

## YOLO-SOLANO AIR QUALITY MANAGEMENT DISTRICT

1947 Galileo Court, Suite 103; Davis, CA 95618

### EMISSION EVALUATION

<b>ENGINEER:</b>	René Toledo	<b>ATC #</b>	<b>C-11-78</b>
		<b>PTO#</b>	<b>P-45-94(a3)</b> (Reserved)
<b>FACILITY NAME:</b>	Buckeye Terminals, LLC	<b>SIC Code #</b>	<b>5171</b>
		<b>UTM E</b>	<b>628.742</b> km
		<b>UTM N</b>	<b>4269.854</b> km

**LOCATION:** The equipment is located at 1601 South River Road in West Sacramento, CA. The equipment is not located within 1,000 feet of a K-12 school and is not subject to the requirements of H&S 42301.6 (see discussion below).

**PURPOSE:** Buckeye is proposing to modify Permit to Operate (PTO) P-45-94(t1) by requesting an increase in the maximum Reid Vapor Pressure (RVP) allowed to be stored in Tank #18 in the months of October to March. The following tanks are also being modified as part of this project:  
 > Tank #15 (under P-54-93(t1) being modified by Authority to Construct (ATC) C-11-77); and  
 > Tank #16 (under PTO P-66-93(t1) being modified by ATC C-11-78).

The source has not proposed an increase in the permitted process limits or any physical modifications to the existing bulk storage tanks.

This evaluation also serves to document the significant modification of the facility's Title V Operating Permit F-00012-8 being performed under the Enhanced New Source Review provisions of District Rule 3.4, Section 404.

**EQUIPMENT:** 798,000 gallon welded storage tank (#18)

**CONTROL EQUIPMENT:** Internal steel floating roof (welded) with a mechanical shoe primary seal and rim mounted secondary seal

**APPLICATION DATA:**

<u>Operating Schedule</u>	<u>Units</u>	<u>Formula Symbol</u>	<u>Reference</u>
Max. Daily Operating Hours =	24 hours/day	OD	Applicant
Max. 1st Qtr. Operating Days =	90 days/quarter	Q1	Applicant
Max. 2nd Qtr. Operating Days =	91 days/quarter	Q2	Applicant
Max. 3rd Qtr. Operating Days =	92 days/quarter	Q3	Applicant
Max. 4th Qtr. Operating Days =	92 days/quarter	Q4	Applicant
Max. Yearly Operating Days =	365 days/year	OY	Applicant

<u>Gasoline Throughput</u>	<u>Units</u>	<u>Formula Symbol</u>	<u>Reference</u>
Max. Daily Throughput =	N/A gallons/day <sup>a</sup>	TD	-
Max. 1st Qtr. Throughput =	14.79 million gallons/quarter	T1	Applicant
Max. 2nd Qtr. Throughput =	14.96 million gallons/quarter	T2	Applicant
Max. 3rd Qtr. Throughput =	15.12 million gallons/quarter	T3	Applicant
Max. 4th Qtr. Throughput =	15.12 million gallons/quarter	T4	Applicant
Max. Yearly Throughput =	60.00 million gallons/year	TY	Applicant

<sup>a</sup>. EPA TANKS 4.0.9d emissions modeling software program calculates VOC emissions on a monthly basis. Therefore, daily throughput and emission limits are not included on the current permit and will not be included in this emission evaluation or the ATC.

**Storage Tank Data**

Tank Type = Internal Floating Roof  
 Deck Material = Steel  
 Deck Construction = Welded  
 Tank Diameter (feet) = 60  
 Tank Volume (gallons) = 798,000  
 Primary Seal = Mechanical shoe  
 Secondary Seal = Rim-mounted  
 Proposed Liquid(s) Stored = Gasoline

## EMISSION CALCULATIONS:

### 1. Determine VOC Emissions:

VOC emissions from the process were quantified using EPA TANKS 4.0.9d emissions modeling software program (TANKS). Currently, TANKS is the most reliable tool available for quantifying VOC emissions from bulk storage tanks because the software relies on meteorological data for the Sacramento region. In additions, TANKS takes into account the actual properties (e.g. dimensions, fittings, etc.) of a specific tank and the maximum Reid Vapor Pressure (RVP) of the gasoline stored when performing VOC calculations. The TANKS run for this proposal is attached to this emission evaluation.

	Rim Seal <sup>b</sup>	Withdrawal <sup>c</sup>	Deck Fitting <sup>b</sup>	Deck Seam <sup>b</sup>	Total	
Maximum Daily VOC =	N/A	N/A	N/A	N/A	N/A	lb/day
1st Quarter VOC =	94	47	807	0	948	lb/quarter
2nd Quarter VOC =	47	48	406	0	501	lb/quarter
3rd Quarter VOC =	52	48	444	0	544	lb/quarter
4th Quarter VOC =	98	48	844	0	991	lb/quarter
Maximum Yearly VOC =	291	192	2,502	0	2,984	lb/year
Maximum Yearly VOC =	0.15	0.1	1.25	0	1.50	tons/year

<sup>b</sup>. VOC emissions from rim seals, deck fittings, and deck seams are called standing (or breathing) losses. Tank standing losses occur just from the tank being in service (having some amount of gasoline in it), independent of whether the tank is being filled or emptied. The quantity of standing loss VOC emissions is significantly affected by the ambient temperature (the hotter the temperature, the higher the VOC emissions), the number and types of deck fittings on the tank, and the tank floating roof deck construction. Typically, the majority (approximately 90-99%) of the VOC emissions from a bulk gasoline storage tank are from standing losses.

<sup>c</sup>. VOC emissions from gasoline withdrawal are called working losses. Tank working losses occur specifically when the tank is being filled or emptied and, therefore, is directly related to the throughput of the tank.

## RULE & REGULATION COMPLIANCE EVALUATION:

### District Rule 2.3-Ringelmann Chart

The source is subject to the provisions of this rule. The rule compliance evaluation is attached and contains a discussion of all applicable requirements that will be listed as conditions in the permit.

### District Rule 2.5-Nuisance

The source is subject to the provisions of this rule. The rule compliance evaluation is attached and contains a discussion of all applicable requirements that will be listed as conditions in the permit.

### District Rule 2.17-Circumvention

The source is subject to the provisions of this rule. The rule compliance evaluation is attached and contains a discussion of all applicable requirements that will be listed as conditions in the permit.

### District Rule 2.21-Organic Liquid Storage and Transfer

The source is subject to the provisions of this rule. The rule compliance evaluation is attached and contains a discussion of all applicable requirements and any streamlining or subsuming demonstrations of conditions contained in the permit.

### District Rule 2.23-Fugitive Hydrocarbon Emissions

The source is subject to the provisions of this rule. The rule compliance evaluation is attached and contains a discussion of all applicable requirements and any streamlining or subsuming demonstrations of conditions contained in the permit.

### District Rule 3.1-General Permit Requirements

The source is subject to the provisions of this rule. The rule compliance evaluation is attached and contains a discussion of all applicable requirements that will be listed as conditions in the permit.

