.0, 0.0, 0.0, 0.0); (3075.0, 0.0, 0.0, 0.0, 0.0);
(3100.0, 0.0, 0.0, 0.0, 0.0); (3125.0, 0.0, 0.0, 0.0, 0.0);
(3150.0, 0.0, 0.0, 0.0, 0.0); (3175.0, 0.0, 0.0, 0.0, 0.0);
(3200.0, 0.0, 0.0, 0.0, 0.0); (3225.0, 0.0, 0.0, 0.0, 0.0);
(3250.0, 0.0, 0.0, 0.0, 0.0); (3275.0, 0.0, 0.0, 0.0, 0.0);
(3300.0, 0.0, 0.0, 0.0, 0.0); (3325.0, 0.0, 0.0, 0.0, 0.0);
(3350.0, 0.0, 0.0, 0.0, 0.0); (3375.0, 0.0, 0.0, 0.0, 0.0);
(3400.0, 0.0, 0.0, 0.0, 0.0); (3425.0, 0.0, 0.0, 0.0, 0.0);
(3450.0, 0.0, 0.0, 0.0, 0.0); (3475.0, 0.0, 0.0, 0.0, 0.0);
(3500.0, 0.0, 0.0, 0.0, 0.0); (3525.0, 0.0, 0.0, 0.0, 0.0);
(3550.0, 0.0, 0.0, 0.0, 0.0); (3575.0, 0.0, 0.0, 0.0, 0.0);
(3600.0, 0.0, 0.0, 0.0, 0.0); (3625.0, 0.0, 0.0, 0.0, 0.0);

(3650.0, 0.0, 0.0, 0.0, 0.0); (3675.0, 0.0, 0.0, 0.0, 0.0);
(3700.0, 0.0, 0.0, 0.0, 0.0); (3725.0, 0.0, 0.0, 0.0, 0.0);
(3750.0, 0.0, 0.0, 0.0, 0.0); (3775.0, 0.0, 0.0, 0.0, 0.0);
(3800.0, 0.0, 0.0, 0.0, 0.0); (3825.0, 0.0, 0.0, 0.0, 0.0);
(3850.0, 0.0, 0.0, 0.0, 0.0); (3875.0, 0.0, 0.0, 0.0, 0.0);
(3900.0, 0.0, 0.0, 0.0, 0.0); (3925.0, 0.0, 0.0, 0.0, 0.0);
(3950.0, 0.0, 0.0, 0.0, 0.0); (3975.0, 0.0, 0.0, 0.0, 0.0);
(4000.0, 0.0, 0.0, 0.0, 0.0); (4025.0, 0.0, 0.0, 0.0, 0.0);
(4050.0, 0.0, 0.0, 0.0, 0.0); (4075.0, 0.0, 0.0, 0.0, 0.0);
(4100.0, 0.0, 0.0, 0.0, 0.0); (4125.0, 0.0, 0.0, 0.0, 0.0);
(4150.0, 0.0, 0.0, 0.0, 0.0); (4175.0, 0.0, 0.0, 0.0, 0.0);
(4200.0, 0.0, 0.0, 0.0, 0.0); (4225.0, 0.0, 0.0, 0.0, 0.0);
(4250.0, 0.0, 0.0, 0.0, 0.0); (4275.0, 0.0, 0.0, 0.0, 0.0);
(4300.0, 0.0, 0.0, 0.0, 0.0); (4325.0, 0.0, 0.0, 0.0, 0.0);
(4350.0, 0.0, 0.0, 0.0, 0.0); (4375.0, 0.0, 0.0, 0.0, 0.0);
(4400.0, 0.0, 0.0, 0.0, 0.0); (4425.0, 0.0, 0.0, 0.0, 0.0);
(4450.0, 0.0, 0.0, 0.0, 0.0); (4475.0, 0.0, 0.0, 0.0, 0.0);

*** AERMOD - VERSION 11103 *** *** Hinkley Plow and Harvest Ops *** 06/29/12
*** *** 17:44:49
PAGE 6
**MODELOPTs: NonDFAULT CONC FLAT
NOCHKD FASTAREA SCREEN

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

(4500.0, 0.0, 0.0, 0.0, 0.0); (4525.0, 0.0, 0.0, 0.0, 0.0);
(4550.0, 0.0, 0.0, 0.0, 0.0); (4575.0, 0.0, 0.0, 0.0, 0.0);
(4600.0, 0.0, 0.0, 0.0, 0.0); (4625.0, 0.0, 0.0, 0.0, 0.0);
(4650.0, 0.0, 0.0, 0.0, 0.0); (4675.0, 0.0, 0.0, 0.0, 0.0);
(4700.0, 0.0, 0.0, 0.0, 0.0); (4725.0, 0.0, 0.0, 0.0, 0.0);
(4750.0, 0.0, 0.0, 0.0, 0.0); (4775.0, 0.0, 0.0, 0.0, 0.0);
(4800.0, 0.0, 0.0, 0.0, 0.0); (4825.0, 0.0, 0.0, 0.0, 0.0);
(4850.0, 0.0, 0.0, 0.0, 0.0); (4875.0, 0.0, 0.0, 0.0, 0.0);
(4900.0, 0.0, 0.0, 0.0, 0.0); (4925.0, 0.0, 0.0, 0.0, 0.0);
(4950.0, 0.0, 0.0, 0.0, 0.0); (4975.0, 0.0, 0.0, 0.0, 0.0);
(5000.0, 0.0, 0.0, 0.0, 0.0);

*** AERMOD - VERSION 11103 *** *** Hinkley Plow and Harvest Ops *** 06/29/12
*** *** 17:44:49
PAGE 7
**MODELOPTs: NonDFAULT CONC FLAT
NOCHKD FASTAREA SCREEN

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** AERMOD - VERSION 11103 *** *** Hinkley Plow and Harvest Ops *** 06/29/12
*** *** 17:44:49
PAGE 8
**MODELOPTs: NonDFAULT CONC FLAT
NOCHKD FASTAREA SCREEN

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: AERSCREEN.SFC Met Version: SCREEN
Profile file: AERSCREEN.PFL

Health Risk Assessment
Agricultural Plowing and Harvesting
AERSCREEN/AERMOD OUTPUT

Surface format: FREE
Profile format: FREE
Surface station no.: 11111 Upper air station no.: 22222
Name: UNKNOWN Name: UNKNOWN
Year: 2010 Year: 2010

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
10	01	01	1	01	-0.8	0.034	-9.000	0.020	-999.	14.	3.7	0.51	1.50	0.22	0.50	270.	10.0	259.8	2.0
10	01	02	2	01	-0.8	0.034	-9.000	0.020	-999.	71.	3.7	0.51	1.50	0.22	0.50	270.	10.0	259.8	2.0
10	01	03	3	01	-0.8	0.034	-9.000	0.020	-999.	142.	3.7	0.51	1.50	0.22	0.50	270.	10.0	259.8	2.0
10	01	04	4	01	-0.7	0.034	-9.000	0.020	-999.	14.	4.1	0.51	1.50	0.22	0.50	270.	10.0	259.8	2.0
10	01	05	5	01	-0.7	0.034	-9.000	0.020	-999.	71.	4.1	0.51	1.50	0.22	0.50	270.	10.0	259.8	2.0
10	01	06	6	01	-0.7	0.034	-9.000	0.020	-999.	142.	4.1	0.51	1.50	0.22	0.50	270.	10.0	259.8	2.0
10	01	07	7	01	-0.2	0.034	-9.000	0.020	-999.	14.	12.0	0.51	1.50	0.22	0.50	270.	10.0	259.8	2.0
10	01	08	8	01	-0.2	0.034	-9.000	0.020	-999.	71.	12.0	0.51	1.50	0.22	0.50	270.	10.0	259.8	2.0
10	01	09	9	01	-0.2	0.034	-9.000	0.020	-999.	142.	12.0	0.51	1.50	0.22	0.50	270.	10.0	259.8	2.0
10	01	10	10	01	-0.9	0.034	-9.000	0.020	-999.	14.	4.1	0.51	1.50	0.22	0.50	270.	10.0	319.3	2.0
10	01	11	11	01	-0.9	0.034	-9.000	0.020	-999.	71.	4.1	0.51	1.50	0.22	0.50	270.	10.0	319.3	2.0
10	01	12	12	01	-0.9	0.034	-9.000	0.020	-999.	142.	4.1	0.51	1.50	0.22	0.50	270.	10.0	319.3	2.0
10	01	13	13	01	-0.8	0.034	-9.000	0.020	-999.	14.	4.5	0.51	1.50	0.22	0.50	270.	10.0	319.3	2.0
10	01	14	14	01	-0.8	0.034	-9.000	0.020	-999.	71.	4.5	0.51	1.50	0.22	0.50	270.	10.0	319.3	2.0
10	01	15	15	01	-0.8	0.034	-9.000	0.020	-999.	142.	4.5	0.51	1.50	0.22	0.50	270.	10.0	319.3	2.0
10	01	16	16	01	-0.3	0.034	-9.000	0.020	-999.	14.	13.3	0.51	1.50	0.22	0.50	270.	10.0	319.3	2.0
10	01	17	17	01	-0.3	0.034	-9.000	0.020	-999.	71.	13.3	0.51	1.50	0.22	0.50	270.	10.0	319.3	2.0
10	01	18	18	01	-0.3	0.034	-9.000	0.020	-999.	142.	13.3	0.51	1.50	0.22	0.50	270.	10.0	319.3	2.0
10	01	19	19	01	-0.6	0.034	-9.000	0.020	-999.	14.	5.3	0.51	1.50	0.22	0.50	270.	10.0	259.8	2.0
10	01	20	20	01	-0.6	0.034	-9.000	0.020	-999.	71.	5.3	0.51	1.50	0.22	0.50	270.	10.0	259.8	2.0
10	01	21	21	01	-0.6	0.034	-9.000	0.020	-999.	142.	5.3	0.51	1.50	0.22	0.50	270.	10.0	259.8	2.0
10	01	22	22	01	-0.5	0.034	-9.000	0.020	-999.	14.	5.8	0.51	1.50	0.22	0.50	270.	10.0	259.8	2.0
10	01	23	23	01	-0.5	0.034	-9.000	0.020	-999.	71.	5.8	0.51	1.50	0.22	0.50	270.	10.0	259.8	2.0
10	01	24	24	01	-0.5	0.034	-9.000	0.020	-999.	142.	5.8	0.51	1.50	0.22	0.50	270.	10.0	259.8	2.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
10	01	01	01	10.0	1	270.	0.50	259.9	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: NonDFAULT CONC FLAT
NOCHKD FASTAREA SCREEN

