American Petroleum Institute

STEP Strategies for Today's Environmental Partnership

CORRELATION EQUATIONS TO PREDICT REID VAPOR PRESSURE AND PROPERTIES OF GASEOUS EMISSIONS FOR EXPLORATION AND PRODUCTION FACILITIES

HEALTH AND ENVIRONMENTAL SCIENCES DEPARTMENT
PUBLICATION NUMBER 4683
NOVEMBER 1998

American Petroleum Institute

STEP Strategies for Today's Environmental Partnership

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Correlation Equations to Predict Reid Vapor Pressure and Properties of Gaseous Emissions for Exploration and Production Facilities

Health and Environmental Sciences Department

API PUBLICATION NUMBER 4683

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ABSTRACT

Operators of petroleum storage tanks often need to prepare site-specific emission inventories to meet environmental regulations. Emission inventories can be quite complicated to prepare, and often necessitate laboratory analyses of oil and gas samples in order to quantify key variables such as Reid Vapor Pressure (RVP), gas molecular weights, hazardous air pollutant species (HAPs) distributions, and specific gravity of the separator gas. This report establishes simple techniques to estimate these variables in the absence of laboratory data. Analyses were performed of emissions measurements, oil and gas sampling results, and emissions modeling results for more than 100 crude oil exploration and production (E&P) storage tanks. In conclusion, correlation equations or statistical averages are recommended in order to estimate RVP, vented flash gas molecular weight, vented working and standing gas molecular weight, hydrocarbon speciation (including HAPs), and separator gas specific gravity.

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EXECUTIVE SUMMARY

It is necessary to estimate certain physico-chemical properties of oil and emitted gases in order to construct an emission inventory for a crude oil storage tank. These properties include (1) the Reid Vapor Pressure (RVP) of sales oil, (2) the molecular weights of gases emitted from flash processes and storage tanks, (3) the mole fractional contributions of hydrocarbons and hazardous air pollutants (HAPs) to gaseous emissions, and (4) the specific gravity of the separator gas. Laboratory analyses of oil and gas samples are necessary in order to determine the RVP and gas properties accurately. However, laboratory analyses are often costly or difficult to obtain. This report establishes simple techniques, such as correlation equations or statistical averages, to estimate these variables in the absence of laboratory data.

In this analysis, physico-chemical data and operational parameters for 103 crude oil exploration and production (E&P) storage tanks were examined. (American Petroleum Institute [API] provided data for the 103 tanks.) Linear regression analyses were performed in order to explore correlations of RVP and gas properties with easily measured or judged parameters, such as separator pressure (SP), separator temperature (ST), sales oil API gravity (APIG), and the fractional contribution of non-hydrocarbons to total emissions (%nonHC$_{TOT}$) (e.g., percent CO_2 plus H_2S by volume). Emission estimates based on these simple correlations were compared to estimates that were calculated with (1) the E&P TANK software package, (2) laboratory analyses of oil and gas samples, and (3) analyses of vent gases and directly measured flow rates. In conclusion, several correlation equations and statistical averages were recommended for use as explained below.

Reid Vapor Pressure (RVP).

If only the API gravity (APIG) of the sales oil is known:

$$RVP = -1.699 + 0.179\ APIG$$

(Equation ES-1)

If the APIG and the bubble point (BP) of the sales oil are both known:

$$RVP = -2.596 + 0.417\ BP + 0.119\ APIG$$

(Equation ES-2)

Molecular Weight of W&S Gas. An average value of 50 lb/lb-mole that was established by earlier research is recommended for continued use.

Molecular Weight of Flash Gas (MWT_F).

$$MWT_F = -0.351 - 0.013\ SP + 0.193\ ST + 0.453\ APIG + 0.360\ \%nonHC_{TOT}$$

(Equation ES-3)

Mole Fractional Contributions of Hydrocarbons and HAPs. Since many of the correlations developed for HAP speciation were weak or uncertain, the average speciation profiles are recommended for use (see Table ES-1).

Table ES-1. Average speciation profiles, mole percent.

Species	Flash Gas – Mean Mole Percent Contribution Percent of THC	W&S Gas – Mean Mole Percent Contribution Percent of THC
CH_4	41.00	22.36
C_2H_6	16.87	20.49
C_3H_8	18.35	28.00
i-C_4H_{10}	5.21	6.83
n-C_4H_{10}	8.67	10.92
i-C_5H_{12}	3.27	3.72
n-C_5H_{12}	2.77	3.17
Hexanes	1.15	1.30
Heptanes	1.07	1.26
Octanes	0.45	0.54
Nonanes	0.10	0.13
Benzene	0.14	0.18
Toluene	0.11	0.15
Ethylbenzene	0.00	0.01
Xylenes	0.03	0.04
n-Hexane	0.78	0.90
Pentanes+	0.00	0.00

Specific Gravity of the Separator Gas. The following equation is recommended to predict the specific gravity of the separator gas when laboratory results are unavailable.

$$\ln(SG_{SG}) = -0.476 - 0.102 \ln(SP) + 0.003\ ST + 0.008\ APIG + 0.011\ \%nonHC_{TOT}$$

(Equation ES-4)

Section 1
INTRODUCTION

Exploration and production (E&P) storage tanks are industrial sites constructed for the extraction and temporary storage of petroleum. Figure 1-1 illustrates operations and equipment at a typical E&P storage tank. Freshly extracted crude oil first enters a separator that removes water from the oil stream. Within the separator (1), volatile organic gases escape from the crude oil. Normally, a combustion device disposes of the separator gas. A pressure drop occurs across the flash valve (2) resulting in flash emissions. At some storage tanks, a blanket gas (3) joins the crude oil stream as it enters the storage tank. A temporary storage tank (4) contains the crude oil until sale and transfer.

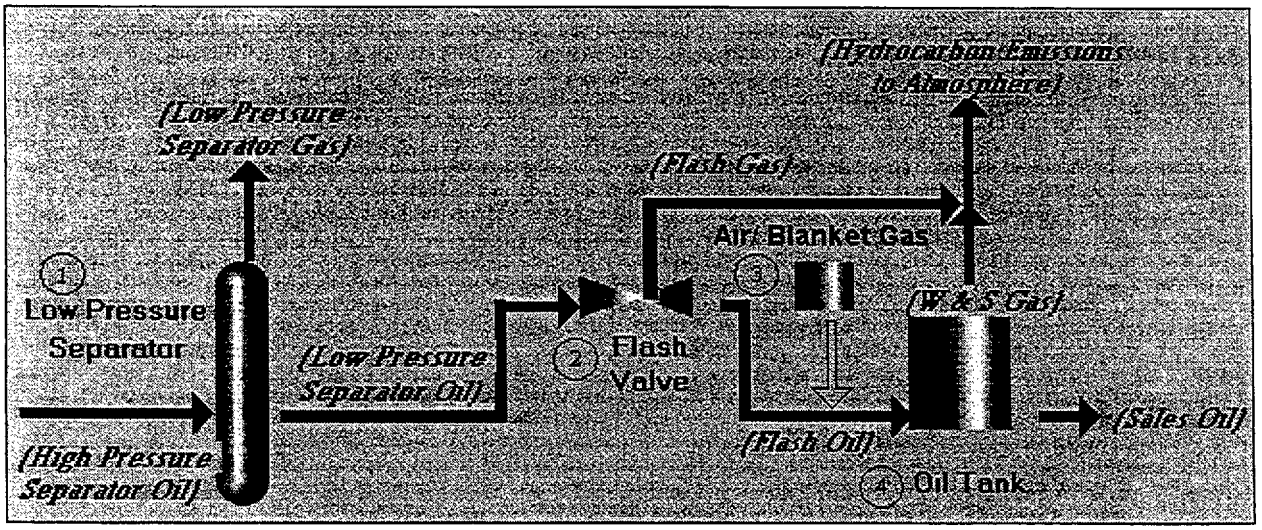


Figure 1-1. Illustration of crude oil extraction and storage processes at an exploration and production storage tank (American Petroleum Institute, 1997a).

The hydrocarbon emission inventory for an E&P storage tank includes working and standing (W&S) losses and flashing losses. W&S emissions arise from changes in the storage tank liquid level, in the atmospheric temperature, or in the barometric pressure that force gases out of the tank vapor space. Flash emissions result when a large pressure drop occurs and dissolved gases escape from the liquid oil stream, similar to the way that carbon dioxide escapes from an opened can of soda pop.

It is necessary to estimate certain physico-chemical properties of oil and emitted gases in order to construct an emission inventory for an E&P storage tank. These properties include (1) the Reid Vapor Pressure (RVP) of sales oil, (2) the molecular weights of gases emitted from flash processes and storage tanks, (3) the mole fractional contributions of hazardous air pollutants (HAPs) to gaseous emissions, and (4) the specific gravity of the separator gas. Laboratory analyses of oil and gas samples are necessary in order to determine the RVP and gas properties accurately. However, when laboratory results are unavailable, the use of default values allows rough estimation of emissions. These default values are constant, although the variables they represent are known to differ among storage tanks. The purpose of this analysis is to replace the default values with simple correlations that only require easily measured inputs. These correlations are intended to increase the accuracy of emission inventories for E&P storage tanks.

OVERVIEW OF THE VARIABLES AND THEORETICAL CONTEXT

The Reid Vapor Pressure (RVP) is a measure of the volatility of a petroleum product. Sales oil RVP is a key parameter needed to estimate W&S emissions from crude oil storage tanks because it is related to the quantity of hydrocarbon vapors present in the vapor headspace of the storage tank. When laboratory tests are unavailable, current practice calls for the use of a default value (RVP = 5 psia) in order to estimate W&S losses from crude oil storage tanks. Section 3 presents an analysis of RVP and an equation that may be used instead of the default value to predict RVP.

The average molecular weights of the hydrocarbon fractions of the W&S gas (MWT_{WS}) and of the flash gases (MWT_F) must be estimated in order to calculate W&S losses and flashing losses. In both cases, default values of 50 lb/lb-mol are currently used in the absence of laboratory analyses. The default value for MWT_{WS} was established by the American Petroleum Institute (API) through a significant research effort (American Petroleum Institute, 1991). The analysis described in this report addresses MWT_{WS} (Section 4) in order to compare results with API's previous research. A favorable comparison (1) confirms that the group of storage tanks analyzed in the report is similar and representative of API's previous research, and (2) enhances API's past research (American Petroleum Institute, 1991).

Due to a lack of available information, the current default value for MWT_F was selected somewhat arbitrarily. Given a basic understanding of E&P operations, it was recognized that the flash gases should consist of lighter compounds than the W&S gases. Therefore, the default value for MWT_{WS} (50 lb/lb-mol) was expected to represent an upper limit to MWT_F. The use of this default value for MWT_F tends to produce conservatively high estimates of flash emissions. Section 4 of this report presents an analysis of MWT_F and a correlation equation intended to replace the default value.

In order to estimate emissions of hazardous air pollutants from an E&P storage tank, it is necessary to estimate their contributions to the inventory as fractions of total hydrocarbon (THC) emissions. The U.S. EPA has established speciation profiles derived from source tests at E&P storage tanks (U.S. Environmental Protection Agency, 1990). The goal of this analysis is to provide an alternative means to estimate HAP mole fractions for emissions at E&P storage tanks (Section 5). The HAPs that are included in this discussion are benzene, ethylbenzene, hexane, toluene, and xylenes.

The RVP of sales oil and the compositions of gaseous emissions from an E&P storage tank depend upon the composition of the fresh crude extract and the storage tank's operational parameters. These relationships are highly complex. Freshly extracted crude petroleum is a multicomponent mixture containing inorganic compounds (H_2S and CO_2) and organic compounds (methane, ethane, and many hydrocarbons). Below, Treybal (1980) comments on the complexities involved with predicting the behaviors of multicomponent mixtures.

> *Many of the multicomponent systems of industrial importance can be considered nearly ideal... This is particularly true for hydrocarbon mixtures of the same homologous series... In such cases, Raoult's law, or its equivalent in terms of fugacities, can be applied and the gas phase equilibria calculated from the properties of the pure components. But it is generally unsafe to predict detailed behavior of a multicomponent system from consideration of the pure components alone, or even from a knowledge of the simple binary systems that may be formed from the components.*

In essence, Treybal's remarks indicate that it is difficult to successfully apply simple physical theories in order to predict the behavior of a multicomponent mixture (such as petroleum), even when the exact chemical composition of the mixture is known. An empirical approach is an alternative to theoretical predictions. For example, this analysis statistically investigates simple correlations among RVP, gaseous emissions, and parameters that are easily measurable at E&P storage tanks. Predictions that are based on such correlations are empirical in nature, rather than theoretical. A few assumptions are necessary in order to apply this empirical analysis, which covers a small data set, to a wider population. These assumptions include (1) that most fresh crude extracts are relatively similar in composition, and (2) that differences in their volatilities can be predicted by a few easily measured parameters (e.g., the API Gravity of the sales oil, the operating temperature and pressure of the separator, or others).

APPROACH

In this analysis, physico-chemical data and operational parameters for 103 E&P storage tanks were examined (Section 2). (Data for the 103 tanks were provided by the API.) Linear regression analyses were performed in order to explore correlations of RVP and gas properties (Sections 3 through 6) with other storage tank parameters. Emission estimates based on these simple correlations were compared to estimates that were calculated with (1) the E&P TANK software package, and (2) laboratory analyses of oil and gas samples (Section 7). In conclusion, correlation equations were recommended for use in the future (Section 8).

Section 2

REVIEW OF THE DATA

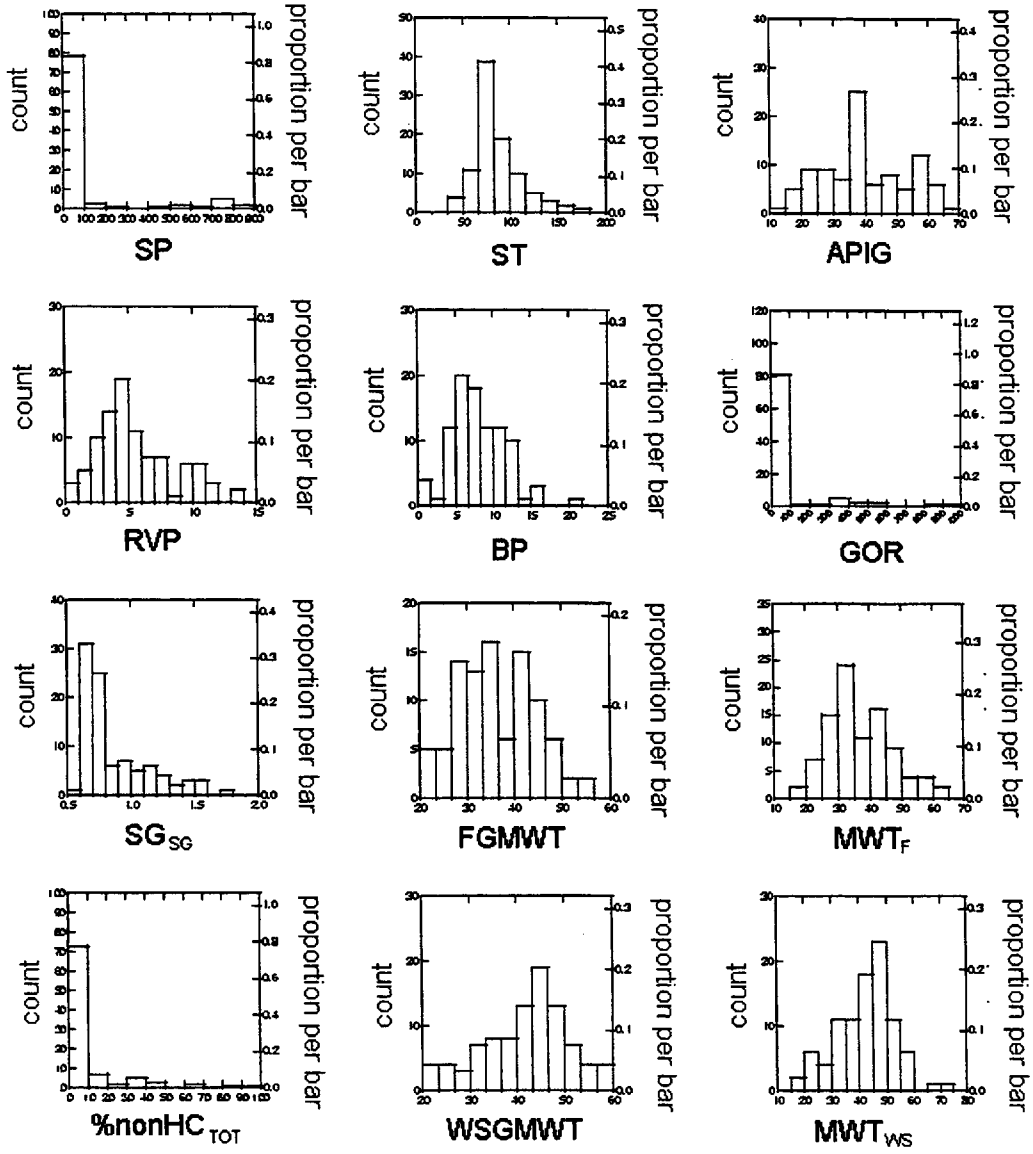
Initially, E&P TANK was used to model emissions and some physico-chemical parameters for all 103 E&P storage tanks. Upon review of the model output, the results were found to be unusual for 16 of the tanks (Table 2-1). Eight of these were excluded from the analysis because E&P TANK could not resolve some of the output parameters intended for use in this analysis (such as the flash gas or the W&S gas molecular weights). One appeared to be duplicated in the data set; only one of the repeated cases was retained. Ninety-four storage tanks remained in the data set for analysis.

Table 2-1. Results of an initial examination of E&P TANK model output for 103 E&P storage tanks.

Reason that results were unusual	Problem Resolution	Defining Tank Parameters			
		Separator Pressure (psig)	Separator Temperature (°F)	Sales Oil APIG (°API)	Sales Oil RVP (psia)
Model diverged.	Excluded.	8	154	23	0.2
Separator oil specific gravity was unrealistically low.	Re-ran E&P TANK with *AP-42* option and replaced the unusual specific gravity data.	42	110	39	5.4
		66	83	40	3
		60	60	44	10.1
		41	72	45	5.2
		40	76	47	10.6
		870	78	57	13.1
		110	72	59	10
No flash emissions.	Excluded.	17	106	20	3.3
No W&S emissions.	Excluded.	15	120	19	4.8
		280	106	30	4.8
		40	110	34	3.2
		95	118	42	8.1
		50	125	49	8.9
		170	75	68	12.5
Duplicate case.	Excluded repeated data.	60	58	39	6.8

Figure 2-1 illustrates the general properties of the data set encompassing the remaining 94 storage tanks. It is apparent that the data for the separator pressure (SP), specific gravity of the separator gas (SG_{SG}), gas-to-oil ratio (GOR), and mole fraction of non-hydrocarbons in the vent gas ($\%nonHC_{TOT}$) are skewed and are probably best modeled with lognormal distributions. The rest of the parameters generally appear to follow a normal distribution, or "bell curve".

Figure 2-2 is a scatter plot matrix of the same parameters illustrated in Figure 2-1. A scatter plot matrix is a visual tool that helps identify correlations among large numbers of variables. In Figure 2-2, several correlations are apparent (for example, sales oil RVP vs. APIG; ln(GOR) vs. sales oil APIG).



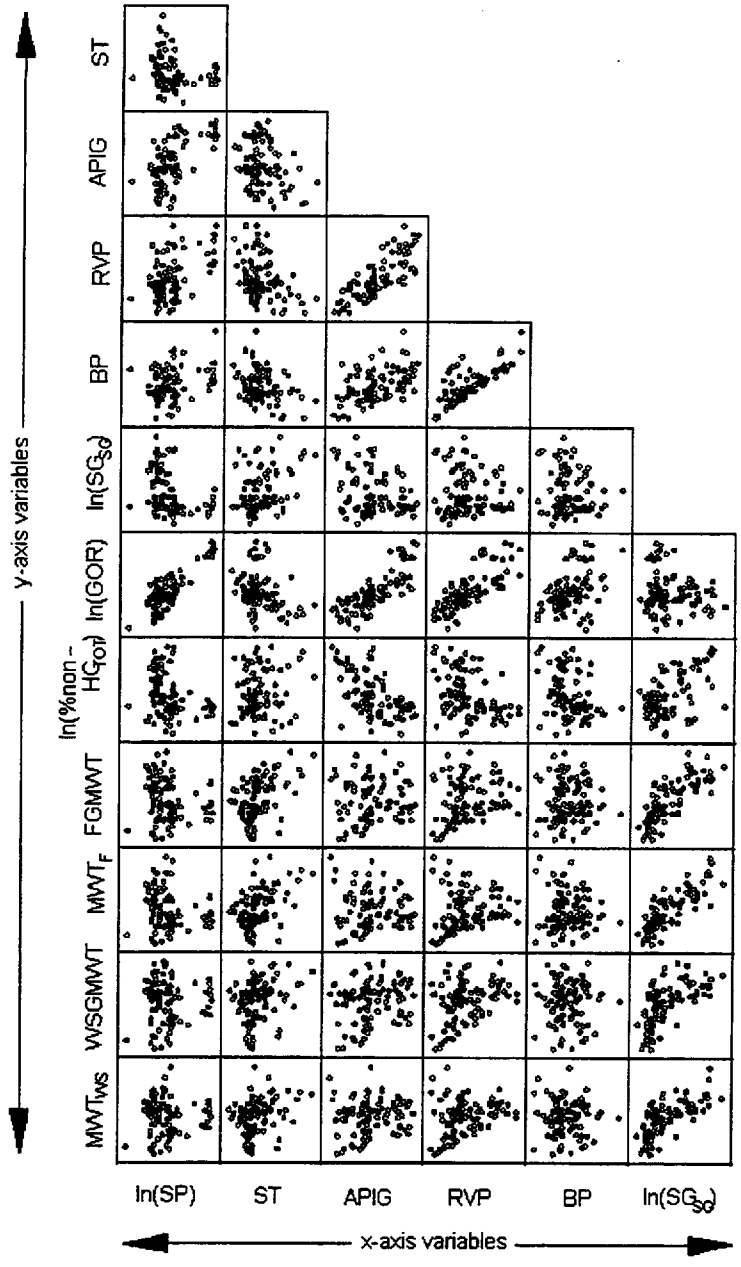
Measured Parameters

SP = Separator pressure (psig)
ST = Separator temperature (°Rankine)
APIG = Sales oil APIG (°API)
RVP = Sales oil RVP (psia)
BP = Sales oil bubble point (psia)
SG_{SG} = Specific gravity of the separator gas

Modeled Parameters

GOR = Gas-to-oil ratio of the sales oil (scf/bbl)
FGMWT = Flash gas total molecular weight (lb/lb-mol)
MWT_F = Molecular weight of the THC fraction of the flash gas (lb/lb-mol)
$\%nonHC_{TOT}$ = Sum mole fraction of the non-hydrocarbon species in the total vent gas (%); total vent gas = W&S gas + flash gas
WSGMWT = W&S gas total molecular weight (lb/lb-mol)
MWT_{WS} = Molecular weight of the THC fraction of the W&S gas (lb/lb-mol)

Figure 2-1. Frequency distributions of selected parameters for the 94-tank data set.



Measured Parameters

SP = Separator pressure (psig)
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MWT_{WS} = Molecular weight of the THC fraction of the W&S gas (lb/lb-mol)

Figure 2-2. Scatter plot matrix of selected parameters for the 94-tank data set. Each cell of the matrix is a scatter plot (x vs. y). y-Axis variables are on the left side of the matrix; x-axis variables are below. A scatter plot matrix is a visual aid to identify correlations; units of measure are unnecessary for this purpose.

Section 3
ANALYSIS OF REID VAPOR PRESSURE

The purpose of this section is to establish a correlation equation that predicts the sales oil RVP. Several measured parameters are discussed, including sales oil RVP, sales oil APIG, sales oil bubble point, separator temperature, and separator pressure.

UNDERLYING THEORY

RVP is a composite value of the vapor pressures exerted by individual components in a gas phase that is in equilibrium with a liquid mixture. For a simpler scenario, that of a pure liquid, the Antoine equation correlates pure substance vapor pressure (p*) with temperature (Felder and Rousseau, 1978).

$$\log_{10} p^* = A - B/(T + C)$$

(Equation 3-1)

A, B, and C are constants determined from a least squares fit of measured data. The RVP of a mixture may be estimated by combining the contributions of individual species to the total vapor pressure. This requires an assumption that species' individual contributions may be predicted from their behaviors as pure substances. This assumption often introduces a large degree of error.

$$RVP = \Sigma\ y_i\ 10^{[A - B/(T + C)]}$$

(Equation 3-2)

where y_i is the mole fraction of component *i* in the gas phase. A, B, and C are constants that are species dependent. Protocol calls for measurements of RVP to be reported at a constant temperature of 560° Rankine (°R); therefore, Equation 3-2 may be simplified as

$$RVP = \Sigma\ y_i\ a_i$$

(Equation 3-3)

where a_i is a species-specific constant defined by $10^{[A - B/(560°R + C)]}$. Equation 3-3 indicates that RVP is related to the mole fractions and species-specific constants of each gas phase component. Although Treybal (1980) cautions against models that treat mixtures as though they were analogous to pure substances, this equation (3-3) represents the best simplified theory currently available.

EXPECTED EMPIRICAL RELATIONSHIPS

Predictors of sales oil RVP are expected to directly relate to the volatility of the sales oil or the conditions of the storage tank (such as sales oil APIG and bubble point). (Measurements of separator pressure and temperature are collected in a vessel external to the sales oil tank, and therefore, are not expected to correlate well with the RVP of the sales oil.)

The bubble point pressure is defined as the pressure at which the first bubble of vapor will form in a liquid that is held in a closed container at a constant temperature. The bubble point pressure of the sales oil is very likely to correlate well with the RVP since (1) both variables represent a pressure measurement of the gas phase in equilibrium with the sales oil, and (2) the bubble point pressure represents the theoretical upper limit to RVP. Figure 3-1 illustrates the relationship between sales oil bubble point and RVP for 94 E&P storage tanks. The fact that none of the data points exceeds the 1:1 line (which would represent perfect agreement) illustrates that the bubble point is the upper limit for the RVP. The bubble point, however, was not considered to be a parameter that could be measured easily at an E&P storage tank. Therefore, it is recommended for use only as an optional input variable.

DESCRIPTIVE STATISTICS

Table 3-1 summarizes key descriptive statistics for the sales oil RVP, separator pressure and temperature, and sales oil APIG associated with the 94 E&P storage tanks considered in this analysis. (Note that the RVP and APIG data were measured at a fixed temperature of 100°F, even though the tank temperatures or ambient temperatures probably varied significantly.) Currently, API employs a default value (RVP = 5 psia) in order to estimate working and standing (W&S) losses from crude oil storage tanks. The goal of this analysis is to improve upon the default assumption.

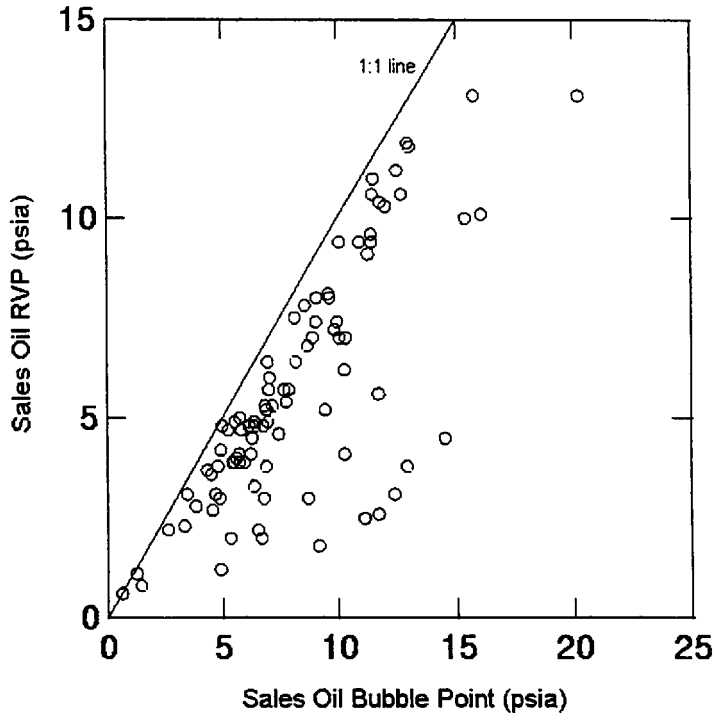


Figure 3-1. The relationship between RVP and bubble point observed at 94 E&P storage tanks. The bubble point is the upper limit to RVP.

