APPENDICES

A. Air Quality Technical Memorandum (see attached CD)

B. Addendum Report for the Tajiguas Landfill Resource Recovery Project (see attached CD)

C. Tajiguas Resource Recovery Project Revised Hydrology (see attached CD)

D. Tajiguas Resource Recovery Project Revised Hydrogeologic and Water Supply Impact Analysis Report (see attached CD)

E. Updated Line-of-Sight Profiles: Views 3, 4 and 5

Appendix A

Air Quality Technical Memorandum

AECOM

Prepared for
County of Santa Barbara
Department of Public Works
Resource Recovery and Waste Management

Submitted by
AECOM
130 Robin Hill Road,
Suite 100
Santa Barbara,
California 93117
August 10, 2017

Air Quality Technical Memorandum

Revised Tajiguas Landfill Resource Recovery Project

Santa Barbara County, California

Air Quality Technical Memorandum
Revised Tajiguas Landfill Resource Recovery Project
Santa Barbara County, California

Prepared By Mary Kaplan

Reviewed By Matt Dunn

Summary of Revisions from Previous Submittal

The Subsequent EIR (SEIR) prepared for the Tajiguas Resource Recovery Project (TRRP) was certified by the Santa Barbara County Board of Supervisors and the project was approved on July 12, 2016 (County of Santa Barbara 2016). A final Authority to Construct (ATC) permit from the Santa Barbara County Air Pollution Control District (SBCAPCD) was issued in August 2016. In support of the original assessment of air quality impacts for TRRP CEQA review and for the air permit applications, in October 2015, AECOM prepared a Revised Air Quality And Greenhouse Gas Technical Report for the TRRP (October 2015).Since the project was approved and the ATC issued, some changes to the project have been proposed (Revised Project) and this Revised Air Quality Technical Memorandum has been prepared to assess these changes.

This updated Air Quality Technical Memorandum analyzes the Revised Project to reflect the relocation of the ADF to a site on the east side of the landfill adjacent to the approved compost area, and replacement of the landfill's existing engine and flare with two new engines and flare located at the MRF building. The new engines will burn the existing landfill gas supply that is currently burned in the existing engine. This updated study includes refinements needed to meet the permitting requirements of the Santa Barbara County Air Pollution Control District and other agencies regarding dispersion modeling procedures. These regulatory guidance changes are considered to be minor from an air quality perspective, and do not change any of the significance findings contained within this addendum. The following revisions to the sources and assumptions were analyzed and incorporated into this updated Air Quality Technical Memorandum:

The list of off-road equipment to be operated for the TRRP has been revised as follows:

- Materials Recovery Facility (MRF) Building:
  - Two Caterpillar 966 M Loaders – 311 horsepower (hp) (revised)
  - One Caterpillar 938 K Loader – 169 hp (same as previous)
  - Three Caterpillar 2P-6000 Forklifts – 61 hp (same as previous)
  - One Tennant 800 Sweeper – 65 hp (same as previous)
  - One Caterpillar M322D Material Handler – 173 hp (same as previous)
- Anaerobic Digestion (AD) Facility Building (same as previous):
  - Two Caterpillar 938 M Loaders – 169 hp
- MRF Facility Perimeter Road (same as previous):
  - One Tennant M30 Scrubber-Sweeper – 41 hp
- AD Facility Perimeter Road (added):
  - One Tennant M30 Scrubber-Sweeper – 41 hp
- Composting Area (modified windrow and compost screening configuration)
  - One Caterpillar 938 K Loader – 169 hp (same as previous)
  - One Backhus A55 Windrow Turner – 235 hp (revised)

  - Note that compost screening will be performed with electrically powered equipment instead of diesel-fueled equipment (same as previous).

- Revisions were made to the facility, layout, building dimensions, and stack locations.
- Addition of two Combined Heat and Power (CHP) engines and one flare at the MRF Facility building to replace the existing landfill gas engine and flare in addition to the two CHP engines and flare at the AD Facility building.
- A paper dryer (formerly called the rolling bed dryer), which will dry paper processed by the Materials Recovery Facility (MRF) with heat for the paper drying operation provided by the CHP engines' exhaust, has been added. Both CHP engines will exhaust completely through the paper dryer cyclone and baghouse filter[1]. The paper dryer is anticipated to operate 16 hours per day, six days per week, but the CHP engine exhaust will route through the paper dryer baghouse filter 24 hours per day, 7 days per week under normal operations.
- The flare stack parameters have been revised.
- The MRF and AD biofilters were modified from a roof-top to a ground-level area source.
- Revisions of which biofilters discharge the MRF and AD Facility off-road equipment emissions to the atmosphere. The emissions from the equipment will be exhausted as follows:
  - The Cat 938 M Loader emissions will exhaust through the two biofilters on the south side of the AD Facility.
  - The Cat M322D Material Handler, Cat 966 M Loader, Cat 938 K Loader and 50 percent of the Tennant 800 Sweeper emissions will exhaust through the tipping floor biofilter east of the MRF Facility building.
  - 50 percent of the Tennant 800 Sweeper emissions will exhaust through the recycling area biofilter east of the MRF Facility building.
- The locations of the clear diesel, red diesel and gasoline tanks have been revised. They will be relocated to the east side of the facility near the maintenance building, north of the AD Facility building.
- Use of AERMOD for all dispersion modeling in place of ISCST3.
- Use of HARP2 in place of HARP for the HRA.
- The previous Maximum Exposed Individual Resident (MEIR) at the planned Hart Residence is no longer an MEIR receptor as the land was purchased by Santa Barbara County. No residence(s) will be built on this property.

The changes in the Greenhouse Gas (GHG) emissions due to the revised project changes were reviewed quantitatively. The changes result in very small (<1 percent) difference in the previous documented numerical reduction of GHG emissions from the approved project.

---

[1] The paper dryer has cyclone and pulse jet baghouse integral to it. Downstream of the paper dryer baghouse, there is additional filtration using High Efficiency Particulate Arrestance (HEPA) technology for fine particulates (less than 10 microns in diameter). The term "baghouse" hereafter includes this fine particulate removal element as well.

Table of Contents

Summary of Revisions from Previous Submittal i

1.0 Introduction 1-1
- 1.1 Revised Project 1-1
- 1.2 Summary of Findings 1-1

2.0 Overview of Approved TRRP and Revised TRRP 2-1
- 2.1 Summary of Changes 2-2
- 2.2 Replacement of Existing Tajiguas Landfill Gas Collection/Control System 2-5

3.0 Methodologies for Evaluating Air Quality Impacts 3-1
- 3.1 Criteria Pollutant Emissions 3-1
  - 3.1.1 Operation Emissions 3-1
- 3.2 Ambient Air Dispersion Modeling 3-6
  - 3.2.1 Overview of Ambient Air Dispersion Modeling 3-7
  - 3.2.2 Good Engineering Practice Stack Height 3-7
  - 3.2.3 Receptor Grid 3-10
  - 3.2.4 Sources and Emission Data 3-13
  - 3.2.5 NO_2 Modeling 3-18
  - 3.2.6 Short-term Operation Emissions Scenarios 3-19
- 3.3 Ambient Air Impact Criteria 3-19

4.0 Impact Assessment Results 4-1
- 4.1 Criteria Pollutants 4-1
  - 4.1.1 Emissions Estimates 4-1
  - 4.1.2 Air Dispersion Modeling 4-3
  - 4.1.3 ROC Ambient Air Quality Increment Analysis 4-12
  - 4.1.4 Recommended Mitigation 4-12
  - 4.1.5 Conclusions 4-12
- 4.2 Health Risk Assessment 4-14
  - 4.2.1 Impact Analysis 4-14
  - 4.2.2 Recommended Mitigation 4-18
  - 4.2.3 Conclusions 4-18
- 4.3 Odors 4-18
  - 4.3.1 Modeling Results 4-18

4.3.2 Hydrogen Sulfide and Organic Sulfides 4-21
4.3.3 Recommended Mitigation Measures 4-21
4.3.4 Conclusions 4-22
4.4 Greenhouse Gases 4-22

5.0 References 5-1

List of Tables

Table 1-1 Summary of Impacts: Permitted Landfill and Revised TRRP 1-2
Table 2-1 Summary of Revised Project Elements 2-2
Table 2-2 Comparison of Permitted and Revised Project Components 2-3
Table 2-3 Maximum Daily Operation Emissions – Existing Engine and Flare 2-5
Table 2-4 Maximum Daily Operation Potential Emissions – Existing and Future Equipment Comparison 2-6
Table 2-5 Top 15 Stationary Sources of NO_X in Santa Barbara County in 2015 2-7
Table 3-1 Summary of GEP Analysis for the Revised Tajiguas Landfill Resource Recovery Project 3-10
Table 3-2 Ambient Air Impact Criteria (µg/m^3) for Project Modeling 3-19
Table 3-3 Ambient Background Concentrations 3-20
Table 3-4 Modeled Odor Source Parameters and Emission Rates 3-28
Table 3-5 Single Point Receptors Used for Frequency Analysis 3-28
Table 4-1 Maximum Daily Operation Emissions – All Sources (with CSSR) 4-1
Table 4-2 Maximum Daily Operation Emissions – Vehicle Emissions Only (with CSSR) 4-2
Table 4-3 Comparison of Final SEIR and Revised Project Emissions 4-2
Table 4-4 Emissions for Short-term Scenarios 4-3
Table 4-5 TRRP AERMOD NAAQS Modeling Results for Normal Operations for MRF CHP Engines Exhaust through Paper Dryer and CSSR (µg/m^3) 4-4
Table 4-6 TRRP AERMOD NAAQS Modeling Results for Flare with One AD CHP Engine Offline and MRF CHP Engines Exhaust through Paper Dryer (µg/m^3) 4-5
Table 4-7 TRRP AERMOD NAAQS Modeling Results for AD CHP Engine Startup and SCR Burn-in (µg/m^3) (Infrequent Maintenance Events) 4-6
Table 4-8 TRRP AERMOD NAAQS Modeling Results for MRF CHP Engine Startup and SCR Burn-in (µg/m^3) (Infrequent Maintenance Events) 4-7
Table 4-9 TRRP AERMOD CAAQS Modeling Results for Normal Operations (MRF Engines Exhaust through Paper Dryer) and CSSR (µg/m^3) 4-8
Table 4-10 TRRP AERMOD CAAQS Modeling Results for AD Flare with One AD CHP Engines Offline Scenario (µg/m^3) (Infrequent Event) 4-10
Table 4-11 TRRP AERMOD CAAQS Modeling Results for AD CHP Engine Startup and SCR Burn-in Scenarios (µg/m^3) (Infrequent Maintenance Event) 4-11
Table 4-12 TRRP AERMOD CAAQS Modeling Results for MRF CHP Engine Startup and SCR Burn-in Scenarios (µg/m^3) (Infrequent Maintenance Events) 4-11
Table 4-13 TRRP AERMOD ROC Modeling Results (µg/m^3) 4-12
Table 4-14 Summary of Criteria Pollutant Emissions Impacts 4-13
Table 4-15 Summary of Maximum Health Risk Impacts for Revised TRRP with CSSR 4-14
Table 4-16 Summary of Maximum Facility-wide Health Risk Impacts for Future Operations of Tajiguas Landfill Sources with Revised TRRP and CSSR 4-15
Table 4-17 Sensitive Receptor Odor Frequency Analysis 4-19
Table 4-18 Change in Greenhouse Gases 4-23

List of Figures

Figure 3-1 Relative Locations of Tajiguas Landfill and the Las Flores Canyon Meteorological Site 3-8
Figure 3-2 Las Flores Canyon Site #1 2015 Wind Rose 3-9
Figure 3-3 Revised TRRP Buildings Included in the Project GEP Analysis 3-10
Figure 3-4 Revised ADF Building and Relocated Existing Landfill Sources 3-12
Figure 3-5 Receptor Grid used in TRRP AERMOD Analysis 3-13
Figure 3-6 Road Sources included in the TRRP Air Dispersion Modeling 3-16
Figure 3-7 Relative Locations of Tajiguas Landfill and Ambient Air Quality Monitors 3-21
Figure 3-8 Revised TRRP Sources Modeled in the HRA 3-23
Figure 3-9 Existing and Revised Project Facility-Wide Sources Modeled in the HRA 3-25
Figure 3-10 Receptors used in TRRP Odor Modeling Analysis 3-30
Figure 4-1 30-Year Cancer Risk Isopleth Greater than 10.0 in-one-million for Future Operations at Tajiguas Landfill including CSSR 4-16
Figure 4-2 Acute Hazard Index Isopleth Greater than 1.0 for Future Operations at Tajiguas Landfill including CSSR 4-17
Figure 4-3 Tajiguas Landfill Odor Modeling Contours 4-20

List of Appendices

Appendix A Project Operation Emissions Calculations
Appendix B Existing Landfill Sources Emissions Calculations
Appendix C Air Dispersion Modeling Archive Data Files (with Air Emission Quantification Files) (on CD)

List of Abbreviations

°F	degrees Fahrenheit
$\mu g/m^3$	micrograms per cubic meter
AD	Anaerobic Digestion
ADF	Anaerobic Digestion Facility
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
AIG	AERMOD Implementation Guide
a.m.	Morning
APCD	Air Pollution Control District
AQAP	Air Quality Attainment Plan
AQIA	Air Quality Impact Assessment
AQMD	Air Quality Management District
AQMP	Air Quality Management Plan
ARB	California Air Resources Board
Avg.	Average
BAAQMD	Bay Area Air Quality Management District
BACT	Best Available Control Technology
BAU	business as usual
Bkgrnd.	Background
BPIP	Building Profile Input Processor
BUB	Braunschweiger Umwelt-Biotechnologie GmbH
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CATEF	California Air Toxic Emission Factors
CCAA	California Clean Air Act
CCR	California Code of Regulations
C&D	Construction & Demolition
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CHP	combined heat and power
CNG	compressed natural gas
CO	carbon monoxide
Conc.	Concentration
CSSR	commingled source separated recyclables
DOC	degradable organic carbon
DPM	diesel particulate matter
e.g.	for example
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
ft	feet
ft^2	square feet

gal	Gallons
GAQM	Guidelines on Air Quality Models
g/bhp-hr	grams per brake-horsepower-hour
GE	General Electric
GEP	good engineering practice
GHG	greenhouse gas
GLC	ground level concentration
g/mile	grams per mile
H_2S	hydrogen sulfide
HAP	hazardous air pollutant
HARP2	Hotspots Analysis Reporting Program Version 2 (model)
H_B	height of the structure
HDV	heavy duty vehicle
HFC	Hydrofluorocarbon
H_{GEP}	GEP height
HI	hazard index
hp	Horsepower
hr	Hour
HRA	Health Risk Assessment
IAQM	Institute of Air Quality Management
IC	internal combustion
i.e.	that is
ISCST3	Industrial Source Complex – Short Term Model version 3
IWMF	Integrated Waste Management Facility
kW	Kilowatt
lb	pound(s)
l/kg-day	liters of air per kilogram per day
lb/MMcf	pound per million cubic feet
LDV	light duty vehicle
LFC	Las Flores Canyon
LFG	landfill gas
LNG	liquefied natural gas
LPG	liquefied petroleum gas
m	meter
m^3	cubic meters
MEIR	maximum exposed individual resident
MEIW	maximum exposed individual worker
$\mu g/m^3$	micrograms per cubic meter
mg/kg-day	milligrams per kilogram per day
min.	Minute
MMBtu	million British thermal units
MMcf	million cubic feet
MND	Mitigated Negative Declaration
MRF	Materials Recovery Facility
MSW	municipal solid waste
MT	metric tons
Mustang	Mustang Renewable Energy
MWh	megawatt hour
N/A	Not Applicable
NA	Not Available

NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NO_X	oxides of nitrogen
NR	Not Reported
NSPS	New Source Performance Standards
NSR	New Source Review
O_3	Ozone
OAQPS	EPA Office of Air Quality Planning and Standards
OEHHA	California Office of Environmental Health Hazard Assessment
OIMP	Odor Impact Minimization Plan
OLM	Ozone Limiting Method
OU	odor units
OU/m^3	odor units per cubic meter
Pb	Lead
PF	Public Facilities
p.m.	past morning
PM_{10}	Respirable Particulate Matter
$PM_{2.5}$	Fine Particulate Matter
PMI	Point of Maximum Impact
ppb	parts per billion
ppm	parts per million
ppmv	parts per million by volume
ppmw	parts per million by weight
Project	Tajiguas Resource Recovery Project
PVMRM	Plume Volume Molar Ratio Method
PSD	Prevention of Significant Deterioration
RRWMD	Resource Recovery and Waste Management Division
REL	reference exposure levels
ROC	reactive organic compound
RRP	Resource Recovery Project
SB	Senate Bill
SBCAG	Santa Barbara County Association of Governments
SBCAPCD	Santa Barbara County Air Pollution Control District
SCAQMD	South Coast Air Quality Management District
SCCAB	South Central Coast Air Basin
SCE	Southern California Edison
scf	standard cubic feet
SCH	California State Clearinghouse
SCR	selective catalytic reduction
sec.	Second
SIP	State Implementation Plan
SJVAPCD	San Joaquin Valley Air Pollution Control District
SLAMS	State and Local Air Monitoring Station
SO_2	sulfur dioxide
SO_x	sulfur oxides
SRP	Scientific Review Panel
SSOW	source separated organic (food and green) waste

SVLRC	Simi Valley Landfill and Recycling Center
TAC	toxic air contaminant
TOG	total organic gases
TRRP	Tajiguas Resource Recovery Project
UCSB	University of California at Santa Barbara
U.S.	United States
VCAPCD	Ventura County Air Pollution Control District
vendor	Mustang Renewable Energy
VMT	vehicle miles traveled
VOC	volatile organic compounds
WRAP	Western Regional Air Partnership
WWTP	wastewater treatment plant

1.0 Introduction

A Subsequent EIR (SEIR) was prepared for the Tajiguas Resource Recovery Project (TRRP) and the County Board of Supervisors certified the Final SEIR and approved the TRRP project on July 12, 2016. The Final SEIR concluded that the only Class I impacts identified were extensions of previously identified Class I impacts associated with extending the life of the Tajiguas Landfill. Implementation of the TRRP did not increase the capacity or footprint of the existing permitted Landfill, but it did extend the operating life of the landfill from approximately 2026 to approximately 2036. Accordingly, the previously approved TRRP resulted in delaying full closure of the landfill and extending the duration of time over which some previously disclosed landfill impacts would occur, including air quality impacts. In certifying the Final SEIR for the TRRP, the Board of Supervisors adopted CEQA Findings and a Statement of Overriding Considerations. The Statement of Overriding Consideration addressed two Class I impacts, one of which was an air quality impact: Impact TRRP AQ-11.

The 2016 Final SEIR identified the non-attainment pollutants in the Project Area, including Ozone and PM_{10} (refer to SEIR Table 4.2-2, Air Quality Summary for Non-attainment Pollutants in the Project Area). While the TRRP would reduce disposal activity levels at the Landfill, and would reduce associated air quality impacts, the SEIR conservatively assumed that air quality impacts: 1) off-site mobile NO_X; 2) 1-hour NO_2 air quality standard exceedances; and 3) 24-hour PM_{10} air quality standard exceedances (as listed in SEIR Section 4.2.2.2) would likely remain significant and unavoidable (refer to SEIR Section 4.2.2.6). The Findings and Statement of Overriding Considerations remain applicable to the impacts associated with extending the landfill's life, including air quality impacts (refer to SEIR Table 2-3 and SEIR Section 4.2).

This Technical Memorandum provides the analysis for the Revised TRRP described below.

1.1 Revised Project

The physical changes to the project are described below. The project would not modify the operation of the facilities as previously described in the certified Final SEIR. During both construction and operation of the project, criteria pollutant emissions would be generated due to equipment and vehicle use. The purpose of this revised technical study is to analyze the potential air quality impacts that could occur during construction and operation of the Revised project. In addition, an analysis of potential health risks associated with emissions of toxic air contaminants (TAC) and an analysis of odorous substances is provided.

The content and methodologies presented in this technical report are based on the following guidance documents: Santa Barbara County's Environmental Thresholds and Guidelines Manual (2008, updated 2015) and Guidelines for Implementation of the California Environmental Quality Act of 1970 (2010), the Santa Barbara County Air Pollution Control District's (SBCAPCD) Scope and Content of Air Quality Sections in Environmental Documents (2011a), Modeling Guidelines for Health Risk Assessments (APCD Form -15i) (2017b) and Environmental Review Guidelines for the Santa Barbara County Air Pollution Control District (2015), and U.S. Environmental Protection Agency's (EPA's) Guidelines on Air Quality Models (GAQM) (EPA, 2017).

1.2 Summary of Findings

This technical report concludes that impacts related to criteria pollutants and health risks associated with the revised project will be insignificant; and impacts related to odors will be less than significant.

A summary of the air quality impacts from the SEIR Tajiguas Landfill Project and from the revised TRRP is provided in Table 1-1.

Table 1-1
Summary of Impacts: Permitted Landfill and Revised TRRP

Impact Category	TRRP Certified Final SEIR	Revised TRRP[1]
Criteria Pollutant Emissions		
Construction Emissions	Less than significant for all criteria pollutants	Less than significant for all criteria pollutants
Operation Emissions and Modeled Impacts		
Maximum Daily (On-site and Off-site Sources)	Less than significant for all criteria pollutants	Less than significant for all criteria pollutants
Off-site Mobile Emissions Only	Less than significant for all criteria pollutants	Less than significant for all criteria pollutants
National Ambient Air Quality Standards (NAAQS)	Less than significant for all criteria pollutants	Less than significant for all criteria pollutants
California Ambient Air Quality Standards (CAAQS)	Less than significant for all criteria pollutants	Less than significant for all criteria pollutants
Health Risk Assessment		
Carcinogenic Health Risk	Less than significant	Less than significant
Chronic and Acute Non-Carcinogenic Health Risk	Less than significant	Less than significant
Odors		
Off-site Odors	Less than significant	Less than significant
Greenhouse Gases		
Operational emissions	Less than significant	Less than significant

[1] Emissions and Modeled Impacts for the TRRP (Certified Final SEIR and Revised) are presented with the approved collected commingled source separated recyclables (CSSR) component.

2.0 Overview of Approved TRRP and Revised TRRP

The TRRP was analyzed in the certified Final SEIR and approved to process MSW from the communities currently served by the Tajiguas Landfill. The TRRP was designed to modify the processing of MSW delivered to the Tajiguas Landfill from unincorporated areas of the south coast of Santa Barbara, Santa Ynez and New Cuyama Valleys and, the cities of Santa Barbara, Goleta, Buellton and Solvang. The approved TRRP includes processing source separated organic waste (SSOW) from the region's existing and future recycling programs and CSSR.

The approved TRRP includes a MRF comprised of an approximate 66,500 sf building to sort MSW into three streams:

- Recyclables (i.e., glass, metal, paper, plastic, wood) - recovered and processed for sale;
- Organics – recovered for processing in the Anaerobic Digestion Facility; and
- Residue – materials left over after all recyclables and organics are recovered that would be disposed of at the existing Landfill.

The approved TRRP also includes an AD Facility housed within an approximate 63,600 sf building, and associated energy facility and percolate storage tanks that would convert all organics recovered from the MSW and SSOW into:

- Bio-gas (primarily composed of methane [CH_4] and carbon dioxide [CO_2]) – that would be used to power two (2) 1,537 horsepower on-site combined heat and power (CHP) engines driving electric power generators that would generate approximately 1+ net megawatts (MW) of renewable power continuously. The Energy Facility would be located on the south side of the AD Facility; and
- Digestate - that can then be cured into compost and/or soil amendments. The curing would require an approximately 5 acre area (located at one or more sites on the Landfill's permitted operations and/or waste disposal footprint). The compost and/or soil amendments would be marketed for agricultural or landscape use or used for reclamation projects.

The approved MRF has a design capacity of up to 930 tons/day of MSW or up to approximately 290,000 tons/year (up to 311 operating days/year), including up to 40,000 tons/year of CSSR. Up to 126,000 tons/year (290 tons/day) of recyclable material would be recovered and sold for reuse. Up to 104,000 tons/year (333 tons/day) of residue from the MRF and residue from the AD Facility which is not suitable for composting were approved to be landfilled. Residue ineligible for disposal in the Landfill (i.e., hazardous waste or e-waste), will be transported to an appropriate recycling or disposal facility.

Based on current waste disposal rates the Tajiguas Landfill may reach its permitted disposal capacity (23.3 million cubic yards) in approximately year 2026. With the additional diversion provided by the approved TRRP, the permitted disposal capacity (which would not be modified as a part of the TRRP) is not expected to be reached until approximately year 2036, extending the Landfill life by approximately 10 years.

The TRRP facilities were approved to be located approximately 3,200 feet north of U.S. Highway 101 on the existing Tajiguas Landfill operations deck, that until early 2017 housed the Landfill administrative office, two crew trailers, engineering trailer, hazardous material storage, electronic-waste storage, equipment storage and parking, employee parking, maintenance facility and three fuel storage tanks.

Construction of the approved MRF was estimated to require approximately twelve months to complete following 4 months of grading and site preparation. Construction of the approved AD Facility was projected to take approximately twelve months to complete and would be completed concurrently with the MRF. Construction work would generally be conducted during daylight hours, in compliance with the County permitted Landfill construction hours of 6:00 am to 8:00 pm, Monday through Saturday, and 7:00 am to 6:00 pm on Sunday. Non-daylight work hours on weekdays or daytime work on Saturdays and holidays may occur to minimize conflicts with ongoing Landfill waste disposal operations, make up schedule deficiencies and/or to complete critical construction activities safely, such as MRF equipment installation and testing. If necessary to meet specific construction requirements, two 8-hour shifts, Monday through Friday between the hours of 6 a.m. and 10 p.m., and potentially on Saturdays and holidays may be implemented.

2.1 Summary of Changes

A summary of Revised Project components is provided in Table 2-1 and a comparison between the TRRP described in certified Final SEIR and revised TRRP is provided in Table 2-2. Under the revised project, the TRRP MRF would remain located approximately 3,200 feet north of U.S. Highway 101 on the existing Tajiguas Landfill Operations Deck., The AD facility would be relocated to an area east of the top deck adjacent to the previously approved TRRP composting area. The top deck would be closed and a final landfill cover system installed prior to using it for the composting area as was previously proposed.

Table 2-1
Summary of Revised Project Elements

Project Element	Associated Facilities	Project Element Capacity (max)	Operational Parameters[1]
MRF			
Base Project MRF	Processing building –56,500 square feet (ft^2), includes 24,800 ft^2 tipping floor, 41,700 ft^2 waste processing and recyclable storage, 1,200 ft^2 load out/waste transfer, 8,800 ft^2 office/administration /employee/control room areas, and visitors center; Total with CSSR is 66,500 ft^2	MSW – 800 tons/day 250,000 tons/year	24 hours/day, 6 days/week, 311 days/year; (2 shifts with 24 employees/ shift and 1 shift with 7 employees/shift)
	Optional Baled Recyclable Storage buildings (detached) – 6,400 ft^2		
	Tipping Floor Area Bio-filter - 6,600 ft^2 and Recycling Area Bio-filter – 4,620 ft^2		
	Wastewater treatment facility - 300 ft2		
MRF CSSR Processing	Additional waste processing area – 10,000 ft^2		
Energy Facility (LFG fueled engines)	Two 1,966 horsepower (hp) combined heat and power (CHP) engines exhausting via baghouse filter for paper dryer.	7.6-10.4 million kilowatt (kW)-hours/year	24 hours/day, 365 days/year

Project Element	Associated Facilities	Project Element Capacity (max)	Operational Parameters[1]
Paper Dryer	Located next to the MRF Processing Building, dry paper processed by the MRF with heat for the paper dryer operation provided by the LFG-fueled CHP engines.		16 hours/day, 6 days/week
AD Facility			
AD Facility	Processing building – 68,250 ft^2, including 16 digesters, two ground level biofilters, and 545,700 gallon percolate storage	Organic waste from MSW and SSOW – 240 tons/day, 73,600 tons/year	Days receiving material - 311 days/year of AD facility Operation – 24 hours/day, 365 days/year; 3 employees/shift, 1 shift (employees present 6 days/week)
	Composting area – 6.2 acres	Digestate – 200 tons/day, 60,000 tons/year	Days receiving material – 208 days/year of operation – 7 a.m. – 4 p.m., 6 days/week; 1 employee/shift
Energy Facility and AD Control Room	Building attached to AD Facility – 1,900 ft^2 housing two 1,573 hp combined heat and power (CHP) engines	7.6-10.4 million kilowatt (kW)-hours/year	24 hours/day, 365 days/year

[1] Waste receipt would occur during the currently permitted operating hours of 7 a.m. to 5 p.m., Monday and Tuesday and 7 a.m. to 4 p.m., Wednesday through Saturday.

