# Targa Sound Terminal

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December 21, 2011

Mr. Gerry Pade
Air Pollution Engineer
Puget Sound Clean Air Agency
1904 3rd Ave Ste. 105
Seattle, WA 98101

RE: Targa Sound Terminal Renewable Fuels Expansion Project follow up:

Dear Mr. Pade,

In response to your Notice of Construction Worksheet for NOC 10325, additional considerations where made to focus on an aggregate emission increases for multiple aspects of gasoline loading including tank losses, component losses, and truck loading / fugitive losses.

URS Corp. was hired by Targa Sound Terminal (previously known as Sound Refining, Inc.) to provide expertise and consultation for the purpose of addressing acceptable source impact levels (ASIL) pertaining to gasoline loading. This included running EPA TANKS 4.09d for any effected tank, calculating TAC emissions for ASIL consideration based on loading and working losses, preparation of a wind rose model based on local meteorological data, and mapping of TAC level impacts.

URS calculated throughput data using the maximum gasoline throughput for the existing VRU of 501,875,000 gal/yr (32738 bbl/day). For this process, four new tanks have been submitted for agency approval, these tanks are designated as 201, 202, 203, and 204 and would hold the majority of gasoline at the facility. However to be flexible Targa Sound Terminal has modeled all tanks with internal floating roofs at the facility for possible gasoline storage, this includes tanks 150, 152, 153, 154, 155, and 156.

The findings of the aggregate model created by URS show that all TAC values are below their ASIL limits.

After researching potential gasoline suppliers, including companies such as Conoco Philips a 1,3 Butadiene speciation value was asked for. The refiners informed Targa Sound Terminal that Butadiene levels in the existing gasoline provided were considered

to be at non-detectable levels. As such, Targa Sound Terminal does not believe that 1,3 Butadiene should be a limiting factor for gasoline throughput.

For the purposes of loading crude oil over the Targa Sound Terminal Marine dock, the facility had estimated vessel fugitive leak values using the SCAQMD method for leak estimates, however to clarify all values these figures were recalculated using the EPA *Protocol for Equipment Leak Emission Estimates* (table 2-3).

Targa Sound Terminal's requests for this current permit package include:

1.) Adjustment of the instantaneous rate of the existing VRU to be increased from 2,400 gpm to 3,600 gpm based on previously submitted documentation from the John Zink Company.
2.) Permitting of the new Vapor Recovery unit as per the previously submitted documentation that additionally will allow for marine loading of gasoline, crude, and ethanol.
3.) That the maximum combined loading throughput should not exceed the total VRU(s) capacity.
4.) The terminal should not exceed 100 tons VOC per year.
5.) Targa Sound Terminal is requesting an annual gasoline throughput of 501,875,000 gallons ~~based on the benzene acceptable source impact level~~.
6.) Targa Sound Terminal has requested that the floating roof tanks at the terminal be permitted for gasoline, crude, and other fuel oils service. The tanks that this request pertains to are tanks 150, 151, 152, 153, 154, 155, 156, 157, 162, 201, 202, 203, and 204.
7.) The terminal has requested additional load arms to be installed at the bottom loading truck rack. The request is to bring each load spot at lanes 3, 4, and 5 up to four arms per load spot (two load spots per lane) for a total of 24 arms. Of those 24 load arms, 10 have already been permitted and installed.

