



Taylor & Mulder
Property and Casualty Consulting Actuaries

**Iowa Comprehensive Petroleum Underground Storage Tank Fund
Actuarial Reserve Study as of November 30, 2014**

February 2015



Taylor & Mulder
Property and Casualty Consulting Actuaries

10508 Rivers Bend Lane,
Potomac, MD 20854

t (301) 365-4800 f (301) 365-4882
e contact@taylorandmulder.com

w taylorandmulder.com

February 11, 2015

Mr. James Gastineau, CSP
Asst. Vice President
Aon Risk Solutions
2700 Westown Parkway, Suite 320
West Des Moines, IA 50266

Dear Mr. Gastineau,

Enclosed is the actuarial review of the Iowa Comprehensive Underground Storage Tank Fund as of November 30, 2014.

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 Fund 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. 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,

E. Toni Mulder, FCAS, MAAA, FCA

Daniel W. Lupton, FCAS, MAAA, MBA
Enclosures

**Iowa Comprehensive Petroleum Underground Storage Tank Fund
Actuarial Reserve Study as of November 30, 2014**

Contents

Executive Summary 3

 Purpose and Scope 3

 Conclusions..... 4

 Loss and Loss Adjustment Expense Reserve Adequacy..... 4

 Future Loss and Loss Adjustment Expense, Claim Severity, and Frequency..... 5

 Large Loss Claims 10

Recommendations..... 10

Claims Practices..... 12

 Reserving 12

 Claims Settlement 12

 Corrective Action Plans 13

 Subrogation..... 14

 Potential for Non-Covered Contamination 15

Background..... 15

Terms Defined 17

Report Distribution and Use 20

Conditions and Limitations..... 20

Actuarial Analysis.....	24
Sources of Data.....	24
Overall Methodology.....	24
Selection of Factors.....	24
Paid Development Method.....	25
Incurred Development Method.....	25
Methodology by Claim Type.....	26
Selections of Ultimate Losses.....	27

Executive Summary

Purpose and Scope

Taylor & Mulder, Incorporated (“T&M”) was requested by Iowa Comprehensive Petroleum Underground Storage Tank Fund (“the Fund”) to conduct an actuarial review of its loss reserves as of November 30, 2014. 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 Fund to conduct an actuarial analysis to include within its scope the following tasks:

- A review and opinion on the adequacy of current claim reserves,
- A review of current practices for establishing claim reserves, including recommendations, if any, regarding improvements,
- A projection of future claim liabilities, including an opinion on future claim severity and frequency, separately for each claim type, and
- An analysis of large loss claims, including:
 - Information on the typical lag time between the time a claim is open and the time it is identified as a “large loss claim,”
 - The history of losses and reserving practices on “large loss claims,” and
 - Information on how “large loss claims” are expected to impact the Fund’s future finances.

This report presents the results of those analyses. This report was prepared by:

- Evelyn Toni Mulder, FCAS, MAAA, FCA, Principal and Consulting Actuary
- Jane C. Taylor, FCAS, MAAA, JD, Principal and Consulting Actuary,
- Daniel W. Lupton, FCAS, MAAA, MBA, Vice President 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, Evelyn Toni Mulder, am Principal 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.

Conclusions

Loss and Loss Adjustment Expense Reserve Adequacy

T&M analyzed loss reserves for remedial, retroactive, innocent landowner, and reopened claims. The following chart shows the result of our analysis in these categories:

Iowa Comprehensive Petroleum Underground Storage Tank Fund Reserves as of November 30, 2014 (\$000s)			
Claim Type	Case Outstanding	IBNR Reserve	Total
Remedial	\$19,980	\$6,142	\$26,121
Retroactive	\$1,477	\$214	\$1,692
Innocent Landowner	\$4,808	\$1,527	\$6,335
Reopened Claims	\$377	\$344	\$721
Total	\$26,642	\$8,227	\$34,869

This table indicates that as of November 30, 2014, the total reserves for claims that have been reported to the Fund is \$26,642,000. This amount represents the case reserves, which are defined as the best estimate by claims personnel of the total amount required to close all currently reported claims. In addition to this amount, \$8,227,000 may be required to cover future development.

