$K_{F_i}$ = deck fitting loss factor for a particular type fitting (i = 0,1,2,...,$n_f$), lb-mole/yr; see Equation 2-15

$n_f$ = total number of different types of fittings, dimensionless

$P^*$, $M_V$, $K_C$ are as defined for Equation 2-3.

The value of $F_F$ may be calculated by using actual tank-specific data for the number of each fitting type ($N_F$) and then multiplying by the fitting loss factor for each fitting ($K_F$).

The deck fitting loss factor, $K_{F_i}$ for a particular type of fitting, can be estimated by the following equation:

$$K_{F_i} = K_{Fa_i} + K_{Fb_i} (K_v v)^{m_i} \tag{2-15}$$

where:

$K_{F_i}$ = loss factor for a particular type of deck fitting, lb-mole/yr

$K_{Fa_i}$ = zero wind speed loss factor for a particular type of fitting, lb-mole/yr

$K_{Fb_i}$ = wind speed dependent loss factor for a particular type of fitting, lb-mole/(mph)$^m$•yr

$m_i$ = loss factor for a particular type of deck fitting, dimensionless

i = 1, 2, ..., n, dimensionless

$K_v$ = fitting wind speed correction factor, dimensionless; see below

v = average ambient wind speed, mph

For external floating roof tanks, the fitting wind speed correction factor, $K_v$, is equal to 0.7. For internal and domed external floating roof tanks, the value of v in Equation 2-15 is zero and the equation becomes:

$$K_{Fi} = K_{Fai} \tag{2-16}$$

Loss factors $K_{Fa}$, $K_{Fb}$, and m are provided in Table 7.1-12 for the most common deck fittings used on floating roof tanks. These factors apply only to typical deck fitting conditions and when the average ambient wind speed is below 15 miles per hour. Typical numbers of deck fittings for floating roof tanks are presented in Tables 7.1-11, 7.1-12, 7.1-13, 7.1-14, and 7.1-15.

Loss factors may be estimated for deck fitting configurations that are not listed in Table 7.1-12, at the zero miles-per-hour wind speed condition (IFRTs and Domed EFRTs), from the following equation:

$$K_{fai} = 0.27(A_{fi})^{0.86} \tag{2-17}$$

Where:

$K_{fai}$ = zero-wind-speed loss factor for a particular type of deck fitting, in pound-moles per year.

$A_{fi}$ = liquid surface area within a particular type of deck fitting, in square inches. The liquid surface area is the area inside the deck fitting well or leg sleeve, less any area occupied by an obstruction in the deck fitting well or leg sleeve (such as a fixed-roof support column, unslotted guidepole, guidepole float, or deck support leg).

The coefficient, 0.27, has units of pound-moles per (square inches)$^{0.86}$-year, and the exponent, 0.86, is dimensionless.

This equation is only applicable when the distance from the liquid surface to the top of the deck fitting well or leg sleeve is 12 inches or greater. Shorter deck fitting wells or leg sleeves may result in higher loss rates. There are no similar algorithms available for estimating loss factors for shorter deck fitting wells or leg sleeves.

This equation is for an uncontrolled deck fitting. Effective deck fitting controls would be expected to result in lower loss factors than would be estimated by this equation, but there are no algorithms available for estimating the effectiveness of deck fitting controls.

This equation is for the zero miles-per-hour wind speed condition. There are no algorithms available for estimating loss factors at non-zero wind speeds (EFRTs).

<u>Deck Seam Loss</u> – Deck seams that are welded are assumed to have no deck seam loss (i.e., $L_D = 0$). All external floating roofs are assumed to be of welded construction, and some internal floating roofs are of welded construction. Internal floating roof tanks with bolted decks may have deck seam losses. Deck seam loss can be estimated by the following equation:

$$L_D = K_D S_D D^2 P^* M_V K_C \tag{2-18}$$

where:

$K_D$ = deck seam loss per unit seam length factor, lb-mole/ft-yr

= 0.0 for welded deck

= 0.14 for bolted deck; see Note

$S_D$ = deck seam length factor, ft/ft$^2$

$= \dfrac{L_{seam}}{A_{deck}}$

where: $L_{seam}$ = total length of deck seams, ft $A_{deck}$ = area of deck, ft$^2$ = $\dfrac{\pi \cdot D^2}{4}$

D, $P^*$, $M_V$, and $K_C$ are as defined for Equation 2-3.

If the total length of the deck seam is not known, Table 7.1-16 can be used to determine $S_D$. For a deck constructed from continuous metal sheets with a 7-ft spacing between the seams, a value of 0.14 ft/ft$^2$ can be used. A value of 0.33 ft/ft$^2$ can be used for $S_D$ when a deck is constructed from rectangular panels 5 ft by 7.5 ft. Where tank-specific data concerning width of deck sheets or size of deck panels are unavailable, a default value for $S_D$ can be assigned. A value of 0.20 ft/ft$^2$ can be assumed to represent the most common bolted decks currently in use.

Note: Recently vendors of bolted decks have been using various techniques, such as gasketing the deck seams, in an effort to reduce deck seam losses. However, emission factors are not currently available in AP-42 that represent the emission reduction, if any, achieved by these techniques. Some vendors have developed specific factors for their deck designs; however, use of these factors is not recommended until approval has been obtained from the governing regulatory agency or permitting authority. A weld seam does not have to be structural (*i.e.*, may be seal welded) to constitute a welded deck seam for purposes of estimating emissions, but a deck seam that is bolted or otherwise mechanically fastened and sealed with elastomeric materials or chemical adhesives is not a welded seam.

7.1.3.2.2 Working (withdrawal) Loss

The working loss from floating roof storage tanks, also known as withdrawal loss, can be estimated using Equation 2-19.

$$L_W = \frac{0.943\ Q\ C_S\ W_L}{D}\left(1 + \frac{N_C\ F_C}{D}\right) \quad \textbf{(2-19)}$$

where:

$L_W$ = working (withdrawal) loss, lb/yr

Q = annual net throughput, bbl/yr; see Note 1

$C_S$ = shell clingage factor, bbl/1,000 $ft^2$; see Table 7.1-10

$W_L$ = average organic liquid density, lb/gal; see Note 2

D = tank diameter, ft

0.943 = constant, 1,000 $ft^3$•gal/$bbl^2$

$N_C$ = number of fixed roof support columns, dimensionless; see Note 3

$F_C$ = effective column diameter, ft (column perimeter [ft]/π); see Note 4

Notes:

1. For tanks in which liquid is pumped in and out at the same time, the use of gross throughput to estimate working loss would overstate emissions, but the overestimation would not be as significant as for the working loss of fixed roof tanks. It would be more appropriate to express Q in terms of the sum of the decreases in liquid level $\Sigma H_{QD}$. Over the course of a year, the sum of decreases in liquid level, $\Sigma H_{QD}$, and the sum of increases in liquid level, $\Sigma H_{QI}$, will be approximately the same. The effective annual throughput, Q, may be calculated in terms of $\Sigma H_{QD}$ as follows:

$$Q = (\pi/4)\ D^2\ (\Sigma H_{QD}/5.614) \quad (2\text{-}20)$$

$\Sigma H_{QD}$ = the annual sum of the decreases in liquid level, ft/yr

D = tank diameter, ft

5.614 = the conversion of barrels to cubic feet, $ft^3$/bbl

If $\Sigma H_{QD}$ is unknown, Q can be taken as the annual net throughput.

2. A listing of the average organic liquid density for select petrochemicals is provided in Tables 7.1-2 and 7.1-3. If $W_L$ is not known for gasoline, an average value of 5.6 lb/gal can be assumed.

3. For a self-supporting fixed roof or an external floating roof tank:

$N_C = 0.$

For a column-supported fixed roof:

$N_C$ = use tank-specific information or see Table 7.1-11.

4. Use tank-specific effective column diameter or

$F_C$ = 1.1 for 9-inch by 7-inch built-up columns, 0.7 for 8-inch-diameter pipe columns, and 1.0 if column construction details are not known

7.1.3.3 Floating Roof Landing Losses[21]

When using floating roof tanks, the roof floats on the surface of the liquid inside the tank and reduces evaporative losses during routine operations. However, when the tank is emptied to the point that the roof lands on deck legs or hangers, there is a period where the roof is not floating and other mechanisms contribute to emissions. These emissions continue until the tank is refilled to a sufficient level to again float the roof. Therefore, these emission estimation calculations are applicable each time there is a landing of the floating roof.

This model does not directly address standing idle losses for partial days, but it would be reasonable to estimate the emissions for a partial day by estimating the standing idle emissions for a single day and then pro-rating that estimate by the number of hours that the floating roof was actually landed. For example, if the floating roof were landed for 6 hours, then the estimated standing idle losses would be 6/24, or one quarter, of the estimated daily standing idle losses.

The total loss from floating roof tanks during a roof landing is the sum of the standing idle losses and the filling losses. This relationship may be written in the form of an equation:

$$L_{TL} = L_{SL} + L_{FL} \tag{3-1}$$

where:

$L_{TL}$ = total losses during roof landing, lb per landing episode

$L_{SL}$ = standing idle losses during roof landing, lb per landing episode

$L_{FL}$ = filling losses during roof landing, lb per landing episode

The group of applicable equations to estimate the landing losses differs according to the type of floating roof tank that is being used. The equations needed to estimate landing losses from internal or domed external floating roof tanks are contained in Table 7.1-17; equations for external floating roof tanks are contained in Table 7.1-18; and equations for drain-dry floating roof tanks are contained in Table 7.1-19. The following sections explain these equations in more detail.

7.1.3.3.1 Standing Idle Losses

After the floating roof is landed and the liquid level in the tank continues to drop, a vacuum is created which could cause the floating roof to collapse. To prevent damage and to equalize the pressure, a breather vent (vacuum breaker) is actuated. Then, a vapor space is formed between the floating roof and the liquid. The breather vent may remain open until the roof is again floated, so whenever the roof is landed, vapor can be lost through this vent as well as through other deck fittings and past the rim seal. Even in the case of a self-closing breather vent, the vapor space beneath the floating roof is vented via the other deck fittings and the rim seal, which is effectively rendered vapor mounted once the liquid level drops below the bottom of the rim seal. These losses are called “standing idle losses.”

The three different mechanisms that contribute to standing idle losses are (1) breathing losses from vapor space, (2) wind losses, and (3) clingage losses. The specific loss mechanism is dependent on the type of floating roof tank and the bottom condition.

For internal or domed external floating roof tanks with liquid remaining in the bottom (liquid heel), the breathing losses originate from a discernible level of liquid that remains in the tank. This is typically the case for internal or domed external floating roof tanks with nominally flat bottoms (including those built with a slight upward cone), due to the flatness of the tank bottom and the position of the withdrawal line. If the remaining liquid covers the entire bottom of the tank, this is known as a full liquid heel. The liquid evaporates into the vapor space beneath the landed floating roof and daily changes in ambient temperature cause this vapor space to breathe in a manner similar to a fixed roof tank. A partial liquid heel may be left in tanks with sloped bottoms, if the withdrawal of liquid ceases while some free standing liquid remains in a sump or elsewhere in the bottom of the tank.

For external floating roof tanks, which are not fully shielded from the surrounding atmosphere, wind action across the landed floating roof can create pressure differentials that cause vapors to flow from beneath the floating roof. The higher the wind speeds, the more vapor that can be expelled. These are known as wind losses.

For tanks with a cone-down or shovel bottom, the floor of the tank is sloped to allow for more thorough emptying of the tank contents, therefore, the amount of liquid remaining may differ significantly from tanks with flat bottoms (see Figure 7.1-20). When the emptying operation drains the tank bottom but leaves a heel of liquid in or near the sump, the tank is considered to have a partial liquid heel. A drain-dry condition is attained only when all of the standing liquid has been removed, including from the bottom of the sump. However, due to sludge buildup, irregularity of the tank bottom and roughness of the inside of the tank, a small layer of liquid can remain clinging to the sloped bottom of a drain-dry tank. This layer of liquid will create vapor that can result in clingage losses. The amount of vapor produced within a drain-dry tank is directly related to this clingage. Clingage factors for various tank conditions are contained in Table 7.1-10. However, the clingage factors given in Table 7.1-10 are for the vertical shell of the tank, which is wiped by the rim seal each time the tank is emptied. The bottom of the tank is more nearly horizontal and is not wiped by a rim seal, and thus the clingage factors for a vertical shell would not be directly applicable. A clingage factor of 0.15 bbl/$10^3$ft$^2$ should be used to represent the clingage on the tank bottom.

Standing Idle Loss for Tanks with a Liquid Heel

A constraint on the standing idle loss is added for floating roof tanks with a liquid heel in that the total emissions cannot exceed the available stock liquid in the tank. This upper limit, represented as $L_{SLmax}$, is a function of the volume and density of the liquid inside the tank.

$$L_{SL\max} = \text{(area of tank) (height of liquid) (density of liquid)} \qquad \textbf{(3-2)}$$

Assuming that the tank has a circular bottom and adding a volume conversion unit, the equation can be simplified to Equation 3-3 and Equation 3-4.

$$L_{SL\max} = \left(\frac{\pi}{4}\right) D^2 \; h_{le} \; W_l \; (7.48) \qquad \textbf{(3-3)}$$

$$L_{SLmax} = 5.9\ D^2\ h_{le}\ W_l \quad \textbf{(3-4)}$$

where:

$L_{SLmax}$ = limit on standing idle loss, lb per landing episode

7.48 = volume conversion factor, gal/$ft^3$

D = diameter of the tank, feet

$h_{le}$ = effective height of the stock liquid, feet

$W_l$ = density of the liquid inside the tank, lb/gal

Internal or Domed External Floating Roof Tank with a Liquid Heel

For internal or domed external floating roof tanks with liquid heels, the amount of "standing idle loss" depends on the amount of vapor within the vapor space under the floating roof. Essentially, the mechanism is identical to the breathing losses experienced with fixed roof tanks. The mechanism shown in Equation 3-5 is identical to Equation 1-2.

$$L_{SL} = 365\,V_V\ W_V\ K_E\ K_S \quad \textbf{(3-5)}$$

where

$L_{SL}$ = annual breathing loss from standing idle during roof landing, lb/yr

365 = number of days in a year, days/yr

$V_V$ = volume of the vapor space, $ft^3$

$W_V$ = stock vapor density, lb/$ft^3$

$$W_V = \frac{M_V P_{VA}}{RT_V} \quad \textbf{(3-6)}$$

$M_V$ = stock vapor molecular weight, lb/lb-mole

$P_{VA}$ = true vapor pressure of the stock liquid, psia at the temperature beneath the landed floating roof (given that the tank bottom is in contact with the ground, assume the temperature to be equal to ground temperature, which is taken as the average ambient temperature for the month in which the landing occurs, unless a different temperature is known)

R = ideal gas constant, 10.731 (psia-$ft^3$)/(lb-mole °R)

$T_V$ = average vapor temperature, °R, given that the tank bottom is in contact with the ground, the temperature is assumed to be equal to ground temperature, which is taken as the average ambient temperature for the month in which the landing occurs, unless a different temperature is known

$K_E$ = vapor space expansion factor, per day, calculated from Equation 1-5, 1-12 or 1-13 as appropriate, with the value of $\Delta P_B$ set equal to zero

$K_S$ = standing idle saturation factor, dimensionless, calculated from Equation 1-21.

This equation requires adjustment, however, in that floating roof landing episodes are measured in days rather than years. Assuming that $n_d$ equals the number of days that the tank stands idle and substituting for the stock vapor density according to Equation 3-6, the equation is further simplified to Equation 3-7.

$$L_{SL} = n_d K_E \frac{P_{VA} V_V}{R T_V} M_V K_S \quad \textbf{(3-7)}$$

The term with the highest amount of uncertainty is the saturation of the vapor beneath the landed floating roof. The standing idle saturation factor, $K_S$, is estimated with the same method used to calculate the vented vapor saturation factor for fixed roof tanks in Equation 1-21. In order to establish limits on the value of $K_S$, the estimated factor is assumed to be less than or equal to the filling saturation factor (S). (For more information see Filling Losses.)

The bottom of the tank may be flooded with a light distillate material, such as diesel, to reduce volatility when the original heel is a relatively volatile liquid such as gasoline. This procedure is referred to as distillate flushing. Testing has shown that, when the characteristics of the liquid heel beneath a landed floating roof are changed, the characteristics of the vapor space beneath the floating roof will tend toward equilibrium with the new liquid heel within 24 hours. The values for $K_E$, $P_{VA}$, and $M_V$ in Equation 3-7 may, then, be based on the properties of the mixture resulting from distillate flushing the day following the introduction of the distillate into the tank. Properties of this mixture would be a weighted average of the properties of the original heel and the properties of the distillate material, proportional to the remaining quantities of each. [add reference]

External Floating Roof Tank with a Liquid Heel

For external floating roof tanks with a liquid heel, wind affects emission releases from the tanks. As a starting point, begin with a basic equation based on rim-seal loss. The equation, shown as Equation 3-8, is equivalent to Equation 2-3.

$$L_{RL} = (K_{Ra} + K_{Rb}\, v^n) D\, P^*\, M_V\, K_C \quad \textbf{(3-8)}$$

where

$L_{RL}$ = annual rim seal loss during roof landing, lb/yr

$K_{Ra}$ = zero wind speed rim seal loss factor, lb-mole/ft-yr

$K_{Rb}$ = wind speed dependent rim seal loss factor, lb-mole/((mph)$^n$-ft-yr))

n = seal-related wind speed loss exponent, dimensionless
($K_{Ra}$, $K_{Rb}$, and n are specific to a given configuration of rim seal)

v = average ambient wind speed, mph

D = tank diameter, ft

$M_V$ = stock vapor molecular weight, lb/lb-mole

$K_C$ = product factor, dimensionless

$P^*$ = a vapor pressure function, dimensionless

$$P^* = \frac{\frac{P_{VA}}{P_A}}{\left(1+\left[1-\left(\frac{P_{VA}}{P_A}\right)\right]^{0.5}\right)^2} \quad \textbf{(3-9)}$$

where: $P_A$ = atmospheric pressure, psia $P_{VA}$ = true vapor pressure of the stock liquid, psia.