### District Rule 3.4-New Source Review

The source is subject to the provisions of this rule. The rule compliance evaluation is attached and contains a discussion of all applicable requirements and any streamlining or subsuming demonstrations of conditions contained in the permit.

The following calculations are required in order to determine the Best Available Control Technology (BACT), offset, major source modification, and public notice requirements specific to this rule.

**PROPOSED EMISSION SUMMARY FOR NEW OR MODIFIED PERMIT \***

	<u>Daily</u>	<u>Yearly</u>	
VOC	11.5 lb	1.50 tons	Use for annual billing
CO	0.0 lb	0.00 tons	Use for annual billing
NOx	0.0 lb	0.00 tons	Use for annual billing
SOx	0.0 lb	0.00 tons	Use for annual billing
PM10	0.0 lb	0.00 tons	Use for annual billing

\* As calculated for Tank #15 using U.S. EPA's Tanks4.0d emission modeling software (see attached emission reports). The highest monthly VOC emissions were calculated as 346.5 pounds during the month of November (30 days), which averages to the above daily value. Sample Calculation: [VOC lb/day] = (346.5 lb/month) \* (1 month/30 days) = 11.5 lb/day

	<u>Quarterly</u>			
	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>
VOC (lb)	948	501	544	991
CO (lb)	0	0	0	0
NOx (lb)	0	0	0	0
SOx (lb)	0	0	0	0
PM10 (lb)	0	0	0	0

**Previous quarterly potential to emit for modified permit\***

	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>
VOC (lb)	841	501	544	881
CO (lb)	0	0	0	0
NOx (lb)	0	0	0	0
SOx (lb)	0	0	0	0
PM10 (lb)	0	0	0	0

\* From PTO P-45-94(t1)

**Historic potential emissions for modified permit\***

	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>
VOC (lb)	841	501	544	881
CO (lb)	0	0	0	0
NOx (lb)	0	0	0	0
SOx (lb)	0	0	0	0
PM10 (lb)	0	0	0	0

\* Historic potential emissions were calculated using EPA TANKS 4.0.9d emissions modeling software. See attached TANKS run for calendar year 2010. Because the historic emissions are over 80% in at least one year out of the last five, the historic potential equals the previous potential to emit (PTE).

<u>Pollutant</u>	<u>Trigger</u> (lb/day)	<u>BACT</u>	<u>Quarterly Increase</u>	<u>BACT *</u>
		<u>Proposed</u> (lb/day)		
VOC	10	12	Yes	Yes
CO	250	0	No	No
NOx	10	0	No	No
SOx	80	0	No	No
PM10	80	0	No	No

\* BACT for VOC is triggered for this emissions unit as part of this proposed modification (see attached BACT Determination 623-2).

**OFFSETS**

**Quarterly permitted emissions for other permits at the stationary source\***

	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>
VOC (lb)	17,428	17,718	17,798	17,700
CO (lb)	44,832	44,832	44,832	44,832
NOx (lb)	8,241	8,241	8,241	8,241
SOx (lb)	0	0	0	0
PM10 (lb)	0	0	0	0

\* Post Project Policy 25 PTE, excluding ATC C-11-78 and emergency equipment (see Quarterly PTE worksheet dated 11/07/2011).

**Quarterly permitted emissions for the stationary source including proposed emissions**

	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>
VOC (lb)	18,376	18,219	18,342	18,691
CO (lb)	44,832	44,832	44,832	44,832
NOx (lb)	8,241	8,241	8,241	8,241
SOx (lb)	0	0	0	0
PM10 (lb)	0	0	0	0

**Offset triggers**

	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>
VOC (lb)	7,500	7,500	7,500	7,500
CO (lb)	49,500	49,500	49,500	49,500
NOx (lb)	7,500	7,500	7,500	7,500
SOx (lb)	13,650	13,650	13,650	13,650
PM10 (lb)	13,650	13,650	13,650	13,650

**Quantity of offsets required**

	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>
VOC (lb)	107	0	0	110
CO (lb)	0	0	0	0
NOx (lb)	0	0	0	0
SOx (lb)	0	0	0	0
PM10 (lb)	0	0	0	0

**Quantity of offsets to be surrendered prior to commencing construction\***

<u>Origin: On-Site Reductions</u>						
	<u>Ratio</u>	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>	<u>Total</u>
VOC (lb)	1.0	107	0	0	110	217

<u>Origin: Within 15 Mile Radius</u>						
	<u>Ratio</u>	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>	<u>Total</u>
VOC (lb)	1.2	128	0	0	132	260

<u>Origin: Greater Than 15 Miles, But Within 50 Miles</u>						
	<u>Ratio</u>	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>	<u>Total</u>
VOC (lb)	1.5	161	0	0	165	326

\* Since the modifications proposed by ATC C-11-78 do not result in a major modification of the facility, the District will apply the offset ratios for Non-Major Modifications contained in Section 303, of Rule 3.4.

**MAJOR MODIFICATION**

**Facility Total Potential to Emit \***

32.29 TPY VOC  
 71.92 TPY CO  
 13.22 TPY NOx  
 0.00 TPY SOx  
 0.00 TPY PM10

**Major Source Thresholds**

25 TPY VOC  
 100 TPY CO  
 25 TPY NOx  
 100 TPY SOx  
 100 TPY PM10

\* See attached Quarterly PTE worksheet (dated 11/07/2011).

**Last five year emission aggregate \***

0.38 TPY VOC  
 0.00 TPY CO  
 0.00 TPY NOx  
 0.00 TPY SOx  
 0.00 TPY PM10

**Major Modification Thresholds**

25 TPY VOC  
 100 TPY CO  
 25 TPY NOx  
 40 TPY SOx  
 25 TPY PM10

\* See attached 5-Year Emission Aggregate worksheet (dated 11/07/2011).

Result: The proposed modification is not a major modification

**PUBLIC NOTICE**

**"Increase in historic potential to emit"**

110 lb VOC/quarter  
0 lb CO/quarter  
0 lb NOx/quarter  
0 lb SOx/quarter  
0 lb PM10/quarter

**Exemption level for notification**

7,500 lb VOC/quarter  
49,500 lb CO/quarter  
7,500 lb NOx/quarter  
13,650 lb SOx/quarter  
13,650 lb PM10/quarter

Result: Public notice is not required

**District Rule 3.8 - Federal Operating Permits**

The facility is a federal major source due to potential to emit over 25 tons VOC per year. The version of the rule used in this evaluation was adopted on April 11, 2001 and is part of the current California SIP. Currently, the facility is operating under Federal Title V Operating Permit F-00012-8, effective August 15, 2011. The source has requested that ATC applications C-11-76, C-11-77, and C-11-78 be processed under the Enhanced New Source Review provisions of District Rule 3.4, Section 404.