Table 3-1. Descriptive statistics of variables used to predict RVP.

Statistic	RVP (psia @ 100°F)	SP* (psig)	ln(SP)**	ST (°F)	APIG (°API @ 100°F)
Minimum	0.60	4.0	1.39	40	15.0
Maximum	13.1	870	6.77	180	66.0
Mean	5.6	122	3.90	87	40.6
Standard Deviation	2.96	221	1.16	26	13.1

*Mean $= \frac{1}{n}\sum_{i=1}^{n} x_i$

**Mean $= \frac{1}{n}\sum_{i=1}^{n} \ln(x_i)$ Note: $\frac{1}{n}\sum_{i=1}^{n} \ln(x_i) \neq \ln\left(\frac{1}{n}\sum_{i=1}^{n} x_i\right)$

RVP = Reid Vapor Pressure (psia)
ST = Separator Temperature (°F)
SP = Separator Pressure (psia)
APIG = API Gravity (°API)

Table 3-2 summarizes Pearson correlation coefficients (r) calculated for the sales oil RVP relative to the other variables. Better correlations are indicated as |r| approaches 1. Table 3-2 shows that sales oil APIG is the best predictor of RVP. (Note that the sales oil bubble point is an equally good predictor, r = 0.78.)

Table 3-2. Single-parameter correlation coefficients for RVP.

Variable	Pearson Correlation With RVP
SP	0.52
ln(SP)	0.51
ST	-0.37
APIG	0.79

REGRESSION ANALYSIS

A multivariate linear regression was developed, represented by the equation shown below.

$$RVP = 0.003 + 0.075 \ln(SP) - 0.016 ST + 0.165 APIG$$

(Equation 3-4)

The correlation coefficient for Equation 3-4 (r = 0.80) is not significantly better than the single-parameter coefficient for sales oil APIG shown in Table 3-2. Therefore, the single-parameter fit based on sales oil APIG is recommended for use (see Figure 3-2).

$$RVP = -1.699 + 0.179 APIG$$

(Equation 3-5)

The error of the estimate (E) is one measure of the performance of a model or assumption, where the error equals the observed value (Obs) less the estimated value (Est), E = Obs - Est. In Figure 3-2, it is obvious that the error associated with the regression line is much less than the error associated with the default assumption, RVP = 5 psia.

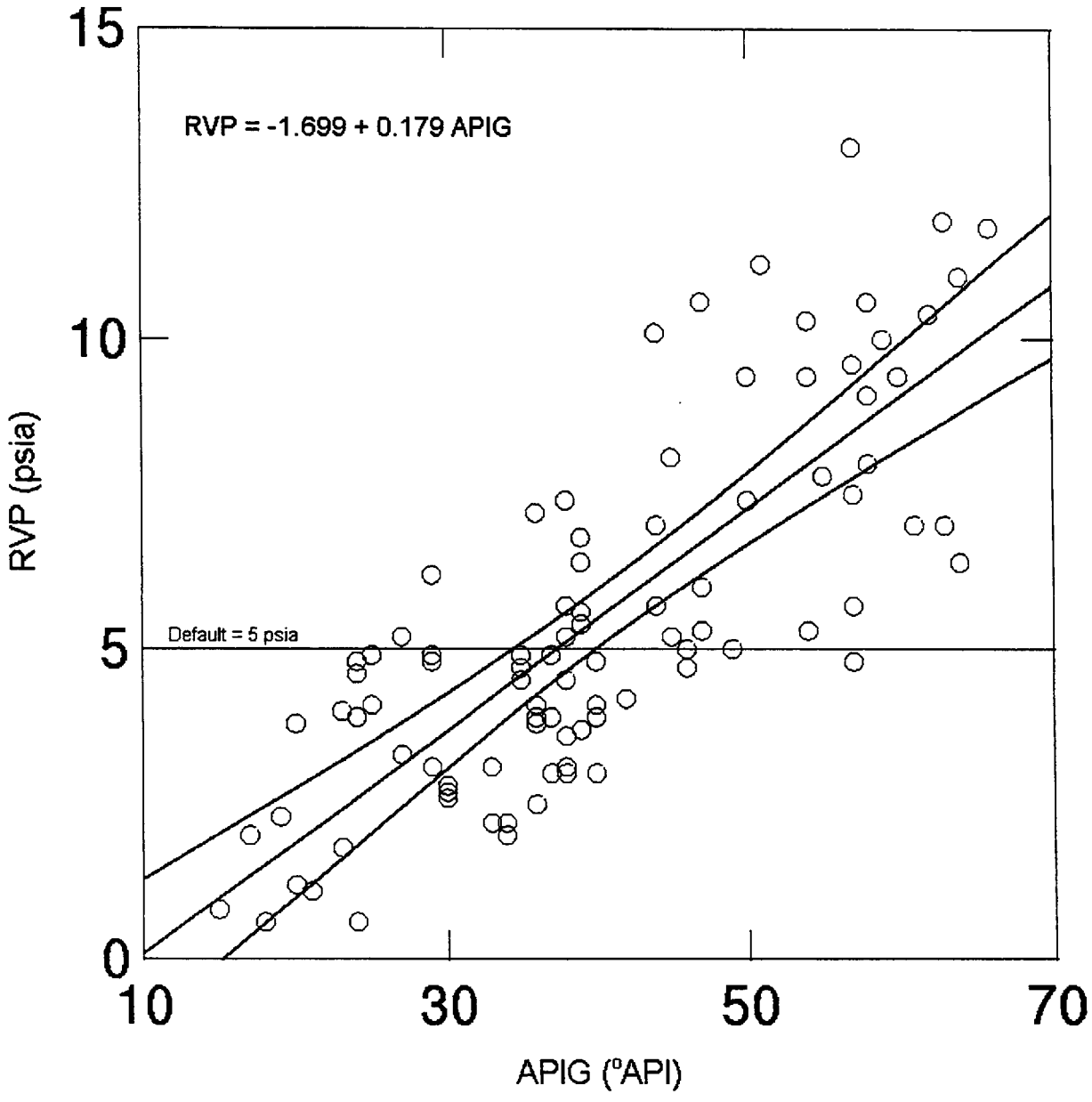


Figure 3-2. Illustration of a single-parameter regression between sales oil APIG (°API) and sales oil RVP (psia). The regression line is bounded by a 95 percent confidence interval. This regression represents a marked improvement over the default value of RVP = 5 psia.

For comparative purposes, a second multivariate linear regression was developed that considered the sales oil bubble point.

$$RVP = -2.596 + 0.417\,BP + 0.119\,APIG \quad \text{(Equation 3-6)}$$

The correlation coefficient for Equation 3-6 ($r = 0.90$) is significantly better than the single-parameter fit based on sales oil APIG. Therefore, the bubble point is a worthwhile parameter to measure in the field.

Section 4

ANALYSES OF GAS MOLECULAR WEIGHTS

The purpose of this section is to summarize an analysis performed to estimate the THC molecular weight during flashing emissions and W&S emissions. It is very important to note that the gaseous THC molecular weights analyzed in this section were not measured, but were modeled from the E&P TANK model, which is a complex thermodynamic model. Thus, the goal of this analysis was to produce a simpler model that estimates THC molecular weights and compares favorably with the E&P TANK model.

UNDERLYING THEORY AND EXPECTED PREDICTORS

For components closely similar in molecular structure (such as hydrocarbons) and at equilibrium, the compositions of the gas and liquid phases are related according to Raoult's Law (Equation 4-1).

$$y_a P \propto x_a p^*_a(T)$$

(Equation 4-1)

where y_a and x_a are the mole fractions of A in the gas and liquid phases, respectively. P is the pressure and $p^*_a(T)$ is the vapor pressure, which is a function of temperature, T. From Equation 4-1, the molecular weight of total hydrocarbons in the gas phase may be defined as shown in Equation 4-2.

$$MWT_{THC} = \Sigma y_i MWT_i / \Sigma y_i \propto (1/P) \Sigma x_i p^*_i(T) MW_i / \Sigma y_i$$

(Equation 4-2)

Equation 4-2 suggests two possible models to estimate the molecular weight of the total hydrocarbon (THC) fraction of the gas phase.

$$MWT_{THC} \propto (1/P) \Sigma x_i p^*_i(T) MW_i / \Sigma y_i \propto a + b\, f(T)/P$$

(Equation 4-3a)

$$MWT_{THC} = \Sigma y_i MWT_i / \Sigma y_i \propto \Sigma (a_i + b_i y_{methane}) / \Sigma y_i \propto a + b\, y_{methane}$$

(Equation 4-3b)

where a and b are constants determined from the best fit to the data; the symbol, $\propto$, denotes a modeling approximation.

Equation 4-3a approximates the molecular weight of hydrocarbons as the ratio of a temperature function to pressure. This model indicates that the separator temperature and pressure may be predictors of the THC molecular weight.

In Equation 4-3b, the mole fraction of methane ($y_{methane}$) was selected as a surrogate species to describe changes in the THC molecular weight. Methane is similar in molecular structure and flash point to other light-end hydrocarbons (such as ethane and propane), which comprise the bulk of the flash gas stream (on a molar basis). Thus, the amount of methane in fresh crude extract is expected to be a good predictor of the quantities of light-end hydrocarbons. Additionally, E&P site operators tend to be more familiar with methane contents of gas streams than other light-end hydrocarbons. Therefore, the mole fraction of methane ($y_{methane}$) was selected as the surrogate species best suited to predict the THC molecular weight.

As shown in Figure 4-1, the mole fraction (percent) of methane acts as a good linear predictor of THC molecular weights, and a weak linear predictor of the non-methane HC molecular weights predicted by E&P TANK. (Note that in Figure 4-1, the mole percent of methane represents a percentage of the entire flash gas phase, and not just the THC portion.)

DESCRIPTIVE STATISTICS

Table 4-1 lists the key descriptive statistics for the parameters discussed in this analysis. Note that the average molecular weights of THC in the flash gas and W&S gas are 37 lb/lb-mole and 42 lb/lb-mole, which are 25 percent and 15 percent less than the default values (50 lb/lb-mole for both). This finding suggests that the default value for the flash gas should at least be altered. The average molecular weight of the W&S gas agrees reasonably well with API's past research, but still suggests some difference. It is interesting to note that the average fractional contribution of non-hydrocarbons to the total vented gas is 10 percent (not 0 percent), and was modeled to be as high as 95 percent.

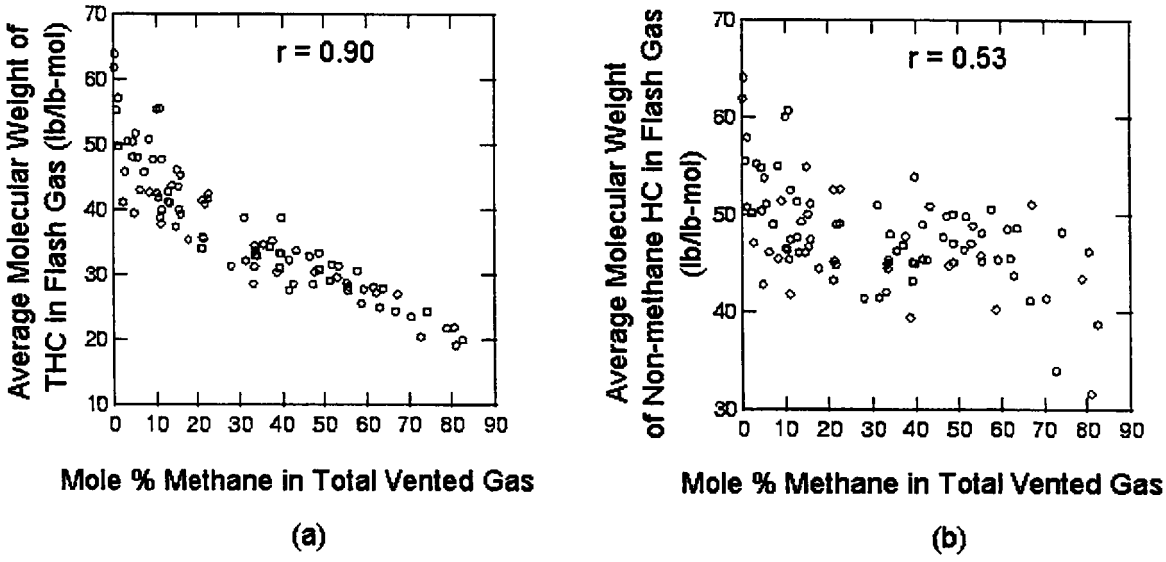


Figure 4-1. Relationships between the mole fraction of methane and flash gas molecular weights. (a) Average molecular weight of total hydrocarbons. (b) Average molecular weight of non-methane hydrocarbons.

Table 4-1. Descriptive statistics of variables used to predict gas molecular weights.

Statistic	MWT_{WS} (lb/lb-mole)	MWT_F (lb/lb-mole)	SP* (psig)	ln(SP)**	ST (°F)	APIG (°API @ 100°F)	$\%nonHC_{TOT}$* (%)	$\ln(\%nonHC_{TOT})$**
Min	19.0	19.1	4.0	1.39	40	15.0	0.0	-1.9
Max	72.4	63.9	870	6.77	180	66.0	95.3	4.6
Mean	42.2	36.8	122	3.90	87	40.6	9.8	1.0
SD	10.5	9.7	221	1.16	26	13.1	18.2	1.6

*Mean $= \frac{1}{n}\sum_{i=1}^{n} x_i$

**Mean $= \frac{1}{n}\sum_{i=1}^{n} \ln(x_i)$ Note: $\frac{1}{n}\sum_{i=1}^{n} \ln(x_i) \neq \ln\left(\frac{1}{n}\sum_{i=1}^{n} x_i\right)$

RVP = Reid Vapor Pressure (psia)
ST = Separator Temperature (°F)
SP = Separator Pressure (psia)
APIG = API Gravity (°API)
$\%nonHC_{TOT}$ = mole fraction of non-HC in total vented gas

Single-parameter correlation coefficients between the gas molecular weights (hydrocarbon) and separator pressure, temperature, API Gravity and mole percent non-hydrocarbons are summarized in Table 4-2. In both cases, the best predictors were the separator temperature (ST) and the mole fraction of non-hydrocarbons in the total[1] vented gas ($\%nonHC_{TOT}$). Separator pressure and sales oil APIG do not correlate well with the gas molecular weights.

Table 4-2. Single-parameter correlation coefficients for gas molecular weights.

Variable	Pearson Correlation with MWT_{WS}	Pearson Correlation with MWT_F
SP	0.044	-0.12
ln(SP)	0.019	-0.17
ST	0.29	0.45
APIG	0.12	-0.028
$\%nonHC_{TOT}$	0.41	0.54
$\ln(\%nonHC_{TOT})$	0.17	0.33

REGRESSION ANALYSIS

Several linear regressions were performed using only two or three of the variables listed in Table 4-1. However, the use of all four independent variables resulted in the best correlations. The following multivariate linear regressions (Equations 4-4 and 4-5), illustrated in Figures 4-2 and 4-3, are recommended for use.

$$MWT_{WS} = 7.737 - 0.007\ SP + 0.149\ ST + 0.468\ APIG + 0.338\ \%nonHC_{TOT} \quad \text{(Equation 4-4)}$$

$$MWT_F = -0.351 - 0.013\ SP + 0.193\ ST + 0.453\ APIG + 0.360\ \%nonHC_{TOT} \quad \text{(Equation 4-5)}$$

The correlation coefficients for Equations 4-4 and 4-5 are 0.64 and 0.79, which are better than any of the single-parameter correlation coefficients listed in Table 4-2. For the W&S gas, the standard error of the prediction is 8 lb/lb-mol, which is somewhat smaller than the standard deviation about the mean W&S gas molecular weight, 10.5 lb/lb-mol. Figure 4-4 illustrates the potential improvement over the original default assumption of 50 lb/lb-mol (a bias reduction of 8 lb/lb-mol and lesser variability about the observed value). For the flash gas, the standard error

[1] Total = W&S + Flash

of the prediction is 6.1 lb/lb-mol, which is smaller than the standard deviation about the mean flash gas molecular weight of 9.7 lb/lb-mol. Therefore, this method represents a superior way to predict flash gas molecular weight than a simple default assumption of 37 lb/lb-mol. Figure 4-5 illustrates the improvements gained over the original default assumption of 50 lb/lb-mol (a bias reduction of 13 lb/lb-mol and lesser variability about the observed value).

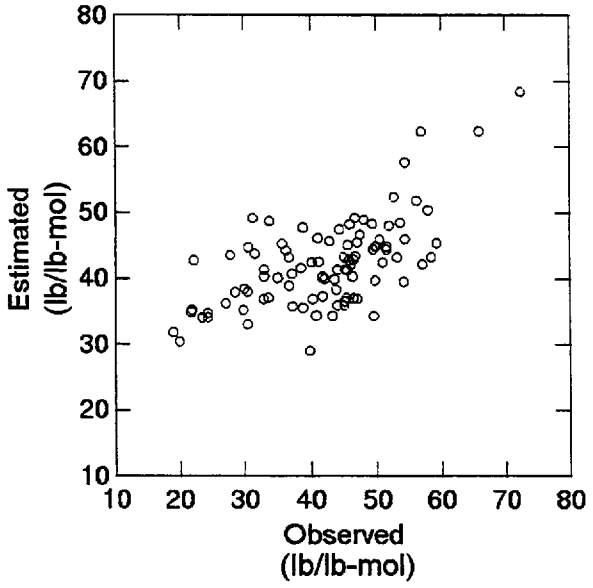


Figure 4-2. Performance of the recommended equation to predict W&S gas molecular weight (MWT_{WS}).

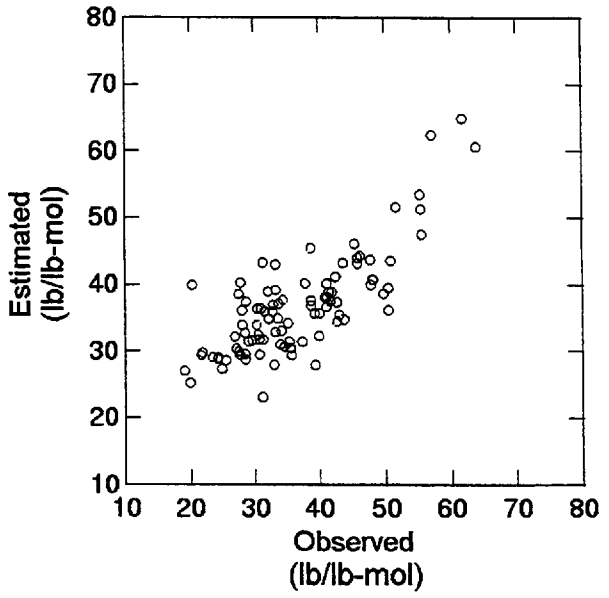


Figure 4-3. Performance of the recommended equation to predict flash gas molecular weight (MWT_F).

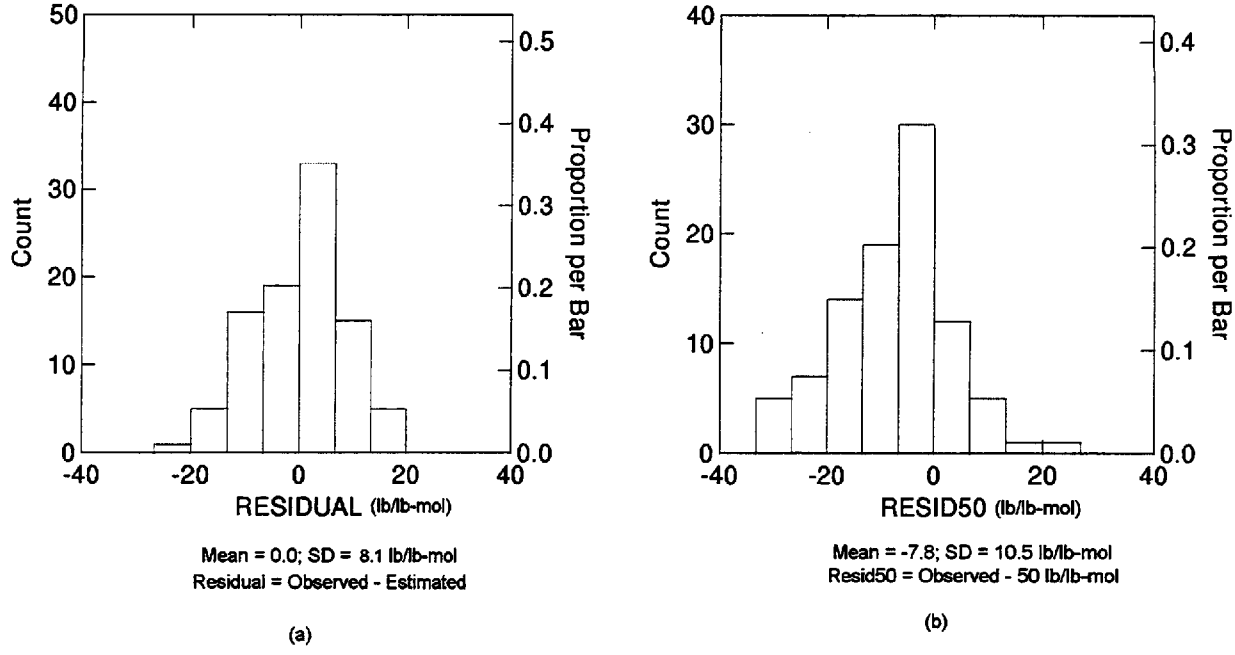


Figure 4-4. Improved performance in the error of the estimate for MWT_{WS}.
(a) Error associated with the recommended correlation equation.
(b) Error associated with a default assumption of 50 lb/lb-mol.

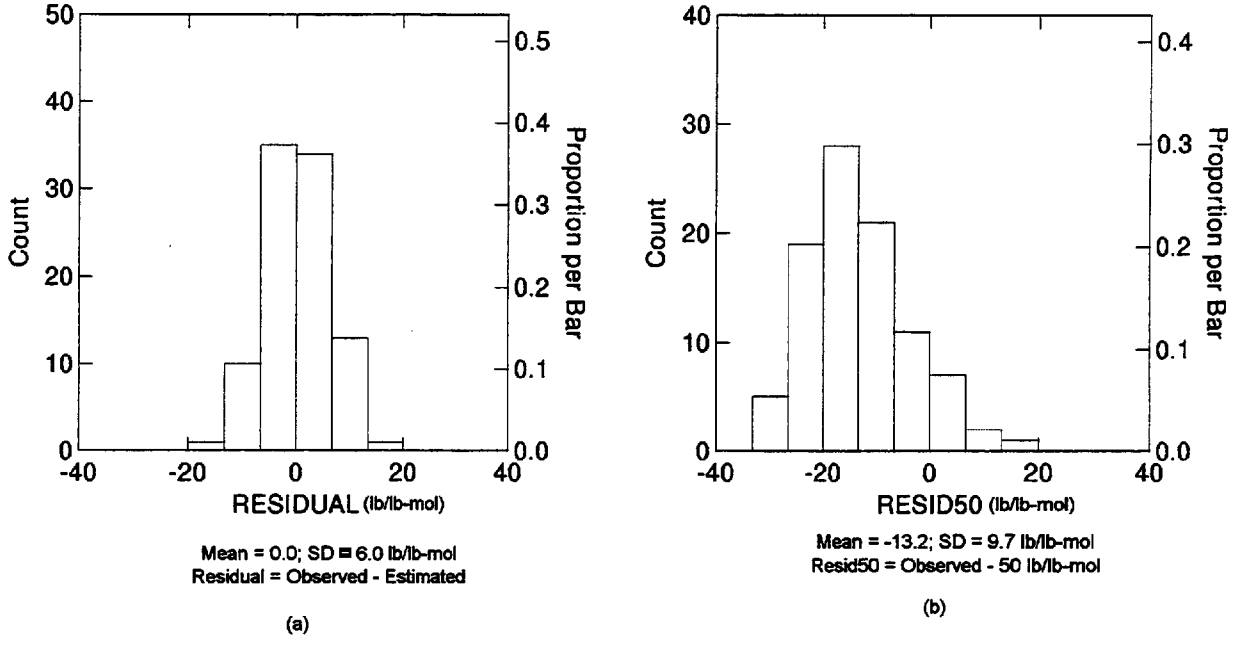


Figure 4-5. Improved performance in the error of the estimate for MWT_F.
(a) Error associated with the recommended correlation equation.
(b) Error associated with a default assumption of 50 lb/lb-mol.

Section 5

ANALYSES OF MOLE FRACTIONAL CONTRIBUTIONS OF HAZARDOUS AIR POLLUTANTS TO HYDROCARBON EMISSIONS

This section summarizes the results of analyses undertaken to predict the mole fractional contributions of HAPs to hydrocarbon emissions from E&P storage tanks. Similar to the previous section, it is important to note that the HAP mole fractions were modeled using the E&P TANK model. The goal of this analysis is to produce correlation equations and an average speciation profile that compare well with the model output.

The HAP mole fractions that were included in the original database of E&P TANK model output were normalized to reflect contributions to the THC fractions of the gas streams, as illustrated by the equation below.

$$\%HAP_{\text{as fraction of HC}} = \%HAP_{\text{as fraction of total gas stream}} \times \frac{100}{(100 - \%nonHC)}$$

(Equation 5-1)

where %nonHC represents the sum contribution of non-hydrocarbons to the gas stream (flash or W&S), including carbon dioxide (CO_2), hydrogen sulfide (H_2S), and nitrogen (N_2).

SUMMARY OF RESULTS

Tables 5-1 and 5-2 list the results of the correlation analyses, including the best single- and multiple-parameter correlation equations for each HAP. The data were stratified according to separator pressure in order to improve the correlations. Note that the group of high pressure storage tanks (SP ≥ 200 psig) numbered only 12, which is a fairly small sample size. Therefore, the correlations for the high pressure tanks are associated with a greater degree of uncertainty. Additionally, it should be noted that many of the reported correlations are weak and have small correlation coefficients. Predictions based on weaker correlations are also associated with a greater degree of uncertainty. In general, analyses of the flash gas resulted in stronger correlations.

Table 5-1. Flash gas analysis: correlations to predict molar contributions of HAPs to THC emissions.

Compound	Set of storage tanks Modeled	Best single-parameter model(s) and correlation coefficient(s)	Best multi-parameter model and correlation coefficient
Benzene	SP ≤ 200 psig ; n = 83	ln(%Benz) = - 8.44 + 1.60 ln(APIG) ; r = 0.39	ln(%Benz) = - 64 + 8.59 ln(ST+460) + 2.04 ln(APIG) ; r = 0.49
	SP > 200 psig ; n = 12	ln(%Benz) = - 81.7 + 12.6 ln(ST+460) ; r = 0.33	ln(%Benz) = - 134 + 0.92 %non-HC + 19.3 ln(ST+460) + 2.3 ln(APIG) - 0.0025 SP ; r = 0.67
Ethylbenzene	SP ≤ 200 psig ; n = 83	ln(%EBnz) = - 70.1 + 10.2 ln(ST+460) ; r = 0.47	ln(%EBnz) = - 90.6 + 0.025 %non-HC + 12.5 ln(ST+460) + 1.64 ln(APIG) ; r = 0.67
	SP > 200 psig ; n = 12	ln(%EBnz) = 0.0022 - 0.0013 %non-HC ; r = 0.83	ln(%EBnz) = 0.0117 - 0.0013 %non-HC - 1.74×10^{-5} ST ; r = 0.87
Hexane	SP ≤ 200 psig ; n = 83	%Hexane = - 13.9 + 0.028 (ST+460) ; r = 0.65 %Hexane =0.92 + 0.036 %non-HC ; r = 0.61	%Hexane = - 16.2 + 0.040 %non-HC + 0.029 (ST+460) + 0.037 APIG ; r = 0.89
	SP > 200 psig ; n = 12	%Hexane = 2.07 - 0.0018 SP ; r = 0.69	%Hexane = - 4.71 - 0.00194 SP + 0.0127 (ST+460) ; r = 0.77
Toluene	SP ≤ 200 psig ; n = 83	ln(%Tol) = - 62.4 + 9.45 ln(ST+460) ; r = 0.35	ln(%Tol) = - 103 + 0.019 %non-HC + 14.4 ln(ST+460) + 2.63 ln(APIG) ; r = 0.64
	SP > 200 psig ; n = 12	ln(%Tol) = 19.1 - 5.32 ln(APIG) ; r = 0.41	ln(%Tol) = - 22.7 + 0.84 %non-HC + 5.4 ln(ST+460) - 3.27 ln(APIG) - 0.0022 SP ; r = 0.55
Xylenes	SP ≤ 200 psig ; n = 83	ln(%Xyl) = - 88.9 + 13.5 ln(ST+460) ; r = 0.60	ln(%Xyl) = - 111 + 0.017 %non-HC + 16.7 ln(ST+460) + 0.055 ln(APIG) ; r = 0.78
	SP > 200 psig ; n = 12	ln(%Xyl) = - 0.80 - 0.37 %non-HC ; r = 0.65	ln(%Xyl) = 5.91 - 1.25 %non-HC - 2.38 ln(APIG) ; r = 0.69

APIG = API Gravity (°API)
ST = Separator Temperature (°F)
SP = Separator Pressure (psia)

Table 5-2. W&S gas analysis: correlations to predict molar contributions of HAPs to THC emissions.

