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MONTANA PETROLEUM TANK RELEASE COMPENSATION BOARD

LOSS AND LOSS ADJUSTMENT EXPENSE RESERVE ANALYSIS AS OF JUNE 30, 2016

OCTOBER 2016

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October 25, 2016

Mr. Terry Wadsworth
Executive Director
Petroleum Tank Release Compensation
1225 Cedar Street
Helena, MT 59620

**RE: ACTUARIAL ANALYSIS OF THE PETROLEUM STORAGE TANK INSURANCE FUND
AS OF JUNE 30, 2016**

Dear Mr. Wadsworth:

Enclosed is the actuarial review of the loss and allocated loss adjustment expense reserves of the Montana Petroleum Tank Release Compensation Board (the "PTRCB") as of June 30, 2016.

The first section in the text of our report is the Executive Summary section. This section presents our conclusions and recommendations. It also describes the purpose and scope of our report, explains the distribution and use of our report, and provides the conditions and limitations underlying our work. This section of our report includes the Background section which provides information about the PTRCB program history.

The next section of the text of our report is the Actuarial Analysis section that describes the sources of data, our overall methodology, the selection of factors and specific methodologies and considerations by line of business. It also describes the selection of ultimate losses, and loss reserve discounting. The Exhibits section of our report follows the text of the report and includes all of our analyses.

Please feel free to call if you have any questions regarding any aspect of our report.

Sincerely,

Daniel W. Lupton, FCAS, MAAA, MBA

E. Toni Mulder, FCAS, MAAA, FCA
Enclosures

Montana Petroleum Tank Release Compensation Board
Loss and Loss Adjustment Expense Reserve
Analysis as of June 30, 2016

Contents

Executive Summary

Purpose and Scope

Taylor & Mulder, Incorporated ("T&M") was requested by Montana Petroleum Tank Release Compensation Board ("PTRCB") to conduct an actuarial review of its loss and loss adjustment expenses reserves as of June 30, 2016. This report contains our summary, conclusions and recommendations along with a description of the analysis underlying our conclusions.

Specifically, T&M was asked by the PTRCB to conduct an actuarial analysis to include within its scope the following tasks:

1. Assessment of the history of claim activity including reimbursement to date by year by type of tank system and to the extent possible by type of cleanup strategy.
2. Assessment of anticipated long-term average cost of release cleanup for all eligible releases.
3. Assessment of anticipated long-term average cost of release cleanup for different types of tank systems (Such as Federally Regulated USTs, not federally regulated USTs, large ASTs, and small ASTs)
4. Assessment of anticipated long-term average cost of release cleanup for different types of cleanup methods (Remediation systems (SVE, AS, etc.), Excavation, Monitored Natural Attenuation, Petroleum Mixing Zone, etc.).
5. Financial projections for the next ten fiscal years assuming no changes are made to the Fund.
6. Projection of Loss & Loss Adjustment Expense Reserves by report year. To assist in determining if the fund were to cease collecting income or accepting new reported claims, how much money would need to be in the fund to be able to bring all currently open eligible sites to closure.
7. Assessment and quantification of risk. Identification, measurement, analyses and understanding the existing and emerging risks that impact the Petro-Fund business. Risk evaluation on the financial impact of current economic, legal and social trends and use these insights to help suggest strategies for the fund.
8. Provision of values for the predictive variables and the actuarial assumptions made about certain variables, especially key predictive variables leading to inputs into any actuarial, financial or predictive models.

This report presents the results of those analyses. This report was prepared by Daniel W. Lupton, FCAS, MAAA, MBA, Vice President and Consulting Actuary and Evelyn Toni Mulder, FCAS, MAAA, FCA, Principal and Consulting Actuary.

In accordance with the requirements of the Actuarial Standards of Practice in making statements of actuarial opinion, I provide the following statement:

> *I, Daniel W. Lupton, am Vice President and Consulting Actuary in the firm of Taylor & Mulder, Inc. I am a Fellow of the Casualty Actuarial Society in good standing and qualified to issue a Statement of Actuarial Opinion. I am also a Member of the American Academy of Actuaries.*

Background

The Petroleum Tank Release Compensation Fund ("the Fund") was established in 1989 to assist in remediating pollution related to the use of petroleum products in Montana. The Fund is financed through a $0.0075 per gallon fee levied on distribution of petroleum products. When the fund balance equals or exceeds $10 million, the fee is suspended until the fund balance (less claims anticipated for board approval within 90 days) drops below $6 million.

In May 2007, the Fund instituted a new claim reimbursement policy to prioritize reimbursements for corrective actions based on the goal of protecting human health and the environment. As a result of this program, high priority sites receive funding first, followed by lower priority sites when additional funds are available.

In 2011, legislative changes enabled the use of a "Petroleum Mixing Zone" (PMZ) whereby water quality standards for petroleum and petroleum constituents may be exceeded in an area subject to certain conditions. When these conditions are satisfied, the petroleum release may be considered resolved and a no-further-action letter may be issued to the owner or operator of the PMZ.

On April 7, 2015, the US Environmental Protection Agency Region 8 provided the results of a Tier II soundness assessment of the Fund. This analysis raised concerns of the long term financial soundness of the fund as well as questions about the speed with which cleanups could proceed toward closure. This assessment included sixteen recommendations for the fund, including an independent actuarial review. This report was prepared as a response to that recommendation.

Terms Defined

Claim   In an actuarial context, a "claim" is typically used to refer to a single event triggering coverage by an insurer. For the Fund, a claim is a request for reimbursement for a single work plan related to the remediation of a site. For the purposes of this report, the term "claim" will have the latter meaning, while "release" will be used to signify individual triggering events, per the terminology used by the Fund.

Frequency   Technically speaking frequency is the average number of releases per insured exposure. For the Fund, an insured exposure is one tank insured for one year. For example, if 250 releases are reported in a year with 10,000 insured tanks, the frequency (average number of releases per insured exposure) is 250 / 10,000 insured tanks = 0.025 releases per tank.

     In spite of this, the term "frequency" is often used to describe simply the number of releases (rather than releases per exposure), such as in the "Frequency Times Severity Method," below. We will clarify our use of this term if the meaning is not clear from context and the distinction is important.

LDF   A Loss Development Factor ("LDF") is calculated by an actuary from historical payment data and applied to current paid losses values to estimate ultimate claim costs

for an insurer. LDFs are determined by analyzing cohorts of releases at similar points in time to determine the anticipated amount by which those releases developed over time.

As an example, consider only the cohort of releases that were reported in the fiscal year ending June 30, 2010. As of fiscal year-end 2010, $17,680 had been paid in remediation expenses for those releases. By the same time a year later (at fiscal year-end 2011), $149,486 had been paid on the same cohort of claims. This yields an LDF of 8.455 (= $149,486 / $17,680).

Looking at similar LDFs for different cohorts at the same point in time provides indication as to how future cohorts might change over time. For instance, as of the date of this report, the cohort of claims that were reported in 2016 is at the same age as the cohort from 2010 was at year-end 2010. Therefore, we might expect that the 2016 cohort will develop by a similar amount between the fiscal year ending 2016 and fiscal year-end 2017. (Note: this was not the final selected LDF, just an example).

By looking at LDFs for each cohort at each year-end, and by using some actuarial judgment and statistical assumptions, we can determine the anticipated amount by which less "mature" cohorts of releases will grow in the future, including the rate at which those remediations will take place and the ultimate liability arising from those releases.

Severity   Severity is the average size of a release for a given collection of releases. For instance, if the total cost for three releases is $45,000, the severity (average size of a release) is $45,000 / 3 releases = $15,000 severity.

Ultimate Loss   Ultimate Losses equal the total paid losses for all currently open and closed claims plus the total unpaid losses for all currently open claims. The ultimate losses represent the total cost final of remediation for all reported releases.

Conclusions

Unpaid Loss Reserves

T&M projected loss reserves for the PTRCB. The following table provides a summary of our findings:

Montana Petroleum Tank Release Compensation Board Actuarial Reserve Study as of June 30, 2016 Summary of Unpaid Losses	
Ultimate Losses 1989-2016	$158,667,836
Paid Losses 1989-2016	$121,174,749
Unpaid Losses 1989-2016	$37,493,087

In the above chart, "Ultimate Losses" represents the total amount anticipated to be paid on all currently open releases as of June 30, 2016 by the time the releases are completely closed in the future. The "Paid Losses" represents the amount paid to date on all such releases. The "Unpaid Losses" represents the difference between these two values, which is the total additional amount anticipated to be required to bring all currently open releases to closure.

It should be noted that these unpaid loss amounts do not include consideration of administrative expenses or any revenues. Therefore, these unpaid loss amounts are not discounted for the time value of money, but represent a nominal cash value required to remediate all currently open petroleum releases.

These unpaid loss projections are subject to uncertainty if release sites do not develop in the future as they have in the past. As a result, we have used Monte Carlo simulation to determine the propensity of losses to vary from our central estimates. The following chart shows possible unpaid loss amounts and their respective probability levels:

Montana Petroleum Tank Release Compensation Board Actuarial Reserve Study as of June 30, 2016 Unpaid Losses by Confidence Level	
Confidence Level	**Loss Reserve**
50.0%	$35,551,038
55.0%	$36,434,499
60.0%	$37,455,366
65.0%	$38,497,388
70.0%	$39,622,590
75.0%	$40,864,324
80.0%	$42,330,137
85.0%	$44,209,826
90.0%	$46,624,050
95.0%	$50,280,647
97.5%	$53,756,258
99.0%	$57,585,629
99.5%	$60,181,549
Expected	**$37,493,087**

As an example, according to this analysis, there is a 50% chance that current unpaid losses will be lower than $35,551,038. There is an 80% chance that unpaid losses will be lower than $42,330,137. Similarly, there is a 0.5% chance (100% - 99.5%) that unpaid losses will exceed $60,181,549 (or a 99.5% chance that losses will be less than $60,181,549.)

Note that the "expected" losses of $37.5 million fall between the 60th and 65th percentiles of loss according to the Monte Carlo model. The expected losses represent the "actuarial central estimate," which is based on our understanding of changes to the program and actuarial judgment. By contrast, the percentiles of loss from the Monte Carlo model are products of applying a more "naïve" statistical model that may not fully capture actuarial judgment about future losses. Therefore, the $37.5 million expected loss estimate represents T&M's best estimate of the amount unpaid as of June 30, 2016.

Unpaid Federally Regulated Fund Eligible Releases
Federally-regulated fund eligible (FRFE) releases are a subset of the releases for which the Fund is liable. Not all FRFE releases have applied for reimbursement through the Fund. There are several potential reasons for this, including:

1. In many cases, remediation costs for such releases may be below the deductible of the coverage provided by the Fund.
2. Some owners/operators of tanks subject to FRFE releases may not be aware of their ability to request reimbursement through the Fund.
3. Remediation activities may not have commenced yet for some more recently-reported releases; these releases may generate requests for reimbursement in the future.

From a statutory accounting perspective, it is not important to hold reserves for remediation activities that do not have a reasonable probability of occurring. For this reason, the unpaid loss reserve estimates above do not include provision for FRFE releases that are unlikely to be reported.

Nevertheless, it can be informative to understand the potential remediation expenses arising from FRFE claims in case they are eventually incurred by the fund in the future. The following table describes the FRFE remediation expenses anticipated to be incurred by the fund as well as those that are not anticipated to be incurred by the fund:

Montana Petroleum Tank Release Compensation Board Actuarial Reserve Study as of June 30, 2016 Summary of FRFE Loss Reserves			
	Anticipated	Not Anticipated	Total
Ultimate Loss	$125,184,547	$10,966,915	$136,151,463
Unpaid Loss Reserve	$27,132,087	$10,966,915	$38,099,002
Open Release Count	604	95	699

Financial Projections

T&M projected anticipated cash flows over the next ten fiscal years. The following chart shows the anticipated total revenue, expenses (including personal services and operating expenses), remediation expenses, and ending loss reserve for 2017 through the final payoff of the remaining backlog of releases:

Montana Petroleum Tank Release Compensation Board Actuarial Reserve Study as of June 30, 2016 Cash Flow Projections – Expected Scenario				
Fiscal Year	Revenues	Misc. Expenses	Remediation Expense	Ending Loss Reserve
2017	$7,406,983	$2,152,547	$7,345,669	$32,302,074
2018	$7,476,934	$2,208,397	$5,268,537	$29,172,175
2019	$7,547,558	$2,266,560	$5,280,998	$26,189,780
2020	$7,618,862	$2,327,151	$5,291,711	$23,190,112
2021	$7,690,853	$2,390,289	$5,300,564	$20,206,869
2022	$7,763,536	$2,456,101	$5,307,435	$17,239,303
2023	$7,836,919	$2,524,719	$5,312,200	$14,298,968
2024	$7,911,008	$2,596,282	$5,314,726	$11,385,696
2025	$7,985,810	$2,670,938	$5,314,873	$8,642,428
2026	$8,061,333	$2,748,840	$5,312,493	$5,936,436
2027	$8,137,582	$2,830,150	$5,307,432	$3,288,728
2028	$8,214,565	$2,915,039	$5,299,526	$703,234
2029	$8,292,289	$3,003,687	$3,472,683	$-

Fuel revenues, personal expenses, and operating expenses were projected using an exponential growth function based on the preceding six years. Other revenues were based on the average for the preceding six years, but were highly volatile over that time period and therefore not subject to exponential growth.

Historically, remediation expenditures have been primarily limited by the amount of money available to perform remediation rather than the pace at which remediation activities proceed. Therefore, remediation expenditures were determined based on cash available (i.e., assuming an average ending fund balance of $0 each year), and were limited based on the outstanding liabilities. Therefore, toward the end of the projection period, remediation expenses may slow as fewer sites are "ready" to proceed with subsequent work plans, for example. Likewise, significant changes in revenues could alter the pace of cleanups in the state.

Taylor & Mulder projected the anticipated expenses each year based on varying losses. This will impact the anticipated liability balance at the end of each year.

It should be noted that financial projections in the future are subject to a higher degree of uncertainty than anticipated unpaid losses for currently known releases. There are several reasons for this, including:
1. Paid remediation expenses may vary based on the available budget. Therefore, paid remediation expenses may tend to be higher when more cash is available.
2. However, paid remediation expenses may also vary based on the availability of work plans, the capacity of contractors, and the maximum speed with which remediation projects can proceed from one step to the next.
3. Finally, future cash flows are based on a larger number of statistical assumptions than current unpaid losses, such as the value of current unpaid losses, the anticipated speed of payment for currently unpaid losses, the anticipated future number of releases reported and their anticipated severities, anticipated revenues, and the anticipated speed of payment of future releases.

As a result of these uncertainties, it is instructive to consider the possible fund balances based on a variety of scenarios. Exhibits E-1 through E-4 show detail of the anticipated future cash flows based on the expected scenario, the 50th percentile of losses, the 75th percentile, and the 95th percentile, respectively.

The anticipated time to payoff of the remaining backlog of claims varies depending on the scenario:

Scenario	Time to Payoff of Backlog
Expected	13 Years
50th Percentile	10 Years
75th Percentile	15 Years
95th Percentile	Indefinite

The 95th percentile of losses represents a "worst-case scenario" in which the current funding will be inadequate to ever clear the backlog of claims. This is because the size of losses incurred each year in this scenario grows to exceed the incoming revenue each year before the backlog is cleared. Put another way, eventually more losses are being added than revenues are coming in each year under this scenario.

Long-Term Average Cost per Release

T&M projected the long-term average cost per release each year in the future. The following graph shows the anticipated average cost per release (i.e., the "severity" of releases) from 1989 to 2026:
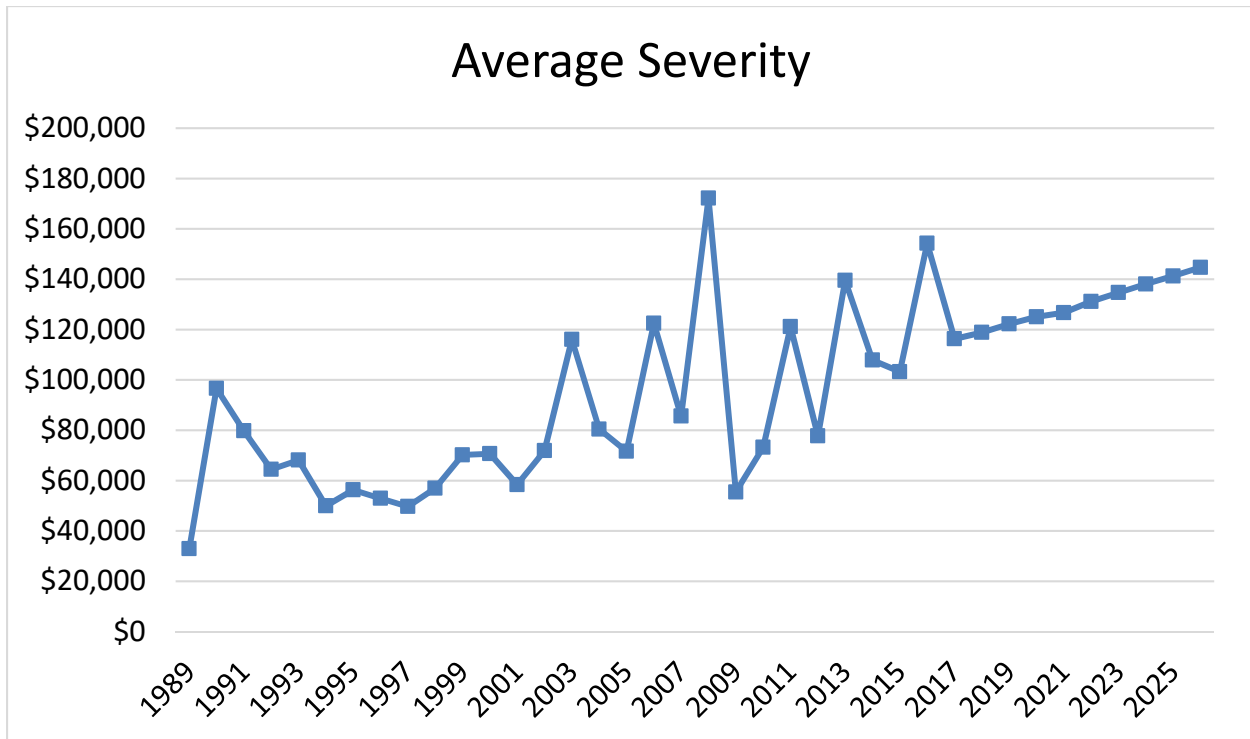
The detail underlying this graph as well as additional information may be found in Exhibits E-7 through E-9.

The average cost per release has shown gradual growth from 1989 to 2016 (approximately 2.5% per year). The relatively low volatility of the average severity of releases in the 1990s is the result of a relatively high volume of reported releases during that time period. In the 2000s, the number of reported releases in each period has declined, leading to higher volatility in average severity[1]. Our projections anticipate that this slow growth will continue into the future.

There are several countervailing pressures that impact severity over time. Improved tank technology, and the switch from single-walled tanks to double-walled tanks, and the move away from certain gasoline additives has led to less severe releases in general. However, larger tank capacity and an aging tank population have a tendency to push release severity in the other direction. Finally, normal inflation (approximately 2.0% per year, as a rule of thumb) impacts the average severity of releases.

The following chart shows a comparison of the average severity of releases from federally-regulated and non-federally regulated sources:

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[1] This makes sense statistically, because the volatility of the average severity is proportional to (1 / number of claims). I.e., as the number of claims increases, the volatility should naturally decrease because there are more claims to "even out" the effects of the outliers.

