

**REPORT OF THE
SPECIAL RECLAMATION FUND
ADVISORY COUNCIL**

January, 13 2014



2013 SRF Advisory Council Annual Report

EXECUTIVE SUMMARY

The Special Reclamation Fund Advisory Council (the “Council”) was established by the Legislature in 2001 in order to ensure the effective, efficient and financially stable operation of the Special Reclamation Fund (the Fund). (W.Va. Code § 22-1-17). The Fund is designated by the Legislature for the reclamation and rehabilitation of lands subject to permitted surface mining operations and abandoned after 1977, where the bond posted is insufficient to cover the cost of reclamation. The Special Reclamation Water Trust Fund (SRWTF) was created “for the purpose of assuring a reliable source of capital to reclaim and restore water treatment systems on forfeited sites.” (W.Va. Code § 22-3-11).

The Secretary of the Department of Environmental Protection is required to conduct formal actuarial studies every two years and conduct informal reviews annually on the Fund and SRWTF.

The Fund is presently funded by a tax of 27.9 cents per ton of clean coal mined in West Virginia. From this revenue, funds based on a tax rate of 15 cents per ton are being paid into the SRWTF, while coal tax revenues based on 12.9 cents per ton are being paid into the Fund. According to W.Va. Code § 22-3-11, “Beginning with the tax period commencing on July 1, 2009, and every two years thereafter, the special reclamation tax shall be reviewed by the Legislature to determine whether the tax should be continued: *Provided*, That the tax may not be reduced until the Fund and SRWTF have sufficient moneys to meet the reclamation responsibilities of the state established in this section.”

The Council is also required to make a report to the Legislature every year on the financial condition of the Fund. (W.Va. Code § 22-1-17). The report is to include: “A

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recommendation as to whether or not any adjustments to the special reclamation tax should be made considering the cost, timeliness and adequacy of bond forfeiture reclamation, including water treatment [and] a discussion of the council's required study issues.”

In accordance with the statutory requirements, the Council submits the following:

- 1. Recommendation:** The Council recommends that the present 12.9 cent per ton tax dedicated to the Fund remain in force and that the tax dedicated to the SRWTF will remain at 15 cents per ton. The Council will closely review the Fund status between now and the next Actuary. The Council recognizes that water treatment liabilities may change radically in response to future interpretations of the State’s water quality standards. The Council thus further recommends that the State Legislature form a panel to examine the elements of our State code that result in these uncontrolled liabilities, how other states deal with such issues and finally to propose a State legislative initiative to rationalize water quality regulation to meet the conditions of the Federal Clean Water Act while adding rationality and certainty to the process.
- 2. Study issues:** Pursuant to W.Va. Code §22-1-17, the Council is also required to “Identify and define problems associated with the special reclamation fund.” The Council conducted multiple studies during 2013 to better assess the current and future financial condition of the funds and to improve upon water treatment technologies:

Studies conducted during the 2013 report period include:

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- a. Actuarial Valuation of the Special Reclamation Fund & Special Reclamation Water Trust Fund by Pinnacle Actuarial Resources, Inc.
- b. Consensus Coal Production Forecast for West Virginia: 2013 Update by Christine Risch from the Center for Business and Economic Research at Marshall University.
- c. An investigation to improve investment rates through the Board of Treasury Investments and the Investment Management Board.
- d. Aluminum Removal: Field Trails at WVDEP Special Reclamation Sites conducted by Dr. Paul Ziemkiewicz of West Virginia University Water Research Institute.
- e. Alternative Enforcement Evaluation by DEP.

Findings of these studies are outlined in the body of the report.

The Council recommends that the Legislature continue to examine the implications of the recent court rulings and subsequent lawsuit settlements on the Fund, Abandoned Mine Lands, and voluntary efforts by citizen-led watershed groups to address historic mining-reclamation related liabilities. The Council further recommends that the Legislature examine the mine reclamation and bonding programs of other states and as implemented in Tennessee by the federal Office of Surface Mining in order to determine if the statute and regulations creating the Fund and SRWTF in West Virginia have inappropriately structured SMCRA to assume long-term CWA liabilities. The Council further recommends the Legislature examine the separate and distinct authorities of the Clean Water Act (CWA) in assessing the eligibility of future forfeitures for transfer of liabilities to the SRWTF. The Council is concerned about default transfer of water

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treatment liability to the SRWTF when opportunities exist to pursue responsible parties under the CWA per the requirements of an NPDES (CWA Section 402) permit.

BACKGROUND ON THE SPECIAL RECLAMATION FUND

Article 1, Chapter 22 of the Code of West Virginia was amended by the West Virginia Legislature in 2001, creating an eight member Special Reclamation Fund Advisory Council (the “Council”) with the responsibility of ensuring the effective, efficient and financially stable operation of the Special Reclamation Fund. The legislation establishing the Council also increased the tax on clean coal mined in West Virginia, from three to seven cents per ton (the “Continuing Tax”), and levied an additional seven cents per ton (the “Temporary Tax”), to be deposited into the Fund. The revenues of the Fund were designated to pay for reclamation on post-1977 bond-forfeited sites.

The 2001 legislation provided for the Temporary Tax to be in effect for thirty-nine months. As a result of a 2005 actuarial report finding that the expiration of the Temporary Tax would result in nearly immediate insolvency of the Fund, the Temporary Tax was extended by the Legislature in 2005, for an additional eighteen months. A 2007 actuarial study commissioned by the Council found that the failure to extend the Temporary Tax again would result in insolvency for the Fund. Accordingly, in 2008 the Legislature, through SB 751, created the SRWTF and enacted a temporary, twelve month tax of 7.4 cents which was to be allocated between the Fund and a SRWTF. Twelve and nine-tenths cents was dedicated to the Fund and 1.5 cents was deposited into the SRWTF. An updated actuarial study in 2008 concluded that terminating the temporary tax would

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result in insolvency within a few years. In response, in the 2009 legislative session, the Legislature amended W.Va. Code § 22-3-11 to remove the expiration date for the Temporary Tax and provided instead for biennial review of the Tax by the Legislature. (Acts of the Legislature 2009, chapter 216).

Based upon projections under the 2011 Actuarial Valuation performed by Pinnacle Actuarial Resources, Inc. the Fund was found to be sufficiently funded under the existing 12.9 cent tax. However, the Council was concerned that as the SRWTF began making payments for water capital and ongoing water treatment in Fiscal Year 2019, as projected, the SRWTF would fall into a deficit position in the second year of operation-2020.” (2011 Actuarial Valuation, page 3). Declining coal production projected by the 2011 Consensus Coal Production Forecast, and the significant increase in water treatment costs resulting from court rulings in two cases, are contributing factors in the projected insolvency of the SRWTF. Accordingly, in 2012 the Legislature increased the special reclamation tax to 27.9 cents per ton, 15 cents of which was to be deposited into the SRWTF.

Membership Status of the Special Reclamation Fund Advisory Council

Christine Risch, Marshall University, Center for Business and Economic Research, serves as the Actuary/Economist member. Carolyn Atkinson serves as the member representing the Treasurer of the State of West Virginia. Dr. Paul Ziemkiewicz serves as the member representing the Director of the National Mine Land Reclamation Center at West Virginia University. Bill Raney serves as the member representing the interests of the coal industry. John Morgan serves as the member representing the

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interest of environmental protection organizations. Ronald Pauley serves as the member representing the interests of coal miners. The SRFAC member representing the interests of the general public is currently vacant.

FINANCES OF THE SPECIAL RECLAMATION FUND

This section of the Report to the Legislature outlines the financial status of the Fund for calendar year 2013 and provides comments regarding the future financial position of the Fund. The three key factors that have the most effect on the adequacy of the Fund are the coal production levels in West Virginia, the risk of future forfeitures, and the cost of reclaiming existing and future bond-forfeited sites.

To summarize the data and analysis that follow, it should be noted that the Fund will cover all costs for both land reclamation and water treatment through June 2018. Starting in July 2018, the SRWTF will begin covering the cost for water treatment—both water capital costs and ongoing water treatment costs.

The Fund is presently solvent and the funded status is projected by the 2013 Actuarial Valuation to be over 100 percent funded using a 20-year cash flow basis and 95.7 percent funded using a 35-year cash flow basis. The SRWTF is currently accumulating 15 cents per ton coal tax revenue and interest and is projected by the 2013 Actuarial Valuation to be 150.4 percent funded using a 20-year cash flow basis and 89.9 percent funded using a 35-year cash flow basis. It should be noted that even though the Fund is expected to carry a positive balance at the end of 20 years, the fund is projected to dip into a slight negative balance in 2018 prior to disengaging from covering the liabilities of the SRWTF in 2019. After 2018 the Fund is projected to add to its balance for a while before the impact of inflation and forfeiture activity outweigh the benefits of

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investment income and release activity. The Fund is projected to go back to a negative balance in 2038. Due to the increased expected revenue from the increased tax for water treatment, the Funded Status of the SRWTF has improved tremendously since the last report. The SRWTF is projected to have sufficient capital to operate until some point in 2038 before experiencing a deficit.

Since 2001, despite a very aggressive reclamation schedule, the Fund and SRWTF have been serving the people of West Virginia well through providing for the reclamation of bond-forfeited sites. At the time of the initial legislation in 2001, there were 392 forfeited permits requiring reclamation, including some requiring water treatment. Since passage of that legislation, an additional 177 permits have forfeited as well, bringing the total to 569 permits requiring reclamation. Of those, work has been completed on 466 permits. With regard to water treatment, the Fund is treating water at 130 sites and has an additional 68 sites under review or construction; 72 sites have been determined to have no conditions requiring treatment, or have completed treatment. As of September 30, 2013, the Fund had accumulated cash and investments totaling \$ 76.4 million while the SRWTF had accumulated \$26.4 million.

Graphic summaries of the status of the Funds as well as potential future concerns are outlined in the following figures. First, historical revenues are presented. Cash flow projections are included in the attached Pinnacle Actuarial Valuation.

The Fund cash flow projection presents the basis for the positive outlook regarding the long-term adequacy of the Fund. However, the SRFWTF cash flow projection shows that the SRWTF will fall into a deficit position in the twenty-fifth year of operation.

Closed Actuarial Valuation

The Council believes it is important to note that this Actuarial Valuation is a “closed” valuation in that it only considers liabilities associated with permits that have already been issued. The estimated Funds’ liabilities account for both known forfeitures and anticipated forfeitures from permits issued before July 1, 2013. Similarly, the revenue projections limit the expected coal tax revenues to the portion of the total expected coal tax revenues that are attributable to the permits issued prior to July 1, 2013.

Pinnacle prepared a measurement of current liabilities and assets in accordance with the guidance set out in Governmental Accounting Standard Number 10, an excerpt of which is:

State and local governmental entities other than public entity risk pools are required to report an estimated loss from a claim as an expenditure/expense and as a liability if both of these conditions are met:

a. Information available before the financial statements are issued indicates that it is probable that an asset had been impaired or a liability had been incurred at the date of the financial statements. It is implicit in this condition that it must be probable that one or more future events will also occur, confirming the fact of the loss.

b. The amount of the loss can be reasonably estimated.

It is Pinnacle’s position that the Fund should provide for liabilities on existing permits that may come under the responsibility of the fund. Permits that have not yet been issued are not the responsibility of the Fund until they become issued. While an

“open” study may provide some interesting information, it is not relevant in defining a liability as of a certain date.

The actual revenues to the Fund in future years will be a combination of receipts from permits issued prior to July 1, 2013 and those issued afterwards.

The future balance of the Fund is dependent on both the forfeiture rate of the currently issued permits and the prospective forfeiture of permits issued after July 1, 2013 combined with the tax revenue from all active and future permits.

Water Treatment Funding

Increased water capital cost and water treatment cost are the result of two identical lawsuits filed against the DEP. The northern and southern district courts entered into separate consent decrees in 2011 and 2012 respectively. As will be discussed later in this report, the DEP is now required to apply for and obtain NPDES permits for all the sites included in Attachment A of the consent decrees plus an additional 21 sites which were included in an earlier lawsuit. The DEP has obtained 101 NPDES permits as of September 30, 2013 and is on schedule to meet the requirements set under the consent decrees to have all draft NPDES permits issued by December 31, 2015. The DEP will be required to have draft permits issued for a total of 192 sites.

DEP estimates that it will cost approximately \$35.5 million to bring bond forfeiture sites into compliance with the more stringent water quality based effluent limits. Additionally, DEP estimates that it will cost approximately \$6.7 million to operate and maintain these treatment systems on an annual basis.

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The current main funding mechanism for bond-forfeited sites is the 27.9 cent tax per ton of clean coal mined. In 2008, the Legislature authorized, but did not separately fund, the Special Reclamation Water Trust Fund (“SRWTF”). In reliance on the SRWTF statutory authorization, beginning in July 2008, coal tax revenues based on a tax rate of 1.5 cents per ton were being paid into the SRWTF. In addition, coal tax revenues based on 12.9 cents per ton were being paid into the Fund. In 2012 the Legislature increased the amount dedicated to the SRWTF to 15 cents per ton, but based on the funded status of the Fund at the time the Fund remained at 12.9 cents per ton. Unless modified in response to future legislation, for budgeting and analysis purposes the DEP plans to continue paying all costs for both land and water reclamation work out of the Fund through FY 2018. Funding the water reclamation and treatment from the Fund will allow the SRWTF to build up assets, although it is not anticipated to be solvent without future continuing funding. The Council is continuing to look at alternatives for water treatment funding. The current balance in the SRWTF is \$26.4M as of September 30, 2013.

Figure 1

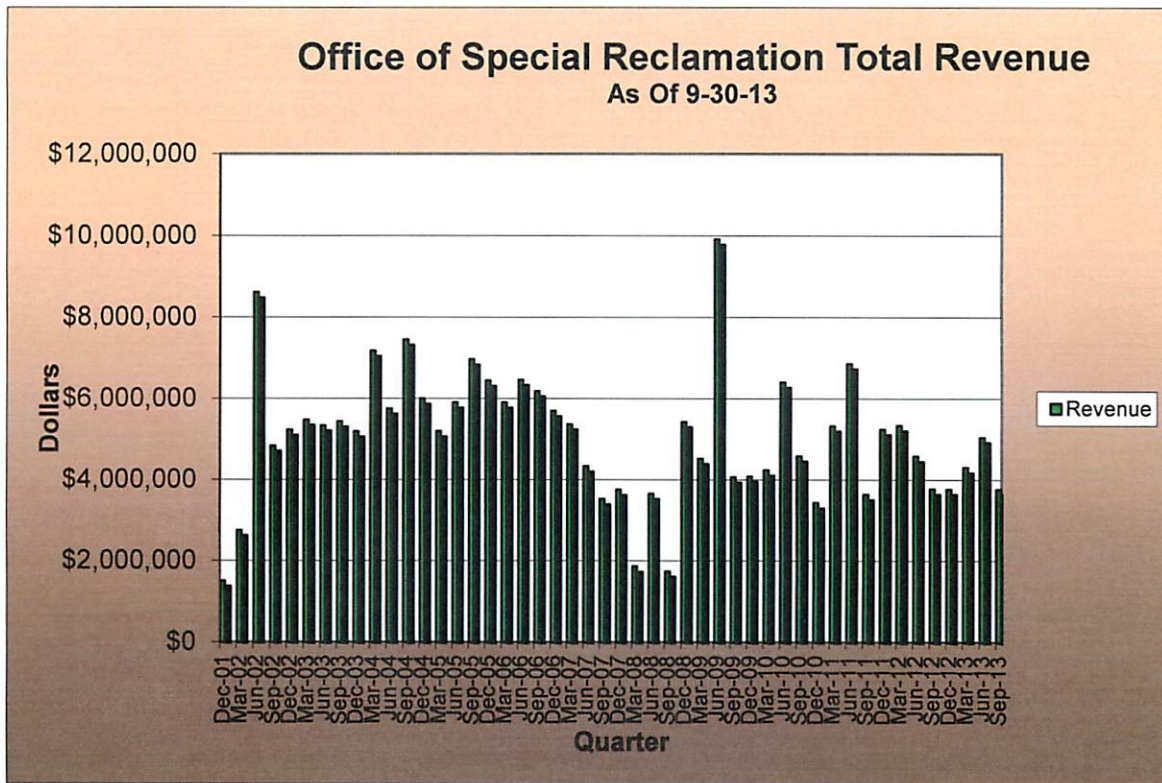


Figure 2

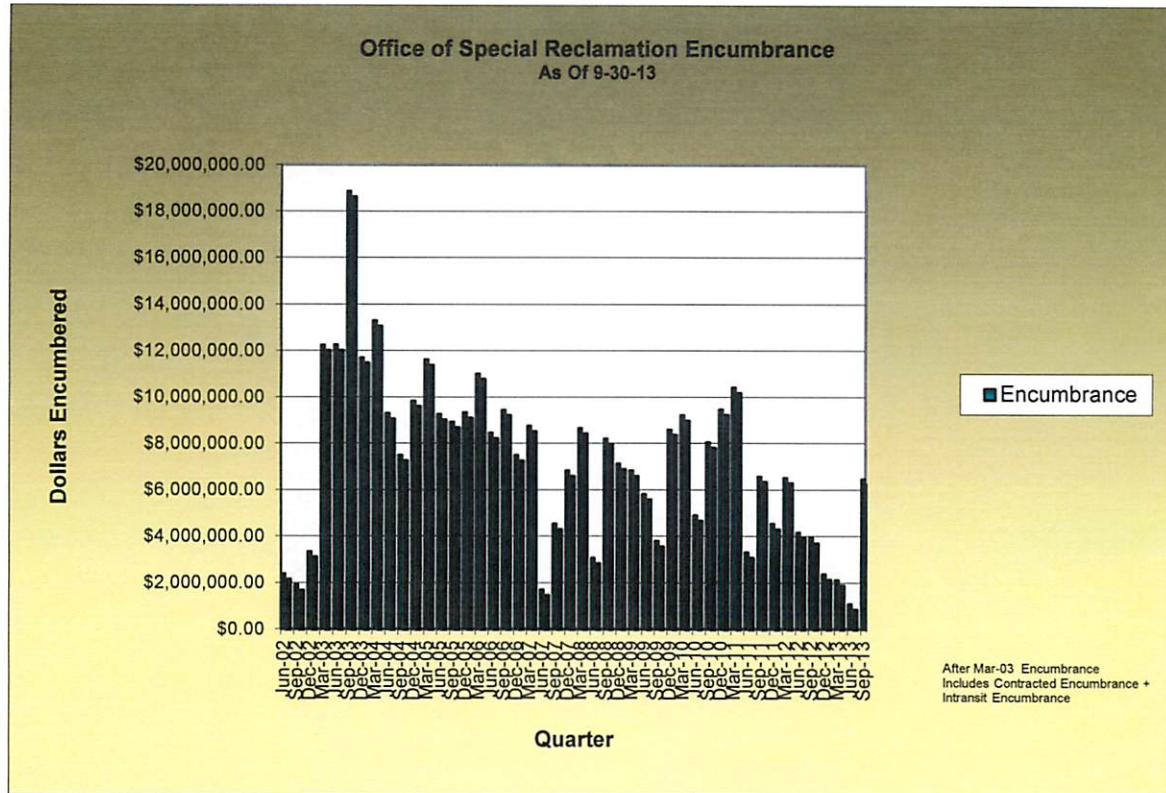
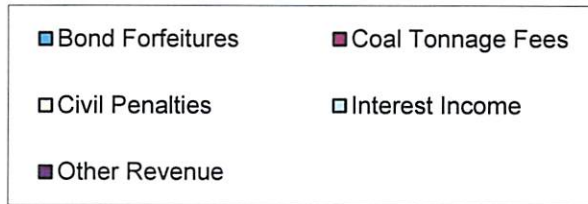
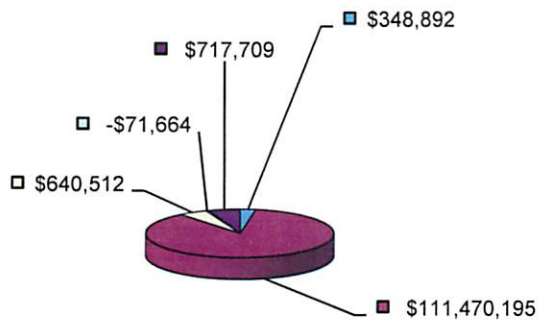


Figure 3. Revenue Sources



Study Issues

1. The Fund through FY 2018 and the SRWTF starting in FY 2019 has acquired liability for additional water treatment as a result of lawsuits filed against the DEP, as described below.

Identical complaints were filed in the Northern and Southern District Courts, Civil Actions No. 07-cv-87 (the “Northern District Case”) and No. 2:07-0410 (the “Southern District Case”), assigned to Judge Irene Keeley and Judge John T. Copenhaver, Jr., respectively. Both cases were styled *West Virginia Highland Conservancy and West Virginia Rivers Coalition v. Randy C. Huffman, Secretary, West Virginia Department of Environmental Protection*.

The two suits alleged that the West Virginia Department of Environmental Protection (DEP) had violated, and continues to violate, the federal Clean Water Act (the Act) by failing to obtain West Virginia National Pollutant Discharge Elimination System (WV/NPDES) permits when the Division of Land Restoration reclaims and treats water at bond forfeited sites as directed by state law. The Northern District Case named 18 specific bond forfeited sites and the Southern District Case named 3 sites.

On March 26, 2009, the Northern District Court entered summary judgment in favor of Plaintiffs in the Northern District Case, and granted a permanent injunction. The injunction requires DEP to apply for, process, and issue WV/NPDES permits to itself for the discharge into waters and streams of pollutants from the eighteen bond-forfeited, coal mining sites at issue in the case, whose reclamation the agency is required to manage. DEP appealed this decision to the United States Court of Appeals for the Fourth Circuit (“Fourth Circuit Court of Appeals”). By order dated November 8, 2010, the Fourth Circuit Court of Appeals affirmed the Northern District Court’s ruling.

Similarly, a motion for summary judgment in the Southern District Case was granted by Order dated August 24, 2009. The Southern District Court found that the Secretary of the DEP was “in violation of the National Pollutant Discharge Elimination System permitting requirements of the Clean Water Act.” The Southern District Court ordered the Secretary to “apply for, and obtain, NPDES permits for all sites at issue in this action,” and the parties subsequently submitted a joint stipulation agreeing to the

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same injunctive relief and timeframes for compliance set forth in the Northern District litigation. The Southern District Court entered final judgment August 31, 2010.

On January 11, 2010, the same Plaintiffs (West Virginia Highlands Conservancy and West Virginia Rivers Coalition) and the Sierra Club submitted a letter giving DEP notice of their intent to sue DEP regarding discharges from 131 additional bond forfeited sites on the same legal basis as the previous suits. Based on the outcome of the previous litigation, DEP engaged in settlement negotiations with the Plaintiffs and reached agreement regarding the permitting of the 21 sites in the previous litigation and the additional 131 sites. In August 2011, the Plaintiffs filed two new suits regarding the additional sites, *West Virginia Rivers Coalition, et al v. Huffman*, Civil Action No. 1:11-cv-118 (N.D. W.Va.), and *West Virginia Rivers Coalition, et al v. Huffman*, Civil Action No. 2:11-cv-524 (S.D. W.Va.), and lodged a proposed Consent Decree with both courts. The Northern District Court entered the Consent Decree on October 12, 2011. The Southern District Court entered the Consent Decree February 10, 2012. A list of all bond forfeited sites at issue in all four suits is attached to the Consent Decree as Attachment A.

The Consent Decree resolves all four suits filed by the Plaintiffs regarding bond forfeited sites. The Consent Decree requires DEP to obtain WV/NPDES permits for all 21 bond forfeiture sites cited in the initial litigation by September 1, 2011. Thereafter, DEP will issue draft WV/NPDES permits for 50 additional sites by the end of each calendar year, beginning in 2012. The Consent Decree requires DEP to issue draft WV/NPDES permits for all bond forfeited sites listed in Attachment A to the Consent Decree by December 31, 2015. As required by the Consent Decree on July 2, 2012 DEP submitted a Final Treatment Cost Report to Plaintiffs and SRFAC, in which DEP determined the capital cost and annual operating and maintenance costs for water discharges from each bond forfeiture site to meet applicable water quality based effluent limitations. The DEP estimates these costs will amount to \$35.5 million for one-time capital construction costs and over \$6 million in annual operations and maintenance costs.

Further, a third case presents potential for future litigation, should the legislature not adequately fund the Fund and SRWTF. *West Virginia Highlands Conservancy v. Secretary Salazar, DOI*, Civil Action No. 2:00-1062 (S.D. W.Va.). The West Virginia

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Highlands Conservancy (WVHC) had filed a motion with the U.S. District Court for the Southern District of West Virginia to reopen the case and schedule further proceedings on the grounds that the recommendations of the Special Reclamation Advisory Council were not being followed with regard to funding the Special Reclamation Fund. Based upon the Legislature's extension of funding through the Continuing and Temporary taxes, the case was placed on the court's inactive docket as of May 2008; however, the court allowed the possibility of a renewed motion if the Legislature does not continue to provide sufficient monies for the Fund to remain solvent.

In March 2011, the WVHC moved once again to have the litigation reopened alleging continuing problems with the Fund. A status conference was held on August 5, and the court ordered the filing of a joint status report. On August 25, 2011, the WVHC and the Defendants filed a joint status report with the court. The WVHC stated that the court should not delay reopening the case until the new actuarial report and Advisory Council recommendations are issued, whereas the Defendants recommended that it was premature for the court to reopen this matter prior to the close of the 2012 legislative session.

2. Actuarial Valuation of the Special Reclamation Fund & Special Reclamation Water Trust Fund by Pinnacle Actuarial Resources, Inc.

Except as noted below, there were no major changes to the methodologies or assumptions in this year's report compared to the one conducted in 2011.

- Release rates were reviewed and, with minor exceptions (underground sites), kept the same as in the prior analysis.
- Forfeiture rates were reviewed and kept the same as in the prior analysis.
- Investment rates were reviewed and adjustments made in keeping with current listings of recent West Virginia State investment pools, U.S. Treasury rates and segmentation between the Fund and SRWTF. In addition, investable amounts were restricted within each fund to allow for liquidity in paying ongoing expenses.
- Inflationary cost trends have been lowered based on historical data.
- Discount rates adjusted to reflect selected investment rates.

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- Water treatment costs were based on DEP estimates as opposed to the special study done two years ago when the new standards from the NPDES were coming into effect.
- Administrative cost estimates increased based on historical data.

These changes and the impact are described in more detail in the text of the report which can be found in Appendix C.

3. Consensus Coal Production Forecast for West Virginia: 2013 Update by Christine M. Risch from the Center for Business and Economic Research at Marshall University.

This report describes the results of the 2013 Consensus Coal Forecast conducted by the Marshall University Center for Business & Economic Research for the Special Reclamation Fund Advisory Council. The report begins with a brief summary of recent trends in West Virginia (WV) Coal Production and then describes each of the four component forecasts used to develop the Consensus Forecast.

The 2013 West Virginia Consensus Coal Forecast figures are somewhat higher than the 2012 Consensus. A primary reason for this is the vacating of the CSAPR, which caused EIA to raise their 2013 projections for Appalachian coal production and to reduce projections for Western coal production throughout much of the forecast time period. The CSAPR had limitations on emissions trading that forced emissions reductions in all states, as well as lower emissions caps and more rapid phasing in of those caps (Energy Information Administration 2013). This factor outweighs the lower forecasted natural gas prices expected to be delivered to the electric power sector compared to the 2012 AEO.

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As the EIA is the dominant forecast utilized to construct the Consensus, its assumptions heavily influence forecast production levels.

4. Investigation to improve investment rates through the Board of Treasury Investments and the Investment Management Board.

In May of 2013, following numerous discussions between DEP personnel and members of the Investment Management Board and the Board of Treasury Investments, the Council was updated on various investment options and made the following recommendations:

The first recommendation is two parts:

1. That the current balance of the Water Quality (WQ) Trust Fund and all additional revenue of the WQ Trust Fund through Fiscal Year (FY) 2018 be invested in the Investment Management Board (IMB) fixed income pool until FY 2019.
2. That DEP develop plans to maximize the return on investment for future WQ Trust revenue.

The second recommendation is also two parts:

1. That the current balance of the Special Reclamation (SR) Fund be invested in the West Virginia (WV) short term bond pool with the exception of \$5 million which should remain in the WV money market pool.
2. That DEP develop plans to maximize the return on investment for future SR Fund revenue.

In October of 2013 the balance of \$28 million from the SRWTF was transferred to the Investment Management Board Fixed Income Pool.

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In June of 2013, with the exception of \$5 million, the balance of the Fund was transferred to the WV Short Term Bond Pool.

The current rate of return for the Fund in the Short Term Bond Pool is about 0.526%, and for the Money Market Pool the rate is about 0.13%

The Fund was earning 0.125% just prior to the transfer. The anticipated rate of return for the SRWTF is approximately 5.6%

5. Aluminum Removal: Field Trials at WVDEP Special Reclamation Sites conducted by Dr. Paul Ziemkiewicz of the West Virginia University Water Research Institute.

The West Virginia Department of Environmental Protection Office of Special Reclamation (WVDEP OSR) are required to obtain National Pollutant Discharge Elimination System (NPDES) permits for water discharges from some of its AMD treatment systems at bond forfeiture (BF) sites. Total aluminum discharge limits of 0.750 mg/L and 0.087 mg/L for discharges into non-trout and trout waters respectively are anticipated. Many of the state's BF sites experience intermittent aluminum discharges above these levels utilizing their existing treatment systems. In an effort to assist the WVDEP OSR determine plausible options for reducing aluminum concentrations from these sites, a field study was conducted using portable treatment units on the discharge side of existing BF treatment facilities.

Existing treatment systems at each of these locations consist of introducing either calcium hydroxide or calcium oxide followed by a series of settlement ponds. The *objective* of this field study is to identify cost-effective and efficient treatment methods to reduce total aluminum in the discharges from BF sites to a level that will meet anticipated

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NPDES permit requirements. Three tanks were set up at the selected locations and filled with three media: stainless steel wool, bio-blocks, and fiberglass insulation. Effluent from the treatment systems was introduced to the tanks at a flow rate of approximately 2 gpm. Effluent sampling was conducted every two weeks.

Results of the field trials indicate that stainless steel wool would be an effective end of system treatment for maintaining compliance at BF sites. The technology would be improved by scaling up to operational levels and fine tuning to identify optimal design and operating conditions. Since the media is not consumed, the only maintenance requirement would be to periodically remove/flush accumulated sediment.

The entire report can be found in Appendix C

6. Alternative Enforcement Evaluation by DEP.

The DEP has begun to re-examine previous bond forfeitures to determine whether there are any persons or entities who may have liability for some or all of the Special Reclamation Fund's reclamation and water treatment costs from whom the DEP could pursue cost recovery. Initially, the DEP has identified the twenty largest Special Reclamation liabilities and referred these to OSM for assistance in investigating and identifying persons who controlled the companies which forfeited these bonds. OSM has provided the DEP with preliminary results for the first two of its investigations. The DEP has assigned legal counsel from its Office of Legal Services to review these preliminary investigations to determine whether any person/entity identified is worth pursuing. As investigations are conducted, the DEP will also be providing feedback to OSM to help OSM perform work that will be of the greatest value to the DEP.

The DEP also monitors and participates in bankruptcy proceedings of permit holders to, among other things, reduce or avoid revocation of permits that have reclamation liabilities in excess of the bond amount. By participating in a bankruptcy proceeding, DEP is sometimes able to encourage/facilitate the transfer (to a capable

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party) of sites with reclamation liability in excess of the bond amount. Other agency efforts in bankruptcy proceedings include filing and pursuing claims for reclamation costs and penalties, objecting to proposed sales or abandonments structured to avoid reclamation liability, collecting bonds and seeking recovery of reclamation costs, objecting to plans filed by debtors, persisting in informing those involved in the proceeding that a debtor must comply with environmental laws, and continuing to enforce environmental laws through the exercise of police powers, notwithstanding the bankruptcy “automatic stay”.

Special Reclamation Fund Advisory Council Recommendations to the Legislature

Based upon conclusions drawn from information included in this report, the Council makes the following recommendations to the Legislature:

The Council recommends that the present 12.9 cent per ton tax dedicated to the Fund remain in force and that the tax dedicated to the SRWTF will remain at 15 cents per ton. The Council will closely review the Fund status between now and the next Actuary. The Council further recommends that the State Legislature form a panel to examine the elements of our State code that result in these uncontrolled liabilities, how other states deal with such issues and finally to propose a State legislative initiative to rationalize water quality regulation to meet the conditions of the Federal Clean Water Act while adding rationality and certainty to the process.

The Council recommends that the Legislature continue to examine the implications of the recent court rulings and subsequent lawsuit settlements on the Special Reclamation Fund, Abandoned Mine Lands, and voluntary efforts by citizen-led watershed groups to address historic mining-reclamation related liabilities. The

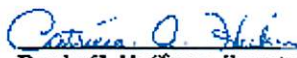
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Council further recommends that the Legislature examine the mine reclamation and bonding programs of other states and as implemented in Tennessee by the federal Office of Surface Mining in order to determine if the statute and regulations creating the Fund and SRWTF in West Virginia have inappropriately structured SMCRA to assume long-term CWA liabilities. The Council further recommends the Legislature examine the separate and distinct authorities of the Clean Water Act (CWA) in assessing the eligibility of future forfeitures for transfer of liabilities to the SRWTF. The Council is concerned about default transfer of water treatment liability to the SRWTF when opportunities exist to pursue responsible parties under the CWA per the requirements of an NPDES (CWA Section 402) permit.

As a partial alternative to fully funding the SRWTF through a future increase in the tax, the Special Reclamation Fund Advisory Council recommends that, if possible, the Legislature commit a portion of excess coal severance tax or other revenues to the SRWTF, so it can begin to build value and help offset the cost of future water reclamation and ongoing treatment.

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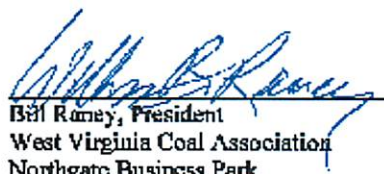
Special Reclamation Fund Advisory Council
Annual Report to the Legislature
January 1, 2014


Randy C. Huffinan, Secretary DEP
Ex Officio
Designee: Patricia Hickman
Director, Division of Land Restoration
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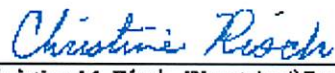

John D. Perdue, Treasurer
Designee: Carolyn Atkinson
Deputy Treasurer for Unclaimed Property
WV State Treasurer's Office
One Players Club Drive
Charleston, WV 25311


Paul Zickiewicz, Director
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Appendices for 2013 SRF Advisory Council Annual Report
(All Appendices as of 9-30-13)

A. OSR Graphs:

Total of Land and Water Permits Scheduled by Quarter

Land Permits To Be Contracted

Land Liabilities To Be Contracted

Permits Forfeited Since 6-30-01

Reclamation Projects Started Since 6-30-01

Contract Dollars Encumbered

Cash Balance

Total Revenue

Revenue by Source: Cumulative Bond Collected, Civil Penalties, Tax

B. OSR Estimated Land Liability-WQ Capital Dollars vs. Contract Amount

C. Reports Commissioned by the Council

Report for the WV Department of Environmental Protection

Office of Special Reclamation

Actuarial Valuation of the Special Reclamation Fund and Special

Reclamation Water Trust Fund

Actuarial Analysis as of June 30, 2013

By Pinnacle Actuarial Resources, Inc.

Consensus Coal Production Forecast for West Virginia: 2013

By Christine M. Risch Center for Business & Economic Research

Marshall University, July 31, 2013

Aluminum Removal Report, 2014 by Paul Ziemkiewicz

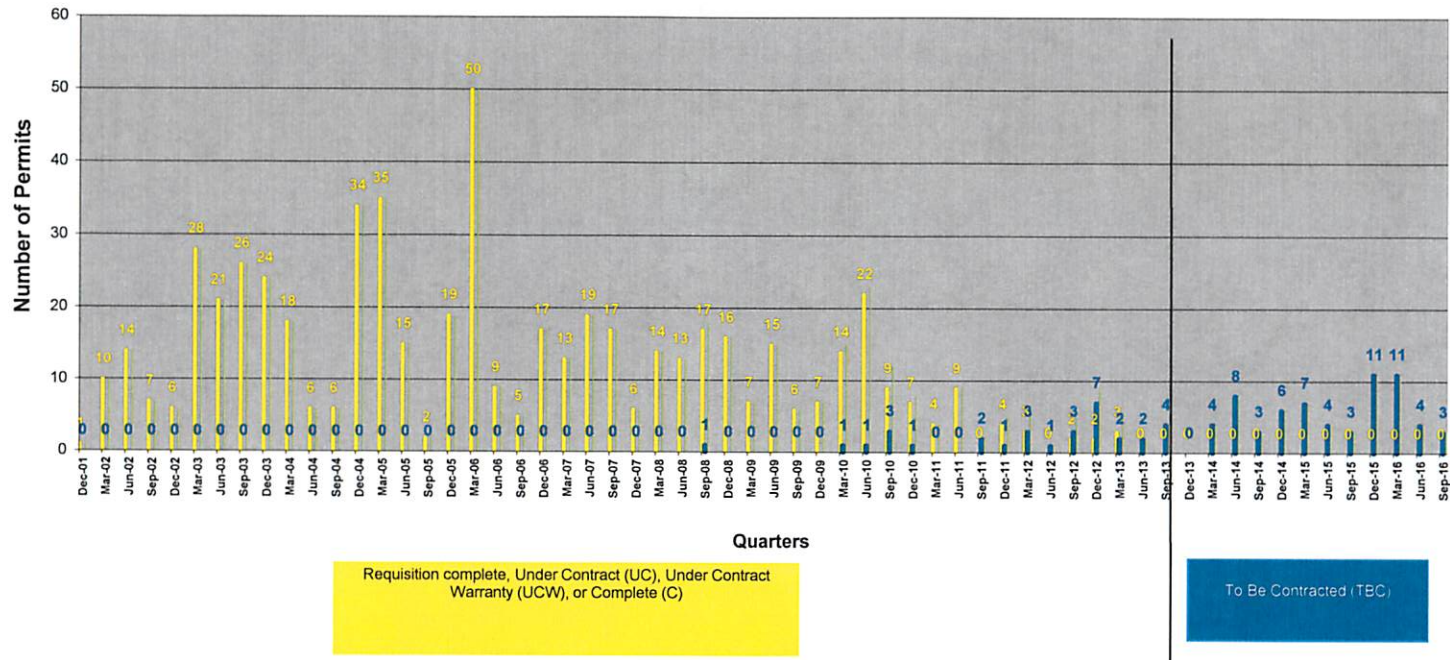
West Virginia Water Research Institute

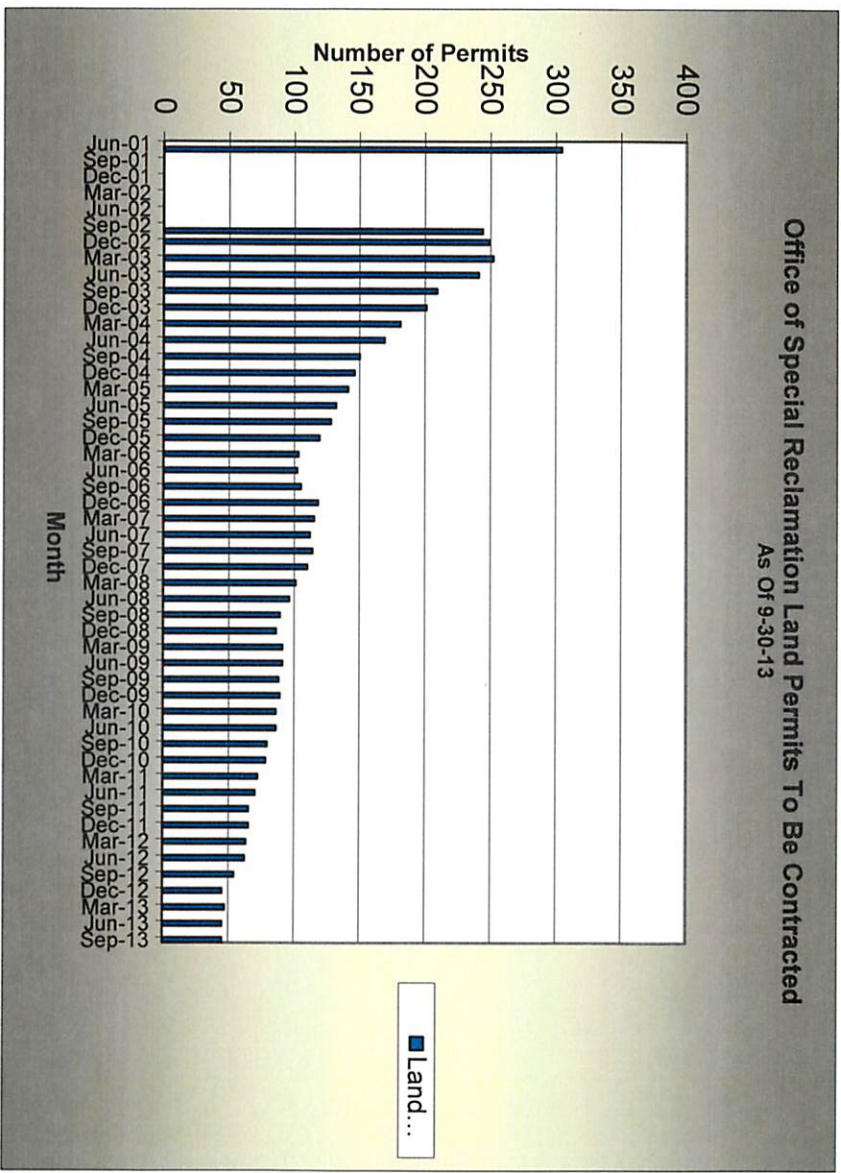
West Virginia University

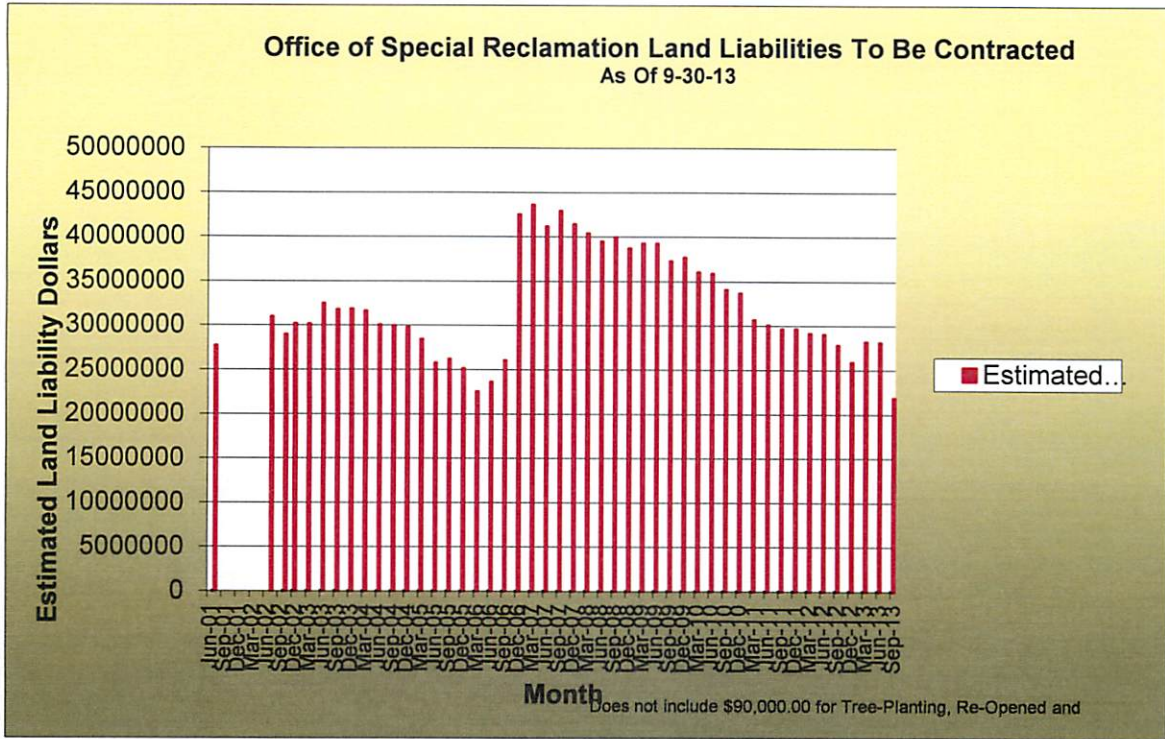
Appendix A

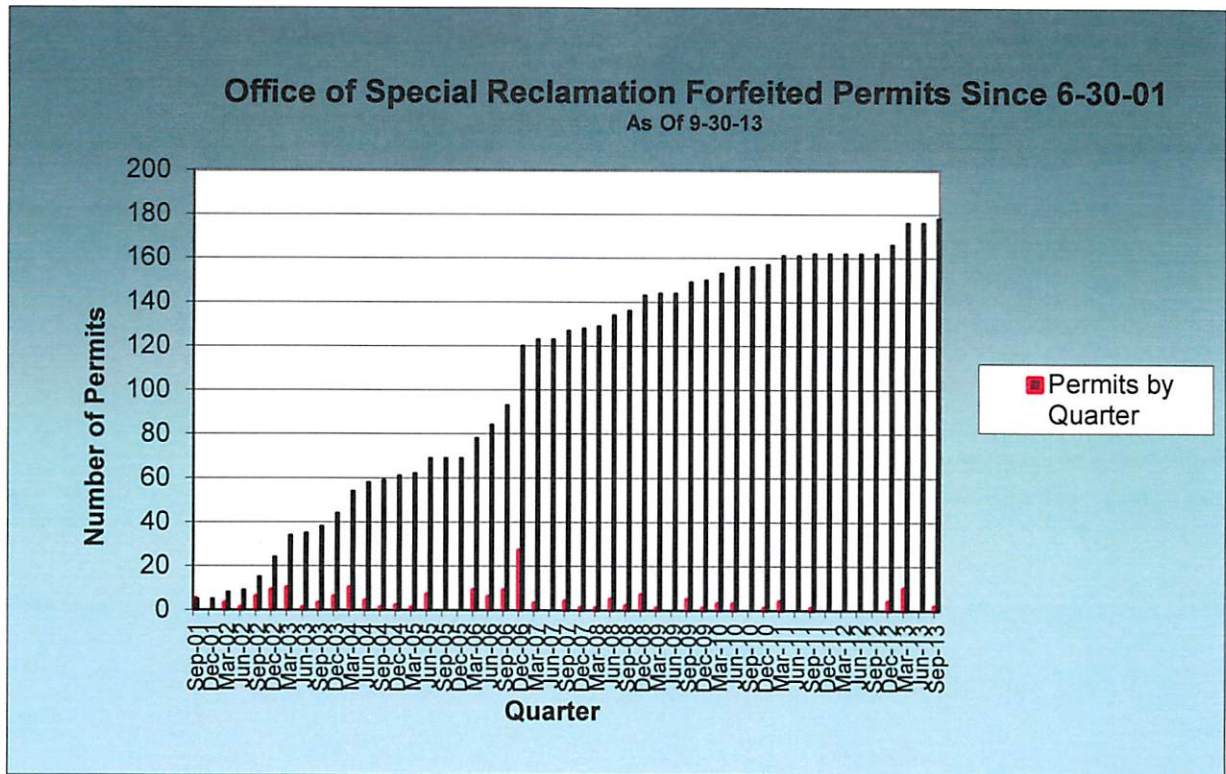
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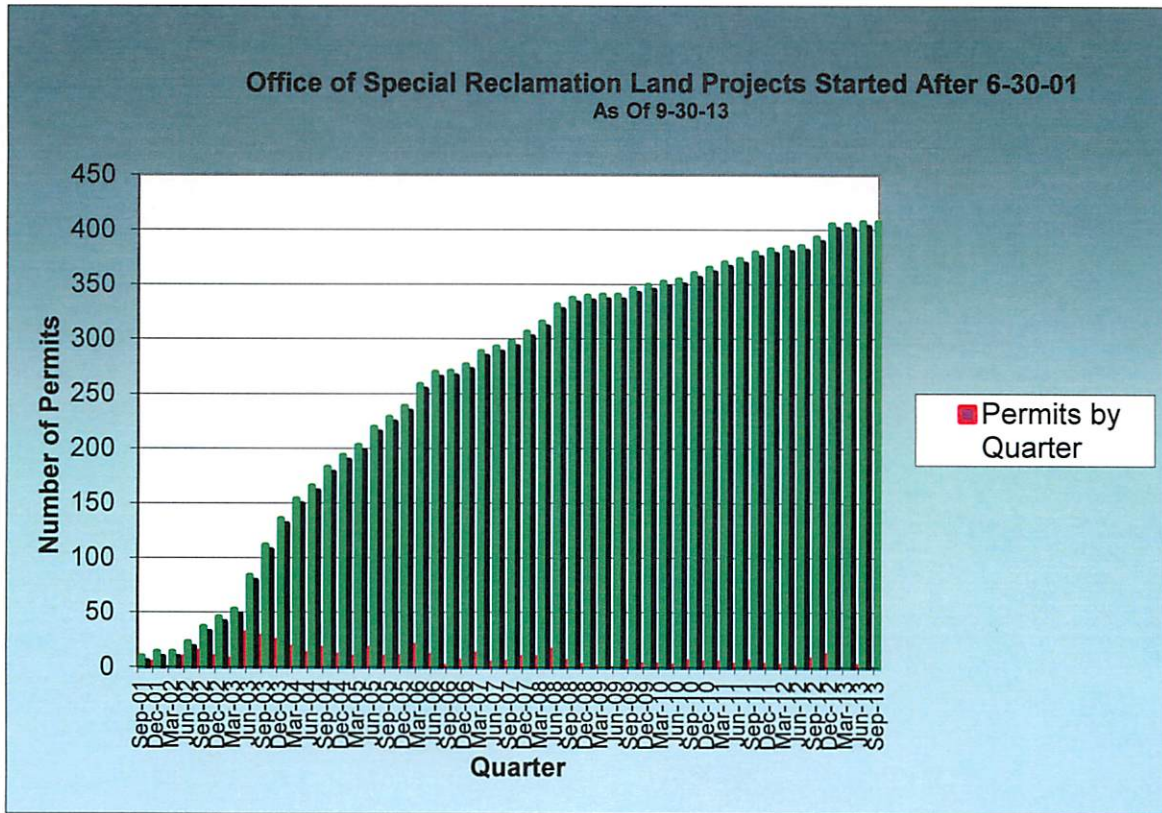
Total of Land and Water Permits Scheduled by Quarter
As Of September 30, 2013