Attached with this letter are the following documents

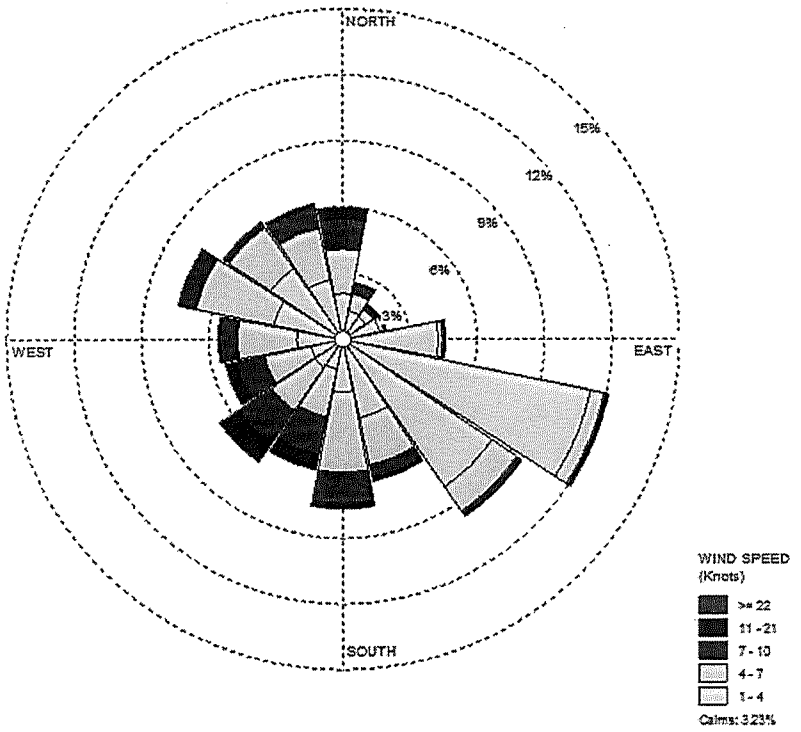
1.) Wind rose model.
2.) Benzene dispersion map
3.) Component Fugitive leak emission calculations, (total including marine)
4.) AERMOD TAC Summary of Results
5.) AERMOD Source Inputs (3)
6.) Permit package for tanks 201, 202, 203, and 204.

Thank you for your attention on this matter.

Matthew Kolata
Targa Resources

WIND ROSE PLOT:

DISPLAY:
Wind Speed
Direction (blowing from)




| | | | |
|---|---|---|---|
| COMMENTS: | DATA PERIOD:<br>2001 2002 2003 2004 2005<br>Jan 1 - Dec 31<br>00:00 - 23:00 | | |
| | CALM WINDS:<br>3.23% | | |
| | AVG. WIND SPEED:<br>4.42 Knots | | PROJECT NO.: |

WRPLOT View - Lakes Environmental Software


URS

Figure 1: Location of the Maximum Annual Benzene Concentration (ug/$m^3$)

# AERMOD Summary of Results

| Toxic Air Pollutant | CAS # | Averaging Period | ASIL ($ug/m^3$) | Maximum Off-Site Concentration ($ug/m^3$) | | |
|---|---|---|---|---|---|---|
| | | | | 2003 | 2004 | 2005 |
| Ethylbenzene | 100414 | year | 0.4 | 0.040 | 0.041 | 0.025 |
| M & p-xylene | 108383; 106423 | 24-hr | 221 | 0.573 | 0.654 | 0.479 |
| Toluene | 108883 | 24-hr | 5000 | 1.030 | 1.186 | 0.862 |
| N-hexane | 110543 | 24-hr | 700 | 0.505 | 0.520 | 0.422 |
| Cyclohexane | 110827 | 24-hr | 6000 | 0.059 | 0.061 | 0.05 |
| Benzene | 71432 | year | 0.0345 | 0.013 | 0.012 | 0.008 |
| O-xylene | 95476 | 24-hr | 221 | 0.213 | 0.219 | 0.177 |
| Isopropylbenzene (cumene) | 98828 | 24-hr | 400 | 0.009 | 0.010 | 0.008 |
| 1,3- Butadiene | 106990 | year | 0.00588 | 0.000 | 0.000 | 0.000 |