These projections of future development on known claims are based on patterns of development on known claims that the Fund has experienced in the past. In general, claims have a tendency to develop adversely over time as additional information on each claim becomes available and claims adjusters increase their estimates. Therefore, the ultimate cost to close all currently reported claims is estimated at \$34,869,000.

For more information, please note that the terms “IBNR Reserve” and “Case Outstanding” are defined in the **Terms Defined** section, below.

In our analysis of loss reserve adequacy, we observed that the estimated reserve levels at all evaluations are very accurate. While paid losses showed typical variability over time, the incurred losses were exceptionally stable, indicating that the claims adjusters are very accurate in estimating the ultimate claim costs very early on in the adjusting process. We note that the performance of the adjusters is well above the industry norms.

Our analysis was performed separately for two groups of claim types: innocent landowners and reopened claims in one group, and remedial and retroactive claims in a second group. These groups were selected based on an analysis of claim development patterns and claim severities for each claim type. In addition, we performed a secondary analysis using the combined losses for all categories of claims. We did this analysis to test the results of splitting out the individual claim categories. The results based on splitting the claims into two groups were very similar to the combined analysis, giving a greater degree of confidence in the ultimate reserve projections.

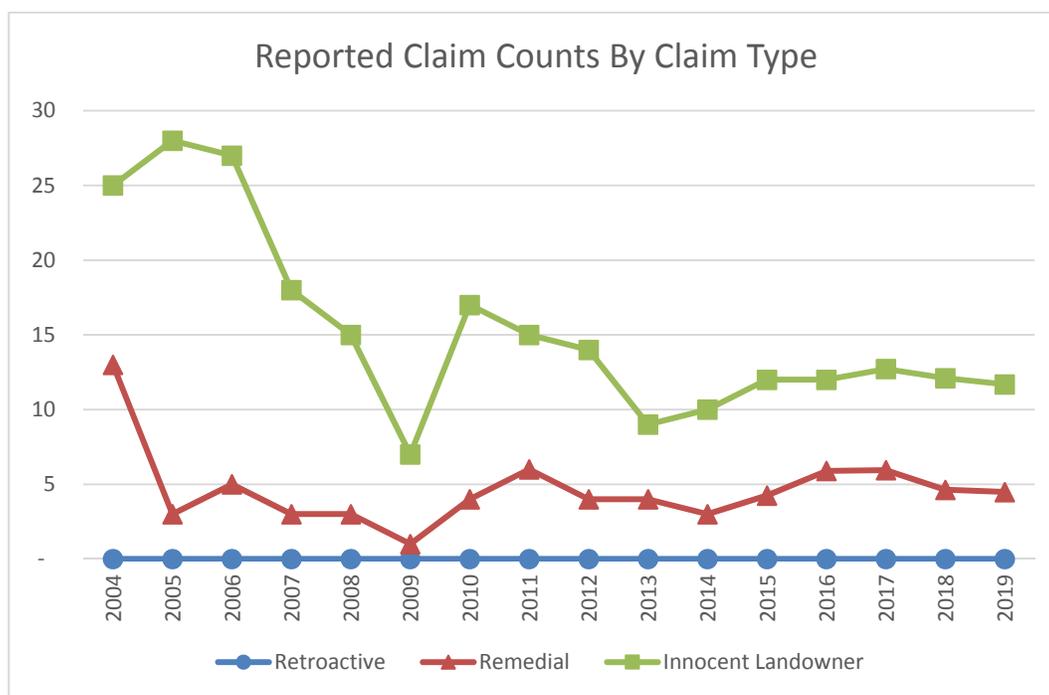
Future Loss and Loss Adjustment Expense, Claim Severity, and Frequency

T&M was asked to estimate costs for claims that will be reported in the remainder of the 2015 report year and subsequent years. It should be noted that in the charts below and in the report that follows, a report year is defined as the fiscal year ending in the given year. For instance, the 2015 report year includes claims reported between July 1, 2014 and June 30, 2015. Thus, as of the date of the evaluation of the data used in this study, November 30, 2014, five months of the 2015 report year have elapsed. As a result, not all claims in report year 2015 have been reported to the Fund as of the evaluation date of this study.

To perform this projection, T&M applied several methodologies to estimate future claim frequency and claim severity for each claim category. These projections included both projecting frequencies and severities for the remainder of the 2015 report year (i.e., from December 1, 2014 through June 30, 2015) and for the next four report years (2016 through 2019).