Table 2-2
Comparison of Permitted and Revised Project Components

Component	Tajiguas Resource Recovery Project as described in the Certified Final SEIR	Revised TRRP
General		
TRRP Earthwork (with 15% compaction)	142,600 cubic yards of cut, 102,765 cubic yards of fill	31,420 cubic yards of cut, 103,100 cubic yards of fill
MRF and AD Facility combined building area	130,100 square feet	135,050 square feet
Parking spaces	72, bus parking area	62, bus parking area
MRF		
Location	Within the Landfill Solid Waste Facility Permit Operational area on the Operations deck (APN 081-150-019)	No change
Site area (acres)	~6 (combined MRF and AD Facility area)	5.8 (MRF only)

Component	Tajiguas Resource Recovery Project as described in the Certified Final SEIR	Revised TRRP
Building area (square feet)	66,500	No change
Maximum building height (feet)	51.3	No change
Building skylights	Included	Deleted
Bio-filters (odor control)	Two – 6,300 sf at ground level and 4,200 sf on the AD Facility Roof	Two – 6,600 sf and 4,620 sf located at ground level
Rolling bed (paper) dryer	Included, using waste heat from the Energy Facility adjacent to the AD Facility	Included, using waste heat from the replacement LFG control system engines adjacent to the MRF
Treated water tank	6,500 gallons	Deleted
AD Facility		
Location	Within the Landfill Solid Waste Facility Permit Operational area on the operations deck (APN 081-150-019)	Within the Landfill Solid Waste Facility Permit Operational area east of the Composting Area. (APN 081-150-019, APN 081-150-026 and APN 081-150-032)
Site area (acres)	~6 (combined MRF and AD Facility area)	3.9 (AD Facility only)
Building area (square feet)	63,600	68,550
Maximum building height (feet)	37.0	No change
Building skylights	Included	Deleted
Bio-filters	Two roof-top – 4,200 sf each	Two at grade – 4,320 sf each
Energy Facility	2,900 sf building adjacent to the ADF, housing two 1,573 BHP CHP engines, with flare extending 62 feet above the MRF/AD Facility floor elevation (394 feet above msl)	1,900 sf building adjacent to the ADF, housing two 1,573 BHP CHP engines, with flare extending 50 feet above the flare pad elevation (590 feet above msl)
Organic waste conveyor to ADF	Included	Deleted (organic waste transported by truck)
Digestate conveyor to Composting Area	Not proposed (digestate transported by truck)	Included, ~110 feet long
Other Components		
Fire water tank (northwest of the MRF) capacity (gallons)	220,000 (33.5 feet in diameter, 33 feet tall)	256,000 (36 feet in diameter, 33 feet tall)
Composting Area Runoff Collection Tank	325,000 gallons (50 feet in diameter, 24 feet tall), located 1,500 feet north of the Composting Area	436,000 gallons (42 feet in diameter, 42 feet tall), located 700 feet north of the Composting Area (formerly the planned location of the Landfill maintenance building)

Component	Tajiguas Resource Recovery Project as described in the Certified Final SEIR	Revised TRRP
Fire water tank near Composting Area	Not proposed	256,000 gallons (36 feet in diameter, 33 feet tall), located adjacent to the Composting Area Runoff Collection Tank
Relocated Landfill maintenance building	650 feet north of the Composting Area, outside the buried waste footprint	Located on the operations deck, immediately east of the MRF site and outside the buried waste footprint
Above-ground power line between the MRF and AD Facility sites	Not proposed	Included (approximately 2,550 linear feet of power line and support poles)

The replacement of the existing landfill gas fueled engine with two new modern engines to be located south of the MRF is the primary equipment change associated with the revised TRRP. This is described in detail in Section 2.2. While other equipment will be relocated in association with the relocation of the AD Facility, except for the minor mobile equipment changes identified in this report, the equipment is substantially the same as described in the certified Final EIR.

2.2 Replacement of Existing Tajiguas Landfill Gas Collection/Control System

The Tajiguas Landfill currently has an existing landfill gas collection/control system that consists of landfill gas (LFG) collection and monitoring system and a landfill gas engine and flare. The purpose of the LFG collection/control system is to remove LFG, specifically methane, and minimize air and ground water quality impacts. A system to control gas emissions from the landfill was recommended by the Santa Barbara County Air Pollution Control District (SBCAPCD) during the preparation of the 1987/2002 Tajiguas Landfill Expansion EIR and was included as a recommended mitigation measure in the EIR. The facility is located at the southern end of the landfill and operates under conditional use permit (95-CP-046) and coastal development permit (95-CDP-118). The existing control equipment (of the collection/control system) was constructed in 1999 and consists of a Caterpillar engine, an enclosed flare and supporting equipment (e.g., gas conditioning). The maximum daily annual emission rate for the existing engine and flare are summarized in Table 2-3.

Table 2-3
Maximum Daily Operation Emissions – Existing Engine and Flare

Source	Maximum Daily Potential to Emit (pounds/day)					
	ROC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Existing Engine	65.73	161.28	639.05	27.96	20.08	20.08
Existing Flare	71.14	89.86	280.80	48.67	14.98	14.98
Combined Flare and Engine[1]	96.01	199.53	758.57	48.67	26.46	26.46

[1] Maximum daily emission rate (pounds/day) for the combined operation of flare and engine, according to current Permit to Operate 9788.

The collection system is comprised of a blower, a network of vertical and horizontal LFG extraction wells and pipelines installed in the waste. Wells are connected via pipework and connected to an electric powered blower that puts the entire collection system under vacuum. The blower directs LFG to the internal combustion engine (ICE) and/or the flare2. The ICE destroys potential pollutants and generates electricity. The flare destroys potential pollutants through thermal combustion.

The Revised TRRP includes decommissioning some of the existing LFG Control System in place (engine and flare) and installing new GE Jenbacher engines (or equivalent) to provide up to 2.8 megawatts of electricity, one John Zink ZTOF-type enclosed flare (or equivalent) and one switchgear/transformer on the operations deck just south of the MRF building, outside of the Coastal Zone. The new engines and flare would be connected to the existing LFG collection network of wells and pipelines and the existing electrical distribution network. The power transmission lines serving the MRF would also serve the new engines and supporting equipment.

The new engines would each be housed in a 756 square foot container with noise attenuating features, and provided with engine exhaust silencers and acoustical gaskets on the doors. The engines would be provided with SBCAPCD-required control systems (selective catalytic reduction, SCR) to reduce oxides of nitrogen (NO_X) emissions. The new flare would be six feet in diameter and 50 feet in height, and located on a concrete pad. The switchgear and /transformers would also be located on a concrete pad. Up to 2.8 megawatts of electricity would be produced by the facility and excess power would be distributed to the regional power grid. The engine exhaust would be ducted through a heat exchanger with to produce heated inlet air for the approved MRF rolling bed dryer to dry paper. The engine exhaust would then be ducted to the baghouse for particulate control. Exhaust air from the rolling bed dryer would be ducted to a baghouse to filter particulate matter. The engine exhaust and the rolling bed dryer exhaust dryer merge into a single air stream for control. Under the approved TRRP, the AD Facility CHP engines were to be used to provide waste heat (exhaust) for the rolling bed dryer.

These engines and flare would be more efficient and emit fewer criteria pollutants than the current equipment as shown in Table 2-4. Engine specifications for the new engines are presented in the appendices

Table 2-4
Maximum Daily Operation Potential Emissions – Existing and Future Equipment Comparison

Source	Maximum Daily Potential to Emit (pounds/day)					
	ROC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Combined Existing Flare and Engine[1]	96.01	199.53	758.57	48.67	26.46	26.46
Project Emissions from Final SEIR	39.60	44.60	138.4	15.01	39.87	39.87
Subtotal	135.61	244.13	925.97	63.68	53.32	53.32
Proposed Revised On-site Sources (future)[2]	63.50	64.11	181.11	17.67	29.02	22.39
Potential Decrease in Emissions	-71.50	-180.63	-744.86	-46.01	-24.4	-30.93

[1] Maximum daily emission rate (pounds/day) for the combined operation of existing flare and engine from SBCAPCD Permit to Operate 9788.

[2] Includes TRRP emissions and modernized relocated engine/flare.

---

[2] The facility land use and Air Quality permits allow for the construction of up to two engines and one flare. Currently the facility operates with one engine and one flare.

The replacement of the existing LFG-fueled engine and flare system with a new control system (two engines and one flare) powered by LFG would be subject to the SBCAPCD New Source Review rules, including the installation of Best Available Control Technology (BACT). The GE Low NO_X technology combined with an SCR would meet this requirement. An Authority to Construct permit from SBCAPCD for the new engines and flare would include similar source compliance demonstration requirements and operational compliance provisions as that of the AD CHP engines.

The facility would be operated by landfill staff and operate 24 hours per day. Periodic maintenance and inspections would be performed on the equipment. A continuous operating and emissions monitoring system will be installed and inform all pertinent personnel in the case of operational failure. Response time of staff would be about two hours.

The modernization of the LFG engines at the MRF would result in a significant decrease of the actual emissions of NO_X and ROCs, making it consistent with the objectives of the SBCAPCD's 2010 Clean Air Plan and its successor 2016 Ozone Plan. Actual NO_X emissions of the entire landfill are estimated to drop by at least 8 tons per year due to this modernization and would remove the landfill operations from the top 10 emitters of NO_X in Santa Barbara County, based on the 2015 actual reported emissions[3] presented in Table 2-5.

Table 2-5
Top 15 Stationary Sources of NO_X in Santa Barbara County in 2015

Stationary Source No	Stationary Source Name	ROG Emissions (t/y)	NOX Emissions (t/y)
2667	Pacific Coast Energy Company- Orcutt Hill	46.6	112.9
1482	ExxonMobil - SYU Project	214.7	108.4
1325	The Point Arguello Project	161.6	98.3
2795	UCSB	4.1	69.4
2658	Greka South Cat Canyon	67.3	31.8
1735	Imerys Minerals California, Inc.	4.5	25.1
8003	Dos Cuadras - South County	126.4	19.8
3707	County of SB-Tajiguas Landfill	11.6	16.0
1063	Venoco – Ellwood	136.0	15.6
1195	Vandenberg Air Force Base	4.3	13.6
2638	Barham Ranch	12.7	11.7
1793	Marian Medical Center	4.0	10.4
4632	Pt. Pedernales	48.5	8.5
4639	Russell Ranch Lease	21.5	7.7
8001	Pacific Operators – Carpinteria	11.7	7.1

3 Santa Barbara County Air Pollution Control District, 2017a.

3.0 Methodologies for Evaluating Air Quality Impacts

The methodologies presented in this technical report are based on the following guidance documents: Santa Barbara County's *Environmental Thresholds and Guidelines Manual* (2015) and *Guidelines for Implementation of the California Environmental Quality Act of 1970* (2010), SBCAPCD's *Scope and Content of Air Quality Sections in Environmental Documents* (2011a), SBCAPCD Environmental Review Guidelines (2015) and *Modeling Guidelines for Health Risk Assessments* (APCD Form -15i) (2017), and EPA's GAQM (2008). The methodologies utilized to evaluate air quality and GHG impacts from the Revised Project include emissions quantification of criteria pollutants, TACs, GHGs and odors generated during short-term, temporary construction activities, and long-term operations. Methods and models used to quantify and evaluate air quality and GHG impacts are described in the following subsections.

3.1 Criteria Pollutant Emissions

3.1.1 Operation Emissions

Criteria pollutant emissions would be generated from the following sources during operation of the Revised Project:

- Exhaust from two Jenbacher/General Electric (GE) combined heat and power (CHP) engines combusting biogas produced in the anaerobic digesters (AD Facility)
- Natural gas or propane co-firing with biogas in the combined heat and power (CHP) engines at the AD Facility. The CHP engines will be fueled with biogas or with a mixture of biogas and natural gas as follows:
  - During normal operation with both engines operating, the engines will be fueled with a mixture of approximately 86.5 percent biogas and 13.5 percent natural gas
  - When only one engine is operating, it will only be fueled with biogas
  - During engine start-up and SCR catalyst burn-in, the engine will only be fueled with natural gas, and only one engine will start up at a time
    - Exhaust from a flare combusting biogas produced in the anaerobic digesters at the AD Facility when the gas in a digester is purged through the flare prior to opening it to remove the digestate
    - Exhaust from a flare combusting biogas produced in the anaerobic digesters at the AD Facility when one or both CHP engine(s) is/are offline for maintenance or other reasons
    - Exhaust from two Jenbacher/General Electric (GE) combined heat and power (CHP) engines combusting landfill gas (located south of the MRF). This exhaust is ducted through the paper dryer baghouse filter which are added as part of the revised project
    - Exhaust from MRF Paper Dryer. The Materials Recovery Facility (MRF) paper drying operation is provided heat by the LFG CHP engines' exhaust via heat exchangers. Both CHP engines will exhaust completely through the paper dryer baghouse 24 hours per day, 7 days per week unless the baghouse filter is down for maintenance, in which case the exhaust will vent through the CHP individual stacks. The paper dryer is anticipated to operate 16 hours per day, six days per week
    - Exhaust from a flare combusting landfill gas at the MRF Facility when one or both CHP engine(s) is/are offline for maintenance or other reasons, which is added as part of this addendum

- Exhaust from a diesel-fueled standby emergency generator
- Fugitive ROC emissions from the diesel fuel storage tank for the MRF and AD Facility equipment and for the standby emergency generator.
- Exhaust from off-road equipment used in the MRF and AD Facility (material handler, front-end loaders, forklifts and a sweeper) and equipment used in the composting process (screen machine and windrow turner).
- Exhaust from motor vehicles operating on-site and off-site.
- Fugitive particulate matter from motor vehicles operating on-site.
- Fugitive particulate matter from motor vehicles operating off-site.
- Fugitive particulate matter from handling various materials, including MSW, digestate from the anaerobic digesters, residual materials from the MRF and digestate, and compost.
- Fugitive particulate matter from digestate and compost screening.
- Fugitive particulate matter emissions from chipping and grinding.
- Fugitive ROC from the Tipping Area Floor, MRF and AD operations which exhaust through the respective biofilters; and
- Fugitive ROC from the composting windrows.

Details of the operation emission calculations are provided in Appendix A.

3.1.1.1 Emissions from CHP Engines

The CHP engines will be Jenbacher/GE Model JMS416Vb82, with an engine horsepower rating of 1,573 horsepower at the AD Facility (burning biogas) and 1,966 horsepower at the MRF (burning LFG). These engines will exhaust through the paper dryer baghouse and filter to capture 99 percent of PM_{10} and $PM_{2.5}$, 24 hours per day and 7 days per week. They will exhaust through the individual engine stacks only when the baghouse filter is down for maintenance. The 1,966 horsepower engines at the MRF will replace the existing older LFG engine.

Maximum hourly CO, ROC, NO_X, PM_{10} and $PM_{2.5}$ exhaust emissions from the CHP engines were estimated by multiplying emission factors, in grams per brake-horsepower-hour (g/bhp-hr), by the engine horsepower ratings. The engines will be equipped with selective catalytic reduction (SCR) systems to control NO_X emissions and oxidation catalysts to control CO and ROC emissions. The CO, ROC and NO_X emission factors were provided by the control system manufacturer and the filterable particulate matter emission factor was estimated by Bekon Energy Technologies. The condensable particulate matter emission factor was from Table 3.2-2 in Section 3.2, Natural Gas Fired Reciprocating Internal Combustion Engines, of AP-42 (EPA 2000). AP-42 assumes that the filterable and condensable PM_{10} and $PM_{2.5}$ emission factors would be the same as the particulate matter emission factor because the particle size is less than 1 μm in diameter.

The CHP engines at the AD Facility will be fueled with biogas or with a mixture of biogas and natural gas/propane as follows:

- During normal operation with both engines operating, the engines will be fueled with a mixture of approximately 86.5 percent biogas and 13.5 percent natural gas/propane.
- When only one engine is operating, it will only be fueled with biogas.
- During engine start-up and SCR catalyst burn-in, the engine will only be fueled with natural gas/propane, and only one engine will start up at a time.

The CHP engines at the MRF will be fueled with landfill gas or with a mixture of landfill gas and natural gas/propane as follows:

- During normal operation with both engines operating, the engines will be fueled with a mixture of approximately 86.5 percent landfill gas and 13.5 percent natural gas/propane and exhaust through the paper dryer baghouse filter.[4]
- When only one engine is operating, that engine will only be fueled with landfill gas and exhaust through the paper dryer baghouse filter.
- During engine start-up and SCR catalyst burn-in, the engine will only be fueled with natural gas/propane, and only one engine will start up at a time and will exhaust through the paper dryer baghouse filter.

When an engine is brought online after being shut down for maintenance or other reasons, approximately 30 minutes without any removal of CO, ROC, or NO_X would occur before the emission control system reaches operating temperature. Emissions during start-up periods were estimated by multiplying uncontrolled emission factors by the engine horsepower ratings. The system vendor estimates that a maximum of 36 start-ups per year would occur for each CHP engine.

The SCR system vendor estimates that the SCR system catalyst would need to be replaced approximately once every two years. The catalyst is coated with a protective material to avoid damage in shipment. Approximately 120 hours of operation at full engine load is required to burn off the coating. During this period, the control system is anticipated to operate at approximately 50 percent of normal control efficiency, according to the control system vendor.

For the CHP engines at the AD Facility, hourly SO_2 emissions were estimated from the anticipated sulfur content of the biogas, the hourly biogas consumption, provided by the engine manufacturer, and the assumption that all sulfur in the biogas would be converted to SO_2. The biogas would be treated with carbon filters that would reduce the sulfur concentration prior to use by the engines. The vendor's technology provider estimated that the carbon filters would reduce the biogas sulfur content from approximately 200 parts per million by volume (ppmv) to approximately 20 ppmv.

For the CHP engines at the MRF, hourly SO_2 emissions were estimated from the anticipated sulfur content of the landfill gas, the hourly landfill gas consumption, provided by the engine manufacturer, and the assumption that all sulfur in the landfill gas would be converted to SO_2. The landfill gas would be treated with carbon filters that would reduce the sulfur concentration prior to use by the engines. The vendor's technology provider estimated that the carbon filters would reduce the landfill gas sulfur content from approximately 200 parts per million by volume (ppmv) to approximately 22 ppmv.

Maximum daily emissions were estimated based on one engine operating at 100 percent load for 24 hours per day and the other engine operating at 100 percent load for 30 minutes during a start-up and at 100 percent load for 23.5 hours with normal emission control system operation. Annual emissions for each engine were estimated by multiplying estimated hourly emissions by estimated operating hours per year for start-ups (36 startups/year x 0.5 hours/start-up = 18 hours/year), catalyst burn-in (120 hours/year) and normal operations (8,760 hours/year – 18 hours for start-ups – 120 hours/year for catalyst burn-in – 438 hours/year offline for maintenance = 8,184 hours/year).

The CHP engines at the MRF are not included in the emissions summary because they are replacement control equipment for the existing permitted landfill gas collection/control system (which has previously undergone CEQA review). The original LFG collection/ control system, including LFG engine/flare, was assessed quantitatively (emissions and modeling) in the 2002 SEIR for Landfill expansion. The engines at the MRF Facility are not included in the emissions calculation tables as they will replace the existing older engine which emits the same or far more criteria pollutants to burn the same amount of landfill gas as shown in Table 2-2. As required by the SBCAPCD modeling guidelines, these engines were still included in the dispersion modeling

[4] Propane and natural gas have similar emission factors. Combustion of propane in the engines as a startup/assisting fuel in place of natural gas will have minimal effect on emissions. Startup ROC is assumed to increase for propane combustion, as the effectiveness of the oxidation catalyst will be minimized before the engine achieves a higher sustained exhaust temperature. Sulfur content of the propane is based on typical propane contents using HD-5 sulfur content limitations. Emissions from CO, ROC (non-startup), NO_X, PM_{10}, and $PM_{2.5}$ are expected to be similar to natural gas.

conducted for criteria pollutants and the health risk assessment as discussed in Section 3.2.4 and Section 3.3, respectively. This is because the entire landfill stationary source is required to undergo an air quality impact analysis.

3.1.1.2 Emissions from Paper Dryer

The emissions calculated for the LFG fueled CHP engines to be located at the MRF would exhaust through the paper dryer stack during normal operations 24 hours per day, seven days per week in order to dry paper recovered from waste in the MRF building. The paper dryer is equipped with a 99+ percent control efficiency dust collector to capture $PM_{10}/PM_{2.5}$.

3.1.1.3 Emissions from Flares

The flare manufacturer and model have not yet been selected. However, the vendor has indicated that emissions from the flare would be equivalent to a John Zink Model ZTOF flare.

Maximum hourly CO, ROC, NO_X, PM_{10} and $PM_{2.5}$ emissions from the flare were estimated by multiplying emission factors, in pounds per million British thermal units (MMBtu), by the flare heat input, in MMBtu per hour. The CO, NO_X, and particulate matter emission factors were provided by John Zink and the ROC emission factor was the limit specified in SPCAPCD Rule 359.

The AD Facility flare would be operated when the gas in one of the 16 anaerobic digester vessels is purged through the flare prior to opening the vessel to remove the digestate. The exhaust from the two CHP engines would be directed through the vessel during the purging process. However, the flow from the CHP engines' exhaust would not result in additional emissions from the flare combustion because the biogas entering the engines would already have been combusted. The vendor estimates that the purging process is anticipated to last for one hour and to occur 278 times per year. Therefore, the hourly heat input was assumed to be one-sixteenth of the heat input for the two CHP engines when operating at 100 percent load.

The flare would also be operated when one CHP engine is offline at the AD Facility for maintenance or other reasons. The hourly heat input was assumed to be equal to the heat input for one CHP engines when operating at 100 percent load. The vendor estimates that each CHP engine would be offline for five percent of the time during a year, which is equal to 438 hours per year. Based on the experience of the anaerobic digestion system vendor (Bekon) with historical operations of similar systems in Europe, both CHP engines have never been offline at the same time.

Hourly SO_2 emissions were estimated from the anticipated sulfur content of the biogas, the hourly biogas consumption and the assumption that all sulfur in the biogas would be converted to SO_2. The biogas would not be treated prior to combustion in the flare. The vendor's technology provider estimated that the biogas sulfur content would be approximately 200 ppmv. The biogas consumption when an anaerobic digester vessel is purged was assumed to be one-sixteenth of the biogas consumption by the two CHP engines operating at 100 percent load. The biogas consumption when one or both CHP engine(s) is/are offline was assumed to be equal to the biogas consumption when one or both of the CHP engines operating at 100 percent load.

Maximum daily emissions were estimated based on the flare operating for one hour per day between the hours of 8 a.m. and 4 p.m. for anaerobic digester purging plus 24 hours per day with both CHP engines offline. It should be noted that the assumption that both CHP engines would be offline at the same time is a conservative assumption, because only one engine would be taken offline at a time for maintenance. Annual emissions were estimated by the sum of estimated hourly emissions during anaerobic digester purging multiplied by 278 operating hours per year and hourly emissions with two engines offline multiplied by 438 hours per year.

The LFG flare would operate when one LFG fueled CHP engine is out for maintenance or for other reasons. The hourly heat input was assumed to be equal to the heat input for one CHP engines when operating at 100 percent load. The vendor estimates that each CHP engine would be offline for five percent of the time during a year, which is equal to 438 hours per year. Emissions for this flare were calculated using the same methodology described above for the AD Flare.

3.1.1.4 Emissions from Fuel Storage Tank

The methodology applied in the certified Final SEIR continues to apply to the current Project, as revised.

3.1.1.5 Emissions from 150-kW Emergency Generator

The methodology applied in the certified Final SEIR continues to apply to the current Project, as revised.

3.1.1.6 Emissions from Sub-skid Diesel Fuel Storage Tank

The methodology applied in the certified Final SEIR continues to apply to the current Project, as revised.

3.1.1.7 Emissions from Off-Road Equipment

Off-road equipment on the Project site during operation will be located within three areas of the site: the MRF building, the AD Facility building and the Composting Area.

The following is a list of equipment within each of these areas:

- MRF Building:
  - Two Caterpillar 966 M Loaders – 311 horsepower (hp)
  - One Caterpillar 938 K Loader – 169 hp
  - Three Caterpillar 2P-6000 Forklifts – 61 hp
  - One Tennant 800 Sweeper – 65 hp
  - One Caterpillar M322D Material Handler – 173 hp
- AD Facility Building:
  - Two Caterpillar 938 M Loaders – 169 hp
- MRF Perimeter Road:
  - One Tennant M30 Scrubber-Sweeper – 41 hp
- AD Facility Perimeter Road:
  - One Tennant M30 Scrubber-Sweeper – 41 hp
- Composting Area:
  - One Caterpillar 938 K Loader – 169 hp
  - One Backhus A55 Windrow Turner – 235 hp

Hourly CO, ROC, NO_X, PM_{10}, and $PM_{2.5}$ exhaust emissions from each piece of equipment were estimated by multiplying emission factors, in g/bhp-hr, by the engine load factor and horsepower rating. The equipment purchased would be subject to requirements for new off-road equipment engines that meet EPA Tier 4 emission standards. Therefore, the emission factors were assumed to be equal to the Tier 4 standards and the PM_{10} and $PM_{2.5}$ emission factors were assumed to equal the particulate matter emission standards (Title 13, California Code of Regulations, Section 2423). Load factors for the equipment were from ARB's OFFROAD2011 model (ARB 2011a). Air in the MRF and AD Facility buildings will be exhausted through baghouse particulate matter filtration systems located ahead of the biofilters with particulate matter control efficiencies of 99.9 percent, based on manufacturer's specifications. Therefore, a control efficiency of 99.9 percent was applied to PM_{10} and $PM_{2.5}$ emissions from equipment operating in the MRF and AD Facility buildings. Hourly SO_2 emissions were estimated from the sulfur content of diesel fuel and estimates of hourly fuel use provided by the vendor's engineering staff.

Daily emissions were estimated by multiplying hourly emissions by the number of hours per day that each piece of equipment would operate, as estimated by the vendor's engineering staff. Annual emissions were estimated by multiplying daily emissions by the anticipated annual operating days estimated by the vendor's engineering staff.

3.1.1.8 Motor Vehicle Exhaust Emissions

The methodology applied in the certified Final SEIR continues to apply to the current Project, as revised.

3.1.1.9 Fugitive Particulate Matter Emissions from On-site Motor Vehicles

Daily on-site fugitive PM_{10} and $PM_{2.5}$ emissions from vehicles traveling on paved surfaces were estimated by multiplying emission factors, in pounds per VMT, by daily VMT by type of vehicle. The emission factors were calculated using Equation 1 from AP-42 Section 13.2.1, Unpaved Roads (EPA 2011). This equation uses surface silt loading and vehicle weight. The silt loading used was the average value for landfill roads from Section 13.2.1 of AP-42, and the vehicle weights were estimated from vehicle specifications. A control efficiency of 79 percent was applied to the uncontrolled emissions based on requiring the construction contractor to apply water three times per day and to limit vehicle speeds to 15 miles per hour. Applying water three times per day is estimated to reduce uncontrolled emissions by 50 percent, and limiting vehicle speeds to 15 miles per hour is estimated to reduce emissions by 57 percent (WRAP 2006). The resulting combined control efficiency is estimated as [1 - (1-50/100) x (1 - 57/100)] = 79 percent. The daily on-site VMT by type of vehicle that was used to calculate on-site motor vehicle exhaust emissions was also used to calculate fugitive PM_{10} and $PM_{2.5}$ emissions, based on the assumption that on-site motor vehicle travel would be on paved surfaces.

Annual motor vehicle fugitive PM_{10} and $PM_{2.5}$ emissions were estimated by multiplying daily emissions by the number of days per year that the vehicles are anticipated to operate.

3.1.1.10 Fugitive Particulate Matter Emissions from Off-site Motor Vehicles

The methodology applied in the certified Final SEIR continues to apply to the current Project, as revised.

3.1.1.11 Fugitive Particulate Matter Emissions from Material Handling

The methodology applied in the certified Final SEIR continues to apply to the current Project, as revised.

3.1.1.12 Fugitive Particulate Matter Emissions from Compost Screening

The methodology applied in the certified Final SEIR continues to apply to the current Project, as revised.

3.1.1.13 Fugitive Particulate Matter Emissions from Chipping and Grinding

The methodology applied in the certified Final SEIR continues to apply to the current Project, as revised.

3.1.1.14 Fugitive ROC Emissions from Composting Windrows

The methodology applied in the certified Final SEIR continues to apply to the current Project, as revised.

3.1.1.15 Fugitive ROC Emissions from Organic Waste in Anaerobic Digestion Facility

The methodology applied in the certified Final SEIR continues to apply to the current Project, as revised.

3.2 Ambient Air Dispersion Modeling

Ambient air dispersion modeling was used to both determine the impacts of criteria pollutants, and also to provide for the dispersion input files for the Health Risk Assessment (HRA). The methodology utilized for the ambient air dispersion modeling is from the SBCAPCD's Modeling Guidelines for Health Risk Assessments (APCD Form -15i) (SBCAPCD 2017) and EPA's GAQM (EPA 2016). The most recent version of SBCAPCD Modeling Guidance adopts AERMOD as the preferred general purpose (flat and complex terrain) dispersion model.

An important difference between the modeling of the criteria pollutants and the modeling of health risks is the sources that are included. The existing Landfill sources were not included in the air quality impact assessment (AQIA) of the criteria pollutants. Instead of including these sources in the AQIA, the maximum air pollutant background levels that were observed at local monitoring stations were added to the results of the Project modeling. This approach is generally conservative as it accounts for existing emissions at the maximum observed levels. However, an HRA integrates the TAC emissions to determine the overall health impacts. There are no background data for TACs available in this area. Therefore, based on the SBCAPCD modeling guidelines for HRAs (SBCAPCD 2017), emissions of TACs from the existing Landfill sources, projected to post-Project levels, were included in the dispersion modeling that is used as the basis for the HRA model. In other words, only emissions from newly Revised Project equipment and activities were included in the AQIA, while all Tajiguas Landfill sources, both existing and revised, were included in the facility-wide HRA.