Comparison of Average Release Severity: Federally Regulated vs Non-Federally Regulated
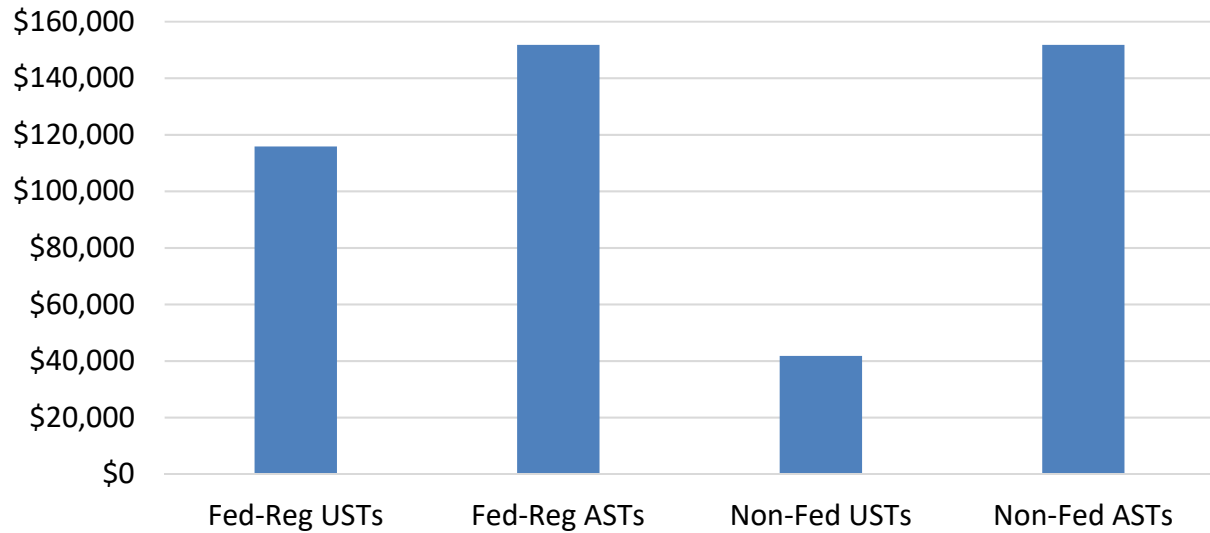
Fed-Reg USTs	Fed-Reg ASTs	Non-Fed USTs	Non-Fed ASTs

The average severities in this chart represent a trended, weighted average severity from 1989 to 2016. In general, aboveground storage tanks have severity that is higher than that of underground storage tanks, and federally-regulated sites have higher average severity than non-federally-regulated sites.

The following graph shows similar statistics for large versus small USTs and ASTs:

Comparison of Average Release Severity: Large Tanks Versus Small

Large UST	Large AST	Small UST	Small AST
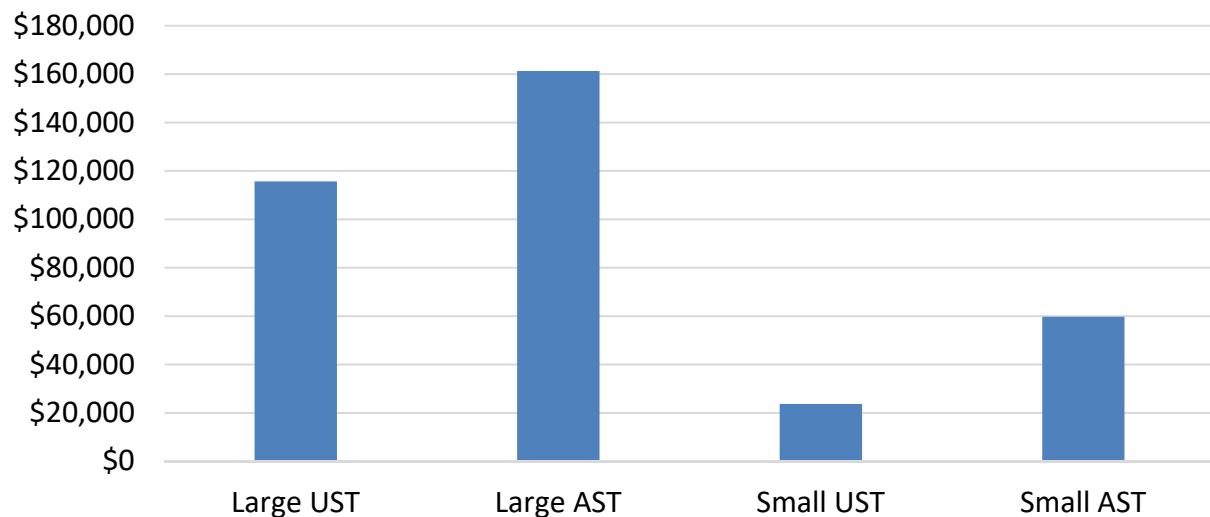
As in the previous chart, the average severities in this chart represent a trended, weighted average severity from 1989 to 2016. Here again, aboveground storage tanks appear to have more costly releases on average than underground storage tanks. As expected, releases from large tanks tend to be about three to five times as expensive as releases from small tanks on average.

Cost per Work Plan Activity

Taylor & Mulder reviewed the average cost per each work plan activity. The following chart shows the average cost for the ten most common work plan activities:

	Montana Petroleum Tank Release Compensation Board		
	Actuarial Reserve Study as of June 30, 2016		
	Average Cost per Work Plan Activity		
Activity Code	Number of Work Plans with Activity	Average Cost per Work Plan	Average Cost per Release
GWM	2,882	$8,267	$25,618
WI	799	$11,617	$16,635
SB	590	$11,268	$14,611
SVE	386	$11,320	$28,009
SR	326	$81,037	$95,372
WA	324	$2,839	$3,046
OI	262	$9,668	$13,331
FPR	225	$9,410	$20,358
LF	140	$4,620	$5,093
AS	126	$23,886	$45,601

As an example, groundwater monitoring is the most common activity included in a work plan. It appeared in 2,882 work plans. On average, groundwater monitoring increases the price of a work plan by $8,267, although this amount varies depending on a number of factors such as the location of the monitoring and the specific activities included in the work plan.

When groundwater monitoring is called for in a release, on average it appears in 3.1 work plans for that release. Therefore, the average cost per release is $25,618.

As another example, soil removal is much more expensive: when it appears in a work plan, the additional cost is $81,037 on average. However, on releases where soil removal is called for, on average it appears in only 1.2 work plans for that release – usually, one work plan for soil removal is enough. As a result, the cost per release is much closer to the cost per work plan, at $95,372 on average.

Report Distribution and Use

This report has been prepared for internal use by the management of PTRCB, their accountants, auditors, and attorneys. This report may be reproduced only in its entirety. The Exhibits and Appendices are integral parts of this report. Other distribution or use of this report by the PTRCB management or related parties

described above is not authorized without the prior written permission of Taylor & Mulder, Incorporated. The PTRCB is not authorized to include this report in any marketing or request for proposal solicitations. In addition, it should be understood that T&M consultants are available to respond to any questions by authorized third parties with respect to this report.

Conditions and Limitations

The analyses contained in this report were performed using accepted loss and loss adjustment expense reserving methods adjusted to the special needs of the PTRCB and in conformance with sound actuarial standards and principles. T&M introduced assumptions and judgments that we considered appropriate in the circumstances.

With regard to projections of ultimate values, it should be understood that the emergence and settlement of claims are subject to uncertainty. While we have used our best professional judgment in all instances, projections of future ultimate losses and loss expenses are inherently uncertain because of the random nature of claims occurrences. They are also dependent upon future contingent events and are affected by many additional factors.

PTRCB claim reserving procedures and settlement philosophy, current and perceived social and economic inflation, current and future court and jury attitudes, legislative changes affecting the PTRCB, improvements in technology, and many other economic, legal, political, legislative and social factors all can have significant effects on ultimate claim costs. Therefore, we cannot warrant that actual developments will not differ from current projections. Such differences could be upward or downward and could be significant.

In summary, the ultimate loss and loss adjustment expense levels estimated in this report are subject to potential variations in estimation due to:
(1) the fact that the ultimate liability of PTRCB is subject to the outcome of events yet to occur;
(2) the unanticipated changes in the legal, economic, legislative or claims adjudication environments;
(3) statistical fluctuation in losses around the estimated or expected values when all other factors remain constant; and
(4) the fact that the actual future loss and loss payment and reporting patterns may differ from those applied in the determination of the expected losses or there may be unanticipated changes in the loss and expense loss and expense payment and reporting patterns;

Accordingly no assurance can be given that future loss emergence will not deviate from the estimated ultimate loss and loss adjustment expenses. However, the ultimate loss and loss adjustment expense estimates were based on a reasonable application of generally accepted actuarial procedures and techniques applied to the information available.

We reviewed the information for overall reasonableness and presented any irregularities to the PTRCB third-party administrator for edification and clarification.

T&M relied without audit or verification on historical loss, loss adjustment expense, exposure data, and other information provided by the PTRCB and its employees and brokers. T&M has relied upon the data provided and on the oral and/or written statements made regarding the quality, accuracy, and completeness of the data and information supplied. Any inaccuracies or inconsistencies in the data could have a significant effect on the conclusions drawn. Should any inaccuracies be found in the data, T&M should be notified immediately so that the analysis can be adjusted accordingly.

The analysis in this report was limited to the loss and loss adjustment expense items noted in the scope of this project. This report does not include an examination of the assets of the PTRCB, nor did we form any opinion as to the value or validity of the assets. This report does not include a review or analysis of any income statement or other balance sheet items. This analysis with respect to loss and loss adjustment expense reserves is based upon the assumption that all reserves are backed by valid assets and that these assets reflect suitably scheduled maturities and/or sufficient liquidity to meet cash flow requirements.

This report is limited in scope to the estimate of the level of reserve adequacy at the evaluation date of the report. It also includes projections regarding cash flow of the operations of the PTRCB under certain narrow assumptions and conditions.

This report was prepared for use by persons technically competent in insurance financial matters. Persons receiving this report should be made aware of the availability of T&M, Inc. personnel to answer questions and/or amplify on any matter addressed therein.

Actuarial Analysis

Sources of Data

Data was provided by Terry Wadsworth, Executive Director of the Petroleum Tank Release Compensation Fund, and Michael Trombetta, Contaminated Site Cleanup Bureau Chief for the Montana Department of Environmental Quality.

Data was provided in the form of Microsoft Access database that included information from the PTRCB as well as the LUST and UST databases maintained by the Department of Environmental Quality. These databases include information pertaining to historical claim payments, release information, work plans, tank information, and site information.

Overall Methodology

Selection of Factors

In each of the methods described below, our selections of development factors were based on the evaluation of the predictive value of the various historical averages and the perceived presence or absence of trends and singularities. Apparent statistical aberrations were eliminated either judgmentally or by selecting a longer experience period to increase the credibility of the experience, whichever we believed more appropriate in the particular circumstances.

Paid Development Method

The paid development method uses historical loss payment patterns to project actual payments as of a given valuation date to ultimate. The PTRCB's historical payment patterns or the fitted loss development factors were relied upon in selecting the expected payment patterns at each evaluation. The difference between the projected ultimate losses and the losses and allocated loss adjustment expenses paid through the evaluation date is the estimated reserve as of the evaluation date.

Estimates produced using the paid development method are not affected by changes in the case reserve position of the PTRCB which might have occurred during the review period, but may be understated since they ignore large unpaid claims. Also, this method may be susceptible to any changes in case settlement philosophy and/or speed of payment.

Frequency Times Severity Method

The "Frequency Times Severity Method" (or, simply, "Frequency / Severity Method") is similar to the loss development method in that it uses historical development patterns to determine anticipated payments in the future. However, this method differs in that it breaks the paid loss data into average release severities and the number of releases reported in each fiscal year.

In this case, the number of releases reported in each fiscal year is fixed as of the end of the fiscal year. However, not all releases lead to applications for reimbursement with the Fund. Therefore, we looked at the number of releases that had applied for reimbursement over time and the rate at which those

applications were approved. This enables us to project the anticipated releases that will apply for reimbursement in the future.

We compare this to the anticipated average severity per release.

Bornhuetter-Ferguson Method

Loss development methods may be affected by changes in the reporting and payment of claims. Random fluctuations in the reporting and payment of claims (such as may result from a single unusually large claim) are magnified by the development factors, potentially resulting in biased estimates and wide changes in the estimates from one evaluation to the next. To minimize such fluctuations, we applied the Bornhuetter-Ferguson method to paid losses. The Bornhuetter-Ferguson method is particularly suited for projecting loss reserves for longer-tailed business with volatile or limited development patterns. The Bornhuetter-Ferguson method represents a compromise between traditional loss development methods such as the incurred and paid loss development methods and an expected loss ratio method.

For the paid Bornhuetter-Ferguson method, initial expected losses are derived from projected pure premium amounts. These initial expected losses are then split into two components: expected paid losses and expected unpaid losses. The expected unpaid losses are calculated as a function of the initial expected loss ratio, the initial expected ultimate losses, and the expected portion of ultimate losses that remains unpaid as of the evaluation date.

In this case, reported releases were used as an exposure base for the Bornhuetter-Ferguson method. Because the losses are evaluated on a report year basis, this exposure base does not change from year to year. This approach therefore has similarities with a frequency times severity method.

Projection Methodologies and Cash Flow Analysis

Several overlapping projection methodologies were used to perform the cash flow analysis. First, regression techniques were used to project frequency and severity into future periods. This analysis was performed by individual claim types in two ways: first, we projected anticipated frequencies and severities for federally regulated and non-federally-regulated USTs and ASTs. Then we performed a similar analysis for large and small USTs and ASTs. We compared the results of these analyses to make sure that they agreed.

It should be noted that there was particular concern that release reports were strongly correlated with economic indicators. The reason for this is that a large number of releases each year are the result of phase II site assessments that are typically performed when property is transferred and a company desires to develop on a property. Because of the commercial nature of the risks, it was therefore expected that the frequency of phase II site assessments (and corresponding release reports) would track closely with the economy.

In defiance of expectations, however, prominent economic indicators were not strongly correlated with the frequency of release reports. The main reason for this is likely that there are simply too few releases

reported in any given year to produce a visible pattern in comparison to normal statistical "noise". Therefore economic indicators were not used to project future release frequencies.

Following this analysis, we converted projections and individual release data into parameters for a simulation model.

The simulation model used a Poisson distribution to predict the number of releases for each report year. For each predicted release, a lognormal distribution was then generated as the prediction of the ultimate (dollar) size of that release. For example, one trial of the simulation might predict that there would be 13 releases in a given report year. Each of those 13 releases would have a simulated loss size drawn from the lognormal distribution.

Repeating this process 20,000 times for each report year from 2017 to 2026, we obtained a set of potential ultimate losses that represent a probability distribution of outcomes, where more common answers represent more likely outcomes.

Historical losses were simulated using paid loss development triangles. For each triangle, the loss development factors were simulated using normal distributions for each development period. The mean for each development period was selected to be the actuarial central estimate, while the standard deviation was selected to be the standard deviation of the historical LDFs.

For both historical and future releases, anticipated future payments by fiscal year were determined by applying fixed projected payment patterns to unpaid losses to determine the anticipated timing of future payments.

Combining these projections, we obtained an estimate of the range of possibilities for loss payments over time. We compared these loss payment projections to revenue projections to obtain an estimate of the range of possible outcomes for cash flows over time.

Selections of Ultimate Losses

Generally, the selection of ultimate losses was based on selecting incurred loss development method for older years, as this method seemed to give the best result. In years where there was great variability, particularly more recent report years, we selected a combination of methods (including the Bornhuetter-Ferguson method) to provide greater stability in results.

Any exceptions to the above description were based on our review of the methods combined with our knowledge of specific accident years and other considerations as described in the background section of our report.

Montana Petroleum Tank Release Compensation Board
Actuarial Reserve Study as of June 30, 2016
Financial Projections - Mean Payment Scenario

(1) Fiscal Year	(2) Revenues Fuel Revenues	(3) Other	(4) Expenses Personal Services	(5) Operating Expenses	(6) Expected Claim Payments	(7) Beginning Fund Balance	(8) Ending Fund Balance	(9) Beginning Loss Reserve	(10) Incurred Losses	(11) Ending Loss Reserve
2011	6,802,572	112,398	1,245,668	758,972	4,830,011	(1,329,625)	(720,427)			
2012	6,953,183	414,146	1,248,368	533,588	3,995,516	(720,427)	1,139,534			
2013	7,048,774	29,576	1,352,281	479,321	5,025,063	1,139,534	1,314,758			
2014	7,034,794	6,484	1,368,808	642,568	5,600,326	1,314,758	205,557			
2015	7,221,648	28,914	1,309,992	1,106,653	5,128,253	205,557	(90,143)			
2016	7,113,694	245,271	1,299,013	658,791	3,501,374	(90,143)	2,091,234			37,493,087
2017	7,267,518	139,465	1,351,814	800,733	7,345,669	2,091,234	-	37,493,087	2,154,656	32,302,074
2018	7,337,469	139,465	1,366,039	842,358	5,268,537	-	-	32,302,074	2,138,638	29,172,175
2019	7,408,093	139,465	1,380,413	886,148	5,280,998	-	-	29,172,175	2,298,603	26,189,780
2020	7,479,397	139,465	1,394,938	932,213	5,291,711	-	-	26,189,780	2,292,043	23,190,112
2021	7,551,388	139,465	1,409,616	980,673	5,300,564	-	-	23,190,112	2,317,321	20,206,869
2022	7,624,071	139,465	1,424,449	1,031,652	5,307,435	-	-	20,206,869	2,339,868	17,239,303
2023	7,697,454	139,465	1,439,437	1,085,281	5,312,200	-	-	17,239,303	2,371,866	14,298,968
2024	7,771,543	139,465	1,454,584	1,141,699	5,314,726	-	-	14,298,968	2,401,454	11,385,696
2025	7,846,346	139,465	1,469,889	1,201,048	5,314,873	-	-	11,385,696	2,571,604	8,642,428
2026	7,921,868	139,465	1,485,356	1,263,484	5,312,493	-	-	8,642,428	2,606,502	5,936,436
2027	7,998,117	139,465	1,500,986	1,329,164	5,307,432	-	-	5,936,436	2,659,723	3,288,728
2028	8,075,100	139,465	1,516,780	1,398,260	5,299,526	-	-	3,288,728	2,714,032	703,234
2029	8,152,824	139,465	1,532,740	1,470,946	3,472,683	-	1,815,919	703,234	2,769,449	-

Notes: Historical revenues, expenses, and fund balances provided by PTRCB
Projected post-2016 values for columns (2), (4), and (5) are projected using exponential growth models based on 2011-2016.
Due to higher volatility, column (3) is set at the average from 2011 to 2016.
Expected Claim Payments set equal to remaining funds available after expenses.
Claim payment amounts assume no limitations in amount that can be spent on individual releases in a year.

Montana Petroleum Tank Release Compensation Board
Actuarial Reserve Study as of June 30, 2016
Financial Projections - 50th Percentile Scenario

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Revenues		Expenses		50th Percentile	Beginning	Ending	Beginning		Ending
	Fuel		Personal	Operating	Claim	Fund	Fund	Loss	Incurred	Loss
Fiscal Year	Revenues	Other	Services	Expenses	Payments	Balance	Balance	Reserve	Losses	Reserve
2011	6,802,572	112,398	1,245,668	758,972	4,830,011	(1,329,625)	(720,427)			
2012	6,953,183	414,146	1,248,368	533,588	3,995,516	(720,427)	1,139,534			
2013	7,048,774	29,576	1,352,281	479,321	5,025,063	1,139,534	1,314,758			
2014	7,034,794	6,484	1,368,808	642,568	5,600,326	1,314,758	205,557			
2015	7,221,648	28,914	1,309,992	1,106,653	5,128,253	205,557	(90,143)			
2016	7,113,694	245,271	1,299,013	658,791	3,501,374	(90,143)	2,091,234			35,751,267
2017	7,267,518	139,465	1,351,814	800,733	7,345,669	2,091,234	-	35,751,267	1,672,120	30,077,717
2018	7,337,469	139,465	1,366,039	842,358	5,268,537	-	-	30,077,717	1,655,720	26,464,900
2019	7,408,093	139,465	1,380,413	886,148	5,280,998	-	-	26,464,900	1,794,101	22,978,003
2020	7,479,397	139,465	1,394,938	932,213	5,291,711	-	-	22,978,003	1,736,574	19,422,866
2021	7,551,388	139,465	1,409,616	980,673	5,300,564	-	-	19,422,866	1,763,576	15,885,878
2022	7,624,071	139,465	1,424,449	1,031,652	5,307,435	-	-	15,885,878	1,763,518	12,341,962
2023	7,697,454	139,465	1,439,437	1,085,281	5,312,200	-	-	12,341,962	1,807,096	8,836,857
2024	7,771,543	139,465	1,454,584	1,141,699	5,314,726	-	-	8,836,857	1,849,260	5,371,392
2025	7,846,346	139,465	1,469,889	1,201,048	5,314,873	-	-	5,371,392	1,985,313	2,041,832
2026	7,921,868	139,465	1,485,356	1,263,484	4,032,060	-	1,280,433	2,041,832	1,990,228	-

Notes: Historical revenues, expenses, and fund balances provided by PTRCB

Projected post-2016 values for columns (2), (4), and (5) are projected using exponential growth models based on 2011-2016.