The proposed Title V permit is considered a significant permit modification, since the proposed permit modifications contained in the ATCs result in a greater than de minimis increase in hazardous air pollutants at the facility. Per the requirements of Section 409.1(b), the District's shall provide written notice to the U.S. EPA and CARB of the project that shall include this Statement of Basis, the proposed Title V permit ("proposed decision"), and proposed ATCs C-11-76, C-11-77, and C-11-78. The District will also publish the public notice for this project in at least one general circulation newspaper. The notice shall inform the public of the 30 day public comment period commencing on the day that the notice is published.

The further rule compliance evaluation is attached and contains a discussion of all applicable requirements and any streamlining or subsuming demonstrations of conditions contained in the permit.

**District Rule 3.20-Ozone Transport Mitigation**

The source is subject to the provisions of this rule, since the facility total potential to emit is above 10 tons per year for VOC or NOx. The rule compliance evaluation is attached and contains a discussion of all applicable requirements and any streamlining or subsuming demonstrations of conditions contained in the permit.

The following calculations are required in order to determine the post-project Stationary Source Potential to Emit (SSPE) for the facility.

**Annual permitted emissions for the stationary source including proposed emissions**

VOC (lb)	64,580	lbs
NOx (lb)	26,440	lbs

**Annual permitted emissions for equipment which is exempt from Rule 3.4 \***

VOC (lb)	0	lbs
NOx (lb)	0	lbs

\* There are no Rule 3.4 exempt units operating at the site.

**Post-project Stationary Source Potential to Emit (SSPE)**

VOC (lb)	64,580	lbs
NOx (lb)	26,440	lbs

Because the post-project SSPE is greater than 10 tons (20,000) lbs per year for VOC or NOx, per section 301.1, calculations shall be performed to determine the quantity of mitigation required, if any.

**Pre-project Stationary Source Potential to Emit (SSPE)**

VOC (lb)	63,823	lbs
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NOx (lb) 26,440 lbs

**Quantity of offsets required by Rule 3.4**

VOC (lb) 766 lbs  
NOx (lb) 0 lbs

**Quantity of Mitigation required by Rule 3.20**

VOC (lb) 0 lbs  
NOx (lb) 0 lbs

**40 CFR Part 60 - Subpart A - General Provisions**

The three affected bulk storage tanks are not subject to the provisions of this rule. No permit condition is required.

**40 CFR Part 60 - Subpart K - Standards of Performance for Storage Vessels for Petroleum Liquids**

The three affected bulk storage tanks are not subject to the provisions of this rule, since none meet the applicability requirements of the rule (see attached discussion). No permit condition is required.

**40 CFR Part 60 - Subpart Ka - Standards of Performance for Storage Vessels for Petroleum Liquids**

The three affected bulk storage tanks are not subject to the provisions of this rule, since none meet the applicability requirements of the rule (see attached discussion). No permit condition is required.

**40 CFR Part 60 - Subpart Kb - Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels)**

The three affected bulk storage tanks are not subject to the provisions of this rule, since none meet the applicability requirements of the rule (see attached discussion). No permit condition is required.

**40 CFR Part 60 - Subpart XX - Standards of Performance for Bulk Gasoline Terminals**

The three affected bulk storage tanks are not subject to the provisions of this rule, since none meet the applicability requirements of the rule (see attached discussion). No permit condition is required.

**40 CFR Part 63 - Subpart A - National Emission Standards for Hazardous Air Pollutants (NESHAP) General Provisions**

The source is subject to the provisions of this rule. The rule compliance evaluation is attached and contains a discussion of all applicable requirements and any streamlining or subsuming demonstrations performed on these requirements.

**40 CFR PART 63 - Subpart R - National Emission Standards for Gasoline Distribution Facilities (Bulk Gasoline Terminals and Pipeline Breakout Stations)**

The three affected bulk storage tanks are not subject to the provisions of this rule, since the facility does not meet the applicability requirements of the rule (see attached discussion). No permit condition is required.

**40 CFR PART 63 - Subpart CC - NESHAP from Petroleum Refineries**

The three affected bulk storage tanks are not subject to the provisions of this rule, since the emission units are not located at a petroleum refining operation (see attached discussion). No permit condition is required.

**40 CFR PART 63 - Subpart WW - National Emission Standards for Storage Vessels (Tanks) - Control Level 2**

The source is subject to the provisions of this rule. The rule compliance evaluation is attached and contains a discussion of all applicable requirements and any streamlining or subsuming demonstrations performed on these requirements.

**40 CFR PART 63 - Subpart BBBBBB - NESHAP for Source Category (Gasoline Distribution Bulk Terminals, Bulk Plants, and Pipelines)**

The source is subject to the provisions of this rule. The rule compliance evaluation is attached and contains a discussion of all applicable requirements and any streamlining or subsuming demonstrations performed on these requirements.

**40 CFR Part 64 - Compliance Assurance Monitoring**

The three affected bulk storage tanks are not subject to the provisions of this rule, since none of the emission units have a pre-control device potential to emit greater than or equal to any of the major source thresholds for VOC (see attached discussion). No permit condition is required.

**District Risk Management Plan and Risk Assessment Guidelines**

Because the application results in an increase of hazardous air pollutant (HAP) emissions, a screening risk assessment (prioritization) will be performed. The RMPRAG requires that any new or modified emission unit satisfy Toxic-Best Available Control Technology (T-BACT), if its individual cancer risk is calculated to be between 1 and 10 in a million, or if its calculated hazardous index (acute or chronic) is greater than 1. The RMPRAG also considers any application or project having a total cancer risk above 10 in a million, unapprovable.

The modifications proposed by ATCs C-11-76, C-11-77, and C-11-78 are be considered part of the same project, and therefore the cumulative risk resulting from all of the modifications will also be evaluated.

**1. HAP Prioritization for ATC C-11-78 [Tank #18] Only:**

Hazardous Air Pollutant	CAS No.	% Weight in Liquid <sup>a</sup> (%)	Uncontrolled Tank Emissions <sup>b</sup>		Screening Level (lb/year)	Less than Screening Level (Yes/No)
			(lb/hr) <sub>avg</sub>	(lb/year)		
2,2,4-Trimethylpentane (isooctane)	00540-84-1	0.95315	6.94E-04	6.08	-	Yes
Benzene	00071-43-2	0.62539	7.59E-04	6.65	6.70	Yes
Cresol	00095-48-7	0.00065	0.00E+00	0.00	34,700	Yes
Ethylbenzene	00100-41-4	0.06313	2.05E-05	0.18	193,000	Yes
Hexane (-n)	00110-54-3	4.42761	8.14E-03	71.33	83,000	Yes
Methyl-tert-butyl ether (MTBE)	01634-04-4	0.3	8.84E-04	7.74	-	Yes
Naphthalene	00091-20-3	0.00055	0.00E+00	0.00	270	Yes
Styrene	00100-42-5	0.08817	2.51E-05	0.22	135,000	Yes
Toluene	00108-88-3	0.84213	4.24E-04	3.71	38,600	Yes
Xylenes	00095-47-6	0.23501	6.74E-05	0.59	57,900	Yes

<sup>a</sup>. The formula based HAP content (percent weight in liquid) estimates provided by Buckeye's Corporate HSSE as reported by Compliance Manager Greg Clark (see email dated 10/07/2011).