Projection of Frequency and Severity

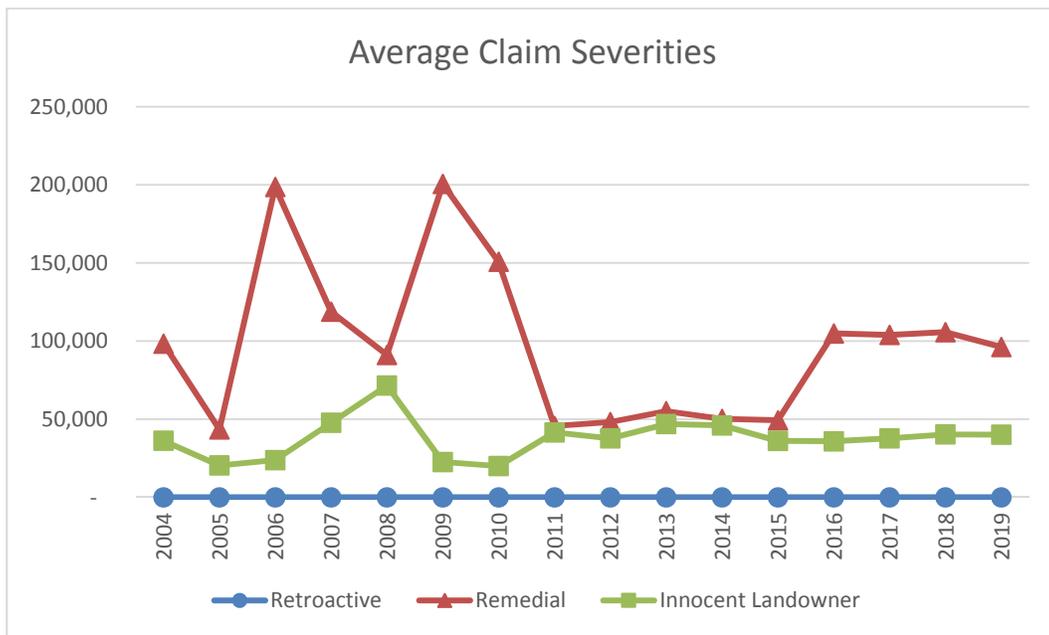
The following chart shows projected claim frequency by claim type over the next six years:



This chart shows the number of claims reported in each fiscal year. So for instance, 2013 represents the fiscal year ending June 30, 2013. As of the data date of the study, five months of the 2015 fiscal year has elapsed – the period from July 1, 2014 to November 30, 2014.

The number of Innocent Landowner claims experienced a modest decrease in 2013, and we anticipate the trend to continue to show a slight decrease or remain steady as the program continues. We also anticipate the number of new remedial claims (i.e., governmental claims) to also remain relatively stable. No new retroactive claims are possible due to statutory regulations.

The following chart shows severity projections over time by claim type:



This chart shows the average anticipated cost of closing claims. For instance, we anticipate that when all claims reported in the 2009 fiscal year are closed, the average cost of innocent landowner claims reported in that year will be \$23,292. By contrast, the average cost of closing remedial claims that were reported during that year will be \$189,431. This large number reflects the fact that only one remedial claim was reported in 2009, so there are fewer “normal-sized” claims to bring the average down. No new retroactive claims are anticipated, and as a result projections are \$0 for all years.

Remedial claim severity has been volatile as a result of the low claim volume relative to Innocent Landowner claims. To account for this high degree of variability, projections of future severities

tend to reflect average costs over a long period of time. Innocent landowner claim severity increases modestly over time, reflecting a small trend of increasing severity over the last ten years.

Projection of Future Cash Flows

Taylor & Mulder prepared projections of future cash flows.

Although the 2014 fiscal year is completed, the audited financial statements as of June 30, 2014 are not yet available. Therefore, financial information for 2014 was provided by Fund personnel. Projections of future years of revenues, administrative, and miscellaneous expenses are based on projections provided by Fund personnel.