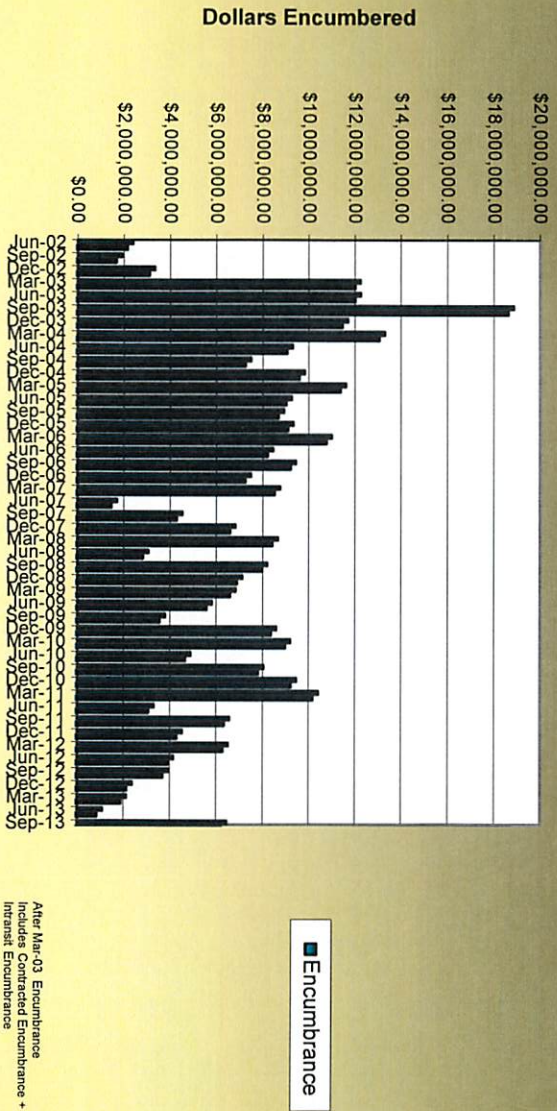




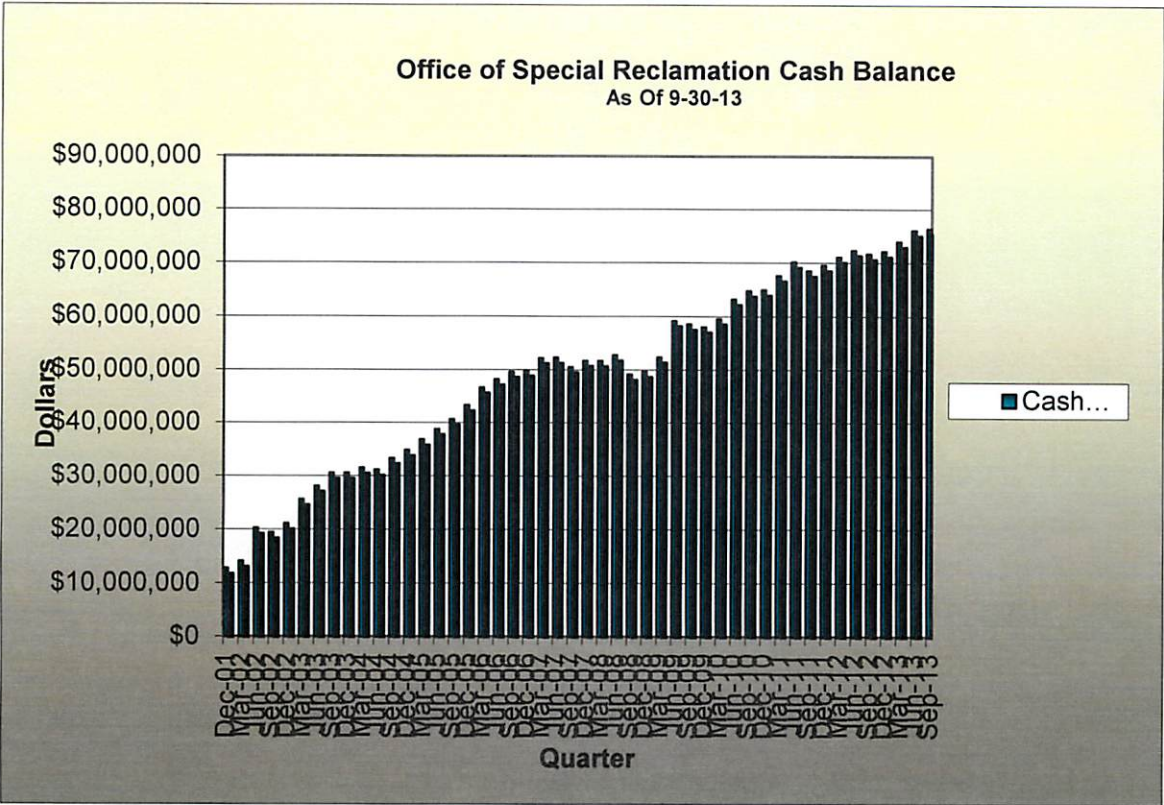


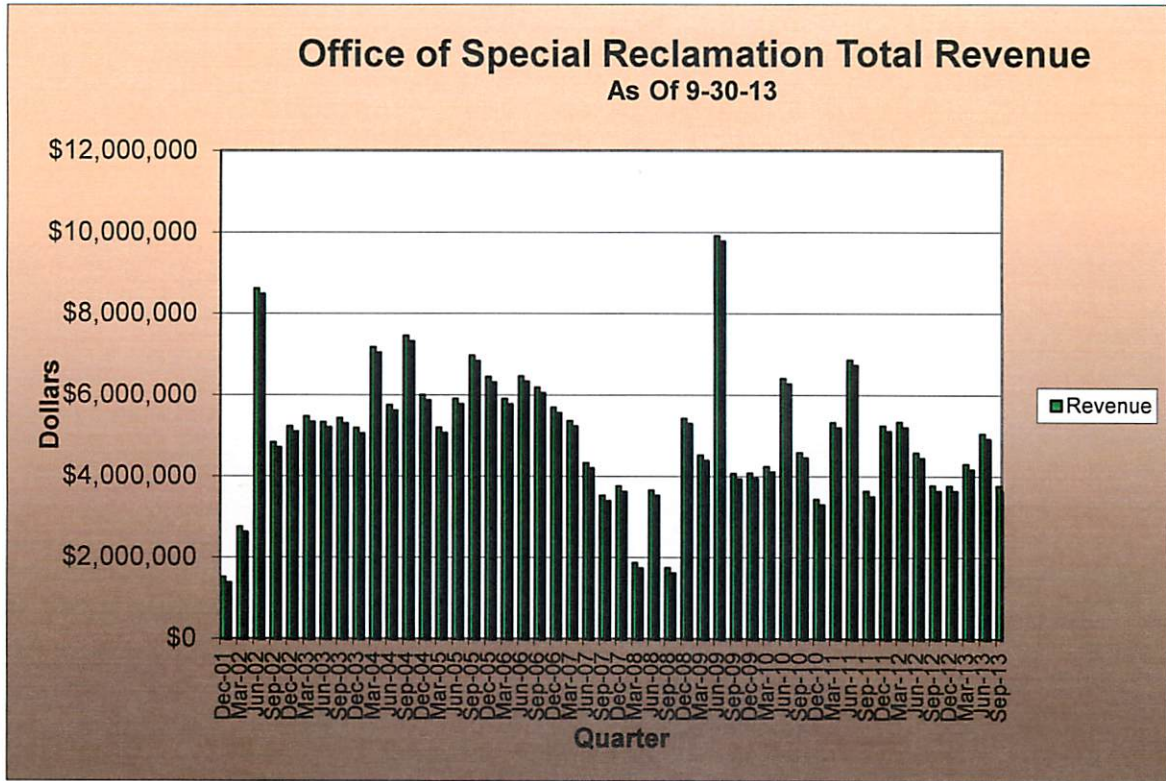
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Office of Special Reclamation Encumbrance As Of 9-30-13

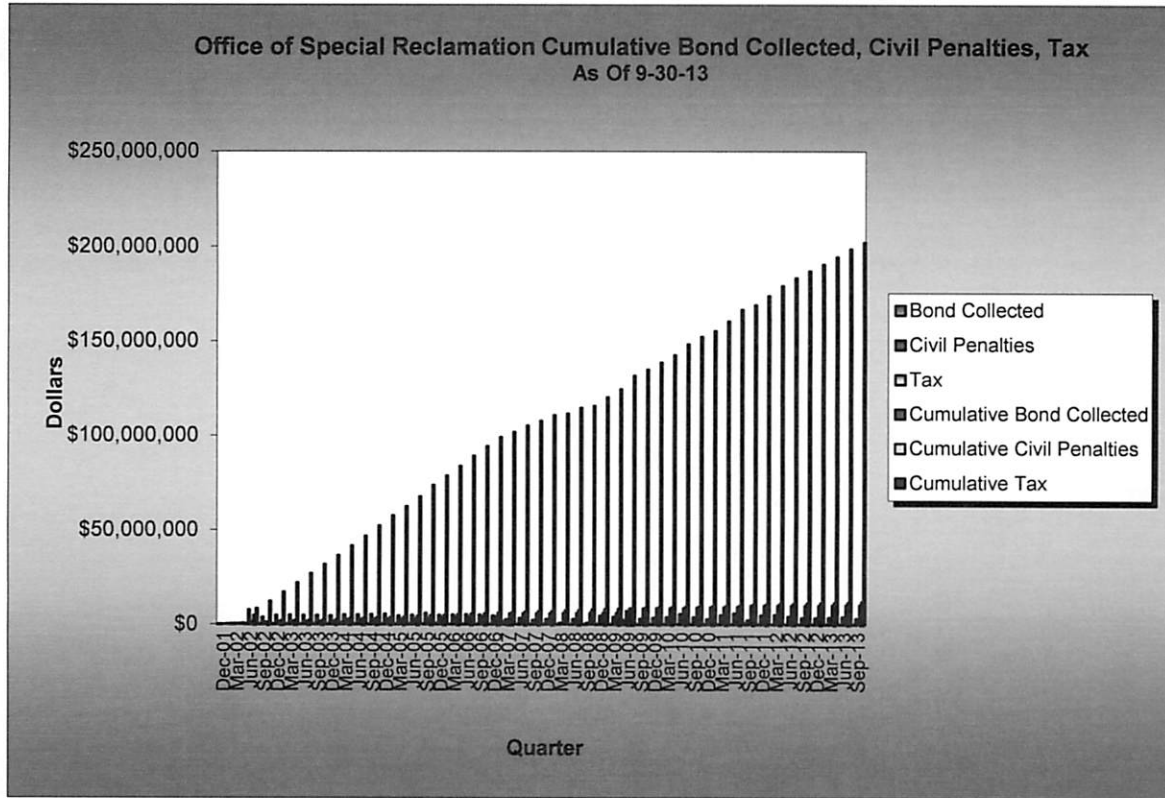


After Mar-03 Encumbrance
Includes Contracted Encumbrance +
Interest Encumbrance





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Appendix B

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OSR Land Liability vs. Land Contract Amount as of 09-30-13 For Contracts Awarded After 1-1-2000

| REC START DATE | OFFICE | PERMIT | LAND STATUS | LIAB REPT POST DATE | EST LIABILITY | LAND CONTRACT AMOUNT |
|----------------|--------|-----------|-------------|---------------------|---------------|----------------------|
| 7/27/2000 | N | EM-118 | C | 8/22/2001 | \$212,200.00 | \$298,585.47 |
| 7/28/2000 | S | 149-79 | C | 5/22/2001 | \$262,140.00 | \$171,553.80 |
| 12/12/2000 | S | EM-133 | C | 5/22/2001 | \$150,285.00 | \$344,513.00 |
| 12/12/2000 | S | P-731 | C | 5/22/2001 | \$213,724.00 | \$416,210.00 |
| 12/13/2000 | S | P-751 | C | 4/23/2001 | \$269,401.00 | \$321,755.00 |
| 12/13/2000 | S | R-734 | C | 5/22/2001 | \$367,048.00 | \$358,431.00 |
| 1/22/2001 | S | S-3003-92 | C | 5/22/2001 | \$442,000.00 | \$737,054.40 |
| 1/30/2001 | N | S-68-82 | C | 1/31/1996 | \$300,000.00 | \$146,309.70 |
| 2/26/2001 | N | S-1032-86 | C | 4/20/1993 | \$39,400.00 | \$35,780.00 |
| 8/23/2001 | S | D-108-82 | C | 5/10/1996 | \$3,770.00 | \$24,920.18 |
| 8/24/2001 | S | U-4005-90 | C | 10/3/2003 | \$7,700.00 | \$2,490.00 |
| 9/19/2001 | S | U-53-85 | C | 10/8/2003 | \$90,800.00 | \$128,002.06 |
| 10/25/2001 | S | U-4012-86 | C | 4/10/2001 | \$224,637.00 | \$310,746.50 |
| 10/25/2001 | S | U-4029-89 | C | 5/19/1997 | \$118,510.00 | \$108,841.20 |
| 11/28/2001 | N | S-1006-92 | C | 11/17/1999 | \$30,000.00 | \$89,910.00 |
| 1/16/2002 | N | U-1012-93 | C | 6/9/2000 | \$40,000.00 | \$67,096.90 |
| 4/5/2002 | N | U-125-83 | C | 7/12/1996 | \$105,000.00 | \$149,168.65 |
| 5/1/2002 | C | O-69-82 | C | 9/15/2003 | \$14,720.00 | \$14,720.00 |
| 5/2/2002 | C | U-140-82 | C | 9/15/2003 | \$11,745.00 | \$11,745.00 |
| 5/2/2002 | C | U-5027-86 | C | 9/16/2003 | \$6,605.00 | \$2,925.00 |
| 5/19/2002 | C | UO-353 | C | 9/16/2003 | \$10,075.00 | \$10,075.00 |
| 6/24/2002 | N | U-2037-86 | C | 2/29/2000 | \$72,000.00 | \$48,921.00 |
| 7/2/2002 | S | S-3024-87 | C | 10/15/1999 | \$38,000.00 | \$67,396.00 |
| 7/2/2002 | S | U-3003-89 | C | 10/15/1999 | \$30,000.00 | \$66,978.00 |
| 7/2/2002 | S | U-3023-87 | C | 10/15/1999 | \$22,000.00 | \$14,600.00 |
| 7/3/2002 | C | U-5035-87 | SSR | 4/23/1999 | \$123,000.00 | \$156,900.00 |
| 7/3/2002 | C | S-5034-87 | SSR | 4/23/1999 | \$72,000.00 | \$73,900.00 |
| 8/14/2002 | N | O-2044-88 | C | 6/9/2000 | \$297,000.00 | \$235,592.80 |
| 8/14/2002 | N | S-2021-87 | C | 9/29/2000 | \$50,000.00 | \$10,750.00 |
| 8/14/2002 | N | S-2052-86 | C | 11/8/1999 | \$60,000.00 | \$49,200.00 |
| 8/14/2002 | N | U-2005-88 | C | 11/8/1999 | \$70,000.00 | \$109,830.00 |
| 8/14/2002 | N | S-2006-93 | C | 10/15/1999 | \$37,500.00 | \$54,140.00 |
| 9/16/2002 | S | S-96-85 | C | | \$50,000.00 | \$162,100.00 |
| 9/16/2002 | S | U-3046-87 | C | 4/17/2001 | \$225,000.00 | \$233,900.00 |
| 10/31/2002 | S | U-3042-89 | C | 3/22/2002 | \$130,000.00 | \$130,565.00 |
| 10/31/2002 | S | S-113-85 | C | 5/28/2001 | \$40,000.00 | \$9,100.00 |
| 10/31/2002 | S | U-3031-93 | C | 5/29/2001 | \$201,000.00 | \$146,000.00 |
| 10/31/2002 | S | U-4011-88 | C | 2/22/1999 | \$110,700.00 | \$115,022.50 |
| 11/22/2002 | S | O-36-84 | C | 8/25/2000 | \$49,378.00 | \$183,690.00 |
| 11/22/2002 | S | R-7-81 | C | 8/25/2000 | \$615,020.00 | \$783,862.00 |
| 12/4/2002 | S | U-4011-90 | C | 10/15/1999 | \$3,500.00 | \$7,210.00 |
| 1/30/2003 | S | U-42-85 | C | 10/15/1999 | \$8,200.00 | \$12,872.50 |
| 2/20/2003 | S | S-3035-87 | C | 10/15/1999 | \$178,500.00 | \$637,700.00 |
| 2/20/2003 | S | U-3036-87 | C | 10/15/1999 | \$42,000.00 | \$357,500.00 |
| 2/24/2003 | C | S-5046-88 | C | 10/15/1999 | \$60,500.00 | \$48,185.00 |
| 4/15/2003 | S | UO-727 | C | 12/12/1997 | \$18,720.00 | \$13,459.50 |
| 4/15/2003 | S | UO-252 | C | 5/22/2003 | \$6,655.00 | \$4,758.46 |
| 4/18/2003 | S | U-107-83 | C | 5/26/2000 | \$133,580.00 | \$249,700.00 |
| 4/18/2003 | S | U-3066-88 | C | 5/26/2000 | \$83,275.00 | \$378,185.00 |
| 4/23/2003 | S | EM-71 | C | 6/30/1998 | \$14,365.00 | \$12,100.16 |
| 4/23/2003 | S | UO-623 | C | 10/15/1999 | \$10,500.00 | \$8,856.34 |
| 4/30/2003 | S | S-682 | C | 5/26/2000 | \$27,735.00 | \$40,400.00 |

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|------------|---|-----------|---|------------|--------------|----------------|
| 5/1/2003 | N | S-1024-88 | C | 3/1/2000 | \$97,600.00 | \$92,937.00 |
| 5/1/2003 | S | S-3050-86 | C | 5/26/2000 | \$160,492.00 | \$177,000.00 |
| 5/1/2003 | S | S-65-76 | C | 5/26/2000 | \$24,842.00 | \$134,800.00 |
| 5/15/2003 | S | D-125-82 | C | 5/26/2000 | \$79,360.00 | \$191,311.75 |
| 5/15/2003 | S | U-3020-86 | C | 5/26/2000 | \$9,480.00 | \$71,500.00 |
| 5/15/2003 | S | UO-571 | C | 5/26/2000 | \$19,775.00 | \$26,800.00 |
| 5/20/2003 | S | S-3011-88 | C | 5/26/2000 | \$89,830.00 | \$130,900.00 |
| 5/22/2003 | S | 32-81 | C | 5/26/2000 | \$71,500.00 | \$105,770.00 |
| 5/22/2003 | S | U-3074-87 | C | 5/26/2000 | \$176,760.00 | \$517,520.00 |
| 6/5/2003 | S | 56-81 | C | 5/26/2000 | \$173,992.00 | \$319,245.00 |
| 6/5/2003 | S | R-3078-86 | C | 5/26/2000 | \$130,104.00 | \$237,536.00 |
| 6/10/2003 | S | U-3017-87 | C | 5/26/2000 | \$77,737.00 | \$157,231.85 |
| 6/19/2003 | S | U-3078-87 | C | 10/15/1999 | \$55,000.00 | \$62,600.00 |
| 6/19/2003 | S | S-33-81 | C | 10/15/1999 | \$58,000.00 | \$68,500.00 |
| 6/19/2003 | S | D-32-81 | C | 5/26/2000 | \$100,090.00 | \$88,000.00 |
| 6/19/2003 | S | O-103-83 | C | 5/26/2000 | \$54,605.00 | \$109,125.00 |
| 7/29/2003 | S | S-60-83 | C | 5/26/2000 | \$99,112.50 | \$74,750.00 |
| 8/6/2003 | S | S-176-75 | C | 5/26/2000 | \$41,450.00 | \$176,510.00 |
| 8/6/2003 | S | S-65-85 | C | 5/26/2000 | \$502,360.00 | \$944,770.00 |
| 8/13/2003 | S | U-171-83 | C | 8/30/2002 | \$40,000.00 | \$70,839.90 |
| 8/13/2003 | S | U-50-85 | C | 8/30/2002 | \$36,000.00 | \$41,496.40 |
| 8/14/2003 | S | S-3020-88 | C | | \$15,000.00 | \$27,467.50 |
| 8/14/2003 | S | D-5-82 | C | 5/14/2003 | \$18,760.00 | \$11,007.50 |
| 9/2/2003 | N | D-75-82 | C | 11/8/2001 | \$55,300.00 | \$115,000.00 |
| 9/2/2003 | N | S-2002-92 | C | 11/26/2001 | \$164,600.00 | \$186,380.00 |
| 9/2/2003 | N | U-1041-91 | C | 11/26/2001 | \$21,800.00 | \$77,300.00 |
| 9/12/2003 | N | S-2009-89 | C | 8/3/2001 | \$75,000.00 | \$121,230.00 |
| 9/12/2003 | S | S-90-82 | C | 5/26/2000 | \$63,200.00 | \$94,300.00 |
| 9/12/2003 | S | U-3046-88 | C | 5/26/2000 | \$709,800.00 | \$1,145,450.00 |
| 9/18/2003 | C | U-5006-95 | C | 5/22/2001 | \$62,000.00 | \$94,635.00 |
| 9/19/2003 | S | D-10-81 | C | 9/10/2003 | \$28,200.00 | \$46,365.00 |
| 9/29/2003 | S | S-99-83 | C | 5/26/2000 | \$46,950.00 | \$142,140.00 |
| 9/29/2003 | S | U-40-85 | C | 5/26/2000 | \$136,505.00 | \$255,500.00 |
| 10/8/2003 | S | O-3077-87 | C | 5/6/2003 | \$49,335.00 | \$27,750.00 |
| 10/14/2003 | S | S-119-85 | C | 11/24/2003 | \$85,500.00 | \$66,600.00 |
| 10/17/2003 | S | S-3009-89 | C | 5/26/2000 | \$118,040.00 | \$220,160.00 |
| 10/17/2003 | S | S-3012-93 | C | 5/26/2000 | \$20,975.00 | \$71,684.00 |
| 10/17/2003 | S | S-3070-88 | C | 5/26/2000 | \$62,450.00 | \$127,624.00 |
| 10/20/2003 | S | U-3006-87 | C | 5/28/2003 | \$114,000.00 | \$72,900.00 |
| 10/31/2003 | C | U-82-84 | C | 10/15/1999 | \$10,400.00 | \$13,597.50 |
| 11/12/2003 | C | U-1-85 | C | 10/15/1999 | \$36,000.00 | \$21,659.88 |
| 11/13/2003 | C | UO-406 | C | 2/3/1999 | \$32,000.00 | \$23,312.50 |
| 12/24/2003 | N | S-1028-86 | C | 10/15/1999 | \$42,000.00 | \$40,800.00 |
| 12/24/2003 | N | S-62-85 | C | 10/15/1999 | \$35,900.00 | \$99,180.00 |
| 12/24/2003 | S | O-104-83 | C | 5/26/2000 | \$122,750.00 | \$94,254.90 |
| 12/24/2003 | S | O-67-82 | C | 5/26/2000 | \$23,005.00 | \$72,566.10 |
| 12/24/2003 | S | U-22-85 | C | 11/20/2002 | \$382,360.00 | \$449,007.49 |
| 1/9/2004 | S | UO-694 | C | 10/15/1999 | \$54,300.00 | \$139,000.00 |
| 1/9/2004 | S | UO-383 | C | 3/12/1999 | \$153,340.00 | \$255,500.00 |
| 2/5/2004 | S | U-4012-94 | C | 3/10/2003 | \$180,000.00 | \$119,801.00 |
| 2/5/2004 | S | U-4017-91 | C | 3/10/2003 | \$37,466.00 | \$40,201.00 |
| 2/5/2004 | S | U-85-83 | C | 10/15/1999 | \$53,940.00 | \$152,201.00 |
| 2/5/2004 | S | UO-439 | C | 10/15/1999 | \$100,380.00 | \$155,501.00 |
| 2/23/2004 | S | S-3076-86 | C | 5/26/2000 | \$354,915.00 | \$749,003.00 |
| 3/2/2004 | S | U-231-83 | C | 4/2/1999 | \$24,700.00 | \$110,835.00 |
| 3/2/2004 | S | UO-155 | C | 5/13/1996 | \$89,573.00 | \$389,389.00 |
| 3/4/2004 | C | P-654 | C | 6/5/2002 | \$171,000.00 | \$149,700.00 |
| 3/10/2004 | S | R-721 | C | 4/14/2004 | \$40,000.00 | \$27,345.00 |
| 3/30/2004 | N | O-46-84 | C | 6/9/2000 | \$90,000.00 | \$268,350.00 |
| 3/30/2004 | N | O-46-85 | C | 6/9/2000 | \$56,000.00 | \$144,720.00 |
| 4/12/2004 | S | S-3031-87 | C | 5/20/1996 | \$18,200.00 | \$20,615.00 |
| 4/26/2004 | S | S-3019-87 | C | | \$20,000.00 | \$49,140.00 |
| 5/4/2004 | N | R-722 | C | 10/15/1999 | \$5,400.00 | \$3,620.00 |

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|------------|---|-----------|-----|------------|----------------|----------------|
| 5/4/2004 | N | U-138-83 | C | 10/15/1999 | \$265,370.00 | \$844,390.00 |
| 5/24/2004 | N | UO-380 | C | 6/9/2000 | \$50,000.00 | \$69,410.00 |
| 7/20/2004 | S | D-60-82 | C | 5/20/1996 | \$30,000.00 | \$91,450.00 |
| 7/21/2004 | N | S-24-83 | C | 11/8/2001 | \$127,000.00 | \$53,767.50 |
| 7/22/2004 | S | 13-79 | C | | \$25,000.00 | \$46,750.00 |
| 8/30/2004 | C | O-5059-86 | C | 4/10/2001 | \$65,436.00 | \$47,050.00 |
| 9/3/2004 | C | U-6012-88 | C | 5/16/2003 | \$25,025.00 | \$24,573.00 |
| 9/4/2004 | C | O-40-82 | C | 5/9/2003 | \$10,000.00 | \$54,700.00 |
| 9/4/2004 | C | O-45-82 | C | 5/9/2003 | \$24,315.00 | \$57,700.00 |
| 11/12/2004 | C | S-94-82 | C | 6/5/2002 | \$200,000.00 | \$91,502.00 |
| 11/12/2004 | S | U-4013-88 | C | 4/23/2003 | \$211,211.00 | \$158,700.00 |
| 11/24/2004 | S | U-26-83 | C | 3/22/2001 | \$132,370.00 | \$197,360.00 |
| 2/4/2005 | S | S-3016-92 | C | 3/29/2004 | \$1,185,363.40 | \$1,191,550.00 |
| 3/29/2005 | S | O-58-83 | C | 3/22/2002 | \$1,900,000.00 | \$2,373,659.00 |
| 5/12/2005 | S | EM-116 | C | 4/23/2003 | \$465,000.00 | \$378,000.00 |
| 5/12/2005 | S | U-4017-89 | C | 5/28/2003 | \$133,700.00 | \$108,000.00 |
| 5/12/2005 | S | U-4002-94 | C | 4/10/2001 | \$100,958.00 | \$210,500.00 |
| 5/31/2005 | S | U-4018-86 | C | 10/15/1999 | \$173,710.00 | \$207,316.00 |
| 6/8/2005 | S | U-4027-88 | C | 4/10/2001 | \$274,588.00 | \$250,582.00 |
| 9/22/2005 | S | S-3010-98 | C | 2/10/2004 | \$794,257.10 | \$370,900.00 |
| 12/29/2005 | S | S-35-81 | C | 5/20/1996 | \$67,200.00 | \$122,600.00 |
| 1/3/2006 | S | S-3028-87 | C | | \$35,000.00 | \$138,000.00 |
| 1/3/2006 | S | U-4020-87 | C | 6/28/2000 | \$53,690.00 | \$64,650.00 |
| 1/16/2006 | S | R-4030-86 | C | | \$469,240.00 | \$921,430.19 |
| 1/20/2006 | S | U-3040-87 | C | 4/12/2001 | \$368,410.00 | \$610,470.00 |
| 1/20/2006 | S | U-3045-86 | C | 5/7/2003 | \$376,722.00 | \$356,000.00 |
| 2/14/2006 | S | S-3055-88 | C | 5/29/1996 | \$257,774.00 | \$254,860.00 |
| 2/14/2006 | S | U-69-85 | C | 5/29/1996 | \$140,000.00 | \$217,400.00 |
| 3/13/2006 | N | U-1012-93 | C | 6/9/2000 | \$40,000.00 | \$50,604.80 |
| 4/14/2006 | C | S-6029-86 | C | | \$50,000.00 | \$224,000.00 |
| 5/4/2006 | S | U-154-83 | C | 10/15/1999 | \$54,635.00 | \$188,575.00 |
| 6/28/2006 | C | U-5069-87 | C | 5/26/2000 | \$151,000.00 | \$186,750.00 |
| 1/8/2007 | S | U-3053-88 | C | 5/27/1999 | \$33,375.00 | \$164,625.00 |
| 1/12/2007 | S | U-3010-87 | C | 6/27/2006 | \$271,500.00 | \$232,140.00 |
| 1/17/2007 | S | U-3003-86 | C | 6/16/2006 | \$157,488.00 | \$208,965.00 |
| 1/17/2007 | S | UO-223 | C | 6/16/2006 | \$218,120.00 | \$199,035.00 |
| 3/19/2007 | N | S-29-80 | C | 10/15/1999 | \$49,500.00 | \$26,200.00 |
| 3/19/2007 | N | S-41-84 | C | 10/15/1999 | \$35,900.00 | \$50,400.00 |
| 3/19/2007 | N | S-55-85 | C | 10/15/1999 | \$51,600.00 | \$175,300.00 |
| 3/19/2007 | N | S-72-84 | C | 10/15/1999 | \$138,300.00 | \$124,510.00 |
| 4/13/2007 | N | S-2023-92 | C | 12/13/2006 | \$2,620,101.00 | \$1,202,392.00 |
| 5/17/2007 | S | D-73-82 | C | 5/9/2001 | \$117,200.00 | \$131,999.00 |
| 11/5/2007 | S | P-664 | C | 8/31/2005 | \$177,000.00 | \$114,741.00 |
| 1/8/2008 | S | O-172-83 | C | 2/10/2004 | \$111,000.00 | \$37,900.00 |
| 2/1/2008 | S | I-544 | C | 1/30/2001 | \$5,000.00 | \$34,000.00 |
| 2/1/2008 | S | O-20-85 | C | 11/6/2006 | \$34,580.00 | \$31,546.00 |
| 2/20/2008 | C | O-16-82 | C | | \$50,000.00 | \$138,600.00 |
| 2/20/2008 | C | O-16-85 | C | | \$50,000.00 | \$583,680.00 |
| 3/24/2008 | S | U-4019-92 | C | 9/1/1998 | \$500,000.00 | \$96,000.00 |
| 3/26/2008 | S | S-3031-90 | C | 3/29/2007 | \$602,000.00 | \$241,500.00 |
| 4/10/2008 | S | 187-74 | C | 10/15/1999 | \$192,810.00 | \$396,800.00 |
| 4/21/2008 | S | P-61-83 | C | 10/15/1999 | \$49,300.00 | \$62,925.00 |
| 6/26/2008 | S | S-23-77 | C | 10/15/1999 | \$934,080.00 | \$1,571,650.00 |
| 6/30/2008 | N | S-1012-87 | C | 10/15/1999 | \$92,900.00 | \$158,150.00 |
| 6/30/2008 | N | S-20-83 | C | 10/15/1999 | \$39,700.00 | \$31,160.00 |
| 7/10/2008 | S | O-169-83 | C | 10/15/1999 | \$60,800.00 | \$99,870.00 |
| 7/10/2008 | S | U-225-83 | C | | \$76,800.00 | \$354,730.00 |
| 8/7/2008 | S | S-19-85 | C | 1/26/2004 | \$101,500.00 | \$47,050.00 |
| 11/26/2008 | C | 120-79 | C | | \$30,000.00 | \$330,694.00 |
| 7/22/2009 | N | S-2003-03 | UCW | 3/29/2007 | \$2,096,350.00 | \$820,111.00 |
| 10/15/2009 | S | O-3012-07 | C | 3/25/2009 | \$337,820.00 | \$117,300.00 |
| 1/26/2010 | N | S-2009-01 | UCW | 8/31/2006 | \$2,069,075.00 | \$533,000.00 |
| 2/9/2010 | N | S-1002-99 | C | 8/31/2006 | \$287,610.00 | \$151,460.00 |

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|------------|---|-----------|-----|------------|----------------|----------------|
| 5/21/2010 | N | S-2018-88 | UCW | 12/31/2006 | \$864,543.00 | \$318,774.00 |
| 6/9/2010 | N | U-2002-95 | C | 4/27/2007 | \$335,924.00 | \$251,909.00 |
| 7/22/2010 | C | O-6013-88 | UCW | 8/27/2003 | \$1,355,000.00 | \$1,391,557.00 |
| 7/22/2010 | C | O-6021-89 | C | 2/26/2003 | \$11,400.00 | \$25,000.00 |
| 7/22/2010 | C | S-73-85 | C | 8/27/2003 | \$258,000.00 | \$223,500.00 |
| 7/22/2010 | C | U-6018-86 | C | 2/26/2003 | \$13,000.00 | \$24,000.00 |
| 8/24/2010 | N | U-2010-94 | C | 12/22/2008 | \$136,230.00 | \$183,420.00 |
| 11/30/2010 | N | P-741 | UCW | 8/4/2004 | \$400,000.00 | \$326,000.00 |
| 1/12/2011 | N | S-100-84 | UCW | 3/29/2007 | \$792,000.00 | \$1,366,126.00 |
| 1/12/2011 | N | S-2004-02 | UCW | 12/13/2006 | \$3,590,402.00 | \$2,571,571.00 |
| 1/12/2011 | N | S-1004-88 | UCW | 9/10/2003 | \$472,500.00 | \$369,000.00 |
| 1/12/2011 | N | S-1019-87 | UCW | 9/10/2003 | \$20,000.00 | \$149,000.00 |
| 1/12/2011 | N | UO-401 | C | 9/22/2008 | \$1,476,730.00 | \$644,250.00 |
| 5/17/2011 | N | S-1005-95 | UCW | 9/10/2003 | \$565,000.00 | \$511,405.00 |
| 7/22/2011 | N | U-2005-97 | UCW | 1/22/2009 | \$131,000.00 | \$207,025.00 |
| 8/3/2011 | C | U-5049-87 | UCW | 11/4/2002 | \$145,100.00 | \$587,554.00 |
| 8/3/2011 | C | S-41-80 | UCW | 6/5/2002 | \$156,000.00 | \$392,477.00 |
| 11/22/2011 | N | U-1008-92 | RO | 7/29/2003 | \$550,000.00 | \$228,750.00 |
| 3/6/2012 | S | S-3016-99 | UCW | | \$399,602.00 | \$284,450.00 |
| 7/16/2012 | C | S-34-82 | UC | 12/10/2001 | \$44,000.00 | \$83,710.00 |
| 7/31/2012 | C | O-5035-88 | UC | 11/4/2002 | \$216,100.00 | \$200,600.00 |
| 7/31/2012 | C | O-5092-87 | UC | 11/4/2002 | \$203,800.00 | \$747,440.00 |
| 7/31/2012 | C | U-5018-98 | UC | 4/29/2003 | \$14,000.00 | \$198,360.00 |
| 7/31/2012 | C | U-5023-97 | UC | 4/29/2003 | \$231,000.00 | \$162,520.00 |
| 7/31/2012 | C | U-5036-88 | UC | 11/4/2002 | \$154,400.00 | \$69,000.00 |
| 7/31/2012 | C | U-5085-88 | UC | 4/29/2003 | \$314,400.00 | \$29,080.00 |
| 12/3/2012 | S | S-3007-89 | UC | 10/17/2007 | \$283,290.00 | \$61,325.00 |
| 12/3/2012 | S | S-3026-88 | UC | 10/17/2007 | \$161,840.00 | \$21,850.00 |
| 12/3/2012 | S | S-3027-90 | UC | 10/17/2012 | \$420,208.00 | \$60,800.00 |

Total: 207 \$45,442,874.00 \$48,688,227.88
Variance: 7.14%

Note: Excludes 10 permits where the variance exceeds 2 standard deviations under the mean or no

Est Liability in database.

Total Unskewed: 190 \$44,715,959.00 \$44,550,755.70
Variance Unskewed: -0.37%

Note: The variance of these 17 permits exceeds 2 standard deviations over the mean. Increased liability over time, more detailed investigation prior to requisition, general inflation, increased costs for specific goods and services are contributing factors in the variance. Without these 17 permits, the Estimated Liability vs. Land Contract Amount variance is -0.37%.

Variance = (Contract Amount - Est Liability) / Est Liability

2013 SRF Advisory Council Annual Report

**OSR WQ Cap vs. Water Contract Amount as of 9-30-13
For Contracts Awarded After 1-1-2000**

| DATE WQ CONST STARTED | OFFICE | PERMIT | LAND STATUS | WATER STATUS | LIAB REPT POST DATE | WQ TOTAL CAPITAL DOLLARS | WATER CONTRACT AMOUNT |
|-----------------------------|--------|-----------|----------------|-----------------|---------------------------|--------------------------------|-----------------------------|
| 9/16/2002 | S | S-96-85 | C | P | | \$67,500.00 | \$128,240.00 |
| 10/17/2002 | N | S-26-85 | C | ACT | | \$398,250.00 | \$243,705.23 |
| 12/19/2002 | N | S-1032-86 | C | ACT | 4/20/1993 | \$364,500.00 | \$209,784.66 |
| 2/20/2003 | N | S-60-84 | C | ACT | | \$175,500.00 | \$282,062.00 |
| 4/25/2003 | N | EM-32 | C | ACT | | \$243,000.00 | \$168,890.00 |
| 5/1/2003 | N | S-1024-88 | C | ACT | 3/1/2000 | \$209,250.00 | \$173,178.00 |
| 5/15/2003 | N | 176-77 | C | ACT | 5/26/2000 | \$54,000.00 | \$312,000.00 |
| 5/21/2003 | N | S-10-81 | C | ACT | 7/21/2000 | \$452,250.00 | \$643,142.22 |
| 6/5/2003 | S | EM-97 | C | ACT | 9/16/2003 | \$175,500.00 | \$341,775.00 |
| 6/5/2003 | S | R-3078-86 | C | ACT | 5/26/2000 | \$209,250.00 | \$91,000.00 |
| 6/19/2003 | S | D-32-81 | C | ACT | 5/26/2000 | \$209,250.00 | \$260,500.00 |
| 8/25/2003 | N | 40-81 | C | ACT | | \$398,250.00 | \$413,962.40 |
| 8/27/2003 | N | S-1063-86 | C | ACT | | \$87,750.00 | \$324,561.00 |
| 9/29/2003 | S | U-40-85 | C | P | 5/26/2000 | \$175,500.00 | \$89,500.00 |
| 10/8/2003 | N | S-37-81 | C | P | | \$364,500.00 | \$118,000.00 |
| 10/14/2003 | N | 65-78 | C | ACT | | \$170,100.00 | \$1,142,151.00 |
| 10/14/2003 | N | S-65-82 | C | ACT | 7/21/2000 | \$315,900.00 | \$1,600,000.00 |
| 10/14/2003 | S | S-119-85 | C | P | 11/24/2003 | \$398,250.00 | \$150,000.00 |
| 11/4/2003 | N | S-17-82 | C | ACT | 10/15/1999 | \$209,250.00 | \$589,265.32 |
| 11/7/2003 | N | UO-519 | C | ACT | 3/14/2001 | \$398,250.00 | \$581,592.00 |
| 1/22/2004 | N | O-1035-87 | C | ACT | | \$173,677.50 | \$406,440.00 |
| 1/22/2004 | N | O-43-85 | C | ACT | | \$121,500.00 | \$202,975.00 |
| 1/22/2004 | N | O-86-82 | C | ACT | 9/24/2003 | \$35,572.50 | \$35,125.00 |
| 2/5/2004 | S | U-3055-87 | C | P | 10/28/2003 | \$209,250.00 | \$251,300.00 |
| 2/5/2004 | S | S-86-85 | C | ACT | 7/24/2000 | \$209,250.00 | \$467,500.00 |
| 6/22/2004 | N | S-1087-86 | C | P | | \$209,250.00 | \$97,400.00 |
| 7/22/2004 | S | 19-75 | C | P | | \$209,250.00 | \$116,710.00 |
| 8/16/2004 | N | S-1030-86 | C | P | | \$209,250.00 | \$87,794.00 |
| 8/17/2004 | S | U-3083-87 | C | P | 3/19/1998 | \$195,750.00 | \$220,161.00 |
| 9/8/2004 | C | O-1-81 | C | ACT | 10/26/1998 | \$324,000.00 | \$499,795.00 |
| 10/1/2004 | N | S-52-83 | C | ACT | | \$155,250.00 | \$298,745.00 |
| 2/10/2005 | N | S-61-82 | C | ACT | | \$121,500.00 | \$245,392.00 |
| 3/4/2005 | N | 237-76 | C | ACT | | \$109,250.00 | \$503,239.00 |
| 3/4/2005 | N | S-1035-86 | C | ACT | | \$100,000.00 | \$449,125.00 |
| 5/12/2005 | S | R-3-81 | C | ACT | | \$175,500.00 | \$487,750.00 |
| 5/17/2005 | N | S-1041-89 | C | ACT | 8/31/2000 | \$364,500.00 | \$312,985.00 |
| 5/24/2005 | N | 60-79 | C | P | | \$54,000.00 | \$95,980.00 |
| 6/8/2005 | N | U-2024-87 | C | ACT | | \$184,997.92 | \$348,350.00 |
| 12/28/2005 | N | S-21-84 | C | ACT | | \$175,500.00 | \$208,543.30 |
| 12/29/2005 | S | S-35-81 | C | P | 5/20/1996 | \$209,250.00 | \$284,400.00 |
| 1/3/2006 | S | S-3028-87 | C | P | | \$67,500.00 | \$412,280.00 |
| 4/14/2006 | C | S-6029-86 | C | ACT | | \$87,750.00 | \$2,497,373.00 |
| 5/4/2006 | N | S-64-83 | C | ACT | | \$243,000.00 | \$316,385.00 |
| 6/7/2006 | N | 34-81 | C | ACT | | \$175,500.00 | \$297,685.00 |
| 6/27/2006 | N | D-35-82 | TBC | ACT | 8/4/2002 | \$2,892,400.00 | \$2,856,667.00 |
| 9/1/2006 | N | S-2003-86 | C | P | | \$364,500.00 | \$80,052.50 |
| 10/18/2006 | S | S-99-83 | C | P | 5/26/2000 | \$95,500.00 | \$107,100.00 |
| 11/1/2006 | S | S-3026-89 | C | P | 6/29/1998 | \$247,800.00 | \$420,500.00 |
| 11/9/2006 | S | O-3086-87 | C | P | 7/25/2001 | \$87,750.00 | \$285,500.00 |
| 11/9/2006 | S | O-43-84 | C | ACT | 7/25/2001 | \$87,750.00 | \$276,000.00 |
| 12/15/2006 | N | 65-77 | C | P | | \$209,250.00 | \$308,028.50 |
| 12/15/2006 | N | S-1009-88 | C | P | | \$87,750.00 | \$159,608.00 |
| 5/3/2007 | N | U-109-83 | C | P | | \$209,250.00 | \$139,880.00 |
| 8/9/2007 | N | 67-78 | C | ACT | | \$121,500.00 | \$321,000.00 |
| 9/21/2007 | N | 192-77 | C | ACT | | \$2,070.90 | \$2,300.00 |
| 9/21/2007 | N | S-1009-86 | C | ACT | | \$396,179.10 | \$611,723.00 |
| 11/27/2007 | N | S-122-80 | C | ACT | 12/13/2006 | \$548,012.00 | \$395,158.00 |

2013 SRF Advisory Council Annual Report

| | | | | | | | |
|------------|---|-----------|-----|-----|------------|----------------|--------------|
| 1/9/2008 | N | 184-77 | C | ACT | | \$153,983.70 | \$380,167.00 |
| 1/9/2008 | N | S-2004-86 | C | P | | \$21,516.30 | \$139,798.75 |
| 2/12/2008 | C | UO-396 | C | ACT | | \$87,750.00 | \$435,825.00 |
| 2/20/2008 | C | O-69-82 | C | P | 9/15/2003 | \$87,750.00 | \$287,225.00 |
| 3/26/2008 | S | S-3031-90 | C | P | 3/29/2007 | \$159,000.00 | \$137,500.00 |
| 5/1/2008 | S | U-4013-91 | C | P | 5/22/2001 | \$157,010.00 | \$132,987.00 |
| 5/23/2008 | S | P-656 | C | ACT | 6/30/2005 | \$778,000.00 | \$997,400.00 |
| 6/12/2008 | N | 3-72 | C | P | | \$324,000.00 | \$123,985.00 |
| 8/7/2008 | S | S-19-85 | C | P | 1/26/2004 | \$225,000.00 | \$429,106.00 |
| 8/29/2008 | N | S-1008-89 | C | RO | | \$243,000.00 | \$446,825.00 |
| 9/15/2008 | N | S-1045-87 | C | ACT | 10/15/1999 | \$209,250.00 | \$664,207.00 |
| 11/26/2008 | C | 120-79 | C | ACT | | \$209,250.00 | \$744,924.00 |
| 1/6/2009 | C | U-5071-86 | C | ACT | | \$243,000.00 | \$677,795.00 |
| 3/25/2009 | C | S-6020-87 | C | P | | \$209,250.00 | \$414,800.00 |
| 3/25/2009 | S | 149-79 | C | P | 5/22/2001 | \$377,230.00 | \$359,750.00 |
| 3/31/2009 | N | 51-78 | C | ACT | | \$209,250.00 | \$299,900.80 |
| 6/1/2009 | C | S-6033-86 | C | P | 7/25/2001 | \$209,250.00 | \$415,235.40 |
| 6/1/2009 | N | S-28-83 | C | ACT | | \$209,250.00 | \$347,902.50 |
| 6/15/2010 | N | S-2003-88 | TBC | ACT | 12/13/2006 | \$716,414.00 | \$589,630.00 |
| 7/22/2010 | C | O-6013-88 | UCW | ACT | 8/27/2003 | \$2,467,307.00 | \$932,400.00 |
| 7/22/2010 | C | S-73-85 | C | NA | 8/27/2003 | \$235,000.00 | \$95,700.00 |
| 8/30/2010 | C | S-6-85 | C | P | 4/27/1999 | \$243,000.00 | \$497,000.00 |
| 1/12/2011 | N | P-177-85 | C | ACT | | \$121,500.00 | \$311,940.00 |
| 2/18/2011 | N | S-1018-88 | C | ACT | 12/8/2000 | \$209,250.00 | \$594,960.00 |
| 5/17/2011 | N | S-1005-95 | UCW | ACT | 9/10/2003 | \$276,000.00 | \$805,210.00 |
| 11/2/2011 | N | S-2006-86 | C | P | 12/12/2006 | \$325,000.00 | \$524,000.00 |
| 7/16/2012 | C | S-34-82 | UC | UC | 12/10/2001 | \$732,433.00 | \$863,290.00 |

Total: 84 **\$23,984,603.92** **\$35,619,721.58**
Variance: 48.51%

Note: Excludes 4 permits where the variance exceeds 2 standard deviations under the mean.