Section 3.2.4 gives the Revised Project sources and emissions, and also lists the existing Landfill sources that were included in the HRA.

3.2.1 Overview of Ambient Air Dispersion Modeling

The most recent version of the EPA's AERMOD model (Version 16216r) was used to analyze the impacts from the Revised Project. AERMOD was applied with default options, as described in SBCAPCD Guidance.

The modeling was run on one year (2015) of meteorological data provided by SBCAPCD consisting of surface observations from Las Flores Canyon Site #4, in Goleta, California, and concurrent upper air data from Vandenberg Air Force Base in Vandenberg, California. The 2015 dataset corresponds to the single year that has been processed by the SBCAPCD for modeling. The location of Las Flores Canyon Site #1 relative to the Tajiguas Landfill is shown in Figure 3-1. The wind rose for Las Flores Canyon Site #1 is shown in Figure 3-2.

Based on CEQA requirements, air dispersion modeling was conducted for the Revised Project sources to determine compliance with the NAAQS and CAAQS. Modeling was conducted for the criteria pollutants NO_2, $PM_{2.5}$, PM_{10}, SO_2 and CO. Lead emissions of lead (a criteria pollutant) were assumed to be negligible based on the type of sources associated with the Revised Project and therefore not modeled in this analysis. The modeling conducted involved assessing the air quality impacts of (1) the revised sources associated with the TRRP, and (2) existing maximum monitored background concentrations to represent non-modeled sources in the area. All model input and output files are provided in Appendix C, the electronic modeling archive, to facilitate review of the modeling analyses. The following sub-sections detail the general aspects of the modeling analyses.

3.2.2 Good Engineering Practice Stack Height

Good engineering practice (GEP) stack height is defined as the stack height necessary to ensure that emissions from the stack do not result in excessive concentrations of any air pollutant as a result of atmospheric downwash, wakes or eddy effects created by the source, nearby structures, or terrain features.

A GEP stack height analysis was performed for all revised stacks for each modeling scenario in accordance with EPA's guidelines (EPA 1985). Per the EPA guidelines, the physical GEP height (H_{GEP}) is determined from the dimensions of all buildings which are within the region of influence using the following equation:

$$H_{GEP} = H_B + 1.5L$$

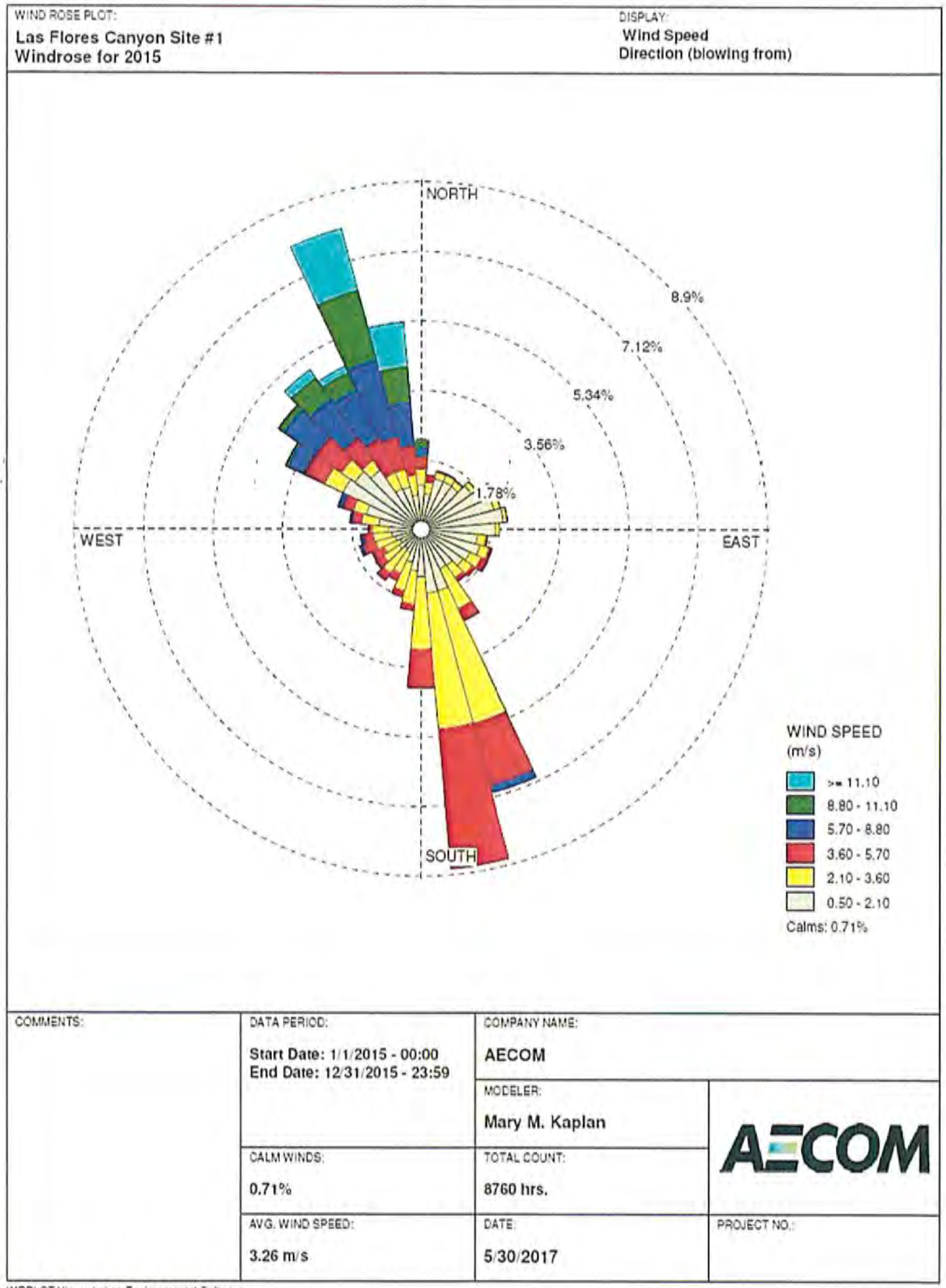
where:

H_B = height of the structure within 5L of the stack which maximizes H_{GEP}, and

L = lesser dimension (height or projected width) of the structure.

Figure 3-1
Relative Locations of Tajiguas Landfill and the Las Flores Canyon Meteorological Site

Figure 3-2
Las Flores Canyon Site #1 2015 Wind Rose



WRPLOT View - Lakes Environmental Software

For a squat structure, i.e., height less than projected width, the formula reduces to:

$$H_{GEP} = 2.5\ H_B$$

In the absence of influencing structures, a "default" GEP stack height is credited up to 65 meters (213 feet).

A summary of the GEP stack height analyses for all TRRP point emission sources is given in Table 3-1. All revised stacks are less than the GEP formula height and therefore potentially subject to building downwash. Wind direction-specific building dimensions for input to ISCST3 were developed with the EPA's Building Profile Input Processor (BPIP-PRIME) for input to ISCST3. The BPIP input and output files are provided in the modeling archive (Appendix C). The buildings included in the BPIP analysis are shown in Figure 3-3 for the revised sources at the MRF Facility and Figure 3-4 for the revised sources at the AD Facility and the existing landfill sources that will be relocated to be close to the ADF building.

Table 3-1
Summary of GEP Analysis for the Revised Tajiguas Landfill Resource Recovery Project

Emission Source	Model Source Name	Stack Height (m)	Controlling Buildings/ Structures	GEP Formula Height (m)
AD CHP Engine 1	ADCHP1	11.582	ADF Building	28.12
AD CHP Engine 2	ADCHP2	11.582	ADF Building	28.12
AD Flare	FLARE	15.240	ADF Building	31.47
MRF CHP Engine 1	MRFCHP1	16.459	MRF Building	39.05
MRF CHP Engine 2	MRFCHP2	16.459	MRF Building	39.05
MRF Flare	MRFFLAR1	15.240	MRF Building	37.83
Paper Dryer	PAPERDRY	16.459	MRF Building	39.05
MRF Equipment Diesel Tank[2]	DSLTANK2	3.100	MRF Building	38.13
Emergency Generator	EMGEN	2.499	MRF Building	39.05
Emergency. Generator. Diesel Tank	EMGENTNK	1.113	MRF Building	39.05
Clear Diesel Tank[1, 2]	CLRDSL	1.60	Red Diesel Tank	9.15
Red Diesel Tank[1, 2]	REDDSL	3.81	Red Diesel Tank	9.15
Unleaded Gas Tank Loading[1, 2]	GASLOAD	3.66	Red Diesel Tank	9.15
Unleaded Gas Tank Breathing[1, 2]	GASBREAT	3.66	Red Diesel Tank	9.15

1 The existing tanks are included in the Health Risk Assessment but not the criteria pollutant modeling.

2 The diesel and gasoline storage tanks emit air toxics only and are, therefore, included in the Health Risk Assessment but not the criteria pollutant modeling.

3.2.3 Receptor Grid

A comprehensive Cartesian receptor grid was developed for use in the AERMOD modeling. The most recent version of EPA's AERMAP terrain processor (version 11103) was used. The grid was centered at the approximate center of the TRRP emission sources and extended out 10 kilometers from that location. The receptors were spaced at the following intervals in accordance with the recommendations in Section 2.8 of the SBCAPCD modeling guidelines:

– 50-m increment along the property line;

– 100-m increment out to 2 kilometers;

Figure 3-3
Revised TRRP Buildings Included in the Project GEP Analysis

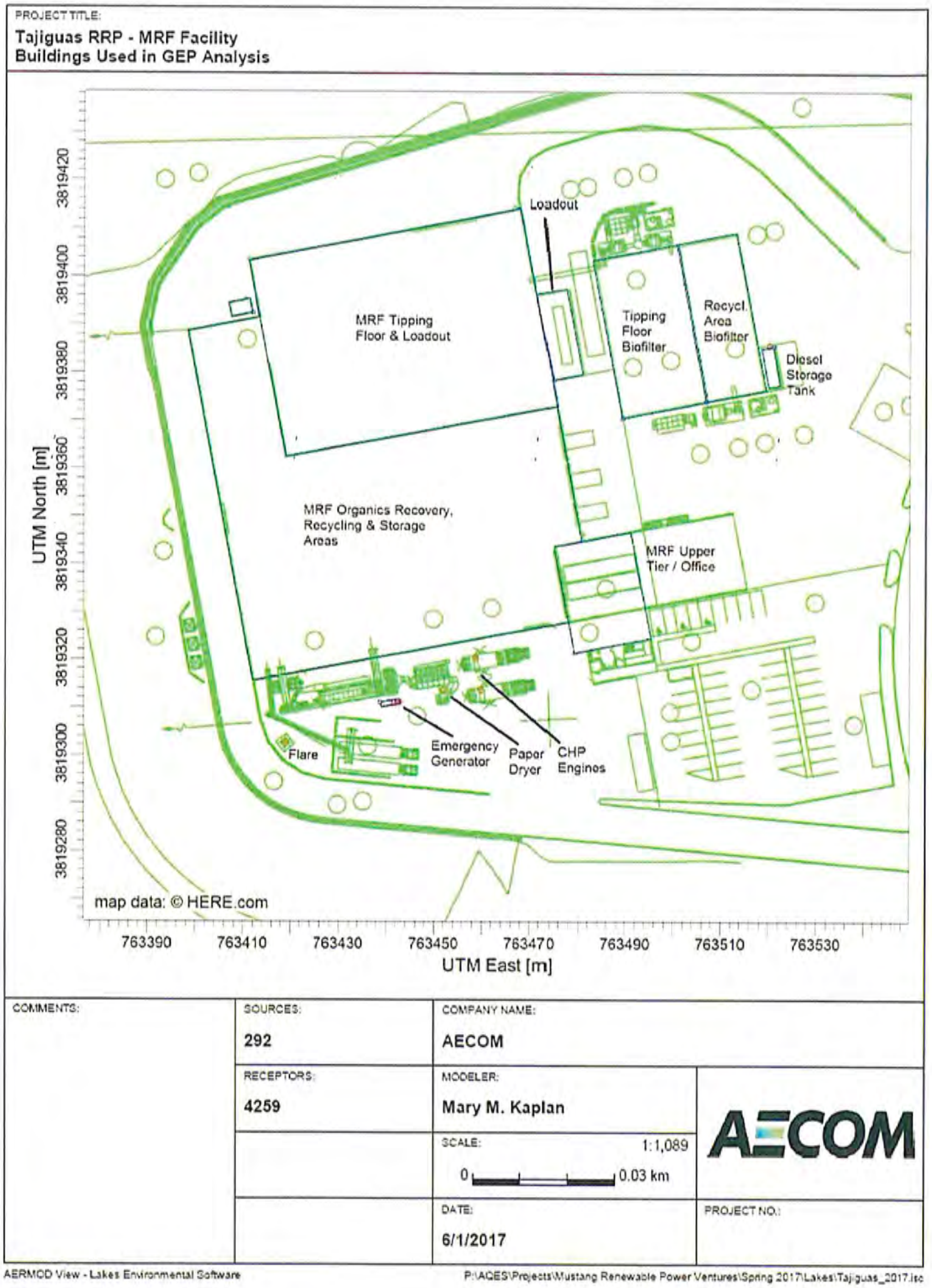
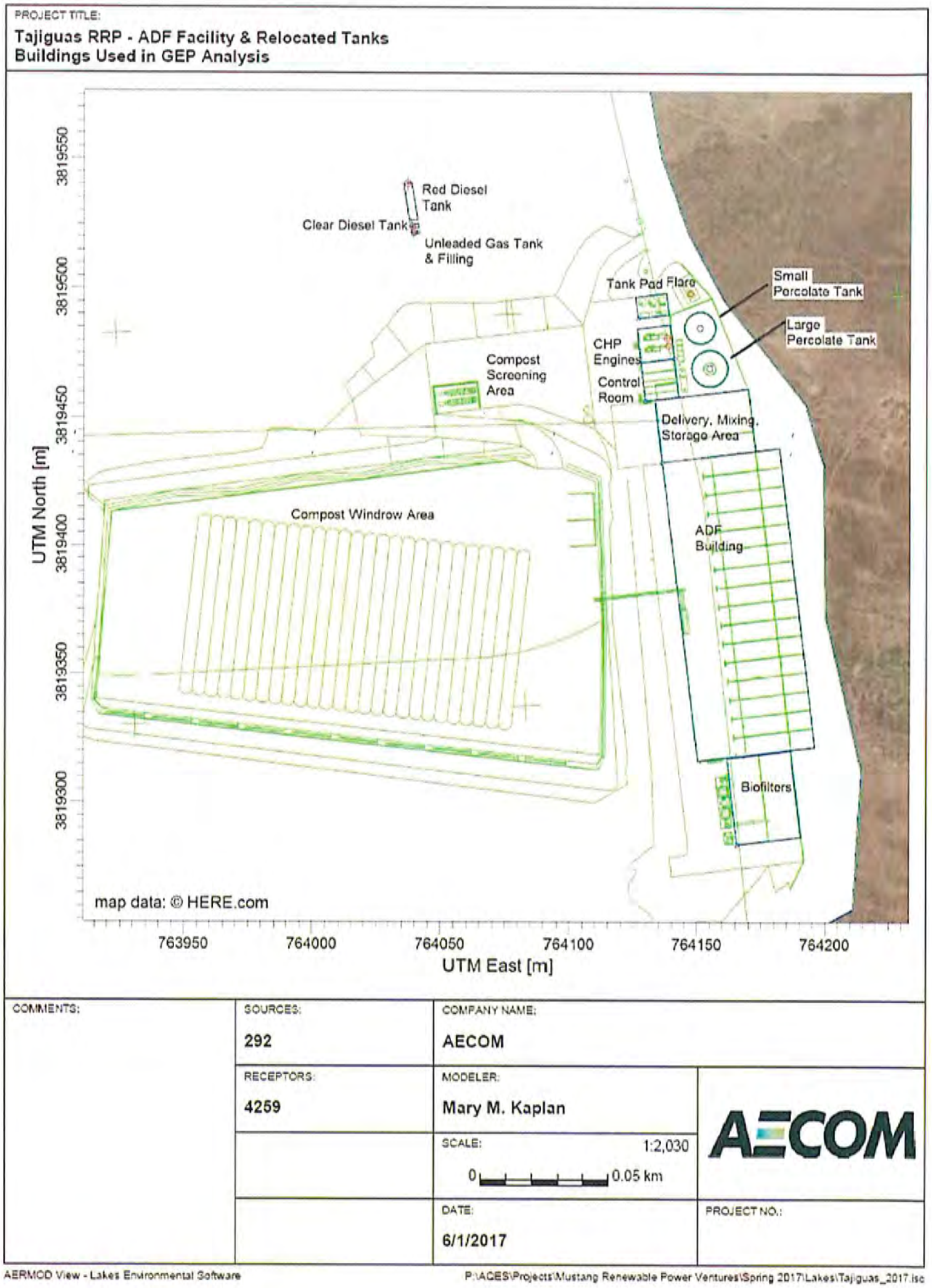


Figure 3-4
Revised ADF Building and Relocated Existing Landfill Sources



- 250-m increment between 2 and 5 kilometers from the property line; and
- 500-m increment between 5 and 10 kilometers from the property line.

All receptor coordinates were in NAD83, UTM Zone 10. A total of 4,252 receptors were used in the analysis. The receptor grid used in the analysis is shown in Figure 3-5. For HARP modeling, the same receptor grid was used with a flagpole height of 1.5 meters.

3.2.4 Sources and Emission Data

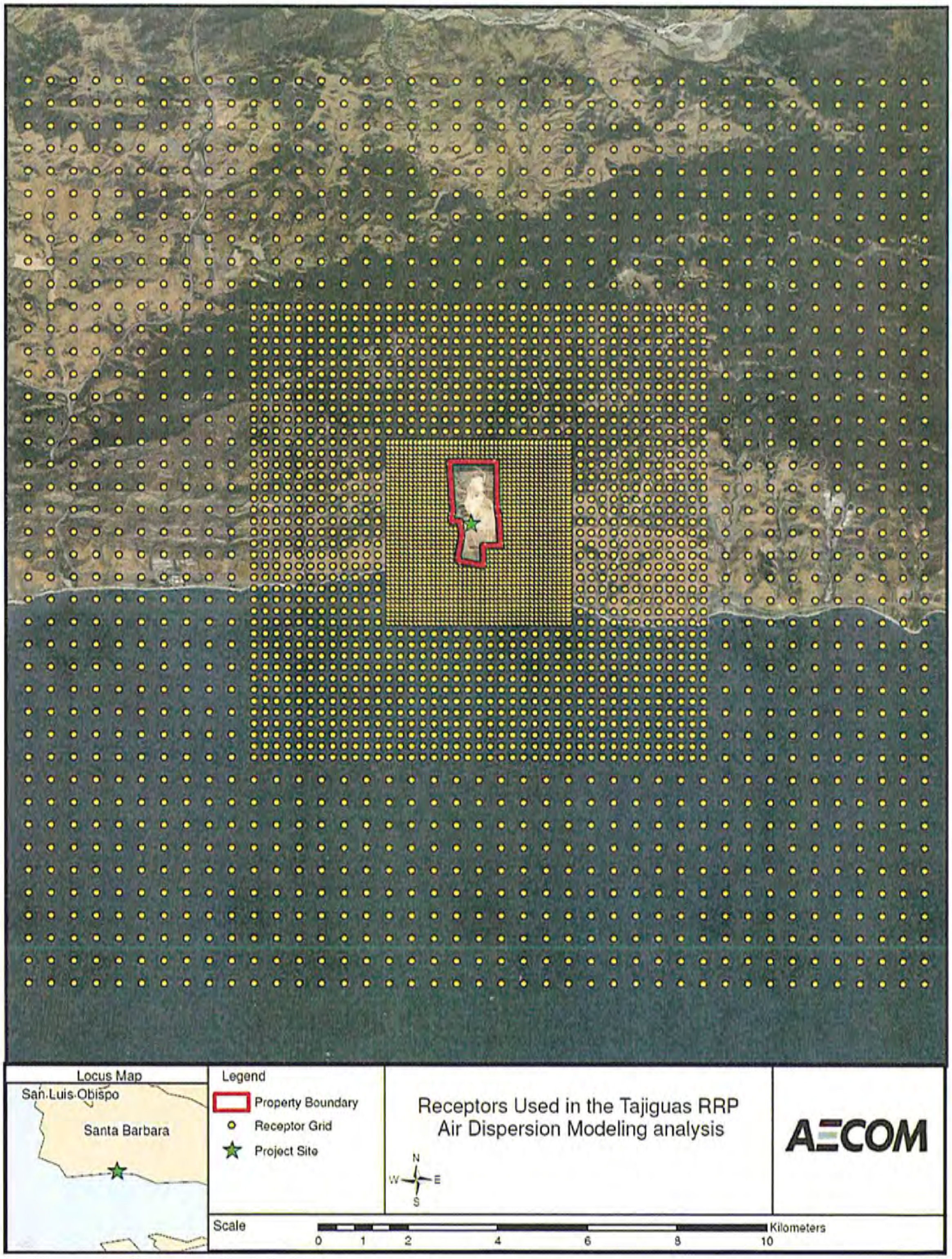
All emission sources associated with the revised TRRP were included in the criteria pollutant modeling and all sources from revised TRRP and the existing Landfill operations were included in the HRA at their future emission rates if the Project is built. These Project sources include combustion related emission sources located at the MRF and AD buildings as well as vehicular, material handling, and fugitive emission sources located near the MRF and AD buildings, the existing and future landfill activities, composting area, and the connecting roads. The following provides a description of the revised TRRP sources. Appendix C contains the characteristics of the point, volume and area sources. Short term and annual emissions for each source are provided in Appendix A.

3.2.4.1 Point Sources

A description of the point sources follows:

- AD Combined Heat and Power Engine (Source: ADCHP1): This source represents the first AD CHP engine stack that will burn biogas.
- AD Combined Heat and Power Engine (Source: ADCHP2): This source represents the second AD CHP engine stack that will burn biogas.
- AD Flare (Source: ADFLARE): This source represents the biogas flare. The flare will operate no more than 1 hour per day during the daytime (8 a.m. to 4 p.m.). For those short-term modeling standards that are longer than 1 hour (3-hour SO_2, 8-hour CO, and 24-hour SO_2, PM_{10}, and $PM_{2.5}$), the emission rate determined for the short-term modeling was divided by the number of hours in the averaging period to simulate that the flare will only operate for 1 hour on any given day. In order to account for the flare operating only during daytime hours, the source was active in the modeling during the period from 8 a.m. to 8 p.m. each day.
- MRF Combined Heat and Power Engine (Source: MRFCHP1): This source represents the first MRF CHP engine stack that will burn landfill gas only in the rare episodic event when the engine the paper dryer baghouse filter is down for maintenance. This engine replaces the existing landfill gas engine.
- MRF Flare (Source: MRFFLAR1): This source represents the landfill flare that replaces the existing landfill flare.
- Paper Dryer (Source: PAPERDRY): This source represents the paper dryer stack. It is assumed that the dryer will operate 16 hours per day, six days per week but the CHP engines will exhaust through the baghouse filter 24 hours per day, seven days per week. It is equipped with a downstream HEPA dust collector that is 99 percent efficient for PM_{10} and $PM_{2.5}$.
- MRF Combined Heat and Power Engine (Source: MRFCHP2): This source represents the second MRF CHP engine stack that will burn landfill gas only in the rare episodic event when the paper dryer baghouse filter is down for maintenance. This engine replaces the existing landfill gas engine.
- Diesel Storage Tank (Source: DSLTNK2): This diesel storage tank is used for the MRF sources.
- Emergency Generator (Source: EMGEN): This source represents the emergency generator stack. This emergency generator is needed for critical life safety systems. It is assumed that the generator will operate 30 minutes per week for testing for a total of 26 hours/year. In order to minimize impacts, the testing would be done in the daytime, and testing emissions are limited in the AQIA and HRA to occurring between 10 am and 4 pm.

Figure 3-5
Receptor Grid used in TRRP AERMOD Analysis



- Emergency Generator Diesel Tank (Source: EMGENTNK): This emergency generator diesel tank is used for the emergency generator.
- Gasoline Storage Tank Loading (Source: GASLOAD): This gasoline storage tank is used for Landfill operations.
- Gasoline Storage Tank Breathing (Source: GASBREAT): This gasoline storage tank is used for Landfill operations.
- Clear Diesel Storage Tank (Source: CLRDSL): This clear diesel storage tank is used for Landfill operations.
- Red Diesel Storage Tank (Source: REDDSL): This red diesel fuel storage tank is used for Landfill operations.

3.2.4.2 Volume and Road Sources

Road sources were developed to represent vehicular traffic related to the TRRP on Landfill property for the criteria pollutant modeling and for all vehicular traffic relating to post-Project operations for the entire Landfill for the HRA. The roads were represented by lines of volume sources, each having the following characteristics, calculated using the haul road configuration tool based on the Haul Road Workgroup Final Report Submission to EPA Office of Air Quality Planning and Standards (EPA OAQPS 2012) in the Lakes Environmental AERMOD View software:

- The sources were assumed to be adjacent, elevated sources.
- Vehicle height was assumed to be 12 feet (3.66 m).
- Plume height, equal to vehicle height (3.66 m) x 1.7 (top of plume height per haul road report) = 6.22 m.
- Release height = Plume height / 2 = 3.11 m.
- Initial Sigma-z = Plume height / 2.15 = 2.89 m.
- Lane type = 2 lanes, road width = 30 feet (9.14 m).
- Plume width = Road width + 6 m = 15.14 m.
- Initial Sigma-Y = Plume width / 2.15 = 7.04 m.

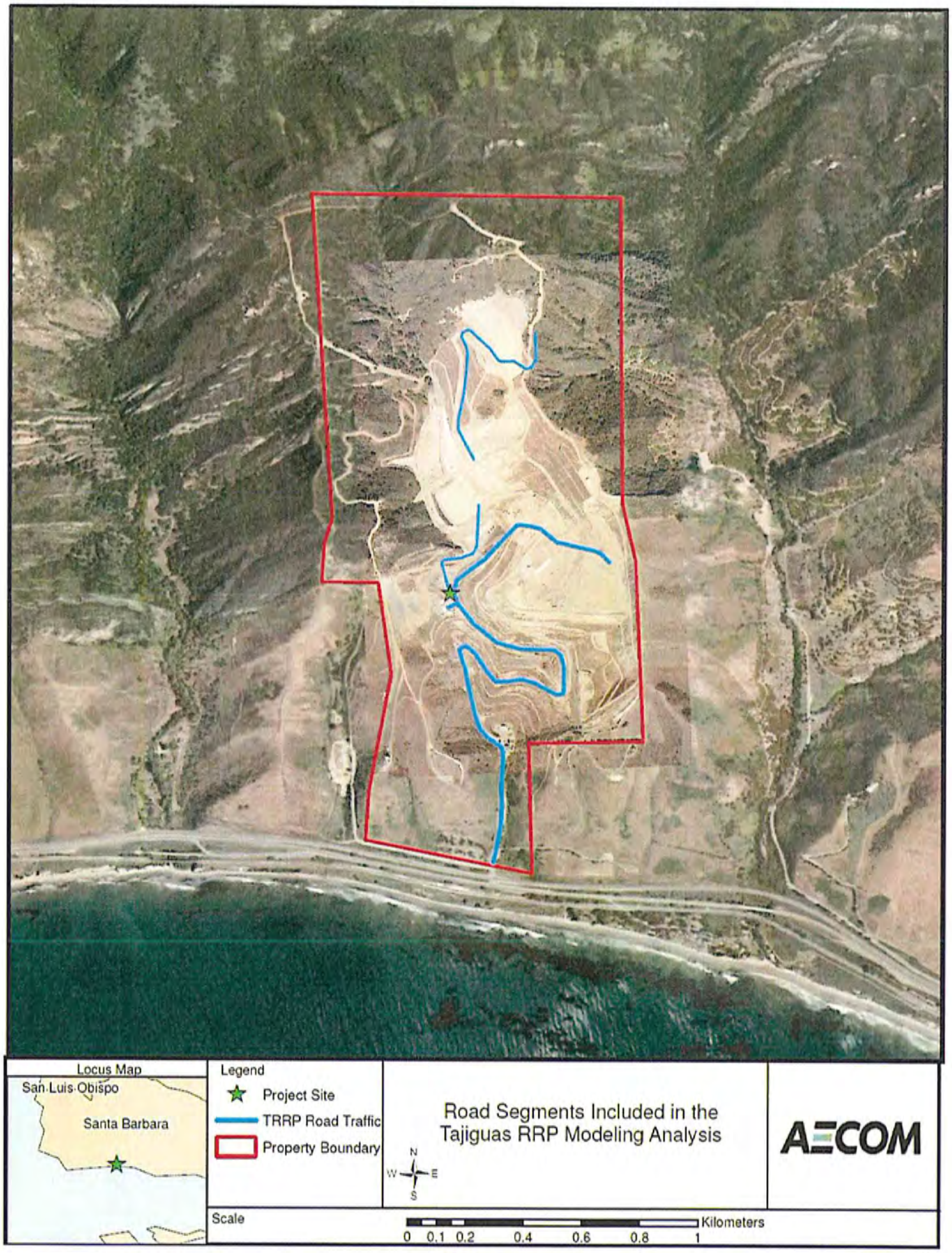
Four road segments, as shown in Figure 3-6, were created to represent vehicular traffic at the landfill. There are two sources of road emissions: vehicular exhaust and fugitive dust. As part of the project, the road from the MRF to AD Building and Compost area will be paved. The following descriptions address details for the four specific road segments:

- **MRFENTRY (Sources ROAD0048-ROAD0166).** These sources represent emissions of vehicular traffic on a paved road from the entrance to the landfill off Route 101 to the MRF Building. Traffic related to the Project will travel from 8 a.m. to 2 p.m., while additional landfill traffic will travel on this road from 7 a.m. to 5 p.m.
- **MRFCOMP (Sources ROAD0001-ROAD0047, ROAD0165-166).** These sources represent emissions on a paved road of the vehicular traffic from the MRF Building to the compost delivery area. Traffic on this road will occur during the hours of 8 a.m. to 2 p.m.
- **HAUL (Sources HL005579-HL005604).** These sources represent emissions of vehicular traffic on an unpaved road from the MRF Building to the Trash Fill area. Traffic on this road will occur during the hours of 7 a.m. to 5 p.m.
- **SCRAPER (Sources SC005663-SC005720).** These sources represent emissions of scraper transporting materials on an unpaved road from the Trash Fill area to the Daily Cover Cut Area and North Stockpile. The scraper will operate during the hours of 7 a.m. to 5 p.m.

