

ENVIRONMENTAL IMPACT ANALYSIS

## 4.6 GREENHOUSE GAS EMISSIONS

### Acronyms

AB	Assembly Bill
CalEEMod	California Emissions Estimator Model
CARB	California Air Resources Board
CFCs	Chlorofluorocarbons
CFR	Code of Federal Regulations
CH <sub>4</sub>	Methane
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Equivalent amount of carbon dioxide
EIR	Environmental Impact Report
GHG	Greenhouse gas
GWP	Global Warming Potential
GWP	Glendale Water and Power
HFCs	Hydrofluorocarbons
IPCC	Intergovernmental Panel on Climate Change
LFG	Landfill gas
MND	Mitigated Negative Declaration
MT	Metric tons
N <sub>2</sub> O	Nitrous oxide
NG	Natural gas
NSR	New Source Review
PFCs	Perfluorocarbons
PSD	Prevention of Significant Deterioration
RPS	Renewable Portfolio Standard
SB	Senate Bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
scfm	Standard cubic feet per minute
SCLF	Scholl Canyon Landfill
SF <sub>6</sub>	Sulfur hexafluoride
USEPA	United States Environmental Protection Agency

This section addresses greenhouse gas (GHG) emissions that would be associated with construction and operation of the proposed Project. The analysis also addresses consistency of the proposed Project with adopted applicable regulations, plans, and policies set forth by the State of California, South Coast Air Quality Management District (SCAQMD), Southern California Association of Governments (SCAG), and the City for the reduction or mitigation of GHG emissions. The proposed Project's potential contributions



## ENVIRONMENTAL IMPACT ANALYSIS

to global climate change are identified. Details regarding the GHG emission inventory are provided in Appendix F of this Draft Environmental Impact Report (EIR.)

### 4.6.1 Environmental Setting

Global warming is the observed increase in the average temperature of the Earth's surface. The effects of increased greenhouse gas concentrations in the atmosphere may contribute to global warming. The major sGHG are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>).

GHGs in the atmosphere absorb solar radiation reflected by the earth, which leads to warming of the atmosphere. GHGs also radiate energy both upwards toward space and downward to the surface of the earth. The downward direction of GHGs radiation is commonly called the "greenhouse effect."

Most GHGs can be produced through biogenic (natural) and anthropogenic (human-caused) processes. Biogenic sources include the combustion of biological material in forest fires, fermentation, decomposition or processing of biologically based materials. Some of the main sources of GHG due to human activity are the burning of fossil fuels, agricultural activities, and the use of chlorofluorocarbons (CFCs) in refrigeration and fire suppression systems.

Global Warming Potential (GWP) is a measure of how much a GHG contributes to global warming relative to the heat contributed by a similar mass of CO<sub>2</sub>. CH<sub>4</sub> and N<sub>2</sub>O have GWP of 21 and 310 times that of CO<sub>2</sub>, respectively. For this analysis, GHGs other than CO<sub>2</sub> will be scaled to a single factor to determine the equivalent amount of CO<sub>2</sub> (CO<sub>2</sub>e) for each gas. For CO<sub>2</sub>, the scaling factor is 1.0. The scaling factors for CH<sub>4</sub> and N<sub>2</sub>O are 21 and 310, respectively. United States Environmental Protection Agency (USEPA) develops emission factor tables to estimate the GHG emissions from various equipment and activity. This project involves the continued destruction of 2.67 tons of CH<sub>4</sub> (43,621 tons CO<sub>2</sub>e) annually from landfill gas (LFG) while incorporating beneficial power production. The amount of CO<sub>2</sub>e was calculated based on the potential LFG production of 5,000 scfm.

#### 4.6.1.1 Existing Conditions

When the previous Mitigated Negative Declaration (MND) for the proposed Project was being prepared in 2017, the majority of LFG produced by the Scholl Canyon Landfill (SCLF) was piped and combusted in existing boilers at Glendale Water and Power's (GWP) Grayson Power Plant. In April 2018, GWP discontinued LFG combustion in the boilers at the Grayson Power Plant. Any LFG produced by the landfill is currently being combusted in the existing flare system at the SCLF.

In the operation phase of the proposed Project, the LFG will be combusted in the proposed engines instead of the flare system. Therefore, the GHG emissions from the existing flare system were estimated as the baseline emission of this Project. The GHG emissions were calculated based on the estimated landfill gas production of 5,000 scfm. **Table 28** summarizes greenhouse gas emissions from the existing flare system.