<sup>b</sup>. The hourly emission rate has been calculated using by dividing the yearly HAP total by 8760 hours.

None of the emissions from any HAPs are above the prioritization level for Tank #18.

**2. Cumulative Prioritization for ATCs C-11-77 [Tank #15], C-11-78 [Tank #16], and C-11-78 [Tank #18]:**

Hazardous Air Pollutant	CAS No.	Uncontrolled Tank Emissions				Screening Level (lb/year)	Less than Screening Level (Yes/No)
		C-11-76 (lb/year)	C-11-77 (lb/year)	C-11-78 (lb/year)	All Tanks (lb/year)		
2,2,4-Trimethylpentane (isooctane)	00540-84-1	6.48	4.22	6.08	16.78	-	Yes
Benzene	00071-43-2	6.45	4.73	6.65	17.83	6.70	No
Cresol	00095-48-7	0.00	0.00	0.00	0.00	34,700	Yes
Ethylbenzene	00100-41-4	0.24	0.11	0.18	0.53	193,000	Yes
Hexane (-n)	00110-54-3	65.96	51.59	71.33	188.88	83,000	Yes
Methyl-tert-butyl ether (MTBE)	01634-04-4	6.90	5.66	7.74	20.30	-	Yes
Naphthalene	00091-20-3	0.00	0.00	0.00	0.00	270	Yes
Styrene	00100-42-5	0.31	0.13	0.22	0.66	135,000	Yes
Toluene	00108-88-3	4.34	2.48	3.71	10.53	38,600	Yes
Xylenes	00095-47-6	0.83	0.35	0.59	1.77	57,900	Yes

Because the cumulative benzene emissions from the project are above the pollutants respective prioritization level, a health risk assessment was performed for this project. The dispersion modeling and health risks were evaluated using CARB's Hotspots Analysis Reporting Program (HARP) which accounts for site's specific parameters (e.g. stack height, stack location, meteorological data, etc.). The health risks for the entire project are summarized below.

**3. Summary of Health Risk Analysis:**

The District modeled the health risks using the site specific data and is using the highest risk values of each receptor type to demonstrate compliance with the RMPRAG requirements. The residential receptor's cancer risk has been modeled over a 70 year

period, while the worksite receptor's risk has been modeled over 46 years. The HARP results are summarized below.

Receptor Type	Receptor No.	Acute Hazard Index (unitless)	Chronic Hazard Index (unitless)	Individual Cancer Risk (in a million)
Worksite (Property Boundary)	1381	0.0001	0.0006	0.0229
Residential	649	0.0001	0.0006	0.137

The acute and chronic hazard index were each calculated to be less than 1.0 and the individual cancer risk was calculated to be less than 1 in a million. Therefore, T-BACT is not triggered.

**California Health and Safety Code 42301.6 - Public Notice for Possible Source of Air Hazardous Emissions near School Prior to Approving Permit**

The three affected bulk storage tanks are not subject to the provisions of this rule, since the facility is not located within 1,000 feet of a K-12 school. No permit condition or additional noticing is required.

**COMMENTS:**

The application triggers BACT, offsets, and public noticing requirements. The application does not trigger T-BACT requirements.

As documented in BACT Determination 623-1, the source satisfies BACT for VOC for this category of source.

All applicable permit conditions have been discussed in their appropriate rule sections (see attached).

The permit will contain a condition specifying the amount of ERCs that are required by the project.

Per the requirements of Section 409.1 of District Rule 3.8, the District's proposed amended Title V permit will be noticed to the public over a 30-day period (with the notice being published in at least one general circulation newspaper) and to EPA over a 45-day period.

**RECOMMENDATIONS:**

Perform the required public and regulatory notice.

Engineer: *Rene Toledo*

Date: *11/07/2011*

Reviewed by: *[Signature]*

Date: *11/7/2011*

**TANKS 4.0.9d**  
**Emissions Report - Detail Format**  
**Tank Identification and Physical Characteristics**

**Identification**

User Identification: C-11-78, Buckeye - Tank #18  
 City: West Sacramento  
 State: California  
 Company: BP West Coast Products LLC  
 Type of Tank: Internal Floating Roof Tank  
 Description: Modification of P-45-94(t1) to increase maximum gasoline RVP in winter months.

**Tank Dimensions**

Diameter (ft): 60.00  
 Volume (gallons): 798,000.00  
 Turnovers: 75.19  
 Self Supp. Roof? (y/n): N  
 No. of Columns: 1.00  
 Eff. Col. Diam. (ft): 1.00

**Paint Characteristics**

Internal Shell Condition: Light Rust  
 Shell Color/Shade: White/White  
 Shell Condition: Good  
 Roof Color/Shade: White/White  
 Roof Condition: Good

**Rim-Seal System**

Primary Seal: Mechanical Shoe  
 Secondary Seal: Rim-mounted

**Deck Characteristics**

Deck Fitting Category: Detail  
 Deck Type: Welded

**Deck Fitting/Status**

	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Column Well (24-in. Diam.)/Built-Up Col.-Sliding Cover, Gask.	6
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Float, Wiper	1
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Sock	9
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Sock	10
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1

Meteorological Data used in Emissions Calculations: Sacramento, California (Avg Atmospheric Pressure = 14.72 psia)