Due to higher volatility, column (3) is set at the average from 2011 to 2016.

Expected Claim Payments set equal to remaining funds available after expenses.

Claim payment amounts assume no limitations in amount that can be spent on individual releases in a year.

Montana Petroleum Tank Release Compensation Board
Actuarial Reserve Study as of June 30, 2016
Financial Projections - 75th Percentile Scenario

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Revenues		Expenses		75th Percentile	Beginning	Ending	Beginning		Ending
	Fuel		Personal	Operating	Claim	Fund	Fund	Loss	Incurred	Loss
Fiscal Year	Revenues	Other	Services	Expenses	Payments	Balance	Balance	Reserve	Losses	Reserve
2011	6,802,572	112,398	1,245,668	758,972	4,830,011	(1,329,625)	(720,427)			
2012	6,953,183	414,146	1,248,368	533,588	3,995,516	(720,427)	1,139,534			
2013	7,048,774	29,576	1,352,281	479,321	5,025,063	1,139,534	1,314,758			
2014	7,034,794	6,484	1,368,808	642,568	5,600,326	1,314,758	205,557			
2015	7,221,648	28,914	1,309,992	1,106,653	5,128,253	205,557	(90,143)			
2016	7,113,694	245,271	1,299,013	658,791	3,501,374	(90,143)	2,091,234			39,705,265
2017	7,267,518	139,465	1,351,814	800,733	7,345,669	2,091,234	-	39,705,265	2,478,332	34,837,928
2018	7,337,469	139,465	1,366,039	842,358	5,268,537	-	-	34,837,928	2,476,802	32,046,193
2019	7,408,093	139,465	1,380,413	886,148	5,280,998	-	-	32,046,193	2,610,010	29,375,204
2020	7,479,397	139,465	1,394,938	932,213	5,291,711	-	-	29,375,204	2,575,531	26,659,024
2021	7,551,388	139,465	1,409,616	980,673	5,300,564	-	-	26,659,024	2,573,717	23,932,176
2022	7,624,071	139,465	1,424,449	1,031,652	5,307,435	-	-	23,932,176	2,587,038	21,211,780
2023	7,697,454	139,465	1,439,437	1,085,281	5,312,200	-	-	21,211,780	2,650,689	18,550,268
2024	7,771,543	139,465	1,454,584	1,141,699	5,314,726	-	-	18,550,268	2,687,878	15,923,420
2025	7,846,346	139,465	1,469,889	1,201,048	5,314,873	-	-	15,923,420	2,844,601	13,453,148
2026	7,921,868	139,465	1,485,356	1,263,484	5,312,493	-	-	13,453,148	2,846,566	10,987,221
2027	7,998,117	139,465	1,500,986	1,329,164	5,307,432	-	-	10,987,221	2,904,689	8,584,479
2028	8,075,100	139,465	1,516,780	1,398,260	5,299,526	-	-	8,584,479	2,964,000	6,248,953
2029	8,152,824	139,465	1,532,740	1,470,946	5,288,603	-	-	6,248,953	3,024,521	3,984,872
2030	8,231,297	139,465	1,548,868	1,547,412	5,274,481	-	-	3,984,872	3,086,278	1,796,669
2031	8,310,524	139,465	1,565,166	1,627,852	4,945,965	-	311,005	1,796,669	3,149,297	-

Notes: Historical revenues, expenses, and fund balances provided by PTRCB
Projected post-2016 values for columns (2), (4), and (5) are projected using exponential growth models based on 2011-2016.
Due to higher volatility, column (3) is set at the average from 2011 to 2016.
Expected Claim Payments set equal to remaining funds available after expenses.
Claim payment amounts assume no limitations in amount that can be spent on individual releases in a year.

Montana Petroleum Tank Release Compensation Board
Actuarial Reserve Study as of June 30, 2016
Financial Projections - 95th Percentile Scenario

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Revenues		Expenses		95th Percentile	Beginning	Ending	Beginning		Ending
	Fuel		Personal	Operating	Claim	Fund	Fund	Loss	Incurred	Loss
Fiscal Year	Revenues	Other	Services	Expenses	Payments	Balance	Balance	Reserve	Losses	Reserve
2011	6,802,572	112,398	1,245,668	758,972	4,830,011	(1,329,625)	(720,427)			
2012	6,953,183	414,146	1,248,368	533,588	3,995,516	(720,427)	1,139,534			
2013	7,048,774	29,576	1,352,281	479,321	5,025,063	1,139,534	1,314,758			
2014	7,034,794	6,484	1,368,808	642,568	5,600,326	1,314,758	205,557			
2015	7,221,648	28,914	1,309,992	1,106,653	5,128,253	205,557	(90,143)			
2016	7,113,694	245,271	1,299,013	658,791	3,501,374	(90,143)	2,091,234			46,252,332
2017	7,267,518	245,271	1,351,814	800,733	7,451,475	2,091,234	-	46,252,332	3,835,758	42,636,614
2018	7,337,469	245,271	1,366,039	842,358	5,374,343	-	-	42,636,614	3,819,402	41,081,674
2019	7,408,093	245,271	1,380,413	886,148	5,386,804	-	-	41,081,674	3,992,111	39,686,981
2020	7,479,397	245,271	1,394,938	932,213	5,397,517	-	-	39,686,981	3,972,589	38,262,053
2021	7,551,388	245,271	1,409,616	980,673	5,406,370	-	-	38,262,053	3,956,966	36,812,649
2022	7,624,071	245,271	1,424,449	1,031,652	5,413,241	-	-	36,812,649	3,951,605	35,351,013
2023	7,697,454	245,271	1,439,437	1,085,281	5,418,006	-	-	35,351,013	4,036,604	33,969,611
2024	7,771,543	245,271	1,454,584	1,141,699	5,420,532	-	-	33,969,611	4,134,631	32,683,711
2025	7,846,346	245,271	1,469,889	1,201,048	5,420,678	-	-	32,683,711	4,255,710	31,518,742
2026	7,921,868	245,271	1,485,356	1,263,484	5,418,299	-	-	31,518,742	4,279,098	30,379,541
2027	7,998,117	245,271	1,500,986	1,329,164	5,413,238	-	-	30,379,541	4,366,472	29,332,775
2028	8,075,100	245,271	1,516,780	1,398,260	5,405,332	-	-	29,332,775	4,455,630	28,383,074
2029	8,152,824	245,271	1,532,740	1,470,946	5,394,409	-	-	28,383,074	4,546,609	27,535,274
2030	8,231,297	245,271	1,548,868	1,547,412	5,380,287	-	-	27,535,274	4,639,445	26,794,432
2031	8,310,524	245,271	1,565,166	1,627,852	5,362,776	-	-	26,794,432	4,734,177	26,165,833

Notes: Historical revenues, expenses, and fund balances provided by PTRCB

Projected post-2016 values for columns (2), (4), and (5) are projected using exponential growth models based on 2011-2016.

Due to higher volatility, column (3) is set at the average from 2011 to 2016.

Expected Claim Payments set equal to remaining funds available after expenses.

Claim payment amounts assume no limitations in amount that can be spent on individual releases in a year.

Montana Petroleum Tank Release Compensation Board
Actuarial Reserve Study as of June 30, 2016
Report Year Ultimate Loss Projections by Confidence Interval

					Report Year Ultimate Losses					
Percentile	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
50.0%	1,672,120	1,655,720	1,794,101	1,736,574	1,763,576	1,763,518	1,807,096	1,849,260	1,985,313	1,990,228
55.0%	1,825,097	1,801,668	1,954,347	1,897,766	1,926,232	1,926,183	1,974,884	2,013,460	2,136,995	2,139,476
60.0%	1,981,715	1,972,158	2,101,317	2,054,242	2,085,272	2,081,562	2,125,638	2,163,977	2,286,111	2,294,170
65.0%	2,140,069	2,124,797	2,251,769	2,222,373	2,230,695	2,231,196	2,292,570	2,321,632	2,454,656	2,451,485
70.0%	2,296,368	2,290,836	2,416,414	2,389,559	2,394,132	2,401,789	2,459,097	2,495,557	2,637,805	2,640,548
75.0%	2,478,332	2,476,802	2,610,010	2,575,531	2,573,717	2,587,038	2,650,689	2,687,878	2,844,601	2,846,566
80.0%	2,694,980	2,691,961	2,828,848	2,803,072	2,797,365	2,810,955	2,882,070	2,942,967	3,081,436	3,071,252
85.0%	2,966,350	2,961,567	3,107,337	3,087,643	3,068,298	3,087,573	3,150,415	3,216,927	3,343,347	3,365,492
90.0%	3,299,102	3,287,772	3,440,668	3,419,442	3,395,724	3,406,449	3,490,513	3,576,071	3,676,009	3,718,207
95.0%	3,835,758	3,819,402	3,992,111	3,972,589	3,956,966	3,951,605	4,036,604	4,134,631	4,255,710	4,279,098
97.5%	4,309,453	4,311,279	4,505,040	4,461,876	4,467,935	4,412,606	4,525,115	4,614,446	4,721,228	4,748,707
99.0%	4,947,220	4,866,237	5,119,964	5,075,405	5,108,420	5,015,596	5,153,193	5,204,487	5,347,274	5,383,900
99.5%	5,404,627	5,221,651	5,586,173	5,519,491	5,501,029	5,469,116	5,646,536	5,622,765	5,730,611	5,917,831
Mean	2,154,656	2,138,638	2,298,603	2,292,043	2,317,321	2,339,868	2,371,866	2,401,454	2,571,604	2,606,502

Montana Petroleum Tank Release Compensation Board
Actuarial Reserve Study as of June 30, 2016
Projected Frequency and Severity by Report Year

Report Year	Reported Releases	Selected Ultimate	Indicated Severity
1989	21	691,193	32,914
1990	128	12,366,643	96,614
1991	166	13,241,777	79,770
1992	211	13,598,904	64,450
1993	163	11,106,312	68,137
1994	168	8,392,272	49,954
1995	148	8,331,079	56,291
1996	149	7,885,499	52,923
1997	138	6,856,130	49,682
1998	156	8,889,425	56,983
1999	177	12,426,877	70,208
2000	124	8,761,178	70,655
2001	52	3,035,420	58,373
2002	48	3,449,605	71,867
2003	45	5,222,015	116,045
2004	44	3,539,014	80,432
2005	57	4,082,974	71,631
2006	33	4,002,616	122,503
2007	44	3,775,483	85,603
2008	23	3,960,248	172,185
2009	21	1,159,483	55,451
2010	9	625,227	73,209
2011	22	2,659,500	121,137
2012	17	1,329,100	77,727
2013	17	2,407,809	139,508
2014	23	2,531,500	107,849
2015	27	2,813,153	103,247
2016	10	1,527,400	154,294
2017	19	2,154,656	116,317
2018	18	2,138,638	118,837
2019	19	2,298,603	122,231
2020	18	2,292,043	125,039
2021	18	2,317,321	126,709
2022	18	2,339,868	131,155
2023	18	2,371,866	134,666
2024	17	2,401,454	138,067
2025	18	2,571,604	141,268
2026	18	2,606,502	144,690

Montana Petroleum Tank Release Compensation Board
Actuarial Reserve Study as of June 30, 2016
Projected Frequency and Severity by Report Year by Federal vs Non-Federal Regulation and Tank Type

| | Federally Regulated | | | | | | | | Non-Federally Regulated | | | | | | | | Both Federal & Non-Federal | | | |
| | UST | | | | AST | | | | UST | | | | AST | | | | Both AST & UST or No Record* | | | |
RY	Count	Paid	Ultimate	Severity	Count	Paid	Ultimate	Severity	Count	Paid	Ultimate	Severity	Count	Paid	Ultimate	Severity	Count	Paid	Ultimate	Severity
1989	19	663,194	689,722	36,301	1	1,414	1,471	1,471	-	-	-	-	-	-	-	-	1	-	-	-
1990	113	10,305,053	10,822,665	95,776	2	11,091	11,648	5,824	8	1,078,232	1,132,390	141,549	5	380,812	399,939	79,988	-	-	-	-
1991	130	10,766,063	11,520,892	88,622	3	159,311	170,480	56,827	27	449,924	481,469	17,832	5	973,661	1,041,927	208,385	1	25,240	27,010	27,010
1992	166	10,918,255	11,982,220	72,182	1	20,834	22,864	22,864	29	147,780	162,181	5,592	14	1,304,516	1,431,639	102,260	1	-	-	-
1993	118	8,119,130	9,078,492	76,936	6	358,644	401,021	66,837	31	1,060,214	1,185,490	38,242	7	386,250	431,890	61,699	1	8,423	9,419	9,419
1994	116	5,726,489	6,504,635	56,257	3	220,791	250,793	84,593	38	821,077	932,649	24,836	12	619,952	704,195	59,382	-	-	-	-
1995	110	5,936,505	6,964,596	63,315	4	3,656	4,289	1,072	17	231,943	272,111	16,007	15	921,110	1,080,630	72,042	2	8,058	9,453	4,727
1996	95	5,751,206	6,864,525	71,985	1	-	-	-	33	354,759	423,434	12,917	17	500,628	597,540	35,385	3	-	-	-
1997	106	2,440,244	3,001,591	28,195	4	1,018,588	1,252,901	317,765	9	44,959	55,301	6,234	18	2,070,131	2,546,337	143,513	1	-	-	-
1998	121	5,202,495	6,535,305	54,011	4	792,514	995,546	248,887	9	119,413	150,005	16,667	20	943,076	1,184,679	59,234	2	19,017	23,889	11,944
1999	133	6,676,358	8,628,156	64,753	11	1,953,491	2,524,584	230,804	11	29,657	38,327	3,504	18	941,150	1,216,290	67,953	4	15,104	19,519	4,907
2000	81	2,896,257	3,834,336	47,337	6	1,231,209	1,629,990	271,665	7	406,420	538,057	76,865	23	1,905,499	2,522,678	109,682	7	178,351	236,118	33,731
2001	32	2,001,073	2,712,347	84,761	-	-	-	-	4	3,497	4,740	1,185	15	234,855	318,333	21,222	1	-	-	-
2002	29	1,943,833	2,707,734	93,370	4	67,767	94,398	23,600	4	18,939	26,381	6,595	10	428,912	597,468	59,747	1	16,959	23,623	23,623
2003	28	2,124,122	3,067,784	109,564	-	-	-	-	4	3,484	5,032	1,258	13	1,488,097	2,149,198	165,323	-	-	-	-
2004	32	1,361,047	2,053,441	63,640	1	11,803	17,808	18,212	5	130,769	197,295	40,356	5	663,868	1,001,592	204,871	1	178,216	268,879	274,989
2005	37	1,450,780	2,292,951	61,972	1	-	-	-	4	24,996	39,507	9,877	15	1,107,574	1,750,516	116,701	-	-	-	-
2006	22	1,474,311	2,448,411	108,997	-	-	-	-	1	25,757	42,775	41,893	9	910,109	1,511,431	164,474	-	-	-	-
2007	32	1,373,057	2,387,036	75,072	1	6,623	11,514	11,226	3	12,583	21,875	7,109	8	779,448	1,355,058	165,139	-	-	-	-
2008	16	1,992,160	3,613,829	225,864	1	4,224	7,662	7,662	1	-	-	-	5	186,743	338,757	67,751	-	-	-	-
2009	12	455,504	860,037	74,783	-	-	-	-	-	-	-	-	8	90,877	171,585	20,515	1	67,720	127,862	122,297
2010	5	197,630	549,029	102,859	-	-	-	-	2	23,852	66,264	31,036	1	3,576	9,934	9,306	-	-	-	-
2011	16	1,080,798	2,244,155	143,106	-	-	-	-	1	4,601	9,554	9,139	3	195,431	405,791	129,383	2	-	-	-
2012	13	225,632	901,140	71,863	-	-	-	-	-	-	-	-	5	100,608	427,960	93,853	-	-	-	-
2013	9	660,360	1,581,617	183,277	-	-	-	-	5	83,477	268,082	54,364	4	21,455	558,110	150,905	-	-	-	-
2014	15	191,392	1,441,385	94,902	-	-	-	-	1	251,413	372,357	269,678	6	78,086	680,915	123,288	1	-	36,843	26,683
2015	13	257,550	1,603,013	125,020	-	-	-	-	2	-	59,158	36,910	6	28,594	926,594	144,532	6	12,438	224,387	35,000
2016	5	-	896,529	168,027	-	-	-	-	1	-	67,115	58,231	2	-	504,304	221,532	1	-	59,452	52,396
2017	11.7		1,385,711	118,727	-		-	-	1.6		67,878	42,824	4.3		663,958	155,584	1.0		37,110	37,110
2018	10.8		1,313,177	121,696	-		-	-	1.7		76,802	43,895	4.5		710,622	159,474	1.0		38,037	38,037
2019	11.7		1,458,870	124,738	-		-	-	1.7		75,187	44,992	4.4		725,558	163,461	1.0		38,988	38,988
2020	11.0		1,406,004	127,856	-		-	-	1.8		81,706	46,117	4.6		764,370	167,547	1.0		39,963	39,963
2021	10.9		1,425,349	131,053	-		-	-	2.0		95,033	47,270	4.4		755,977	171,736	1.0		40,962	40,962
2022	11.2		1,506,407	134,329	-		-	-	1.6		75,540	48,451	4.1		715,935	176,029	1.0		41,986	41,986
2023	10.6		1,459,251	137,687	-		-	-	1.6		81,896	49,663	4.4		787,683	180,430	1.0		43,036	43,036
2024	10.4		1,463,318	141,130	-		-	-	1.6		83,626	50,904	4.4		810,398	184,941	1.0		44,112	44,112
2025	11.1		1,608,656	144,658	-		-	-	1.7		89,417	52,177	4.4		828,316	189,564	1.0		45,214	45,214
2026	10.9		1,621,278	148,274	-		-	-	1.7		92,094	53,481	4.4		846,785	194,303	1.0		46,345	46,345

Note: * Includes all tanks not fitting into the other categories. This includes double-walled USTs (which are a variety of sizes), large tanks that have no record, large tank releases with both
USTs and ASTs combined, and small tank releases with both USTs and ASTs combined.

