

**Permit Amendment
Source Analysis & Technical Review**

Company	Intercontinental Terminals Company LLC ("ITC")	Permit Number	95754
City	Pasadena	Project Number	243313 and 243317
County	Harris	Account Number	HG-A153-W
Project Type	Amend	Regulated Entity Number	RN106119175
Project Reviewer	Xuan Zhao, Ph.D. and Jesse Lovegren, Ph.D., P.E.	Customer Reference Number	CN601470222
Site Name	Pasadena Terminal		

Project Overview

ITC owns and operates the Pasadena Terminal, a for-hire liquid storage facility and marine terminal. The Pasadena Terminal handles crude oil, fuels and blendstocks, and commodity chemicals. ITC wishes to expand the storage capacity of the Pasadena terminal, and proposes to amend permit 95754 to authorize construction (40) forty new storage tanks, including (2) 60,000 barrel (60 MBbl) tanks, (6) 100 MBbl tanks, (26) 120 MBbl tanks, and (6) 165 MBbl tanks. The permit amendment will also cover installation of appurtenant equipment (three emergency generators and associated piping components), loading at the existing marine docks and truck/railcar loading racks from the new tanks, and maintenance, startup and shutdown (MSS) activities on the new tanks.

The Pasadena Terminal is located in the Houston-Galveston-Brazoria (HGB) ozone nonattainment area. At the time the permit amendment application was filed (October 14, 2015), the HGB area was classified as severe, which was its classification under the revoked 1997 8-hour ozone National Ambient Air Quality Standard (NAAQS). Under the severe classification, the Pasadena Terminal was considered a major source of VOC (ozone precursor), and the proposed expansion was subject to Nonattainment New Source Review (NNSR) as a major modification. On November 8, 2016, however, notice of approval of a redesignation substitute for the 1997 8-hour ozone standard was published in the Federal Register (81 FR 78691), with an effective date of December 8, 2016. Following the effective date, the HGB area's classification was based on the 2008 8-hour ozone NAAQS, with a corresponding classification of moderate. Since NNSR permitting requirements are evaluated based on the issuance date of a proposed permit (30 TAC § 116.150), the Pasadena Terminal is now a minor source of VOC and NO_x for purposes of this permit action, and the expansion project does not constitute construction of a new major source. Accordingly, the NNSR permit application (TCEQ project 243317) is administratively voided, and the amendment is processed as a minor NSR action.

The project is not located in any air pollutant watch list area (APWL), and no outstanding permit by rule authorizations require incorporation into the permit at this time.

Emission Summary

This project only involves the construction/installation of new sources, and not the modification of any existing source. The project will also result in increased emissions at existing, unmodified facilities (viz., docks and transfer racks). In addition to allowable emission rates for new facilities, allowable emission rates have been established which correspond to the maximum increase in actual emission rates from existing, unmodified facilities which may occur as a result of construction/installation of the new equipment. These emission rates are considered for major NSR applicability purposes and are reflected in the following summary table. Accordingly, the change in allowable emission rates is the same as the project emissions increase for major NSR purposes.

Air Contaminant	Change in Allowable Emission Rates (tpy)
PM	+1.46
PM ₁₀	+1.46
PM _{2.5}	+1.46
VOC	+79.15
NO _x	+12.28
CO	+40.47
SO ₂	+22.62

Compliance History Evaluation - 30 TAC Chapter 60 Rules

A compliance history report was reviewed on:

April 26, 2017

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Site rating & classification:	0.00 / High
Company rating & classification:	3.17 / Satisfactory
If the rating is 50<RATING<55, what was the outcome, if any, based on the findings in the formal report:	N/A
Has the permit changed on the basis of the compliance history or rating?	No