ENVIRONMENTAL IMPACT ANALYSIS

**Table 28 Baseline GHG Emission Rates**

Devices	CO <sub>2</sub> (MT/year)	CH <sub>4</sub> (MT/year)	N <sub>2</sub> O (MT/year)	Total CO <sub>2</sub> e (MT/year)
Flares	43,397	2.67	0.53	43,621

Effects of Global Climate Change

The scientific community’s understanding of the fundamental processes responsible for global climate change has improved over the past decade, and its predictive capabilities are advancing. However, there remain significant scientific uncertainties in, for example, predictions of local effects of climate change, occurrence, frequency, and magnitude of extreme weather events, effects of aerosols, changes in clouds, shifts in the intensity and distribution of precipitation, and changes in oceanic circulation. Due to the complexity of the Earth’s climate system and inability to accurately model it, the uncertainty surrounding climate change may never be completely eliminated. Nonetheless, the Intergovernmental Panel on Climate Change’s (IPCC) *Fifth Assessment Report, Summary for Policy Makers* states that, “it is *extremely likely* that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in GHG concentrations and other anthropogenic forces [sic] together.”<sup>66</sup> A report from the National Academy of Sciences concluded that 97 to 98 percent of the climate researchers most actively publishing in the field support the tenets of the IPCC in that climate change is very likely caused by human (i.e., anthropogenic) activity.<sup>67</sup>

According to California Air Resources Board (CARB), the potential impacts in California due to global climate change may include: loss in snow pack; sea level rise; more extreme heat days per year; more high ozone days; more large forest fires; more drought years; increased erosion of California’s coastlines and sea water intrusion into the Sacramento and San Joaquin Deltas and associated levee systems; and increased pest infestation.<sup>68</sup>

**4.6.2 Laws, Ordinances, Regulations and Standards**

**4.6.2.1 Federal**

Title 40 Code of Federal Regulations, Part 52, Subpart A, Section 52.21 – Prevention of Significant Deterioration of Air Quality

Beginning January 2, 2011, GHG has been subject to Prevention of Significant Deterioration (PSD) regulation with an emissions increase threshold of 75,000 tons CO<sub>2</sub>e per year. PSD review is not triggered solely based on GHG emissions. A facility will be subject to PSD review if its annual CO<sub>2</sub>e is

<sup>66</sup> Intergovernmental Panel on Climate Change, *Fifth Assessment Report, Summary for Policy Makers*, (2013) 15. Available: <http://ipcc.ch/report/ar5/syr/>. Accessed April 2019.

<sup>67</sup> Anderegg, William R. L., J.W. Prall, J. Harold, S.H., Schneider, Expert Credibility in Climate Change, *Proceedings of the National Academy of Sciences of the United States of America*. 2010;107:12107-12109.

<sup>68</sup> California Environmental Protection Agency, Climate Action Team, *Climate Action Team Report to Governor Schwarzenegger and the Legislature*, (2006). Available at: [https://www.climatechange.ca.gov/climate\\_action\\_team/reports/2006report/2006-04-03\\_FINAL\\_CAT\\_REPORT.PDF](https://www.climatechange.ca.gov/climate_action_team/reports/2006report/2006-04-03_FINAL_CAT_REPORT.PDF). Accessed April 2019.



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CITY OF GLENDALE BIOGAS RENEWABLE GENERATION PROJECT**

**ENVIRONMENTAL IMPACT ANALYSIS**

equal or more than 75,000 tons only if any of the regulated New Source Review (NSR) (non-GHG) pollutants emissions exceed the applicable PSD threshold of 100 or 250 tons per year.

The proposed Project is not expected to emit more than 75,000 tons per year of CO<sub>2</sub>e; therefore, PSD permitting for GHG emissions for the proposed Project is not required.

**4.6.2.2 State**

California Assembly Bill 32 – Global Warming Solutions Act

Assembly Bill (AB) 32, which was signed by Governor Schwarzenegger on September 27, 2006, is the first enforceable state-wide program in U.S. to limit all GHG emissions from major industries. AB 32 requires the state of California to reduce its GHG emissions to 1990 levels by 2020. CARB had developed emissions reduction plan to achieve this goal. The reduction plan includes adopting laws and regulations, developing cap and trade program, and expansion of energy efficiency and renewable programs.

Assembly Bill 197 and Senate Bill 32 of 2017

Senate Bill (SB) 32 was signed into law on September 8, 2016 by Governor Edmond G. Brown. This bill requires a GHG emissions reduction of 40 percent below the 1990 levels by 2030. SB 32 went into effect on January 1, 2017.

AB 197, which was signed into law on September 8, 2016, becomes operative only if SB 32 is enacted and becomes effective on January 1, 2017. This bill creates the Joint Legislative Committee on Climate Change Policies; this Committee will advise and make recommendations to the Legislature concerning the state's programs, policies, and investments related to climate change.