Compound	Set of storage tanks Modeled	Best single-parameter model(s) and correlation coefficient(s)	Best multi-parameter model and correlation coefficient
Benzene	SP ≤ 200 psig ; n = 83	ln(%Benz) = - 9.2 + 1.8 ln(APIG) ; r = 0.42	ln(%Benz) = - 63.5 + 0.014 %non-HC + 8.1 ln(ST+460) + 2.67 ln(APIG) ; r = 0.52
	SP > 200 psig ; n = 12	ln(%Benz) = - 56.7 + 8.6 ln(ST+460) ; r = 0.25	ln(%Benz) = - 63.2 -0.0006 SP + 9.2 ln(ST+460) ; r = 0.29
Ethylbenzene	SP ≤ 200 psig ; n = 83	ln(%EBnz) = - 62.0 + 9.96 ln(ST+460) ; r = 0.38	ln(%EBnz) = - 92.2 + 0.034 %non-HC + 12.4 ln(ST+460) + 2.01 ln(APIG) + 0.23 ln(APIG) ; r = 0.67
	SP > 200 psig ; n = 12	%EBnz = 0.0203 - 3.51×10^{-5} (ST+460) ; r = 0.29	%EBnz = 0.034 - 0.001 %non-HC - 5.27×10^{-5} (ST+460)) - 8.54×10^{-5} APIG + 1.89×10^{-6} SP ; r = 0.40
Hexane	SP ≤ 200 psig ; n = 83	%Hexane = - 12.2 + 0.025 (ST+460) ; r = 0.51 %Hexane = 1.05 + 0.040 %non-HC ; r = 0.54	%Hexane = - 15.8 + 0.050 %non-HC + 0.027 (ST+460) + 0.053 APIG ; r = 0.79
	SP > 200 psig ; n = 12	%Hexane = 2.11 - 0.0015 SP ; r = 0.54	%Hexane = 5.8 - 0.0012 SP - 0.58 %non-HC - 0.044 APIG ; r = 0.69
Toluene	SP ≤ 200 psig ; n = 83	ln(%Tol) = - 8.4 + 1.59 ln(APIG) ; r = 0.37	ln(%Tol) = - 100 + 0.024 %non-HC + 13.7 ln(ST+460) + 3.00 ln(APIG) ; r = 0.63
	SP > 200 psig ; n = 12	ln(%Tol) = 15.8 - 4.43 ln(APIG) ; r = 0.37	ln(%Tol) = 8.85 + 0.45 %non-HC - 2.81 ln(APIG) ; r = 0.40
Xylenes	SP ≤ 200 psig ; n = 83	ln(%Xyl) = - 80.0 + 12.1 ln(ST+460) ; r = 0.50	ln(%Xyl) = - 116 + 0.0266 %non-HC + 16.3 ln(ST+460) + 2.50 ln(APIG) ; r = 0.74
	SP > 200 psig ; N = 12	ln(%Xyl) = 42.3 - 7.47 ln(ST+460) ; r = 0.22	ln(%Xyl) = 62.5 - 0.44 %non-HC - 9.66 ln(ST+460) - 1.51 ln(APIG) ; r = 0.30

It was noted that the results of the correlation analyses were related to the compounds' chemical structures. For example, hexane was the only straight chain hydrocarbon species included in the analysis, and its correlation equations are unique. The other four HAPs are structurally similar (each containing a benzene ring), and correlate similarly with separator temperature, APIG, and/or mole percent non-hydrocarbons. Of the ringed species, ethylbenzene and xylenes are the largest (8 carbon atoms each), followed by toluene (7 carbon atoms), and benzene (6 carbon atoms).

- For high separator pressures, the molar contribution of hexane (%Hex) was uniquely related to the separator pressure.
- Correlations of benzene and toluene, the lightest of the benzene-ringed HAPs, were similar because both species were best correlated with separator temperature and API Gravity.
- Correlations of ethylbenzene and xylenes, the heaviest of the benzene-ringed HAPs, were also similar because both species correlated best with mole percent non-hydrocarbons and separator temperature.

Since many of the correlation equations shown in Tables 5-1 and 5-2 were weak and highly uncertain, the average speciation profiles are recommended for use (Table 5-3). These average profiles are quite different from those in the EPA SPECIATE database (U.S. Environmental Protection Agency, 1990). Mole percents were converted to weight percents for comparison to the SPECIATE database (Table 5-4). Note that the SPECIATE database is based on references that are 10-20 years old, and/or engineering judgement. Also note that the SPECIATE profile, "Oil and Gas Production – Average" was used for comparison to the average flash gas data because no directly corresponding flash gas profile was available in the SPECIATE database.

Table 5-3. Average speciation profiles modeled for the 94-tank data set, mole percent.

Species	Flash Gas – Mean Mole Percent Contribution		W&S Gas – Mean Mole Percent Contribution	
	Percent of total gas stream (Std. Deviation)	Percent of THC	Percent of total gas stream (Std. Deviation)	Percent of THC
H_2S	0.89 (2.58)	na	1.33 (3.63)	na
CO_2	8.16 (18.18)	na	7.31 (15.93)	na
N_2	1.33 (3.78)	na	0.34 (1.94)	na
CH_4	36.75 (22.56)	41.00	20.36 (23.30)	22.36
C_2H_6	15.12 (6.12)	16.87	18.65 (9.76)	20.49
C_3H_8	16.45 (7.72)	18.35	25.48 (13.58)	28.00
i-C_4H_{10}	4.67 (2.94)	5.21	6.22 (4.07)	6.83
n-C_4H_{10}	7.77 (4.41)	8.67	9.94 (6.51)	10.92
i-C_5H_{12}	2.93 (1.73)	3.27	3.39 (2.02)	3.72
n-C_5H_{12}	2.49 (1.61)	2.77	2.88 (1.99)	3.17
Hexanes	1.03 (0.75)	1.15	1.18 (0.84)	1.30
Heptanes	0.96 (0.78)	1.07	1.14 (0.98)	1.26
Octanes	0.40 (0.38)	0.45	0.49 (0.47)	0.54
Nonanes	0.09 (0.10)	0.10	0.12 (0.13)	0.13
Benzene	0.12 (0.17)	0.14	0.16 (0.30)	0.18
Toluene	0.10 (0.12)	0.11	0.14 (0.23)	0.15
Ethylbenzene	0.00 (0.00)	0.00	0.01 (0.01)	0.01
Xylenes	0.03 (0.04)	0.03	0.04 (0.06)	0.04
n-Hexane	0.70 (0.58)	0.78	0.82 (0.69)	0.90
Pentanes+	0.00 (0.00)	0.00	0.00 (0.00)	0.00

Table 5-4. Comparison of average modeled speciation profiles to the EPA SPECIATE database (U.S. Environmental Protection Agency, 1990), as weight percent.

Species	Flash Gas – Mean Weight Percent Contribution		W&S Gas – Mean Weight Percent Contribution	
	Average	SPECIATE[a]	Average	SPECIATE[b]
CH_4	18.4	53.8	10.0	6.2
C_2H_6	14.2	7.4	17.2	5.6
C_3H_8	22.6	8.2	34.5	17.6
i-C_4H_{10}	8.5	0.3	11.1	1.5
n-C_4H_{10}	14.1	5.2	17.7	27.1
i-C_5H_{12}	6.6	3.2	7.5	1.5
n-C_5H_{12}	5.6		6.4	14.6
Hexanes	2.8	6.6	3.1	7.9
Heptanes	3.0	7.8	3.5	9.2
Octanes	1.4	5.8	1.7	6.9
Nonanes	0.4		0.5	
Benzene	0.3	0.1	0.4	0.1
Toluene	0.3		0.4	
Ethylbenzene	0.0		0.0	
Xylenes	0.1		0.1	
n-Hexane	1.9		2.2	
Pentanes+	0.0		0.0	
C_7-Cycloparaffins		1.1		1.3
C_8-Cycloparaffins		0.4		0.5

[a] Profile Number 9015, "Oil and Gas Production – Average." (Profile Data Quality : E)
[b] Profile Number 0296, "Fixed Roof Tank - Crude Oil Production." (Profile Data Quality : C)

Section 6
ANALYSIS OF SEPARATOR GAS SPECIFIC GRAVITY

The purpose of this section is to generate a correlation equation that predicts the specific gravity of the separator gas, which was measured via gas analysis. This analysis considers separator operating conditions (temperature and pressure), the API gravity of the sales oil, and the mole percent of non-hydrocarbons present in the total vent gas (which was a modeled value).

DESCRIPTIVE STATISTICS

Table 6-1 summarizes key descriptive statistics for the separator gas specific gravity, separator temperature, sales oil API gravity, and mole percent non-hydrocarbons in the total vent gas.

Table 6-1. Descriptive statistics of variables used to predict specific gravity of the separator gas.

Statistic	SG_{SG}*	$\ln(SG_{SG})$**	SP* (psig)	ln(SP)**	ST (°F)	APIG (°API @ 100°F)	$\%nonHC_{TOT}$* (%)	$\ln(\%nonHC_{TOT})$**
Min	0.6	-0.58	4.0	1.39	40	15.0	0.0	-1.9
Max	1.8	0.59	870	6.77	180	66.0	95.3	4.6
Mean	0.9	-0.17	122	3.90	87	40.6	9.8	1.0
SD	0.3	0.27	221	1.16	26	13.1	18.2	1.6

*Mean $= \frac{1}{n}\sum_{i=1}^{n} x_i$

**Mean $= \frac{1}{n}\sum_{i=1}^{n} \ln(x_i)$ Note: $\frac{1}{n}\sum_{i=1}^{n} \ln(x_i) \neq \ln\left(\frac{1}{n}\sum_{i=1}^{n} x_i\right)$

SG_{SG} = Separator Gas Specific Gravity
ST = Separator Temperature (°F)
SP = Separator Pressure (psia)
APIG = API Gravity (°API)
$\%nonHC_{TOT}$ = mole fraction of non-HC in total vented gas

Single-parameter correlation coefficients between the separator gas specific gravity and separator pressure, temperature, API gravity and mole percent non-hydrocarbons are summarized Table 6-2. The best predictor is the mole fraction of non-hydrocarbons in the total vented gas ($\%nonHC_{TOT}$). Separator pressure, separator temperature, and sales oil APIG do not correlate well with the gas molecular weights.

Table 6-2. Single-parameter correlation coefficients for gas molecular weights.

Variable	Pearson Correlation with SG_{SG}	Pearson Correlation with $\ln(SG_{SG})$
SP	-0.252	-0.255
ln(SP)	-0.352	-0.368
ST	0.351	0.352
APIG	-0.296	-0.276
$\%nonHC_{TOT}$	0.654	0.634
$\ln(\%nonHC_{TOT})$	0.563	0.563

REGRESSION ANALYSIS

Since the specific gravity of the separator gas appears to be lognormally distributed (see Figure 2-1), it was modeled as such. Several linear regressions were performed using only two or three of the variables listed in Table 6-1. However, the use of all four independent variables resulted in the best correlation. The following multivariate linear regression (Equation 6-1), illustrated in Figure 6-1, is recommended for use.

$$\ln(SG_{SG}) = -0.476 - 0.102 \ln(SP) + 0.003\ ST + 0.008\ APIG + 0.011\ \%nonHC_{TOT} \quad \text{(Equation 6-1)}$$

The correlation coefficient for Equation 6-1 is 0.76, which is somewhat better than the single-parameter correlation coefficient for $\%nonHC_{TOT}$ shown in Table 6-1. The standard error of the prediction is 0.18, which is somewhat smaller than the standard deviation about the mean of $\ln(SG_{SG})$, 0.27. Figure 6-2 illustrates the potential improvement over the average value (lesser variability about the observed value).

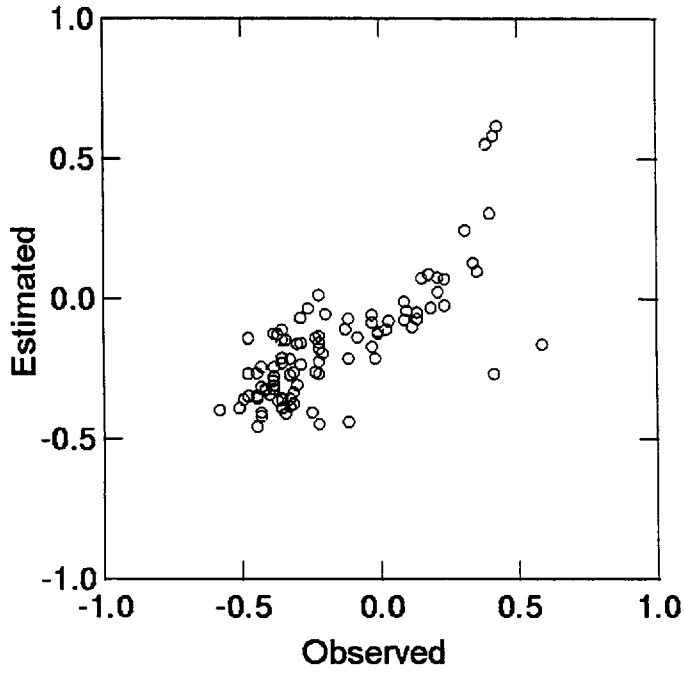


Figure 6-1. Performance of the recommended equation to predict the logarithm of separator gas specific gravity, $\ln(SG_{SG})$.

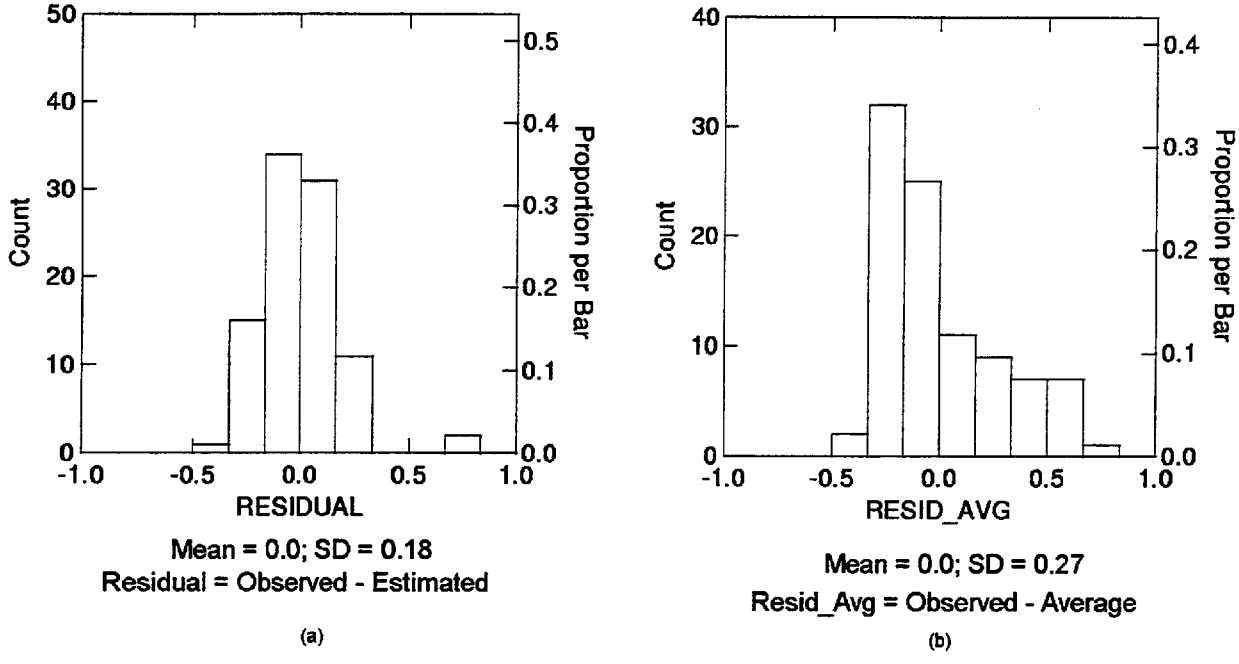


Figure 6-2. Improved performance in the error of the estimate for $\ln(SG_{SG})$.
(a) Error associated with the recommended correlation equation.
(b) Error associated with the average value.

Section 7

COMPARATIVE EVALUATION OF ALTERNATIVE MODELS AND INPUTS

The correlation equations for RVP, MWT_F, and MWT_{WS} that were developed in Sections 2 through 6 were used to estimate flash and W&S emissions. These estimates were compared to E&P TANK model results and to emission measurements from seven tank sites. Measured emissions were available for seven E&P storage tanks (American Petroleum Institute, 1997b), and E&P TANK results (based on oil sample compositions) were available for the 94 storage tanks discussed throughout the earlier sections of this report.

Flashing losses were estimated according to the Vasquez-Beggs equation (Vasquez and Beggs, 1980).

$$L_f = GOR \times Q \times \chi \times MWT_F \times \frac{P_a}{RT} \times \frac{ton}{2000lb}$$

(Equation 7-1)

where:

L_f = Flashing losses (tons/year)

GOR = Gas-to-oil ratio (scf/bbl), calculated according to the Vasquez-Beggs methodology (Vasquez and Beggs, 1980)

Q = Annual throughput (bbl/yr)

χ = Concentration of total hydrocarbons (THC) in the vented gas (mole fraction, a number between 0.0 and 1.0)

MWT_F = Molecular weight of THC in the vented gas (lb/lb mole), Equation 4-5

P_a = Pressure of vented gas at atmospheric pressure (psia)

R = Ideal gas constant (10.731 psia ft^3/lb mol °R)

T = Temperature of vented tank gas (°R)

According to the Vasquez-Beggs equation, GOR may be calculated according to the following equation.

$$GOR = C_1 \times CSG \times UP^{C_2} \times \exp\left(\frac{C_3 \times APIG}{T + 460}\right)$$

(Equation 7-2)

where:

GOR	=	Gas-to-oil ratio (scf/bbl)
C_1, C_2, and C_3	=	Correlation coefficients
CSG	=	Corrected specific gravity of the gas (for pure air, CSG = 1.0)
UP	=	Separator pressure (psia)
APIG	=	API gravity of the oil (°API)
T	=	Separator fluid temperature (°F)

W&S emissions were calculated according to methods published in the U.S. EPA's *AP-42* document (U.S. Environmental Protection Agency, 1996; American Petroleum Institute, 1991), which employs Equations 7-3 and 7-4 and fully describes how each of the variables may be quantified.

$$L_s = 365 \times V_V \times W_V \times K_E \times K_S \times \frac{\text{ton}}{2000\text{lb}}$$

(Equation 7-3)

where:

Ls	=	Standing losses (tons/year)
V_V	=	Tank vapor space volume (ft^3)
W_V	=	Stock vapor density (lb/ft^3), dependent on MWT_{WS}
K_E	=	Calculated vapor space expansion factor (unitless), dependent on RVP
K_S	=	Calculated vented vapor saturation factor (unitless), dependent on RVP

$$L_w = 0.0010 \times MWT_{WS} \times P_{VA} \times Q \times K_N \times K_P \times \frac{\text{ton}}{2000\text{lb}}$$

(Equation 7-4)

where:

L_w = Working losses (tons/year)

MWT_{WS} = Stock vapor molecular weight (lb/lb-mol), Equation 4-4

P_{VA} = Stock vapor pressure at the average daily liquid surface temperature (psia), dependent on RVP

Q = Annual stock net throughput (bbl/yr)

K_N = Working loss turnover factor (unitless)

K_p = Working loss product factor (unitless)

The correlation equations for MWT_{WS}, MWT_F, and RVP were employed as needed to estimate emissions according to Equations 7-1 through 7-4. Emissions were also calculated with API's current default values (MWT_{WS} = 50 lb/lb-mol, MWT_F = 50 lb/lb-mol, RVP = 5 psia), and with measured values of RVP.

COMPARISON OF FLASH EMISSION ESTIMATES

Figure 7-1 displays a comparison of flash emissions estimated with the Vasquez-Beggs correlation equation and E&P TANK for 94 storage tanks. Two linear regressions are plotted, representing the default assumption (MWT_F = 50 lb/lb-mol) and the use of correlated values for MWT_F. When estimated emissions are high, the default assumption appears to yield slightly better agreement, however the difference is not statistically significant. Figure 7-2 better illustrates this point. Figure 7-2 plots the 95 percent confidence bounds on the regression lines shown in Figure 7-1. The 1:1 line, which represents perfect agreement between Vasquez-Beggs and E&P TANK, deviates from the 95 percent confidence ranges whether default values or correlated values are used for MWT_F.

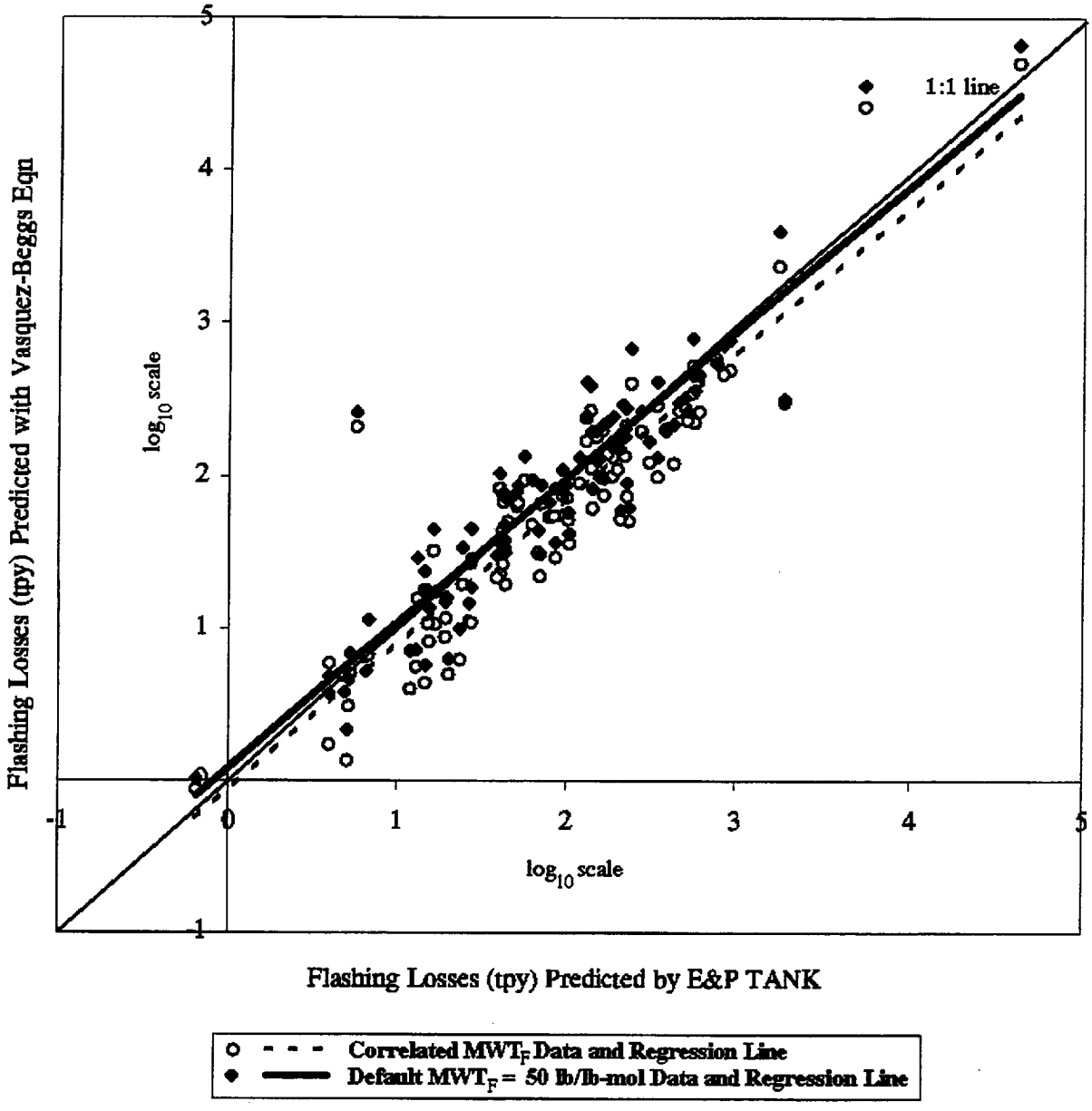
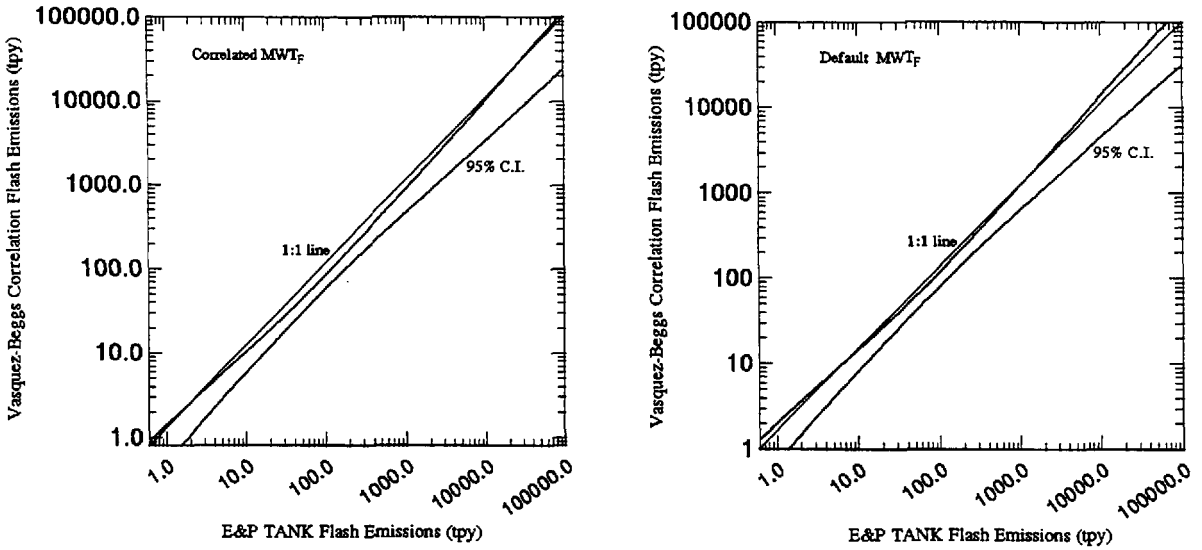


Figure 7-1. Comparison of the Vasquez-Beggs correlation equation and E&P TANK results (flash THC emissions for 94 E&P storage tanks).



(a) (b)

Figure 7-2. Comparison of the Vasquez-Beggs correlation equation and E&P TANK - 95 percent confidence bounds on the agreement between estimated flash emissions. Note the 1:1 lines (perfect agreement). (a) Agreement when correlated values of MWT_F are input to Vasquez-Beggs. (b) Agreement when a default value of MWT_F is input to Vasquez-Beggs.

COMPARISON OF W&S EMISSION ESTIMATES

It was not possible to use *AP-42* methods to estimate the W&S emissions for the 94 storage tanks discussed above. (Some necessary data, such as storage tank dimensions and geographic locations were not available.) Data for a group of seven storage tanks were input to the EPEC model (American Petroleum Institute *et al.*, 1997c) to compare estimated W&S emissions. Figure 7-3 compares *AP-42* emissions that were estimated with default and correlated values of RVP to *AP-42* estimates based on RVP measurements. The use of correlated values of RVP improves agreement over the use of default values. (Note that data are plotted on a linear scale in Figure 7-3. Figures 7-1 and 7-2 are plotted with logarithmic scales.)