maximum values

## AERMOD Point Source Inputs

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | ANNUAL | 24 | 24 | 24 | 24 | ANNUAL | ANNUAL | 24 | ANNUAL |
| POINT | | | | | 1yr= | 8760 hrs | | CAS | 100-41-4 | 108-38-3; 106-42-3 | 108-88-3 | 110-54-3 | 110-82-7 | 71-43-2 | 95-47-6 | 98-82-8 | 106990 |
| | | | | | | | | | Ethylbenzene | M & p-xylene | Toluene | N-hexane | Cyclohexane | Benzene | O-xylene | Isopropylbenzene (cumene) | 1,3- Butadiene |
| Source ID | | Easting (x) (m) | Northing (Y) (m) | Base Elevation (m) | Stack Height (m) | Temperature (K) | Exit Velocity (m/s) | Stack Diameter (m) | 10414 (lb/hr) | 106423 (lb/hr) | 10883 (lb/hr) | 110543 (lb/hr) | 110827 (lb/hr) | 71432 (lb/hr) | 95476 (lb/hr) | 98828 (lb/hr) | 106990 (lb/hr) |
| VRU | VRU | 546410.5 | 5236190 | 1.25 | 6.096 | 0 | 9.57 | 0.1524 | 2.10051E-06 | 7.60638E-06 | 1.38761E-05 | 6.81073E-06 | 7.95646E-07 | 6.42624E-07 | 2.86433E-06 | 1.27303E-07 | 2.30742E-09 |

## AERMOD Area Source Inputs

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Averaging Period | ANNUAL | 24 | 24 | 24 | 24 | ANNUAL | ANNUAL | 24 | ANNUAL |
| AREA | | | | | 1yr= | | 8760 hrs | | CAS | 100-41-4 | 108-38-3; 106-42-3 | 108-88-3 | 110-54-3 | 110-82-7 | 71-43-2 | 95-47-6 | 98-82-8 | 106990 |
| | | | | | | | | | | Ethylbenzene | M & p-xylene | Toluene | N-hexane | Cyclohexane | Benzene | O-xylene | Isopropylbenzene (cumene) | 1,3- Butadiene |
| Source ID | Source Desc. | Easting (x) (m) | Northing (Y) (m) | Base Elevation (m) | Release Height (m) | Easterly Length (m) | Northerly Length (m) | Angle from North | Vertical Dimension (m) | 10414 (lb/hr) | 106423 (lb/hr) | 10883 (lb/hr) | 110543 (lb/hr) | 110827 (lb/hr) | 71432 (lb/hr) | 95476 (lb/hr) | 98828 (lb/hr) | 106990 (lb/hr) |
| FUGITIVE | FUGITIVE | 546408.5 | 5236178 | | 3.048 | 3.05 | 10.67 | | | 0.000522424 | 0.001891809 | 0.003451 | 0.001693921 | 0.000197888 | 0.000156 | 0.000712 | 3.16621E-05 | 0 |

