
PRINCE ENVIRONMENTAL



Report on GCGV Air Permit Applications

City of Portland, Texas

April, 2018

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GCGV Air Permit Application Review

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WO # 057-001

A handwritten signature in black ink, appearing to read "Timothy J. Prince". The signature is fluid and cursive, with a large initial "T" and "P".

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EXECUTIVE SUMMARY

Gulf Coast Growth Ventures, LLC (GCGV) has submitted air quality permit applications for chemical processing, railyard and terminal operations in close proximity to the City of Portland. The combined air pollutant emissions from these facilities is major in scale, and the City of Portland has commissioned a study to evaluate the air permit application submittals, the Texas Commission on Environmental Quality (TCEQ) review of these applications, and the predicted air pollutant concentrations associated with these projects. Based on a review of publicly available information contained in TCEQ air permit files, the main findings of this study can be summarized as follows.

- The air permit applications were generally prepared in accordance with best practices for applications for projects of a similar nature and scale. Though certain elements of the initial application submittals could be considered to be inconsistent with best practices, these elements were the subject of TCEQ Notice of Deficiency (NOD) letters and generally addressed through GCGV's NOD responses and the permit negotiation process typical for projects of this scale.
- TCEQ conducted thorough reviews of the applications submitted by GCGV as evidenced by multiple and detailed NOD letters directing GCGV to provide additional information and consider stricter emissions limitations than originally proposed. This resulted in multiple instances where the emissions specifications included in the draft permit are in fact lower than what was originally proposed.
- Air dispersion modeling was generally conducted in accordance with best practices consistent with TCEQ and EPA modeling guidance. TCEQ questions on the initial modeling submittal were addressed via additional information and revised modeling submitted by GCGV, and internal modeling performed by TCEQ. A health effects review performed by the TCEQ Toxicology Division concluded that predicted off-site concentrations would not result in adverse health effects among the general public.
- The draft permit for the Main Chemical facility is very detailed with enforceable permit language covering a wide range of emission source specifications, work practice, stack sampling, emissions monitoring, recordkeeping and reporting requirements appropriate for a project of this scale. The draft permit for the Railyard facility also contains a number of enforceable conditions, but is considerably shorter, in keeping with the less complex operational nature and lower emissions potential of the Railyard operations. The Terminal facility has not yet progressed to the draft permit stage.
- It is important to note that GCGV submitted certain technical information as confidential and not subject to public disclosure. This confidential information was not reviewed for the purposes of this report.

The TCEQ notified GCGV on April 24th that second public can be published for the Main Chemical and Railyard facility permits, and it is reasonable to expect second notice may be the end of April. Affected parties then have 30 days to request a public meeting or contested case permit hearing, if they wish to do so.

1.0 INTRODUCTION

Gulf Coast Growth Ventures, LLC (GCGV) is an ExxonMobil / Saudi Basic Industries Corporation (SABIC) joint venture seeking to construct and operate various ethylene production and processing facilities near the City of Portland in San Patricio County, Texas. GCGV submitted state and federal air permit applications for these facilities to the Texas Commission on Environmental Quality (TCEQ) on April 19, 2017, followed by separate applications for associated railyard facilities on May 25, 2017, and an associated marine terminal on November 10, 2017. A summary of the relative emissions potential provided in the initial permit application for each facility is provided in Table 1-1.

Emissions from the adjacent ethylene production and processing facilities (i.e., the “Main Chemical” facility) and railyard operations (i.e., the “Railyard” facility) are each considered “major” permitting actions in their own right that trigger federal Prevention of Significant Deterioration (PSD) permitting requirements. The applications for these facilities have undergone extensive TCEQ technical review, and draft permit language was finalized by TCEQ on April 24th, 2018. Accordingly, GCGV is now authorized to publish a second public notice, which could occur within the week. Once notice has been published, affected parties, if they choose to do so, have 30 days to request a public meeting or contested case permit hearing.

The marine terminal (i.e., the “Terminal” facility) located approximately three miles southeast of the Main Chemical and Railyard facilities, is proposed to have lower emissions than these other two facilities and thus is subject to a state-only Minor New Source Review (MNSR). The Terminal facility permit is not yet in the draft permit stage of the permitting process.

The City of Portland, Texas, (the City) has an interest in determining any potential impact of air pollutant emissions from these projects on the local community. Accordingly, the City has commissioned Prince Environmental (PE) to provide technical assistance by reviewing and reporting on the quality and completeness of the air permit applications, the nature and disposition of TCEQ’s technical review, the utilization of best practices for the control of air emissions, and the potential for public exposure to adverse air quality concentrations.