Montana Petroleum Tank Release Compensation Board
Actuarial Reserve Study as of June 30, 2016
Projected Frequency and Severity by Report Year by Tank Size and Tank Type

| | Large Tanks | | | | | | | | Small Tanks | | | | | | | | All Tank Types | | | |
| | UST | | | | AST | | | | UST | | | | AST | | | | Both AST & UST or No Record* | | | |
RY	Count	Paid	Ultimate	Severity	Count	Paid	Ultimate	Severity	Count	Paid	Ultimate	Severity	Count	Paid	Ultimate	Severity	Count	Paid	Ultimate	Severity
1989	19	663,194	689,722	36,301	1	1,414	1,471	1,471	-	-	-	-	-	-	-	-	1	-	-	-
1990	119	11,264,149	11,829,935	99,411	7	391,903	411,588	58,798	2	119,136	125,121	62,560	-	-	-	-	-	-	-	-
1991	134	10,894,124	11,657,932	86,999	8	1,132,972	1,212,407	151,551	23	321,863	344,429	14,975	-	-	-	-	1	25,240	27,010	27,010
1992	163	10,968,185	12,037,016	73,847	14	1,324,711	1,453,802	103,843	32	97,850	107,385	3,356	1	639	701	701	1	-	-	-
1993	122	9,105,939	10,181,903	83,458	13	744,894	832,911	64,070	27	73,405	82,079	3,040	-	-	-	-	1	8,423	9,419	9,419
1994	124	6,055,069	6,877,864	55,678	15	840,743	954,988	64,424	30	492,497	559,420	18,869	-	-	-	-	-	-	-	-
1995	111	5,939,528	6,968,143	62,776	18	924,767	1,084,919	60,273	16	228,920	268,564	16,785	1	-	-	-	2	8,058	9,453	4,727
1996	95	5,740,537	6,851,790	71,852	18	500,628	597,540	33,419	33	365,429	436,169	13,306	-	-	-	-	3	-	-	-
1997	110	2,421,091	2,978,032	26,975	21	3,088,719	3,799,238	183,538	5	64,112	78,860	16,001	1	-	-	-	1	-	-	-
1998	127	5,286,975	6,641,428	52,295	22	1,733,649	2,177,787	98,990	3	34,933	43,883	14,628	2	1,941	2,438	1,219	2	19,017	23,889	11,944
1999	140	6,690,139	8,645,966	61,665	29	2,894,641	3,740,874	129,724	4	15,876	20,517	5,158	-	-	-	-	4	15,104	19,519	4,907
2000	84	3,174,889	4,203,216	50,038	26	3,117,345	4,127,032	158,732	3	32,729	43,330	14,443	3	19,364	25,635	8,545	8	273,409	361,964	45,246
2001	35	2,004,570	2,717,087	77,631	11	91,693	124,284	11,299	1	-	-	-	4	143,162	194,049	48,512	1	-	-	-
2002	31	1,943,833	2,707,734	87,346	12	408,048	568,405	47,367	2	18,939	26,381	13,191	2	88,630	123,461	61,730	1	16,959	23,623	23,623
2003	29	2,045,882	2,954,784	101,889	12	1,460,943	2,109,980	175,832	1	-	-	-	1	27,154	39,218	39,218	2	81,725	118,032	59,016
2004	36	1,480,503	2,233,668	61,741	6	675,671	1,019,400	173,761	1	11,313	17,068	17,456	-	-	-	-	1	178,216	268,879	274,989
2005	35	1,304,827	2,062,274	58,922	13	794,275	1,255,348	96,565	3	15,950	25,209	8,403	3	313,299	495,168	165,056	3	154,999	244,975	81,658
2006	22	1,474,311	2,448,411	108,997	7	899,033	1,493,038	208,894	1	25,757	42,775	41,893	2	11,076	18,393	9,007	-	-	-	-
2007	33	1,284,069	2,232,331	68,013	7	781,195	1,358,094	189,154	1	63,515	110,419	107,654	2	4,877	8,478	4,133	1	38,056	66,160	64,503
2008	16	1,992,160	3,613,829	225,864	5	190,967	346,419	69,284	1	-	-	-	1	-	-	-	-	-	-	-
2009	12	455,504	860,037	74,783	5	77,674	146,657	28,055	-	-	-	-	3	13,202	24,928	7,948	1	67,720	127,862	122,297
2010	6	221,482	615,293	96,061	1	3,576	9,934	9,306	1	-	-	-	-	-	-	-	-	-	-	-
2011	16	1,080,798	2,244,155	143,106	1	-	-	-	1	4,601	9,554	9,139	2	195,431	405,791	194,074	2	-	-	-
2012	13	225,632	944,781	75,343	3	100,608	351,577	102,803	-	-	-	-	1	-	32,742	28,721	-	-	-	-
2013	9	660,360	1,732,524	200,764	2	18,926	413,120	167,552	5	83,477	193,967	39,334	1	2,529	68,198	55,319	-	-	-	-
2014	14	114,712	1,345,114	97,420	4	42,663	531,323	128,270	3	328,094	517,492	187,396	1	35,422	83,233	60,281	1	-	54,338	39,354
2015	14	257,550	1,745,085	120,978	5	28,594	691,930	143,904	-	-	-	-	2	-	73,993	46,166	6	12,438	302,145	47,129
2016	5	-	961,336	179,088	2	-	393,659	236,794	1	-	35,936	32,079	1	-	48,463	78,931	1	-	88,007	77,562
2017	11.9		1,472,728	124,222	2.9		506,345	173,169	1.4		35,626	25,432	1.3		86,146	64,119	1.0		53,812	53,812
2018	11.0		1,391,560	126,741	3.2		571,930	176,681	1.6		40,501	25,948	1.2		79,744	65,419	1.0		54,903	54,903
2019	11.8		1,533,315	130,405	3.2		582,921	181,788	1.6		42,943	26,698	1.2		82,935	67,310	1.0		56,490	56,490
2020	11.1		1,482,340	133,708	3.3		620,708	186,393	1.7		46,046	27,375	1.2		85,028	69,015	1.0		57,921	57,921
2021	11.0		1,506,987	137,314	3.2		611,538	191,420	1.9		53,748	28,113	1.2		85,565	70,877	1.0		59,483	59,483
2022	11.3		1,584,675	139,919	2.9		570,684	195,050	1.4		41,471	28,646	1.1		82,427	72,221	1.0		60,611	60,611
2023	10.9		1,557,390	142,605	3.1		623,499	198,795	1.3		38,724	29,196	1.2		90,478	73,607	1.0		61,775	61,775
2024	10.5		1,546,448	147,586	3.2		652,561	205,739	1.5		46,325	30,216	1.2		92,187	76,178	1.0		63,933	63,933
2025	11.3		1,699,568	150,784	3.2		664,412	210,196	1.6		48,238	30,870	1.2		94,070	77,829	1.0		65,318	65,318
2026	11.1		1,713,206	154,694	3.2		680,000	215,647	1.6		50,088	31,671	1.2		96,197	79,847	1.0		67,012	67,012

Note: * Includes all tanks not fitting into the other categories. This includes double-walled USTs (which are a variety of sizes), large tanks that have no record, large tank releases with both USTs and ASTs combined, and small tank releases with both USTs and ASTs combined.
USTs and ASTs combined, and small tank releases with both USTs and ASTs combined.

Montana Petroleum Tank Release Compensation Board
Actuarial Reserve Study as of June 30, 2016
Losses by Confidence Interval

Percentile	Total Ultimate	Paid Losses	Unpaid Losses
50.0%	156,926,016	121,174,749	35,751,267
55.0%	157,629,724	121,174,749	36,454,974
60.0%	158,319,978	121,174,749	37,145,229
65.0%	159,085,310	121,174,749	37,910,561
70.0%	159,920,181	121,174,749	38,745,432
75.0%	160,880,014	121,174,749	39,705,265
80.0%	161,898,649	121,174,749	40,723,900
85.0%	163,174,837	121,174,749	42,000,088
90.0%	164,828,294	121,174,749	43,653,544
95.0%	167,427,081	121,174,749	46,252,332
97.5%	169,542,915	121,174,749	48,368,166
99.0%	172,241,501	121,174,749	51,066,752
99.5%	174,126,186	121,174,749	52,951,437
Expected	158,667,836	121,174,749	37,493,087

Montana Petroleum Tank Release Compensation Board
Actuarial Reserve Study as of June 30, 2016
Summary of Methods

Report Year	LDM Ultimate	Freq x Sev Ultimate	BF Ultimate	Selected Ultimate	Paid Loss	Unpaid Loss
1989	691,193	691,193	710,004	691,193	664,608	26,584
1990	12,366,643	12,464,018	12,127,858	12,366,643	11,775,188	591,455
1991	13,241,777	13,189,129	13,016,418	13,241,777	12,374,199	867,578
1992	13,598,904	13,609,335	13,525,374	13,598,904	12,391,385	1,207,519
1993	11,106,312	11,062,154	11,001,265	11,106,312	9,932,662	1,173,650
1994	8,392,272	8,562,780	8,666,311	8,392,272	7,388,309	1,003,963
1995	8,331,079	8,281,406	8,525,257	8,331,079	7,101,272	1,229,808
1996	7,885,499	7,999,547	8,221,053	7,885,499	6,606,594	1,278,905
1997	6,856,130	6,815,251	7,341,238	6,856,130	5,573,921	1,282,208
1998	8,889,425	8,912,513	9,309,607	8,889,425	7,076,515	1,812,910
1999	12,426,877	12,540,207	12,496,430	12,426,877	9,615,759	2,811,117
2000	8,761,178	8,704,305	8,854,902	8,761,178	6,617,736	2,143,442
2001	3,035,420	3,090,791	3,270,158	3,035,420	2,239,425	795,995
2002	3,449,605	3,435,873	3,525,582	3,449,605	2,476,409	973,196
2003	5,222,015	5,307,614	4,714,970	5,222,015	3,615,703	1,606,311
2004	3,539,014	3,493,210	3,553,369	3,539,014	2,345,703	1,193,312
2005	4,082,974	4,008,867	4,330,086	4,082,974	2,583,350	1,499,624
2006	4,002,616	3,942,303	3,521,876	4,002,616	2,410,177	1,592,439
2007	3,775,483	3,733,098	3,814,002	3,775,483	2,171,711	1,603,771
2008	3,960,248	3,986,751	3,110,471	3,960,248	2,183,127	1,777,122
2009	1,159,483	1,158,263	1,519,901	1,159,483	614,100	545,383
2010	446,869	454,200	625,227	625,227	225,058	400,168
2011	2,729,220	2,841,094	2,408,185	2,659,500	1,280,831	1,378,669
2012	798,325	886,483	1,329,100	1,329,100	326,240	1,002,860
2013	2,372,934	2,896,523	1,953,970	2,407,809	765,292	1,642,517
2014	2,249,121	2,945,118	2,400,260	2,531,500	520,891	2,010,608
2015	2,309,257	3,297,830	2,832,372	2,813,153	298,583	2,514,570
2016	2,002,172	1,124,286	1,052,628	1,527,400	-	1,527,400
Total	157,682,046	159,434,143	157,757,875	158,667,836	121,174,749	37,493,087

Montana Petroleum Tank Release Compensation Board
Actuarial Reserve Study as of June 30, 2016
Paid Loss Development Method

Report Year	Indicated Ultimate	Paid Loss	Unpaid Loss
1989	691,193	664,608	26,584
1990	12,366,643	11,775,188	591,455
1991	13,241,777	12,374,199	867,578
1992	13,598,904	12,391,385	1,207,519
1993	11,106,312	9,932,662	1,173,650
1994	8,392,272	7,388,309	1,003,963
1995	8,331,079	7,101,272	1,229,808
1996	7,885,499	6,606,594	1,278,905
1997	6,856,130	5,573,921	1,282,208
1998	8,889,425	7,076,515	1,812,910
1999	12,426,877	9,615,759	2,811,117
2000	8,761,178	6,617,736	2,143,442
2001	3,035,420	2,239,425	795,995
2002	3,449,605	2,476,409	973,196
2003	5,222,015	3,615,703	1,606,311
2004	3,539,014	2,345,703	1,193,312
2005	4,082,974	2,583,350	1,499,624
2006	4,002,616	2,410,177	1,592,439
2007	3,775,483	2,171,711	1,603,771
2008	3,960,248	2,183,127	1,777,122
2009	1,159,483	614,100	545,383
2010	446,869	225,058	221,811
2011	2,729,220	1,280,831	1,448,390
2012	798,325	326,240	472,085
2013	2,372,934	765,292	1,607,642
2014	2,249,121	520,891	1,728,229
2015	2,309,257	298,583	2,010,674
2016	2,002,172	-	2,002,172
Total	157,682,046	121,174,749	36,507,297

Montana Petroleum Tank Release Compensation Board
Actuarial Reserve Study as of June 30, 2016
Paid Loss Development Factors

Report Year	12-24	24-36	36-48	48-60	60-72	72-84	84-96	96-108	108-120	120-132	132-144	144-156	156-168	168-180	180-192	192-204	204-216	216-228	228-240	240-252	252-264	264-276	276-288	288-300	300-312	312-324	324-336	336-Ult
1989	4.508	2.011	1.255	2.679	1.135	1.065	1.061	1.186	1.025	1.044	1.066	1.057	1.325	1.057	1.110	1.027	1.013	1.434	1.110	1.002	1.000	1.000	1.002	1.004	1.015	1.000	1.010	1.040
1990	4.211	1.722	1.509	1.346	1.329	1.192	1.199	1.117	1.032	1.020	1.037	1.032	1.023	1.026	1.032	1.037	1.025	1.020	1.008	1.012	1.024	1.046	1.044	1.041	1.026	1.019	1.010	1.040
1991	14.784	1.714	1.378	1.363	1.273	1.208	1.121	1.069	1.131	1.092	1.057	1.018	1.024	1.024	1.024	1.024	1.016	1.025	1.018	1.029	1.017	1.042	1.009	1.026	1.019	1.026	1.010	1.040
1992	8.630	2.237	1.809	1.251	1.160	1.067	1.045	1.049	1.093	1.057	1.030	1.033	1.027	1.038	1.073	1.014	1.014	1.009	1.011	1.009	1.013	1.014	1.028	1.012	1.026	1.019	1.010	1.040
1993	3.130	2.079	1.547	1.590	1.719	1.095	1.084	1.042	1.038	1.047	1.051	1.067	1.041	1.018	1.008	1.010	1.012	1.023	1.026	1.018	1.028	1.010	1.016	1.019	1.026	1.019	1.010	1.040
1994	15.960	2.734	1.360	1.074	1.236	1.170	1.102	1.115	1.076	1.084	1.116	1.040	1.060	1.028	1.029	1.022	1.026	1.052	1.057	1.067	1.044	1.016	1.019	1.026	1.019	1.019	1.010	1.040
1995	10.600	2.208	1.168	1.140	1.152	1.169	1.087	1.084	1.044	1.103	1.060	1.061	1.062	1.035	1.035	1.019	1.011	1.023	1.023	1.016	1.073	1.018	1.033	1.016	1.019	1.026	1.019	1.040
1996	7.054	2.471	1.435	1.262	1.135	1.210	1.158	1.076	1.063	1.078	1.111	1.130	1.029	1.055	1.028	1.036	1.037	1.046	1.025	1.056	1.017	1.033	1.016	1.019	1.026	1.019	1.010	1.040
1997	13.116	1.515	2.618	2.001	1.254	1.115	1.155	1.113	1.182	1.035	1.045	1.238	1.012	1.007	1.012	1.024	1.167	1.012	1.006	1.031	1.017	1.033	1.016	1.019	1.026	1.019	1.010	1.040
1998	14.643	3.033	1.934	1.320	1.251	1.297	1.165	1.124	1.107	1.083	1.061	1.054	1.026	1.055	1.068	1.031	1.069	1.047	1.021	1.031	1.017	1.033	1.016	1.019	1.026	1.019	1.010	1.040
1999	62.967	2.538	1.262	1.136	1.171	1.130	1.092	1.077	1.164	1.058	1.020	1.055	1.066	1.028	1.022	1.030	1.029	1.021	1.031	1.017	1.033	1.016	1.019	1.026	1.019	1.026	1.010	1.040
2000	81.506	1.364	1.198	1.150	1.209	1.184	1.170	1.331	1.035	1.065	1.080	1.029	1.044	1.066	1.065	1.045	1.028	1.024	1.029	1.021	1.031	1.017	1.033	1.016	1.019	1.026	1.010	1.040
2001	7.967	1.283	1.192	1.449	1.117	1.096	1.163	1.046	1.186	1.182	1.014	1.042	1.071	1.034	1.009	1.024	1.024	1.029	1.021	1.031	1.017	1.033	1.016	1.019	1.026	1.019	1.010	1.040
2002	1.347	1.744	1.206	1.266	1.127	1.077	1.043	1.045	1.022	1.014	1.079	1.070	1.063	1.031	1.028	1.024	1.024	1.029	1.021	1.031	1.017	1.033	1.016	1.019	1.026	1.019	1.010	1.040
2003	4.698	1.428	1.676	1.294	1.468	1.066	1.050	1.195	1.051	1.192	1.085	1.038	1.018	1.037	1.028	1.024	1.024	1.029	1.021	1.031	1.017	1.033	1.016	1.019	1.026	1.019	1.010	1.040
2004	3.157	1.524	1.554	1.131	1.219	1.137	1.052	1.040	1.056	1.098	1.036	1.063	1.045	1.037	1.028	1.024	1.024	1.029	1.021	1.031	1.017	1.033	1.016	1.019	1.026	1.019	1.010	1.040
2005	5.280	1.886	1.404	1.326	1.104	1.074	1.021	1.044	1.066	1.026	1.037	1.048	1.045	1.037	1.028	1.024	1.024	1.029	1.021	1.031	1.017	1.033	1.016	1.019	1.026	1.019	1.010	1.040
2006	60.840	1.884	1.168	1.495	1.195	1.065	1.061	1.434	1.045	1.026	1.051	1.048	1.045	1.037	1.028	1.024	1.024	1.029	1.021	1.031	1.017	1.033	1.016	1.019	1.026	1.019	1.010	1.040
2007	39.723	2.868	1.751	1.711	1.334	1.040	1.071	1.039	1.007	1.047	1.051	1.048	1.045	1.037	1.028	1.024	1.024	1.029	1.021	1.031	1.017	1.033	1.016	1.019	1.026	1.019	1.010	1.040
2008	6.656	1.624	1.609	1.080	1.056	1.027	1.057	1.037	1.043	1.047	1.051	1.048	1.045	1.037	1.028	1.024	1.024	1.029	1.021	1.031	1.017	1.033	1.016	1.019	1.026	1.019	1.010	1.040
2009	4.508	1.306	1.270	1.145	1.131	1.232	1.056	1.041	1.043	1.047	1.051	1.048	1.045	1.037	1.028	1.024	1.024	1.029	1.021	1.031	1.017	1.033	1.016	1.019	1.026	1.019	1.010	1.040
2010	8.455	1.051	1.089	1.178	1.083	1.031	1.052	1.041	1.043	1.047	1.051	1.048	1.045	1.037	1.028	1.024	1.024	1.029	1.021	1.031	1.017	1.033	1.016	1.019	1.026	1.019	1.010	1.040
2011	3.412	3.405	1.182	1.212	1.045	1.073	1.052	1.041	1.043	1.047	1.051	1.048	1.045	1.037	1.028	1.024	1.024	1.029	1.021	1.031	1.017	1.033	1.016	1.019	1.026	1.019	1.010	1.040
2012	2.056	1.345	1.066	1.133	1.148	1.073	1.052	1.041	1.043	1.047	1.051	1.048	1.045	1.037	1.028	1.024	1.024	1.029	1.021	1.031	1.017	1.033	1.016	1.019	1.026	1.019	1.010	1.040
2013	4.682	2.207	1.361	1.267	1.148	1.073	1.052	1.041	1.043	1.047	1.051	1.048	1.045	1.037	1.028	1.024	1.024	1.029	1.021	1.031	1.017	1.033	1.016	1.019	1.026	1.019	1.010	1.040
2014	6.429	1.241	1.393	1.267	1.148	1.073	1.052	1.041	1.043	1.047	1.051	1.048	1.045	1.037	1.028	1.024	1.024	1.029	1.021	1.031	1.017	1.033	1.016	1.019	1.026	1.019	1.010	1.040
2015	1.395	1.791	1.393	1.267	1.148	1.073	1.052	1.041	1.043	1.047	1.051	1.048	1.045	1.037	1.028	1.024	1.024	1.029	1.021	1.031	1.017	1.033	1.016	1.019	1.026	1.019	1.010	1.040
2016	4.508	1.791	1.393	1.267	1.148	1.073	1.052	1.041	1.043	1.047	1.051	1.048	1.045	1.037	1.028	1.024	1.024	1.029	1.021	1.031	1.017	1.033	1.016	1.019	1.026	1.019	1.010	1.040