Total Unskewed: 73 **\$22,485,587.62** **\$26,577,795.83**
Variance Unskewed: 18.20%

Note: The variance of these 11 permits exceeds 2 standard deviations over the mean. Sparse WQ data at time of Tiff Hilton's liability estimation, new seeps found after estimation, additional roads, more and larger ponds required after original estimation are the factors in the variance. For S-6029-86 a large underground AMD pool and other problems were discovered during requisition planning, which were not addressed in the initial liability estimate. Without these 11 permits, the variance is 18.20%.

Variance = (Water Contract Amt - WQ Total Cap Dollars) / WQ Total Cap Dollars

Appendix C



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Senior Consulting Actuary
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December 26, 2013

Special Reclamation Advisory Council
c/o Department of Environmental Protection
Division of Land Restoration – Office of Special Reclamation
601 57th Street S.E.
Charleston, West Virginia 25304

Dear Council Members:

Pinnacle Actuarial Resources, Inc is pleased to provide the enclosed final report to the Special Reclamation Advisory Council of the West Virginia Department of Environmental Protection. The report provides summary and various details regarding the actuarial valuation of the Special Reclamation Fund and the Special Reclamation Water Trust Fund as of June 30, 2013.

If you have any questions, or require anything further please call us at the numbers listed below. Thank you for allowing us to be of service to the Council again this year. We look forward to the opportunity to work with you again in the near future.

Best Regards,

A handwritten signature in blue ink that reads "John E. Wade".

John E. Wade, ACAS, MAAA
Senior Consulting Actuary
jwade@pinnacleactuarial.com
317-889-5760

A handwritten signature in blue ink that reads "Laura A. Maxwell".

Laura A. Maxwell, FCAS, MAAA
Consulting Actuary
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415-692-0938



**Report for the
West Virginia Department of Environmental Protection
Office of Special Reclamation**

**Actuarial Valuation of the
Special Reclamation Fund &
Special Reclamation Water Trust Fund**

Actuarial Analysis as of June 30, 2013



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REPORT ORGANIZATION

Page 2 - EXECUTIVE SUMMARY provides a thumbnail sketch of the results of our analysis.

Page 12 - ACTUARIAL CERTIFICATION attests that this valuation has been conducted in accordance with generally accepted actuarial principles and practices.

Page 13 - SECTION 1 describes the actuarial model in detail and the development of the assumptions used to estimate the revenues and liabilities of the Special Reclamation Fund and the Special Reclamation Water Trust Fund.

Page 23 - SECTION 2 provides a projection of required income for solvency through fiscal year 2048.

Page 24 - SECTION 3 describes the data reviewed and used in the report.

Page 29 - SECTION 4 describes the actuarial assumptions used in the valuation.

Starting after page 32,

“EXHIBITS” have been included as a separate section of the report. There are three types of exhibits included with this report. In order of appearance, exhibits labeled as “Table” duplicate the Tables contained within the body of this report. Exhibits labeled as “Exhibit” provide additional information that clarify the development of our estimates. Exhibits labeled as “Appendix” provide the actuarial forfeiture and release triangles pivotal in our selection of those parameters, as well as additional report items of interest to the Department of Environmental Protection (projected tax rate to maintain a positive fund balance 35 years from now).

The timely completion of our report depended on complete responses to our data and information requests. The Department of Environmental Protection staff provided us with timely and complete responses to all of our requests for information. We wish to thank them, especially Michael Sheehan, Lewis Halstead, Tom McCarthy, Jean Sheppard, Jennifer Paxton, and Patty Hickman for their time and for providing us with their counsel as well as the information that we used in this report.

EXECUTIVE SUMMARY

This report from Pinnacle Actuarial Resources provides the Department of Environmental Protection (DEP) with information regarding the funded status of the Special Reclamation Fund (SRF) and an analysis of the SRF's projected financial status under a range of operational parameters. This report updates and expands our previous actuarial study completed in 2011. This analysis incorporates the current estimates of future water treatment costs under the expanded National Pollutant Discharge Elimination System (NPDES) standards.

This valuation is a "closed" valuation in that it only considers liabilities associated with permits that have already been issued. The estimated Funds' liabilities account for both known forfeitures and anticipated forfeitures from permits issued before July 1, 2013. Accordingly, we have included in this report reclamation liabilities based on the date of forfeiture as well as based on the issue date of permit, to provide the SRF Advisory Council with a complete picture of the fund's current obligations.

The estimates in this report are actuarial central estimates. As actuarial central estimates, they represent an expected value within the range of reasonably possible outcomes. The bond recoveries are considered as an income item rather than an adjustment to the liabilities as the Fund is responsible for the reclamation from first dollar regardless of bond collection. The estimates do not consider any excess insurance or other recoveries because there is no excess insurance and no other recoveries are expected. The estimated liability at June 30, 2013 is based on permit and forfeiture data through June 30, 2013 and data received through December 23, 2013.

BACKGROUND ON COAL TAX RATES FOR FUNDS

In Senate Bill No. 751, a separate Special Reclamation Water Trust Fund (SRWTF or Water Trust Fund) was established effective July 1, 2008. Beginning in 2012, coal tax revenues based on a tax rate of 15.0 cents per ton are being paid into the Special Reclamation Water Trust Fund. In addition, coal tax revenues based on 12.9 cents per ton (7 cents plus 5.9 cents per SB 751) are being paid into the Special Reclamation Fund (SRF). These rates have continued into 2013 and our estimates assume they will for the foreseeable future.

Unless modified in response to future legislation, for budgeting and analysis purposes the Department of Environmental Protection plans to continue paying all costs for both land and water reclamation work out of the Special Reclamation Fund (SRF) through June 2018. This delay may allow the SRWTF to build up assets and reach a position where it is large enough to begin covering water treatment costs – both water capital costs and ongoing water treatment costs.

ASSUMPTION CHANGES

Except as noted below, there were no major changes to methodologies or assumptions compared to the prior analysis.

- Release rates were reviewed and, with minor exceptions (underground sites), kept the same as in the prior analysis.
- Forfeiture rates were reviewed and kept the same as in the prior analysis.
- Investment rates were reviewed and adjustments made in keeping with current listings of recent West Virginia State investment pools, U.S. Treasury rates and a segmentation between the SRF and SRWTF. In addition, investable amounts were restricted within each fund to allow for liquidity in paying ongoing expenses.
- Inflationary cost trends have been lowered based on historical data.
- Discount rates adjusted to reflect selected investment rates.
- Water treatment costs were based on DEP estimates as opposed to the special study done two years ago when the new standards from the NPDES were coming into effect.
- Administrative cost estimates increased based on historical data.

These changes and the impact are described in more detail in the text of the report.

FUNDED STATUS

Separate projections of the SRF and the SRWTF have been developed to show the overall financial solvency of each fund.

For the funded status, we have compared the present value of future expenditures with the current value of the Fund's assets plus the present value of future income. Using a 20-year cash-flow projection, the funded status of the Special Reclamation Fund is 107.6 percent and for the Special Reclamation Water Trust Fund is 150.4 percent. We also developed a longer 35 year time period projection the funded status is 95.7 percent for the SRF and 89.9percent for the SRWTF.

We estimate on a cash flow basis that the Special Reclamation Fund's assets and future revenues cover the expected costs through 2017, developing a slight negative balance in 2018 before becoming positive again in 2019 and staying that way until 2038. With the significantly increased costs in water treatment, we project that the Special Reclamation Water Trust Fund should remain solvent for the next twenty-five years, falling into a deficit position in 2038. The additional tax implemented in 2012 has pushed the projected date of the deficit back significantly since our last study.

VALUATION RESULTS

Expenditures

Tables A-1 through A-4 below show the present value of future expenditures from July 2013 to June 2033 and from July 2013 to June 2048 for the Special Reclamation Fund and the Special Reclamation Water Trust Fund. The future expenditures associated with these Funds include:

- land capital expenditures, (restoring the land to agreed setting)
- water capital expenditures, (creation of water treatment facilities)
- ongoing water treatment expenditures
- water abandonment expenditures, (removal of treatment facilities) and
- administration costs.

These amounts include the Department of Environmental Protection estimated costs for reclamation activities on permits that have already been forfeited, including the estimated ongoing water treatment costs. The projected amounts are the discounted present value of projected cash flows using a discount rate equal to the expected investment returns based upon recent returns on West Virginia investments and US Treasury Notes. Since the estimated annual reclamation cost inflation rate of 3.3 percent is fairly close to the implicit discount rate, the discounted figures are nearly the same as the estimated costs in 2013 dollar terms.

A complete description of all of the assumptions used in the valuation can be found in Section 4. The Water Capital and Water Abandonment costs are only included in the Special Reclamation Fund figures until July of 2018, at which point following a ten year capital build up, the Water Trust Fund will begin covering water capital and water abandonment costs.

- Table A-1 - Special Reclamation Fund 20 Year Liabilities for Known and Expected Forfeitures
- Table A-2 - Special Reclamation Fund 35 Year Liabilities for Known and Expected Forfeitures
- Table A-3 - Special Reclamation Water Trust Fund 20 Year Liabilities for Known and Expected Forfeitures
- Table A-4 - Special Reclamation Water Trust Fund 35 Year Liabilities for Known and Expected Forfeitures

| Table A-1 Special Reclamation Fund Liability as of June 30, 2013 for Known and Expected Forfeitures Limited to a 20-Year Cash Flow (Present Value in \$ Millions) | | | |
|---|-----------------------------|------------------------------|--------------------------|
| | Currently Forfeited Permits | Projected Future Forfeitures | Total Liabilities |
| Land Capital | \$9.4 | \$75.6 | \$85.0 |
| Water Capital | 61.3 | 1.5 | 62.8 |
| Water Abandonment | 0.0 | 0.0 | 0.0 |
| Ongoing Water Treatment | 44.0 | 0.2 | 44.2 |
| Administration | | | 92.1 |
| Total | | | \$284.0 |

For comparison purposes, the 20-Year SRF cost projection in 2011 was \$259.7 million. The increase in Ongoing Water Treatment costs and revised Administrative costs are somewhat offset by lowered cost trends. Changes in the projected investment yields create additional impacts depending on the direction of the change. Note that the Water Treatment costs as provided by the DEP are about 95% greater in comparison to the estimated costs from 2011.

| Table A-2 Special Reclamation Fund Liability as of June 30, 2013 for Known and Expected Forfeitures Cash Flow Projection through 2048 (Present Value in \$ Millions) | | | |
|--|-----------------------------|------------------------------|--------------------------|
| | Currently Forfeited Permits | Projected Future Forfeitures | Total Liabilities |
| Land Capital | \$9.4 | \$109.5 | \$118.9 |
| Water Capital | 61.3 | 1.5 | 62.8 |
| Water Abandonment | 0.0 | 0.0 | 0.0 |
| Ongoing Water Treatment | 44.0 | 0.2 | 44.2 |
| Administration | | | 164.1 |
| Total | | | \$389.9 |

For comparison purposes, the 35-Year SRF cost projection in 2011 was \$320.8 million.

| Table A-3 Special Reclamation Water Trust Fund Liability as of June 30, 2013 for Known and Expected Forfeitures Limited to a 20-Year Cash Flow (Present Value in \$ Millions) | | | |
|---|-----------------------------|------------------------------|--------------------------|
| | Currently Forfeited Permits | Projected Future Forfeitures | Total Liabilities |
| Land Capital | \$0.0 | \$0.0 | \$0.0 |
| Water Capital | 0.0 | 11.6 | 11.6 |
| Water Abandonment | 0.0 | 0.0 | 0.0 |
| Ongoing Water Treatment | 125.8 | 14.1 | 139.9 |
| Administration | | | 0.0 |
| Total | | | \$151.5 |

For comparison purposes, the 20-Year SRWTF cost projection in 2011 was \$136.8 million. The increase in Ongoing Water Treatment costs and revised Administrative costs are somewhat offset by lowered cost trends. Changes in the projected investment yields create additional impacts depending on the direction of the change. Note that Water Treatment costs are nearly double as provided by the DEP in comparison to the estimated costs from 2011.

| Table A-4 Special Reclamation Water Trust Fund Liability as of June 30, 2013 for Known and Expected Forfeitures Cash Flow Projection through 2048 (Present Value in \$ Millions) | | | |
|--|-----------------------------|------------------------------|--------------------------|
| | Currently Forfeited Permits | Projected Future Forfeitures | Total Liabilities |
| Land Capital | \$0.0 | \$0.0 | \$0.0 |
| Water Capital | 0.0 | 15.8 | 15.8 |
| Water Abandonment | 0.0 | 0.0 | 0.0 |
| Ongoing Water Treatment | 232.2 | 42.4 | 274.6 |
| Administration | | | 0.0 |
| Total | | | \$290.4 |

For comparison purposes, the 35-Year SRWTF cost projection in 2011 was \$292.5 million.

Revenues

The SRF and SRWTF receive revenues from several sources. The primary funding source for both Funds is tax on current coal extraction. The second funding source, available only to the SRF, is from the underlying security on forfeited permits, as the Fund collects the bond amounts associated with the forfeited permits and/or civil penalties and court settlements. The third funding source, available to both Funds, is interest income earned on the SRF and SRWTF assets invested in State investment pools (SRF) and other higher yielding instruments (SRWTF).

As with the projection of expenses, we have developed income projections across both a 20 year and 35 year time horizon for each Fund. Future revenue streams have been discounted at the implicit annual investment returns for both the SRF and the SRWTF.

- Table B-1 - Special Reclamation Fund 20 Year Revenue
- Table B-2 - Special Reclamation Fund 35 Year Revenue
- Table B-3 - Special Reclamation Water Trust Fund 20 Year Revenue
- Table B-4 - Special Reclamation Water Trust Fund 35 Year Revenue

Estimated SRF revenues are down somewhat because of lower estimated coal production.

| Table B-1 Special Reclamation Fund Revenue Projection as of June 30, 2013 for Known and Expected Forfeitures Limited to a 20-Year Cash Flow (Present Value in \$ Millions) | | | |
|--|--|-----------------|----------------|
| Coal Tax Current Permits | Bond Forfeiture, Civil Penalties & Court Settlements | Interest Income | Total Income |
| \$183.9 | \$45.3 | \$1.6 | \$230.8 |

| Table B-2 Special Reclamation Fund Revenue Projection as of June 30, 2013 for Known and Expected Forfeitures Cash Flow Projections Through 2048 (Present Value in \$ Millions) | | | |
|--|--|-----------------|----------------|
| Coal Tax Current Permits | Bond Forfeiture, Civil Penalties & Court Settlements | Interest Income | Total Income |
| \$241.3 | \$55.3 | \$1.7 | \$298.3 |

Estimated SRWTF revenues are up substantially due to the fact that the tax rate has increased from 1.5% to 15.0%.

| Table B-3 Special Reclamation Water Trust Fund Revenue Projection as of June 30, 2013 for Known and Expected Forfeitures Limited to a 20-Year Cash Flow (Present Value in \$ Millions) | | | |
|--|--|-----------------|----------------|
| Coal Tax Current Permits | Bond Forfeiture, Civil Penalties & Court Settlements | Interest Income | Total Income |
| \$155.3 | \$0.0 | \$50.1 | \$205.4 |

| Table B-4 Special Reclamation Water Trust Fund Revenue Projection as of June 30, 2013 for Known and Expected Forfeitures Cash Flow Projections Through 2048 (Present Value in \$ Millions) | | | |
|--|--|-----------------|----------------|
| Coal Tax Current Permits | Bond Forfeiture, Civil Penalties & Court Settlements | Interest Income | Total Income |
| \$187.9 | \$0.0 | \$50.8 | \$238.7 |

Fund Status as of June 30, 2013

The Special Reclamation Fund had accumulated assets of \$75.0 million while the Special Reclamation Water Trust Fund had accumulated \$22.5 million in assets as of June 30, 2013. The SRF balance and the SRWTF balance are higher than the balances at the time of the prior report. The SRF assets have increased by \$4.8 million while the SRWTF is up by \$16.6 million. These levels reflect both the continued benefit of significant reclamation efforts in the past and the revenue from various sources including the coal tax collections.

In Tables C-1 and C-2 below, we combine the projected reclamation liabilities, current assets and expected future revenue to produce the Funded Status for each of the Funds. A Funded Status of above 100 percent indicates that the current revenue structure (i.e. legislated coal tax revenues and amounts of permit bonds) should provide sufficient funding to meet the long-term obligations of the Fund for the reclamation of forfeitures of permitted mining operations.

A Funded Status of less than 100 percent would indicate that the Fund's assets, combined with expected future revenues, are not sufficient to cover the expected future expenditures for the reclamation of forfeitures of the permitted mining operations.

| Table C-1 Special Reclamation Fund Funded Status as of June 30, 2013 (in \$ Millions) | | |
|---|----------|--------------|
| | 20 Years | Through 2048 |
| Present Value of Future Revenues | 230.8 | 298.3 |
| Assets as of June 30, 2013 | 75.0 | 75.0 |
| Assets + Present Value of Future Revenues | 305.7 | 373.3 |
| Present Value of Future Expenditures | 284.0 | 389.9 |
| Funded Status | 107.6% | 95.7% |
| Year Fund Balance Becomes Negative | 2018 | |

| Table C-2 Special Reclamation Water Trust Fund Funded Status as of June 30, 2013 (in \$ Millions) | | |
|---|----------|--------------|
| | 20 Years | Through 2048 |
| Present Value of Future Revenues | 205.4 | 238.7 |
| Assets as of June 30, 2013 | 22.5 | 22.5 |
| Assets + Present Value of Future Revenues | 227.9 | 261.2 |
| Present Value of Future Expenditures | 151.5 | 290.4 |
| Funded Status | 150.4% | 89.9% |
| Year Fund Balance Becomes Negative | 2038 | |

Note that for the SRF, even though the Fund is expected to carry a positive balance at the end of 20 years, the fund is projected to dip into a slight negative balance in 2018 prior to disengaging from covering the liabilities of the SRWTF in 2019. After 2018 the SRF is projected to add to its balance for a while before the impact of inflation and forfeiture activity outweigh the benefits of investment income and release activity. The SRF is projected to go back to a negative balance in 2038. Due to the increased expected revenue from the increased tax for water treatment, the Funded Status of the SRWTF has improved tremendously since our last review.

In Tables D and E in the attached exhibits, we provide projections of the estimated cash flows over the next 35 years. The elements shown in the projection are:

The expenditures are comprised of:

- Land capital expenditures
- Water capital expenditures
- Ongoing water treatment expenditures
- Water abandonment expenditures – delayed beyond the study horizon
- Administration costs

The revenues are comprised of:

- Coal tax receipts
- Bond forfeitures, civil penalties, and court settlements
- Investment income

The investment income is determined by applying varied US Treasury based interest rates against the prior year-end closing fund balance plus one-half the year's income less one-half of the year's expenditure. For projected years where the total fund balance is negative, total investment income is set to zero.

Tables D and E show the projected cash flow for the next 35 years assuming continuation of current law, whereby the coal tax continues to be collected at a rate of 27.9 cents per ton with 15.0 cents per ton allocated to the Special Reclamation Water Trust Fund.

Table D Summary shows that under the current law, the SRF balance is projected to fall below zero in Fiscal Year 2018. Subsequently, accumulated future income and current assets are projected to continue to outpace the expected required expenditures until 2038.

Table E Summary shows the accumulation of assets in the Water Trust Fund. The SRWTF plans begin making payments for water capital and ongoing water treatment in Fiscal Year 2019. The Fund is projected to have sufficient capital to operate until some point in 2038 before experiencing a deficit. We expect that the Water Trust Fund will have accumulated \$115.5 million at the end of fiscal year 2018.

Appendices 2 and 3 project for both Funds to remain solvent through the next 35 years, the tax rates need to increase to 14.41 and 19.06 cents per ton for the SRF and SRWTF, respectively.

Table F below shows the expected capital costs for reclamation based upon previously forfeited permits in 2013 dollars. With the current bond limit of \$5,000 per acre, the expected receipts from permits issued in the future will not be sufficient to cover the expected reclamation costs for Underground Permits or Other Permits.

| Table F | | | |
|--|----------------|--------------------|--------------------|
| Cost Per Acre by Permit Type | | | |
| (in 2013 Dollars) | | | |
| <i>Based on Forfeited Permits</i> | Surface | Underground | Other Types |
| Land Capital | \$2,700 | \$12,400 | \$7,300 |
| Water Capital | 900 | 1,900 | 1,500 |
| Water Abandonment | 230 | 575 | 475 |
| Total Capital | 3,830 | 14,875 | 9,275 |

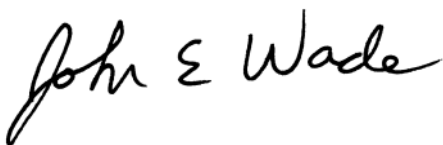
ACTUARIAL CERTIFICATION

The State of West Virginia's Department of Environmental Protection retained Pinnacle Actuarial Resources, Inc. to perform an actuarial valuation of the Special Reclamation Fund for the purposes of reporting the progress of the Fund.

John E. Wade, ACAS, MAAA, Senior Consulting Actuary and Laura A. Maxwell, FCAS, MAAA, Consulting Actuary are members of the American Academy of Actuaries and meet its Qualification Standards of Actuaries Issuing Statement of Actuarial Opinion in the United States to render the actuarial opinion contained here.

This valuation has been conducted in accordance with generally accepted actuarial principles and practices. The actuarial assumptions and methods employed in the measurement of the liability have been selected by Pinnacle Actuarial Resources, Inc. after consultation with the staff of the Department of Environmental Protection and the Special Reclamation Fund Board.

The results shown in this report are reasonable actuarial results. However, a different set of results could also be considered reasonable actuarial results. The reason for this is that actuarial standards of practice describe a "central estimate" for each assumption, rather than a single best-estimate value. Thus, reasonable results differing from those presented in this report could have been developed by selecting different points within the best-estimate ranges for various assumptions.



John E. Wade, ACAS, MAAA
Senior Consulting Actuary
Pinnacle Actuarial Resources, Inc



Laura A Maxwell, FCAS, MAAA
Consulting Actuary
Pinnacle Actuarial Resources, Inc

December 2013

SECTION 1

ACTUARIAL VALUATION

BACKGROUND

This is the third actuarial valuation performed by Pinnacle Actuarial Resources, Inc. of the Special Reclamation Fund and the Special Reclamation Water Trust Fund. As in the prior valuations, forfeiture and release rates and reclamation costs have been selected on per permit or per acre bases separately for Underground, Surface, and Other permits. We have revised selections of expected future release rates based upon the available data. We have also reviewed the forfeiture data and developed expected forfeiture rates, based upon the calendar year rather than the year of permit issuance. This selection process is described more fully later in this document.

This valuation builds on the prior analyses valuations and develops separate updated reclamation costs for the different types of permits using the most up-to-date costs as reported in the Department of Environmental Protection database.

We have prepared a measurement of current liabilities and assets in accordance with the guidance set out in Governmental Accounting Standard Number 10, an excerpt of which is:

State and local governmental entities other than public entity risk pools are required to report an estimated loss from a claim as an expenditure/expense and as a liability if both of these conditions are met:

- a. Information available before the financial statements are issued indicates that it is probable that an asset had been impaired or a liability had been incurred at the date of the financial statements. It is implicit in this condition that it must be probable that one or more future events will also occur, confirming the fact of the loss.*
- b. The amount of the loss can be reasonably estimated.*

This valuation is a “closed” valuation in that it only considers liabilities associated with permits that have already been issued. With regard to the basis for the fund’s liabilities, we believe the accounting rules are framed to require the fund to account for both known forfeitures and anticipated forfeitures from existing permits. Accordingly, we have included in this report reclamation liabilities based on the date of forfeiture as well as based on the date of permit, to provide the SRF Advisory Council with a complete picture of the fund’s obligations.

DISTRIBUTION AND USE

The purpose of this report is to provide information to the Department of Environmental Protection to address the long-term funding requirements for both the Special Reclamation Fund and the Special Reclamation Water Trust Fund. It may be given to the SRF Advisory Council as well as the State of West Virginia's Governor, Legislature, and external auditor. However, we ask that this report be reproduced only in its entirety so that the reader has the full benefit of the information provided. Other distribution or use of this report or the estimates contained in it before it is made available to the public requires our prior, written permission.

LIMITATIONS AND RELIANCES

We relied without audit or verification on issued permits, forfeited permits, investment return and other information supplied for this analysis by Michael Sheehan, Lewis Halstead, Tom McCarthy, Jean Sheppard, Jennifer Paxton, and Patty Hickman, all employees of the West Virginia Department of Environmental Protection. We reviewed the data for overall reasonableness and consistency. We worked with the above named individuals to gain a better understanding of the data make adjustments if needed. If issues are discovered with the data as provided, we would ask to be informed as our estimates heavily rely upon the data.

RISKS POSING MATERIAL EFFECTS

There are two major components to both the SRF and the SRWTF: generated revenues and actual outlays. In the past few years both sides of the equation have been significantly impacted by external changes. The recent change in water treatment standards has added tremendous costs to the Funds. The recent legislated change to the tax rates will bring considerable revenues into the Funds. Both of these changes are the results of external factors and it can be assumed that future changes of similar magnitude, in the same or opposite directions, can occur again.

Other specific and significant risks faced by the SRF and SRWTF include the concentration of large amounts of liabilities within single operators. The overall economic condition of the industry also could play a large role since economic turns could cause major disruptions by leading to the bankruptcies of many smaller operators at the same time.

ACTUARIAL MODEL

The actuarial model combines the Department of Environmental Protection Special Reclamation Unit's estimated reclamation expenditures of the permits that have already been forfeited with the projection of estimated expenditures associated with the estimated numbers and types of future forfeited permits. The actuarial model uses separate release and forfeiture rates to project the expected number of existing permits/acres to be released and the number of permits/acres that are expected to be forfeited in the future. The model assumes that the SRF does not incur any additional costs when a permit is released. The model projects four types of expenditures associated with a forfeited permit. A forfeited permit is expected to produce associated revenues to the SRF in the form of the amount of the bond associated with the permit and/or any associated civil penalties or court settlements.

The four types of reclamation expenditures associated with a forfeited permit are:

- Land capital expenditures
- Water capital expenditures
- Ongoing water treatment costs
- Water abandonment costs

Some forfeited sites will require only land capital expenditures, while others may require both land and water capital expenditures. The current model assumes that where water capital expenditures are incurred there also will be ongoing water treatment costs. The future reclamation capital costs are developed based on a projection of the forfeited acreage, the current status of each permit and the average reclamation cost amounts per permitted acre. With this treatment of costs as an overall average across permits, the water capital expenditures are projected for all forfeited permits, even though some sites may not require water treatment activities.

The future annual water treatment expenditures have been developed differently with this analysis from prior reports. After the settlement agreement regarding compliance with the NPDES water quality standards, for the 2011 analysis we were provided with estimated annual water treatment costs for the forfeited permits currently in the process of treating water and those permits where the water treatment facilities were yet to be completed. These costs were from a study completed by Dr. Paul Ziemkiewicz and his colleagues at West Virginia University along with the members of the team in the Office of Special Reclamation. For the 2013 analysis we have utilized projected costs listed in the DEP's Job Scheduling Report. The Job Scheduling Report's annual operating dollars is based on the Special Reclamation database. Fixed pre-existing water treatment is based on the prior actuarial study.

As the treatment continues through time, it is expected that the nominal cost of treatment will decline by 2 percent per year before the application of normal cost inflation which is assumed to be 3 percent per year. Thus, the net annual change in water treatment costs is expected to be 1 percent.

In our prior analysis we expanded the number of years in which the water treatment process is expected to operate. Older studies assumed a 17 year timeframe for treatment. At that time, the water treatment facilities would be dismantled; incurring water abandonment costs. Based upon the recommendation of Michael Sheehan and his staff in the Office of Special Reclamation, in 2011 we assumed the Water Treatment costs would continue to be required beyond the 35 year time horizon of our estimates. We have continued that assumption in our 2013 analysis. This assumption leaves the Water Abandonment costs outside of the study horizon and becomes an un-reflected cost within our estimates. Thus, all water abandonment costs related to forfeited permits requiring water treatment would be in addition to any numbers quoted in this report.

Our analysis includes a projection of the administration costs expected to be incurred in the oversight of the reclamation activities. Our projections start with historical data provided by the Fund. We have assumed that the administration costs are independent of the reclamation expenditures and will increase into the future in line with price inflation. We have not made an explicit adjustment to administrative costs for the fact that as time passes, forfeited sites being handled will include permits not yet issued as of July 2013.

The actuarial model was applied to a database of all existing issued permits that have not yet been released or forfeited. The data on each permit included:

- Date of permit issue
- Status of permit (Active, Inactive or Phased Release)
- Type of permit (Underground, Surface, or Other)
- Number of permitted acres
- Total current bond amount

The model projects the number of permits/acres expected to be released or forfeited each year over the next 20+ years.

The projection of permit forfeiture is also used to determine the expected revenues from bond forfeiture and/or civil penalties and court settlements.

The actuarial model produced as output expected cash disbursements over the next 35 years. These disbursements were incorporated into a cash flow model that included projected tax receipts from coal production. The resulting fund balance, after consideration of

administration costs, was assumed to earn investment rates commensurate with current rates (averaging 1.0%) in the State's investment pools (SRF) and higher yields (5.6%) in other instruments (SRWTF). The current short term to long term Treasury rates are used as a guide to project the expected investment rates into the future for the SRF.

Investable amounts are divided into two categories within each fund, short term (liquid) and longer term vehicles. For the SRF, the short term rate is the West Virginia Money Market pool, currently earning about 0.1% annually. The SRF long term rate is the West Virginia Short Term Bond pool, currently earning about 1.1%. For the SRWTF, the short term rate is the West Virginia Money Market pool, currently earning about 0.1% annually. The SRWTF long term rate is based on current SRWTF investments, currently earning about 5.6%. The amount of money invested into each vehicle is limited to each fund's balance, with the short term investments being allocated two years of future expenditures in order to maintain a reasonable level of liquidity within the funds. For 2014, the SRF short term investment amount is limited to \$8 million, which is approximately where it currently stands.

THE KEY MODEL COMPONENTS

The actuarial model used the following components, each of which was developed from an analysis of experience data.

- Rates of release of permits by type of permit
- Rates of forfeiture of permits by type of permit
- Disturbed acres as a percent of permitted acres
- Expected land capital costs per disturbed acre
- Expected water capital costs per disturbed acre
- Expected ongoing water treatment costs per disturbed acre
- Expected water abandonment costs per disturbed acre
- Administration costs

Expected Release and Forfeiture Rates

With this analysis, we have reviewed the historical release and forfeiture data of the West Virginia Program. With minor exception, we have maintained the expected release rates for the surface mine, underground mine and other facilities permits. Our selections relied primarily on the release activity over the past 10 calendar years. As such, much of the activity related to the older permits in the early years of operation is not considered. We did not observe an obvious difference in the release rate activity based upon year in which the permit was issued. The selected release rates are provided in Exhibits 4.1, 4.2 and 4.3 of the Exhibit package and in Appendices 1.1, 1.2, and 1.3.

The projected forfeiture rates have been selected on a calendar year basis rather than based upon the year of permit issuance as previously used in studies of the Fund. With the sporadic nature of forfeitures and the high likelihood that there is correlation between permit forfeiture of multiple permits of one operator, we feel that this calendar year method of estimation is more appropriate for the West Virginia dynamics associated with this analysis. We reviewed the historical and recent forfeiture rates as a percent of open permits and selected a rate for each of surface mines, underground mines and other facility permits. The selected rates are shown in Exhibits 4.1, 4.2 and 4.3 of the Exhibit package and in Appendices 1.1, 1.2, and 1.3. Note that we continue to expect that there will be no forfeitures during the first three years following this issuance of any permit in West Virginia.

Since inception of the Special Reclamation Trust Fund in 1977, over 6,000 coal-related permits have been issued in West Virginia, 1,817 of which were still in-force as of June 30, 2013. A summary of the in-force and forfeited permit information is found in Section 3.

Each permit in the open permit database had an associated status. We grouped the statuses into three main categories:

- active,
- inactive, and
- phased release.

We performed the analysis of costs based on disturbed acres of the previously forfeited permits. As not all of the permitted acres are disturbed in the current coal production process, adjustment factors have been developed based on the percent of permitted acres that are disturbed. The ratios of disturbed acres to permitted acres are displayed in Exhibit 4.4. With the expansion of the analysis to project water treatment based upon forfeited permits that are currently or expected to treat water issues, we have expanded this exhibit to develop ratios based upon the inventory of those permits.

Permits that have already entered a phased release status were deemed to be much less likely to be forfeited than those in active or inactive status. However, as a single mine operator may hold permits in all three statuses, even some permits in phased release status may be forfeited due to enterprise risk rather than reclamation cost risk. We therefore applied a factor to each permit based on these categories that reflected variations in the magnitude of potential forfeiture and liability to the Fund. The factors used are shown in Exhibit 4.5.

Development of Cost per Acre

We performed an analysis of the land capital expenditures for the 1,934 permits that have been forfeited in West Virginia as of June 30, 2013.

Exhibit 1.1 provides the development of Land Capital Expenditures per Acre and by Permit Type.

Exhibit 1.2 provides the development of Water Capital Expenditures per Acre and by Permit Type.

Based upon the percentage of previously forfeited permits with significant water treatment issues (shown on Exhibits 3.2, 3.3 and 3.4), we have adjusted the projected future costs per permitted acre to reflect the fact that not all future forfeitures are anticipated to have significant water treatment issues. We have assumed that permits classified as “Closed Not Water But With Water Costs” do not have significant water treatment issues but rather the costs incurred were to test for compliance prior to closure.

Exhibit 1.3 displays the Water Abandonment Costs per Acre by Permit Type.

The valuation includes the anticipated costs for water capital equipment removal after testing indicates that water treatment is no longer needed. We are now assuming that all water treatment will continue over the next 35 years and thus, have not included any water abandonment costs within our projections.

Exhibit 1.4 provides a summary of the expected reclamation costs per Forfeited Acre by Permit Type. The Exhibit is provided here as well as in the exhibit package.

| Exhibit 1.4 | | | |
|---|----------------|--------------------|--------------|
| Reclamation Costs Summary | | | |
| <i>(In 2013 Dollars)</i> | | | |
| <i>Based upon Forfeited Permits</i> | <i>Surface</i> | <i>Underground</i> | <i>Other</i> |
| Land Capital Cost Per Permitted Acre | 2,700 | 12,400 | 7,300 |
| Water Capital Cost Per Permitted Acre | 900 | 1,900 | 1,500 |
| Water Abandonment Cost Per Permitted Acre | 230 | 575 | 475 |
| Total Capital Cost Per Permitted Acre | 3,830 | 14,875 | 9,275 |

Exhibit 1.5 summarizes the data for ongoing water treatment costs and shows the development of the initial year annual water treatment costs.

We have made a similar adjustment to the water treatment cost estimate as with the water capital estimate to reflect the assumption that not all future forfeited acres/permits will have

water treatment issues. The ratio used in our analysis is based upon the historical ratio of forfeited permits with water treatment issues to the total number of forfeited permits. The development of these ratios is displayed in Exhibits 3.2, 3.3 and 3.4.

Administration Costs

The Administration Costs are displayed and discussed further in the following section, Actuarial Valuation.

One Method for Estimating Liabilities

Generally it is preferable to use multiple methods to estimate outstanding and future liabilities. There are no standard actuarial techniques in making these estimates for mine reclamation exposures, however the developed methodology used in this analysis is similar to those used in neighboring state's mine reclamation programs.

ACTUARIAL VALUATION

The actuarial model builds on the current cash projections developed by the Department of Environmental Protection for the expected reclamation costs on sites where permits have already been forfeited. The figures for permits forfeited prior to July 1, 2013 were provided by the Department of Environmental Protection in their Job Scheduling Report as of June 30, 2013. The following exhibits show the expected expenditures for the next 35 years in the following categories:

- **Exhibit 1.6 - Land Capital Expenditures**
- **Exhibit 1.7 - Water Capital Expenditures**
- **Exhibit 1.8 –Water Abandonment Expenditures**
- **Exhibit 1.9 - Water Treatment Expenditures**

Each exhibit provides the estimated expenditures in the following categories:

- Permits forfeited prior to July 1, 2013 (from the Job Scheduling Report)
- Permits forfeited after July 1, 2013
- Total of the above

Administration Costs

Generally, the administration costs are independent of the cost of the reclamation activities. The current DEP staffing levels may be adjusted over time as the inventory of older permit forfeitures is processed. We have assumed the current staffing levels will remain unchanged. Future administration costs were estimated by increasing the current administration costs by 1

percent per year. These expected costs by year are displayed in Exhibit 1.11. It should be noted that in prior studies current administration costs were estimated, whereas for the 2013 study we were able to obtain actual historical costs. This increased liabilities by about \$2 million annually.

Coal Tax Revenues

Exhibit 1.12 shows the projected coal production and the projected Coal Tax revenue by year and fund. Coal production figures were derived from the “Consensus Coal Production Forecast for West Virginia 2013” as prepared by Christine Risch and Alicia K. Copley, Center for Business and Economic Research, Marshall University and supplemental information from the SRF.

For the revenue projections included in our analysis, we have limited the expected coal tax revenues to the portion of the total expected coal tax revenues that are attributable to the permits issued prior to June 30, 2013. The expected coal tax to be paid from the permits issued prior to June 30, 2013 have been developed using the ratio of expected remaining surface and underground mining acres under permit to the total acres as of June 30, 2013. This ratio is provided in column (4) of this Exhibit.

Bond Forfeiture, Civil Penalties, and Court Settlements

Based on the permit and acreage forfeiture projections along with the current bond values on the open permits issued in each year, we had developed an estimation of the expected bond forfeiture collections in each of the next 35 fiscal years. As might be expected, the amounts decline over time as the permits in-force today decline through attrition, and the expected number of permit forfeitures declines as well.

We have also included an explicit estimate of Civil Penalties and Other Revenues in this year’s analysis. Our starting point of \$500,000 was based on current amounts collected (\$1.2 million), tempered to reflect the fortuitous and sporadic nature of the collection of these funds.

Exhibit 1.13 provides the estimated bond collections from future forfeitures, civil penalties, and other revenue.

Investment Income

The investment income has been estimated by applying the investment rates to the fund balance at the beginning of the year plus one-half the current year income less one-half the current year expenditures. As the SRF is prohibited from borrowing, when the projected fund balance is zero, there will be no investment income in the following year.

In our prior analyses we selected investment rates of return based upon the recent returns available through investing in US Treasuries. With this analysis we have bifurcated the rates of return by the Funds, that is, we have used different rates for the SRF vs. the SRWTF. Moreover, we have reviewed recent rates of return actually earned by the Pools the SRF is invested in and found them to be closer to an average of 1.0% as opposed to the 2011 return of 0.125% earned by the Funds. Similarly, the SRWTF is currently earning a rate of return of 5.67%.

Investable amounts are divided into two categories within each fund, short term (liquid) and longer term vehicles. For the SRF, the short term rate is the West Virginia Money Market pool, currently earning about 0.1% annually. The SRF long term rate is the West Virginia Short Term Bond pool, currently earning about 1.1%. For the SRWTF, the short term rate is the West Virginia Money Market pool, currently earning about 0.1% annually. The SRWTF long term rate is based on current SRWTF investments, currently earning about 5.6%.

The amount of money invested into each vehicle is limited to each fund's balance, with the short term investments being allocated two years of future expenditures in order to maintain a reasonable level of liquidity within the funds. For 2014, the SRF short term investment amount is limited to \$8 million, which is approximately where it currently stands.

The rates of return on US Treasuries were used to facilitate a gradual increase in expected short term rates of return to more historical levels.

Exhibits 1.14 and 1.14a provide the projected future investment rates, discount rates, and projected amounts of return for each fund. The discount rates are based on the average expected investment rates of return to be available to each fund over the next 35 years.

Permit and Acreage Projections

As part of the analysis, we have developed projections of the permits and acreage into the future. While the most important pieces of information are the number of forfeited permits and number of forfeited acres, the number of (open) permits that remain to be closed via release or forfeiture is also interesting and useful. We have made separate projections of the active and inactive permits as well as permits in phased release status.

- Exhibit 1.15 - projected number of permits in-force over time.
- Exhibit 1.16 -the projection of the acreage of permits in force.
- Exhibit 1.17 - projected acreage of in-force permits, forfeited permits, and released permits

We have also provided these exhibits separated by the type of permit. Please note that these projections are only for the permits that had been issued on or before June 30, 2013.

SECTION 2

PROJECTION OF REQUIRED INCOME

We have also developed an estimate of the required coal tax rates needed to generate income sufficient for the Funds to cover the projected forfeiture reclamation of in-force permits through 2048.

Appendices 2 and 3 show the projected cash flow for the next 35 years with the goal of a positive cash balance at the end of fiscal year 2048.

Appendices 2.1, 2.2, and 2.3 shows that under the current projections, the Special Reclamation Fund SRF tax would need to increase to 14.41 cents per ton of coal in order to balance the projected future income with the projected reclamation expenditures of permits in force as of June 30, 2013.