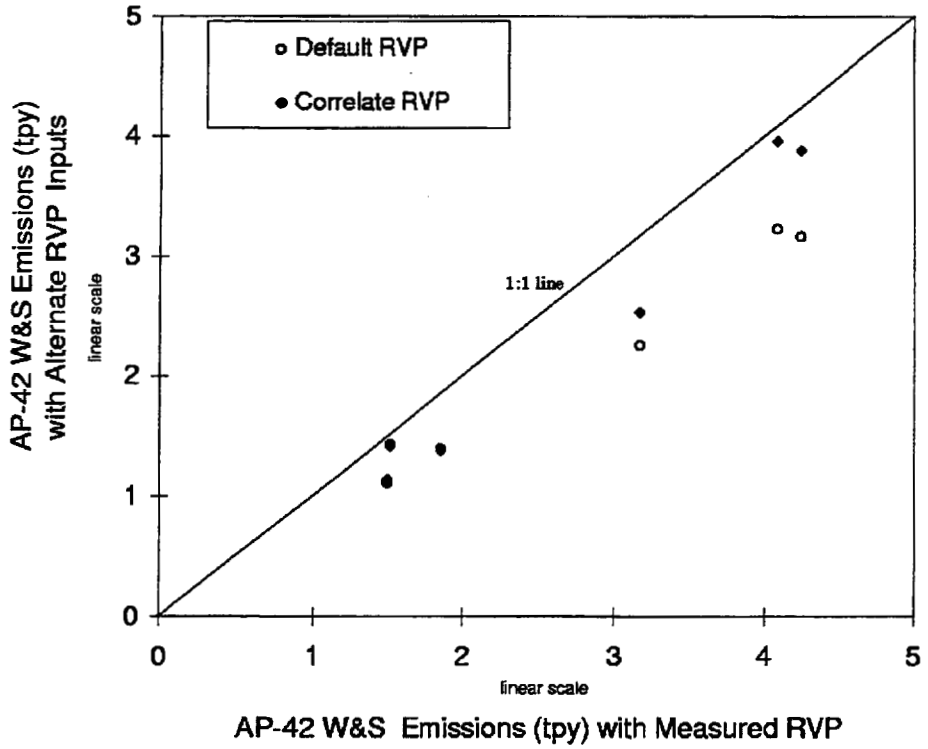


Figure 7-3. Comparison of *AP-42* W&S emissions estimated from default and correlated RVPs with *AP-42* emissions estimated from measured RVPs. (Estimates were calculated with correlated values of MWT_{WS}.)

COMPARISON OF TOTAL EMISSION ESTIMATES

This section evaluates the accuracy of emission estimates based on *AP-42*, Vasquez-Beggs, and E&P TANK. Measurements of W&S and flash emissions were conducted at seven storage tanks (American Petroleum Institute, 1997b). The results of these measurements are compared to three alternatives to estimate emissions: (1) *AP-42* and Vasquez-Beggs equations with default inputs, (2) *AP-42* and Vasquez-Beggs equations with correlated inputs, and (3) E&P TANK.

Total measured emissions were compared to total emissions estimated with the various models (Figure 7-4). It appears that the correlation equations are able to predict total emissions equally as well as the E&P TANK model. For this set of seven storage tanks, emission measurements were reported as total emissions; therefore, the W&S and flash losses could not be compared separately. However, the flash losses probably overwhelm the total emissions.

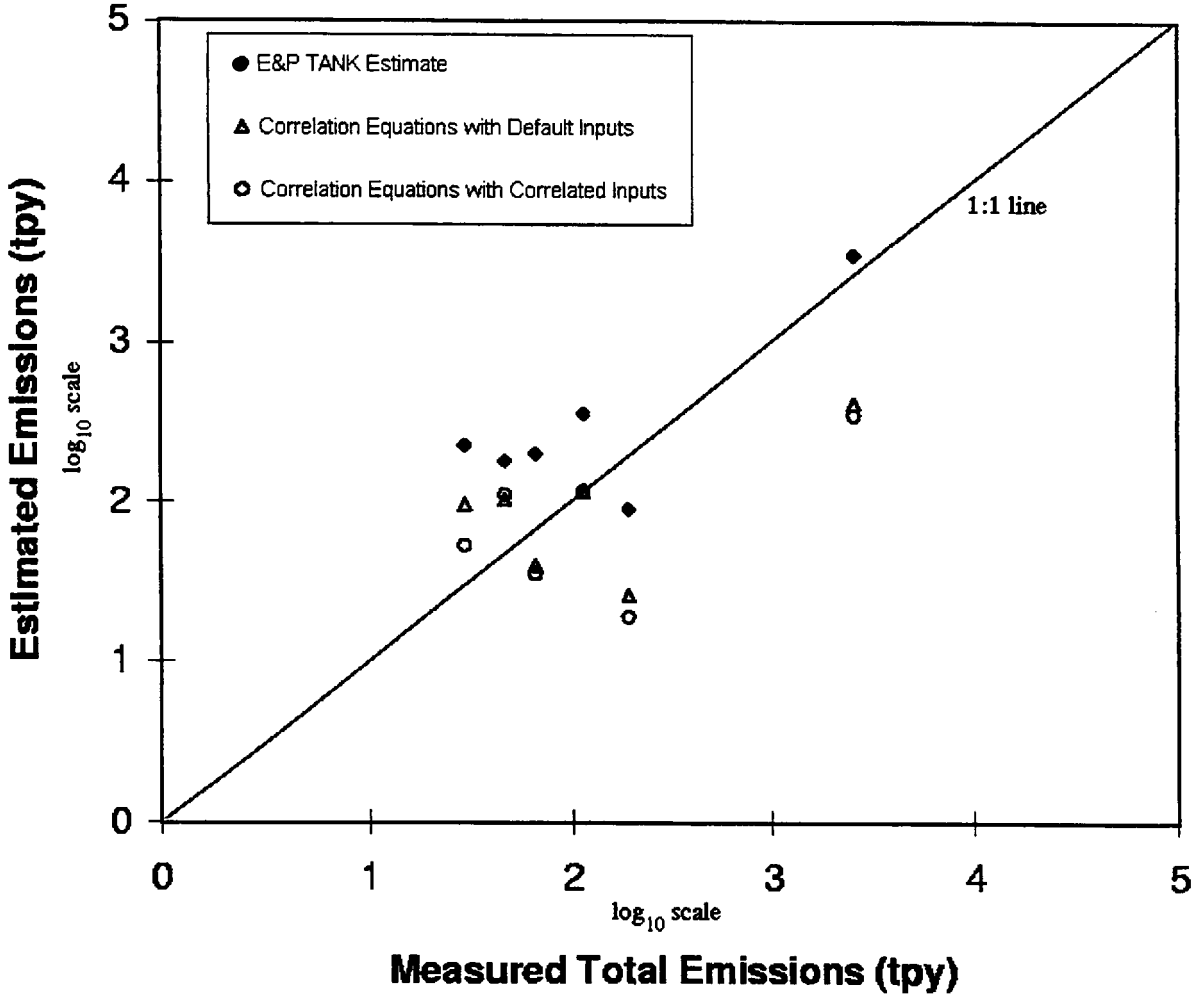


Figure 7-4. Comparison of modeled (E&P TANK) and correlated emissions with measured total THC emissions for seven storage tanks.

Section 8
CONCLUSIONS

In some cases, the use of correlation equations instead of default values to predict RVP, MWT_F, and/or MWT_{WS} improved agreement between modeled emissions, emission estimates based on measured values, and/or measured emissions. Therefore, the following correlation equations are recommended in order to estimate THC emissions from E&P storage tanks when laboratory results are unavailable.

Reid Vapor Pressure. When the *AP-42* method is used to calculate W&S emissions, the use of a correlation equation to predict RVP (instead of a default value) improves the results. *AP-42* results based on the correlated RVP more closely match results based on RVP measurements.

If only the APIG of the sales oil is known:

$$RVP = -1.699 + 0.179\ APIG$$

(Equation 3-5)

If the APIG and the bubble point of the sales oil are both known:

$$RVP = -2.596 + 0.417\ BP + 0.119\ APIG$$

(Equation 3-6)

Molecular Weight of W&S Gas. The default value of 50 lb/lb-mole that was established by API's earlier research (American Petroleum Institute, 1991) is recommended for continued use.

Molecular Weight of Flash Gas. The following equation is recommended to predict MWT_F when laboratory results are unavailable.

$$MWT_F = -0.351 - 0.013\ SP + 0.193\ ST + 0.453\ APIG + 0.360\ \%nonHC_{TOT}$$

(Equation 4-5)

Mole Fractional Contributions of HAPs. Since many of the correlations developed for HAP speciation were weak or uncertain, the average speciation profiles are recommended for use (Table 8-1).

Table 8-1. Average speciation profiles, mole percent.

Species	Flash Gas – Mean Mole Percent Contribution Percent of THC	W&S Gas – Mean Mole Percent Contribution Percent of THC
CH_4	41.00	22.36
C_2H_6	16.87	20.49
C_3H_8	18.35	28.00
i-C_4H_{10}	5.21	6.83
n-C_4H_{10}	8.67	10.92
i-C_5H_{12}	3.27	3.72
n-C_5H_{12}	2.77	3.17
Hexanes	1.15	1.30
Heptanes	1.07	1.26
Octanes	0.45	0.54
Nonanes	0.10	0.13
Benzene	0.14	0.18
Toluene	0.11	0.15
Ethylbenzene	0.00	0.01
Xylenes	0.03	0.04
n-Hexane	0.78	0.90
Pentanes+	0.00	0.00

Specific Gravity of the Separator Gas. The following equation is recommended to predict the specific gravity of the separator gas when laboratory results are unavailable.

$$\ln(SG_{SG}) = -0.476 - 0.102 \ln(SP) + 0.003\ ST + 0.008\ APIG + 0.011\ \%nonHC_{TOT} \quad \text{(Equation 6-1)}$$

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Appendix A

QUALITY-REVIEWED DATA SET FOR 94 TANKS

Acronyms and Abbreviations

224 TriMe – 2,2,4-Trimethylpentane
APIG – API Gravity (°API)
BENZ – Benzene
BubPt – Bubble Point (psia)
C1 to C10+ - Hydrocarbon Gas (with 1 to 10 or more carbon atoms)
E-BENZ – Ethylbenzene
ems –Emissions (lb/hr)
FG – Flash Gas
FlsOil – Flash Tank Oil
GOR – Gas to Oil Ratio (scf/bbl)
Grav – Specific Gravity
H2S – Hydrogen Sulfide Gas
HEXS – Hexanes
HEPTS – Heptanes
i- – Isomers of Hydrocarbon Molecules (branched chain molecules)
mol% - Mole Fraction (percent)
Mol Frac – Mole Fraction (as a fraction)
MWt – Molecular Weight (lb/lb-mol)
n- – Straight-chain Hydrocarbon Molecules
N2 – Nitrogen Gas
NONS – Nonanes
O2 – Oxygen Gas
OCTS – Octanes
prod rate – Production Rate (bbl/day)
RVP – Reid Vapor Pressure (psia)
Sep Oil – Separator Oil
Sep Pres – Separator Pressure (psia)
Sep Temp – Separator Temperature (°F)
SG – Specific Gravity
SlsOil – Sales Oil
Tank ID – Tank Identification Number (assigned specifically for this project)
THC – Total Hydrocarbon
TOL – Toluene
TotG – Total Gas (WSG+FG)
VOC – Volatile Organic Carbon
WSG – Working & Standing Gas
XYL – Xylenes

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Tank ID	Sep Pres	Sep Temp	SlsOil APIG	SlsOil RVP	GOR	Sep Oil MWt	Sep Oil BubPt	Sep Oil RVP	Sep Oil SG	FlsOil MWt	FlsOil BubPt	FlsOil RVP	FlsOil SG	SlsOil MWt
2	1	45	106	15	0.8	8.8873	386.7508	36.8463	5.6383	0.7644	393.4735	14.0871	2.2411	0.7642	397.2984
3	2	22	155	17	2	9.6033	360.3739	28.4693	5.8926	0.7486	367.9278	9.2545	3.0381	0.7488	369.569
4	3	20	160	18	0.6	6.4454	417.3879	24.0558	3.5434	0.7025	421.8316	9.8277	2.0089	0.7024	426.5238
5	4	53	101	19	2.3	17.7758	321.974	82.5867	10.1789	0.7785	333.2543	14.6566	3.8346	0.7795	336.5525
6	6	23	79	20	1.2	4.9875	332.1324	59.6152	5.3462	0.7911	335.7019	16.0379	1.8664	0.7916	336.7173
7	8	18	75	20	3.8	3.94	321.1654	52.9892	6.6365	0.7722	323.8687	17.2375	4.3808	0.7724	324.2103
8	9	54	125	21	1.1	13.8965	308.5478	74.2207	8.0013	0.7873	315.6836	12.7487	2.7171	0.7884	319.3936
9	10	35	76	23	1.8	8.5264	265.3335	77.5599	8.1615	0.8536	269.6992	16.41	2.6896	0.8547	270.2265
10	12	30	66	23	4	15.4103	289.2338	59.6658	10.3025	0.767	295.0625	19.5599	6.3482	0.7677	299.2691
11	13	20	122	24	0.6	4.6002	299.4488	47.5581	3.2839	0.7931	301.859	13.5591	1.838	0.7934	303.0588
12	14	20	88	24	3.9	19.1103	283.8749	57.2852	11.4572	0.7661	291.1285	16.5494	6.4631	0.7668	295.6764
13	15	22	86	24	4.6	13.7343	299.315	41.367	10.0353	0.7427	305.3546	16.8743	6.352	0.743	308.6442
14	16	20	68	24	4.8	17.8387	283.2271	42.403	11.3071	0.7227	288.409	20.3303	8.0857	0.723	293.9877
15	17	19	133	25	4.1	3.4871	272.2935	19.0887	5.7435	0.7994	274.0192	11.0455	4.5294	0.7998	274.1862
16	18	30	60	25	4.9	16.662	280.5031	68.382	11.7272	0.7595	286.5598	20.6403	7.3651	0.7606	290.8026
17	19	25	136	27	3.3	6.7533	335.8695	30.838	5.7945	0.6808	340.3619	10.9186	3.9786	0.681	341.8173
18	20	31	64	27	5.2	18.4682	247.6823	81.8646	13.1875	0.7915	252.4981	20.0647	8.0737	0.7925	256.3684
19	21	23	79	29	3.1	6.3657	250.8289	47.5423	6.5844	0.7719	253.6374	16.6608	3.8675	0.7726	254.03
20	22	17	86	29	4.8	20.4413	216.0331	33.3501	11.0683	0.8058	218.6088	17.0202	8.4498	0.8068	223.0516
21	23	20	120	29	4.9	11.5044	229.9469	13.3897	7.4449	0.7932	230.4339	11.7357	7.1633	0.7934	234.1811
22	24	22	98	29	6.2	24.2657	224.5037	41.7702	14.0038	0.7864	231.833	15.2732	7.6486	0.7886	233.6235
23	26	4	80	30	2.6	2.345	270.8425	26.18	4.4436	0.7651	271.7838	16.4309	3.2822	0.7653	272.2403
24	27	25	180	30	2.7	11.755	237.3015	20.8947	6.09	0.7967	241.3255	6.8658	3.4509	0.7978	242.0531
25	28	64	70	30	2.8	18.7812	289.932	117.2333	12.6891	0.7155	301.2848	17.7486	4.0461	0.7171	303.6996
26	29	80	77	33	2.2	32.7847	221.9064	119.0589	16.5455	0.761	231.2896	17.4526	5.5201	0.7639	235.662
27	30	20	115	33	3.1	8.9682	232.4277	37.8575	7.085	0.7808	235.0693	13.226	4.4453	0.7815	236.3231
28	31	60	78	34	2	12.593	285.167	96.8157	9.865	0.7125	293.3098	16.434	2.9696	0.7137	294.3194
29	32	18	70	34	2.2	6.2016	236.997	45.8224	6.0253	0.7715	239.1704	17.2292	3.4387	0.7721	239.9932
30	34	18	80	35	4.7	24.3594	194.5784	40.266	12.3363	0.7509	197.3778	17.9682	8.7113	0.752	201.5484
31	35	15	108	35	4.5	18.782	206.795	36.0958	11.0245	0.7812	210.5973	13.7321	6.8624	0.7824	212.7895
32	36	17	100	35	4.9	17.6196	210.5629	36.6732	10.8408	0.7705	214.072	14.8214	7.0355	0.7717	216.5587
33	37	30	125	36	2.5	5.0253	236.1106	36.2333	5.6956	0.7547	238.2616	12.8143	2.9287	0.7553	238.4162
34	38	50	68	36	3.8	14.0122	243.7807	85.0761	10.3933	0.6973	249.9626	17.9084	4.5764	0.6986	251.0035
35	39	57	80	36	3.9	15.5162	212.9906	66.9672	11.2108	0.7564	217.3672	17.0254	5.6634	0.7578	218.834
36	40	75	81	36	4.1	27.8439	210.5349	118.0427	16.9277	0.7617	219.4885	17.0345	5.8662	0.7647	220.9459
37	41	28	60	36	3.8	22.0411	193.0086	63.1345	13.3092	0.774	196.5066	20.208	7.6167	0.7755	199.6478
38	42	18	95	36	7.2	23.673	193.7409	30.4235	13.4904	0.7756	197.5668	15.8399	9.6483	0.777	200.1667
39	43	18	98	37	3.9	10.0223	211.6698	44.9266	8.7342	0.7651	214.4081	14.9514	5.1814	0.7661	215.3372
40	44	190	70	37	3	53.7473	209.308	253.2932	29.9103	0.7496	229.3644	18.0964	5.0732	0.7559	231.0886
41	45	22	50	37	4.9	67.2169	189.8661	57.1542	21.3827	0.7201	195.947	26.3698	14.2646	0.722	208.8721
42	46	24	68	38	3.6	15.4607	184.7762	51.283	10.6455	0.7861	187.0382	18.5121	6.463	0.7873	189.0685
43	47	60	72	38	4.5	17.433	235.9418	94.3705	12.7665	0.7087	243.736	17.8751	5.2677	0.7104	244.0874
44	48	32	149	38	3	5.8273	203.285	24.3398	5.6189	0.7699	204.7858	10.3149	3.7272	0.7705	205.1644
45	49	62	80	38	5.2	37.5989	192.8927	65.0965	19.5754	0.7478	201.0835	18.4746	8.3898	0.7481	203.3277
46	50	13	113	38	5.7	13.5927	207.0225	14.7016	8.9693	0.7516	208.0146	12.6959	8.1689	0.752	211.2388
47	51	28	45	38	7.4	28.2424	182.8103	60.9715	18.8233	0.7671	187.2083	25.8505	11.6092	0.7681	189.8935
48	52	22	114	38	3.1	45.812	215.2793	46.3622	11.7194	0.7056	220.8066	12.8653	7.5027	0.7069	231.6073

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Tank ID	Sep Pres	Sep Temp	SlsOil APIG	SlsOil RVP	GOR	Sep Oil MWt	Sep Oil BubPt	Sep Oil RVP	Sep Oil SG	FlsOil MWt	FlsOil BubPt	FlsOil RVP	FlsOil SG	SlsOil MWt
49	53	66	89	39	3.7	30.0749	188.503	92.4084	16.5156	0.7524	195.0056	16.1898	6.1276	0.7551	197.2922
50	54	60	80	39	5.6	23.3671	176.2175	95.231	17.0655	0.7736	181.607	17.3169	6.6556	0.7766	182.0023
51	55	60	68	39	6.8	43.1452	197.8115	115.2802	22.9701	0.7287	208.2514	22.0599	9.8751	0.7303	211.8192
52	67	33	60	39	6.4	36.0314	173.4779	52.5234	19.2621	0.7674	178.1336	22.9183	11.4307	0.7683	181.4015
53	68	42	110	39	5.4	26.6095	181.9529	58.4609	14.5156	0.753	187.8709	13.655	6.8944	0.7557	189.3302
54	69	66	83	40	3	25.9649	191.3346	64.4855	16.2221	0.7709	197.6996	17.0634	4.9511	0.7701	198.9804
55	60	66	90	40	4.1	30.3258	162.7215	100.0506	18.5821	0.7742	168.3811	16.0191	5.8793	0.7777	169.2265
56	61	13	110	40	4.8	12.2983	188.9155	26.2437	8.8378	0.741	190.5659	13.4456	6.7975	0.7417	192.2095
57	62	64	74	40	3.9	19.5795	209.364	97.5616	13.3801	0.7239	215.6986	17.575	5.3396	0.7268	216.8113
58	63	28	78	42	4.2	19.6852	190.6577	55.8832	10.8475	0.7331	192.6785	17.6174	7.5785	0.7336	196.2622
59	65	29	60	44	5.7	32.4522	171.7673	63.0201	17.4516	0.7557	175.7934	21.6395	10.631	0.758	179.3978
60	66	44	71	44	7	16.9219	213.903	55.3375	12.8348	0.6575	218.6952	19.1577	8.2084	0.6585	220.3379
61	67	60	60	44	10.1	41.3061	163.6307	105.2248	25.1265	0.7474	171.2679	22.3417	11.495	0.7519	172.3515
62	68	41	72	45	5.2	17.6513	169.9644	71.746	13.2686	0.7281	173.5393	18.1016	6.6555	0.7299	174.461
63	69	20	68	45	8.1	30.8081	146.4585	47.5069	17.0432	0.7541	148.838	20.9123	12.0992	0.7558	151.187
64	70	23	85	46	4.7	43.2607	172.7178	48.818	14.6283	0.7118	176.4867	17.4003	9.592	0.7133	182.5218
65	71	24	114	46	5	26.2927	160.0748	34.1731	11.3747	0.7317	162.7856	12.9438	7.3545	0.7332	164.9142
66	72	52	108	47	5.3	24.2757	179.1085	48.3453	13.2196	0.7675	183.4552	13.8213	7.3663	0.7698	185.1624
67	73	45	140	47	6	78.804	148.5125	59.5218	18.8428	0.7431	158.9452	10.156	7.1989	0.7507	160.1663
68	74	40	76	47	10.6	41.319	159.8864	126.4867	23.3224	0.7133	166.6092	19.95	12.5476	0.716	168.7883
69	75	31	76	49	5	24.479	166.4494	57.8777	13.6452	0.6865	169.7873	18.1738	7.9712	0.688	172.009
70	77	700	100	60	7.4	491.9068	90.5706	697.7762	157.1524	0.7181	125.0592	21.0253	11.0881	0.7776	126.3273
71	78	20	48	60	9.4	56.4482	116.5064	68.5126	25.2078	0.7681	119.0863	26.115	15.9631	0.7718	121.7843
72	79	98	40	61	11.2	128.1693	124.3335	150.5425	44.1245	0.7154	133.4947	31.9558	20.2204	0.7242	139.4293
73	80	115	73	64	5.3	51.3388	121.6321	136.6961	28.3261	0.7292	127.2625	18.5389	7.7965	0.7353	127.982
74	81	30	100	64	9.4	68.3277	114.9974	52.6946	22.7376	0.7368	119.658	16.1285	11.6739	0.7431	120.639
75	82	15	86	64	10.3	47.1258	124.4413	34.5414	18.7716	0.7202	127.102	18.3863	13.6277	0.7229	129.1123
76	83	770	100	65	7.8	578.206	86.6827	664.2274	157.5247	0.6826	121.7339	23.3133	13.7829	0.7405	124.6692
77	84	39	66	67	5.7	25.454	114.787	67.5156	16.8006	0.7239	116.8603	19.1645	8.0569	0.7265	117.5341
78	85	38	95	67	9.6	57.3834	145.1156	42.0138	18.9432	0.6112	151.1286	16.8397	12.1467	0.6127	153.8421
79	86	65	80	67	4.8	61.258	105.0226	18.9109	12.1053	0.7229	105.0669	18.2134	11.9803	0.723	108.6564
80	87	64	60	67	13.1	97.006	118.4242	87.8055	35.3978	0.6997	125.522	26.6415	18.3763	0.7068	128.1335
81	88	870	78	67	13.1	578.2002	87.664	853.7997	181.952	0.6553	130.3022	27.2382	14.6709	0.7111	130.9637
82	89	600	70	67	7.5	396.2332	89.202	625.324	135.8481	0.6899	114.2712	25.6081	13.9692	0.7319	117.0662
83	90	780	70	68	8	436.9841	83.886	789.3505	163.3392	0.6797	111.8772	24.5135	12.184	0.7306	113.0229
84	91	60	66	68	8	79.5471	105.4775	140.7463	37.5566	0.722	111.1256	23.1616	12.3855	0.7304	112.3857
85	92	600	84	68	9.1	323.8754	91.7224	520.6829	116.8323	0.7022	113.7276	22.1497	12.0645	0.7399	114.4793
86	93	300	80	68	10.6	287.108	100.9508	322.2362	79.3879	0.6717	120.3487	24.5715	15.9151	0.6951	123.4617
87	94	110	72	69	10	79.9004	103.5503	140.2871	37.6723	0.7192	109.5508	20.4886	11.3535	0.7284	109.9364
88	95	750	90	60	9.4	320.4718	92.669	182.3722	64.9305	0.6912	106.4613	23.5934	17.2254	0.7152	110.4881
89	96	85	85	61	7	45.0407	111.6458	97.7429	24.4748	0.7057	115.6032	17.2771	8.5272	0.7107	116.0447
90	97	67	82	62	10.4	84.2072	106.3649	72.6126	28.106	0.6987	110.9727	20.079	14.0643	0.7049	112.5952
91	98	72	80	63	7	36.5627	109.7447	87.9349	21.8547	0.6974	112.9104	17.722	8.4248	0.7014	113.2546
92	99	730	80	63	11.9	321.6246	90.6078	178.2398	67.7678	0.68	104.0326	27.155	20.0638	0.7034	107.8645
93	100	580	77	64	6.4	309.6429	85.1237	583.6786	123.0081	0.6629	104.6757	21.1611	10.1428	0.6973	105.6089
94	101	730	80	64	11	924.9587	68.399	649.2551	188.761	0.626	93.6528	37.8902	25.9541	0.691	100.2615
95	102	807	96	66	11.8	804.5404	72.2599	641.5309	184.8571	0.6222	104.154	30.3521	19.53	0.6869	107.0911

