

APPENDIX E – AIR QUALITY AND GHG

Draft Report
Analysis of Air Quality Impacts and Greenhouse
Gas Emissions

Mount Diablo Resource Recovery Park

Pittsburg, California

February 28, 2014

Prepared For:
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TABLE OF CONTENTS

SUMMARY	1
1. INTRODUCTION	5
2. BASIS FOR AIR QUALITY ANALYSIS	6
3. ESTIMATE OF EMISSIONS	8
3.1 Calculation of Emissions	
3.2 Emissions of Criteria Air Pollutants	
3.3 Emissions of Toxic Air Pollutants	
3.4 Greenhouse Gas Emissions	
4. ANALYSIS OF PUBLIC HEALTH RISKS	13
4.1 Dispersion Modeling Analysis	
4.2 Risk Calculations	
4.3 Results	
5. MITIGATION MEASURES	22
6. SIGNIFICANCE OF EMISSIONS AND AIR QUALITY IMPACTS	26
APPENDIX	
A Calculation of Operational Emissions	
B Excerpts of HARP Model Output	
C Documentation of Tier 4 Diesel Engine Emissions	

SUMMARY

PMC has retained Air Permitting Specialists to analyze air quality impacts and impacts associated with greenhouse gas (GHG) emissions from the proposed expansion of the Mt. Diablo Resource Recovery Park (Facility). The facility is located at 1300 Loveridge Road in Pittsburg (Contra Costa County), California.

The facility is currently permitted to process up to 1,500 tons per day (tpd) of municipal solid waste and electronic waste with up to 450 tpd of that total being composed of mixed construction and demolition debris; up to 500 tons per day of residential and mixed commercial recyclables and up to 200 tpd of green and wood waste that is permitted under Local Enforcement Agency (LEA) notification. The proposed expansion would increase the daily acceptance rate from the current totals to a maximum of 5,500 tpd for all recyclables and waste materials. Any individual capacities listed for various types of waste within this report are estimates, not permitted limits. The applicant is also planning to install a Biomass Gasification Unit that would utilize up to 40 tpd of clean wood chips processed on-site to generate one megawatt per hour of renewable energy to be used for on-site purposes. The proposed project also includes a physical expansion of the plant from the current location to the adjacent, currently vacant 18.5 acres located west of the current location. The expansion area will generally be utilized for commodity vehicle and equipment storage and parking. The proposed operational and physical expansion would result in an increase in vehicular traffic to and from the Mt. Diablo Resource Recovery Park.

Consistent with requirements of the BAAQMD CEQA Guidelines, the scope of the current analysis is as follows:

1. Quantify the daily and annual emission rates of criteria air pollutants. The analysis is limited to carbon monoxide (CO), oxides of nitrogen (NO_x), reactive organic gases (ROG), particulate matter (PM-10, PM-2.5)
2. Quantify the emissions rates of toxic air contaminants (TACs)
3. Quantify the emission rates of greenhouse gases (CO₂, N₂O and CH₄)
4. Analyze potential impacts to public health risks (cancer risk, acute and chronic hazard index and annual PM-2.5 concentration)
5. Assess the significance of emissions of criteria, GHG and toxic air emissions

The significance of potential impacts are assessed by comparing daily and annual emission rates with thresholds¹ established by the Bay Area Air Quality Management

¹ BAAQMD May 2011, *California Environmental Quality Act, Air Quality Guidelines*.

District (BAAQMD). The thresholds include maximally acceptable public health risks. Table 5-1 of the 2010 BAAQMD CEQA Guidelines were used as GHG emissions thresholds for stationary and non-stationary sources for this project.

The BAAQMD Guidelines, however, are currently under legal review and therefore, *BAAQMD is recommending that these Guidelines not be used until the legal review is complete and a final opinion has been rendered by the California Supreme Court.* Until that time, the lead agencies have the discretion to use these or any other Guidelines to determine the significance of air quality and GHG impacts. The BAAQMD's CEQA Thresholds Options and Justification Report (2009) outlines the substantial evidence supporting a variety of thresholds of significance, including the BAAQMD's proposed CEQA thresholds. (The BAAQMD's proposed CEQA significance thresholds can be viewed on the BAAQMD's website at url: <http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Updated-CEQA-Guidelines.aspx>.) Given that BAAQMD's proposed CEQA thresholds are supported by substantial evidence, per CEQA requirements, these thresholds are used by the City for evaluation of air quality and greenhouse gas impacts, as outlined in this report.

An estimate of operational emissions is presented in Tables 1. Detailed calculations are provided in Appendices A and B.

Table 1 Summary of Operational Project Emissions					
Pollutant	Project Emissions		Significance Thresholds²		Impact Significant?
	<i>(lbs/day)</i>	<i>(tons/yr)</i>	<i>(lbs/day)</i>	<i>(tons/yr)</i>	
Particulate (PM-10) (Exhaust)	11.37	2.536	82	15	No
Particulate (PM-2.5) ¹ (Exhaust)	11.37	2.536	54	10	No
Oxides of Nitrogen (NOx)	203.07	38.53	54	10	Yes
Reactive Organic Gases (ROG)	29.53	6.23	54	10	No
Carbon Monoxide (CO)	234.34	40.40	No Threshold	No Threshold	No
Greenhouse Gas- Equipment + Stationary Sources (CO ₂ (e))	25,025	7,818	No Threshold	10,000 MT	No
Greenhouse Gas- Mobile Sources (CO ₂ (e)) ³	118,464	17,629	No Threshold	1,100 MT	Yes ³

1. Emissions data for PM-2.5 is not available for most of the sources. Therefore, we have conservatively assumed that the emission rate of PM-2.5 will be the same as PM-10.
2. Based on BAAQMD's proposed gross pollutant thresholds (BAAQMD 2010)
3. Emissions estimates do not account for displaced emissions associated with the proposed project. Actual operational emissions in comparison to BAAQMD significance thresholds may vary. Depending on the amount of displaced emissions attributable to the proposed project, this impact conclusion may change.

Table 2 Summary of Project Health Risks			
Public Health Risks²	Incremental Risk at Nearest Residence	Significant Threshold	Impact Significant?
Project Level Cancer Risk	10.7	10 cancers/million	Yes
Cumulative Cancer Risk (Project + Existing Emissions)	12.6	100 cancers/million	No
Ambient PM-2.5 Increase	0.01	0.3ug/m3 (annual)	No
Chronic Hazard Index	0.011	1.0	No
Acute Hazard Index	0.061	1.0	No

² For DPM, the potential cancer risk will outweigh the potential non-cancer health impacts. There is no acute reference exposure level (REL) for diesel exhaust.

1. INTRODUCTION

This air quality study has been prepared on behalf of PMC to analyze air quality impacts associated with the expansion of the Mt. Diablo Resource Recovery Park. The facility is located at 1300 Loveridge Road, in Pittsburg (Contra Costa County), California.

The Facility is currently permitted to process up to 1,500 tons per day (tpd) of municipal solid waste and electronic waste with up to 450 tpd of that total being composed of mixed construction and demolition debris; up to 500 tpd of residential and mixed commercial recyclables and up to 200 tpd of green and wood waste that is permitted under Local Enforcement Agency (LEA) notification. The proposed expansion would increase the daily acceptance rate from the current totals to a maximum of 5,500 tpd for all recyclables and waste materials. Any individual capacities listed for various types of waste within this report are estimates, not permitted limits. The applicant is also planning to install a Biomass Gasification Unit that would utilize up to 40 tpd of clean wood chips processed on-site to generate one megawatt per hour of renewable energy to be used for on-site purposes. The proposed project also includes a physical expansion of the plant from the current location to the adjacent, currently vacant 18.5 acres located west of the current location. The expansion area will generally be utilized for commodity vehicle and equipment storage and parking. The proposed operational and physical expansion would result in increased equipment usage and an increase in vehicular traffic to and from the facility.

This report is divided into five Sections and four Appendices. Section 2 presents the basis of the current analysis. Section 3 summarizes the emissions from equipment and mobile sources. Section 4 analyzes public health risks associated with exposure to toxic air pollutants. Section 5 discusses mitigation measures. Section 6 discusses the significance of project impacts on air quality and public health. Detailed emission calculations and model output are provided in Appendices A thru D.

2. BASIS OF AIR QUALITY ANALYSIS

The proposed increase in the daily acceptance rate would lead to increased usage of equipment and an increase vehicular traffic. The latter consists of increased traffic associated with employees/self-haul vehicles as well as an increase in the number of trucks that would transport the additional material to and from the Facility. The changes in equipment use and mobile sources are summarized below.

Table 3 Summary of Motor Vehicle Trips							
Activity	Vehicle Type	Operating Schedule	Round Trip Length (miles)	Current Peak Daily Vehicles	Maximum Future Permitted Daily Vehicles	Net Increase (Project) Daily Vehicles	Net Increase (Project) Annual Vehicles
Employee Vehicles/Self Haul	Light Duty	7 days/week 52 weeks/yr 365 days/yr	23	900	4,220	3,320	1,211,800
Collection Trucks	Heavy Duty	5 days/week 52 weeks/yr	17	180	840	660	171,600
Long Haul Trucks	Heavy Duty	5 days/week 52 weeks/yr 260 days/yr	17	120	560	440	114,400
Annual vehicles = vehicles/day x days/year							
Source: Fehr & Peers Trip Generation Memo, Revised May 1, 2012							

Table 4 List of Current and Future On-Site Equipment							
	Current			Future (Project + Current)			
	No.	(hrs/day)	(total hrs/year)	No.	(hrs/day)	(hrs/year)	
Transfer Processing Facility							
Front End Loaders	4	16	23,296	10	24	87,360	
Excavators	1	4	1,456	2	16	11,648	
Skip Loaders	1	4	1,456	1	4	1,456	
Sweeper	2	6	4,368	2	10	7,280	
Forklift	1	2	728	2	4	2,912	
Recycling Center							
Front End Loaders	1	16	4,160	2	16	11,648	
Forklift	3	16	12,480	6	16	34,944	

C & D Processing Area								
Front End Loaders		1	4	832		2	8	5,824
Excavator		1	8	1,664		2	8	5,824
Organic Processing Area								
Front End Loaders		2	8	4,160		2	16	11,648
Biomass Gasification Facility								
Loaders		-	-	-		1	16	5,824
<i>Source: Contra Costa Waste Services, June 13, 2012</i>								

In addition to on-site equipment and additional vehicle trips, the project includes a biomass gasification unit that would generate up to 1 megawatt (MW) of electric power. The biogas would be combusted in an internal combustion engine and the engine would be connected to an electric generator. The engine would operate 24 hours/day, 365 days/year. In the event of engine malfunction or during periods of maintenance, the biogas would be directed to the existing flare.

Emissions from mobile sources are based on average trip length, peak daily and average annual vehicle miles traveled. Emissions per vehicle were calculated using the EMFAC 2011 model. Three categories of vehicles are assumed. These categories and their designation in EMFAC 2011 are as follows:

1. Light Duty Autos and Trucks (LDA)
2. Heavy Duty Trucks (T6)
3. Solid Waste Collection Vehicles (T7)

For light duty vehicles and heavy duty truck emissions we assumed an average fleet mix between 2010 to 2014 model years. The use of a five year average is justified since ARB enacted fleetwide emission limits for heavy duty trucks on December 14, 2011. As a direct result of these regulations, the use of the most recent five year average emission rate is justified. For solid waste collection vehicles (SWCV) we assumed the 2014 fleet average. As with heavy duty trucks, SWCV are also subject to (separate) ARB rules enacted in 2003. The 2014 fleet average reflects the SWCV rule.