Assuming that the stock properties included in the vapor pressure function will adequately account for differences in liquid product type, $K_C$ is assumed to equal 1. Regardless of the type of rim seal that is in use, it is effectively rendered a 'vapor-mounted' seal when the liquid level falls such that the rim seal is no longer in contact with the liquid. The contribution of a secondary seal is neglected in that it is offset by emissions through the deck fittings. The emissions are therefore based on the case of a welded tank with an average-fitting vapor-mounted primary seal. According to Table 7.1-8, the values of $K_{ra}$, $K_{rb}$, and n are 6.7, 0.2, and 3.0, respectively. The variables were substituted and the equation was converted from annual emissions to daily emissions by dividing the equation by 365. A value of 10 mph is assigned to the wind speed, so that estimated standing idle losses from an external floating roof tank will not be less than for a typical internal or domed external floating roof tank. Lower values for the rim seal loss factors or the wind speed should not be used. The equation for standing idle loss due to wind can be simplified to Equation 3-10.

$$L_{SLwind} = 0.57\, n_d\, D\, P^*\, M_V \quad (3\text{-}10)$$

where:

$L_{SLwind}$ = standing idle loss due to wind, lb per landing episode

$n_d$ = number of days that the tank is standing idle, days

D = tank diameter, ft

P* = a vapor pressure function, dimensionless

$M_V$ = stock vapor molecular weight, lb/lb-mole

As with internal or domed external floating roof tanks with a liquid heel, distillate flushing may be used to reduce the volatility of the liquid heel and thus the values used for the stock properties. The value for $M_V$, and for $P_{VA}$ in the calculation of P*, may be based on the properties of the mixture resulting from distillate flushing the day following the introduction of the distillate into the tank.

After the wind empties the vapor space above the remaining liquid heel, the liquid will continue to produce vapor. Thus, this standing idle loss will occur every day that the tank stands idle with liquid remaining in the tank. This equation is adequate at this time but could be revised as additional testing is conducted and studied.

Limit on Standing Idle Losses from Drain-Dry Tanks

When a drain-dry tank has been emptied, the only stock liquid available inside the tank is a thin layer that clings to the wetted surface of the tank interior (if free-standing liquid remains in or near a sump, or in puddles on the tank bottom, then the tank should be evaluated as having a partial heel, and not as drain dry – see Figure 7.1-20). The slope prevents a significant amount of stock liquid from remaining in the tank so that evaporation is much lower than from tanks with liquid heels. Due to the limited amount of liquid clinging to the interior of the tank, as shown in Figure 7.1-20, there would be no liquid remaining to replenish vapors once the clingage layer has evaporated. For this model, standing idle loss due to clingage is a one-time event rather than a daily event, involving only evaporation of the clingage layer.

The loss due to clingage is proportional to a clingage factor, which varies with the condition of the inside of the tank. A list of clingage factors are shown in Table 7.1-10. However, the clingage factors given in Table 7.1-10 are for the vertical shell of the tank, which is wiped by the rim seal each time the tank is emptied. The bottom of the tank is more nearly horizontal and is not wiped by a rim seal, and thus the clingage factors for a vertical shell would not be directly applicable to the tank bottom.

The factors are given in terms of barrels per thousand square feet. To convert the loss to pounds, the density of the liquid and the area of the tank bottom must be taken into account, as shown in Equation 3-11.

$$L_C = 0.042\, C_S\, W_l (Area) \tag{3-11}$$

where:

$L_C$ = clingage loss from the drain-dry tank, lb

0.042 = conversion factor, 1,000 gal/bbl

$C_S$ = clingage factor, bbl/1,000 ft$^2$

$W_l$ = density of the liquid, lb/gal

Area = area of the tank bottom, ft$^2$

$$Area = \left(\frac{\pi D^2}{4}\right) \tag{3-12}$$

Among the conditions shown in Table 7.1-10, the one that best approximates a sludge-lined tank bottom is gunite-lined, particularly given that the tank bottom is nearly horizontal and is not wiped by a rim seal. Assuming that gasoline is being stored in the tank, a clingage factor of 0.15 and the area term in Equation 3-12 were substituted into Equation 3-11, which simplifies to Equation 3-13.

$$L_{SL} = 0.0063\, W_l\, \frac{\pi D^2}{4} \tag{3-13}$$

The clingage loss should be constrained by an upper limit equal to the filling loss for an internal or domed external floating roof tank with a liquid heel. This is demonstrated in Equation 3-14.

$$L_{SLmax} = 0.60 \frac{P_{VA} V_V}{R\, T_V} M_V \tag{3-14}$$

where:

$L_{SLmax}$ = maximum standing idle loss for drain-dry tanks due to clingage, lb

$W_l$ = density of the liquid inside the tank, lb/gal

D = diameter of the tank, feet
$P_{VA}$ = true vapor pressure of the liquid inside the tank, psia
$V_V$ = volume of the vapor space, $ft^3$
R = ideal gas constant, 10.731 psia $ft^3$ /lb-mole °R
$T_V$ = average temperature of the vapor and liquid below the floating roof, °R (= $T_{AA}$)
$M_V$ = stock vapor molecular weight, lb/lb-mole

Therefore, the standing idle loss for drain-dry tanks, shown in Equation 3-13, must be less than or equal to Equation 3-14. This relationship is shown by Equation 3-15.

$$L_{SL} \leq 0.60 \frac{P_{VA} V_V}{R\ T_V} M_V \quad \textbf{(3-15)}$$

7.1.3.3.2 Filling Losses

When a floating roof tank is refilled, there are additional emissions resulting from the roof being landed. These losses are called "filling losses" and continue until the liquid reaches the level of the floating roof.

The first contributor to filling losses is called the "arrival" component. These are the vapors that remain under the floating roof at the end of the standing idle period but have not been accounted for as standing idle losses. For example, in the case of a liquid heel evaporation takes place into the vapor space beneath the landed floating roof. The vapors that are expelled from this vapor space by breathing are accounted for as standing idle losses, and the vapors that remain upon the commencement of refilling are deemed the arrival component of filling losses.

The second contributor to filling losses is called the "generated" component. These are the vapors created by the incoming liquid as it evaporates during the filling operation. Even when filling a completely clean and gas-free tank, the incoming liquid will generate a certain amount of vapors.

Limit on Filling Loss for Tanks with a Liquid Heel

A constraint on the filling loss is added for floating roof tanks with a liquid heel in that the total emissions cannot exceed the amount of stock liquid initially left in the tank less the amount attributed to standing idle loss, plus the vapors generated by incoming liquid upon refilling. This upper limit, represented as $L_{FLmax}$, may be determined as follows:

Initial amount of stock liquid = 5.9 $D^2$ $h_{le}$ $W_l$ from Equation 3-4

Amount attributed to standing idle loss = $L_{SL}$ from the applicable equation above for the given type of tank

Amount generated by incoming liquid = 0.15 $P_{VA}$ $V_V$ $M_V$ / R $T_V$
from Equation 3-18 evaluated for a drain-dry tank, to account for only the generated component of vapors

These components of the upper limit on filling loss for a tank with a liquid heel may be combined into the following equation:

$$L_{FL} \leq (5.9 D^2 h_{le} W_l) - L_{SL} + 0.15 \frac{P_{VA} V_V}{R\, T_V} M_V \qquad (3\text{-}16)$$

General Equation for Filling Loss

The amount of vapor that is lost during filling is directly related to the volume of the vapor space and the saturation level of the vapor within the space, as shown in Equation 3-17.

$L_{FL}$ = (*vapor space volume*)(*vapor concentration*)(*vapor mol wt*)(*saturation factor*)
After substituting for the major terms in Equation 3-17, the equation can be simplified to Equation 3-18.

(3-17)

$$L_{FL} = \left( \frac{P_{VA}\, V_V}{R\, T_V} \right) M_V \left( C_{sf}\, S \right) \qquad \textbf{(3-18)}$$

where:

$L_{FL}$ = filling loss during roof landing, lb

$P_{VA}$ = true vapor pressure of the liquid within the tank, psia

$V_V$ = volume of the vapor space, $ft^3$

R = ideal gas constant, 10.731 psia-$ft^3$/(lb-mole-°R)

$T_V$ = average temperature of the vapor below the floating roof, °R(see Equation 3-6)

$M_V$ = stock vapor molecular weight, lb/lb-mole

$C_{sf}$ = filling saturation correction factor for wind, dimensionless

S = filling saturation factor, dimensionless (0.60 for a full liquid heel; 0.50 for a partial liquid heel).

In the event of a change of service during the landing event, the equation should be run separately for the arrival and generated components. The arrival component should be based on the liquid properties of the prior service and a saturation factor of (Csf S – 0.15). The generated component should be based on the properties of the incoming liquid and a saturation factor of 0.15. Internal or Domed External Floating Roof Tank with a Liquid Heel

A value of 0.6 for the filling saturation factor, which is used in Section 5.2, Table 5.2-1 for submerged loading of tank trucks and rail cars, has been demonstrated to be suitable for the case of a full liquid heel. A value of 0.5 has been demonstrated for the case of a partial liquid heel. In that the landed floating roof in an internal or domed external floating roof tank is shielded from wind by the fixed roof, the value of $C_{sf}$ is taken as 1.0.

External Floating Roof Tank with a Liquid Heel

For external floating roof tanks with a liquid heel, the amount of vapor lost during filling will be less than the amount for internal or domed external floating roof tanks because of wind effects. The “arrival” component will have been partially flushed out of the tank by the wind, so the preceding equation requires evaluation of the filling saturation correction factor for wind, $C_{sf}$. The basic premise of the correction factor is that the vapors expelled by wind action will not be present in the vapor space when the tank is refilled, so the amount of saturation is lowered. This is demonstrated in Equation 3-19.

$$C_{sf} = 1 - \frac{(\text{one day of wind driven standing idle loss}) - (\text{one day without wind standing idle loss})}{\text{one day without wind total loss}} \quad \textbf{(3-19)}$$

The equation for the filling saturation correction factor can be simplified based on other equations contained in this section as shown in Equation 3-20 and Equation 3-21.

$$C_{sf} = 1 - \left( \frac{(Equation\ 3-10) - (Equation\ 3-7)}{(Equation\ 3-7) + (Equation\ 3-18)} \right) \quad \textbf{(3-20)}$$

Substituting the indicated equations, with the number of days set equal to 1 and $C_{sf}$ set equal to 1 in Equation 3-18 for the case without wind:

$$C_{sf} = 1 - \left( \frac{(0.57 \cdot 1 \cdot D \cdot P^* \cdot M_V) - \left(1 \cdot K_E \cdot \left(\frac{P_{VA} \cdot V_V}{R \cdot T_V}\right) \cdot M_V \cdot K_S\right)}{\left(1 \cdot K_E \cdot \left(\frac{P_{VA} \cdot V_V}{R \cdot T_V}\right) \cdot M_V \cdot K_S\right) + \left(\left(\frac{P_{VA} \cdot V_V}{R \cdot T_V}\right) \cdot M_V \cdot (1 \cdot S)\right)} \right) \quad \textbf{(3-21)}$$

where:

$C_{sf}$ = filling saturation correction factor for wind, dimensionless

$n_d$ = set equal to 1, days

$K_E$ = vapor space expansion factor, per day, calculated from Equation 1-5, 1-12 or 1-13 as appropriate, with the value of $\Delta P_B$ set equal to zero

$V_V$ = volume of the vapor space, $ft^3$

$$V_V = \frac{h_v\ \pi D^2}{4} \quad \textbf{(3-22)}$$

$h_v$ = height of the vapor space under the floating roof, ft D = tank diameter, ft

R = ideal gas constant, 10.731 psia $ft^3$ / lb-mole R

$M_V$ = stock vapor molecular weight, lb/lb-mole

$K_S$ = standing idle saturation factor, dimensionless

S = filling saturation factor, dimensionless

$P^*$ = vapor pressure function, dimensionless

$W_l$ = stock liquid density, lb/gal

## 1.5 Liquefied Petroleum Gas Combustion

### 1.5.1 General[1]

Liquefied petroleum gas (LPG or LP-gas) consists of propane, propylene, butane, and butylenes; the product used for domestic heating is composed primarily of propane. This gas, obtained mostly from gas wells (but also, to a lesser extent, as a refinery by-product) is stored as a liquid under moderate pressures. There are three grades of LPG available as heating fuels: commercial-grade propane, engine fuel-grade propane (also known as HD-5 propane), and commercial-grade butane. In addition, there are high-purity grades of LPG available for laboratory work and for use as aerosol propellants. Specifications for the various LPG grades are available from the American Society for Testing and Materials and the Gas Processors Association. A typical heating value for commercial-grade propane and HD-5 propane is 90,500 British thermal units per gallon (Btu/gal), after vaporization; for commercial-grade butane, the value is 97,400 Btu/gal.

The largest market for LPG is the domestic/commercial market, followed by the chemical industry (where it is used as a petrochemical feedstock) and the agriculture industry. Propane is also used as an engine fuel as an alternative to gasoline and as a standby fuel for facilities that have interruptible natural gas service contracts.

### 1.5.2 Firing Practices[2]

The combustion processes that use LPG are very similar to those that use natural gas. Use of LPG in commercial and industrial applications may require a vaporizer to provide the burner with the proper mix of air and fuel. The burner itself will usually have different fuel injector tips as well as different fuel-to-air ratio controller settings than a natural gas burner since the LPG stoichiometric requirements are different than natural gas requirements. LPG is fired as a primary and backup fuel in small commercial and industrial boilers and space heating equipment and can be used to generate heat and process steam for industrial facilities and in most domestic appliances that typically use natural gas.

### 1.5.3 Emissions[1,3-5]

#### 1.5.3.1 Criteria Pollutants -

LPG is considered a "clean" fuel because it does not produce visible emissions. However, gaseous pollutants such as nitrogen oxides ($NO_x$), carbon monoxide (CO), and organic compounds are produced as are small amounts of sulfur dioxide ($SO_2$) and particulate matter (PM). The most significant factors affecting $NO_x$, CO, and organic emissions are burner design, burner adjustment, boiler operating parameters, and flue gas venting. Improper design, blocking and clogging of the flue vent, and insufficient combustion air result in improper combustion and the emission of aldehydes, CO, hydrocarbons, and other organics. $NO_x$ emissions are a function of a number of variables, including temperature, excess air, fuel and air mixing, and residence time in the combustion zone. The amount of $SO_2$ emitted is directly proportional to the amount of sulfur in the fuel. PM emissions are very low and result from soot, aerosols formed by condensable emitted species, or boiler scale dislodged during combustion. Emission factors for LPG combustion are presented in Table 1.5-1.

Table 1.5-1 presents emission factors on a volume basis (lb/$10^3$gal). To convert to an energy basis (lb/MMBtu), divide by a heating value of 91.5 MMBtu/$10^3$gal for propane and 102 MMBtu/$10^3$gal for butane.

#### 1.5.3.2 Greenhouse Gases[6-11] -

Carbon dioxide ($CO_2$), methane ($CH_4$), and nitrous oxide ($N_2O$) emissions are all produced during LPG combustion. Nearly all of the fuel carbon (99.5 percent) in LPG is converted to $CO_2$ during the combustion process. This conversion is relatively independent of firing configuration. Although the formation of CO acts to reduce $CO_2$ emissions, the amount of CO produced is insignificant compared to the amount of $CO_2$ produced. The majority of the 0.5 percent of fuel carbon not converted to $CO_2$ is due to incomplete combustion in the fuel stream.

Formation of $N_2O$ during the combustion process is governed by a complex series of reactions and its formation is dependent upon many factors. Formation of $N_2O$ is minimized when combustion temperatures are kept high (above 1475°F) and excess air is kept to a minimum (less than 1 percent).

Methane emissions are highest during periods of low-temperature combustion or incomplete combustion, such as the start-up or shut-down cycle for boilers. Typically, conditions that favor formation of $N_2O$ also favor emissions of $CH_4$.

## 1.5.4 Controls

The only controls developed for LPG combustion are to reduce $NO_x$ emissions. $NO_x$ controls have been developed for firetube and watertube boilers firing propane or butane. Vendors are now guaranteeing retrofit systems to levels as low as 30 to 40 ppm (based on 3 percent oxygen). These systems use a combination of low-$NO_x$ burners and flue gas recirculation (FGR). Some burner vendors use water or steam injection into the flame zone for $NO_x$ reduction. This is a trimming technique which may be necessary during backup fuel periods because LPG typically has a higher $NO_x$-forming potential than natural gas; conventional natural gas emission control systems may not be sufficient to reduce LPG emissions to mandated levels. Also, LPG burners are more prone to sooting under the modified combustion conditions required for low $NO_x$ emissions. The extent of allowable combustion modifications for LPG may be more limited than for natural gas.

One $NO_x$ control system that has been demonstrated on small commercial boilers is FGR. $NO_x$ emissions from propane combustion can be reduced by as much as 50 percent by recirculating about 16 percent of the flue gas. $NO_x$ emission reductions of over 60 percent have been achieved with FGR and low-$NO_x$ burners used in combination.

## 1.5.5 Updates Since the Fifth Edition

The Fifth Edition was released in January 1995. Revisions to this section since that date are summarized below. For further detail, consult the memoranda describing each supplement or the background report for this section.

Supplement A, February 1996

No changes.

Supplement B, October 1996

- Text was added concerning firing practices.
- The $CO_2$ emission factor was updated.
- Emission factors were added for $N_2O$ and $CH_4$.

July 2008

The PM filterable, NOx, CO and TOC emissions factors were updated and the PM condensable and PM total emissions factors were added using the revised PM, NOx, CO and TOC emissions factors for natural gas combustion for small boilers (see July 1998 revisions to section 1.4, Natural Gas Combustion).

Table 1.5-1. EMISSION FACTORS FOR LPG COMBUSTION[a]

EMISSION FACTOR RATING: E

| Pollutant | Butane Emission Factor ($lb/10^3$ gal) | | Propane Emission Factor ($lb/10^3$ gal) | |
|---|---|---|---|---|
| | Industrial Boilers[b] (SCC 1-02-010-01) | Commercial Boilers[c] (SCC 1-03-010-01) | Industrial Boilers[b] (SCC 1-02-010-02) | Commercial Boilers[c] (SCC 1-03-010-02) |
| PM, Filterable [d] | 0.2 | 0.2 | 0.2 | 0.2 |
| PM, Condensable | 0.6 | 0.6 | 0.5 | 0.5 |
| PM, Total | 0.8 | 0.8 | 0.7 | 0.7 |
| $SO_2$[e] | 0.09S | 0.09S | 0.10S | 0.10S |
| $NO_x$[f] | 15 | 15 | 13 | 13 |
| $N_2O$[g] | 0.9 | 0.9 | 0.9 | 0.9 |
| $CO_2$[h,j] | 14,300 | 14,300 | 12,500 | 12,500 |
| CO | 8.4 | 8.4 | 7.5 | 7.5 |
| TOC | 1.1 | 1.1 | 1.0 | 1.0 |
| $CH_4$[k] | 0.2 | 0.2 | 0.2 | 0.2 |

[a] Assumes PM, CO, and TOC emissions are the same, on a heat input basis, as for natural gas combustion. Use heat contents of 91.5 x $10^6$ Btu/$10^3$ gallon for propane, 102 x $10^6$ Btu/$10^3$ gallon for butane, 1020 x $10^6$ Btu/$10^6$ scf for methane when calculating an equivalent heat input basis. For example, the equation for converting from methane's emissions factors to propane's emissions factors is as follows: lb pollutant/$10^3$ gallons of propane = (lb pollutant /$10^6$ $ft^3$ methane) * (91.5 x $10^6$ Btu/$10^3$ gallons of propane) / (1020 x $10^6$ Btu/$10^6$ scf of methane). The $NO_x$ emission factors have been multiplied by a correction factor of 1.5, which is the approximate ratio of propane/butane $NO_x$ emissions to natural gas $NO_x$ emissions. To convert from lb/$10^3$ gal to kg/$10^3$ L, multiply by 0.12. SCC = Source Classification Code.