Year	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	312	324	336	Ult
1989	-	20,145	40,521	50,845	136,200	154,601	164,637	174,688	207,098	212,299	221,535	236,234	249,612	330,786	349,730	388,325	398,690	404,013	579,172	642,833	644,327	644,327	645,861	648,569	658,135	658,135	664,608	691,193	
1990	228,952	964,219	1,660,799	2,506,508	3,373,692	4,484,520	5,344,295	6,406,508	7,155,855	7,381,959	7,527,020	7,808,367	8,060,119	8,248,697	8,464,815	8,734,513	9,059,923	9,285,603	9,468,586	9,545,267	9,659,070	9,891,708	10,351,029	10,804,903	11,246,979	11,544,126	11,775,188	11,891,003	12,366,643
1991	79,553	1,176,104	2,015,475	2,776,922	3,783,564	4,815,973	5,819,751	6,526,760	6,976,322	7,889,981	8,615,752	9,106,705	9,266,775	9,488,148	9,623,494	9,851,425	10,087,303	10,248,403	10,501,963	10,690,620	11,000,248	11,185,866	11,658,212	11,763,326	12,065,970	12,374,199	12,608,467	12,732,478	13,241,777
1992	131,601	1,135,727	2,540,173	4,595,040	5,748,333	6,665,857	7,109,700	7,426,748	7,792,199	8,515,733	8,999,562	9,266,819	9,569,806	9,825,501	10,200,402	10,347,129	11,098,197	11,251,590	11,356,065	11,483,481	11,592,005	11,741,821	11,910,144	12,244,225	12,391,385	12,707,928	12,948,514	13,075,869	13,598,904
1993	186,426	583,569	1,213,021	1,877,052	2,984,550	5,131,056	5,620,033	6,091,418	6,461,158	6,730,501	6,988,896	7,313,963	7,685,076	8,202,031	8,534,479	8,690,703	8,760,749	8,844,120	8,951,988	9,158,753	9,393,185	9,558,675	9,829,564	9,932,662	10,120,123	10,378,646	10,575,134	10,679,146	11,106,312
1994	31,553	503,588	1,376,658	1,872,279	2,011,278	2,485,944	2,907,940	3,203,859	3,570,863	3,841,451	4,164,890	4,645,978	4,831,855	5,121,753	5,265,611	5,417,398	5,535,189	5,678,445	5,974,405	6,312,410	6,734,231	7,032,409	7,388,309	7,505,426	7,647,077	7,842,425	7,990,897	8,069,492	8,392,272
1995	84,364	894,272	1,974,334	2,305,502	2,628,218	3,027,360	3,538,338	3,845,424	4,168,753	4,353,797	4,804,316	5,091,667	5,400,332	5,734,804	5,933,371	6,048,236	6,113,177	6,255,870	6,402,754	6,504,904	6,977,966	7,101,272	7,334,437	7,450,700	7,591,318	7,785,242	7,932,632	8,010,653	8,331,079
1996	62,603	441,608	1,091,271	1,566,489	1,977,392	2,243,893	2,714,600	3,143,218	3,382,932	3,595,856	3,877,332	4,308,760	4,869,562	5,009,725	5,286,141	5,433,806	5,629,462	5,840,289	6,107,042	6,258,050	6,606,594	6,721,466	6,942,161	7,052,205	7,185,303	7,368,855	7,508,362	7,582,210	7,885,499
1997	14,966	196,293	297,417	778,736	1,558,459	1,954,770	2,180,383	2,519,313	2,804,484	3,313,983	3,429,121	3,584,862	4,436,747	4,487,792	4,520,829	4,576,856	4,688,920	5,472,291	5,539,255	5,744,172	5,844,050	6,035,935	6,131,614	6,247,338	6,406,928	6,528,224	6,592,432	6,856,130	
1998	16,461	241,042	731,178	1,414,183	1,867,354	2,335,436	3,028,039	3,526,985	3,962,628	4,387,570	4,751,596	5,039,087	5,313,088	5,448,907	5,746,725	6,134,696	6,322,329	6,759,721	7,076,515	7,226,957	7,447,699	7,577,196	7,825,988	7,950,043	8,100,086	8,307,005	8,464,273	8,547,524	8,889,425
1999	17,206	1,083,430	2,749,426	3,468,948	3,941,897	4,617,790	5,219,038	5,696,809	6,136,131	7,141,579	7,557,651	7,706,385	8,129,195	8,667,452	8,906,256	9,134,908	9,340,143	9,615,759	9,892,539	10,102,848	10,411,431	10,592,460	10,940,256	11,113,677	11,323,428	11,612,689	11,832,540	11,948,920	12,426,877
2000	13,236	1,078,801	1,471,800	1,762,526	2,027,478	2,450,977	2,903,148	3,397,692	4,520,728	4,681,007	4,986,837	5,387,733	5,544,670	5,786,932	6,160,918	6,438,295	6,617,736	6,779,288	6,974,423	7,122,695	7,340,251	7,467,881	7,713,083	7,835,348	7,983,226	8,187,161	8,342,160	8,424,210	8,761,178
2001	51,406	409,544	525,550	626,569	908,100	1,014,051	1,111,785	1,293,334	1,352,520	1,604,130	1,896,208	1,923,405	2,003,430	2,146,068	2,218,880	2,239,425	2,292,798	2,348,770	2,416,376	2,467,747	2,543,122	2,587,341	2,672,294	2,714,655	2,765,889	2,836,545	2,890,246	2,918,673	3,035,420
2002	397,921	535,854	934,546	1,126,995	1,427,070	1,608,945	1,732,257	1,806,360	1,887,922	1,929,971	1,956,813	2,110,730	2,258,781	2,401,372	2,476,409	2,544,996	2,605,651	2,669,260	2,746,092	2,804,472	2,890,133	2,940,385	3,036,930	3,085,071	3,143,296	3,223,593	3,284,622	3,316,928	3,449,605
2003	88,075	413,766	591,000	990,266	1,281,106	1,881,017	2,004,739	2,105,760	2,516,787	2,645,528	3,152,715	3,421,439	3,550,171	3,615,703	3,748,790	3,852,616	3,944,437	4,040,729	4,157,037	4,245,412	4,375,085	4,451,157	4,597,308	4,670,183	4,758,324	4,879,877	4,972,263	5,021,168	5,222,015
2004	143,209	452,086	689,071	1,070,618	1,210,791	1,475,550	1,678,219	1,766,006	1,835,939	1,938,135	2,128,049	2,205,673	2,345,703	2,450,400	2,540,594	2,610,959	2,673,187	2,738,444	2,817,268	2,877,161	2,965,042	3,016,596	3,115,644	3,165,032	3,224,767	3,307,144	3,369,755	3,402,899	3,539,014
2005	97,312	513,824	968,839	1,360,132	1,802,935	1,989,584	2,137,356	2,181,614	2,278,244	2,428,222	2,490,859	2,583,350	2,706,246	2,827,036	2,931,093	3,012,273	3,084,065	3,159,353	3,250,292	3,319,391	3,420,779	3,480,258	3,594,530	3,651,509	3,720,425	3,815,464	3,887,699	3,925,396	4,082,974
2006	5,794	352,507	664,086	775,921	1,159,694	1,385,943	1,476,418	1,566,304	2,246,123	2,348,294	2,410,177	2,532,507	2,652,984	2,771,397	2,873,406	2,952,988	3,023,367	3,097,174	3,186,223	3,254,062	3,353,454	3,411,763	3,523,786	3,579,643	3,647,203	3,740,372	3,811,185	3,848,670	4,002,616
2007	4,095	162,678	466,499	816,704	1,397,320	1,863,531	1,937,803	2,075,843	2,155,993	2,171,711	2,273,408	2,388,796	2,502,437	2,614,130	2,710,351	2,785,417	2,851,803	2,921,421	3,005,511	3,069,406	3,163,158	3,218,158	3,323,824	3,376,512	3,440,238	3,528,120	3,594,914	3,630,272	3,775,483
2008	97,811	650,979	1,056,938	1,700,693	1,836,882	1,939,292	1,991,486	2,104,782	2,183,127	2,277,991	2,384,665	2,505,700	2,624,902	2,742,061	2,842,991	2,921,730	2,991,365	3,064,390	3,152,595	3,219,617	3,317,958	3,375,649	3,486,486	3,541,753	3,608,597	3,700,780	3,770,843	3,807,931	3,960,248
2009	-	219,704	286,952	364,469	417,171	471,896	581,325	614,100	639,177	666,951	698,183	733,620	768,520	802,822	832,372	855,426	875,813	897,193	923,018	942,641	971,433	988,324	1,020,775	1,036,956	1,056,527	1,083,516	1,104,029	1,114,888	1,159,483
2010	17,680	149,486	157,117	171,032	201,521	218,321	225,058	236,676	246,341	257,045	269,082	282,740	296,190	309,410	320,799	329,684	337,542	345,782	355,735	363,297	374,394	380,904	393,410	399,647	407,189	417,591	425,497	429,682	446,869
2011	73,652	251,303	855,582	1,011,435	1,225,585	1,280,831	1,374,527	1,445,484	1,504,510	1,569,886	1,643,401	1,726,813	1,808,961	1,889,702	1,959,258	2,013,522	2,061,511	2,111,836	2,172,623	2,218,812	2,286,583	2,326,342	2,402,725	2,440,812	2,486,878	2,550,407	2,598,691	2,624,250	2,729,220
2012	97,761	200,980	270,238	288,018	326,240	374,656	402,063	422,819	440,085	459,208	480,712	505,510	552,757	573,103	588,976	603,013	617,734	635,515	649,025	668,849	680,479	702,822	713,963	727,438	746,020	760,144	767,620	798,325	
2013	54,431	254,851	562,477	765,292	969,712	1,113,625	1,195,089	1,256,783	1,308,100	1,364,945	1,428,863	1,501,386	1,572,810	1,643,011	1,703,486	1,750,666	1,792,390	1,836,146	1,888,998	1,929,151	1,988,081	2,022,649	2,089,061	2,122,176	2,162,229	2,217,464	2,259,445	2,281,667	2,372,934
2014	65,289	419,739	520,891	725,361	919,115	1,055,519	1,132,733	1,191,208	1,239,850	1,273,001	1,328,318	1,390,520	1,461,096	1,530,404	1,557,283	1,598,921	1,614,603	1,659,321	1,698,868	1,740,341	1,790,435	1,828,498	1,884,348	1,917,113	1,980,060	2,011,447	2,049,409	2,101,762	2,141,553
2015	213,977	298,583	534,819	744,756	943,690	1,083,741	1,163,019	1,223,058	1,273,003	1,328,318	1,390,520	1,461,096	1,530,404	1,598,921	1,657,774	1,703,686	1,744,292	1,786,874	1,838,307	1,877,388	1,934,732	1,968,372	2,033,002	2,065,228	2,104,206	2,157,959	2,198,813	2,220,439	2,309,257
2016	-	258,877	463,699	645,718	818,198	939,625	1,008,361	1,060,416	1,103,717	1,151,678	1,205,609	1,266,800	1,327,064	1,386,296	1,437,323	1,477,131	1,512,336	1,549,255	1,593,849	1,627,733	1,677,451	1,706,618	1,762,653	1,790,594	1,824,388	1,870,993	1,906,415	1,925,165	2,002,172

Montana Petroleum Tank Release Compensation Board
Actuarial Reserve Study as of June 30, 2016
Paid Loss Development Factors

Report Year	12-24	24-36	36-48	48-60	60-72	72-84	84-96	96-108	108-120	120-132	132-144	144-156	156-168	168-180	180-192	192-204	204-216	216-228	228-240	240-252	252-264	264-276	276-288	288-300	300-312	312-324	324-336	Tail
1989		2.011	1.255	2.679	1.135	1.065	1.061	1.186	1.025	1.044	1.066	1.057	1.325	1.057	1.110	1.027	1.013	1.434	1.110	1.002	1.000	1.000	1.002	1.004	1.015	1.000	1.010	
1990	4.211	1.722	1.509	1.346	1.329	1.192	1.199	1.117	1.032	1.020	1.037	1.032	1.023	1.026	1.032	1.037	1.025	1.020	1.008	1.012	1.024	1.046	1.044	1.041	1.026	1.020		
1991	14.784	1.714	1.378	1.363	1.273	1.208	1.121	1.069	1.131	1.092	1.057	1.018	1.024	1.014	1.024	1.024	1.016	1.025	1.018	1.029	1.017	1.042	1.009	1.026	1.026			
1992	8.630	2.237	1.809	1.251	1.160	1.067	1.045	1.049	1.093	1.057	1.030	1.033	1.027	1.038	1.073	1.014	1.014	1.009	1.011	1.009	1.013	1.014	1.028	1.012				
1993	3.130	2.079	1.547	1.590	1.719	1.095	1.084	1.061	1.042	1.038	1.047	1.051	1.067	1.041	1.018	1.008	1.010	1.012	1.023	1.026	1.018	1.028	1.010					
1994	15.960	2.734	1.360	1.074	1.236	1.170	1.102	1.115	1.076	1.084	1.116	1.040	1.060	1.028	1.029	1.022	1.026	1.052	1.057	1.067	1.044	1.051						
1995	10.600	2.208	1.168	1.140	1.152	1.169	1.087	1.084	1.044	1.103	1.060	1.061	1.062	1.035	1.019	1.011	1.023	1.023	1.046	1.025	1.073	1.018						
1996	7.054	2.471	1.435	1.262	1.135	1.210	1.158	1.076	1.063	1.078	1.111	1.130	1.029	1.055	1.028	1.036	1.037	1.046	1.025	1.056								
1997	13.116	1.515	2.618	2.001	1.254	1.115	1.155	1.113	1.182	1.035	1.045	1.238	1.012	1.007	1.012	1.024	1.167	1.012	1.006									
1998	14.643	3.033	1.934	1.320	1.251	1.297	1.165	1.124	1.107	1.083	1.061	1.054	1.026	1.055	1.068	1.031	1.069	1.047										
1999	62.967	2.538	1.262	1.136	1.171	1.130	1.092	1.077	1.164	1.058	1.020	1.055	1.066	1.028	1.026	1.022	1.030											
2000	81.506	1.364	1.198	1.150	1.209	1.184	1.170	1.331	1.035	1.065	1.080	1.029	1.044	1.065	1.045	1.028												
2001	7.967	1.283	1.192	1.449	1.117	1.096	1.163	1.046	1.186	1.182	1.014	1.042	1.071	1.034	1.009													
2002	1.347	1.744	1.206	1.266	1.127	1.077	1.043	1.045	1.022	1.014	1.079	1.070	1.063	1.031														
2003	4.698	1.428	1.676	1.294	1.468	1.066	1.050	1.195	1.051	1.192	1.085	1.038	1.018															
2004	3.157	1.524	1.554	1.131	1.219	1.137	1.052	1.040	1.056	1.098	1.036	1.037																
2005	5.280	1.886	1.404	1.326	1.104	1.074	1.021	1.044	1.066	1.026	1.026																	
2006	60.840	1.884	1.168	1.495	1.195	1.065	1.061	1.434	1.045	1.026																		
2007	39.723	2.868	1.751	1.711	1.334	1.040	1.071	1.039	1.007																			
2008	6.656	1.624	1.609	1.080	1.056	1.027	1.057	1.037																				
2009		1.306	1.270	1.145	1.131	1.232	1.056																					
2010	8.455	1.051	1.089	1.178	1.083	1.031																						
2011	3.412	3.405	1.182	1.212	1.045																							
2012	2.056	1.345	1.066	1.133																								
2013	4.682	2.207	1.361																									
2014	6.429	1.241																										
2015	1.395																											
Avg All Yr	15.708	1.939	1.440	1.364	1.213	1.125	1.096	1.114	1.075	1.072	1.058	1.063	1.061	1.037	1.038	1.024	1.039	1.068	1.030	1.034	1.019	1.030	1.019	1.021	1.022	1.010	1.010	
Avg 89-03	17.901	2.005	1.503	1.421	1.249	1.143	1.113	1.112	1.084	1.076	1.061	1.063	1.061	1.037	1.038	1.024	1.039	1.068	1.030	1.034	1.019	1.030	1.019	1.021	1.022	1.010	1.010	
Avg 04-Present	12.917	1.849	1.345	1.268	1.146	1.087	1.053	1.119	1.045	1.050	1.037	1.050	1.048	1.053	1.042	1.032	1.028	1.065	1.036	NA	1.046	1.022	NA	NA	NA	NA	NA	
Avg LS	3.595	1.850	1.193	1.149	1.130	1.079	1.053	1.119	1.045	1.071	1.050	1.048	1.053	1.042	1.032	1.028	1.065	1.036	1.025	1.046	1.022	1.036	1.019	1.021	1.022	1.010	1.010	
Wtd All Yr	5.979	1.932	1.431	1.282	1.236	1.133	1.102	1.101	1.080	1.067	1.054	1.055	1.041	1.034	1.035	1.023	1.034	1.027	1.020	1.033	1.021	1.034	1.022	1.025	1.026	1.019	1.010	
Wtd 04-Present	4.508	1.791	1.393	1.267	1.148	1.073	1.052	1.104	1.043	1.047	1.037	1.063	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Wtd LS	2.822	1.854	1.219	1.133	1.137	1.057	1.051	1.104	1.045	1.075	1.053	1.043	1.053	1.043	1.035	1.028	1.058	1.036	1.025	1.040	1.020	1.035	1.022	1.025	1.026	1.019	1.010	
5 Yr x Hi/Lo	3.383	1.598	1.180	1.152	1.090	1.045	1.058	1.041	1.051	1.050	1.051	1.048	1.058	1.040	1.028	1.028	1.045	1.039	1.021	1.049	1.017	1.039	1.016	1.019	1.026	NA	NA	
All Yr x Hi/Lo	13.472	1.915	1.405	1.317	1.197	1.121	1.094	1.101	1.073	1.068	1.057	1.054	1.045	1.037	1.034	1.024	1.028	1.030	1.023	1.033	1.018	1.033	1.016	1.019	1.026	NA	NA	
All Yr x 2 Hi/Lo	11.690	1.895	1.395	1.295	1.190	1.120	1.093	1.090	1.069	1.063	1.055	1.050	1.045	1.037	1.032	1.024	1.024	1.029	1.019	1.031	1.017	1.035	1.010	NA	NA	NA	NA	
Selected	4.508	1.791	1.393	1.267	1.148	1.073	1.052	1.041	1.043	1.047	1.051	1.048	1.045	1.037	1.028	1.024	1.024	1.029	1.021	1.031	1.017	1.033	1.016	1.019	1.026	1.019	1.010	1.040

Montana Petroleum Tank Release Compensation Board
Actuarial Reserve Study as of June 30, 2016
Paid Losses Net of Deductibles