Daily and annual emission rates of the following pollutants were calculated:

- Coarse Particulate Matter (PM-10)
- Fine Particulate Matter (PM-2.5)
- Oxides of Nitrogen (NOx)
- Reactive Organic Gases (ROG)

- Carbon Monoxide (CO)
- Carbon Dioxide (CO₂)

Emissions data for PM-2.5 is not available for most of the sources. Therefore, we have conservatively assumed that the emission rate of PM-2.5 will be the same as PM-10. The main toxic air pollutant released from the project will be diesel particulate matter (DPM). The emission rates of DPM are the same as the emission rates of PM-10 from on-site equipment and trucks presented in Tables 3 and 4, and are used to estimate public health risks as described in Section 3 below. The emission rates of DPM were calculated using the EMFAC 2011 model for on-road mobile sources and the OFFROAD Model for on-site equipment. The gasification unit will release trace amounts of toxic air pollutants. The risk analysis accounts for both DPM and emissions from the gasification unit. Emissions associated with gasifier operations are included in Table 6, and calculated in Table A-5 in the Appendix.

3. ESTIMATE OF EMISSIONS

The main sources of emissions associated with the proposed project are:

- Exhaust Emissions from on-site equipment
- Exhaust Emissions from on-road mobile source (Cars, Trucks)
- Emissions from biogas unit

These emissions are described in the following sub-sections.

3.1 Calculation of Emissions

Emissions from the various sources will be estimated using the following methodology

Table 5		
Source(s)	Basis of Emission Calculations	Reference
Mobile Sources (cars, trucks)	EMFAC 2011 Emissions Model for light duty, heavy duty (T7) and solid waste collection vehicles (SWCV)	CARB (Sept. 19, 2011) http://www.arb.ca.gov/msei/modeling.htm
On-Site Equipment	OFFROAD Emissions Model, Tier 4 Emission Standards. Capacity Factors from CARB	<u>For Existing Equipment</u> CARB (April 14, 2010) http://www.arb.ca.gov/msei/offroad/offroad.htm As tabulated in CalEMod User's Guide Appendix D, Table 3.4,

	Guidance	February 2011. Use the fleet average for 2014 calendar year. For New Equipment For new equipment, assume equipment will meet Tier 4 emission standards. Mitigation has been included to require Tier 4 equipment in support of this assumption. Load factors for all equipment based on latest CARB Guidance: http://www.arb.ca.gov/regact/2010/offroadlsi10/offroadappd.pdf
Biogas Fuelled Engine	Manufacturer's Emissions Data	CAT 3516 TA Gas Engine Technical Data October 14, 2008

3.2 Emissions of Criteria Air Pollutants

Increases in daily and annual incremental emissions associated with both on-road mobile sources and on-site equipment are summarized in Table 6. The emissions are compared with the BAAQMD CEQA Thresholds³.

Table 6 Summary of Operational Emissions					
Pollutant	Project Emissions		Significance Thresholds²		Impact Significant?
	<i>(lbs/day)</i>	<i>(tons/yr)</i>	<i>(lbs/day)</i>	<i>(tons/yr)</i>	
Particulate (PM-10)	11.37	2.536	82	15	No
Particulate (PM-2.5) ¹	11.37	2.536	54	10	No
Oxides of Nitrogen (NOx)	203.07	38.53	54	10	Yes
Reactive Organic Gases (ROG)	29.53	6.23	54	10	No
Carbon Monoxide (CO)	234.34	40.40	No Threshold	No Threshold	No
Greenhouse Gas-Stationary Sources (CO ₂ (e))	25,025	7,818	No Threshold	10,000 MT	No
Greenhouse Gas-Mobile Sources(CO ₂ (e)) ³	118,464	17,629	No Threshold	1,100 MT	Yes ³

1. Emissions data for PM-2.5 is not available for most of the sources. Therefore, we have conservatively assumed that the emission rate of PM-2.5 will be the same as PM-10.

³ BAAQMD (May 2010 or 2012?) California Environmental Quality Act Air Quality Guidelines, Bay Area Air Quality Management District, San Francisco, CA 94109

2. Based on BAAQMD's proposed gross pollutant thresholds (BAAQMD 2010)
3. Emissions estimates do not account for displaced or avoided emissions associated with the proposed project A separate analysis has been completed by the applicant that takes into account GHG emissions associated with no-project alternative. The current project reduces some of the no-project alternative emissions. GHG emissions in and their significance presented in this table do no account for such avoided emissions. As a result, the actual significance from GHG emissions is expected to be lower.

Detailed calculations are provided in Tables A-1 thru A-6 in Appendix A.

On-site storage of greenwaste and foodwaste will be limited to a maximum of 48 hours. As a result, emissions from greenwaste and foodwaste is considered negligible.

3.3 Emissions of Toxic Air Contaminants

In accordance with BAAQMD recommended methodology, this risk assessment evaluated emissions from onsite sources and potential impacts to offsite sensitive receptors. The risks assessment did not evaluate risks to onsite or offsite workers. The Occupational Safety and Health Administration (OSHA) is the main federal agency that adopts laws and regulations for ensuring safe and healthful work environment to prevent injuries and protect the health of workers. Compliance with existing regulatory requirements governing worker safety would be anticipated to be sufficient to ensure that risks to onsite workers would be within acceptable levels.

The principal toxic air contaminant released from the project is diesel exhaust particulate matter (DPM) from on-site equipment and mobile sources. This is reported as PM-10 in Table 9. DPM consists of gaseous and particulate matter containing various toxic air contaminants such as formaldehyde, benzene, and metals. The exhaust mixture has been identified by the state of California as a carcinogen. Under ARB Guidelines⁴, diesel particulate matter is used as a surrogate that characterizes the various components contained in the exhaust mixture.

In addition to DPM, there would be trace amounts of organic emissions associated with the gasifier. The amounts and toxicity of these emissions is 10 to 100 times lower than DPM. These emissions have been included in our analysis and are summarized in Table 10.

3.4 Emissions of Greenhouse Gases

The release of GHG emissions from anthropogenic sources is believed to increase the global temperature by changing the radiative transfer properties of the atmosphere. GHG emissions consist primarily of carbon dioxide (CO₂) with trace amount of methane (CH₄) and nitrous oxide (N₂O). For diesel combustion, the primary fuel that will be used with on-site equipment and trucks, methane and nitrous oxide will contribute less than 0.5 percent to the overall GHG.

⁴ Cal EPA 2005 Air Toxics Hot Spots Program Risk Assessment Guidelines, Part 2, Technical Support Document for Describing Available Cancer Potency Factors, May 2005.

Table 7 Summary of Toxic Air Emissions from Gasifier Operations (Based on AP-42 Table 3.2-3 July 2000)					
Pollutant	(lb/mmbtu)		(lbs/hr)		(lbs/yr)
1,3 Butadiene	6.63E-04		3.91E-03		30.52
Acetaldehyde	2.79E-03		1.65E-02		128.45
Acrolein	2.63E-03		1.55E-02		121.08
Benzene	1.58E-03		9.33E-03		72.74
Carbon Tetrachloride	1.77E-05		1.04E-04		0.81
Chlorobenzene	1.29E-05		7.61E-05		0.59
Chloroform	1.37E-05		8.09E-05		0.63
Ethylbenzene	2.48E-05		1.46E-04		1.14
Formaldehyde	2.05E-02		1.21E-01		943.78
Methanol	3.06E-03		1.81E-02		140.88
Methylene Chloride	4.12E-05		2.43E-04		1.90
Napthalene	9.71E-05		5.73E-04		4.47
Styrene	1.19E-05		7.02E-05		0.55
Toluene	5.58E-04		3.29E-03		25.69
Vinyl Chloride	7.18E-06		4.24E-05		0.33
Xylene	1.95E-04		1.15E-03		8.98

Fuel Input	5.90	mmbtu/hr
Annual Hours	7,800	hrs
Annual Fuel Consumption	46,038	mmbtu/yr

Collectively, the total emissions of CO₂, CH₄ and N₂O, are reported in terms of carbon dioxide equivalents or CO₂(e). The GHG emissions associated with the current project are summarized in Table 8. *It is important to note that emissions from non-permitted sources do not take into account displaced emissions. Evaluation of displaced emissions was not included in this analysis. As a result, actual emissions and resultant impacts may vary depending on the amount of GHG emissions displaced by the proposed project.*

Table 8		
Summary of GHG Emissions		
	CO ₂ (MT/yr)	CO ₂ (e) (MT/yr)
Permitted Sources		
Existing Stationary Sources	0	0
Future (Project) Stationary Sources (Gasification Unit)	3,743.5	3,745.2
<i>TOTAL (Permitted Sources)</i>	3,743.5	3,745.2
<i>BAAQMD Threshold of Significance</i>		10,000
<i>Significant?</i>		No
Non-Permitted Sources		
Future Mobile Sources	15,935	15,989
Future On-Site Equipment	3,342.6	3,353.9
<i>Total (non-permitted Sources)</i>	19,277.6	19,342.9
<i>BAAQMD Threshold of Significance</i>		1,100
Above The Threshold?		Yes
CO ₂ (e)/CO ₂ Ratios:		
Diesel/Gasoline	1.0034	
Natural Gas/Biogas	1.0005	

4. Analysis of Public Health Risks

Risk analysis involves calculating the amount of a toxic compounds present in the environment that could enter the body through various exposure pathways and then determining the level of risk associated with a given level of exposure. As discussed previously (Section 3.3), the present analysis focuses on exposure to DPM (diesel particulate matter) released from on-site equipment and idling trucks. The analysis focuses of 70 year averaged residential cancer risk; therefore, a 70 year averaged emission rate of DPM is required and was calculated as follows:

Three categories of emissions were modeled:

On-Site Equipment

The emission rate of DPM is assumed to be the same as PM-10 emissions calculated in Table A-4a. These represent unmitigated emissions. Emissions were modeled as a single area source.

On-Site Truck Idling

For emissions from idling trucks, data presented in the EMFAC 2011 model for the period 2007 to 2040 were used. Emissions were modeled as three (3) point sources.

Biomass Gasification Unit

Emissions based on combustion of natural gas presented earlier in Table 7 Emissions were modeled as a single point source.

To translate the emissions from the three categories of sources into public risk, the CARB/OEHHA recommended HARP model was used. This model includes a dispersion modeling module and a separate risk calculator. Version 1.4d.

4.1 Dispersion Modeling

The following model options were used in running the dispersion module in HARP.

Land-Use (Urban/Rural):	Urban
Complex Terrain Option:	Not Used
Regulatory Default Option:	Option Used
Gradual Plume Rise:	Option Not Used
Calm Wind Processing:	Option Not Used
Stack Tip Downwash:	Option Used

Building Downwash:

Option Not Used

Meteorological Data

Meteorological data (hourly wind speed, wind direction, surface temperature) collected during 2005 to 2008 in Pittsburg. This data was obtained from the BAAQMD staff and has been pre-processed by the District for use with the ISCST3 model that is included in the HARP model.

Receptor Grid

An overall rectangular grid extending 3.4 kilometers along the east-west direction by 2.4 kilometers along the north-south direction was used in the dispersion model. Receptor points were spaced 50 meters apart. A total of 3,382 receptors were modeled. The layout of the modeling grid is shown in Figure 1. The location of the area and point sources is shown in Figure 2. A discrete receptor was located at the nearby Martin Luther King Jr. Junio High School located at 950 El Pueblo Ave.