[b] Heat input capacities generally between 10 and 100 million Btu/hour.

[c] Heat input capacities generally between 0.3 and 10 million Btu/hour.

[d] Filterable particulate matter (PM) is that PM collected on or prior to the filter of an EPA Method 5 (or equivalent) sampling train. For natural gas, a fuel with similar combustion characteristics, all PM is less than 10 μm in aerodynamic equivalent diameter (PM-10).

[e] S equals the sulfur content expressed in gr/100 $ft^3$ gas vapor. For example, if the butane sulfur content is 0.18 gr/100 $ft^3$, the emission factor would be (0.09 x 0.18) = 0.016 lb of $SO_2$/$10^3$ gal butane burned.

[f] Expressed as $NO_2$.

[g] Reference 12.

[h] Assuming 99.5% conversion of fuel carbon to $CO_2$.

[j] EMISSION FACTOR RATING = C.

[k] Reference 13.

References For Section 1.5


1. Written Communication from W. Butterbaugh of the National Propane Gas Association, Lisle, Illinois, to J. McSorley of the U. S. Environmental Protection Agency, Research Triangle Park, NC, August 19, 1992.

2. Emission Factor Documentation for AP-42 Section 1.5. *Liquefied Petroleum Gas Combustion.* April 1993.

3. *Air Pollutant Emission Factors*, Final Report, Contract No. CPA-22-69-119, Resources Research, Inc., Reston, VA, Durham, NC, April 1970.

4. *Nitrous Oxide Reduction With The Weishaupt Flue Gas Recirculation System*, Weishaupt Research and Development Institute, January 1987.

5. Phone communication memorandum of conversation between B. Lusher of Acurex Environmental and D. Childress of Suburban/Petrolane, Durham, NC, May 14, 1992.

6. L. P. Nelson, *et al.*, *Global Combustion Sources Of Nitrous Oxide Emissions*, Research Project 2333-4 Interim Report, Radian Corporation, Sacramento, CA, 1991.

7. R. L. Peer, *et al.*, *Characterization Of Nitrous Oxide Emission Sources*, EPA Contract No. 68-D1-0031, Research Triangle Park, NC, 1995.

8. S. D. Piccot, *et al.*, *Emissions And Cost Estimates For Globally Significant Anthropogenic Combustion Sources Of* $NO_x$*,* $N_2O$*,* $CH_4$*, CO, And* $CO_2$, EPA Contract No. 68-02-4288, Research Triangle Park, NC, 1990.

9. G. Marland and R. M. Rotty, *Carbon Dioxide Emissions From Fossil Fuels: A Procedure For Estimation And Results For 1951-1981*, DOE/NBB-0036 TR-003, Carbon Dioxide Research Division, Office of Energy Research, U.S. Department of Energy, Oak Ridge, TN, 1983.

10. G. Marland and R.M. Rotty, *Carbon Dioxide Emissions From Fossil Fuels: A Procedure For Estimation And Results For 1950-1982*, *Tellus*, 36B: 232-261.

11. *Sector-Specific Issues And Reporting Methodologies Supporting The General Guidelines For The Voluntary Reporting Of Greenhouse Gases Under Section 1605(b) Of The Energy Policy Act Of 1992*, Volume 2 of 3, DOE/PO-0028, U.S. Department of Energy, 1994.

12. A. Rosland, *Greenhouse Gas Emissions In Norway: Inventories And Estimation Methods*, Ministry of Environment, Oslo, Norway, 1993.

13. *Inventory Methods Manual For Estimating Canadian Emissions Of Greenhouse Gases*, Prepared for Environment Canada by Ortech Corporation, 1994.

# Section 8

## Map(s)

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**A map** such as a 7.5 minute topographic quadrangle showing the exact location of the source. The map shall also include the following:

| | |
|---|---|
| The UTM or Longitudinal coordinate system on both axes | An indicator showing which direction is north |
| A minimum radius around the plant of 0.8km (0.5 miles) | Access and haul roads |
| Topographic features of the area | Facility property boundaries |
| The name of the map | The area which will be restricted to public access |
| A graphical scale | |

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Three maps are included in this section. Figure 1 is a map of the refinery and surrounding area. Figure 2 depicts the city limits of Artesia. Figure 3 shows the location of the refinery flares.

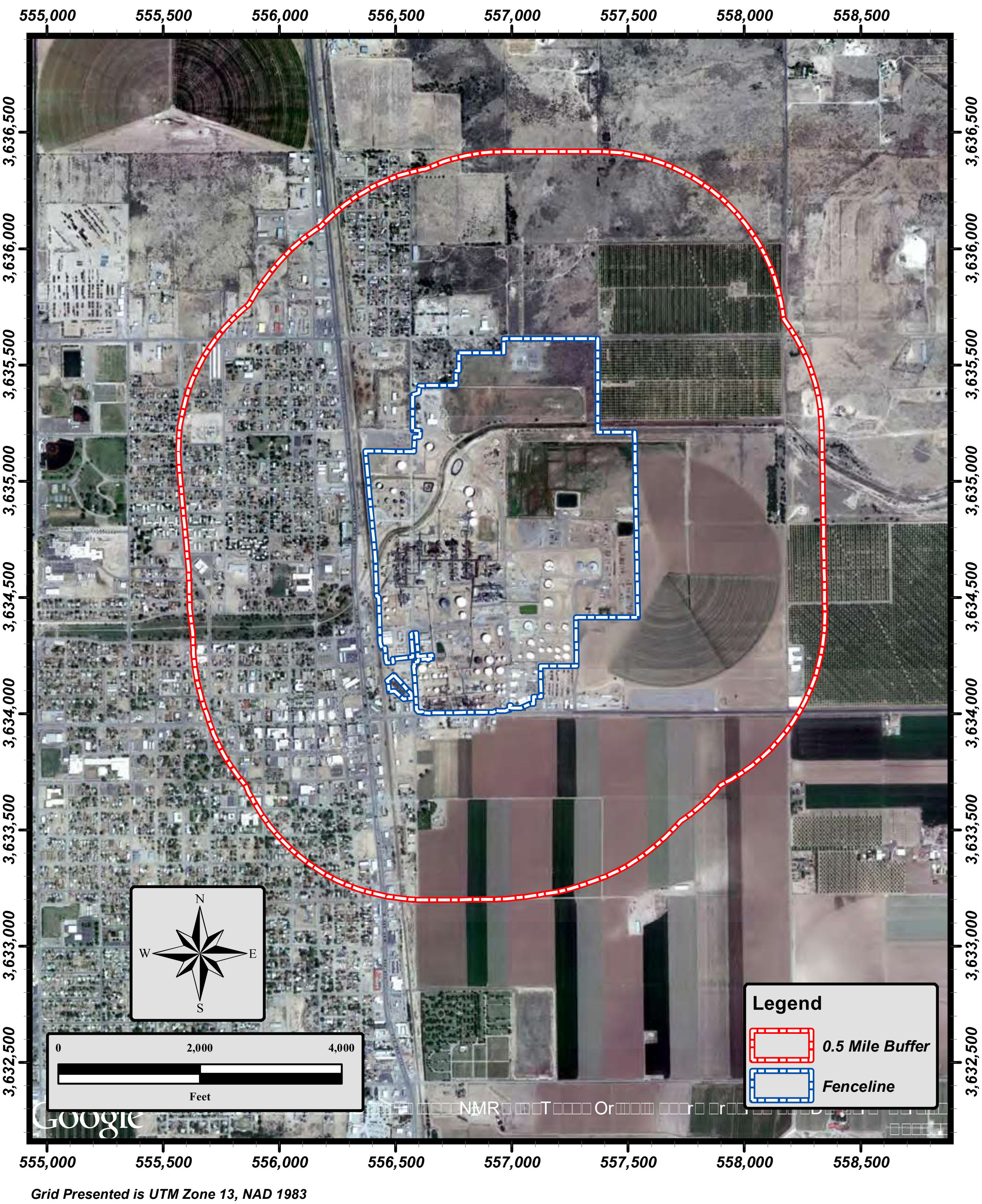


**FIGURE 1 AREA MAP**

**Artesia Refinery**
**Artesia, New Mexico**

*from USGS Quadrangle Artesia, New Mexico*
*Ground Condition Depicted May 2014*
*Digital Data Courtesy of Google Earth*

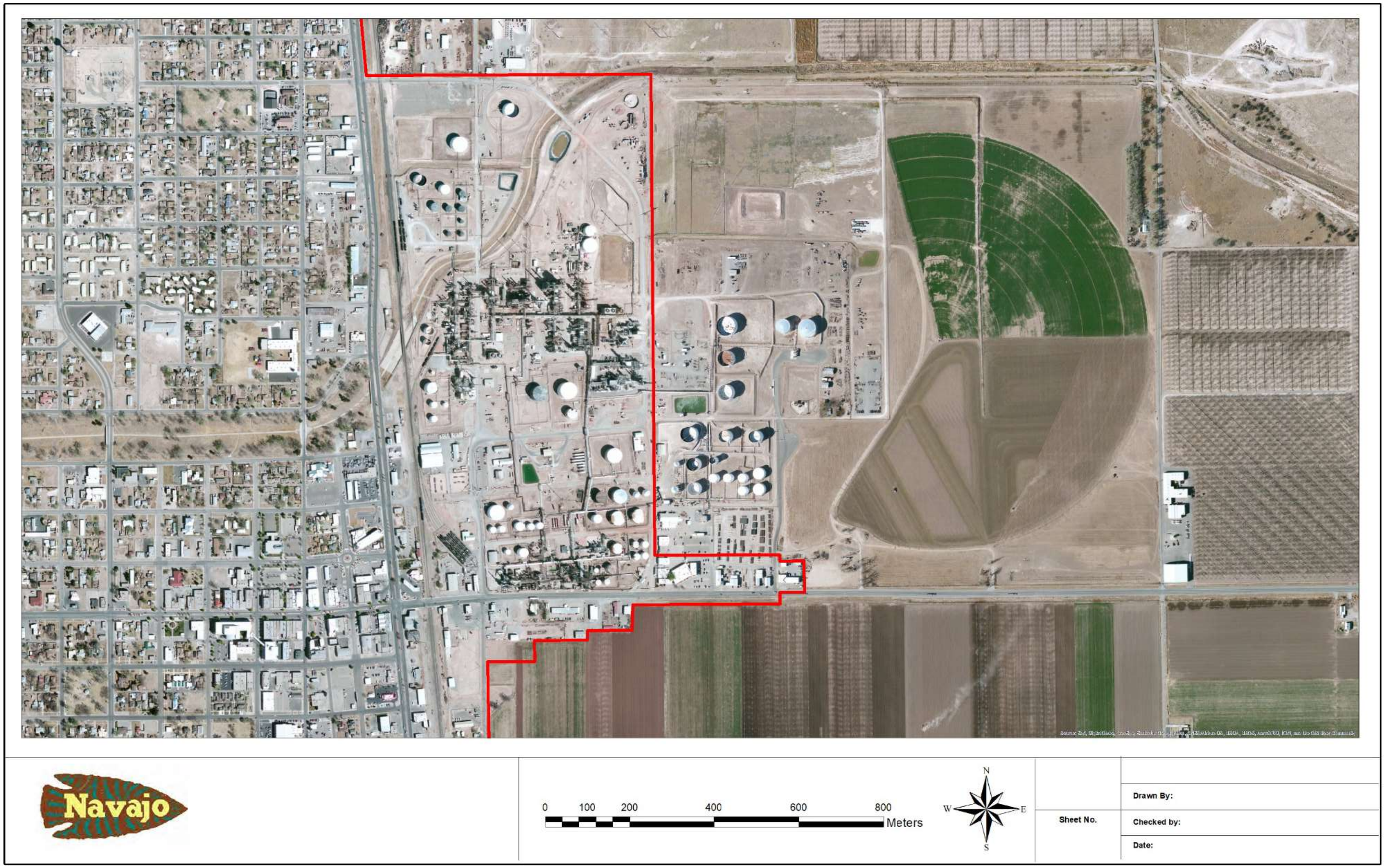


FIGURE 2 – CITY LIMITS OF ARTESIA


FIGURE 3 UNIT LOCATION MAP

Artesia Refinery
Artesia, New Mexico

*from USGS Quadrangle Artesia, New Mexico*
*Ground Condition Depicted May 2014*
*Digital Data Courtesy of Google Earth*

# Section 9

## Proof of Public Notice

(for NSR applications submitting under 20.2.72 or 20.2.74 NMAC)

(This proof is required by: 20.2.72.203.A.14 NMAC "Documentary Proof of applicant's public notice")

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**X I have read the AQB "Guidelines for Public Notification for Air Quality Permit Applications"**

This document provides detailed instructions about public notice requirements for various permitting actions. It also provides public notice examples and certification forms. Material mistakes in the public notice will require a re-notice before issuance of the permit.

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Unless otherwise allowed elsewhere in this document, the following items document proof of the applicant's Public Notification. Please include this page in your proof of public notice submittal with checkmarks indicating which documents are being submitted with the application.

**New Permit** and **Significant Permit Revision** public notices must include all items in this list.

**Technical Revision** public notices require only items 1, 5, 9, and 10.

Per the Guidelines for Public Notification document mentioned above, include:

1. X A copy of the certified letter receipts with post marks (20.2.72.203.B NMAC)
2. X A list of the places where the public notice has been posted in at least four publicly accessible and conspicuous places, including the proposed or existing facility entrance. (e.g: post office, library, grocery, etc.)
3. X A copy of the property tax record (20.2.72.203.B NMAC).
4. X A sample of the letters sent to the owners of record.
5. X A sample of the letters sent to counties, municipalities, and Indian tribes.
6. X A sample of the public notice posted and a verification of the local postings.
7. X A table of the noticed citizens, counties, municipalities and tribes and to whom the notices were sent in each group.
8. X A copy of the public service announcement (PSA) sent to a local radio station and documentary proof of submittal.
9. X A copy of the classified or legal ad including the page header (date and newspaper title) or its affidavit of publication stating the ad date, and a copy of the ad. When appropriate, this ad shall be printed in both English and Spanish.
10. X A copy of the display ad including the page header (date and newspaper title) or its affidavit of publication stating the ad date, and a copy of the ad. When appropriate, this ad shall be printed in both English and Spanish.
11. X A map with a graphic scale showing the facility boundary and the surrounding area in which owners of record were notified by mail. This is necessary for verification that the correct facility boundary was used in determining distance for notifying land owners of record.

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# Section 10

## Written Description of the Routine Operations of the Facility

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**A written description of the routine operations of the facility**. Include a description of how each piece of equipment will be operated, how controls will be used, and the fate of both the products and waste generated. For modifications and/or revisions, explain how the changes will affect the existing process. In a separate paragraph describe the major process bottlenecks that limit production. The purpose of this description is to provide sufficient information about plant operations for the permit writer to determine appropriate emission sources.

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The Artesia Refinery operates one crude oil distillation unit and various downstream process units to produce various petroleum products. The Artesia Refinery processes crude oil, as well as intermediates, received from outside sources such as Navajo's Lovington Refinery and other third-party sources. The crude oil, and other intermediates, enter the Artesia Refinery via pipeline, truck, or rail. The Artesia Refinery produces liquefied petroleum gases ("LPG"), kerosene, diesel fuel, various grades of gasoline, carbon black oil , gas oils, fuel oils, asphalt, pitch, and molten sulfur. For its own use, the Artesia Refinery produces refinery fuel gas, hydrogen, nitrogen, and steam.

This revision is being submitted to propose an alternate operating scenario for several storage tanks and to reflect tank representation corrections, change of service, and dome installation.

# Section 11

## Source Determination

Source submitting under 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC

Sources applying for a construction permit, PSD permit, or operating permit shall evaluate surrounding and/or associated sources (including those sources directly connected to this source for business reasons) and complete this section. Responses to the following questions shall be consistent with the Air Quality Bureau's permitting guidance, Single Source Determination Guidance, which may be found on the Applications Page in the Permitting Section of the Air Quality Bureau website.

Typically, buildings, structures, installations, or facilities that have the same SIC code, that are under common ownership or control, and that are contiguous or adjacent constitute a single stationary source for 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC applicability purposes. Submission of your analysis of these factors in support of the responses below is optional, unless requested by NMED.

**A. Identify the emission sources evaluated in this section** (list and describe)**:**
Storage Tanks: T-0801, T-0836, T-0830, T-401, T-411, T-0081, & T-0082
Thermal Oxidizers: T-801/T-830 TO, T-836 TO, & T-401/T-411 TO.

**B. Apply the 3 criteria for determining a single source:**

**SIC Code:** Surrounding or associated sources belong to the same 2-digit industrial grouping (2-digit SIC code) as this facility, OR surrounding or associated sources that belong to different 2-digit SIC codes are support facilities for this source.

**X Yes** ☐ **No**

**Common Ownership or Control:** Surrounding or associated sources are under common ownership or control as this source.

**X Yes** ☐ **No**

**Contiguous or Adjacent:** Surrounding or associated sources are contiguous or adjacent with this source.

**X Yes** ☐ **No**

**C. Make a determination:**

☐ The source, as described in this application, constitutes the entire source for 20.2.70, 20.2.72, 20.2.73, or 20.2.74 NMAC applicability purposes. If in "A" above you evaluated only the source that is the subject of this application, all "**YES**" boxes should be checked. If in "A" above you evaluated other sources as well, you must check **AT LEAST ONE** of the boxes "**NO**" to conclude that the source, as described in the application, is the entire source for 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC applicability purposes.

X The source, as described in this application, **does not** constitute the entire source for 20.2.70, 20.2.72, 20.2.73, or 20.2.74 NMAC applicability purposes (A permit may be issued for a portion of a source). The entire source consists of the following facilities or emissions sources (list and describe):

The entire source consists of all sources listed in the PSD and Title V permit (see Table 2-A of this application package).