Four other sources are modeled as volume sources since they generate only fugitive emissions:

- **Chipper/Grinder (Source: CHIPPER).** This source represents the chipping and grinding of materials in the composting area. It has an electric motor and thus generates PM_{10} and $PM_{2.5}$ only as fugitive emissions from the chipping and grinding activity. The chipper will operate during the hours of 9 a.m. to 12 p.m.

Figure 3-6
Road Sources Included in the TRRP Air Dispersion Modeling



- **Green Waste Grinder (Source: GWGRIND).** This source represents the grinding of materials in the green waste area of the existing landfill. This grinder operates during the hours of 7 a.m. to 5 p.m.
- **Gasoline Tank Refueling (Source: GASREFU).** This source represents the refueling of the on-site gasoline tank modeled with parameters outlined in Form 25T.
- **Gasoline Tank Spillage (Source: GASSPILL).** This source represents the spillage of gasoline at the gasoline tank modeled with parameters outlined in Form 25T.

3.2.4.2 Area Sources

The following descriptions address area sources used in the dispersion modeling analysis:

- **MRF Tipping Area Biofilter (Source BFTIPDPM):** This source represents emissions from the tipping area in the MRF building vented through the biofilter that is 60 feet wide, 110 feet long and 9 feet deep at ground level. This source is assumed to be active for 16 hours/day, from 7 a.m. to 11 p.m. for all pieces of equipment except the sweeper, which is assumed to operate 24 hours/day. The initial sigma-z to represent the plume turbulence was calculated based on the volume source calculation for a source on or adjacent to a building, using the adjacent roof height next to the biofilter: Building height is 49 feet (14.94 m) / 2.15 = 22.8 feet (6.95 m).
- **MRF Tipping Area Biofilter (Source BFTIPTAC):** This source represents emissions from the tipping area in the MRF building vented through the biofilter that is 60 feet wide, 110 feet long and 9 feet deep at ground level. This source is assumed to be active for 24 hours/day, for the fugitive ROC emissions from processing material. The initial sigma-z to represent the plume turbulence was calculated based on the volume source calculation for a source on or adjacent to a building, using the adjacent roof height next to the biofilter: Building height is 49 feet (14.94 m) / 2.15 = 22.8 feet (6.95) m.
- **AD Facility Biofilters (Sources BFADDPM).** This source represents emissions from the two AD Facility biofilters. The emissions are distributed based on the area of the sources between the two biofilters. These sources are located south of the AD Facility building. The initial sigma-z to represent the plume turbulence was calculated based on the volume source calculation for a source on or adjacent to a building, using the additional roof height above the biofilter as the side of the building: Building height is 27 feet (8.2 m) / 2.15 = 12.6 feet (3.8 m). These sources are assumed to be active for 6 hours per day, from 8 a.m. to 2 p.m., which is the time period when mobile sources would be operating and generating emissions inside the AD Facility.
- **AD Facility Biofilters (Sources BFADTAC).** This source represents emissions from the two AD Facility biofilters. The emissions are distributed based on the area of the sources between the two biofilters. These sources are assumed to be active for 24 hours/day, for the fugitive ROC emissions from processing material. These sources are located south of the AD Facility building. The initial sigma-z to represent the plume turbulence was calculated based on the volume source calculation for a source on or adjacent to a building, using the additional roof height above the biofilter as the side of the building: Building height is 27 feet (8.2 m) / 2.15 = 12.6 feet (3.8 m).
- **MRF Recycling Area Biofilter (Source BFRECDPM).** This source represents emissions from the MRF building biofilter for the recycling area. This source is 42 feet wide, 110 feet long and 9 feet deep. The initial sigma-z to represent the plume turbulence was calculated based on the volume source calculation for a source on or adjacent to a building, using the additional roof height above the biofilter as the side of the building: Building height is 49 feet (14.94 m) / 2.15 = 22.8 feet (6.95) m. These sources are assumed to be active for 8 hours per day, from 8 a.m. to 4 p.m.
- **MRF Recycling Area Biofilter (Source BFRECTAC).**This source represents emissions from the MRF building biofilter for the recycling area. This source is 42 feet wide, 110 feet long and 9 feet deep. This source is assumed to be active for 24 hours/day, for the fugitive ROC emissions from processing material. The initial sigma-z to represent the plume turbulence was calculated based on the volume source calculation for a source on or adjacent to a building, using the additional roof height above the biofilter as the side of the building: Building height is 49 feet (14.94 m) / 2.15 = 22.8 feet (6.95) m.
- **Outdoor sweeper (Sources MRFSWP1 and MRFSWP2).** This source represents emissions from the Tennant M30 Scrubber-Sweeper that will be used around the MRF building to sweep road dust and debris. The initial sigma-z to represent the plume turbulence was calculated based on the volume source calculation for a source on or adjacent to a

building, using the adjacent building height: Building height is 51 feet (15.54 m) / 2.15 = 23.7 feet (7.23 m). These sources are assumed to be active for 6 hours per day, from 11 a.m. to 5 p.m.

- **Outdoor sweeper (Source ADSWEEP).** This source represents emissions from the Tennant M30 Scrubber-Sweeper that will be used around the AD building to sweep road dust and debris. The initial sigma-z to represent the plume turbulence was calculated based on the volume source calculation for a source on or adjacent to a building, using the adjacent building height: Building height is 27 feet (8.2 m) / 2.15 = 12.6 feet (3.8 m). These sources are assumed to be active for 6 hours per day, from 11 a.m. to 5 p.m.
- **Windrow / Composting Area: (Source: WNDRWDPM).** This source represents equipment and fugitive emissions occurring in the composting area including the turning of windrows, material transfer to the curing pile, etc. The initial sigma-z was based on an equipment height of 13 feet (3.93 m) / 2.15 = 6 feet (1.83 m). The emissions from the windrow turning operations and fugitive dust are assumed to occur 8 hours per day from 8 a.m. – 4 p.m.
- **Windrow / Composting Area: (Source: WNDRWTAC).** This source represents fugitive emissions occurring in the composting area. The initial sigma-z was based on an equipment height of 13 feet (3.93 m) / 2.15 = 6 feet (1.83 m). The fugitive emissions occur 24 hours per day.
- **Composting Delivery Area (Source: COMPMAT).** This source represents vehicular and fugitive emissions in the compost delivery area. Sources include the fugitive emissions from compost screening, compost to curing pile transfer, compost into truck transfer, and wood grinding operations. The initial sigma-z was based on an equipment height of 13 feet (3.93 m) / 2.15 = 6 feet (1.83 m). The daily hours of operation are 8 a.m. – 4 p.m.
- **Trash Fill Area (Source: TRSHFILL).** This source represents the vehicle exhaust and fugitive emissions generated by the trash compactors and bulldozers in this area. The daily hours of operation for this equipment are 7 a.m. to 5 p.m.
- **Green Waste Area (Source: GRNWASTE).** This source represents the vehicle exhaust and fugitive emissions generated by the wheeled loaders in this area. The daily hours of operation for this equipment are 7 a.m. to 5 p.m.
- **Landfill Main Operational Area (Source: LFMAINOP).** This source represents the vehicle exhaust and fugitive emissions generated by the motor graders, backhoe loader, hydraulic excavator, wheeled tractor mower, wheeled loaders, small off-road trucks, water trucks and fuel truck. The daily hours of operation for this equipment are 7 a.m. to 5 p.m.
- **Daily Cover Cut Area and North Stockpile (Source: AREA6N7).** This source represents the vehicle exhaust and fugitive emissions from the bulldozers maintaining these areas. The daily hours of operation for this equipment are 7 a.m. to 5 p.m.
- **Landfill Gas Fugitives (Source: LFGFUG).** This source represents the landfill gas fugitive emissions not routed to the engines or flares.

3.2.5 NO_2 Modeling

On December 20, 2016, EPA released an updated version of Appendix W with guidance for the modeling of the 1-hour NO_2 and Annual NAAQS. Appendix W presents a tiered approach for modeling NO_2 from NO_X emissions that provides for increased levels of refinement:

- Tier 1: full conversion of NO_X-to-NO_2
- Tier 2: use of ARM2 as an ambient ratio of NO_2-to-NO_X for the 1-hour and annual NO_2 standard
- Tier 3: apply the ozone limiting method (OLM) or Plume Volume Molar Ratio Method (PVMRM)

For 1-hour and annual NO_2 NAAQS and CAAQS modeling for all operating scenarios, the Tier 2 refinement approach was applied. Additionally, because only one year of meteorological data was provided by the agency, the 98th percentile of the hourly modeled concentrations, rather than the 3-year average of the 98th percentile daily maxima, is reported.

3.2.6 Short-term Operation Emissions Scenarios

Emissions of NO_X, CO, and SO_X will be higher than normal during certain short-term operations. Five additional scenarios were modeled for determining maximum short-term impacts of these criteria pollutants:

1. The flare combusting the landfill gas/biogas while one CHP engines is offline
2. Start-up of one AD CHP engine while the second is in normal operating mode
3. SCR burn-in on one AD CHP engine while the second is in normal operating mode
4. Start-up of one MRF CHP engine while the second is in normal operating mode
5. SCR burn-in on one MRF CHP engine while the second is in normal operating mode

Short-term NO_X, CO, and SO_X emissions were evaluated for these scenarios because 1) the flare is a higher emitting source of these pollutants than the CHP engines; 2) NO_X and CO control technologies (i.e., SCR and oxidation catalyst) are not as efficient at reducing emissions during startup as the SCR and oxidation catalyst must first reach an optimum temperature for the catalytic reactions to occur; and 3) the SCR catalyst system will need to be replaced about once every two years, and it takes about 120 hours to break in (burn off) the protective coating on the new SCR replacement catalyst, which, similar to start-up, has lower control efficiency during these events. Further, there are very stringent short-term NO_2 NAAQS and CAAQS that warrant these additional analyses.

Although these scenarios will occur infrequently (i.e., each CHP engine is anticipated to be offline five percent of the time, each engine is anticipated to be started-up 36 times per year and catalyst replacement is anticipated to occur once every 18 months to two years), they can be planned and are not considered to be upsets, and hence were evaluated in order to ensure maximum impacts were determined.

In order to most effectively mitigate the emissions during the SCR burn-in period, the Project operator would not use landfill gas (LFG) to fuel the engine during this activity. Instead, only propane from the existing propane tank will be used or natural gas, if it is available in the future. Natural gas would be used as fuel to ensure the minimum criteria pollutant emissions during the SCR burn-in period. Bekon Energy Technology provided the flare purging emissions mitigation guidance based on their experience with 20 operating anaerobic digestion facilities in Europe. An SCR manufacturer (Stueller Technology) provided the CHP engine start-up and SCR burn-in emission effectiveness parameters and SCR burn-in emission mitigation guidance.

3.2.7 Ambient Air Impact Criteria

The NAAQS and CAAQS are health standards which have been implemented to protect the public, and hence constitute the criteria by which impacts are judged. These standards are summarized for each pollutant and averaging period that was analyzed for this Report in Table 3-2.

Table 3-2
Ambient Air Impact Criteria ($\mu g/m^3$) for Project Modeling

Pollutant	Averaging Period	NAAQS		CAAQS
		Primary	Secondary	Primary
NO_2	1-hour	188	–	339
	Annual	100	100	57
CO	1-hour	40,000	–	23,000
	8-hour	10,000	–	10,000

Pollutant	Averaging Period	NAAQS		CAAQS
		Primary	Secondary	Primary
PM_{10}	24-hour	150	150	50
	Annual	–	–	20
$PM_{2.5}$	24-hour	35	35	
	Annual	12.0	15	12
SO_2	1-hour	196	–	655
	1-hour	188	–	105
	Annual	80	–	–

3.2.7.1 *Representative Ambient Background Concentrations*

For the Revised Project analysis, the appropriate ambient background for each pollutant was added to the modeled impacts from the Project to account for impacts from non-Project sources since there were no other sources in the immediate vicinity of the Project. The background concentrations for the years 2013 through 2015 used in this revised analysis are summarized in Table 3-3. CO, 1-hour NO_2 and SO_2 (CAAQS), 3-hour and 24-hour SO_2, annual NO_2 and SO_2, 24-hour and annual PM_{10} and annual $PM_{2.5}$ values are the maximum concentration over the three year period. The PM_{10} maximum concentration in 2013 is very close to or equal to the CAAQS. There was one day measured at the CAAQS in 2013 and the next highest 24 concentration was at 45 µg/m^3. The 2016 data were not used as the maximum concentrations were above the CAAQS due to nearby wildfires. These exceptional events have yet to be removed from the dataset. The 1-hour NO_2 and 24-hour $PM_{2.5}$ (NAAQS) values are the 98th percentile for each year averaged over the three year period. The 1-hour SO_2 (NAAQS) values are the 99th percentile for each year averaged over the 3-year period. The relative locations of the Tajiguas Landfill and the monitors used in the modeling are shown in Figure 3-7.

Table 3-3
Ambient Background Concentrations[1]

Pollutant	Averaging Period	Concentration (ppm)			Concentration (µg/m^3)			Background (µg/m^3)
		2013	2014	2015	2013	2014	2015	
CO	1 hour	0.6	0.5	0.4	689.66	574.71	459.77	689.7
	8 hour	0.5	0.4	0.3	574.71	459.77	344.83	574.7
NO_2	1 hour (NAAQS)	0.016	0.004	0.007	30.1	7.5	13.2	16.9
	1 hour (CAAQS)	0.023	0.013	0.011	43.3	24.5	20.7	43.3
	Annual	0.002	0.001	0.001	3.8	2.6	1.2	3.8
SO_2	1 hour (NAAQS)	0.038	0.015	0.005	99.6	39.3	13.1	50.7
	1 hour (CAAQS)	0.083	0.111	0.025	217.5	290.8	65.5	290.8
	24 hour	0.0138	0.0081	0.0018	36.2	21.2	4.7	36.2
	Annual	0.000	0.000	0.000	1.1	0.5	0.3	1.1
PM_{10}	24 hour	–	–	–	50.0	44.0	39.0	50.0
	Annual	–	–	–	19.0	18.6	17.3	19.0
$PM_{2.5}$	24 hour (NAAQS)	–	–	–	16.0	17.0	18.0	17.0
	Annual	–	–	–	9.2	7.8	9.2	9.2

[1] All data taken from the EPA AIRS database: https://www.epa.gov/outdoor-air-quality-data. All values are from the Las Flores Canyon Site #1 monitor, except 24-hour and annual $PM_{2.5}$ which are taken from 700 E. Canon Perdido, Santa Barbara, and Goleta – Fairview, respectively. Santa Barbara was used for 24-hour $PM_{2.5}$ because it was the only monitor nearby with data in the form of the $PM_{2.5}$ 24-hour NAAQS (98th percentile). The Las Flores Canyon Site #1 station does not monitor $PM_{2.5}$.

Figure 3-7
Relative Locations of Tajiguas Landfill and Ambient Air Quality Monitors

3.2.7.2 *Health Risk Assessment*

As discussed in Section 3.2.1, the existing Landfill sources as well as the Revised Project sources were analyzed in the HRA.

3.2.7.3 *Toxic Air Contaminant Emission Calculation Methodology*

TACs would be emitted from the following on-site sources during operation of the Tajiguas Landfill including existing and revised sources:

- Revised and proposed CHP engines;
- Revised Paper Dryer;
- Revised composting windrows;
- Revised MRF and AD Facility biofilters;
- Revised screen;
- Revised emergency diesel generator;
- Revised diesel fuel tanks;
- Revised and proposed flares;
- Existing and revised diesel-fueled engines in equipment and motor vehicles;
- Existing and revised diesel fuel storage tanks;
- Existing and revised chipping and grinding equipment;
- Existing Landfill gas fugitives; and
- Existing gasoline fuel storage tank.

Details of the TAC emission calculations for the Revised Project are presented in Appendix A while TAC emission calculations for the existing Landfill sources are presented in Appendix B.

3.2.7.4 *Methodology for TAC Emissions from CHP Engines*

TACs contained in the biogas and landfill gas that are not completely combusted to carbon dioxide in the engines would be emitted in the engines' exhausts. Additionally, ammonia, produced from urea, would be used as a reactant in the SCR systems controlling NO_X emissions from the engines. Excess ammonia would be used in the system to achieve adequate NO_X reduction, which would result in unreacted ammonia being emitted in the SCR systems' exhausts.

Hourly TAC emissions in the engines' exhausts from incomplete biogas or landfill gas combustion were estimated based on the emission factors presented in the SBCAPCD approved emission factors for LFG-fired IC engines equipped with an oxidation catalyst. Hourly TAC emissions from the CHP engines were calculated by multiplying the emission factor (lb/MMcf) with the hourly LFG usage (MMcf/hour). Annual TAC emissions from the CHP engines were estimated by multiplying the emission factor (lb/MMcf) with the annual LFG usage (MMcf/year). The annual LFG usage was estimated by multiplying the hourly fuel usage by the operating hours per year. The MRF CHP exhausts will be diverted to the paper dryer 24 hours per day, 7 days per week and will exit the paper dryer stack.

Hourly ammonia emissions in the SCR systems' exhausts were estimated from the ammonia concentration in the exhaust specified by the SCR system manufacturer and the SCR system exhaust flow rate.

Annual ammonia emissions from the CHP engines were estimated by multiplying the hourly emissions (lb/hour) by the estimated annual hours of operation (hours/year), which in turn were calculated as the ratio of annual biogas and landfill gas combusted in the engines to the hourly biogas and landfill gas combustion rate in the engines.

3.2.7.5 Methodology for TAC Emissions from Flares

TACs contained in the biogas and landfill gasses that are not completely combusted to carbon dioxide in the flare would be emitted in the flare exhaust. TAC emissions from the flare were estimated based on emission factors from a source test of a flare combusting LFG at the Santa Maria Landfill from September 9 to 11, 2010 and from emission factors presented in the California Air Toxic Emission Factor (CATEF) database, updated December 7, 2000 for flares fired on LFG. This choice of emission factors is based on the assumption that biogas is similar in composition to landfill gas. The CATEF database presents mean, median and maximum emission factors for all California air toxics emitted by LFG-fired IC engines. The maximum CATEF emission factors were used for TACs that were not measured during the source test at the Santa Maria Landfill. Hourly TAC emissions were estimated by multiplying the emission factors (lb/MMscf) by the maximum hourly rating of the flare (MMscf).

Annual TAC emissions from the flare were estimated by multiplying the emission factors by the annual flare biogas use. The annual flare biogas use was calculated by adding the annual biogas use during AD vessel purging (1/16 of flow to both CHP engines x number of annual vessel purges) to the annual biogas use when CHP engines are offline (flow to each CHP engine at 100 percent load x hours each engine is offline x 2 engines).

3.2.7.6 Methodology for TAC Emissions from Revised Project Diesel-fueled Engines

The methodology applied in the certified Final SEIR continues to apply to the current Project, as revised.

3.2.7.7 Methodology for TAC Emissions from Diesel and Gasoline Fuel Storage Tanks

The methodology applied in the certified Final SEIR continues to apply to the current Project, as revised.

3.2.7.8 Methodology for TAC Emissions from Composting Windrows

The methodology applied in the certified Final SEIR continues to apply to the current Project, as revised.

3.2.7.9 Methodology for Fugitive TAC Fugitive Emissions from Organic Waste in Anaerobic Digestion Facility Building

The methodology applied in the certified Final SEIR continues to apply to the current Project, as revised.

3.2.7.10 Methodology for TAC Emissions from Existing Diesel-fueled Engines

The methodology applied in the certified Final SEIR continues to apply to the current Project, as revised.

3.2.7.11 Methodology for TAC Emissions from Existing Landfill Gas Fugitives

The methodology applied in the certified Final SEIR continues to apply to the current Project, as revised.

3.2.7.12 Methodology for Evaluating Cancer Risk and Non-cancer Health Hazards

The Health Risk Assessment (HRA) evaluated the TRRP and the entire facility for cancer risk and both acute and chronic non-cancer health hazards. Figures 3-8 and 3-9 show the sources assessed in the Project-only and facility-wide HRAs, respectively. The health risk methodology is based on the OEHHA Guidance Manual (2015). The latest OEHHA cancer potency factors and chronic and acute RELs for each TAC were used. The approved health values are incorporated into HARP2 Version 17052. Carcinogenic risks and potential non-carcinogenic chronic health effects were calculated using the annual concentrations at the flagpole height of 1.5 meters while the acute non-cancer health hazards were determined using the predicted maximum 1-hour concentrations at 1.5 meters above ground-level. The HARP2 software performs the necessary risk calculations following the OEHHA Risk Assessment Guidelines and the ARB Interim Risk Management Policy for risk management decisions.

3.2.7.11 HARP Model Input Options and Pathways

The following HARP2 modeling options were used for the risk analysis to estimate cancer and non-cancer impacts at the maximum impact location on the same receptor grid (Figure 3-5) as the criteria pollutant modeling. AECOM plotted the

Figure 3-8
Revised TRRP Sources Modeled in the HRA

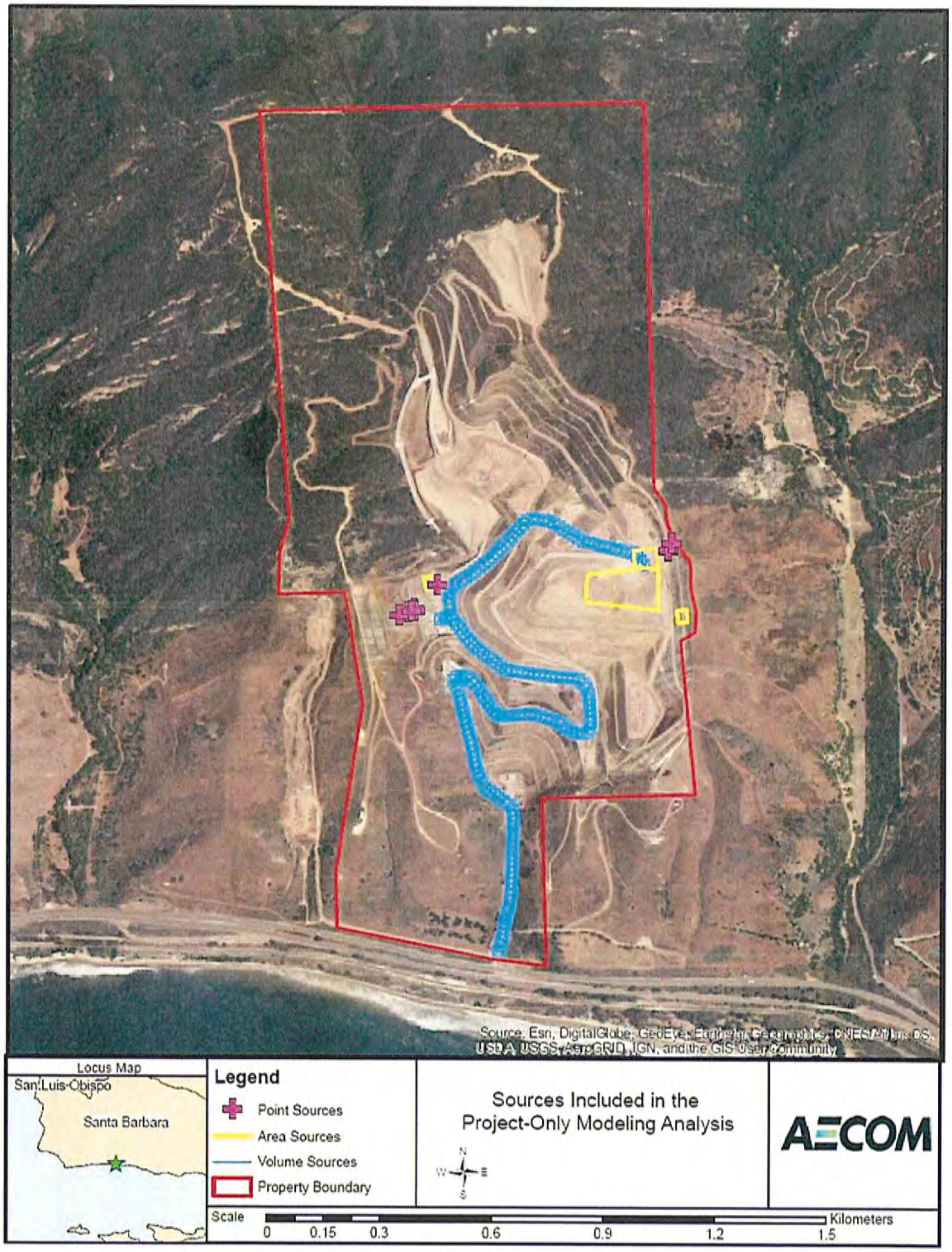
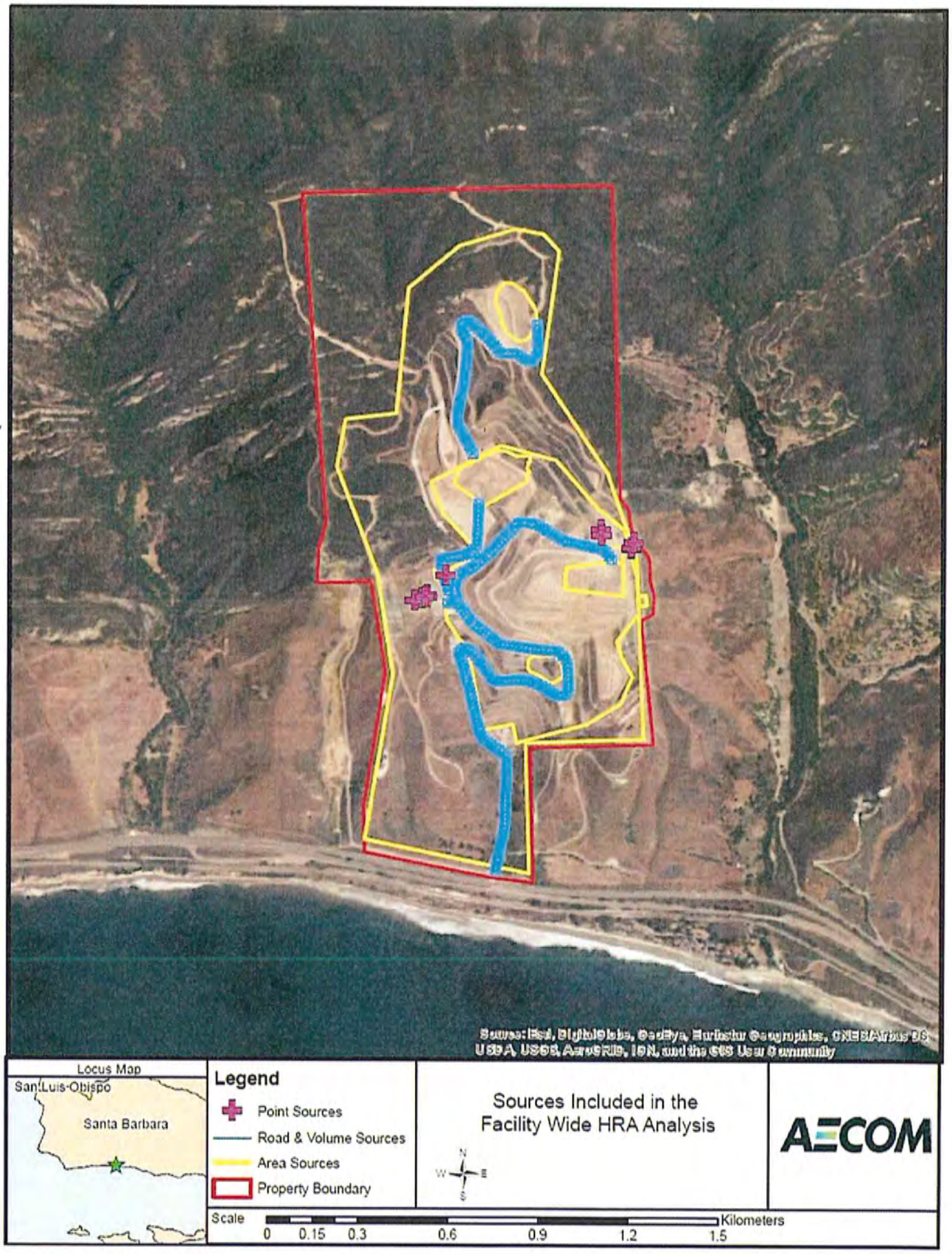


Figure 3-9
Existing and Revised Project Facility-Wide Sources Modeled in the HRA



calculated risk for each option below and selected the highest residential, worker or acute risk based on the entire receptor grid:

- 30-year Resident Cancer Risk – RMP using the Derived Method
- 25-year Worker Cancer Risk – OEHHA Derived Method
- 8-hour Chronic Risk (Non-cancer)
- Acute Risk (Non-cancer) – Inhalation Only
- Chronic Risk (Non-cancer) – OEHHA Derived Method

The RMP using the Derived Method risk analysis method uses the high-end point-estimates of exposure for the two dominant (driving) exposure pathways, while the remaining exposure pathways use average point estimates. The RMP using the Derived method is identical to the OEHHA Derived Method but uses the breathing rate at the 95th percentile for age bins 3rd Trimester to 2 years old and the 80th percentile for age bins 2 to 30 years old for exposure rather than the high-end point-estimate when the inhalation pathway is one of the dominant exposure pathways. The cancer risk estimates using the Derived equations/methods are based on a 30-year exposure (resident). The point-estimate analysis uses a single value rather than a distribution of values in the dose equation for each exposure pathway. The off-site worker exposure duration assumed a standard work schedule since the facility will operate full time, per OEHHA guidance (2015). For the cancer and chronic HI impacts for workers, the HARP2 scaling factor of 4.2 was used as some sources do not operate during all hours of the day. This includes the highly conservative 25-year exposure duration for the worker receptors along with an OEHHA-recommended 8-hour moderate intensity breathing rates.