4.2 Risk Calculations

The results of the dispersion modeling are used in the risk calculation module of HARP. The calculations follow the current OEHHA Guidelines for risk analysis. The emission rates of individual toxic air pollutants are read by the HARP model⁵ and along with the toxicity data. Three types of risks are calculated:

- Residential (70-Year) Cancer Risk
- Chronic Non-Cancer Hazard Index
- Acute Hazard index

Predicted risks at offsite locations are presented in tabular format and localized concentrations and risk isopleths are depicted graphically. A copy of the HARP model output is provided in the Appendix C.

⁵ HARP "Hazard Assessment Reporting Program" Version 1.4d released by California Air Resources Board. Information available at: <http://www.arb.ca.gov/toxics/harp/data.htm>

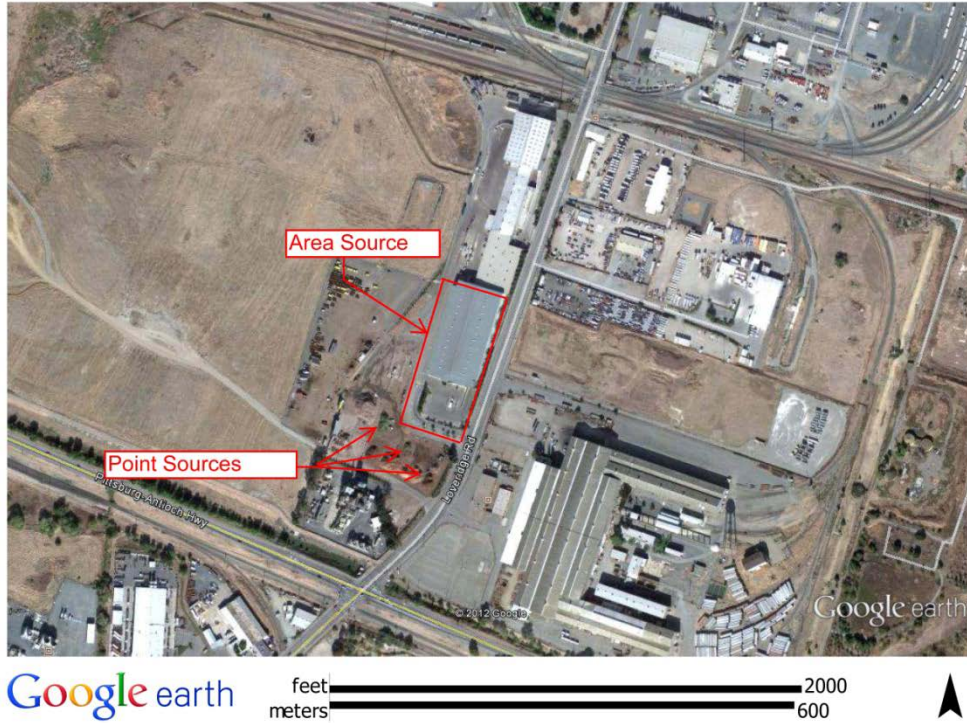
Figure 1
Layout of Modeling Grid



Google earth



Figure 2
Location of Area and Point Sources



4.3 Results

The predicted cancer risk and chronic hazard indices prior to mitigation for project-level and cumulative exposure are shown in Tables 9 and 10, respectively. Figure 3 shows the spatial variation of cancer risk across the modeling domain. The results indicate that the maximum cancer risk at off-site locations, including some residential neighborhoods, would vary between 10.4 to less than 1 cancers/million. The 70 year cancer risk would not exceed the BAAQMD threshold of significance of 10 cancers/million. A summary of risk at various residential areas near the project is presented in Table 12.

Table 9 Predicted Project-Level Cancer Risk and Chronic Hazard Indices at Maximum Exposed Individuals without Mitigation			
Area	Maximum Increase in Cancer Risk/Million	Chronic and Acute Hazard Index	PM2.5 Concentration ($\mu\text{g}/\text{m}^3$)
Area bounded by Hwy 4, East Leland Avenue and between Loveridge Road and Gladstone Drive	5.65	Chronic: Less than 0.01 Acute: 0.0797	0.01
Area bounded by Auto Center Drive, L Street, Highway 4 and Pittsburg-Antioch Highway/West 10 th Street	4.95	Chronic: Less than 0.01 Acute: 0.0267	0.02
Area bounded by 14 th Street, Pittsburg Antioch Highway, Pine Street and 12 th Street	10.8	Chronic: Less than 0.01 Acute: 0.040	0.02
BAAQMD Project-Level Threshold	10	1	0.3

Unmitigated project level cancer risk (10.8 cancers/million) in the area bounded by 14th Street, Pittsburg-Antioch Highway, Pine Street and 12th street exceeds the threshold of significance of 10 cancers/million. The main source of risk is DPM emissions from on-site equipment. This risk is reduced to less than significant after mitigation. This is discussed in Section 5 under “Mitigation Measures”.

Maximum off-site chronic hazard index is estimated to be less than 0.01 as shown in Figure 4. Maximum annual PM-2.5 concentrations are estimated to be between 0.01 and 0.07 depending on location. See Figure 5 for a plot of HI at various grid locations.

Table 10 Predicted Cumulative Cancer Risk and Chronic Hazard Indices at Maximum Exposed Individuals without Mitigation			
Area	Cumulative Cancer Risk/Million	Chronic and Acute Hazard Index	PM2.5 Concentration ($\mu\text{g}/\text{m}^3$)
Area bounded by Hwy 4, East Leland Avenue and between Loveridge Road and Gladstone Drive		Chronic: 0.01 Acute: 0.0797	0.05
Area bounded by Auto Center Drive, L Street, Highway 4 and Pittsburg-Antioch Highway/West 10 th Street	102	Chronic: 0.13 Acute: 0.0267	3.64
Area bounded by 14 th Street, Pittsburg Antioch Highway, Pine Street and 12 th Street	13.8	Chronic: Less than 0.01 Acute: 0.04	0.06
BAAQMD Project-Level Threshold	100	10	0.8

We note that cumulative cancer risk would exceed the BAAQMD threshold for cumulative risk. Chronic and acute cumulative hazard indices and annual PM-2.5 would not exceed the BAAQMD significance thresholds.