# Section 12

## Section 12.A

## PSD Applicability Determination for All Sources

(Submitting under 20.2.72, 20.2.74 NMAC)

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**A PSD applicability determination for all sources**. For sources applying for a significant permit revision, apply the applicable requirements of 20.2.74.AG and 20.2.74.200 NMAC and to determine whether this facility is a major or minor PSD source, and whether this modification is a major or a minor PSD modification. It may be helpful to refer to the procedures for Determining the Net Emissions Change at a Source as specified by Table A-5 (Page A.45) of the EPA New Source Review Workshop Manual to determine if the revision is subject to PSD review.

A. This facility is:

- ☐ **a minor PSD source before and after this modification (if so, delete C and D below).**
- ☐ **a major PSD source before this modification. This modification will make this a PSD minor source.**
- ☐ **an existing PSD Major Source that has never had a major modification requiring a BACT analysis.**
- X **an existing PSD Major Source that has had a major modification requiring a BACT analysis**
- ☐ **a new PSD Major Source after this modification.**

B. **This facility is one of the listed 20.2.74.501 Table I – PSD Source Categories. The "project" emissions** for this modification are **not significant. The increases in emissions associated with this application do not exceed the major modification thresholds The "project" emissions listed below do only result from changes described in this permit application, thus no emissions from other [revisions or modifications, past or future] to this facility. Also, specifically discuss whether this project results in "de-bottlenecking", or other associated emissions resulting in higher emissions. The project emissions (before netting) for this project are as follows [see Table 2 in 20.2.74.502 NMAC for a complete list of significance levels]:**

a. **NOx: 18.67 TPY**
b. **CO: 10.77 TPY**
c. **VOC: 5.57 TPY**
d. **SOx: 0.00 TPY**
e. **PM: 1.01 TPY**
f. **PM10: 1.01 TPY**
g. **PM2.5: 1.01 TPY**
h. **Fluorides: 0.00 TPY**
i. **Lead: 0.00 TPY**
j. **Sulfur compounds (listed in Table 2): 0.00 TPY**
k. **GHG: 18,343.15 TPY**

C. **Netting is not required, as this project is not significant.**

D. **BACT** is **not required for this modification, as this application is a minor modification.**

E. If this is an existing PSD major source, or any facility with emissions greater than 250 TPY (or 100 TPY for 20.2.74.501 Table 1 – PSD Source Categories), determine whether any permit modifications are related, or could be considered a single project with this action, and provide an explanation for your determination whether a PSD modification is triggered.

Information on the changes requested are included in Section 3 of the application.

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# Section 13

## Determination of State & Federal Air Quality Regulations

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**This section lists each state and federal air quality regulation that may apply to your facility and/or equipment that are stationary sources of regulated air pollutants.**

Not all state and federal air quality regulations are included in this list. Go to the Code of Federal Regulations (CFR) or to the Air Quality Bureau's regulation page to see the full set of air quality regulations.

**Required Information for Specific Equipment:**
For regulations that apply to specific source types, in the 'Justification' column **provide any information needed to determine if the regulation does or does not apply**. **For example**, to determine if emissions standards at 40 CFR 60, Subpart IIII apply to your three identical stationary engines, we need to know the construction date as defined in that regulation; the manufacturer date; the date of reconstruction or modification, if any; if they are or are not fire pump engines; if they are or are not emergency engines as defined in that regulation; their site ratings; and the cylinder displacement.

**Required Information for Regulations that Apply to the Entire Facility:**
See instructions in the 'Justification' column for the information that is needed to determine if an 'Entire Facility' type of regulation applies (e.g. 20.2.70 or 20.2.73 NMAC).

**Regulatory Citations for Regulations That Do Not, but Could Apply:**
If there is a state or federal air quality regulation that does not apply, but you have a piece of equipment in a source category for which a regulation has been promulgated, you must **provide the low level regulatory citation showing why your piece of equipment is not subject to or exempt from the regulation. For example** if you have a stationary internal combustion engine that is not subject to 40 CFR 63, Subpart ZZZZ because it is an existing 2 stroke lean burn stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, your citation would be 40 CFR 63.6590(b)(3)(i). **We don't want a discussion of every non-applicable regulation, but if it is possible a regulation could apply, explain why it does not. For example,** if your facility is a power plant, you do not need to include a citation to show that 40 CFR 60, Subpart OOO does not apply to your non-existent rock crusher.

**Regulatory Citations for Emission Standards:**
**For each unit that is subject to an emission standard in a source specific regulation, such as 40 CFR 60, Subpart OOO or 40 CFR 63, Subpart HH, include the low level regulatory citation of that emission standard.** Emission standards can be numerical emission limits, work practice standards, or other requirements such as maintenance. **Here are examples:** a glycol dehydrator is subject to the general standards at 63.764C(1)(i) through (iii); an engine is subject to 63.6601, Tables 2a and 2b; a crusher is subject to 60.672(b), Table 3 and all transfer points are subject to 60.672(e)(1)

**Federally Enforceable Conditions:**
All federal regulations are federally enforceable. All Air Quality Bureau State regulations are federally enforceable except for the following: affirmative defense portions at 20.2.7.6.B, 20.2.7.110(B)(15), 20.2.7.11 through 20.2.7.113, 20.2.7.115, and 20.2.7.116; 20.2.37; 20.2.42; 20.2.43; 20.2.62; 20.2.63; 20.2.86; 20.2.89; and 20.2.90 NMAC. Federally enforceable means that EPA can enforce the regulation as well as the Air Quality Bureau and federally enforceable regulations can count toward determining a facility's potential to emit (PTE) for the Title V, PSD, and nonattainment permit regulations.

INCLUDE ANY OTHER INFORMATION NEEDED TO COMPLETE AN APPLICABILITY DETERMINATION OR THAT IS RELEVENT TO YOUR FACILITY'S NOTICE OF INTENT OR PERMIT.

**EPA Applicability Determination Index for 40 CFR 60, 61, 63, etc**: http://cfpub.epa.gov/adi/

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**Table 13-1 - State Regulations**

| STATE REGU-LATIONS CITATION | Title | Applies? Enter Yes or No | Unit(s) or Facility | JUSTIFICATION: |
|---|---|---|---|---|
| 20.2.1 NMAC | General Provisions | Yes | Facility | General Provisions apply Construction permit applications. |
| 20.2.3 NMAC | Ambient Air Quality Standards NMAAQS | Yes | Facility | The Artesia Refinery is subject to 20.2.3 NMAC State Implementation Plan ("SIP") approved regulation that limits the maximum allowable concentration of, Sulfur Compounds, Carbon Monoxide and Nitrogen Dioxide. |
| 20.2.7 NMAC | Excess Emissions | Yes | Facility | The Artesia Refinery is subject to permit emissions limits, and federal or state regulation's numerical emissions standards. Thus, it is subject to 20.2.7 NMAC requirements. |
| 20.2.23 NMAC | Fugitive Dust Control | No | Facility | The Artesia Refinery is not a fugitive dust source listed at 20.2.23.108.A NMAC, and is not located in an area subject to a mitigation plan pursuant to 40 CFR 51.930. As of January 2019, the only areas of the State subject to a mitigation plan per 40 CFR 51.930 are in Doña Ana and Luna Counties. |
| 20.2.33 NMAC | Gas Burning Equipment - Nitrogen Dioxide | Yes | See Table 13-3 | The Artesia Refinery has new (equipment which commenced construction or modification after February 17, 1972) and existing gas burning equipment (i.e., gas fired boilers and heaters) with a heat input of greater than 1,000,000 million British Thermal Units per year per unit. Table 13-3 at the end of this section, summarizes the applicable regulations to the Artesia Refinery boilers and heaters. |
| 20.2.34 NMAC | Oil Burning Equipment: $NO_2$ | No | N/A | The Artesia Refinery does not have oil burning equipment (i.e., external combustion emission sources, such as oil-fired boilers and heaters) having a heat input of greater than 1,000,000 million British Thermal Units per year per unit. |
| 20.2.35 NMAC | Natural Gas Processing Plant – Sulfur | No | N/A | The Artesia Refinery is not a natural gas processing plant as the term is defined in 20.2.35.7.A and B. |
| 20.2.37 and 20.2.36 NMAC | Petroleum Processing Facilities and Petroleum Refineries | N/A | N/A | The Artesia Refinery had equipment subject to 20.2.36 and 20.2.37 NMAC before the repeal of these rules. Therefore, the affected combustion emission sources are now subject to 20.2.61 NMAC. |
| 20.2.38 NMAC | Hydrocarbon Storage Facility | Yes | See Table 13-12 | Section 111 of this rule does not apply because the Artesia Refinery is not located within five miles of the corporate limits of a municipality that has a population of 20,000 or greater. Section 112 of this rule does not apply because the Artesia Refinery is not a petroleum production facility. Table 13-12, included at the end of this section, summarizes the Artesia Refinery petroleum storage tanks subject to certain other 20.2.38 NMAC requirements. |
| 20.2.39 NMAC | Sulfur Recovery Plant - Sulfur | No | N/A | The Artesia Refinery SRUs are part of a petroleum processing facility, therefore, per 20.2.39.6 NMAC this regulation is not applicable. |
| 20.2.61.109 NMAC | Smoke & Visible Emissions | Yes | See Tables 13-3, 13-4, 13-6, and 13-7 | The Artesia Refinery boilers, heaters, SRU tail gas incinerators, flares, and engines are subject to the 20% opacity limit for Stationary Combustion Equipment in 20.2.61.109 NMAC as summarized in Tables 13-3 through 13-6 included at the end of this section. |

| STATE REGU-LATIONS CITATION | Title | Applies? Enter Yes or No | Unit(s) or Facility | JUSTIFICATION: |
|---|---|---|---|---|
| 20.2.70 NMAC | Operating Permits | Yes | Facility | The Artesia Refinery is a major source with a potential to emit (“PTE”) of 100 tpy or more for $NO_X$, CO, VOC, $SO_2$ and $PM/PM_{10}/PM_{2.5}$, and a HAPs PTE of 10 tpy or more for a single HAP or 25 or more tpy for combined HAPs. The Artesia Refinery operates under Operating Permit P051-R3. |
| 20.2.71 NMAC | Operating Permit Fees | Yes | Facility | The Artesia Refinery is subject to 20.2.70 NMAC. The Artesia Refinery Operating Permit P051-R3 includes numerical ton per year emission limits. Therefore, it is subject to 20.2.71 NMAC |
| 20.2.72 NMAC | Construction Permits | Yes | Facility | The Artesia Refinery is subject to 20.2.72 NMAC and NSR Permit number: PSD-NM-0195-M39R4. |
| 20.2.73 NMAC | NOI & Emissions Inventory Requirements | Yes | Facility | Notice of Intent (“NOI”): N/A.<br>All facilities that are a Title V Major Source as defined at 20.2.70.7.R NMAC, are subject to Emissions Inventory Reporting. |
| 20.2.74 NMAC | Permits – Prevention of Significant Deterioration (PSD) | Yes | Units | Per 20.2.74.7.AG(1) NMAC, the Artesia Refinery is a major stationary source as it is a stationary source listed in Table 1 (20.2.74.501 NMAC) which emits, or has the potential to emit, emissions equal to or greater than one hundred (100) tons per year of any regulated NSR air pollutant. Certain units at the Artesia Refinery are subject to PSD requirements in NSR Permit No. PSD-NM-0195-M39R4. |
| 20.2.75 NMAC | Construction Permit Fees | Yes | Facility | The Artesia Refinery is not subject to the 20.2.75.11.E annual fees because it is subject to 20.2.71 NMAC. |
| 20.2.77 NMAC | New Source Performance | Yes | See Tables 13-3 thru 13-12 | Tables 13-3 through 13-12, included at the end of this section. summarize 40 CFR Part 60 applicability for the Artesia Refinery NSPS affected facilities. |
| 20.2.78 NMAC | Emission Standards for HAPS | Yes | Facility | The Artesia Refinery is subject to 40 CFR 61, Subpart FF but is exempt from control requirements (40 CFR §§ 61.340(a) and 61.342(a)) |
| 20.2.79 NMAC | Permits – Nonattainment Areas | No | Facility | The Artesia Refinery is located in Eddy County, an area that is designated as unclassifiable or attainment with respect to all National Ambient Air Quality Standards. |
| 20.2.80 NMAC | Stack Heights | No | Facility | Rule restricts NMED, not stationary sources. |
| 20.2.82 NMAC | MACT Standards for source categories of HAPS | Yes | See Tables 13-3 thru 13-12 | Tables 13-3 through 13-12, included at the end of this section. summarize 40 CFR Part 63 applicability for the Artesia Refinery affected HAPs emission sources. |

**Table 13-2 - Federal Regulations**

| FEDERAL REGU-LATIONS CITATION | Title | Applies? Enter Yes or No | Unit(s) or Facility | JUSTIFICATION: |
|---|---|---|---|---|
| 40 CFR 50 | NAAQS | Yes | Facility | The Artesia Refinery is subject to 20.2.70, 20.2.72, and 20.2.74 NMAC. Per 20.2.70.7.E.11 |
| 40 CFR 60 Subpart A | General Provisions | Yes | See Tables 13-3 thru 13-12 | Tables 13-3 through 13-12, included at the end of this section. summarize 40 CFR Part 60 applicability for the Artesia Refinery NSPS affected facilities. |
| 40 CFR 60 Subpart D | Standards of Performance for Fossil-Fuel-Fired Steam Generators | No | N/A | The Artesia Refinery boilers design capacities are less than Subpart D applicability threshold of 250 MMBtu/hr, and the process heaters are not fossil-fuel-fired steam generating units, as the term is defined in 40 CFR § 60.41. |
| 40 CFR 60 Subpart Da | Standards of Performance for Electric Utility Steam Generating Units | No | N/A | The Artesia Refinery does not own or operate an electric utility steam generating unit, as the term is defined in 40 CFR §60.41Da. |
| 40 CFR 60 Subpart Db | Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units | Yes | See Table 13-3 | The Artesia Refinery boilers B-0007, B-0008, and B-0009 and hot oil heater H-2501 commenced construction after June 19, 1984, have design heat input capacities great than 100 MMBtu/hr (HHV), fire solely fuel gas, and are "*steam generating units*" as this term is defined in 40 CFR §60.41b. Subpart Db standards for PM and $SO_2$ are not applicable to refinery fuel gas firing units. |
| 40 CFR 60 Subpart Dc | Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units | Yes | See Table 13-3 | The SRU Hot Oil Heaters H-0464 and H-3101 each commenced construction after June 9, 1989, has design heat input capacity greater than 10 MMBtu/hr (HHV) and less than 100 MMBtu/hr (HHV), fires solely fuel gas, and is a "*steam generating unit*" as this term is defined in 40 CFR §60.41c. Subpart Dc standards for $SO_2$ and PM are not applicable to refinery fuel gas firing units. |
| 40 CFR 60 Subpart J | Standards of Performance for Petroleum Refineries | Yes | See Tables 13-3 and 13-5 | Tables 13-3 and 13-5, included at the end of this section. summarize 40 CFR Part 60, Subpart J applicability for potentially affected Artesia Refinery boilers, heaters, FCCU, and SRU2. |
| 40 CFR 60 Subpart Ja | Standards of Performance for Petroleum Refineries for which Construction, Reconstruction, or Modification Commenced After May 14, 2007 | Yes | See Tables 13-3, 13-4, 13-6 | Tables 13-3, 13-4, and 13-6, included at the end of this section. summarize 40 CFR Part 60, Subpart Ja applicability for potentially affected Artesia Refinery boilers, heaters, SRU3, and flares. |

| FEDERAL REGU-LATIONS CITATION | Title | Applies? Enter Yes or No | Unit(s) or Facility | JUSTIFICATION: |
|---|---|---|---|---|
| 40 CFR 60 Subpart K | Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978 | Yes | See Table 13-12 | Table 13-12, included at the end of this section, summarizes 40 CFR Part 60, Subpart K applicability for potentially affected Artesia Refinery storage tanks. |
| 40 CFR 60 Subpart Ka | Standards of Performance for Storage Vessels for Petroleum Liquids for which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and Prior to July 23, 1984 | Yes | See Table 13-12 | Table 13-12 included at the end of this section, summarizes 40 CFR Part 60, Subpart Ka applicability for potentially affected Artesia Refinery storage tanks. |
| 40 CFR 60 Subpart Kb | Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984 | Yes | See Table 13-12 | Table 13-12, included at the end of this section, summarizes 40 CFR Part 60, Subpart Kb applicability for potentially affected Artesia Refinery storage tanks. |
| 40 CFR 60 Subpart GG | Standards of Performance for Stationary Gas Turbines | No | N/A | The Artesia Refinery does not include stationary gas turbines. |
| 40 CFR 60 Subpart XX | Standards of Performance for Bulk Gasoline Terminals | No | See Table 13-10 | Table 13-10, included at the end of this section, summarizes 40 CFR Part 60, Subpart XX applicability for potentially affected Artesia Refinery loading racks. |
| 40 CFR 60 Subpart GGG | Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for which Construction, Reconstruction, or Modification Commenced after January 4, 1983, and on or before November 7, 2006 | No | N/A | The Artesia Refinery affected facilities were constructed, reconstructed, or modified after November 7, 2006, and are therefore subject to 40 CFR 60, Subpart GGGa, rather than Subpart GGG. |

| FEDERAL REGU-LATIONS CITATION | Title | Applies? Enter Yes or No | Unit(s) or Facility | JUSTIFICATION: |
|---|---|---|---|---|
| 40 CFR 60 Subpart GGGa | Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for Which Construction, Reconstruction, or Modification Commenced after November 7, 2006 | Yes | See Table 13-11 | Table 13-11, included at the end of this section, summarizes 40 CFR Part 60, Subpart GGGa applicability for the affected facilities in the Artesia Refinery. |
| 40 CFR 60 Subpart KKK | Standards of Performance for Equipment Leaks of VOC From Onshore Natural Gas Processing Plants for Which Construction, Reconstruction, or Modification Commenced After January 20, 1984, and on or Before August 23, 2011 | No | N/A | The Artesia Refinery is not a natural gas processing plant as this term is defined in 40 CFR § 60.631. |
| 40 CFR 60 Subpart LLL | Standards of Performance for $SO_2$ Emissions from Onshore Natural Gas Processing for Which Construction, Reconstruction, or Modification Commenced After January 20, 1984, and on or Before August 23, 2011 | No | N/A | The Artesia Refinery does not include any sweetening units as this term is defined in 40 CFR § 60.641. |
| 40 CFR 60 Subpart NNN | Standards of Performance for Volatile Organic Compound (VOC) Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations | Yes | W-623, | The depropanizer column in the Alkylation Unit is subject to this rule because it produces, among other things, propane as a product. (See, 40 CFR §§ 60.660(b) and 60.667.) |
| 40 CFR 60 Subpart QQQ | Standards of Performance for VOC Emissions from Petroleum Refinery Wastewater Systems | Yes | See Tables 13-9 and 13-11 | Tables 13-9 and 13-11, included at the end of this section, summarize 40 CFR Part 60, Subpart QQQ applicability for the affected facilities in the Artesia Refinery. |
| 40 CFR 60 Subpart RRR | Standards of Performance for Volatile Organic Compound (VOC) Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes | Yes | Alky Reactor | The reactor in the Alkylation Unit is subject to this rule because it produces, among other things, propane as a product. (See, 40 CFR §§ 60.700(b) and 60.707.) |