Report Year	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	312	324	336
1989	-	20,145	40,521	50,845	136,200	154,601	164,637	174,688	207,098	212,299	221,535	236,234	249,612	330,786	349,730	388,325	398,690	404,013	579,172	642,833	644,327	644,327	644,327	645,861	648,569	658,135	658,135	664,608
1990	228,952	964,219	1,660,799	2,506,508	3,373,692	4,484,520	5,344,295	6,406,508	7,155,855	7,381,959	7,527,020	7,808,367	8,060,119	8,248,697	8,464,815	8,734,513	9,059,923	9,285,603	9,468,586	9,545,267	9,659,070	9,891,708	10,351,029	10,804,903	11,246,979	11,544,174	11,775,188	
1991	79,553	1,176,104	2,015,475	2,776,922	3,783,564	4,815,973	5,819,751	6,526,760	6,976,322	7,889,981	8,615,752	9,106,705	9,266,775	9,488,148	9,623,494	9,851,425	10,087,303	10,248,403	10,501,963	10,690,620	11,000,248	11,185,866	11,658,212	11,763,326	12,065,970	12,374,199		
1992	131,601	1,135,727	2,540,173	4,595,040	5,748,333	6,665,857	7,109,710	7,426,748	7,792,199	8,515,733	8,999,562	9,266,819	9,569,806	9,825,501	10,200,402	10,947,129	11,098,197	11,251,590	11,356,065	11,483,481	11,592,005	11,741,821	11,910,144	12,244,225	12,391,385			
1993	186,426	583,569	1,213,021	1,877,052	2,984,550	5,131,056	5,620,033	6,091,418	6,461,158	6,730,501	6,988,896	7,313,963	7,685,076	8,202,031	8,534,479	8,690,703	8,760,749	8,844,120	8,951,988	9,158,753	9,393,185	9,558,675	9,829,564	9,932,662				
1994	31,553	503,588	1,376,658	1,872,279	2,011,278	2,485,944	2,907,940	3,203,859	3,570,863	3,841,451	4,164,890	4,645,978	4,831,855	5,121,753	5,265,611	5,417,398	5,535,189	5,678,445	5,974,405	6,312,410	6,734,231	7,032,409	7,388,309					
1995	84,364	894,272	1,974,334	2,305,502	2,628,218	3,027,360	3,538,338	3,845,424	4,168,753	4,353,797	4,804,316	5,091,667	5,400,332	5,734,804	5,933,371	6,048,236	6,113,177	6,255,870	6,402,754	6,504,904	6,977,966	7,101,272						
1996	62,603	441,608	1,091,271	1,566,489	1,977,392	2,243,893	2,714,600	3,143,218	3,382,932	3,595,856	3,877,332	4,308,760	4,869,562	5,009,725	5,286,141	5,433,806	5,629,462	5,840,289	6,107,042	6,258,050	6,606,594							
1997	14,966	196,293	297,417	778,736	1,558,459	1,954,770	2,180,383	2,519,313	2,804,484	3,313,983	3,429,121	3,584,862	4,436,747	4,487,792	4,520,829	4,576,856	4,688,920	5,472,291	5,539,255	5,573,921								
1998	16,461	241,042	731,178	1,414,183	1,867,354	2,335,436	3,028,039	3,526,985	3,962,628	4,387,570	4,751,596	5,039,087	5,313,088	5,448,907	5,746,725	6,134,696	6,322,329	6,759,721	7,076,515									
1999	17,206	1,083,430	2,749,426	3,468,948	3,941,897	4,617,790	5,219,038	5,696,809	6,136,131	7,141,579	7,557,651	7,706,385	8,129,195	8,667,452	8,906,256	9,134,908	9,340,143	9,615,759										
2000	13,236	1,078,801	1,471,800	1,762,526	2,027,478	2,450,977	2,903,148	3,397,692	4,520,728	4,681,007	4,986,837	5,387,733	5,544,670	5,786,932	6,160,918	6,438,295	6,617,736											
2001	51,406	409,544	525,550	626,569	908,100	1,014,051	1,111,785	1,293,334	1,352,520	1,604,130	1,896,208	1,923,405	2,003,430	2,146,068	2,218,880	2,239,425												
2002	397,921	535,854	934,546	1,126,995	1,427,070	1,608,945	1,732,257	1,806,360	1,887,922	1,929,971	1,956,813	2,110,730	2,258,781	2,401,372	2,476,409													
2003	88,075	413,766	591,003	990,266	1,281,106	1,881,017	2,004,739	2,105,760	2,516,787	2,645,528	3,152,715	3,421,439	3,550,171	3,615,703														
2004	143,209	452,086	689,071	1,070,618	1,210,791	1,475,550	1,678,219	1,766,006	1,835,939	1,938,135	2,128,049	2,205,673	2,345,703															
2005	97,312	513,824	968,839	1,360,132	1,802,935	1,989,584	2,137,356	2,181,614	2,278,244	2,428,222	2,490,859	2,583,350																
2006	5,794	352,507	664,086	775,921	1,159,694	1,385,943	1,476,418	1,566,304	2,246,123	2,348,294	2,410,177																	
2007	4,095	162,678	466,499	816,704	1,397,320	1,863,531	1,937,803	2,075,843	2,155,993	2,171,711																		
2008	97,811	650,979	1,056,938	1,700,693	1,836,882	1,939,292	1,991,486	2,104,782	2,183,127																			
2009	-	219,704	286,952	364,469	417,171	471,896	581,325	614,100																				
2010	17,680	149,486	157,117	171,032	201,521	218,321	225,058																					
2011	73,652	251,303	855,582	1,011,435	1,225,585	1,280,831																						
2012	97,761	200,980	270,238	288,018	326,240																							
2013	54,431	254,851	562,477	765,292																								
2014	65,289	419,739	520,891																									
2015	213,977	298,583																										
2016	-																											

Montana Petroleum Tank Release Compensation Board
Actuarial Reserve Study as of June 30, 2016
Frequency x Severity Method

Report Year	Ultimate Frequency	Ultimate Severity	Indicated Ultimate Loss	Paid Loss	Unpaid Loss
1989	21	32,914	691,193	664,608	26,584
1990	128	97,375	12,464,018	11,775,188	688,830
1991	166	79,453	13,189,129	12,374,199	814,930
1992	211	64,499	13,609,335	12,391,385	1,217,950
1993	163	67,866	11,062,154	9,932,662	1,129,492
1994	168	50,969	8,562,780	7,388,309	1,174,472
1995	148	55,955	8,281,406	7,101,272	1,180,134
1996	149	53,688	7,999,547	6,606,594	1,392,953
1997	138	49,386	6,815,251	5,573,921	1,241,329
1998	156	57,131	8,912,513	7,076,515	1,835,998
1999	177	70,849	12,540,207	9,615,759	2,924,448
2000	124	70,196	8,704,305	6,617,736	2,086,569
2001	52	59,438	3,090,791	2,239,425	851,366
2002	48	71,581	3,435,873	2,476,409	959,464
2003	45	117,947	5,307,614	3,615,703	1,691,911
2004	44	79,391	3,493,210	2,345,703	1,147,508
2005	57	70,331	4,008,867	2,583,350	1,425,517
2006	33	120,657	3,942,303	2,410,177	1,532,126
2007	44	84,642	3,733,098	2,171,711	1,561,387
2008	23	173,337	3,986,751	2,183,127	1,803,624
2009	21	55,393	1,158,263	614,100	544,163
2010	9	53,183	454,200	225,058	229,142
2011	22	129,408	2,841,094	1,280,831	1,560,263
2012	17	51,842	886,483	326,240	560,243
2013	17	167,824	2,896,523	765,292	2,131,231
2014	23	125,470	2,945,118	520,891	2,424,227
2015	27	121,035	3,297,830	298,583	2,999,248
2016	10	113,572	1,124,286	-	1,124,286
Total	2,241	2,345,333	159,434,143	121,174,749	38,259,394

Montana Petroleum Tank Release Compensation Board
Actuarial Reserve Study as of June 30, 2016
Paid Severity Development Factors

Report Year	12-24	24-36	36-48	48-60	60-72	72-84	84-96	96-108	108-120	120-132	132-144	144-156	156-168	168-180	180-192	192-204	204-216	216-228	228-240	240-252	252-264	264-276	276-288	288-300	300-312	312-324	324-336	336-Ult
1989	2.368	2.011	0.209	1.607	1.032	0.901	0.985	1.106	0.854	0.989	1.066	1.057	1.325	1.057	1.110	0.975	1.013	1.434	1.110	1.002	1.000	1.000	0.955	1.004	1.015	1.000	1.010	1.040
1990	0.766	1.089	1.368	1.292	1.242	1.149	1.147	1.098	1.032	1.003	1.037	1.032	1.015	1.018	1.007	1.029	1.025	1.020	1.008	1.012	1.038	1.044	1.041	1.026	1.026	1.020	1.010	1.040
1991	2.957	1.203	1.227	1.273	1.194	1.184	1.092	1.048	1.117	1.078	1.044	1.018	1.024	1.014	1.005	1.024	1.016	1.025	1.012	1.029	1.017	1.042	1.009	1.026	1.026	1.015	1.010	1.040
1992	2.733	1.688	1.634	1.159	1.142	1.056	1.013	1.044	1.044	1.077	1.057	1.030	1.028	1.022	1.028	1.073	1.014	1.014	1.009	1.011	1.005	1.013	1.014	1.028	1.012	1.026	1.015	1.040
1993	0.950	1.468	1.393	1.546	1.684	1.081	1.070	1.040	1.042	1.019	1.047	1.044	1.061	1.028	1.018	1.008	1.003	1.012	1.012	1.026	1.018	1.028	1.010	1.019	1.026	1.015	1.010	1.040
1994	3.731	1.863	1.260	1.016	1.172	1.128	1.071	1.107	1.076	1.070	1.116	1.006	1.040	1.028	1.029	1.002	1.026	1.052	1.031	1.067	1.038	1.051	1.016	1.019	1.026	1.015	1.010	1.040
1995	2.748	1.939	1.140	1.105	1.134	1.160	1.055	1.068	1.044	1.096	1.045	1.053	1.055	1.035	1.019	1.011	1.023	1.016	1.009	1.058	1.018	1.031	1.016	1.019	1.026	1.015	1.010	1.040
1996	3.859	2.295	1.381	1.225	1.110	1.201	1.158	1.076	1.055	1.071	1.103	1.130	1.022	1.048	1.028	1.036	1.037	1.031	1.025	1.056	1.017	1.031	1.016	1.019	1.026	1.015	1.010	1.040
1997	5.692	1.265	2.618	1.986	1.245	1.098	1.155	1.105	1.173	1.035	1.045	1.228	1.012	0.993	1.012	1.017	1.159	1.012	1.006	1.031	1.017	1.031	1.016	1.019	1.026	1.015	1.010	1.040
1998	6.551	2.789	1.817	1.311	1.223	1.260	1.165	1.116	1.092	1.075	1.052	1.039	1.047	1.012	1.048	1.054	1.062	1.047	1.017	1.031	1.017	1.031	1.016	1.019	1.026	1.015	1.010	1.040
1999	35.323	2.138	1.196	1.108	1.150	1.165	1.116	1.085	1.077	1.150	1.052	1.020	1.055	1.060	1.021	1.014	1.017	1.024	1.025	1.017	1.031	1.031	1.016	1.019	1.026	1.015	1.010	1.040
2000	45.396	1.135	1.115	1.097	1.155	1.174	1.130	1.319	1.027	1.065	1.080	1.021	1.027	1.065	1.045	1.020	1.024	1.025	1.017	1.031	1.017	1.031	1.016	1.019	1.026	1.015	1.010	1.040
2001	3.983	1.134	1.165	1.417	1.069	1.052	1.163	1.046	1.186	1.182	0.994	1.042	1.071	1.034	1.009	1.017	1.024	1.025	1.017	1.031	1.017	1.031	1.016	1.019	1.026	1.015	1.010	1.040
2002	0.364	1.698	1.175	1.176	1.101	1.077	1.019	1.022	1.000	0.992	1.079	1.070	1.063	1.031	1.024	1.017	1.024	1.025	1.017	1.031	1.017	1.031	1.016	1.019	1.026	1.015	1.010	1.040
2003	1.879	1.316	1.592	1.262	1.400	1.066	1.050	1.195	1.051	1.192	1.085	1.038	1.018	1.033	1.024	1.017	1.024	1.025	1.017	1.031	1.017	1.031	1.016	1.019	1.026	1.015	1.010	1.040
2004	1.538	1.450	1.481	1.131	1.219	1.137	1.052	1.040	1.056	1.098	1.036	1.063	1.018	1.033	1.024	1.017	1.024	1.025	1.017	1.031	1.017	1.031	1.016	1.019	1.026	1.015	1.010	1.040
2005	2.347	1.632	1.327	1.326	1.104	1.074	1.002	1.044	1.066	1.026	1.037	1.048	1.038	1.033	1.024	1.017	1.024	1.025	1.017	1.031	1.017	1.031	1.016	1.019	1.026	1.015	1.010	1.040
2006	36.938	1.702	1.132	1.495	1.195	1.065	1.061	1.434	1.045	1.026	1.051	1.048	1.038	1.033	1.024	1.017	1.024	1.025	1.017	1.031	1.017	1.031	1.016	1.019	1.026	1.015	1.010	1.040
2007	19.294	2.509	1.751	1.711	1.301	1.040	1.046	1.014	1.007	1.046	1.051	1.048	1.038	1.033	1.024	1.017	1.024	1.025	1.017	1.031	1.017	1.031	1.016	1.019	1.026	1.015	1.010	1.040
2008	4.904	1.542	1.532	1.080	1.056	1.027	1.057	1.033	1.042	1.046	1.051	1.048	1.038	1.033	1.024	1.017	1.024	1.025	1.017	1.031	1.017	1.031	1.016	1.019	1.026	1.015	1.010	1.040
2009	2.368	1.237	1.270	1.145	1.075	1.232	1.056	1.033	1.042	1.046	1.051	1.048	1.038	1.033	1.024	1.017	1.024	1.025	1.017	1.031	1.017	1.031	1.016	1.019	1.026	1.015	1.010	1.040
2010	3.624	1.051	0.952	1.178	1.083	1.031	1.048	1.033	1.042	1.046	1.051	1.048	1.038	1.033	1.024	1.017	1.024	1.025	1.017	1.031	1.017	1.031	1.016	1.019	1.026	1.015	1.010	1.040
2011	1.896	3.064	1.182	1.212	1.045	1.069	1.048	1.033	1.042	1.046	1.051	1.048	1.038	1.033	1.024	1.017	1.024	1.025	1.017	1.031	1.017	1.031	1.016	1.019	1.026	1.015	1.010	1.040
2012	1.740	1.249	1.066	1.057	1.180	1.069	1.048	1.033	1.042	1.046	1.051	1.048	1.038	1.033	1.024	1.017	1.024	1.025	1.017	1.031	1.017	1.031	1.016	1.019	1.026	1.015	1.010	1.040
2013	3.241	2.049	1.361	1.288	1.180	1.069	1.048	1.033	1.042	1.046	1.051	1.048	1.038	1.033	1.024	1.017	1.024	1.025	1.017	1.031	1.017	1.031	1.016	1.019	1.026	1.015	1.010	1.040
2014	4.538	1.241	1.334	1.288	1.180	1.069	1.048	1.033	1.042	1.046	1.051	1.048	1.038	1.033	1.024	1.017	1.024	1.025	1.017	1.031	1.017	1.031	1.016	1.019	1.026	1.015	1.010	1.040
2015	0.575	1.683	1.334	1.288	1.180	1.069	1.048	1.033	1.042	1.046	1.051	1.048	1.038	1.033	1.024	1.017	1.024	1.025	1.017	1.031	1.017	1.031	1.016	1.019	1.026	1.015	1.010	1.040
2016	2.368	1.683	1.334	1.288	1.180	1.069	1.048	1.033	1.042	1.046	1.051	1.048	1.038	1.033	1.024	1.017	1.024	1.025	1.017	1.031	1.017	1.031	1.016	1.019	1.026	1.015	1.010	1.040

Report Year	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	312	324	336	Ult
1989	-	20,145	40,521	8,474	13,620	14,055	12,664	12,478	13,807	11,794	11,660	12,433	13,137	17,410	18,407	20,438	19,935	20,201	28,959	32,142	32,216	32,216	30,755	30,884	31,340	31,340	31,648		32,914
1990	22,895	17,531	19,090	26,109	33,737	41,911	48,147	55,229	60,643	62,559	62,725	65,070	67,168	68,171	69,384	69,876	71,904	73,695	75,148	75,756	76,659	78,506	81,504	85,078	88,559	90,899	92,718	93,630	97,375
1991	4,972	14,701	17,680	21,695	27,617	32,986	39,059	42,659	44,720	49,937	53,848	56,214	57,202	58,569	59,404	59,706	61,135	62,112	63,648	64,401	66,267	67,385	70,230	70,863	72,687	74,543	75,653	76,397	79,453
1992	3,463	9,464	15,976	26,108	30,254	34,538	36,460	36,949	38,575	41,540	43,900	45,204	46,455	47,466	48,806	52,379	53,101	53,835	54,335	54,945	55,200	55,913	56,715	58,306	59,007	60,514	61,414	62,018	64,499
1993	6,905	6,557	9,627	13,408	20,726	34,905	37,718	40,341	41,956	43,705	44,515	46,586	48,640	51,585	53,009	53,980	54,415	54,593	55,259	56,189	57,627	58,642	60,304	60,937	62,087	63,673	64,620	65,256	67,866
1994	1,753	6,540	12,183	15,347	15,591	18,279	20,624	22,096	24,458	26,311	28,141	31,392	31,581	32,832	33,754	34,727	34,813	35,713	37,575	38,726	41,314	42,881	45,051	45,765	46,629	47,820	48,531	49,009	50,969
1995	3,013	8,280	16,051	18,298	20,217	22,935	26,604	28,069	29,991	31,322	34,317	35,857	37,765	39,825	41,204	42,002	42,453	43,444	44,157	44,554	47,148	47,982	49,458	50,242	51,190	52,498	53,279	53,803	55,955
1996	978	3,774	8,661	11,958	14,647	16,260	19,529	22,613	24,338	25,685	27,499	30,343	34,293	35,033	36,709	37,735	39,093	40,558	41,829	42,863	45,251	46,037	47,454	48,206	49,116	50,371	51,121	51,623	53,688
1997	325	1,852	2,342	6,132	12,175	15,153	16,644	19,231	21,246	24,917	25,783	26,954	33,110	33,491	33,653	34,226	39,654	40,140	40,391	41,624	42,348	43,651	44,343	45,180	46,334	47,024	47,486		49,386
1998	323	2,114	5,897	10,714	14,040	17,172	21,629	25,193	28,104	30,682	32,997	34,280	35,899	36,326	38,058	40,096	41,322	43,894	45,951	46,726	48,153	48,990	50,498	51,298	52,266	53,601	54,399	54,934	57,131
1999	249	8,808	18,832	22,526	24,949	28,682	32,019	34,737	37,415	43,022	45,255	46,146	48,678	51,592	52,700	53,421	54,303	55,582	56,984	57,944	59,714	60,752	62,622	63,615	64,815	66,471	67,460	68,124	70,849
2000	301	13,656	15,493	17,280	18,948	21,884	25,692	29,040	38,311	39,336	41,906	45,275	46,206	47,434	50,499	52,773	53,803	55,070	56,459	57,411	59,164	60,193	62,045	63,029	64,218	65,859	66,839	67,496	70,196
2001	2,706	10,777	12,222	14,240	20,180	21,576	22,689	26,395	27,602	32,737	38,698	38,468	40,069	42,921	44,378	44,788	45,557	46,631	47,807	48,612	50,097	50,968	52,537	53,369	54,377	55,766	56,596	57,152	59,438
2002	39,792	14,483	24,593	28,897	33,978	37,417	40,285	41,054	41,954	41,956	45,073	41,634	44,909	48,059	51,093	52,690	53,938	54,864	56,157	57,573	58,543	60,331	61,380	63,269	64,272	65,485	67,158	68,157	71,581
2003	6,291	11,822	15,553	24,757	31,246	43,745	46,622	48,971	58,530	61,524	73,319	79,568	82,562	84,086	86,819	88,877	90,402	92,532	94,866	96,464	99,411	101,139	104,252	105,904	107,903	110,659	112,306	113,411	117,947
2004	7,537	11,592	16,807	24,898	28,158	34,315	39,028	41,070	42,696	45,073	49,490	51,295	54,551	56,599	58,439	59,824	60,850	62,284	63,855	64,931	66,914	68,078	70,173	71,285	72,630	74,486	75,594	76,338	79,391
2005	4,866	11,418	18,632	24,730	32,781	36,174	38,861	38,957	40,683	43,361	44,480	46,131	48,326	50,140	51,770	52,996	53,906	55,176	56,568	57,521	59,278	60,309	62,164	63,150	64,342	65,985	66,967	67,626	70,331
2006	341	12,590	21,422	24,248	36,240	43,311	46,138	48,947	70,191	73,384	75,318	79,141	82,906	86,018	88,814	90,919	92,479	94,658	97,045	98,680	101,695	103,463	106,647	108,337	110,382	113,202	114,886	116,016	120,657
2007	241	4,648	11,662	20,418	34,933	45,452	47,263	49,425	50,139	50,505	52,836	55,518	58,159	60,342	62,303	63,780	64,875	66,403	68,078	69,225	71,339	72,580	74,813	75,999	77,434	79,412	80,593	81,386	84,642
2008	6,986	34,262	52,847	80,985	87,471	92,347	94,833	100,228	99,233	103,429	108,203	113,695	119,103	123,574	127,591	130,615	132,857	135,987	139,417	141,765	146,096	148,636	153,210	155,639	158,576	162,627	165,047	166,670	173,337
2009	-	12,206	15,103	19,183	21,956	23,595	29,066	30,705	31,712	33,052	34,578	36,333	38,062	39,490	40,774	41,740	42,457	43,457	44,553	45,304	46,687	47,499	48,961	49,737	50,676	51,970	52,744	53,262	55,393
2010	5,893	21,355	22,445	21,379	25,190	27,290	28,132	29,480	30,447	31,734	33,199	34,884	36,543	37,915	39,147	40,075	40,763	41,723	42,776	43,496	44,825	45,604	47,008	47,753	48,654	49,897	50,639	51,137	53,183
2011	7,365	13,961	42,779	50,572	61,279	64,042	68,453	71,733	74,084	77,217	80,781	84,881	88,919	92,257	95,256	97,513	99,187	101,524	104,084	105,838	109,011	110,967	114,382	116,195	118,388	121,412	123,219	124,411	129,408
2012	8,887	15,460	19,303	20,573	21,749	25,656	27,423	28,737	29,679	30,934	32,362	34,004	35,622	36,959	38,160	39,065	39,735	40,671	41,697	42,400	43,695	44,455	45,823	46,549	47,427	48,639	49,363	49,848	51,842
2013	6,048	19,604	40,177	54,664	70,407	83,053	88,774	93,027	96,077	100,139	104,761	110,078	115,315	119,644	123,533	126,460	128,631	131,662	134,982	137,257	141,449	143,908	148,337	150,688	153,532	157,454	159,797	161,369	167,824
2014	5,441	24,691	30,641	40,868	52,638	62,093	66,370	69,550	71,830	74,867	78,323	82,298	86,213	89,450	92,357	94,546	96,168	98,434	100,917	102,617	105,751	107,590	110,901	112,659	114,785	117,718	119,469	120,644	125,470
2015	30,568	17,564	29,558	39,424	50,778	59,898	64,024	67,092	69,291	72,221	75,554	79,389	83,166	86,288	89,092	91,204	92,769	94,955	97,350	98,990	102,014	103,787	106,981	108,677	110,728	113,557	115,247	116,380	121,035
2016	6,959	16,481	27,735	36,993	47,647	56,205	60,077	62,955	65,019	67,768	70,896	74,494	78,038	80,967	83,599	85,580	87,049	89,100	91,347	92,886	95,724	97,388	100,385	101,976	103,901	106,555	108,141	109,204	113,572