## AERMOD Area Circle Source Inputs (Tanks)

AREA CIRC 1yr= 8760 hrs

| Source ID | Source Desc. | Easting (x) (m) | Northing (Y) (m) | Base Elevation (m) | Release Height (m) | Radius of Circle (m) | Number of Vertices | Vertical Dimension (m) | 10414 (lb/hr) | 106423 (lb/hr) | 10883 (lb/hr) | 110543 (lb/hr) | 110827 (lb/hr) | 71432 (lb/hr) | 95476 (lb/hr) | 98828 (lb/hr) | 106990 (lb/hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | ANNUAL | 24 | 24 | 24 | 24 | ANNUAL | ANNUAL | 24 | ANNUAL |
| | | | | | | | | | 100-41-4 | 108-38-3; 106-42-3 | 108-88-3 | 110-54-3 | 110-82-7 | 71-43-2 | 95-47-6 | 98-82-8 | 106990 |
| | | | | | | | | | Ethylbenzene | M & p-xylene | Toluene | N-hexane | Cyclohexane | Benzene | O-xylene | Isopropylbenzene (cumene) | 1,3-Butadiene |
| TK152 | TANK 152 | 546393.8 | 5236218 | | 18.288 | 13.11 | | | 0.000159438 | 0.000652094 | 0.001059 | 0.000501577 | 5.85209E-05 | 4.95E-05 | 0.000211 | 9.36335E-06 | 0 |
| TK155 | TANK 155 | 546363 | 5236212 | | 15.24 | 9.27 | | | 0.000333899 | 0.001391223 | 0.002219 | 0.001045145 | 0.000121915 | 0.000104 | 0.000439 | 1.95064E-05 | 0 |
| TK156 | TANK 156 | 546363.4 | 5236186 | | 15.24 | 9.19 | | | 0.000157059 | 0.000691958 | 0.001047 | 0.000483882 | 5.64054E-05 | 4.99E-05 | 0.000203 | 9.02486E-06 | 0 |
| TK150 | TANK 150 | 546367.2 | 5236129 | | 12.192 | 6.4 | | | 0.000177471 | 0.000771987 | 0.001182 | 0.000548808 | 6.39842E-05 | 5.61E-05 | 0.00023 | 1.02375E-05 | 0 |
| TK153 | TANK 153 | 546386.7 | 5236065 | | 10.668 | 7.32 | | | 0.00019111 | 0.000792997 | 0.00127 | 0.000598876 | 6.98615E-05 | 5.96E-05 | 0.000252 | 1.11778E-05 | 0 |
| TK154 | TANK 154 | 546405.6 | 5236060 | | 10.668 | 7.62 | | | 0.00019111 | 0.000792997 | 0.00127 | 0.000598876 | 6.98615E-05 | 5.96E-05 | 0.000252 | 1.11778E-05 | 0 |
| | TANK 201 | 546278.9 | 5236318 | | | 17.0688 | | | 0.001913153 | 0.006927933 | 0.012638 | 0.006203254 | 0.000724679 | 0.000649 | 0.002609 | 0.000115949 | 0 |
| | TANK 202 | 546273.2 | 5236347 | | | 17.0688 | | | 0.001818097 | 0.006583715 | 0.01201 | 0.005895041 | 0.000688673 | 0.000617 | 0.002479 | 0.000110188 | 0 |
| | TANK 203 | 546247.8 | 5236331 | | | 17.0688 | | | 0.001818097 | 0.006583715 | 0.01201 | 0.005895041 | 0.000688673 | 0.000617 | 0.002479 | 0.000110188 | 0 |
| | TANK 204 | 546219.5 | 5236338 | | | 17.0688 | | | 0.001818097 | 0.006583715 | 0.01201 | 0.005895041 | 0.000688673 | 0.000617 | 0.002479 | 0.000110188 | 0 |

| Throughput | Benzene | 1,3 Butadiene |
|---|---|---|
| Annual Emissions (lb/year) @ 1,344,031 gallons/day | 8.18 | 1.41 |
| Annual Emissions (g/s) @ 1,344,031 gallons/day | 1.18E-04 | 2.02E-05 |

**Conversions**

| | | | |
|---|---|---|---|
| 0.002 | mg benzene/liter fuel* | 0.0003 | mg 1,3 butadiene/liter fuel |
| 1000 | mg/g | 1000 | mg/g |
| 453.59 | g/lb | 453.59 | g/lb |
| 3.78 | l/gal | 3.78 | l/gal |
| 1,344,031.30 | gal/day | 1,344,031.30 | gal/day |
| 365 | day/yr | 365 | day/yr |
| 8.176 | lbs benzene/year | 1.405 | lbs 1,3 butadiene/year |
| 490,571,424.00 | gal/year | 490,571,424.00 | gal/year |
| | | 5.82 | Benzene/Butadiene Ratio[1] |

* John Zink emission rate

[1] Conoco Phillips TAC weight % ratio

| | 100-41-4 | 108-38-3; 106-42-3 | 108-88-3 | 110-54-3 | 110-82-7 | 71-43-2 | 95-47-6 | 98-82-8 | 106990 |
|---|---|---|---|---|---|---|---|---|---|
| | Ethylbenzene | M & p-xylene | Toluene | N-hexane | Cyclohexane | Benzene | O-xylene | Isopropylbenzene (cumene) | 1,3- Butadiene |
| Degassing | 1.840043034 | 6.663186137 | 12.15544 | 5.96620014 | 0.696985998 | 0.551178 | 2.50915 | 0.11151776 | 0 |
| John Zink 99% Control Efficiency | 0.01840043 | 0.066631861 | 0.121554 | 0.059662001 | 0.00696986 | 0.005512 | 0.025091 | 0.001115178 | 0 |
| Total VRU + Degassing (lb/yr) | 0.01840043 | 0.066631861 | 0.121554 | 0.059662001 | 0.00696986 | 5.63E-03 | 0.025091 | 0.001115178 | 2.02E-05 |