**TANKS 4.0.9d**  
**Emissions Report - Detail Format**  
**Liquid Contents of Storage Tank**

**C-11-78, Buckeye - Tank #18 - Internal Floating Roof Tank**  
**West Sacramento, California**

Mixture Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Gasoline (RVP 15.0)	Jan	54.77	51.34	58.20	60.81	7.2951	N/A	N/A	0.0000			92.00	Option 4: RVP=15, ASTM Slope=3
2,2,4-Trimethylpentane (isooctane)						0.5114	N/A	N/A	114.2300	0.0095	0.0010	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.0084	N/A	N/A	78.1100	0.0063	0.0013	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresol (-o)						0.0013	N/A	N/A	108.1400	0.0000	0.0000	108.14	Option 2: A=6.911, B=1435.5, C=165.16
Ethylbenzene						0.0903	N/A	N/A	106.1700	0.0006	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						1.6672	N/A	N/A	86.1700	0.0443	0.0153	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Methyl-tert-butyl ether (MTBE)						2.8434	N/A	N/A	88.1500	0.0030	0.0018	88.15	Option 1: VP50 = 2.5 VP60 = 3.22
Naphthalene						0.0020	N/A	N/A	128.2000	0.0000	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Styrene						0.0596	N/A	N/A	104.1500	0.0009	0.0000	104.15	Option 2: A=7.14, B=1574.51, C=224.09
Toluene						0.2799	N/A	N/A	92.1300	0.0084	0.0005	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						7.9071	N/A	N/A	58.6237	0.9246	0.9801	92.19	
Xylene (-o)						0.0583	N/A	N/A	106.1700	0.0024	0.0000	106.17	Option 2: A=6.998, B=1474.679, C=213.69
Gasoline (RVP 15.0)	Feb	57.63	53.16	62.09	60.81	7.8007	N/A	N/A	60.0000			92.00	Option 4: RVP=15, ASTM Slope=3
2,2,4-Trimethylpentane (isooctane)						0.5561	N/A	N/A	114.2300	0.0095	0.0010	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.0930	N/A	N/A	78.1100	0.0063	0.0013	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresol (-o)						0.0016	N/A	N/A	108.1400	0.0000	0.0000	108.14	Option 2: A=6.911, B=1435.5, C=165.16
Ethylbenzene						0.0999	N/A	N/A	106.1700	0.0006	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						1.7982	N/A	N/A	86.1700	0.0443	0.0156	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Methyl-tert-butyl ether (MTBE)						3.0490	N/A	N/A	88.1500	0.0030	0.0018	88.15	Option 1: VP50 = 2.5 VP60 = 3.22
Naphthalene						0.0022	N/A	N/A	128.2000	0.0000	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Styrene						0.0960	N/A	N/A	104.1500	0.0009	0.0000	104.15	Option 2: A=7.14, B=1574.51, C=224.09
Toluene						0.3065	N/A	N/A	92.1300	0.0084	0.0005	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						8.3346	N/A	N/A	59.6146	0.9246	0.9798	92.19	
Xylene (-o)						0.0652	N/A	N/A	106.1700	0.0024	0.0000	106.17	Option 2: A=6.998, B=1474.679, C=213.69
Gasoline (RVP 13)	Mar	50.49	54.11	64.87	60.81	8.8608	N/A	N/A	62.0000			92.00	Option 4: RVP=13, ASTM Slope=3
2,2,4-Trimethylpentane (isooctane)						0.5639	N/A	N/A	114.2300	0.0095	0.0012	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.1513	N/A	N/A	78.1100	0.0063	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresol (-o)						0.0017	N/A	N/A	108.1400	0.0000	0.0000	108.14	Option 2: A=6.911, B=1435.5, C=165.16
Ethylbenzene						0.1066	N/A	N/A	106.1700	0.0006	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						1.8680	N/A	N/A	86.1700	0.0443	0.0180	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Methyl-tert-butyl ether (MTBE)						3.1630	N/A	N/A	88.1500	0.0030	0.0021	88.15	Option 1: VP50 = 2.5 VP60 = 3.22
Naphthalene						0.0024	N/A	N/A	128.2000	0.0000	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Styrene						0.0705	N/A	N/A	104.1500	0.0009	0.0000	104.15	Option 2: A=7.14, B=1574.51, C=224.09
Toluene						0.3249	N/A	N/A	92.1300	0.0084	0.0008	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						7.3318	N/A	N/A	61.5738	0.9246	0.9785	92.19	
Xylene (-o)						0.0698	N/A	N/A	106.1700	0.0024	0.0000	106.17	Option 2: A=6.998, B=1474.679, C=213.69
Gasoline (RVP 7)	Apr	62.23	55.39	69.07	60.81	3.8457	N/A	N/A	68.0000			92.00	Option 4: RVP=7, ASTM Slope=3
2,2,4-Trimethylpentane (isooctane)						0.6350	N/A	N/A	114.2300	0.0095	0.0022	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.2419	N/A	N/A	78.1100	0.0063	0.0029	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresol (-o)						0.0020	N/A	N/A	108.1400	0.0000	0.0000	108.14	Option 2: A=6.911, B=1435.5, C=165.16
Ethylbenzene						0.1172	N/A	N/A	106.1700	0.0006	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.0270	N/A	N/A	86.1700	0.0443	0.0333	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Methyl-tert-butyl ether (MTBE)						3.4183	N/A	N/A	88.1500	0.0030	0.0038	88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Naphthalene						0.0027	N/A	N/A	128.2000	0.0000	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Styrene						0.0776	N/A	N/A	104.1500	0.0009	0.0000	104.15	Option 2: A=7.14, B=1574.51, C=224.09
Toluene						0.3537	N/A	N/A	92.1300	0.0084	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						3.8167	N/A	N/A	67.3908	0.9246	0.9565	92.19	
Xylene (-o)						0.0769	N/A	N/A	106.1700	0.0024	0.0001	106.17	Option 2: A=6.998, B=1474.679, C=213.69
Gasoline (RVP 7)	May	65.86	57.74	73.97	60.81	3.9208	N/A	N/A	68.0000			92.00	Option 4: RVP=7, ASTM Slope=3
2,2,4-Trimethylpentane (isooctane)						0.7036	N/A	N/A	114.2300	0.0095	0.0023	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.3708	N/A	N/A	78.1100	0.0063	0.0030	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresol (-o)						0.0025	N/A	N/A	108.1400	0.0000	0.0000	108.14	Option 2: A=6.911, B=1435.5, C=165.16
Ethylbenzene						0.1327	N/A	N/A	106.1700	0.0006	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2237	N/A	N/A	86.1700	0.0443	0.0340	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Methyl-tert-butyl ether (MTBE)						3.7411	N/A	N/A	88.1500	0.0030	0.0039	88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Naphthalene						0.0032	N/A	N/A	128.2000	0.0000	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Styrene						0.0879	N/A	N/A	104.1500	0.0009	0.0000	104.15	Option 2: A=7.14, B=1574.51, C=224.09
Toluene						0.3952	N/A	N/A	92.1300	0.0084	0.0011	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						4.1016	N/A	N/A	67.3157	0.9246	0.9555	92.19	
Xylene (-o)						0.0874	N/A	N/A	106.1700	0.0024	0.0001	106.17	Option 2: A=6.998, B=1474.679, C=213.69
Gasoline (RVP 7)	Jun	68.89	60.07	77.70	60.81	4.1634	N/A	N/A	68.0000			92.00	Option 4: RVP=7, ASTM Slope=3
2,2,4-Trimethylpentane (isooctane)						0.7855	N/A	N/A	114.2300	0.0095	0.0024	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.4867	N/A	N/A	78.1100	0.0063	0.0030	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresol (-o)						0.0029	N/A	N/A	108.1400	0.0000	0.0000	108.14	Option 2: A=6.911, B=1435.5, C=165.16
Ethylbenzene						0.1469	N/A	N/A	106.1700	0.0006	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3999	N/A	N/A	86.1700	0.0443	0.0345	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Methyl-tert-butyl ether (MTBE)						4.0109	N/A	N/A	88.1500	0.0030	0.0039	88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Naphthalene						0.0037	N/A	N/A	128.2000	0.0000	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Styrene						0.0975	N/A	N/A	104.1500	0.0009	0.0000	104.15	Option 2: A=7.14, B=1574.51, C=224.09
Toluene						0.4329	N/A	N/A	92.1300	0.0084	0.0012	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						4.2527	N/A	N/A	67.3034	0.9246	0.9549	92.19	
Xylene (-o)						0.0971	N/A	N/A	106.1700	0.0024	0.0001	106.17	Option 2: A=6.998, B=1474.679, C=213.69
Gasoline (RVP 7)	Jul	70.72	61.41	80.04	60.81	4.3163	N/A	N/A	68.0000			92.00	Option 4: RVP=7, ASTM Slope=3
2,2,4-Trimethylpentane (isooctane)						0.8053	N/A	N/A	114.2300	0.0095	0.0024	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.5810	N/A	N/A	78.1100	0.0063	0.0031	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresol (-o)						0.0032	N/A	N/A	108.1400	0.0000	0.0000	108.14	Option 2: A=6.911, B=1435.5, C=165.16
Ethylbenzene						0.1562	N/A	N/A	106.1700	0.0006	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.5122	N/A	N/A	86.1700	0.0443	0.0349	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Methyl-tert-butyl ether (MTBE)						4.1876	N/A	N/A	88.1500	0.0030	0.0039	88.15	Option 1: VP70 = 4.11