Table 1-1

Proposed Permit Allowable Emissions Rates (ton/year)
 GCGV Main Chemical, Railyard and Terminal Sites

Site / Permitting Threshold	VOC	NO _x	CO	PM ₁₀	PM _{2.5}	SO ₂	GHG
Main Chemical	976	525	1,445	176	168	38	2,933,595
Railyard	38	--	--	0.4	0.4	--	--
Terminal	32	2.3	8.7	0.03	0.03	1.1	--
PSD Major Source Threshold	100	100	100	100	100	100	100,000
PSD Significant Emission Rate (SER)	40	40	100	15	10	40	75,000

2.0 PERMIT APPLICATIONS AND TCEQ REVIEW

2.1 Permit Applications

2.1.1 Main Chemical Facility

The Main Chemical facility is the largest and most complex of the three proposed GCGV facilities. The application includes approximately 130 different emission points (EPNs) that consist of 16 different emission source types (i.e., boilers, flares, internal combustion engines, cooling tower, loading / unloading operations, etc.), and that the proposed emissions from the Main Chemical facility are one to two orders of magnitude greater than for the Railyard or Terminal facilities. The scale of the combustion units at the Main Chemical facility also necessitated one air permit application be prepared to address “criteria” air pollutants, and a second application prepared to address greenhouse gas (GHG) emissions.

In general, GCGV provided extensive documentation in the Main Chemical facility applications that can be considered consistent with best practices for a project of this scale; however, there are limited instances where the application content or detail could be considered inconsistent with best practices, as discussed under the “*Emissions Calculations*” heading in this Section 2.1.1 and in Section 2.2 of this report. In general, these issues have been resolved based on additional technical information provided in GCGV responses to TCEQ Notice of Deficiency (NOD) letters requesting additional information on technical issues identified by TCEQ.

Introduction, Process Description and Regulatory Analysis

The introductions to the GCGV Main Chemical facility applications provide a comprehensive overview of the processing units, feed materials and products, as well as other aspects of the project including plant ownership, potential impacts on the local economy, the types of air quality permits being sought, and the technical analyses performed. These overviews are followed by process descriptions that contain sufficient detail on the operations at the various process units, and a regulatory analysis addressing the applicability of 31 separate state and federal air quality regulations.

It is important to note that GCGV also submitted certain technical information under a claim of confidentiality, which is common practice for applications of this scale. This confidential information was not requested or reviewed for the purposes of this report. Therefore, the opinions rendered herein are within the context of best practices typical for these kinds of permit applications.

Emissions Calculations

The emissions calculations section of the Main Chemical facility applications provided documentation on the basis used to calculate volatile organic compound (VOC), nitrogen oxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO₂), inhalable particulate (PM₁₀),

fine particulate (PM_{2.5}), ammonia (NH₃), greenhouse gas (GHG) and other compound emissions from 16 different emission source categories as summarized in Table 2-1. The emission basis cited included published EPA emission factors, vendor performance guarantees, fuel sulfur specifications, design firing rates and material handling rates of emissions generating equipment. The level of detail provided in the emissions calculations write-up can be considered consistent with best practices for a project of this scale; however, the level of detail employed in the underlying emissions calculations could not be evaluated because the emissions calculations were submitted under a claim of confidentiality. One area where the initial emissions calculations can be considered to not be inconsistent with best practices is the permit applicant's failure to address the emission rates of specific VOC species (i.e., speciated VOCs) such as benzene, styrene and toluene. The submittal of speciated emission rates was subsequently resolved through the NOD process with emission rates for 84 specific chemical compounds being identified by GCGV.

Emissions Controls

GCGV utilized TCEQ's Three-Tier approach for identifying the appropriate emission control technology for each of 16 different emissions source categories in accordance with TCEQ and EPA "Best Available Control Technology" criteria. In the first tier, control technology determinations for similar facilities in Texas and other states were identified through a review of TCEQ and other state air permit files for similar facilities and through a query of EPA's nationwide RACT / BACT / LAER Clearinghouse (RBLC) database. GCGV placed special emphasis on 11 permitting actions occurring over the last five years in conducting their BACT analysis as documented in Table 2-2. Given there was an ample record for permitting actions on similar facilities that GCGV deemed economically reasonable, GCGV did not need to pursue Tier II (review of BACT determinations for different types of facilities) or Tier III (rule out control options as economically unreasonable) when performing their BACT analysis.