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): SOURCE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)	X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)	
1.00	0.00	115.07082	(10011901)	25.00	0.00	120.81706	(10012801)	
50.00	0.00	126.54587	(10011901)	75.00	0.00	131.96122	(10011901)	
100.00	0.00	137.74690	(10011301)	125.00	0.00	143.27492	(10010401)	
150.00	0.00	148.71806	(10011001)	175.00	0.00	154.17903	(10010101)	227.8475 max regard
200.00	0.00	159.57826	(10010101)	225.00	0.00	164.90104	(10010101)	180.4261 max at 300
250.00	0.00	170.14899	(10010101)	275.00	0.00	175.32354	(10010101)	
300.00	0.00	180.42607	(10010101)	325.00	0.00	185.45797	(10010101)	
350.00	0.00	190.42059	(10010101)	375.00	0.00	195.31527	(10010101)	
400.00	0.00	200.14333	(10010101)	425.00	0.00	204.90607	(10010101)	
450.00	0.00	209.60478	(10010101)	475.00	0.00	214.24072	(10010101)	
500.00	0.00	218.81516	(10010101)	525.00	0.00	222.74572	(10010101)	
550.00	0.00	224.99947	(10010101)	575.00	0.00	226.91782	(10010101)	
600.00	0.00	227.84745	(10010101)	625.00	0.00	227.63398	(10010101)	
650.00	0.00	226.48260	(10010101)	675.00	0.00	224.65365	(10010101)	
700.00	0.00	222.36747	(10010101)	725.00	0.00	221.37965	(10010101)	
750.00	0.00	218.16240	(10010101)	775.00	0.00	214.97283	(10010101)	
800.00	0.00	211.82944	(10010101)	825.00	0.00	208.74487	(10010101)	
850.00	0.00	205.72651	(10010101)	875.00	0.00	202.78409	(10010101)	
900.00	0.00	199.91981	(10010101)	925.00	0.00	197.13383	(10010101)	

950.00	0.00	194.42576	(10010101)	975.00	0.00	191.79377	(10010101)
1000.00	0.00	189.23611	(10010101)	1025.00	0.00	186.75135	(10010101)
1050.00	0.00	184.33799	(10010101)	1075.00	0.00	181.99419	(10010101)
1100.00	0.00	179.71754	(10010101)	1125.00	0.00	177.50515	(10010101)
1150.00	0.00	175.35425	(10010101)	1175.00	0.00	173.26343	(10010101)
1200.00	0.00	171.23051	(10010101)	1225.00	0.00	169.25193	(10010101)
1250.00	0.00	167.32687	(10010101)	1275.00	0.00	165.45337	(10010101)
1300.00	0.00	163.62954	(10010101)	1325.00	0.00	161.85350	(10010101)
1350.00	0.00	160.12304	(10010101)	1375.00	0.00	158.43644	(10010101)
1400.00	0.00	156.79174	(10010101)	1425.00	0.00	155.18689	(10010101)
1450.00	0.00	153.62140	(10010101)	1475.00	0.00	152.09381	(10010101)
1500.00	0.00	150.60275	(10010101)	1525.00	0.00	149.14688	(10010101)
1550.00	0.00	147.72489	(10010101)	1575.00	0.00	146.33561	(10010101)
1600.00	0.00	144.97788	(10010101)	1625.00	0.00	143.64712	(10010101)
1650.00	0.00	142.34387	(10010101)	1675.00	0.00	141.06877	(10010101)
1700.00	0.00	139.82087	(10010101)	1725.00	0.00	138.59925	(10010101)
1750.00	0.00	137.40166	(10010101)	1775.00	0.00	136.22776	(10010101)
1800.00	0.00	135.07754	(10010101)	1825.00	0.00	133.95026	(10010101)
1850.00	0.00	132.84525	(10010101)	1875.00	0.00	131.76176	(10010101)
1900.00	0.00	130.69641	(10010101)	1925.00	0.00	129.65249	(10010101)
1950.00	0.00	128.62696	(10010101)	1975.00	0.00	127.61898	(10010101)

**MODELOPTs: NonDFAULT CONC FLAT
NOCHKD FASTAREA SCREEN

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): SOURCE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)	X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)
2000.00	0.00	126.62515	(10010101)	2025.00	0.00	125.64897	(10010101)
2050.00	0.00	124.69152	(10010101)	2075.00	0.00	123.75223	(10010101)
2100.00	0.00	122.82833	(10010101)	2125.00	0.00	121.91511	(10010101)
2150.00	0.00	121.01707	(10010101)	2175.00	0.00	120.13548	(10010101)
2200.00	0.00	119.26987	(10010101)	2225.00	0.00	118.41978	(10010101)
2250.00	0.00	117.58304	(10010101)	2275.00	0.00	116.74707	(10010101)
2300.00	0.00	115.92219	(10010101)	2325.00	0.00	115.11177	(10010101)
2350.00	0.00	114.31541	(10010101)	2375.00	0.00	113.53049	(10010101)
2400.00	0.00	112.75755	(10010101)	2425.00	0.00	111.99021	(10010101)
2450.00	0.00	111.23578	(10010101)	2475.00	0.00	110.49114	(10010101)
2500.00	0.00	109.75625	(10010101)	2525.00	0.00	109.03346	(10010101)
2550.00	0.00	108.32245	(10010101)	2575.00	0.00	107.61974	(10010101)
2600.00	0.00	106.91513	(10010101)	2625.00	0.00	106.22119	(10010101)
2650.00	0.00	105.53833	(10010101)	2675.00	0.00	104.86627	(10010101)
2700.00	0.00	104.20475	(10010101)	2725.00	0.00	103.54808	(10010101)
2750.00	0.00	102.90070	(10010101)	2775.00	0.00	102.25535	(10010101)
2800.00	0.00	101.61807	(10010101)	2825.00	0.00	100.99049	(10010101)
2850.00	0.00	100.36945	(10010101)	2875.00	0.00	99.75142	(10010101)
2900.00	0.00	99.14268	(10010101)	2925.00	0.00	98.54301	(10010101)
2950.00	0.00	97.95220	(10010101)	2975.00	0.00	97.36650	(10010101)
3000.00	0.00	96.78279	(10010101)	3025.00	0.00	96.20117	(10010101)
3050.00	0.00	95.62800	(10010101)	3075.00	0.00	95.06312	(10010101)
3100.00	0.00	94.50631	(10010101)	3125.00	0.00	93.95741	(10010101)
3150.00	0.00	93.41624	(10010101)	3175.00	0.00	92.87816	(10010101)
3200.00	0.00	92.34213	(10010101)	3225.00	0.00	91.80291	(10010101)
3250.00	0.00	91.27122	(10010101)	3275.00	0.00	90.74690	(10010101)
3300.00	0.00	90.22979	(10010101)	3325.00	0.00	89.71974	(10010101)
3350.00	0.00	89.21659	(10010101)	3375.00	0.00	88.71104	(10010101)
3400.00	0.00	88.21172	(10010101)	3425.00	0.00	87.71911	(10010101)
3450.00	0.00	87.23306	(10010101)	3475.00	0.00	86.75008	(10010101)
3500.00	0.00	86.26778	(10010101)	3525.00	0.00	85.79181	(10010101)
3550.00	0.00	85.32205	(10010101)	3575.00	0.00	84.85374	(10010101)
3600.00	0.00	84.38776	(10010101)	3625.00	0.00	83.92779	(10010101)
3650.00	0.00	83.47374	(10010101)	3675.00	0.00	83.02547	(10010101)
3700.00	0.00	82.58287	(10010101)	3725.00	0.00	82.14584	(10010101)
3750.00	0.00	81.71426	(10010101)	3775.00	0.00	81.28533	(10010101)
3800.00	0.00	80.85349	(10010101)	3825.00	0.00	80.41773	(10010101)
3850.00	0.00	79.98739	(10010101)	3875.00	0.00	79.56239	(10010101)

3900.00	0.00	79.14261	(10010101)	3925.00	0.00	78.72796	(10010101)
3950.00	0.00	78.31834	(10010101)	3975.00	0.00	77.91366	(10010101)

**MODELOPTs: NonDFAULT CONC FLAT
NOCHKD FASTAREA SCREEN

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): SOURCE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)	X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)
4000.00	0.00	77.51382	(10010101)	4025.00	0.00	77.11875	(10010101)
4050.00	0.00	76.72834	(10010101)	4075.00	0.00	76.33798	(10010101)
4100.00	0.00	75.94770	(10010101)	4125.00	0.00	75.55848	(10010101)
4150.00	0.00	75.16953	(10010101)	4175.00	0.00	74.78513	(10010101)
4200.00	0.00	74.40521	(10010101)	4225.00	0.00	74.02968	(10010101)
4250.00	0.00	73.65847	(10010101)	4275.00	0.00	73.29151	(10010101)
4300.00	0.00	72.92871	(10010101)	4325.00	0.00	72.57001	(10010101)
4350.00	0.00	72.21534	(10010101)	4375.00	0.00	71.86069	(10010101)
4400.00	0.00	71.50447	(10010101)	4425.00	0.00	71.15224	(10010101)
4450.00	0.00	70.80392	(10010101)	4475.00	0.00	70.45947	(10010101)
4500.00	0.00	70.11880	(10010101)	4525.00	0.00	69.77809	(10010101)
4550.00	0.00	69.43717	(10010101)	4575.00	0.00	69.09998	(10010101)
4600.00	0.00	68.76644	(10010101)	4625.00	0.00	68.43650	(10010101)
4650.00	0.00	68.11009	(10010101)	4675.00	0.00	67.78717	(10010101)
4700.00	0.00	67.46768	(10010101)	4725.00	0.00	67.14700	(10010101)
4750.00	0.00	66.82642	(10010101)	4775.00	0.00	66.50924	(10010101)
4800.00	0.00	66.19539	(10010101)	4825.00	0.00	65.88482	(10010101)
4850.00	0.00	65.57749	(10010101)	4875.00	0.00	65.27334	(10010101)
4900.00	0.00	64.97231	(10010101)	4925.00	0.00	64.67437	(10010101)
4950.00	0.00	64.37946	(10010101)	4975.00	0.00	64.08754	(10010101)
5000.00	0.00	63.79229	(10010101)				