| FEDERAL REGU-LATIONS CITATION | Title | Applies? Enter Yes or No | Unit(s) or Facility | JUSTIFICATION: |
|---|---|---|---|---|
| 40 CFR 60 Subpart IIII | Standards of performance for Stationary Compression Ignition Internal Combustion Engines | Yes | See Table 13-7 | Table 13-7 included at the end of this section, summarizes 40 CFR Part 60, Subpart IIII applicability for the Artesia Refinery stationary compression ignition ("CI") internal combustion engines ("ICE.") |
| 40 CFR 60 Subpart JJJJ | Standards of Performance for Stationary Spark Ignition Internal Combustion Engines | No | N/A | The Artesia Refinery does not own or operate any stationary spark ignition internal combustion engines. |
| 40 CFR 60 Subpart OOOO | Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution for which construction, modification or reconstruction commenced after August 23, 2011 and before September 18, 2015 | No | N/A | The Artesia Refinery is not in the Crude Oil and Natural Gas Production source category, as defined in §60.5430. |
| 40 CFR 60 Subpart OOOOa | Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015 | No | N/A | The Artesia Refinery is not in the Crude Oil and Natural Gas Production source category, as defined in §60.5430a. |
| 40 CFR 60 Subpart TTTT | Standards of Performance for Greenhouse Gas Emissions for Electric Generating Units | No | N/A | The Artesia Refinery does not own or operate any steam generating unit, IGCC, or stationary combustion turbine as these terms are defined in 40 CFR § 60.5580 that commenced construction after January 8, 2014 and have a base load rating greater than 250 MMBtu/hr of fossil fuel. |
| 40 CFR 60 Subpart UUUUa | Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units | No | N/A | Rule applies to NMED, not stationary sources. |
| 40 CFR 60 Subparts WWW, XXX, Cc, and Cf | Standards of performance for Municipal Solid Waste (MSW) Landfills | No | N/A | The Artesia Refinery is not a municipal solid waste landfill. |
| 40 CFR 61 Subpart A | General Provisions | Yes | Units Subject to 40 CFR 61 | Applies if any other Subpart in 40 CFR 61 applies. |
| 40 CFR 61 Subparts J & V | National Emission Standard for Equipment Leaks (Fugitive Emission Sources) of Benzene | No | N/A | The Artesia Refinery does not operate any piece of equipment in benzene service (i.e., fluid that is at least 10 percent benzene by weight) as this term is defined in 40 CFR § 61.111. |
| 40 CFR 61 Subpart M | National Emission Standard for Asbestos | Yes | Facility | The Artesia Refinery complies with the requirements of 40 CFR §61.145 as applicable. |

| FEDERAL REGU-LATIONS CITATION | Title | Applies? Enter Yes or No | Unit(s) or Facility | JUSTIFICATION: |
|---|---|---|---|---|
| 40 CFR 61 Subpart FF | National Emission Standard for Benzene Waste Operations | Yes | See Tables 13-9 and 13-12 | Tables 13-9 and 13-12, included at the end of this section. summarize 40 CFR Part 61, Subpart FF applicability for the Artesia Refinery storage tanks and wastewater emission sources. |
| MACT 40 CFR 63.1, Subpart A | General Provisions | Yes | Units Subject to 40 CFR 63 | Applies if any other Subpart in 40 CFR 63 applies. |
| NESHAP 40 CFR 63.400, Subpart Q | National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers | No | See Table 13-8 | The Artesia Refinery no longer owns or operates any industrial process cooling tower operated with chromium-based water treatment chemicals. |
| NESHAP 40 CFR 63.640, Subpart R | National Emission Standards for Gasoline Distribution Facilities (Bulk Gasoline Terminals and Pipeline Breakout Stations) | No | See Table 13-10 | Table 13-10, included at the end of this section, summarizes 40 CFR Part 63, Subpart R applicability for potentially affected Artesia Refinery loading rack. |
| NESHAP 40 CFR 63.640, Subpart CC | National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries | Yes | See Tables 13-3 through 13-12 | Tables 13-3 through 13-12, included at the end of this section. summarize 40 CFR Part 63, Subpart CC applicability for the Artesia Refinery NESHAP affected sources. |
| MACT 40 CFR 63.760 Subpart HH | **Oil and Natural Gas Production Facilities** | No | N/A | The Artesia Refinery is not an oil and natural gas production facility. |
| MACT 40 CFR 63.1270 Subpart HHH | National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities | No | N/A | The Artesia Refinery is not a natural gas transmission and storage facility. |
| MACT 40 CFR 63.1561 Subpart UUU | National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units | Yes | See Tables 13-4 and 13-5 | Tables 13-4 and 13-5, included at the end of this section. summarize 40 CFR Part 63, Subpart UUU applicability for the Artesia Refinery FCC regenerator, Continuous Catalyst Regenerator ("CCR"), and SRUs. |

| FEDERAL REGU-LATIONS CITATION | Title | Applies? Enter Yes or No | Unit(s) or Facility | JUSTIFICATION: |
|---|---|---|---|---|
| MACT<br>40 CFR 63.6580 Subpart ZZZZ | National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (**RICE MACT**) | Yes | See Table 13-7 | Table 13-7, included at the end of this section, summarizes 40 CFR Part 60, Subpart ZZZZ applicability for the Artesia Refinery stationary reciprocating internal combustion engines ("RICE.") |
| MACT<br>40 CFR 63.7485 Subpart DDDDD | National Emission Standards for Hazardous Air Pollutants for Major Industrial, Commercial, and Institutional Boilers & Process Heaters | Yes | See Table 13-3 | Table 13-3, included at the end of this section, summarizes 40 CFR Part 60, Subpart DDDDD applicability for the Artesia Refinery boilers and process heaters as defined in §63.7575. |
| 40 CFR 63 Subpart UUUUU | National Emission Standards for Hazardous Air Pollutants Coal & Oil Fire Electric Utility Steam Generating Unit | No | N/A | The Artesia Refinery does not own or operate a coal-fired electric generating unit ("EGU") or an oil-fired EGU as defined in §63.10042. |
| 40 CFR 63 Subpart BBBBBB | National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Distribution Bulk Terminals, Bulk Plants, and Pipeline Facilities | No | N/A | The Artesia Refinery is not an area source of HAPs. |
| 40 CFR 63 Subpart CCCCCC | National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities | No | N/A | The Artesia Refinery is not an area source of HAPs. |
| 40 CFR 64 | **Compliance Assurance Monitoring** | No | N/A | The Artesia Refinery FCC Regenerator and SRUs are subject to 40 CFR 63, Subpart UUU emission standards proposed after November 15, 1990, and are therefore exempt from the requirements of 40 CFR Part 64 per §64.2(b)(1)(i).<br><br>The Artesia Refinery fuels truck loading rack, TL-4, is subject to 40 CFR 63, Subpart CC emission standards proposed after November 15, 1990, and are therefore exempt from the requirements of 40 CFR Part 64 per §64.2(b)(1)(i). |
| 40 CFR 68 | **Chemical Accident Prevention** | Yes | Facility | The Artesia Refinery is a stationary source that processes more than the threshold quantity of a regulated substance, as determined under 40 CFR §68.115. |
| Title IV – Acid Rain 40 CFR 72.6 | **Acid Rain** | No | N/A | The Artesia Refinery does not generate commercial electric power or electric power for sale. |
| Title IV – Acid Rain 40 CFR 73.2 | **Sulfur Dioxide** Allowance Emissions | No | N/A | The Artesia Refinery does not generate commercial electric power or electric power for sale. |

| **FEDERAL REGU-LATIONS CITATION** | **Title** | **Applies? Enter Yes or No** | **Unit(s) or Facility** | **JUSTIFICATION:** |
|---|---|---|---|---|
| Title IV-Acid Rain 40 CFR 75.2 | **Continuous Emissions Monitoring** | No | N/A | The Artesia Refinery does not generate commercial electric power or electric power for sale. |
| Title IV – Acid Rain 40 CFR 76.1 | **Acid Rain** Nitrogen Oxides **Emission Reduction Program** | No | N/A | The Artesia Refinery does not generate commercial electric power or electric power for sale. |
| Title VI – 40 CFR 82 | Protection of **Stratospheric Ozone** | Yes | N/A | The Artesia Refinery maintains and services building air conditioning units that may contain affected refrigerants. Therefore, the Artesia Refinery is subject to Subpart F to Part 82, which regulates activities to maintaining, servicing, or repairing appliances containing class I, class II or non-exempt substitute refrigerants. |

## Table 13-3 Boilers and Heaters Summary of Applicable Regulations

| Unit ID | Description | NSPS D | NSPS Db | NSPS Dc | NSPS J [a] | NSPS Ja [b] | MACT DDDDD | 20.2.33.108 NMAC | 20.2.61 NMAC | CAM |
|---|---|---|---|---|---|---|---|---|---|---|
| B-0007 | Boiler 7 | NO | YES | NO | YES | NO | YES | YES | YES | NO |
| B-0008 | Boiler 8 | NO | YES | NO | YES | NO | YES | YES | YES | NO |
| B-0009 | Boiler 9 | NO | YES | NO | NO | YES [c] | YES | YES | YES | NO |
| H-0009 | Unit 13 Naphtha Splitter Reboiler | NO | NO | NO | YES | NO | YES | NO | YES | NO |
| H-0011 | Unit 21 Vacuum Unit Heater | NO | NO | NO | YES | NO | YES | NO | YES | NO |
| H-0018 | Unit 06 HDS Reboiler | NO | NO | NO | YES | NO | YES | NO | YES | NO |
| H-0019 | South Crude Charge Heater | NO | NO | NO | YES | NO | YES | NO | YES | NO |
| H-0020 | South Crude Charge Heater | NO | NO | NO | YES | NO | YES | NO | YES | NO |
| H-0028 | Unit 21 Heater H-28 | NO | NO | NO | YES | NO | YES | NO | YES | NO |
| H-0030 | Unit 06 Charge Heater | NO | NO | NO | YES | NO | YES | NO | YES | NO |
| H-0040 | Unit 13 Charge Heater | NO | NO | NO | YES | NO | YES | NO | YES | NO |
| H-0303 | Unit 05 Charge Heater | NO | NO | NO | YES | NO | YES | NO | YES | NO |
| H-0312 | Unit 10 FCC Feed Heater | NO | NO | NO | YES | NO | YES | NO | YES | NO |
| H-0352 | Unit 70 CCR Reformer Heater | NO | NO | NO | YES | NO | YES | NO | YES | NO |
| H-0353 | Unit 70 CCR Reformer Heater | NO | NO | NO | YES | NO | YES | NO | YES | NO |
| H-0354 | Unit 70 CCR Reformer Heater | NO | NO | NO | YES | NO | YES | NO | YES | NO |
| H-0355 | Unit 70 Stabilizer Reboiler Heater | NO | NO | NO | YES | NO | YES | NO | YES | NO |
| H-0362 | Unit 70 CCR Heater | NO | NO | NO | YES | NO | YES | NO | YES | NO |
| H-0363 | Unit 70 CCR Heater | NO | NO | NO | YES | NO | YES | NO | YES | NO |
| H-0364 | Unit 70 CCR Heater | NO | NO | NO | YES | NO | YES | NO | YES | NO |
| H-0421 | Unit 44 Charge Heater | NO | NO | NO | YES | NO | YES | NO | YES | NO |
| H-0464 | SRU Hot Oil Heater | NO | NO | YES | YES | NO | YES | NO | YES | NO |
| H-0473 | SRU2 Tail Gas Incinerator | NO | NO | NO | YES | NO | NO | NO | YES | NO |
| H-0600 | Unit 09 Depropanizer Reboiler Heater | NO | NO | NO | YES | NO | YES | NO | YES | NO |
| H-0601 | Unit 33 Charge Heater | NO | NO | NO | YES | NO | YES | NO | YES | NO |
| H-2421 | Unit 45 Charge Heater | NO | NO | NO | YES | NO | YES | NO | YES | NO |
| H-8801/ H-8802 | Unit 63 Hydrogen Plant Reformer | NO | NO | NO | YES | NO | YES | YES | YES | NO |
| H-3402 | Unit 34 Hydrocracker Reboiler 1 | NO | NO | NO | NO | YES | YES | NO | YES | NO |
| H-3403 | Hydrocracker Reactor Charge Heater | NO | NO | NO | NO | YES | YES | NO | YES | NO |
| H-5401 | Unit 54 HDS Reactor Heater | NO | NO | NO | NO | YES | YES | NO | YES | NO |
| H-9851 | Unit 64 Hydrogen Plant Reformer | NO | NO | NO | NO | YES | YES | YES | YES | NO |

| Unit ID | Description | NSPS D | NSPS Db | NSPS Dc | NSPS J [a] | NSPS Ja [b] | MACT DDDDD | 20.2.33.108 NMAC | 20.2.61 NMAC | CAM |
|---|---|---|---|---|---|---|---|---|---|---|
| H-2501 | Unit 25 ROSE® Unit No.2 Hot Oil Heater | NO | YES | NO | NO | YES [c] | YES | YES | YES | NO |
| H-3101 | SRU3 Hot Oil Heater | NO | NO | YES | NO | YES [d] | YES | NO | YES | NO |
| H-3103 | SRU3 Tail Gas Incinerator | NO | NO | NO | NO | YES | NO | NO | YES | NO |

a. For all fuel gas combustion devices that are affected facilities under NSPS subpart J, Navajo has elected to comply with the fuel gas $H_2S$ concentration standard under 40 CFR § 60.102a(g)(1)(ii) and associated monitoring, recordkeeping, and reporting requirements in NSPS subpart Ja, as provided by 40 CFR §§ 60.100(e) and 60.100a(b).

b. Except as noted, affected facilities under NSPS subpart Ja are process heaters subject to both the fuel gas $H_2S$ concentration standard under 40 CFR § 60.102a(g)(1)(ii) and, if applicable based on heat input capacity, emission standards for $NO_X$ under § 60.102a(g)(2).

c. Steam generating unit, not subject to $NO_X$ emission standards under NSPS subpart Ja pursuant to 40 CFR § 60.40b(c).

d. Steam generating unit, not subject to $NO_X$ emission standards under NSPS subpart Ja pursuant to 40 CFR § 60.40c(h).

## Table 13-4 SRU Summary of Applicable Regulations

| Source ID | Emission Point ID | Description | NSPS J | NSPS Ja | MACT UUU | 20.2.61 NMAC | 20.2.39 NMAC | CAM |
|---|---|---|---|---|---|---|---|---|
| SRU2 | H-0473 | SRU2 Tail Gas Incinerator | YES | NO | YES | YES | NO | YES<br>Satisfied by MACT UUU |
| SRU3 | H-3103 | SRU3 Tail Gas Incinerator | NO | YES | YES | YES | NO | YES<br>Satisfied by MACT UUU |

## Table 13-5 FCCU and CCR Summary of Applicable Regulations

| Unit ID | NSPS J | NSPS Ja | MACT UUU | CAM |
|---|---|---|---|---|
| FCCREGEN | YES | NO | YES | YES<br>Satisfied by MACT UUU |
| CCR | N/A | N/A | YES | NO |

## Table 13-6 Flares Summary of Applicable Regulations

| Unit ID | Description[a] | NSPS J | NSPS Ja | MACT CC | 20.2.61 NMAC |
|---|---|---|---|---|---|
| FL-400 | North Plant Flare | NO | YES | YES | YES |
| FL-401 | South Plant Flare | NO | YES | YES | YES |
| FL-402 | FCCU Flare | NO | YES | YES | YES |
| FL-403 | Alky Flare | NO | YES | YES | YES |
| FL-404 | GOHT Flare | NO | YES | YES | YES |
| FL-HEP-PORT | Portable Flare for Holly Energy Partners (HEP) Pipeline Pigging Operations | NO[b] | NO[b] | NO[c] | NO[d] |

a. FL-400 through FL-404 flares are steam assisted.

b. Flare is not in a petroleum refinery.

c. Flare is not used as a control device for any emission points listed in 40 CFR § 63.640(c).

d. Flare is portable, not stationary.

## Table 13-7 Engines Summary of Applicable Regulations

| Source ID | Description | NSPS IIII | NSPS JJJJ | MACT ZZZZ | 20.2.61.109 NMAC | CAM |
|---|---|---|---|---|---|---|
| MG-0001 | Portable Air Compressor | YES | NO | YES | YES | NO |
| MG-0002 | Portable Air Compressor | YES | NO | YES | YES | NO |
| MG-0003 | Portable Air Compressor | YES | NO | YES | YES | NO |
| MG-0004 | Portable Fire Water Pump Engine | YES | NO | YES | YES | NO |
| SG-0100 | UPS backup generator | NO | NO | YES | YES | NO |
| SG-0101 | UPS backup generator | NO | NO | YES | YES | NO |
| SG-0102 | Server Backup Generator | YES | NO | YES | YES | NO |
| FWG-0600 | Fire Water Pump Engine | YES | NO | YES | YES | NO |
| FWG-0601 | Fire Water Pump Engine | YES | NO | YES | YES | NO |
| FWG-0602 | Fire Water Pump Engine | YES | NO | YES | YES | NO |
| FWG-0603 | Fire Water Pump Engine | YES | NO | YES | YES | NO |

**Table 13-8 Cooling Towers Summary of Applicable Regulations**

| Cooling Tower | Description | MACT Q | MACT CC[a] | CAM |
|---|---|---|---|---|
| Y-0001 | TCC Cooling Tower | NO | YES | NO |
| Y-0002 | S. Alky Cooling Tower (Marley Cooling Tower) | NO | YES | NO |
| Y-0008 | North Alky Cooling Tower | NO | YES | NO |
| Y-0011 | FCC & NP Cooling Tower | NO | YES | NO |
| Y-0012 | Hydrogen Plants Cooling Tower | NO | YES | NO |
| CT TT-0006 | Unit 07 Amine W-0745 Cooling Tower | NO | NO | NO |

a For MACT CC, the “heat exchange system” is included in the existing affected source. “YES” indicates the listed cooling tower is part of a heat exchange systems that is part of the affected source.