The analytical approach and level of detail employed in GCGV's BACT analysis can be considered to be consistent with best practices for a project of this scale; however, there were a number of areas where TCEQ questioned certain of GCGV's conclusions on what level of control constituted BACT. These issues were subsequently resolved as addressed in more detail in Section 2.2 of this report.

2.1.2 Railyard Facility

The Railyard facility, whose main function is to load polyethylene pellets produced in the Main Chemical Facility into railcars, is smaller in scale than the adjacent Main Chemical facility. There are no combustion units at the Railyard facility, and thus there are no associated emissions of NO_x, CO or SO₂; emissions are limited to VOC, PM₁₀ and PM_{2.5}. The proposed emissions for VOC are also an order of magnitude lower than for the Main Chemical facility and two orders of magnitude lower for PM₁₀ and PM_{2.5}. The application includes 14 different emission points (EPNs) that consist of five different emission source types (i.e., PE pellet conveying/loading, vehicle refueling, fuel storage tanks, equipment

Table 2-1

Emission Source Categories
GCGV Main Chemical, Railyard and Terminal Sites

No.	Emissions Source Category	Site		
		Chemical	Railyard	Terminal
1	Boilers	X		
2	Furnaces	X		
3	Elevated Flare	X		X
4	Ground Flare	X		
5	Thermal Oxidizers	X		
6	Process Vents	X		
7	Engines	X		X
8	Fugitive Equipment Leaks	X	X	X
9	Cooling Tower	X		
10	Loading and Unloading	X		
11	Maintenance, Startup and Shutdown (MSS)	X	X	X
12	Polyethylene Product Conveying	X	X	
13	Polyethylene Product Residual VOC	X		
14	Storage Tanks	X	X	X
15	Vehicle Refueling	X	X	
16	Wastewater	X		
17	Marine Vessel Loading			X
18	Vapor Combustor			X

Table 2-2

Similar Permits Considered
GCGV Main Chemical and Railyard Sites

No.	Site		Company	Site			
	Chemical	Railyard		City	State	Permit Nos.	Year
1	X		Dow Chemical	Freeport	TX	107153	2014
2	X	X	Dow Chemical	Freeport	TX	114991	2014
3	X		Chevron Phillips	Baytown	TX	1504A	2013
4	X	X	Chevron Phillips	Sweeny	TX	103832	2013
5	X		Formosa Chemical	Point Comfort	TX	107518	2014
6	X	X	Formosa Chemical	Point Comfort	TX	107520	2014
7	X		Formosa Chemical	Point Comfort	TX	15072	2014
8	X		Shell Chemicals	Monaco	PA	04-00740A	2015
9	X		Axiall Corporation	Lake Charles	LA	3136-V0	2015
10	X		Exxon-Mobil Chemical	Baytown	TX	102982	2014
11	X		Exxon-Mobil Chemical	Mont Belvieu	TX	103048	2013

component leaks, and planned maintenance, startup and shutdown (MSS) activities). GCGV provided a reasonable level of documentation in the Railyard facility application that could generally be considered consistent with best practices for a project of this scale. As is the case for the Main Chemical facility, there are limited instances where the application content or detail could be considered to be inconsistent with best practices, as discussed under the *“Introduction, Process Description and Regulatory Analysis”* heading directly below and later in Section 2.2 of this report. These issues, however, were resolved by additional technical information contained in GCGV’s responses to TCEQ NOD letters.

Introduction, Process Description and Regulatory Analysis

The introduction to the GCGV Railyard facility application provides a comprehensive overview of the railyard operations, the sites relationship to the adjacent Main Chemical facility, and other aspects of the project including plant ownership, the types of air quality permits being sought, and the technical analyses performed. This overview is followed by a concise three-paragraph process description that may not meet best practices given there does not appear to be additional process description information submitted to TCEQ under a claim of confidentiality. It should be noted that additional process information was later submitted by GCGV in response to TCEQ NODs, as discussed in Section 2.2 of this report. The application also included a regulatory analysis addressing the applicability of 11 different state and federal air quality regulations.

Emissions Calculations

The emissions calculations section of the Railyard facility application provided documentation on the basis used to calculate VOC and PM₁₀ and PM_{2.5} emissions from five different emission source categories as summarized in Table 2-1. The cited emissions basis included published EPA emission factors, air flow rate and particulate filter performance specifications, storage tank design information, and fuel oil material property information. The level of detail provided in the emissions calculation write-up can be considered to be consistent with best practices for a project of this scale. As with the Main Chemical facility, the level of detail employed in the underlying emissions calculations could not be evaluated because the emissions calculations were submitted under a claim of confidentiality. It should be noted that TCEQ requested additional information and instructed GCGV to revise certain emissions bases as part of its technical NOD letters. Such questions and corrections are customary during the technical review of a permit application.