# Targa Sound Terminal

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General:

Targa Sound Terminal will construct four new tanks within the facility. Three of the tanks will have an 80' diameter with a working capacity of 50,135 barrels each, and the fourth tank will have a 95' diameter with a working capacity of 70,698 barrels. These tanks will contain internal floating roofs, and will provide additional storage for the expansion of the facility. The tanks have been designated as 201 (95'), 202, 203, and 204 (80').

To reduce emissions, the floating legs for the roof will be removable and capped/sealed while the tanks are in service.

## General Information (Tank 201)

| | |
|---|---|
| 1. Type of construction: | New |
| 2. Date of construction: | 2012 |
| 3. Hours of operation: | 24/7 |
| 4. Estimated installation start date: | |

## Liquid Properties (Tank 201)

| | |
|---|---|
| 1. Products stored: | Gasoline<br>Distillates<br>Crude |
| 2. Maximum Storage Temp. | Ambient |
| 3. Vapor pressure at max storage temp | 5 – 15 RVP |
| 4. Estimated annual throughput(gal/yr) | 142,527,168 |

## Design of Internal Floating Roof Tank (201)

| | |
|---|---|
| 1. Working diameter | 95' |
| 2. Working capacity (gal) | 2,969,310 |
| 3. External shell color/shade | White |
| 4. External shell condition | Good |
| 5. Roof color/shade | White |
| 6. Roof paint condition | Good |
| 7. Number of columns supporting fixed roof | (1) Double channel support column |
| 8. Effective column diameter | 2.75" x 12" |
| 9. Type of primary seal | Mechanical shoe |
| 10. Type of secondary seal | Mechanical rim seal |
| 11. Type of deck | Steel, welded |
| 12. Number of each type of deck fitting | |
| a. 24" Manway | 1 |
| b. 19" float well | 1 |
| c. 10" vacuum breaker | 1 |
| d. 4" gauge/guide pole | 1 |
| e. 18" x 30" ladder well | 1 |
| f. 3" emergency roof drain | 1 |

## Operation and Maintenance (Tank 201)

| | |
|---|---|
| 1. Method used to fill tank | Truck, railcar, barge, pipeline |
| 2. Method used to drain tank | Truck, barge |
| 3. Describe preventative maintenance | Tank 201 will be inspected and maintained to API 653 standards |

## General Information (Tank 202)

| | |
|---|---|
| 5. Type of construction: | New |
| 6. Date of construction: | 2012 |
| 7. Hours of operation: | 24/7 |
| 8. Estimated installation start date: | |

## Liquid Properties (Tank 202)

| | |
|---|---|
| 5. Products stored: | Gasoline<br>Distillates<br>Crude |
| 6. Maximum Storage Temp. | Ambient |
| 7. Vapor pressure at max storage temp | 5 – 15 RVP |
| 8. Estimated annual throughput(gal/yr) | 101,071,728 |

## Design of Internal Floating Roof Tank (202)

| | |
|---|---|
| 13. Working diameter | 80' |
| 14. Working capacity (gal) | 2,105,661 |
| 15. External shell color/shade | White |
| 16. External shell condition | Good |
| 17. Roof color/shade | White |
| 18. Roof paint condition | Good |
| 19. Number of columns supporting fixed roof | (1) Double channel support column |
| 20. Effective column diameter | 2.75" x 12" |
| 21. Type of primary seal | Mechanical shoe |
| 22. Type of secondary seal | Mechanical rim seal |
| 23. Type of deck | Steel, welded |
| 24. Number of each type of deck fitting | |
| a. 24" Manway | 1 |
| b. 19" float well | 1 |
| c. 10" vacuum breaker | 1 |
| d. 4" gauge/guide pole | 1 |
| e. 18" x 30" ladder well | 1 |
| f. 3" emergency roof drain | 1 |