The chart on the following page shows projected cash flows for three fiscal years, inclusive of a roll-forward to June 30, 2016:

Iowa Petroleum Underground Storage Tank Program
Reserve Study as of November 30, 2014
Projected Financial Position - Total All Lines

	Audited <u>2013</u>	Estimated <u>2014</u>	Projected <u>2015</u>	Projected <u>2016</u>	Projected <u>2017</u>	Projected <u>2018</u>	Projected <u>2019</u>
Revenues:							
(1) Total Revenues	\$14,330,105	\$14,621,919	\$14,584,744	\$14,621,919	\$14,659,397	\$14,794,798	\$14,975,996
Expenditures / Expenses:							
Administration							
(2) Administrator	(\$1,195,208)	(\$1,234,800)	(\$1,215,000)	(\$1,215,000)	(\$500,000)	(\$500,000)	(\$500,000)
(3) Attorney General, Auditor, Dept of Revenue	(\$94,563)	(\$61,695)	(\$90,000)	(\$90,000)	(\$90,000)	(\$90,000)	(\$90,000)
(4) Transfers to Other Gov. Agencies (DNR, IDALS,etc)	(\$494,106)	(\$2,000,174)	(\$650,000)	(\$650,000)	(\$650,000)	(\$650,000)	(\$650,000)
(5) Total Administration = (2) + (3) + (4)	(\$1,783,877)	(\$3,296,669)	(\$1,955,000)	(\$1,955,000)	(\$1,240,000)	(\$1,240,000)	(\$1,240,000)
Misc. Expenses							
(6) Contracts & Projects (Actury, Op Training & Closure Contract)	(\$96,666)	(\$312,053)	(\$920,000)	(\$900,000)	(\$900,000)	(\$100,000)	(\$100,000)
(7) Total Misc. Expenses = (6)	(\$96,666)	(\$312,053)	(\$920,000)	(\$900,000)	(\$900,000)	(\$100,000)	(\$100,000)
Claims Expenses							
(8) Innocent Landowner Claims	(\$1,105,387)	(\$2,573,386)	(\$1,728,416)	(\$835,425)	(\$792,953)	(\$770,877)	(\$723,121)
(9) Remedial / Retroactive Claims	(\$6,163,717)	(\$7,665,224)	(\$9,862,701)	(\$3,401,777)	(\$2,949,391)	(\$2,680,704)	(\$2,369,143)
(10) Other Expenditures / Expenses	\$0	\$0	(\$300,070)	(\$109,265)	(\$90,258)	(\$80,031)	(\$69,905)
(11) Total Claims Expenses = (8) + (9) + (10)	(\$7,269,104)	(\$10,238,610)	(\$11,891,187)	(\$4,346,468)	(\$3,832,601)	(\$3,531,612)	(\$3,162,169)
(12) Total Expenditures / Expenses = (5) + (7) + (11)	(\$9,149,647)	(\$13,847,332)	(\$14,766,187)	(\$7,201,468)	(\$5,972,601)	(\$4,871,612)	(\$4,502,169)
(13) Change in Net Position = (1) + (12)	\$5,180,458	\$774,587	(\$181,443)	\$7,420,451	\$8,686,796	\$9,923,186	\$10,473,827
(14) Fund Balance Beginning of Year	\$24,533,694	\$29,868,825	\$30,643,412	\$30,461,969	\$37,882,421	\$46,569,216	\$56,492,402
(15) Fund Balance End of Year = (14) + (13)	\$29,714,152	\$30,643,412	\$30,461,969	\$37,882,421	\$46,569,216	\$56,492,402	\$66,966,229

Notes: Audited financial statements as of June 30, 2014 are not available. Values shown are provided by Fund personnel.
Rows (1) - (7) provided by client.

Large Loss Claims

Large losses represent a significant portion of the Fund's liabilities. While our projections indicate that only approximately 3.3% of claims will become "large" claims (greater than \$250,000 in size), they may ultimately represent as much as 28.0% of the Fund's liabilities. This reflects the catastrophic nature of large claims. Claim sizes tend to be starkly divided between "normal" sized claims and fairly large claims. Claims of an intermediate size are fewer in number.

On average, claims that become large will have paid out over \$250,000 within the first 16.05 years of the life of the claim. This relatively long duration comports with expectations: claims that can be closed more quickly than 16 years will tend to be smaller, on average, whereas longer lasting claims will tend to be more expensive. Furthermore, this suggests a useful benchmark for claim severity: to the extent that a claim exceeds \$250,000 in losses ahead of schedule, that claim may be more severe than an average large claim which will take 16 years on average to reach that point.