The modeled exposure pathways consisted of all pathways recommended for a health risk assessment. Exposure pathways that were enabled include homegrown produce (using households that garden ingestion fractions), dermal absorption, soil ingestion, pigs, eggs, poultry, and mother's milk in addition to the inhalation pathway. As discussed later in Section 4.2, although TRRP health risk impacts are well below significance levels, the cancer risks modeled for the facility-wide HRA that includes the existing Tajiguas Landfill sources extended well to the east and west before dropping to below a 1.0 in-one-million risk isopleth. Long-term risks (i.e., cancer and chronic non-carcinogenic risk) and short-term risk (Acute risk) were calculated at the identified off-site receptors.

3.2.7.13 Exposure Assumptions

The chief exposure assumptions are continuous exposure to the TAC concentrations produced by continuous emissions at the maximum emission rates over a 30-year period at each receptor location to estimate lifetime residential cancer risks and over a 25-year period to estimate worker cancer risks. Although the Landfill would only have approximately 20 years (2016 to approximately 2036) of capacity left if extended by the Revised Project, SBCAPCD requires that these long exposure periods (25 and 30 years) be assessed. The actual risks are not expected to be any higher than the predicted risks and are likely to be substantially lower. The cancer risk for an inhaled TAC is estimated by multiplying the exposure concentration by the breathing rate (l/kg-day) times the inhalation cancer potency factor (milligrams per kilogram per day [mg/kg-day]$)^{-1}$.

<u>Air Dispersion Modeling</u>

In general, EPA-dispersion models such as AERMOD (used in this HRA) are designed to over-predict concentrations rather than under-predict. For example, the model algorithms assume chemical emissions are not transformed in the atmosphere into other chemical compounds (e.g., photochemical reactions). For certain pollutants, conversion may occur quickly enough to reduce concentrations substantially.

The previous analysis was conducted with the ISCST3 and HARP1 models, whereas this analysis was conducted with AERMOD and HARP2. It has been documented that HARP2 is more conservative than HARP1[5]:

"In some situations when evaluating residential impacts, the potential inhalation cancer risk estimates for the same level of emissions may be 1.5 to 3 times higher than under the 2003 risk assessment methodology. In addition to this 1.5 to 3 times increase with inhalation-only assessments, there may also be additional increases in potential cancer risk estimates when risk assessments include multiple pathways of exposure (e.g., ingestion of soil or crops, dermal exposure, etc.)."

Exposure Characteristics

Important uncertainties related to exposure include the identification of exposed populations and their exposure characteristics. The choice of a "residential" maximum exposed individual is very conservative in the sense that no real person is likely to spend 24 hours a day, 365 days a year over a 30-year period at exactly the point of highest toxicity-weighted annual average air concentration. Further, the remaining life of the Landfill with the Revised TRRP would be approximately 20 years.

Toxicity Assessment

Another area of uncertainty is in the use of toxicity data in risk estimation. Estimates of toxicity for the HRA obtained from OEHHA are conservative compilations of toxicity information. Toxicity estimates are derived either from observations in humans or from projections derived from experiments with laboratory animals. When toxicity estimates are derived from animal data, they usually involve extra safety factors to account for possibly greater sensitivity in humans, and the less-than-human-lifetime observations in animals. Overall, the chemical toxicity factors (e.g., unit risk factors and RELs) used in the Revised Project HRA are biased toward over-estimating risk. The amount of the bias is unknown, but could be substantial.

3.2.7.14 Risk Reporting

The original Tajiguas Landfill Expansion EIR (County of Santa Barbara 2002) determined there would be a Class I significant health risk impact. This result was based on exceedance of the cancer risk threshold at the point of maximum impact (PMI) which occurred at the Landfill property boundary. For CEQA impact analyses, the SBCAPCD currently only requires the reporting of the HRA results at a PMI that is reasonably accessible to the public for the acute non-cancer health risk (SBCAPCD 2014a, 2014b). Acute impacts are based on short-term exposures, and hence could be experienced by people after a relatively short exposure (e.g., 1 hour). Long-term impacts, e.g., cancer risk and chronic non-cancer effects that depend on exposures over many years (30 years), are only required to be reported for the maximum exposed individual at a residence (MEIR) or work place (MEIW).

Health impacts were assessed at all receptors shown in Figure 3-5 as previously noted. Those receptor grids were used to determine the health risk at the PMI for Acute HI, as well as the HRA results at the MEIR and MEIW. A significant health risk criteria, based on SBCAPCD guidance, is the same as that used in the certified Final SEIR. These include the following:

- Cancer: 10 in a million excess cancer risk
- Non-cancer, acute: Hazard Index greater than (>) 1.0
- Non-cancer, chronic: Hazard Index greater than (>) 1.0

3.2.7.15 Odors

The potential for an objectionable odor response depends on several other factors besides the magnitude of the odor. These other factors are the frequency, duration, location and offensiveness of the odor. For this study, the modeling of odor unit emissions provides a means to accomplish a quantitative odor impact assessment.

[5] https://www.arb.ca.gov/toxics/rma/rmgssat.pdf, page 14

3.2.7.16 Operating Scenario

The calculations and methodology applied in the certified Final SEIR (and previous supporting air quality technical report) continue to apply to the current Project, as revised.

3.2.7.17 Model Inputs

As previously discussed, SBCAPCD Modeling Guidance requires that the AERMOD model be used for air dispersion modeling assessments. Therefore, the latest version of AERMOD was used for the modeling of odor emissions.

Similar model inputs from the criteria pollutants impact analysis were used for the odor impact modeling. The buildings, source parameters and meteorological data set remain the same. Only one "pollutant", odor, was modeled. All sources were modeled as area sources with an odor flux rate in OU/sec/m^2. Table 3-4 presents the emission rates modeled. Note that because of emission unit limitations, it was necessary to divide the emission rates by 1,000, and then multiply the modeled impacts by 1,000 in order to facilitate the modeling.

Table 3-4
Modeled Odor Source Parameters and Emission Rates

Source Description	Source Name	Release Height (m)	Area (m^2)	Initial Sigma-z (m)	Emissions (OU/sec/m^2)
Tipping Area Biofilter	BF_TIP	3.048	613.2	6.95	9.8342E-03
AD Biofilter	BF_ADF	3.048	838.0	3.24	1.9040E-02
MRF Biofilter	BF_RECYC	3.048	429.2	6.95	1.3050E-02
Windrow Area – Undisturbed	WINDROWS	3.66	12,854.3	1.83	8.1405E-05
Windrow Area – Recently Turned	TURNING	3.66	2,958.6	1.83	1.0275E-03
Curing Pile	CURING	3.66	1,652.6	1.83	3.5474E-06

All guidelines for odor-based contaminants are expressed in a 10-minute averaging period; however, the dispersion model estimates concentration for a 1-hour averaging time period. Hourly results obtained with the model needed to be converted to 10 minutes average concentration according to the following equation: C (1 hour) = C (10 minutes) $*(10/60)^{0.28}$[6].

A standard receptor grid was placed around the TRRP facility, along with receptors spaced evenly along the property line, similar to the criteria pollutant impact analysis. In addition, two single point receptors were chosen for frequency analysis (Table 3-5). These receptors were selected to represent locations where members of the general public might be present. One receptor was located on the nearby Baron Ranch hiking trail to the east[7], while the other was located at the closest residential dwelling in the southeast rural community. The locations of these receptors are shown in Figure 3-10. The receptor known as the Hart Residence is no longer a sensitive receptor as Santa Barbara County has purchased the property and the residence will not be built.

---

[6] http://web4.uwindsor.ca/users/x/xxu/93-425.nsf/9d019077a3c4f6768525698a00593654/d3900192b2d7e25b85256bb80074a93f/$FILE/Air%20Dispers%20Modelling%20for%20Ont.pdf.

[7] Based on the revised trail location approved by the Santa Barbara County Planning Commission on June 28, 2017.

Table 3-5
Single Point Receptors Used for Frequency Analysis

Single Point Receptor	UTM East	UTM North
Baron Ranch Trail	764609	3819332
Closest Existing Single Residential Dwelling (Arroyo Quemada Lane)	764002	3818221

3.2.7.18 Odor Threshold

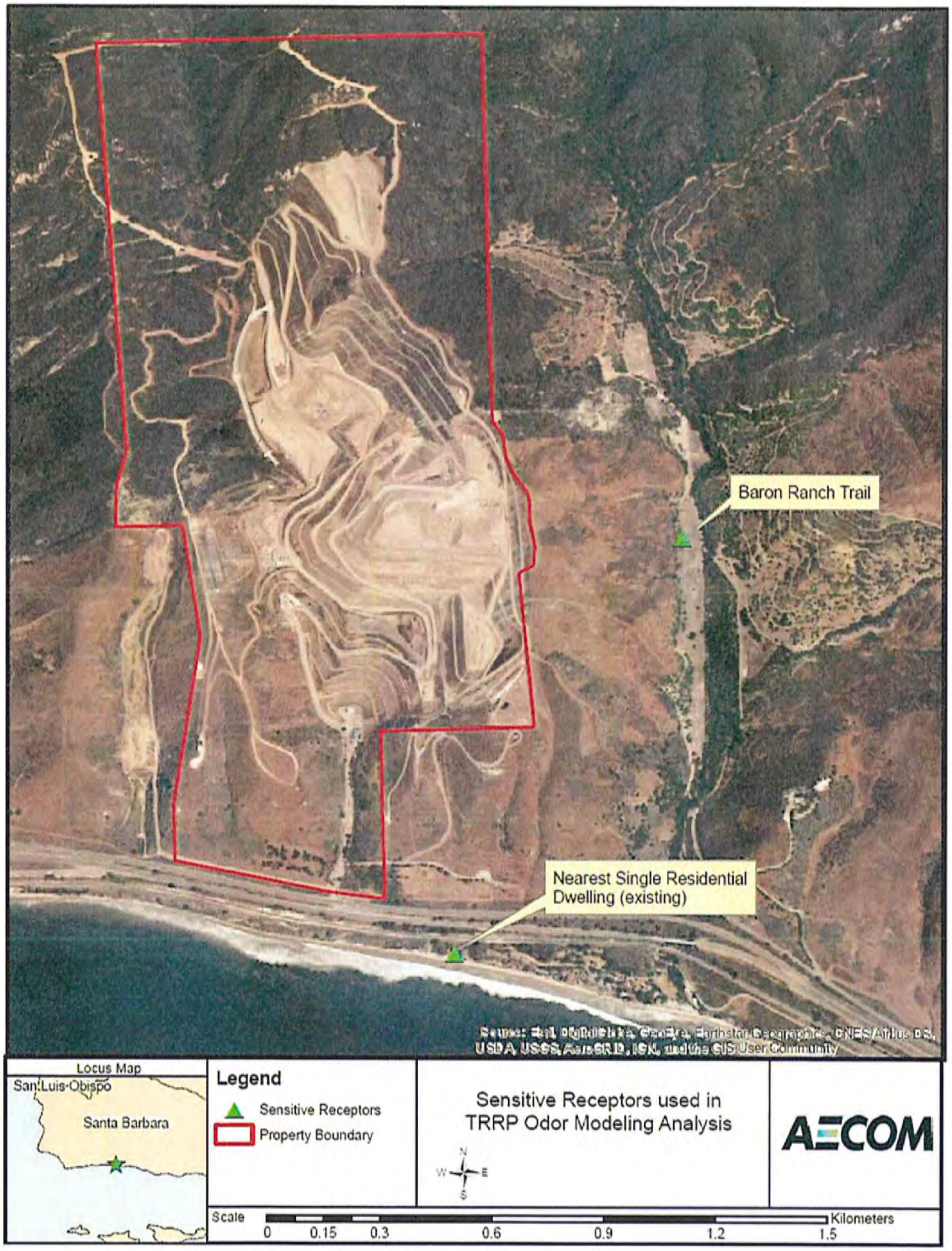
Based on the research presented in the certified Final SEIR (and supporting Air Quality and Greenhouse Gas Technical Report), an odor concentration of 5 OU/m^3 was selected as a guideline to determine if off-site odors can be detected.

Although an odor may be detected, the frequency of occurrences and the number of locations where an odor might be detected are also considerations. To help quantify if detectable odors would result in a nuisance impact, a frequency analysis was also applied. Typically if an odor can be detected more than two percent of the time (175 hours per year), a nuisance impact may occur (Bull *et al.* 2014).

3.3 Greenhouse Gases

There are two pieces of mobile source equipment associated with the project that were modified due to the revised project. This change would result in a change in diesel fuel use. The first equipment change is the addition of the second sweeper around the MRF facility. The second change is the change in the model (and subsequent horsepower and fuel use) of the loader used insider the MRF. The make/model change of the windrow turner does not result in a fuel use rate change. The estimated volume of LFG burned in the new flare and engines will remain the same. The volume of methane predicted from the LFG with and without the project remains the same. The methodology of calculating the GHG remains the same with the same Global Warming Potentials (GWP) for methane and nitrous oxide.

Figure 3-10
Receptors used in TRRP Odor Modeling Analysis



4.0 Impact Assessment Results

4.1 Criteria Pollutants

The following section is an analysis of criteria pollutant air quality impacts associated with construction and operation of the Revised Project.

4.1.1 Emissions Estimates

4.1.1.1 Construction Emissions Estimates and Impacts

The methodology applied in the certified Final SEIR continues to apply to the current Project, as revised.

4.1.1.2 Normal Operation Emissions Estimates

Operation emissions were calculated for the revised Project with the approved CSSR component. Table 4-1 and Table 4-2 show maximum daily criteria pollutant emissions generated during operation of the revised Project (with the approved CSSR). Table 4-1 includes emissions from all sources – on-site equipment except CHP engines burning landfill gas, on-site vehicles, and off-site vehicles and compares the emissions to the a current CEQA significance threshold for Air Quality (the daily triggers for offsets in the SBCAPCD New Source Review Rule[8]. Table 4-2 shows emissions from on-site and off-site vehicles only and compares emissions to Santa Barbara County's threshold of 25 pounds per day of NO_X or ROC for motor vehicle trips only.

Table 4-1
Maximum Daily Operation Emissions – All Sources (with CSSR)

Source	Maximum Daily Emissions (pounds/day)					
	ROC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
On-site Equipment and Vehicles	39.71	37.49	181.11	13.74	28.77	22.14
Off-site Vehicles	5.73	4.98	30.71	0.09	5.45	1.62
Total Emissions	45.44	42.47	211.82	13.83	34.22	23.76
Santa Barbara County CEQA Threshold[1]	240	240	240	240	80	240
Significant Impact (Yes/No)	No	No	No	No	No	No

[1] Thresholds are from the *Environmental Thresholds and Guidelines Manual* (County of Santa Barbara 2008). These thresholds are based on SBCAPCD's New Source Review Rule.

[8] 240 pounds per day for attainment pollutants; 80 pounds per day for PM10. These limits are located within Regulation VIII of the current Santa Barbara County Air Pollution District's Rules and Regulations (as of August 25, 2016).

Table 4-2
Maximum Daily Operation Emissions – Vehicle Emissions Only (with CSSR)

Source	Maximum Daily Emissions (pounds/day)					
	ROC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
On-site Vehicles	0.06	0.14	0.19	<0.005	2.09	0.53
Off-site Vehicles	5.73	4.98	30.71	0.09	5.45	1.62
Total Emissions	5.79	5.12	30.90	0.09	7.54	2.15
Santa Barbara County CEQA Threshold[1]	25	25	–	–	–	–
Significant Impact (Yes/No)	No	No	No	No	No	No

[1] Thresholds are from the *Environmental Thresholds and Guidelines Manual* (County of Santa Barbara 2008).

As shown in Table 4-1, the maximum daily emissions of ROC, NO_X, and PM_{10} from all sources are below the thresholds. Additionally, implementation of the TRRP is anticipated to result in the recovery and beneficial reuse of 60 percent or more (by weight) of the waste stream by diverting such amount from disposal at the Landfill. This reduction in disposal at the Landfill would reduce activities at the Landfill working face, including operation of off-road equipment, such as scrapers, which would reduce the associated emissions. Thus, the overall change in emissions from operation of the Revised Project would be expected to be less than the emissions listed in Table 4-1. Impacts based on the emissions from the Revised Project's operation with approved CSSR would be less than significant.

As shown in Table 4-2, the maximum daily emissions from vehicles only (with CSSR) would not exceed the thresholds established by Santa Barbara County. Therefore, the vehicle emissions from operation of the Revised Project would not result in a significant impact.

As shown in Table 4-1, the maximum daily emissions of ROC, NO_X, and PM_{10} from all sources including CSSR are below the thresholds. As shown in Table 4-2, the maximum daily emissions from vehicles only, with the approved CSSR element, would not exceed the thresholds established by Santa Barbara County.

Impacts from the Revised Project's operation with the approved CSSR element would be less than significant. Table 4-3 summarizes the change in emissions from the Final SEIR to the Revised Project. The emissions from the Revised Project are substantially less than the emissions from the existing engine and flare shown in Table 2-1.

Table 4-3
Comparison of Final SEIR and Revised Project Emissions

Source	Maximum Daily Emissions (pounds/day)					
	ROC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Project Comparisons without CSSR						
SEIR without CSSR	44.32	52.04	167.08	13.61	44.20	24.31
Revised Project Emissions without CSSR	44.13	44.36	204.87	13.81	32.40	23.26
Project Comparison with CSSR						
SEIR with CSSR	45.64	42.91	156.58	12.35	51.57	25.17
Revised Project Emissions with CSSR	45.44	42.47	211.82	13.83	34.22	23.76

4.1.1.3 Short-Term Operation Emissions Scenarios

As noted in Section 3.2.6, emissions of NO_X, CO, ROC, and SO_X criteria pollutants were estimated for three additional, but infrequent, short-term scenarios. These emissions are presented in Table 4-4. Scenarios 2 and 3 reflect use of propane as the fuel in the engines. These infrequent short-term scenarios are potential events that would occur during the lifetime of the project. All other sources would operate normally under these scenarios.

Table 4-4
Emissions for Short-term Scenarios

Scenario	Scenario Description	Emissions (pounds/hour)			
		NO_X	CO	SO_2	ROC
1	Flare Operation with One AD CHP Engine Offline	0.79	1.98	0.56	0.027
2	One AD CHP Engine Start-up or Burn-In on Propane, One AD CHP Engine Operating Normally[1]	1.25	5.72	N/A	N/A
3	One MRF CHP Engine Start-up on Propane, One MRF CHP Engine Operating Normally[1]	1.56	6.93	N/A	N/A

[1] These highly infrequent cases (once every two years) occur during the normal replacement of new catalyst material for the SCR serving as best available control technology. These maintenance events are allowed within operating permits by specific conditions or by variance authorized by state and SBCAPCD rules.

4.1.2 Air Dispersion Modeling

AERMOD was applied with 1 year of meteorological data to determine maximum impacts during operation of the Project in order to evaluate compliance with the NAAQS and CAAQS. All modeling files are provided in Appendix C, the electronic modeling archive. All modeling scenarios included the emissions from the approved CSSR element.

4.1.2.1 NAAQS Modeling Results (With CSSR)

The results of the NAAQS analysis for Normal Operations (including the approved CSSR element) when the CHP engines are emitting through the paper dryer baghouse filter is shown in Table 4-5. Table 4-6 summarizes the results of the NAAQS analysis for the Flare purging with one AD CHP Engine offline. Table 4-7 summarizes the results of the NAAQS analysis for the AD CHP Engine Start-up and SCR Burn-in scenarios. These scenarios affect NO_2 and SO_2 concentrations for both scenarios and CO for AD CHP engine startup only. Table 4-8 summarizes the results of the NAAQS analysis for the Flare purging with one MRF CHP Engine offline. Table 4-9 summarizes the results of the NAAQS analysis for the MRF CHP Engine Start-up and SCR Burn-in scenarios. As seen in Tables 4-5 through 4-9, all impacts are below the NAAQS. Therefore compliance with all NAAQS is demonstrated.

The modeled concentrations shown are the "design value" concentrations based on the form of the standard:

- For all annual modeling periods, the NAAQS concentration is the highest modeled annual average impact.
- For 1-hour NO_2 and SO_2, the NAAQS concentration is the highest 98^{th} and 99^{th} percentile modeled impact respectively. This is a conservative value relative to the forms of those standards, which are the 3-year average of the 98^{th} (or 99^{th}) percentile daily maximum impact as SBCAPCD only provided one-year of meteorological data.
- For 24-hour $PM_{2.5}$, the form of the standard is the 3-year average of the 98^{th} percentile impact. However, because EPA guidance[9] recommends adding the 3-year average of the highest modeled concentration at each receptor to the 98^{th} percentile background, that value is what is reported here.

[9] http://www.epa.gov/ttn/scram/guidance/clarification/Official%20Signed%20Modeling%20Proc%20for%20Demo%20Compli%20w%20PM2.5.pdf.

Table 4-5
TRRP AERMOD NAAQS Modeling Results for Normal Operations for MRF CHP Engines Exhaust through Paper Dryer and CSSR (µg/m³)

Pollutant	Avg. Period	Final SEIR Results				Revised Project Results				NAAQS
		NAAQS Conc.	Ambient Back-ground	Total Conc.	Percent of NAAQS	NAAQS Conc.	Ambient Back-ground	Total Conc.	Percent of NAAQS	
SO_2	1-hour[2]	5.6	65.5	71.1	36%	3.6	50.7	54.3	28%	196.5
	24-hour	0.9	62.9	62.9	18%	0.6	36.2	36.7	10%	356
	Annual	0.05	4.0	4.0	5.0%	0.21	1.1	1.3	1.6%	80
CO	1-hour	1,127.5	689.7	1,817.1	4.5%	667.6	689.7	1,357.3	3.4%	40,000
	8-hour	140.9	574.7	715.6	7.2%	190.2	574.7	764.9	7.6%	10,000
NO_2[1]	1-hour[3]	80.9	23.8	104.7	56%	106.4	16.9	123.3	66%	188
	Annual	1.4	3.9	5.3	5.3%	1.7	3.8	5.5	5.5%	100
PM_{10}	24-hour	11.2	34.0	45.2	30%	3.3	50.0	53.3	36%	150
$PM_{2.5}$	24-hour[3]	8.2	16.0	24.2	69%	2.4	17.0	19.4	55%	35
	Annual	0.3	9.0	9.3	78%	1.0	9.2	10.2	85 %	12

[1] 1-hour NO_2 impacts modeled with ARM2 Tier 2 NO_X/NO_2 conversion.

[2] 99th percentile modeled concentration. Proper form of standard is 3-year average of the 99th percentile of the daily maxima.

[3] 98th percentile modeled concentration. Proper form of standard is 3-year average of the 98th percentile of the daily maxima.

Note: Results are conservative because they do not account for retirement of existing landfill gas engines (which is part of the Revised Project), which are included in background ambient concentrations.

Table 4-6
TRRP AERMOD NAAQS Modeling Results for Flare with One AD CHP Engine Offline and MRF CHP Engines Exhaust through Paper Dryer (μg/m³)

Pollutant	Avg. Period	Final SEIR Results				Revised Project Results				NAAQS
		NAAQS Conc.	Ambient Back-ground	Total Conc.	Percent of NAAQS	NAAQS Conc.	Ambient Back-ground	Total Conc.	Percent of NAAQS	
SO_2	1-hour[2]	17.42	65.5	82.9	42%	3.6	50.7	54.3	28%	196.5
	24-hour	2.7	62.9	65.6	18%	0.8	36.2	36.9	10%	356
CO	1-hour	1,127.5	689.7	1,817.1	4.5%	667.6	689.7	1,357.3	3.4%	40,000
	8-hour	140.9	574.7	715.6	7.2%	190.2	574.7	764.9	7.6%	10,000
NO_2[1]	1-hour[3]	80.93	23.8	104.7	56%	106.4	16.9	123.3	66%	188
PM_{10}	24-hour	NR	NR	NR	NR	3.44	50.0	53.4	36%	150
$PM_{2.5}$	24-hour[3]	NR	NR	NR	NR	2.64	17	19.6	56%	35

[1] 1-hour NO_2 impacts modeled with ARM2 Tier 2 NO_X/NO_2 conversion.

[2] 99th percentile modeled concentration. Proper form of standard is 3-year average of the 99th percentile of the daily maxima.

[3] 98th percentile modeled concentration. Proper form of standard is 3-year average of the 98th percentile of the daily maxima.

Note: Results are conservative because they do not account for retirement of existing landfill gas engines (which is part of the Revised Project), which are included in background ambient concentrations.

Table 4-7
TRRP AERMOD NAAQS Modeling Results for AD CHP Engine Startup and SCR Burn-in (μg/m³) (Infrequent Maintenance Events)

Pollutant	Avg. Period	Final SEIR Results				Revised Project Results				NAAQS
		NAAQS Conc.	Ambient Back-ground	Total Conc.	Percent of NAAQS	NAAQS Conc.	Ambient Back-ground	Total Conc.	Percent of NAAQS	
CO	1-hour	1,127.5	689.7	1,817.1	4.5%	667.6	689.7	1,357.3	3.4%	40,000
	8-hour	140.9	574.7	715.6	7.2%	190.2	574.7	764.9	7.6%	10,000
NO_2 [1]	1-hour[2]	80.9	23.8	104.7	56%	106.4	16.9	123.3	66%	188

[1] 1-hour NO_2 impacts modeled with ARM2 Tier 2 NO_X/NO_2 conversion.

[2] 98th percentile modeled concentration. Proper form of standard is 3-year average of the 98th percentile of the daily maxima.

Note: Results are conservative because they do not account for retirement of existing landfill gas engines (which is part of the Revised Project), which are included in background ambient concentrations.

Table 4-8
TRRP AERMOD NAAQS Modeling Results for MRF CHP Engine Startup and SCR Burn-in (µg/m³) (Infrequent Maintenance Events)

Pollutant	Avg. Period	Final SEIR Results				Revised Project Results				NAAQS
		NAAQS Conc.	Ambient Back-ground	Total Conc.	Percent of NAAQS	NAAQS Conc.	Ambient Back-ground	Total Conc.	Percent of NAAQS	
CO	1-hour	1,127.5	689.7	1,817.1	4.5%	667.6	689.7	1,357.3	3.3%	40,000
	8-hour	140.9	574.7	715.6	7.2%	190.2	574.7	764.9	7.6%	10,000
NO_2 [1]	1-hour[2]	902.0	23.8	925.8	56%	106.6	16.9	123.5	66%	188

[1] 1-hour NO_2 impacts modeled with ARM2 Tier 2 NO_X/NO_2 conversion.

[2] 98^{th} percentile modeled concentration. Proper form of standard is 3-year average of the 98^{th} percentile of the daily maxima.

Note: Results are conservative because they do not account for retirement of existing landfill gas engines (which is part of the Revised Project), which are included in background ambient concentrations.

Table 4-9

TRRP AERMOD CAAQS Modeling Results for Normal Operations (MRF Engines Exhaust through Paper Dryer) and CSSR (μg/m³)

Pollutant	Avg. Period	Final SEIR Results				Revised Project Results				CAAQS
		CAAQS Conc.	Ambient Back-ground	Total Conc.[1]	Percent of CAAQS	CAAQS Conc.	Ambient Back-ground	Total Conc.	Percent of CAAQS	
SO_2	1-hour	6.8	191.3	198.1	30%	3.8	290.8	294.7	45%	655
	24-hour	0.9	62.9	63.8	61%	0.8	36.2	37.0	35%	105
CO	1-hour	1,141.8	689.7	1,831.5	8.0%	687.8	689.7	1,377.4	6.0%	23,000
	8-hour	169.7	574.7	744.4	7.4%	216.9	574.7	791.6	7.9%	10,000
NO_2	1-hour	150.8	65.8	216.6	64%	126.5	43.3	169.8	50%	339
	Annual	1.4	3.9	5.3	9.3%	1.7	3.8	5.5	10%	57
PM_{10}	24-hour	12.9	34	46.9	94%	3.8	50.0	53.8	108%[2]	50
	Annual	0.5	13.3	13.8	69%	1.0	19.0	20.0	100%	20
$PM_{2.5}$	Annual	0.3	9	9.3	78%	1.0	9.2	10.2	85%	12

1 All short term results are highest modeled value. Annual results are highest annual average.

2 Ambient background is equal to the 24-hour CAAQS. Because the project contribution would not exceed 10% of the CAAQS and a significant PM_{10} impact was previously identified for the Tajiguas Landfill, the contribution would be considered less than significant.

