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September 8, 2017

BY U.S. MAIL AND EMAIL

Mr. Ralph Munoz
Reviewing Engineer
Puget Sound Clean Air Agency
1904 3rd Avenue, Suite 105
Seattle, WA 98101-3317

Re: Tacoma LNG Project Air Quality Modeling

Dear Ralph:

Thank you again for taking time to discuss meteorological data input options for the proposed Tacoma LNG Facility with Eri Ottersburg, Mark Brunner of Landau Associates, Inc. (LAI) on August 24 and Bill Steiner (LAI) and me on August 31. We appreciate these opportunities to review your concerns and receive your feedback.

As discussed during the call, LAI agrees with you that the Tideflats monitoring station is the most representative source of wind data (speed and direction) for our project. Candidate sources to supplement required modeling input data that are not measured at Tideflats, and to substitute wind data during missing hours in the Tideflats record were discussed with you:

- SeaTac Airport (wind speed and direction¹, temperature, relative humidity (RH), pressure and cloud cover);
- McChord AFB: (wind speed and direction, temperature, RH, pressure and cloud cover); and
- Tacoma South L Street: (wind speed and direction, temperature, RH, and pressure).

LAI provided windroses for all four stations prior to the August 24 call. You expressed a preliminary preference for Tacoma South L data during that call, but upon learning from LAI that Tacoma South L does not provide all necessary data, you requested further analysis to determine the most representative station. LAI offered during the August 31 call to modify the original five-year record (2012 through 2016) to improve data recovery. Because the Tideflats station experienced low data recovery (i.e., many periods of missing data), LAI has changed the five-year record to 2011 and 2013 through 2016 for all current air quality modeling. This results in greater than 96% data availability for each of the

¹ Note that SeaTac records data on a one-minute basis. All other stations record data hourly. One-minute data at SeaTac provide improved modeling performance (i.e., better representation of actual conditions).

5 years at Tideflats. We discussed this change with you during the August 31 call, and believe that you agreed in concept.

In response to your request for additional analysis of which supporting data source is most representative to supplement/substitute Tideflats data, LAI concluded that the best way to determine which is most conservative would be to model with all three sources of data. Four input scenarios have been modeled by LAI, all of them use Tideflats as the primary WD and WS source:

- **Scenario 1** - SeaTac as the primary source of temperature, RH, pressure and cloud cover data, and wind speed and direction substitution when Tideflats is missing;
- **Scenario 2** – Tacoma South L as the primary source of temperature, RH and pressure, and wind speed and direction substitution when Tideflats is missing, and SeaTac provides cloud cover and substitutes during hours when Tideflats and Tacoma South L are both missing;
- **Scenario 3** – McChord as the primary source of temperature, pressure and cloud cover data, and wind speed and direction substitution when Tideflats is missing; and
- **Scenario 4** – Tacoma South L as the primary source of temperature, RH, pressure data, and wind speed and direction substitution when Tideflats is missing, and McChord provides cloud cover and substitutes during hours when Tideflats and Tacoma South L are both missing.

Table 1 provides modeling results for all criteria pollutants for the four scenarios. Results for PM, SO₂ and CO are preliminary, subject to further QA checking of data inputs. Final results will be provided to you next week along with digital modeling inputs and outputs. As you can see from the table, all four Scenarios give very similar results and are all below respective Significant Impact Levels (SILs). Another way to put it is that it matters very little which met data set is used to supplement/substitute Tidelands data.

We look forward to discussing with you today by telephone.

Sincerely,



Attachment

Table 1: Criteria Pollutant Modeling Results – Project-Related Increase

cc (by email):

Jim Hogan
Lorna Luebbe
Bill Steiner
Tom Wood

Table 1: Criteria Pollutant Modeling Results – Project-Related Increase

Criteria Pollutant	Averaging Period	NAAQS/WAAQS ($\mu\text{g}/\text{m}^3$)	Threshold Value ^a ($\mu\text{g}/\text{m}^3$)	Modeled Concentration ^b ($\mu\text{g}/\text{m}^3$)				Scenario
				SEA	L+SEA	TCM	L+TCM	
CO	8-hour	10,000	500	10	10	10	11	Vaporizing + Transfer Case B
	1-hour	40,000	2,000	25	25	25	25	Vaporizing + Transfer Case A2
SO ₂	Annual	52	1	0.35	0.35	0.35	0.35	Liquefying Case 1
	24-hour	260	5	3.9	3.9	3.9	4	Liquefying Case 1
	3-hour	1,310	25	10	10	12	12	Liquefying Case 1
	1-hour	200	30	20	20	26	26	Liquefying Case 1
PM ₁₀	Annual	--	1	0.016	0.016	0.017	0.017	Liquefying Case 3
	24-hour	150	5	1.1	1.1	1.2	1.2	Vaporizing + Transfer Case A2
PM _{2.5}	Annual	12	0.3	0.016	0.016	0.017	0.017	Liquefying Case 3
	24-hour	35	1.2	1.1	1.1	1.2	1.2	Vaporizing + Transfer Case A2
NO ₂	Annual	100	1	0.042	0.042	0.043	0.043	Liquefying Case 2
	1-hour	188	7.5	5.9	5.9	5.9	5.9	Vaporizing + Transfer Case A2

^a Cause or contribute threshold value from WAC 173-400-113, Table 4a. The 1-hour NO₂ threshold value reflects the EPA's Interim 1-hour NO₂ Significant Impact Level.

^b Highest first high value for all receptors.

SEA = Scenario 1 - SeaTac

L+SEA = Scenario 2 - Tacoma South L and SeaTac

TCM = Scenario 3 - McChord

L+TCM = Scenario 4 - Tacoma South L and McChord