Due to the revised water capital cost and treatment assumptions, the anticipated annual costs in the Special Reclamation Water Trust Fund and the time horizon for these annual costs to be required, the required future revenue in this Fund is also increased. Appendices 3.1, 3.2, and 3.3 shows that under the current projections the Special Reclamation Water Trust Fund would need to increase significantly to 19.06 cents per ton of coal in order to balance the projected future income with the projected reclamation expenditures of the permits in force as of June 30, 2013.

Appendices 2 and 3 can be found following the Exhibits section of this report.

Even though the SRWTF tax rate recently increased to 15.0 cents, it appears that water treatment costs are going to be greater yet. This facet of West Virginia's reclamation program should be monitored closely in years to come. It is likely that additional increases will be needed to achieve 100% funding in the next 35 years.

SECTION 3**DATA UNDERLYING ANALYSIS**

Data provided for this study are enumerated and discussed below. We did not audit or verify the data, although we did put them through some reasonability tests and found no obvious problems. In addition, we also used information provided for the prior evaluations of the Special Reclamation Fund and the Special Reclamation Water Trust Fund.

Data Provided By West Virginia for This Study

We were provided with a complete copy of the OSR (Office of Special Reclamation) database containing the forfeited permits as of June 30, 2013 in an Excel spreadsheet. The OSR also provided a detailed list of field definitions applicable to their database.

We also obtained a separate database from the Division of Mining and Reclamation that provided detailed information regarding permits issued for coal mining operations.

Following is a summary of the changes in the number of permits contained in the various databases and categories using information contained in the prior report and the current files.

| Summary of Forfeited Permits in West Virginia | | | |
|--|--------------|---------------------------|------------------------------|
| | Total | Active Reclamation | Completed Reclamation |
| As of 6/30/2011 | 1,905 | 127 | 1,778 |
| As of 6/30/2013 | 1,934 | 99 | 1,835 |
| Change | 29 | (28) | 57 |

| Summary of Issued Permits in West Virginia | | | |
|---|--------------|-----------------|------------------------------|
| | Total | In Force | Released or Forfeited |
| As of 6/30/2011 | 5,948 | 1,773 | 4,175 |
| As of 6/30/2013 | 6,065 | 1,817 | 4,248 |
| Change | 117 | 44 | 73 |

We have utilized the “Consensus Coal Production Forecast for West Virginia 2013” prepared by Christine Risch and Alicia K. Copley from the Center for Business and Economic Research at Marshall University. The most recent report was issued in August 2013.

The forfeiture and release rates were reviewed using the available historical data updated through June of 2013. Based upon that data, we have revised the expected release rates for the surface mine, underground mine and other facilities permits. Our selections relied primarily on the release activity over the past 10 calendar years. As such, much of the activity related to the

older permits in the early years of operation is not considered. We did not observe an obvious difference in the release rate activity based upon year in which the permit was issued. The selected release rates are provided in Exhibits 4.1, 4.2 and 4.3 of the Exhibit package and Appendices 1.1, 1.2, and 1.3.

Using the historical data, the projected forfeiture rates have been selected on a calendar year basis rather than based upon the year of permit issuance. With the sporadic nature of forfeitures and the high likelihood that there is correlation between permit forfeiture of multiple permits of one operator, we feel that this method of estimation is more appropriate for the West Virginia dynamics associated with this analysis. We reviewed the historical and recent forfeiture rates as a percent of open permits and selected a rate for each of surface mines, underground mines and other facility permits. The selected rates are shown in Exhibits 4.1, 4.2 and 4.3 of the Exhibit package and Appendices 1.1, 1.2, and 1.3. Note that we continue to expect that there will be no forfeitures during the first three years following this issuance of any permit in West Virginia.

We were provided with a copy of the Job Scheduling Report (JSR) as of June 30, 2013. This report contains the Department of Environmental Protection estimates of work scheduled to be performed on sites for permits forfeited prior to June 30, 2013. The JSR contains the expected amount of payment for work in the next several quarters. This information was used for projecting costs for land capital and water capital costs for permits forfeited prior to June 30, 2013. In addition, data in the JSR providing estimates of future Bond Forfeitures, Civil Penalties & Court Settlements was used in the valuation.

Using the OSR Data – Forfeited Permits

Taking the database of forfeited permits as provided by the Department of Environmental Protection, we split the forfeited permit data into three components: Other, Surface, and Underground. Within these categories, we had four types of forfeited permits: open water, closed water, closed not water but with water costs, and land only. We further split each of these twelve categories into open land and closed land.

This resulted in the following eight categories for each of Other, Surface, and Underground:

- Open water – open land;
- Open water – closed land;
- Closed water – open land;
- Closed water – closed land;
- Closed not water but with water costs – open land;
- Closed not water but with water costs – closed land;

- Land only – open water; and
- Land only – closed water.

The water claims were determined by the use of the acid mine drainage code. Next, we split out the open and closed water claims. Open water forfeited permits are those that have not yet had the capital water projects completed. They are labeled TBC (to be contracted) or UC (under contract) in the water status column. As we worked our way through the remaining sorts, we discovered that there are some open water claims with no code in water status column because they are only being monitored at this time.

The closed water forfeited permits are those that have had the capital water projects completed but are undergoing monitoring and/or treatment. They are labeled ACT (active) or P (passive).

The closed not water but with water cost forfeited permits are those that have some capital or ongoing water costs associated with them but are not considered water forfeited permits. This can arise from several situations.

- A closed water forfeited permit that has four consecutive quarters of untreated water monitoring that shows no problems will be reclassified as closed (C);
- An open water forfeited permit that has four consecutive quarters of untreated water monitoring that shows no problems will be reclassified as not applicable (NA); and
- Land capital costs are at times labeled as water capital costs if they involve a water source even if the water is not being treated.

In all three situations, we treated the water capital and ongoing costs as land capital costs. This is consistent with the treatment in the prior actuarial study.

The land only forfeited permits are those that have no capital water costs or ongoing water costs.

We then went through these four categories and split them into open land and closed land based on the land status column. The open land claims were assigned to one of the following status:

- TBC (to be contracted),
- TPL (tree planting),
- SSR (sediment structure removal), or
- RO (reopened).

The closed land claims were assigned to the following status codes:

- UCW (under contract warranty),
- RPM (re-permitted),
- OTR (others to reclaim)
- NR (OSR not responsible), or
- C (closed).

The first four closed land categories were deemed closed for the purpose of this study because any additional funds spent on the sites' reclamation would not come from the Special Reclamation Fund.

The final model parameters based on the OSR and other data are shown in Section 4.

Forfeited Permits by Type of Mining Operation –

Total Forfeited and Forfeited Pending Reclamation Completion

Of the 1,934 forfeited permits at June 30, 2013, 99 permits were either in active reclamation or awaiting reclamation activity.

In Exhibits 3.1 through 3.4 of the Exhibit Package, we display the total number of forfeited permits and the number of open forfeited permits, the total number of forfeited permitted acres and the number of open forfeited permitted acres that formed the basis for the measurement

- Exhibit 3.1 - Forfeitures - All Permit Types
- Exhibit 3.2 - Forfeitures – Surface Permits
- Exhibit 3.3 - Forfeitures – Underground Permits
- Exhibit 3.4 - Forfeitures - All Other Permit Types

In-Force Permits

In a separate database, we have been provided information regarding permits issued before June 30, 2013 that are still in-force. The in-force designation means that the site is either

- a. currently being mined,
- b. inactive and not yet reclaimed, or
- c. in the process of being reclaimed (phased release)

Exhibits 3.5 through 3.8, displayed in the Exhibits section of our report, summarize the in-force permits and acreage as of June 30, 2013 by year of issuance and type of permit:

- Exhibit 3.5 - the total number of permits and acres in force
 - Surface Mine,
 - Underground Mine,
 - Other Permit.
- Exhibit 3.6 - Surface Permits in-force and issued by year.
- Exhibit 3.7 - Underground Permits in-force and issued by year.
- Exhibit 3.8 - Other Permits (acres) in-force and issued by year.

SECTION 4

ACTUARIAL ASSUMPTIONS

This section summarizes the actuarial assumptions used in the measurement.

Since the model is one based upon a projection of the number of permits that will be forfeited and become the obligation of the Funds, the rates of permit forfeiture and release are the first key model assumptions. The selected rates of forfeiture and release are applied to the current in-force permit counts by year of issuance and years since issuance, and by type of permit. The selected release and forfeiture rates by type of permit are displayed on Exhibits 4.1, 4.2, 4.3 and 4.4 and Appendices 1.1, 1.2, and 1.3. Also, the number of forfeited acres is determined in this part of the process.

Exhibit 4.1 Forfeiture and Release Rates – Surface Permits

Exhibit 4.2 Forfeiture and Release Rates – Underground Permits

Exhibit 4.3 Forfeiture and Release Rates – Other Permits

Once the number of projected forfeitures is determined, the cost of reclamation is estimated by applying the estimated average land reclamation costs, water reclamation costs, water abandonment costs and annual on-going water treatment costs per acre by type of mining operation (permit). The average costs in 2013 dollars as developed from the previously forfeited permit data are displayed in Exhibit 4.6, shown below. In adjusting the previous costs to 2013 dollars, we have used a 4 percent inflation rate for reclamation costs. We used Exhibit 2.1 as a guide in selecting the historic (4.0%) and prospective (3.3%) inflation rates for both Funds.

| Exhibit 4.6 | | | |
|-------------------------------------|-----------------------|---------------------------|---------------------------|
| Cost Per Acre by Permit Type | | | |
| (in 2013 Dollars) | | | |
| | <i>Surface</i> | <i>Underground</i> | <i>Other Types</i> |
| Land Capital | 2,700 | 12,400 | 7,300 |
| Water Capital | 900 | 1,900 | 1,500 |
| Water Abandonment | 230 | 575 | 475 |
| Annual Water Treatment | 105 | 170 | 130 |

In development of the cash flow projections, the first item to determine is the timing of future payments. We have used the following assumptions as to the delay between permit forfeiture

and the expenditure of land capital and water capital funds for reclamation. This expenditure delay is the same as used in previous reviews by the Hay Group and our previous study. We have not attempted to test these assumptions based upon the timing of actual expenditures.

| Land Capital and Water Capital Expenditure Delay | |
|---|---|
| <i>Forfeiture Fiscal Year</i> | <i>Expenditure Fiscal Year</i> |
| 2014 | Half in FY 2017, half in FY 2018 |
| 2015 | Half in FY 2018, half in FY 2019 |
| 2016 | All in FY 2019 |
| 2017 | All in FY 2020 |
| 2018 | Half in FY 2020, half in FY 2021 |
| 2019 | All in FY 2021 |
| 2020 and beyond | Completed in fiscal year 2 years after forfeiture |

For the projection of annual on-going water treatment expenditures, we have assumed that there is no delay between the water capital expenditure and the commencement of the on-going water treatment. Thus, the exhibit above applies to the origination of the water treatment.

The projection of administration costs assumes an annual increase of 1 percent.

In the cash flow projections, we have applied an inflation rate to historical actual reclamation costs to develop these costs in terms of 2013 dollars. The inflation rate applied to these reclamation costs is 4.0 percent annually. We used Exhibit 2.1 as a guide in making this selection.

The reflection of investment income on the Fund Balances and general net cash flow has been developed based upon recent historical earnings of the SRF and SRWTF, and investment rates from US Treasuries. While the longer term investment returns are typically about 4 to 5 percent, the current returns of the Funds are about 1.0 and 5.67 percent for the SRF and the SRWTF, respectively. The investment rates provided in Exhibit 1.14 start at 1.0% (0.1% Money Market and 1.1% Short Term Bond pools) and 5.6% for the SRF and SRWTF, respectively, and assume the current environment will gradually return to more long term rates in the coming years. Interim annual periods have been interpolated to further smooth the transition of rates to the historical levels. In addition, the SRWTF is assumed to begin maintaining roughly two years of future expenditures worth of their investable assets in the Money Market funds for liquidity purposes. Implicit Discount Factors based upon the average Investment Rates of Return are also displayed in Exhibit 1.14.

We have continued to utilize the adjustment factors for Bond Value Size and Permit Status as shown in Exhibits 4.5 and 4.7 below.

| Exhibit 4.5 | |
|---|-------------------------|
| Adjustment Factors for Permit Status | |
| Permit Status | Liability Factor |
| Active | 1.00 |
| Inactive | 1.00 |
| Phased Release | 0.50 |

| Exhibit 4.7 | |
|---|---------------|
| Adjustment Factors for Size of Permits | |
| Bond Value | Factor |
| Less than \$100,000 | 1.25 |
| Between \$100,000 and \$500,000 | 1.00 |
| Over \$500,000 | 0.25 |

As previously mentioned, since not all permitted acres are disturbed during the mining operations, in the case of forfeiture, only a portion of the permitted acres will require reclamation. The following exhibit shows the development of the percentages used in our analysis based upon historical forfeiture information.

| Exhibit 4.4 | | | |
|---|----------------|--------------------|--------------|
| Percent of Permitted Acres That Had Been Disturbed Prior to Forfeiture | | | |
| Based upon Forfeited Permits | Surface | Underground | Other |
| Forfeited Disturbed Acres | 35,545.80 | 3,750.62 | 4,519.02 |
| Forfeited Permitted Acres | 51,031.15 | 5,204.82 | 6,068.55 |
| Percent of Permitted Acres That Are Disturbed | 69.66% | 72.06% | 74.47% |
| Forfeited Disturbed Acres with Open Water | 10,485.99 | 391.32 | 1,199.06 |
| Forfeited Permitted Acres with Open Water | 15,134.51 | 454.50 | 1,447.03 |
| Percent Disturbed with Open Water | 69.29% | 86.10% | 82.86% |
| Forfeited Disturbed Acres with Closed Water | 6,694.57 | 303.89 | 929.91 |
| Forfeited Permitted Acres with Closed Water | 9,359.50 | 335.89 | 1,132.45 |
| Percent Disturbed with Closed Water | 71.53% | 90.47% | 82.11% |

A new variable first considered in the 2011 analysis is the structure of the permit ownership. This potential variable has come into focus based upon work of Christine Risch at Marshall University in the Center for Business and Economic Research. During the operation of the Fund, we have a record of only one revoked permit from a publicly traded company. This permit did not appear to have been handled by the Office of Special Reclamation.

Based on information at hand, there is insufficient data to support varying adjustment factors at this time. However, we have built the following exhibit into our model for possible future reflection of the impact of ownership structure on our projection of future permit forfeitures.

| Adjustment Factors for Ownership Structure | |
|---|---------------|
| Ownership Structure | Factor |
| Sole Proprietor | 100% |
| Partnership | 100% |
| Multi-Corporation | 100% |
| Public Corporation | 100% |
| Private Corporation | 100% |

As can be seen, our current model sets all the adjustment factors to 100% (i.e., no impact in this year's analysis).

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| Table A-1 | | | |
|--|---------------------|---------------------|-------------------|
| Special Reclamation Fund | | | |
| Liability as of June 30, 2013 for Known and Expected Forfeitures | | | |
| Limited to a 20-Year Cash Flow | | | |
| (Present Value in \$ Millions) | | | |
| | Currently Forfeited | Projected Forfeited | Total Liabilities |
| (1) Land Capital | 9.4 | 75.6 | 85.0 |
| (2) Water Capital | 61.3 | 1.5 | 62.8 |
| (3) Water Abandonment | 0.0 | 0.0 | 0.0 |
| (4) Ongoing Water Treatment | 44.0 | 0.2 | 44.2 |
| (5) Legacy Water Treatment | 0.0 | 0.0 | 0.0 |
| (6) Administration | | | 92.1 |
| Total | | | 284.0 |

Footnotes:

- (1) Exhibit 1.6 Col (7)
- (2) Exhibit 1.7 Col (7)
- (3) Exhibit 1.8 Col (7)
- (4) Exhibit 1.9 Col (7)
- (5) Exhibit 1.10 Col (3)
- (6) Exhibit 1.11 Col (3)

| Table A-2 | | | |
|--|---------------------|---------------------|-------------------|
| Special Reclamation Fund | | | |
| Liability as of June 30, 2013 for Known and Expected Forfeitures | | | |
| Cash Flow Projection through 2048 | | | |
| (Present Value in \$ Millions) | | | |
| | Currently Forfeited | Projected Forfeited | Total Liabilities |
| (7) Land Capital | 9.4 | 109.5 | 118.9 |
| (8) Water Capital | 61.3 | 1.5 | 62.8 |
| (9) Water Abandonment | 0.0 | 0.0 | 0.0 |
| (10) Ongoing Water Treatment | 44.0 | 0.2 | 44.2 |
| (11) Legacy Water Treatment | 0.0 | 0.0 | 0.0 |
| (12) Administration | | | 164.1 |
| Total | | | 389.9 |

Footnotes:

- (7) Exhibit 1.6 Col (8)
- (8) Exhibit 1.7 Col (8)
- (9) Exhibit 1.8 Col (8)
- (10) Exhibit 1.9 Col (8)
- (11) Exhibit 1.10 Col (3)
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| Table A-3 | | | |
|--|---------------------|---------------------|-------------------|
| Special Reclamation Water Trust Fund | | | |
| Liability as of June 30, 2013 for Known and Expected Forfeitures | | | |
| Limited to a 20-Year Cash Flow | | | |
| (Present Value in \$ Millions) | | | |
| | Currently Forfeited | Projected Forfeited | Total Liabilities |
| (1) Land Capital | 0.0 | 0.0 | 0.0 |
| (2) Water Capital | 0.0 | 11.6 | 11.6 |
| (3) Water Abandonment | 0.0 | 0.0 | 0.0 |
| (4) Ongoing Water Treatment | 125.8 | 14.1 | 139.9 |
| (5) Legacy Water Treatment | 0.0 | 0.0 | 0.0 |
| (6) Administration | | | 0.0 |
| Total | | | 151.5 |

Footnotes:

- (1)
- (2) Exhibit 1.7 Col (7)
- (3) Exhibit 1.8 Col (7)
- (4) Exhibit 1.9 Col (7)
- (5) Exhibit 1.10 Col (3)
- (6)

| Table A-4 | | | |
|--|---------------------|---------------------|-------------------|
| Special Reclamation Water Trust Fund | | | |
| Liability as of June 30, 2013 for Known and Expected Forfeitures | | | |
| Cash Flow Projection through 2048 | | | |
| (Present Value in \$ Millions) | | | |
| | Currently Forfeited | Projected Forfeited | Total Liabilities |
| (7) Land Capital | 0.0 | 0.0 | 0.0 |
| (8) Water Capital | 0.0 | 15.8 | 15.8 |
| (9) Water Abandonment | 0.0 | 0.0 | 0.0 |
| (10) Ongoing Water Treatment | 232.2 | 42.4 | 274.6 |
| (11) Legacy Water Treatment | 0.0 | 0.0 | 0.0 |
| (12) Administration | | | 0.0 |
| Total | | | 290.4 |

Footnotes:

- (7)
- (8) Exhibit 1.7 Col (8)
- (9) Exhibit 1.8 Col (8)
- (10) Exhibit 1.9 Col (8)
- (11) Exhibit 1.10 Col (3)
- (12)

| <p style="text-align: center;">Table B-1 Special Reclamation Fund Revenue Projection as of June 30, 2013 for Known and Expected Forfeitures Limited to a 20-Year Cash Flow (Present Value in \$ Millions)</p> | | | |
|---|--|-----------------|--------------|
| Coal Tax Current Permits | Bond Forfeiture, Civil Penalties and Court Settlements | Interest Income | Total Income |
| (1) | (2) | (3) | (4) |
| 183.9 | 45.3 | 1.6 | 230.8 |

Footnotes:

- (1) Exhibit 1.12 Col (8)
- (2) Exhibit 1.13 Col (3) + Col (6)
- (3) Exhibit 1.14a Col (4)
- (4) Sum of Col (1) through Col (3)

| <p style="text-align: center;">Table B-2 Special Reclamation Fund Revenue Projection as of June 30, 2013 for Known and Expected Forfeitures Cash Flow Projection through 2048 (Present Value in \$ Millions)</p> | | | |
|--|--|-----------------|--------------|
| Coal Tax Current Permits | Bond Forfeiture, Civil Penalties and Court Settlements | Interest Income | Total Income |
| (5) | (6) | (7) | (8) |
| 241.3 | 55.3 | 1.7 | 298.3 |

Footnotes:

- (5) Exhibit 1.12 Col (8)
- (6) Exhibit 1.13 Col (3) + Col (6)
- (7) Exhibit 1.14a Col (4)
- (8) Sum of Col (5) through Col (7)

| <p style="text-align: center;">Table B-3 Special Reclamation Water Trust Fund Revenue Projection as of June 30, 2013 for Known and Expected Forfeitures Limited to a 20-Year Cash Flow (Present Value in \$ Millions)</p> | | | |
|---|--|-----------------|--------------|
| Coal Tax Current Permits | Bond Forfeiture, Civil Penalties and Court Settlements | Interest Income | Total Income |
| (1) | (2) | (3) | (4) |
| 155.3 | 0.0 | 50.1 | 205.4 |

Footnotes:

- (1) Exhibit 1.12 Col (9)
- (2) Included in Table B-1, SRF Aamounts
- (3) Exhibit 1.14a Col (8)
- (4) Sum of Col (1) through Col (3)

| <p style="text-align: center;">Table B-4 Special Reclamation Water Trust Fund Revenue Projection as of June 30, 2013 for Known and Expected Forfeitures Cash Flow Projection through 2048 (Present Value in \$ Millions)</p> | | | |
|--|--|-----------------|--------------|
| Coal Tax Current Permits | Bond Forfeiture, Civil Penalties and Court Settlements | Interest Income | Total Income |
| (5) | (6) | (7) | (8) |
| 187.9 | 0.0 | 50.8 | 238.7 |

Footnotes:

- (5) Exhibit 1.12 Col (9)
- (6) Included in Table B-2, SRF Aamounts
- (7) Exhibit 1.14a Col (8)
- (8) Sum of Col (5) through Col (7)

| Table C-1 Special Reclamation Fund Funded Status as of June 30, 2013 (in \$ Millions) | | |
|---|----------|--------------|
| | 20 Years | Through 2048 |
| (1) Present Value of Future Revenues | 230.8 | 298.3 |
| (2) Assets as of June 30, 2013 | 75.0 | 75.0 |
| (3) Assets + Present Value of Future Revenues | 305.7 | 373.3 |
| (4) Present Value of Future Expenditures | 284.0 | 389.9 |
| (5) Funded Status | 107.6% | 95.7% |
| (6) Year Fund Balance Becomes Negative | 2018 | |

Footnotes:

- | | |
|-----|--------------------------------------|
| (1) | Table B-1 Col (4); Table B-2 Col (8) |
| (2) | Client Data |
| (3) | Row (1) + Row (2) |
| (4) | Table A-1 Total; Table A-2 Total |
| (5) | Row (3) / Row (4) |
| (6) | Table D Summary |

| Table C-2 Special Reclamation Water Trust Fund Funded Status as of June 30, 2013 (in \$ Millions) | | |
|---|----------|--------------|
| | 20 Years | Through 2048 |
| (1) Present Value of Future Revenues | 205.4 | 238.7 |
| (2) Assets as of June 30, 2013 | 22.5 | 22.5 |
| (3) Assets + Present Value of Future Revenues | 227.9 | 261.2 |
| (4) Present Value of Future Expenditures | 151.5 | 290.4 |
| (5) Funded Status | 150.4% | 89.9% |
| (6) Year Fund Balance Becomes Negative | 2038 | |

Footnotes:

- | | |
|-----|--------------------------------------|
| (1) | Table B-3 Col (4); Table B-4 Col (8) |
| (2) | Client Data |
| (3) | Row (1) + Row (2) |
| (4) | Table A-3 Total; Table A-4 Total |
| (5) | Row (3) / Row (4) |
| (6) | Table E Summary |

| Table D-1 Summary Special Reclamation Fund Projected Cash Flow For 2014 to 2048 (in \$ Thousands) | | | |
|---|--------------|---------|---------------------------|
| Fiscal Year Ending 6/30 | Expenditures | Revenue | Projected Fund Balance |
| | (1) | (2) | (3) |
| 2013 | 0 | 0 | 74,960 |
| 2014 | 28,412 | 19,086 | 65,633 |
| 2015 | 38,804 | 17,363 | 44,193 |
| 2016 | 46,763 | 16,560 | 13,990 |
| 2017 | 21,116 | 16,015 | 8,888 |
| 2018 | 23,956 | 14,825 | -243 |
| 2019 | 12,321 | 13,879 | 1,315 |
| 2020 | 12,234 | 13,242 | 2,323 |
| 2021 | 11,993 | 12,605 | 2,935 |
| 2022 | 9,401 | 12,176 | 5,709 |
| 2023 | 9,337 | 11,696 | 8,068 |
| 2024 | 9,268 | 11,136 | 9,936 |
| 2025 | 9,194 | 10,578 | 11,319 |
| 2026 | 9,120 | 10,109 | 12,308 |
| 2027 | 9,047 | 9,653 | 12,915 |
| 2028 | 8,978 | 9,194 | 13,131 |
| 2029 | 8,910 | 8,779 | 12,999 |
| 2030 | 8,844 | 8,379 | 12,533 |
| 2031 | 8,780 | 7,990 | 11,743 |
| 2032 | 8,719 | 7,593 | 10,617 |
| 2033 | 8,661 | 7,199 | 9,155 |
| 2034 | 8,605 | 6,894 | 7,444 |
| 2035 | 8,549 | 6,575 | 5,470 |
| 2036 | 8,497 | 6,265 | 3,238 |
| 2037 | 8,451 | 5,978 | 764 |
| 2038 | 8,410 | 5,719 | -1,926 |
| 2039 | 8,374 | 5,501 | -4,799 |
| 2040 | 8,342 | 5,305 | -7,836 |
| 2041 | 8,315 | 5,126 | -11,025 |
| 2042 | 8,292 | 4,963 | -14,353 |
| 2043 | 8,273 | 4,817 | -17,810 |
| 2044 | 8,259 | 4,684 | -21,384 |
| 2045 | 8,248 | 4,564 | -25,068 |
| 2046 | 8,241 | 4,455 | -28,854 |
| 2047 | 8,237 | 4,356 | -32,735 |
| 2048 | 8,237 | 4,266 | -36,706 |

Footnotes:

- (1) Table D-2 Expenditures Col (7)
- (2) Table D-3 Revenue Col (4)
- (3) Prior Col (3) + (Col (2) - Col (1))

Table D-2 Expenditures
Special Reclamation Fund
 Projected Cash Flow For 2014 to 2048
 (in \$ Thousands)

| Fiscal Year Ending 6/30 | Land Capital (1) | Water Capital (2) | Water Abandonment (3) | Ongoing Water (4) | Fixed Water Treatment (5) | Administration Costs (6) | Total Expenditures (7) | |
|----------------------------|------------------------|---|-----------------------------|-------------------------|---------------------------------|--------------------------------|------------------------------|--------|
| 2013 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 2014 | 687 | 17,014 | 0 | 6,360 | 0 | 4,350 | 28,412 | |
| 2015 | 1,140 | 25,140 | 0 | 8,131 | 0 | 4,394 | 38,804 | |
| 2016 | 7,662 | 23,523 | 0 | 11,140 | 0 | 4,437 | 46,763 | |
| 2017 | 2,406 | 1,829 | 0 | 12,400 | 0 | 4,482 | 21,116 | |
| 2018 | 4,951 | 1,291 | 0 | 13,187 | 0 | 4,527 | 23,956 | |
| 2019 | 7,749 | Cost covered by Water Trust Fund post 2018 | | | | | 4,572 | 12,321 |
| 2020 | 7,616 | | | | | | 4,618 | 12,234 |
| 2021 | 7,329 | | | | | | 4,664 | 11,993 |
| 2022 | 4,691 | | | | | | 4,710 | 9,401 |
| 2023 | 4,580 | | | | | | 4,758 | 9,337 |
| 2024 | 4,463 | | | | | | 4,805 | 9,268 |
| 2025 | 4,341 | | | | | | 4,853 | 9,194 |
| 2026 | 4,218 | | | | | | 4,902 | 9,120 |
| 2027 | 4,097 | | | | | | 4,951 | 9,047 |
| 2028 | 3,978 | | | | | | 5,000 | 8,978 |
| 2029 | 3,860 | | | | | | 5,050 | 8,910 |
| 2030 | 3,744 | | | | | | 5,101 | 8,844 |
| 2031 | 3,628 | | | | | | 5,152 | 8,780 |
| 2032 | 3,516 | | | | | | 5,203 | 8,719 |
| 2033 | 3,406 | | | | | | 5,255 | 8,661 |
| 2034 | 3,297 | | | | | | 5,308 | 8,605 |
| 2035 | 3,188 | | | | | | 5,361 | 8,549 |
| 2036 | 3,083 | | | | | | 5,415 | 8,497 |
| 2037 | 2,983 | | | | | | 5,469 | 8,451 |
| 2038 | 2,887 | | | | | | 5,523 | 8,410 |
| 2039 | 2,795 | | | | | | 5,579 | 8,374 |
| 2040 | 2,708 | | | | | | 5,634 | 8,342 |
| 2041 | 2,624 | | | | | | 5,691 | 8,315 |
| 2042 | 2,544 | | | | | | 5,748 | 8,292 |
| 2043 | 2,468 | | | | | | 5,805 | 8,273 |
| 2044 | 2,396 | | | | | | 5,863 | 8,259 |
| 2045 | 2,326 | | | | | | 5,922 | 8,248 |
| 2046 | 2,260 | | | | | | 5,981 | 8,241 |
| 2047 | 2,196 | | | | | | 6,041 | 8,237 |
| 2048 | 2,136 | | | | | | 6,101 | 8,237 |

Footnotes:

- (1) Exhibit 1.6 Col (6)
- (2) Exhibit 1.7 Col (6)
- (3) Exhibit 1.8 Col (6)
- (4) Exhibit 1.9 Col (6)
- (5) Exhibit 1.10 Col (1)
- (6) Exhibit 1.11 Col (1)
- (7) Sum of Col (1) through (6)

| Table D-3 Revenue Special Reclamation Fund Projected Cash Flow For 2014 to 2048 (in \$ Thousands) | | | | |
|---|-----------------|--------------------------|----------------------|------------------|
| Fiscal Year Ending 6/30 | SRF Coal Tax | Bond, Penalties, etc. | Investment Income | Total Revenue |
| | (1) | (2) | (3) | (4) |
| 2013 | 0 | 0 | 0 | 0 |
| 2014 | 14,696 | 3,700 | 689 | 19,086 |
| 2015 | 13,735 | 3,573 | 55 | 17,363 |
| 2016 | 13,051 | 3,481 | 29 | 16,560 |
| 2017 | 12,695 | 3,308 | 11 | 16,015 |
| 2018 | 11,702 | 3,119 | 4 | 14,825 |
| 2019 | 10,939 | 2,938 | 1 | 13,879 |
| 2020 | 10,471 | 2,766 | 5 | 13,242 |
| 2021 | 9,994 | 2,602 | 9 | 12,605 |
| 2022 | 9,714 | 2,444 | 18 | 12,176 |
| 2023 | 9,367 | 2,294 | 34 | 11,696 |
| 2024 | 8,936 | 2,152 | 48 | 11,136 |
| 2025 | 8,501 | 2,017 | 60 | 10,578 |
| 2026 | 8,147 | 1,892 | 70 | 10,109 |
| 2027 | 7,801 | 1,774 | 79 | 9,653 |
| 2028 | 7,445 | 1,664 | 85 | 9,194 |
| 2029 | 7,129 | 1,560 | 90 | 8,779 |
| 2030 | 6,823 | 1,464 | 91 | 8,379 |
| 2031 | 6,525 | 1,374 | 91 | 7,990 |
| 2032 | 6,216 | 1,290 | 87 | 7,593 |
| 2033 | 5,908 | 1,211 | 80 | 7,199 |
| 2034 | 5,686 | 1,138 | 70 | 6,894 |
| 2035 | 5,449 | 1,070 | 56 | 6,575 |
| 2036 | 5,219 | 1,007 | 39 | 6,265 |
| 2037 | 5,011 | 948 | 19 | 5,978 |
| 2038 | 4,826 | 894 | 0 | 5,719 |
| 2039 | 4,658 | 843 | 0 | 5,501 |
| 2040 | 4,509 | 796 | 0 | 5,305 |
| 2041 | 4,374 | 752 | 0 | 5,126 |
| 2042 | 4,252 | 712 | 0 | 4,963 |
| 2043 | 4,143 | 674 | 0 | 4,817 |
| 2044 | 4,045 | 638 | 0 | 4,684 |
| 2045 | 3,958 | 605 | 0 | 4,564 |
| 2046 | 3,880 | 575 | 0 | 4,455 |
| 2047 | 3,810 | 546 | 0 | 4,356 |
| 2048 | 3,747 | 519 | 0 | 4,266 |

Footnotes:

- (1) Exhibit 1.12 Col (5)
- (2) Exhibit 1.13 Col (1) + Col (4)
- (3) Exhibit 1.14a Col (3)
- (4) Sum of Col (1) through (3)

| Table E-1 Summary Special Reclamation Water Trust Fund Projected Cash Flow For 2014 to 2048 (in \$ Thousands) | | | |
|---|--------------|---------|---------------------------|
| Fiscal Year Ending 6/30 | Expenditures | Revenue | Projected Fund Balance |
| | (1) | (2) | (3) |
| 2013 | 0 | 0 | 22,488 |
| 2014 | 0 | 18,826 | 41,314 |
| 2015 | 0 | 18,731 | 60,045 |
| 2016 | 0 | 18,963 | 79,007 |
| 2017 | 0 | 18,740 | 97,748 |
| 2018 | 0 | 17,723 | 115,471 |
| 2019 | 15,620 | 17,354 | 117,204 |
| 2020 | 15,987 | 16,908 | 118,125 |
| 2021 | 16,304 | 16,411 | 118,232 |
| 2022 | 15,930 | 16,088 | 118,390 |
| 2023 | 16,232 | 15,671 | 117,829 |
| 2024 | 16,535 | 15,094 | 116,388 |
| 2025 | 16,841 | 14,463 | 114,010 |
| 2026 | 17,151 | 13,878 | 110,737 |
| 2027 | 17,465 | 13,251 | 106,523 |
| 2028 | 17,784 | 12,560 | 101,299 |
| 2029 | 18,107 | 11,859 | 95,051 |
| 2030 | 18,436 | 11,114 | 87,729 |
| 2031 | 18,769 | 10,317 | 79,277 |
| 2032 | 19,108 | 9,443 | 69,613 |
| 2033 | 19,452 | 8,503 | 58,663 |
| 2034 | 19,802 | 7,593 | 46,455 |
| 2035 | 20,157 | 6,682 | 32,980 |
| 2036 | 20,518 | 6,302 | 18,764 |
| 2037 | 20,886 | 5,932 | 3,810 |
| 2038 | 21,262 | 5,611 | -11,840 |
| 2039 | 21,645 | 5,416 | -28,069 |
| 2040 | 22,036 | 5,243 | -44,861 |
| 2041 | 22,434 | 5,086 | -62,210 |
| 2042 | 22,841 | 4,944 | -80,107 |
| 2043 | 23,257 | 4,818 | -98,546 |
| 2044 | 23,681 | 4,704 | -117,523 |
| 2045 | 24,114 | 4,603 | -137,035 |
| 2046 | 24,556 | 4,511 | -157,079 |
| 2047 | 25,008 | 4,430 | -177,657 |
| 2048 | 25,469 | 4,357 | -198,769 |

Footnotes:

- (1) Table E-2 Expenditures Col (7)
- (2) Table E-3 Revenue Col (4)
- (3) Prior Col (3) + (Col (2) - Col (1))

Table E-2 Expenditures
Special Reclamation Water Trust Fund
 Projected Cash Flow For 2014 to 2048
 (in \$ Thousands)

| Fiscal Year Ending 6/30 | Land Capital | Water Capital | Water Abandonment | Ongoing Water | Fixed Water Treatment | Administration Costs | Total Expenditures | |
|----------------------------|-----------------|--|----------------------|------------------|--------------------------|-------------------------|-----------------------|--|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | |
| 2013 | | | | | | | | |
| 2014 | | | | | | | | |
| 2015 | | | | | | | | |
| 2016 | | | | | | | | |
| 2017 | | | | | | | | |
| 2018 | | | | | | | | |
| | | Cost covered by Special Reclamation Fund until 2019 | | | | | | |
| 2019 | | 2,047 | 0 | 13,573 | 0 | | 15,620 | |
| 2020 | | 2,022 | 0 | 13,965 | 0 | | 15,987 | |
| 2021 | | 1,946 | 0 | 14,358 | 0 | | 16,304 | |
| 2022 | | 1,246 | 0 | 14,684 | 0 | | 15,930 | |
| 2023 | | 1,215 | 0 | 15,016 | 0 | | 16,232 | |
| 2024 | | 1,183 | 0 | 15,352 | 0 | | 16,535 | |
| 2025 | | 1,150 | 0 | 15,692 | 0 | | 16,841 | |
| 2026 | | 1,116 | 0 | 16,036 | 0 | | 17,151 | |
| 2027 | | 1,082 | 0 | 16,383 | 0 | | 17,465 | |
| 2028 | | 1,049 | 0 | 16,735 | 0 | | 17,784 | |
| 2029 | | 1,016 | 0 | 17,092 | 0 | | 18,107 | |
| 2030 | | 984 | 0 | 17,452 | 0 | | 18,436 | |
| 2031 | | 951 | 0 | 17,818 | 0 | | 18,769 | |
| 2032 | | 920 | 0 | 18,188 | 0 | | 19,108 | |
| 2033 | | 889 | 0 | 18,563 | 0 | | 19,452 | |
| 2034 | | 859 | 0 | 18,943 | 0 | | 19,802 | |
| 2035 | | 828 | 0 | 19,328 | 0 | | 20,157 | |
| 2036 | | 799 | 0 | 19,719 | 0 | | 20,518 | |
| 2037 | | 771 | 0 | 20,116 | 0 | | 20,886 | |
| 2038 | | 744 | 0 | 20,518 | 0 | | 21,262 | |
| 2039 | | 718 | 0 | 20,927 | 0 | | 21,645 | |
| 2040 | | 693 | 0 | 21,342 | 0 | | 22,036 | |
| 2041 | | 670 | 0 | 21,765 | 0 | | 22,434 | |
| 2042 | | 647 | 0 | 22,194 | 0 | | 22,841 | |
| 2043 | | 626 | 0 | 22,631 | 0 | | 23,257 | |
| 2044 | | 606 | 0 | 23,075 | 0 | | 23,681 | |
| 2045 | | 586 | 0 | 23,528 | 0 | | 24,114 | |
| 2046 | | 568 | 0 | 23,989 | 0 | | 24,556 | |
| 2047 | | 550 | 0 | 24,458 | 0 | | 25,008 | |
| 2048 | | 533 | 0 | 24,937 | 0 | | 25,469 | |

Footnotes:

- (2) Exhibit 1.7 Col (6)
- (3) Exhibit 1.8 Col (6)
- (4) Exhibit 1.9 Col (6)
- (5) Exhibit 1.10 Col (1)
- (7) Sum of Col (1) through (6)

| Table E-3 Revenue Special Reclamation Water Trust Fund Projected Cash Flow For 2014 to 2048 (in \$ Thousands) | | | | |
|---|--------------------------|---------------------------------|-----------------------------|-------------------------|
| Fiscal Year Ending 6/30 | SRWTF Coal Tax (1) | Bond, Penalties, etc. (2) | Investment Income (3) | Total Revenue (4) |
| 2013 | 0 | 0 | 0 | 0 |
| 2014 | 17,088 | 0 | 1,738 | 18,826 |
| 2015 | 15,970 | 0 | 2,761 | 18,731 |
| 2016 | 15,175 | 0 | 3,787 | 18,963 |
| 2017 | 14,761 | 0 | 3,979 | 18,740 |
| 2018 | 13,607 | 0 | 4,116 | 17,723 |
| 2019 | 12,720 | 0 | 4,633 | 17,354 |
| 2020 | 12,175 | 0 | 4,732 | 16,908 |
| 2021 | 11,621 | 0 | 4,790 | 16,411 |
| 2022 | 11,295 | 0 | 4,793 | 16,088 |
| 2023 | 10,892 | 0 | 4,778 | 15,671 |
| 2024 | 10,391 | 0 | 4,703 | 15,094 |
| 2025 | 9,884 | 0 | 4,579 | 14,463 |
| 2026 | 9,473 | 0 | 4,405 | 13,878 |
| 2027 | 9,071 | 0 | 4,181 | 13,251 |
| 2028 | 8,657 | 0 | 3,903 | 12,560 |
| 2029 | 8,289 | 0 | 3,570 | 11,859 |
| 2030 | 7,934 | 0 | 3,180 | 11,114 |
| 2031 | 7,587 | 0 | 2,730 | 10,317 |
| 2032 | 7,228 | 0 | 2,215 | 9,443 |
| 2033 | 6,870 | 0 | 1,633 | 8,503 |
| 2034 | 6,612 | 0 | 981 | 7,593 |
| 2035 | 6,336 | 0 | 346 | 6,682 |
| 2036 | 6,069 | 0 | 233 | 6,302 |
| 2037 | 5,827 | 0 | 105 | 5,932 |
| 2038 | 5,611 | 0 | 0 | 5,611 |
| 2039 | 5,416 | 0 | 0 | 5,416 |
| 2040 | 5,243 | 0 | 0 | 5,243 |
| 2041 | 5,086 | 0 | 0 | 5,086 |
| 2042 | 4,944 | 0 | 0 | 4,944 |
| 2043 | 4,818 | 0 | 0 | 4,818 |
| 2044 | 4,704 | 0 | 0 | 4,704 |
| 2045 | 4,603 | 0 | 0 | 4,603 |
| 2046 | 4,511 | 0 | 0 | 4,511 |
| 2047 | 4,430 | 0 | 0 | 4,430 |
| 2048 | 4,357 | 0 | 0 | 4,357 |

Footnotes:

- (1) Exhibit 1.12 Col (6)
- (2) Included in Table D.3, SRF amounts
- (3) Exhibit 1.14a Col (7)
- (4) Sum of Col (1) through (3)

| Table F | | | |
|-------------------------------------|----------|-------------|-------------|
| Cost Per Acre by Permit Type | | | |
| Based on Forfeited Permits | | | |
| (in 2013 Dollars) | | | |
| | Surface | Underground | Other Types |
| (1) Land Capital | 2,700.00 | 12,400.00 | 7,300.00 |
| (2) Water Capital | 900.00 | 1,900.00 | 1,500.00 |
| (3) Water Abandonment | 230.00 | 575.00 | 475.00 |
| Total | 3,830.00 | 14,875.00 | 9,275.00 |

Footnotes:

- (1) Exhibit 1.1 Row (11)
- (2) Exhibit 1.2 Row (16)
- (3) Exhibit 1.3 Row (9)

| Exhibit 1.1 Land Capital Expenditure Per Acre by Permit Type Based on Forfeited Permits | | | |
|--|---------------|---------------|---------------|
| | Surface | Underground | Other |
| (1) Total expenditure in actual dollars | 69,632,604.88 | 32,480,374.42 | 22,199,145.03 |
| (2) Total disturbed acreage under permit | 35,545.80 | 3,750.62 | 4,519.02 |
| (3) Average cost per acre in actual dollars | 1,958.95 | 8,660.00 | 4,912.38 |
| (4) Mid-point of experience data | 1995.5 | 1995.5 | 1995.5 |
| (5) Average annual increase in Land capital expenditures over experience period | 4% | 4% | 4% |
| (6) Increase factor $(1.04)^{17.5}$ | 1.99 | 1.99 | 1.99 |
| (7) Average cost per disturbed acre in 2013 dollars | 3,891.42 | 17,202.89 | 9,758.33 |
| (8) Percent of permitted acreage that is disturbed | 69.66% | 72.06% | 74.47% |
| (9) Cost Per Permitted Acre in 2013 dollars | 2,710.57 | 12,396.49 | 7,266.66 |
| (10) Prior Cost Per Permitted Acre as of 6/30/11 | 2,898.24 | 13,259.83 | 9,575.60 |
| (11) Selected Cost Per Permitted Acre | 2,700.00 | 12,400.00 | 7,300.00 |

Footnotes:

| | |
|------|--|
| (1) | Client Data |
| (2) | Exhibit 4.4 Row (1) |
| (3) | Row (1) / Row (2) |
| (4) | Client Data |
| (5) | Table 2.1 Selection (5a) |
| (6) | $(\text{Row (5)} + 1) ^ (2013 - \text{Row (4)})$ |
| (7) | Row (3) x Row (6) |
| (8) | Exhibit 4.4 Row (3) |
| (9) | Row (7) x Row (8) |
| (10) | From the 6/30/11 analysis |
| (11) | Selection based on rows (9) and (10) |

| Exhibit 1.2 Water Capital Expenditure Per Acre by Permit Type Based on Forfeited Permits | | | |
|---|---------------|--------------|--------------|
| | Surface | Underground | Other |
| (1) Total expenditure in actual dollars for Open Water Forfeited Permits | 1,459,415.95 | 121,348.00 | 45,471.50 |
| (2) Mid-point of experience data | 2006.5 | 2006.5 | 2006.5 |
| (3) Average annual increase in Water capital expenditures over experience period | 4% | 4% | 4% |
| (4) Increase factor (1.04)^6.5 | 1.29 | 1.29 | 1.29 |
| (5) Total expenditure in 2013 dollars | 1,883,197.17 | 156,584.70 | 58,675.39 |
| (6) Additional expenditure for Currently Operating Permits | 16,659,393.58 | 6,273,157.92 | 6,302,500.50 |
| (7) Additional expenditure for To Be Contracted Permits | 26,833,640.00 | 2,277,676.50 | 2,238,660.00 |
| (8) Total Expenditure | 45,376,230.75 | 8,707,419.12 | 8,599,835.89 |
| (9) Total disturbed acreage under permits with water issues | 10,485.99 | 391.32 | 1,199.06 |
| (10) Average cost per disturbed acre in 2013 dollars | 4,327.32 | 22,251.40 | 7,172.15 |
| (11) Percent of permitted acreage that is disturbed under permits with water issues | 69.29% | 86.10% | 82.86% |
| (12) Cost Per Permitted Acre in 2013 dollars | 2,998.20 | 19,158.24 | 5,943.09 |
| (13) Percent of forfeited acres with water issues | 30.00% | 10.00% | 25.00% |
| (14) Cost Per Permitted Acre in 2013 dollars with water issues | 899.46 | 1,915.82 | 1,485.77 |
| (15) Prior Cost Per Permitted Acre with water issues as of 6/30/11 | 913.81 | 1,024.62 | 1,804.78 |
| (16) Selected Cost Per Permitted Acre with water issues | 900.00 | 1,900.00 | 1,500.00 |