AB 197 will require CARB to publish an annual emission inventory of GHGs, criteria pollutants, and toxic air contaminants for each facility that reports to the state board and local air districts. It also requires CARB, when updating rules and regulations to achieve GHG emissions reductions beyond the statewide GHG emission limit, to follow specified requirements, consider the social costs of the emissions of GHG, and prioritize specified emission reduction rules and regulations in an effort to protect impacted and disadvantaged communities.

California Code of Regulations, Section 95100

This rule establishes mandatory GHG reporting, verification, and other requirements for certain facilities, including electrical power facilities. SCLF GHG emissions are estimated to exceed 25,000 metric tons CO<sub>2</sub>e per year; therefore, the facility will report emissions in accordance to the rule reporting requirements.



ENVIRONMENTAL IMPACT ANALYSIS

**4.6.2.3 Local**

South Coast Air Quality Management District Rule 1714 – Prevention of Significant Deterioration for Greenhouse Gases

This rule sets forth preconstruction review requirements for GHG emissions. As discussed in the above section of 40 CFR, Part 52, Subpart A, Section 52.21, the proposed Project is not expected to exceed the PSD threshold of 75,000 CO<sub>2</sub>e tons per year; therefore, PSD permitting is not required for the proposed Project.

Greener Glendale Plan for Community Activities

In March 2012, the Glendale City Council adopted the Greener Glendale Plan for Community Activities to promote sustainability toward environmental protection and reductions in greenhouse gas emissions. This plan specifies that the City will meet Southern California Association of Governments (SCAG) regional GHG reduction targets of eight percent by 2020 and 13 percent by 2023. Additionally, due to Clean Car & Fuel Standards, the City estimates to achieve a 25 percent reduction in transportation related GHG by 2020 and an additional ten percent by 2034.

The Plan incorporates the following strategies to reduce GHG emissions within the community:

- 1) Transportation
  - a) Comply with California vehicle and fuel standards
  - b) Implement programs to assist business for electronic vehicles (EV) charging stations
  - c) Continue to purchase and provide EV to the community
- 2) Energy
  - a) Increase renewable energy portfolio (REP) to 33% by 2020
  - b) Implement energy efficiency audits and upgrades for building sales
- 3) Water
  - a) Implement water efficiency audits and upgrades
  - b) Provide rebates for turf reduction
  - c) Reduce community water consumption through promotion, education, and outreach campaigns
  - d) Implement stormwater management practices to protect water quality and replenish local groundwater resources
- 4) Waste
  - a) Develop and implement a zero waste plan by community education and working with restaurants to encourage use of biodegradable take out materials and elimination of disposable/non-recyclable materials, such as Styrofoam and plastic bags.
- 5) Urban Design and Nature
  - a) Implement green building standards, such as requirements to include shade trees, cool paving and roofing, and increased permeability through natural landscaping
  - b) Develop Zone changes
  - c) Implement the GWP Tree Power Program



## ENVIRONMENTAL IMPACT ANALYSIS

- d) Plant 3,400 trees by 2020 and additional 7,750 trees by 2035

### Greener Glendale Plan for Municipal Operations

In November 2011, the Glendale City Council adopted the Greener Glendale Plan for Municipal Operations to achieve sustainability in municipal operations. The Greener Glendale Plan for Municipal Operations shows the City's GHG reduction target of 8% below 2004 levels by 2020; 13% below 2004 levels by 2035; and 30% below 2004 levels after 2035. The plan includes strategies similar to those of the Plan for Community Activities with the additional focus on climate change adaptation and adherence to climate change policies, including renewable energy standards.

Section 4.4 (Energy) contains additional information regarding the Greener Glendale Plan.

### **4.6.3 Methodology and Thresholds of Significance**

#### **4.6.3.1 Methodology**

The GHG emissions from construction and long-term operation of the proposed Project is conducted as follows.

##### Construction Impacts

The GHG emissions during construction phase of the project would be mainly from fuel combustion of off-road and on-road equipment. These emissions were calculated using California Emissions Estimator Model (CalEEMod) version 2016.3.1.

##### Operational Impacts

GHG emissions in the long-term operation of the proposed Project would be contributed by the LFG combustion in the engines and facility occupancy. CalEEMod were used to calculate GHG emissions due to facility occupancy, which include the emission from vehicles, building utilities, and waste generated. USEPA emission factors were used to calculate GHG emissions from the LFG combustion in the proposed electrical generating equipment.