Figure 3
Spatial Variation of Increased Cancer Risk

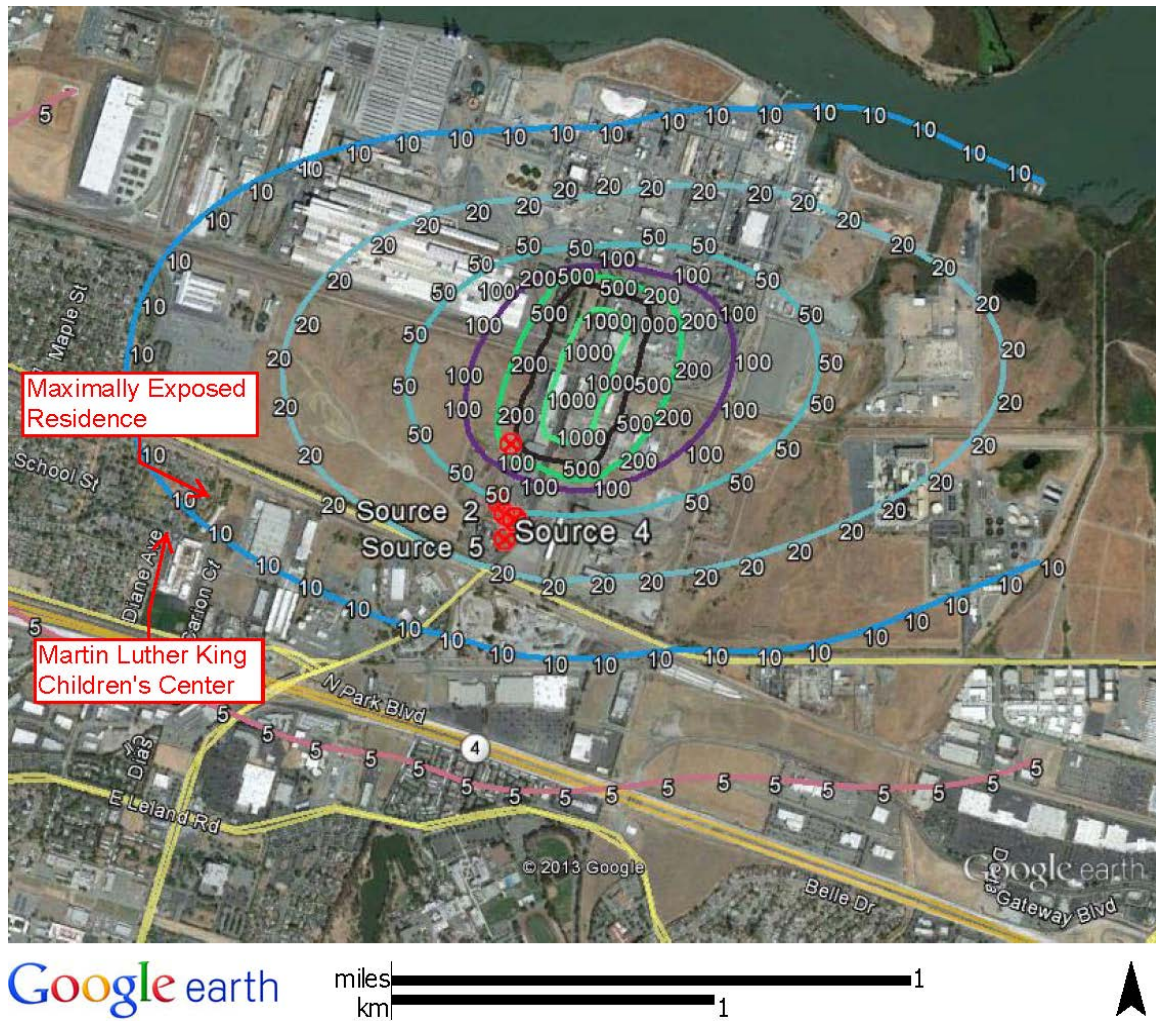


Figure 4
Spatial Variation of Chronic Hazard Index

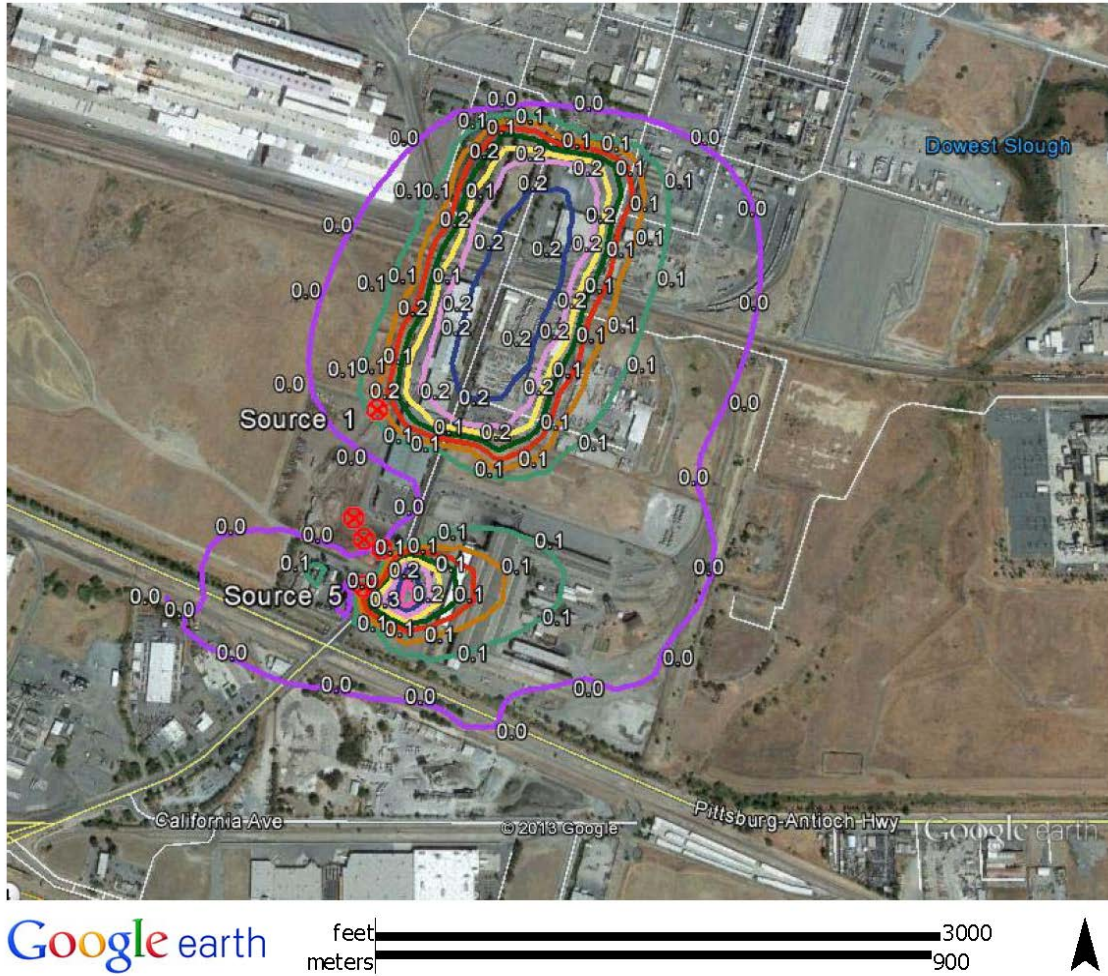


Figure 5
Spatial Variation of Annual PM-2.5 Concentration



5. MITIGATION MEASURES

Emissions of NOx and GHG emissions from the proposed project would exceed the daily and annual thresholds of significance, respectively. The following mitigation measures are recommended to reduce the significance of these emissions:

1. All off-road, heavy-duty equipment (25 hp, or greater) shall meet ARB's Tier 4 emissions standards.
2. Equipment should not be left idling when not in use.
3. All heavy-duty trucks owned by the project applicant and associated with project operations shall be model year 2010, or newer, or achieve equivalent emissions reductions.
4. Purchase NOx and GHG emission offsets to reduce emissions below the thresholds of significance.

If mitigation measures 1 to 3 are implemented, the annual and daily NOx emissions would be substantially reduced. Use of Tier 4 engines in all new equipment that is added to the fleet would reduce NOx emissions by over 60%.

A comparison of unmitigated and mitigated emissions is given below in Table 11.

Table 11				
Comparison of Mitigated and Unmitigated Emissions				
Pollutant	Mitigated Emissions		Unmitigated Emissions	
	<i>(lbs/day)</i>	<i>(tons/yr)</i>	<i>(lbs/day)</i>	<i>(tons/yr)</i>
Particulate (PM-10)	3.22	0.849	8.06	2.536
Particulate (PM-2.5) ¹	3.22	0.849	8.06	2.536
Oxides of Nitrogen (NOx)	74.65	11.93	142.66	38.53
Reactive Organic Gases (ROG)	16.34	3.45	21.63	6.23
Carbon Monoxide (CO)	206.8	36.15	191.93	40.40
Greenhouse Gas-Equipment + Gasifier (CO ₂ (e))	25,025	7,818	25,025	7,818
Greenhouse Gas-Mobile Sources (CO ₂ (e))	118,464	17,629	118,464	17,629

A comparison of emissions with mitigation measures 1 to 3 are presented in Table 12 and updated project level risks are shown in Table 13. The updated plot of project level cancer risk is shown in Figure 6.

Table 12 Summary of Operational Project Emissions with Mitigation					
Pollutant	Project Emissions		Significance Thresholds		Impact Significant?
	<i>(lbs/day)</i>	<i>(tons/yr)</i>	<i>(lbs/day)</i>	<i>(tons/yr)</i>	
Particulate (PM-10)	3.22	0.849	82	15	No
Particulate (PM-2.5) ¹	3.22	0.849	54	10	No
Oxides of Nitrogen (NOx)	74.65	11.93	54	10	Yes
Reactive Organic Gases (ROG)	16.34	3.45	54	10	No
Carbon Monoxide (CO)	206.8	36.15	No Threshold	No Threshold	No
Greenhouse Gas-Equipment + Stationary Sources (CO ₂ (e))	25,025	7,818	No Threshold	10,000 MT	No
Greenhouse Gas-Non-Stationary Source (CO ₂ (e))	118,464	17,692	No Threshold	1,100 MT	Yes

4. Emissions data for PM-2.5 is not available for most of the sources. Therefore, we have conservatively assumed that the emission rate of PM-2.5 will be the same as PM-10.

While implementation of mitigation measures 1-3 would substantially reduce NOx emissions, the impacts from both NOx and GHG emissions would remain significant. To further reduce the significance of impacts, mitigation measure #4 would have to be implemented. The applicant may choose to secure NOx and GHG emission offsets to ensure emissions remain below the thresholds of significance.

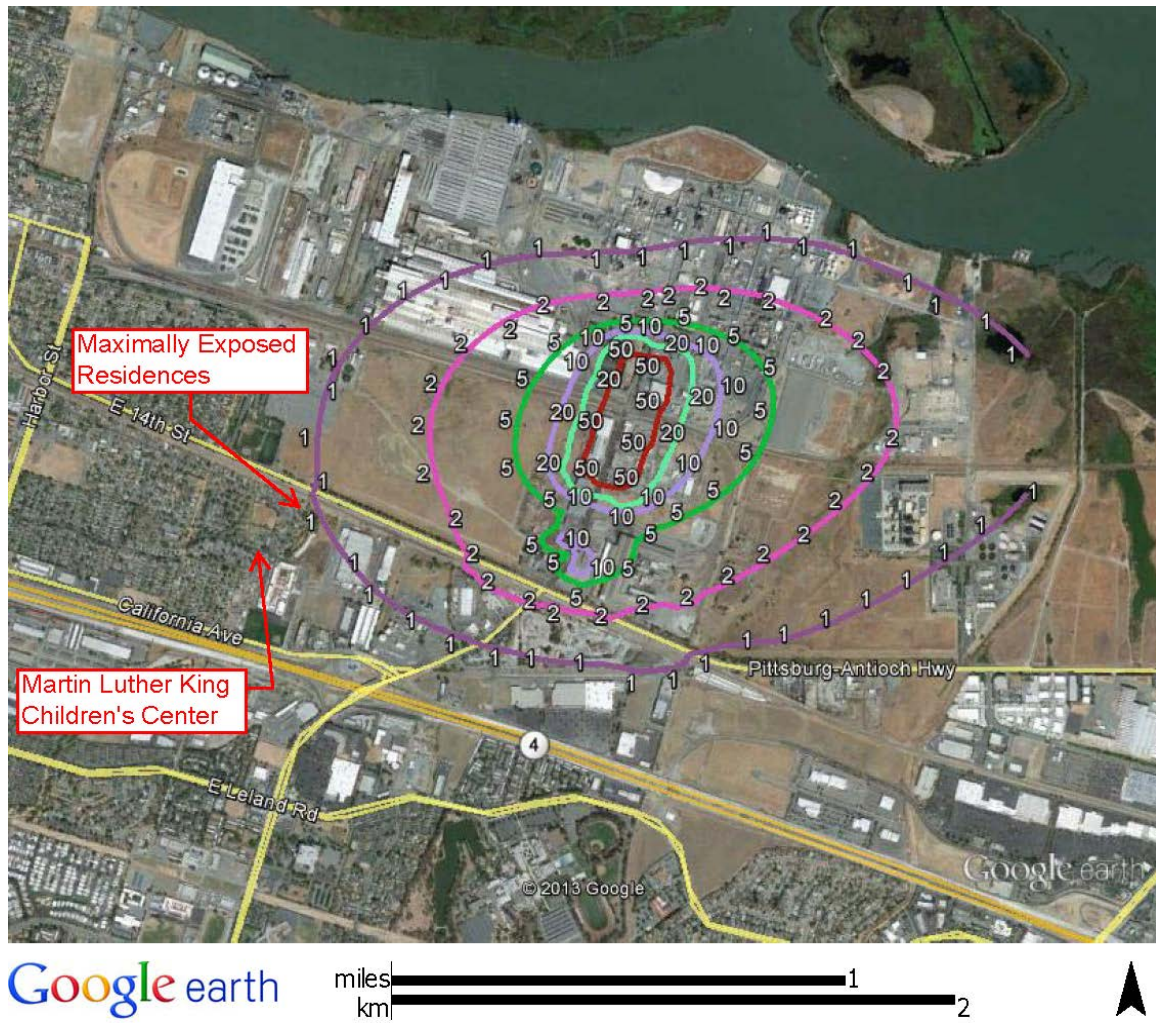
As discussed previously, GHG emissions calculated in the current analysis do not take into account for reductions elsewhere that can be attributed to this project. If these reductions are taken into account, the significance of impacts from GHG may no longer be significant. Finally, we note that the project emissions presented in Table 12 represent emissions that would occur under maximum permitted conditions. This is not expected to occur for five or more years into the future. If the project is operating at less than the maximum permitted capacity prior to reaching the permitted capacity, then the emissions would also be lower and may well be less than significant.

**Table 13
Summary of Project Health Risks with Mitigation**

Public Health Risks⁶	Incremental Risk at Nearest Residence	Significant Threshold	Impact Significant?
Project Level Cancer Risk	0.461	10 cancers/million	No
Cumulative Cancer Risk (Project + Existing Emissions)	2.4	100 cancers/million	No
Ambient PM-2.5 Increase	0.01	0.3ug/m3 (annual)	No
Chronic Hazard Index	Less than 0.01	1.0	No

⁶ For DPM, the potential cancer risk will outweigh the potential non-cancer health impacts. There is no acute reference exposure level (REL) for diesel exhaust.

Figure 6
Spatial Variation of Increased Cancer Risk with Mitigation



Google earth

miles 1
km 2



6. SIGNIFICANCE OF EMISSIONS AND AIR QUALITY IMPACTS

The BAAQMD issued updated CEQA Guidelines in May 2011 that required, in part, that the effects of climate change be addressed in the CEQA documents. The Guidelines also specify:

1. Thresholds of significance for operations related to GHG emissions (Table 5-1)
2. Discuss how the BAAQMD established the thresholds of significance
3. Recommend that CEQA documents include a discussion of project's GHG emissions from construction and operation
4. Discuss GHG impact assessment and mitigation measures available

Though these Guidelines are effectively set aside pursuant to a legal challenge (California Building Industry Association v Bay Area Air Quality Management District, Alameda County Superior County, Docket No. RG10548693, January 16, 2012) these Guidelines are used as GHG emissions thresholds for stationary and non-stationary sources provided in Table 5-1 of the BAAQMD CEQA Guidelines.