	A	B	C	D	P	Q	R	S	T	U	V	W	X	Y	Z
1	Tank ID	Sep Pres	Sep Temp	SlsOil APIG	SlsOil BubPt	SlsOil RVP	SlsOil SG	FG mol% H2S	FG mol% O2	FG mol% CO2	FG mol% N2	FG mol% C1	FG mol% C2	FG mol% C3	FG mol% i-C4
2	1	45	106	15	1.4414	0.7706	0.764	1.8951	0	93.397	0	0.4301	0.2663	0.2705	0.3367
3	2	22	155	17	5.3435	2.3788	0.7489	0	0	40.4382	0	5.5102	10.7454	13.1749	5.6285
4	3	20	160	18	0.6285	0.5286	0.7023	1.0834	0	75.1353	2.2535	1.9196	1.5597	4.6582	1.845
5	4	53	101	19	3.3402	2.2681	0.7798	6.5628	0	24.1706	0.2558	36.6216	9.3697	8.5241	2.8639
6	6	23	79	20	4.9036	1.2912	0.7917	0.1604	0	2.8065	7.1382	80.0646	5.9179	0.9439	0.4582
7	8	18	75	20	12.8963	4.0448	0.7725	0	0	10.6712	19.8835	38.6625	9.9755	8.4816	2.3215
8	9	54	125	21	1.2524	1.0816	0.789	0	0	0	0.3829	63.028	13.2314	7.401	2.1929
9	10	35	76	23	9.1808	1.9512	0.8549	0	0	1.9413	0.5356	82.494	7.4314	4.1765	1.1696
10	12	30	66	23	5.6118	3.9805	0.7682	5.5335	0	17.0641	0.4229	39.7025	11.1943	12.6577	2.7434
11	13	20	122	24	0.6066	0.5825	0.7936	0	0	6.3779	10.0293	75.679	1.9883	1.2493	0.5141
12	14	20	88	24	5.7397	4.098	0.7673	6.9986	0	22.9436	3.9512	14.7021	12.8476	17.6882	3.7214
13	15	22	86	24	7.4533	4.6507	0.7432	6.5169	0	31.7766	0.8206	13.1184	11.0214	16.8053	3.782
14	16	20	68	24	6.7673	5.0463	0.7234	0	0	38.9934	0.8851	10.3686	12.9526	17.2599	4.2515
15	17	19	133	25	10.2685	4.5244	0.7998	0	0	2.9448	0	22.4899	21.3923	22.9279	5.8068
16	18	30	60	25	6.9634	4.9726	0.7613	0	0	1.5077	1.5921	47.2638	16.5434	17.3082	4.047
17	19	25	136	27	6.3825	3.2959	0.6811	8.4826	0	8.7197	5.9738	16.5207	12.9256	17.7794	4.955
18	20	31	64	27	6.9253	5.3507	0.7933	3.4661	0	5.6076	12.7629	32.1791	11.1491	15.3798	4.4211
19	21	23	79	29	12.3783	3.5248	0.7727	0	0	3.4475	0	66.799	14.7789	7.7858	2.1543
20	22	17	86	29	6.1558	4.9123	0.8084	5.1057	0	2.9368	0	23.6613	19.1799	23.8199	5.0308
21	23	20	120	29	6.3657	5.1363	0.7946	0	0	2.2824	0	12.1023	9.9283	24.2899	8.7505
22	24	22	98	29	10.2902	6.1532	0.789	13.9478	0	2.1881	0	9.3921	28.3743	22.0872	6.0832
23	26	4	80	30	11.7192	3.0827	0.7654	0	0	1.1278	0	70.6025	14.6658	6.8565	2.2916
24	27	25	180	30	4.5651	2.8784	0.798	0.745	0	9.3125	0	10.4575	14.3468	15.7954	4.3879
25	28	64	70	30	3.8429	2.6419	0.7174	0	0	3.0311	0.4683	67.9774	10.4782	8.4284	3.3373
26	29	80	77	33	2.6522	2.2789	0.7652	0	0	0.4996	0.4193	57.1059	15.6833	13.5988	4.3018
27	30	20	115	33	4.6868	3.3635	0.7818	0	0	1.2546	0	49.0767	11.9423	14.0367	7.4373
28	31	60	78	34	6.6898	2.2674	0.7139	0	0	1.1285	0	80.6	5.7208	5.733	2.0585
29	32	18	70	34	6.5241	2.4622	0.7724	0	0	2.8058	0	79.0107	6.7819	5.1171	1.8544
30	34	18	80	35	5.8193	4.8273	0.7535	0.1719	0	1.9108	0.5277	28.8701	24.7486	22.0205	3.6323
31	35	15	108	35	6.3004	4.7548	0.7831	0.9225	0	17.8418	2.0542	9.6191	18.6043	21.6802	5.3269
32	36	17	100	35	6.4116	4.8521	0.7726	0	0	2.8019	0.4635	21.7073	27.3689	21.1453	4.6695
33	37	30	125	36	11.1404	2.984	0.7553	0	0	1.4565	0	63.7774	11.7149	9.7085	3.241
34	38	50	68	36	6.9005	3.5199	0.6988	0	0	0.6985	0.3439	74.2786	8.1978	6.7201	1.9933
35	39	57	80	36	5.4838	3.9842	0.7583	0	0	1.6195	0.4048	57.1054	15.2445	10.851	3.4538
36	40	75	81	36	5.7343	4.186	0.7652	0	0	2.3102	0.2057	56.1464	13.5074	11.7647	4.1843
37	41	28	60	36	4.7907	3.8194	0.7767	2.8445	0	1.6267	0.4489	51.7547	18.826	14.0027	1.5068
38	42	18	95	36	9.8833	7.2643	0.778	14.2763	0	3.1971	0.7522	6.4393	14.591	27.3004	5.9964
39	43	18	98	37	5.9611	3.9844	0.7664	0	0	1.8415	0	53.929	11.7798	12.2699	6.7806
40	44	190	70	37	4.877	3.0119	0.7564	0	0	2.7528	0.3	60.649	17.94	11.212	1.7698
41	45	22	50	37	5.5377	4.9433	0.7258	1.3462	0	9.3343	0	12.6216	31.9054	24.9982	4.9745
42	46	24	68	38	4.4948	3.599	0.7884	0	0	0.687	0	60.7044	14.3873	12.0394	3.7325
43	47	60	72	38	14.4906	4.9457	0.7105	0	0	0.9816	0	62.1851	13.8503	10.9655	3.7152
44	48	32	149	38	6.7988	3.2851	0.7706	0	0	0.5548	0	39.8506	18.4865	12.1346	5.7163
45	49	62	80	38	6.9085	5.4293	0.7482	0	0	61.2834	0.3634	0.8591	4.1001	10.9282	3.3334
46	50	13	113	38	7.8776	6.0134	0.7531	0	0	0.5695	0	2.8423	17.599	38.092	8.5332
47	51	28	45	38	9.9775	7.5217	0.7686	0	0	41.4896	0	15.0654	16.3081	12.4316	3.6453
48	52	22	114	38	3.4629	3.1288	0.7091	0	0	0.9182	5.9167	11.454	10.9995	23.9967	6.8345

	A	B	C	D	P	Q	R	S	T	U	V	W	X	Y	Z
1	Tank ID	Sep Pres	Sep Temp	SlsOil APIG	SlsOil BubPt	SlsOil RVP	SlsOil SG	FG mol% H2S	FG mol% O2	FG mol% CO2	FG mol% N2	FG mol% C1	FG mol% C2	FG mol% C3	FG mol% i-C4
49	53	66	89	39	4.3294	3.6609	0.756	0	0	3.4079	0	50.8367	13.4442	13.1548	4.6883
50	54	60	80	39	11.7238	5.9678	0.7768	0	0	1.0162	0.27	57.7746	12.0476	10.2157	3.7159
51	55	60	68	39	8.7243	6.6257	0.7315	0	0	0.3954	0.1636	41.2851	19.4089	21.7402	5.4488
52	57	33	60	39	8.2038	6.6515	0.7692	1.2838	0	47.1099	0	4.0202	11.8069	18.6132	2.8347
53	58	42	110	39	7.7742	5.3608	0.7564	0	0	0.1942	0	24.5258	25.1503	21.4172	4.6914
54	59	66	83	40	8.7179	2.9531	0.77	0	0	91.1161	0	0.2165	0.6202	1.7261	1.2292
55	60	66	90	40	6.2278	4.183	0.7781	0	0	5.029	0.2354	49.7633	19.0351	11.7766	3.2647
56	61	13	110	40	6.3835	5.0292	0.7424	0	0	0	0	30.4395	15.3971	22.0211	4.0376
57	62	64	74	40	5.4308	4.0835	0.7261	0	0	1.6599	0.5689	68.844	6.5606	7.6468	3.8236
58	63	28	78	42	4.9163	4.2293	0.735	0	0	1.4644	21.3798	22.4264	16.8135	17.7377	3.9981
59	65	29	60	44	7.6703	6.0531	0.7599	0	0	0.2234	0.6711	33.9063	24.655	25.1337	1.4932
60	66	44	71	44	10.0859	6.8306	0.6589	0	0	0.4799	0.3594	40.9379	18.9428	19.0301	4.1229
61	67	60	60	44	16.0774	10.1741	0.7525	0	0	0.6955	0	38.4516	18.2457	23.5566	3.9508
62	68	41	72	45	9.4588	5.2742	0.7304	0	0	1.0134	0.383	62.2728	11.7659	10.7397	3.323
63	69	20	68	45	9.6088	8.1633	0.7575	0	0	8.3929	0.8633	25.8114	18.4166	21.534	5.8629
64	70	23	85	46	5.2384	4.7495	0.7156	0.7561	0	5.7542	0.3392	28.6643	12.4898	19.6349	4.793
65	71	24	114	46	5.7733	5.0209	0.7343	1.3134	0	4.9447	0	22.4727	11.9841	19.9346	5.9772
66	72	52	108	47	6.8474	5.4861	0.7707	0	0	0	0	27.7344	15.2638	22.2383	8.982
67	73	45	140	47	7.0469	6.015	0.7515	0	0	0.3632	0	11.5462	6.48	19.7545	20.1714
68	74	40	76	47	12.7042	10.5944	0.717	0	0	0.5738	14.7944	12.9539	9.1042	23.7698	7.02
69	75	31	76	49	5.7636	4.9738	0.6888	0	0	2.0338	0.3832	47.1818	18.6078	11.4481	3.9695
70	77	700	100	50	9.0727	7.5333	0.7792	0	0	1.0877	0.1856	40.4112	22.6752	18.4317	4.1328
71	78	20	48	50	10.9331	9.5093	0.7758	0	0	0.2068	0.3123	31.8131	24.4857	24.1179	5.7332
72	79	98	40	51	12.5002	11.2506	0.7292	0	0	0.0884	0.4203	32.4066	22.0275	24.8938	3.8363
73	80	115	73	54	7.1712	5.5928	0.736	0	0	1.2606	0.512	57.2995	16.6319	11.6395	2.0982
74	81	30	100	54	11.453	9.6021	0.7444	0	0	1.4346	0.3027	10.262	17.4592	32.178	9.1405
75	82	15	86	54	12.0256	10.3587	0.7249	0	0	0.424	0.2849	8.558	18.0623	30.7298	14.131
76	83	770	100	55	8.5988	7.7696	0.744	0	0	1.3217	0.0738	39.4772	16.7501	20.0018	6.2093
77	84	39	66	57	7.0189	5.5386	0.7273	0	0	1.8168	0	60.4915	16.372	9.8269	3.0112
78	85	38	95	57	11.4256	9.76	0.6132	0	0	0.5428	0	10.6855	12.6702	24.9757	11.0312
79	86	65	80	57	4.9957	4.7737	0.729	0	0	0.6859	0	26.378	19.3544	23.6891	6.7469
80	87	54	60	57	15.7792	13.3924	0.7092	0	0	0.7942	0	16.5367	24.5955	32.3628	5.9506
81	88	870	78	57	20.2294	13.1747	0.7116	0	0	0.9522	0.186	48.9802	18.2703	16.1517	3.223
82	89	600	70	57	8.1576	7.476	0.7357	0	0	1.8432	0.0662	52.4974	12.5173	16.6668	4.4487
83	90	780	70	58	9.1113	7.941	0.7322	0	0	0.7805	0.0599	60.239	14.3534	12.7024	2.1748
84	91	60	56	58	9.6619	8.1036	0.7321	0	0	0.9216	0.1391	44.7416	23.0491	18.4971	2.9092
85	92	500	84	58	11.307	9.4228	0.7409	0	0	0.8085	0.2195	46.9887	19.4296	12.6019	3.9444
86	93	300	80	58	11.4718	10.5731	0.698	0	0	0.1194	0.3763	34.7691	15.8939	17.1306	9.8124
87	94	110	72	59	15.3757	10.0036	0.729	0	0	0.8591	0.1249	40.5154	22.2749	20.0409	3.4514
88	95	750	90	60	10.0999	9.3954	0.7213	0	0	1.4601	0.0904	16.7106	19.3169	28.8859	9.9043
89	96	85	85	61	8.9391	6.9481	0.7112	0	0	0.6517	0.4033	49.1093	15.2488	15.1602	3.1869
90	97	57	82	62	11.7924	10.3852	0.7069	0	0	0.9722	0.1432	19.0674	18.1513	27.95	8.4071
91	98	72	80	63	10.3616	7.0248	0.7018	0	0	0.7594	0.7442	53.3915	14.6196	14.3826	2.3274
92	99	730	80	63	12.9541	11.8876	0.7091	0	0	1.3727	0.0908	15.555	22.1793	30.1745	9.2269
93	100	580	77	64	6.9712	6.32	0.6986	0	0	0.2608	0.2727	62.9091	12.8278	9.7517	3.054
94	101	730	80	64	11.527	11.0007	0.7032	0	0	1.2841	0.0709	39.6811	18.9431	21.0329	6.0159
95	102	807	96	66	13.0403	11.7637	0.6909	0	0	0.4691	0.1744	35.2427	24.2257	20.5459	5.7377

	A	B	C	D	AA	AB	AC	AD	AE	AF	AG	AH	AI
1	Tank ID	Sep Pres	Sep Temp	SlsOil APIG	FG mol% n-C4	FG mol% i-C5	FG mol% n-C5	FG mol% HEXS	FG mol% HEPTS	FG mol% OCTS	FG mol% NONS	FG mol% BENZ	FG mol% TOL
2	1	45	106	15	0.908	0.6924	0.752	0.2979	0.3172	0.1419	0.046	0.0034	0.0064
3	2	22	155	17	10.1487	3.5156	4.0848	2.3386	1.7386	0.8716	0.3274	0.0422	0.0279
4	3	20	160	18	4.2866	1.8858	2.3283	0.776	0.8611	0.4614	0.2243	0.0097	0.0217
5	4	53	101	19	5.2454	2.2331	2.0105	0.7898	0.6007	0.2041	0.0773	0.003	0.0094
6	6	23	79	20	0.6526	0.5639	0.4722	0.2947	0.2229	0.0924	0.0285	0.0037	0.0058
7	8	18	75	20	5.0292	1.7332	1.6844	0.6041	0.3685	0.151	0.0341	0.017	0.0091
8	9	54	125	21	5.5659	2.7446	2.1432	1.2007	0.8467	0.393	0.1512	0.0145	0.0228
9	10	35	76	23	1.1144	0.6941	0.2501	0.0678	0.0545	0.0149	0.0026	0.0175	0.0054
10	12	30	66	23	5.4101	2.011	1.8498	0.5592	0.3488	0.1117	0.028	0.0069	0.0042
11	13	20	122	24	0.6384	0.6644	0.4958	0.6121	0.7297	0.407	0.1681	0.0091	0.0315
12	14	20	88	24	9.1597	2.7703	2.7126	0.8851	0.6356	0.2203	0.0608	0.0093	0.0075
13	15	22	86	24	8.788	2.5765	2.4165	0.8531	0.6222	0.2263	0.0619	0.0091	0.0175
14	16	20	68	24	8.3382	2.3222	2.5256	0.8422	0.3995	0.2468	0.0502	0.0122	0.0198
15	17	19	133	25	11.5422	4.6193	3.6532	1.6441	1.1597	0.5577	0.2327	0.0166	0.0284
16	18	30	60	25	6.8068	2.061	1.695	0.399	0.3293	0.0823	0.0255	0.0036	0.0094
17	19	25	136	27	9.8521	4.903	3.7954	2.1741	1.222	0.6612	0.2318	0.2921	0.4651
18	20	31	64	27	8.4588	2.9718	1.9333	0.732	0.3741	0.1103	0.0246	0.0038	0.0041
19	21	23	79	29	2.1544	0.8547	0.4581	0.2335	0.4537	0.2728	0.0628	0.1875	0.1483
20	22	17	86	29	10.1836	4.0356	2.5853	1.1438	0.9501	0.2776	0.0974	0.2529	0.1708
21	23	20	120	29	23.8599	5.7876	6.474	1.6565	1.8049	0.6694	0.1763	0.4975	0.3317
22	24	22	98	29	7.7959	4.9905	1.8332	1.2708	1.0384	0.3969	0.1131	0.0411	0.0513
23	26	4	80	30	2.2778	0.6649	0.4657	0.2824	0.4152	0.1531	0.0461	0.0176	0.0062
24	27	25	180	30	11.7061	6.815	9.0199	4.6117	5.0959	2.5012	0.7632	0.0239	0.0422
25	28	64	70	30	3.1185	1.1742	0.8422	0.3517	0.3375	0.1404	0.0344	0.0535	0.0183
26	29	80	77	33	3.4304	1.8504	1.1412	0.6201	0.5422	0.2544	0.0641	0.0692	0.0555
27	30	20	115	33	7.3318	3.2454	2.276	1.0807	1.0406	0.4471	0.1208	0.0679	0.044
28	31	60	78	34	2.3765	0.9266	0.6549	0.2968	0.2198	0.0891	0.0204	0.0231	0.0091
29	32	18	70	34	1.9777	0.9195	0.594	0.2905	0.2693	0.1294	0.0304	0.0213	0.0291
30	34	18	80	35	8.6664	2.6345	2.8985	1.0014	1.0919	0.3487	0.0914	0.3153	0.2409
31	35	15	108	35	11.2813	4.6596	3.6141	1.5936	1.1689	0.4514	0.1317	0.017	0.0292
32	36	17	100	35	10.2951	3.9542	3.7423	1.4491	0.9514	0.3732	0.1237	0.0206	0.0236
33	37	30	125	36	3.641	1.7913	1.2352	0.7488	0.9187	0.5841	0.1756	0.277	0.2663
34	38	50	68	36	3.1472	1.3933	1.2468	0.5382	0.5449	0.2292	0.0445	0.1381	0.0944
35	39	57	80	36	5.2134	1.9832	1.6349	0.7311	0.6894	0.3038	0.0566	0.0974	0.0847
36	40	75	81	36	5.7525	2.1935	1.7777	0.6223	0.6075	0.2582	0.0605	0.1011	0.0625
37	41	28	60	36	4.7387	1.1054	1.4436	0.43	0.5322	0.1806	0.0343	0.0725	0.0557
38	42	18	95	36	14.7897	4.9003	3.6249	1.4238	1.2467	0.334	0.1037	0.1202	0.1162
39	43	18	98	37	5.6765	2.9857	1.7577	0.8789	0.7907	0.3988	0.0914	0.1429	0.1043
40	44	190	70	37	2.9303	0.8982	0.5823	0.3038	0.2932	0.1621	0.0228	0.029	0.0135
41	45	22	50	37	9.1761	2.2992	1.7194	0.3997	0.5379	0.1535	0.0221	0.2447	0.0253
42	46	24	68	38	4.0446	1.7243	1.0892	0.4991	0.46	0.1927	0.0446	0.0425	0.0565
43	47	60	72	38	3.8467	1.5955	1.1351	0.5011	0.4378	0.1907	0.0486	0.1512	0.0754
44	48	32	149	38	5.2845	5.1038	3.4799	2.6649	2.8683	1.5151	0.263	0.2402	0.2452
45	49	62	80	38	9.6044	3.7156	2.5699	1.2884	0.938	0.3558	0.0679	0.0057	0.0131
46	50	13	113	38	17.0901	4.6062	5.2782	1.3011	1.6371	0.6343	0.1913	0.0788	0.1258
47	51	28	45	38	6.67	1.8891	1.3367	0.3166	0.4233	0.1195	0.0211	0.085	0.0136
48	52	22	114	38	19.8302	6.1208	7.1482	1.9607	2.1946	0.7609	0.133	0.0469	0.0431

	A	B	C	D	AA	AB	AC	AD	AE	AF	AG	AH	AI
1	Tank ID	Sep Pres	Sep Temp	SlsOil APIG	FG mol% n-C4	FG mol% i-C5	FG mol% n-C5	FG mol% HEXS	FG mol% HEPTS	FG mol% OCTS	FG mol% NONS	FG mol% BENZ	FG mol% TOL
49	53	66	89	39	5.4511	2.9922	2.0567	1.1611	1.0378	0.4425	0.0744	0.3901	0.188
50	54	60	80	39	5.5747	2.9449	3.0346	1.1198	0.9556	0.3608	0.067	0.055	0.0542
51	55	60	68	39	6.826	2.0492	1.2806	0.4503	0.427	0.1866	0.0252	0.0451	0.0047
52	57	33	60	39	7.8623	2.2266	2.1003	0.6495	0.5894	0.1951	0.0337	0.1414	0.103
53	58	42	110	39	9.8131	3.2318	3.8738	1.3439	1.8878	0.6184	0.1579	0.9845	0.6066
54	59	66	83	40	1.5675	1.0384	0.7639	0.4507	0.4809	0.2232	0.0586	0.115	0.1254
55	60	66	90	40	3.695	1.7694	1.2613	0.7005	0.8398	0.3935	0.1002	1.1114	0.5257
56	61	13	110	40	12.5961	3.7193	4.6539	2.0248	2.0985	0.875	0.1881	0.2154	0.2361
57	62	64	74	40	4.2089	2.3417	1.8542	0.8498	0.6557	0.2537	0.0595	0.0774	0.0559
58	63	28	78	42	7.6413	2.909	2.6874	0.7356	0.9834	0.3384	0.0632	0.0133	0.0147
59	65	29	60	44	9.4312	0.6195	2.6303	0.1654	0.3068	0.0913	0.0233	0.0185	0.0114
60	66	44	71	44	8.7288	2.4947	2.3687	0.7115	0.735	0.2817	0.0529	0.0686	0.08
61	67	60	60	44	8.2858	2.5622	2.4143	0.6121	0.4197	0.2224	0.0256	0.0273	0.0404
62	68	41	72	45	4.1849	1.893	1.4696	0.7967	0.8297	0.3087	0.0659	0.2549	0.1739
63	69	20	68	45	9.3439	3.5852	2.7687	1.0761	0.8276	0.3883	0.0645	0.0406	0.0546
64	70	23	85	46	14.4812	3.9945	4.937	1.2549	1.0815	0.3716	0.0678	0.0136	0.0139
65	71	24	114	46	14.2431	4.9773	5.4098	2.4532	1.8698	1.411	0.2595	0.2092	0.2517
66	72	52	108	47	9.3858	6.5298	4.3553	1.6261	1.6943	0.7816	0.1495	0.1013	0.1713
67	73	45	140	47	12.5764	9.1937	5.953	3.906	4.3385	1.8828	0.4082	0.3904	0.3882
68	74	40	76	47	17.3444	5.2107	5.8645	0.9939	0.9211	0.3038	0.0545	0.0246	0.0188
69	75	31	76	49	6.6716	2.9607	2.7062	1.1883	0.9694	0.338	0.0885	0.2701	0.1275
70	77	700	100	50	6.4671	2.2039	1.689	0.8312	0.7849	0.258	0.0366	0.1347	0.2159
71	78	20	48	50	7.8278	2.5599	1.2831	0.5555	0.342	0.1393	0.0196	0.2124	0.1192
72	79	98	40	51	10.3894	2.0977	2.3639	0.5158	0.4115	0.0891	0.0086	0.0204	0.0146
73	80	115	73	54	4.4886	1.5451	1.4184	0.5584	1.1659	0.614	0.1047	0.0365	0.0089
74	81	30	100	54	13.1693	5.3015	3.944	1.9625	1.8134	0.9133	0.1237	0.3022	0.4255
75	82	15	86	54	13.5633	5.2008	3.4687	1.8092	1.6226	0.5996	0.0746	0.2154	0.1559
76	83	770	100	55	8.348	2.826	2.3466	0.8905	0.6813	0.2111	0.0241	0.0889	0.0965
77	84	39	66	57	3.127	1.197	0.9121	0.8154	0.9552	0.4812	0.0945	0.1932	0.1601
78	85	38	95	57	18.4645	7.9995	6.0692	2.6682	1.7047	0.5422	0.1302	0.3835	0.1983
79	86	65	80	57	9.5903	4.4433	3.0491	1.8563	1.8344	0.6239	0.0785	0.2168	0.2768
80	87	54	60	57	11.7939	3.0002	2.6903	0.738	0.6216	0.2024	0.0269	0.0604	0.0663
81	88	870	78	57	6.8177	2.0079	1.8428	0.5197	0.4239	0.131	0.0165	0.0422	0.0444
82	89	600	70	57	6.2916	2.1677	1.7408	0.5755	0.4653	0.1443	0.0167	0.0765	0.0719
83	90	780	70	58	5.055	1.4914	1.3509	0.5666	0.5206	0.1951	0.029	0.0171	0.0301
84	91	60	66	58	5.0365	1.4966	1.1396	0.5613	0.6169	0.3079	0.0493	0.038	0.0926
85	92	500	84	58	6.3764	3.8031	2.3695	1.279	0.9113	0.2533	0.0341	0.1526	0.1963
86	93	300	80	58	9.4102	6.3777	2.6955	1.71	0.6869	0.1882	0.0352	0.0496	0.0351
87	94	110	72	59	6.1775	1.957	1.5257	0.7955	0.9224	0.4855	0.0817	0.0547	0.1413
88	95	750	90	60	11.5039	4.4499	3.6978	1.3629	0.9506	0.2874	0.031	0.1633	0.1554
89	96	85	85	61	6.2697	2.29	2.3569	1.0553	2.0197	0.9216	0.1783	0.059	0.0279
90	97	57	82	62	13.1598	4.0629	2.953	1.6605	1.5371	0.5169	0.072	0.0978	0.1631
91	98	72	80	63	5.3614	1.6753	2.0121	0.9424	1.6345	0.8315	0.1697	0.0297	0.1053
92	99	730	80	63	11.6835	3.8489	3.006	0.9838	0.6783	0.1999	0.0199	0.1483	0.1236
93	100	680	77	64	4.2779	1.8576	1.458	0.7559	1.1695	0.3786	0.0293	0.1624	0.2173
94	101	730	80	64	8.0306	2.2163	1.6368	0.4724	0.2092	0.0506	0.0042	0.0513	0.0327
95	102	807	96	66	8.1979	2.5132	1.6591	0.5034	0.27	0.148	0.0226	0.0386	0.0078

	A	B	C	D	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS
1	Tank ID	Sep Pres	Sep Temp	SlsOil APIG	FG mol% E-BENZ	FG mol% XYL	FG mol% n-C6	FG mol% 224TriMe	FG mol% C10+	FG Mol Frac	FG MWt	FG MWt THC	FG MWt VOC	FG Grav
2	1	45	106	15	0.0031	0.0079	0.2281	0	0	0.0193	44.7726	63.86987803	68.67850402	1.5455
3	2	22	155	17	0.0077	0.0429	1.3568	0	0	0.0237	48.6786	51.70217986	55.33739534	1.6803
4	3	20	160	18	0.0015	0.0246	0.6643	0	0	0.0118	46.4059	57.11401467	61.1347774	1.6019
5	4	53	101	19	0.0054	0.0152	0.4376	0	0	0.0378	35.15	32.13191166	50.32321269	1.2133
6	6	23	79	20	0.0004	0.0042	0.1692	0	0	0.0113	20.4833	19.11440071	44.12996167	0.7071
7	8	18	75	20	0.003	0.0065	0.3641	0	0	0.0092	31.3671	30.35811221	48.33756911	1.0827
8	9	54	125	21	0.0019	0.0251	0.6542	0	0	0.0249	28.5743	28.53399311	50.05084685	0.9863
9	10	35	76	23	0.0002	0.0007	0.0296	0	0	0.0175	20.4986	19.98663393	41.63304905	0.7076
10	12	30	66	23	0.0018	0.0069	0.3433	0	0	0.0223	33.6368	31.31405909	47.57875913	1.1611
11	13	20	122	24	0.0017	0.0157	0.3886	0	0	0.0086	22.6834	20.3731109	61.7815952	0.783
12	14	20	88	24	0.0047	0.0131	0.6683	0	0	0.029	41.3425	41.93443217	49.33958978	1.4271
13	15	22	86	24	0.0009	0.0117	0.5752	0	0	0.023	42.3532	42.51674246	49.78723271	1.462
14	16	20	68	24	0.0005	0.0034	0.5282	0	0	0.0211	43.3115	43.05038765	48.67877916	1.495
15	17	19	133	25	0.003	0.0119	0.9694	0	0	0.0074	41.8015	41.67469194	49.40555587	1.4429
16	18	30	60	25	0.0022	0.0057	0.3178	0	0	0.0237	31.3889	31.23084404	45.69271523	1.0835
17	19	25	136	27	0.0225	0.1019	0.9219	0	0	0.0151	43.2752	45.31470497	53.33399841	1.4938
18	20	31	64	27	0.0009	0.0051	0.4155	0	0	0.0221	35.0484	35.57339863	49.24046871	1.2098
19	21	23	79	29	0.0043	0.0408	0.1634	0	0	0.0123	25.051	24.3503262	43.00094152	0.8647
20	22	17	86	29	0.0037	0.0222	0.5424	0	0	0.0144	39.8801	40.01865072	48.32504353	1.3766
21	23	20	120	29	0.0086	0.041	1.3392	0	0	0.0027	50.447	50.50499037	55.3764251	1.7414
22	24	22	98	29	0.0012	0.0184	0.3764	0	0	0.0385	41.564	42.68357531	46.04337426	1.4347
23	26	4	80	30	0.0004	0.0134	0.113	0	0	0.0038	23.7264	23.4740091	42.03267154	0.819
24	27	25	180	30	0.0103	0.1013	4.2639	0	0.0003	0.0215	54.4723	55.44074369	60.62413558	1.8803
25	28	64	70	30	0.0008	0.0068	0.2011	0	0	0.0412	25.5064	24.89560484	45.99341505	0.8804
26	29	80	77	33	0.0054	0.0331	0.3252	0	0	0.0463	28.6986	28.59688629	45.67604196	0.9906
27	30	20	115	33	0.0043	0.0167	0.577	0	0.0001	0.0131	33.9499	33.76928225	51.28428539	1.1719
28	31	60	78	34	0.0006	0.0035	0.1386	0	0	0.03	22.1314	21.87040244	47.57648224	0.7639
29	32	18	70	34	0.0025	0.0143	0.1522	0	0	0.01	22.4044	21.76684971	46.63804461	0.7734
30	34	18	80	35	0.0046	0.0409	0.7834	0	0	0.0175	37.5635	37.43867525	46.45355837	1.2966
31	35	15	108	35	0.002	0.0207	0.9816	0	0.0001	0.023	45.1085	45.85434473	49.97666233	1.5571
32	36	17	100	35	0.0042	0.016	0.8904	0	0	0.0202	40.1839	40.08228981	47.03746581	1.3871
33	37	30	125	36	0.0084	0.0374	0.4176	0	0.0002	0.0102	28.1156	27.83385888	49.46384682	0.9705
34	38	50	68	36	0.0043	0.0348	0.352	0	0	0.0274	24.471	24.29315402	49.12438262	0.8447
35	39	57	80	36	0.0045	0.0346	0.4877	0	0	0.0233	29.3101	29.03755567	47.19399932	1.0117
36	40	75	81	36	0.0043	0.0292	0.412	0	0	0.0472	29.9726	29.61289872	48.04403935	1.0346
37	41	28	60	36	0.002	0.0118	0.383	0	0	0.0209	28.9917	28.5593034	43.51082185	1.0007
38	42	18	95	36	0.0065	0.0338	0.7472	0	0	0.0252	45.966	48.20684298	50.95606126	1.5867
39	43	18	98	37	0.0056	0.0472	0.5195	0	0	0.015	31.8499	31.58149495	50.52757153	1.0994
40	44	190	70	37	0.0026	0.0077	0.131	0	0	0.0987	26.0707	25.54023585	41.40873228	0.8999
41	45	22	50	37	0.0029	0.0034	0.2356	0	0	0.0389	39.8127	39.43035988	43.27904284	1.3743
42	46	24	68	38	0.0022	0.019	0.2745	0	0.0001	0.0142	27.7054	27.5694965	45.69263627	0.9563
43	47	60	72	38	0.002	0.0117	0.3067	0	0	0.036	27.3573	27.17031164	45.95638258	0.9443
44	48	32	149	38	0.0164	0.1464	1.4273	0	0.0022	0.0091	38.9826	38.80839757	54.03150088	1.3456
45	49	62	80	38	0.0055	0.0155	0.5524	0	0	0.0536	48.3029	55.23212427	56.13006226	1.6673
46	50	13	113	38	0.0099	0.0482	1.363	0	0	0.0063	49.8551	49.8062347	50.79978507	1.7209
47	51	28	45	38	0.002	0.0023	0.1808	0	0	0.03	40.4598	37.90631869	45.48785031	1.3966
48	52	22	114	38	0.0021	0.0358	1.6041	0	0	0.0322	49.1437	50.41846833	55.23711126	1.6964