**MODELOPTs: NonDFAULT CONC FLAT
NOCHKD FASTAREA SCREEN

*** THE MAXIMUM 50 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): SOURCE ,

** CONC OF OTHER IN MICROGRAMS/M**3 **

RANK	CONC	(YYMMDDHH)	AT	RECEPTOR (XR,YR)	OF	TYPE
1.	227.84745	(10010101)	AT	(600.00, 0.00)		DC
2.	227.63398	(10010101)	AT	(625.00, 0.00)		DC
3.	226.91782	(10010101)	AT	(575.00, 0.00)		DC
4.	226.48260	(10010101)	AT	(650.00, 0.00)		DC
5.	224.99947	(10010101)	AT	(550.00, 0.00)		DC
6.	224.98986	(10011001)	AT	(600.00, 0.00)		DC
7.	224.98980	(10010401)	AT	(600.00, 0.00)		DC
8.	224.65365	(10010101)	AT	(675.00, 0.00)		DC
9.	224.44872	(10011001)	AT	(625.00, 0.00)		DC
10.	224.44866	(10010401)	AT	(625.00, 0.00)		DC
11.	224.35832	(10011001)	AT	(575.00, 0.00)		DC
12.	224.35827	(10010401)	AT	(575.00, 0.00)		DC
13.	222.98193	(10011001)	AT	(650.00, 0.00)		DC
14.	222.98186	(10010401)	AT	(650.00, 0.00)		DC
15.	222.74572	(10010101)	AT	(525.00, 0.00)		DC
16.	222.36747	(10010101)	AT	(700.00, 0.00)		DC
17.	222.28816	(10011001)	AT	(550.00, 0.00)		DC
18.	222.28812	(10010401)	AT	(550.00, 0.00)		DC
19.	222.17787	(10011301)	AT	(600.00, 0.00)		DC
20.	222.06930	(10011301)	AT	(575.00, 0.00)		DC
21.	221.37965	(10010101)	AT	(725.00, 0.00)		DC
22.	221.35201	(10011301)	AT	(625.00, 0.00)		DC
23.	220.87323	(10011001)	AT	(675.00, 0.00)		DC
26.	220.76447	(10010401)	AT	(525.00, 0.00)		DC
27.	220.09960	(10011301)	AT	(550.00, 0.00)		DC
28.	219.61584	(10011301)	AT	(650.00, 0.00)		DC
29.	218.81516	(10010101)	AT	(500.00, 0.00)		DC
30.	218.70854	(10011301)	AT	(525.00, 0.00)		DC
31.	218.34884	(10011001)	AT	(700.00, 0.00)		DC
32.	218.34876	(10010401)	AT	(700.00, 0.00)		DC
33.	218.16240	(10010101)	AT	(750.00, 0.00)		DC
34.	217.30938	(10011901)	AT	(575.00, 0.00)		DC
35.	217.27347	(10011301)	AT	(675.00, 0.00)		DC
36.	217.06104	(10011001)	AT	(500.00, 0.00)		DC
37.	217.06101	(10010401)	AT	(500.00, 0.00)		DC
38.	216.92372	(10011001)	AT	(725.00, 0.00)		DC
39.	216.92363	(10010401)	AT	(725.00, 0.00)		DC
40.	216.81598	(10011901)	AT	(600.00, 0.00)		DC
41.	215.80116	(10011901)	AT	(550.00, 0.00)		DC
42.	215.51787	(10011901)	AT	(625.00, 0.00)		DC
43.	215.21164	(10011301)	AT	(500.00, 0.00)		DC
44.	214.97283	(10010101)	AT	(775.00, 0.00)		DC
45.	214.55396	(10011301)	AT	(700.00, 0.00)		DC
46.	214.48340	(10012201)	AT	(575.00, 0.00)		DC
47.	214.24072	(10010101)	AT	(475.00, 0.00)		DC
48.	213.93363	(10012801)	AT	(575.00, 0.00)		DC

24. 220.87315 (10010401) AT (675.00, 0.00) DC 49. 213.93363 (10013101) AT (575.00, 0.00) DC
25. 220.76451 (10011001) AT (525.00, 0.00) DC 50. 213.93363 (10020301) AT (575.00, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
*** AERMOD - VERSION 11103 *** *** Hinkley Plow and Harvest Ops *** 06/29/12
*** *** 17:44:49
PAGE 13
**MODELOPTs: NonDFAULT CONC FLAT
NOCHKD FASTAREA SCREEN

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	NETWORK RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	227.84745	ON 10010101: AT (600.00, 0.00, 0.00, 0.00, 0.00)	DC	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
*** AERMOD - VERSION 11103 *** *** Hinkley Plow and Harvest Ops *** 06/29/12
*** *** 17:44:49
PAGE 14
**MODELOPTs: NonDFAULT CONC FLAT
NOCHKD FASTAREA SCREEN

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 0 Warning Message(s)
A Total of 0 Informational Message(s)

A Total of 511 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 0 Missing Hours Identified (0.00 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********
*** NONE ***

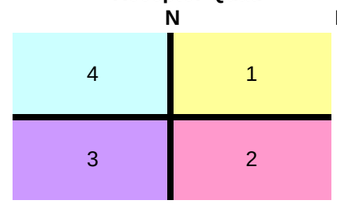
****
*** AERMOD Finishes Successfully ***
****

Truck Travel HRA

Date : 7/3/2012
Facility Name: Hinkley Diesel Truck Trips
Facility Location:
Facility ID #:

Calculate Risk

Receptor Quad



Unit #	Segment Direction EW = East-West NS = North-South NWSE = Northwest-Southeast NESW = Northeast-Southwest	# (50m) Segments	PM10 g/mi	Events/ Year	Receptor Distance (m)	Quad	Load %	Emissions Lb / Yr	Location U=Urban R=Rural	Segment Risk
	ns	1	0.291	1	25	1	100	1.99E-05	r	**8.29E-11**
	ns	1	0.291	1	25	2	100	1.99E-05	r	**1.49E-10**
	ns	1	0.291	1	25	3	100	1.99E-05	r	**5.69E-11**
	ns	1	0.291	1	25	4	100	1.99E-05	r	**6.81E-11**
	ew	1	0.291	1	25	1	100	1.99E-05	r	**3.82E-11**
	ew	1	0.291	1	25	2	100	1.99E-05	r	**1.55E-10**
	ew	1	0.291	1	25	3	100	1.99E-05	r	**6.72E-11**
	ew	1	0.291	1	25	4	100	1.99E-05	r	**7.72E-11**
	nwse	1	0.291	1	25	1	100	1.99E-05	r	**5.39E-11**
	nwse	1	0.291	1	25	2	100	1.99E-05	r	**1.53E-10**
	nwse	1	0.291	1	25	3	100	1.99E-05	r	**5.43E-11**
	nwse	1	0.291	1	25	4	100	1.99E-05	r	**7.37E-11**
	nesw	1	0.291	1	25	1	100	1.99E-05	r	**1.07E-10**
	nesw	1	0.291	1	25	2	100	1.99E-05	r	**1.12E-10**
	nesw	1	0.291	1	25	3	100	1.99E-05	r	**1.03E-10**
	nesw	1	0.291	1	25	4	100	1.99E-05	r	**6.51E-11**
									max risk per trip	**1.55E-10**

	ANNUAL TRIPS				RISK
	Material Deliveries (Ex-Situ)	Material Deliveries (ethanol)	Offsite treatment residue or waste disposal	total annual trips	max risk (scaled from 1 trip above)
No Project	0	24	0	24	0.0037
4B	0	36	0	36	0.0056
4C-2	0	30	0	30	0.0047
4C-3	38	18	38	94	0.0146
4C-4	0	40	0	40	0.0062
4C-5	24	18	24	66	0.0102
VMT per trip	*120*	*120*	*212*		0.0146 max

Hinkley Ex-Situ HRA Calcs

Methods

DPM through inhalation pathway only
ALL PM10 exhaust from equipmnet assumed to be DPM.
DPM emissions remain constant over 9/40/70 year time frame, assuming no future turnover in fleet and reduction in emission rates.
Methodology based on Cancer Risk and Hazard Quotient procedures in:
Attachment 1 of CAPCOA, July 2009. Health Risk Assessments for Proposed Land Use Projects
http://www.capcoa.org/wp-content/uploads/downloads/2010/05/CAPCOA_HRA_LU_Guidelines_8-6-09.pdf
Breathing Rates,Exposure Frequency, and Exposure Duration based on: Assessment and Stochastic Analysis"
OEHHA September 2000 Guidance "Technical Support Document for Exposure Assessment and Stochastic Analysis"
http://oehha.ca.gov/air/hot_spots/finalStoc.html

HRA CALCS

2331.02418	1 g/sAERSCREEN 1-hr Concentration at 1,000 ft (300 meters), nearest home		(see "AERSCREEN out")
4.43345E-05	actual g/s (Alt 4C-3)	1.6218E-05	
0.1	annual conversion	0.1	
0.010334473	annual concentration (Ci) <---USE for 4C-3	0.003780457	
0.00002859	actual g/s (Alt 4C-5)	1.04581E-05	
0.1	annual conversion	0.1	
0.0066641	annual concentration (Ci) <---USE for 4C-5	0.002437807	

		UNMITIGATED		MITIGATED		
		4C-3	**4C-5**	**4C-3**	**4C-5**	
Cancer Risk (per million) =		3.29	2.12	1.2043	0.78	
	Si	1.1	1.1	1.1	1.1	(cancer potency for DPM, from OEHHA)
	Ci	0.010334	0.006664	0.003780	0.002438	annual avg concentration from above, based on 1hr->annual conversion)
	DBR	302	302	302	302	(Daily Breathing Rate. 302 for residential (80th %ile), 149 for workers, 581 for schools (95th %ile)
	A	1	1	1	1	(inhalation absorption rate. Default for all)
	EF	350	350	350	350	(Exposure Frequency, Days per Year)
	ED	70	70	70	70	(Exposure Duration, Years)
	AT	25550	25550	25550	25550	(Averaging Time)
Chronic Hazard Quotient (noncancer chronic inh		0.00207	0.00133	0.00076	0.00049	
	Ci	0.010334	0.006664	0.003780	0.002438	annual avg concentration from above, based on 1hr->annual conversion, adjusted for daily exposure based on daily onsite hours)
	RELi	5	5	5	5	Non Cancer Chronic Inhalation factor, from OEHAA