The results of this analysis indicate that emissions of NO_x and GHGs would exceed daily thresholds of significance established by the Bay Area Air Quality Management District. This conclusion is based on the maximum net increase in traffic volumes projected in the (May 1, 2012) traffic report and the existing and projected use of on-site equipment from Contra Costa Waste Services (June 13, 2012). It is important to note that the predicted increases in emissions presented in this report do not take into account displaced emissions that may be attributable to the proposed project. Implementation of the recommended mitigation measure would result in substantial reductions in emissions from onsite off-road equipment; however, they would still result in **significant and unavoidable** impacts related to NO_x and GHGs as shown in Table 12 above.

For instance, in comparison to uncontrolled equipment, Tier-4 compliant equipment generally achieve NO_x reductions of 70-80 percent and PM₁₀ reductions greater than 90 percent (SCAQMD 2013). No additional practical mitigation measures have been identified to further reduce NO_x emissions, including the purchase of offsets. Based on the modeling conducted, reductions of approximately 77 tons would be required, over the assumed 25-year life of the project, to offset increased emissions in excess of BAAQMD thresholds. Assuming a fee rate of \$17, 800/ton, based on the current Carl Moyer Program Cost Effectiveness value, the total offset fee would be roughly \$1,381,000. It is important to reiterate that this assessment does not take into account displaced emission attributable to the proposed project.

As a result, the no-project alternative would not necessarily result in the status quo or even a reduction in emissions that are presented in this report. This is because state regulations (AB-939) requiring cities to recycle greenwaste and other wastes are intended to take effect in the next several years. Therefore, the material destined for the Mount Diablo Resource Recovery Park could be shifted to other, more distant, recycling centers potentially resulting in increased emissions as compared to the emissions presented in this report.

APPENDIX

CONTENTS

Appendix A	Calculation of Operational Emissions
Appendix B	Excerpts of HARP Model Output
Appendix C	Documentation of Tier 4 Diesel Engine Emission Factors

Appendix A Calculation of Operational Emissions

Table A-1
Estimate of Current Daily and Annual Emissions From Mobile Sources

Breakdown of Daily Traffic	Maximum Trips/Day	Annual Trips/Yr	Round Trip Length (mile)	PM-10		NOx		ROG		CO		CO ₂	
				(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)
Employees/Self Haul <i>Light Duty Vehicles</i>	900	328,500	23	0.0333	0.006	1.991	0.363	0.300	0.055	17.902	3.267	15,583	2,844.0
Collection Truck <i>Heavy Duty Vehicles</i>	180	46,800	17	0.245	0.032	6.050	0.787	0.875	0.114	3.830	0.498	10,841	1,409.3
Long Haul Truck <i>Heavy Duty Vehicles</i>	120	31,200	17	0.16	0.021	4.0	0.524	0.583	0.076	2.55	0.332	7,227	940
TOTALS				0.44	0.06	12.07	1.67	1.76	0.24	24.29	4.10	33,651	5,193
CALCULATIONS													
Daily (lbs/day) = $\frac{\text{Peak Trips/day} \times \text{Round Trip Length} \times \text{Emissions/Mile}}{454 \text{ grams/lb}}$													
Annual (tons/yr) = $\frac{\text{Average Trips/yr} \times \text{Round Trip Length} \times \text{Emissions/Mile}}{454 \text{ grams/lb} \times 2000 \text{ lbs/ton}}$													

Table A-2
Estimate of Project Daily and Annual Emissions From Mobile Sources

Breakdown of Daily Traffic	Peak Trips/Day	Annual Trips/Yr	Round Trip Length (mile)	PM-10		NOx		ROG		CO		CO ₂	
				(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)	(lbs/day)	(tons/yr)
Employees/Self Haul <i>Light Duty Vehicles</i>	3,320	1,211,800	17	0.090	0.016	5.406	0.987	0.814	0.149	48.600	8.869	42,305	7,720.7
Collection Truck <i>Heavy Duty Vehicles</i>	660	171,600	17	0.900	0.117	22.183	2.884	3.209	0.417	14.045	1.826	39,749	5,167.4
Long Haul Truck <i>Heavy Duty Vehicles</i>	440	114,400	23	0.82	0.106	20.1	2.612	2.907	0.378	12.72	1.654	36,008	4,681
TOTALS				1.81	0.24	47.69	6.48	6.93	0.94	75.37	12.35	118,063	17,569
CALCULATIONS													
Daily (lbs/day) = $\frac{\text{Peak Trips/day} \times \text{Round Trip Length} \times \text{Emissions/Mile}}{454 \text{ grams/lb}}$													
Annual (tons/yr) = $\frac{\text{Average Trips/yr} \times \text{Round Trip Length} \times \text{Emissions/Mile}}{454 \text{ grams/lb} \times 2000 \text{ lbs/ton}}$													

Table A-3
Existing Equipment Exhaust Emissions

	Total Daily		Total Annual	Capacity	Particulate Matter (PM-10)				NOx				ROG				CO				CO2				
	#	HP	Hrs	Hours	Factor	(g/hp-hr)	(lbs/hr)	(lbs/day)	(tons/yr)	(g/hp-hr)	(lbs/hr)	(lbs/day)	(tons/yr)	(g/hp-hr)	(lbs/hr)	(lbs/day)	(tons/yr)	(g/hp-hr)	(lbs/hr)	(lbs/day)	(tons/yr)	(g/hp-hr)	(lbs/hr)	(lbs/day)	(tons/yr)
Transfer Processing Facility																									
Front End Loaders	4	162	16	23,296	0.36	0.261	0.13	2.15	0.39053	4.766	2.45	39.18	7.131	0.624	0.32	5.13	0.934	3.346	1.72	27.51	5.007	568.3	292	4,672	850
Excavators	1	73	4	1,456	0.38	0.400	0.02	0.10	0.01779	4.887	0.30	1.19	0.217	0.770	0.05	0.19	0.034	3.965	0.24	0.97	0.176	568.3	35	139	25
Skip Loader	1	64	4	1,456	0.36	0.272	0.01	0.06	0.01005	4.013	0.25	0.98	0.148	0.504	0.03	0.12	0.019	3.624	0.22	0.89	0.134	568.3	35	139	21
Sweeper	2	39	6	4,368	0.46	0.427	0.03	0.20	0.03685	5.276	0.42	2.50	0.455	1.613	0.13	0.76	0.139	5.903	0.47	2.80	0.509	568.3	45	269	49
Forklifts	1	59	2	728	0.2	0.370	0.010	0.02	0.00350	4.645	0.12	0.24	0.044	0.701	0.02	0.04	0.007	3.921	0.10	0.20	0.037	568.3	15	30	5
Mount Diablo Recycling Center																									
Loaders	1	97	16	4,160	0.36	0.261	0.02	0.32	0.04176	4.766	0.37	5.87	0.762	0.624	0.05	0.77	0.100	3.346	0.26	4.12	0.535	568.3	44	699	91
Forklifts	3	59	16	12,480	0.2	0.370	0.03	0.46	0.06001	4.645	0.36	5.79	0.753	0.701	0.05	0.87	0.114	3.921	0.31	4.89	0.636	568.3	44	709	92
C & D Processing Facility																									
Loaders	1	162	4	832	0.36	0.261	0.03	0.13	0.01395	4.766	0.61	0.00	0.255	0.624	0.08	0.00	0.033	3.346	0.43	0.00	0.179	568.3	73	584	30
Excavator	1	73	8	1,664	0.38	0.400	0.02	0.20	0.02033	4.887	0.30	2.39	0.248	0.770	0.05	0.38	0.039	3.965	0.24	1.94	0.202	568.3	35	278	29
Organic Processing Facility																									
Loaders	2	162	8	4,160	0.36	0.261	0.07	0.54	0.06974	4.766	1.22	9.80	1.273	0.624	0.16	1.28	0.167	3.346	0.86	6.88	0.894	568.3	146	1,168	152
Totals							0.39	4.17	0.665		6.39	67.95	11.29		0.93	9.54	1.585		4.85	50.19	8.31		763	8,687	1,345

Table A-4a
Unmitigated Project Equipment Exhaust Emissions

Equipment	#	HP	Project Hours		Capacity Factor	Particulate Matter (PM-10)				NOx				ROG				CO				CO2							
			Daily	Annual		(g/hp-hr)	(lb/hr)	(lbs/day)	(tons/yr)	(g/hp-hr)	(lb/hr)	(lbs/day)	(tons/yr)	(g/hp-hr)	(lb/hr)	(lbs/day)	(tons/yr)	(g/hp-hr)	(lb/hr)	(lbs/day)	(tons/yr)	(g/hp-hr)	(lb/hr)	(lbs/day)	(tons/yr)				
Transfer Processing Facility																													
Front End Loaders	6	162	24	64,064	0.37	0.261	0.207	4.96	1.10379	4.766	3.78	90.6	20.156	0.624	0.494	11.86	2.639	3.346	2.65	63.61	14.150	568,299	450	10804	2403				
Excavators	1	48	16	10,192	0.38	0.400	0.016	0.26	0.08190	4.887	0.20	3.1	1.001	0.770	0.031	0.49	0.158	3.965	0.16	3.82	0.812	568,299	23	365	116				
Skip Loader	1	64	4	0	0.37	0.272	0.014	0.06	0.00000	4.013	0.16	0.6	0.000	0.504	0.020	0.08	0.000	3.624	0.15	3.49	0.000	568,299	23	365	0				
Sweeper	2	39	10	2,912	0.46	0.427	0.034	0.34	0.02457	5.276	0.42	4.2	0.304	1.613	0.127	1.27	0.093	5.903	0.47	11.20	0.340	568,299	45	449	33				
Forklifts	1	59	4	2,184	0.20	0.370	0.010	0.04	0.01050	4.645	0.12	0.5	0.132	0.701	0.018	0.07	0.020	3.921	0.10	2.45	0.111	568,299	15	59	16				
Mount Diablo Recycling Center																													
Loaders	1	97	16	7,488	0.37	0.261	0.021	0.33	0.07725	4.766	0.38	6.0	1.411	0.624	0.049	0.79	0.185	3.346	0.26	6.35	0.990	568,299	45	719	168				
Forklifts	3	59	16	22,464	0.2	0.370	0.029	0.46	0.10802	4.645	0.36	5.8	1.356	0.701	0.055	0.87	0.205	3.921	0.31	7.34	1.145	568,299	44	709	166				
C & D Processing Facility																													
Loaders	1	162	8	4,992	0.37	0.261	0.034	0.28	0.08601	4.766	0.63	5.0	1.571	0.624	0.082	0.66	0.206	3.346	0.44	10.60	1.103	568,299	75	0	187				
Excavator	1	97	8	4,160	0.38	0.400	0.032	0.26	0.06755	4.887	0.40	3.2	0.825	0.770	0.063	0.50	0.130	3.965	0.32	7.73	0.670	568,299	46	369	96				
Organic Processing Facility																													
Loaders	2	162	16	7,488	0.37	0.261	0.069	1.10	0.12901	4.766	1.26	20.1	2.356	0.624	0.165	2.64	0.308	3.346	0.88	21.20	1.654	568,299	150	2401	281				
Biomass Gasification Facility																													
Loaders	1	162	16	5,824	0.37	0.261	0.034	0.55	0.10034	4.766	0.63	10.1	1.832	0.624	0.082	1.32	0.240	3.346	0.44	10.60	1.286	568,299	75	1200	218				
Totals																													
								0.500	8.63	1.789			8.32	149.3	30.94			1.19	20.56	4.183			6.18	148.39	22.26		991	17442	3685