**Table 13-9 Wastewater Units Summary of Applicable Regulations**

| Equipment ID | Emission Point ID | NESHAP FF | NSPS QQQ | MACT CC | CAM |
|---|---|---|---|---|---|
| Collector Sump | D-8000/D-8001 | YES | YES | YES | NO |
| T-0845 Weir Box | | | | | |
| T-0844 Stilling Well | | | | | |
| T-0846 Stormwater Lift Station (SWLS) | | | | | |
| T-0830 Stormwater Surge Tank | T-0830 | YES | YES | YES | NO |
| S-1/T-1 Barscreen and Junction Box | D-0829/0830 | YES | YES | YES | NO |
| API-894 | | | | | |
| API-895 | | | | | |
| Equalization T-801 | T-801 | YES | NO | YES | NO |
| Equalization T-836 | T-836 | YES | NO | YES | NO |
| Flocculator T-0805 | T-805 | YES | NO | YES | NO |
| DAF-896 | DAF-896/ 806 | YES | NO | YES | NO |
| DAF-806 | | | | | |
| Open Sump T-897 | T-0897 | YES | NO | YES | NO |
| Walnut Hull Filters D-810/811 and Mechanical Filter D-808/809 | D-810/811 D-808/809 | YES | NO | YES | NO |
| DAF Surge Tank T-809 | T-0809 | YES | NO | YES | NO |

## Table 13-10 Truck and Rail Loading Racks Summary of Applicable Regulations

| Unit ID | Description | NSPS XX | MACT R | MACT CC | CAM |
|---|---|---|---|---|---|
| TLO-1 | Asphalt Truck Loading and Off-Loading Rack #1 | NO | NO | NO | NO |
| TL-2 | Asphalt Truck Loading Rack #2 | NO | NO | NO | NO |
| TL-4 | Fuels Truck Loading Rack | NO* | NO** | YES | NO |
| TL-7 | CBO/LCO Truck Loading Rack | NO | NO | NO | NO |
| RLO-8 | Railcar Loading & Off-Loading | NO | NO | NO | NO |
| RLO-19 | Railcar Loading & Off-Loading | NO | NO | NO | NO |
| TLO-20 | Asphalt/Pitch Truck Loading | NO | NO | NO | NO |
| TRLO-9 | Molten Sulfur Truck/Railcar Loading | NO | NO | NO | NO |

*Compliance is not required pursuant to 40 CFR § 63.640(r).
**Compliance is not required pursuant to 40 CFR § 63.420(i).

## Table 13-11 Fugitives Summary of Applicable Regulations

| Title V Permit Unit ID | Description | MACT CC | NSPS GGGa | NSPS QQQ[a] | NESHAP J[b] | NESHAP V[c] |
|---|---|---|---|---|---|---|
| FUG-02-SP CRUDE | South Division Crude Unit | NO[d] | YES | YES | NO | NO |
| FUG-06-NHDU | Naphtha HDS Unit 06 | NO[d] | YES | YES | NO | NO |
| FUG-07-N AMINE | Amine Unit-Treating/Regen. | NO[d] | YES | YES | NO | NO |
| FUG-07-SWS1 | Sour Water Stripper | NO[d] | YES | YES | NO | NO |
| FUG-08-TRUCK RK | Loading Racks | NO[d] | YES | YES | NO | NO |
| FUG-09-N ALKY | North Alkylation Unit (New-Inside battery limits) | NO[d] | YES | YES | NO | NO |
| FUG-10-FCC | FCC w/CVS | NO[d] | YES | YES | NO | NO |
| FUG-13-NHDU | Naphtha HDS Unit 13 | NO[d] | YES | YES | NO | NO |
| FUG-18-LSR MEROX TRT | Merox/Merichem Treating Units | NO[d] | NO | YES | NO | NO |
| FUG-19-NAPH | Naphtha Merox | NO[d] | NO | YES | NO | NO |
| FUG-20-ISOM | BenFree Unit | NO[d] | YES | YES | NO | NO |
| FUG-21-SP VACUUM | Flasher/Vacuum Unit | NO[d] | YES | YES | NO | NO |
| FUG-25-ROSE-2 | ROSE Unit | NO[d] | YES | YES | NO | NO |

| Title V Permit Unit ID | Description | MACT CC | NSPS GGGa | NSPS QQQ[a] | NESHAP J[b] | NESHAP V[c] |
|---|---|---|---|---|---|---|
| FUG-29-BLENDER/TK FARM | Light Oil Tankage | NO[d] | YES | YES | NO | NO |
| FUG-30-SRU2/TGTU | SRU2/SWS w/CVS | NO[d] | YES | YES | NO | NO |
| FUG-31- SRU3/TGTU3/TGI3 | SRU3 Unit | NO[d] | YES | YES | NO | NO |
| FUG-33-DIST HDU | Relocated Diesel HDS Unit w/CVS | NO[d] | YES | YES | NO | NO |
| FUG-34- HYDROCRACKER | WX Hydrocracker | NO[d] | YES | YES | NO | NO |
| FUG-35-SAT GAS | Saturates Gas Plant | NO[d] | YES | YES | NO | NO |
| FUG-36-RO | Reverse Osmosis | NO | NO | YES | NO | NO |
| FUG-37-NP-UT | North Plant Utilities | NO | NO | YES | NO | NO |
| FUG-41-PBC | PBC Unit | NO[d] | YES | YES | NO | NO |
| FUG-43-S ALKY | South Alky Unit (W-76) | NO[d] | NO | YES | NO | NO |
| FUG-44-DIST-HDU | Gas Oil Hydrotreater (incl. CVS) | NO[d] | YES | YES | NO | NO |
| FUG-45-DIST-HDU | Gas Oil Hydrotreater (incl. CVS) | NO[d] | YES | YES | NO | NO |
| FUG-54-PRIMEG | Prime G Unit | NO[d] | YES | YES | NO | NO |
| FUG-63-H2 PLANT-1 | Hydrogen Plant | NO | YES | YES | NO | NO |
| FUG-64-H2 PLANT-2 | Hydrogen Plant | NO | YES | YES | NO | NO |
| FUG-70-CCR | CCR Reformer (w/in battery limits) | NO[d] | YES | YES | NO | NO |
| FUG-73-SP UTIL | Utilities | NO | NO | YES | NO | NO |
| FUG-80-WWTP CVS | Oil/Water Separator | NO[d] | YES | YES | NO | NO |
| FUG-LPG | LPG Storage System | NO[d] | YES | YES | NO | NO |

a. All wastewater sources are subject to NSPS QQQ (0195-M17(5)(J), December 15, 2004).
b. No refinery streams contain benzene at concentration of 10% wt or greater.
c. NESHAP V is only applicable if subject to NESHAP J.
d. Exempt from MACT CC pursuant to 40 CFR §63.640(p)(2)

## Table 13-12 Storage Tanks Summary of Applicable Regulations

| Tank No. | NSPS K | NSPS Ka | NSPS Kb | MACT CC Storage | MACT CC Wastewater | NESHAP FF | NSPS QQQ | 20.2.38.109 NMAC | 20.2.38.110 NMAC | 20.2.38.113 NMAC | CAM |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T-0001 | NO | NO | NO | NO | YES | YES | NO | NO | NO | NO | NO |
| T-0002 | NO | NO | NO | NO | YES | YES | NO | NO | NO | NO | NO |
| T-0003 | NO | NO | NO | NO | YES | YES | NO | NO | NO | NO | NO |
| T-0004 | NO | NO | NO | NO | YES | NO | NO | NO | NO | NO | NO |
| T-0011 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0012 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0020 | NO | NO | YES | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0021 | NO | NO | YES | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0022 | NO | NO | YES | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0023 | NO | NO | YES | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0026 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0028 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0031 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0040 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0041 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0042 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0045 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0046 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0049 | NO | NO | NO | YES | N/A | YES | YES | YES | YES | NO | NO |
| T-0055 | NO | YES | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0056 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0059 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0061 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0063 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0064 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0065 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0071 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0072 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0073 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0074 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0075 | NO | NO | YES | YES | N/A | N/A | N/A | NO | NO | NO | NO |

| Tank No. | NSPS K | NSPS Ka | NSPS Kb | MACT CC Storage | MACT CC Wastewater | NESHAP FF | NSPS QQQ | 20.2.38.109 NMAC | 20.2.38.110 NMAC | 20.2.38.113 NMAC | CAM |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T-0076 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0079 | NO | NO | YES | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0081 | NO | NO | NO | YES | N/A | N/A | N/A | YES | NO | NO | NO |
| T-0082 | NO | NO | NO | YES | N/A | N/A | N/A | YES | NO | NO | NO |
| T-0106 | NO | NO | NO | YES | N/A | N/A | N/A | YES | YES | NO | NO |
| T-0107 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0108 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0109 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0110 | NO | NO | NO | YES | N/A | N/A | N/A | YES | YES | NO | NO |
| T-0111 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0112 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0114 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0115 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0116 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0117 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0119 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0124 | NO | YES | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0400 | NO | YES | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0401 | NO | YES | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0402 | NO | YES | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0410 | NO | NO | NO | YES | N/A | N/A | N/A | YES | YES | NO | NO |
| T-0411 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0412 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0413 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0415 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0417 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0418 | NO | NO | YES | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0419 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0420 | NO | NO | NO | YES | N/A | N/A | N/A | YES | YES | NO | NO |
| T-0422 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0423 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0431 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0432 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |

| Tank No. | NSPS K | NSPS Ka | NSPS Kb | MACT CC Storage | MACT CC Wastewater | NESHAP FF | NSPS QQQ | 20.2.38.109 NMAC | 20.2.38.110 NMAC | 20.2.38.113 NMAC | CAM |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T-0433 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0434 | NO | YES | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0435 | NO | NO | YES | YES | N/A | N/A | N/A | YES | YES | YES | NO |
| T-0437 | YES | NO | NO | YES | N/A | N/A | N/A | YES | NO | NO | NO |
| T-0438 | NO | YES | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0439 | NO | YES | NO | YES | N/A | N/A | N/A | YES | YES | YES | NO |
| T-0446 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0447 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0448 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0449 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0450 | NO | NO | YES | YES | N/A | N/A | N/A | YES | NO | NO | NO |
| T-0451 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0452 | NO | NO | YES | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0453 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0460 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0465 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0466 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0467 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0468 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0600 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0737 | NO | NO | YES | YES | N/A | N/A | N/A | YES | YES | YES | NO |
| T-0802 | NO | NO | YES | YES | N/A | N/A | N/A | YES | YES | YES | NO |
| T-0803 | NO | NO | NO | NO | YES | YES | NO | NO | NO | NO | NO |
| T-0804 | NO | NO | NO | NO | YES | YES | NO | NO | NO | NO | NO |
| T-0807 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0809 | NO | NO | NO | NO | YES | YES | NO | NO | NO | NO | NO |
| T-0814 | NO | NO | NO | YES | N/A | N/A | N/A | YES | YES | YES | NO |
| T-0815 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0816 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0821 | NO | NO | YES | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0829 | NO | NO | NO | NO | YES | YES | NO | NO | NO | NO | NO |
| T-0834 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0835 | NO | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |

| Tank No. | NSPS K | NSPS Ka | NSPS Kb | MACT CC Storage | MACT CC Wastewater | NESHAP FF | NSPS QQQ | 20.2.38.109 NMAC | 20.2.38.110 NMAC | 20.2.38.113 NMAC | CAM |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T-0838 | YES | NO | NO | YES | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0839 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0840 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0841 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0891 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-0892 | NO | NO | NO | NO | N/A | N/A | N/A | NO | NO | NO | NO |
| T-1224 | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO |
| T-1225 | NO | NO | YES | YES | N/A | N/A | N/A | YES | NO | NO | NO |
| T-1227 | NO | NO | YES | YES | N/A | N/A | N/A | YES | YES | YES | NO |

# Section 14

## Operational Plan to Mitigate Emissions

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

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☐ **Title V Sources** (20.2.70 NMAC)**:** By checking this box and certifying this application the permittee certifies that it has developed an **Operational Plan to Mitigate Emissions During Startups, Shutdowns, and Emergencies** defining the measures to be taken to mitigate source emissions during startups, shutdowns, and emergencies as required by 20.2.70.300.D.5(f) and (g) NMAC. This plan shall be kept on site to be made available to the Department upon request. This plan should not be submitted with this application.

☒ **NSR** (20.2.72 NMAC)**, PSD** (20.2.74 NMAC) **& Nonattainment** (20.2.79 NMAC) **Sources:** By checking this box and certifying this application the permittee certifies that it has developed an **Operational Plan to Mitigate Source Emissions During Malfunction, Startup, or Shutdown** defining the measures to be taken to mitigate source emissions during malfunction, startup, or shutdown as required by 20.2.72.203.A.5 NMAC. This plan shall be kept on site to be made available to the Department upon request. This plan should not be submitted with this application.

☐ **Title V** (20.2.70 NMAC)**, NSR** (20.2.72 NMAC)**, PSD** (20.2.74 NMAC) **& Nonattainment** (20.2.79 NMAC) **Sources:** By checking this box and certifying this application the permittee certifies that it has established and implemented a Plan to Minimize Emissions During Routine or Predictable Startup, Shutdown, and Scheduled Maintenance through work practice standards and good air pollution control practices as required by 20.2.7.14.A and B NMAC. This plan shall be kept on site or at the nearest field office to be made available to the Department upon request. This plan should not be submitted with this application.

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Artesia Refinery's Standard Operating Procedures describe measures used to mitigate source excess emissions during startup, shutdown, or malfunction. The Artesia Refinery will comply with the startup, shutdown, and malfunction requirements in 40 CFR 63, Subparts CC and UUU and maintain records to demonstrate compliance. Changes proposed in this application will not affect the current procedures.

# Section 15

## Alternative Operating Scenarios

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

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**Alternative Operating Scenarios:** Provide all information required by the department to define alternative operating scenarios. This includes process, material and product changes; facility emissions information; air pollution control equipment requirements; any applicable requirements; monitoring, recordkeeping, and reporting requirements; and compliance certification requirements. Please ensure applicable Tables in this application are clearly marked to show alternative operating scenario.

**Construction Scenarios**: When a permit is modified authorizing new construction to an existing facility, NMED includes a condition to clearly address which permit condition(s) (from the previous permit and the new permit) govern during the interval between the date of issuance of the modification permit and the completion of construction of the modification(s). There are many possible variables that need to be addressed such as: Is simultaneous operation of the old and new units permitted and, if so for example, for how long and under what restraints? In general, these types of requirements will be addressed in Section A100 of the permit, but additional requirements may be added elsewhere. Look in A100 of our NSR and/or TV permit template for sample language dealing with these requirements. Find these permit templates at: www.env.nm.gov/air-quality/permitting-section-procedures-and-guidance/. Compliance with standards must be maintained during construction, which should not usually be a problem unless simultaneous operation of old and new equipment is requested.

In this section, under the bolded title "Construction Scenarios", specify any information necessary to write these conditions, such as: conservative-realistic estimated time for completion of construction of the various units, whether simultaneous operation of old and new units is being requested (and, if so, modeled), whether the old units will be removed or decommissioned, any PSD ramifications, any temporary limits requested during phased construction, whether any increase in emissions is being requested as SSM emissions or will instead be handled as a separate Construction Scenario (with corresponding emission limits and conditions, etc.

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This application is requesting an alternative operating scenario to control the vent streams of the Biodegradation Tanks T-0801 and T-0836 utilizing either activated sludge techniques, or thermal oxidation, depending on refinery operational need.

Additionally, this application is requesting to use tank T-0830 as an alternative tank for the service currently utilized in tank T-0801. Both tanks will be in service, however only one tank will utilize a thermal oxidizer being proposed in this application to control emissions.

Additional information on these operating scenarios is included in Sections 3, 6, and 7 of this application.

# Section 16

## Air Dispersion Modeling

1) Minor Source Construction (20.2.72 NMAC) and Prevention of Significant Deterioration (PSD) (20.2.74 NMAC) ambient impact analysis (modeling): Provide an ambient impact analysis as required at 20.2.72.203.A(4) and/or 20.2.74.303 NMAC and as outlined in the Air Quality Bureau's Dispersion Modeling Guidelines found on the Planning Section's modeling website. If air dispersion modeling has been waived for one or more pollutants, attach the AQB Modeling Section modeling waiver approval documentation.
2) SSM Modeling: Applicants must conduct dispersion modeling for the total short term emissions during routine or predictable startup, shutdown, or maintenance (SSM) using realistic worst case scenarios following guidance from the Air Quality Bureau's dispersion modeling section. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on SSM emissions modeling requirements.
3) Title V (20.2.70 NMAC) ambient impact analysis: Title V applications must specify the construction permit and/or Title V Permit number(s) for which air quality dispersion modeling was last approved. Facilities that have only a Title V permit, such as landfills and air curtain incinerators, are subject to the same modeling required for preconstruction permits required by 20.2.72 and 20.2.74 NMAC.

| **What is the purpose of this application?** | Enter an X for each purpose that applies |
|---|---|
| New PSD major source or PSD major modification (20.2.74 NMAC). See #1 above. | |
| New Minor Source or significant permit revision under 20.2.72 NMAC (20.2.72.219.D NMAC). See #1 above. **Note:** Neither modeling nor a modeling waiver is required for VOC emissions. | X |
| Reporting existing pollutants that were not previously reported. | |
| Reporting existing pollutants where the ambient impact is being addressed for the first time. | |
| Title V application (new, renewal, significant, or minor modification. 20.2.70 NMAC). See #3 above. | |
| Relocation (20.2.72.202.B.4 or 72.202.D.3.c NMAC) | |
| Minor Source Technical Permit Revision 20.2.72.219.B.1.d.vi NMAC for like-kind unit replacements. | |
| Other: i.e. SSM modeling. See #2 above. | |
| This application does not require modeling since this is a No Permit Required (NPR) application. | |
| This application does not require modeling since this is a Notice of Intent (NOI) application (20.2.73 NMAC). | |
| This application does not require modeling according to 20.2.70.7.E(11), 20.2.72.203.A(4), 20.2.74.303, 20.2.79.109.D NMAC and in accordance with the Air Quality Bureau's Modeling Guidelines. | |

**Check each box that applies:**

☐ See attached, approved modeling **waiver for all** pollutants from the facility.
☒ See attached, approved modeling **waiver for some** pollutants from the facility.
☐ Attached in Universal Application Form 4 (UA4) is a **modeling report for all** pollutants from the facility.
☒ Attached in UA4 is a **modeling report for some** pollutants from the facility.
☐ No modeling is required.