Toluene						0.4485	N/A	N/A	92.1300	0.0084	0.0012	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						4.4544	N/A	N/A	67.2988	0.9246	0.9546	92.19	
Xylene (-o)						0.1011	N/A	N/A	106.1700	0.0024	0.0001	106.17	Option 2: A=6.998, B=1474.679, C=213.69
Gasoline (RVP 7)	Sep	67.95	60.10	75.80	60.81	4.0872	N/A	N/A	68.0000			92.00	Option 4: RVP=7, ASTM Slope=3
2,2,4-Trimethylpentane (isooctane)						0.7450	N/A	N/A	114.2300	0.0095	0.0024	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.4501	N/A	N/A	78.1100	0.0063	0.0030	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresol (-o)						0.0028	N/A	N/A	108.1400	0.0000	0.0000	108.14	Option 2: A=6.911, B=1435.5, C=165.16
Ethylbenzene						0.1424	N/A	N/A	106.1700	0.0006	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.3443	N/A	N/A	86.1700	0.0443	0.0344	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Methyl-tert-butyl ether (MTBE)						3.9275	N/A	N/A	88.1500	0.0030	0.0039	88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Naphthalene						0.0095	N/A	N/A	128.2000	0.0000	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Styrene						0.0944	N/A	N/A	104.1500	0.0009	0.0000	104.15	Option 2: A=7.14, B=1574.51, C=224.09
Toluene						0.4209	N/A	N/A	92.1300	0.0084	0.0012	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						4.2736	N/A	N/A	67.3072	0.9246	0.9551	92.19	
Xylene (-o)						0.0940	N/A	N/A	106.1700	0.0024	0.0001	106.17	Option 2: A=6.998, B=1474.679, C=213.69
Gasoline (RVP 13)	Oct	64.00	57.53	70.47	60.81	7.4811	N/A	N/A	62.0000			92.00	Option 4: RVP=13, ASTM Slope=3
2,2,4-Trimethylpentane (isooctane)						0.6677	N/A	N/A	114.2300	0.0095	0.0013	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.3034	N/A	N/A	78.1100	0.0063	0.0016	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresol (-o)						0.0022	N/A	N/A	108.1400	0.0000	0.0000	108.14	Option 2: A=6.911, B=1435.5, C=165.16
Ethylbenzene						0.1246	N/A	N/A	106.1700	0.0006	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1210	N/A	N/A	86.1700	0.0443	0.0186	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Methyl-tert-butyl ether (MTBE)						3.5756	N/A	N/A	88.1500	0.0030	0.0021	88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Naphthalene						0.0090	N/A	N/A	128.2000	0.0000	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Styrene						0.0825	N/A	N/A	104.1500	0.0009	0.0000	104.15	Option 2: A=7.14, B=1574.51, C=224.09
Toluene						0.3734	N/A	N/A	92.1300	0.0084	0.0006	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						7.9668	N/A	N/A	61.5584	0.9246	0.8757	92.19	
Xylene (-o)						0.0819	N/A	N/A	106.1700	0.0024	0.0000	106.17	Option 2: A=6.998, B=1474.679, C=213.69
Gasoline (RVP 15.0)	Nov	58.51	54.06	62.96	60.81	7.9288	N/A	N/A	60.0000			92.00	Option 4: RVP=15, ASTM Slope=3
2,2,4-Trimethylpentane (isooctane)						0.5705	N/A	N/A	114.2300	0.0095	0.0011	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.1204	N/A	N/A	78.1100	0.0063	0.0014	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresol (-o)						0.0016	N/A	N/A	108.1400	0.0000	0.0000	108.14	Option 2: A=6.911, B=1435.5, C=165.16
Ethylbenzene						0.1030	N/A	N/A	106.1700	0.0006	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						1.8403	N/A	N/A	86.1700	0.0443	0.0158	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Methyl-tert-butyl ether (MTBE)						3.1126	N/A	N/A	88.1500	0.0030	0.0018	88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Naphthalene						0.0023	N/A	N/A	128.2000	0.0000	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Styrene						0.0691	N/A	N/A	104.1500	0.0009	0.0000	104.15	Option 2: A=7.14, B=1574.51, C=224.09
Toluene						0.3151	N/A	N/A	92.1300	0.0084	0.0005	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						8.4705	N/A	N/A	59.6118	0.9246	0.8795	92.19	
Xylene (-o)						0.0673	N/A	N/A	106.1700	0.0024	0.0000	106.17	Option 2: A=6.998, B=1474.679, C=213.69
Gasoline (RVP 15.0)	Dec	54.71	51.37	58.04	60.81	7.3893	N/A	N/A	60.0000			92.00	Option 4: RVP=15, ASTM Slope=3
2,2,4-Trimethylpentane (isooctane)						0.5104	N/A	N/A	114.2300	0.0095	0.0010	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.0065	N/A	N/A	78.1100	0.0063	0.0013	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cresol (-o)						0.0013	N/A	N/A	108.1400	0.0000	0.0000	108.14	Option 2: A=6.911, B=1435.5, C=165.16
Ethylbenzene						0.0900	N/A	N/A	106.1700	0.0006	0.0000	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						1.8644	N/A	N/A	86.1700	0.0443	0.0153	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Methyl-tert-butyl ether (MTBE)						2.8388	N/A	N/A	88.1500	0.0030	0.0018	88.15	Option 1: VP60 = 3.22 VP70 = 4.11
Naphthalene						0.0020	N/A	N/A	128.2000	0.0000	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
Styrene						0.0695	N/A	N/A	104.1500	0.0009	0.0000	104.15	Option 2: A=7.14, B=1574.51, C=224.09
Toluene						0.2794	N/A	N/A	92.1300	0.0084	0.0005	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						7.8977	N/A	N/A	59.6239	0.9246	0.8801	92.19	
Xylene (-o)						0.0568	N/A	N/A	106.1700	0.0024	0.0000	106.17	Option 2: A=6.998, B=1474.679, C=213.69