Public Notice Information - 30 TAC Chapter 39 Rules

Rule Citation	Requirement
39.403	Is Public Notice Required? Yes
	Date Application Received: October 14, 2015
	Date Administratively Complete: October 21, 2015
	Small Business Source? No
	Date Leg Letters mailed: October 21, 2015
39.603	Date Published: November 12, 2015
	Publication Name: <i>The Pasadena Citizen</i>
	Pollutants: Organic compounds, hydrogen sulfide, particulate matter including particulate matter with diameters of 10 microns or less and 2.5 microns or less, nitrogen oxides, carbon monoxide, and sulfur dioxide.
	Date Affidavits/Copies Received: November 30, 2015
	Is bilingual notice required? Yes
	Language: Spanish
	Date Published: November 5, 2015
	Publication Name: <i>La Información</i>
	Date Affidavits/Copies Received: November 20, 2015
	Date Certification of Sign Posting / Application Availability Received: December 18, 2015
39.604	Public Comments Received? No
	Hearing Requested? No
	Meeting Request? No
	Is 2nd Public Notice required? Yes
39.602(c)	Date SB 709 Legislative Notification Sent: March 23, 2017
39.419	Date 2nd Public Notice/Preliminary Decision Letter Mailed: May 31, 2017
39.603	Date Published: May 31, 2017
	Publication Name: <i>Pasadena Citizen</i>
	Pollutants: Carbon monoxide, hazardous air pollutants, hydrogen sulfide, nitrogen oxides, organic compounds, particulate matter including particulate matter with diameters of 10 microns or less and 2.5 microns or less and sulfur dioxide.
	Date Affidavits/Copies Received: June 12, 2017
	Is bilingual notice required? Yes
	Language: Spanish
	Date Published: June 1, 2017
	Publication Name: <i>La Información</i>
	Date Affidavits/Copies Received: June 12, 2017

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Rule Citation	Requirement
	Date Certification of Sign Posting / Application Availability Received: July 6, 2017
	Public Comments Received? No
	Meeting Request? No
	Date Meeting Held: N/A
	Hearing Request? No
	Date Hearing Held: N/A
	Request(s) withdrawn? N/A
	Date Withdrawn: N/A
	Consideration of Comments: N/A
39.421	Date RTC, Technical Review & Draft Permit Conditions sent to OCC: N/A
	Request for Reconsideration Received? N/A
	Final Action: N/A
	Are letters Enclosed? N/A

Construction Permit & Amendment Requirements - 30 TAC Chapter 116 Rules

Rule Citation	Requirement
116.111(a)(2)(G)	Is the facility expected to perform as represented in the application? Yes
116.111(a)(2)(A)(i)	Are emissions from this facility expected to comply with all TCEQ air quality Rules & Regulations, and the intent of the Texas Clean Air Act? Yes
116.111(a)(2)(B)	Emissions will be measured using the following Stack sampling, emission calculation, recordkeeping method: Comments on emission verification:
116.111(a)(2)(D)	Subject to NSPS? Yes Subparts A, Kb & IIII
116.111(a)(2)(E)	Subject to NESHAP? Yes Subparts A, J, V, Y & BB
116.111(a)(2)(F)	Subject to NESHAP (MACT) for source categories? Yes Subparts A & BBBB
116.111(a)(2)(H)	Nonattainment review applicability: The Pasadena terminal is located in a moderate ozone nonattainment area, and is a minor source of VOC and NO _x (ozone precursors) (potential to emit is less than 100 tpy for each pollutant). Since the project does not constitute a major source by itself, nonattainment review is not required.

Nonattainment review applicability was also considered under source obligation provisions at 40 CFR § 51.165(a)(5)(ii), and related guidance on major NSR circumvention. ITC received approval to construct storage tanks and loading facilities (the "Group B facilities") with an aggregate potential to emit of 24.9 tpy VOC in January 2015, and applied for the present permit amendment in October 2015 (for construction of the "Group C facilities"), when construction on Group B facilities was still in progress. Considering the relatively close timing of these actions, the permit writers identified possible indicia of relatedness in order to determine whether construction of the Group B and Group C facilities should be aggregated for major NSR applicability purposes. Such a review, including the scope of appropriate documentation considered, is necessarily case-specific.

The permit reviewers reviewed contemporaneous documentation provided by ITC on the two projects, which was generated during the 2013–2016 time period, including: agreements with terminal customers, engineering firms and insurance underwriters; transactions of ITC's board of