Montana Petroleum Tank Release Compensation Board
Actuarial Reserve Study as of June 30, 2016
Paid Severity Development Factors

Report Year	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	276 - 288	288 - 300	300 - 312	312 - 324	324 - 336	Tail
1989		2.011	0.209	1.607	1.032	0.901	0.985	1.106	0.854	0.989	1.066	1.057	1.325	1.057	1.110	0.975	1.013	1.434	1.110	1.002	1.000	1.000	0.955	1.004	1.015	1.000	1.010	
1990	0.766	1.089	1.368	1.292	1.242	1.149	1.147	1.098	1.032	1.003	1.037	1.032	1.015	1.018	1.007	1.029	1.025	1.020	1.008	1.012	1.024	1.038	1.044	1.041	1.026	1.020		
1991	2.957	1.203	1.227	1.273	1.194	1.184	1.092	1.048	1.117	1.078	1.044	1.018	1.024	1.014	1.005	1.024	1.016	1.025	1.012	1.029	1.017	1.042	1.009	1.026				
1992	2.733	1.688	1.634	1.159	1.142	1.056	1.013	1.044	1.077	1.057	1.030	1.028	1.022	1.028	1.073	1.014	1.014	1.009	1.011	1.005	1.013	1.014	1.028	1.010				
1993	0.950	1.468	1.393	1.546	1.684	1.081	1.070	1.040	1.042	1.019	1.047	1.044	1.061	1.028	1.018	1.008	1.003	1.012	1.017	1.026	1.018	1.028	1.010					
1994	3.731	1.863	1.260	1.016	1.172	1.128	1.071	1.107	1.076	1.070	1.116	1.006	1.040	1.028	1.029	1.002	1.026	1.052	1.031	1.067	1.038	1.051						
1995	2.748	1.939	1.140	1.105	1.134	1.160	1.055	1.068	1.044	1.096	1.045	1.053	1.055	1.035	1.019	1.011	1.023	1.016	1.031	1.025	1.056							
1996	3.859	2.295	1.381	1.225	1.110	1.201	1.158	1.076	1.055	1.071	1.103	1.130	1.022	1.048	1.028	1.036	1.037	1.031	1.025	1.018								
1997	5.692	1.265	2.618	1.986	1.245	1.098	1.155	1.105	1.173	1.035	1.045	1.228	1.012	0.993	1.012	1.017	1.159	1.012	1.006									
1998	6.551	2.789	1.817	1.311	1.223	1.260	1.165	1.116	1.092	1.075	1.039	1.012	1.048	1.054	1.031	1.062	1.047											
1999	35.323	2.138	1.196	1.108	1.150	1.116	1.085	1.077	1.150	1.052	1.020	1.055	1.060	1.021	1.014	1.017	1.024											
2000	45.396	1.135	1.115	1.097	1.155	1.174	1.130	1.319	1.027	1.065	1.080	1.021	1.027	1.065	1.045	1.020												
2001	3.983	1.134	1.165	1.417	1.069	1.052	1.163	1.046	1.186	1.182	0.994	1.042	1.071	1.034	1.009													
2002	0.364	1.698	1.175	1.176	1.101	1.077	1.019	1.022	1.000	0.992	1.079	1.070	1.063	1.031														
2003	1.879	1.316	1.592	1.262	1.400	1.066	1.050	1.195	1.051	1.192	1.085	1.038	1.018															
2004	1.538	1.450	1.481	1.131	1.219	1.137	1.052	1.040	1.056	1.098	1.036	1.037																
2005	2.347	1.632	1.327	1.326	1.104	1.074	1.002	1.044	1.066	1.026	1.026																	
2006	36.938	1.702	1.132	1.495	1.195	1.065	1.061	1.434	1.045	1.026																		
2007	19.294	2.509	1.751	1.711	1.301	1.040	1.046	1.014	1.007																			
2008	4.904	1.542	1.532	1.080	1.056	1.027	1.057	0.990																				
2009		1.237	1.270	1.145	1.075	1.232	1.056																					
2010	3.624	1.051	0.952	1.178	1.083	1.031																						
2011	1.896	3.064	1.182	1.212	1.045																							
2012	1.740	1.249	1.066	1.057																								
2013	3.241	2.049	1.361																									
2014	4.538	1.241																										
2015	0.575																											
Avg All Yr	7.903	1.683	1.334	1.288	1.180	1.105	1.078	1.100	1.060	1.062	1.053	1.058	1.055	1.032	1.033	1.015	1.037	1.066	1.025	1.032	1.018	1.029	1.009	1.021	1.022	1.010	1.010	
Avg 89-03	8.352	1.669	1.353	1.305	1.204	1.113	1.091	1.098	1.065	1.065	1.055	1.058	1.055	1.032	1.033	1.015	1.037	1.066	1.025	1.032	1.018	1.029	1.009	1.021	1.022	1.010	1.010	
Avg 04-Present	7.330	1.702	1.305	1.259	1.135	1.087	1.046	1.104	1.044	1.050	1.037	1.063	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Avg LS	2.398	1.731	1.166	1.134	1.112	1.079	1.044	1.104	1.045	1.067	1.046	1.047	1.048	1.040	1.027	NA	1.061	1.032	1.017	1.042	1.021	1.035	1.009	1.021	1.022	1.010	1.010	
Wtd All Yr	1.964	1.585	1.225	1.233	1.164	1.093	1.071	1.093	1.060	1.064	1.051	1.051	1.040	1.030	1.028	1.018	1.033	1.041	1.020	1.030	1.019	1.031	1.017	1.025	1.024	1.015	1.010	
Wtd 04-Present	2.368	1.605	1.308	1.219	1.117	1.069	1.048	1.087	1.042	1.046	1.037	1.063	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Wtd LS	1.565	1.634	1.190	1.130	1.095	1.058	1.047	1.087	1.044	1.071	1.051	1.046	1.044	1.039	1.027	1.023	1.056	1.031	1.017	1.039	1.020	1.035	1.017	1.025	1.024	1.015	1.010	
5 Yr x Hi/Lo	2.292	1.513	1.173	1.134	1.071	1.045	1.053	1.033	1.051	1.050	1.051	1.048	1.050	1.038	1.024	1.022	1.041	1.032	1.017	1.047	1.017	1.036	1.016	1.019	1.026	NA	NA	
All Yr x Hi/Lo	6.600	1.652	1.327	1.269	1.163	1.107	1.078	1.087	1.065	1.059	1.053	1.050	1.038	1.033	1.028	1.017	1.027	1.027	1.016	1.031	1.018	1.031	1.016	1.019	1.026	NA	NA	
All Yr x 2 Hi/Lo	5.442	1.626	1.321	1.257	1.156	1.105	1.078	1.077	1.062	1.055	1.052	1.046	1.037	1.032	1.025	1.017	1.024	1.025	1.015	1.031	1.017	1.033	1.010	NA	NA	NA	NA	
Selected	2.368	1.683	1.334	1.288	1.180	1.069	1.048	1.033	1.042	1.046	1.051	1.048	1.038	1.033	1.024	1.017	1.024	1.025	1.017	1.031	1.017	1.031	1.016	1.019	1.026	1.015	1.010	1.040

Montana Petroleum Tank Release Compensation Board
Actuarial Reserve Study as of June 30, 2016
Paid Severity Net of Deductibles

Report

Year	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	312	324	336
1989		20,145	40,521	8,474	13,620	14,055	12,664	12,478	13,807	11,794	11,660	12,433	13,137	17,410	18,407	20,438	19,935	20,201	28,959	32,142	32,216	32,216	32,216	30,755	30,884	31,340	31,340	31,648
1990	22,895	17,531	19,090	26,109	33,737	41,911	48,147	55,229	60,643	62,559	62,725	65,070	67,168	68,171	69,384	69,876	71,904	73,695	75,148	75,756	76,659	78,506	81,504	85,078	88,559	90,899	92,718	
1991	4,972	14,701	17,680	21,695	27,617	32,986	39,059	42,659	44,720	49,937	53,848	56,214	57,202	58,569	59,404	59,706	61,135	62,112	63,648	64,401	66,267	67,385	70,230	70,863	72,687	74,543		
1992	3,463	9,464	15,976	26,108	30,254	34,538	36,460	36,949	38,575	41,540	43,900	45,204	46,455	47,466	48,806	52,379	53,101	53,835	54,335	54,945	55,200	55,913	56,715	58,306	59,007			
1993	6,905	6,557	9,627	13,408	20,726	34,905	37,718	40,341	41,956	43,705	44,515	46,586	48,640	51,585	53,009	53,980	54,415	54,593	55,259	56,189	57,627	58,642	60,304	60,937				
1994	1,753	6,540	12,183	15,347	15,591	18,279	20,624	22,096	24,458	26,311	28,141	31,392	31,581	32,832	33,754	34,727	34,813	35,713	37,575	38,726	41,314	42,881	45,051					
1995	3,013	8,280	16,051	18,298	20,217	22,935	26,604	28,069	29,991	31,322	34,317	35,857	37,765	39,825	41,204	42,002	42,453	43,444	44,157	44,554	47,148	47,982						
1996	978	3,774	8,661	11,958	14,647	16,260	19,529	22,613	24,338	25,685	27,499	30,343	34,293	35,033	36,709	37,735	39,093	40,558	41,829	42,863	45,251							
1997	325	1,852	2,342	6,132	12,175	15,153	16,644	19,231	21,246	24,917	25,783	26,954	33,110	33,491	33,241	33,653	34,226	39,654	40,140	40,391								
1998	323	2,114	5,897	10,714	14,040	17,172	21,629	25,193	28,104	30,682	32,997	34,280	35,899	36,326	38,058	40,096	41,322	43,894	45,951									
1999	249	8,808	18,832	22,526	24,949	28,682	32,019	34,737	37,415	43,022	45,255	46,146	48,678	51,592	52,700	53,421	54,303	55,582										
2000	301	13,656	15,493	17,280	18,948	21,884	25,692	29,040	38,311	39,336	41,906	45,275	46,206	47,434	50,499	52,773	53,803											
2001	2,706	10,777	12,222	14,240	20,180	21,576	22,689	26,395	27,602	32,737	38,698	38,468	40,069	42,921	44,378	44,788												
2002	39,792	14,483	24,593	28,897	33,978	37,417	40,285	41,054	41,954	41,956	41,634	44,909	48,059	51,093	52,690													
2003	6,291	11,822	15,553	24,757	31,246	43,745	46,622	48,971	58,530	61,524	73,319	79,568	82,562	84,086														
2004	7,537	11,592	16,807	24,898	28,158	34,315	39,028	41,070	42,696	45,073	49,490	51,295	54,551															
2005	4,866	11,418	18,632	24,730	32,781	36,174	38,861	38,957	40,683	43,361	44,480	46,131																
2006	341	12,590	21,422	24,248	36,240	43,311	46,138	48,947	70,191	73,384	75,318																	
2007	241	4,648	11,662	20,418	34,933	45,452	47,263	49,425	50,139	50,505																		
2008	6,986	34,262	52,847	80,985	87,471	92,347	94,833	100,228	99,233																			
2009	-	12,206	15,103	19,183	23,595	29,066	30,705																					
2010	5,893	21,355	22,445	21,379	25,190	27,290	28,132																					
2011	7,365	13,961	42,779	50,572	61,279	64,042																						
2012	8,887	15,460	19,303	20,573	21,749																							
2013	6,048	19,604	40,177	54,664																								
2014	5,441	24,691	30,641																									
2015	30,568	17,564																										
2016	-																											

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1989	3.088	1.000	6.000	1.667	1.100	1.182	1.077	1.071	1.200	1.056	1.000	1.000	1.000	1.000	1.000	1.053	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.050	1.000	1.000	1.000	1.000
1990	5.500	1.582	1.103	1.042	1.070	1.037	1.045	1.017	1.000	1.017	1.000	1.000	1.008	1.008	1.025	1.008	1.000	1.000	1.000	1.006	1.000	1.008	1.000	1.000	1.000	1.000	1.000	1.000
1991	5.000	1.425	1.123	1.070	1.066	1.021	1.027	1.020	1.013	1.013	1.013	1.000	1.000	1.000	1.000	1.019	1.000	1.000	1.006	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1992	3.158	1.325	1.107	1.080	1.016	1.010	1.031	1.005	1.015	1.000	1.000	1.005	1.005	1.010	1.000	1.000	1.000	1.000	1.000	1.000	1.005	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1993	3.296	1.416	1.111	1.029	1.021	1.014	1.013	1.020	1.000	1.019	1.000	1.006	1.006	1.013	1.000	1.000	1.006	1.000	1.006	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1994	4.278	1.468	1.080	1.057	1.054	1.037	1.028	1.007	1.000	1.014	1.000	1.034	1.020	1.000	1.000	1.019	1.000	1.000	1.000	1.025	1.000	1.000	1.006	1.000	1.000	1.000	1.000	1.000
1995	3.857	1.139	1.024	1.032	1.015	1.008	1.030	1.015	1.000	1.007	1.000	1.007	1.014	1.007	1.000	1.000	1.000	1.000	1.007	1.007	1.014	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1996	1.828	1.077	1.040	1.031	1.022	1.007	1.000	1.000	1.007	1.007	1.007	1.000	1.007	1.007	1.000	1.000	1.014	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1997	2.304	1.198	1.000	1.008	1.008	1.016	1.000	1.008	1.008	1.000	1.000	1.008	1.000	1.015	1.000	1.007	1.007	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1998	2.235	1.088	1.065	1.008	1.023	1.029	1.000	1.007	1.014	1.007	1.021	1.007	1.014	1.007	1.013	1.000	1.007	1.007	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1999	1.783	1.187	1.055	1.026	1.019	1.012	1.006	1.000	1.012	1.006	1.000	1.000	1.006	1.006	1.012	1.006	1.006	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2000	1.795	1.203	1.074	1.049	1.047	1.009	1.035	1.009	1.008	1.000	1.000	1.008	1.017	1.000	1.000	1.008	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2001	2.000	1.132	1.023	1.023	1.044	1.043	1.000	1.000	1.000	1.000	1.020	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2002	3.700	1.027	1.026	1.077	1.024	1.000	1.023	1.023	1.022	1.022	1.000	1.000	1.000	1.000	1.010	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2003	2.500	1.086	1.053	1.025	1.049	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.002	1.010	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2004	2.053	1.051	1.049	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.002	1.002	1.010	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2005	2.250	1.156	1.058	1.000	1.000	1.000	1.018	1.000	1.000	1.000	1.000	1.003	1.002	1.002	1.010	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2006	1.647	1.107	1.032	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.004	1.003	1.002	1.002	1.010	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2007	2.059	1.143	1.000	1.000	1.025	1.000	1.024	1.024	1.000	1.005	1.004	1.003	1.002	1.002	1.010	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2008	1.357	1.053	1.050	1.000	1.000	1.000	1.000	1.048	1.006	1.005	1.004	1.003	1.002	1.002	1.010	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2009	2.571	1.056	1.000	1.000	1.053	1.000	1.000	1.013	1.006	1.005	1.004	1.003	1.002	1.002	1.010	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2010	2.333	1.000	1.143	1.000	1.000	1.000	1.021	1.013	1.006	1.005	1.004	1.003	1.002	1.002	1.010	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2011	1.800	1.111	1.000	1.000	1.000	1.028	1.021	1.013	1.006	1.005	1.004	1.003	1.002	1.002	1.010	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2012	1.182	1.077	1.000	1.071	1.038	1.028	1.021	1.013	1.006	1.005	1.004	1.003	1.002	1.002	1.010	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2013	1.444	1.077	1.000	1.081	1.038	1.028	1.021	1.013	1.006	1.005	1.004	1.003	1.002	1.002	1.010	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2014	1.417	1.000	1.120	1.081	1.038	1.028	1.021	1.013	1.006	1.005	1.004	1.003	1.002	1.002	1.010	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2015	2.429	1.161	1.120	1.081	1.038	1.028	1.021	1.013	1.006	1.005	1.004	1.003	1.002	1.002	1.010	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2016	3.088	1.161	1.120	1.081	1.038	1.028	1.021	1.013	1.006	1.005	1.004	1.003	1.002	1.002	1.010	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Year	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	312	324	336	Ult
1989	-	1	1	6	10	11	13	14	15	18	19	19	19	19	19	19	20	20	20	20	20	20	20	21	21	21	21	21	21
1990	10	55	87	96	100	107	111	116	118	118	120	120	120	121	122	125	126	126	126	126	126	127	127	127	127	127	127	127	128
1991	16	80	114	128	137	146	149	153	156	158	160	162	162	162	162	165	165	165	165	166	166	166	166	166	166	166	166	166	166
1992	38	120	159	176	190	193	195	201	202	205	205	205	206	207	209	209	209	209	209	210	210	210	210	210	210	210	210	210	211
1993	27	89	126	140	144	147	149	151	154	154	157	157	158	159	161	161	161	161	162	162	163	163	163	163	163	163	163	163	163
1994	18	77	113	122	129	136	141	145	146	146	148	148	153	156	156	156	159	159	159	163	163	164	164	164	164	164	164	164	168
1995	28	108	123	126	130	132	133	137	139	139	140	142	143	144	144	144	144	144	145	146	148	148	148	148	148	148	148	148	148
1996	64	117	126	131	135	138	139	139	139	140	141	142	142	143	144	144	144	144	146	146	146	146	146	146	146	146	146	146	149
1997	46	106	127	127	128	129	131	131	132	133	133	133	134	134	136	136	137	138	138	138	138	138	138	138	138	138	138	138	138
1998	51	114	124	132	133	136	140	140	141	143	144	147	148	150	151	153	153	154	154	154	154	154	154	154	154	154	154	154	156
1999	69	123	146	154	158	161	163	164	164	166	167	167	167	168	169	171	172	173	173	173	173	173	173	173	173	173	173	173	177
2000	44	79	95	102	107	112	113	117	118	119	119	119	120	122	122	122	123	123	123	123	123	123	123	123	123	123	123	123	124
2001	19	38	43	44	45	47	49	49	49	49	49	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	52
2002	10	37	38	39	42	43	43	44	45	46	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	48
2003	14	35	38	40	41	43	43	43	43	43	43	43	43	43	44	44	44	44	44	44	44	44	44	44	44	44	44	44	45
2004	19	39	41	43	43	43	43	43	43	43	43	43	43	43	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44
2005	20	45	52	55	55	55	55	56	56	56	56	56	56	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57
2006	17	28	31	32	32	32	32	32	32	32	32	32	32	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33
2007	17	35	40	40	41	41	42	43	43	43	43	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44
2008	14	19	20	21	21	21	21	22	22	22	22	22	22	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
2009	7	18	19	19	19	20	20	20	20	20	20	20	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
2010	3	7	7	8	8	8	8	8	8	8	8	8	8	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
2011	10	18	20	20	20	20	21	21	21	21	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
2012	11	13	14	14	15	16	16	16	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
2013	9	13	14	14	15	16	16	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
2014	12	17	17	19	21	21	22	22	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
2015	7	17	20	22	24	25	26	26	26	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
2016	2	6	7	8	9	9	9	9	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