	A	B	C	D	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS
1	Tank ID	Sep Pres	Sep Temp	SlsOil APIG	FG mol% E-BENZ	FG mol% XYL	FG mol% n-C6	FG mol% 224TriMe	FG mol% C10+	FG Mol Frac	FG MWt	FG MWt THC	FG MWt VOC	FG Grav
49	53	66	89	39	0.0051	0.0512	0.6179	0	0	0.0401	32.6702	32.21640036	50.18591439	1.1277
50	54	60	80	39	0.0051	0.0275	0.7609	0	0	0.0357	30.7672	30.59001254	51.11918337	1.062
51	55	60	58	39	0.0023	0.0115	0.2494	0	0	0.0596	33.1031	33.04657101	45.11747232	1.1427
52	57	33	60	39	0.002	0.0144	0.4135	0	0	0.0349	44.8676	45.86169435	48.38085677	1.5488
53	58	42	110	39	0.0084	0.0518	1.4432	0	0	0.0403	41.0606	40.96021152	49.07809869	1.4173
54	59	66	83	40	0.0034	0.0132	0.2515	0	0.0002	0.0419	45.6137	61.78834006	62.93099716	1.5745
55	60	66	90	40	0.0108	0.0421	0.4462	0	0.0002	0.0412	31.1681	30.44998458	46.39177755	1.0759
56	61	13	110	40	0.0127	0.0735	1.4113	0	0	0.0111	41.566	41.46106227	52.58394244	1.4348
57	62	64	74	40	0.0017	0.0131	0.5244	0	0	0.0336	27.2599	26.9374573	52.86523524	0.941
58	63	28	78	42	0.0004	0.0087	0.7844	0	0	0.013	36.6472	38.83595171	48.17579195	1.265
59	65	29	60	44	0.0007	0.0021	0.6167	0	0.0001	0.0284	34.0435	34.04630521	43.40877388	1.1751
60	66	44	71	44	0.0046	0.0351	0.5656	0	0	0.026	34.2913	34.23015168	47.01799075	1.1837
61	67	60	60	44	0.003	0.016	0.471	0	0	0.0559	34.7364	34.65026984	46.40779161	1.199
62	68	41	72	45	0.0033	0.0544	0.4671	0	0	0.0246	28.3285	28.12649665	48.83821151	0.9779
63	69	20	68	45	0.0053	0.0204	0.9437	0	0	0.0218	39.673	39.33720258	48.5969247	1.3695
64	70	23	85	46	0.0016	0.0133	1.3377	0	0	0.0279	41.3359	41.22019571	52.41153107	1.4269
65	71	24	114	46	0.009	0.1075	2.172	0	0	0.0232	46.0212	46.19469941	55.70217382	1.5886
66	72	52	108	47	0.0082	0.0946	0.8836	0	0	0.0308	42.544	42.45918286	52.59729812	1.4686
67	73	45	140	47	0.015	0.211	2.4215	0	0.0001	0.1011	55.7056	55.53050288	60.70620387	1.9229
68	74	40	76	47	0.0044	0.0146	1.0286	0	0	0.0552	44.9226	47.83036984	53.57510301	1.5507
69	75	31	76	49	0.0029	0.0639	0.9888	0	0	0.0244	33.1632	32.90769269	48.69514532	1.1447
70	77	700	100	50	0.0004	0.005	0.4466	0	0.0023	0.3764	33.42	33.27320707	45.21331466	1.1536
71	78	20	48	50	0.0032	0.0159	0.2522	0	0.0009	0.0308	35.4274	35.41552554	44.52325613	1.2229
72	79	98	40	51	0.0002	0.0014	0.4148	0	0	0.0937	35.7746	35.7796063	45.31376693	1.2349
73	80	115	73	54	0.0091	0.0332	0.5748	0	0.0005	0.0573	28.9798	28.73226179	46.49736472	1.0003
74	81	30	100	54	0.0068	0.1152	1.1455	0	0.0003	0.0648	47.7587	47.7820308	51.48320515	1.6486
75	82	16	86	54	0.0045	0.0516	1.0439	0	0	0.0337	48.0958	48.08917059	51.11178447	1.6602
76	83	770	100	55	0.0003	0.0048	0.6475	0	0.0004	0.4059	35.3815	35.23657658	48.05144655	1.2213
77	84	39	66	57	0.0076	0.0337	0.5023	0	0.0023	0.0233	27.8912	27.54403798	46.00208151	0.9628
78	85	38	95	57	0.013	0.0963	1.8251	0	0	0.06	50.8993	50.85127157	55.04116301	1.757
79	86	65	80	57	0.0083	0.0766	1.0859	0	0.0055	0.0007	41.2886	41.17744233	50.26754064	1.4252
80	87	54	60	57	0.002	0.0104	0.5481	0	0	0.0841	41.1631	41.10923929	46.1233604	1.4209
81	88	870	78	57	0.0012	0.0066	0.3828	0	0	0.4293	30.9852	30.84390802	45.37735191	1.0696
82	89	600	70	57	0.0002	0.003	0.4057	0	0.0009	0.3011	31.0245	30.75840478	47.70217032	1.0709
83	90	780	70	58	0.0014	0.0101	0.4221	0	0.0006	0.3331	27.8462	27.69248982	45.72288033	0.9612
84	91	60	56	58	0.0038	0.0389	0.3601	0	0.0008	0.0706	31.1747	31.02837853	43.39919523	1.0761
85	92	500	84	58	0.0002	0.0049	0.6265	0	0.0001	0.2724	32.9348	32.80906419	47.96423057	1.1369
86	93	300	80	58	0.0017	0.0114	0.6969	0	0	0.238	38.8291	38.82931755	51.06778678	1.3403
87	94	110	72	59	0.0061	0.063	0.519	0	0.004	0.0789	33.4603	33.32924536	45.30107378	1.155
88	95	750	90	60	0.0004	0.0067	1.0226	0	0.0001	0.2201	43.8007	43.76401491	49.43126504	1.5119
89	96	85	85	61	0.0052	0.0222	1.0335	0	0.0004	0.0482	33.4785	33.32912824	50.36329566	1.1556
90	97	57	82	62	0.0043	0.0491	1.0325	0	0	0.0684	43.6289	43.57016825	50.14608833	1.506
91	98	72	80	63	0.0045	0.0401	0.968	0	0.0008	0.0389	31.4883	31.33483832	49.43606869	1.0869
92	99	730	80	63	0.0002	0.0043	0.7042	0	0	0.2191	42.7723	42.73425599	47.73756983	1.4764
93	100	580	77	64	0.002	0.0199	0.5954	0	0.0002	0.2556	28.1844	28.08461422	48.8061949	0.9729
94	101	730	80	64	0	0.0009	0.2667	0	0	0.4221	33.8289	33.68964062	45.56534951	1.1677
95	102	807	96	66	0.0011	0.0065	0.2357	0	0.0007	0.4578	34.4909	34.44373268	44.5584272	1.1906

	A	B	C	D	AT	AU	AV	AW	AX	AY	AZ	BA	BB
1	Tank ID	Sep Pres	Sep Temp	SlsOil APIG	WSG mol% H2S	WSG mol% O2	WSG mol% CO2	WSG mol% N2	WSG mol% C1	WSG mol% C2	WSG mol% C3	WSG mol% i-C4	WSG mol% n-C4
2	1	45	106	16	2.4011	0	93.0086	0	0.1602	0.3529	0.3119	0.3452	0.9192
3	2	22	155	17	0	0	41.572	0	3.6976	11.1996	13.3291	5.6503	10.1758
4	3	20	160	18	2.173	0	52.8803	0.2704	0.5917	1.7474	12.6961	6.7392	13.6745
5	4	53	101	19	14.2562	0	25.4645	0.0299	13.4643	15.437	15.6791	3.3932	5.7807
6	6	23	79	20	0.1615	0	3.0184	2.873	83.9378	6.0895	0.9476	0.4587	0.6532
7	8	18	75	20	0	0	10.7529	18.3147	40.0958	10.0152	8.4905	2.3225	5.0307
8	9	54	125	21	0	0	0	0.0366	17.711	15.9971	24.3926	10.0545	21.0353
9	10	35	76	23	0	0	1.9542	0.2871	82.7098	7.4495	4.1777	1.1697	1.1145
10	12	30	66	23	13.5021	0	16.2818	0.036	11.6451	17.7076	26.0901	3.3203	6.0219
11	13	20	122	24	0	0	14.8555	3.128	66.8019	6.8605	3.371	0.6776	0.7412
12	14	20	88	24	12.5579	0	16.6212	0.2994	3.5878	15.1792	29.2369	4.339	10.0354
13	15	22	86	24	8.221	0	32.5304	0.0952	4.629	15.0254	19.0318	3.9	8.959
14	16	20	68	24	0	0	27.0135	0.0585	2.3092	15.4204	33.6109	5.1671	9.3115
15	17	19	133	25	0	0	2.9448	0	22.4824	21.3914	22.9268	5.8064	11.5418
16	18	30	60	25	0	0	1.4619	0.1338	13.8201	26.988	39.6301	5.1043	7.7714
17	19	25	136	27	9.2219	0	11.0175	2.0038	13.871	15.3774	18.6421	5.0418	9.9765
18	20	31	64	27	8.1812	0	4.8279	0.9781	8.3073	16.2574	38.543	5.986	10.0609
19	21	23	79	29	0	0	3.4519	0	66.7855	14.7845	7.7859	2.1542	2.1543
20	22	17	86	29	7.2705	0	1.5207	0	4.0031	16.8987	41.7859	6.3627	11.7272
21	23	20	120	29	0	0	1.1423	0	2.2764	8.085	32.9095	10.1011	26.2533
22	24	22	98	29	15.0099	0	2.2229	0	4.2025	31.5067	22.8754	6.1576	7.8613
23	26	4	80	30	0	0	1.1298	0	70.5894	14.674	6.8568	2.2915	2.2778
24	27	25	180	30	0.7722	0	10.0293	0	8.3265	15.2617	16.0989	4.4213	11.7707
25	28	64	70	30	0	0	5.2445	0.085	39.0025	28.5767	16.6636	3.8451	3.373
26	29	80	77	33	0	0	0.3166	0.0268	11.7702	17.2092	44.7596	12.8899	7.3911
27	30	20	115	33	0	0	2.017	0	31.3441	23.9057	18.1049	7.9575	7.6531
28	31	60	78	34	0	0	1.1756	0	80.464	5.8007	5.7399	2.059	2.3769
29	32	18	70	34	0	0	2.972	0	78.6999	6.915	5.1255	1.855	1.9781
30	34	18	80	35	0.2532	0	1.0118	0.0289	5.127	23.3099	44.865	4.9771	10.5027
31	35	15	108	35	1.31	0	15.1055	0.2174	3.0217	23.4351	26.7222	5.6599	11.7248
32	36	17	100	35	0	0	2.3343	0.0459	6.5246	35.4209	28.0491	5.0689	10.8436
33	37	30	125	36	0	0	1.4565	0	63.77	11.7147	9.7082	3.2408	3.6409
34	38	50	68	36	0	0	0.776	0.1273	74.1003	8.4898	6.7395	1.9945	3.1485
35	39	57	80	36	0	0	2.7367	0.0751	33.7557	34.1198	14.069	3.6627	5.4059
36	40	75	81	36	0	0	3.9416	0.0382	33.255	30.6945	15.4479	4.4497	5.974
37	41	28	60	36	6.7647	0	1.3611	0.0328	13.0529	27.7377	38.6411	2.1391	5.7873
38	42	18	95	36	16.665	0	2.2833	0.0613	1.658	15.2863	30.0123	6.1848	15.0998
39	43	18	98	37	0	0	3.1861	0	45.3921	17.8593	13.1581	6.9054	5.7446
40	44	190	70	37	0	0	4.6592	0.0523	34.3573	39.2818	14.2799	1.8669	3.0287
41	45	22	50	37	1.1225	0	2.1388	0	0.8793	13.7102	39.195	13.5843	21.8804
42	46	24	68	38	0	0	0.7746	0	21.0838	27.8609	35.3861	5.2923	4.9446
43	47	60	72	38	0	0	0.9821	0	62.1801	13.852	10.9654	3.7151	3.8467
44	48	32	149	38	0	0	0.5631	0	39.6984	18.6017	12.1478	5.7183	5.2858
45	49	62	80	38	0	0	58.7854	0.0377	0.2874	5.758	12.4271	3.4106	9.7294
46	50	13	113	38	0	0	0.3156	0	0.6085	15.2425	42.0792	8.854	17.5169
47	51	28	45	38	0	0	41.5926	0	4.4466	24.7395	14.2613	3.7465	6.7853
48	52	22	114	38	0	0	0.1729	0.1572	0.8482	3.5747	22.6252	12.0151	36.3163

	A	B	C	D	AT	AU	AV	AW	AX	AY	AZ	BA	BB
1	Tank ID	Sep Pres	Sep Temp	SlsOil APIG	WSG mol% H2S	WSG mol% O2	WSG mol% CO2	WSG mol% N2	WSG mol% C1	WSG mol% C2	WSG mol% C3	WSG mol% i-C4	WSG mol% n-C4
49	53	66	89	39	0	0	3.0677	0	15.8046	20.9694	36.6726	7.0224	6.9499
50	54	60	80	39	0	0	1.0245	0.1369	57.8641	12.077	10.2179	3.7158	5.5747
51	55	60	58	39	0	0	0.3267	0.0125	10.6582	28.2465	41.6343	6.5448	7.6448
52	57	33	60	39	2.3346	0	32.3867	0	0.8424	14.5046	31.4769	3.2507	8.5296
53	58	42	110	39	0	0	0.07	0	0.4503	17.6528	26.6113	7.2445	16.189
54	59	66	83	40	0	0	71.4407	0	0.0393	0.6795	3.2518	3.0836	4.3504
55	60	66	90	40	0	0	8.2852	0.0483	34.3925	30.0459	12.8679	3.3482	3.7587
56	61	13	110	40	0	0	0	0	11.9545	23.9118	30.4015	4.4652	13.465
57	62	64	74	40	0	0	3.6298	0.1528	58.3558	14.2613	8.6879	3.9185	4.2725
58	63	28	78	42	0	0	0.8944	1.4082	4.6605	18.2854	47.626	6.9617	10.8598
59	65	29	60	44	0	0	0.1434	0.0369	6.5622	27.3766	48.4649	1.8637	10.8266
60	66	44	71	44	0	0	0.7446	0.0756	25.8234	31.4515	21.2761	4.2528	8.9169
61	67	60	60	44	0	0	0.5464	0	13.8999	18.141	32.6694	6.3968	14.1375
62	68	41	72	45	0	0	0.9207	0.0057	19.4789	14.2777	20.2721	7.9675	10.9297
63	69	20	68	45	0	0	5.8443	0.0546	5.8789	23.9154	36.5892	6.943	10.45
64	70	23	86	46	0.6363	0	1.757	0.012	3.1075	6.8801	33.4359	10.7631	27.6598
65	71	24	114	46	1.922	0	3.0026	0	5.3633	12.796	33.2195	7.3806	16.3878
66	72	52	108	47	0	0	0	0	9.5515	22.1688	31.3768	10.0337	10.0954
67	73	45	140	47	0	0	0.2956	0	4.0134	7.8264	23.4819	21.5936	13.202
68	74	40	76	47	0	0	0.0175	0	0.0043	2.3435	28.1176	10.8623	28.7441
69	75	31	76	49	0	0	1.825	0.0385	14.9196	30.4129	29.0111	5.4168	8.0822
70	77	700	100	50	0	0	1.1647	0.0155	13.4283	41.0748	25.9346	4.5608	6.9253
71	78	20	48	50	0	0	0.1079	0.011	4.7431	24.8463	47.0298	7.4958	9.4798
72	79	98	40	51	0	0	0.0296	0.0104	3.1472	15.2631	53.4722	6.1391	14.549
73	80	115	73	54	0	0	2.2609	0.0949	39.1625	32.3908	13.1435	2.1737	4.6036
74	81	30	100	54	0	0	1.2373	0.0294	3.4735	21.0304	35.0201	9.4403	13.4898
75	82	15	86	54	0	0	0.2294	0.0164	1.6914	17.6647	36.4706	15.0751	14.2191
76	83	770	100	55	0	0	0.6038	0.0027	5.628	15.1664	47.469	10.0287	11.6636
77	84	39	66	57	0	0	3.3002	0	40.6233	33.128	11.1489	3.1246	3.213
78	85	38	95	57	0	0	0.3115	0	2.4932	12.7223	30.7571	11.9395	19.5643
79	86	65	80	57	0	0	0.1439	0	1.9897	8.4038	34.6955	15.3697	20.0021
80	87	54	60	57	0	0	0.4555	0	3.0821	27.0738	41.7961	6.5293	12.6638
81	88	870	78	57	0	0	0.8696	0.0197	22.3428	20.9418	24.8471	5.7217	12.7585
82	89	600	70	57	0	0	0.9126	0.0024	7.7192	12.7926	51.274	9.0546	10.4815
83	90	780	70	58	0	0	1.0156	0.0056	23.8326	37.3795	24.1634	2.6292	5.8084
84	91	60	56	58	0	0	0.9513	0.0112	14.7931	44.5441	25.9811	3.2374	5.4608
85	92	500	84	58	0	0	1.2918	0.0305	25.9023	37.6592	14.4707	4.1344	6.6117
86	93	300	80	58	0	0	0.0496	0.0145	4.8646	13.8313	37.7108	15.2521	13.0089
87	94	110	72	59	0	0	0.7384	0.0121	18.9097	23.9473	27.7608	5.3823	10.0766
88	95	750	90	60	0	0	0.3497	0.0019	1.3489	9.7048	44.1398	14.535	15.3913
89	96	85	85	61	0	0	0.9651	0.11	45.9666	17.958	15.4771	3.2087	6.3023
90	97	57	82	62	0	0	0.5723	0.0085	4.0709	20.8687	37.7802	9.4439	14.3682
91	98	72	80	63	0	0	0.8083	0.2629	53.564	14.8433	14.4048	2.328	5.3631
92	99	730	80	63	0	0	0.3746	0.0021	1.3909	12.9941	47.0682	12.2347	14.5294
93	100	580	77	64	0	0	0.3341	0.03	27.0799	34.0535	22.069	3.8981	5.0746
94	101	730	80	64	0	0	0.2289	0.0008	2.0306	7.9483	38.6636	18.153	22.0239
95	102	807	96	66	0	0	0.2069	0.006	4.9196	24.1451	44.5567	8.319	10.982

	A	B	C	D	BC	BD	BE	BF	BG	BH	BI	BJ
1	Tank ID	Sep Pres	Sep Temp	SlsOil APIG	WSG mol% i-C5	WSG mol% n-C5	WSG mol% HEXS	WSG mol% HEPTS	WSG mol% OCTS	WSG mol% NONS	WSG mol% BENZ	WSG mol% TOL
2	1	45	106	15	0.6936	0.7527	0.2979	0.3172	0.142	0.0484	0.0034	0.0064
3	2	22	155	17	3.5191	4.0881	2.3392	1.7389	0.8717	0.3408	0.0423	0.0279
4	3	20	160	18	2.9244	3.1755	0.8116	0.8721	0.4644	0.2344	0.01	0.0219
5	4	53	101	19	2.2892	2.0465	0.7947	0.6038	0.2054	0.0821	0.003	0.0095
6	6	23	79	20	0.5642	0.4724	0.2948	0.223	0.0924	0.0302	0.0037	0.0058
7	8	18	75	20	1.7334	1.6846	0.6042	0.3685	0.1511	0.0362	0.017	0.0091
8	9	54	125	21	4.3698	2.9351	1.2725	0.8734	0.4049	0.1641	0.0151	0.0234
9	10	35	76	23	0.6941	0.2501	0.0678	0.0545	0.0149	0.0028	0.0175	0.0054
10	12	30	66	23	2.0701	1.891	0.567	0.3543	0.114	0.0305	0.007	0.0042
11	13	20	122	24	0.6816	0.504	0.6142	0.7315	0.4081	0.1769	0.0091	0.0315
12	14	20	88	24	2.8441	2.7663	0.8936	0.6416	0.2229	0.0653	0.0093	0.0076
13	15	22	86	24	2.5927	2.4281	0.8552	0.6237	0.227	0.0657	0.0092	0.0175
14	16	20	68	24	2.3902	2.5815	0.8537	0.4055	0.2515	0.0546	0.0124	0.0201
15	17	19	133	25	4.6191	3.6531	1.6441	1.1597	0.5577	0.2435	0.0166	0.0284
16	18	30	60	25	2.1403	1.7456	0.4074	0.3375	0.0849	0.0282	0.0037	0.0096
17	19	25	136	27	4.9276	3.8104	2.1773	1.2233	0.6619	0.2419	0.2924	0.4656
18	20	31	64	27	3.1247	2.0105	0.7527	0.3862	0.1148	0.0275	0.0039	0.0043
19	21	23	79	29	0.8547	0.4581	0.2335	0.4537	0.2728	0.0666	0.1875	0.1483
20	22	17	86	29	4.2148	2.6736	1.1676	0.9704	0.2847	0.1063	0.2584	0.1751
21	23	20	120	29	5.9861	6.6438	1.6757	1.8218	0.6763	0.1873	0.5027	0.335
22	24	22	98	29	5.0069	1.838	1.2726	1.0399	0.3976	0.1196	0.0412	0.0514
23	26	4	80	30	0.6649	0.4657	0.2824	0.4152	0.1531	0.0489	0.0176	0.0062
24	27	25	180	30	6.831	9.037	4.615	5.0979	2.502	0.7916	0.0239	0.0422
25	28	64	70	30	1.1974	0.8547	0.3547	0.3408	0.1421	0.0371	0.0539	0.0185
26	29	80	77	33	2.2312	1.2992	0.6595	0.5774	0.2742	0.0743	0.0736	0.0595
27	30	20	115	33	3.2934	2.302	1.0863	1.0453	0.4494	0.1277	0.0682	0.0442
28	31	60	78	34	0.9267	0.6549	0.2968	0.2198	0.0891	0.0216	0.0231	0.0091
29	32	18	70	34	0.9195	0.594	0.2905	0.2693	0.1294	0.0323	0.0213	0.0291
30	34	18	80	35	2.8013	3.0456	1.0376	1.1344	0.3649	0.1021	0.3272	0.2515
31	35	15	108	35	4.723	3.6526	1.6026	1.1751	0.4541	0.1396	0.0171	0.0294
32	36	17	100	35	4.0262	3.7959	1.4608	0.9589	0.3767	0.1319	0.0207	0.0238
33	37	30	125	36	1.7913	1.2351	0.7488	0.9187	0.5841	0.1838	0.277	0.2663
34	38	50	68	36	1.3935	1.247	0.5383	0.545	0.2292	0.0472	0.1381	0.0944
35	39	57	80	36	2.0092	1.6523	0.7366	0.695	0.3068	0.0606	0.0981	0.0854
36	40	75	81	36	2.223	1.797	0.627	0.6125	0.2608	0.0648	0.1019	0.0631
37	41	28	60	36	1.1755	1.5191	0.4489	0.559	0.1916	0.0392	0.0759	0.059
38	42	18	95	36	4.9415	3.6499	1.4303	1.2525	0.3358	0.1103	0.1208	0.1168
39	43	18	98	37	2.9992	1.7641	0.8808	0.7924	0.3998	0.0967	0.1432	0.1045
40	44	190	70	37	0.9093	0.5883	0.3063	0.2959	0.164	0.0246	0.0293	0.0136
41	45	22	50	37	3.1969	2.2463	0.4941	0.6808	0.202	0.0322	0.3033	0.0325
42	46	24	68	38	1.8376	1.1481	0.521	0.4826	0.204	0.0507	0.0445	0.0597
43	47	60	72	38	1.5955	1.1351	0.5011	0.4378	0.1907	0.0515	0.1513	0.0754
44	48	32	149	38	5.1043	3.4801	2.665	2.8683	1.5152	0.2741	0.2403	0.2452
45	49	62	80	38	3.7308	2.5785	1.2916	0.9405	0.3569	0.0723	0.0057	0.0132
46	50	13	113	38	4.6482	5.3164	1.306	1.6426	0.6368	0.2018	0.0791	0.1262
47	51	28	45	38	1.9046	1.347	0.3192	0.4274	0.1209	0.0229	0.0858	0.0137
48	52	22	114	38	8.1426	8.8373	2.1268	2.3459	0.8181	0.1515	0.0504	0.046