Emissions Controls

As with the Main Chemical facility, GCGV utilized TCEQ’s Three-Tier approach for identifying the appropriate emission control technology for each of five different emissions source categories associated with the Railyard facility. GCGV placed special emphasis on three recent permitting actions in conducting their BACT analysis as listed in Table 2-2. Given there was an ample record for permitting actions on similar facilities

that GCGV deemed economically reasonable, GCGV did not need to pursue Tier II (review of BACT determinations for different types of facilities) or Tier III (rule out control options as economically unreasonable) when performing their BACT analysis. The analytical approach and level of detail employed in GCGV's BACT analysis can be considered in keeping with best practices for a project of this scale.

2.1.3 Terminal Facility

The Terminal facility's main function is to store liquid products received via pipeline from the Main Chemical facility located approximately three miles to the northwest, and then load this material onto ships. The Terminal facility is smaller in scale when compared to the Main Chemical facility. Lower emissions for the Terminal facility, and its separation from the Main Chemical facility for air permitting purposes results in the site only being subject to state-only MNSR permitting requirements with no federal PSD permitting required. The Terminal facility also differs from the Main Chemical and Railyard facilities in that TCEQ does not appear to have completed its technical review of the application, and the project has not yet reached the draft permit / permit negotiation phase.

The proposed emissions from the Terminal facility are an order of magnitude (or more) less than for the Main Chemical facility depending upon the pollutant of concern. The application includes 17 different emission points (EPNs) that consist of seven different emission source types (i.e., storage tanks, marine vessel loading, vapor combustor, emergency engine, etc.). GCGV provided a reasonable level of documentation in the Terminal facility application that could generally be considered consistent with best practices for a MNSR permitting action for a project of this scale. It is important to point out, however, that the TCEQ does not appear to have completed its technical review, and therefore, that the TCEQ will request additional technical information before the project reaches the draft permit stage.

Introduction, Process Description and Regulatory Analysis

The introduction to the GCGV Terminal facility application provides a comprehensive overview of the terminal operations, the sites relationship to the Main Chemical facility, and other aspects of the project including plant ownership, the types of air quality permits being sought, and the technical analyses performed. This overview is followed by a one-page process description that may be considered to not meet best practices given there does not appear to be additional process description information submitted to TCEQ under confidential cover. The application also included a regulatory analysis addressing the applicability of 11 different state and air quality regulations.

Emissions Calculations

The emissions calculations section of the Terminal facility application provided documentation on the basis used to calculate VOC, NO_x, CO, SO₂, PM₁₀, and PM_{2.5} from seven different emission source categories as summarized in Table 2-1. The cited

emissions basis included published EPA emission factors, physical properties for the materials being stored then loaded onto ships, material throughput rates, design vapor combustor destruction efficiency, and emergency engine equipment specifications. The level of detail provided in the emissions calculation write-up can be considered to be in adherence with best practices for MNSR permitting actions for a project of this scale. As with the Main Chemical and the Railyard facilities, the level of detail employed in the underlying emissions calculations could not be evaluated because the emissions calculations were submitted under a claim of confidentiality. Given the level of rigor employed by TCEQ in their review of the Main Chemical and Railyard facilities, it is reasonable to expect TCEQ will request additional information for the Terminal facility before the project proceeds to the draft permit stage.

Emissions Controls

GCGV based its proposed emissions controls for the Terminal facility based on TCEQ Tier I BACT determinations for similar facilities which is standard practice for projects subject to MNSR only. The BACT analysis entailed identifying the appropriate emission control technology for each of seven different emissions source categories associated with the Terminal facility. The analytical approach and level of detail employed in GCGV's BACT analysis can be considered consistent with best practices for a MNSR permitting action for a project of this scale.

2.2 TCEQ Review

The nature and disposition of the TCEQ's review to date of air permit applications for the Main Chemical and Railyard facilities is demonstrated by the following:

- TCEQ's initial NODs for the Main Chemical and Railyard facilities included 53 and 14 separate NOD items respectively. Though certain of the NOD items were relatively straightforward in nature, others were very detailed in the manner they questioned certain GCGV conclusions and/or referenced information not considered by the applicant in their applications.
- TCEQ did not in all cases accept GCGV replies to the initial NODs. The TCEQ issued a total of five different NODs over the course of an eight-month period, with many of the NOD items questioning information provided in earlier NOD responses.
- The TCEQ permit files included additional information not submitted by the applicant that appears to have been considered by TCEQ in conducting its technical review. This included more than 400 pages of patents, rules and technical articles relevant to the GCGV facilities, over 800 pages of TCEQ technical reviews and permit conditions for similar facilities, along with various other Federal Register information, background information documents and TCEQ guidance documents.