Health Risk Assessment
Ex-Situ Maintenence Equipment Operations
AERSCREEN/AERMOD INPUTS

AERSCREEN inputs for Ex-Situ Maint ops

Source Type	Area			
emissions rate	1	g/s		
Source height	5	m	SCAQMD LST Methodology, Table 2-1:	http://aqmd.gov/ceqa/handbook/LST/Method_final.pdf
length larger side	59.02	m		
length smaller side	59.02	m		
initial vertical dimension	1.4		SCAQMD LST Methodology, Table 2-1:	http://aqmd.gov/ceqa/handbook/LST/Method_final.pdf
urban/rural setting?	R			
min distance to ambient air	1m (default)			
NO2 Chemistry	1	no chem or pollutant		
max distance to probe	5000m	default		
discrete receptors	N			
flagpole receptors	N			
source elevation	0	default	F	
min temperature	259.82	k	8	http://www.wrcc.dri.edu/cgi-bin/cliGCStT.pl?ca0521
max temp	319.26	k	115	http://www.wrcc.dri.edu/cgi-bin/cliGCStT.pl?ca0521
min wind speed	0.5	m/s default		
anemometer height	10	m default		
Surface characteristics				
single user specified values:				
albedo	0.22		for Palm Springs	http://www.aqmd.gov/smog/metdata/AERMOD_Table2.html
Bowen Ratio	1.5		for Palm Springs	http://www.aqmd.gov/smog/metdata/AERMOD_Table2.html
surface roughness	0.509		for Palm Springs	http://www.aqmd.gov/smog/metdata/AERMOD_Table2.html
receptor height above ground	1.5	m		

Emission Rate calc:

		PM10 pounds/day (scaled and weighted)	grams/day	grams/second
Unmitigated	4C-3	0.0084	3.830498421	4.43345E-05
	4C-5	0.0054	2.470075905	2.85888E-05
Mitigated	4C-3	0.003	1.40123595	1.6218E-05
	4C-5	0.002	0.903579319	1.04581E-05

(see operational emission calcs)

size:

37500	ft2	size of treatment facility		
3483.864	m2		*3.2808*	*feet per meter*
59.0242662	side1 and 2			

Health Risk Assessment
Ex-Situ Maintenence Equipment Operations
AERSCREEN/AERMOD OUTPUT

```
**BEE-Line Software: BEEST for Windows (Version 9.90a) data input file
**  Model: AERMOD.EXE     Input File Creation Date: 4/27/2012  Time: 12:01:55 AM
** ECHO


CO STARTING
CO TITLEONE Hinkley Ex-Situ DPM
CO MODELOPT CONC FLAT SCREEN FASTAREA
CO AVERTIME 1
CO POLLUTID OTHER
CO RUNORNOT RUN
CO FINISHED

SO STARTING
SO ELEVUNIT METERS
SO LOCATION SOURCE AREA -29.5 -29.5 0.
SO SRCPARAM SOURCE 1.235E-07 5.000 59 59 0 1
SO SRCGROUP ALL
SO FINISHED

RE STARTING
RE DISCCART 1. 0.
RE DISCCART 25. 0.
RE DISCCART 50. 0.
RE DISCCART 75. 0.
RE DISCCART 100. 0.
RE DISCCART 125. 0.
RE DISCCART 150. 0.
RE DISCCART 175. 0.
RE DISCCART 200. 0.
RE DISCCART 225. 0.
RE DISCCART 250. 0.
RE DISCCART 275. 0.
RE DISCCART 300. 0.
RE DISCCART 325. 0.
RE DISCCART 350. 0.
RE DISCCART 375. 0.
RE DISCCART 400. 0.
RE DISCCART 425. 0.
RE DISCCART 450. 0.
RE DISCCART 475. 0.
RE DISCCART 500. 0.
RE DISCCART 525. 0.
RE DISCCART 550. 0.
RE DISCCART 575. 0.
RE DISCCART 600. 0.
RE DISCCART 625. 0.
RE DISCCART 650. 0.
RE DISCCART 675. 0.
RE DISCCART 700. 0.
RE DISCCART 725. 0.
RE DISCCART 750. 0.
RE DISCCART 775. 0.
RE DISCCART 800. 0.
RE DISCCART 825. 0.
RE DISCCART 850. 0.
RE DISCCART 875. 0.
RE DISCCART 900. 0.
RE DISCCART 925. 0.
RE DISCCART 950. 0.
RE DISCCART 975. 0.
RE DISCCART 1000. 0.
RE DISCCART 1025. 0.
RE DISCCART 1050. 0.
RE DISCCART 1075. 0.
RE DISCCART 1100. 0.
```

RE DISCCART 1125. 0.
RE DISCCART 1150. 0.
RE DISCCART 1175. 0.
RE DISCCART 1200. 0.
RE DISCCART 1225. 0.
RE DISCCART 1250. 0.
RE DISCCART 1275. 0.
RE DISCCART 1300. 0.
RE DISCCART 1325. 0.
RE DISCCART 1350. 0.
RE DISCCART 1375. 0.
RE DISCCART 1400. 0.
RE DISCCART 1425. 0.
RE DISCCART 1450. 0.
RE DISCCART 1475. 0.
RE DISCCART 1500. 0.
RE DISCCART 1525. 0.
RE DISCCART 1550. 0.
RE DISCCART 1575. 0.
RE DISCCART 1600. 0.
RE DISCCART 1625. 0.
RE DISCCART 1650. 0.
RE DISCCART 1675. 0.
RE DISCCART 1700. 0.
RE DISCCART 1725. 0.
RE DISCCART 1750. 0.
RE DISCCART 1775. 0.
RE DISCCART 1800. 0.
RE DISCCART 1825. 0.
RE DISCCART 1850. 0.
RE DISCCART 1875. 0.
RE DISCCART 1900. 0.
RE DISCCART 1925. 0.
RE DISCCART 1950. 0.
RE DISCCART 1975. 0.
RE DISCCART 2000. 0.
RE DISCCART 2025. 0.
RE DISCCART 2050. 0.
RE DISCCART 2075. 0.
RE DISCCART 2100. 0.
RE DISCCART 2125. 0.
RE DISCCART 2150. 0.
RE DISCCART 2175. 0.
RE DISCCART 2200. 0.
RE DISCCART 2225. 0.
RE DISCCART 2250. 0.
RE DISCCART 2275. 0.
RE DISCCART 2300. 0.
RE DISCCART 2325. 0.
RE DISCCART 2350. 0.
RE DISCCART 2375. 0.
RE DISCCART 2400. 0.
RE DISCCART 2425. 0.
RE DISCCART 2450. 0.
RE DISCCART 2475. 0.
RE DISCCART 2500. 0.
RE DISCCART 2525. 0.
RE DISCCART 2550. 0.
RE DISCCART 2575. 0.
RE DISCCART 2600. 0.
RE DISCCART 2625. 0.
RE DISCCART 2650. 0.
RE DISCCART 2675. 0.
RE DISCCART 2700. 0.
RE DISCCART 2725. 0.
RE DISCCART 2750. 0.