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1989		6.000	1.667	1.100	1.182	1.077	1.071	1.200	1.056	1.000	1.000	1.000	1.000	1.000	1.000	1.053	1.000	1.000	1.000	1.000	1.000	1.000	1.050	1.000	1.000	1.000	1.000	
1990	5.500	1.582	1.103	1.042	1.070	1.037	1.045	1.017	1.000	1.017	1.000	1.000	1.008	1.008	1.025	1.008	1.000	1.000	1.000	1.008	1.000	1.000	1.000	1.000	1.000		
1991	5.000	1.425	1.123	1.070	1.066	1.021	1.027	1.020	1.013	1.013	1.013	1.000	1.000	1.000	1.019	1.000	1.000	1.000	1.006	1.000	1.000	1.000	1.000	1.000	1.000		
1992	3.158	1.325	1.107	1.080	1.016	1.010	1.031	1.005	1.015	1.000	1.000	1.005	1.005	1.010	1.000	1.000	1.000	1.000	1.005	1.000	1.000	1.000	1.000	1.000			
1993	3.296	1.416	1.111	1.029	1.021	1.014	1.013	1.020	1.000	1.019	1.000	1.006	1.006	1.013	1.000	1.000	1.006	1.000	1.000	1.000	1.000	1.000	1.000				
1994	4.278	1.468	1.080	1.057	1.054	1.037	1.028	1.007	1.000	1.014	1.000	1.034	1.020	1.000	1.000	1.019	1.000	1.000	1.025	1.000	1.006	1.000					
1995	3.857	1.139	1.024	1.032	1.015	1.030	1.008	1.015	1.000	1.007	1.014	1.007	1.007	1.000	1.000	1.000	1.000	1.007	1.007	1.014	1.000						
1996	1.828	1.077	1.040	1.031	1.022	1.007	1.000	1.000	1.007	1.007	1.007	1.000	1.007	1.007	1.000	1.000	1.000	1.014	1.000	1.000							
1997	2.304	1.198	1.008	1.008	1.008	1.016	1.000	1.008	1.008	1.000	1.000	1.008	1.000	1.000	1.007	1.007	1.000	1.000									
1998	2.235	1.088	1.065	1.008	1.023	1.029	1.000	1.007	1.014	1.007	1.021	1.007	1.014	1.007	1.013	1.000	1.007	1.007	1.000	1.000							
1999	1.783	1.187	1.055	1.026	1.019	1.012	1.000	1.006	1.000	1.012	1.006	1.000	1.006	1.006	1.012	1.006	1.006										
2000	1.795	1.203	1.074	1.049	1.047	1.009	1.035	1.009	1.008	1.000	1.000	1.008	1.017	1.000	1.000	1.008											
2001	2.000	1.132	1.023	1.023	1.044	1.043	1.000	1.000	1.000	1.000	1.020	1.000	1.000	1.000	1.000												
2002	3.700	1.027	1.026	1.077	1.024	1.000	1.023	1.023	1.022	1.022	1.000	1.000	1.000	1.000													
2003	2.500	1.086	1.053	1.025	1.049	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000														
2004	2.053	1.051	1.049	1.000	1.000	1.000	1.018	1.000	1.000	1.000	1.000	1.000															
2005	2.250	1.156	1.058	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000																
2006	1.647	1.107	1.032	1.000	1.000	1.000	1.000	1.000	1.000	1.000																	
2007	2.059	1.143	1.000	1.000	1.025	1.000	1.024	1.024	1.000																		
2008	1.357	1.053	1.050	1.000	1.000	1.000	1.000	1.048																			
2009	2.571	1.056	1.000	1.000	1.053	1.000	1.000																				
2010	2.333	1.000	1.143	1.000	1.000	1.000																					
2011	1.800	1.111	1.000	1.000	1.000																						
2012	1.182	1.077	1.000	1.071																							
2013	1.444	1.077	1.000																								
2014	1.417	1.000																									
2015	2.429																										
Avg All Yr	2.530	1.161	1.051	1.054	1.028	1.019	1.017	1.014	1.016	1.009	1.004	1.005	1.006	1.005	1.005	1.008	1.002	1.002	1.005	1.002	1.001	1.001	1.010	1.000	1.000	1.000	1.000
Avg 89-03	3.088	1.223	1.063	1.081	1.038	1.028	1.021	1.013	1.020	1.011	1.005	1.005	1.006	1.005	1.005	1.008	1.002	1.002	1.005	1.002	1.001	1.001	1.010	1.000	1.000	1.000	1.000
Avg 04-Present	1.878	1.075	1.033	1.008	1.010	1.000	1.007	1.014	1.000	1.000	1.000	1.000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Avg LS	1.654	1.053	1.029	1.014	1.016	1.000	1.009	1.014	1.000	1.004	1.004	1.002	1.005	1.003	1.005	1.004	1.004	1.004	1.008	1.004	1.001	1.002	1.010	1.000	1.000	1.000	1.000
Wtd All Yr	2.413	1.212	1.065	1.037	1.029	1.019	1.016	1.018	1.010	1.008	1.008	1.005	1.006	1.006	1.006	1.005	1.003	1.002	1.006	1.003	1.001	1.001	1.001	1.000	1.000	1.000	1.000
Wtd 04-Present	1.842	1.091	1.031	1.004	1.008	1.000	1.009	1.010	1.000	1.000	1.000	1.000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wtd LS	1.592	1.059	1.014	1.012	1.019	1.000	1.012	1.010	1.000	1.005	1.004	1.003	1.007	1.004	1.006	1.004	1.004	1.004	1.008	1.004	1.001	1.001	1.001	1.000	1.000	1.000	1.000
5 Yr x Hi/Lo	1.554	1.051	1.000	1.000	1.008	1.000	1.006	1.008	1.000	1.000	1.000	1.000	1.002	1.002	1.004	1.004	1.004	1.002	1.004	1.002	1.000	1.000	1.000	1.000	1.000	NA	NA
All Yr x Hi/Lo	2.462	1.150	1.053	1.028	1.026	1.012	1.015	1.011	1.006	1.007	1.004	1.003	1.005	1.004	1.004	1.005	1.002	1.001	1.003	1.001	1.000	1.000	1.000	1.000	1.000	NA	NA
All Yr x 2 Hi/Lo	2.397	1.142	1.051	1.027	1.026	1.011	1.014	1.010	1.005	1.006	1.003	1.003	1.005	1.004	1.003	1.004	1.002	1.000	1.002	1.000	1.000	1.000	1.000	NA	NA	NA	NA	Tail
Selected	3.088	1.161	1.120	1.081	1.038	1.028	1.021	1.013	1.006	1.005	1.004	1.003	1.002	1.002	1.010	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

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Montana Petroleum Tank Release Compensation Board
Actuarial Reserve Study as of June 30, 2016
Claim Counts

Report Year	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	312	324	336
1989	-	1	1	6	10	11	13	14	15	18	19	19	19	19	19	19	20	20	20	20	20	20	20	21	21	21	21	21
1990	10	55	87	96	100	107	111	116	118	118	120	120	120	121	122	125	126	126	126	126	126	127	127	127	127	127	127	
1991	16	80	114	128	137	146	149	153	156	158	160	162	162	162	162	165	165	165	165	166	166	166	166	166	166	166		
1992	38	120	159	176	190	193	195	201	202	205	205	205	206	207	209	209	209	209	209	209	210	210	210	210	210			
1993	27	89	126	140	144	147	149	151	154	154	157	157	158	159	161	161	162	162	163	163	163	163	163	163				
1994	18	77	113	122	129	136	141	145	146	146	148	148	153	156	156	156	159	159	159	163	163	163	164					
1995	28	108	123	126	130	132	133	137	139	139	140	142	143	144	144	144	144	145	146	148	148	148						
1996	64	117	126	131	135	138	139	139	139	140	141	142	142	143	144	144	144	144	146	146	146							
1997	46	106	127	127	128	129	131	131	132	133	133	133	134	134	136	136	137	138	138	138								
1998	51	114	124	132	133	136	140	140	141	143	144	147	148	150	151	153	153	154	154									
1999	69	123	146	154	158	161	163	164	164	166	167	167	167	168	169	171	172	173										
2000	44	79	95	102	107	112	113	117	118	119	119	119	120	122	122	122	123											
2001	19	38	43	44	45	47	49	49	49	49	49	50	50	50	50	50												
2002	10	37	38	39	42	43	43	44	45	46	47	47	47	47	47													
2003	14	35	38	40	41	43	43	43	43	43	43	43	43	43														
2004	19	39	41	43	43	43	43	43	43	43	43	43	43															
2005	20	45	52	55	55	55	55	56	56	56	56	56																
2006	17	28	31	32	32	32	32	32	32	32	32																	
2007	17	35	40	40	41	41	42	43	43	43																		
2008	14	19	20	21	21	21	21	21	22																			
2009	7	18	19	19	19	20	20	20																				
2010	3	7	7	8	8	8	8																					
2011	10	18	20	20	20	20																						
2012	11	13	14	14	15																							
2013	9	13	14	14																								
2014	12	17	17																									
2015	7	17																										
2016	2																											

Montana Petroleum Tank Release Compensation Board
Actuarial Reserve Study as of June 30, 2016
Paid Frequency / Severity Bornhuetter-Ferguson Method

Report Year	LDM Ultimate	Reported Releases	Ind. Avg. Severity	Trended Severity	Detrended Severity	A Priori Ultimate	Percent Unpaid	Indicated Unpaid	Paid Loss	Indicated Ultimate	Ending Severity
1989	691,193	21	32,914	64,110	56,204	1,180,277	4%	45,395	664,608	710,004	33,810
1990	12,366,643	128	96,614	183,596	57,609	7,373,923	5%	352,670	11,775,188	12,127,858	94,749
1991	13,241,777	166	79,770	147,889	59,049	9,802,132	7%	642,219	12,374,199	13,016,418	78,412
1992	13,598,904	211	64,450	116,572	60,525	12,770,820	9%	1,133,989	12,391,385	13,525,374	64,101
1993	11,106,312	163	68,137	120,235	62,038	10,112,250	11%	1,068,604	9,932,662	11,001,265	67,492
1994	8,392,272	168	49,954	85,999	63,589	10,683,003	12%	1,278,002	7,388,309	8,666,311	51,585
1995	8,331,079	148	56,291	94,545	65,179	9,646,497	15%	1,423,985	7,101,272	8,525,257	57,603
1996	7,885,499	149	52,923	86,720	66,809	9,954,468	16%	1,614,460	6,606,594	8,221,053	55,175
1997	6,856,130	138	49,682	79,424	68,479	9,450,064	19%	1,767,316	5,573,921	7,341,238	53,197
1998	8,889,425	156	56,983	88,875	70,191	10,949,748	20%	2,233,092	7,076,515	9,309,607	59,677
1999	12,426,877	177	70,208	106,830	71,945	12,734,346	23%	2,880,671	9,615,759	12,496,430	70,601
2000	8,761,178	124	70,655	104,887	73,744	9,144,268	24%	2,237,166	6,617,736	8,854,902	71,410
2001	3,035,420	52	58,373	84,542	75,588	3,930,560	26%	1,030,733	2,239,425	3,270,158	62,888
2002	3,449,605	48	71,867	101,546	77,477	3,718,915	28%	1,049,173	2,476,409	3,525,582	73,450
2003	5,222,015	45	116,045	159,969	79,414	3,573,645	31%	1,099,266	3,615,703	4,714,970	104,777
2004	3,539,014	44	80,432	108,172	81,400	3,581,586	34%	1,207,666	2,345,703	3,553,369	80,758
2005	4,082,974	57	71,631	93,986	83,435	4,755,777	37%	1,746,736	2,583,350	4,330,086	75,966
2006	4,002,616	33	122,503	156,814	85,521	2,794,269	40%	1,111,699	2,410,177	3,521,876	107,789
2007	3,775,483	44	85,603	106,906	87,659	3,866,163	42%	1,642,291	2,171,711	3,814,002	86,476
2008	3,960,248	23	172,185	209,790	89,850	2,066,550	45%	927,344	2,183,127	3,110,471	135,238
2009	1,159,483	21	55,451	65,914	92,096	1,925,732	47%	905,801	614,100	1,519,901	72,688
2010	446,869	9	52,325	60,680	94,399	806,196	50%	400,168	225,058	625,227	73,209
2011	2,729,220	22	124,312	140,648	96,759	2,124,289	53%	1,127,354	1,280,831	2,408,185	109,690
2012	798,325	17	46,687	51,533	99,178	1,695,898	59%	1,002,860	326,240	1,329,100	77,727
2013	2,372,934	17	137,487	148,059	101,657	1,754,529	68%	1,188,678	765,292	1,953,970	113,213
2014	2,249,121	23	95,819	100,670	104,198	2,445,814	77%	1,879,369	520,891	2,400,260	102,258
2015	2,309,257	27	84,753	86,872	106,803	2,910,054	87%	2,533,789	298,583	2,832,372	103,952
2016	2,002,172	10	202,254	202,254	109,474	1,083,709	97%	1,052,628	-	1,052,628	106,334
Total	157,682,046	2,241	70,357			156,835,484		36,583,126	121,174,749	157,757,875	70,391

Selected Trend	2.5%

Average Severity	
5-Year Avg x 2016	105,556
04-15 Avg	110,837
04-15 Wtd	112,469
89-03 Avg	108,383
89-03 Wtd	109,906
All-Year Avg x 2016	109,474
Selected Avg	**109,474**

Notes;   Reported claim counts for years 2012-2016 are inflated to reflect anticipated late-reported claims

Montana Petroleum Tank Release Compensation Board
Actuarial Reserve Study as of June 30, 2016
Reimbursements Paid by Fiscal Year by Tank System

Fiscal Year	Type of Tank System				
	UST	AST	Both	No Record	Total
1990	239,020	10,076	-	-	249,096
1991	803,649	31,547	-	-	835,196
1992	1,881,770	53,287	-	-	1,935,056
1993	2,786,237	174,751	-	-	2,960,988
1994	3,128,552	351,623	-	-	3,480,175
1995	4,994,628	373,595	-	-	5,368,223
1996	5,020,182	444,957	-	-	5,465,139
1997	5,442,787	650,292	-	-	6,093,079
1998	5,130,706	238,827	-	-	5,369,533
1999	2,826,114	271,844	8,469	-	3,106,427
2000	4,274,934	916,721	1,557	-	5,193,212
2001	5,344,683	2,064,945	23,234	-	7,432,863
2002	4,367,994	1,056,020	15,895	-	5,439,909
2003	2,983,629	720,547	10,988	-	3,715,163
2004	3,792,796	988,336	12,195	-	4,793,327
2005	3,899,424	1,128,619	24,974	-	5,053,017
2006	4,490,173	1,049,205	5,512	-	5,544,890
2007	4,382,796	1,577,163	17,688	-	5,977,647
2008	4,000,508	2,389,145	16,976	-	6,406,629
2009	2,886,758	1,798,024	10,035	-	4,694,816
2010	3,217,489	760,275	2,057	-	3,979,821
2011	3,961,225	856,824	11,963	-	4,830,011
2012	3,252,928	741,300	1,288	-	3,995,516
2013	3,617,082	1,390,614	17,367	-	5,025,063
2014	3,580,990	1,851,727	164,871	2,738	5,600,326
2015	4,287,035	692,471	148,747	-	5,128,253
2016	2,924,159	544,243	12,477	20,496	3,501,374
Total	97,518,247	23,126,976	506,292	23,234	121,174,749

Montana Petroleum Tank Release Compensation Board
Actuarial Reserve Study as of June 30, 2016
Estimated Reimbursements by Fiscal Year by Work Plan Activity

Fiscal	Work Plan Activity Estimated Cost									
Year	GWM	WI	SB	SVE	SR	WA	OI	FPR	LF	AS
1999	2,920	4,104	3,980	-	-	-	-	-	-	-
2000	21,932	2,846	-	-	83,080	-	-	-	-	-
2001	429,542	-	16,665	37,157	191,254	-	-	1,700	2,428	-
2002	1,471,810	8,864	98,784	216,253	179,636	2,267	44,390	165,973	12,695	156,789
2003	2,672,622	24,445	318,616	354,759	1,452,644	5,758	46,255	129,456	5,479	167,230
2004	2,119,414	470,071	303,179	459,084	1,405,467	1,706	161,333	165,012	18,390	21,678
2005	1,940,509	721,996	656,496	398,076	1,502,828	5,375	108,529	87,865	62,756	191,978
2006	2,415,171	1,429,819	964,513	401,575	1,553,975	48,392	221,142	192,205	77,597	375,335
2007	1,873,560	1,293,978	441,132	352,581	3,350,344	25,544	134,979	175,384	125,496	213,633
2008	1,309,544	880,325	250,935	343,145	1,846,556	21,345	111,764	165,720	63,821	282,282
2009	935,303	641,635	154,153	334,468	915,712	49,744	149,565	157,281	11,306	269,173
2010	811,775	368,897	152,199	292,627	1,012,340	93,859	96,787	90,220	16,035	267,360
2011	757,550	287,549	188,912	172,843	1,492,396	51,030	156,280	116,054	8,039	167,031
2012	1,178,778	453,900	390,715	216,238	1,720,439	119,235	141,481	92,582	22,536	275,486
2013	1,494,272	941,387	637,344	287,191	2,255,039	118,203	400,510	163,974	48,262	268,161
2014	1,183,024	684,014	728,648	109,191	2,096,004	110,860	202,266	93,666	56,717	76,953
2015	1,164,382	457,378	405,166	201,715	2,208,150	77,718	327,623	104,670	37,999	133,943
2016	907,290	414,477	306,271	171,465	2,201,306	82,085	105,423	59,435	48,002	215,524
Total	22,689,397	9,085,685	6,017,708	4,348,367	25,467,170	813,122	2,408,328	1,961,195	617,557	3,082,555

Notes: Chart shows estimated costs by year for 10 most common work plan activities. Estimates are based on the cost per work plan and the anticipated long-term average cost for each work plan activity.

Early fiscal years have low payments due to lack of records of work plans.

The strategy codes listed are as follows:

GWM - Ground Water Monitoring

WI - Well Installation

SB - Soil Borings

SVE - Soil Vapor Extraction

SR - Soil Removal

WA - Well Abandonment

OI - Other Investigation

FPR - Free Product Recovery

LF - Landfarm / Landfill

AS - Air Sparging

Montana Petroleum Tank Release Compensation Board
Actuarial Reserve Study as of June 30, 2016
Anticipated Average Cost by Work Plan Activity

Activity	Number of Work Plans with Activity	Mean Cost By Work Plan	Std Dev By Work Plan	Mean Cost By Release	Std Dev By Release
GWM	2,882	$8,267	$214	$25,618	$662
WI	799	$11,617	$877	$16,635	$1,256
SB	590	$11,268	$847	$14,611	$1,099
SVE	386	$11,320	$1,138	$28,009	$2,816
SR	326	$81,037	$5,114	$95,372	$6,019
WA	324	$2,839	$179	$3,046	$192
OI	262	$9,668	$992	$13,331	$1,368
FPR	225	$9,410	$1,208	$20,358	$2,613
LF	140	$4,620	$1,178	$5,093	$1,298
AS	126	$23,886	$4,014	$45,601	$7,663

Notes: The strategy codes listed are as follows:
    GWM - Ground Water Monitoring
    WI - Well Installation
    SB - Soil Borings
    SVE - Soil Vapor Extraction
    SR - Soil Removal
    WA - Well Abandonment
    OI - Other Investigation
    FPR - Free Product Recovery
    LF - Landfarm / Landfill
    AS - Air Sparging