Recommendations

1. Reserves for Low-Risk Sites

Sites that were assessed as having a low level of risk were historically reserved for based on DNR requirements requiring monitoring only for low risk sites. Nevertheless, some historically low-risk sites have been re-categorized as high-risk sites as classification standards have changed over time or as new data has been acquired. If this occurs, the claim reserve is adjusted to reflect the DNR requirement for that classification. Some low risk sites have also been considered for corrective action, as allowed based on 2010 legislation. To the extent that the Fund Board considers proposals for cleanup on these low-risk sites, the reserves for such sites may be inadequate to cover the

ultimate costs of such claims. Therefore, it may be necessary to revise reserve estimates for those low-risk sites where cleanup is considered possible.

2. Identification of Large Claims

Large claims, despite being a very small percent of total claims to the Fund, represent a large portion of the total liabilities to the fund. In general, the longer a claim is open, the more likely it is to become a large claim. One reason for this is that large claims may be more difficult to close, thus causing them to remain open for longer on average than normal-sized claims. Conversely, however, the longer petroleum remains on a site before remediation, the more the plume of petroleum has the potential to spread, potentially affecting groundwater or wells. It is therefore possible that taking efforts (i.e., expenses) to identify potential large claims early, along with mobilizing adequate resources to remediate such sites quickly, could reduce the ultimate liabilities to the Fund. We would therefore recommend further study to determine under what conditions a large loss is likely, as well as allocation of resources to help identify such large losses quickly and focus Fund resources on remediation quickly.

3. Identification of Potential Exposures

The extent of potential future exposures to the fund under the Remedial or Innocent Land Owners programs is not known at this time. For example, historical land use records may provide the Fund with the ability to estimate the number of former UST sites that could become liabilities to the fund in the future under the coverages it provides. If such information is accessible and not costly to obtain, identifying the number of such sites and their locations will be useful in estimating future costs to the fund and/or determining appropriate actions for the future of the Fund and the State.

Claims Practices

Administration for the Fund is provided by Aon Risk Solutions, though most claims administration tasks and reserving responsibilities fall to Cunningham Lindsey, acting as a subcontractor to Aon Risk Solutions. General administration of the fund is performed by Mr. James Gastineau, while reserving is performed by Mr. Steve Reinders. Mr. Dale Cira is the fund administrator. We met with Mr. Cira, Mr. Gastineau, and Mr. Reinders on January 5-6 to discuss their reserving practices as well as to review claim files. Our claim file review focused on particularly large claims, but included a mix of claim types, report dates, claim size, and closure dates.

Reserving

Reserving is performed when a claim is opened based on the anticipated ultimate cost of the claim and revised as expected costs change over the life of the claim. Reserves tend to be reevaluated approximately every six months on average.

Prior to 2010, the Fund didn't have the ability to perform corrective action on low risk sites. Due to legislative changes in 2010, corrective action at low-risk sites became permissible, and some low risk sites have received corrective actions. Reserves for low risk sites have tended to be lower, historically, reflecting the expectation that such sites were of low priority and per prevailing statute that only monitoring could be funded. In light of the recent change in law, however, Mr. Reinders and Mr. Gastineau stated that it is possible that low risk sites may be under-reserved on average.

Claims Settlement

Mr. Gastineau has indicated that settlement of claims has been attempted in some cases. However, there are cases in which the responsible party ("RP") is not the same as the claimant. In such cases, settling with the claimant carries no guarantee that the claimant will complete corrective actions. In this

situation, the DNR would not have legal recourse to force cleanup. As such, settling may not lead to corrective actions, which may mean that settlement would not completely eliminate the possibility that the Fund would have to pay for claims at a later date.

Corrective Action Plans

We reviewed claim files to determine the process by which corrective actions are performed. When corrective actions are required, a contractor submits a work plan and expected budget, which is reviewed by the claims administrators before proceeding. The approved budget and work plan are used, and if costs exceed the budgeted amount, they can be denied.

We did not observe much evidence of push-back on budgeted costs, although there were instances where it was clear that work plans had been revised in light of conversations with claims personnel. It was apparent that many of the contractors employed for corrective actions had been contracting with the Fund for a long period of time. Mr. Reinders confirmed that, due to the closeness of their relationship with many of the contractors, work plans and budgeted amounts tended to comport with what the Fund would be willing to approve.