RE DISCCART 2775. 0.
RE DISCCART 2800. 0.
RE DISCCART 2825. 0.
RE DISCCART 2850. 0.
RE DISCCART 2875. 0.
RE DISCCART 2900. 0.
RE DISCCART 2925. 0.
RE DISCCART 2950. 0.
RE DISCCART 2975. 0.
RE DISCCART 3000. 0.
RE DISCCART 3025. 0.
RE DISCCART 3050. 0.
RE DISCCART 3075. 0.
RE DISCCART 3100. 0.
RE DISCCART 3125. 0.
RE DISCCART 3150. 0.
RE DISCCART 3175. 0.
RE DISCCART 3200. 0.
RE DISCCART 3225. 0.
RE DISCCART 3250. 0.
RE DISCCART 3275. 0.
RE DISCCART 3300. 0.
RE DISCCART 3325. 0.
RE DISCCART 3350. 0.
RE DISCCART 3375. 0.
RE DISCCART 3400. 0.
RE DISCCART 3425. 0.
RE DISCCART 3450. 0.
RE DISCCART 3475. 0.
RE DISCCART 3500. 0.
RE DISCCART 3525. 0.
RE DISCCART 3550. 0.
RE DISCCART 3575. 0.
RE DISCCART 3600. 0.
RE DISCCART 3625. 0.
RE DISCCART 3650. 0.
RE DISCCART 3675. 0.
RE DISCCART 3700. 0.
RE DISCCART 3725. 0.
RE DISCCART 3750. 0.
RE DISCCART 3775. 0.
RE DISCCART 3800. 0.
RE DISCCART 3825. 0.
RE DISCCART 3850. 0.
RE DISCCART 3875. 0.
RE DISCCART 3900. 0.
RE DISCCART 3925. 0.
RE DISCCART 3950. 0.
RE DISCCART 3975. 0.
RE DISCCART 4000. 0.
RE DISCCART 4025. 0.
RE DISCCART 4050. 0.
RE DISCCART 4075. 0.
RE DISCCART 4100. 0.
RE DISCCART 4125. 0.
RE DISCCART 4150. 0.
RE DISCCART 4175. 0.
RE DISCCART 4200. 0.
RE DISCCART 4225. 0.
RE DISCCART 4250. 0.
RE DISCCART 4275. 0.
RE DISCCART 4300. 0.
RE DISCCART 4325. 0.
RE DISCCART 4350. 0.
RE DISCCART 4375. 0.
RE DISCCART 4400. 0.

```
RE DISCCART 4425. 0.
RE DISCCART 4450. 0.
RE DISCCART 4475. 0.
RE DISCCART 4500. 0.
RE DISCCART 4525. 0.
RE DISCCART 4550. 0.
RE DISCCART 4575. 0.
RE DISCCART 4600. 0.
RE DISCCART 4625. 0.
RE DISCCART 4650. 0.
RE DISCCART 4675. 0.
RE DISCCART 4700. 0.
RE DISCCART 4725. 0.
RE DISCCART 4750. 0.
RE DISCCART 4775. 0.
RE DISCCART 4800. 0.
RE DISCCART 4825. 0.
RE DISCCART 4850. 0.
RE DISCCART 4875. 0.
RE DISCCART 4900. 0.
RE DISCCART 4925. 0.
RE DISCCART 4950. 0.
RE DISCCART 4975. 0.
RE DISCCART 5000. 0.
RE FINISHED

ME STARTING
ME SURFFILE "C:\Users\19551\Desktop\AQ GHG models\dispersion models\AERSCREEN\assorted files\AERSCREEN.SFC" FREE
ME PROFFILE "C:\Users\19551\Desktop\AQ GHG models\dispersion models\AERSCREEN\assorted files\AERSCREEN.PFL" FREE
ME SURFDATA  11111 2010 SCREEN
ME UAIRDATA  22222 2010 SCREEN
ME PROFBASE 0.0 METERS
ME FINISHED

OU STARTING
OU RECTABLE 1 FIRST
OU MAXTABLE 1 50
OU PLOTFILE 1 ALL FIRST "C:\Users\19551\Desktop\AQ GHG models\dispersion models\AERSCREEN\assorted files\hinkley dpm test_2010_OTHER.GRI
OU RANKFILE 1       10       "C:\Users\19551\Desktop\AQ GHG models\dispersion models\AERSCREEN\assorted files\AERSCREEN.FIL"
OU SUMMFILE "C:\Users\19551\Desktop\AQ GHG models\dispersion models\AERSCREEN\assorted files\hinkley dpm test_2010_OTHER.SUM"
OU FILEFORM EXP
OU FINISHED


 BEE-Line AERMOD "BEEST" Version ****


 Input File - C:\Users\19551\Desktop\AQ GHG models\dispersion models\AERSCREEN\assorted files\hinkley dpm test_2010_OTH
              ER.DTA
Output File - C:\Users\19551\Desktop\AQ GHG models\dispersion models\AERSCREEN\assorted files\hinkley dpm test_2010_OTH
              ER.LST
  Met File - C:\Users\19551\Desktop\AQ GHG models\dispersion models\AERSCREEN\assorted files\AERSCREEN.SFC


 ***********************************
 *** SETUP Finishes Successfully ***
 ***********************************

 *** AERMOD - VERSION  11103 ***   *** Hinkley Ex-Situ DPM                          ***       04/27/12
                        ***                                          ***       00:02:02
                                                                        PAGE   1
 **MODELOPTs:  NonDFAULT CONC                        FLAT
           NOCHKD    FASTAREA  SCREEN

                           ***    MODEL SETUP OPTIONS SUMMARY      ***
 ------------------------------------------------------------------------
```

**Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION. DRYDPLT = F
**Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses RURAL Dispersion Only.

**Model Allows User-Specified Options:
1. Stack-tip Downwash.
2. Model Assumes Receptors on FLAT Terrain.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay.

**Other Options Specified:
NOCHKD - Suppresses checking of date sequence in meteorology files
FASTAREA - Use hybrid approach to optimize AREA sources
(formerly TOXICS option)
SCREEN - Use screening option
which forces calculation of centerline values

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates 1 Short Term Average(s) of: 1-HR

**This Run Includes: 1 Source(s); 1 Source Group(s); and 201 Receptor(s)

**The Model Assumes A Pollutant Type of: OTHER

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
Model Outputs Tables of Overall Maximum Short Term Values (MAXTABLE Keyword)
Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
Model Outputs External File(s) of Ranked Values (RANKFILE Keyword)
Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

NOTE: Option for EXPonential format used in formatted output result files (FILEFORM Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 0.00 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07
Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.5 MB of RAM.

**Input Runstream File: hinkley dpm test_2010_OTHER.DTA
**Output Print File: hinkley dpm test_2010_OTHER.LST

**File for Summary of Results: C:\Users\19551\Desktop\AQ GHG models\dispersion models\AERSCREEN\assorted files\hinkley dpm test

**MODELOPTs: NonDFAULT CONC FLAT
NOCHKD FASTAREA SCREEN

*** AREA SOURCE DATA ***

```
         NUMBER EMISSION RATE  COORD (SW CORNER)  BASE    RELEASE  X-DIM    Y-DIM    ORIENT.   INIT.  URBAN  EMISSION RATE
 SOURCE      PART. (GRAMS/SEC     X      Y     ELEV.   HEIGHT  OF AREA  OF AREA  OF AREA    SZ    SOURCE  SCALAR VARY
   ID        CATS.  /METER**2)  (METERS) (METERS) (METERS) (METERS) (METERS)  (METERS)  (DEG.)  (METERS)          BY
------------------------------------------------------------------------------

 SOURCE         0  0.12350E-06   -29.5    -29.5     0.0     5.00    59.00    59.00     0.00     1.00    NO
 *** AERMOD - VERSION  11103 ***  *** Hinkley Ex-Situ DPM                                  ***      04/27/12
                      ***                                          ***      00:02:02
                                                                  PAGE   3
 **MODELOPTs:  NonDFAULT CONC                        FLAT
         NOCHKD    FASTAREA  SCREEN


                          *** SOURCE IDs DEFINING SOURCE GROUPS ***

 GROUP ID                              SOURCE IDs



  ALL      SOURCE     ,
 *** AERMOD - VERSION  11103 ***  *** Hinkley Ex-Situ DPM                                  ***      04/27/12
                      ***                                          ***      00:02:02
                                                                  PAGE   4
 **MODELOPTs:  NonDFAULT CONC                        FLAT
         NOCHKD    FASTAREA  SCREEN

                           *** DISCRETE CARTESIAN RECEPTORS ***
                          (X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
                                    (METERS)

    (     1.0,     0.0,     0.0,     0.0,     0.0);     (    25.0,     0.0,     0.0,     0.0,     0.0);
    (    50.0,     0.0,     0.0,     0.0,     0.0);     (    75.0,     0.0,     0.0,     0.0,     0.0);
    (   100.0,     0.0,     0.0,     0.0,     0.0);     (   125.0,     0.0,     0.0,     0.0,     0.0);
    (   150.0,     0.0,     0.0,     0.0,     0.0);     (   175.0,     0.0,     0.0,     0.0,     0.0);
    (   200.0,     0.0,     0.0,     0.0,     0.0);     (   225.0,     0.0,     0.0,     0.0,     0.0);
    (   250.0,     0.0,     0.0,     0.0,     0.0);     (   275.0,     0.0,     0.0,     0.0,     0.0);
    (   300.0,     0.0,     0.0,     0.0,     0.0);     (   325.0,     0.0,     0.0,     0.0,     0.0);
    (   350.0,     0.0,     0.0,     0.0,     0.0);     (   375.0,     0.0,     0.0,     0.0,     0.0);
    (   400.0,     0.0,     0.0,     0.0,     0.0);     (   425.0,     0.0,     0.0,     0.0,     0.0);
    (   450.0,     0.0,     0.0,     0.0,     0.0);     (   475.0,     0.0,     0.0,     0.0,     0.0);
    (   500.0,     0.0,     0.0,     0.0,     0.0);     (   525.0,     0.0,     0.0,     0.0,     0.0);
    (   550.0,     0.0,     0.0,     0.0,     0.0);     (   575.0,     0.0,     0.0,     0.0,     0.0);
    (   600.0,     0.0,     0.0,     0.0,     0.0);     (   625.0,     0.0,     0.0,     0.0,     0.0);
    (   650.0,     0.0,     0.0,     0.0,     0.0);     (   675.0,     0.0,     0.0,     0.0,     0.0);
    (   700.0,     0.0,     0.0,     0.0,     0.0);     (   725.0,     0.0,     0.0,     0.0,     0.0);
    (   750.0,     0.0,     0.0,     0.0,     0.0);     (   775.0,     0.0,     0.0,     0.0,     0.0);
    (   800.0,     0.0,     0.0,     0.0,     0.0);     (   825.0,     0.0,     0.0,     0.0,     0.0);
    (   850.0,     0.0,     0.0,     0.0,     0.0);     (   875.0,     0.0,     0.0,     0.0,     0.0);
    (   900.0,     0.0,     0.0,     0.0,     0.0);     (   925.0,     0.0,     0.0,     0.0,     0.0);
    (   950.0,     0.0,     0.0,     0.0,     0.0);     (   975.0,     0.0,     0.0,     0.0,     0.0);
    (  1000.0,     0.0,     0.0,     0.0,     0.0);     (  1025.0,     0.0,     0.0,     0.0,     0.0);
    (  1050.0,     0.0,     0.0,     0.0,     0.0);     (  1075.0,     0.0,     0.0,     0.0,     0.0);
    (  1100.0,     0.0,     0.0,     0.0,     0.0);     (  1125.0,     0.0,     0.0,     0.0,     0.0);
    (  1150.0,     0.0,     0.0,     0.0,     0.0);     (  1175.0,     0.0,     0.0,     0.0,     0.0);
    (  1200.0,     0.0,     0.0,     0.0,     0.0);     (  1225.0,     0.0,     0.0,     0.0,     0.0);
    (  1250.0,     0.0,     0.0,     0.0,     0.0);     (  1275.0,     0.0,     0.0,     0.0,     0.0);
    (  1300.0,     0.0,     0.0,     0.0,     0.0);     (  1325.0,     0.0,     0.0,     0.0,     0.0);
    (  1350.0,     0.0,     0.0,     0.0,     0.0);     (  1375.0,     0.0,     0.0,     0.0,     0.0);
    (  1400.0,     0.0,     0.0,     0.0,     0.0);     (  1425.0,     0.0,     0.0,     0.0,     0.0);
    (  1450.0,     0.0,     0.0,     0.0,     0.0);     (  1475.0,     0.0,     0.0,     0.0,     0.0);
    (  1500.0,     0.0,     0.0,     0.0,     0.0);     (  1525.0,     0.0,     0.0,     0.0,     0.0);
    (  1550.0,     0.0,     0.0,     0.0,     0.0);     (  1575.0,     0.0,     0.0,     0.0,     0.0);
    (  1600.0,     0.0,     0.0,     0.0,     0.0);     (  1625.0,     0.0,     0.0,     0.0,     0.0);
    (  1650.0,     0.0,     0.0,     0.0,     0.0);     (  1675.0,     0.0,     0.0,     0.0,     0.0);
    (  1700.0,     0.0,     0.0,     0.0,     0.0);     (  1725.0,     0.0,     0.0,     0.0,     0.0);
```