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Rule Citation	Requirement
	directors; construction progress and start-up notifications provided to the TCEQ; and ITC's prior statements to TCEQ concerning its plans for operation. Considering the overall timespan of a construction project (from initial "open season" discussions with customers through start of operations of new facilities), there is no indication that ITC has improperly avoided major NSR review. All Group B facilities having been authorized in January 2015 will have started operation before any actual construction work begins on the Group C facilities.
	Notwithstanding, however, ITC may be subject to post-construction major NSR review in case it wishes to relax any of the emission limits in Special Condition 2 of the permit. Special Conditions 2 and 3 (the latter containing a restatement of 40 CFR § 51.165(a)(5)(ii)) are retained in the amended permit. Additionally, the permit has been structured in such a way that compliance with allowable emission rates for loading activities is to be tracked by tank group, rather than in the aggregate for the entire set of docks and loading racks.
116.111(a)(2)(I)	PSD review applicability: The Pasadena Terminal is located in an attainment area for at least one pollutant, and is a minor source for PSD purposes (petroleum storage facility with emissions less than 100 tpy of any pollutant). Project emissions increases are less than 100 tpy for all PSD pollutants. PSD review does not apply. Since PSD review does not apply for traditional pollutants, PSD BACT review for Greenhouse gases is not required.
116.111(a)(2)(L)	Is Mass Emissions Cap and Trade applicable to the new or modified facilities? No If yes, did the proposed facility, group of facilities, or account obtain allowances to operate: N/A
116.140 - 141	Permit Fee: \$ 75,000 Fee certification: Check 445

Title V Applicability - 30 TAC Chapter 122 Rules

Rule Citation	Requirement
122.10(14)	Title V applicability: Site Operating Permit O3785
122.602	Periodic Monitoring (PM) applicability: The site is subject to 30 TAC Chap. 122 requirements. Periodic monitoring is conducted in the form of calculation and recordkeeping for storage tanks (SC 11), calculation and recordkeeping for loading activities (SCs 27–28), LDAR programs for piping components (SC 29), pilot flame and flow monitoring for the flare (SC 32), and calculation and recordkeeping for planned MSS activities (SC 35).
122.604	Compliance Assurance Monitoring (CAM) applicability: The site is subject to 30 TAC Chap. 122 requirements. The vapor combustors (EPNs VCU-1, VCU-2, VCU-3) are control devices used to achieve compliance with an applicable requirement of the permit, and which control sources of emissions with an uncontrolled PTE in excess of an applicable major source threshold. The VCUs and associated capture systems are subject to CAM. CAM is accomplished through monitoring of VCU exhaust temperature (SC 30), and continuous monitoring of total vapor flow rate to each VCU (SC 46).

Request for Comments

Received From	Program/Area Name	Reviewed By/Date	Comments
Region:	12	Andrea Gustavson / May 3, 2017	Require continuous monitoring of NO_x flow rate from vapor combustors.
City:	Pasadena		
County:	Harris		
ADMT:		Ahmed Omar and Robert Scalise (March 21, 2017)	AQA is acceptable for all review types and pollutants.
EB&T:			
Toxicology:		Tiffany Bredfeldt (May 26, 2017)	Air impacts are allowable.

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Compliance:	
Legal:	
Comment resolution and/or unresolved issues:	Compliance with the NO_x emission limit for vapor combustors is to be demonstrated during stack sampling, as the vapor combustors will not be equipped with a NO_x CEMS. Explanation provided to regional office inspector.

Process/Project Description

The Pasadena Terminal is a for-hire storage facility and marine terminal which handles crude oil, fuels and blendstocks, and commodity chemicals. The proposed expansion will increase the terminal's total storage capacity from approximately 3.1 million barrels (MMBbl) to 7.9 MMBbl. Loading facilities include one pier consisting of four docks (docks 1 and 2 can support one tanker vessel each, and docks 3 and 4 can support up to two barges each); three truck/railcar loading racks; and shoreside vapor control equipment (a closed vent system and three vapor combustors).

Pollution Prevention, Sources, Controls and BACT- [30 TAC 116.111(a)(2)(C)]

Site facilities, with the exception of MSS activities, were required to meet LAER control requirements at initial issuance of the permit in 2011. This level of control (summarized below) continues to meet or exceed the level of control that would be required for a new facility applying BACT. With the exception of tank floating roof landings (described below), no additional MSS activities are expected as a result of the expansion project.

Storage tanks are internal floating roof (IFR) tanks which must have welded decks, primary and secondary seals, and be designed to drain dry. Tanks must also be painted white. The vapor space below the fixed roof on the IFR tanks must be monitored semiannually with an explosimeter, and the hydrocarbon concentration must not exceed 30% of its LEL (this follows SCAQMD rule 1178).

For tank floating roof landing episodes where the liquid stored has a VOC vapor pressure of 0.10 psia or greater at 95° F, the permit requires that the tank vapor space be connected to a closed vent system and emissions controlled by a vapor during standing idle periods and during filling or refilling of the tank.