Footnotes:

| | |
|------|---|
| (1) | Client Data |
| (2) | Client Data |
| (3) | Table 2.1 Selection (5a) |
| (4) | (Row (3) + 1) ^ (2013 - Row (2)) |
| (5) | Row (1) x Row (4) |
| (6) | Client Data |
| (7) | Client Data |
| (8) | Row (5) + Row (6) + Row (7) |
| (9) | Exhibit 4.4 Row (4) |
| (10) | Row (8) / Row (9) |
| (11) | Exhibit 4.4 Row (6) |
| (12) | Row (10) x Row (11) |
| (13) | Table 3.2, Table 3.3, Table 3.4 Col (6) |
| (14) | Row (12) x Row (13) |
| (15) | From the 6/30/11 analysis |
| (16) | Selection based on rows (14) and (15) |

| Exhibit 1.3 Water Abandonment Expenditure Per Acre by Permit Type Based on Forfeited Permits | | | |
|---|--------------|--------------|--------------|
| | Surface | Underground | Other |
| (1) Total expenditure in actual dollars | 7,243,215.00 | 1,930,158.00 | 2,151,745.00 |
| (2) Total disturbed acreage under permits with closed water | 6,694.57 | 303.89 | 929.91 |
| (3) Average cost per disturbed acre in 2013 dollars | 1,081.95 | 6,351.50 | 2,313.93 |
| (4) Percent of permitted acreage that is disturbed under permits with closed water | 71.53% | 90.47% | 82.11% |
| (5) Cost Per Permitted Acre in 2013 dollars | 773.89 | 5,746.40 | 1,900.08 |
| (6) Percent of forfeited acres with water issues | 30.00% | 10.00% | 25.00% |
| (7) Cost Per Permitted Acre in 2013 dollars with water issues | 232.17 | 574.64 | 475.02 |
| (8) Prior Cost Per Permitted Acre with water issues as of 6/30/11 | 203.38 | 538.46 | 473.16 |
| (9) Selected Cost Per Permitted Acre with water issues | 230.00 | 575.00 | 475.00 |

Footnotes:

- | | |
|-----|---|
| (1) | Client Data |
| (2) | Exhibit 4.4 Row (7) |
| (3) | Row (1) / Row (2) |
| (4) | Exhibit 4.4 Row (9) |
| (5) | Row (3) x Row (4) |
| (6) | Table 3.2, Table 3.3, Table 3.4 Col (6) |
| (7) | Row (5) x Row (6) |
| (8) | From the 6/30/11 analysis |
| (9) | Selection based on rows (7) and (8) |

| Exhibit 1.4 | | | |
|--|----------|-------------|----------|
| Total Capital Expenditure Per Acre by Permit Type | | | |
| Based on Forfeited Permits | | | |
| (in 2013 Dollars) | | | |
| | Surface | Underground | Other |
| (1) Land Capital Cost Per Permitted Acre | 2,700.00 | 12,400.00 | 7,300.00 |
| (2) Water Capital Cost Per Permitted Acre | 900.00 | 1,900.00 | 1,500.00 |
| (3) Water Abandonment Cost Per Permitted Acre | 230.00 | 575.00 | 475.00 |
| (4) Total Capital Cost Per Permitted Acre | 3,830.00 | 14,875.00 | 9,275.00 |

Footnotes:

- | | |
|-----|--------------------------------|
| (1) | Exhibit 1.1 Row (11) |
| (2) | Exhibit 1.2 Row (16) |
| (3) | Exhibit 1.3 Row (9) |
| (4) | Sum of Row (1) through Row (3) |

| Exhibit 1.5 | | | |
|--|--------------|-------------|------------|
| Ongoing Water Treatment Expenditure Per Acre by Permit Type | | | |
| Based on Forfeited Permits that are Currently Treating or Scheduled to Treat Water | | | |
| | Surface | Underground | Other |
| (1) Total Annual Expenditure in Actual Dollars for Water Forfeited Permits | 5,219,272.14 | 780,763.34 | 740,667.19 |
| (2) Total disturbed acreage under permits with water issues | 10,485.99 | 391.32 | 1,199.06 |
| (3) Total cost per disturbed acre for water issue sites | 497.74 | 1,995.20 | 617.71 |
| (4) Percent of permitted acreage that is disturbed under permits with water issues | 69.29% | 86.10% | 82.86% |
| (5) Valuation Cost Per Permitted Acre | 344.86 | 1,717.85 | 511.85 |
| (6) Percent of forfeited acres with water issues | 30.00% | 10.00% | 25.00% |
| (7) Valuation Cost Per Permitted Acre with water issues | 103.46 | 171.79 | 127.96 |
| (8) Prior Valuation Cost Per Permitted Acre with water issues as of 6/30/11 | 101.39 | 141.27 | 199.22 |
| (9) Selected Valuation Cost Per Permitted Acre with water issues | 105.00 | 170.00 | 130.00 |

Footnotes:

- | | |
|-----|---|
| (1) | Client Data |
| (2) | Exhibit 4.4 Row (4) |
| (3) | Row (1) / Row (2) |
| (4) | Exhibit 4.4 Row (6) |
| (5) | Row (3) x Row (4) |
| (6) | Exhibit 3.2, Exhibit 3.3, Exhibit 3.4 Col (6) |
| (7) | Row (5) x Row (6) |
| (8) | From the 6/30/11 analysis |
| (9) | Selection based on rows (7) and (8) |

Exhibit 1.6
Land Capital Expenditures
(in 2013 Dollars)

| Fiscal Year | Nominal | | | Inflated | | | Discounted | | |
|----------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|
| | Known (1) | Future (2) | Total (3) | Known (4) | Future (5) | Total (6) | Known (7) | Future (8) | Total (9) |
| 2014 | 676,368 | 0 | 676,368 | 687,438 | 0 | 687,438 | 684,075 | 0 | 684,075 |
| 2015 | 1,085,469 | 0 | 1,085,469 | 1,139,640 | 0 | 1,139,640 | 1,127,954 | 0 | 1,127,954 |
| 2016 | 7,064,229 | 0 | 7,064,229 | 7,661,531 | 0 | 7,661,531 | 7,575,387 | 0 | 7,575,387 |
| 2017 | 0 | 2,147,771 | 2,147,771 | | 2,406,240 | 2,406,240 | | 2,376,809 | 2,376,809 |
| 2018 | | 4,278,207 | 4,278,207 | | 4,951,232 | 4,951,232 | | 4,885,786 | 4,885,786 |
| 2019 | | 6,481,787 | 6,481,787 | | 7,749,015 | 7,749,015 | | 7,636,088 | 7,636,088 |
| 2020 | | 6,166,953 | 6,166,953 | | 7,615,926 | 7,615,926 | | 7,489,025 | 7,489,025 |
| 2021 | | 5,745,347 | 5,745,347 | | 7,329,404 | 7,329,404 | | 7,186,318 | 7,186,318 |
| 2022 | | 3,559,721 | 3,559,721 | | 4,691,036 | 4,691,036 | | 4,582,273 | 4,582,273 |
| 2023 | | 3,364,242 | 3,364,242 | | 4,579,734 | 4,579,734 | | 4,453,142 | 4,453,142 |
| 2024 | | 3,173,507 | 3,173,507 | | 4,462,651 | 4,462,651 | | 4,317,035 | 4,317,035 |
| 2025 | | 2,988,239 | 2,988,239 | | 4,340,793 | 4,340,793 | | 4,176,315 | 4,176,315 |
| 2026 | | 2,811,192 | 2,811,192 | | 4,218,368 | 4,218,368 | | 4,035,200 | 4,035,200 |
| 2027 | | 2,642,798 | 2,642,798 | | 4,096,550 | 4,096,550 | | 3,894,937 | 3,894,937 |
| 2028 | | 2,484,079 | 2,484,079 | | 3,977,590 | 3,977,590 | | 3,757,758 | 3,757,758 |
| 2029 | | 2,333,641 | 2,333,641 | | 3,860,015 | 3,860,015 | | 3,622,344 | 3,622,344 |
| 2030 | | 2,191,055 | 2,191,055 | | 3,743,765 | 3,743,765 | | 3,488,721 | 3,488,721 |
| 2031 | | 2,055,498 | 2,055,498 | | 3,628,045 | 3,628,045 | | 3,356,237 | 3,356,237 |
| 2032 | | 1,928,227 | 1,928,227 | | 3,515,719 | 3,515,719 | | 3,227,616 | 3,227,616 |
| 2033 | | 1,808,268 | 1,808,268 | | 3,405,799 | 3,405,799 | | 3,101,984 | 3,101,984 |
| 2034 | | 1,694,725 | 1,694,725 | | 3,297,281 | 3,297,281 | | 2,978,481 | 2,978,481 |
| 2035 | | 1,586,193 | 1,586,193 | | 3,187,960 | 3,187,960 | | 2,855,193 | 2,855,193 |
| 2036 | | 1,484,903 | 1,484,903 | | 3,082,871 | 3,082,871 | | 2,736,700 | 2,736,700 |
| 2037 | | 1,390,671 | 1,390,671 | | 2,982,511 | 2,982,511 | | 2,623,424 | 2,623,424 |
| 2038 | | 1,302,982 | 1,302,982 | | 2,886,663 | 2,886,663 | | 2,515,144 | 2,515,144 |
| 2039 | | 1,221,358 | 1,221,358 | | 2,795,125 | 2,795,125 | | 2,411,647 | 2,411,647 |
| 2040 | | 1,145,360 | 1,145,360 | | 2,707,699 | 2,707,699 | | 2,312,727 | 2,312,727 |
| 2041 | | 1,074,578 | 1,074,578 | | 2,624,200 | 2,624,200 | | 2,218,186 | 2,218,186 |
| 2042 | | 1,008,636 | 1,008,636 | | 2,544,448 | 2,544,448 | | 2,127,833 | 2,127,833 |
| 2043 | | 947,183 | 947,183 | | 2,468,275 | 2,468,275 | | 2,041,484 | 2,041,484 |
| 2044 | | 889,896 | 889,896 | | 2,395,517 | 2,395,517 | | 1,959,265 | 1,959,265 |
| 2045 | | 836,475 | 836,475 | | 2,326,019 | 2,326,019 | | 1,881,260 | 1,881,260 |
| 2046 | | 786,643 | 786,643 | | 2,259,635 | 2,259,635 | | 1,807,237 | 1,807,237 |
| 2047 | | 740,142 | 740,142 | | 2,196,221 | 2,196,221 | | 1,736,979 | 1,736,979 |
| 2048 | | 696,735 | 696,735 | | 2,135,645 | 2,135,645 | | 1,670,278 | 1,670,278 |
| Total | 8,826,066 | 72,967,013 | 81,793,079 | 9,488,609 | 118,461,951 | 127,950,560 | 9,387,415 | 109,463,429 | 118,850,844 |
| First 20 Years | 8,826,066 | 56,160,531 | 64,986,597 | 9,488,609 | 78,571,882 | 88,060,491 | 9,387,415 | 75,587,588 | 84,975,003 |

Footnotes:

- (1) Client Data. Forfeitures 7/1/13 and prior.
- (2) Exhibit 1.16a. Forfeitures 7/1/13 and subsequent.
- (3) Col (1) + Col (2)
- (4) Col (1) x 3.3% annual inflation
- (5) Col (2) x 3.3% annual inflation
- (6) Col (4) + Col (5)
- (7) Col (4) x Exhibit 1.14 Col (4)
- (8) Col (5) x Exhibit 1.14 Col (4)
- (9) Col (7) + Col (8)

Exhibit 1.7
Water Capital Expenditures
(in 2013 Dollars)

| Fiscal Year | Nominal | | | Inflated | | | Discounted | | |
|-------------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|
| | Known (1) | Future (2) | Total (3) | Known (4) | Future (5) | Total (6) | Known (7) | Future (8) | Total (9) |
| 2014 | 16,740,345 | 0 | 16,740,345 | 17,014,319 | 0 | 17,014,319 | 16,557,037 | 0 | 16,557,037 |
| 2015 | 23,944,992 | 0 | 23,944,992 | 25,139,995 | 0 | 25,139,995 | 23,166,974 | 0 | 23,166,974 |
| 2016 | 21,689,409 | 0 | 21,689,409 | 23,523,315 | 0 | 23,523,315 | 20,527,626 | 0 | 20,527,626 |
| 2017 | 1,074,224 | 557,907 | 1,632,131 | 1,203,500 | 625,047 | 1,828,547 | 999,256 | 518,972 | 1,518,228 |
| 2018 | | 1,115,886 | 1,115,886 | 0 | 1,291,431 | 1,291,431 | 0 | 1,028,346 | 1,028,346 |
| 2019 | | 1,712,008 | 1,712,008 | | 2,046,716 | 2,046,716 | | 1,567,076 | 1,567,076 |
| 2020 | | 1,637,272 | 1,637,272 | | 2,021,962 | 2,021,962 | | 1,487,379 | 1,487,379 |
| 2021 | | 1,525,636 | 1,525,636 | | 1,946,271 | 1,946,271 | | 1,375,039 | 1,375,039 |
| 2022 | | 945,185 | 945,185 | | 1,245,573 | 1,245,573 | | 845,046 | 845,046 |
| 2023 | | 892,890 | 892,890 | | 1,215,489 | 1,215,489 | | 791,915 | 791,915 |
| 2024 | | 841,500 | 841,500 | | 1,183,335 | 1,183,335 | | 740,503 | 740,503 |
| 2025 | | 791,384 | 791,384 | | 1,149,585 | 1,149,585 | | 691,202 | 691,202 |
| 2026 | | 743,420 | 743,420 | | 1,115,548 | 1,115,548 | | 644,773 | 644,773 |
| 2027 | | 697,800 | 697,800 | | 1,081,646 | 1,081,646 | | 601,357 | 601,357 |
| 2028 | | 654,876 | 654,876 | | 1,048,610 | 1,048,610 | | 561,236 | 561,236 |
| 2029 | | 614,196 | 614,196 | | 1,015,926 | 1,015,926 | | 524,009 | 524,009 |
| 2030 | | 575,681 | 575,681 | | 983,642 | 983,642 | | 489,621 | 489,621 |
| 2031 | | 539,027 | 539,027 | | 951,407 | 951,407 | | 457,862 | 457,862 |
| 2032 | | 504,640 | 504,640 | | 920,106 | 920,106 | | 429,185 | 429,185 |
| 2033 | | 472,261 | 472,261 | | 889,485 | 889,485 | | 403,602 | 403,602 |
| 2034 | | 441,580 | 441,580 | | 859,145 | 859,145 | | 381,328 | 381,328 |
| 2035 | | 412,168 | 412,168 | | 828,383 | 828,383 | | 362,675 | 362,675 |
| 2036 | | 384,755 | 384,755 | | 798,805 | 798,805 | | 346,638 | 346,638 |
| 2037 | | 359,297 | 359,297 | | 770,568 | 770,568 | | 331,330 | 331,330 |
| 2038 | | 335,650 | 335,650 | | 743,609 | 743,609 | | 316,720 | 316,720 |
| 2039 | | 313,681 | 313,681 | | 717,871 | 717,871 | | 302,777 | 302,777 |
| 2040 | | 293,266 | 293,266 | | 693,298 | 693,298 | | 289,473 | 289,473 |
| 2041 | | 274,290 | 274,290 | | 669,837 | 669,837 | | 276,779 | 276,779 |
| 2042 | | 256,648 | 256,648 | | 647,436 | 647,436 | | 264,670 | 264,670 |
| 2043 | | 240,242 | 240,242 | | 626,049 | 626,049 | | 253,119 | 253,119 |
| 2044 | | 224,981 | 224,981 | | 605,628 | 605,628 | | 242,138 | 242,138 |
| 2045 | | 210,782 | 210,782 | | 586,129 | 586,129 | | 231,735 | 231,735 |
| 2046 | | 197,567 | 197,567 | | 567,510 | 567,510 | | 221,878 | 221,878 |
| 2047 | | 185,264 | 185,264 | | 549,732 | 549,732 | | 212,536 | 212,536 |
| 2048 | | 173,807 | 173,807 | | 532,756 | 532,756 | | 203,682 | 203,682 |
| Total | 63,448,970 | 19,125,546 | 82,574,516 | 66,881,128 | 30,928,534 | 97,809,662 | 61,250,893 | 17,394,603 | 78,645,495 |
| Years 2014 - 2018 | 63,448,970 | 1,673,793 | 65,122,763 | 66,881,128 | 1,916,478 | 68,797,607 | 61,250,893 | 1,547,317 | 62,798,210 |
| Years 2019 - 2033 | 0 | 13,147,777 | 13,147,777 | 0 | 18,815,301 | 18,815,301 | 0 | 11,609,807 | 11,609,807 |
| Years 2019 - 2048 | 0 | 17,451,753 | 17,451,753 | 0 | 29,012,056 | 29,012,056 | 0 | 15,847,285 | 15,847,285 |

Footnotes:

- (1) Client Data. Forfeitures 7/1/13 and prior.
- (2) Exhibit 1.16a. Forfeitures 7/1/13 and subsequent.
- (3) Col (1) + Col (2)
- (4) Col (1) x 3.3% annual inflation
- (5) Col (2) x 3.3% annual inflation
- (6) Col (4) + Col (5)
- (7) Col (4) x Exhibit 1.14 Col (8)
- (8) Col (5) x Exhibit 1.14 Col (8)
- (9) Col (7) + Col (8)

Exhibit 1.8
Water Abandonment Expenditures
(in 2013 Dollars)

| Fiscal Year | Nominal | | | Inflated | | | Discounted | | |
|-------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|
| | Known (1) | Future (2) | Total (3) | Known (4) | Future (5) | Total (6) | Known (7) | Future (8) | Total (9) |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Footnotes:

We have expanded the number of years in which the water treatment process is expected to operate when compared to the 6/30/10 analysis time frame of 17 years. In the 17 year time frame, water treatment facilities would be dismantled; incurring water abandonment costs. Based upon the recommendation of Michael Sheehan and his staff in the Office of Special Reclamation, we are now assuming the Water Treatment costs will continue to be required beyond the 35 year time horizon of our estimates. This assumption leaves the Water Abandonment costs outside of the study horizon and becomes an un-reflected cost within our estimates. Thus, all water abandonment costs related to forfeited permits requiring water treatment would be in addition to any numbers quoted in this analysis.

Exhibit 1.9

Water Treatment Expenditures
(in 2013 Dollars) Including Legacy Sites

| Fiscal Year | Nominal | | | Inflated | | | Discounted | | |
|-------------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|
| | Known (1) | Future (2) | Total (3) | Known (4) | Future (5) | Total (6) | Known (7) | Future (8) | Total (9) |
| 2014 | 6,257,965 | 0 | 6,257,965 | 6,360,383 | 0 | 6,360,383 | 6,189,439 | 0 | 6,189,439 |
| 2015 | 7,744,140 | 0 | 7,744,140 | 8,130,620 | 0 | 8,130,620 | 7,492,518 | 0 | 7,492,518 |
| 2016 | 10,271,951 | 0 | 10,271,951 | 11,140,476 | 0 | 11,140,476 | 9,721,738 | 0 | 9,721,738 |
| 2017 | 11,007,601 | 60,215 | 11,067,816 | 12,332,292 | 67,461 | 12,399,753 | 10,239,405 | 56,012 | 10,295,417 |
| 2018 | 11,214,829 | 179,612 | 11,394,441 | 12,979,086 | 207,867 | 13,186,953 | 10,335,035 | 165,521 | 10,500,556 |
| 2019 | 10,990,533 | 363,010 | 11,353,542 | 13,139,248 | 433,981 | 13,573,228 | 10,060,120 | 332,279 | 10,392,399 |
| 2020 | 10,770,722 | 537,186 | 11,307,908 | 13,301,386 | 663,402 | 13,964,788 | 9,784,658 | 488,006 | 10,272,665 |
| 2021 | 10,555,307 | 699,330 | 11,254,637 | 13,465,525 | 892,143 | 14,357,668 | 9,513,384 | 630,298 | 10,143,682 |
| 2022 | 10,344,201 | 798,629 | 11,142,830 | 13,631,690 | 1,052,441 | 14,684,131 | 9,248,278 | 714,018 | 9,962,295 |
| 2023 | 10,137,317 | 893,447 | 11,030,764 | 13,799,905 | 1,216,247 | 15,016,152 | 8,990,907 | 792,409 | 9,783,316 |
| 2024 | 9,934,571 | 982,706 | 10,917,277 | 13,970,196 | 1,381,901 | 15,352,096 | 8,742,218 | 864,761 | 9,606,979 |
| 2025 | 9,735,880 | 1,066,560 | 10,802,440 | 14,142,588 | 1,549,313 | 15,691,901 | 8,503,407 | 931,544 | 9,434,951 |
| 2026 | 9,541,162 | 1,145,244 | 10,686,406 | 14,317,107 | 1,718,510 | 16,035,618 | 8,275,107 | 993,277 | 9,268,385 |
| 2027 | 9,350,339 | 1,219,012 | 10,569,350 | 14,493,781 | 1,889,567 | 16,383,347 | 8,058,033 | 1,050,533 | 9,108,566 |
| 2028 | 9,163,332 | 1,288,159 | 10,451,491 | 14,672,634 | 2,062,644 | 16,735,278 | 7,853,080 | 1,103,967 | 8,957,047 |
| 2029 | 8,980,065 | 1,352,929 | 10,332,994 | 14,853,694 | 2,237,845 | 17,091,539 | 7,661,459 | 1,154,269 | 8,815,728 |
| 2030 | 8,800,464 | 1,413,557 | 10,214,021 | 15,036,989 | 2,415,287 | 17,452,276 | 7,484,864 | 1,202,242 | 8,687,106 |
| 2031 | 8,624,455 | 1,470,244 | 10,094,699 | 15,222,545 | 2,595,046 | 17,817,591 | 7,325,799 | 1,248,857 | 8,574,656 |
| 2032 | 8,451,966 | 1,523,236 | 9,975,202 | 15,410,391 | 2,777,303 | 18,187,694 | 7,188,202 | 1,295,477 | 8,483,679 |
| 2033 | 8,282,926 | 1,572,752 | 9,855,678 | 15,600,556 | 2,962,214 | 18,562,770 | 7,078,731 | 1,344,101 | 8,422,831 |
| 2034 | 8,117,268 | 1,618,973 | 9,736,240 | 15,793,066 | 3,149,895 | 18,942,962 | 7,009,688 | 1,398,068 | 8,407,757 |
| 2035 | 7,954,922 | 1,662,032 | 9,616,955 | 15,987,953 | 3,340,383 | 19,328,336 | 6,999,697 | 1,462,456 | 8,462,152 |
| 2036 | 7,795,824 | 1,702,150 | 9,497,974 | 16,185,244 | 3,533,906 | 19,719,150 | 7,023,520 | 1,533,524 | 8,557,044 |
| 2037 | 7,639,907 | 1,739,538 | 9,379,446 | 16,384,970 | 3,730,710 | 20,115,680 | 7,045,242 | 1,604,138 | 8,649,380 |
| 2038 | 7,487,109 | 1,774,395 | 9,261,504 | 16,587,161 | 3,931,046 | 20,518,207 | 7,064,843 | 1,674,321 | 8,739,164 |
| 2039 | 7,337,367 | 1,806,902 | 9,144,269 | 16,791,846 | 4,135,165 | 20,927,011 | 7,082,307 | 1,744,091 | 8,826,398 |
| 2040 | 7,190,620 | 1,837,229 | 9,027,848 | 16,999,058 | 4,343,319 | 21,342,377 | 7,097,618 | 1,813,466 | 8,911,084 |
| 2041 | 7,046,807 | 1,865,531 | 8,912,338 | 17,208,826 | 4,555,765 | 21,764,591 | 7,110,762 | 1,882,462 | 8,993,223 |
| 2042 | 6,905,871 | 1,891,953 | 8,797,825 | 17,421,183 | 4,772,760 | 22,193,943 | 7,121,727 | 1,951,090 | 9,072,817 |
| 2043 | 6,767,754 | 1,916,630 | 8,684,384 | 17,636,160 | 4,994,567 | 22,630,727 | 7,130,506 | 2,019,362 | 9,149,867 |
| 2044 | 6,632,399 | 1,939,686 | 8,572,085 | 17,853,791 | 5,221,451 | 23,075,242 | 7,138,191 | 2,087,608 | 9,225,799 |
| 2045 | 6,499,751 | 1,961,235 | 8,460,986 | 18,074,106 | 5,453,681 | 23,527,787 | 7,145,885 | 2,156,199 | 9,302,085 |
| 2046 | 6,369,756 | 1,981,384 | 8,351,139 | 18,297,141 | 5,691,530 | 23,988,671 | 7,153,588 | 2,225,203 | 9,378,791 |
| 2047 | 6,242,361 | 2,000,231 | 8,242,592 | 18,522,927 | 5,935,277 | 24,458,204 | 7,161,298 | 2,294,685 | 9,455,984 |
| 2048 | 6,117,513 | 2,017,869 | 8,135,382 | 18,751,500 | 6,185,204 | 24,936,704 | 7,169,017 | 2,364,708 | 9,533,726 |
| Total | 296,264,955 | 44,281,565 | 340,546,519 | 524,496,025 | 95,097,830 | 619,593,854 | 276,200,273 | 42,578,953 | 318,779,226 |
| Years 2014 - 2018 | 46,496,486 | 239,826 | 46,736,312 | 50,942,857 | 275,328 | 51,218,186 | 43,978,136 | 221,534 | 44,199,670 |
| Years 2019 - 2033 | 143,663,239 | 16,326,001 | 159,989,241 | 215,058,235 | 25,847,843 | 240,906,077 | 125,768,247 | 14,146,038 | 139,914,284 |
| Years 2019 - 2048 | 249,768,469 | 44,041,738 | 293,810,207 | 473,553,168 | 94,822,501 | 568,375,669 | 232,222,137 | 42,357,419 | 274,579,556 |

Footnotes:

- (1) Client Data for FY 2014 - 2018. FY 2019 and Subsequent = Prior FY x 0.98. Forfeitures 7/1/13 and prior.
- (2) Exhibit 1.16a. Forfeitures 7/1/13 and subsequent.
- (3) Col (1) + Col (2)
- (4) Col (1) x 3.3% annual inflation
- (5) Col (2) x 3.3% annual inflation
- (6) Col (4) + Col (5)
- (7) Col (4) x Exhibit 1.14 Col (8)
- (8) Col (5) x Exhibit 1.14 Col (8)
- (9) Col (7) + Col (8)

| Exhibit 1.10 | | | |
|---------------------------|---------|------------------|--------------------|
| Legacy Water Treatment | | | |
| NOW INCLUDED IN TABLE 1.9 | | | |
| Fiscal Year | Dollars | Discount Factors | Discounted Dollars |
| | (1) | (2) | (3) |
| | 0 | | 0 |

Footnotes:

With the expansion of the water treatment costs to reflect the NPDES standards, we have included the water treatment cost of the legacy sites as part of the water treatment estimates for currently forfeited permits.

| Exhibit 1.11 | | | |
|------------------------------------|-------------|------------------|--------------------|
| Administrative Expenditures | | | |
| Fiscal Year | Dollars | Discount Factors | Discounted Dollars |
| | (1) | (2) | (3) |
| 2014 | 4,350,000 | 99.511% | 4,328,720 |
| 2015 | 4,393,500 | 98.975% | 4,348,445 |
| 2016 | 4,437,435 | 98.876% | 4,387,542 |
| 2017 | 4,481,809 | 98.777% | 4,426,990 |
| 2018 | 4,526,627 | 98.678% | 4,466,794 |
| 2019 | 4,571,894 | 98.543% | 4,505,267 |
| 2020 | 4,617,613 | 98.334% | 4,540,671 |
| 2021 | 4,663,789 | 98.048% | 4,572,741 |
| 2022 | 4,710,427 | 97.681% | 4,601,214 |
| 2023 | 4,757,531 | 97.236% | 4,626,024 |
| 2024 | 4,805,106 | 96.737% | 4,648,317 |
| 2025 | 4,853,157 | 96.211% | 4,669,265 |
| 2026 | 4,901,689 | 95.658% | 4,688,850 |
| 2027 | 4,950,706 | 95.078% | 4,707,055 |
| 2028 | 5,000,213 | 94.473% | 4,723,863 |
| 2029 | 5,050,215 | 93.843% | 4,739,260 |
| 2030 | 5,100,717 | 93.188% | 4,753,232 |
| 2031 | 5,151,724 | 92.508% | 4,765,765 |
| 2032 | 5,203,242 | 91.805% | 4,776,850 |
| 2033 | 5,255,274 | 91.079% | 4,786,477 |
| 2034 | 5,307,827 | 90.331% | 4,794,636 |
| 2035 | 5,360,905 | 89.562% | 4,801,321 |
| 2036 | 5,414,514 | 88.771% | 4,806,526 |
| 2037 | 5,468,659 | 87.960% | 4,810,247 |
| 2038 | 5,523,346 | 87.130% | 4,812,481 |
| 2039 | 5,578,579 | 86.280% | 4,813,225 |
| 2040 | 5,634,365 | 85.413% | 4,812,481 |
| 2041 | 5,690,709 | 84.528% | 4,810,248 |
| 2042 | 5,747,616 | 83.627% | 4,806,531 |
| 2043 | 5,805,092 | 82.709% | 4,801,331 |
| 2044 | 5,863,143 | 81.789% | 4,795,396 |
| 2045 | 5,921,774 | 80.879% | 4,789,469 |
| 2046 | 5,980,992 | 79.979% | 4,783,548 |
| 2047 | 6,040,802 | 79.089% | 4,777,636 |
| 2048 | 6,101,210 | 78.210% | 4,771,730 |
| Total | 181,222,199 | | 164,050,149 |
| First 20 Years | 95,782,667 | | 92,063,343 |

Footnotes:

- (1) Client Data for FY 2014. FY 2015 and Subsequent = Prior FY x 1.01
- (2) Exhibit 1.14 Col (4)
- (3) Col (1) x Col (2)

Exhibit 1.12

Projected Coal Tax Revenues

| Fiscal Year | Total Production (Millions of Tons) | N App Production (Millions of Tons) | Tax Revenue Excluding N App | Known % of Acres | Tax Revenue SRF | Tax Revenue SRWTF | Discount Factors | | Discounted SRF | Discounted SRWTF |
|----------------|--|--|--------------------------------|---------------------|--------------------|----------------------|------------------|---------|-------------------|---------------------|
| | | | | | | | SRF | SRWTF | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| 2014 | 117.80 | 25.00 | 25,891,200 | 95.8% | 14,695,834 | 17,088,179 | 99.511% | 97.312% | 14,623,941 | 16,628,911 |
| 2015 | 113.90 | 25.00 | 24,803,100 | 91.6% | 13,734,593 | 15,970,457 | 98.975% | 92.152% | 13,593,746 | 14,717,074 |
| 2016 | 112.20 | 25.00 | 24,328,800 | 87.3% | 13,050,778 | 15,175,323 | 98.876% | 87.265% | 12,904,039 | 13,242,749 |
| 2017 | 113.50 | 25.00 | 24,691,500 | 82.9% | 12,694,873 | 14,761,480 | 98.777% | 83.029% | 12,539,596 | 12,256,340 |
| 2018 | 108.70 | 25.00 | 23,352,300 | 78.5% | 11,701,609 | 13,606,523 | 98.678% | 79.628% | 11,546,935 | 10,834,653 |
| 2019 | 105.60 | 25.00 | 22,487,400 | 74.2% | 10,939,379 | 12,720,208 | 98.543% | 76.565% | 10,779,958 | 9,739,280 |
| 2020 | 105.30 | 25.00 | 22,403,700 | 69.9% | 10,470,799 | 12,175,348 | 98.334% | 73.561% | 10,296,328 | 8,956,331 |
| 2021 | 104.80 | 25.00 | 22,264,200 | 65.8% | 9,994,108 | 11,621,056 | 98.048% | 70.650% | 9,799,000 | 8,210,267 |
| 2022 | 106.60 | 25.00 | 22,766,400 | 61.6% | 9,713,609 | 11,294,894 | 97.681% | 67.844% | 9,488,397 | 7,662,903 |
| 2023 | 107.60 | 25.00 | 23,045,400 | 57.6% | 9,367,446 | 10,892,379 | 97.236% | 65.152% | 9,108,513 | 7,096,597 |
| 2024 | 107.20 | 25.00 | 22,933,800 | 53.9% | 8,936,091 | 10,390,803 | 96.737% | 62.578% | 8,644,508 | 6,502,319 |
| 2025 | 106.30 | 25.00 | 22,682,700 | 50.3% | 8,500,556 | 9,884,368 | 96.211% | 60.126% | 8,178,459 | 6,036,353 |
| 2026 | 106.30 | 25.00 | 22,682,700 | 46.9% | 8,147,087 | 9,473,356 | 95.658% | 57.799% | 7,793,328 | 5,475,480 |
| 2027 | 106.10 | 25.00 | 22,626,900 | 43.7% | 7,800,721 | 9,070,606 | 95.078% | 55.596% | 7,416,806 | 5,042,938 |
| 2028 | 105.40 | 25.00 | 22,431,600 | 40.7% | 7,445,082 | 8,657,073 | 94.473% | 53.522% | 7,033,611 | 4,633,434 |
| 2029 | 105.00 | 25.00 | 22,320,000 | 37.8% | 7,128,619 | 8,289,092 | 93.843% | 51.579% | 6,689,691 | 4,275,471 |
| 2030 | 104.40 | 25.00 | 22,152,600 | 35.1% | 6,823,254 | 7,934,017 | 93.188% | 49.776% | 6,358,422 | 3,949,264 |
| 2031 | 103.50 | 25.00 | 21,901,500 | 32.6% | 6,525,212 | 7,587,455 | 92.508% | 48.125% | 6,036,353 | 3,651,438 |
| 2032 | 101.90 | 25.00 | 21,455,100 | 30.2% | 6,215,946 | 7,227,845 | 91.805% | 46.645% | 5,706,567 | 3,371,440 |
| 2033 | 99.60 | 25.00 | 20,813,400 | 27.9% | 5,908,210 | 6,870,012 | 91.079% | 45.375% | 5,381,168 | 3,117,259 |
| 2034 | 99.00 | 25.00 | 20,646,000 | 25.8% | 5,686,406 | 6,612,100 | 90.331% | 44.385% | 5,136,612 | 2,934,754 |
| 2035 | 97.30 | 25.00 | 20,171,700 | 23.8% | 5,448,964 | 6,336,004 | 89.562% | 43.781% | 4,880,188 | 2,773,970 |
| 2036 | 95.10 | 25.00 | 19,557,900 | 22.1% | 5,219,101 | 6,068,722 | 88.771% | 43.395% | 4,633,056 | 2,633,497 |
| 2037 | 92.90 | 25.00 | 18,944,100 | 20.4% | 5,011,244 | 5,827,028 | 87.960% | 42.998% | 4,407,904 | 2,505,517 |
| 2038 | 90.80 | 25.00 | 18,358,200 | 18.9% | 4,825,814 | 5,611,412 | 87.130% | 42.592% | 4,204,723 | 2,390,026 |
| 2039 | 88.70 | 25.00 | 17,772,300 | 17.4% | 4,658,179 | 5,416,487 | 86.280% | 42.177% | 4,019,100 | 2,284,515 |
| 2040 | 86.70 | 25.00 | 17,214,300 | 16.1% | 4,508,791 | 5,242,780 | 85.413% | 41.753% | 3,851,094 | 2,189,018 |
| 2041 | 84.70 | 25.00 | 16,656,300 | 14.9% | 4,373,771 | 5,085,781 | 84.528% | 41.320% | 3,697,066 | 2,101,467 |
| 2042 | 82.70 | 25.00 | 16,098,300 | 13.8% | 4,251,803 | 4,943,957 | 83.627% | 40.880% | 3,555,635 | 2,021,075 |
| 2043 | 80.80 | 25.00 | 15,568,200 | 12.8% | 4,143,332 | 4,817,828 | 82.709% | 40.431% | 3,426,907 | 1,947,904 |
| 2044 | 78.90 | 25.00 | 15,038,100 | 11.8% | 4,045,372 | 4,703,921 | 81.789% | 39.981% | 3,308,663 | 1,880,692 |
| 2045 | 77.10 | 25.00 | 14,535,900 | 10.9% | 3,958,361 | 4,602,746 | 80.879% | 39.537% | 3,201,481 | 1,819,769 |
| 2046 | 75.30 | 25.00 | 14,033,700 | 10.1% | 3,879,800 | 4,511,395 | 79.979% | 39.097% | 3,103,032 | 1,763,809 |
| 2047 | 73.60 | 25.00 | 13,559,400 | 9.3% | 3,810,113 | 4,430,363 | 79.089% | 38.662% | 3,013,396 | 1,712,859 |
| 2048 | 71.90 | 25.00 | 13,085,100 | 8.6% | 3,747,204 | 4,357,214 | 78.210% | 38.232% | 2,930,672 | 1,665,837 |
| Total | | | 709,273,800 | | 257,362,064 | 299,258,214 | | | 241,288,897 | 187,931,958 |
| First 20 Years | | | 458,034,300 | | 189,793,806 | 220,690,472 | | | 183,919,366 | 155,307,248 |

Footnotes:

- (1) From the August 13, 2013 report by the Center for Business and Economic Research titled "Consensus Coal Production Forecast for West Virginia: 2013"
For years 2036 and subsequent, detrended 2.31%
- (2) Estimated production for Northern Appalachian region
- (3) [Col (1) - Col (2)] x 1,000,000 x Coal Tax of 27.9 cents / 100
- (4) Ratio of current year Col (1) surface and underground acres to all subsequent years Col (1) surface and underground acres
- (5) Col (3) x Col (4) x Coal Tax of (12.9 / 27.9) for Special Reclamation Fund (SRF) +
Col (2) x 1,000,000 x Coal Tax of 27.9 cents / 100 x Coal Tax of (12.9 / 27.9) for Special Reclamation Fund (SRF)
- (6) Col (3) x Col (4) x Coal Tax of (15 / 27.9) for Special Reclamation Water Trust Fund (SRWTF) +
Col (2) x 1,000,000 x Coal Tax of 27.9 cents / 100 x Coal Tax of (15 / 27.9) for Special Reclamation Fund (SRF)
- (7) Exhibit 1.14 Col (4)
- (8) Exhibit 1.14 Col (8)
- (9) Col (5) x Col (7)
- (10) Col (6) x Col (8)

Exhibit 1.13
Projected Bond Forfeiture Collection, Civil Penalties and Other Revenue

| Fiscal Year | Projected Bond Forfeiture Collection | Discount Factors | Discounted Bond Collection | Civil Penalties & Other Revenue | Discount Factors | Discounted Civil Pen Collection |
|----------------|--------------------------------------|------------------|----------------------------|---------------------------------|------------------|---------------------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| 2014 | 3,200,455 | 99.511% | 3,184,799 | 500,000 | 99.511% | 497,554 |
| 2015 | 3,084,935 | 98.975% | 3,053,299 | 488,456 | 98.975% | 483,447 |
| 2016 | 3,003,416 | 98.876% | 2,969,646 | 477,178 | 98.876% | 471,813 |
| 2017 | 2,842,034 | 98.777% | 2,807,272 | 466,161 | 98.777% | 460,459 |
| 2018 | 2,663,924 | 98.678% | 2,628,712 | 455,398 | 98.678% | 449,378 |
| 2019 | 2,493,407 | 98.543% | 2,457,070 | 444,884 | 98.543% | 438,401 |
| 2020 | 2,331,656 | 98.334% | 2,292,805 | 434,612 | 98.334% | 427,370 |
| 2021 | 2,177,311 | 98.048% | 2,134,805 | 424,577 | 98.048% | 416,288 |
| 2022 | 2,029,299 | 97.681% | 1,982,249 | 414,774 | 97.681% | 405,157 |
| 2023 | 1,889,189 | 97.236% | 1,836,969 | 405,198 | 97.236% | 393,998 |
| 2024 | 1,755,983 | 96.737% | 1,698,685 | 395,843 | 96.737% | 382,927 |
| 2025 | 1,630,749 | 96.211% | 1,568,958 | 386,704 | 96.211% | 372,051 |
| 2026 | 1,514,201 | 95.658% | 1,448,452 | 377,776 | 95.658% | 361,372 |
| 2027 | 1,405,082 | 95.078% | 1,335,931 | 369,054 | 95.078% | 350,891 |
| 2028 | 1,303,257 | 94.473% | 1,231,229 | 360,533 | 94.473% | 340,607 |
| 2029 | 1,208,216 | 93.843% | 1,133,823 | 352,209 | 93.843% | 330,523 |
| 2030 | 1,119,882 | 93.188% | 1,043,590 | 344,077 | 93.188% | 320,637 |
| 2031 | 1,037,849 | 92.508% | 960,095 | 336,133 | 92.508% | 310,950 |
| 2032 | 961,490 | 91.805% | 882,698 | 328,372 | 91.805% | 301,463 |
| 2033 | 890,167 | 91.079% | 810,760 | 320,790 | 91.079% | 292,174 |
| 2034 | 824,258 | 90.331% | 744,564 | 313,383 | 90.331% | 283,083 |
| 2035 | 763,503 | 89.562% | 683,806 | 306,147 | 89.562% | 274,191 |
| 2036 | 707,489 | 88.771% | 628,046 | 299,079 | 88.771% | 265,496 |
| 2037 | 655,835 | 87.960% | 576,875 | 292,174 | 87.960% | 256,997 |
| 2038 | 608,194 | 87.130% | 529,918 | 285,428 | 87.130% | 248,693 |
| 2039 | 564,243 | 86.280% | 486,832 | 278,838 | 86.280% | 240,583 |
| 2040 | 523,689 | 85.413% | 447,298 | 272,400 | 85.413% | 232,665 |
| 2041 | 486,259 | 84.528% | 411,026 | 266,111 | 84.528% | 224,939 |
| 2042 | 451,705 | 83.627% | 377,746 | 259,967 | 83.627% | 217,401 |
| 2043 | 419,799 | 82.709% | 347,211 | 253,965 | 82.709% | 210,052 |
| 2044 | 390,329 | 81.789% | 319,246 | 248,101 | 81.789% | 202,919 |
| 2045 | 363,102 | 80.879% | 293,673 | 242,373 | 80.879% | 196,029 |
| 2046 | 337,941 | 79.979% | 270,283 | 236,777 | 79.979% | 189,372 |
| 2047 | 314,683 | 79.089% | 248,881 | 231,310 | 79.089% | 182,942 |
| 2048 | 293,176 | 78.210% | 229,292 | 225,969 | 78.210% | 176,729 |
| Total | 46,246,708 | | 44,056,543 | 12,094,751 | | 11,209,551 |
| First 20 Years | 38,542,503 | | 37,461,847 | 8,082,729 | | 7,807,461 |

Footnotes:

- (1) Client Data of Average Bond Value Per Permit x Projected Forfeiture Rate
- (2) Exhibit 1.14 Col (4)
- (3) Col (1) x Col (2)
- (4) Client Data for FY 2014. FY 2015 and Subsequent = Prior FY detrended 2.31%
- (5) Exhibit 1.14 Col (4)
- (6) Col (4) x Col (5)

Exhibit 1.14

Projected Investment Rates

Based on West Virginia Pool Funds and US Treasury Returns in Fall 2013

| Fiscal Year | Special Reclamation Fund Investment Rates | | | | Special Reclamation Water Trust Fund Investment Rates | | | |
|-------------|---|------------------------|------------------|-------------------------|---|----------------------|--------------------|-------------------------|
| | Money Market (1) | Short Term Bond (2) | SRF Blend (3) | Discount Factors (4) | Short Term Yield (5) | Current Yield (6) | SRWTF Blend (7) | Discount Factors (8) |
| 2014 | 0.100% | 1.100% | 0.986% | 99.511% | 0.100% | 5.600% | 5.600% | 97.312% |
| 2015 | 0.100% | 1.100% | 0.100% | 98.975% | 0.100% | 5.600% | 5.600% | 92.152% |
| 2016 | 0.100% | 1.100% | 0.100% | 98.876% | 0.100% | 5.600% | 5.600% | 87.265% |
| 2017 | 0.100% | 1.100% | 0.100% | 98.777% | 0.100% | 5.600% | 4.606% | 83.029% |
| 2018 | 0.100% | 1.100% | 0.100% | 98.678% | 0.100% | 5.600% | 3.937% | 79.628% |
| 2019 | 0.175% | 1.175% | 0.175% | 98.543% | 0.175% | 5.600% | 4.064% | 76.565% |
| 2020 | 0.250% | 1.250% | 0.250% | 98.334% | 0.250% | 5.600% | 4.104% | 73.561% |
| 2021 | 0.333% | 1.333% | 0.333% | 98.048% | 0.333% | 5.600% | 4.137% | 70.650% |
| 2022 | 0.417% | 1.417% | 0.417% | 97.681% | 0.417% | 5.600% | 4.135% | 67.844% |
| 2023 | 0.500% | 1.500% | 0.500% | 97.236% | 0.500% | 5.600% | 4.129% | 65.152% |
| 2024 | 0.531% | 1.531% | 0.531% | 96.737% | 0.531% | 5.600% | 4.099% | 62.578% |
| 2025 | 0.563% | 1.563% | 0.563% | 96.211% | 0.563% | 5.600% | 4.056% | 60.126% |
| 2026 | 0.594% | 1.594% | 0.594% | 95.658% | 0.594% | 5.600% | 3.998% | 57.799% |
| 2027 | 0.625% | 1.625% | 0.625% | 95.078% | 0.625% | 5.600% | 3.924% | 55.596% |
| 2028 | 0.656% | 1.656% | 0.656% | 94.473% | 0.656% | 5.600% | 3.828% | 53.522% |
| 2029 | 0.688% | 1.688% | 0.688% | 93.843% | 0.688% | 5.600% | 3.704% | 51.579% |
| 2030 | 0.719% | 1.719% | 0.719% | 93.188% | 0.719% | 5.600% | 3.541% | 49.776% |
| 2031 | 0.750% | 1.750% | 0.750% | 92.508% | 0.750% | 5.600% | 3.323% | 48.125% |
| 2032 | 0.781% | 1.781% | 0.781% | 91.805% | 0.781% | 5.600% | 3.021% | 46.645% |
| 2033 | 0.813% | 1.813% | 0.813% | 91.079% | 0.813% | 5.600% | 2.579% | 45.375% |
| 2034 | 0.844% | 1.844% | 0.844% | 90.331% | 0.844% | 5.600% | 1.885% | 44.385% |
| 2035 | 0.875% | 1.875% | 0.875% | 89.562% | 0.875% | 5.600% | 0.875% | 43.781% |
| 2036 | 0.906% | 1.906% | 0.906% | 88.771% | 0.906% | 5.600% | 0.906% | 43.395% |
| 2037 | 0.938% | 1.938% | 0.938% | 87.960% | 0.938% | 5.600% | 0.938% | 42.998% |
| 2038 | 0.969% | 1.969% | 0.969% | 87.130% | 0.969% | 5.600% | 0.969% | 42.592% |
| 2039 | 1.000% | 2.000% | 1.000% | 86.280% | 1.000% | 5.600% | 1.000% | 42.177% |
| 2040 | 1.031% | 2.031% | 1.031% | 85.413% | 1.031% | 5.600% | 1.031% | 41.753% |
| 2041 | 1.063% | 2.063% | 1.063% | 84.528% | 1.063% | 5.600% | 1.063% | 41.320% |
| 2042 | 1.094% | 2.094% | 1.094% | 83.627% | 1.094% | 5.600% | 1.094% | 40.880% |
| 2043 | 1.125% | 2.125% | 1.125% | 82.709% | 1.125% | 5.600% | 1.125% | 40.431% |
| 2044 | 1.125% | 2.125% | 1.125% | 81.789% | 1.125% | 5.600% | 1.125% | 39.981% |
| 2045 | 1.125% | 2.125% | 1.125% | 80.879% | 1.125% | 5.600% | 1.125% | 39.537% |
| 2046 | 1.125% | 2.125% | 1.125% | 79.979% | 1.125% | 5.600% | 1.125% | 39.097% |
| 2047 | 1.125% | 2.125% | 1.125% | 79.089% | 1.125% | 5.600% | 1.125% | 38.662% |
| 2048 | 1.125% | 2.125% | 1.125% | 78.210% | 1.125% | 5.600% | 1.125% | 38.232% |