Table A-4b
Mitigated Project Equipment Exhaust Emissions

Equipment	#	HP	Project Hours		Capacity Factor	Particulate Matter (PM-10)				NOx				ROG				CO				CO2			
			Daily	Annual		(g/hp-hr)	(lbs/hr)	(lbs/day)	(tons/yr)	(g/hp-hr)	(lbs/hr)	(lbs/day)	(tons/yr)	(g/hp-hr)	(lbs/hr)	(lbs/day)	(tons/yr)	(g/hp-hr)	(lbs/hr)	(lbs/day)	(tons/yr)	(g/hp-hr)	(lbs/hr)	(lbs/day)	(tons/yr)
			Transfer Processing Facility																						
Front End Loaders	6	162	24	64,064	0.37	0.015	0.012	0.28	0.06312	0.299	0.24	5.7	1.262	0.142	0.112	2.70	0.600	2.612	2.07	49.66	11.046	568,299	450	10804	2403
Excavators	1	48	16	10,192	0.38	0.022	0.001	0.01	0.00458	3.507	0.14	2.3	0.718	0.560	0.022	0.36	0.115	4.104	0.16	3.96	0.840	568,299	23	365	116
Skip Loader	1	64	4	0	0.37	0.015	0.001	0.00	0.00000	3.507	0.14	0.6	0.000	0.560	0.022	0.09	0.000	3.731	0.15	3.60	0.000	568,299	23	365	0
Sweeper	2	39	10	2,912	0.46	0.022	0.002	0.02	0.00129	3.507	0.28	2.8	0.202	1.828	0.144	1.44	0.105	4.104	0.32	7.79	0.236	568,299	45	449	33
Forklifts	1	59	4	2,184	0.20	0.022	0.001	0.00	0.00064	3.507	0.09	0.4	0.100	0.880	0.023	0.09	0.025	3.731	0.10	2.33	0.106	568,299	15	59	16
Mount Diablo Recycling Center																									
Loaders	1	97	16	7,488	0.37	0.015	0.001	0.02	0.00442	0.299	0.02	0.4	0.088	0.142	0.011	0.18	0.042	2.612	0.21	4.96	0.773	568,299	45	719	168
Forklifts	3	59	16	22,464	0.2	0.022	0.002	0.03	0.00654	3.507	0.27	4.4	1.024	0.880	0.069	1.10	0.257	3.988	0.31	7.46	1.164	568,299	44	709	166
C & D Processing Facility																									
Loaders	1	162	8	4,992	0.37	0.015	0.002	0.02	0.00492	0.299	0.04	0.3	0.098	0.142	0.019	0.15	0.047	2.612	0.34	8.28	0.861	568,299	75	0	187
Excavator	1	97	8	4,160	0.38	0.015	0.001	0.01	0.00252	3.507	0.28	2.3	0.592	0.560	0.045	0.36	0.095	4.104	0.33	8.00	0.693	568,299	46	369	96
Organic Processing Facility																									
Loaders	2	162	16	7,488	0.37	0.015	0.004	0.06	0.00738	0.299	0.08	1.3	0.148	0.142	0.037	0.60	0.070	2.612	0.69	16.55	1.291	568,299	150	2401	281
Biomass Gasification Facility																									
Loaders	1	162	16	5,824	0.37	0.015	0.002	0.03	0.00574	0.299	0.04	0.6	0.115	0.142	0.019	0.30	0.055	2.612	0.34	8.28	1.004	568,299	75	1200	218
Totals											1.63	20.9	4.35		0.52	7.37	1.409		5.04	120.85	18.01		991	17442	3685

Table A-5
Estimate of Emissions From Gasification Unit

Equipment: CAT G3516 TA			PM-10	NO _x	ROG	CO	CO ₂
Emission Factor (g/hp-hr)			0.05	0.11	0.11	0.57	54.01 kg/mmbtu
	lbs/hr		0.116	0.3	0.26	1.32	940.1
	lbs/day		0.928	6.1	2.0	10.58	7,521.2
	tons/yr		0.508	1.1	1.1	5.79	4,117.9 tons
							3,743.5 metric tons (MT)
Engine HP	1053	hp					
Annual Use	8760	hrs					
Fuel Consumption	7,514	btu/hp-hr	Ref: Manufacturer's Data (Attached)				
	7,912,242	btu/hr					
	7.91	mmbtu/hr					

Table A-6

Estimate of Toxic Air Emissions from Gasifier/CAT G3516 TA Engine

Pollutant	(lb/mmbtu)	(lbs/hr)	(lbs/yr)
1,3 Butadiene	6.63E-04	3.91E-03	30.52
Acetaldehyde	2.79E-03	1.65E-02	128.45
Acrolein	2.63E-03	1.55E-02	121.08
Benzene	1.58E-03	9.33E-03	72.74
Carbon Tetrachloride	1.77E-05	1.04E-04	0.81
Chlorobenzene	1.29E-05	7.61E-05	0.59
Chloroform	1.37E-05	8.09E-05	0.63
Ethylbenzene	2.48E-05	1.46E-04	1.14
Formaldehyde	2.05E-02	1.21E-01	943.78
Methanol	3.06E-03	1.81E-02	140.88
Methylene Chloride	4.12E-05	2.43E-04	1.90
Napthalene	9.71E-05	5.73E-04	4.47
Styrene	1.19E-05	7.02E-05	0.55
Toluene	5.58E-04	3.29E-03	25.69
Vinyl Chloride	7.18E-06	4.24E-05	0.33
Xylene	1.95E-04	1.15E-03	8.98

Fuel Input	5.90	mmbtu/hr
Annual Hours	7,800	hrs
Annual Fuel Consumption	46,038	mmbtu

Table A-7
Evaluation of GHG Emissions in Terms of CO2 Equivalents (CO2(e))
from Natural Gas and Diesel Combustion

Basis: 1 mmbtu of Natural Gas				
Pollutant	Emission Factor (kg/mmbtu)	Global Warming Potential (GWP)	kg	kg CO2(e)
CO2	53.02	1	265.1	265.1
CH4	0.0009	21	0.0045	0.0945
N2O	0.0001	310	0.0001	0.031
			265.1	265.2
	Ratio CO2(e)/CO2			1.0005
Notes				
CO2 (e) - carbon dioxide equivalents				
CO2 (e) = kg/day x GWP				
Emission factors from Appendix A, Subchapter 10 (Climate Change), Article 2, Sections 951000 to 95133, California Code of Regulations (CCR) Title 17. Excerpts attached.				

Basis: 1 mmbtu of Diesel				
Pollutant	Emission Factor (kg/mmbtu)	Global Warming Potential (GWP)	kg	kg CO2(e)
CO2	73.1	1	73.1	73.1
CH4	0.003	21	0.003	0.063
N2O	0.0006	310	0.0006	0.186
	Totals		73.1	73.3
	Ratio CO2(e)/CO2			1.0034
Notes				
CO2 (e) - carbon dioxide equivalents				
CO2 (e) = kg/day x GWP				
Emission factors from Appendix A, Subchapter 10 (Climate Change), Article 2, Sections 951000 to 95133, California Code of Regulations (CCR) Title 17. Excerpts attached.				

Table A-8

Estimate of PROJECT Daily and Annual Emissions of Diesel Particulate Matter (DPM)
Used in HARP Model

PROJECT AREA Source	PM-10 (DPM)		
	(lbs/day)	(tons/yr)	(lbs/yr)
PROJECT MODELING			
On-Site Emissions	0.30	0.1011	202.27
Total	0.30	0.1011	202.27
FUTURE EMISSIONS			
On-Site Emissions			
Total			
NET PROJECT EMISSIONS (EQUIP ONLY)			
<i>(Future - Baseline Emissions)</i>			

PROJECT EMISSIONS - TRUCK IDLING		
PROJECT TRUCKS IDLING	1,100	<i>trucks/day</i>
From Basic Data	286,000	<i>trucks/yr</i>
Idling/truck (min)	5	<i>min/truck</i>
Idling/truck (hrs)	0.0833	<i>hrs/truck</i>
Total Annual Idling Hrs (5min/truck x Annual Trucks)	23,833	<i>hrs</i>
Truck Idling Emission Rate Per Truck (from EMFAC)	0.09027	<i>grams/idle-hr</i>
Annual Idle Emissions (EF x Annual Hrs)	2,151.44	<i>grams/yr</i>
TOTAL 3 Trucks	4.74	<i>lbs/yr</i>
	0.00054	<i>lbs/hr</i>
TOTAL 1 Truck	1.580	<i>lbs/yr</i>
	1.80E-04	<i>lbs/hr</i>

Table A-9

Estimate of BASELINE Daily and Annual Emissions of Diesel Particulate Matter (DPM_

BASELINE + PROJECT AREA Source	PM-10 (DPM)			
	(lbs/hr)	(lbs/day)	(tons/yr)	(lbs/yr)
BASELINE + PROJECT EMISSIONS				
On-Site Emissions		4.47	0.7656	1,531.28
Total		4.47	0.7656	1,531.28

BASELINE + PROJECT EMISSIONS - TRUCK IDLING			
EXISTING + PROJECT IDLING TRUCKS	1,400	trucks/day	
From Basic Data	364,000	trucks/yr	
Idling/truck (min)	5	min/truck	
Idling/truck (hrs)	0.0833	hrs/truck	
Total Annual Idling Hrs (5min/truck x Annual Trucks)	30,333	hrs	
Truck Idling Emission Rate Per Truck (from EMFAC)	0.09027	grams/idle-hr	
TOTAL Annual Idle Emissions (EF x Annual Hrs)	2,738.19	grams/yr	
TOTAL 3 Trucks	6.03	lbs/yr	
	0.00069	lbs/hr	
TOTAL 1 Truck	2.010	lbs/yr	
	2.29E-04	lbs/hr	

Appendix B

Excerpts of HARP Model Output

This file: C:\Diablo50\Dec02_Project_Cancer

Created by HARP Version 1.4d Build 23.09.07
Uses ISC Version 99155
Uses BPIP (Dated: 04112)
Creation date: 12/2/2013 6:39:07 AM

EXCEPTION REPORT

(there have been no changes or exceptions)

INPUT FILES:

Source-Receptor file: C:\Diablo50\DIABLO50.SRC
Averaging period adjustment factors file: not applicable
Emission rates file: DiabloProject120313.ems
Site parameters file: C:\Diablo50\project112913.sit

Coordinate system: UTM NAD83

Screening mode is OFF

Exposure duration: 70 year (adult resident)
Analysis method: Derived (OEHHA) Method
Health effect: Cancer Risk
Receptor(s): All
Sources(s): All
Chemicals(s): All