Note: Results are conservative because they do not account for retirement of existing landfill gas engines (which is part of the Revised Project), which are included in background ambient concentrations.

– For all other standards, the form of the standard is "not to be exceeded more than once per year;" therefore, the high-2nd-high impact is reported.

As shown in the tables, the modeled impacts from Project sources when combined with the appropriate ambient background, are below the NAAQS in all cases. These results are conservative as they do not account for the reduction in emissions from the retirement of the existing engine and flare as part of the modeling or as part of the ambient background concentration.

4.1.2.2 CAAQS Modeling Results (with CSSR)

The results of the CAAQS analysis for Normal Operations (including the approved CSSR) are shown in Table 4-9. Table 4-10 summarizes the results of the CAAQS analyses for the Flare purging with one AD CHP Engine offline. Tables 4-11 and 4-12 summarize the AD CHP Engine Startup and SCR Burn-In scenarios and MRF CHP Engine Startup and SCR Burn-In scenarios. As seen in Tables 4-9 through 4-12, all impacts except PM_{10} at one fenceline receptor on the western boundary are below the CAAQS. The receptor is located on non-publically accessible land.

According to the County and SBCAPCD guidelines, a significant adverse air quality impact may occur if a project causes or contributes to a violation of any California or National Ambient Air Quality Standard (except ozone) or equals or exceeds the state or federal ambient air quality standards for any criteria pollutant (as determined by modeling).

As noted in Table 3-3, years 2013 through 2015 ambient data was used in the CAAQS modeling. Detailed review of the EPA data used shows that the 24-hour PM_{10} CAAQS of 50 µg/m³ was reached on single day (10/4/13) in the 2013 through 2015 data set. Because the ambient concentration was at the standard on that one day, any project contribution would result in violation of 24-hour PM_{10} standard. The SBCAPCD Environment Review Guidelines state: "Thresholds of significance provide general guidance for determining significant impacts, but are not ironclad definitions of significant impacts. Each project must be judged individually for its potential for significant impacts, based on specific circumstances and evidence". Because, the background setting was at the standard, the SBCAPCD was consulted to assist in determining the significance of the revised TRRP's PM_{10} contribution. The SBCAPCD is the responsible agency for TRRP permitting with respect to air quality (issuance of an authority to construct and permit to operate). Per consultation with SBCAPCD (SBCAPCD 2017c), a project typically will not create an ambient air quality standard violation if the modeled project concentrations are less that 10 percent of the standard. Ten percent of the CAAQS PM_{10} 24-hour standard is equal to 5 µg/m³. The modeled revised TRRP concentration is equal to 3.8 µg/m³; therefore, per the SBCAPCD guidance, the revised TRRP would not be considered to result in a violation of the PM_{10} 24-hour ambient air quality standard.

As noted earlier, the Board of Supervisors adopted a Statement of Overriding Considerations for significant impacts in air quality associated with Landfill operational activities. SEIR Section 4.2.2.6, Extension of Landfill Life Impacts, Impact AQ-11, identified a Class 1 impact in air quality attributed, in part, to the exceedances of the 24-hour PM_{10} impacts (see below).

> **Impact TRRP AQ-11: Project-related extension of life of the Tajiguas Landfill would extend the duration of air ~~quality~~ pollutant emissions associated with landfill operations and associated NO_x, NO_2 and 24-hour PM_{10} air quality impacts – Class I Impact.**

Moreover, this Class I impact, identified in the SEIR, specifically identified that existing Landfill operations are part of the regional background data presented in the SEIR and the impacts would likely "remain significant and unavoidable". This impact will be reduced in the future as a result of the TRRP due to waste diversion. In certifying the SEIR, the Board of Supervisors adopted a Statement of Overriding Considerations that covered the extended duration of air pollutants, including the exceedance of the 24-hour standard for PM_{10}. (Final SEIR, Appendix B, at p. 29; see also SEIR Section 4.2.2.6,

Table 4-10
TRRP AERMOD CAAQS Modeling Results for AD Flare with One AD CHP Engines Offline Scenario (µg/m³) (Infrequent Event)

Pollutant	Avg. Period	Final SEIR Results				Revised Project Results				CAAQS
		CAAQS Conc.	Ambient Back-ground	Total Conc.[1]	Percent of CAAQS	CAAQS Conc.	Ambient Back-ground	Total Conc.	Percent of CAAQS	
SO_2	1-hour	17.5	191.3	208.8	32%	3.8	290.8	294.6	45%	655
	24-hour	3.1	62.9	66	63%	0.9	36.2	37.0	35%	105
CO	1-hour	1,141.80	689.7	1,831.5	8.0%	687.8	689.7	1,377.4	6.0%	23,000
	8-hour	169.7	574.7	744.4	7.4%	216.9	574.7	791.6	7.9%	10,000
NO_2	1-hour	150.8	65.8	216.6	64%	126.5	43.3	169.8	50%	339
PM_{10}	24-hour	NR	NR	NR	NR	3.4	50.0	53.4	107%	50

1 All short term results are highest modeled value. Annual results are highest annual average.

Note: Results are conservative because they do not account for retirement of existing landfill gas engines (which is part of the Revised Project), which are included in background ambient concentrations.

Table 4-11
TRRP AERMOD CAAQS Modeling Results for AD CHP Engine Startup and SCR Burn-in Scenarios (μg/m³) (Infrequent Maintenance Event)

Pollutant	Averaging Period	Maximum Conc.[1]	Ambient Background	Total Conc.	CAAQS	Percent of CAAQS
CO	1-hour	687.4	689.7	1,377.0	23,000	6.0%
	8-hour	216.9	574.7	791.6	10,000	7.9%
NO_2	1-hour	126.4	43.3	169.7	339	50%

[1] All short term results are highest modeled value. Annual results are highest annual average.

Table 4-12
TRRP AERMOD CAAQS Modeling Results for MRF CHP Engine Startup and SCR Burn-in Scenarios (μg/m³) (Infrequent Maintenance Events)

Pollutant	Avg. Period	Final SEIR Results				Revised Project Results				CAAQS
		CAAQS Conc.	Ambient Back-ground	Total Conc.[1]	Percent of CAAQS	CAAQS Conc.	Ambient Back-ground	Total Conc.[1]	Percent of CAAQS	
CO	1-hour	1,141.8	689.7	1,831.5	8.0%	687.7	689.7	1,377.4	6.0%	23,000
	8-hour	169.7	574.7	744.4	7.4%	216.9	574.7	791.6	7.9%	10,000
NO_2	1-hour	150.8	65.8	216.6	64%	126.6	43.3	169.9	50%	339

[1] All short term results are highest modeled value. Annual results are highest annual average.

Note: Results are conservative because they do not account for retirement of existing landfill gas engines (which is part of the Revised Project), which are included in background ambient concentrations.

Impact AQ-11.). The Revised TRRP would facilitate waste diversion and would reduce associated air quality impacts due to reduced usage of the material handling equipment at the landfill in concert with modernization of the LFG control engines, which will further improve air quality.

4.1.3 ROC Ambient Air Quality Increment Analysis

The results of the ambient air quality ROC increment analysis[10] with the CHP engines exhausting through the CHP engine stacks and through the paper dryer stack are summarized in Table 4-13. As shown in Table 4-13, the Minimum Increment is exceeded but to a lesser extent than it was in the Final SEIR. It is important to recognize that the values modeled to be over the allowed ROC increment only occur during one three-hour period, from 6 a.m. to 9 a.m., in January during the year of meteorological data that was used for the dispersion modeling. The high impact is due to the ADF biofilter that is close to the eastern fenceline and the threshold is exceeded at only one receptor.

Table 4-13
TRRP AERMOD ROC Modeling Results (μg/m^3)

CHP Engine Exhaust Scenario	Final SEIR Results			Revised Project Results			Minimum Increment (3-hour)[2]
	Modeled Project Impact (3-hour)[1]	Ambient Back-ground (3-Hour)	Total Conc. (3-hour)	Modeled Project Impact (3-hour)[1]	Ambient Back-ground (3-Hour)	Total Conc. (3-hour)	
AD CHP Normal, MRF CHP via Paper Dryer Stack	50.9	1.5	52.2	40.2	1.5	41.7	40
1 AD CHP Normal, 1 offline with Flare Purging, MRF CHP via Paper Dryer Stack	48.7	1.5	49.9	40.2	1.5	41.7	40
1 AD CHP Normal, 1 AD CHP SCR Start-up	54.4	1.5	55.7	40.2	1.5	41.7	40

1 Highest modeled value.

2 From SBCAPCD Rule 803, Table 3.

4.1.4 Recommended Mitigation

Impacts on criteria pollutants are anticipated to be less than significant. Therefore, mitigation measures are not required. Project design features have been incorporated to reduce emissions to the extent practicable. For instance, the Project's engines will meet EPA Tier 4 emissions standards and the Project will utilize an electric chipper/grinder rather than a diesel-fired engine. Dust control measures will also be implemented.

4.1.5 Conclusions

A comparative table between the Approved TRRP and the Revised TRRP with the thresholds of significance for criteria pollutant emissions is provided below. Below each threshold, the significance of potential criteria pollutant impacts of the Revised TRRP is provided. Table 4-14 provides a summary of criteria pollutant emissions impacts of the Revised TRRP as well as the criteria pollutant emissions impacts identified in the previous EIRs for the currently permitted Tajiguas Landfill. Each of the criteria is discussed below the table.

---

10 ROC Increment analyses are SBCAPCD requirements but are not NAAQS or CAAQS (ambient standards).

Table 4-14
Summary of Criteria Pollutant Emissions Impacts

Impact Category	Certified Final SEIR1	Revised TRRP
Operation Emissions		
Maximum Daily On-site and Off-site Sources	Less than significant for all criteria pollutants	Less than significant for all criteria pollutants
Motor Vehicle Exhaust Emissions Only	Less than significant for all criteria pollutants	Less than significant for all criteria pollutants
NAAQS	Less than significant for all criteria pollutants	Less than significant for all criteria pollutants
CAAQS	Less than significant for all criteria pollutants[1]	Less than significant for all criteria pollutants

[1] Also referred to Approved TRRP with approved CSSR element.

The project would be significant if:

- Interferes with progress toward the attainment of the ozone standard by releasing emissions which equal or exceed the established long-term quantitative thresholds for NO_X and ROC:
  - As discussed above in Section 4.1.1.2, emissions from all operation sources both with the approved CSSR element would not exceed the maximum daily thresholds for NO_X and ROC. Therefore, impacts related to the attainment of ozone would be Class III, less than significant.
- Emits (from all sources, except registered portable equipment) greater than the daily trigger for offsets in the SBCAPCD NSR Rule (240 pounds per day for attainment pollutants; 80 pounds per day for PM_{10}):
  - As discussed above in Section 4.1.1.2, NO_X, ROC, and PM_{10} emissions from all operation sources both with and without the approved CSSR element would not exceed the thresholds. Therefore, impacts would be Class III, less than significant.
- Emits greater than 25 pounds per day of NO_X or ROC (motor vehicle trips only):
  - As discussed above in Section 4.1.1.2, emissions from motor vehicle trips both with and without the approved CSSR element would not exceed 25 pounds per day for NO_X and ROC. Therefore, impacts related to motor vehicle emissions would be Class III, less than significant.
- A significant adverse air quality impact may occur when a project, equals or exceeds the State or Federal ambient air quality standards for any criteria pollutant (as determined by modeling):
  - As discussed in Sections 4.1.2.1 and 4.1.2.2, operation emissions would not result in an exceedance of the NAAQS and are less than 10 percent of the CAAQS under normal operations[11]. Therefore, impacts related to the exceedance of ambient air quality standards would be Class III, less than significant.
- For Ozone Precursors (NO_X and ROC), causes or contributes to a violation of a State or Federal air quality standard (except ozone):
  - As discussed in Sections 4.1.2.1 and 4.1.2.2, operation emissions would not result in exceedances of the NAAQS or CAAQS under normal operations. Therefore, impacts related to the exceedance of ambient air quality standards would be Class III, less than significant.

[11] As cited in Section 4.1.2.2, per consultation with the SBCAPCD, a project will not create an ambient air quality standard violation if the modeled project concentrations are less that 10 percent of the standard.

– Inconsistent with adopted State and Federal Air Quality Plans (e.g., the SBCAPCD 2010 Clean Air Plan):

- The SBCAPCD 2010 Clean Air Plan and 2016 Ozone plan relies on the land use and population projections provided in the Santa Barbara County Association of Governments' Regional Growth Forecast. The TRRP is designed to process and further recover recyclable material from MSW generated from current and projected population growth. The revised TRRP would not induce population growth that would cause an exceedance of future growth projections on which the SBCAPCD's 2010 Clean Air Plan and the 2016 Ozone Plan is based.

The emissions associated with the TRRP are below significance thresholds, and as a population related project, should be within the Plan's growth related emissions projections. The revised TRRP would be constructed within the boundaries of the existing Tajiguas Landfill and therefore would be consistent with the existing land use of the site. The revised TRRP would not inhibit the effectiveness of transportation control measures established by the Clean Air Plan. Development of the revised TRRP would extend the operating lifespan of the Tajiguas Landfill, thereby reducing emissions from vehicle miles traveled associated with hauling waste to landfills farther away. Therefore, the TRRP would be consistent with the 2010 Clean Air Plan and 2016 Ozone Plan and impacts related to this issue would be Class III, less than significant.

4.2 Health Risk Assessment

An HRA was performed accounting for the Revised Project source TAC emissions only (including CSSR), and a facility-wide HRA, which included both existing and Revised Landfill sources, was completed.

4.2.1 Impact Analysis

As noted in Section 3.3.2, the HRA provides results for the point of maximum impact (PMI) for Acute HI impacts, as well as the maximum exposed individual resident (MEIR) and maximum exposed individual worker (MEIW) for cancer and non-carcinogenic chronic health risk impacts. For the Revised Project, the MEIR was identified based on location of the maximum impact at a residence and the MEIW is the farm area east of the landfill. A summary of cancer risk and non-cancer health impacts values at the Acute HI PMI, MEIR and the MEIW are presented for TRRP only in Table 4-15. Table 4-16 summarizes the health risk impacts for the facility-wide (both existing and revised Landfill sources) HRA.

Table 4-15
Summary of Maximum Health Risk Impacts for Revised TRRP with CSSR

Receptor Type	Maximum Cancer Risk (per million)	Maximum Acute Hazard Index	Maximum Chronic Hazard Index
Final SEIR Results			
PMI	N/R	0.49	N/R
MEIR[2,3]	0.92	0.14	0.02
MEIW[4]	0.22	N/A	N/A
Revised Project Results			
PMI	N/R	0.40	N/R
MEIR[2,3]	0.67	0.16	0.006
MEIW[4]	0.11	0.05	0.011

[1] PMI: Point of maximum impact at any off-site location.
[2] MEIR: Maximum exposed individual at an existing or planned residential receptor; 30-year adult exposure scenario for cancer risk.
[3] The MEIR for the Final SEIR (planned Hart residence) will not be built as Santa Barbara County has purchased the property. The MEIR for the Revised Project is shown in Figure 4-1.
[4] MEIW: Maximum exposed individual at an existing occupational worker receptor; 25-year adult worker exposure scenario for cancer risk
N/R – PMI for long term effects not reported.

Table 4-16
Summary of Maximum Facility-wide Health Risk Impacts for Future Operations of Tajiguas Landfill Sources with Revised TRRP and CSSR

Receptor Type	Maximum Cancer Risk (per million)	Maximum Acute Hazard Index	Maximum Chronic Hazard Index
Final SEIR Results			
PMI[1]	N/R	1.56	N/R
MEIR[2,3]	5.86	0.62	0.11
MEIW[4]	0.24	0.06	0.03
Revised Project Results			
PMI[1]	N/R	1.04	N/R
MEIR[2,3]	3.48	0.69	0.033
MEIW[4]	0.20	0.90	0.028
Significance Threshold	10	1	1
Exceed Threshold (Yes/No)?	No	Yes	No

[1] PMI: Point of maximum impact at any off-site location.
[2] MEIR: Maximum exposed individual at an existing or planned residential receptor; 30-year adult exposure scenario for cancer risk.
[3] The MEIR for the Final SEIR (planned Hart residence) will not be built as Santa Barbara County has purchased the property. The MEIR for the Revised Project is shown in Figure 4-1.
[4] MEIW: Maximum exposed individual at an existing occupational worker receptor; 25-year adult worker exposure scenario for cancer risk
N/R – PMI for long term effects not reported.

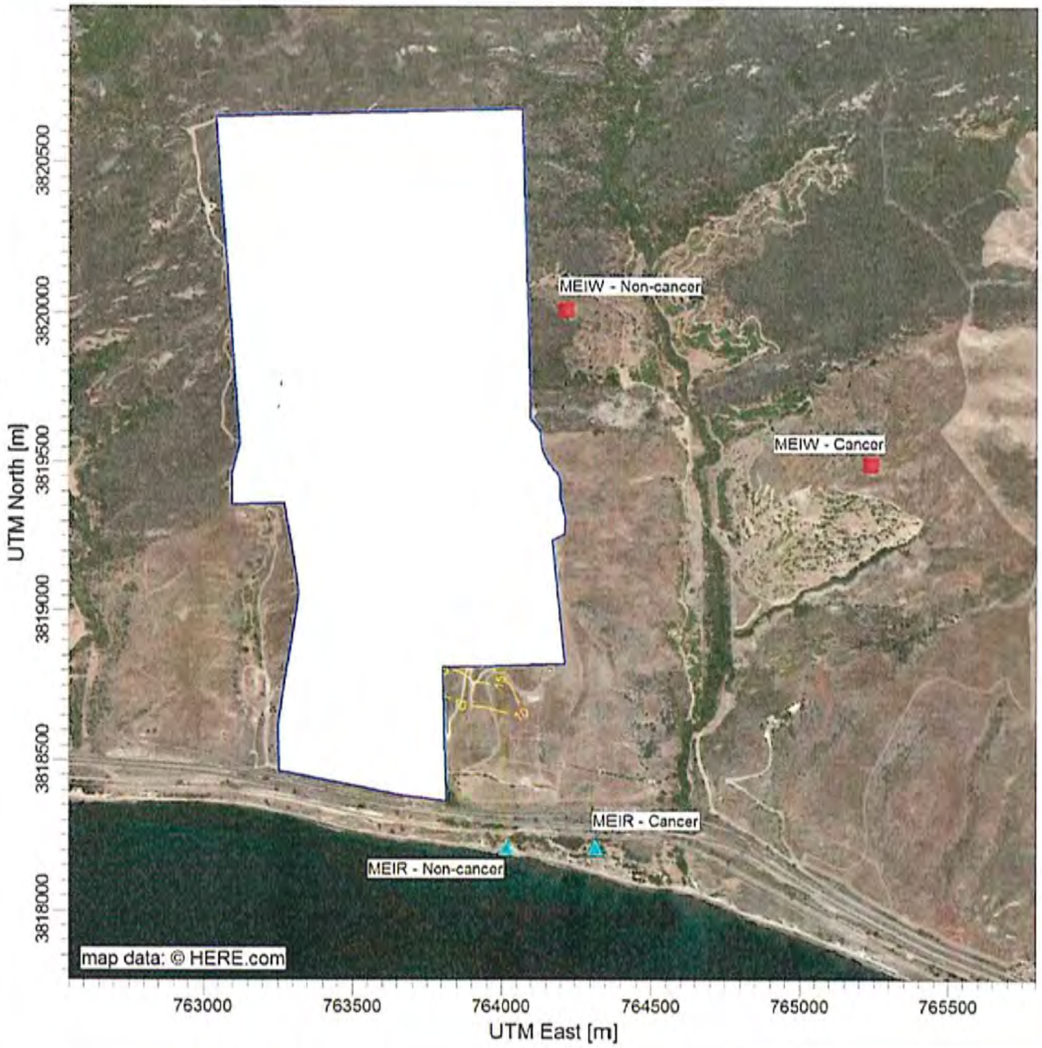
Acute noncancer risk (Receptor 625) due to the operation of TRRP at the PMI was determined to be 0.40. Cancer risk at the MEIR (Receptor 773) was determined to be 0.67 in-one-million. Non-cancer chronic and acute health impacts at the MEIR (Receptor 1102) were determined to be 0.006 and 0.16, respectively. Cancer risk at the MEIW (Receptor 1275), based on a worker exposure, was determined to be 0.11 in-one million, which is well below the SBCAPCD CEQA threshold. Non-cancer chronic and acute health impacts at the MEIW were determined to be 0.011 and 0.05, respectively.

The facility-wide HRA indicates a cancer risk at the MEIR (Receptor 852) of 3.48 in-one-million. Non-cancer chronic and acute health impacts at the MEIR (Receptor 773) were determined to be 0.033 and 0.69; respectively. Cancer risk at the MEIW (Receptor 1275), based on a worker exposure, was determined to be 0.20 in-one million. Non-cancer chronic and acute health impacts at the MEIW (Receptor 829) were determined to be 0.028 and 0.90, respectively.

Per SBCAPCD's HRA guidance (SBCAPCD 2017a), up to three air quality health risk isopleth plots may be required: (a) cancer risk results equal or greater than 10.0 in-one-million; (b) chronic non-cancer risk results with a HI greater than or equal to 1.0; and (c) acute non-cancer risks with HI greater than or equal to 1.0. The facility-wide HRA results for cancer risk and acute non-cancer risk are plotted in Figures 4-1 and 4-2. An isopleth plot of non-cancer chronic risk was not required as the HRA results did not equal or exceed a HI of 1.0 beyond the property boundary.

Figure 4-1
30-Year Cancer Risk Isopleth Greater than 10.0 in-one-million for Future Operations at Tajiguas Landfill including CSSR

PROJECT TITLE:
Tajiguas RRP
Facility Wide Cancer Risk



COMMENTS:	SOURCES: 292	COMPANY NAME: AECOM	
	RECEPTORS: 4259	MODELER: Mary M. Kaplan	AECOM
	OUTPUT TYPE: Concentration	SCALE: 1:20,442 (0 — 0.5 km)	
	MAX: 19.3 in a million	DATE: 6/6/2017	PROJECT NO.:

AERMOD View - Lakes Environmental Software P:\AQES\Projects\Mustang Renewable Power Ventures\Spring 2017\Lakes\Tajiguas_2017.isc

Figure 4-2
Acute Hazard Index Isopleth Greater than 1.0 for Future Operations at Tajiguas Landfill including CSSR

PROJECT TITLE:

Tajiguas RRP - HRA Modeling Results
Facility Wide Acute Noncancer Risk PMI

COMMENTS: Acute PMI = 1.04 at Property Boundary	SOURCES: **292**	COMPANY NAME: **AECOM**	
	RECEPTORS: **4259**	MODELER: **Mary M. Kaplan**	AECOM
		SCALE: 1:18,360 (0 — 0.5 km)	
		DATE: **6/1/2017**	PROJECT NO.:

AERMOD View - Lakes Environmental Software P:\AQES\Projects\Mustang Renewable Power Ventures\Spring 2017\Lakes\Tajiguas_2017.isc

Cancer risk is considered insignificant since there are no residential or worker receptors within the areas shown inside the isopleth on Figure 4-1 (i.e., the risk is less than 10 in-one million). Although the Acute noncancer risk at the PMI is shown in Table 4-16 to be greater than 1.0, this impact occurs at one receptor on the southeast property boundary.[12] This area is not reasonably accessible by the public as Santa Barbara County now owns the land. Access into this area is by landfill staff to conduct facility functions such as groundwater monitoring. Therefore, the facility-wide toxic air contaminant emissions are not considered to result in a significant health risk impact. Figures 4-1 and 4-2 are provided for disclosure purposes only.

4.2.2 Recommended Mitigation

No mitigation is necessary, as Revised Project TAC emissions would result in less than significant health risks.

4.2.3 Conclusions

A significant impact related to TAC emissions may occur when a project, individually or cumulatively, equals or exceeds the SBCAPCD health risk significance thresholds (10 excess cancer cases per million people and/or a hazard index of 1.0) at locations that are reasonably accessible to the public. As discussed above, the cancer risk at the MEIR due to Project sources alone was determined to be 0.67 in-a-million, and the chronic non-cancer and acute HIs were determined to be 0.006 and 0.16, respectively. These values are all below the applicable CEQA thresholds for the revised TRRP. Therefore, impacts related to TACs and health risks from the Revised Project sources would be Class III, less than significant.

For the facility-wide HRA (both existing and revised Landfill sources), the PMI for Acute HI is 1.04. The value over 1.0 only occurred at one location on the facility boundary and Santa Barbara County now owns the adjacent property. The cancer risk at the MEIR was determined to be 3.48-in a-million, attributed primarily to the existing landfill fugitive source at the Tajiguas Landfill. The non-cancer chronic and acute HIs at the MEIR were determined to be 0.033 and 0.69, respectively. Therefore, impacts related to TAC emissions and health risks from the facility-wide HRA would be less than significant and Class III.

4.3 Odors

The following section presents the results of the odor analysis associated with operation of the Revised Project, performed as described in Section 3.4.

4.3.1 Modeling Results

The region surrounding the TRRP is primarily zoned and used for agriculture and is sparsely populated, so population exposure to potential nuisance odor impacts will be very limited. The maximum 10-minute concentration determined by the odor analysis was 355 OU/m^3 (above the guidance concentration of 5 OU/m^3), indicating the potential for nuisance air quality impacts to occur due to odorous emissions from the Project. However, the peak concentration occurs on the eastern boundary of the Landfill, in an area where the public will not typically be present because it is not near residences or public trails. Therefore, it would not adversely affect a considerable number of persons. When the TRRP becomes operational, a substantial amount of organic waste will no longer be landfilled as it will be processed in the AD Facility instead. This change will gradually reduce odor emissions from the Landfill. It is expected that the actual odor emissions from the Landfill could be less than the modeled results.

The modeling results were analyzed to determine the impacts to places where the public could reasonably be expected on a relatively frequent basis (i.e., residences and the Baron Ranch hiking trail). While lower than the peak off-site concentration, the

[12] This same receptor had an acute HI 1.56 under the certified Final SEIR, indicating the modernization of the existing LFG engine and flare reduced the acute risk by 30%

peak odor concentrations modeled at these receptor locations were still above 5 OU/m^3 (see Table 4-17). A contour plot of the maximum 10-minute average concentrations (in OU) in the modeling grid is shown in Figure 4-3. Based on the larger contour values present on the east side of the facility adjacent to the composting area and AD Facility and an analysis of emission source contributions to the modeled results, the AD Facility biofilter is responsible for a larger impact off-site than the MRF Facility. As shown in Figure 4-3, the odor concentrations decline dramatically after one mile from the site boundary, further decreasing the potential for odor impacts in residentially-zoned areas.

Table 4-17
Sensitive Receptor Odor Frequency Analysis

Receptor	Max OU/m^3 10 min avg.	98th% OU/m^3 10 min avg.	95th% OU/m^3 10 min avg.	Hours per Year Over the 10-min Odor Guideline (5.0 OU/m^3)
Final SEIR Results				
Baron Ranch Hiking Trail	16.51	0.01	0.00	15
Existing Single Residential Dwelling (Arroyo Quemada Lane)	13.84	2.00	1.21	15
Number of Hours Exceeding Percentile Value	–	0	0	–
Revised Project Results				
Baron Ranch Hiking Trail	94.11	6.47	0.66	207
Existing Single Residential Dwelling (Arroyo Quemada Lane)	24.07	3.44	1.68	102
Number of Hours Exceeding Percentile Value	–	32	0	–

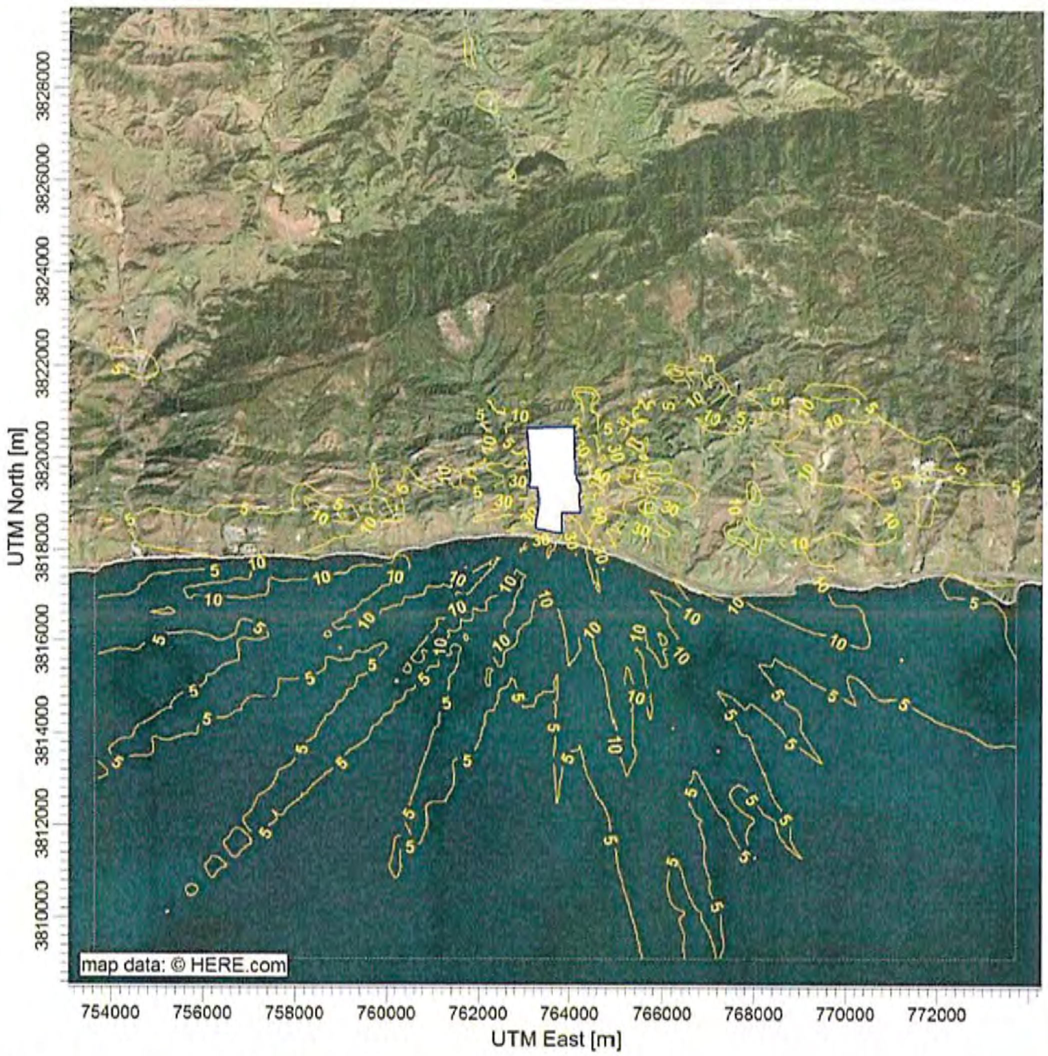
Given the very small potential for exposing residential populations to odor impacts above the 5 OU/m^3 guidance concentration, a frequency analysis was conducted of the modeling results at the three receptors modeled to identify the potential frequency of elevated odor concentrations. This provides consistency with odor threshold guidance of section 3.4.