As noted above, the TCEQ questioned GCGV on many technical issues, which resulted in certain areas of disagreement that needed to be addressed through the NOD and permit

negotiation process which is typical for PSD permitting projects of this scale. A summary of matters subject to significant negotiation are summarized in Table 2-3 along with a description of their eventual resolution. Review of Table 2-3 reveals that of the seven significant NOD items noted, three (items 1, 2 and 4) were resolved by GCGV agreeing to more stringent emission limitations requested by TCEQ, three (items 3, 6 and 7) were addressed by GCGV providing additional information that allayed TCEQ's initial concern, and one (item 5) was resolved in a manner that could be considered an acceptable middle ground to both parties through agreements in the draft permit language.

As of February 1, 2018, there were still several unresolved NOD items for the Main Chemical facility application. At this stage in the process, TCEQ and GCGV appeared to have agreed to expedite the process for addressing outstanding NOD items through a series of meetings, emails and telephone conversations rather than the more formal NOD process used earlier. More specifically, the TCEQ online permit tracking system indicates that eight meetings between TCEQ and GCGV were held between the period January 31 to March 20, 2018. Such meetings are not unusual for a large-scale project subject to expedited permitting.

2.3 Dispersion Modeling

2.3.1 Overview

GCGV submitted an air dispersion modeling report to TCEQ on March 7, 2018 documenting maximum predicted off-site air pollutant concentrations associated with the proposed GCGV projects. The analysis was conducted in accordance with TCEQ and EPA modeling guidance using the EPA approved AERMOD model, and provided a level of documentation that is consistent with best practices for projects of this scale. The modeling results obtained indicated acceptable air quality impacts for all air criteria air pollutants as summarized in Table 2-4. Modeling submitted by GCGV, however, also indicated predicted impacts for 16 Effects Screening Level (ESL) pollutants would be above TCEQ default approval levels and therefore were subject to further review. The subsequent TCEQ Toxicology Division review concluded that the maximum predicted concentrations, which were predicted to occur on agricultural property, were considered allowable since they were not expected to result in adverse health effects to the general public.

2.3.2 Air Quality Standards

The dispersion modeling addressed a variety of state and federal air quality standards for various air pollutants. The approach used to perform modeling for the different types of air quality standards is documented below.

Table 2-3

Resolution of NOD Issues
GCGV Main Chemical, Railyard and Terminal Sites

No.	Issue	Facility			Description	Resolution
		Chemical	Railyard	Terminal		
1	Emissions Caps	X	X		TCEQ contends an "emissions cap" for a group of similar sources (i.e., boilers, furnaces, etc.) is not appropriate and instructs GCGV to provide individual emission rates for each emissions source	GCGV agrees to separate emission rate limits for individual units. TCEQ agrees to emission caps that limit the sum of emissions from a group of sources to a value that is less than the sum of the individual source emission rates.
2	Residual VOC Concentration	X	X		TCEQ contends GCGV's proposed VOC concentration in polyethylene (PE) pellets of 64 ppmw is too lenient given similar facilities have committed to a 50 ppmw residual VOC concentration	GCGV agrees to lower 50 ppmw emissions specification.
3	Flare Minimization	X			TCEQ directs GCGV to provide more robust analysis on how flare emissions can be minimized during plant startup and other non-routine events	GCGV provides additional information. Draft permit contains language typical of that found in permits for similar facilities.
4	Emergency Engine Emissions Specifications	X			TCEQ directs GCGV to address feasibility of utilizing emergency engines with lower "Tier 4" emissions specifications than those proposed in application	GCGV agrees to meet more stringent Tier 4 emissions specifications.
5	Fabric Filter Outlet Grain Loading	X			TCEQ directs GCGV to address feasibility of utilizing fabric filters with a 0.002 to 0.003 grain/scf outlet grain loading rather than GCGV's proposed 0.01 grain/scf outlet grain loading.	GCGV provides additional information. TCEQ and GCGV agree to outlet grain loading specification of 0.005 grain/scf.
6	180 Day Initial Shakedown Period	X			TCEQ directs GCGV to provide justification for alternative emission limits that should apply during the initial 180 day "shakedown period" following initial startup of the Olefins facility.	GCGV provides additional information where regulations allow alternative limits during shakedown period. TCEQ and GCGV agree to permit language and emission limits applicable during shakedown period.
7	Marine Terminal as Separate Stationary Source			X	TCEQ directs GCGV to provide additional information supporting its claim the Terminal facility is a separate stationary source from the Olefins facility and thus not subject to PSD review.	GCGV provides additional regulatory rationale on why Terminal is separate source and states Terminal will be operated by a third party. TCEQ concurs with GCGV's evaluation.