Air dispersion modeling has been conducted for pollutants with emission rates above the thresholds outlined in the Modeling Waiver form. A detailed modeling report and the modeling waiver form have been provided with this application. The modeling parameters and emission rates utilized in the modeling analysis are shown in the table below:

| Source ID | Source Description | UTM Coordinates | | Height (m) | Temperature (K) | Exit Velocity (m/s) | Diameter (m) | NOx (lb/hr) | PM (lb/hr) |
|---|---|---|---|---|---|---|---|---|---|
| | | Easting (m) | Northing (m) | | | | | | |
| T-836 TO | Thermal oxidizer for Tank 836 | 556764 | 3634869 | 3.87 | 1088.71 | 8.84 | 1.22 | 1.421 | 0.0765 |
| T-801/T-830 TO | Thermal oxidizer for Tanks 801 and 830 | 556740 | 3634813 | 3.87 | 1088.71 | 8.84 | 1.22 | 1.421 | 0.0765 |
| T-401 TO | Thermal oxidizer for Tanks 401 and 411 (Location 1 - Tank 401) | 557156 | 3634410 | 3.87 | 1088.71 | 8.84 | 1.22 | 1.421 | 0.0765 |
| T-411 TO | Thermal oxidizer for Tanks 401 and 411 (Location 2 - Tank 411) | 557054 | 3634212 | 3.87 | 1088.71 | 8.84 | 1.22 | 1.421 | 0.0765 |

# Universal Application 4

## Air Dispersion Modeling Report

Refer to and complete Section 16 of the Universal Application form (UA3) to assist your determination as to whether modeling is required. If, after filling out Section 16, you are still unsure if modeling is required, e-mail the completed Section 16 to the AQB Modeling Manager for assistance in making this determination. If modeling is required, a modeling protocol would be submitted and approved prior to an application submittal. The protocol should be emailed to the modeling manager. A protocol is recommended but optional for minor sources and is required for new PSD sources or PSD major modifications. Fill out and submit this portion of the Universal Application form (UA4), the "Air Dispersion Modeling Report", only if air dispersion modeling is required for this application submittal. This serves as your modeling report submittal and should contain all the information needed to describe the modeling. No other modeling report or modeling protocol should be submitted with this permit application.

| 16-A: Identification | | |
|---|---|---|
| 1 | Name of facility: | **Artesia Refinery** |
| 2 | Name of company: | **HF Sinclair Navajo Refining LLC** |
| 3 | Current Permit number: | **PSD-NM-0195-M40** |
| 4 | Name of applicant's modeler: | **Mark Gruber** |
| 5 | Phone number of modeler: | **(805) 764-6015** |
| 6 | E-mail of modeler: | **mgruber@algcorp.com** |

| 16-B: Brief | | | |
|---|---|---|---|
| 1 | Was a modeling protocol submitted and approved? | Yes☒ | No☐ |
| 2 | Why is the modeling being done? | **Adding New Equipment** | |
| 3 | Describe the permit changes relevant to the modeling. | | |
| | **Installation of three 10 MMBtu/hr thermal oxidizer to control emissions from 5 storage tanks.** | | |
| 4 | What geodetic datum was used in the modeling? | **NAD83** | |
| 5 | How long will the facility be at this location? | **No end date known** | |
| 6 | Is the facility a major source with respect to Prevention of Significant Deterioration (PSD)? | Yes☒ | No☐ |
| 7 | Identify the Air Quality Control Region (AQCR) in which the facility is located | **155** | |

| | | |
|---|---|---|
| 8 | List the PSD baseline dates for this region (minor or major, as appropriate). | |
| | NO2 | |
| | SO2 | |
| | PM10 | |
| | PM2.5 | |
| 9 | Provide the name and distance to Class I areas within 50 km of the facility (300 km for PSD permits). | |
| | **None within 50 km.** | |
| 10 | Is the facility located in a non-attainment area? If so describe below | Yes☐ No☒ |
| | | |
| 11 | Describe any special modeling requirements, such as streamline permit requirements. | |
| | | |

## 16-C: Modeling History of Facility

1 Describe the modeling history of the facility, including the air permit numbers, the pollutants modeled, the National Ambient Air Quality Standards (NAAQS), New Mexico AAQS (NMAAQS), and PSD increments modeled. (Do not include modeling waivers).

| Pollutant | Latest permit and modification number that modeled the pollutant facility-wide. | Date of Permit | Comments |
|---|---|---|---|
| **CO** | **n/a** | | |
| **$NO_2$** | **PSD-NM-0195-M40** | **1/24/2022** | **Cumulative analysis performed for 1-hr and annual NAAQS** |
| **$SO_2$** | **PSD-NM-0195-M40** | **1/24/2022** | **Cumulative analysis performed for 1-hr NAAQS, others were below SILs** |
| **$H_2S$** | **PSD-NM-0195-M40** | **1/24/2022** | **Cumulative analysis performed for 1-hr NAAQS** |
| **PM2.5** | **PSD-NM-0195-M40** | **1/24/2022** | **Cumulative analysis performed for 24-hr and annual NAAQS** |
| **PM10** | **n/a** | | |
| **Lead** | **n/a** | | |
| **Ozone (PSD only)** | **n/a** | | |
| **NM Toxic Air Pollutants (20.2.72.402 NMAC)** | **PSD-NM-0195-M40** | **1/24/2022** | **Cumulative analysis performed for toxics (8-hr H2SO4 and NH3)** |

## 16-D: Modeling performed for this application

1 For each pollutant, indicate the modeling performed and submitted with this application.
Choose the most complicated modeling applicable for that pollutant, i.e., culpability analysis assumes ROI and cumulative analysis were also performed.

| Pollutant | ROI | Cumulative analysis | Culpability analysis | Waiver approved | Pollutant not emitted or not changed. |
|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| | CO | ☐ | ☐ | ☐ | ☒ | ☐ |
| | $NO_2$ | ☐ | ☒ | ☐ | ☐ | ☐ |
| | $SO_2$ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | $H_2S$ | ☐ | ☐ | ☐ | ☐ | ☒ |
| | PM2.5 | ☒ | ☐ | ☐ | ☐ | ☐ |
| | PM10 | ☒ | ☐ | ☐ | ☐ | ☐ |
| | Lead | ☐ | ☐ | ☐ | ☐ | ☐ |
| | Ozone | ☐ | ☐ | ☐ | ☐ | ☐ |
| | State air toxic(s) (20.2.72.402 NMAC) | ☐ | ☐ | ☐ | ☒ | ☐ |

## 16-E: New Mexico toxic air pollutants modeling

| | |
|---|---|
| 1 | List any New Mexico toxic air pollutants (NMTAPs) from Tables A and B in 20.2.72.502 NMAC that are modeled for this application.<br>**N/A; all TAP emission rates below modeling thresholds.** |
| 2 | List any NMTAPs that are emitted but not modeled because stack height correction factor. Add additional rows to the table below, if required. |

| Pollutant | Emission Rate (pounds/hour) | Emission Rate Screening Level (pounds/hour) | Stack Height (meters) | Correction Factor | Emission Rate/ Correction Factor |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

## 16-F: Modeling options

| | | | |
|---|---|---|---|
| 1 | Was the latest version of AERMOD used with regulatory default options? If not explain below. | Yes☒ | No☐ |
| | | | |

## 16-G: Surrounding source modeling

| | | |
|---|---|---|
| 1 | Date of surrounding source retrieval | |
| 2 | If the surrounding source inventory provided by the Air Quality Bureau was believed to be inaccurate, describe how the sources modeled differ from the inventory provided. If changes to the surrounding source inventory were made, use the table below to describe them. Add rows as needed. | |

| AQB Source ID | Description of Corrections |
|---|---|
| | |
| | |

## 16-H: Building and structure downwash

| | | |
|---|---|---|
| 1 | How many buildings are present at the facility? | **62** |

| | | | | |
|---|---|---|---|---|
| 2 | How many above ground storage tanks are present at the facility? | **95+** | | |
| 3 | Was building downwash modeled for all buildings and tanks? If not explain why below. | | Yes☐ | No☒ |
| | **A small number of tanks that were too small or too far from the modeled sources to influence building downwash were not included in the BPIP-PRIME run.** | | | |
| 4 | Building comments | | | |

## 16-I: Receptors and modeled property boundary

| | | | |
|---|---|---|---|
| 1 | "Restricted Area" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with a steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be identified with signage only. Public roads cannot be part of a Restricted Area. A Restricted Area is required in order to exclude receptors from the facility property. If the facility does not have a Restricted Area, then receptors shall be placed within the property boundaries of the facility.<br><br>Describe the fence or other physical barrier at the facility that defines the restricted area. | | |
| | **Chain link fence with barbed wire** | | |
| 2 | Receptors must be placed along publicly accessible roads in the restricted area.<br>Are there public roads passing through the restricted area? | Yes☐ | No☒ |
| 3 | Are restricted area boundary coordinates included in the modeling files? | Yes☒ | No☐ |

4 Describe the receptor grids and their spacing. The table below may be used, adding rows as needed.

| Grid Type | Shape | Spacing | Start distance from restricted area or center of facility | End distance from restricted area or center of facility | Comments |
|---|---|---|---|---|---|
| **Cartesian** | **Fenceline following** | **25m** | **0m** | **100m** | |
| **Cartesian** | **Fenceline following** | **50m** | **100m** | **200m** | |
| **Cartesian** | **Fenceline following** | **100m** | **200m** | **1,000m** | |
| **Cartesian** | **Fenceline following** | **250m** | **1,000m** | **5,000m** | |
| **Cartesian** | **Rectangular** | **25m** | **5,000m** | **10,000m** | |

| | |
|---|---|
| 5 | Describe receptor spacing along the fence line. |
| | **25 meters** |
| 6 | Describe the PSD Class I area receptors. |
| | **N/A** |

## 16-J: Sensitive areas

| | | | |
|---|---|---|---|
| 1 | Are there schools or hospitals or other sensitive areas near the facility? If so describe below. This information is optional (and purposely undefined) but may help determine issues related to public notice. | Yes☒ | No☐ |
| | **Artesia General Hospital is ~1.1 km west of the western facility boundary. Several schools are less than 1 km from the facility; Roselawn Elementary School is the closest at ~0.25 km west of the western facility boundary.** | | |
| 3 | The modeling review process may need to be accelerated if there is a public hearing. Are there likely to be public comments opposing the permit application? | Yes☐ | No☐ |

## 16-K: Modeling Scenarios

| | | | |
|---|---|---|---|
| 1 | Identify, define, and describe all modeling scenarios. Examples of modeling scenarios include using different production rates, times of day, times of year, simultaneous or alternate operation of old and new equipment during transition periods, etc. Alternative operating scenarios should correspond to all parts of the Universal Application and should be fully described in Section 15 of the Universal Application (UA3). | | |
| | **Two scenarios were modeled since the location of one of the thermal oxidizers will vary as it will potentially be used in two locations. To address the multi-location scenario, two source groups were modeled, one with the two thermal oxidizers at their fixed locations plus the third thermal oxidizer at location 1, and the second with the two thermal oxidizers at their fixed locations plus the third thermal oxidizer at location 2.** | | |
| 2 | Which scenario produces the highest concentrations? Why? | | |
| | **The differences between the two scenarios were not significant.** | | |
| 3 | Were emission factor sets used to limit emission rates or hours of operation? (This question pertains to the "SEASON", "MONTH", "HROFDY" and related factor sets, not to the factors used for calculating the maximum emission rate.) | Yes☐ | No☒ |
| 4 | If so, describe factors for each group of sources. List the sources in each group before the factor table for that group. (Modify or duplicate table as necessary. It’s ok to put the table below section 16-K if it makes formatting easier.)<br>Sources: | | |

5

| Hour of Day | Factor | Hour of Day | Factor | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 13 | | | | | | | | | |
| 2 | | 14 | | | | | | | | | |
| 3 | | 15 | | | | | | | | | |
| 4 | | 16 | | | | | | | | | |
| 5 | | 17 | | | | | | | | | |
| 6 | | 18 | | | | | | | | | |
| 7 | | 19 | | | | | | | | | |
| 8 | | 20 | | | | | | | | | |
| 9 | | 21 | | | | | | | | | |
| 10 | | 22 | | | | | | | | | |
| 11 | | 23 | | | | | | | | | |
| 12 | | 24 | | | | | | | | | |

If hourly, variable emission rates were used that were not described above, describe them below.

| | | |
|---|---|---|
| Were different emission rates used for short-term and annual modeling? If so describe below. | Yes☐ | No☒ |

| | | | |
|---|---|---|---|
| 6 | | | |
| | | | |

## 16-L: $NO_2$ Modeling

| | | |
|---|---|---|
| 1 | Which types of $NO_2$ modeling were used?<br>Check all that apply. | |
| | ☐ | ARM2 |
| | ☒ | 100% $NO_X$ to $NO_2$ conversion **(Conservative assumption)** |
| | ☐ | PVMRM |
| | ☐ | OLM |
| | ☐ | Other: |
| 2 | Describe the $NO_2$ modeling. | |
| | **Modeled NOx emissions from three thermal oxidizers using maximum emission rates assuming 24/7 operation. Modeled two scenarios as described in Section K above.** | |

| | | | |
|---|---|---|---|
| 3 | Were default $NO_2/NO_X$ ratios (0.5 minimum, 0.9 maximum or equilibrium) used? If not describe and justify the ratios used below. | Yes☐ | No☒ |
| | **Used 100% NOx to $NO_2$ conversion** | | |
| 4 | Describe the design value used for each averaging period modeled. | | |
| | 1-hour: **High eighth high**<br>Annual: Other (Describe): **Highest annual average of 5 years.** | | |

## 16-M: Particulate Matter Modeling

| | | |
|---|---|---|
| 1 | Select the pollutants for which plume depletion modeling was used. | |
| | ☐ | PM2.5 |
| | ☐ | PM10 |
| | ☒ | None |
| 2 | Describe the particle size distributions used. Include the source of information. | |
| | | |

| | | | |
|---|---|---|---|
| 3 | Does the facility emit at least 40 tons per year of $NO_X$ or at least 40 tons per year of $SO_2$? Sources that emit at least 40 tons per year of $NO_X$ or at least 40 tons per year of $SO_2$ are considered to emit significant amounts of precursors and must account for secondary formation of PM2.5. | Yes☒ | No☐ |
| 4 | Was secondary PM modeled for PM2.5? | Yes☐ | No☒ |

| | | | | |
|---|---|---|---|---|
| 5 | If MERPs were used to account for secondary PM2.5 fill out the information below. If another method was used describe below. | | | |
| | $NO_X$ (ton/yr) | $SO_2$ (ton/yr) | $[PM2.5]_{annual}$ | $[PM2.5]_{24\text{-hour}}$ |
| | | | | |

| | |
|---|---|
| | |

## 16-N: Setback Distances

| | |
|---|---|
| 1 | Portable sources or sources that need flexibility in their site configuration requires that setback distances be determined between the emission sources and the restricted area boundary (e.g. fence line) for both the initial location and future locations. Describe the setback distances for the initial location. |
| | **The thermal oxidizers are technically portable, but will not be used in locations other than what was demonstrated in the modeling.** |
| 2 | Describe the requested, modeled, setback distances for future locations, if this permit is for a portable stationary source. Include a haul road in the relocation modeling. |
| | |

## 16-O: PSD Increment and Source IDs

| | | | | |
|---|---|---|---|---|
| 1 | The unit numbers in the Tables 2-A, 2-B, 2-C, 2-E, 2-F, and 2-I should match the ones in the modeling files. Do these match? If not, provide a cross-reference table between unit numbers if they do not match below. | | Yes☐ | No☐ |
| | Unit Number in UA-2 | Unit Number in Modeling Files | | |
| | | | | |
| | | | | |
| 2 | The emission rates in the Tables 2-E and 2-F should match the ones in the modeling files. Do these match? If not, explain why below. | | Yes☐ | No☐ |
| | | | | |
| 3 | Have the minor NSR exempt sources or Title V Insignificant Activities" (Table 2-B) sources been modeled? | | Yes☐ | No☐ |

| | | | | | |
|---|---|---|---|---|---|
| 4 | Which units consume increment for which pollutants? | | | | |
| | Unit ID | $NO_2$ | $SO_2$ | PM10 | PM2.5 |
| | | | | | |
| | | | | | |

| | | | | |
|---|---|---|---|---|
| 5 | PSD increment description for sources.<br>(for unusual cases, i.e., baseline unit expanded emissions after baseline date). | | | |
| 6 | Are all the actual installation dates included in Table 2A of the application form, as required? This is necessary to verify the accuracy of PSD increment modeling. If not please explain how increment consumption status is determined for the missing installation dates below. | | Yes☐ | No☐ |
| | | | | |

## 16-P: Flare Modeling

| | | | | |
|---|---|---|---|---|
| 1 | For each flare or flaring scenario, complete the following | | | |
| | Flare ID (and scenario) | Average Molecular Weight | Gross Heat Release (cal/s) | Effective Flare Diameter (m) |

| | | | | |
|---|---|---|---|---|
| | | | | |

## 16-Q: Volume and Related Sources

| | | | |
|---|---|---|---|
| 1 | Were the dimensions of volume sources different from standard dimensions in the Air Quality Bureau (AQB) Modeling Guidelines?<br><br>If not please explain how increment consumption status is determined for the missing installation dates below. | Yes☐ | No☐ |
| | **No volume sources were modeled.** | | |
| 2 | Describe the determination of sigma-Y and sigma-Z for fugitive sources. | | |
| | | | |
| 3 | Describe how the volume sources are related to unit numbers.<br>Or say they are the same. | | |
| | | | |
| 4 | Describe any open pits. | | |
| | | | |
| 5 | Describe emission units included in each open pit. | | |
| | | | |

## 16-R: Background Concentrations

| | | | |
|---|---|---|---|
| 1 | Were NMED provided background concentrations used? Identify the background station used below. If non-NMED provided background concentrations were used describe the data that was used. | Yes☒ | No☐ |
| | CO: Choose an item. | | |
| | $NO_2$: **Outside Carlsbad (350151005)** | | |
| | PM2.5: Choose an item. | | |
| | PM10: Choose an item. | | |
| | $SO_2$: Choose an item. | | |
| | Other: | | |
| | Comments: | | |
| 2 | Were background concentrations refined to monthly or hourly values? If so describe below. | Yes☐ | No☒ |
| | | | |