Footnotes:

- (1) Col (2) - 1%, reflecting West Virginia Money Market Pool Return and US Treasury Returns in Fall of 2013
- (2) Based on West Virginia Short Term Bond Pool Return and US Treasury Returns in Fall of 2013
- (3) Exhibit 1.14a [Col (3) / (Col (1) + Col (2))]
- (4) Based on Col (3)
- (5) Col (1)
- (6) Based on current yields and planned investment strategy changes in 2019
- (7) Exhibit 1.14a [Col (7) / (Col (5) + Col (6))]
- (8) Based on Col (7)

Exhibit 1.14a

Projected Investment Income

Based on West Virginia Pool Funds and US Treasury Returns in Fall 2013
(in \$ Thousands)

| Fiscal Year | Special Reclamation Fund Investable Amounts and Returns | | | | Special Reclamation Water Trust Fund Investable Amounts and Returns | | | |
|----------------|---|------------------------|--------------------|------------------------|---|-----------------------|--------------------|------------------------|
| | Money Mkt. Inv. (1) | Short Term Inv. (2) | Inv. Income (3) | Discounted I.I. (4) | Money Mkt. Inv. (5) | Long Term Inv. (6) | Inv. Income (7) | Discounted I.I. (8) |
| 2014 | 8,000 | 61,952 | 689 | 686 | 0 | 31,032 | 1,738 | 1,691 |
| 2015 | 54,886 | 0 | 55 | 54 | 0 | 49,299 | 2,761 | 2,544 |
| 2016 | 29,077 | 0 | 29 | 29 | 0 | 67,632 | 3,787 | 3,305 |
| 2017 | 11,434 | 0 | 11 | 11 | 15,620 | 70,768 | 3,979 | 3,303 |
| 2018 | 4,321 | 0 | 4 | 4 | 31,607 | 72,944 | 4,116 | 3,278 |
| 2019 | 536 | 0 | 1 | 1 | 32,291 | 81,730 | 4,633 | 3,548 |
| 2020 | 1,817 | 0 | 5 | 4 | 32,234 | 83,065 | 4,732 | 3,481 |
| 2021 | 2,625 | 0 | 9 | 9 | 32,161 | 83,622 | 4,790 | 3,384 |
| 2022 | 4,313 | 0 | 18 | 18 | 32,767 | 83,148 | 4,793 | 3,252 |
| 2023 | 6,871 | 0 | 34 | 33 | 33,377 | 82,344 | 4,778 | 3,113 |
| 2024 | 8,978 | 0 | 48 | 46 | 33,993 | 80,764 | 4,703 | 2,943 |
| 2025 | 10,598 | 0 | 60 | 57 | 34,616 | 78,293 | 4,579 | 2,753 |
| 2026 | 11,779 | 0 | 70 | 67 | 35,249 | 74,922 | 4,405 | 2,546 |
| 2027 | 12,572 | 0 | 79 | 75 | 35,891 | 70,648 | 4,181 | 2,324 |
| 2028 | 12,980 | 0 | 85 | 80 | 36,543 | 65,416 | 3,903 | 2,089 |
| 2029 | 13,020 | 0 | 90 | 84 | 37,205 | 59,185 | 3,570 | 1,841 |
| 2030 | 12,720 | 0 | 91 | 85 | 37,877 | 51,924 | 3,180 | 1,583 |
| 2031 | 12,093 | 0 | 91 | 84 | 38,560 | 43,578 | 2,730 | 1,314 |
| 2032 | 11,137 | 0 | 87 | 80 | 39,254 | 34,083 | 2,215 | 1,033 |
| 2033 | 9,846 | 0 | 80 | 73 | 39,959 | 23,363 | 1,633 | 741 |
| 2034 | 8,265 | 0 | 70 | 63 | 40,675 | 11,394 | 981 | 436 |
| 2035 | 6,429 | 0 | 56 | 50 | 39,544 | 0 | 346 | 151 |
| 2036 | 4,334 | 0 | 39 | 35 | 25,755 | 0 | 233 | 101 |
| 2037 | 1,992 | 0 | 19 | 16 | 11,235 | 0 | 105 | 45 |
| 2038 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2039 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2040 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2041 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2042 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2043 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2044 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2045 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2046 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2047 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2048 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 260,621 | 61,952 | 1,819 | 1,746 | 696,413 | 1,299,154 | 76,873 | 50,801 |
| First 20 Years | 239,602 | 61,952 | 1,635 | 1,581 | 579,204 | 1,287,760 | 75,207 | 50,067 |

Footnotes:

- (1) Table D.1 Col (3) prior year plus half current year anticipated revenues minus half current year anticipated expenditures.
Limited to \$8,000,000 first year, then next two years of anticipated expenditures for subsequent years;
- (2) Table D.1 Col (3) prior year plus half current year anticipated revenues minus half current year anticipated expenditures minus Col (1)
- (3) Col (1) x Exhibit 1.14 Col (1) + Col (2) x Exhibit 1.14 Col (2)
- (4) Col (3) x Exhibit 1.14 Col (4)
- (5) Table E.1 Col (3) prior year plus half current year anticipated revenues minus half current year anticipated expenditures.
Limited to next two years of anticipated expenditures;
- (6) Table E.1 Col (3) prior year plus half current year anticipated revenues minus half current year anticipated expenditures minus Col (5)
- (7) Col (5) x Exhibit 1.14 Col (5) + Col (6) x Exhibit 1.14 Col (6)
- (8) Col (7) x Exhibit 1.14 Col (8)

| Exhibit 1.15a Projected Number of Permits In-Force All Permit Types Combined | | | | |
|---|--------|----------|----------------|-------|
| Fiscal Year Ending 6/30 | Active | Inactive | Phase Released | Total |
| | (1) | (2) | (3) | (4) |
| 2013 | 908 | 177 | 732 | 1,817 |
| 2014 | 873 | 168 | 687 | 1,729 |
| 2015 | 839 | 159 | 644 | 1,642 |
| 2016 | 803 | 151 | 603 | 1,557 |
| 2017 | 768 | 143 | 564 | 1,475 |
| 2018 | 732 | 135 | 528 | 1,395 |
| 2019 | 698 | 127 | 493 | 1,318 |
| 2020 | 664 | 120 | 461 | 1,245 |
| 2021 | 632 | 113 | 430 | 1,175 |
| 2022 | 599 | 107 | 401 | 1,108 |
| 2023 | 569 | 101 | 375 | 1,044 |
| 2024 | 539 | 95 | 350 | 984 |
| 2025 | 511 | 89 | 326 | 927 |
| 2026 | 484 | 84 | 304 | 873 |
| 2027 | 459 | 79 | 284 | 822 |
| 2028 | 434 | 74 | 265 | 773 |
| 2029 | 410 | 70 | 247 | 728 |
| 2030 | 388 | 66 | 231 | 685 |
| 2031 | 367 | 62 | 216 | 645 |
| 2032 | 347 | 58 | 201 | 606 |
| 2033 | 328 | 55 | 188 | 571 |
| 2034 | 310 | 52 | 176 | 537 |
| 2035 | 293 | 49 | 165 | 506 |
| 2036 | 277 | 46 | 154 | 477 |
| 2037 | 262 | 43 | 145 | 450 |
| 2038 | 248 | 41 | 135 | 425 |
| 2039 | 236 | 39 | 127 | 401 |
| 2040 | 223 | 37 | 119 | 379 |
| 2041 | 212 | 35 | 112 | 358 |
| 2042 | 201 | 33 | 105 | 339 |
| 2043 | 191 | 31 | 99 | 321 |
| 2044 | 182 | 29 | 93 | 304 |
| 2045 | 173 | 28 | 87 | 288 |
| 2046 | 164 | 26 | 82 | 273 |
| 2047 | 156 | 25 | 77 | 259 |
| 2048 | 149 | 24 | 73 | 245 |

Footnotes:

- (1) Exhibit 3.6a through Exhibit 3.8a x Exhibit 4.1 through Exhibit 4.3
- (2) Exhibit 3.6a through Exhibit 3.8a x Exhibit 4.1 through Exhibit 4.3
- (3) Exhibit 3.6a through Exhibit 3.8a x Exhibit 4.1 through Exhibit 4.3
- (4) Sum of Col (1) through Col (3)

| Table 1.15b Projected Number of Permits In-Force Surface Permits | | | | |
|---|--------|----------|----------------|-------|
| Fiscal Year Ending 6/30 | Active | Inactive | Phase Released | Total |
| | (1) | (2) | (3) | (4) |
| 2013 | 235 | 20 | 362 | 617 |
| 2014 | 226 | 19 | 338 | 583 |
| 2015 | 217 | 18 | 315 | 549 |
| 2016 | 207 | 17 | 292 | 516 |
| 2017 | 196 | 16 | 271 | 483 |
| 2018 | 186 | 15 | 251 | 452 |
| 2019 | 176 | 14 | 232 | 422 |
| 2020 | 165 | 13 | 215 | 393 |
| 2021 | 155 | 12 | 198 | 365 |
| 2022 | 145 | 11 | 183 | 338 |
| 2023 | 135 | 10 | 169 | 313 |
| 2024 | 125 | 9 | 155 | 290 |
| 2025 | 116 | 9 | 143 | 268 |
| 2026 | 108 | 8 | 132 | 248 |
| 2027 | 100 | 7 | 121 | 229 |
| 2028 | 93 | 7 | 111 | 211 |
| 2029 | 86 | 6 | 102 | 194 |
| 2030 | 79 | 6 | 94 | 179 |
| 2031 | 73 | 5 | 86 | 165 |
| 2032 | 67 | 5 | 79 | 151 |
| 2033 | 62 | 4 | 72 | 139 |
| 2034 | 57 | 4 | 66 | 127 |
| 2035 | 52 | 4 | 61 | 117 |
| 2036 | 48 | 3 | 56 | 107 |
| 2037 | 44 | 3 | 51 | 98 |
| 2038 | 40 | 3 | 47 | 90 |
| 2039 | 37 | 3 | 43 | 83 |
| 2040 | 34 | 2 | 40 | 76 |
| 2041 | 31 | 2 | 36 | 70 |
| 2042 | 28 | 2 | 33 | 64 |
| 2043 | 26 | 2 | 31 | 59 |
| 2044 | 24 | 2 | 28 | 54 |
| 2045 | 22 | 2 | 26 | 49 |
| 2046 | 20 | 1 | 24 | 45 |
| 2047 | 19 | 1 | 22 | 42 |
| 2048 | 17 | 1 | 20 | 38 |

Footnotes:

- (1) Exhibit 3.6a x Exhibit 4.1
- (2) Exhibit 3.6a x Exhibit 4.1
- (3) Exhibit 3.6a x Exhibit 4.1
- (4) Sum of Col (1) through Col (3)

| Table 1.15c Projected Number of Permits In-Force Underground Permits | | | | |
|---|--------|----------|----------------|-------|
| Fiscal Year Ending 6/30 | Active | Inactive | Phase Released | Total |
| | (1) | (2) | (3) | (4) |
| 2013 | 342 | 111 | 252 | 705 |
| 2014 | 326 | 105 | 235 | 665 |
| 2015 | 309 | 98 | 219 | 627 |
| 2016 | 293 | 92 | 204 | 589 |
| 2017 | 277 | 86 | 190 | 553 |
| 2018 | 261 | 81 | 176 | 518 |
| 2019 | 246 | 75 | 164 | 485 |
| 2020 | 231 | 70 | 152 | 453 |
| 2021 | 217 | 66 | 141 | 424 |
| 2022 | 204 | 61 | 130 | 395 |
| 2023 | 191 | 57 | 121 | 369 |
| 2024 | 179 | 53 | 112 | 344 |
| 2025 | 167 | 49 | 104 | 320 |
| 2026 | 156 | 46 | 96 | 298 |
| 2027 | 145 | 42 | 89 | 277 |
| 2028 | 135 | 39 | 82 | 257 |
| 2029 | 126 | 36 | 76 | 238 |
| 2030 | 117 | 34 | 70 | 221 |
| 2031 | 108 | 31 | 65 | 205 |
| 2032 | 100 | 29 | 60 | 189 |
| 2033 | 93 | 27 | 56 | 175 |
| 2034 | 86 | 25 | 52 | 162 |
| 2035 | 79 | 23 | 48 | 150 |
| 2036 | 73 | 21 | 44 | 139 |
| 2037 | 68 | 20 | 41 | 128 |
| 2038 | 63 | 18 | 38 | 119 |
| 2039 | 58 | 17 | 35 | 110 |
| 2040 | 54 | 15 | 32 | 101 |
| 2041 | 50 | 14 | 30 | 94 |
| 2042 | 46 | 13 | 28 | 87 |
| 2043 | 43 | 12 | 26 | 80 |
| 2044 | 39 | 11 | 24 | 74 |
| 2045 | 36 | 10 | 22 | 69 |
| 2046 | 34 | 10 | 20 | 64 |
| 2047 | 31 | 9 | 19 | 59 |
| 2048 | 29 | 8 | 17 | 54 |

Footnotes:

- (1) Exhibit 3.7a x Exhibit 4.2
- (2) Exhibit 3.7a x Exhibit 4.2
- (3) Exhibit 3.7a x Exhibit 4.2
- (4) Sum of Col (1) through Col (3)

| Table 1.15d Projected Number of Permits In-Force Other Permits | | | | |
|---|--------|----------|----------------|-------|
| Fiscal Year Ending 6/30 | Active | Inactive | Phase Released | Total |
| | (1) | (2) | (3) | (4) |
| 2013 | 331 | 46 | 118 | 495 |
| 2014 | 322 | 45 | 114 | 481 |
| 2015 | 312 | 43 | 111 | 466 |
| 2016 | 303 | 42 | 107 | 452 |
| 2017 | 294 | 41 | 104 | 438 |
| 2018 | 285 | 40 | 100 | 425 |
| 2019 | 276 | 38 | 97 | 412 |
| 2020 | 268 | 37 | 94 | 399 |
| 2021 | 259 | 36 | 91 | 386 |
| 2022 | 251 | 35 | 88 | 374 |
| 2023 | 243 | 34 | 85 | 362 |
| 2024 | 235 | 33 | 82 | 350 |
| 2025 | 228 | 31 | 79 | 339 |
| 2026 | 220 | 30 | 77 | 327 |
| 2027 | 213 | 29 | 74 | 316 |
| 2028 | 206 | 28 | 72 | 306 |
| 2029 | 199 | 27 | 69 | 295 |
| 2030 | 192 | 26 | 67 | 285 |
| 2031 | 185 | 26 | 65 | 275 |
| 2032 | 179 | 25 | 62 | 266 |
| 2033 | 173 | 24 | 60 | 257 |
| 2034 | 167 | 23 | 58 | 248 |
| 2035 | 161 | 22 | 56 | 240 |
| 2036 | 156 | 21 | 54 | 232 |
| 2037 | 151 | 21 | 52 | 224 |
| 2038 | 145 | 20 | 51 | 216 |
| 2039 | 141 | 19 | 49 | 209 |
| 2040 | 136 | 19 | 47 | 202 |
| 2041 | 131 | 18 | 46 | 195 |
| 2042 | 127 | 17 | 44 | 188 |
| 2043 | 122 | 17 | 43 | 182 |
| 2044 | 118 | 16 | 41 | 176 |
| 2045 | 114 | 16 | 40 | 170 |
| 2046 | 110 | 15 | 38 | 164 |
| 2047 | 107 | 15 | 37 | 158 |
| 2048 | 103 | 14 | 36 | 153 |

Footnotes:

- (1) Exhibit 3.8a x Exhibit 4.3
- (2) Exhibit 3.8a x Exhibit 4.3
- (3) Exhibit 3.8a x Exhibit 4.3
- (4) Sum of Col (1) through Col (3)

| Exhibit 1.16a | | | | |
|--|---------|----------|----------------|---------|
| Projected Acreage of Permits In-Force | | | | |
| All Permit Types Combined | | | | |
| Fiscal Year Ending 6/30 | Active | Inactive | Phase Released | Total |
| | (1) | (2) | (3) | (4) |
| 2013 | 177,427 | 17,180 | 137,767 | 332,374 |
| 2014 | 170,504 | 16,400 | 129,377 | 316,281 |
| 2015 | 163,587 | 15,643 | 121,266 | 300,496 |
| 2016 | 156,513 | 14,896 | 113,362 | 284,772 |
| 2017 | 149,302 | 14,163 | 105,841 | 269,306 |
| 2018 | 142,043 | 13,457 | 98,803 | 254,303 |
| 2019 | 134,993 | 12,757 | 92,178 | 239,928 |
| 2020 | 128,056 | 12,089 | 85,924 | 226,070 |
| 2021 | 121,221 | 11,447 | 79,994 | 212,661 |
| 2022 | 114,516 | 10,831 | 74,451 | 199,798 |
| 2023 | 108,001 | 10,246 | 69,246 | 187,493 |
| 2024 | 101,804 | 9,653 | 64,380 | 175,836 |
| 2025 | 95,948 | 9,096 | 59,850 | 164,894 |
| 2026 | 90,382 | 8,569 | 55,615 | 154,566 |
| 2027 | 85,077 | 8,073 | 51,675 | 144,825 |
| 2028 | 79,991 | 7,607 | 48,016 | 135,615 |
| 2029 | 75,194 | 7,163 | 44,606 | 126,962 |
| 2030 | 70,659 | 6,746 | 41,442 | 118,847 |
| 2031 | 66,367 | 6,350 | 38,509 | 111,226 |
| 2032 | 62,241 | 5,980 | 35,790 | 104,012 |
| 2033 | 58,381 | 5,635 | 33,271 | 97,287 |
| 2034 | 54,784 | 5,311 | 30,937 | 91,033 |
| 2035 | 51,433 | 5,009 | 28,773 | 85,215 |
| 2036 | 48,308 | 4,726 | 26,767 | 79,801 |
| 2037 | 45,395 | 4,461 | 24,908 | 74,763 |
| 2038 | 42,677 | 4,213 | 23,183 | 70,073 |
| 2039 | 40,141 | 3,981 | 21,584 | 65,706 |
| 2040 | 37,775 | 3,763 | 20,101 | 61,639 |
| 2041 | 35,565 | 3,559 | 18,725 | 57,849 |
| 2042 | 33,501 | 3,368 | 17,448 | 54,317 |
| 2043 | 31,572 | 3,188 | 16,264 | 51,024 |
| 2044 | 29,769 | 3,020 | 15,164 | 47,953 |
| 2045 | 28,084 | 2,862 | 14,144 | 45,089 |
| 2046 | 26,507 | 2,713 | 13,196 | 42,416 |
| 2047 | 25,032 | 2,573 | 12,316 | 39,921 |
| 2048 | 23,650 | 2,442 | 11,499 | 37,591 |

Footnotes:

- (1) Client data x Exhibit 4.1 through Exhibit 4.3
- (2) Client data x Exhibit 4.1 through Exhibit 4.3
- (3) Client data x Exhibit 4.1 through Exhibit 4.3
- (4) Sum of Col (1) through Col (3)

| Exhibit 1.16b Projected Acreage of Permits In-Force Surface Permits | | | | |
|--|---------|----------|----------------|---------|
| Fiscal Year Ending 6/30 | Active | Inactive | Phase Released | Total |
| | (1) | (2) | (3) | (4) |
| 2013 | 123,303 | 9,424 | 120,672 | 253,399 |
| 2014 | 118,505 | 8,987 | 113,146 | 240,639 |
| 2015 | 113,652 | 8,561 | 105,862 | 228,075 |
| 2016 | 108,588 | 8,130 | 98,743 | 215,461 |
| 2017 | 103,320 | 7,706 | 91,968 | 202,994 |
| 2018 | 97,949 | 7,298 | 85,636 | 190,882 |
| 2019 | 92,717 | 6,881 | 79,681 | 179,279 |
| 2020 | 87,522 | 6,482 | 74,065 | 168,069 |
| 2021 | 82,350 | 6,096 | 68,737 | 157,184 |
| 2022 | 77,247 | 5,726 | 63,763 | 146,737 |
| 2023 | 72,270 | 5,376 | 59,095 | 136,741 |
| 2024 | 67,549 | 5,007 | 54,735 | 127,291 |
| 2025 | 63,115 | 4,664 | 50,682 | 118,461 |
| 2026 | 58,908 | 4,342 | 46,896 | 110,146 |
| 2027 | 54,918 | 4,039 | 43,381 | 102,338 |
| 2028 | 51,101 | 3,757 | 40,123 | 94,982 |
| 2029 | 47,512 | 3,488 | 37,091 | 88,091 |
| 2030 | 44,132 | 3,238 | 34,284 | 81,653 |
| 2031 | 40,941 | 2,999 | 31,688 | 75,629 |
| 2032 | 37,868 | 2,779 | 29,289 | 69,935 |
| 2033 | 35,010 | 2,574 | 27,071 | 64,655 |
| 2034 | 32,368 | 2,385 | 25,022 | 59,774 |
| 2035 | 29,925 | 2,209 | 23,127 | 55,262 |
| 2036 | 27,667 | 2,047 | 21,377 | 51,091 |
| 2037 | 25,580 | 1,896 | 19,758 | 47,235 |
| 2038 | 23,650 | 1,757 | 18,263 | 43,670 |
| 2039 | 21,866 | 1,628 | 16,881 | 40,374 |
| 2040 | 20,216 | 1,508 | 15,603 | 37,327 |
| 2041 | 18,691 | 1,397 | 14,422 | 34,510 |
| 2042 | 17,281 | 1,294 | 13,331 | 31,906 |
| 2043 | 15,978 | 1,199 | 12,322 | 29,499 |
| 2044 | 14,773 | 1,111 | 11,390 | 27,273 |
| 2045 | 13,659 | 1,029 | 10,528 | 25,216 |
| 2046 | 12,628 | 954 | 9,732 | 23,314 |
| 2047 | 11,676 | 884 | 8,995 | 21,555 |
| 2048 | 10,796 | 819 | 8,315 | 19,929 |

Footnotes:

- (1) Client data x Exhibit 4.1
- (2) Client data x Exhibit 4.1
- (3) Client data x Exhibit 4.1
- (4) Sum of Col (1) through Col (3)

| Exhibit 1.16c Projected Acreage of Permits In-Force Underground Permits | | | | |
|--|--------|----------|----------------|--------|
| Fiscal Year Ending 6/30 | Active | Inactive | Phase Released | Total |
| | (1) | (2) | (3) | (4) |
| 2013 | 19,356 | 3,524 | 8,698 | 31,577 |
| 2014 | 18,190 | 3,307 | 8,108 | 29,606 |
| 2015 | 17,083 | 3,100 | 7,549 | 27,731 |
| 2016 | 16,024 | 2,903 | 7,022 | 25,949 |
| 2017 | 15,013 | 2,712 | 6,526 | 24,251 |
| 2018 | 14,048 | 2,529 | 6,062 | 22,639 |
| 2019 | 13,129 | 2,359 | 5,625 | 21,113 |
| 2020 | 12,266 | 2,198 | 5,213 | 19,677 |
| 2021 | 11,457 | 2,048 | 4,829 | 18,334 |
| 2022 | 10,689 | 1,906 | 4,472 | 17,067 |
| 2023 | 9,967 | 1,772 | 4,141 | 15,881 |
| 2024 | 9,285 | 1,646 | 3,835 | 14,766 |
| 2025 | 8,646 | 1,528 | 3,551 | 13,724 |
| 2026 | 8,045 | 1,417 | 3,287 | 12,748 |
| 2027 | 7,477 | 1,314 | 3,042 | 11,833 |
| 2028 | 6,945 | 1,218 | 2,815 | 10,978 |
| 2029 | 6,449 | 1,128 | 2,605 | 10,183 |
| 2030 | 5,985 | 1,044 | 2,411 | 9,439 |
| 2031 | 5,551 | 966 | 2,231 | 8,747 |
| 2032 | 5,144 | 893 | 2,064 | 8,102 |
| 2033 | 4,766 | 827 | 1,910 | 7,503 |
| 2034 | 4,416 | 765 | 1,767 | 6,948 |
| 2035 | 4,092 | 707 | 1,635 | 6,434 |
| 2036 | 3,791 | 655 | 1,513 | 5,959 |
| 2037 | 3,513 | 606 | 1,400 | 5,518 |
| 2038 | 3,254 | 560 | 1,295 | 5,110 |
| 2039 | 3,015 | 518 | 1,199 | 4,732 |
| 2040 | 2,794 | 480 | 1,109 | 4,382 |
| 2041 | 2,589 | 444 | 1,026 | 4,059 |
| 2042 | 2,398 | 411 | 949 | 3,759 |
| 2043 | 2,222 | 380 | 879 | 3,481 |
| 2044 | 2,059 | 351 | 813 | 3,223 |
| 2045 | 1,908 | 325 | 752 | 2,985 |
| 2046 | 1,768 | 301 | 696 | 2,765 |
| 2047 | 1,638 | 278 | 644 | 2,560 |
| 2048 | 1,518 | 257 | 596 | 2,371 |

Footnotes:

- (1) Client data x Exhibit 4.2
- (2) Client data x Exhibit 4.2
- (3) Client data x Exhibit 4.2
- (4) Sum of Col (1) through Col (3)

| Exhibit 1.16d Projected Acreage of Permits In-Force Other Permits | | | | |
|--|--------|----------|----------------|--------|
| Fiscal Year Ending 6/30 | Active | Inactive | Phase Released | Total |
| | (1) | (2) | (3) | (4) |
| 2013 | 34,768 | 4,233 | 8,397 | 47,398 |
| 2014 | 33,809 | 4,106 | 8,122 | 46,037 |
| 2015 | 32,852 | 3,982 | 7,856 | 44,689 |
| 2016 | 31,902 | 3,863 | 7,597 | 43,362 |
| 2017 | 30,968 | 3,745 | 7,347 | 42,061 |
| 2018 | 30,046 | 3,630 | 7,105 | 40,782 |
| 2019 | 29,147 | 3,518 | 6,872 | 39,537 |
| 2020 | 28,268 | 3,409 | 6,645 | 38,323 |
| 2021 | 27,413 | 3,303 | 6,427 | 37,143 |
| 2022 | 26,580 | 3,199 | 6,215 | 35,994 |
| 2023 | 25,764 | 3,098 | 6,009 | 34,871 |
| 2024 | 24,969 | 2,999 | 5,810 | 33,779 |
| 2025 | 24,188 | 2,904 | 5,618 | 32,710 |
| 2026 | 23,430 | 2,810 | 5,432 | 31,672 |
| 2027 | 22,682 | 2,720 | 5,252 | 30,654 |
| 2028 | 21,945 | 2,632 | 5,078 | 29,655 |
| 2029 | 21,232 | 2,547 | 4,909 | 28,689 |
| 2030 | 20,543 | 2,465 | 4,747 | 27,754 |
| 2031 | 19,875 | 2,385 | 4,589 | 26,850 |
| 2032 | 19,229 | 2,308 | 4,437 | 25,975 |
| 2033 | 18,605 | 2,234 | 4,290 | 25,129 |
| 2034 | 18,000 | 2,162 | 4,148 | 24,310 |
| 2035 | 17,415 | 2,092 | 4,011 | 23,518 |
| 2036 | 16,850 | 2,025 | 3,878 | 22,752 |
| 2037 | 16,302 | 1,959 | 3,749 | 22,011 |
| 2038 | 15,773 | 1,896 | 3,625 | 21,294 |
| 2039 | 15,260 | 1,835 | 3,505 | 20,600 |
| 2040 | 14,765 | 1,776 | 3,389 | 19,929 |
| 2041 | 14,285 | 1,718 | 3,276 | 19,280 |
| 2042 | 13,821 | 1,663 | 3,168 | 18,652 |
| 2043 | 13,372 | 1,609 | 3,063 | 18,044 |
| 2044 | 12,938 | 1,557 | 2,961 | 17,457 |
| 2045 | 12,517 | 1,507 | 2,863 | 16,888 |
| 2046 | 12,111 | 1,459 | 2,769 | 16,338 |
| 2047 | 11,717 | 1,412 | 2,677 | 15,806 |
| 2048 | 11,337 | 1,366 | 2,588 | 15,291 |

Footnotes:

- (1) Client data x Exhibit 4.3
- (2) Client data x Exhibit 4.3
- (3) Client data x Exhibit 4.3
- (4) Sum of Col (1) through Col (3)

| Exhibit 1.17a | | | | |
|---|--------------------------------|---------------------------------|--------------------------------|---------------------------------|
| Projected Acreage of Permits Issued On Or Before June 30, 2013 | | | | |
| All Permit Types Combined | | | | |
| Fiscal Year Ending 6/30 | Acreage of In Force Permits | Acreage of Forfeited Permits | Acreage of Released Permits | End of Year In Force Acreage |
| | (1) | (2) | (3) | (4) |
| 2013 | 332,374 | 0 | 0 | 332,374 |
| 2014 | 316,281 | 1,446 | 14,646 | 300,189 |
| 2015 | 300,496 | 1,429 | 14,356 | 284,710 |
| 2016 | 284,772 | 1,452 | 14,272 | 269,048 |
| 2017 | 269,306 | 1,387 | 14,079 | 253,840 |
| 2018 | 254,303 | 1,311 | 13,692 | 239,299 |
| 2019 | 239,928 | 1,237 | 13,138 | 225,553 |
| 2020 | 226,070 | 1,166 | 12,693 | 212,211 |
| 2021 | 212,661 | 1,097 | 12,311 | 199,253 |
| 2022 | 199,798 | 1,029 | 11,834 | 186,934 |
| 2023 | 187,493 | 964 | 11,341 | 175,188 |
| 2024 | 175,836 | 903 | 10,754 | 164,180 |
| 2025 | 164,894 | 844 | 10,098 | 153,952 |
| 2026 | 154,566 | 789 | 9,539 | 144,238 |
| 2027 | 144,825 | 737 | 9,004 | 135,083 |
| 2028 | 135,615 | 688 | 8,522 | 126,405 |
| 2029 | 126,962 | 642 | 8,010 | 118,310 |
| 2030 | 118,847 | 599 | 7,517 | 110,732 |
| 2031 | 111,226 | 558 | 7,063 | 103,606 |
| 2032 | 104,012 | 520 | 6,694 | 96,798 |
| 2033 | 97,287 | 483 | 6,242 | 90,562 |
| 2034 | 91,033 | 449 | 5,805 | 84,778 |
| 2035 | 85,215 | 418 | 5,400 | 79,397 |
| 2036 | 79,801 | 389 | 5,024 | 74,388 |
| 2037 | 74,763 | 362 | 4,676 | 69,725 |
| 2038 | 70,073 | 337 | 4,353 | 65,383 |
| 2039 | 65,706 | 314 | 4,053 | 61,339 |
| 2040 | 61,639 | 292 | 3,775 | 57,571 |
| 2041 | 57,849 | 272 | 3,518 | 54,059 |
| 2042 | 54,317 | 254 | 3,278 | 50,785 |
| 2043 | 51,024 | 237 | 3,056 | 47,731 |
| 2044 | 47,953 | 221 | 2,850 | 44,883 |
| 2045 | 45,089 | 206 | 2,658 | 42,225 |
| 2046 | 42,416 | 192 | 2,481 | 39,743 |
| 2047 | 39,921 | 179 | 2,316 | 37,426 |
| 2048 | 37,591 | 168 | 2,162 | 35,261 |

Footnotes:

- (1) Exhibit 1.16a Col (4)
- (2) Exhibit 1.16a Col (4) x Exhibit 4.1 through Exhibit 4.3
- (3) Exhibit 1.16a Col (4) x Exhibit 4.1 through Exhibit 4.3
- (4) Col (1) - Col (2) - Col (3)

| Exhibit 1.17b Projected Acreage of Permits Issued On Or Before June 30, 2013 Surface Permits | | | | |
|---|--------------------------------|---------------------------------|--------------------------------|---------------------------------|
| Fiscal Year Ending 6/30 | Acreage of In Force Permits | Acreage of Forfeited Permits | Acreage of Released Permits | End of Year In Force Acreage |
| | (1) | (2) | (3) | (4) |
| 2013 | 253,399 | 0 | 0 | 253,399 |
| 2014 | 240,639 | 1,210 | 11,550 | 227,879 |
| 2015 | 228,075 | 1,202 | 11,362 | 215,511 |
| 2016 | 215,461 | 1,230 | 11,384 | 202,847 |
| 2017 | 202,994 | 1,173 | 11,294 | 190,527 |
| 2018 | 190,882 | 1,107 | 11,005 | 178,771 |
| 2019 | 179,279 | 1,042 | 10,562 | 167,675 |
| 2020 | 168,069 | 980 | 10,230 | 156,859 |
| 2021 | 157,184 | 920 | 9,965 | 146,299 |
| 2022 | 146,737 | 861 | 9,586 | 136,290 |
| 2023 | 136,741 | 804 | 9,192 | 126,746 |
| 2024 | 127,291 | 750 | 8,701 | 117,840 |
| 2025 | 118,461 | 698 | 8,132 | 109,631 |
| 2026 | 110,146 | 650 | 7,665 | 101,831 |
| 2027 | 102,338 | 605 | 7,203 | 94,530 |
| 2028 | 94,982 | 562 | 6,794 | 87,625 |
| 2029 | 88,091 | 522 | 6,369 | 81,200 |
| 2030 | 81,653 | 484 | 5,953 | 75,216 |
| 2031 | 75,629 | 449 | 5,575 | 69,604 |
| 2032 | 69,935 | 416 | 5,278 | 64,241 |
| 2033 | 64,655 | 384 | 4,895 | 59,376 |
| 2034 | 59,774 | 355 | 4,526 | 54,893 |
| 2035 | 55,262 | 328 | 4,184 | 50,750 |
| 2036 | 51,091 | 303 | 3,868 | 46,920 |
| 2037 | 47,235 | 280 | 3,576 | 43,378 |
| 2038 | 43,670 | 259 | 3,306 | 40,105 |
| 2039 | 40,374 | 239 | 3,057 | 37,078 |
| 2040 | 37,327 | 221 | 2,826 | 34,280 |
| 2041 | 34,510 | 204 | 2,613 | 31,694 |
| 2042 | 31,906 | 188 | 2,416 | 29,302 |
| 2043 | 29,499 | 174 | 2,233 | 27,092 |
| 2044 | 27,273 | 161 | 2,065 | 25,048 |
| 2045 | 25,216 | 148 | 1,909 | 23,158 |
| 2046 | 23,314 | 137 | 1,765 | 21,411 |
| 2047 | 21,555 | 127 | 1,632 | 19,796 |
| 2048 | 19,929 | 117 | 1,509 | 18,303 |

Footnotes:

- (1) Exhibit 1.16a Col (4)
- (2) Exhibit 1.16a Col (4) x Exhibit 4.1
- (3) Exhibit 1.16a Col (4) x Exhibit 4.1
- (4) Col (1) - Col (2) - Col (3)

| Exhibit 1.17c Projected Acreage of Permits Issued On Or Before June 30, 2013 Underground Permits | | | | |
|---|--------------------------------|---------------------------------|--------------------------------|---------------------------------|
| Fiscal Year Ending 6/30 | Acreage of In Force Permits | Acreage of Forfeited Permits | Acreage of Released Permits | End of Year In Force Acreage |
| | (1) | (2) | (3) | (4) |
| 2013 | 31,577 | 0 | 0 | 31,577 |
| 2014 | 29,606 | 118 | 1,853 | 27,634 |
| 2015 | 27,731 | 113 | 1,762 | 25,857 |
| 2016 | 25,949 | 108 | 1,674 | 24,167 |
| 2017 | 24,251 | 102 | 1,596 | 22,553 |
| 2018 | 22,639 | 95 | 1,517 | 21,026 |
| 2019 | 21,113 | 89 | 1,437 | 19,587 |
| 2020 | 19,677 | 83 | 1,352 | 18,242 |
| 2021 | 18,334 | 78 | 1,266 | 16,991 |
| 2022 | 17,067 | 72 | 1,195 | 15,800 |
| 2023 | 15,881 | 67 | 1,119 | 14,694 |
| 2024 | 14,766 | 63 | 1,052 | 13,652 |
| 2025 | 13,724 | 58 | 984 | 12,682 |
| 2026 | 12,748 | 54 | 922 | 11,772 |
| 2027 | 11,833 | 50 | 865 | 10,917 |
| 2028 | 10,978 | 47 | 808 | 10,123 |
| 2029 | 10,183 | 43 | 752 | 9,387 |
| 2030 | 9,439 | 40 | 703 | 8,696 |
| 2031 | 8,747 | 37 | 655 | 8,056 |
| 2032 | 8,102 | 35 | 611 | 7,457 |
| 2033 | 7,503 | 32 | 567 | 6,904 |
| 2034 | 6,948 | 30 | 525 | 6,393 |
| 2035 | 6,434 | 27 | 486 | 5,921 |
| 2036 | 5,959 | 25 | 450 | 5,483 |
| 2037 | 5,518 | 23 | 417 | 5,078 |
| 2038 | 5,110 | 22 | 386 | 4,702 |
| 2039 | 4,732 | 20 | 358 | 4,355 |
| 2040 | 4,382 | 19 | 331 | 4,033 |
| 2041 | 4,059 | 17 | 307 | 3,735 |
| 2042 | 3,759 | 16 | 284 | 3,458 |
| 2043 | 3,481 | 15 | 263 | 3,203 |
| 2044 | 3,223 | 14 | 244 | 2,966 |
| 2045 | 2,985 | 13 | 226 | 2,747 |
| 2046 | 2,765 | 12 | 209 | 2,544 |
| 2047 | 2,560 | 11 | 194 | 2,356 |
| 2048 | 2,371 | 10 | 179 | 2,182 |

Footnotes:

- (1) Exhibit 1.16a Col (4)
- (2) Exhibit 1.16a Col (4) x Exhibit 4.2
- (3) Exhibit 1.16a Col (4) x Exhibit 4.2
- (4) Col (1) - Col (2) - Col (3)

| Exhibit 1.17d Projected Acreage of Permits Issued On Or Before June 30, 2013 Other Permits | | | | |
|---|--------------------------------|---------------------------------|--------------------------------|---------------------------------|
| Fiscal Year Ending 6/30 | Acreage of In Force Permits | Acreage of Forfeited Permits | Acreage of Released Permits | End of Year In Force Acreage |
| | (1) | (2) | (3) | (4) |
| 2013 | 47,398 | 0 | 0 | 47,398 |
| 2014 | 46,037 | 117 | 1,244 | 44,675 |
| 2015 | 44,689 | 115 | 1,233 | 43,342 |
| 2016 | 43,362 | 114 | 1,214 | 42,034 |
| 2017 | 42,061 | 112 | 1,188 | 40,760 |
| 2018 | 40,782 | 109 | 1,170 | 39,502 |
| 2019 | 39,537 | 106 | 1,139 | 38,292 |
| 2020 | 38,323 | 102 | 1,111 | 37,110 |
| 2021 | 37,143 | 99 | 1,081 | 35,963 |
| 2022 | 35,994 | 96 | 1,053 | 34,844 |
| 2023 | 34,871 | 93 | 1,030 | 33,748 |
| 2024 | 33,779 | 90 | 1,001 | 32,688 |
| 2025 | 32,710 | 87 | 982 | 31,640 |
| 2026 | 31,672 | 85 | 953 | 30,634 |
| 2027 | 30,654 | 82 | 936 | 29,636 |
| 2028 | 29,655 | 79 | 920 | 28,656 |
| 2029 | 28,689 | 77 | 890 | 27,723 |
| 2030 | 27,754 | 74 | 861 | 26,819 |
| 2031 | 26,850 | 72 | 833 | 25,945 |
| 2032 | 25,975 | 69 | 805 | 25,100 |
| 2033 | 25,129 | 67 | 779 | 24,282 |
| 2034 | 24,310 | 65 | 754 | 23,491 |
| 2035 | 23,518 | 63 | 729 | 22,726 |
| 2036 | 22,752 | 61 | 706 | 21,986 |
| 2037 | 22,011 | 59 | 683 | 21,270 |
| 2038 | 21,294 | 57 | 660 | 20,577 |
| 2039 | 20,600 | 55 | 639 | 19,906 |
| 2040 | 19,929 | 53 | 618 | 19,258 |
| 2041 | 19,280 | 51 | 598 | 18,631 |
| 2042 | 18,652 | 50 | 578 | 18,024 |
| 2043 | 18,044 | 48 | 560 | 17,437 |
| 2044 | 17,457 | 46 | 541 | 16,869 |
| 2045 | 16,888 | 45 | 524 | 16,319 |
| 2046 | 16,338 | 43 | 507 | 15,788 |
| 2047 | 15,806 | 42 | 490 | 15,274 |
| 2048 | 15,291 | 41 | 474 | 14,776 |

Footnotes:

- (1) Exhibit 1.16a Col (4)
- (2) Exhibit 1.16a Col (4) x Exhibit 4.3
- (3) Exhibit 1.16a Col (4) x Exhibit 4.3
- (4) Col (1) - Col (2) - Col (3)

Exhibit 2.1
Average Fofeiture Cost Trends

| Issue Year | Land | | Water | |
|----------------------------|-------------------|---------------|-------------------|---------------|
| | Avg Cost Per Acre | Yearly Change | Avg Cost Per Acre | Yearly Change |
| | (1) | (2) | (3) | (4) |
| 1977 | 118 | | 6 | |
| 1978 | 1,119 | 9.498 | 9 | 1.345 |
| 1979 | 1,626 | 1.452 | 149 | 17.137 |
| 1980 | 693 | 0.426 | 32 | 0.214 |
| 1981 | 1,886 | 2.723 | 43 | 1.354 |
| 1982 | 2,574 | 1.365 | 889 | 20.614 |
| 1983 | 5,016 | 1.949 | 5,277 | 5.936 |
| 1984 | 4,397 | 0.876 | 72 | 0.014 |
| 1985 | 1,894 | 0.431 | 11,065 | 153.828 |
| 1986 | 3,355 | 1.771 | 1,758 | 0.159 |
| 1987 | 5,990 | 1.786 | 2,272 | 1.292 |
| 1988 | 1,368 | 0.228 | 1,654 | 0.728 |
| 1989 | 4,641 | 3.392 | 3,301 | 1.996 |
| 1990 | 3,734 | 0.805 | 1,781 | 0.540 |
| 1991 | 3,111 | 0.833 | 1,652 | 0.927 |
| 1992 | 3,464 | 1.114 | 3,084 | 1.867 |
| 1993 | 2,346 | 0.677 | 2,548 | 0.826 |
| 1994 | 3,094 | 1.319 | 6,356 | 2.495 |
| 1995 | 3,573 | 1.155 | 9,704 | 1.527 |
| 1996 | 7,475 | 2.092 | 315 | 0.032 |
| 1997 | 3,185 | 0.426 | 412 | 1.309 |
| 1998 | 2,574 | 0.808 | 2,003 | 4.865 |
| 1999 | 2,478 | 0.962 | 9,614 | 4.799 |
| 2000 | 3,669 | 1.481 | 1,077 | 0.112 |
| 2001 | 3,948 | 1.076 | 1,767 | 1.640 |
| 2002 | 7,821 | 1.981 | 216 | 0.122 |
| 2003 | 6,694 | 0.856 | 6,087 | 28.181 |
| 2004 | 2,664 | 0.398 | 7,291 | 1.198 |
| 2005 | 748 | 0.281 | 6,360 | 0.872 |
| 2006 | 1,754 | 2.345 | 1,171 | 0.184 |
| 2007 | 1,813 | 1.033 | 37 | 0.032 |
| 2008 | 5,815 | 3.208 | 534 | 14.460 |
| 2009 | 614 | 0.106 | 970 | 1.818 |
| 2010 | 145 | 0.236 | 633 | 0.652 |
| 2011 | 0 | 0.000 | 381 | 0.602 |
| 2012 | 211 | 0.000 | 12 | 0.031 |
| 2013 | 20 | 0.095 | 17 | 1.457 |
| YEARS | TRENDS | AVERAGE | TRENDS | AVERAGE |
| 1982 - 2008 | 0.993 | 1.283 | 0.975 | 9.280 |
| 1992 - 2008 | 0.980 | 1.248 | 0.903 | 3.795 |
| 1999 - 2008 | 0.945 | 1.362 | 0.778 | 5.160 |
| 2004 - 2008 | 1.277 | 1.453 | 0.354 | 3.349 |
| CPI Inflation | AVERAGE | | | |
| 1982 - 2008 | 1.033 | | | |
| 2008 - 2012 | 1.021 | | | |
| Selected Avg Trend Factors | | | | |
| (5a) Historic | 1.040 | | 1.040 | |
| (5b) Prospective | 1.033 | | 1.033 | |