Table 2-4

Maximum Predicted Off-Site Impacts
GCGV Main Chemical, Railyard and Terminal Sites

Pollutant	Averaging Period	Type of Standard ^[1]	Project Impact ($\mu\text{g}/\text{m}^3$)	SIL ^[1] ($\mu\text{g}/\text{m}^3$)	Total Impact ($\mu\text{g}/\text{m}^3$)	Standard ($\mu\text{g}/\text{m}^3$)
Nitrogen Dioxide (NO ₂)	1-hour	NAAQS	18	7.5	163	188
	Annual	NAAQS	1.3	1.0	15.3	100
Carbon Monoxide (CO)	1-hour	NAAQS	319	2,000	NA ^[3]	40,000
	8-hour	NAAQS	144	500	NA ^[3]	10,000
Sulfur Dioxide (SO ₂)	1-hour	NAAQS	7.77	7.80	NA ^[3]	196.0
	3-hour	NAAQS	6.7	25	NA ^[3]	1,300.0
	24-hour	NAAQS	4.1	5.0	NA ^[3]	365.0
	Annual	NAAQS	0.2	1.0	NA ^[3]	80.0
Inhalable Particulate (PM ₁₀)	24-hour	NAAQS	8.3	5.0	75	150
Fine Particulate (PM _{2.5})	24-hour	NAAQS	8.5	1.2	27	35
	Annual	NAAQS	1.0	0.2	10	12
Ozone (O ₃)	8-hour	NAAQS	4.4 (ppb)	NA ^[2]	68 (ppb)	70 (ppb)
<hr/>						
Nitrogen Dioxide (NO ₂)	Annual	PSD	1.3	1.0	4.1	25
Inhalable Particulate (PM ₁₀)	24-hour	PSD	8.3	5.0	9.8	30
	Annual	PSD	1.0	1.0	1.5	17
Fine Particulate (PM _{2.5})	24-hour	PSD	8.5	1.2	8.95	9
	Annual	PSD	1.0	0.2	1.4	4
<hr/>						
Sulfur Dioxide (SO ₂)	1-hour	SPLS	7.8	NA ^[2]	7.8	1,021.0
Hydrogen Sulfide (H ₂ S)	1-hour	SPLS	18	NA ^[2]	18	108
Sulfuric Acid (H ₂ SO ₄)	1-hour	SPLS	0.6	NA ^[2]	0.6	50
	24-hour	SPLS	0.06	NA ^[2]	0.06	15
<hr/>						
84 Chemical Species	1-hour	ESL	Model predictions for 10 ESL chemicals above TCEQ default approval levels. Acceptability of predicted concentrations subject to further TCEQ review.			
	Annual	ESL				

[1]: NAAQS = National Ambient Air Quality Standard; PSD = Prevention of Significant Deterioration Increment; SPLS = State Property Line Standard; ESL = Effects Screening Level; SIL = Significant Impact Level

[2]: Significant Impact Level (SIL) not applicable to 1-hour ozone NAAQS, or TCEQ SPLS evaluations.

[3]: Project impact less than SIL thus NAAQS analysis considered complete.

NAAQS

EPA has promulgated National Ambient Air Quality Standards (NAAQS) designed to protect human health and welfare. The first step in the NAAQS analysis was to model the maximum allowable emission rates from the GCGV projects to determine if and where concentrations were predicted to be above the NAAQS significant impacts levels (SILs) for a given pollutant and averaging period. In cases where the predicted project impacts were below the SIL, the NAAQS demonstration was considered complete. Otherwise, the GCGV sources were modeled in concert with nearby existing non-GCGV sources to determine a maximum predicted modeled concentration from all industrial sources. These modeled values were then added to concentrations actually measured at ambient air monitoring stations to obtain a total modeled plus monitored concentration for comparison to the NAAQS.