(1750.0,	0.0,	0.0,	0.0,	0.0);	(1775.0,	0.0,	0.0,	0.0,	0.0);
(1800.0,	0.0,	0.0,	0.0,	0.0);	(1825.0,	0.0,	0.0,	0.0,	0.0);
(1850.0,	0.0,	0.0,	0.0,	0.0);	(1875.0,	0.0,	0.0,	0.0,	0.0);
(1900.0,	0.0,	0.0,	0.0,	0.0);	(1925.0,	0.0,	0.0,	0.0,	0.0);
(1950.0,	0.0,	0.0,	0.0,	0.0);	(1975.0,	0.0,	0.0,	0.0,	0.0);
(2000.0,	0.0,	0.0,	0.0,	0.0);	(2025.0,	0.0,	0.0,	0.0,	0.0);
(2050.0,	0.0,	0.0,	0.0,	0.0);	(2075.0,	0.0,	0.0,	0.0,	0.0);
(2100.0,	0.0,	0.0,	0.0,	0.0);	(2125.0,	0.0,	0.0,	0.0,	0.0);
(2150.0,	0.0,	0.0,	0.0,	0.0);	(2175.0,	0.0,	0.0,	0.0,	0.0);
(2200.0,	0.0,	0.0,	0.0,	0.0);	(2225.0,	0.0,	0.0,	0.0,	0.0);

**MODELOPTs: NonDFAULT CONC FLAT
NOCHKD FASTAREA SCREEN

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

(2250.0,	0.0,	0.0,	0.0,	0.0);	(2275.0,	0.0,	0.0,	0.0,	0.0);
(2300.0,	0.0,	0.0,	0.0,	0.0);	(2325.0,	0.0,	0.0,	0.0,	0.0);
(2350.0,	0.0,	0.0,	0.0,	0.0);	(2375.0,	0.0,	0.0,	0.0,	0.0);
(2400.0,	0.0,	0.0,	0.0,	0.0);	(2425.0,	0.0,	0.0,	0.0,	0.0);
(2450.0,	0.0,	0.0,	0.0,	0.0);	(2475.0,	0.0,	0.0,	0.0,	0.0);
(2500.0,	0.0,	0.0,	0.0,	0.0);	(2525.0,	0.0,	0.0,	0.0,	0.0);
(2550.0,	0.0,	0.0,	0.0,	0.0);	(2575.0,	0.0,	0.0,	0.0,	0.0);
(2600.0,	0.0,	0.0,	0.0,	0.0);	(2625.0,	0.0,	0.0,	0.0,	0.0);
(2650.0,	0.0,	0.0,	0.0,	0.0);	(2675.0,	0.0,	0.0,	0.0,	0.0);
(2700.0,	0.0,	0.0,	0.0,	0.0);	(2725.0,	0.0,	0.0,	0.0,	0.0);
(2750.0,	0.0,	0.0,	0.0,	0.0);	(2775.0,	0.0,	0.0,	0.0,	0.0);
(2800.0,	0.0,	0.0,	0.0,	0.0);	(2825.0,	0.0,	0.0,	0.0,	0.0);
(2850.0,	0.0,	0.0,	0.0,	0.0);	(2875.0,	0.0,	0.0,	0.0,	0.0);
(2900.0,	0.0,	0.0,	0.0,	0.0);	(2925.0,	0.0,	0.0,	0.0,	0.0);
(2950.0,	0.0,	0.0,	0.0,	0.0);	(2975.0,	0.0,	0.0,	0.0,	0.0);
(3000.0,	0.0,	0.0,	0.0,	0.0);	(3025.0,	0.0,	0.0,	0.0,	0.0);
(3050.0,	0.0,	0.0,	0.0,	0.0);	(3075.0,	0.0,	0.0,	0.0,	0.0);
(3100.0,	0.0,	0.0,	0.0,	0.0);	(3125.0,	0.0,	0.0,	0.0,	0.0);
(3150.0,	0.0,	0.0,	0.0,	0.0);	(3175.0,	0.0,	0.0,	0.0,	0.0);
(3200.0,	0.0,	0.0,	0.0,	0.0);	(3225.0,	0.0,	0.0,	0.0,	0.0);
(3250.0,	0.0,	0.0,	0.0,	0.0);	(3275.0,	0.0,	0.0,	0.0,	0.0);
(3300.0,	0.0,	0.0,	0.0,	0.0);	(3325.0,	0.0,	0.0,	0.0,	0.0);
(3350.0,	0.0,	0.0,	0.0,	0.0);	(3375.0,	0.0,	0.0,	0.0,	0.0);
(3400.0,	0.0,	0.0,	0.0,	0.0);	(3425.0,	0.0,	0.0,	0.0,	0.0);
(3450.0,	0.0,	0.0,	0.0,	0.0);	(3475.0,	0.0,	0.0,	0.0,	0.0);
(3500.0,	0.0,	0.0,	0.0,	0.0);	(3525.0,	0.0,	0.0,	0.0,	0.0);
(3550.0,	0.0,	0.0,	0.0,	0.0);	(3575.0,	0.0,	0.0,	0.0,	0.0);
(3600.0,	0.0,	0.0,	0.0,	0.0);	(3625.0,	0.0,	0.0,	0.0,	0.0);
(3650.0,	0.0,	0.0,	0.0,	0.0);	(3675.0,	0.0,	0.0,	0.0,	0.0);
(3700.0,	0.0,	0.0,	0.0,	0.0);	(3725.0,	0.0,	0.0,	0.0,	0.0);
(3750.0,	0.0,	0.0,	0.0,	0.0);	(3775.0,	0.0,	0.0,	0.0,	0.0);
(3800.0,	0.0,	0.0,	0.0,	0.0);	(3825.0,	0.0,	0.0,	0.0,	0.0);
(3850.0,	0.0,	0.0,	0.0,	0.0);	(3875.0,	0.0,	0.0,	0.0,	0.0);
(3900.0,	0.0,	0.0,	0.0,	0.0);	(3925.0,	0.0,	0.0,	0.0,	0.0);
(3950.0,	0.0,	0.0,	0.0,	0.0);	(3975.0,	0.0,	0.0,	0.0,	0.0);
(4000.0,	0.0,	0.0,	0.0,	0.0);	(4025.0,	0.0,	0.0,	0.0,	0.0);
(4050.0,	0.0,	0.0,	0.0,	0.0);	(4075.0,	0.0,	0.0,	0.0,	0.0);
(4100.0,	0.0,	0.0,	0.0,	0.0);	(4125.0,	0.0,	0.0,	0.0,	0.0);
(4150.0,	0.0,	0.0,	0.0,	0.0);	(4175.0,	0.0,	0.0,	0.0,	0.0);
(4200.0,	0.0,	0.0,	0.0,	0.0);	(4225.0,	0.0,	0.0,	0.0,	0.0);
(4250.0,	0.0,	0.0,	0.0,	0.0);	(4275.0,	0.0,	0.0,	0.0,	0.0);
(4300.0,	0.0,	0.0,	0.0,	0.0);	(4325.0,	0.0,	0.0,	0.0,	0.0);
(4350.0,	0.0,	0.0,	0.0,	0.0);	(4375.0,	0.0,	0.0,	0.0,	0.0);
(4400.0,	0.0,	0.0,	0.0,	0.0);	(4425.0,	0.0,	0.0,	0.0,	0.0);
(4450.0,	0.0,	0.0,	0.0,	0.0);	(4475.0,	0.0,	0.0,	0.0,	0.0);

*** *** 00:02:02
PAGE 6
**MODELOPTs: NonDFAULT CONC FLAT
NOCHKD FASTAREA SCREEN

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

(4500.0, 0.0, 0.0, 0.0, 0.0); (4525.0, 0.0, 0.0, 0.0, 0.0);
(4550.0, 0.0, 0.0, 0.0, 0.0); (4575.0, 0.0, 0.0, 0.0, 0.0);
(4600.0, 0.0, 0.0, 0.0, 0.0); (4625.0, 0.0, 0.0, 0.0, 0.0);
(4650.0, 0.0, 0.0, 0.0, 0.0); (4675.0, 0.0, 0.0, 0.0, 0.0);
(4700.0, 0.0, 0.0, 0.0, 0.0); (4725.0, 0.0, 0.0, 0.0, 0.0);
(4750.0, 0.0, 0.0, 0.0, 0.0); (4775.0, 0.0, 0.0, 0.0, 0.0);
(4800.0, 0.0, 0.0, 0.0, 0.0); (4825.0, 0.0, 0.0, 0.0, 0.0);
(4850.0, 0.0, 0.0, 0.0, 0.0); (4875.0, 0.0, 0.0, 0.0, 0.0);
(4900.0, 0.0, 0.0, 0.0, 0.0); (4925.0, 0.0, 0.0, 0.0, 0.0);
(4950.0, 0.0, 0.0, 0.0, 0.0); (4975.0, 0.0, 0.0, 0.0, 0.0);
(5000.0, 0.0, 0.0, 0.0, 0.0);

*** AERMOD - VERSION 11103 *** *** Hinkley Ex-Situ DPM *** 04/27/12
*** *** 00:02:02
PAGE 7
**MODELOPTs: NonDFAULT CONC FLAT
NOCHKD FASTAREA SCREEN

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** AERMOD - VERSION 11103 *** *** Hinkley Ex-Situ DPM *** 04/27/12
*** *** 00:02:02
PAGE 8
**MODELOPTs: NonDFAULT CONC FLAT
NOCHKD FASTAREA SCREEN

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: AERSCREEN.SFC Met Version: SCREEN
Profile file: AERSCREEN.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 11111 Upper air station no.: 22222
Name: SCREEN Name: SCREEN
Year: 2010 Year: 2010