When the program was started, claims personnel were required to collect three bids for every corrective action. However, due to the volume of claims in the program at this time, that would be onerous in the current system, and three bids are generally not pursued in an effort to promote faster turnaround of services. Instead, the Fund reserves the right to go out for competitive bid if a disagreement arises on price. We observed some instances in which claims personnel solicited multiple bids for corrective actions. Mr. Reinders indicated that even when competitive bids were not sought, the suggestion that multiple bids could be requested should a disagreement arise was probably adequate to keep costs in check.

Mr. Reinders indicated that the Board does not utilize a price schedule for different activities associated with corrective action. In states using a price schedule, there is a sense that contractors tend to find ways to increase costs unnecessarily outside of the price schedule. Alternatively, in states that use price ranges, quoted rates tend to be always at the high end of the acceptable range. Mr. Reinders indicates that an open system is more likely to generate competitive pricing.

Subrogation

Mr. Gastineau indicated that the Fund does not subrogate against contractors or manufacturers in general. However, the Fund will occasionally subrogate against a responsible party if there is evidence of commingled contamination, and a cost sharing agreement will be worked out between the fund and applicable insurance.

It is unclear under what circumstances a determination of commingled contamination might be made. The Fund does not test for tetraethyllead (“TEL”), which was banned in the US in 1996 and could be used to indicate the age of contamination. The fund does test for methyl tert-butyl ether (“MTBE”), which was in use from approximately 1979 to 2004-2006 in the United States (although it should be noted that MTBE contamination levels are not currently being used in assessing risks because no acceptable standards of MTBE target levels have been established in the state of Iowa.)

It is possible that opportunities for cost sharing with private financial responsibility mechanisms may be missed in some cases.

Potential for Non-Covered Contamination

There are several possible situations in which known contamination – even high-risk contamination – may go uncorrected in the state. For instance, claims occurring after 1990 that are denied by private market mechanisms may remain unaddressed. Also, if there is a claim covered under the program in which a responsible party is not available, a claimant is under no obligation to perform cleanups. In either case, even high-risk severe spills could remain untreated, in part because the DNR may not have the legal authority to force corrective actions.

A goal of the DNR is to protect human health and the environment. To the extent that non-covered petroleum contamination goes uncorrected in the state, the DNR is unable to pursue this goal. In light of this fact, legislative action may ultimately be required to address this serious problem. Nevertheless, it is important to note that this is not an explicit goal of the Fund at the present time.

Background

The Iowa Comprehensive Petroleum Underground Storage Tank Fund was established in 1989 under Iowa Code 455G “...to assist Iowa’s owners and operators of petroleum underground storage tanks in complying with federal environmental protection agency technical and financial responsibility regulations.”

Legislation has established several types of claims that are covered under the Fund. Remedial benefits are provided for releases reported to the Iowa Department of Natural Resources (DNR) before October 26, 1990 and to the Board before February 26, 1994. UST sites where the USTs were closed prior to July 1, 1985 or taken out of use prior to January 1, 1974 may be covered under the Innocent Landowner claims program. In addition, individuals who complied with all technical regulations but missed the original application deadlines may now be covered under the Innocent Landowners program.

Presently, the Board provides funding to governmental entities for properties acquired by eminent domain or through the tax deed processes. Governmental claims are also possible when petroleum contamination is encountered during work in utility right of ways. These claims are covered as remedial claims and are considered eligible regardless of the release report date.

The Iowa Comprehensive Petroleum Underground Storage Tank Fund pays costs for remediation subject to a maximum of \$1 million per release. The Fund only provides first-party coverage, and does not pay third-party liability claims or defense costs related to those claims. Cleanups are performed under Risk-Based Corrective Action Program (“RBCA”) standards.

Cleanup by the Fund requires the identification of a responsible party or an individual willing to claim the benefits of the responsible party. In some cases, a responsible party may not exist, and a claimant will be required to claim the benefits. In this case, the claimant may not be under legal obligation to proceed with cleanup. In other cases, a responsible party cannot be reached and no party is willing to accept Fund benefits. In such cases, the claim may be stalled until a responsible party is identified or a claimant agrees to proceed with the corrective action.