#### **4.6.3.2 Thresholds of Significance**

In accordance with Appendix G of the State CEQA Guidelines, the proposed Project would have a significant impact related to GHG emissions if it would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.
- Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

The SCAQMD significance threshold for an increase in GHG emissions from an industrial project is 10,000 metric tons (MT) CO<sub>2e</sub> per year for industrial facilities. This threshold is a total of GHG emissions from both construction and operation of the proposed Project. SCAQMD policy allows construction GHG



ENVIRONMENTAL IMPACT ANALYSIS

emissions to be amortized over a 30-year project lifespan. For this analysis, however, construction emissions reflect the project total, without amortization. GHG due to Project operations include emissions from both stationary and mobile sources.

**4.6.4 Project Impacts**

***Threshold: Would the Project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?***

The proposed Project will emit GHG emissions from construction and operation activities. The construction GHG emissions would be generated primarily by the off-road equipment and on-road vehicles.

During the operations phase of the proposed Project, the electrical generation units will be the primary contributor of GHG emissions. LFG will be transferred from the existing flare operations to electrical generating units with the exception of periods when the system is under maintenance or repair. During these periods, the existing flares will serve as backup devices. Facility occupancy related activity, such as water usage, power usage, and vehicles will also generate a small level of GHG emissions.

CalEEMod was used to calculate GHG emissions from the construction and facility occupancy activities. USEPA emission factors and an estimated LFG production rate of 5,000 scfm were used to calculate GHG emissions from the proposed electrical generating equipment. CalEEMod results are provided in Appendix B.

Additionally, natural gas (NG) may be utilized to augment ignition when the LFG heating value is unusually low. GHG emissions from NG combustion were calculated. **Tables 29** and **30** summarizes the potential net increase of GHG emissions that could occur during construction and operation of the proposed Project. A GHG emission inventory is provided in Appendix F.

**Table 29 Net Increase of GHG Emissions from the Construction Activities**

Device/Activity	CO <sub>2</sub> (MT/year)	CH <sub>4</sub> (MT/year)	N <sub>2</sub> O (MT/year)	Total CO <sub>2</sub> e (MT/year)
Construction	257	0.06	0	258

**Table 30 Net Increase of GHG Emissions from the Operation Activities**

Device/Activity	CO <sub>2</sub> (MT/year)	CH <sub>4</sub> (MT/year)	N <sub>2</sub> O (MT/year)	Total CO <sub>2</sub> e (MT/year)
Proposed Engines	48,146	2.76	0.53	48,375
Occupants	49	0.13	1.29 x 10 <sup>-3</sup>	52
Total GHG Emissions:				48,427
Total Baseline GHG Emissions:				43,621
Net Increase of GHG Emissions:				4,806



## ENVIRONMENTAL IMPACT ANALYSIS

As shown in **Tables 29** and **30**, the potential net increase of GHG emissions from the proposed Project is below the significance threshold of 10,000 MT per year. The proposed Project would therefore not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment and potential impacts would be less than significant.

### Mitigation Measures

No mitigation measures are required.

### ***Threshold: Would the Project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?***

The proposed Project would generate GHG emissions at a level that is below the applicable SCAQMD threshold of significance. The proposed Project would comply with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions by following ways:

- The proposed Project is a renewable energy project which aligns with CARB AB 32 GHG emissions reduction plan in expanding the Renewable Portfolio Standard (RPS). Governor Schwarzenegger signed Executive Order S-14-08 requiring all electricity retailers shall serve 33 percent of their load with renewable energy by 2020. The proposed Project is also consistent with the Greener Glendale Plan that includes measures such as creating electricity from biogas to reduce GHG emissions associated with energy production.
- Since the GHG emissions of the proposed Project were calculated to exceed 25,000 MT CO<sub>2</sub>e per year, the facility is expected to comply with CARB mandatory GHG reporting regulation, which requires an annual reporting and verification.

As a result, the potential GHG emissions of the proposed Project would be expected to be less than significant.

### Mitigation Measures

No mitigation measures are required.

### Level of Significance After Mitigation

Less than Significant Impact

## **4.6.5 Cumulative Impacts**

The proposed Grayson Repower Project is located approximately five miles from the proposed Project. Because the Grayson project is also a combustion project, it will also produce GHGs. The emission increases from the Grayson Repower Project will be offset through allowances and offset credits pursuant to AB 32 so there will be no net emission increase from that project. As shown in **Tables 29** and **30**, the potential net increase of GHG emissions from the proposed Project is below the significance threshold of 10,000 MT per year and would remain below the 10,000 MT per year threshold even when considering potential GHG emissions from the proposed Grayson Repowering Project. The climate change impact of GHG emissions from the proposed Project would therefore be less than significant on a project-specific and cumulative scale. The proposed Project would not have cumulatively considerable GHG emissions impacts.