PSD Increments

EPA has promulgated PSD increments designed for the purposes of “Prevention of Significant Deterioration” in areas that are considered in compliance with the NAAQS. For the PSD increment analysis, the proposed GCGV emissions were modeled in concert with those emissions from nearby sources that came on line after prescribed baseline dates for comparison to the PSD increment to in effect demonstrate that air quality had not deteriorated in a significant fashion since the prescribed baseline date.

TCEQ SPLS

The TCEQ has adopted state property-line standards (SPLS) for SO₂, H₂S and H₂SO₄ designed to ensure that the combined impact from all sources at a given site do not exceed prescribed levels. For the SPLS analysis, all sources at the GCGV site were simply modeled at their maximum allowable emissions rates and the combined impact compared to the applicable SPLS.

TCEQ ESLs

The TCEQ effects screening levels (ESLs) are conservative screening levels rather than mandatory standards that cannot be exceeded. Like the SPLS, ESL evaluations are conducted on a facility-specific basis; the interactive impacts with other nearby facilities is not considered. If predicted impacts are below an ESL, then no further analysis is required. If predicted impacts are above an ESL, a more detailed review of the location, predicted frequency and magnitude of concentrations above the ESL is conducted by TCEQ to determine if the concentrations predicted can be considered protective of human health and the environment.

2.3.3 Modeling Assumptions

The GCGV modeling report notes that a number of conservative modeling techniques were employed that would tend to provide an over prediction of maximum off-site impacts. Foremost among these were the following.

- Including other “nearby” existing non-GCGV sources within 50 km of the Main Chemical and Railyard facilities in the NAAQS modeling analyses whereas EPA guidance cited in the report recommended including sources from within 10 to 20 km.
- In cases where an emissions cap applied, the totality of all emission from emission sources in the cap were modeled using the location and stack parameters for the worst case emissions source in the cap.

2.3.4 TCEQ Follow-Up Questions

TCEQ’s initial review of the GCGV modeling report resulted in 14 follow-up questions or requests for additional information, which can be considered to fall within a range typically observed for dispersion modeling reports for PSD applications for projects of this scale. Certain questions were of an overlapping nature with a summary of what would be considered the more significant questions, and the eventual resolution of these questions, summarized in Table 2-5. Review of Table 2-5 reveals that of the five significant follow-up questions noted, three (items 1, 2 and 3) were resolved by GCGV providing additional information that addressed TCEQ’s concerns, one item (item 4) was addressed by TCEQ performing its own internal modeling, and one (item 5) was addressed by GCGV providing supplemental modeling and the TCEQ Toxicology evaluating the acceptability of the predicted concentrations.

2.4 Draft Permits

The draft permits for the Main Chemical facility (Permit 146425 for criteria air pollutants and Permit GHGPSDTX170 for GHG), and Railyard facility (Permit 146959 for criteria air pollutants) have not been finalized; however, as currently drafted, they would place numerous enforceable conditions on the operations of the subject facilities. A summary of the proposed provisions for each of the three draft permits at the current point in the negotiations is provided below.

2.4.1 Main Chemical Facility (Criteria Pollutants)

Draft Permit 146425 is very detailed, reflecting the complex nature of the operations, the wide variety of emission generating activities, and the highly regulated nature of chemical facilities. The draft permit is 48 pages long, with 69 separate permit conditions, and includes the following:

- Definitions providing clarity on the applicability of subsequent permit conditions to the emissions units and modes of operation addressed in the permit.

Table 2-5

TCEQ Follow-Up Modeling Questions
GCGV Main Chemical, Railyard and Terminal Sites

No.	Issue	Description	Resolution
1	Mode of Operation	TCEQ asks for verification that stack parameters (i.e., stack gas exit velocity and temperature) do not vary between the routine and MSS modes of operation.	GCGV provides supplemental information stating conditions are not expected to vary which satisfies TCEQ concerns.
2	Source Locations	TCEQ asks for additional information on the rationale for modeling certain sources as being at the center of a process area.	GCGV provides additional information elaborating on why using center of a process area is appropriate which satisfies TCEQ's concerns.
3	Emission Release Heights	TCEQ asks for additional clarification / justification on the emission release height assumed in modeling for sources whose emissions are released at varying heights.	GCGV provides additional information elaborating on why using center of a process area is appropriate which satisfies TCEQ's concerns.
4	Multi-point Flare Exit Velocity	TCEQ directs GCGV to provide the technical basis for its assumed 300 m/s stack exit velocity for the multi-point flare.	GCGV response including statement that TCEQ has accepted 300 m/s modeling on other projects does not fully satisfy TCEQ. TCEQ conducts its own modeling using alternative set of parameters and determines use of alternative basis would not significantly impact predicted impacts.
5	Non-Industrial Receptor Grid	TCEQ seeks clarification as to whether the reported concentrations at non-industrial receptors were limited to "sensitive" receptors (hospitals, schools, etc.) and if there are other closer non-industrial receptors that were not included in the modeling.	Revised modeling results submitted by GCGV assumes all off-site locations are "non-industrial" locations and result in predicted concentrations above TCEQ default approval levels for 16 ESL chemicals. TCEQ Toxicology Division determines results are allowable since maximum impacts occur on agricultural land and adverse health effects are not expected among the general public.