First 24 hours of scalar data
YR MO DY JDY HR H0 U* W* DT/DZ ZICNV ZIMCH M-O LEN Z0 BOWEN ALBEDO REF WS WD HT REF TA HT
- -
10 01 01 1 01 -0.8 0.034 -9.000 0.020 -999. 14. 3.7 0.51 1.50 0.22 0.50 270. 10.0 259.8 2.0

```
10 01 02   2 01   -0.8  0.034 -9.000  0.020 -999.   71.     3.7  0.51   1.50   0.22    0.50  270.   10.0  259.8    2.0
10 01 03   3 01   -0.8  0.034 -9.000  0.020 -999.  142.     3.7  0.51   1.50   0.22    0.50  270.   10.0  259.8    2.0
10 01 04   4 01   -0.7  0.034 -9.000  0.020 -999.   14.     4.1  0.51   1.50   0.22    0.50  270.   10.0  259.8    2.0
10 01 05   5 01   -0.7  0.034 -9.000  0.020 -999.   71.     4.1  0.51   1.50   0.22    0.50  270.   10.0  259.8    2.0
10 01 06   6 01   -0.7  0.034 -9.000  0.020 -999.  142.     4.1  0.51   1.50   0.22    0.50  270.   10.0  259.8    2.0
10 01 07   7 01   -0.2  0.034 -9.000  0.020 -999.   14.    12.0  0.51   1.50   0.22    0.50  270.   10.0  259.8    2.0
10 01 08   8 01   -0.2  0.034 -9.000  0.020 -999.   71.    12.0  0.51   1.50   0.22    0.50  270.   10.0  259.8    2.0
10 01 09   9 01   -0.2  0.034 -9.000  0.020 -999.  142.    12.0  0.51   1.50   0.22    0.50  270.   10.0  259.8    2.0
10 01 10  10 01   -0.9  0.034 -9.000  0.020 -999.   14.     4.1  0.51   1.50   0.22    0.50  270.   10.0  319.3    2.0
10 01 11  11 01   -0.9  0.034 -9.000  0.020 -999.   71.     4.1  0.51   1.50   0.22    0.50  270.   10.0  319.3    2.0
10 01 12  12 01   -0.9  0.034 -9.000  0.020 -999.  142.     4.1  0.51   1.50   0.22    0.50  270.   10.0  319.3    2.0
10 01 13  13 01   -0.8  0.034 -9.000  0.020 -999.   14.     4.5  0.51   1.50   0.22    0.50  270.   10.0  319.3    2.0
10 01 14  14 01   -0.8  0.034 -9.000  0.020 -999.   71.     4.5  0.51   1.50   0.22    0.50  270.   10.0  319.3    2.0
10 01 15  15 01   -0.8  0.034 -9.000  0.020 -999.  142.     4.5  0.51   1.50   0.22    0.50  270.   10.0  319.3    2.0
10 01 16  16 01   -0.3  0.034 -9.000  0.020 -999.   14.    13.3  0.51   1.50   0.22    0.50  270.   10.0  319.3    2.0
10 01 17  17 01   -0.3  0.034 -9.000  0.020 -999.   71.    13.3  0.51   1.50   0.22    0.50  270.   10.0  319.3    2.0
10 01 18  18 01   -0.3  0.034 -9.000  0.020 -999.  142.    13.3  0.51   1.50   0.22    0.50  270.   10.0  319.3    2.0
10 01 19  19 01   -0.6  0.034 -9.000  0.020 -999.   14.     5.3  0.51   1.50   0.22    0.50  270.   10.0  259.8    2.0
10 01 20  20 01   -0.6  0.034 -9.000  0.020 -999.   71.     5.3  0.51   1.50   0.22    0.50  270.   10.0  259.8    2.0
10 01 21  21 01   -0.6  0.034 -9.000  0.020 -999.  142.     5.3  0.51   1.50   0.22    0.50  270.   10.0  259.8    2.0
10 01 22  22 01   -0.5  0.034 -9.000  0.020 -999.   14.     5.8  0.51   1.50   0.22    0.50  270.   10.0  259.8    2.0
10 01 23  23 01   -0.5  0.034 -9.000  0.020 -999.   71.     5.8  0.51   1.50   0.22    0.50  270.   10.0  259.8    2.0
10 01 24  24 01   -0.5  0.034 -9.000  0.020 -999.  142.     5.8  0.51   1.50   0.22    0.50  270.   10.0  259.8    2.0


First hour of profile data
YR MO DY HR HEIGHT F  WDIR    WSPD AMB_TMP sigmaA  sigmaW  sigmaV
10 01 01 01   10.0 1  270.    0.50   259.9   99.0  -99.00  -99.00

F indicates top of profile (=1) or below (=0)
 *** AERMOD - VERSION  11103 ***   *** Hinkley Ex-Situ DPM                                ***       04/27/12
                        ***                                          ***       00:02:02
                                                                        PAGE   9
**MODELOPTs:  NonDFAULT CONC                          FLAT
          NOCHKD    FASTAREA  SCREEN

                  *** THE   1ST HIGHEST  1-HR AVERAGE CONCENTRATION   VALUES FOR SOURCE GROUP:  ALL     ***
                    INCLUDING SOURCE(S):    SOURCE     ,

                          *** DISCRETE CARTESIAN RECEPTOR POINTS ***

                        ** CONC OF OTHER    IN MICROGRAMS/M**3                  **

   X-COORD (M)  Y-COORD (M)       CONC     (YYMMDDHH)          X-COORD (M)  Y-COORD (M)       CONC     (YYMMDDHH)
-----------------------------------------------------------------------------
        1.00        0.00       0.63343  (10010112)               25.00        0.00       1.08533  (10010112)
       50.00        0.00       1.27813  (10012501)               75.00        0.00       1.68888  (10012501)
      100.00        0.00       1.66573  (10012501)              125.00        0.00       1.57979  (10011601)
      150.00        0.00       1.47436  (10010701)              175.00        0.00       1.35678  (10012801)
      200.00        0.00       1.27952  (10012801)              225.00        0.00       1.19776  (10011901)
      250.00        0.00       1.12637  (10010401)              275.00        0.00       1.06334  (10010101)
      300.00        0.00       1.00434  (10010101)              325.00        0.00       0.94797  (10010101)
      350.00        0.00       0.89498  (10010101)              375.00        0.00       0.84516  (10010101)
      400.00        0.00       0.79946  (10010101)              425.00        0.00       0.75711  (10010101)
      450.00        0.00       0.71785  (10010101)              475.00        0.00       0.68138  (10010101)
      500.00        0.00       0.64787  (10010101)              525.00        0.00       0.61703  (10010101)
      550.00        0.00       0.58858  (10010101)              575.00        0.00       0.56219  (10010101)
      600.00        0.00       0.53753  (10010101)              625.00        0.00       0.51436  (10010101)
      650.00        0.00       0.49282  (10010101)              675.00        0.00       0.47277  (10010101)
      700.00        0.00       0.45408  (10010101)              725.00        0.00       0.43662  (10010101)
      750.00        0.00       0.42028  (10010101)              775.00        0.00       0.40497  (10010101)
      800.00        0.00       0.39060  (10010101)              825.00        0.00       0.37709  (10010101)
      850.00        0.00       0.36438  (10010101)              875.00        0.00       0.35235  (10010101)
      900.00        0.00       0.34094  (10010101)              925.00        0.00       0.33007  (10010101)
      950.00        0.00       0.31980  (10010101)              975.00        0.00       0.31006  (10010101)
     1000.00        0.00       0.30082  (10010101)             1025.00        0.00       0.29205  (10010101)
```

1050.00	0.00	0.28372	(10010101)	1075.00	0.00	0.27579	(10010101)
1100.00	0.00	0.26823	(10010101)	1125.00	0.00	0.26103	(10010101)
1150.00	0.00	0.25416	(10010101)	1175.00	0.00	0.24759	(10010101)
1200.00	0.00	0.24132	(10010101)	1225.00	0.00	0.23532	(10010101)
1250.00	0.00	0.22957	(10010101)	1275.00	0.00	0.22406	(10010101)
1300.00	0.00	0.21878	(10010101)	1325.00	0.00	0.21372	(10010101)
1350.00	0.00	0.20885	(10010101)	1375.00	0.00	0.20417	(10010101)
1400.00	0.00	0.19968	(10010101)	1425.00	0.00	0.19535	(10010101)
1450.00	0.00	0.19119	(10010101)	1475.00	0.00	0.18718	(10010101)
1500.00	0.00	0.18331	(10010101)	1525.00	0.00	0.17958	(10010101)
1550.00	0.00	0.17598	(10010101)	1575.00	0.00	0.17249	(10010101)
1600.00	0.00	0.17011	(10010101)	1625.00	0.00	0.16680	(10010101)
1650.00	0.00	0.16360	(10010101)	1675.00	0.00	0.16051	(10010101)
1700.00	0.00	0.15751	(10010101)	1725.00	0.00	0.15461	(10010101)
1750.00	0.00	0.15181	(10010101)	1775.00	0.00	0.14909	(10010101)
1800.00	0.00	0.14645	(10010101)	1825.00	0.00	0.14389	(10010101)
1850.00	0.00	0.14141	(10010101)	1875.00	0.00	0.13900	(10010101)
1900.00	0.00	0.13667	(10010101)	1925.00	0.00	0.13440	(10010101)
1950.00	0.00	0.13219	(10010101)	1975.00	0.00	0.13005	(10010101)