Footnotes:

- (1) Client Data of average forfeiture cost by year
- (2) Col (1) / Prior Year Col (1)
- (3) Client Data of average forfeiture cost by year
- (4) Col (3) / Prior Year Col (3)
- (5) Selection based on Trends and Averages

Exhibit 3.1
Number of Forfeited Permits and Acres for All Permits

| Site Type | Total Number of Forfeited Permits | Open Number of Forfeited Permits | Total Forfeited Permitted Acres | Open Forfeited Permitted Acres | Percent of Forfeited Permitted Acres are Water Only | Selected Percentage |
|---|-----------------------------------|----------------------------------|---------------------------------|--------------------------------|---|---------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Open Water - Open Land | 22 | 22 | 2,657 | 2,657 | | |
| Open Water - Closed Land | 31 | 31 | 3,552 | 3,552 | | |
| Open Water - Total | 53 | 53 | 6,208 | 6,208 | | |
| Closed Water - Open Land | 3 | 3 | 768 | 768 | | |
| Closed Water - Closed Land | 148 | 0 | 10,060 | 0 | | |
| Closed Water - Total | 151 | 3 | 10,828 | 768 | | |
| Closed Not Water But With Water Costs - Open Land | 20 | 20 | 1,755 | 1,755 | | |
| Closed Not Water But With Water Costs - Closed Land | 764 | 0 | 28,080 | 0 | | |
| Closed Not Water But With Water Costs - Total | 784 | 20 | 29,836 | 1,755 | | |
| Open Land - Land Only | 23 | 23 | 1,179 | 1,179 | | |
| Closed Land - Land Only | 923 | 0 | 14,254 | 0 | | |
| Land Only - Total | 946 | 23 | 15,433 | 1,179 | | |
| Total | 1,934 | 99 | 62,305 | 9,911 | 27.34% | |

Footnotes:

- (1) Exhibit 3.2, Exhibit 3.3, Exhibit 3.4 Col (1)
- (2) Exhibit 3.2, Exhibit 3.3, Exhibit 3.4 Col (2)
- (3) Exhibit 3.2, Exhibit 3.3, Exhibit 3.4 Col (3)
- (4) Exhibit 3.2, Exhibit 3.3, Exhibit 3.4 Col (4)
- (5) Col (3) ratio of water only acres and total acres
- (6) Selection

Exhibit 3.2

Number of Forfeited Permits and Acres for Surface Mines

| Site Type | Total Number of Forfeited Permits | Open Number of Forfeited Permits | Total Forfeited Permitted Acres | Open Forfeited Permitted Acres | Percent of Forfeited Permitted Acres are Water Only | Selected Percentage |
|---|-----------------------------------|----------------------------------|---------------------------------|--------------------------------|---|---------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Open Water - Open Land | 12 | 12 | 2,309 | 2,309 | | |
| Open Water - Closed Land | 26 | 26 | 3,466 | 3,466 | | |
| Open Water - Total | 38 | 38 | 5,775 | 5,775 | | |
| Closed Water - Open Land | 2 | 2 | 756 | 756 | | |
| Closed Water - Closed Land | 106 | 0 | 8,604 | 0 | | |
| Closed Water - Total | 108 | 2 | 9,360 | 756 | | |
| Closed Not Water But With Water Costs - Open Land | 8 | 8 | 1,280 | 1,280 | | |
| Closed Not Water But With Water Costs - Closed Land | 389 | 0 | 22,766 | 0 | | |
| Closed Not Water But With Water Costs - Total | 397 | 8 | 24,046 | 1,280 | | |
| Open Land - Land Only | 9 | 9 | 810 | 810 | | |
| Closed Land - Land Only | 637 | 0 | 11,041 | 0 | | |
| Land Only - Total | 646 | 9 | 11,851 | 810 | | |
| Total | 1,189 | 57 | 51,031 | 8,621 | 29.66% | 30.00% |

Footnotes:

- (1) Client data
- (2) Client data
- (3) Client data
- (4) Client data
- (5) Col (3) ratio of water only acres and total acres
- (6) Selection

Exhibit 3.3

Number of Forfeited Permits and Acres for Underground Mines

| Site Type | Total Number of Forfeited Permits | Open Number of Forfeited Permits | Total Forfeited Permitted Acres | Open Forfeited Permitted Acres | Percent of Forfeited Permitted Acres are Water Only | Selected Percentage |
|---|-----------------------------------|----------------------------------|---------------------------------|--------------------------------|---|---------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Open Water - Open Land | 5 | 5 | 63 | 63 | | |
| Open Water - Closed Land | 4 | 4 | 55 | 55 | | |
| Open Water - Total | 9 | 9 | 119 | 119 | | |
| Closed Water - Open Land | 1 | 1 | 12 | 12 | | |
| Closed Water - Closed Land | 24 | 0 | 324 | 0 | | |
| Closed Water - Total | 25 | 1 | 336 | 12 | | |
| Closed Not Water But With Water Costs - Open Land | 9 | 9 | 198 | 198 | | |
| Closed Not Water But With Water Costs - Closed Land | 291 | 0 | 3,147 | 0 | | |
| Closed Not Water But With Water Costs - Total | 300 | 9 | 3,344 | 198 | | |
| Open Land - Land Only | 8 | 8 | 115 | 115 | | |
| Closed Land - Land Only | 151 | 0 | 1,291 | 0 | | |
| Land Only - Total | 159 | 8 | 1,406 | 115 | | |
| Total | 493 | 27 | 5,205 | 443 | 8.73% | 10.00% |

Footnotes:

- (1) Client data
- (2) Client data
- (3) Client data
- (4) Client data
- (5) Col (3) ratio of water only acres and total acres
- (6) Selection

Exhibit 3.4

Number of Forfeited Permits and Acres for Other Mines

| Site Type | Total Number of Forfeited Permits | Open Number of Forfeited Permits | Total Forfeited Permitted Acres | Open Forfeited Permitted Acres | Percent of Forfeited Permitted Acres are Water Only | Selected Percentage |
|---|-----------------------------------|----------------------------------|---------------------------------|--------------------------------|---|---------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Open Water - Open Land | 5 | 5 | 285 | 285 | | |
| Open Water - Closed Land | 1 | 1 | 30 | 30 | | |
| Open Water - Total | 6 | 6 | 315 | 315 | | |
| Closed Water - Open Land | 0 | 0 | 0 | 0 | | |
| Closed Water - Closed Land | 18 | 0 | 1,132 | 0 | | |
| Closed Water - Total | 18 | 0 | 1,132 | 0 | | |
| Closed Not Water But With Water Costs - Open Land | 3 | 3 | 278 | 278 | | |
| Closed Not Water But With Water Costs - Closed Land | 84 | 0 | 2,167 | 0 | | |
| Closed Not Water But With Water Costs - Total | 87 | 3 | 2,445 | 278 | | |
| Open Land - Land Only | 6 | 6 | 254 | 254 | | |
| Closed Land - Land Only | 135 | 0 | 1,923 | 0 | | |
| Land Only - Total | 141 | 6 | 2,176 | 254 | | |
| Total | 252 | 15 | 6,069 | 846 | 23.84% | 25.00% |

Footnotes:

- (1) Client data
- (2) Client data
- (3) Client data
- (4) Client data
- (5) Col (3) ratio of water only acres and total acres
- (6) Selection

| Exhibit 3.5a | | | | |
|---|--------------------------|------------------------------|------------------------|------------------------|
| Number of In Force Permits by Type and Year of Issuance | | | | |
| Issue Year | Surface Permits In Force | Underground Permits In Force | Other Permits In Force | Total Permits In Force |
| | (1) | (2) | (3) | (4) |
| 1977 | 4 | 4 | 2 | 10 |
| 1978 | 5 | 7 | 4 | 16 |
| 1979 | 6 | 13 | 7 | 26 |
| 1980 | 14 | 15 | 18 | 47 |
| 1981 | 15 | 28 | 56 | 99 |
| 1982 | 10 | 23 | 29 | 62 |
| 1983 | 8 | 43 | 71 | 122 |
| 1984 | 6 | 14 | 16 | 36 |
| 1985 | 14 | 12 | 19 | 45 |
| 1986 | 14 | 7 | 17 | 38 |
| 1987 | 10 | 25 | 8 | 43 |
| 1988 | 20 | 17 | 12 | 49 |
| 1989 | 25 | 17 | 18 | 60 |
| 1990 | 8 | 11 | 8 | 27 |
| 1991 | 13 | 19 | 10 | 42 |
| 1992 | 16 | 13 | 11 | 40 |
| 1993 | 11 | 19 | 17 | 47 |
| 1994 | 16 | 28 | 14 | 58 |
| 1995 | 21 | 28 | 8 | 57 |
| 1996 | 25 | 27 | 8 | 60 |
| 1997 | 33 | 28 | 12 | 73 |
| 1998 | 11 | 25 | 7 | 43 |
| 1999 | 10 | 21 | 4 | 35 |
| 2000 | 14 | 26 | 7 | 47 |
| 2001 | 30 | 17 | 7 | 54 |
| 2002 | 14 | 25 | 7 | 46 |
| 2003 | 29 | 16 | 11 | 56 |
| 2004 | 26 | 18 | 5 | 49 |
| 2005 | 14 | 18 | 4 | 36 |
| 2006 | 30 | 17 | 12 | 59 |
| 2007 | 23 | 20 | 7 | 50 |
| 2008 | 24 | 22 | 10 | 56 |
| 2009 | 19 | 14 | 6 | 39 |
| 2010 | 17 | 23 | 10 | 50 |
| 2011 | 22 | 17 | 7 | 46 |
| 2012 | 35 | 19 | 16 | 70 |
| 2013 | 5 | 9 | 10 | 24 |
| Total | 617 | 705 | 495 | 1,817 |
| After 1995 | 381 | 362 | 150 | 893 |
| Before 1996 | 236 | 343 | 345 | 924 |

Footnotes:

- (1) Client data
- (2) Client data
- (3) Client data
- (4) Sum of Col (1) through Col (3)

| Exhibit 3.5b | | | | |
|--|---------------------------|-------------------------------|-------------------------|-------------------------|
| Number of In Force Acres by Type and Year of Issuance | | | | |
| Issue Year | Surface Acres In Force | Underground Acres In Force | Other Acres In Force | Total Acres In Force |
| | (1) | (2) | (3) | (4) |
| 1977 | 1,806 | 120 | 103 | 2,029 |
| 1978 | 2,588 | 190 | 116 | 2,893 |
| 1979 | 1,382 | 934 | 156 | 2,473 |
| 1980 | 2,866 | 483 | 1,095 | 4,443 |
| 1981 | 3,136 | 1,191 | 6,100 | 10,427 |
| 1982 | 3,462 | 915 | 2,182 | 6,560 |
| 1983 | 2,130 | 8,250 | 7,695 | 18,075 |
| 1984 | 2,122 | 1,915 | 1,989 | 6,026 |
| 1985 | 5,848 | 465 | 2,448 | 8,760 |
| 1986 | 5,018 | 148 | 1,613 | 6,778 |
| 1987 | 2,356 | 756 | 407 | 3,519 |
| 1988 | 7,194 | 459 | 711 | 8,364 |
| 1989 | 7,784 | 397 | 1,322 | 9,504 |
| 1990 | 3,032 | 430 | 516 | 3,978 |
| 1991 | 6,409 | 957 | 562 | 7,929 |
| 1992 | 7,187 | 323 | 980 | 8,490 |
| 1993 | 4,522 | 1,103 | 2,353 | 7,979 |
| 1994 | 8,005 | 1,079 | 1,922 | 11,005 |
| 1995 | 11,670 | 793 | 1,806 | 14,270 |
| 1996 | 16,073 | 672 | 1,225 | 17,970 |
| 1997 | 17,245 | 1,045 | 1,273 | 19,563 |
| 1998 | 5,680 | 846 | 1,290 | 7,816 |
| 1999 | 3,358 | 886 | 397 | 4,641 |
| 2000 | 7,367 | 872 | 877 | 9,115 |
| 2001 | 13,218 | 278 | 369 | 13,865 |
| 2002 | 5,276 | 996 | 824 | 7,095 |
| 2003 | 19,056 | 449 | 1,247 | 20,753 |
| 2004 | 13,115 | 843 | 388 | 14,345 |
| 2005 | 3,958 | 309 | 398 | 4,665 |
| 2006 | 10,079 | 540 | 326 | 10,946 |
| 2007 | 8,146 | 658 | 346 | 9,150 |
| 2008 | 10,767 | 454 | 590 | 11,812 |
| 2009 | 6,529 | 292 | 329 | 7,150 |
| 2010 | 5,083 | 590 | 1,019 | 6,693 |
| 2011 | 6,387 | 342 | 215 | 6,944 |
| 2012 | 11,993 | 462 | 1,111 | 13,566 |
| 2013 | 1,551 | 136 | 1,097 | 2,783 |
| Total | 253,399 | 31,577 | 47,398 | 332,374 |
| After 1995 | 164,883 | 10,667 | 13,322 | 188,872 |
| Before 1996 | 88,516 | 20,910 | 34,075 | 143,501 |

Footnotes:

- (1) Client data
- (2) Client data
- (3) Client data
- (4) Sum of Col (1) through Col (3)

| Exhibit 3.6a Number of Surface Permits by Year of Issuance | | | |
|--|--------------------------|---|------------------------|
| Issue Year | Number of Permits Issued | Number Still In Force as of June 30, 2013 | Percent Still In Force |
| | (1) | (2) | (3) |
| 1977 | 128 | 4 | 3% |
| 1978 | 126 | 5 | 4% |
| 1979 | 100 | 6 | 6% |
| 1980 | 121 | 14 | 12% |
| 1981 | 139 | 15 | 11% |
| 1982 | 160 | 10 | 6% |
| 1983 | 162 | 8 | 5% |
| 1984 | 109 | 6 | 6% |
| 1985 | 130 | 14 | 11% |
| 1986 | 133 | 14 | 11% |
| 1987 | 133 | 10 | 8% |
| 1988 | 125 | 20 | 16% |
| 1989 | 135 | 25 | 19% |
| 1990 | 57 | 8 | 14% |
| 1991 | 63 | 13 | 21% |
| 1992 | 65 | 16 | 25% |
| 1993 | 39 | 11 | 28% |
| 1994 | 44 | 16 | 36% |
| 1995 | 33 | 21 | 64% |
| 1996 | 42 | 25 | 60% |
| 1997 | 44 | 33 | 75% |
| 1998 | 21 | 11 | 52% |
| 1999 | 17 | 10 | 59% |
| 2000 | 18 | 14 | 78% |
| 2001 | 34 | 30 | 88% |
| 2002 | 19 | 14 | 74% |
| 2003 | 33 | 29 | 88% |
| 2004 | 26 | 26 | 100% |
| 2005 | 16 | 14 | 88% |
| 2006 | 30 | 30 | 100% |
| 2007 | 24 | 23 | 96% |
| 2008 | 24 | 24 | 100% |
| 2009 | 19 | 19 | 100% |
| 2010 | 17 | 17 | 100% |
| 2011 | 22 | 22 | 100% |
| 2012 | 35 | 35 | 100% |
| 2013 | 5 | 5 | 100% |
| Total | 2,448 | 617 | |
| After 1995 | 446 | 381 | |
| Before 1996 | 2,002 | 236 | |

Footnotes:

- (1) Client data
- (2) Client data
- (3) Col (2) / Col (1)

| Exhibit 3.6b Number of Surface Acres by Year of Issuance | | | |
|---|------------------------|---|------------------------|
| Issue Year | Number of Acres Issued | Number Still In Force as of June 30, 2013 | Percent Still In Force |
| | (1) | (2) | (3) |
| 1977 | 4,414 | 1,806 | 41% |
| 1978 | 4,542 | 2,588 | 57% |
| 1979 | 4,795 | 1,382 | 29% |
| 1980 | 8,446 | 2,866 | 34% |
| 1981 | 8,821 | 3,136 | 36% |
| 1982 | 9,545 | 3,462 | 36% |
| 1983 | 6,222 | 2,130 | 34% |
| 1984 | 6,237 | 2,122 | 34% |
| 1985 | 10,846 | 5,848 | 54% |
| 1986 | 13,593 | 5,018 | 37% |
| 1987 | 8,166 | 2,356 | 29% |
| 1988 | 14,744 | 7,194 | 49% |
| 1989 | 17,268 | 7,784 | 45% |
| 1990 | 8,254 | 3,032 | 37% |
| 1991 | 10,886 | 6,409 | 59% |
| 1992 | 11,604 | 7,187 | 62% |
| 1993 | 7,648 | 4,522 | 59% |
| 1994 | 11,422 | 8,005 | 70% |
| 1995 | 13,489 | 11,670 | 87% |
| 1996 | 17,668 | 16,073 | 91% |
| 1997 | 18,810 | 17,245 | 92% |
| 1998 | 6,887 | 5,680 | 82% |
| 1999 | 4,278 | 3,358 | 78% |
| 2000 | 7,565 | 7,367 | 97% |
| 2001 | 13,681 | 13,218 | 97% |
| 2002 | 5,906 | 5,276 | 89% |
| 2003 | 19,662 | 19,056 | 97% |
| 2004 | 13,115 | 13,115 | 100% |
| 2005 | 4,286 | 3,958 | 92% |
| 2006 | 10,079 | 10,079 | 100% |
| 2007 | 8,156 | 8,146 | 100% |
| 2008 | 10,767 | 10,767 | 100% |
| 2009 | 6,529 | 6,529 | 100% |
| 2010 | 5,083 | 5,083 | 100% |
| 2011 | 6,387 | 6,387 | 100% |
| 2012 | 11,993 | 11,993 | 100% |
| 2013 | 1,551 | 1,551 | 100% |
| Total | 353,347 | 253,399 | |
| After 1995 | 172,404 | 164,883 | |
| Before 1996 | 180,943 | 88,516 | |

Footnotes:

- (1) Client data
- (2) Client data
- (3) Col (2) / Col (1)

| Exhibit 3.7a Number of Underground Permits by Year of Issuance | | | |
|---|--------------------------|---|------------------------|
| Issue Year | Number of Permits Issued | Number Still In Force as of June 30, 2013 | Percent Still In Force |
| | (1) | (2) | (3) |
| 1977 | 83 | 4 | 5% |
| 1978 | 80 | 7 | 9% |
| 1979 | 76 | 13 | 17% |
| 1980 | 134 | 15 | 11% |
| 1981 | 148 | 28 | 19% |
| 1982 | 213 | 23 | 11% |
| 1983 | 273 | 43 | 16% |
| 1984 | 118 | 14 | 12% |
| 1985 | 87 | 12 | 14% |
| 1986 | 103 | 7 | 7% |
| 1987 | 159 | 25 | 16% |
| 1988 | 155 | 17 | 11% |
| 1989 | 90 | 17 | 19% |
| 1990 | 43 | 11 | 26% |
| 1991 | 52 | 19 | 37% |
| 1992 | 45 | 13 | 29% |
| 1993 | 45 | 19 | 42% |
| 1994 | 61 | 28 | 46% |
| 1995 | 46 | 28 | 61% |
| 1996 | 44 | 27 | 61% |
| 1997 | 42 | 28 | 67% |
| 1998 | 37 | 25 | 68% |
| 1999 | 24 | 21 | 88% |
| 2000 | 34 | 26 | 76% |
| 2001 | 20 | 17 | 85% |
| 2002 | 33 | 25 | 76% |
| 2003 | 22 | 16 | 73% |
| 2004 | 21 | 18 | 86% |
| 2005 | 21 | 18 | 86% |
| 2006 | 19 | 17 | 89% |
| 2007 | 21 | 20 | 95% |
| 2008 | 26 | 22 | 85% |
| 2009 | 16 | 14 | 88% |
| 2010 | 24 | 23 | 96% |
| 2011 | 17 | 17 | 100% |
| 2012 | 19 | 19 | 100% |
| 2013 | 9 | 9 | 100% |
| Total | 2,460 | 705 | |
| After 1995 | 449 | 362 | |
| Before 1996 | 2,011 | 343 | |

Footnotes:

- (1) Client data
- (2) Client data
- (3) Col (2) / Col (1)

| Exhibit 3.7b Number of Underground Acres by Year of Issuance | | | |
|---|------------------------|---|------------------------|
| Issue Year | Number of Acres Issued | Number Still In Force as of June 30, 2013 | Percent Still In Force |
| | (1) | (2) | (3) |
| 1977 | 455 | 120 | 26% |
| 1978 | 314 | 190 | 60% |
| 1979 | 1,237 | 934 | 76% |
| 1980 | 1,380 | 483 | 35% |
| 1981 | 1,997 | 1,191 | 60% |
| 1982 | 2,274 | 915 | 40% |
| 1983 | 10,147 | 8,250 | 81% |
| 1984 | 2,568 | 1,915 | 75% |
| 1985 | 1,025 | 465 | 45% |
| 1986 | 921 | 148 | 16% |
| 1987 | 1,676 | 756 | 45% |
| 1988 | 3,024 | 459 | 15% |
| 1989 | 1,201 | 397 | 33% |
| 1990 | 870 | 430 | 49% |
| 1991 | 1,375 | 957 | 70% |
| 1992 | 793 | 323 | 41% |
| 1993 | 1,579 | 1,103 | 70% |
| 1994 | 1,777 | 1,079 | 61% |
| 1995 | 1,148 | 793 | 69% |
| 1996 | 858 | 672 | 78% |
| 1997 | 1,241 | 1,045 | 84% |
| 1998 | 1,040 | 846 | 81% |
| 1999 | 920 | 886 | 96% |
| 2000 | 1,036 | 872 | 84% |
| 2001 | 311 | 278 | 89% |
| 2002 | 1,166 | 996 | 85% |
| 2003 | 514 | 449 | 87% |
| 2004 | 863 | 843 | 98% |
| 2005 | 374 | 309 | 83% |
| 2006 | 586 | 540 | 92% |
| 2007 | 691 | 658 | 95% |
| 2008 | 538 | 454 | 84% |
| 2009 | 335 | 292 | 87% |
| 2010 | 604 | 590 | 98% |
| 2011 | 342 | 342 | 100% |
| 2012 | 462 | 462 | 100% |
| 2013 | 136 | 136 | 100% |
| Total | 47,778 | 31,577 | |
| After 1995 | 12,016 | 10,667 | |
| Before 1996 | 35,761 | 20,910 | |

Footnotes:

- (1) Client data
- (2) Client data
- (3) Col (2) / Col (1)

| Exhibit 3.8a Number of Other Permits by Year of Issuance | | | |
|---|--------------------------|---|------------------------|
| Issue Year | Number of Permits Issued | Number Still In Force as of June 30, 2013 | Percent Still In Force |
| | (1) | (2) | (3) |
| 1977 | 19 | 2 | 11% |
| 1978 | 18 | 4 | 22% |
| 1979 | 20 | 7 | 35% |
| 1980 | 44 | 18 | 41% |
| 1981 | 115 | 56 | 49% |
| 1982 | 101 | 29 | 29% |
| 1983 | 216 | 71 | 33% |
| 1984 | 56 | 16 | 29% |
| 1985 | 59 | 19 | 32% |
| 1986 | 46 | 17 | 37% |
| 1987 | 62 | 8 | 13% |
| 1988 | 59 | 12 | 20% |
| 1989 | 30 | 18 | 60% |
| 1990 | 17 | 8 | 47% |
| 1991 | 17 | 10 | 59% |
| 1992 | 31 | 11 | 35% |
| 1993 | 44 | 17 | 39% |
| 1994 | 18 | 14 | 78% |
| 1995 | 13 | 8 | 62% |
| 1996 | 12 | 8 | 67% |
| 1997 | 17 | 12 | 71% |
| 1998 | 9 | 7 | 78% |
| 1999 | 7 | 4 | 57% |
| 2000 | 8 | 7 | 88% |
| 2001 | 7 | 7 | 100% |
| 2002 | 7 | 7 | 100% |
| 2003 | 13 | 11 | 85% |
| 2004 | 5 | 5 | 100% |
| 2005 | 4 | 4 | 100% |
| 2006 | 13 | 12 | 92% |
| 2007 | 8 | 7 | 88% |
| 2008 | 13 | 10 | 77% |
| 2009 | 6 | 6 | 100% |
| 2010 | 10 | 10 | 100% |
| 2011 | 7 | 7 | 100% |
| 2012 | 16 | 16 | 100% |
| 2013 | 10 | 10 | 100% |
| Total | 1,157 | 495 | |
| After 1995 | 172 | 150 | |
| Before 1996 | 985 | 345 | |

Footnotes:

- (1) Client data
- (2) Client data
- (3) Col (2) / Col (1)

| Exhibit 3.8b Number of Other Acres by Year of Issuance | | | |
|---|------------------------|---|------------------------|
| Issue Year | Number of Acres Issued | Number Still In Force as of June 30, 2013 | Percent Still In Force |
| | (1) | (2) | (3) |
| 1977 | 210 | 103 | 49% |
| 1978 | 184 | 116 | 63% |
| 1979 | 297 | 156 | 53% |
| 1980 | 1,388 | 1,095 | 79% |
| 1981 | 7,475 | 6,100 | 82% |
| 1982 | 2,743 | 2,182 | 80% |
| 1983 | 8,930 | 7,695 | 86% |
| 1984 | 3,117 | 1,989 | 64% |
| 1985 | 2,848 | 2,448 | 86% |
| 1986 | 1,784 | 1,613 | 90% |
| 1987 | 1,365 | 407 | 30% |
| 1988 | 1,220 | 711 | 58% |
| 1989 | 2,199 | 1,322 | 60% |
| 1990 | 923 | 516 | 56% |
| 1991 | 855 | 562 | 66% |
| 1992 | 1,847 | 980 | 53% |
| 1993 | 2,985 | 2,353 | 79% |
| 1994 | 2,196 | 1,922 | 88% |
| 1995 | 1,958 | 1,806 | 92% |
| 1996 | 1,433 | 1,225 | 85% |
| 1997 | 1,755 | 1,273 | 73% |
| 1998 | 1,314 | 1,290 | 98% |
| 1999 | 740 | 397 | 54% |
| 2000 | 877 | 877 | 100% |
| 2001 | 369 | 369 | 100% |
| 2002 | 824 | 824 | 100% |
| 2003 | 1,270 | 1,247 | 98% |
| 2004 | 388 | 388 | 100% |
| 2005 | 398 | 398 | 100% |
| 2006 | 329 | 326 | 99% |
| 2007 | 351 | 346 | 99% |
| 2008 | 597 | 590 | 99% |
| 2009 | 329 | 329 | 100% |
| 2010 | 1,019 | 1,019 | 100% |
| 2011 | 215 | 215 | 100% |
| 2012 | 1,111 | 1,111 | 100% |
| 2013 | 1,097 | 1,097 | 100% |
| Total | 58,939 | 47,398 | |
| After 1995 | 14,414 | 13,322 | |
| Before 1996 | 44,524 | 34,075 | |

Footnotes:

- (1) Client data
- (2) Client data
- (3) Col (2) / Col (1)

| Exhibit 4.1 | | |
|--|------------|---------|
| Valuation Rates of Forfeiture and Release for Surface Permits | | |
| Year Since Issuance | Forfeiture | Release |
| | (1) | (2) |
| 1 | 0.00% | 0.00% |
| 2 | 0.00% | 0.00% |
| 3 | 0.00% | 0.00% |
| 4 | 1.25% | 0.50% |
| 5 | 1.25% | 0.50% |
| 6 | 1.25% | 1.00% |
| 7 | 1.25% | 1.00% |
| 8 | 1.25% | 2.00% |
| 9 | 1.25% | 3.00% |
| 10 | 1.25% | 5.00% |
| 11 | 1.25% | 5.00% |
| 12 | 1.25% | 5.00% |
| 13 | 1.25% | 5.00% |
| 14 | 1.25% | 5.00% |
| 15 | 1.25% | 5.00% |
| 16 | 1.25% | 5.00% |
| 17 | 1.25% | 5.00% |
| 18 | 1.25% | 5.00% |
| 19 | 1.25% | 5.00% |
| 20+ | 1.25% | 7.00% |

Footnotes:

- (1) Appendix 1.1
- (2) Appendix 1.1

| Exhibit 4.2 | | |
|--|------------|---------|
| Valuation Rates of Forfeiture and Release for Underground Permits | | |
| Year Since Issuance | Forfeiture | Release |
| | (1) | (2) |
| 1 | 0.00% | 0.00% |
| 2 | 0.00% | 1.00% |
| 3 | 0.00% | 1.00% |
| 4 | 0.50% | 1.00% |
| 5 | 0.50% | 1.00% |
| 6 | 0.50% | 4.00% |
| 7 | 0.50% | 4.00% |
| 8 | 0.50% | 4.00% |
| 9 | 0.50% | 4.00% |
| 10 | 0.50% | 4.00% |
| 11 | 0.50% | 4.00% |
| 12 | 0.50% | 4.00% |
| 13 | 0.50% | 4.00% |
| 14 | 0.50% | 4.00% |
| 15 | 0.50% | 5.00% |
| 16 | 0.50% | 5.00% |
| 17 | 0.50% | 5.00% |
| 18 | 0.50% | 5.00% |
| 19 | 0.50% | 5.00% |
| 20+ | 0.50% | 7.00% |

Footnotes:

- (1) Appendix 1.2
- (2) Appendix 1.2

| Exhibit 4.3 | | |
|--|------------|---------|
| Valuation Rates of Forfeiture and Release for Other Permits | | |
| Year Since Issuance | Forfeiture | Release |
| | (1) | (2) |
| 1 | 0.00% | 0.00% |
| 2 | 0.00% | 0.00% |
| 3 | 0.00% | 1.25% |
| 4 | 0.40% | 1.25% |
| 5 | 0.40% | 1.25% |
| 6 | 0.40% | 1.25% |
| 7 | 0.40% | 1.25% |
| 8 | 0.40% | 1.25% |
| 9 | 0.40% | 1.25% |
| 10 | 0.40% | 1.50% |
| 11 | 0.40% | 1.50% |
| 12 | 0.40% | 1.50% |
| 13 | 0.40% | 1.50% |
| 14 | 0.40% | 1.50% |
| 15 | 0.40% | 3.00% |
| 16 | 0.40% | 3.00% |
| 17 | 0.40% | 3.00% |
| 18 | 0.40% | 3.00% |
| 19 | 0.40% | 3.00% |
| 20+ | 0.40% | 3.00% |

Footnotes:

- (1) Appendix 1.3
- (2) Appendix 1.3

Exhibit 4.4
Percent of Permitted Acres That Had Been Disturbed
Based on Forfeited Permits

| | Surface | Underground | Other |
|---|-----------|-------------|----------|
| (1) Forfeited Disturbed Acres | 35,545.80 | 3,750.62 | 4,519.02 |
| (2) Forfeited Permitted Acres | 51,031.15 | 5,204.82 | 6,068.55 |
| (3) Percent of Permitted Acres That Are Disturbed | 69.66% | 72.06% | 74.47% |
| (4) Forfeited Disturbed Acres for Permits with Water Issues | 10,485.99 | 391.32 | 1,199.06 |
| (5) Forfeited Permitted Acres for Permits with Water Issues | 15,134.51 | 454.50 | 1,447.03 |
| (6) Percent of Permitted Acres That Are Disturbed | 69.29% | 86.10% | 82.86% |
| (7) Forfeited Disturbed Acres for Permits with Closed Water | 6,694.57 | 303.89 | 929.91 |
| (8) Forfeited Permitted Acres for Permits with Closed Water | 9,359.50 | 335.89 | 1,132.45 |
| (9) Percent of Permitted Acres That Are Disturbed | 71.53% | 90.47% | 82.11% |

Footnotes:

- | | |
|-----|---|
| (1) | Client Data |
| (2) | Exhibit 3.2, Exhibit 3.3, Exhibit 3.4 Col (3) |
| (3) | Row (1) / Row (2) |
| (4) | Client Data |
| (5) | Exhibit 3.2, Exhibit 3.3, Exhibit 3.4 Col (3) |
| (6) | Row (4) / Row (5) |
| (7) | Client Data |
| (8) | Exhibit 3.2, Exhibit 3.3, Exhibit 3.4 Col (3) |
| (9) | Row (7) / Row (8) |

| Exhibit 4.5 Adjustment Factors for Permit Status | |
|--|------------------|
| Permit Status | Liability Factor |
| | (1) |
| Active | 1.00 |
| Inactive | 1.00 |
| Phased Release | 0.50 |

Footnotes:

(1) Judgmentally selected.

These factors are intended to reflect that the cost of Phase Release acreage is much less than the cost associated with land that has not had any reclamation activity.

| Exhibit 4.6 | | | |
|--|----------|-------------|----------|
| Valuation Costs Per Acre by Permit Type | | | |
| (in 2013 Dollars) | | | |
| | Surface | Underground | Other |
| (1) Land Capital | 2,700.00 | 12,400.00 | 7,300.00 |
| (2) Water Capital | 900.00 | 1,900.00 | 1,500.00 |
| (3) Water Abandonment | 230.00 | 575.00 | 475.00 |
| (4) Annual Water Treatment | 105.00 | 170.00 | 130.00 |

Footnotes:

- (1) Exhibit 1.1 Row (11)
- (2) Exhibit 1.2 Row (16)
- (3) Exhibit 1.3 Row (9)
- (4) Exhibit 1.5 Row (9)

| Exhibit 4.7 Adjustment Factors for Size of Permits | |
|--|--------|
| Bond Value | Factor |
| | (1) |
| Less than \$100,000 | 1.25 |
| Between \$100,000 and \$500,000 | 1.00 |
| Above \$500,000 | 0.25 |

Footnotes:

(1) Judgmentally selected.

These factors are intended to reflect the financial strength of the permit holder.

| Exhibit 4.8 Adjustment Factors for Permit Ownership | |
|---|--------|
| Ownership | Factor |
| | (1) |
| Private Corporation | 1.00 |
| Public Corporation | 1.00 |
| Multi Corporation | 1.00 |

Footnotes:

(1) Judgmentally selected.

These factors are intended to reflect the varying probability of forfeiture between different ownership structure.

Number of Permits

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | | |
|----------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | 156 | 168 | 180 | 192 | 204 | 216 | 228 |
| 1977 | 128 | 128 | 123 | 121 | 119 | 118 | 116 | 91 | 70 | 56 | 43 | 35 | 27 | 25 | 22 | 22 | 21 | 21 | 19 |
| 1978 | 126 | 123 | 122 | 119 | 115 | 115 | 97 | 74 | 62 | 54 | 43 | 41 | 39 | 32 | 30 | 27 | 20 | 17 | 15 |
| 1979 | 100 | 99 | 98 | 96 | 94 | 85 | 78 | 74 | 64 | 59 | 54 | 48 | 42 | 37 | 31 | 28 | 26 | 20 | 20 |
| 1980 | 121 | 121 | 120 | 120 | 107 | 102 | 95 | 90 | 85 | 80 | 76 | 70 | 64 | 57 | 51 | 47 | 44 | 40 | 38 |
| 1981 | 139 | 137 | 136 | 126 | 119 | 115 | 109 | 105 | 97 | 92 | 83 | 77 | 68 | 57 | 53 | 46 | 40 | 37 | 33 |
| 1982 | 160 | 160 | 153 | 144 | 128 | 123 | 113 | 104 | 98 | 89 | 72 | 63 | 52 | 41 | 40 | 38 | 32 | 26 | 23 |
| 1983 | 162 | 159 | 152 | 142 | 125 | 118 | 109 | 100 | 90 | 63 | 54 | 48 | 42 | 34 | 29 | 26 | 22 | 17 | 16 |
| 1984 | 109 | 106 | 100 | 93 | 92 | 87 | 85 | 77 | 71 | 61 | 52 | 42 | 38 | 29 | 27 | 24 | 20 | 20 | 18 |
| 1985 | 130 | 123 | 115 | 113 | 109 | 107 | 105 | 97 | 85 | 72 | 64 | 54 | 49 | 34 | 29 | 26 | 26 | 26 | 21 |
| 1986 | 132 | 130 | 126 | 120 | 116 | 111 | 97 | 88 | 76 | 66 | 59 | 54 | 48 | 44 | 38 | 31 | 27 | 24 | 23 |
| 1987 | 133 | 133 | 123 | 120 | 118 | 106 | 95 | 90 | 80 | 61 | 55 | 43 | 37 | 31 | 25 | 22 | 21 | 20 | 20 |
| 1988 | 124 | 122 | 115 | 110 | 104 | 99 | 89 | 82 | 72 | 64 | 54 | 49 | 43 | 35 | 34 | 33 | 32 | 30 | 30 |
| 1989 | 133 | 133 | 130 | 124 | 120 | 117 | 112 | 101 | 92 | 83 | 66 | 60 | 52 | 48 | 46 | 44 | 42 | 40 | 35 |
| 1990 | 57 | 56 | 50 | 47 | 42 | 42 | 41 | 36 | 30 | 22 | 19 | 17 | 16 | 16 | 15 | 14 | 11 | 11 | 11 |
| 1991 | 63 | 61 | 60 | 59 | 58 | 56 | 55 | 50 | 47 | 33 | 29 | 27 | 23 | 22 | 21 | 19 | 18 | 15 | 15 |
| 1992 | 65 | 63 | 63 | 57 | 56 | 55 | 54 | 49 | 42 | 36 | 32 | 30 | 27 | 26 | 20 | 20 | 17 | 17 | 17 |
| 1993 | 39 | 36 | 32 | 31 | 31 | 31 | 28 | 25 | 23 | 19 | 19 | 18 | 18 | 16 | 15 | 13 | 12 | 12 | 12 |
| 1994 | 44 | 44 | 44 | 43 | 39 | 37 | 32 | 32 | 30 | 26 | 23 | 22 | 21 | 19 | 19 | 17 | 17 | 16 | 16 |
| 1995 | 33 | 33 | 33 | 33 | 33 | 32 | 32 | 30 | 29 | 27 | 26 | 26 | 25 | 25 | 23 | 22 | 22 | 21 | 21 |
| 1996 | 42 | 41 | 40 | 39 | 38 | 38 | 38 | 38 | 36 | 36 | 34 | 34 | 31 | 28 | 27 | 27 | 26 | 25 | 25 |
| 1997 | 44 | 44 | 44 | 42 | 42 | 42 | 41 | 40 | 39 | 37 | 37 | 36 | 34 | 34 | 33 | 33 | 33 | 33 | 33 |
| 1998 | 21 | 21 | 20 | 19 | 18 | 17 | 16 | 16 | 15 | 15 | 15 | 14 | 12 | 11 | 11 | 11 | 11 | 11 | 11 |
| 1999 | 17 | 16 | 16 | 16 | 15 | 14 | 14 | 13 | 11 | 11 | 11 | 11 | 10 | 10 | 10 | | | | |
| 2000 | 18 | 18 | 18 | 17 | 17 | 16 | 15 | 15 | 14 | 14 | 14 | 14 | 14 | 14 | | | | | |
| 2001 | 34 | 34 | 34 | 33 | 33 | 33 | 33 | 31 | 31 | 31 | 31 | 30 | 30 | | | | | | |
| 2002 | 19 | 19 | 19 | 19 | 18 | 18 | 16 | 15 | 15 | 15 | 15 | 14 | | | | | | | |
| 2003 | 33 | 33 | 33 | 32 | 32 | 30 | 30 | 30 | 30 | 29 | 29 | | | | | | | | |
| 2004 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | | | | | | | | | |
| 2005 | 16 | 16 | 16 | 15 | 14 | 14 | 14 | 14 | 14 | | | | | | | | | | |
| 2006 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | | | | | | | | | | | |
| 2007 | 24 | 24 | 24 | 24 | 23 | 23 | 23 | | | | | | | | | | | | |
| 2008 | 24 | 24 | 24 | 24 | 24 | 24 | | | | | | | | | | | | | |
| 2009 | 19 | 19 | 19 | 19 | 19 | | | | | | | | | | | | | | |
| 2010 | 17 | 17 | 17 | 17 | | | | | | | | | | | | | | | |
| 2011 | 22 | 22 | 22 | | | | | | | | | | | | | | | | |
| 2012 | 35 | 35 | | | | | | | | | | | | | | | | | |
| 2013 | 5 | | | | | | | | | | | | | | | | | | |

Forfeiture and Release Rates
As of 6/30/13
Surface

Number of Permits

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | |
|----------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 240 | 252 | 264 | 276 | 288 | 300 | 312 | 324 | 336 | 348 | 360 | 372 | 384 | 396 | 408 | 420 | 432 | 444 |
| 1977 | 17 | 14 | 13 | 11 | 10 | 9 | 7 | 7 | 7 | 6 | 6 | 6 | 5 | 5 | 4 | 4 | 4 | 4 |
| 1978 | 14 | 12 | 11 | 10 | 10 | 8 | 7 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 1979 | 18 | 17 | 16 | 16 | 15 | 14 | 11 | 10 | 10 | 8 | 8 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 1980 | 35 | 30 | 25 | 23 | 22 | 22 | 22 | 21 | 20 | 15 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 1981 | 29 | 27 | 24 | 21 | 21 | 18 | 18 | 18 | 18 | 18 | 17 | 16 | 15 | 15 | | | | |
| 1982 | 19 | 17 | 16 | 14 | 13 | 13 | 13 | 12 | 11 | 11 | 10 | 10 | 10 | | | | | |
| 1983 | 15 | 15 | 13 | 13 | 13 | 12 | 12 | 12 | 9 | 8 | 8 | 8 | | | | | | |
| 1984 | 15 | 13 | 13 | 13 | 13 | 8 | 8 | 8 | 8 | 7 | 6 | | | | | | | |
| 1985 | 19 | 19 | 19 | 19 | 16 | 15 | 15 | 14 | 14 | 14 | | | | | | | | |
| 1986 | 23 | 21 | 20 | 18 | 16 | 15 | 14 | 14 | 14 | | | | | | | | | |
| 1987 | 19 | 18 | 17 | 15 | 12 | 11 | 11 | 11 | | | | | | | | | | |
| 1988 | 29 | 27 | 25 | 25 | 25 | 23 | 21 | | | | | | | | | | | |
| 1989 | 33 | 31 | 29 | 26 | 26 | 25 | | | | | | | | | | | | |
| 1990 | 11 | 9 | 8 | 8 | 8 | | | | | | | | | | | | | |
| 1991 | 14 | 13 | 13 | 13 | | | | | | | | | | | | | | |
| 1992 | 17 | 16 | 16 | | | | | | | | | | | | | | | |
| 1993 | 11 | 11 | | | | | | | | | | | | | | | | |
| 1994 | 16 | | | | | | | | | | | | | | | | | |
| 1995 | | | | | | | | | | | | | | | | | | |
| 1996 | | | | | | | | | | | | | | | | | | |
| 1997 | | | | | | | | | | | | | | | | | | |
| 1998 | | | | | | | | | | | | | | | | | | |
| 1999 | | | | | | | | | | | | | | | | | | |
| 2000 | | | | | | | | | | | | | | | | | | |
| 2001 | | | | | | | | | | | | | | | | | | |
| 2002 | | | | | | | | | | | | | | | | | | |
| 2003 | | | | | | | | | | | | | | | | | | |
| 2004 | | | | | | | | | | | | | | | | | | |
| 2005 | | | | | | | | | | | | | | | | | | |
| 2006 | | | | | | | | | | | | | | | | | | |
| 2007 | | | | | | | | | | | | | | | | | | |
| 2008 | | | | | | | | | | | | | | | | | | |
| 2009 | | | | | | | | | | | | | | | | | | |
| 2010 | | | | | | | | | | | | | | | | | | |
| 2011 | | | | | | | | | | | | | | | | | | |
| 2012 | | | | | | | | | | | | | | | | | | |
| 2013 | | | | | | | | | | | | | | | | | | |

Number of Releases

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | | |
|----------|--------------------|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | 156 | 168 | 180 | 192 | 204 | 216 | 228 |
| 1977 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 21 | 16 | 14 | 11 | 7 | 5 | 2 | 2 | 0 | 1 | 0 | 1 |
| 1978 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 17 | 10 | 7 | 11 | 2 | 1 | 4 | 2 | 2 | 5 | 3 | 2 |
| 1979 | 0 | 0 | 0 | 0 | 0 | 8 | 7 | 4 | 9 | 5 | 4 | 5 | 2 | 4 | 5 | 1 | 1 | 6 | 0 |
| 1980 | 0 | 0 | 0 | 0 | 10 | 4 | 7 | 5 | 5 | 4 | 4 | 3 | 5 | 6 | 4 | 3 | 3 | 3 | 2 |
| 1981 | 0 | 0 | 0 | 6 | 6 | 3 | 6 | 4 | 7 | 4 | 7 | 4 | 7 | 7 | 3 | 5 | 6 | 3 | 4 |
| 1982 | 0 | 0 | 5 | 8 | 14 | 4 | 7 | 8 | 6 | 6 | 11 | 8 | 6 | 8 | 0 | 1 | 6 | 6 | 2 |
| 1983 | 0 | 2 | 4 | 7 | 12 | 5 | 4 | 8 | 8 | 15 | 5 | 5 | 4 | 7 | 5 | 2 | 4 | 2 | 0 |
| 1984 | 0 | 0 | 5 | 2 | 0 | 4 | 2 | 5 | 4 | 9 | 9 | 9 | 4 | 6 | 2 | 2 | 4 | 0 | 2 |
| 1985 | 0 | 7 | 4 | 1 | 1 | 0 | 2 | 6 | 5 | 7 | 7 | 10 | 4 | 13 | 5 | 0 | 0 | 0 | 3 |
| 1986 | 1 | 2 | 3 | 3 | 2 | 1 | 4 | 4 | 6 | 9 | 6 | 4 | 5 | 4 | 4 | 7 | 4 | 3 | 1 |
| 1987 | 0 | 0 | 3 | 1 | 0 | 7 | 4 | 3 | 8 | 15 | 6 | 10 | 4 | 5 | 5 | 2 | 0 | 0 | 0 |
| 1988 | 1 | 1 | 2 | 1 | 1 | 1 | 4 | 5 | 9 | 5 | 9 | 5 | 3 | 8 | 1 | 0 | 1 | 2 | 0 |
| 1989 | 1 | 0 | 0 | 1 | 3 | 1 | 4 | 9 | 8 | 8 | 17 | 4 | 5 | 4 | 2 | 1 | 2 | 2 | 4 |
| 1990 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 5 | 6 | 7 | 2 | 2 | 1 | 0 | 1 | 0 | 1 | 2 | 0 |
| 1991 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 5 | 3 | 14 | 4 | 2 | 4 | 1 | 0 | 1 | 1 | 3 | 0 |
| 1992 | 0 | 1 | 0 | 5 | 1 | 1 | 0 | 3 | 5 | 5 | 4 | 2 | 3 | 1 | 6 | 0 | 0 | 0 | 0 |
| 1993 | 0 | 1 | 1 | 0 | 0 | 0 | 3 | 1 | 2 | 4 | 0 | 0 | 0 | 2 | 0 | 2 | 1 | 0 | 0 |
| 1994 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | 2 | 4 | 3 | 1 | 1 | 2 | 0 | 2 | 0 | 1 | 0 |
| 1995 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 1 | 2 | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 1 | 0 |
| 1996 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 1 | 2 | 1 | 0 | 1 | 1 | 0 |
| 1997 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 0 | 0 | 0 | 0 |
| 1998 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1999 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2001 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2003 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2006 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2007 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2008 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2009 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2011 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2012 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Forfeiture and Release Rates
As of 6/30/13
Surface