SITE PARAMETERS

DEPOSITION

Deposition rate (m/s) 0.05

DRINKING WATER

*** Pathway disabled ***

FISH

*** Pathway disabled ***

PASTURE

*** Pathway disabled ***

HOME GROWN PRODUCE

*** Pathway disabled ***

PIGS, CHICKENS AND EGGS

*** Pathway disabled ***

DERMAL ABSORPTION

*** Pathway enabled ***

SOIL INGESTION

*** Pathway enabled ***

MOTHER'S MILK

*** Pathway enabled ***

CHEMICAL CROSS-REFERENCE TABLE AND BACKGROUND CONCENTRATIONS

CHEM	CAS	ABBREVIATION	POLLUTANT NAME	BACKGROUND (ug/m^3)
0001	9901	DieselExhPM	Diesel engine exhaust, particulate matter (Diesel PM)	0.000E+00
0002	71432	Benzene	Benzene	0.000E+00
0003	11101	PM	Particulate Matter	0.000E+00
0004	106990	1,3-Butadiene	1,3-Butadiene	0.000E+00
0005	75070	Acetaldehyde	Acetaldehyde	0.000E+00
0006	107028	Acrolein	Acrolein	0.000E+00
0007	56235	CCl4	Carbon tetrachloride	0.000E+00
0008	108907	Chlorobenzn	Chlorobenzene	0.000E+00
0009	67663	Chloroform	Chloroform	0.000E+00
0010	100414	Ethyl Benzene	Ethyl benzene	0.000E+00
0011	50000	Formaldehyde	Formaldehyde	0.000E+00
0012	67561	Methanol	Methanol	0.000E+00
0013	75092	Methylene Chlor	Methylene chloride {Dichloromethane}	0.000E+00
0014	91203	Naphthalene	Naphthalene	0.000E+00
0015	100425	Styrene	Styrene	0.000E+00
0016	108883	Toluene	Toluene	0.000E+00
0017	75014	Vinyl Chloride	Vinyl chloride	0.000E+00
0018	1330207	Xylenes	Xylenes (mixed)	0.000E+00

CHEMICAL HEALTH VALUES

CHEM	CAS	ABBREVIATION	CancerPF (Inh) (mg/kg-d)^-1	CancerPF (Oral) (mg/kg-d)^-1	ChronicREL (Inh) ug/m^3	ChronicREL (Oral) mg/kg-d	AcuteREL ug/m^3
0001	9901	DieselExhPM	1.10E+00	*	5.00E+00	*	*
0002	71432	Benzene	1.00E-01	*	6.00E+01	*	1.30E+03
0003	11101	PM	*	*	*	*	*
0004	106990	1,3-Butadiene	6.00E-01	*	2.00E+01	*	*
0005	75070	Acetaldehyde	1.00E-02	*	1.40E+02	*	4.70E+02
0006	107028	Acrolein	*	*	3.50E-01	*	2.50E+00
0007	56235	CCl4	1.50E-01	*	4.00E+01	*	1.90E+03
0008	108907	Chlorobenzn	*	*	1.00E+03	*	*
0009	67663	Chloroform	1.90E-02	*	3.00E+02	*	1.50E+02
0010	100414	Ethyl Benzene	8.70E-03	*	2.00E+03	*	*
0011	50000	Formaldehyde	2.10E-02	*	9.00E+00	*	5.50E+01
0012	67561	Methanol	*	*	4.00E+03	*	2.80E+04
0013	75092	Methylene Chlor	3.50E-03	*	4.00E+02	*	1.40E+04
0014	91203	Naphthalene	1.20E-01	*	9.00E+00	*	*
0015	100425	Styrene	*	*	9.00E+02	*	2.10E+04
0016	108883	Toluene	*	*	3.00E+02	*	3.70E+04
0017	75014	Vinyl Chloride	2.70E-01	*	*	*	1.80E+05
0018	1330207	Xylenes	*	*	7.00E+02	*	2.20E+04

EMISSIONS DATA SOURCE: Emission rates loaded from file: C:\Diablo50\DiabloProject120313.ems
 EMISSION RATES HAVE BEEN MANUALLY EDITED BY USER
 CHEMICALS ADDED OR DELETED: none

EMISSIONS FOR FACILITY FAC=1 DEV=* PRO=* STK=1 NAME=DIABLO STACK 1 EMS (lbs/yr)

SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
9901	DieselExhPM	1		202.27	0.065
71432	Benzene	1		0	0
11101	PM	1			
106990	1,3-Butadiene	1			
75070	Acetaldehyde	1			
107028	Acrolein	1			
56235	CCl4	1			
108907	Chlorobenzn	1			
67663	Chloroform	1			

100414	Ethyl Benzene	1
50000	Formaldehyde	1
67561	Methanol	1
75092	Methylene Chlor	1
91203	Naphthalene	1
100425	Styrene	1
108883	Toluene	1
75014	Vinyl Chloride	1
1330207	Xylenes	1

EMISSIONS FOR FACILITY FAC=1 DEV=* PRO=* STK=2 NAME=DIABLO STACK 2 EMS (lbs/yr)

SOURCE	MULTIPLIER=1					
CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)	
9901	DieselExhPM	1		1.58	1.80e-4	
71432	Benzene	1		0	0	
11101	PM	1				
106990	1,3-Butadiene	1				
75070	Acetaldehyde	1				
107028	Acrolein	1				
56235	CCl4	1				
108907	Chlorobenzn	1				
67663	Chloroform	1				
100414	Ethyl Benzene	1				
50000	Formaldehyde	1				
67561	Methanol	1				
75092	Methylene Chlor	1				
91203	Naphthalene	1				
100425	Styrene	1				
108883	Toluene	1				
75014	Vinyl Chloride	1				
1330207	Xylenes	1				

EMISSIONS FOR FACILITY FAC=1 DEV=* PRO=* STK=3 NAME=DIABLO STACK 3 EMS (lbs/yr)

SOURCE	MULTIPLIER=1					
CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)	
9901	DieselExhPM	1		1.58	1.80e-5	
71432	Benzene	1		0	0	
11101	PM	1				
106990	1,3-Butadiene	1				
75070	Acetaldehyde	1				
107028	Acrolein	1				
56235	CCl4	1				
108907	Chlorobenzn	1				
67663	Chloroform	1				
100414	Ethyl Benzene	1				
50000	Formaldehyde	1				
67561	Methanol	1				
75092	Methylene Chlor	1				
91203	Naphthalene	1				
100425	Styrene	1				
108883	Toluene	1				
75014	Vinyl Chloride	1				
1330207	Xylenes	1				

EMISSIONS FOR FACILITY FAC=1 DEV=* PRO=* STK=4 NAME=DIABLO STACK 4 EMS (lbs/yr)

SOURCE	MULTIPLIER=1					
CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)	
9901	DieselExhPM	1		1.58	1.80e-5	
71432	Benzene	1		0	0	
11101	PM	1				
106990	1,3-Butadiene	1				
75070	Acetaldehyde	1				
107028	Acrolein	1				
56235	CCl4	1				

108907	Chlorobenzn	1
67663	Chloroform	1
100414	Ethyl Benzene	1
50000	Formaldehyde	1
67561	Methanol	1
75092	Methylene Chlor	1
91203	Naphthalene	1
100425	Styrene	1
108883	Toluene	1
75014	Vinyl Chloride	1
1330207	Xylenes	1

EMISSIONS FOR FACILITY FAC=1 DEV=* PRO=* STK=5 NAME=DIABLO STACK 5 EMS (lbs/yr)

SOURCE MULTIPLIER=1

CAS	ABBREV	MULTIPLIER	BG (ug/m^3)	AVRG (lbs/yr)	MAX (lbs/hr)
9901	DieselExhPM	1		0	0
71432	Benzene	1		72.74	9.33e-3
11101	PM	1			
106990	1,3-Butadiene	1		30.52	3.91e-3
75070	Acetaldehyde	1		128.45	1.65e-2
107028	Acrolein	1		121.08	1.55e-2
56235	CCl4	1		0.81	1.04e-4
108907	Chlorobenzn	1		0.59	7.61e-5
67663	Chloroform	1		0.63	8.09e-5
100414	Ethyl Benzene	1		1.14	1.46e-4
50000	Formaldehyde	1		943.78	.121
67561	Methanol	1		140.88	1.81e-2
75092	Methylene Chlor	1		1.9	2.43e-4
91203	Naphthalene	1		4.47	5.73e-4
100425	Styrene	1		0.55	7.02e-5
108883	Toluene	1		25.69	3.29e-3
75014	Vinyl Chloride	1		0.33	4.24e-5
1330207	Xylenes	1		8.98	1.15e-3

CANCER RISK REPORT

REC	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL	UTME	UTMN
0001	2.73E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.73E-07	598401	4209576
0002	2.79E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.79E-07	598451	4209576
0003	2.85E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.85E-07	598501	4209576
0004	2.91E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.91E-07	598551	4209576
0005	2.97E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.97E-07	598601	4209576
0006	3.03E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.03E-07	598651	4209576
0007	3.10E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.10E-07	598701	4209576
0008	3.17E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.17E-07	598751	4209576
0009	3.24E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.24E-07	598801	4209576
0010	3.31E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.31E-07	598851	4209576
0011	3.39E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.39E-07	598901	4209576
0012	3.46E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.46E-07	598951	4209576
0013	3.54E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.54E-07	599001	4209576
0014	3.61E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.61E-07	599051	4209576
0015	3.69E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.69E-07	599101	4209576
0016	3.77E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.77E-07	599151	4209576
0017	3.86E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.86E-07	599201	4209576
0018	3.94E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.94E-07	599251	4209576
0019	4.03E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.03E-07	599301	4209576
0020	4.11E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.11E-07	599351	4209576
0021	4.19E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.19E-07	599401	4209576
0022	4.27E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.27E-07	599451	4209576
0023	4.34E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.34E-07	599501	4209576
0024	4.41E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.41E-07	599551	4209576
0025	4.47E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.47E-07	599601	4209576
0026	4.52E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.52E-07	599651	4209576
0027	4.56E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.56E-07	599701	4209576
0028	4.60E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.60E-07	599751	4209576

FILE: C:\Diablo50\Dec02_Project_PMI.txt

EXCEPTION REPORT

(there have been no changes or exceptions)

RECEPTORS WITH HIGHEST CANCER RISK

REC	TYPE	CANCER	CHRONIC	ACUTE	UTME	UTMN	ZONE
1282	GRID	6.39E-05	3.47E-02	9.73E-02	600351	4208676	10
1214	GRID	6.39E-05	3.44E-02	8.76E-02	600401	4208726	10
1145	GRID	6.38E-05	3.39E-02	8.20E-02	600401	4208776	10
1351	GRID	6.38E-05	3.53E-02	1.07E-01	600351	4208626	10
1213	GRID	6.34E-05	3.40E-02	8.93E-02	600351	4208726	10
1283	GRID	6.33E-05	3.46E-02	9.53E-02	600401	4208676	10
1076	GRID	6.28E-05	3.31E-02	7.74E-02	600401	4208826	10
1420	GRID	6.28E-05	3.55E-02	1.12E-01	600351	4208576	10
1419	GRID	6.23E-05	3.49E-02	1.14E-01	600301	4208576	10
1350	GRID	6.22E-05	3.43E-02	1.09E-01	600301	4208626	10
1077	GRID	6.22E-05	3.29E-02	7.52E-02	600451	4208826	10
1144	GRID	6.22E-05	3.30E-02	8.43E-02	600351	4208776	10
1146	GRID	6.20E-05	3.31E-02	7.97E-02	600451	4208776	10
1352	GRID	6.19E-05	3.47E-02	1.03E-01	600401	4208626	10
1281	GRID	6.12E-05	3.32E-02	9.99E-02	600301	4208676	10
1008	GRID	6.08E-05	3.19E-02	7.10E-02	600451	4208876	10
1007	GRID	6.06E-05	3.18E-02	7.29E-02	600401	4208876	10
1488	GRID	6.05E-05	3.51E-02	1.24E-01	600301	4208526	10
1215	GRID	6.05E-05	3.28E-02	8.41E-02	600451	4208726	10
1489	GRID	6.03E-05	3.56E-02	1.22E-01	600351	4208526	10
1075	GRID	6.01E-05	3.18E-02	7.92E-02	600351	4208826	10
1212	GRID	5.93E-05	3.19E-02	9.43E-02	600301	4208726	10
1421	GRID	5.93E-05	3.43E-02	1.09E-01	600401	4208576	10
1418	GRID	5.83E-05	3.26E-02	1.16E-01	600251	4208576	10
1284	GRID	5.75E-05	3.20E-02	9.16E-02	600451	4208676	10