Cumulative frequency distributions of the modeled impacts were generated, and the 95th percentile and 98th percentile odor concentrations were determined. For each of these percentile values, the number of hours exceeding the percentile value was also determined. For example, the 98th percentile represents an odor value which is equal or lower for 98 percent of the hours in a year – 8,585 out of 8,760 hours. The results of this cumulative frequency analysis are given in Table 4-17. As noted in Section 4, odors above the 5 OU/m^3 guidance level that occur less than two percent of the hours in a year (i.e., 175 hours) would not be considered significant based on the *Institute of Air Quality Management Guidance on the Assessment of Odour for Planning* (Bull *et al.* 2014).

The modeling results indicate that operation of the Revised Project could occasionally create off-site detectable odors above the 5 OU/m^3 concentration guidance value used in this analysis at several receptors. The two sensitive receptors show 207 and 102 hours per year in which the odors are potentially detected, which is less than 3 percent of the time. In particular, it is unlikely that an individual would be present at the Baron Ranch hiking trail receptor location for the 207 hours out of a year that the odor concentration would be more than the guidance value as many of these hours are nighttime hours (166 of the 207 hours are between 9 p.m. and 6 a.m.). Additionally, the odor concentration would only be over the guidance value at the existing single residential dwelling for 102 hours out of the year (less than 2 percent of the time).

Figure 4-3
Tajiguas Landfill Odor Modeling Contours

PROJECT TITLE:
Tajiguas RRP - Odor Modeling Results



COMMENTS:	SOURCES:	COMPANY NAME:	
	292	**AECOM**	
	RECEPTORS: **4259**	MODELER: **Mary M. Kaplan**	AECOM
	OUTPUT TYPE: Concentration	SCALE: 1:133,606 0 — 5 km	
	MAX: 355 OU/m³	DATE: **6/1/2017**	PROJECT NO.:

AERMOD View - Lakes Environmental Software

P:\AQES\Projects\Mustang Renewable Power Ventures\Spring 2017\Lakes\Tajiguas_2017.isc

In addition to the two receptors listed in Table 4-17, the Arroyo Honda Preserve is located west of the Landfill property. The Preserve is a 782-acre canyon that includes hiking trails, some of which are close to the Landfill's western boundary. These hiking trails may experience elevated odor impacts as shown by the contours presented in Figure 4-3. However, these impacts would occur infrequently since winds are predominately from the north or south and infrequently blow from the east and west, as shown in the wind rose in Figure 3-2. Additionally, the Preserve is only open to the public by reservation on the first and third full weekends of each month and every Monday and Wednesday for school and community groups. Therefore, individuals would be expected to be present on the trails near the Landfill infrequently.

The likelihood that a person in the sparsely populated, agricultural area surrounding the TRRP would experience the peak odor concentration is low because of the small number of people potentially affected, conservative odor emission assumptions, and the low frequency of occurrence of the meteorological conditions and process conditions that produce the highest odor concentrations. Therefore, it is expected that the TRRP would not conflict with SBCAPCD Rule 303, which restricts emissions that would cause nuisance or injury to any considerable number of persons or to the public or property. Odors impacts are therefore classified as less than significant for the TRRP.

As discussed Section 3.6 of 01-EIR-05 for the Tajiguas Landfill Expansion, potential impacts associated with odors emitted from landfill gas emissions and waste haul trucks were considered to be a potentially significant but mitigable nuisance impact. The existing Landfill operation has received no public complaints over the past 10 years (County of Santa Barbara 2013b). The lack of complaints for the existing operation (which includes landfilling and green waste chipping operations) serves as an indicator that, with mitigation such as the measures listed in Section 4.3.4 that have been incorporated into the Revised Project design, the odor nuisance impacts are likely to be less than significant. Measures to reduce potential odor impacts are identified in Section 4.3.4.

4.3.2 Hydrogen Sulfide and Organic Sulfides

H_2S and other organic sulfides are produced during anaerobic conditions in the anaerobic digester. Very little H_2S and organic sulfides generation and emission occur under the aerobic conditions present in an active composting pile. In addition, the digestate used for composting has already undergone anaerobic digestion during which most organic sulfur is reduced to organic sulfides, captured in an activated carbon filter treatment of the biogas and thereafter combusted in the AD CHP engines and in the flare, converting any residual sulfur compounds to SO_2.

The magnitude of fugitive emissions of hydrogen sulfide and organic sulfides from the Project is expected to be small and below the specified thresholds in Rule 310 (which prohibits hydrogen sulfide concentrations at or beyond the property line of 0.06 ppm for an averaging time of 3 minutes and 0.03 ppm for an averaging time of 1 hour). For the Revised Project, H_2S and organic sulfides will mainly be produced during the anaerobic digestion process; however, any gaseous H_2S and organic sulfides produced which are not captured in the activated carbon filter are combusted in the CHP engines. After oxidation in the CHP engines, the emissions are insignificant. Ventilation air from the AD Facility and MRF buildings containing low concentrations of H_2S and organic sulfides will be treated with biofilters which provide removal efficiencies of 99 percent for H_2S and 80 percent for organic sulfides. With this treatment, the H_2S and organic sulfides emissions would be less than significant.

4.3.3 Recommended Mitigation Measures

Odor impacts would be less than significant and mitigation measures are not required.

Consistent with the Final Program EIR for Statewide AD Facilities (CalRecycle), the following measures have been incorporated into the Project design:

- Establish time limit for on-site retention of undigested substrates (i.e., feed stocks should be processed and placed into the portion of the system where liquid discharge and air emissions can be controlled within 24 or 48 hours of receipt).

- Provide enclosed, negative pressure buildings for indoor receiving and pre-processing. Treat collected foul air in a biofilter or air scrubbing system. (TRRP MRF and AD buildings will be equipped with biofilters and will be kept under negative pressure).
- Establish contingency plans for operating downtime (e.g. equipment malfunction, power outage).
- Manage delivery schedule to facilitate prompt handling of odorous substrates. (Odorous substrates will be handled promptly).
- Providing windrow irrigation immediately after turning events.
- Handle fresh unstable digestate within enclosed building, or mix with green waste and incorporate into a composting operation within the same business day, and/or directly pump to covered, liquid leak-proof containers for transportation. Establish a protocol for monitoring and recording odor events. (The facility will develop an Odor Impact Minimization Plan (OIMP) including the above measures.) Instituting an OIMP, preventative maintenance program and formal odor monitoring/response strategy is currently the best form of mitigation. The revised measures can be accomplished through Standard Operating Procedures and Operation and Maintenance Manuals, which are included in the OIMP.
- Establish a protocol for reporting and responding to odor events. (The facility will develop an OIMP, as discussed above).

Due to the intermittent nature of nuisance odor impacts, an adaptive approach is recommended for the OIMP. Based on the location, duration and time of any potential odor complaints, the OIMP should document a clear standard operating and logging procedure. Additional odor minimization techniques can include:

- Installation of physical barriers around the facility, such as berms and vegetation, to minimize odor migration.
- Restricting windrow compost turning events based on weather conditions and prevailing winds.
- Ambient odor monitoring and sampling program for pre and post construction conditions.
- Application of deodorants or cover material on windrows.

4.3.4 Conclusions

As discussed in Section 4.3.1, the modeling results indicate that operation of the Revised Project could occasionally create off-site objectionable odors above the selected 5 OU/m^3 guidance concentration. However, the frequency of occurrences above the guidance concentration level would be low, less than three percent (263 hours) of the hours in a year at specified locations and 80 percent of the hours with concentrations over the 5 OU/m^3 occur between 9 p.m. and 6 a.m. when it is unlikely someone would be at that location. Additionally, the area surrounding the TRRP is agriculturally zoned, sparsely populated and therefore a considerable amount of persons would not be impacted. Odor impacts are therefore classified as less than significant for the TRRP.

As required by the Final Program EIR for Statewide AD Facilities (CalRecycle 2011), an OIMP will be established to outline the Project design features and best management practices listed in Section 4.3.3. Several aspects of the OIMP have already been incorporated into the Project; however, an adaptive approach is recommended to manage odor nuisance complaints if they arise.

4.4 Greenhouse Gases

The change in the greenhouse gases from the mobile source equipment changes would result in an increase of 42 metric tons of carbon dioxide equivalent (CO_2e). This change would result in a total GHG of 5,566 $MTCO_2e$ for all off-site and on-site sources. However, when the Revised Project's reduction of GHG from waste diversion is incorporated, the overall GHG impact remains beneficial (reduction of 18,494 $MTCO_2e$/year). This is presented in Table 4-18.

Table 4-18
Change in Greenhouse Gases

Source	Approved Project ($MTCO_2e$/year)	Revised Project ($MTCO_2e$/year)
On-site Sources	3,407	3,452
Off-site Sources	2,117	2,117
Total Direct	5,524	5,566
Total with Reduction	-18,536	-18,494

5.0 References

Associated Transportation Engineers, 2013. Tajiguas Resource Recovery Project EIR, Santa Barbara, California, Traffic and Circulation Study. October 8.

Bay Area Air Quality Management District (BAAQMD), 2008. Permit Handbook, Section 11.13, Tub Grinders, April. Downloaded from http://hank.baaqmd.gov/pmt/handbook/rev02/PH_00_05_11_13.pdf.

Braunschweiger Umwelt-Biotechnologie GmbH (BUB), 2010. Bericht über die Emissionsmessungen an der - Kompostierungs-Anlage - Biogas-Anlagedes Abfallwirtschaftszentrums, Borgstedt [Bekon Study]. December.

Bull, M., A. McIntyre, D. Hall, G. Allison, J. Redmore, J. Pullen, L. Caird, M. Stoaling, R. Fain, (2014). IAQM Guidance on the assessment of odour for planning, Institute of Air Quality Management, London. www.iaqm.co.uk/text/guidance/odour-guidance-2014. April.

California Air Resources Board (ARB), 2006. OFFROAD2007 model. Downloaded from http://www.arb.ca.gov/msei/offroad/downloads/models/offroad2007_1215_exe.zip.

2013a. EMFAC2011 model online data. Accessed at http://www.arb.ca.gov/emfac/.

2013b. EMFAC2011-LDV model. Downloaded from http://www.arb.ca.gov/msei/emfac2011_ldv.htm.

2013c. EMFAC2011 Frequently Asked Questions. Accessed at http://www.arb.ca.gov/msei/emfac2011-faq.htm#emfac2011_web_db_qstn07.

2011a. OFFROAD2011 model. Downloaded from http://www.arb.ca.gov/msei/categories.htm#offroad_motor_vehicles.

2011b. The Carl Moyer Program Guidelines, Approved Revisions 2011, Approved April 2011. Downloaded from http://www.arb.ca.gov/msprog/moyer/guidelines/current.htm.

2009. AB 32 Climate Change Scoping Plan. May 11.

California Air Pollution Control Officers Association (CAPCOA). 2009. Health Risk Assessments for Proposed Land Use Projects. July.

2011. Quantifying Greenhouse Gas Mitigation Measures.

California Integrated Waste Management Board (CIWMB). 2008. Emissions Testing of Volatile Organic Compounds from Greenwaste Composting at the Modesto Compost Facility in the San Joaquin Valley. Accessed at http://www.calrecycle.ca.gov/Publications/Documents/Organics/44207009.pdf.

California Office of Planning and Research. 2011. California Environmental Quality Act Statutes and Guidelines.

California Senate Bill 97 - CEQA GHG Guidelines. 2009. CCR Title 14. Natural Resources Division 6. Resources Agency Chapter 3. Article 5. §15064.4.

CalRecycle. 2011. Statewide Anaerobic Digester Facilities for the Treatment of Municipal Organic Solid Waste, Final Program Environmental Impact Report, SCH No. 2010042100.

CH2M HILL Report. 2010. Odor Impact Evaluation for Cedar Grove Composting's Everett Facility. City of Everett, Washington.

City of Santa Maria, 1995. Conditional Negative Declaration for Engel & Gray Composting Facility, E- 94–56. June 21, 1995.

2013. Final Subsequent Environmental Impacts Report for the Atlas Copco – Mafi Trench Project. November. Downloaded from http://www.cityofsantamaria.org/3069.html.

2010. Santa Maria Integrated Waste Management Facility Project Final EIR. April 2010.

2008. Addendum for Conditional Negative Declaration for Engel & Gray Composting Facility. July 3, 2008.

Climate Registry. 2009. Electric Power Sector Protocol for the Voluntary Reporting Program, Version 1.0. Available at: http://www.theclimateregistry.org/downloads/2009/05/Electric-Power-Sector-Protocol_v1.0.pdf.

2013. 2013 Climate Registry Default Emission Factors, January. Downloaded from http://www.theclimateregistry.org/downloads/2013/01/2013-Climate-Registry-Default-Emissions-Factors.pdf.

County of Santa Barbara. 2016. Final Subsequent Environmental Impact Report (Subsequent EIR), 12EIR-00000-00002. July 12.

2015. Board of Supervisors Adoption of the Energy and Climate Action Plan. May 19. Downloaded from http://longrange.sbcountyplanning.org/programs/climateactionstrategy/climateaction.php.

2013a. Energy and Climate Action Plan Summary Information. March. Downloaded from http://longrange.sbcountyplanning.org/programs/climateactionstrategy/climateaction.php.

2013b. Email from Joddi Leipner of RRWMD to Sean Wazlaw of AECOM on February 7, 2013 confirming that the Tajiguas Landfill has not received odor complaints in the past.

2013c. E-mail from Joddi Leipner, Senior Environmental Planner of RRWMD to Sara Head of AECOM. August 8.

2002. Final Environmental Impact Report, Tajiguas Landfill Expansion Project. State Clearing House Number 98041003, Santa Barbara County Number 01-EIR-5. July.

2001. Draft Environmental Impact Report, Tajiguas Landfill Expansion Project, Appendix E.8. State Clearing House Number 98041003, Santa Barbara County Number 01-EIR-5. October.

County of Santa Barbara Environmental Health Services, 2007. Air Quality Impact Analysis, MarBorg C&D Recycling Facility Revised Permit -2007. August 29.

County of Santa Barbara Planning and Development, 2008. Environmental Thresholds and Guidelines Manual, October. Greenhouse gas thresholds most recently updated in July 2015.

2010. Guidelines for the Implementation of the California Environmental Quality Act of 1970 As Proposed. June.

County of Ventura Planning Division. 2010. Simi Valley Landfill and Recycling Center Expansion Project Final EIR.

DiStefano, T. and L. Belenky. 2009. Life-Cycle Analysis of Energy and Greenhouse Gas Emissions from Anaerobic Biodegradation of Municipal Solid Waste, J. Environ. Eng., 135(11), 1097–1105

Doll, R. and R. Peto. 1981. The causes of cancer: quantitative estimates of avoidable risks of cancer in the United States today. Journal of the National Cancer Institute. 66(6):1191–1308.

Drude, Kevin. 2009. Memorandum: Shell Hercules Slope Remediation/Stabilization Project, Case No. 09CDH-00000-00002, County of Santa Barbara Planning Department. September 4.

Engel, B., 2013. Personal communication between Bob Engel (Engel and Gray) and Matt Ingamells (Padre Associates). March.

Environ, 2011. California Emissions Estimator Model (CalEEMod), version 2011.1.1. Downloaded from http://www.caleemod.com/.

Homans, W.J. and K. Fischer. 1992. A Composting Plant as An Odor Source. Acta Horticulturae, 302, 37–44.

Intergovernmental Panel on Climate Change (IPCC). 2007. Synthesis Report Summary for Policymakers. Available at: http://www.ipcc.ch.publications_and_data/ar4/syr/en/spm.html.

Kumar, Anuj, C.P. Alaimo, R. Horowitz, F.M. Mitloehner, M.J. Kleinman, and P.G. Green. 2011. Volatile organic compound emissions from green waste composting: Characterization and ozone formation, Atmos. Environ., 45 (2011) 1841–1848.

Nunez, F. 2006. California Global Warming Solutions Act; 2006. Assembly Bill No. 32, Chapter 488, Legislative Counsel's Digest: Sacramento, California.

Office of Environmental Health Hazard Assessment (OEHHA). 2009. Technical Support Document for Describing Available Cancer Potency Factors, Appendix A: Hot Spots Unit Risk and Cancer Potency Values. June.

2017. Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values. February.

2015. Air Toxics Hotspots Program Guidance Manual for Preparation of Health Risk Assessments. August.

PMC. 2015. Final Environmental Impact Report For the Energy and Climate Action Plan. SCH# 20144021021. May.

RWDI. 2005. Final Report Odour Management in British Columbia: Review and Recommendations.

San Joaquin Valley Air Pollution Control District, 2010. Compost VOC Emission Factors. September 15. Downloaded from http://valleyair.org/Workshops/postings/2010/9-22-10-rule4566/SJVAPCD%20Compost%20VOC%20EF%20Report%209-15-10.pdf.

Santa Barbara County Air Pollution Control District and Santa Barbara County Association of Governments. 2011. 2010 Clean Air Plan. January.

Santa Barbara County Air Pollution Control District. 2010a. Permit to Operate 9788, Final Part 70 Permit Renewal/Reevalution 09788-R3. December 22, 2010.

2017a Email correspondence between Alex Economou, Air Quality Specialist, SBCAPCD, and Matt Dunn (AECOM).

2017b. Modeling Guidelines for Health Risk Assessments (APCD Form -15i). Last updated May, 2017.

2017c. Email correspondence between Michael F. Goldman, Engineering Division Manager of Santa Barbara County Air Pollution Control, and Matt Dunn (AECOM). April.

2015. Environmental Review Guidelines for Health Risk Assessments (APCD Form -15i). Last updated May, 2017.

2014a. Email correspondence between David Harris, SBCAPCD and Mary Kaplan, AECOM. June.

2014b. Email correspondence between David Harris, SBCAPCD and Joddi Leipner, RRWMD. July.

2011a. Scope and Content of Air Quality Sections in Environmental Documents. December.

2011b. Gasoline Station Health Risk Assessment Application Form 25T. http://www. sbcapcd.org/eng/dl/appforms/apcd-25T.pdf. Last updated September, 2011.

Schmidt, C.E., T.R. Card, and B. Kiehl, 2009. Composting Trials Evaluate VOC Emissions Control. BioCycle, Vol. 50, No. 4, p.33. April.

SCS Engineers with Cascadia. 2009. Waste Characterization Study for the Tajiguas Landfill. March.

Spencer, R. and C. Alix, 2007. Compost Facility Odor Control. Solid Waste Association of North America New York State Chapter Odor Control at Solid Waste Management Facilities Specialty Seminar. Albany, New York. November 7.

South Coast Air Quality Management District (SCAQMD). 1996. Source Test Report 96-0007/96-0008/96-0009, Conducted at San Joaquin Composting, Inc., Holloway Road, Lost Hills, California. March. Downloaded from http://www.aqmd.gov/rules/doc/r1133/sanjoaquin_source.pdf.

U. S. Environmental Protection Agency (EPA). 1985. Guideline for Determination of Good Engineering Practice Stack Height. EPA Document No. EPA-450/4-80-023R. Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina. June.

2017. Ambient Air Quality Data. Accessed at https://www.epa.gov/outdoor-air-quality-data.

2016. Guideline on Air Quality Models (Revised). Codified in the Appendix W to 40 CFR Part 51. Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina. December.

2015. National Ambient Air Quality Standards for Ozone, Final Rule. October 1. Accessed at http://www3.epa.gov/airquality/ozonepollution/actions.html#current.

2012. Haul Road Workgroup Final Report Submission to EPA-OAQPS, memorandum dated March 2, 2012. Accessed at http://www.epa.gov/ttn/scram/reports/Haul_Road_Workgroup-Final_Report_Package-20120302.pdf.

2010a. Landfill Gas (LFG) Energy Project Development Handbook. Washington, DC. U.S. Government Printing Office. Retrieved from: http://www.epa.gov/lmop/documents/pdfs/pdh_chapter1.pdf.

2010b. Municipal Solid Waste in the United States: 2010 Facts and Figures. Downloaded from http://www.epa.gov/osw/nonhaz/municipal/msw99.htm.

2010c. Climate Change – Basic Information. Available at: http://epa.gov/climatechange/basicinfo.html.

2009. AERMOD Implementation Guide (AIG). Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina. March.

2008a. Compilation of Air Pollutant Emission Factors (AP-42), Draft Section 2.4, Municipal Solid Waste Landfills. October. Downloaded from http://www.epa.gov/ttn/chief/ap42/ch02/draft/d02s04.pdf.

2006a. Compilation of Air Pollutant Emission Factors (AP-42), Section 13.2.2, Unpaved Roads. November. Downloaded from http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s0202.pdf.

2006b. Compilation of Air Pollutant Emission Factors (AP-42), Section 13.2.2, Aggregate Handling and Storage Piles. November. Downloaded from http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s0204.pdf.

2006c. TANKS Emission Estimation Software, Version 4.09D. October. Downloaded from http://www.epa.gov/ttn/chief/software/tanks/index.html#order.

2004. Compilation of Air Pollutant Emission Factors (AP-42), Section 11.19, Crushed Stone Processing and Pulverized Mineral Processing. August. Downloaded from http://www.epa.gov/|ttn/chief/ap42/ch13/final/c13s0201.pdf.

2000. Compilation of Air Pollutant Emission Factors (AP-42), Section 3.2, Natural Gas Fired Reciprocating Engines. July. Downloaded from http://www.epa.gov/ttn/chief/ap42/ch03/final/c03s02.pdf.

1998. Compilation of Air Pollutant Emission Factors (AP-42), Section 11.9, Western Surface Coal Mining. October. Downloaded from http://www.epa.gov/ttn/chief/ap42/ch11/final/c11s09.pdf.

van Harreveld, F., B.T. Rutjens, M.Rotteveel, L.F. Nordgren, J. van der Pligt, 2009. Ambivalence and decisional conflict as a cause of psychological discomfort: Feeling tense before jumping off the fence. Journal of Experimental Social Psychology, 45, 167–173.

Ventura County Air Pollution Control District, 2001. AB2588 Combustion Emission Factors for Diesel Fuel Internal Combustion, May. http://www.aqmd.gov/docs/default-source/permitting/toxics-emission-factors-from-combustion-process-.pdf?sfvrsn=0.

2003. Ventura County Air Quality Assessment Guidelines. October.

Western Regional Air Partnership, 2006. WRAP Fugitive Dust Handbook, September. Downloaded from http://www.wrapair.org/forums/dejf/fdh/content/fdhandbook_rev_06.pdf.

Appendix A
Project Operation Emissions Calculations

Table 1 Criteria Pollutant Daily Emissions Summary without CSSR

Source	Emissions (lb/day)					
	CO	ROC	NOx	SOx	PM10	PM2.5
Onsite						
AD CHP Engines	54.62	20.51	20.81	0.00	19.64	19.64
Flare	0.25	0.00	0.10	13.62	0.05	0.05
MRF Facility Equipment	48.18	2.22	13.21	0.07	0.00	0.00
AD Facility Equipment	7.98	0.30	0.65	0.01	0.00	0.00
Equipment Outside MRF and AD Fac.	1.83	0.09	1.64	0.01	0.01	0.01
Composting Equipment Exhaust	8.25	0.38	0.82	0.02	0.02	0.02
Emergency Engine	0.69	0.04	0.13	0.00	0.01	0.01
Diesel Fuel Storage Tanks		0.02				
Material Handling Fugitive PM					5.91	0.89
Compost Screening Fugitive PM					0.06	0.00
Chipper/Grinder Fugitive PM					0.98	0.98
Motor Vehicle Fugitive PM					1.37	0.34
AD/MRF Fugitive ROC		3.50				
Windrow ROC		12.59				
Motor Vehicle Exhaust	0.12	0.03	0.06	0.00	0.00	0.00
Onsite Total	**121.91**	**39.68**	**37.42**	**13.74**	**28.05**	**21.96**
Offsite						
Motor Vehicle Exhaust	23.76	4.42	6.87	0.07	0.49	0.36
Motor Vehicle Fugitive PM					3.84	0.94
Offsite Total	**23.76**	**4.42**	**6.87**	**0.07**	**4.33**	**1.30**
Total	**145.67**	**44.11**	**44.29**	**13.82**	**32.38**	**23.27**

Table 2 Criteria Pollutant Annual Emissions Summary without CSSR

Source	Emissions (ton/year)					
	CO	ROC	NOx	SOx	PM10	PM2.5
Onsite						
AD CHP Engines	8.74	3.49	3.58	0.64	3.41	3.41
Flare	0.90	0.01	0.36	0.26	0.19	0.19
MRF Facility Equipment	7.49	0.35	2.05	0.01	0.00	0.00
AD Facility Equipment	0.83	0.03	0.07	0.00	0.00	0.00
Equipment Outside MRF and AD Fac.	0.28	0.01	0.26	0.00	0.00	0.00
Composting Equipment Exhaust	0.11	0.01	0.01	0.00	0.00	0.00
Emergency Engine	0.03	0.00	0.01	0.00	0.00	0.00
Diesel Fuel Storage Tanks		0.00				
Material Handling Fugitive PM					0.18	0.03
Compost Screening Fugitive PM					0.01	0.00
Chipper/Grinder Fugitive PM					0.15	0.15
Motor Vehicle Fugitive PM					0.21	0.05
AD/MRF Fugitive ROC		0.64				
Windrow ROC		2.30				
Motor Vehicle Exhaust	0.02	0.01	0.01	0.00	0.00	0.00
Onsite Total[a]	**18.41**	**6.84**	**6.34**	**0.91**	**4.15**	**3.83**
Offsite						
Motor Vehicle Exhaust	3.69	0.69	1.07	0.01	0.08	0.06
Motor Vehicle Fugitive PM					0.60	0.15
Offsite Total	**3.69**	**0.69**	**1.07**	**0.01**	**0.67**	**0.20**
Total	**22.11**	**7.53**	**7.41**	**0.93**	**4.82**	**4.03**

Table 3 Criteria Pollutant Daily Emissions Summary with CSSR

Source	Emissions (lb/day)					
	CO	ROC	NOx	SOx	PM10	PM2.5
Onsite						
AD CHP Engines	54.62	20.51	20.81	0.00	19.64	19.64
Flare	0.25	0.00	0.10	13.62	0.05	0.05
MRF Facility Equipment	48.18	2.22	13.21	0.07	0.00	0.00
AD Facility Equipment	7.98	0.30	0.65	0.01	0.00	0.00
Equipment Outside MRF and AD Fac.	1.83	0.09	1.64	0.01	0.01	0.01
Composting Equipment Exhaust	8.25	0.38	0.82	0.02	0.02	0.02
Emergency Engine	0.69	0.04	0.13	0.00	0.01	0.01
Diesel Fuel Storage Tanks		0.02				
Material Handling Fugitive PM					5.91	0.89
Compost Screening Fugitive PM					0.06	0.00
Chipper/Grinder Fugitive PM					0.98	0.98
Motor Vehicle Fugitive PM					2.08	0.53
AD/MRF Fugitive ROC		3.50				
Windrow ROC		12.59				
Motor Vehicle Exhaust	0.19	0.06	0.14	0.00	0.00	0.00
Onsite Total	**121.98**	**39.71**	**37.50**	**13.74**	**28.77**	**22.15**
Offsite						
Motor Vehicle Exhaust	30.71	5.73	4.98	0.09	0.54	0.41
Motor Vehicle Fugitive PM					4.91	1.20
Offsite Total	**30.71**	**5.73**	**4.98**	**0.09**	**5.45**	**1.62**
Total	**152.69**	**45.44**	**42.48**	**13.83**	**34.22**	**23.76**