## Operation and Maintenance (Tank 202)

| | |
|---|---|
| 4. Method used to fill tank | Truck, railcar, barge, pipeline |
| 5. Method used to drain tank | Truck, barge |
| 6. Describe preventative maintenance | Tank 202 will be inspected and maintained to API 653 standards |

## General Information (Tank 203)

| | |
|---|---|
| 9. Type of construction: | New |
| 10. Date of construction: | 2012 |
| 11. Hours of operation: | 24/7 |
| 12. Estimated installation start date: | |

## Liquid Properties (Tank 203)

| | |
|---|---|
| 9. Products stored: | Gasoline<br>Distillates<br>Crude |
| 10. Maximum Storage Temp. | Ambient |
| 11. Vapor pressure at max storage temp | 5 – 15 RVP |
| 12. Estimated annual throughput(gal/yr) | 101,071,728 |

## Design of Internal Floating Roof Tank (203)

| | |
|---|---|
| 25. Working diameter | 80' |
| 26. Working capacity (gal) | 2,105,661 |
| 27. External shell color/shade | White |
| 28. External shell condition | Good |
| 29. Roof color/shade | White |
| 30. Roof paint condition | Good |
| 31. Number of columns supporting fixed roof | (1) Double channel support column |
| 32. Effective column diameter | 2.75" x 12" |
| 33. Type of primary seal | Mechanical shoe |
| 34. Type of secondary seal | Mechanical rim seal |
| 35. Type of deck | Steel, welded |
| 36. Number of each type of deck fitting | |
| a. 24" Manway | 1 |
| b. 19" float well | 1 |
| c. 10" vacuum breaker | 1 |
| d. 4" gauge/guide pole | 1 |
| e. 18" x 30" ladder well | 1 |
| f. 3" emergency roof drain | 1 |

## Operation and Maintenance (Tank 203)

| | |
|---|---|
| 7. Method used to fill tank | Truck, railcar, barge, pipeline |
| 8. Method used to drain tank | Truck, barge |
| 9. Describe preventative maintenance | Tank 203 will be inspected and maintained to API 653 standards |

## General Information (Tank 204)

| | |
|---|---|
| 13. Type of construction: | New |
| 14. Date of construction: | 2012 |
| 15. Hours of operation: | 24/7 |
| 16. Estimated installation start date: | |

## Liquid Properties (Tank 204)

| | |
|---|---|
| 13. Products stored: | Gasoline<br>Distillates<br>Crude |
| 14. Maximum Storage Temp. | Ambient |
| 15. Vapor pressure at max storage temp | 5 – 15 RVP |
| 16. Estimated annual throughput(gal/yr) | 101,071,728 |

## Design of Internal Floating Roof Tank (204)

| | |
|---|---|
| 37. Working diameter | 80' |
| 38. Working capacity (gal) | 2,105,661 |
| 39. External shell color/shade | White |
| 40. External shell condition | Good |
| 41. Roof color/shade | White |
| 42. Roof paint condition | Good |
| 43. Number of columns supporting fixed roof | (1) Double channel support column |
| 44. Effective column diameter | 2.75" x 12" |
| 45. Type of primary seal | Mechanical shoe |
| 46. Type of secondary seal | Mechanical rim seal |
| 47. Type of deck | Steel, welded |
| 48. Number of each type of deck fitting | |
| a. 24" Manway | 1 |
| b. 19" float well | 1 |
| c. 10" vacuum breaker | 1 |
| d. 4" gauge/guide pole | 1 |
| e. 18" x 30" ladder well | 1 |
| f. 3" emergency roof drain | 1 |

## Operation and Maintenance (Tank 204)

| | |
|---|---|
| 10. Method used to fill tank | Truck, railcar, barge, pipeline |
| 11. Method used to drain tank | Truck, barge |
| 12. Describe preventative maintenance | Tank 204 will be inspected and maintained to API 653 standards |