	A	B	C	D	BC	BD	BE	BF	BG	BH	BI	BJ
1	Tank ID	Sep Pres	Sep Temp	SlsOil APIG	WSG mol% i-C5	WSG mol% n-C5	WSG mol% HEXS	WSG mol% HEPTS	WSG mol% OCTS	WSG mol% NONS	WSG mol% BENZ	WSG mol% TOL
49	53	66	89	39	3.2132	2.1748	1.2034	1.077	0.4622	0.0828	0.4045	0.1959
50	54	60	80	39	2.9447	3.0345	1.1197	0.9555	0.3608	0.071	0.055	0.0542
51	55	60	58	39	2.141	1.3304	0.4663	0.4448	0.1962	0.0284	0.0468	0.0049
52	57	33	60	39	2.3008	2.1626	0.6676	0.6083	0.2025	0.0375	0.1458	0.1068
53	58	42	110	39	6.1191	7.6992	3.0831	4.9161	1.8335	0.5289	2.3264	1.6508
54	59	66	83	40	3.6078	2.895	2.242	3.0354	1.8019	0.5979	0.606	0.8629
55	60	66	90	40	1.783	1.2697	0.7041	0.8445	0.3961	0.1069	1.1178	0.5291
56	61	13	110	40	3.8159	4.7516	2.0501	2.1235	0.8869	0.2008	0.2181	0.2392
57	62	64	74	40	2.3544	1.8626	0.8527	0.6583	0.2549	0.0634	0.0777	0.0561
58	63	28	78	42	3.2359	2.9258	0.7812	1.0492	0.3654	0.0731	0.0142	0.0158
59	65	29	60	44	0.6554	2.7656	0.1735	0.3241	0.0974	0.0268	0.0195	0.0121
60	66	44	71	44	2.517	2.3868	0.7158	0.7401	0.2841	0.0565	0.069	0.0806
61	67	60	60	44	4.8868	4.8135	1.3839	1.069	0.6411	0.083	0.0633	0.1069
62	68	41	72	45	5.9954	5.0267	3.4186	4.4181	2.0573	0.5436	1.1409	0.9916
63	69	20	68	45	3.7919	2.9155	1.1308	0.8753	0.4147	0.0739	0.0429	0.0582
64	70	23	85	46	5.0553	5.9553	1.4228	1.2319	0.4317	0.0849	0.0153	0.016
65	71	24	114	46	5.2541	5.6562	2.5253	1.9231	1.4564	0.2825	0.2153	0.2595
66	72	52	108	47	6.7173	4.4566	1.6495	1.718	0.7942	0.1603	0.1028	0.174
67	73	45	140	47	9.395	6.0613	3.9495	4.3821	1.9034	0.4323	0.3947	0.3925
68	74	40	76	47	9.912	11.6974	2.2638	2.3745	0.889	0.1796	0.0571	0.0502
69	75	31	76	49	3.1696	2.8684	1.2463	1.0216	0.3595	0.1005	0.2836	0.1348
70	77	700	100	50	2.2955	1.7584	0.8654	0.8218	0.2722	0.0416	0.1409	0.2277
71	78	20	48	50	2.902	1.4531	0.6355	0.3991	0.1665	0.0257	0.2471	0.1422
72	79	98	40	51	2.589	2.9108	0.6472	0.5349	0.1209	0.013	0.026	0.0194
73	80	115	73	54	1.5681	1.4386	0.5663	1.1845	0.6255	0.1138	0.0371	0.0091
74	81	30	100	54	5.3765	3.996	1.9863	1.8374	0.9272	0.133	0.3063	0.4321
75	82	15	86	54	5.3442	3.5582	1.8535	1.6668	0.6186	0.0818	0.2211	0.1606
76	83	770	100	55	3.4051	2.805	1.0685	0.8376	0.268	0.0337	0.1083	0.1214
77	84	39	66	57	1.2178	0.9276	0.8295	0.9742	0.4924	0.1033	0.1971	0.1639
78	85	38	95	57	8.2348	6.2297	2.7281	1.7461	0.5576	0.1412	0.3921	0.2033
79	86	65	80	57	6.6397	4.3639	2.5195	2.5382	0.8992	0.125	0.2973	0.3934
80	87	54	60	57	3.1542	2.8277	0.7788	0.6615	0.2176	0.0312	0.064	0.071
81	88	870	78	57	4.2039	4.0506	1.2936	1.2042	0.4271	0.0613	0.108	0.1315
82	89	600	70	57	2.9396	2.3438	0.7866	0.6642	0.2174	0.0284	0.1073	0.1066
83	90	780	70	58	1.6473	1.4933	0.6316	0.59	0.2255	0.0367	0.0193	0.0347
84	91	60	56	58	1.5864	1.2083	0.5974	0.6628	0.3346	0.0579	0.0407	0.1005
85	92	500	84	58	3.9022	2.4309	1.3143	0.9404	0.2628	0.038	0.1574	0.2035
86	93	300	80	58	7.7795	3.2686	2.0852	0.8605	0.2442	0.0503	0.061	0.0448
87	94	110	72	59	3.4857	2.8281	1.6135	2.0735	1.214	0.2261	0.1149	0.333
88	95	750	90	60	5.3247	4.3985	1.6229	1.1564	0.3598	0.0424	0.1966	0.1925
89	96	85	85	61	2.297	2.3641	1.0583	2.0262	0.9251	0.1897	0.0593	0.028
90	97	57	82	62	4.3032	3.1223	1.7558	1.6367	0.5558	0.083	0.1038	0.1749
91	98	72	80	63	1.6754	2.0125	0.9425	1.6348	0.8317	0.1799	0.0297	0.1055
92	99	730	80	63	4.4886	3.5039	1.1567	0.8157	0.2472	0.027	0.1763	0.1512
93	100	580	77	64	2.071	1.6224	0.8434	1.3246	0.4371	0.0367	0.1828	0.2494
94	101	730	80	64	4.7927	3.5497	1.0739	0.5316	0.1468	0.0149	0.1215	0.0887
95	102	807	96	66	3.149	2.0868	0.6469	0.3605	0.2065	0.0353	0.0505	0.0107

	A	B	C	D	BK	BL	BM	BN	BO	BP	BQ	BR
1	Tank ID	Sep Pres	Sep Temp	SlsOil APIG	WSG mol% E-BENZ	WSG mol% XYL	WSG mol% n-C6	WSG mol% 224TriMe	WSG mol% C10+	WSG Mol Frac	WSG MWt	WSG MWt
2	1	45	106	15	0.0031	0.0079	0.2281	0	0	0.0106	44.7911	44.7750947
3	2	22	155	17	0.0077	0.043	1.3571	0	0	0.005	49.1423	49.05551098
4	3	20	160	18	0.0015	0.0247	0.6869	0	0	0.0123	49.5535	49.50980287
5	4	53	101	19	0.0054	0.0153	0.4402	0	0	0.0107	40.2444	40.21417538
6	6	23	79	20	0.0004	0.0042	0.1692	0	0	0.0032	20.0601	20.04861828
7	8	18	75	20	0.003	0.0065	0.3641	0	0	0.0012	31.2139	31.19307584
8	9	54	125	21	0.0019	0.0259	0.6866	0	0	0.0132	44.9816	44.93782671
9	10	35	76	23	0.0002	0.0007	0.0296	0	0	0.0021	20.4757	20.47297129
10	12	30	66	23	0.0019	0.007	0.348	0	0	0.0159	40.0653	40.04753621
11	13	20	122	24	0.0017	0.0158	0.3898	0	0	0.0043	25.6475	25.61043871
12	14	20	88	24	0.0048	0.0132	0.6744	0	0	0.0176	44.4289	44.39675521
13	15	22	86	24	0.0009	0.0118	0.5765	0	0	0.0122	44.1164	44.08526429
14	16	20	68	24	0.0006	0.0035	0.5354	0	0	0.022	45.6871	45.66691664
15	17	19	133	25	0.003	0.0119	0.9694	0	0	0.0007	41.812	41.75410572
16	18	30	60	25	0.0023	0.0059	0.3248	0	0	0.0165	39.8756	39.85855684
17	19	25	136	27	0.0226	0.102	0.9231	0	0	0.0048	44.2891	44.22778887
18	20	31	64	27	0.0009	0.0053	0.4275	0	0	0.0177	42.9865	42.96712421
19	21	23	79	29	0.0043	0.0408	0.1634	0	0	0.0017	25.0569	25.03414986
20	22	17	86	29	0.0038	0.0229	0.5537	0	0	0.0247	46.0188	45.9703522
21	23	20	120	29	0.0086	0.0415	1.3537	0	0	0.0208	54.1312	54.04021463
22	24	22	98	29	0.0012	0.0185	0.3769	0	0	0.009	42.5071	42.45511046
23	26	4	80	30	0.0004	0.0134	0.113	0	0	0.0018	23.731	23.71037648
24	27	25	180	30	0.0103	0.1014	4.2667	0	0.0003	0.0038	54.988	54.73268385
25	28	64	70	30	0.0008	0.0069	0.2029	0	0	0.0085	31.2802	31.26331961
26	29	80	77	33	0.0058	0.0361	0.3458	0	0	0.0217	43.2476	43.21866151
27	30	20	115	33	0.0044	0.0168	0.5799	0	0.0001	0.0062	37.3978	37.34550535
28	31	60	78	34	0.0006	0.0035	0.1386	0	0	0.0036	22.1594	22.14829792
29	32	18	70	34	0.0025	0.0143	0.1522	0	0	0.0037	22.4744	22.46087656
30	34	18	80	35	0.0048	0.0431	0.8121	0	0	0.0262	45.1122	45.05551581
31	35	15	108	35	0.002	0.0208	0.9869	0	0.0001	0.0129	46.6956	46.63669624
32	36	17	100	35	0.0043	0.0162	0.8975	0	0	0.0141	43.5703	43.52244225
33	37	30	125	36	0.0084	0.0374	0.4176	0	0.0002	0.0007	28.1241	28.07792424
34	38	50	68	36	0.0043	0.0348	0.3521	0	0	0.0045	24.5176	24.49016322
35	39	57	80	36	0.0046	0.035	0.4914	0	0	0.0077	33.3465	33.31160628
36	40	75	81	36	0.0043	0.0295	0.4152	0	0	0.0074	34.103	34.07232865
37	41	28	60	36	0.0022	0.0126	0.4004	0	0	0.0191	38.5936	38.56569393
38	42	18	95	36	0.0066	0.0341	0.7506	0	0	0.0166	47.185	47.12234591
39	43	18	98	37	0.0056	0.0474	0.5207	0	0	0.005	33.4309	33.39125798
40	44	190	70	37	0.0027	0.0078	0.1321	0	0	0.0077	30.5292	30.51441914
41	45	22	60	37	0.0039	0.0046	0.2931	0	0	0.0778	49.2798	49.24582488
42	46	24	68	38	0.0023	0.0203	0.287	0	0.0001	0.0132	37.3654	37.34134964
43	47	60	72	38	0.002	0.0117	0.3067	0	0	0.0016	27.3608	27.339082
44	48	32	149	38	0.0164	0.1464	1.4274	0	0.0022	0.0023	39.0187	38.87338833
45	49	62	80	38	0.0055	0.0156	0.5538	0	0	0.0137	48.3278	48.28080472
46	50	13	113	38	0.01	0.0484	1.368	0	0	0.02	50.9572	50.87524764
47	51	28	45	38	0.0021	0.0024	0.1824	0	0	0.0176	42.3003	42.27911827
48	52	22	114	38	0.0022	0.0387	1.7307	0	0	0.0604	58.4247	58.30727275

	A	B	C	D	BK	BL	BM	BN	BO	BP	BQ	BR
1	Tank ID	Sep Pres	Sep Temp	SlsOil APIG	WSG mol% E-BENZ	WSG mol% XYL	WSG mol% n-C6	WSG mol% 224TriMe	WSG mol% C10+	WSG Mol Frac	WSG MWt	WSG MWt
49	53	66	89	39	0.0053	0.0538	0.6405	0	0	0.0141	42.153	42.09913346
50	54	60	80	39	0.0051	0.0275	0.7609	0	0	0.0025	30.7624	30.71441687
51	55	60	58	39	0.0025	0.0122	0.2587	0	0	0.0196	40.818	40.79582976
52	57	33	60	39	0.0021	0.015	0.4256	0	0	0.0232	45.5125	45.48207018
53	58	42	110	39	0.0258	0.162	3.4367	0	0.0003	0.005	57.2807	57.03450539
54	59	66	83	40	0.0292	0.1185	1.3432	0	0.0151	0.0052	52.2794	52.11753461
55	60	66	90	40	0.0108	0.0425	0.4486	0	0.0002	0.006	34.0059	33.96358795
56	61	13	110	40	0.0129	0.0747	1.4285	0	0	0.0111	45.8455	45.73951204
57	62	64	74	40	0.0017	0.0132	0.5263	0	0	0.0057	29.2229	29.1898762
58	63	28	78	42	0.0004	0.0095	0.8335	0	0	0.0235	45.7641	45.7113909
59	65	29	60	44	0.0007	0.0022	0.6481	0	0.0002	0.0254	41.764	41.74762207
60	66	44	71	44	0.0046	0.0354	0.5691	0	0	0.0087	36.8893	36.85226923
61	67	60	60	44	0.0089	0.0484	1.1041	0	0	0.0073	45.4394	45.38579991
62	68	41	72	45	0.0231	0.3959	2.1363	0	0.0004	0.0046	49.9018	49.68061421
63	69	20	68	45	0.0057	0.022	0.9936	0	0	0.0217	45.1286	45.0847447
64	70	23	85	46	0.0019	0.0156	1.5178	0	0	0.0453	52.9092	52.84763187
65	71	24	114	46	0.0093	0.1114	2.2349	0	0	0.0183	51.4328	51.33638518
66	72	52	108	47	0.0084	0.0984	0.8962	0	0.0001	0.012	47.0518	46.98588515
67	73	45	140	47	0.0152	0.2136	2.4476	0	0.0001	0.0108	58.0936	57.87454591
68	74	40	76	47	0.0132	0.0447	2.4292	0	0	0.0078	59.3826	59.26391073
69	75	31	76	49	0.0031	0.0683	1.0382	0	0	0.0166	41.2251	41.17397444
70	77	700	100	50	0.0005	0.0054	0.4658	0	0.0026	0.009	38.6681	38.62660285
71	78	20	48	50	0.0039	0.0195	0.2904	0	0.0013	0.0335	43.7694	43.74936095
72	79	98	40	51	0.0002	0.0019	0.5261	0	0	0.0578	46.3895	46.36274525
73	80	115	73	54	0.0093	0.034	0.5832	0	0.0005	0.0071	31.9947	31.93530404
74	81	30	100	54	0.0069	0.1172	1.1597	0	0.0003	0.0129	49.3798	49.28766593
75	82	15	86	54	0.0046	0.0535	1.0704	0	0	0.0247	50.487	50.40370152
76	83	770	100	55	0.0003	0.0062	0.7828	0	0.0007	0.0224	46.6798	46.63757792
77	84	39	66	57	0.0078	0.0346	0.5114	0	0.0024	0.0076	31.1895	31.1404655
78	85	38	95	57	0.0133	0.0992	1.8668	0	0	0.0236	53.6728	53.58558908
79	86	65	80	57	0.0123	0.1144	1.4823	0	0.0101	0.0662	54.4616	54.33469406
80	87	54	60	57	0.0021	0.0113	0.5799	0	0	0.0288	44.9438	44.91070255
81	88	870	78	57	0.0042	0.0226	0.9919	0	0	0.0038	41.8166	41.75657395
82	89	600	70	57	0.0003	0.0047	0.5622	0	0.002	0.0273	45.5215	45.48811564
83	90	780	70	58	0.0017	0.0119	0.473	0	0.0007	0.0098	35.2063	35.17665006
84	91	60	56	58	0.0042	0.0429	0.3844	0	0.0009	0.0155	36.8132	36.77986719
85	92	500	84	58	0.0002	0.0052	0.6446	0	0.0001	0.007	36.4797	36.43275159
86	93	300	80	58	0.0022	0.0152	0.8566	0	0	0.0322	49.7573	49.71421306
87	94	110	72	59	0.016	0.1666	1.0867	0	0.0147	0.0045	42.8885	42.78538401
88	95	760	90	60	0.0005	0.0086	1.2258	0	0.0001	0.0532	51.4967	51.43891451
89	96	85	85	61	0.0053	0.0224	1.0366	0	0.0004	0.0051	34.0561	33.9548513
90	97	57	82	62	0.0047	0.0532	1.094	0	0	0.0234	48.0686	47.98675141
91	98	72	80	63	0.0045	0.0402	0.9682	0	0.0008	0.004	31.4949	31.41305122
92	99	730	80	63	0.0002	0.0054	0.8337	0	0	0.0512	49.4466	49.40570973
93	100	580	77	64	0.0024	0.0234	0.6674	0	0.0003	0.01	35.8508	35.78464646
94	101	730	80	64	0.0001	0.0029	0.6279	0	0.0001	0.0784	51.558	51.53132865
95	102	807	96	66	0.0015	0.0093	0.3064	0	0.0013	0.0254	44.2795	44.2614502

	A	B	C	D	BS	BT	BU	BV	BW	BX	BY	BZ	CA
1	Tank ID	Sep Pres	Sep Temp	SlsOil APIG	WSG MWt THC	WSG MWt VOC	WSG Grav	TotG mol% H2S	TotG mol% O2	TotG mol% CO2	TotG mol% N2	TotG mol% C1	TotG mol% C2
2	1	45	106	15	65.87392994	67.67590167	1.5461	2.0751	0	93.2588	0	0.3341	0.2971
3	2	22	155	17	52.64543332	55.11830319	1.6963	0	0	40.636	0	5.1939	10.8246
4	3	20	160	18	56.90041332	57.44879828	1.7105	1.6386	0	63.7941	1.2429	1.2429	1.6553
5	4	53	101	19	40.06833963	46.98260037	1.3892	8.2599	0	24.456	0.206	31.5132	10.7081
6	6	23	79	20	19.01149445	43.90523263	0.6924	0.1607	0	2.8528	6.2053	80.9118	5.9554
7	8	18	75	20	30.0745619	48.31933271	1.0775	0	0	10.6802	19.7092	38.8217	9.9799
8	9	54	125	21	44.94402823	51.16714282	1.5527	0	0	0	0.2629	47.3212	14.19
9	10	35	76	23	19.98035967	41.620362	0.7068	0	0	1.9426	0.5093	82.5168	7.4333
10	12	30	66	23	40.28330029	45.10572655	1.383	8.8466	0	16.7388	0.262	28.037	13.9024
11	13	20	122	24	22.18662484	49.16109751	0.8853	0	0	9.1909	7.7394	72.7334	3.6049
12	14	20	88	24	46.39535899	48.02231512	1.5336	9.0947	0	20.5598	2.5743	10.5116	13.7267
13	15	22	86	24	45.54360577	48.16597114	1.5228	7.1066	0	32.0374	0.5696	10.25	12.4069
14	16	20	68	24	46.29483229	47.28405231	1.5771	0	0	32.8853	0.4637	6.2594	14.2109
15	17	19	133	25	41.68565851	49.41647331	1.4433	0	0	2.9448	0	22.4892	21.3922
16	18	30	60	25	39.8130068	43.69675661	1.3764	0	0	1.4889	0.994	33.5458	20.8276
17	19	25	136	27	45.88083419	52.3592785	1.5288	8.6612	0	9.2749	5.0146	15.8805	13.518
18	20	31	64	27	43.92447602	46.90521465	1.4838	5.563	0	5.2609	7.522	21.563	13.4208
19	21	23	79	29	24.35570319	43.00891355	0.8649	0	0	3.448	0	66.7973	14.7796
20	22	17	86	29	46.9511676	48.36997951	1.5885	6.4735	0	2.042	0	11.2401	17.7385
21	23	20	120	29	54.15611368	55.05443139	1.8685	0	0	1.2738	0	3.4096	8.2976
22	24	22	98	29	43.93290899	45.42476656	1.4673	14.1491	0	2.1947	0	8.4085	28.968
23	26	4	80	30	23.47841058	42.03733294	0.8192	0	0	1.1284	0	70.5982	14.6685
24	27	25	180	30	56.11714776	60.24314182	1.8981	0.7491	0	9.4201	0	10.1375	14.4842
25	28	64	70	30	30.56011658	40.73119941	1.0797	0	0	3.4099	0.4027	63.0188	13.5754
26	29	80	77	33	43.22024015	46.85995633	1.4928	0	0	0.4412	0.2942	42.655	16.1697
27	30	20	115	33	37.20831537	47.16357815	1.2909	0	0	1.4996	0	43.3781	15.7869
28	31	60	78	34	21.88823445	47.50483019	0.7649	0	0	1.1336	0	80.5854	5.7293
29	32	18	70	34	21.80081972	46.52459557	0.7758	0	0	2.851	0	78.9262	6.8181
30	34	18	80	35	45.09939122	46.69132914	1.5572	0.2206	0	1.3721	0.2288	14.642	23.8865
31	35	15	108	35	47.358608	48.53635275	1.6119	1.0618	0	16.8581	1.3939	7.2474	20.3409
32	36	17	100	35	43.51808221	45.48595671	1.504	0	0	2.6097	0.2918	15.4665	30.6786
33	37	30	125	36	27.84244379	49.48106315	0.9708	0	0	1.4565	0	63.777	11.7149
34	38	50	68	36	24.3327998	48.90740462	0.8463	0	0	0.7094	0.3136	74.2536	8.2388
35	39	67	80	36	33.01445712	42.04584347	1.1511	0	0	1.8979	0.3226	51.2871	19.9479
36	40	75	81	36	33.66680603	43.00445922	1.1772	0	0	2.532	0.1829	53.0349	15.8436
37	41	28	60	36	38.81947645	42.59285797	1.3322	4.7171	0	1.4998	0.2501	33.2678	23.0829
38	42	18	95	36	49.90904623	50.61682646	1.6288	15.2229	0	2.835	0.4784	4.5446	14.8666
39	43	18	98	37	33.04180016	48.04732772	1.154	0	0	2.1792	0	51.7849	13.3067
40	44	190	70	37	29.85592303	37.64462144	1.0538	0	0	2.8916	0.2819	58.7343	19.4942
41	45	22	50	37	49.53760584	49.84484547	1.7011	1.1971	0	4.5385	0	4.7953	19.7783
42	46	24	68	38	37.28929103	43.02186563	1.2898	0	0	0.7292	0	41.6202	20.8772
43	47	60	72	38	27.17373302	45.96177389	0.9445	0	0	0.9816	0	62.1849	13.8503
44	48	32	149	38	38.84430027	53.99659132	1.3469	0	0	0.5564	0	39.8202	18.5095
45	49	62	80	38	54.39650429	54.66607954	1.6682	0	0	60.7749	0.2971	0.7427	4.4376
46	50	13	113	38	50.89698296	51.11104762	1.759	0	0	0.3762	0	1.1421	15.8053
47	51	28	45	38	41.04653693	43.10693498	1.4601	0	0	41.5278	0	11.1298	19.4331
48	52	22	114	38	58.37987543	58.74325855	2.0167	0	0	0.4322	2.1608	4.5378	6.1576

	A	B	C	D	BS	BT	BU	BV	BW	BX	BY	BZ	CA
1	Tank ID	Sep Pres	Sep Temp	SlsOil APIG	WSG MWt THC	WSG MWt VOC	WSG Grav	TotG mol% H2S	TotG mol% O2	TotG mol% CO2	TotG mol% N2	TotG mol% C1	TotG mol% C2
49	53	66	89	39	42.03865862	47.10290901	1.4551	0	0	3.3191	0	41.6928	15.4084
50	54	60	80	39	30.58036275	51.10999489	1.0619	0	0	1.0167	0.2612	57.7805	12.0495
51	55	60	58	39	40.78689825	43.75001861	1.409	0	0	0.3784	0.1262	33.7005	21.5975
52	57	33	60	39	46.62032977	47.02007871	1.571	1.7032	0	41.2331	0	2.7518	12.8837
53	58	42	110	39	57.04362893	57.22922039	1.9772	0	0	0.1804	0	21.8455	24.3156
54	59	66	83	40	72.39842202	72.47607868	1.8046	0	0	88.9304	0	0.1968	0.6268
55	60	66	90	40	33.05869367	43.27645817	1.1738	0	0	5.4421	0.2117	47.8131	20.4321
56	61	13	110	40	45.73951204	49.77159719	1.5825	0	0	0	0	21.1853	19.6598
57	62	64	74	40	28.63267686	48.03705133	1.0087	0	0	1.9469	0.5083	67.3161	7.6825
58	63	28	78	42	45.98225691	47.48200493	1.5797	0	0	1.0969	8.5035	10.9722	17.7625
59	65	29	60	44	41.74945399	43.55832612	1.4416	0	0	0.1856	0.3714	20.9856	25.941
60	66	44	71	44	36.80527968	44.11415324	1.2734	0	0	0.5464	0.2881	37.1399	22.086
61	67	60	60	44	45.39335858	50.16190803	1.5685	0	0	0.6784	0	35.6295	18.2337
62	68	41	72	45	49.73455909	57.97976274	1.7225	0	0	0.9989	0.3238	55.5532	12.1603
63	69	20	68	45	45.16140648	47.10178203	1.5578	0	0	7.1224	0.4602	15.8754	21.1576
64	70	23	85	46	53.13217888	54.35196975	1.8263	0.6819	0	3.2808	0.1367	12.8502	9.0186
65	71	24	114	46	51.91668949	54.06134287	1.7754	1.5818	0	4.0881	0	14.9261	12.3422
66	72	52	108	47	46.96588515	50.23138914	1.6242	0	0	0	0	22.6484	17.1953
67	73	45	140	47	57.91565101	59.67184227	2.0053	0	0	0.3567	0	10.8216	6.6095
68	74	40	76	47	59.26658063	59.26843965	2.0498	0	0	0.5054	12.9743	11.3608	8.2724
69	75	31	76	49	41.12640245	45.62349777	1.423	0	0	1.9494	0.2439	34.1426	23.379
70	77	700	100	50	38.56482039	42.10650499	1.3348	0	0	1.0895	0.1816	39.7795	23.1059
71	78	20	48	50	43.75081387	45.13218548	1.5109	0	0	0.1553	0.1554	17.7143	24.6735
72	79	98	40	51	46.36535243	47.35107444	1.6013	0	0	0.066	0.2639	21.2465	19.4474
73	80	116	73	54	31.65954552	42.11722653	1.1044	0	0	1.3705	0.4662	55.3079	18.3624
74	81	30	100	54	49.36014313	50.57500078	1.7045	0	0	1.4019	0.2574	9.1372	18.0509
75	82	15	86	54	50.42208807	51.01506308	1.7427	0	0	0.3416	0.1713	5.652	17.8941
76	83	770	100	55	46.65404633	48.49138489	1.6113	0	0	1.2842	0.07	37.71	16.6675
77	84	39	66	57	30.70125014	41.3200743	1.0766	0	0	2.1824	0	55.5948	20.5016
78	85	38	95	57	53.61551025	54.57929947	1.8527	0	0	0.4774	0	8.3702	12.6849
79	86	65	80	57	54.3495727	55.12837511	1.8799	0	0	0.1495	0	2.2427	8.5174
80	87	54	60	57	44.91482402	45.8373166	1.5514	0	0	0.708	0	13.11	25.2267
81	88	870	78	57	41.73953669	49.21834723	1.4434	0	0	0.9515	0.1845	48.7485	18.2935
82	89	600	70	57	45.50215308	47.99106134	1.5713	0	0	1.7659	0.0609	48.7752	12.5402
83	90	780	70	58	35.08641901	41.12603495	1.2153	0	0	0.7872	0.0583	59.1966	15.0127
84	91	60	56	58	36.71141139	40.34073128	1.2707	0	0	0.927	0.1161	39.3538	26.916
85	92	500	84	58	36.3361635	43.55892846	1.2592	0	0	0.8206	0.2148	46.4595	19.8871
86	93	300	80	58	49.72019475	51.44338652	1.7175	0	0	0.1111	0.3332	31.2062	15.6481
87	94	110	72	59	42.77807562	49.07075073	1.4804	0	0	0.8526	0.1188	39.3509	22.365
88	95	750	90	60	51.465432	51.95151096	1.7776	0	0	1.2438	0.0732	13.7188	17.4449
89	96	85	85	61	33.86337595	49.33105699	1.1756	0	0	0.6818	0.3751	48.8072	15.5093
90	97	57	82	62	48.01135211	49.37624236	1.6593	0	0	0.8702	0.1089	15.2428	18.8443
91	98	72	80	63	31.31919763	49.35640379	1.0872	0	0	0.764	0.6988	53.4077	14.6407
92	99	730	80	63	49.4264497	49.89913529	1.7068	0	0	1.1836	0.074	12.8716	20.4392
93	100	580	77	64	35.75940906	43.11811662	1.2375	0	0	0.2635	0.2636	61.5657	13.6237
94	101	730	80	64	51.54877329	52.28642671	1.7797	0	0	1.1188	0.0599	33.783	17.2208
95	102	807	96	66	44.26294933	45.72636791	1.5285	0	0	0.4553	0.1656	33.6517	24.2214