Table 4 Criteria Pollutant Annual Emissions Summary with CSSR

Source	Emissions (ton/year)					
	CO	ROC	NOx	SOx	PM10	PM2.5
Onsite						
AD CHP Engines	8.74	3.49	3.58	0.64	3.41	3.41
Flare	0.90	0.01	0.36	0.26	0.19	0.19
MRF Facility Equipment	7.49	0.35	2.05	0.01	0.00	0.00
AD Facility Equipment	0.83	0.03	0.07	0.00	0.00	0.00
Equipment Outside MRF and AD Fac.	0.28	0.01	0.26	0.00	0.00	0.00
Composting Equipment Exhaust	0.11	0.01	0.01	0.00	0.00	0.00
Emergency Engine	0.03	0.00	0.01	0.00	0.00	0.00
Diesel Fuel Storage Tanks		0.00				
Material Handling Fugitive PM					0.18	0.03
Compost Screening Fugitive PM					0.01	0.00
Chipper/Grinder Fugitive PM					0.15	0.15
Motor Vehicle Fugitive PM					0.32	0.08
AD/MRF Fugitive ROC		0.64				
Windrow ROC		2.30				
Motor Vehicle Exhaust	0.03	0.01	0.02	0.00	0.00	0.00
Onsite Total[a]	**18.42**	**6.85**	**6.36**	**0.91**	**4.27**	**3.86**
Offsite						
Motor Vehicle Exhaust	4.77	0.89	0.77	0.01	0.08	0.06
Motor Vehicle Fugitive PM					0.76	0.19
Offsite Total	**4.77**	**0.89**	**0.77**	**0.01**	**0.85**	**0.25**
Total	**23.20**	**7.74**	**7.13**	**0.93**	**5.11**	**4.11**

Table 5
Greenhouse Gas Annual Emissions Summary without CSSR

Source	Emissions (MT/year)[a]			
	CO_2	CH_4	N_2O	CO_2e[b]
Onsite				
CHP Engines Combustion	8,899.71	0.21	0.03	8,912.91
CHP Engines Pass-through CO_2	5,824.47			5,824.47
Flare Combustion	476.99	0.03	0.01	479.40
Flare Pass-through CO_2	328.68			328.68
MRF Facility Equipment	1,122.79	0.06	0.03	1,132.90
AD Facility Equipment	118.93	0.01	0.00	120.00
Equipment Outside MRF and AD Fac.	76.21	0.00	0.00	76.89
Composting Equipment Exhaust	50.97	0.00	0.00	51.43
Motor Vehicle Exhaust	17.52	0.03	0.00	18.87
Onsite Total	**16,916.27**	**0.34**	**0.07**	**16,945.55**
Offsite				
Motor Vehicle Exhaust	1,560.81	2.38	0.22	1,685.56
Offsite Total	**1,560.81**	**2.38**	**0.22**	**1,685.56**
Total	**18,477.07**	**2.71**	**0.29**	**18,631.11**

[a] Metric ton = 1,000 kilograms = pounds x 453.6 g/lb / 1,000,000 g/MT
[b] CO_2e = CO2-equivalent = $CO_2 + 25 \times CH_4 + 298 \times N_2O$

Table 6
Greenhouse Gas Annual Emissions Summary with CSSR

Source	Emissions (MT/year)[a]			
	CO_2	CH_4	N_2O	CO_2e[b]
Onsite				
CHP Engines Combustion	8,899.71	0.21	0.03	8,912.91
CHP Engines Pass-through CO_2	5,824.47			5,824.47
Flare Combustion	476.99	0.03	0.01	479.40
Flare Pass-through CO_2	328.68			328.68
MRF Facility Equipment	1,122.79	0.06	0.03	1,132.90
AD Facility Equipment	118.93	0.01	0.00	120.00
Equipment Outside MRF and AD Fac.	76.21	0.00	0.00	76.89
Composting Equipment Exhaust	50.97	0.00	0.00	51.43
Motor Vehicle Exhaust	33.82	0.03	0.00	35.60
Onsite Total	**16,932.57**	**0.35**	**0.07**	**16,962.29**
Offsite				
Motor Vehicle Exhaust	1,951.40	3.18	0.29	2,116.99
Offsite Total	**1,951.40**	**3.18**	**0.29**	**2,116.99**
Total	**18,883.98**	**3.53**	**0.36**	**19,079.28**

[a] Metric ton = 1,000 kilograms = pounds x 453.6 g/lb / 1,000,000 g/MT
[b] CO_2e = CO2-equivalent = $CO_2 + 25 \times CH_4 + 298 \times N_2O$

Table 7 Emission Rates for Dispersion Modeling

Table 7-A Daily Emissions Inside MRF Facility - 7:00 a.m. - 11:00 p.m.

Time Period	Emissions (g/s)					
	CO	ROC	NOx	SOx	PM10	PM2.5
7:00 a.m. - 11:00 p.m.	3.64E-01	2.28E-02	9.04E-02	5.28E-04	5.55E-06	2.39E-06

Table 7-B Annual Average Emissions Inside MRF Facility - 7:00 a.m. - 11:00 p.m.

Time Period	Emissions (g/s)					
	CO	ROC	NOx	SOx	PM10	PM2.5
7:00 a.m. - 11:00 p.m.	3.10E-01	1.95E-02	7.70E-02	4.49E-04	4.73E-06	2.03E-06

Table 7-C Daily Emissions Inside MRF Facility - 11:00 p.m. - 7:00 a.m.

Time Period	Emissions (g/s)					
	CO	ROC	NOx	SOx	PM10	PM2.5
11:00 p.m. - 7:00 a.m.	3.04E-02	7.48E-03	2.74E-02	1.05E-04	1.65E-07	1.65E-07

Table 7-D Annual Average Emissions Inside MRF Facility - 11:00 p.m. - 7:00 a.m.

Time Period	Emissions (g/s)					
	CO	ROC	NOx	SOx	PM10	PM2.5
11:00 p.m. - 7:00 a.m.	2.59E-02	6.37E-03	2.33E-02	8.94E-05	1.40E-07	1.40E-07

Table 7-E Daily Emissions Inside AD Facility - 8:00 a.m. - 4:00 p.m.

Time Period	Emissions (g/s)					
	CO	ROC	NOx	SOx	PM10	PM2.5
8:00 a.m. - 4:00 p.m.	1.26E-01	1.12E-02	1.02E-02	1.84E-04	4.61E-06	1.13E-06

Table 7-F Annual Average Emissions Inside AD Facility - 8:00 a.m. - 4:00 p.m.

Time Period	Emissions (g/s)					
	CO	ROC	NOx	SOx	PM10	PM2.5
8:00 a.m. - 4:00 p.m.	7.16E-02	6.36E-03	5.81E-03	1.05E-04	2.63E-06	6.44E-07

Table 7-G Daily Emissions from MRF Facility Biofilter (BF_TIP) - 7:00 a.m. - 11:00 p.m. (Emissions inside MRF Tipping Area)

Time Period	Emissions (g/s)						(m²)
	CO	ROC	NOx	SOx	PM10	PM2.5	Area
7:00 a.m. - 11:00 p.m.	3.11E-01	1.43E-02	4.27E-02	3.57E-04	1.54E-06	1.54E-06	613.2

Emissions (g/s/m²)							
CO	ROC	NOx	SOx	PM10	PM2.5		Night %
5.07487E-04	3.31466E-05	6.97053E-05	5.82109E-07	2.50423E-09	2.50423E-09	BF_TIP	0.05

Table 7-H Annual Average Emissions from MRF Facility Biofilter (BF_TIP) - 7:00 a.m. - 11:00 p.m. (Emissions inside MRF Tipping Area)

Time Period	Emissions (g/s)						(m²)
	CO	ROC	NOx	SOx	PM10	PM2.5	Area
7:00 a.m. - 11:00 p.m.	2.65E-01	1.22E-02	3.64E-02	3.04E-04	1.31E-06	1.31E-06	613.2

Emissions (g/s/m²)							
CO	ROC	NOx	SOx	PM10	PM2.5		Night %
4.32407E-04	2.97003E-05	5.93927E-05	4.95988E-07	2.13374E-09	2.13374E-09	BF_TIP	0.05

Table 7-I Daily Emissions from MRF Facility Biofilter (BF_TIP) - 11:00 p.m. - 7:00 a.m. (Emissions inside MRF Tipping Area)

Time Period	Emissions (g/s)						(m²)
	CO	ROC	NOx	SOx	PM10	PM2.5	Area
11:00 p.m. - 7:00 a.m.	1.52E-02	7.20E-04	1.37E-02	5.25E-05	8.23E-08	8.23E-08	613.2

Emissions (g/s/m²)							
CO	ROC	NOx	SOx	PM10	PM2.5		ROC Night %
2.48195E-05	1.10260E-05	2.23040E-05	8.56042E-08	1.34159E-10	1.34159E-10	BF_TIP	0.33

Table 7-J Annual Average Emissions from MRF Facility Biofilter (BF_TIP) - 11:00 p.m. - 7:00 a.m. (Emissions inside MRF Tipping Area)

Time Period	Emissions (g/s)						(m²)
	CO	ROC	NOx	SOx	PM10	PM2.5	Area
11:00 p.m. - 7:00 a.m.	1.30E-02	6.13E-04	1.17E-02	4.47E-05	7.01E-08	7.01E-08	613.2

Emissions (g/s/m²)							
CO	ROC	NOx	SOx	PM10	PM2.5		ROC Night %
2.11475E-05	1.08523E-05	1.90042E-05	7.29395E-08	1.14311E-10	1.14311E-10	BF_TIP	0.37

Table 7-K Daily Emissions from AD Facility Biofilters (ADF1 & ADF2) - 8:00 a.m. - 4:00 p.m.

Time Period	Emissions (g/s)						(m²)
	CO	ROC	NOx	SOx	PM10	PM2.5	Area
8:00 a.m. - 4:00 p.m.	1.26E-01	4.76E-03	1.02E-02	1.84E-04	5.10E-07	5.10E-07	838.0

Emissions (g/s/m²)							
CO	ROC	NOx	SOx	PM10	PM2.5		ROC Night %
1.49982E-04	1.27209E-05	1.21607E-05	2.19226E-07	6.08037E-10	6.08037E-10	BF_ADF	0.56

Table 7-L Annual Average Emissions from AD Facility Biofilters (ADF1 & ADF2) - 8:00 a.m. - 4:00 p.m.

Time Period	Emissions (g/s)						(m²)
	CO	ROC	NOx	SOx	PM10	PM2.5	Area
8:00 a.m. - 4:00 p.m.	7.16E-02	2.71E-03	5.81E-03	1.05E-04	2.90E-07	2.90E-07	838.0

Emissions (g/s/m²)							
CO	ROC	NOx	SOx	PM10	PM2.5		ROC Night %
8.54695E-05	1.02799E-05	6.92996E-06	1.24929E-07	3.46498E-10	3.46498E-10	BF_ADF	0.69

Table 7-M Daily Emissions from MRF Facility Recycling Area Biofilter (BF_RECYC) - 7:00 a.m. - 11:00 p.m. (Emissions inside MRF Recycling Area)

Time Period	Emissions (g/s)						(m²)
	CO	ROC	NOx	SOx	PM10	PM2.5	Area
7:00 a.m. - 11:00 p.m.	5.30E-02	2.51E-03	4.76E-02	1.71E-04	2.87E-07	2.87E-07	429.2

Emissions (g/s/m²)							
CO	ROC	NOx	SOx	PM10	PM2.5		Night %
1.23536E-04	2.07747E-05	1.11015E-04	3.97448E-07	6.67761E-10	6.67761E-10	BF_RECYC	0.29

Table 7 Emission Rates for Dispersion Modeling

Table 7-N Annual Average Emissions from MRF Facility Recycling Area Biofilter (BF_RECYC) - 7:00 a.m. - 11:00 p.m. (Emissions inside MRF Recycling Area)

Time Period	Emissions (g/s)						(m^2)
	CO	ROC	NOx	SOx	PM10	PM2.5	Area
7:00 a.m. - 11:00 p.m.	4.52E-02	2.14E-03	4.06E-02	1.45E-04	2.44E-07	2.44E-07	429.2

Emissions ($g/s/m^2$)								
CO	ROC	NOx	SOx	PM10	PM2.5			Night %
1.05259E-04	1.99102E-05	9.45911E-05	3.38648E-07	5.68969E-10	5.68969E-10	BF_RECYC		0.29

Table 7-O Daily Emissions from MRF Facility Recycling Area Biofilter (BF_RECYC) - 11:00 p.m. - 7:00 a.m. (Emissions inside MRF Recycling Area)

Time Period	Emissions (g/s)						(m^2)
	CO	ROC	NOx	SOx	PM10	PM2.5	Area
11:00 p.m. - 7:00 a.m.	1.52E-02	7.20E-04	1.37E-02	5.25E-05	8.23E-08	8.23E-08	429.2

Emissions ($g/s/m^2$)							ROC Night %
CO	ROC	NOx	SOx	PM10	PM2.5		0.80
3.54564E-05	1.66087E-05	3.18628E-05	1.22292E-07	1.91656E-10	1.91656E-10	BF_RECYC	

Table 7-P Annual Average Emissions from MRF Facility Recycling Area Biofilter (BF_RECYC) - 11:00 p.m. - 7:00 a.m. (Emissions inside MRF Recycling Area)

Time Period	Emissions (g/s)						(m^2)
	CO	ROC	NOx	SOx	PM10	PM2.5	Area
11:00 p.m. - 7:00 a.m.	1.30E-02	6.13E-04	1.17E-02	4.47E-05	7.01E-08	7.01E-08	429.2

Emissions ($g/s/m^2$)							ROC Night %
CO	ROC	NOx	SOx	PM10	PM2.5		0.82
3.02108E-05	1.63606E-05	2.71489E-05	1.04199E-07	1.63302E-10	1.63302E-10	BF_RECYC	

Table 7-Q Daily Emissions Outside MRF Facility Building (MRFSWEEP)

Time Period	Emissions (g/s)						(m^2)
	CO	ROC	NOx	SOx	PM10	PM2.5	Area
11:00 a.m. - 5:00 p.m.	1.92E-02	9.08E-04	1.73E-02	1.05E-04	1.04E-04	1.04E-04	12150.1

Emissions ($g/s/m^2$)						
CO	ROC	NOx	SOx	PM10	PM2.5	
1.58011E-06	7.47349E-08	1.41996E-06	8.64011E-09	8.54113E-09	8.54113E-09	MRFSWP1, MRFSWP2

Table 7-R Annual Average Hourly Emissions Outside MRF Facility Building (MRFSWEEP)

Time Period	Emissions (g/s)						(m^2)
	CO	ROC	NOx	SOx	PM10	PM2.5	Area
11:00 a.m. - 5:00 p.m.	1.64E-02	7.74E-04	1.47E-02	8.94E-05	8.84E-05	8.84E-05	12150.1

Emissions ($g/s/m^2$)						
CO	ROC	NOx	SOx	PM10	PM2.5	
1.34634E-06	6.36782E-08	1.20989E-06	7.36184E-09	7.27751E-09	7.27751E-09	MRFSWP1, MRFSWP2

Table 7-S Daily Emissions Outside AD Facility Building (ADSWEEP)

Time Period	Emissions (g/s)						(m^2)
	CO	ROC	NOx	SOx	PM10	PM2.5	Area
11:00 a.m. - 5:00 p.m.	1.92E-02	9.08E-04	1.73E-02	1.05E-04	1.04E-04	1.04E-04	3497.3

Emissions ($g/s/m^2$)						
CO	ROC	NOx	SOx	PM10	PM2.5	
5.49E-06	2.60E-07	4.93E-06	3.00E-08	2.97E-08	2.97E-08	ADSWEEP

Table 7-T Annual Average Hourly Emissions Outside AD Facility Building (ADSWEEP)

Time Period	Emissions (g/s)						(m^2)
	CO	ROC	NOx	SOx	PM10	PM2.5	Area
11:00 a.m. - 5:00 p.m.	1.64E-02	7.74E-04	1.47E-02	8.94E-05	8.84E-05	8.84E-05	3497.3

Emissions ($g/s/m^2$)						
CO	ROC	NOx	SOx	PM10	PM2.5	
4.677E-06	2.212E-07	4.203E-06	2.558E-08	2.528E-08	2.528E-08	ADSWEEP

Table 7-U Daily Exhaust Emissions from On-site Vehicles

Time Period	Segment	Emissions (g/s)					
		CO	ROC	NOx	SOx	PM10	PM2.5
8:00 a.m. - 2:00 p.m.	MRF-Compost	2.48E-04	6.64E-05	1.94E-04	2.83E-06	6.07E-06	6.07E-06
8:00 a.m. - 2:00 p.m.	MRF-Entrance	3.78E-03	1.22E-03	2.72E-03	3.10E-05	9.55E-05	9.34E-05

#	Emissions (g/s/volume)					
Volumes	CO	ROC	NOx	SOx	PM10	PM2.5
49	5.05E-06	1.40E-06	3.97E-06	5.77E-08	7.29E-05	1.82E-05
119	3.18E-05	1.03E-05	2.29E-05	2.61E-07	3.40E-04	8.72E-05

Table 7-V Annual Average Exhaust Emissions from On-site Vehicles

Time Period	Segment	Emissions (g/s)					
		CO	ROC	NOx	SOx	PM10	PM2.5
8:00 a.m. - 2:00 p.m.	MRF-Compost	2.11E-04	5.83E-05	1.66E-04	2.41E-06	5.17E-06	5.17E-06
8:00 a.m. - 2:00 p.m.	MRF-Entrance	3.22E-03	1.04E-03	2.32E-03	2.64E-05	8.14E-05	7.96E-05

#	Emissions (g/s/volume)					
Volumes	CO	ROC	NOx	SOx	PM10	PM2.5
49	4.31E-06	1.19E-06	3.38E-06	4.92E-08	6.21E-05	1.55E-05
119	2.71E-05	8.74E-06	1.95E-05	2.22E-07	2.90E-04	7.43E-05

Table 7-W Daily Emissions from AD 1.1MW CHP Engines 165-166

Time Period	Emissions, Each Engine (g/s)						
	CO	ROC	NOx	SOx	PM10	PM2.5	
12:00 a.m. - 12:00 a.m.	1.31E-01	5.24E-02	5.24E-02	9.79E-03	5.16E-02	5.16E-02	ADCHP1, ADCHP2

ST	3.08E-05	1.17E-05	2.68E-05	3.18E-07	4.13E-04	1.05E-04
Annual	3.14E-05	9.93E-06	2.28E-05	2.71E-07	3.52E-04	8.98E-05

Table 7-Y Annual Average Hourly Emissions from AD 1.1MW CHP Engines

Time Period	Emissions, Each Engine (g/s)						
	CO	ROC	NOx	SOx	PM10	PM2.5	
12:00 a.m. - 12:00 a.m.	1.26E-01	5.01E-02	5.15E-02	9.24E-03	4.90E-02	4.90E-02	ADCHP1, ADCHP2

Table 7-Z Daily Emissions from AD Flare, Purging Only

Time Period	Emissions (g/s)						
	CO	ROC	NOx	SOx	PM10	PM2.5	
1 hour, daytime	3.11E-02	4.20E-04	1.24E-02	8.89E-03	6.53E-03	6.53E-03	ADFLARE

Table 7-AA Daily Emissions from AD Flare, Purging and One AD 1.1 MW CHP Engine Off-line

Time Period	Emissions (g/s)						
	CO	ROC	NOx	SOx	PM10	PM2.5	
12:00 a.m. - 12:00 a.m.	2.50E-01	3.38E-03	1.00E-01	7.15E-02	5.25E-02	5.25E-02	ADFLARE

Table 7 Emission Rates for Dispersion Modeling

Table 7-AB Daily Emissions from CHP Engine during SCR Start-Up (1 engine)

Time Period	Emissions, Each Engine (g/s)						
	CO	ROC	NOx	SOx	PM10	PM2.5	
12:00 a.m. - 12:00 a.m.	7.21E-01	1.20E-01	1.57E-01	4.43E-03	5.16E-02	5.16E-02	ADCHP1, ADCHP2

Table 7-AC Daily Emissions from CHP Engine during SCR Burn-In (1 engine)

Time Period	Emissions, Each Engine (g/s)						
	CO	ROC	NOx	SOx	PM10	PM2.5	
12:00 a.m. - 12:00 a.m.	1.31E-01	5.24E-02	1.57E-01	8.30E-04	5.16E-02	5.16E-02	ADCHP1, ADCHP2

Table 7-AD Annual Average Hourly Emissions from Flare

Time Period	Emissions (g/s)						
	CO	ROC	NOx	SOx	PM10	PM2.5	
12:00 a.m. - 12:00 a.m.	2.59E-02	3.49E-04	1.04E-02	7.40E-03	5.43E-03	5.43E-03	ADFLARE

Table 7-AE Daily Emissions from Compost Area (Loader Exhaust, Material Transfers)

Time Period	Emissions (g/s)						(m²)
	CO	ROC	NOx	SOx	PM10	PM2.5	Area
8:00 a.m. - 4:00 p.m.	6.28E-02	2.38E-03	5.10E-03	7.09E-05	9.64E-04	1.46E-04	1412.1

Emissions (g/s/m²) for COMPMAT Source					
CO	ROC	NOx	SOx	PM10	PM2.5
4.45030E-05	1.68390E-06	3.60835E-06	5.01808E-08	6.82952E-07	1.03572E-07

Table 7-AF Annual Average Hourly Emissions from Compost Area (Loader Exhaust, Material Transfers)

Time Period	Emissions (g/s)						(m²)
	CO	ROC	NOx	SOx	PM10	PM2.5	Area
8:00 a.m. - 4:00 p.m.	5.35E-02	2.03E-03	4.34E-03	6.04E-05	8.22E-04	1.25E-04	1412.1

Emissions (g/s/m²) for COMPMAT Source					
CO	ROC	NOx	SOx	PM10	PM2.5
3.79190E-05	1.43477E-06	3.07451E-06	4.27568E-08	5.81912E-07	8.82485E-08

Table 7-AG Daily Exhaust Emissions from Windrow Turner

Time Period	Emissions (g/s)						(m²)
	CO	ROC	NOx	SOx	PM10	PM2.5	Area
8:00 a.m. - 4:00 p.m.	6.71E-02	3.61E-03	7.74E-03	3.15E-04	3.87E-04	3.87E-04	18175.7

Emissions (g/s/m²) for WINDROW Source						
CO	ROC	NOx	SOx	PM10	PM2.5	Night %
3.69126E-06	1.98760E-07	4.25914E-07	1.73272E-08	5.03304E-06	7.80217E-07	0.95

3.63545E-06 Windrow ROC
3.83421E-06 Windrow Source Total

Table 7-AH Annual Average Hourly Emissions from Windrow Turner Exhaust

Time Period	Emissions (g/s)						(m²)
	CO	ROC	NOx	SOx	PM10	PM2.5	Area
8:00 a.m. - 4:00 p.m.	9.56E-03	5.15E-04	1.10E-03	4.49E-05	5.51E-05	5.51E-05	18175.7

Emissions (g/s/m²) for WINDROW Source					
CO	ROC	NOx	SOx	PM10	PM2.5
5.25878E-07	2.83165E-08	6.06782E-08	2.46854E-09	7.74228E-07	1.19815E-07

Table 7-AI Daily Fugitive PM Emissions from On-site Vehicles

Time Period	Segment	Emissions (g/s)		#	Emissions (g/s/vol)	
		PM10	PM2.5	Volumes	PM10	PM2.5
8:00 a.m. - 2:00 p.m.	MRF-Compost	3.56E-03	8.85E-04	49	7.27E-05	1.81E-05
8:00 a.m. - 2:00 p.m.	MRF-Entrance	4.02E-02	1.01E-02	119	3.38E-04	8.53E-05

Table 7-AJ Annual Average Fugitive PM Emissions from On-site Vehicles

Time Period	Segment	Emissions (g/s)		#	Emissions (g/s/vol)	
		PM10	PM2.5	Volumes	PM10	PM2.5
8:00 a.m. - 2:00 p.m.	MRF-Compost	3.04E-03	7.54E-04	49	6.20E-05	1.54E-05
8:00 a.m. - 2:00 p.m.	MRF-Entrance	3.43E-02	8.65E-03	119	2.88E-04	7.27E-05

Table 7 Emission Rates for Dispersion Modeling

Table 7-AK Daily Fugitive PM Emissions from Windrow Area Material Transfers

Time Period	Activity	Emissions (g/s)		
		PM10	PM2.5	WINDROW
8:00 a.m. - 4:00 p.m.	Digestate to Windrow	1.68E-03	2.54E-04	
8:00 a.m. - 4:00 p.m.	Windrow Turning	8.94E-02	1.35E-02	

Table 7-AL Annual Average Hourly Fugitive PM Emissions from Windrow Area Material Transfers

Time Period	Activity	Emissions (g/s)		
		PM10	PM2.5	WINDROW
8:00 a.m. - 4:00 p.m.	Digestate to Windrow	1.28E-03	1.94E-04	
8:00 a.m. - 4:00 p.m.	Windrow Turning	1.27E-02	1.93E-03	

Table 7-AM Daily Fugitive PM Emissions from Compost Screening

Time Period	Emissions (g/s)		
	PM10	PM2.5	
8:00 a.m. - 4:00 p.m.	1.93E-03	2.11E-04	SCREEN

Table 7-AN Annual Average Hourly Fugitive PM Emissions from Compost Screen

Time Period	Emissions (g/s)		
	PM10	PM2.5	
8:00 a.m. - 4:00 p.m.	1.64E-03	1.80E-04	SCREEN

Table 7-AO Daily Fugitive PM Emissions from Chipper/Grinder

Time Period	Emissions (g/s)		
	PM10	PM2.5	
7:00 a.m. - 8:30 a.m.	8.26E-02	8.26E-02	CHIPPER

Table 7-AP Annual Average Hourly Fugitive PM Emissions from Chipper/Grinder

Time Period	Emissions (g/s)		
	PM10	PM2.5	
7:00 a.m. - 8:30 a.m.	7.03E-02	7.03E-02	CHIPPER

Table 7 Emission Rates for Dispersion Modeling

Table 7-AQ Daily Emissions from 1.4 MW MRF CHP Engines

Time Period	Emissions, Each Engine (g/s)						
	CO	ROC	NOx	SOx	PM10	PM2.5	
12:00 a.m. - 12:00 a.m.	1.09E-01	6.23E-02	6.55E-02	1.04E-02	6.44E-02	6.44E-02	MRFCHP1, 2
	2.18E-01	1.25E-01	1.31E-01	2.08E-02	1.29E-03	1.29E-03	PAPERDRY (2 Engines) * 99% Eff Baghous

Table 7-AR Annual Average Hourly Emissions from 1.4MW MRF CHP Engines

Time Period	Emissions, Each Engine (g/s)						
	CO	ROC	NOx	SOx	PM10	PM2.5	
12:00 a.m. - 12:00 a.m.	1.16E-01	6.05E-02	6.43E-02	1.00E-02	6.12E-02	6.12E-02	MRFCHP1, 2
	2.32E-01	1.21E-01	1.29E-01	2.00E-02	1.22E-03	1.22E-03	PAPERDRY (2 Engines) * 99% Eff Baghous

Table 7-AS Daily Emissions from 1.4MW MRF CHP Engine during SCR Start-Up (1 engine)

Time Period	Emissions, Each Engine (g/s)						
	CO	ROC	NOx	SOx	PM10	PM2.5	
12:00 a.m. - 12:00 a.m.	8.74E-01	1.49E-01	1.97E-01	6.24E-03	6.44E-02	6.44E-02	MRFCHP1-2 (1 Engine in any hour)
	9.83E-01	2.11E-01	2.62E-01	1.66E-02	1.29E-03	1.29E-03	PAPERDRY (2 Engines) * 99% Eff Baghous

Table 7-AT Daily Emissions from 1.4 MW MRF CHP Engine during SCR Burn-In (1 engine)

Time Period	Emissions, Each Engine (g/s)						
	CO	ROC	NOx	SOx	PM10	PM2.5	
12:00 a.m. - 12:00 a.m.	8.74E-01	1.49E-01	1.97E-01	5.29E-03	6.44E-02	6.44E-02	MRFCHP1-2 (1 Engine in any hour)
	9.83E-01	2.11E-01	2.62E-01	1.57E-02	1.29E-03	1.29E-03	PAPERDRY (2 Engines) * 99% Eff Baghous

Table 7-AU Maximum Hourly Emissions from MRF Flare

Time Period	Emissions, Each Engine (g/s)						
	CO	ROC	NOx	SOx	PM10	PM2.5	
12:00 a.m. - 12:00 a.m.	3.10E-01	4.19E-03	1.24E-01	1.04E-02	6.52E-02	6.52E-02	MRFFLAR1

Table 7-AV Annual Average Hourly Emissions from MRF Flare

Time Period	Emissions (g/s)						
	CO	ROC	NOx	SOx	PM10	PM2.5	
12:00 a.m. - 12:00 a.m.	3.10E-02	4.19E-04	1.24E-02	1.04E-03	6.52E-03	6.52E-03	MRFFLAR1

e

e

e

e