**MODELOPTs: NonDFAULT CONC FLAT
NOCHKD FASTAREA SCREEN

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): SOURCE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)	X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)
2000.00	0.00	0.12797	(10010101)	2025.00	0.00	0.12594	(10010101)
2050.00	0.00	0.12397	(10010101)	2075.00	0.00	0.12205	(10010101)
2100.00	0.00	0.12019	(10010101)	2125.00	0.00	0.11837	(10010101)
2150.00	0.00	0.11660	(10010101)	2175.00	0.00	0.11487	(10010101)
2200.00	0.00	0.11319	(10010101)	2225.00	0.00	0.11155	(10010101)
2250.00	0.00	0.10995	(10010101)	2275.00	0.00	0.10839	(10010101)
2300.00	0.00	0.10687	(10010101)	2325.00	0.00	0.10539	(10010101)
2350.00	0.00	0.10394	(10010101)	2375.00	0.00	0.10253	(10010101)
2400.00	0.00	0.10115	(10010101)	2425.00	0.00	0.09980	(10010101)
2450.00	0.00	0.09848	(10010101)	2475.00	0.00	0.09719	(10010101)
2500.00	0.00	0.09593	(10010101)	2525.00	0.00	0.09470	(10010101)
2550.00	0.00	0.09350	(10010101)	2575.00	0.00	0.09232	(10010101)
2600.00	0.00	0.09117	(10010101)	2625.00	0.00	0.09004	(10010101)
2650.00	0.00	0.08894	(10010101)	2675.00	0.00	0.08786	(10010101)
2700.00	0.00	0.08680	(10010101)	2725.00	0.00	0.08576	(10010101)
2750.00	0.00	0.08475	(10010101)	2775.00	0.00	0.08376	(10010101)
2800.00	0.00	0.08278	(10010101)	2825.00	0.00	0.08183	(10010101)
2850.00	0.00	0.08089	(10010101)	2875.00	0.00	0.07998	(10010101)
2900.00	0.00	0.07908	(10010101)	2925.00	0.00	0.07820	(10010101)
2950.00	0.00	0.07733	(10010101)	2975.00	0.00	0.07649	(10010101)
3000.00	0.00	0.07566	(10010101)	3025.00	0.00	0.07484	(10010101)
3050.00	0.00	0.07404	(10010101)	3075.00	0.00	0.07325	(10010101)
3100.00	0.00	0.07248	(10010101)	3125.00	0.00	0.07172	(10010101)
3150.00	0.00	0.07098	(10010101)	3175.00	0.00	0.07025	(10010101)
3200.00	0.00	0.06953	(10010101)	3225.00	0.00	0.06883	(10010101)
3250.00	0.00	0.06813	(10010101)	3275.00	0.00	0.06745	(10010101)
3300.00	0.00	0.06678	(10010101)	3325.00	0.00	0.06613	(10010101)
3350.00	0.00	0.06548	(10010101)	3375.00	0.00	0.06485	(10010101)
3400.00	0.00	0.06422	(10010101)	3425.00	0.00	0.06361	(10010101)
3450.00	0.00	0.06300	(10010101)	3475.00	0.00	0.06241	(10010101)
3500.00	0.00	0.06182	(10010101)	3525.00	0.00	0.06125	(10010101)
3550.00	0.00	0.06068	(10010101)	3575.00	0.00	0.06013	(10010101)

3600.00	0.00	0.05958 (10010101)	3625.00	0.00	0.05904 (10010101)
3650.00	0.00	0.05851 (10010101)	3675.00	0.00	0.05799 (10010101)
3700.00	0.00	0.05747 (10010101)	3725.00	0.00	0.05697 (10010101)
3750.00	0.00	0.05647 (10010101)	3775.00	0.00	0.05598 (10010101)
3800.00	0.00	0.05549 (10010101)	3825.00	0.00	0.05502 (10010101)
3850.00	0.00	0.05455 (10010101)	3875.00	0.00	0.05408 (10010101)
3900.00	0.00	0.05363 (10010101)	3925.00	0.00	0.05318 (10010101)
3950.00	0.00	0.05274 (10010101)	3975.00	0.00	0.05230 (10010101)

**MODELOPTs: NonDFAULT CONC FLAT
NOCHKD FASTAREA SCREEN

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): SOURCE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)	X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)
4000.00	0.00	0.05187	(10010101)	4025.00	0.00	0.05145	(10010101)
4050.00	0.00	0.05103	(10010101)	4075.00	0.00	0.05062	(10010101)
4100.00	0.00	0.05021	(10010101)	4125.00	0.00	0.04981	(10010101)
4150.00	0.00	0.04941	(10010101)	4175.00	0.00	0.04902	(10010101)
4200.00	0.00	0.04864	(10010101)	4225.00	0.00	0.04826	(10010101)
4250.00	0.00	0.04789	(10010101)	4275.00	0.00	0.04752	(10010101)
4300.00	0.00	0.04715	(10010101)	4325.00	0.00	0.04679	(10010101)
4350.00	0.00	0.04644	(10010101)	4375.00	0.00	0.04609	(10010101)
4400.00	0.00	0.04574	(10010101)	4425.00	0.00	0.04540	(10010101)
4450.00	0.00	0.04507	(10010101)	4475.00	0.00	0.04473	(10010101)
4500.00	0.00	0.04441	(10010101)	4525.00	0.00	0.04408	(10010101)
4550.00	0.00	0.04376	(10010101)	4575.00	0.00	0.04345	(10010101)
4600.00	0.00	0.04314	(10010101)	4625.00	0.00	0.04283	(10010101)
4650.00	0.00	0.04252	(10010101)	4675.00	0.00	0.04222	(10010101)
4700.00	0.00	0.04193	(10010101)	4725.00	0.00	0.04163	(10010101)
4750.00	0.00	0.04135	(10010101)	4775.00	0.00	0.04106	(10010101)
4800.00	0.00	0.04078	(10010101)	4825.00	0.00	0.04050	(10010101)
4850.00	0.00	0.04022	(10010101)	4875.00	0.00	0.03995	(10010101)
4900.00	0.00	0.03968	(10010101)	4925.00	0.00	0.03941	(10010101)
4950.00	0.00	0.03915	(10010101)	4975.00	0.00	0.03889	(10010101)
5000.00	0.00	0.03863	(10010101)				

**MODELOPTs: NonDFAULT CONC FLAT
NOCHKD FASTAREA SCREEN

*** THE MAXIMUM 50 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): SOURCE ,

** CONC OF OTHER IN MICROGRAMS/M**3 **

RANK	CONC	(YYMMDDHH)	AT	RECEPTOR (XR,YR)	OF TYPE
1.	1.68888	(10012501)	AT (	75.00, 0.00)	DC
2.	1.66573	(10012501)	AT (	100.00, 0.00)	DC
3.	1.61369	(10011601)	AT (	100.00, 0.00)	DC
4.	1.59120	(10010701)	AT (	100.00, 0.00)	DC
5.	1.57979	(10011601)	AT (	125.00, 0.00)	DC
6.	1.57248	(10010701)	AT (	125.00, 0.00)	DC
7.	1.50441	(10012501)	AT (	125.00, 0.00)	DC
8.	1.47436	(10010701)	AT (	150.00, 0.00)	DC
9.	1.47160	(10011601)	AT (	150.00, 0.00)	DC
26.	1.35551	(10010701)	AT (	175.00, 0.00)	DC
27.	1.35502	(10012201)	AT (	175.00, 0.00)	DC
28.	1.34660	(10011601)	AT (	175.00, 0.00)	DC
29.	1.34397	(10011901)	AT (	175.00, 0.00)	DC
30.	1.33963	(10011301)	AT (	150.00, 0.00)	DC
31.	1.32819	(10012501)	AT (	150.00, 0.00)	DC
32.	1.32315	(10021801)	AT (	75.00, 0.00)	DC
33.	1.32310	(10021601)	AT (	75.00, 0.00)	DC
34.	1.32299	(10022101)	AT (	75.00, 0.00)	DC

10.	1.44766 (10011601) AT (75.00, 0.00) DC	35.	1.32299 (10022301) AT (75.00, 0.00) DC
11.	1.42085 (10012801) AT (125.00, 0.00) DC	36.	1.32299 (10022501) AT (75.00, 0.00) DC
12.	1.42085 (10013101) AT (125.00, 0.00) DC	37.	1.32153 (10012801) AT (100.00, 0.00) DC
13.	1.42085 (10020301) AT (125.00, 0.00) DC	38.	1.32153 (10013101) AT (100.00, 0.00) DC
14.	1.41459 (10012201) AT (125.00, 0.00) DC	39.	1.32153 (10020301) AT (100.00, 0.00) DC
15.	1.41352 (10012801) AT (150.00, 0.00) DC	40.	1.31899 (10021301) AT (75.00, 0.00) DC
16.	1.41352 (10013101) AT (150.00, 0.00) DC	41.	1.31565 (10011301) AT (175.00, 0.00) DC
17.	1.41352 (10020301) AT (150.00, 0.00) DC	42.	1.31356 (10021101) AT (75.00, 0.00) DC
18.	1.40983 (10012201) AT (150.00, 0.00) DC	43.	1.31266 (10020801) AT (75.00, 0.00) DC
19.	1.40825 (10010701) AT (75.00, 0.00) DC	44.	1.31240 (10012201) AT (100.00, 0.00) DC
20.	1.40301 (10012601) AT (75.00, 0.00) DC	45.	1.30626 (10010401) AT (150.00, 0.00) DC
21.	1.38825 (10011901) AT (150.00, 0.00) DC	46.	1.30626 (10011001) AT (150.00, 0.00) DC
22.	1.37929 (10011901) AT (125.00, 0.00) DC	47.	1.30534 (10011301) AT (125.00, 0.00) DC
23.	1.35678 (10012801) AT (175.00, 0.00) DC	48.	1.30463 (10020601) AT (75.00, 0.00) DC
24.	1.35678 (10013101) AT (175.00, 0.00) DC	49.	1.29438 (10010401) AT (175.00, 0.00) DC
25.	1.35678 (10020301) AT (175.00, 0.00) DC	50.	1.29438 (10011001) AT (175.00, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
*** AERMOD - VERSION 11103 *** *** Hinkley Ex-Situ DPM *** 04/27/12
*** *** 00:02:02
PAGE 13
**MODELOPTs: NonDFAULT CONC FLAT
NOCHKD FASTAREA SCREEN

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	NETWORK RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	1.68888	ON 10012501: AT (75.00, 0.00, 0.00, 0.00, 0.00)	DC	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
*** AERMOD - VERSION 11103 *** *** Hinkley Ex-Situ DPM *** 04/27/12
*** *** 00:02:02
PAGE 14
**MODELOPTs: NonDFAULT CONC FLAT
NOCHKD FASTAREA SCREEN

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 0 Warning Message(s)
A Total of 0 Informational Message(s)

A Total of 511 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 0 Missing Hours Identified (0.00 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********
*** NONE ***

****
*** AERMOD Finishes Successfully ***
****