	A	B	C	D	CB	CC	CD	CE	CF	CG	CH	CI
1	Tank ID	Sep Pres	Sep Temp	StsOil APIG	TotG mol% C3	TotG mol% i-C4	TotG mol% n-C4	TotG mol% i-C5	TotG mol% n-C5	TotG mol% HEXS	TotG mol% HEPTS	TotG mol% OCTS
2	1	45	106	15	0.2852	0.3397	0.912	0.6928	0.7522	0.2979	0.3172	0.142
3	2	22	155	17	13.2018	5.6323	10.1535	3.5162	4.0854	2.3387	1.7386	0.8716
4	3	20	160	18	8.7543	4.3391	9.0707	2.4151	2.76	0.7941	0.8667	0.4629
5	4	53	101	19	10.1024	2.9806	5.3635	2.2455	2.0184	0.7909	0.6013	0.2044
6	6	23	79	20	0.9447	0.4583	0.6527	0.564	0.4722	0.2947	0.2229	0.0924
7	8	18	75	20	8.4826	2.3216	5.0294	1.7332	1.6844	0.6041	0.3685	0.151
8	9	54	125	21	13.2902	4.9177	10.9276	3.3079	2.4177	1.2256	0.856	0.3971
9	10	35	76	23	4.1766	1.1696	1.1144	0.6941	0.2501	0.0678	0.0545	0.0149
10	12	30	66	23	18.2425	2.9833	5.6645	2.0356	1.8669	0.5624	0.3511	0.1127
11	13	20	122	24	1.9533	0.5684	0.6725	0.6701	0.4985	0.6128	0.7303	0.4074
12	14	20	88	24	22.0425	3.9543	9.4899	2.7981	2.7329	0.8883	0.6379	0.2213
13	15	22	86	24	17.5757	3.8228	8.8472	2.5821	2.4205	0.8538	0.6227	0.2265
14	16	20	68	24	25.5967	4.7183	8.8345	2.3568	2.5541	0.8481	0.4026	0.2492
15	17	19	133	25	22.9278	5.8067	11.5422	4.6193	3.6532	1.6441	1.1597	0.5577
16	18	30	60	25	26.4643	4.4807	7.2025	2.0935	1.7158	0.4025	0.3327	0.0834
17	19	25	136	27	17.9879	4.976	9.8822	4.9089	3.799	2.1749	1.2223	0.6614
18	20	31	64	27	25.6808	5.117	9.1713	3.0398	1.9676	0.7412	0.3794	0.1123
19	21	23	79	29	7.7858	2.1543	2.1544	0.8547	0.4581	0.2335	0.4537	0.2728
20	22	17	86	29	35.1719	5.8723	11.1589	4.1488	2.6411	1.1588	0.9629	0.2821
21	23	20	120	29	31.9154	9.9453	25.9773	5.9632	6.6242	1.6735	1.8198	0.6755
22	24	22	98	29	22.2366	6.0973	7.8083	4.9936	1.8341	1.2711	1.0387	0.397
23	26	4	80	30	6.8566	2.2915	2.2778	0.6649	0.4657	0.2824	0.4152	0.1531
24	27	25	180	30	15.841	4.3929	11.7158	6.8174	9.0225	4.6122	5.0962	2.5013
25	28	64	70	30	9.8377	3.4242	3.162	1.1782	0.8444	0.3522	0.3381	0.1407
26	29	80	77	33	23.5314	7.0393	4.6929	1.9718	1.1916	0.6327	0.5534	0.2607
27	30	20	115	33	15.3441	7.6044	7.435	3.2608	2.2844	1.0825	1.0421	0.4478
28	31	60	78	34	5.7338	2.0586	2.3766	0.9266	0.6549	0.2968	0.2198	0.0891
29	32	18	70	34	5.1194	1.8545	1.9778	0.9195	0.594	0.2905	0.2693	0.1294
30	34	18	80	35	35.7101	4.4382	9.7668	2.7344	2.9866	1.0231	1.1174	0.3584
31	35	15	108	35	23.4927	5.4466	11.4407	4.6824	3.6279	1.5968	1.1712	0.4524
32	36	17	100	35	23.983	4.8337	10.5206	3.9838	3.7643	1.4539	0.9545	0.3746
33	37	30	125	36	9.7085	3.241	3.641	1.7913	1.2352	0.7488	0.9187	0.5841
34	38	50	68	36	6.7228	1.9935	3.1474	1.3933	1.2468	0.5382	0.5449	0.2292
35	39	57	80	36	11.6529	3.5059	5.2613	1.9897	1.6392	0.7324	0.6908	0.3045
36	40	75	81	36	12.2653	4.2204	5.7826	2.1975	1.7803	0.623	0.6082	0.2586
37	41	28	60	36	25.7718	1.8088	5.2396	1.1389	1.4797	0.439	0.545	0.1859
38	42	18	95	36	28.3751	6.0711	14.9126	4.9167	3.6348	1.4264	1.249	0.3347
39	43	18	98	37	12.493	6.812	5.6936	2.9891	1.7593	0.8793	0.7911	0.399
40	44	190	70	37	11.4354	1.7769	2.9374	0.899	0.5828	0.304	0.2934	0.1623
41	45	22	50	37	34.4604	10.7129	17.6436	2.8975	2.0706	0.4626	0.6332	0.1858
42	46	24	68	38	23.2849	4.4838	4.4781	1.7789	1.1176	0.5097	0.4709	0.1981
43	47	60	72	38	10.9655	3.7152	3.8467	1.5955	1.1351	0.5011	0.4378	0.1907
44	48	32	149	38	12.1372	5.7167	5.2847	5.1039	3.4799	2.6649	2.8683	1.5151
45	49	62	80	38	11.2333	3.3491	9.6298	3.7187	2.5717	1.2891	0.9385	0.356
46	50	13	113	38	41.1269	8.7773	17.415	4.6382	5.3073	1.3048	1.6413	0.6362
47	51	28	45	38	13.1097	3.6828	6.7127	1.8949	1.3405	0.3176	0.4248	0.12
48	52	22	114	38	23.1024	10.2128	30.5811	7.4393	8.2497	2.069	2.2933	0.7982

	A	B	C	D	CB	CC	CD	CE	CF	CG	CH	CI
1	Tank ID	Sep Pres	Sep Temp	SlsOil APIG	TotG mol% C3	TotG mol% i-C4	TotG mol% n-C4	TotG mol% i-C5	TotG mol% n-C5	TotG mol% HEXS	TotG mol% HEPTS	TotG mol% OCTS
49	53	66	89	39	19.2933	5.2976	5.8423	3.0499	2.0875	1.1722	1.048	0.4476
50	54	60	80	39	10.2159	3.7159	5.5747	2.9449	3.0346	1.1198	0.9556	0.3608
51	55	60	58	39	26.6669	5.7202	7.0288	2.072	1.2929	0.4543	0.4314	0.189
52	57	33	60	39	23.7478	3.0008	8.1287	2.2562	2.1252	0.6567	0.5969	0.198
53	58	42	110	39	21.9955	4.9756	10.5229	3.5533	4.2997	1.5376	2.2248	0.7537
54	59	66	83	40	1.8956	1.4352	1.8766	1.3238	1.0006	0.6497	0.7646	0.3985
55	60	66	90	40	11.915	3.2753	3.7031	1.7711	1.2624	0.701	0.8404	0.3938
56	61	13	110	40	26.2166	4.2517	13.0311	3.7677	4.7028	2.0375	2.111	0.881
57	62	64	74	40	7.7985	3.8374	4.2182	2.3436	1.8554	0.8502	0.6561	0.2538
58	63	28	78	42	37.0076	5.9088	9.7164	3.1198	2.8411	0.765	1.0258	0.3558
59	65	29	60	44	36.1582	1.6683	10.0906	0.6365	2.6943	0.1692	0.3149	0.0942
60	66	44	71	44	19.5945	4.1556	8.776	2.5003	2.3733	0.7126	0.7363	0.2823
61	67	60	60	44	24.604	4.232	8.9584	2.8294	2.6901	0.7008	0.4943	0.2705
62	68	41	72	45	12.2365	4.0523	5.244	2.5372	2.0281	1.2084	1.3931	0.5833
63	69	20	68	45	29.0387	6.4013	9.8953	3.6883	2.8419	1.1034	0.8514	0.4015
64	70	23	85	46	28.1747	8.4872	22.6359	4.6509	5.5671	1.3588	1.1746	0.4088
65	71	24	114	46	25.7943	6.5962	15.1891	5.0994	5.5185	2.485	1.8933	1.431
66	72	52	108	47	24.7945	9.2762	9.5843	6.5823	4.3836	1.6327	1.7009	0.7851
67	73	45	140	47	20.1131	20.3082	12.6366	9.2131	5.9634	3.9102	4.3427	1.8847
68	74	40	76	47	24.3047	7.4927	18.7468	5.7891	6.5821	1.1502	1.0999	0.3758
69	75	31	76	49	18.5464	4.5544	7.2417	3.0451	2.7717	1.2118	0.9905	0.3467
70	77	700	100	50	18.6073	4.1429	6.4778	2.2061	1.6906	0.832	0.7858	0.2584
71	78	20	48	50	36.0511	6.6512	8.6882	2.738	1.3716	0.5972	0.3717	0.1535
72	79	98	40	51	35.7941	4.7147	11.9759	2.2851	2.5725	0.5659	0.4585	0.1012
73	80	115	73	54	11.8047	2.1065	4.5012	1.5476	1.4206	0.5593	1.1679	0.6152
74	81	30	100	54	32.6489	9.1901	13.2224	5.3139	3.9526	1.9665	1.8174	0.9156
75	82	15	86	54	33.1593	14.5305	13.8408	5.2614	3.5066	1.8279	1.6413	0.6077
76	83	770	100	55	21.4359	6.4087	8.5211	2.8562	2.3705	0.8998	0.6895	0.2141
77	84	39	66	57	10.1527	3.0392	3.1482	1.2021	0.9159	0.8189	0.9599	0.484
78	85	38	95	57	26.6096	11.2879	18.7753	8.066	6.1146	2.6851	1.7164	0.5466
79	86	65	80	57	34.5814	15.2802	19.8941	6.6169	4.3503	2.5126	2.5309	0.8984
80	87	54	60	57	34.7653	6.098	12.0155	3.0394	2.7253	0.7484	0.6317	0.2062
81	88	870	78	57	16.2273	3.2447	6.8694	2.027	1.862	0.5265	0.4307	0.1336
82	89	600	70	57	19.5435	4.8316	6.6399	2.2318	1.7909	0.5931	0.4819	0.1504
83	90	780	70	58	13.0305	2.1878	5.0766	1.4959	1.355	0.5685	0.5226	0.196
84	91	60	56	58	19.8435	2.9682	5.1129	1.5127	1.152	0.5678	0.6252	0.3127
85	92	500	84	58	12.6488	3.9491	6.3823	3.8056	2.371	1.2799	0.9121	0.2535
86	93	300	80	58	19.5826	10.4605	9.8389	6.5447	2.7638	1.7547	0.7075	0.1949
87	94	110	72	59	20.457	3.5555	6.3877	2.0394	1.5959	0.8396	0.9844	0.5247
88	95	750	90	60	31.8567	10.8061	12.261	4.6203	3.8343	1.4135	0.9907	0.3015
89	96	85	85	61	15.1907	3.189	6.2728	2.2907	2.3576	1.0555	2.0203	0.922
90	97	57	82	62	30.457	8.6715	13.468	4.1242	2.9962	1.6848	1.5625	0.5269
91	98	72	80	63	14.3847	2.3275	5.3616	1.6753	2.0121	0.9424	1.6345	0.8315
92	99	730	80	63	33.375	9.7968	12.2227	3.9701	3.1004	1.0166	0.7044	0.2089
93	100	580	77	64	10.2136	3.0856	4.3077	1.8656	1.4641	0.7591	1.1753	0.3808
94	101	730	80	64	23.7948	7.9172	10.2227	2.6199	1.9365	0.5667	0.2597	0.0657
95	102	807	96	66	21.8057	5.8732	8.344	2.5466	1.6815	0.5109	0.2748	0.151

	A	B	C	D	CJ	CK	CL	CM	CN	CO	CP	CQ
1	Tank ID	Sep Pres	Sep Temp	SlsOil APIG	TotG mol% NONS	TotG mol% BENZ	TotG mol% TOL	TotG mol% E-BENZ	TotG mol% XYL	TotG mol% n-C6	TotG mol% 224TriMe	TotG mol% C10+
2	1	45	106	15	0.0469	0.0034	0.0064	0.0031	0.0079	0.2281	0	0
3	2	22	155	17	0.3297	0.0422	0.0279	0.0077	0.0429	1.3568	0	0
4	3	20	160	18	0.2295	0.0099	0.0218	0.0015	0.0247	0.6758	0	0
5	4	53	101	19	0.0783	0.003	0.0094	0.0054	0.0153	0.4382	0	0
6	6	23	79	20	0.0289	0.0037	0.0058	0.0004	0.0042	0.1692	0	0
7	8	18	75	20	0.0343	0.017	0.0091	0.003	0.0065	0.3841	0	0
8	9	54	125	21	0.1557	0.0147	0.023	0.0019	0.0254	0.6654	0	0
9	10	35	76	23	0.0027	0.0175	0.0054	0.0002	0.0007	0.0296	0	0
10	12	30	66	23	0.0291	0.007	0.0042	0.0018	0.0069	0.3452	0	0
11	13	20	122	24	0.171	0.0091	0.0315	0.0017	0.0157	0.389	0	0
12	14	20	88	24	0.0625	0.0093	0.0076	0.0048	0.0131	0.6706	0	0
13	15	22	86	24	0.0632	0.0092	0.0175	0.0009	0.0117	0.5756	0	0
14	16	20	68	24	0.0524	0.0123	0.0199	0.0006	0.0035	0.5319	0	0
15	17	19	133	25	0.2336	0.0166	0.0284	0.003	0.0119	0.9694	0	0
16	18	30	60	25	0.0266	0.0037	0.0095	0.0023	0.0058	0.3207	0	0
17	19	25	136	27	0.2342	0.2922	0.4652	0.0226	0.1019	0.9222	0	0
18	20	31	64	27	0.0259	0.0038	0.0042	0.0009	0.0052	0.4208	0	0
19	21	23	79	29	0.0633	0.1875	0.1483	0.0043	0.0408	0.1634	0	0
20	22	17	86	29	0.103	0.2563	0.1735	0.0038	0.0227	0.5496	0	0
21	23	20	120	29	0.186	0.5021	0.3346	0.0086	0.0414	1.352	0	0
22	24	22	98	29	0.1143	0.0412	0.0513	0.0012	0.0184	0.3765	0	0
23	26	4	80	30	0.047	0.0176	0.0062	0.0004	0.0134	0.113	0	0
24	27	25	180	30	0.7675	0.0239	0.0422	0.0103	0.1014	4.2643	0	0.0003
25	28	64	70	30	0.0349	0.0535	0.0183	0.0008	0.0068	0.2014	0	0
26	29	80	77	33	0.0674	0.0706	0.0568	0.0055	0.0341	0.3318	0	0
27	30	20	115	33	0.123	0.088	0.0441	0.0044	0.0168	0.5779	0	0.0001
28	31	60	78	34	0.0206	0.0231	0.0091	0.0006	0.0035	0.1386	0	0
29	32	18	70	34	0.0309	0.0213	0.0291	0.0025	0.0143	0.1522	0	0
30	34	18	80	35	0.0979	0.3225	0.2472	0.0047	0.0422	0.8006	0	0
31	35	15	108	35	0.1345	0.0171	0.0293	0.002	0.0207	0.9835	0	0.0001
32	36	17	100	35	0.1271	0.0206	0.0237	0.0042	0.0161	0.8933	0	0
33	37	30	125	36	0.1762	0.277	0.2663	0.0084	0.0374	0.4176	0	0.0002
34	38	50	68	36	0.0449	0.1381	0.0944	0.0043	0.0348	0.352	0	0
35	39	67	80	36	0.0576	0.0976	0.0849	0.0045	0.0347	0.4886	0	0
36	40	75	81	36	0.061	0.1012	0.0626	0.0043	0.0292	0.4125	0	0
37	41	28	60	36	0.0367	0.0741	0.0573	0.0021	0.0122	0.3913	0	0
38	42	18	95	36	0.1063	0.1204	0.1165	0.0066	0.0339	0.7485	0	0
39	43	18	98	37	0.0927	0.143	0.1043	0.0056	0.0472	0.5198	0	0
40	44	190	70	37	0.023	0.0291	0.0135	0.0026	0.0077	0.1311	0	0
41	45	22	50	37	0.0289	0.2837	0.0301	0.0035	0.0042	0.2739	0	0
42	46	24	68	38	0.0475	0.0435	0.058	0.0023	0.0196	0.2805	0	0.0001
43	47	60	72	38	0.0487	0.1512	0.0754	0.002	0.0117	0.3067	0	0
44	48	32	149	38	0.2652	0.2402	0.2452	0.0164	0.1464	1.4273	0	0.0022
45	49	62	80	38	0.0688	0.0057	0.0131	0.0055	0.0155	0.5527	0	0
46	50	13	113	38	0.1993	0.079	0.1261	0.0099	0.0483	1.3668	0	0
47	51	28	45	38	0.0217	0.0853	0.0136	0.0021	0.0023	0.1814	0	0
48	52	22	114	38	0.1451	0.0492	0.045	0.0022	0.0377	1.6867	0	0

	A	B	C	D	CJ	CK	CL	CM	CN	CO	CP	CQ
1	Tank ID	Sep Pres	Sep Temp	SlsOil APIG	TotG mol% NONS	TotG mol% BENZ	TotG mol% TOL	TotG mol% E-BENZ	TotG mol% XYL	TotG mol% n-C6	TotG mol% 224TriMe	TotG mol% C10+
49	53	66	89	39	0.0766	0.3938	0.1901	0.0051	0.0519	0.6238	0	0
50	54	60	80	39	0.0672	0.055	0.0542	0.0051	0.0275	0.7609	0	0
51	55	60	58	39	0.026	0.0455	0.0048	0.0024	0.0117	0.2517	0	0
52	57	33	60	39	0.0352	0.1432	0.1046	0.0021	0.0146	0.4183	0	0
53	58	42	110	39	0.1992	1.1339	0.7229	0.0103	0.064	1.6652	0	0.0001
54	59	66	83	40	0.1185	0.1696	0.2074	0.0062	0.0249	0.3728	0	0.0019
55	60	66	90	40	0.101	1.1122	0.5261	0.0108	0.0422	0.4465	0	0.0002
56	61	13	110	40	0.1945	0.2168	0.2376	0.0128	0.0741	1.4199	0	0
57	62	64	74	40	0.0601	0.0774	0.0559	0.0017	0.0131	0.5247	0	0
58	63	28	78	42	0.0696	0.0139	0.0154	0.0004	0.0092	0.8161	0	0
59	65	29	60	44	0.0249	0.019	0.0117	0.0007	0.0022	0.6315	0	0.0001
60	66	44	71	44	0.0538	0.0687	0.0802	0.0046	0.0351	0.5665	0	0
61	67	60	60	44	0.0322	0.0315	0.048	0.0037	0.0197	0.5438	0	0
62	68	41	72	45	0.1409	0.394	0.3023	0.0064	0.108	0.7292	0	0.0001
63	69	20	68	45	0.0692	0.0418	0.0564	0.0055	0.0212	0.9685	0	0
64	70	23	85	46	0.0784	0.0147	0.0152	0.0018	0.0147	1.4491	0	0
65	71	24	114	46	0.2696	0.2119	0.2551	0.0092	0.1092	2.1998	0	0
66	72	52	108	47	0.1525	0.1017	0.1721	0.0083	0.0951	0.8871	0	0.0001
67	73	45	140	47	0.4105	0.3908	0.3886	0.015	0.2112	2.424	0	0.0001
68	74	40	76	47	0.0699	0.0286	0.0227	0.0055	0.0183	1.2009	0	0
69	75	31	76	49	0.0933	0.2756	0.1304	0.003	0.0657	1.0088	0	0
70	77	700	100	50	0.0368	0.1348	0.2161	0.0004	0.005	0.4471	0	0.0023
71	78	20	48	50	0.0228	0.2305	0.1312	0.0036	0.0177	0.2721	0	0.0011
72	79	98	40	51	0.0103	0.0225	0.0164	0.0002	0.0016	0.4573	0	0
73	80	115	73	54	0.1057	0.0365	0.0089	0.0092	0.0333	0.5758	0	0.0005
74	81	30	100	54	0.1252	0.3029	0.4266	0.0068	0.1155	1.1478	0	0.0003
75	82	15	86	54	0.0776	0.2178	0.1579	0.0046	0.0524	1.0551	0	0
76	83	770	100	55	0.0246	0.09	0.0978	0.0003	0.0048	0.6546	0	0.0005
77	84	39	66	57	0.0967	0.1941	0.161	0.0077	0.0339	0.5046	0	0.0024
78	85	38	95	57	0.1333	0.3859	0.1997	0.0131	0.0971	1.8369	0	0
79	86	65	80	57	0.1245	0.2965	0.3922	0.0122	0.114	1.4782	0	0.0101
80	87	64	60	57	0.028	0.0613	0.0675	0.002	0.0106	0.5562	0	0
81	88	870	78	57	0.0169	0.0428	0.0451	0.0013	0.0067	0.3881	0	0
82	89	600	70	57	0.0177	0.0791	0.0748	0.0002	0.0031	0.4187	0	0.001
83	90	780	70	58	0.0292	0.0171	0.0303	0.0014	0.0102	0.4236	0	0.0006
84	91	60	56	58	0.0508	0.0385	0.094	0.0039	0.0397	0.3645	0	0.0008
85	92	500	84	58	0.0342	0.1527	0.1965	0.0002	0.0049	0.6269	0	0.0001
86	93	300	80	58	0.037	0.0509	0.0363	0.0017	0.0119	0.716	0	0
87	94	110	72	59	0.0895	0.058	0.1517	0.0067	0.0686	0.5496	0	0.0046
88	95	750	90	60	0.0332	0.1698	0.1626	0.0004	0.0071	1.0622	0	0.0001
89	96	85	85	61	0.1794	0.059	0.0279	0.0052	0.0222	1.0338	0	0.0004
90	97	57	82	62	0.0748	0.0993	0.1661	0.0044	0.0501	1.0482	0	0
91	98	72	80	63	0.1706	0.0297	0.1053	0.0045	0.0401	0.968	0	0.0008
92	99	730	80	63	0.0212	0.1536	0.1288	0.0002	0.0045	0.7287	0	0
93	100	580	77	64	0.0296	0.1631	0.2185	0.002	0.02	0.5981	0	0.0002
94	101	730	80	64	0.0059	0.0623	0.0415	0	0.0012	0.3233	0	0
95	102	807	96	66	0.0233	0.0392	0.0079	0.0011	0.0066	0.2394	0	0.0008

	A	B	C	D	CR	CS	CT	CU	CV
1	Tank ID	Sep Pres	Sep Temp	SlsOil APIG	TotG Mol Frac	TotG MWt	TotG Grav	prod rate	THC ems
2	1	45	106	15	0.0299	44.7792	1.5457	480	1.4205
3	2	22	155	17	0.0287	48.7595	1.6831	3228	105.225
4	3	20	160	18	0.0241	48.0099	1.6572	230	3.1011
5	4	53	101	19	0.0485	36.2738	1.2521	3663	162.0545
6	6	23	79	20	0.0145	20.3907	0.7039	405	3.8512
7	8	18	75	20	0.0104	31.3501	1.0822	3650	33.4051
8	9	54	125	21	0.038	34.261	1.1826	35	1.8281
9	10	35	76	23	0.0196	20.4962	0.7075	871	15.9198
10	12	30	66	23	0.0382	36.3096	1.2534	360	15.769
11	13	20	122	24	0.0129	23.6669	0.8169	1550	13.6821
12	14	20	88	24	0.0466	42.5062	1.4672	975	60.7106
13	15	22	86	24	0.0351	42.9633	1.483	1350	53.5742
14	16	20	68	24	0.0431	44.5227	1.5369	763	44.7712
15	17	19	133	25	0.0081	41.8024	1.443	1131	17.563
16	18	30	60	25	0.0402	34.87	1.2037	25	1.5541
17	19	25	136	27	0.0199	43.5202	1.5023	1872	48.7592
18	20	31	64	27	0.0399	38.5785	1.3317	105	6.8776
19	21	23	79	29	0.014	25.0517	0.8647	655	10.7879
20	22	17	86	29	0.0391	43.7589	1.5105	1250	114.202
21	23	20	120	29	0.0235	53.7063	1.8539	160000	10754.7562
22	24	22	98	29	0.0475	41.7428	1.4409	1000	95.9194
23	26	4	80	30	0.0056	23.7279	0.8191	7300	43.7217
24	27	25	180	30	0.0253	54.5497	1.883	646	41.8662
25	28	64	70	30	0.0497	26.4945	0.9145	1000	51.3736
26	29	80	77	33	0.068	33.3361	1.1507	1696	202.0897
27	30	20	115	33	0.0194	35.0579	1.2101	1410	47.8196
28	31	60	78	34	0.0336	22.1344	0.764	231	6.9192
29	32	18	70	34	0.0138	22.4234	0.774	150	2.1649
30	34	18	80	35	0.0437	42.0871	1.4528	120	13.2865
31	35	15	108	35	0.0359	45.679	1.5768	476	36.8652
32	36	17	100	35	0.0343	41.5758	1.4351	345	26.9625
33	37	30	125	36	0.011	28.1162	0.9705	820	12.4471
34	38	50	68	36	0.0319	24.4775	0.8449	995	36.9054
35	39	57	80	36	0.031	30.3159	1.0465	1050	52.6414
36	40	75	81	36	0.0547	30.534	1.054	2700	242.7301
37	41	28	60	36	0.04	33.5783	1.1591	110	8.3272
38	42	18	95	36	0.0418	46.449	1.6033	850	88.2221
39	43	18	98	37	0.02	32.247	1.1131	340	11.7213
40	44	190	70	37	0.1064	26.3954	0.9111	40	5.9193
41	45	22	50	37	0.1168	46.1225	1.5921	900	290.7519
42	46	24	68	38	0.0274	32.3584	1.117	124	6.7524
43	47	60	72	38	0.0376	27.3575	0.9443	70	3.6123
44	48	32	149	38	0.0113	38.9898	1.3459	1700	42.1971
45	49	62	80	38	0.0673	48.308	1.6675	2438	216.4445
46	50	13	113	38	0.0263	50.694	1.7499	2819	212.8561
47	51	28	45	38	0.0476	41.142	1.4202	400	28.3984
48	52	22	114	38	0.0926	55.1961	1.9053	48	13.1515

	A	B	C	D	CR	CS	CT	CU	CV
1	Tank ID	Sep Pres	Sep Temp	StsOil APIG	TotG Mol Frac	TotG MWt	TotG Grav	prod rate	THC ems
49	53	66	89	39	0.0542	35.1454	1.2132	550	61.2558
50	54	60	80	39	0.0383	30.7668	1.062	2657	206.4514
51	55	60	58	39	0.0792	35.0137	1.2086	22	3.6327
52	57	33	60	39	0.0581	45.125	1.5576	1650	172.5381
53	58	42	110	39	0.0454	42.8664	1.4797	30	3.7551
54	59	66	83	40	0.0471	46.3542	1.6001	62	1.2771
55	60	66	90	40	0.0472	31.5282	1.0883	52	5.0404
56	61	13	110	40	0.0222	43.7085	1.5088	100	5.9096
57	62	64	74	40	0.0393	27.5458	0.9508	1000	57.1426
58	63	28	78	42	0.0365	42.5251	1.4679	40	3.4332
59	65	29	60	44	0.0538	37.6916	1.3011	140	18.7336
60	66	44	71	44	0.0347	34.9441	1.2062	2600	167.4696
61	67	60	60	44	0.0632	35.9666	1.2415	900	145.776
62	68	41	72	45	0.0292	31.7161	1.0948	530	32.0743
63	69	20	68	45	0.0435	42.3925	1.4633	233	30.8795
64	70	23	85	46	0.0732	48.4972	1.6741	71	15.7975
65	71	24	114	46	0.0415	48.4081	1.671	312	41.5487
66	72	52	108	47	0.0428	43.8049	1.5121	270	31.5652
67	73	45	140	47	0.1118	55.9353	1.9308	1000	483.2405
68	74	40	76	47	0.063	46.7016	1.6121	115	22.3818
69	75	31	76	49	0.041	36.4215	1.2572	1100	105.0764
70	77	700	100	50	0.3854	33.5429	1.1578	11	19.6383
71	78	20	48	50	0.0644	39.7721	1.3729	10	2.4612
72	79	98	40	51	0.1516	39.8233	1.3746	18	10.0744
73	80	115	73	54	0.0644	29.3108	1.0118	23	3.7097
74	81	30	100	54	0.0777	48.0273	1.6578	160	56.8956
75	82	15	86	54	0.0584	49.1078	1.6951	353	89.449
76	83	770	100	55	0.4283	35.9713	1.2417	10	22.4942
77	84	39	66	57	0.0309	28.7041	0.9908	200	15.5274
78	85	38	95	57	0.0836	51.6831	1.784	500	162.3623
79	86	65	80	57	0.0669	54.325	1.8752	346	126.4333
80	87	54	60	57	0.1129	42.126	1.4541	210	93.647
81	88	870	78	57	0.4331	31.0794	1.0728	210	408.5969
82	89	600	70	57	0.3284	32.2295	1.1125	5	6.8468
83	90	780	70	58	0.3429	28.0569	0.9685	42	55.8794
84	91	60	56	58	0.0861	32.1891	1.1111	42	11.6613
85	92	500	84	58	0.2794	33.0238	1.1399	9	10.4477
86	93	300	80	58	0.2701	40.1311	1.3853	45	56.7998
87	94	110	72	59	0.0834	33.9685	1.1725	35	10.3178
88	95	750	90	60	0.2733	45.2996	1.5637	10	15.7599
89	96	85	85	61	0.0533	33.534	1.1575	1	0.164
90	97	57	82	62	0.0918	44.7612	1.5451	370	151.905
91	98	72	80	63	0.0429	31.4889	1.0869	85	10.5771
92	99	730	80	63	0.2704	44.0368	1.5201	25	38.4485
93	100	580	77	64	0.2656	28.4718	0.9828	4	3.8511
94	101	730	80	64	0.5005	36.6062	1.2636	25	91.7663
95	102	807	96	66	0.4832	35.0045	1.2083	3341	10271.2944

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