In addition to the statutory claims program, the Board provides funding to assist the DNR through the use of intergovernmental agreements. In one such agreement, the Board has retained the service of two environmental contractors to facilitate work on stalled claim sites and on DNR selected sites not eligible for benefits through a Board-administered claim program. As of November 30, 2014, there were 53 open claims designated USTCA claims which relate to work on selected stalled sites and non-eligible sites. It is anticipated that continued use of these contractors will be necessary to facilitate further work on the stalled sites and on the non-eligible sites in order to assist the DNR in meeting their goal of protecting human health and the environment.

Terms Defined

Case Outstanding Case Outstanding, also known as “Case Reserve” or “Outstanding Loss Reserve” (“OSLR”), represents the best estimate by claims personnel about the total amount of money required to close a currently open claim. In the case of the Fund, this amount does not include claim adjustment expense. The terms “Case Outstanding” or “Case Reserve” may sometimes be used to refer to individual claims and sometimes to the sum total of all claims.

As an example, if a claim is open as of November 30, 2014, and the Fund’s claim adjusters believe it will cost an additional \$50,000 to close that claim, then that is the case outstanding for that claim.

IBNR Reserve Incurred But Not Reported (“IBNR”), strictly speaking, is a reserve derived by actuaries for claims *not yet reported* to the Fund for which coverage has been provided and for which the Fund is responsible. Under this narrow definition of IBNR, claims-made policies would not have *any* IBNR, as all claims are known at the end of the policy period (or very soon thereafter). That is to say, because claims are covered based on the date on which the claim is *reported* to the fund, after the year is up, no more claims can be reported during that (previous) year. It would be impossible to learn in 2014 of a claim *reported* in 2013, because the claim would be known of when it was reported (by definition). Therefore, individual report years can have no new claims once they are over.

Compare this to the situation where claims are covered based on the date on which the claim *occurred* (which is called an “occurrence basis” rather than a “claims-made” basis) – in this case, even after the year is over, a claim may be discovered as having occurred in the previous year. For instance, a claim could be reported in 2014 where the release occurred in 2013.

Underground storage tank coverage is typically administered on a claims-made basis. Even if there are restrictions on when a claim must have occurred, claims are incurred based on when they are reported to the Fund.

Since the claims are on a claims-made basis, there is no IBNR under this “strict definition” of IBNR. However, the term IBNR for claims-made insurance may be used in a broad sense (sometimes called the “broad definition of IBNR”) to also include changes in incurred amounts (i.e., paid plus case reserves) for known claims. That is, although there may be no new claims *reported*, the estimates of amounts required to close all claims will change over time. The difference between the estimated ultimate total amount extra required to close all claims and the current case outstanding for all claims represents “development” on known claims – additional amounts above what is currently estimated to be required to close all claims – which is part of this broad definition.

Claim estimates done by a claim department must rely on information about the claim at a point in time. That information may be lacking in important details that will greatly impact the ultimate cost of the claim. Actuaries review aggregated claims data by year as it changes over time, from the first report of the claim to settlement. From this analysis, the actuary can calculate the amount by which claims typically develop over

time. For instance, historical data might reveal that a year after a claim is first reported, the typical level of case incurred losses (i.e., case outstanding reserves plus paid amounts) are 30% lower than the ultimate cost of the claim once it is closed. This allows us to produce an estimate of the ultimate cost of the claim by multiplying the current case incurred losses by 130%. The difference between estimated ultimate values and current case incurred is IBNR. In this example, if the claim has \$5,000 paid and \$5,000 in case outstanding, the case incurred is $\$10,000 = \$5,000 + \$5,000$. The estimated *ultimate* cost of the claim is $\$13,000 = \$10,000 * 130\%$, and the IBNR is therefore $\$3,000 = \$13,000 - \$10,000$.

Because coverage provided by the Fund is claims-made rather than occurrence, all references to IBNR in this report will refer exclusively to development on known claims unless otherwise noted.

LDF A Loss Development Factor (“LDF”) is calculated by an actuary from historical claim data and applied to current paid or incurred values to estimate ultimate claim costs for an insurer.

Frequency Frequency is generally defined as the average number of claims per unit of exposure. In the case of this analysis, exposure data was not available. As a result, future reported claim counts were estimated directly on the basis of historical claim counts.