**TANKS 4.0.9d**  
**Emissions Report - Detail Format**  
**Detail Calculations (AP-42)**

**C-11-78, Buckeye - Tank #18 - Internal Floating Roof Tank**  
**West Sacramento, California**

Month:	January	February	March	April	May	June	July	August	September	October	November	December
<b>Rim Seal Losses (lb):</b>	31.1174	33.5807	28.0650	14.4821	15.7883	16.9197	17.6588	17.3933	16.5552	32.6689	31.3908	31.0647
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph) <sup>1/2</sup> ):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Value of Vapor Pressure Function:	0.1729	0.1886	0.1563	0.0710	0.0773	0.0829	0.0868	0.0853	0.0812	0.1758	0.1911	0.1728
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.3981	7.8007	6.8808	3.6457	3.9208	4.1634	4.3163	4.2616	4.0872	7.4811	7.9263	7.3893
Tank Diameter (ft):	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000
Vapor Molecular Weight (lb/lb-mole):	60.0000	60.0000	62.0000	68.0000	68.0000	68.0000	68.0000	68.0000	68.0000	62.0000	60.0000	60.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
<b>Withdrawal Losses (lb):</b>	15.7597	15.7597	15.7587	15.9348	15.9348	15.9348	16.1099	16.1099	16.1099	16.1099	16.1099	16.1099
Number of Columns:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Effective Column Diameter (ft):	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Net Throughput (gal/mo):	4,931,506.8500	4,931,506.8500	4,931,506.8500	4,986,301.3700	4,986,301.3700	4,986,301.3700	5,041,095.8900	5,041,095.8900	5,041,095.8900	5,041,095.8900	5,041,095.8900	5,041,095.8900
Shall Clingage Factor (lb/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000
Tank Diameter (ft):	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000
<b>Deck Fitting Losses (lb):</b>	267.7908	288.9899	250.1287	124.7165	135.8994	145.6093	151.9684	149.6838	142.4711	281.1429	285.9613	287.3373
Value of Vapor Pressure Function:	0.1729	0.1886	0.1563	0.0710	0.0773	0.0829	0.0868	0.0853	0.0812	0.1758	0.1911	0.1728
Vapor Molecular Weight (lb/lb-mole):	60.0000	60.0000	62.0000	68.0000	68.0000	68.0000	68.0000	68.0000	68.0000	62.0000	60.0000	60.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	308.8100	308.8100	308.8100	309.8100	309.8100	309.8100	309.8100	309.8100	309.8100	309.8100	309.8100	309.8100
<b>Deck Seam Losses (lb):</b>	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length Factor(ft/sqft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tank Diameter (ft):	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000
Vapor Molecular Weight (lb/lb-mole):	60.0000	60.0000	62.0000	68.0000	68.0000	68.0000	68.0000	68.0000	68.0000	62.0000	60.0000	60.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
<b>Total Losses (lb):</b>	314.6679	338.3303	294.9534	155.1424	167.4026	178.4628	185.7371	183.1870	175.1362	329.8217	346.4620	314.5119

Roof Fitting/Status	Quantity	KFa(lb-mole/yr)	Roof Fitting Loss Factors KFb(lb-mole/yr mph <sup>1/2</sup> )	m	Losses(lb)
Access Hatch (24-in. Diam.) Bolted Cover, Gasketed	2	1.60	0.00	0.00	25.7962
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	22.5734
Column Well (24-in. Diam.) Built-Up Col.-Sliding Cover, Gask.	6	33.00	0.00	0.00	1,596.2627
Vacuum Breaker (10-in. Diam.) Weighted Mech. Actuation, Gask.	2	6.20	1.20	0.94	99.9680
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Float, Wiper	1	21.00	7.90	1.80	168.3006
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Sock	9	0.45	0.16	0.14	36.5531
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Sock	10	1.20	0.14	0.85	96.7432
Ladder Well (36-in. Diam.) Sliding Cover, Gasketed	1	58.00	0.00	0.00	451.4682

**TANKS 4.0.9d**  
**Emissions Report - Detail Format**  
**Individual Tank Emission Totals**

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

C-11-78, Buckeye - Tank #18 - Internal Floating Roof Tank  
 West Sacramento, California

Components	Losses(lbs)				
	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Gasoline (RVP 15.0)	130.15	63.74	1,120.08	0.00	1,313.97
2,2,4-Trimethylpentane (isooctane)	0.13	0.61	1.15	0.00	1.89
Benzene	0.17	0.40	1.46	0.00	2.06
Cresol (-o)	0.00	0.00	0.00	0.00	0.00
Ethylbenzene	0.00	0.04	0.01	0.00	0.06
Hexane (-n)	2.02	2.82	17.37	0.00	22.21
Methyl-tert-butyl ether (MTBE)	0.23	0.19	2.00	0.00	2.42
Naphthalene	0.00	0.00	0.00	0.00	0.00
Styrene	0.00	0.06	0.01	0.00	0.07
Toluene	0.07	0.54	0.56	0.00	1.16
Unidentified Components	127.52	58.94	1,097.45	0.00	1,283.91
Xylene (-o)	0.00	0.15	0.03	0.00	0.19
Gasoline (RVP 13)	61.73	31.87	531.27	0.00	624.88
2,2,4-Trimethylpentane (isooctane)	0.08	0.30	0.66	0.00	1.04
Benzene	0.10	0.20	0.84	0.00	1.14
Cresol (-o)	0.00	0.00	0.00	0.00	0.00
Ethylbenzene	0.00	0.02	0.01	0.00	0.03
Hexane (-n)	1.13	1.41	9.75	0.00	12.29
Methyl-tert-butyl ether (MTBE)	0.13	0.10	1.11	0.00	1.34
Naphthalene	0.00	0.00	0.00	0.00	0.00
Styrene	0.00	0.03	0.01	0.00	0.04
Toluene	0.04	0.27	0.32	0.00	0.63
Unidentified Components	60.26	29.47	518.55	0.00	608.28
Xylene (-o)	0.00	0.07	0.02	0.00	0.10
Gasoline (RVP 7)	98.79	96.13	850.15	0.00	1,045.07
2,2,4-Trimethylpentane (isooctane)	0.23	0.92	2.00	0.00	3.15
Benzene	0.30	0.60	2.55	0.00	3.45
Cresol (-o)	0.00	0.00	0.00	0.00	0.00
Ethylbenzene	0.00	0.06	0.03	0.00	0.09
Hexane (-n)	3.39	4.26	29.19	0.00	36.83
Methyl-tert-butyl ether (MTBE)	0.38	0.29	3.31	0.00	3.98
Naphthalene	0.00	0.00	0.00	0.00	0.00
Styrene	0.00	0.08	0.02	0.00	0.11
Toluene	0.12	0.81	1.00	0.00	1.92
Unidentified Components	94.35	88.89	812.00	0.00	995.24
Xylene (-o)	0.01	0.23	0.08	0.00	0.30

**TANKS 4.0.9d**  
**Emissions Report - Detail Format**  
**Total Emissions Summaries - All Tanks in Report**

**Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December**

Tank Identification				Losses (lbs)
C-11-76, Buckeye - Tank #15	BP West Coast Products LLC	Internal Floating Roof Tank	West Sacramento, California	2,633.14
C-11-77, Buckeye - Tank #16	BP West Coast Products LLC	Internal Floating Roof Tank	West Sacramento, California	2,184.85
C-11-78, Buckeye - Tank #18	BP West Coast Products LLC	Internal Floating Roof Tank	West Sacramento, California	2,983.92
Total Emissions for all Tanks:				7,801.91

## BACT DETERMINATION 623-2

**Emission Unit:** Bulk Gasoline Storage Tank – Internal Floating Steel Roof Tank  
**Rating:** 798,000 gallons

**Facility Name:** Buckeye Terminals, LLC  
**Mailing Address:** P.O. Box 230  
Acampo, CA 95220

**Contact Name:** Robert Russell, Vice President, Field Operations  
**Telephone:** (209) 386-9277

**Engineer:** René Toledo  
**Date:** November 7, 2011

**Application #'s:** C-11-78 [Tank #18]

**I. Proposal:** The applicant is proposing to modify PTO P-45-94(t1) [Tank #18] to increase the maximum Reid Vapor Pressure (RVP) allowed to be stored in the bulk storage tank.