## 16-S: Meteorological Data

| | | | |
|---|---|---|---|
| 1 | Was NMED provided meteorological data used? If so select the station used.<br><br>**Artesia Municipal Airport** | Yes☒ | No☐ |
| 2 | If NMED provided meteorological data was not used describe the data set(s) used below. Discuss how missing data were handled, how stability class was determined, and how the data were processed. | | |
| | | | |

## 16-T: Terrain

| | | | |
|---|---|---|---|
| 1 | Was complex terrain used in the modeling? If not, describe why below. | Yes☒ | No☐ |
| | | | |
| 2 | What was the source of the terrain data? | | |
| | **USGS NED 1/3 second elevation data** | | |

## 16-U: Modeling Files

| | | | |
|---|---|---|---|
| 1 | Describe the modeling files: | | |
| | File name (or folder and file name) | Pollutant(s) | Purpose (ROI/SIA, cumulative, culpability analysis, other) |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

## 16-V: PSD New or Major Modification Applications

| | | | |
|---|---|---|---|
| 1 | A new PSD major source or a major modification to an existing PSD major source requires additional analysis.<br>Was preconstruction monitoring done (see 20.2.74.306 NMAC and PSD Preapplication Guidance on the AQB website)? | Yes☐ | No☐ |

| | | | |
|---|---|---|---|
| 2 | If not, did AQB approve an exemption from preconstruction monitoring? | Yes☐ | No☐ |
| 3 | Describe how preconstruction monitoring has been addressed or attach the approved preconstruction monitoring or monitoring exemption. | | |
| | | | |
| 4 | Describe the additional impacts analysis required at 20.2.74.304 NMAC. | | |
| | | | |
| 5 | If required, have ozone and secondary PM2.5 ambient impacts analyses been completed? If so describe below. | Yes☐ | No☐ |
| | | | |

## 16-W: Modeling Results

| | | | |
|---|---|---|---|
| 1 | If ambient standards are exceeded because of surrounding sources, a culpability analysis is required for the source to show that the contribution from this source is less than the significance levels for the specific pollutant. Was culpability analysis performed? If so describe below. | Yes☐ | No☒ |
| | | | |
| 2 | Identify the maximum concentrations from the modeling analysis. Rows may be modified, added and removed from the table below as necessary. | | |

| Pollutant, Time Period and Standard | Modeled Facility Concentration (µg/m3) | Modeled Concentration with Surrounding Sources (µg/m3) | Secondary PM (µg/m3) | Background Concentration (µg/m3) | Cumulative Concentration (µg/m3) | Value of Standard (µg/m3) | Percent of Standard | Location | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | UTM E (m) | UTM N (m) | Elevation (m) |
| $NO_2$ Annual | 1.3 | N/A | N/A | 9.3 | 10.6 | 94.0 | 11.3% | 556572 | 3635129 | 1025 |
| $NO_2$ 1-Hr | 30.9 | N/A | N/A | 54.5 | 85.4 | 188.0 | 45.4% | 557123 | 3634205 | 1026 |
| $PM_{10}$ Annual | 0.07 | N/A (below SIL) | N/A | N/A | N/A | N/A | N/A | 556572 | 3635129 | 1025 |
| $PM_{10}$ 24-Hr | 0.42 | N/A (below SIL) | N/A | N/A | N/A | 150 | 0.3% | 557150 | 3634200 | 1026 |
| $PM_{2.5}$ Annual | 0.07 | N/A (below SIL) | N/A | N/A | N/A | N/A | N/A | 556572 | 3635129 | 1025 |
| $PM_{2.5}$ 24-Hr | 0.42 | N/A (below SIL) | N/A | N/A | N/A | 150 | 0.3% | 557150 | 3634200 | 1026 |

| 16-X: Summary/conclusions | |
|---|---|
| 1 | A statement that modeling requirements have been satisfied and that the permit can be issued. |
| | |

| | | |
|---|---|---|
| New Mexico Environment Department<br>Air Quality Bureau<br>Modeling Section<br>525 Camino de Los Marquez - Suite 1<br>Santa Fe, NM 87505<br><br>Phone: (505) 476-4300<br>Fax: (505) 476-4375<br>www.env.nm.gov/air-quality/ | | **For Department use only:**<br><br>Approved by:<br><br>Date: |

**Air Dispersion Modeling Waiver Request Form**

This form must be completed and submitted with all air dispersion modeling waiver requests.

If an air permit application requires air dispersion modeling, in some cases the demonstration that ambient air quality standards and Prevention of Significant Deterioration (PSD) increments will not be violated can be satisfied with a discussion of previous modeling. The purpose of this form is to document and streamline requests to certify that previous modeling satisfies all or some of the current modeling requirements. The criteria for requesting and approving modeling waivers are found in the Air Quality Bureau Modeling Guidelines. Typically, only construction permit applications submitted per 20.2.72, 20.2.74, or 20.2.79 NMAC require air dispersion modeling. However, modeling is sometimes also required for a Title V permit application.

A waiver may be requested by e-mailing this completed form in **MS Word** format to the modeling manager, sufi.mustafa@env.nm.gov.

This modeling waiver is not valid if the emission rates in the application are higher than those listed in the approved waiver request.

**Section 1 and Table 1: Contact and facility information:**

| | |
|---|---|
| Contact name | Robert Dunaway |
| E-mail Address: | Rob.Dunaway@HFSinclair.com |
| Phone | 575-746-5281 |
| Facility Name | HF Sinclair Navajo Refining LLC – Artesia Refinery |
| Air Quality Permit Number(s) | PSD-195-M40 |
| Agency Interest Number (if known) | 198 |
| Latitude and longitude of facility (decimal degrees) | 32°50’33.6” W, 104°23’26.5” N |

**General Comments: (Add introductory remarks or comments here, including the purpose of and type of permit application.)**

Navajo is submitting this application for a Minor Permit Revision of Permit No. PSD-0195M40, in accordance with 20.2.72.219.D and 20.2.72.402 New Mexico Administrative Code ("NMAC"). This revision is being submitted to reflect operational changes at the refinery and to propose an alternate operating scenario for two sources.

Enhanced Biodegradation Tanks T-0801 and T-0836 are equipped with activated sludge to degrade organic compounds found in the wastewater stream. These tanks are aerated, providing oxygen to the activated sludge, and then vented to atmosphere. The activated sludge achieves 95% removal of organics. Hot temperatures caused reduced biological activity in the media, resulting in a reduction in VOC control. Navajo has installed two thermal oxidizers, one at each of the tanks, in order to collect and control organics being vented. These oxidizer systems have a performance guarantee of >99%, which meets or exceeds the control efficiency of the biodegradation units. Utilization of the thermal oxidizer systems will ensure continued compliance with the current emission limits of T-0801 and T-0836 in Table 106.I.

In addition to the use of a thermal oxidizer on tank T-0801, Navajo is requesting to authorize a change of service of tank T-0830 to serve as an alternative to tank T-0801. With this change, tank T-0830 will have an identical emissions profile to tank T-0801. The tanks will not operate simultaneously; only T-0801 or T-0830 will be in service with emissions routed to a thermal oxidizer at any given time.

Additionally, a new thermal oxidizer was installed to control Tanks 401 and 411 to reduce organic compound emissions. These tanks will not operate simultaneously; only T-401 or T-411 will be in service while controlled via thermal oxidizer at a given time.

Lastly, HF Sinclair is updating tank representations for Tanks 81 and 82 and conducting a change of service for Tank 81. The diameters of these tanks were inadvertently swapped and are being corrected in this project. Tank 81 will go through a change of service and will go from storing fuel oil to storing crude oil. To assist with this change of service, Tank 81 will be converted from a fixed roof tank to an internal floating roof tank.

Sources in this application that will be connected to thermal oxidizers currently have no control or achieve a 95% control. The addition of the thermal oxidizers will result in lower emissions for all sources in this application. The increases in emissions being modeled are associated with the fuel combustion for the thermal oxidizers. Tank 82 is being reduced in size, so emissions will be lowered for this tank. Emissions of toxics from the modified Tank 81 are below the limits outlined in NMAC 20.2.72.502. Navajo is requesting a modeling waiver for the pollutants that are not increasing in emissions beyond the small emission rate limits outlined in this document.

**Section 2 – List All Regulated Pollutants from the Entire Facility - Required**

In Table 2, below, list all regulated air pollutants emitted from your facility, except for New Mexico Toxic Air Pollutants, which are listed in Table 6 of this form. All pollutants emitted from the facility must be listed whether or not a modeling waiver is requested for that pollutant or if the pollutant emission rate is subject to the proposed permit changes.

**Table 2: Air Pollutant summary table (Check all that apply. Include all pollutants emitted by the facility):**

| Pollutant | Pollutant is not emitted at the facility and modeling or waiver are not required. | Pollutant does not increase in emission rate at any emission unit (based on levels currently in the permit) and stack parameters are unchanged. Modeling or waiver are not required. | Stack parameters or stack location has changed. | Pollutant is new to the permit, but already emitted at the facility. | Pollutant is increased at any emission unit (based on levels currently in the permit). | A modeling waiver is being requested for this pollutant. | Modeling for this pollutant will be included in the permit application. |
|---|---|---|---|---|---|---|---|
| CO | | | | | | X | |
| $NO_2$ | | | | | | | X |
| $SO_2$ | | X | | | | | |
| PM10 | | | | | | | X |
| PM2.5 | | | | | | | X |
| $H_2S$ | | X | | | | | |
| Reduced S | | X | | | | | |
| $O_3$ (PSD only) | | X | | | | | |
| Pb | X | | | | | | |

**Section 3: Pollutants, other than NMTAPs, with very small emission rates**

The Air Quality Bureau has performed generic modeling to demonstrate that small sources, as listed in Appendix 2 of this form, do not need computer modeling. This modeling compared emissions from a project (the increase in emissions from the previous permit or total facility emissions for a new facility) with significance levels. After comparing the project's emission rates for various pollutants to Appendix 2, list in Table 3 the pollutants that do not need to be modeled because of very small emission rates.

The facility must be at least 2 km from the nearest Class I area to qualify for a waiver due to very small emission rates. List the nearest Class I area and the distance from the facility in Section 3 comments.

Section 3 Comments. (If you are not requesting a waiver for any pollutants based on their low emission rate, then note that here. You do not need to complete the rest of Section 3 or Table 3.)
<Add comments here>

**Table 3: List of Pollutants with very small emission rates from the project**

| Pollutant | Requested Allowable Emission Rate for Project (pounds/hour) | Release Type (select "all from stacks >20 ft" or "other") | Waiver Threshold (from appendix 2) (lb/hr) |
|---|---|---|---|
| CO | 2.46 | Other | 2.58 |
| | | | |
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**Section 4: Pollutants that have previously been modeled at equal or higher emission rates**

List the pollutants and averaging periods in Table 4 for which you are requesting a modeling waiver based on previous modeling for this facility. The previous modeling reports that apply to the pollutant must be submitted with the modeling waiver request. Request previous modeling reports from the Modeling Section of the Air Quality Bureau if you do not have them and believe they exist in the AQB modeling file archive.

Section 4 Comments. (If you are not asking for a waiver based on previously modeled pollutants, note that here. You do not need to complete the rest of section 4 or table 4.)

**Navajo is not requesting a modeling waiver based on previously modeled pollutants.**

**Section 5: Modeling waiver using scaled emission rates and scaled concentrations**

At times it may be possible to scale the results of modeling one pollutant and apply that to another pollutant. Increases in emissions of one pollutant might also demonstrate compliance by applying a scaling factor to the modeling results. If the analysis for the waiver gets too complicated, then it becomes a modeling review rather than a modeling waiver, and applicable modeling fees will be charged for the modeling. Plume depletion, ozone chemical reaction modeling, post-processing, and unequal pollutant ratios from different sources are likely to invalidate scaling.

If you are not scaling previous results, note that here. You do not need to complete the rest of section 5. Scaling analyses are not intended to be used for previously modeled pollutants with decreasing emissions, which is already addressed in section 4.

**Navajo is not requesting a modeling waiver based on scaled emission rates and concentrations.**

**Section 6: New Mexico Toxic air pollutants – 20.2.72.400 NMAC**

Modeling must be provided for any New Mexico Toxic Air Pollutant (NMTAP) with a facility-wide controlled emission rate in excess of the pound per hour emission levels specified in Tables A and B at **20.2.72.502 NMAC** - Toxic Air Pollutants and Emissions. An applicant may use a stack height correction factor based on the release height of the stack for the purpose of determining whether modeling is required. See Table C - Stack Height Correction Factor at 20.2.72.502 NMAC. Divide the emission rate for each release point of a NMTAP by the correction factor for that release height and add the total values together to determine the total adjusted pound per hour emission rate for that NMTAP. If the total adjusted pound per hour emission rate is lower than the emission rate screening level found in Tables A and B, then modeling is not required.

In Table 6, below, list the total facility-wide emission rates for each New Mexico Toxic Air Pollutant emitted by the facility. The table is pre-populated with common examples. Extra rows may be added for NMTAPS not listed or for NMTAPS emitted from multiple stack heights. NMTAPS not emitted at the facility may be deleted, left blank, or noted as 0 emission rate. Toxics previously modeled may be addressed in Section 5 of this waiver form. For convenience, we have listed the stack height correction factors in Appendix 1 of this form.

Section 6 Comments. (If you are not requesting a waiver for any NMTAPs then note that here. You do not need to complete the rest of section 6 or Table 6.)

**There are no increases in NMTAP pollutants beyond the rates outlined in 20.2.72.502 in this project.**

**Table 6: New Mexico Toxic Air Pollutants emitted at the facility**

If requesting a waiver for any NMTAP, all NMTAPs from this facility must be listed in Table 3 regardless of if a modeling waiver is requested for that pollutant or if the pollutant emission rate is subject to the proposed permit changes.

| Pollutant | Requested Allowable Emission Rate (pounds/hour) | Release Height (Meters) | Correction Factor | Allowable Emission Rate Divided by Correction Factor | Emission Rate Screening Level (pounds/hour) |
|---|---|---|---|---|---|
| Dichlorobenzene | 3.5E-05 | 3.8 | 1 | 3.5E-05 | 20 |
| Antimony | 4.11E-05 | | 1 | 4.11E-05 | 0.03 |
| Cadmium | 2.88E-07 | | 1 | 2.88E-07 | 0.003 |
| Chromium | 5.72E-06 | | 1 | 5.72E-06 | 0.03 |
| Manganese | 6.38E-06 | | 1 | 6.38E-06 | 0.07 |
| Nickel | 1.80E-03 | | 1 | 1.80E-03 | 0.07 |
| Selenium | 6.90E-06 | | 1 | 6.90E-06 | 0.01 |

**Section 7: Approval or Disapproval of Modeling Waiver**

The AQB air dispersion modeler should list each pollutant for which the modeling waiver is approved, the reasons why, and any other relevant information. If not approved, this area may be used to document that decision.

<Add comments here>

**Appendix 1: Stack Height Release Correction Factor (adapted from 20.2.72.502 NMAC)**

| Release Height in Meters | Correction Factor |
|---|---|
| 0 to 9.9 | 1 |
| 10 to 19.9 | 5 |
| 20 to 29.9 | 19 |
| 30 to 39.9 | 41 |
| 40 to 49.9 | 71 |
| 50 to 59.9 | 108 |
| 60 to 69.9 | 152 |
| 70 to 79.9 | 202 |
| 80 to 89.9 | 255 |
| 90 to 99.9 | 317 |
| 100 to 109.9 | 378 |
| 110 to 119.9 | 451 |
| 120 to 129.9 | 533 |
| 130 to 139.9 | 617 |
| 140 to 149.9 | 690 |
| 150 to 159.9 | 781 |
| 160 to 169.9 | 837 |
| 170 to 179.9 | 902 |
| 180 to 189.9 | 1002 |
| 190 to 199.9 | 1066 |
| 200 or greater | 1161 |

**Appendix 2. Very small emission rate modeling waiver requirements (updated 7/27/2023)**
**Modeling is waived if emissions of a pollutant for the project are below the amount:**

| Pollutant | If all emissions come from stacks 20 feet or greater in height and there are no horizontal stacks or raincaps (lb/hr) | If not all emissions come from stacks 20 feet or greater in height, or there are horizontal stacks, raincaps, volume, or area sources (lb/hr) |
|---|---|---|
| CO | 16.037 | 2.580 |
| $H_2S$ (Pecos-Permian Basin) | 0.114 | 0.015 |
| $H_2S$ (Not in Pecos-Permian Basin) | 0.022 | 0.003 |
| Lead | 0.005 | 0.001 |
| $NO_2$ | 0.189 | 0.024 |
| PM2.5 – Point Sources | 0.056 | 0.009 |
| PM2.5 – Volume Sources | | 0.003 |
| PM10 – Point Sources | 0.255 | 0.039 |
| PM10 – Volume Sources | | 0.015 |
| $SO_2$ | 0.179 | 0.023 |
| Reduced sulfur (Pecos-Permian Basin) | 0.033 | No waiver |
| Reduced sulfur (Not in Pecos-Permian Basin) | No waiver | No waiver |

# Section 17

## Compliance Test History

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

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To show compliance with existing NSR permits conditions, you must submit a compliance test history.

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The sources in this application have not been required to conduct compliance testing.

# Section 20

## Other Relevant Information

**Other relevant information**. Use this attachment to clarify any part in the application that you think needs explaining. Reference the section, table, column, and/or field. Include any additional text, tables, calculations or clarifying information.

Additionally, the applicant may propose specific permit language for AQB consideration. In the case of a revision to an existing permit, the applicant should provide the old language and the new language in track changes format to highlight the proposed changes. If proposing language for a new facility or language for a new unit, submit the proposed operating condition(s), along with the associated monitoring, recordkeeping, and reporting conditions. In either case, please limit the proposed language to the affected portion of the permit.

None.

# Section 22: Certification

Company Name: HF Sinclair Navajo Refining, LLC ________________________

I, Travis Gibb, hereby certify that the information and data submitted in this application are true and as accurate as possible, to the best of my knowledge and professional expertise and experience.

Signed this ____ day of ______________, 2023, upon my oath or affirmation, before a notary of the State of New Mexico.

_________________________________ ____________________

*Signature Date

_________________________________ ____________________

Printed Name Title

Scribed and sworn before me on this ____ day of ____________________, ________.

My authorization as a notary of the State of ________________________ expires on the

______________ day of ___________________, ___________.

_________________________________ ____________________

Notary's Signature Date

_________________________________

Notary's Printed Name

*For Title V applications, the signature must be of the Responsible Official as defined in 20.2.70.7.AE NMAC