RECEPTORS WITH HIGHEST CHRONIC HI

REC	TYPE	CANCER	CHRONIC	ACUTE	UTME	UTMN	ZONE
1969	GRID	1.28E-05	2.72E-01	3.42E-01	600201	4208176	10
1900	GRID	1.30E-05	2.35E-01	3.51E-01	600201	4208226	10
1968	GRID	8.98E-06	1.76E-01	7.89E-01	600151	4208176	10
1970	GRID	8.77E-06	1.70E-01	2.15E-01	600251	4208176	10
1901	GRID	9.49E-06	1.61E-01	2.10E-01	600251	4208226	10
1971	GRID	6.38E-06	1.12E-01	1.58E-01	600301	4208176	10
1902	GRID	7.13E-06	1.11E-01	1.54E-01	600301	4208226	10
2038	GRID	5.57E-06	1.04E-01	2.61E-01	600201	4208126	10
2039	GRID	4.81E-06	8.36E-02	1.88E-01	600251	4208126	10
1903	GRID	5.75E-06	8.21E-02	1.22E-01	600351	4208226	10
1972	GRID	5.09E-06	8.17E-02	1.23E-01	600351	4208176	10
2040	GRID	4.23E-06	6.91E-02	1.45E-01	600301	4208126	10
1904	GRID	4.86E-06	6.39E-02	1.29E-01	600401	4208226	10
1973	GRID	4.27E-06	6.29E-02	1.29E-01	600401	4208176	10
1833	GRID	6.07E-06	5.90E-02	1.43E-01	600301	4208276	10
2041	GRID	3.75E-06	5.81E-02	1.18E-01	600351	4208126	10
1897	GRID	4.68E-06	5.63E-02	3.35E-01	600051	4208226	10
1832	GRID	6.78E-06	5.48E-02	1.81E-01	600251	4208276	10
1834	GRID	5.51E-06	5.46E-02	1.20E-01	600351	4208276	10
1974	GRID	3.77E-06	5.14E-02	1.41E-01	600451	4208176	10
1905	GRID	4.24E-06	5.14E-02	1.33E-01	600451	4208226	10
2108	GRID	3.13E-06	4.92E-02	1.57E-01	600251	4208076	10
2042	GRID	3.34E-06	4.90E-02	1.30E-01	600401	4208126	10
2037	GRID	3.35E-06	4.88E-02	3.42E-01	600151	4208126	10
1835	GRID	5.02E-06	4.84E-02	1.31E-01	600401	4208276	10

RECEPTORS WITH HIGHEST ACUTE HI

REC	TYPE	CANCER	CHRONIC	ACUTE	UTME	UTMN	ZONE
1968	GRID	8.98E-06	1.76E-01	7.89E-01	600151	4208176	10
1899	GRID	4.50E-06	3.36E-02	7.54E-01	600151	4208226	10
1898	GRID	4.28E-06	3.16E-02	7.13E-01	600101	4208226	10
1967	GRID	2.25E-06	9.34E-03	3.73E-01	600101	4208176	10
2036	GRID	2.77E-06	3.45E-02	3.59E-01	600101	4208126	10
1900	GRID	1.30E-05	2.35E-01	3.51E-01	600201	4208226	10
1966	GRID	3.52E-06	4.60E-02	3.42E-01	600051	4208176	10
2037	GRID	3.35E-06	4.88E-02	3.42E-01	600151	4208126	10
1969	GRID	1.28E-05	2.72E-01	3.42E-01	600201	4208176	10
1897	GRID	4.68E-06	5.63E-02	3.35E-01	600051	4208226	10
1830	GRID	1.42E-05	1.50E-02	3.21E-01	600151	4208276	10
1829	GRID	6.98E-06	1.01E-02	3.14E-01	600101	4208276	10
2035	GRID	3.14E-06	4.66E-02	2.83E-01	600051	4208126	10
2038	GRID	5.57E-06	1.04E-01	2.61E-01	600201	4208126	10
1828	GRID	4.37E-06	1.99E-02	2.45E-01	600051	4208276	10
1831	GRID	8.18E-06	3.15E-02	2.42E-01	600201	4208276	10
2106	GRID	2.29E-06	2.93E-02	2.19E-01	600151	4208076	10
2105	GRID	2.12E-06	2.58E-02	2.18E-01	600101	4208076	10
1965	GRID	3.17E-06	4.14E-02	2.16E-01	600001	4208176	10
1970	GRID	8.77E-06	1.70E-01	2.15E-01	600251	4208176	10
1896	GRID	3.77E-06	4.40E-02	2.12E-01	600001	4208226	10
1901	GRID	9.49E-06	1.61E-01	2.10E-01	600251	4208226	10
2104	GRID	2.35E-06	3.30E-02	2.07E-01	600051	4208076	10
2034	GRID	2.86E-06	4.19E-02	2.06E-01	600001	4208126	10
1760	GRID	4.28E-06	6.76E-03	1.99E-01	600101	4208326	10

Appendix C

Documentation of Tier 4 Diesel Engine Emission Factors

Table 1. Off-Road Compression-Ignition (Diesel) Engine Standards (NMHC+NOx/CO/PM in g/kW-hr)

Maximum Power	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015+
< 8 kW	See Table 2 footnote (a)					10.5 / 8.0 / 1.0			7.5 / 8.0 / 0.80			7.5 / 8.0 / 0.40 ^a									
8≤kW<19						9.5 / 6.6 / 0.80			7.5 / 6.6 / 0.80			7.5 / 6.6 / 0.40									
19≤kW<37	-					9.5 / 5.5 / 0.80			7.5 / 5.5 / 0.60			7.5 / 5.5 / 0.30			4.7 / 5.5 / 0.03						
37≤kW<56						-			7.5 / 5.0 / 0.40			4.7 / 5.0 / 0.30 ^c			4.7 / 5.0 / 0.03 ^c						
56≤kW<75	-					- / 9.2 / - / - ^b			7.5 / 5.0 / 0.40			4.7 / 5.0 / 0.40			0.19 / 3.4 / 5.0 / 0.02 ^{b,d}		0.19				
75≤kW<130						6.6 / 5.0 / 0.30			4.0 / 5.0 / 0.30			5.0		0.02 ^b							
130≤kW<225	-					6.6 / 3.5 / 0.20			4.0 / 3.5 / 0.20 ^e			0.19 / 2.0 / 3.5 / 0.02 ^{b,d}		0.19							
225≤kW<450						1.3 / 9.2 / 11.4 / 0.54 ^b			6.4 / 3.5 / 0.20			3.5			0.02 ^b						
450≤kW≤560						-			6.4 / 3.5 / 0.20			0.02 ^b									
Mobile Machines > 560kW	-					1.3 / 9.2 / 11.4 / 0.54 ^b			6.4 / 3.5 / 0.20			0.40 / 3.5 / 3.5 / 0.10 ^b			0.19						
560kW<GEN ≤900 kW						-			6.4 / 3.5 / 0.20			0.04 ^b									
GEN>900 kW						-			6.4 / 3.5 / 0.20			0.19			0.40 / 0.67 / 3.5 / 0.10 ^b		0.67	3.5	0.03 ^b		

a) The PM standard for hand-start, air cooled, direct injection engines below 8 kW may be delayed until 2010 and be set at 0.60 g/kW-hr.

b) Standards given are NMHC/NOx/CO/PM in g/kW-hr.

c) Engine families in this power category may alternately meet Tier 3 PM standards (0.40 g/kW-hr) from 2008-2011 in exchange for introducing final PM standards in 2012.

d) The implementation schedule shown is the three-year alternate NOx approach. Other schedules are available.

e) Certain manufacturers have agreed to comply with these standards by 2005.



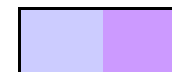
: Tier 1



: Tier 2



: Tier 3



: Tier 4 Interim / Final



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MEMO

Date: November 10, 2014

To: Patrick Hindmarsh, PMC

From: Kurt Legleiter

**Re: Construction Phase Emissions Modeling & Estimated Fuel Use
Mt. Diablo Resource Recovery Park, Pittsburg, CA**

The following provides a summary of the updated construction emissions modeling conducted for the above referenced project. Emissions were quantified using the California Emissions Estimator Model (CalEEMod), version 2013.2.2, for each of the proposed primary construction activities based on default parameters contained in the model for the BAAQMD region and construction data and activity schedule durations identified for the proposed project. Summary tables are included in the attached.

Criteria Air Pollutants and Precursors

The attached provides estimated emissions associated with the construction of each project component, under both summer and winter conditions. Maximum daily emissions were conservatively estimated assuming that all construction activities for the specified year could potentially occur on the same day. Based on the modeling conducted, the highest emissions would be associated with construction of the proposed maintenance building and onsite paving activities. In the event that multiple construction activities were to occur simultaneously on the same day, the highest unmitigated daily emissions would total approximately 65.4 pounds per day (lbs/day) of ROG, 112.4 lbs/day of NO_x, 113.3 lbs/day of CO, 24.0 lbs/day of PM₁₀, and 14.6 lbs/day of PM_{2.5}. Maximum daily emissions of ROG and NO_x would exceed applicable BAAQMD thresholds of 54 lbs/day for each pollutant. With implementation of proposed mitigation, which would require the use of off-road construction equipment meeting Tier 3 emission standards (or better), maximum daily emissions would be reduced to approximately 58.1 lbs/day of ROG, 60.5 lbs/day of NO_x. Mitigated emissions would continue to exceed applicable significance thresholds. It is important to note that these estimates are based, in part, on construction schedules provided by the project applicant. Any changes to these assumptions may result in increased maximum daily emissions.

Greenhouse Gas Emissions

Annual construction-generated greenhouse gas (GHG) emissions would range from approximately 12 to 665 MTCO_{2e}/year. Annual emissions would vary depending on the specific activities conducted. In total, construction of the proposed project would generate approximately 707 MTCO_{2e}. When amortized over the assumed 25-year life of the project, amortized GHG emissions would total 28.3 MTCO_{2e}/year. Amortized construction-generated GHG emissions will be incorporated into the operational GHG emissions analysis prepared by Air Permitting Specialists.

Fuel Use

Fuel use was quantified for project construction, existing conditions, and proposed project conditions. Fuel use associated with construction activities were based on estimated equipment assumptions provided by the project applicant, as well as, vehicle trips identified in the CalEEMod computer modeling conducted for this project. Fuel consumption rates for off-road construction equipment were based on data obtained from the California Air Resources Board's *Carl Moyer Program Guidelines* (April 2011), as well as information derived from the U.S. Environmental Protection Agency, and the Emfac2011 computer program. In total, project construction would use approximately 23,108 gallons of gasoline and approximately 47,397 gallons of diesel fuel. Existing operations currently use roughly 39,134 gallons of gasoline and approximately 19,857 gallons of diesel fuel. With implementation of the proposed project, gasoline use would increase to roughly 183,496 gallons of gasoline and approximately 92,668 gallons of diesel fuel. It is important to note, however, that the estimated increases in gasoline and diesel fuel use attributable to the proposed project do not take into account potential reductions in vehicle travel associated with the hauling of waste to other potentially more distant facilities, which would likely otherwise occur without project implementation.

The results of the construction emissions modeling and estimated fuel use are summarized in the attached. Please feel free to contact me if you need any additional information or if you have any questions.

Sincerely,

Kurt Legleiter