Piping components are subject to the 28LAER leak detection and repair (LDAR) program, which requires quarterly instrumental monitoring of accessible valves, connectors, and pump and compressor seals, with a leak definition of 500 ppmv VOC. Leaking components must be repaired as soon as practicable, but no later than 15 days after detection of a leak. Since the required level of control is BACT (and not LAER) as of the permit issuance date, BACT requirements for group C piping components could have been satisfied through use of the 28VHP LDAR program.

Loading Operations must be controlled if the liquid loaded has a VOC vapor pressure of 0.10 psia or greater at 95° F.

Marine vessels must be loaded under vacuum unless the cargo space is inerted for safety reasons. For inerted vessels, the vessel pressure must be maintained at a level below the set point for the pressure relief valve. The vessel must meet MACT Y vapor-tightness requirements. The loading rate and cargo tank pressure must be continuously monitored. Transfer hoses must be blown with nitrogen either back to the vessel or back to the storage tank prior to disconnecting. Based on the foregoing control techniques, and sampling conducted in 2015 and 2016, a capture efficiency of 99.865% is assumed for inerted tanker vessels.

Truck and railcars must either satisfy the MACT R vapor tightness requirements (99.2% capture efficiency is assumed in this case); be loaded under vacuum (100% capture efficiency assumed); or satisfy applicable department of transportation (DOT) requirements for integrity of pressure-rated transport vessels (100% capture efficiency assumed).

When control is required, displaced loading emissions must be captured using a closed vent system and directed to a vapor combustor achieving 99.9% destruction of VOC. A flare may also be used for control (typically as a back-up device), in which case the flare must satisfy the requirements of 40 CFR § 60.18.

Since the existing permit already contains adequate control, monitoring and recordkeeping requirements applying to storage tanks and loading activities, the new and existing facilities will be subject to the same requirements. Changes to the permit are summarized as follows:

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SC No.	Comment
1	New emission points added to maximum allowable emission rates table (MAERT), with the following emission point numbers (EPNs): <u>Storage tanks</u> P060-001, P060-002, P100-014, P100-015, P100-016, P100-017, P100-018, P100-019, P120-005, P120-006, P120-007, P120-008, P120-009, P120-010, P120-011, P120-012, P120-013, P120-014, P120-015, P120-016, P120-017, P120-018, P120-019, P120-020, P120-021, P120-022, P120-023, P120-024, P120-025, P120-026, P120-027, P120-028, P120-029, P120-030, P165-007, P165-008, P165-009, P165-010, P165-011, P165-012; <u>Emergency engines</u> EGEN-4, EGEN-5, EGEN-6 <u>Group C piping components</u> FUG-C; <u>Group C loading operations</u> HOSEVENT-C, HOSEDRAIN-C, LOADFUG-C, LOAD-CONT-C <u>MSS on Group C facilities</u> MSS-CONT-C, MSS-ATM-C, TK-LAND-C
3	Revert source obligation clause to original wording.
8	Add synonyms clause to condition incorporating attachment 1, which clarifies that the CAS number for a product shall be used in determining whether a product is authorized under the permit (numerous trade names may exist for a product with a single CAS number).
22C	Revert vapor-tightness standard for tanker trucks to original requirement (MACT R).
50	Defining group C facilities
51	Incorporating control, monitoring and recordkeeping requirements for group C facilities by cross-reference.
52	Restriction on product storage/loading for group C facilities (attachment 1 does not apply to group C facilities). This requirement may be adjusted in the future if ITC submits acceptable site-wide modeling results for additional products.
53	Throughput flexibility for group C facilities.
54	Continuous monitoring requirements for vapor combustors used to control emissions from group C facilities, NO _x emission limitation for vapor combustors, restricting flare to use as a back-up control device only.
55	Authorizing MSS activities for group C facilities.

No changes are made to any of the permit attachments, and no changes are made to the MAERT entries for group A and group B facilities.

Impacts Evaluation - 30 TAC 116.111(a)(2)(J)

Was modeling conducted?	Yes	Type of Modeling:	Refined (AERMOD 15181)
Will GLC of any air contaminant cause violation of NAAQS?	No		
Is this a sensitive location with respect to nuisance?	No		
[§116.111(a)(2)(A)(ii)] Is the site within 3000 feet of any school?	No		
Additional site/land use information: The site is located along the Houston ship channel, with industrial lands to the East, West and North. The closest non-industrial receptor is approximately 0.9 miles away to the south (residential and commercial district).			

Summary of Modeling Results

Air dispersion modeling was conducted for criteria pollutants and for all constituents listed in Special Condition 52 of the permit (concerning authorized storage/loading products for Group C facilities).