Severity Severity is the average size of claim for a given collection of claims. For instance, if the total cost for three claims is \$45,000, the claim severity (average size of claim) is $\$45,000 / 3 \text{ claims} = \$15,000$ severity.

Report Distribution and Use

This report has been prepared for internal use by the management of the Fund and its board, their accountants, auditors, and attorneys. The Fund 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 Fund 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.

Fund claim reserving procedures and settlement philosophy, current and perceived social and economic inflation, current and future court and jury attitudes, legislative changes affecting the Fund, 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 Fund 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 Fund 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 Fund 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.

With regard to projections of estimated revenues, it should be understood that the revenue streams are subject to uncertainty. While we have used our best professional judgment in all instances, projections of future revenues are inherently uncertain due to potential changes in technology, the implementation of environmental requirements, the introduction of alternative vehicle fuels, and changes in the economy among others. While T&M has used its best judgment in selecting trend values for each category of revenue, actual revenue collected is dependent upon unknown future events and may be affected by additional factors outside of Fund control.

We did not independently verify the ability of the Fund to match this assumed rate.

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 Fund, 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 Fund 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

Loss run data was provided by Mr. James Gastineau and Mr. Steve Reinders. Loss runs included an evaluation as of November 30, 2014, as well as a transaction-level database covering the history of the fund. This allowed us to compile loss triangles on the basis of transaction dates.

Information about fund eligibility, governance and regulations, and administration of the fund was provided by Mr. Gastineau. Claims handling information was provided by interviews with Mr. Gastineau, Mr. Reinders, and Mr. Dale Cira, as well as through analysis of claim files on site. The Fund financial statement as of June 30, 2013 was provided by Mr. Gastineau, and copies of historical Fund financial statements as of June 30 for years 2005-2012 were obtained online. Financial projections, including revenues, administrative, and miscellaneous expenses, as well as financial values as of June 30, 2014, were provided by Fund personnel.

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 Fund'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 Fund 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.

Incurred Development Method

The incurred, or reported, development method is similar to the paid development method and uses historical reporting patterns to project actual reported amounts (excluding IBNR) as of a given evaluation date to ultimate. The difference between the projected ultimate losses and the losses paid through the evaluation date is the estimated reserve as of the evaluation date.

In many situations, the incurred development method is preferred over the paid method since large open but unpaid claims are considered. This method is more responsive to changes in the external business environment, since changes in liability laws, legislative changes affecting the Fund, court decisions and other external factors are generally reflected in the case reserves as soon as claims management becomes aware of them. As a result, the incurred loss development factors at each stage of development tend to be lower, and more stable, than those of the corresponding paid development method. However,

the incurred development method may be affected by changes in case reserving practices over time and, to a lesser extent, also may be affected by changes in claims settlement rates.

Methodology by Claim Type

Long-tailed lines of business have some important properties. These are lines of business for which claim payments can extend over a very long period (10 years or more) before closure. As claim payments are made over a long time horizon, the first few years after a claim is reported may have little or no actual claim payments. This produces relatively low paid losses at early maturities, and as a result, payment patterns can be strongly affected by small random fluctuations in payments from year to year.

The long payment pattern has a substantial effect on most categories of Fund claims. Paid losses at early maturities have shown extreme volatility, and as a result, paid losses have very low credibility (i.e., statistical stability) for some categories of claims.

By contrast, incurred losses have shown greater stability. When a claim is reported to the Fund, a reserve is established based on the expected ultimate loss for the claim. As the claim matures and losses are paid out, the incurred loss may be increased or decreased commensurate with the adjuster's interpretation of the ultimate value of the claim. In this case, the first estimate by the adjusters is close enough to the ultimate loss that development is low when compared to paid losses. Because development patterns for incurred losses were more stable over time, incurred loss development methods received greater relative weight in our analysis.

Incurred loss development, by contrast, is stable. Incurred losses do not undergo the same extreme changes as paid losses, making estimates from incurred losses more credible. In some cases, incurred loss development is modestly negative, implying that early reserve estimates are slightly over-stated. However,

these trends seem to reverse at later maturities, returning incurred losses on average to slightly higher than the initial reserves as of 12 months.

When relatively little credibility could be placed in the paid loss development patterns higher reliance was placed on the incurred loss development method.

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 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.