**II. Applicability:** The proposed emissions for the bulk storage tank are shown below.

	VOC	CO	NO <sub>x</sub> (as NO <sub>2</sub> )	SO <sub>x</sub> (as SO <sub>2</sub> )	PM <sub>10</sub>
Proposed Emissions	11.5 lb/day	- lb/day	- lb/day	- lb/day	- lb/day
Rule 3.4, Section 301.1 Triggers	10.0 lb/day	250.0 lb/day	10.0 lb/day	80.0 lb/day	80.0 lb/day

The bulk gasoline storage operation is being treated as a modified operation and results in an increase in quarterly potential to emit for VOC. As shown above, BACT is not triggered for CO, NO<sub>x</sub>, SO<sub>x</sub> and PM<sub>10</sub> because the process does not emit these pollutants. BACT is triggered for VOC emissions because the proposed emissions exceed the trigger level specified by Rule 3.4, Section 301.1 and the application results in a quarterly increase in potential to emit.

### III. BACT for VOC:

- A. Identify all control technologies:
1. Converted to fixed roof with emissions vented to vapor control system
  2. Pressure/vacuum (PV) vent upgrade and bolted aluminum internal floating roof (sheet)
  3. Continued operation of a welded steel internal floating steel roof

B. Eliminate Technologically Infeasible Options  
 Options 1, 2, and 3 are all technologically feasible.

C. Rank remaining control technologies by control effectiveness

Control Technology	Efficiency <sup>a</sup>	Achieved in Practice (Yes/No)
Option 1	90%	No
Option 2	0.01% <sup>b</sup>	No
Option 3	N/A	Yes

- a. Control efficiency as compare to the existing steel internal floating roof.
- b. The District expects a very small increase in the VOC control efficiency of the storage tank if the existing P/V vents are upgraded and the existing bolted steel internal floating roof is replaced with a bolted aluminum internal floating roof.

D. Cost effective analysis

The cost effectiveness of Options 1 and 2 have been calculated to determine the total annual cost for the control option as well as the corresponding amount of emission reduced (see the attached worksheet). Each option's annualized capital cost has been calculated using the following formula:

$$A = P * ((i * (1 + i)^n) / (1 + i)^n - 1)), \text{ where:}$$

Where: A = annualized capital cost of the control equipment

P = present capital cost of the control equipment

i = interest rate (use 10% unless alternate can be documented to representative)

n = Equipment life (use 10 years unless alternate can be documented)

Option 1 annualized capital cost calculation (see attached calculation sheet):

- a. Annualized Capital Cost = \$280,085
- b. Annual Operating Cost = \$121,250
- c. Total Annual Cost = \$401,335
- d. Annual Pollutant Reduction = 1.35 tons
- e. VOC Cost Effectiveness = \$297,285/ton

Option 2 annualized capital cost calculation:

- a. Annualized Capital Cost = \$7,324
- b. Annual Operating Cost = \$1,150
- c. Total Annual Cost = \$8,474
- d. Annual Pollutant Reduction = 0.0002 tons
- e. VOC Cost Effectiveness = \$56,490,285/ton

E. Select BACT

Options 1 and 2 are not cost effective. Therefore, the District has determined that the continued use of the welded steel internal floating roof in compliance with the provisions of District Rule 2.21 (Organic Liquid Storage and Transfer) is BACT for this application.

**BEST AVAILABLE CONTROL TECHNOLOGY  
COST EFFECTIVE CALCULATIONS**

**ENGINEER:** René Toledo **ATC #** C-11-78  
**FACILITY NAME:** Buckeye Terminals, LLC **Determination #** 623-2  
**LOCATION:** 1601 South River Road; West Sacramento, CA  
**EQUIPMENT:** 798,000 gallon welded storage tank (#18)  
**CONTROL EQUIPMENT:** Internal steel floating roof (welded) with a mechanical shoe primary seal and rim mounted secondary seal

**EVALUATED POLLUTANT:** VOC **Control Efficiency**  
90%  
0.01%

**Option 1 -** Converted to fixed roof with emissions vented to new vapor recovery unit  
**Option 2 -** Pressure/vacuum (PV) vent upgrade and bolted aluminum roof (sheet)

**BACT POLICY DATA:**  
 Interest Rate, i = 10%  
 Equipment Life, n = 10

OPTION	1	2
<b>Capital Cost - Material</b>		
Bolted Manway	-	\$500
Leg Actuated Vent	-	\$3,500
New Distributor	-	\$5,000
Drain Repairs	-	\$0
PM Gasket Replacement	-	\$1,000
Side Vent Patch	\$50,000	-
Blower	\$50,000	-
Vapor Recovery Unit (John Zink 825)	\$385,000	-
Install Costs (15% of Material Costs)	-	\$11,500
Tank Cleaning with Degassing	-	\$15,000
Inspections	-	\$4,000
Misc. Disposal	-	\$1,000
Seam Test	-	\$3,500
Install Costs (Lang Factor = 2.5)	\$1,212,500	-
Tank Cleaning/Degas	\$15,000	-
Inspections	\$4,000	-
Misc. Disposal	\$1,000	-
Seam Test	\$3,500	-
<b>Total Capital Costs</b>	<b>\$1,721,000</b>	<b>\$45,000</b>
<b>Annualized Capital Costs</b>	<b>\$280,085</b>	<b>\$7,324</b>
<b>Operational Expenses (10% Install Costs)</b>	<b>\$121,250</b>	<b>\$1,150</b>
<b>Total Project Costs per Year</b>	<b>\$401,335</b>	<b>\$8,474</b>
<b>Tank Emissions</b>		
Project Potential to Emit (tons per year)	1.50	1.50
<b>Emission Reductions</b>		
VOC (tons per year)	1.35	0.0002
<b>Cost Effectiveness (C/E)</b>		
Cost per Ton Reduced	\$297,285	\$56,490,285
BACT VOC Cost Effectiveness Limit	\$17,500	\$17,500
<b>Is the Option Cost Effective?</b>	<b>No</b>	<b>No</b>