For NAAQS pollutants, project-wide emission totals were modeled and compared to applicable de minimis levels. For any pollutant and averaging time where the maximum predicted off-property ground level concentration (GLC_{MAX}) exceeded the de minimis level, sitewide modeling was conducted. The sitewide GLC_{MAX} was added to the monitored background concentration, and the result compared to the standard. As summarized below, the project is not expected to cause or contribute to an exceedance of any applicable NAAQS.

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Pollutant	Averaging Time	GLC _{MAX} (µg/m ³)	De minimis (µg/m ³)	Background + GLC _{MAX} (µg/m ³)	Standard (µg/m ³)
SO ₂	1-hr	62	7.8	156	196
SO ₂	3-hr	70	25	171	1300
SO ₂	24-hr	29	5	57	365
SO ₂	Annual	0.2	1	—	—
PM ₁₀	24-hr	1	5	—	—
PM _{2.5}	24-hr	0.7	1.2	—	—
PM _{2.5}	Annual	0.01	0.3	—	—
NO ₂	1-hr	34	7.5	186	188
NO ₂	Annual	0.1	1	—	—
CO	1-hr	6450	2000	8305	40000
CO	8-hr	410	500	—	—

Site-wide modeling was conducted for state ambient air quality standards (30 TAC Chap. 112). Site-wide modeling results for SO₂ (135 µg/m³) were less than the applicable standard of 715 µg/m³ (30-min avg.), and site-wide modeling results for H₂S (46 µg/m³) were less than the applicable standard of 108 µg/m³ (30-min avg.). No exceedance of any state ambient air quality standard is anticipated.

Site-wide modeling was conducted for constituents with 15 distinct CAS numbers, for which storage or loading is authorized in Group C facilities (identified below). The annual average effects screening level (ESL) is 10% of the 1-hr ESL for each constituent.

CAS	Product Name	1-hr ESL (µg/m ³)
64741-64-6	Alkylate	1750
67784-80-9	Biodiesel (as methyl soyate)	1000
68476-22-5	Atmospheric residuum	1000
98-82-8	Cumene	650
77650-28-3, 68476-30-2	Fuel oil	1000
8006-61-9	Gasoline and gasoline blendstocks	3500
8008-20-6	Jet fuels (including Jet Fuel No. 4) and Kerosene (does not include aviation gasoline)	1000
64741-47-5, 8002-05-9	Crude oil (including Natural Gas Condensate)	3500
64742-49-0, 64741-84-0	Naphtha, Raffinate	3500
64742-47-8	Distillate (including diesel fuel)	1000
77650-28-3	Distillate Blendstock and Fuel Oils	1000
64741-68-0	Reformate	1250

For all compounds other than alkylate, biodiesel, fuel oils, and kerosene, the predicted sitewide GLC_{MAX} was less than the following thresholds: no exceedance of the annual average ESL, no exceedance of the 1-hr average ESL at any non-industrial receptor, no exceedance of 2 times the ESL at any land-based industrial receptor, and no exceedance of 10 times the ESL at any receptor over industrial waters.

For the remaining compounds, the predicted sitewide GLC_{MAX} was less than the following thresholds: no exceedance of the annual average ESL, no exceedance of the 1-hr average ESL at any non-industrial receptor, and no exceedance of 10 times the ESL at any receptor over industrial waters. Estimated impacts (including frequency of exceedances, λ) at the worst-impacted land-based industrial receptor are as follows.

Product Name	GLC _{MAX} (µg/m ³)	GLC _{MAX} (as % of ESL)	2×λ (hrs/yr)
Alkylate	3530	201%	8
Biodiesel	2053	205%	3
Fuel oils	2160	216%	47

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Kerosene	2386	239%	87
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Modeling methodology was approved by ADMT memo dated March 21, 2017. Health effects for the four constituents listed immediately above were deemed acceptable by Toxicology Division memo dated May 26, 2017. No further review is required.

Permit Concurrence and Related Authorization Actions

Is the applicant in agreement with special conditions?	Yes
Company representative(s):	Neal Nygaard (DiSorbo)
Contacted Via:	E-mail
Date of contact:	May 24, 2017
Other permit(s) or permits by rule affected by this action:	None
List permit and/or PBR number(s) and actions required or taken:	N/A

	7/6/2017		7/7/2017
Project Reviewer Jesse Lovegren	Date	Section Manager Rebecca Partee	Date