- Permit language stating the facility is subject to 21 different federal emissions standards pursuant to EPA New Source Performance Standards (NSPS), National Emission Standards for Hazardous Air Pollutants (NESHAPS) and Maximum Achievable Control Technology (MACT) regulations.
- Provisions detailing stack testing requirements to provide an initial demonstration of compliance with applicable emission limits.
- Provisions pertaining to the design, calibration and maintenance of continuous emissions monitoring systems (CEMS) used to provide a continuous demonstration of compliance.
- Language specifying records required by the various rules and regulations shall be maintained for a period of five years.
- Provisions requiring GCGV to alter the permit prior to the start operation for the purposes of documenting the as-built design of individual tanks and emergency engines, and documenting the installed firing rate of furnaces.
- Additional permit language detailing emissions specifications and work practices consistent with applicable regulations and permit application representations for various emission source categories including;
 - Process vents,
 - PE residual VOC,
 - Solids handling,
 - Combustion devices
 - Liquid storage and transfer operations,
 - Tanker Truck and Railcar loading operations,
 - Fugitive leaks from piping, valves, flanges and other equipment components,
 - Heat exchange systems,
 - Wastewater treatment,
 - Control device and capture systems,
 - Flares,
 - Thermal oxidizers,
 - Carbon adsorption systems,
 - Maintenance, startup and shutdown (MSS) operations,
 - Laboratory operations,
 - Emergency generators, and
 - Firewater pumps.

The extensive nature of the draft Permit 146425 reflects the highly-regulated nature of chemical plants and TCEQ's technical review. Accordingly, the proposed permit provisions are typical for projects of this scale.

2.4.2 Main Chemical Facility (GHG Pollutants)

Draft Permit GHGPSDTX170 is less complicated than Permit 146425 in that it focuses on GHG emissions only, and there are few TCEQ or EPA GHG regulations that apply to the specific emission sources proposed for the Main Chemical facility. Accordingly, the permit primarily focuses on good combustion practices, net thermal efficiency

specifications and proper GHG calculation and reporting practices. The permit is three pages long and contains 11 different permit conditions, as summarized below.

- Six permit conditions in whole or in part that apply to the proper calculation and reporting of GHG emissions.
- One permit condition specifying requirements to monitor fuel heating value and carbon content, install air/fuel controllers, and continuously monitor exhaust gas temperature and oxygen content.
- One permit condition specifying minimum net thermal efficiency requirements.
- One permit condition specifying good combustion practices.
- Three permit conditions stating that certain terms, definitions, fugitive equipment leak monitoring, and MSS emission control, monitoring and recordkeeping requirements contained in Permit 146425 are also applicable to Permit GHGPSDTX170.

The concise nature of the draft Permit GHGPSDTX170 reflects the fewer state and federal rules applicable to GHG emissions. The proposed permit provisions are typical for projects of this scale.

2.4.3 Railyard Facility

Draft Permit 146425 is seven pages long, with 16 separate permit conditions, and includes the following:

- A statement that wastewater from the Railyard facility operations are subject EPA NESHAP regulations for control of benzene waste operations.
- Conditions specifying best practices for preventing leaks during diesel refueling operations
- Conditions pertaining to particulate filter emissions specifications, monitoring and calibration requirements,
- Conditions detailing appropriate monitoring, recordkeeping, reporting and repair requirements for pumps, valves and other components in liquid VOC service.
- Conditions pertaining to the proper design and emissions tracking for diesel storage tanks.
- Conditions stating the permit holder has the authority to reject any polyethylene resin shipment if it determines acceptance of the shipment would result in a violation of the VOC emissions limitations in the permit.
- Conditions addressing the appropriate work practices to limit emissions from MSS activities.

The proposed permit provisions in draft Permit 146959 reflect the Railyard facility's less complex operational and regulatory nature and its much smaller emissions when compared to the Main Chemical facility. The proposed provisions are typical for projects of this scale.