Appendix 1.1

Number of Releases

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | |
|----------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 240 | 252 | 264 | 276 | 288 | 300 | 312 | 324 | 336 | 348 | 360 | 372 | 384 | 396 | 408 | 420 | 432 | 444 |
| 1977 | 2 | 3 | 1 | 2 | 1 | 1 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 1978 | 1 | 2 | 1 | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1979 | 2 | 1 | 1 | 0 | 1 | 1 | 3 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1980 | 3 | 5 | 3 | 2 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1981 | 2 | 0 | 3 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | | | | |
| 1982 | 1 | 2 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | | | | | |
| 1983 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 3 | 1 | 0 | 0 | | | | | | |
| 1984 | 3 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 1 | | | | | | | |
| 1985 | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 0 | | | | | | | | |
| 1986 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | | | | | | | | | |
| 1987 | 1 | 1 | 0 | 2 | 3 | 0 | 0 | 0 | | | | | | | | | | |
| 1988 | 0 | 0 | 2 | 0 | 0 | 2 | 1 | | | | | | | | | | | |
| 1989 | 2 | 2 | 2 | 2 | 0 | 1 | | | | | | | | | | | | |
| 1990 | 0 | 2 | 1 | 0 | 0 | | | | | | | | | | | | | |
| 1991 | 1 | 1 | 0 | 0 | | | | | | | | | | | | | | |
| 1992 | 0 | 1 | 0 | | | | | | | | | | | | | | | |
| 1993 | 1 | 0 | | | | | | | | | | | | | | | | |
| 1994 | 0 | | | | | | | | | | | | | | | | | |
| 1995 | | | | | | | | | | | | | | | | | | |
| 1996 | | | | | | | | | | | | | | | | | | |
| 1997 | | | | | | | | | | | | | | | | | | |
| 1998 | | | | | | | | | | | | | | | | | | |
| 1999 | | | | | | | | | | | | | | | | | | |
| 2000 | | | | | | | | | | | | | | | | | | |
| 2001 | | | | | | | | | | | | | | | | | | |
| 2002 | | | | | | | | | | | | | | | | | | |
| 2003 | | | | | | | | | | | | | | | | | | |
| 2004 | | | | | | | | | | | | | | | | | | |
| 2005 | | | | | | | | | | | | | | | | | | |
| 2006 | | | | | | | | | | | | | | | | | | |
| 2007 | | | | | | | | | | | | | | | | | | |
| 2008 | | | | | | | | | | | | | | | | | | |
| 2009 | | | | | | | | | | | | | | | | | | |
| 2010 | | | | | | | | | | | | | | | | | | |
| 2011 | | | | | | | | | | | | | | | | | | |
| 2012 | | | | | | | | | | | | | | | | | | |
| 2013 | | | | | | | | | | | | | | | | | | |

Number of Forfeitures

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | | |
|----------|--------------------|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | 156 | 168 | 180 | 192 | 204 | 216 | 228 |
| 1977 | 0 | 0 | 5 | 2 | 2 | 1 | 1 | 4 | 5 | 0 | 2 | 1 | 3 | 0 | 1 | 0 | 0 | 0 | 1 |
| 1978 | 0 | 3 | 1 | 3 | 4 | 0 | 1 | 6 | 2 | 1 | 0 | 0 | 1 | 3 | 0 | 1 | 2 | 0 | 0 |
| 1979 | 0 | 1 | 1 | 2 | 2 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 4 | 1 | 1 | 2 | 1 | 0 | 0 |
| 1980 | 0 | 0 | 1 | 0 | 3 | 1 | 0 | 0 | 0 | 1 | 0 | 3 | 1 | 1 | 2 | 1 | 0 | 1 | 0 |
| 1981 | 0 | 2 | 1 | 4 | 1 | 1 | 0 | 0 | 1 | 1 | 2 | 2 | 2 | 4 | 1 | 2 | 0 | 0 | 0 |
| 1982 | 0 | 0 | 2 | 1 | 2 | 1 | 3 | 1 | 0 | 3 | 6 | 1 | 5 | 3 | 1 | 1 | 0 | 0 | 1 |
| 1983 | 0 | 1 | 3 | 3 | 5 | 2 | 5 | 1 | 2 | 12 | 4 | 1 | 2 | 1 | 0 | 1 | 0 | 3 | 1 |
| 1984 | 0 | 3 | 1 | 5 | 1 | 1 | 0 | 3 | 2 | 1 | 0 | 1 | 0 | 3 | 0 | 1 | 0 | 0 | 0 |
| 1985 | 0 | 0 | 4 | 1 | 3 | 2 | 0 | 2 | 7 | 6 | 1 | 0 | 1 | 2 | 0 | 3 | 0 | 0 | 2 |
| 1986 | 0 | 0 | 1 | 3 | 2 | 4 | 10 | 5 | 6 | 1 | 1 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 |
| 1987 | 0 | 0 | 7 | 2 | 2 | 5 | 7 | 2 | 2 | 4 | 0 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 0 |
| 1988 | 0 | 1 | 5 | 4 | 5 | 4 | 6 | 2 | 1 | 3 | 1 | 0 | 3 | 0 | 0 | 1 | 0 | 0 | 0 |
| 1989 | 1 | 0 | 3 | 5 | 1 | 2 | 1 | 2 | 1 | 1 | 0 | 2 | 3 | 0 | 0 | 1 | 0 | 0 | 1 |
| 1990 | 0 | 1 | 5 | 3 | 4 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 1991 | 0 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 1992 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| 1993 | 0 | 2 | 3 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 1994 | 0 | 0 | 0 | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1996 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1997 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1998 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1999 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2000 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2001 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2002 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2006 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2007 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2008 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2009 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2011 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2012 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Number of Forfeitures

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | |
|----------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 240 | 252 | 264 | 276 | 288 | 300 | 312 | 324 | 336 | 348 | 360 | 372 | 384 | 396 | 408 | 420 | 432 | 444 |
| 1977 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1978 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1979 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1980 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1981 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | | | | |
| 1982 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| 1983 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| 1984 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | | | | | | | |
| 1985 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | | | | | | | | |
| 1986 | 0 | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | | | | | | | | | |
| 1987 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | | | | | | | | | | |
| 1988 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | | | | | | | | | | | |
| 1989 | 0 | 0 | 0 | 1 | 0 | 0 | | | | | | | | | | | | |
| 1990 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | |
| 1991 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | |
| 1992 | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| 1993 | 0 | 0 | | | | | | | | | | | | | | | | |
| 1994 | 0 | | | | | | | | | | | | | | | | | |
| 1995 | | | | | | | | | | | | | | | | | | |
| 1996 | | | | | | | | | | | | | | | | | | |
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| 2005 | | | | | | | | | | | | | | | | | | |
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| 2008 | | | | | | | | | | | | | | | | | | |
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| 2010 | | | | | | | | | | | | | | | | | | |
| 2011 | | | | | | | | | | | | | | | | | | |
| 2012 | | | | | | | | | | | | | | | | | | |
| 2013 | | | | | | | | | | | | | | | | | | |

Number of Misc Terminations

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | | |
|----------|--------------------|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | 156 | 168 | 180 | 192 | 204 | 216 | 228 |
| 1977 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1978 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1979 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1980 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1981 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1982 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1983 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1984 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1985 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1986 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1987 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1988 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1996 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1997 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1998 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2001 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2006 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2007 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2008 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2009 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2011 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2012 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Number of Misc Terminations:

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | |
|----------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 240 | 252 | 264 | 276 | 288 | 300 | 312 | 324 | 336 | 348 | 360 | 372 | 384 | 396 | 408 | 420 | 432 | 444 |
| 1977 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1978 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1979 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1980 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1981 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1982 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1983 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1984 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1985 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1986 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1987 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1988 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1996 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1997 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1998 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2001 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2006 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2007 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2008 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2009 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2011 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2012 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Forfeiture and Release Rates
As of 6/30/13
Surface

Forfeiture Percentages

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | |
|----------------|--------------------|-------|-------|--------|-------|--------|-------|--------|-------|--------|-------|-------|--------|-------|-------|-------|-------|-------|
| | 240 | 252 | 264 | 276 | 288 | 300 | 312 | 324 | 336 | 348 | 360 | 372 | 384 | 396 | 408 | 420 | 432 | 444 |
| 1977 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 16.67% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1978 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 14.29% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1979 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1980 | 0.00% | 0.00% | 6.67% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 25.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1981 | 6.06% | 6.90% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 5.88% | 0.00% | 0.00% | | | | |
| 1982 | 8.70% | 0.00% | 0.00% | 6.25% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | |
| 1983 | 0.00% | 0.00% | 6.67% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | |
| 1984 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 23.08% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | | |
| 1985 | 4.76% | 0.00% | 0.00% | 0.00% | 5.26% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | | | |
| 1986 | 0.00% | 4.35% | 0.00% | 10.00% | 5.56% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | | | | |
| 1987 | 0.00% | 0.00% | 5.56% | 0.00% | 0.00% | 8.33% | 0.00% | 0.00% | | | | | | | | | | |
| 1988 | 3.33% | 6.90% | 0.00% | 0.00% | 0.00% | 0.00% | 4.35% | | | | | | | | | | | |
| 1989 | 0.00% | 0.00% | 0.00% | 3.45% | 0.00% | 0.00% | | | | | | | | | | | | |
| 1990 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | | | | | | | | |
| 1991 | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | | | | | | | | | |
| 1992 | 0.00% | 0.00% | 0.00% | | | | | | | | | | | | | | | |
| 1993 | 0.00% | 0.00% | | | | | | | | | | | | | | | | |
| 1994 | 0.00% | | | | | | | | | | | | | | | | | |
| 1995 | | | | | | | | | | | | | | | | | | |
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| 2013 | | | | | | | | | | | | | | | | | | |
| Weighted Avg | | | | | | | | | | | | | | | | | | |
| 5 Year | 0.00% | 0.00% | 0.00% | 1.09% | 1.09% | 1.05% | 1.39% | 0.00% | 0.00% | 0.00% | 0.00% | 1.75% | 0.00% | 0.00% | | | | |
| 10 Year | 1.00% | 1.57% | 1.10% | 2.31% | 1.16% | 2.26% | 0.66% | 0.76% | 0.00% | | | | | | | | | |
| 15 Year | 1.83% | 1.63% | 1.40% | 1.53% | | | | | | | | | | | | | | |
| All Year | 1.57% | 1.48% | 1.34% | 1.53% | 0.86% | 1.89% | 0.60% | 0.72% | 0.00% | 4.85% | 0.00% | 1.45% | 1.72% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Prior Selected | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% |
| Selected | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% |

Release Percentages

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | |
|----------------|--------------------|--------|--------|--------|--------|--------|--------|-------|--------|--------|--------|--------|-------|-------|--------|-------|-------|-------|
| | 240 | 252 | 264 | 276 | 288 | 300 | 312 | 324 | 336 | 348 | 360 | 372 | 384 | 396 | 408 | 420 | 432 | 444 |
| 1977 | 10.53% | 17.65% | 7.14% | 15.38% | 9.09% | 10.00% | 22.22% | 0.00% | 0.00% | 14.29% | 0.00% | 0.00% | 0.00% | 0.00% | 20.00% | 0.00% | 0.00% | 0.00% |
| 1978 | 6.67% | 14.29% | 8.33% | 9.09% | 0.00% | 20.00% | 12.50% | 0.00% | 0.00% | 0.00% | 0.00% | 16.67% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1979 | 10.00% | 5.56% | 5.88% | 0.00% | 6.25% | 6.67% | 21.43% | 9.09% | 0.00% | 20.00% | 0.00% | 12.50% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1980 | 7.89% | 14.29% | 10.00% | 8.00% | 4.35% | 0.00% | 0.00% | 4.55% | 4.76% | 0.00% | 6.67% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1981 | 6.06% | 0.00% | 11.11% | 12.50% | 0.00% | 14.29% | 0.00% | 0.00% | 0.00% | 0.00% | 5.56% | 0.00% | 6.25% | 0.00% | | | | |
| 1982 | 4.35% | 10.53% | 5.88% | 6.25% | 7.14% | 0.00% | 0.00% | 7.69% | 8.33% | 0.00% | 9.09% | 0.00% | 0.00% | | | | | |
| 1983 | 6.25% | 0.00% | 6.67% | 0.00% | 0.00% | 7.69% | 0.00% | 0.00% | 25.00% | 11.11% | 0.00% | | | | | | | |
| 1984 | 16.67% | 13.33% | 0.00% | 0.00% | 0.00% | 15.38% | 0.00% | 0.00% | 0.00% | 12.50% | 14.29% | | | | | | | |
| 1985 | 4.76% | 0.00% | 0.00% | 0.00% | 10.53% | 6.25% | 0.00% | 6.67% | 0.00% | 0.00% | | | | | | | | |
| 1986 | 0.00% | 4.35% | 4.76% | 0.00% | 5.56% | 6.25% | 6.67% | 0.00% | 0.00% | | | | | | | | | |
| 1987 | 5.00% | 5.26% | 0.00% | 11.76% | 20.00% | 0.00% | 0.00% | 0.00% | | | | | | | | | | |
| 1988 | 0.00% | 0.00% | 7.41% | 0.00% | 0.00% | 8.00% | 4.35% | | | | | | | | | | | |
| 1989 | 5.71% | 6.06% | 6.45% | 6.90% | 0.00% | 3.85% | | | | | | | | | | | | |
| 1990 | 0.00% | 18.18% | 11.11% | 0.00% | 0.00% | | | | | | | | | | | | | |
| 1991 | 6.67% | 7.14% | 0.00% | 0.00% | | | | | | | | | | | | | | |
| 1992 | 0.00% | 5.88% | 0.00% | | | | | | | | | | | | | | | |
| 1993 | 8.33% | 0.00% | | | | | | | | | | | | | | | | |
| 1994 | 0.00% | | | | | | | | | | | | | | | | | |
| 1995 | | | | | | | | | | | | | | | | | | |
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| 2012 | | | | | | | | | | | | | | | | | | |
| 2013 | | | | | | | | | | | | | | | | | | |
| Weighted Avg | | | | | | | | | | | | | | | | | | |
| 5 Year | 2.82% | 6.98% | 5.21% | 4.35% | 4.35% | 5.26% | 2.78% | 1.67% | 6.67% | 3.33% | 6.78% | 1.75% | 1.92% | 0.00% | | | | |
| 10 Year | 3.00% | 5.24% | 3.85% | 2.89% | 4.07% | 6.21% | 3.31% | 3.05% | 4.10% | | | | | | | | | |
| 15 Year | 4.88% | 5.86% | 5.61% | 4.96% | | | | | | | | | | | | | | |
| All Year | 5.50% | 6.80% | 5.69% | 4.96% | 4.31% | 7.08% | 4.76% | 2.90% | 4.10% | 4.85% | 5.06% | 2.90% | 1.72% | 0.00% | 3.23% | 0.00% | 0.00% | 0.00% |
| Prior Selected | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% |
| Selected | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% |

Forfeiture and Release Rates
As of 6/30/13
Underground

Appendix 1.2

Number of Permits

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | | |
|----------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | 156 | 168 | 180 | 192 | 204 | 216 | 228 |
| 1977 | 83 | 82 | 80 | 77 | 74 | 71 | 67 | 55 | 43 | 38 | 33 | 31 | 31 | 28 | 27 | 26 | 24 | 23 | 22 |
| 1978 | 80 | 78 | 74 | 67 | 65 | 64 | 50 | 38 | 31 | 29 | 29 | 27 | 26 | 26 | 26 | 25 | 24 | 22 | 20 |
| 1979 | 76 | 75 | 75 | 75 | 74 | 57 | 51 | 43 | 42 | 38 | 38 | 38 | 38 | 37 | 36 | 36 | 34 | 30 | 29 |
| 1980 | 134 | 134 | 132 | 132 | 115 | 103 | 98 | 96 | 89 | 85 | 85 | 84 | 83 | 83 | 80 | 73 | 67 | 63 | 52 |
| 1981 | 148 | 148 | 148 | 139 | 133 | 132 | 130 | 128 | 127 | 123 | 121 | 117 | 115 | 111 | 102 | 91 | 79 | 74 | 67 |
| 1982 | 213 | 213 | 208 | 190 | 176 | 160 | 147 | 140 | 139 | 134 | 123 | 114 | 107 | 85 | 77 | 68 | 61 | 54 | 49 |
| 1983 | 273 | 270 | 264 | 255 | 242 | 218 | 202 | 195 | 183 | 173 | 162 | 153 | 141 | 132 | 124 | 110 | 101 | 85 | 81 |
| 1984 | 117 | 114 | 106 | 98 | 83 | 77 | 71 | 68 | 65 | 62 | 52 | 50 | 45 | 40 | 37 | 34 | 31 | 28 | 26 |
| 1985 | 87 | 87 | 84 | 79 | 77 | 67 | 65 | 65 | 62 | 60 | 51 | 44 | 42 | 37 | 35 | 28 | 25 | 22 | 22 |
| 1986 | 103 | 99 | 97 | 96 | 92 | 92 | 88 | 85 | 78 | 68 | 62 | 57 | 47 | 42 | 33 | 27 | 26 | 22 | 21 |
| 1987 | 159 | 153 | 146 | 140 | 134 | 114 | 108 | 102 | 92 | 84 | 78 | 72 | 63 | 51 | 47 | 42 | 41 | 39 | 38 |
| 1988 | 154 | 151 | 143 | 134 | 126 | 114 | 99 | 87 | 77 | 69 | 60 | 51 | 41 | 36 | 29 | 27 | 24 | 24 | 22 |
| 1989 | 90 | 90 | 86 | 80 | 76 | 67 | 66 | 63 | 57 | 53 | 47 | 43 | 41 | 38 | 30 | 29 | 28 | 24 | 24 |
| 1990 | 43 | 40 | 37 | 36 | 34 | 34 | 30 | 26 | 26 | 24 | 22 | 21 | 19 | 19 | 16 | 16 | 16 | 16 | 16 |
| 1991 | 52 | 51 | 51 | 46 | 43 | 40 | 39 | 38 | 37 | 35 | 29 | 28 | 26 | 25 | 24 | 24 | 24 | 23 | 22 |
| 1992 | 45 | 45 | 41 | 40 | 40 | 36 | 34 | 33 | 33 | 30 | 28 | 27 | 24 | 22 | 20 | 19 | 18 | 17 | 16 |
| 1993 | 45 | 39 | 39 | 38 | 37 | 35 | 34 | 34 | 33 | 32 | 31 | 30 | 30 | 29 | 25 | 24 | 23 | 22 | 22 |
| 1994 | 61 | 59 | 58 | 58 | 55 | 51 | 49 | 48 | 46 | 46 | 43 | 40 | 40 | 38 | 34 | 34 | 31 | 31 | 30 |
| 1995 | 46 | 44 | 43 | 43 | 42 | 41 | 39 | 38 | 38 | 38 | 35 | 33 | 31 | 30 | 30 | 28 | 28 | 28 | 28 |
| 1996 | 44 | 44 | 43 | 41 | 39 | 38 | 36 | 36 | 36 | 36 | 35 | 32 | 30 | 30 | 29 | 27 | 27 | 27 | 27 |
| 1997 | 42 | 42 | 42 | 42 | 41 | 37 | 37 | 36 | 35 | 32 | 29 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 |
| 1998 | 37 | 37 | 37 | 35 | 35 | 32 | 30 | 30 | 30 | 30 | 29 | 27 | 26 | 26 | 26 | 25 | | | |
| 1999 | 24 | 24 | 24 | 24 | 24 | 23 | 23 | 23 | 22 | 22 | 22 | 22 | 22 | 21 | 21 | | | | |
| 2000 | 34 | 34 | 34 | 34 | 33 | 33 | 31 | 29 | 29 | 29 | 26 | 26 | 26 | 26 | | | | | |
| 2001 | 20 | 20 | 20 | 20 | 20 | 19 | 19 | 19 | 19 | 18 | 17 | 17 | 17 | | | | | | |
| 2002 | 33 | 33 | 33 | 32 | 32 | 30 | 30 | 29 | 29 | 28 | 25 | 25 | | | | | | | |
| 2003 | 22 | 22 | 21 | 21 | 20 | 18 | 18 | 17 | 17 | 17 | 16 | | | | | | | | |
| 2004 | 21 | 20 | 20 | 20 | 20 | 20 | 20 | 19 | 18 | 18 | | | | | | | | | |
| 2005 | 21 | 21 | 21 | 20 | 20 | 19 | 19 | 18 | 18 | | | | | | | | | | |
| 2006 | 19 | 19 | 19 | 19 | 19 | 17 | 17 | 17 | | | | | | | | | | | |
| 2007 | 21 | 21 | 21 | 21 | 21 | 20 | 20 | | | | | | | | | | | | |
| 2008 | 26 | 25 | 23 | 23 | 22 | 22 | | | | | | | | | | | | | |
| 2009 | 16 | 16 | 16 | 16 | 14 | | | | | | | | | | | | | | |
| 2010 | 24 | 24 | 24 | 23 | | | | | | | | | | | | | | | |
| 2011 | 17 | 17 | 17 | | | | | | | | | | | | | | | | |
| 2012 | 19 | 19 | | | | | | | | | | | | | | | | | |
| 2013 | 9 | | | | | | | | | | | | | | | | | | |

Forfeiture and Release Rates
As of 6/30/13
Underground

Number of Permits

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | |
|----------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 240 | 252 | 264 | 276 | 288 | 300 | 312 | 324 | 336 | 348 | 360 | 372 | 384 | 396 | 408 | 420 | 432 | 444 |
| 1977 | 17 | 15 | 14 | 11 | 9 | 9 | 8 | 7 | 7 | 7 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 4 |
| 1978 | 20 | 19 | 17 | 13 | 13 | 12 | 12 | 12 | 12 | 11 | 11 | 10 | 10 | 9 | 8 | 7 | 7 | |
| 1979 | 29 | 28 | 27 | 26 | 25 | 23 | 20 | 19 | 19 | 17 | 15 | 14 | 14 | 13 | 13 | 13 | | |
| 1980 | 51 | 44 | 39 | 31 | 29 | 28 | 20 | 17 | 17 | 17 | 17 | 16 | 16 | 16 | 15 | | | |
| 1981 | 58 | 54 | 47 | 43 | 40 | 39 | 37 | 34 | 32 | 30 | 29 | 29 | 28 | 28 | | | | |
| 1982 | 42 | 41 | 40 | 36 | 36 | 30 | 28 | 26 | 26 | 25 | 25 | 23 | 23 | | | | | |
| 1983 | 77 | 72 | 69 | 66 | 63 | 55 | 53 | 53 | 51 | 49 | 48 | 43 | | | | | | |
| 1984 | 24 | 24 | 24 | 22 | 19 | 18 | 17 | 15 | 15 | 15 | 14 | | | | | | | |
| 1985 | 21 | 20 | 17 | 17 | 13 | 13 | 13 | 13 | 13 | 12 | | | | | | | | |
| 1986 | 19 | 16 | 13 | 10 | 9 | 8 | 8 | 7 | 7 | | | | | | | | | |
| 1987 | 35 | 33 | 30 | 29 | 29 | 27 | 27 | 25 | | | | | | | | | | |
| 1988 | 21 | 20 | 19 | 17 | 17 | 17 | 17 | | | | | | | | | | | |
| 1989 | 22 | 22 | 21 | 20 | 18 | 17 | | | | | | | | | | | | |
| 1990 | 13 | 13 | 13 | 11 | 11 | | | | | | | | | | | | | |
| 1991 | 19 | 19 | 19 | 19 | | | | | | | | | | | | | | |
| 1992 | 16 | 14 | 13 | | | | | | | | | | | | | | | |
| 1993 | 21 | 19 | | | | | | | | | | | | | | | | |
| 1994 | 28 | | | | | | | | | | | | | | | | | |
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| 2012 | | | | | | | | | | | | | | | | | | |
| 2013 | | | | | | | | | | | | | | | | | | |

Forfeiture and Release Rates
As of 6/30/13
Underground

Number of Releases

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | | |
|----------|--------------------|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | 156 | 168 | 180 | 192 | 204 | 216 | 228 |
| 1977 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 8 | 6 | 5 | 5 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| 1978 | 0 | 1 | 0 | 0 | 0 | 0 | 12 | 8 | 4 | 2 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 2 | 2 |
| 1979 | 0 | 0 | 0 | 0 | 0 | 11 | 3 | 4 | 1 | 3 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 3 | 0 |
| 1980 | 0 | 0 | 0 | 0 | 10 | 6 | 4 | 1 | 7 | 4 | 0 | 1 | 1 | 0 | 2 | 7 | 4 | 4 | 9 |
| 1981 | 0 | 0 | 0 | 6 | 2 | 1 | 2 | 2 | 1 | 3 | 2 | 2 | 1 | 1 | 7 | 8 | 11 | 5 | 6 |
| 1982 | 0 | 0 | 3 | 16 | 14 | 13 | 13 | 5 | 1 | 3 | 9 | 6 | 4 | 14 | 6 | 9 | 6 | 7 | 4 |
| 1983 | 0 | 1 | 5 | 5 | 7 | 20 | 14 | 4 | 10 | 7 | 9 | 4 | 8 | 8 | 4 | 13 | 7 | 14 | 4 |
| 1984 | 0 | 0 | 7 | 5 | 10 | 1 | 1 | 2 | 1 | 1 | 4 | 1 | 5 | 4 | 3 | 3 | 3 | 1 | 1 |
| 1985 | 0 | 0 | 1 | 3 | 0 | 7 | 1 | 0 | 1 | 2 | 6 | 5 | 0 | 5 | 2 | 5 | 3 | 2 | 0 |
| 1986 | 0 | 3 | 2 | 1 | 2 | 0 | 2 | 0 | 5 | 7 | 4 | 5 | 9 | 5 | 7 | 3 | 1 | 3 | 1 |
| 1987 | 0 | 5 | 2 | 4 | 5 | 16 | 3 | 4 | 5 | 5 | 6 | 1 | 9 | 9 | 4 | 4 | 1 | 2 | 1 |
| 1988 | 1 | 3 | 4 | 7 | 5 | 9 | 6 | 7 | 9 | 6 | 6 | 5 | 8 | 3 | 4 | 2 | 1 | 0 | 1 |
| 1989 | 0 | 0 | 2 | 4 | 2 | 7 | 0 | 2 | 4 | 4 | 6 | 3 | 1 | 2 | 6 | 1 | 1 | 4 | 0 |
| 1990 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 3 | 0 | 2 | 2 | 1 | 2 | 0 | 3 | 0 | 0 | 0 | 0 |
| 1991 | 0 | 1 | 0 | 2 | 1 | 2 | 0 | 0 | 1 | 2 | 5 | 1 | 2 | 1 | 1 | 0 | 0 | 1 | 1 |
| 1992 | 0 | 0 | 3 | 1 | 0 | 2 | 2 | 1 | 0 | 3 | 1 | 0 | 3 | 2 | 2 | 1 | 1 | 1 | 1 |
| 1993 | 0 | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 4 | 1 | 1 | 1 | 0 |
| 1994 | 0 | 1 | 0 | 0 | 2 | 4 | 2 | 1 | 2 | 0 | 3 | 3 | 0 | 2 | 4 | 0 | 3 | 0 | 1 |
| 1995 | 0 | 2 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 3 | 2 | 2 | 0 | 0 | 2 | 0 | 0 | 0 |
| 1996 | 0 | 0 | 1 | 2 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 2 | 2 | 0 | 1 | 2 | 0 | 0 | 0 |
| 1997 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 1 | 1 | 3 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1998 | 0 | 0 | 0 | 2 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 1 | | | |
| 1999 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | | | | |
| 2000 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | | | | | |
| 2001 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | | | | | | |
| 2002 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 3 | 0 | | | | | | | |
| 2003 | 0 | 0 | 1 | 0 | 1 | 2 | 0 | 1 | 0 | 0 | 1 | | | | | | | | |
| 2004 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | | | | | | | | | |
| 2005 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | | | | | | | | | | |
| 2006 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | | | | | | | | | | | |
| 2007 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | | | | | | | | | | | | |
| 2008 | 0 | 1 | 2 | 0 | 1 | 0 | | | | | | | | | | | | | |
| 2009 | 0 | 0 | 0 | 0 | 2 | | | | | | | | | | | | | | |
| 2010 | 0 | 0 | 0 | 1 | | | | | | | | | | | | | | | |
| 2011 | 0 | 0 | 0 | | | | | | | | | | | | | | | | |
| 2012 | 0 | 0 | | | | | | | | | | | | | | | | | |
| 2013 | 0 | | | | | | | | | | | | | | | | | | |

Forfeiture and Release Rates
As of 6/30/13
Underground

Appendix 1.2

Number of Releases

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | |
|----------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 240 | 252 | 264 | 276 | 288 | 300 | 312 | 324 | 336 | 348 | 360 | 372 | 384 | 396 | 408 | 420 | 432 | 444 |
| 1977 | 4 | 2 | 1 | 3 | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 1978 | 0 | 1 | 0 | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | |
| 1979 | 0 | 1 | 1 | 1 | 1 | 2 | 3 | 1 | 0 | 2 | 1 | 1 | 0 | 1 | 0 | 0 | | |
| 1980 | 1 | 7 | 5 | 8 | 2 | 1 | 8 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | | | |
| 1981 | 8 | 3 | 6 | 4 | 3 | 1 | 2 | 3 | 2 | 2 | 1 | 0 | 1 | 0 | | | | |
| 1982 | 3 | 1 | 1 | 3 | 0 | 6 | 2 | 1 | 0 | 0 | 0 | 2 | 0 | | | | | |
| 1983 | 2 | 5 | 3 | 2 | 3 | 7 | 2 | 0 | 2 | 2 | 1 | 2 | | | | | | |
| 1984 | 2 | 0 | 0 | 1 | 3 | 1 | 1 | 1 | 0 | 0 | 1 | | | | | | | |
| 1985 | 1 | 1 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | | | | | | | | |
| 1986 | 2 | 2 | 3 | 3 | 1 | 1 | 0 | 1 | 0 | | | | | | | | | |
| 1987 | 2 | 2 | 2 | 1 | 0 | 2 | 0 | 2 | | | | | | | | | | |
| 1988 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | | | | | | | | | | | |
| 1989 | 2 | 0 | 1 | 1 | 2 | 1 | | | | | | | | | | | | |
| 1990 | 3 | 0 | 0 | | 0 | | | | | | | | | | | | | |
| 1991 | 2 | 0 | 0 | 0 | | | | | | | | | | | | | | |
| 1992 | 0 | 2 | 1 | | | | | | | | | | | | | | | |
| 1993 | 1 | 2 | | | | | | | | | | | | | | | | |
| 1994 | 2 | | | | | | | | | | | | | | | | | |
| 1995 | | | | | | | | | | | | | | | | | | |
| 1996 | | | | | | | | | | | | | | | | | | |
| 1997 | | | | | | | | | | | | | | | | | | |
| 1998 | | | | | | | | | | | | | | | | | | |
| 1999 | | | | | | | | | | | | | | | | | | |
| 2000 | | | | | | | | | | | | | | | | | | |
| 2001 | | | | | | | | | | | | | | | | | | |
| 2002 | | | | | | | | | | | | | | | | | | |
| 2003 | | | | | | | | | | | | | | | | | | |
| 2004 | | | | | | | | | | | | | | | | | | |
| 2005 | | | | | | | | | | | | | | | | | | |
| 2006 | | | | | | | | | | | | | | | | | | |
| 2007 | | | | | | | | | | | | | | | | | | |
| 2008 | | | | | | | | | | | | | | | | | | |
| 2009 | | | | | | | | | | | | | | | | | | |
| 2010 | | | | | | | | | | | | | | | | | | |
| 2011 | | | | | | | | | | | | | | | | | | |
| 2012 | | | | | | | | | | | | | | | | | | |
| 2013 | | | | | | | | | | | | | | | | | | |

Forfeiture and Release Rates
As of 6/30/13
Underground

Appendix 1.2

Number of Forfeitures

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | | |
|----------|--------------------|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | 156 | 168 | 180 | 192 | 204 | 216 | 228 |
| 1977 | 0 | 1 | 2 | 3 | 3 | 3 | 3 | 4 | 6 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 1 | 1 | 0 |
| 1978 | 0 | 1 | 4 | 7 | 2 | 1 | 2 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 1979 | 0 | 1 | 0 | 0 | 1 | 6 | 3 | 4 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| 1980 | 0 | 0 | 2 | 0 | 7 | 6 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 2 |
| 1981 | 0 | 0 | 0 | 3 | 4 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 1 | 3 | 2 | 3 | 1 | 0 | 1 |
| 1982 | 0 | 0 | 2 | 2 | 0 | 3 | 0 | 2 | 0 | 2 | 2 | 3 | 3 | 8 | 2 | 0 | 1 | 0 | 1 |
| 1983 | 0 | 2 | 1 | 4 | 6 | 4 | 2 | 3 | 2 | 3 | 2 | 5 | 4 | 1 | 4 | 1 | 2 | 2 | 0 |
| 1984 | 1 | 3 | 1 | 3 | 5 | 5 | 5 | 1 | 2 | 2 | 6 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 1 |
| 1985 | 0 | 0 | 2 | 2 | 2 | 3 | 1 | 0 | 2 | 0 | 3 | 2 | 2 | 0 | 0 | 2 | 0 | 1 | 0 |
| 1986 | 0 | 1 | 0 | 0 | 2 | 0 | 2 | 3 | 2 | 3 | 2 | 0 | 1 | 0 | 2 | 3 | 0 | 1 | 0 |
| 1987 | 0 | 1 | 5 | 2 | 1 | 4 | 3 | 2 | 5 | 3 | 0 | 5 | 0 | 3 | 0 | 1 | 0 | 0 | 0 |
| 1988 | 0 | 0 | 4 | 2 | 3 | 3 | 9 | 5 | 1 | 2 | 3 | 4 | 2 | 2 | 3 | 0 | 2 | 0 | 1 |
| 1989 | 0 | 0 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 |
| 1990 | 0 | 2 | 3 | 1 | 0 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1991 | 0 | 0 | 0 | 3 | 2 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1992 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1993 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1994 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1995 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1996 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1997 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1998 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2001 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2002 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2006 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2007 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2008 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2009 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2011 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2012 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Forfeiture and Release Rates
 As of 6/30/13
 Underground

Appendix 1.2

Number of Forfeitures

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | |
|----------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 240 | 252 | 264 | 276 | 288 | 300 | 312 | 324 | 336 | 348 | 360 | 372 | 384 | 396 | 408 | 420 | 432 | 444 |
| 1977 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1978 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1979 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1980 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 1981 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1982 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1983 | 2 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1984 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1985 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1986 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1987 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1988 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1991 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1996 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1997 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1998 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2001 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2006 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2007 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2008 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2009 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2011 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2012 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Number of Misc Terminations

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | | |
|----------|--------------------|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | 156 | 168 | 180 | 192 | 204 | 216 | 228 |
| 1977 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1978 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1979 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1980 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1981 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1982 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1983 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1984 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1985 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1986 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1987 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1988 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1993 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1996 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1997 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1998 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2001 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2006 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2007 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2008 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2009 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2011 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2012 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Number of Misc Terminations:

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | |
|----------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 240 | 252 | 264 | 276 | 288 | 300 | 312 | 324 | 336 | 348 | 360 | 372 | 384 | 396 | 408 | 420 | 432 | 444 |
| 1977 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1978 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1979 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1980 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1981 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1982 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1983 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1984 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1985 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1986 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1987 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1988 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1996 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1997 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1998 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2001 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2006 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2007 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2008 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2009 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2011 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2012 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Forfeiture and Release Rates
As of 6/30/13
Underground

Forfeiture Percentages

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | |
|----------------|--------------------|-------|--------|-------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | 240 | 252 | 264 | 276 | 288 | 300 | 312 | 324 | 336 | 348 | 360 | 372 | 384 | 396 | 408 | 420 | 432 | 444 |
| 1977 | 4.55% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 12.50% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1978 | 0.00% | 0.00% | 10.53% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 8.33% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1979 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 5.88% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1980 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 6.25% | 0.00% | 0.00% | 0.00% |
| 1981 | 1.49% | 1.72% | 1.85% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1982 | 6.12% | 0.00% | 0.00% | 2.50% | 0.00% | 0.00% | 0.00% | 3.57% | 0.00% | 3.85% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1983 | 2.47% | 0.00% | 0.00% | 1.45% | 0.00% | 1.59% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 6.25% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1984 | 0.00% | 0.00% | 0.00% | 4.17% | 0.00% | 0.00% | 0.00% | 5.88% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1985 | 0.00% | 0.00% | 15.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 7.69% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1986 | 0.00% | 5.26% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1987 | 2.63% | 0.00% | 3.03% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1988 | 0.00% | 0.00% | 0.00% | 5.26% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1989 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1990 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1991 | 4.55% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1992 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1993 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1994 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1995 | | | | | | | | | | | | | | | | | | |
| 1996 | | | | | | | | | | | | | | | | | | |
| 1997 | | | | | | | | | | | | | | | | | | |
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| 2006 | | | | | | | | | | | | | | | | | | |
| 2007 | | | | | | | | | | | | | | | | | | |
| 2008 | | | | | | | | | | | | | | | | | | |
| 2009 | | | | | | | | | | | | | | | | | | |
| 2010 | | | | | | | | | | | | | | | | | | |
| 2011 | | | | | | | | | | | | | | | | | | |
| 2012 | | | | | | | | | | | | | | | | | | |
| 2013 | | | | | | | | | | | | | | | | | | |
| Weighted Avg | | | | | | | | | | | | | | | | | | |
| 5 Year | 0.94% | 0.00% | 0.00% | 0.98% | 0.00% | 0.00% | 0.00% | 0.85% | 0.00% | 1.46% | 0.00% | 2.24% | 0.00% | 0.00% | | | | |
| 10 Year | 0.86% | 0.47% | 1.58% | 1.51% | 0.00% | 0.37% | 0.00% | 0.85% | 0.00% | | | | | | | | | |
| 15 Year | 1.57% | 0.43% | 1.59% | 0.98% | | | | | | | | | | | | | | |
| All Year | 1.55% | 0.40% | 1.54% | 0.98% | 0.00% | 0.31% | 0.00% | 1.23% | 0.00% | 1.56% | 0.58% | 1.99% | 0.00% | 0.00% | 2.33% | 0.00% | 0.00% | 0.00% |
| Prior Selected | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% |
| Selected | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% | 0.50% |

Forfeiture and Release Rates
As of 6/30/13
Underground

Release Percentages

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | | |
|----------------|--------------------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|-------|--------|--------|--------|--------|--------|--------|--------|
| | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | 156 | 168 | 180 | 192 | 204 | 216 | 228 |
| 1977 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 1.41% | 11.94% | 10.91% | 11.63% | 13.16% | 6.06% | 0.00% | 3.23% | 0.00% | 0.00% | 3.85% | 0.00% | 4.35% |
| 1978 | 0.00% | 1.25% | 0.00% | 0.00% | 0.00% | 0.00% | 18.75% | 16.00% | 10.53% | 6.45% | 0.00% | 6.90% | 3.70% | 0.00% | 0.00% | 3.85% | 0.00% | 8.33% | 9.09% |
| 1979 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 14.86% | 5.26% | 7.84% | 2.33% | 7.14% | 0.00% | 0.00% | 0.00% | 0.00% | 2.70% | 0.00% | 5.56% | 8.82% | 0.00% |
| 1980 | 0.00% | 0.00% | 0.00% | 0.00% | 7.58% | 5.22% | 3.88% | 1.02% | 7.29% | 4.49% | 0.00% | 1.18% | 1.19% | 0.00% | 2.41% | 8.75% | 5.48% | 5.97% | 14.29% |
| 1981 | 0.00% | 0.00% | 0.00% | 4.05% | 1.44% | 0.75% | 1.52% | 1.54% | 0.78% | 2.36% | 1.63% | 1.65% | 0.85% | 0.87% | 6.31% | 7.84% | 12.09% | 6.33% | 8.11% |
| 1982 | 0.00% | 0.00% | 1.41% | 7.69% | 7.37% | 7.39% | 8.13% | 3.40% | 0.71% | 2.16% | 6.72% | 4.88% | 3.51% | 13.08% | 7.06% | 11.69% | 8.82% | 11.48% | 7.41% |
| 1983 | 0.00% | 0.37% | 1.85% | 1.89% | 2.75% | 8.26% | 6.42% | 1.98% | 5.13% | 3.83% | 5.20% | 2.47% | 5.23% | 5.67% | 3.03% | 10.48% | 6.36% | 13.86% | 4.71% |
| 1984 | 0.00% | 0.00% | 6.14% | 4.72% | 10.20% | 1.20% | 1.30% | 2.82% | 1.47% | 1.54% | 6.45% | 1.92% | 10.00% | 8.89% | 7.50% | 8.11% | 8.82% | 3.23% | 3.57% |
| 1985 | 0.00% | 0.00% | 1.15% | 3.57% | 0.00% | 9.09% | 1.49% | 0.00% | 1.54% | 3.23% | 10.00% | 9.80% | 0.00% | 11.90% | 5.41% | 14.29% | 10.71% | 8.00% | 0.00% |
| 1986 | 0.00% | 2.91% | 2.02% | 1.03% | 2.08% | 0.00% | 2.17% | 0.00% | 5.88% | 8.97% | 5.88% | 8.06% | 15.79% | 10.64% | 16.67% | 9.09% | 3.70% | 11.54% | 4.55% |
| 1987 | 0.00% | 3.14% | 1.31% | 2.74% | 3.57% | 11.94% | 2.63% | 3.70% | 4.90% | 5.43% | 7.14% | 1.28% | 12.50% | 14.29% | 7.84% | 8.51% | 2.38% | 4.88% | 2.56% |
| 1988 | 0.65% | 1.95% | 2.65% | 4.90% | 3.73% | 7.14% | 5.26% | 7.07% | 10.34% | 7.79% | 8.70% | 8.33% | 15.69% | 7.32% | 11.11% | 6.90% | 3.70% | 0.00% | 4.17% |
| 1989 | 0.00% | 0.00% | 2.22% | 4.65% | 2.50% | 9.21% | 0.00% | 3.03% | 6.35% | 7.02% | 11.32% | 6.38% | 2.33% | 4.88% | 15.79% | 3.33% | 3.45% | 14.29% | 0.00% |
| 1990 | 0.00% | 2.33% | 0.00% | 0.00% | 5.56% | 0.00% | 0.00% | 10.00% | 0.00% | 7.69% | 8.33% | 4.55% | 9.52% | 0.00% | 15.79% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1991 | 0.00% | 1.92% | 0.00% | 3.92% | 2.17% | 4.65% | 0.00% | 0.00% | 2.63% | 5.41% | 14.29% | 3.45% | 7.14% | 3.85% | 4.00% | 0.00% | 0.00% | 4.17% | 4.35% |
| 1992 | 0.00% | 0.00% | 6.67% | 2.44% | 0.00% | 5.00% | 5.56% | 2.94% | 0.00% | 9.09% | 3.33% | 0.00% | 11.11% | 8.33% | 9.09% | 5.00% | 5.26% | 5.56% | 5.88% |
| 1993 | 0.00% | 2.22% | 0.00% | 0.00% | 0.00% | 5.41% | 2.86% | 0.00% | 0.00% | 3.03% | 3.13% | 3.23% | 0.00% | 3.33% | 13.79% | 4.00% | 4.17% | 4.35% | 0.00% |
| 1994 | 0.00% | 1.64% | 0.00% | 0.00% | 3.45% | 7.27% | 3.92% | 2.04% | 4.17% | 0.00% | 6.52% | 6.98% | 0.00% | 5.00% | 10.53% | 0.00% | 8.82% | 0.00% | 3.23% |
| 1995 | 0.00% | 4.35% | 2.27% | 0.00% | 0.00% | 2.38% | 2.44% | 2.56% | 0.00% | 0.00% | 7.89% | 5.71% | 6.06% | 0.00% | 0.00% | 6.67% | 0.00% | 0.00% | 0.00% |
| 1996 | 0.00% | 0.00% | 2.27% | 4.65% | 0.00% | 2.56% | 5.26% | 0.00% | 0.00% | 0.00% | 2.78% | 5.71% | 6.25% | 0.00% | 3.33% | 6.90% | 0.00% | 0.00% | |
| 1997 | 0.00% | 0.00% | 0.00% | 0.00% | 2.38% | 7.32% | 0.00% | 2.70% | 2.78% | 8.57% | 9.38% | 3.45% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | |
| 1998 | 0.00% | 0.00% | 0.00% | 5.41% | 0.00% | 2.86% | 6.25% | 0.00% | 0.00% | 0.00% | 0.00% | 3.70% | 0.00% | 0.00% | 0.00% | 3.85% | | | |
| 1999 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 4.17% | 0.00% | 0.00% | 4.35% | 0.00% | 0.00% | 0.00% | 0.00% | 4.55% | 0.00% | | | | |
| 2000 | 0.00% | 0.00% | 0.00% | 0.00% | 2.94% | 0.00% | 6.06% | 6.45% | 0.00% | 0.00% | 6.90% | 0.00% | 0.00% | 0.00% | | | | | |
| 2001 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 5.00% | 0.00% | 0.00% | 0.00% | 5.26% | 5.56% | 0.00% | 0.00% | | | | | | |
| 2002 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 6.25% | 0.00% | 3.33% | 0.00% | 3.45% | 10.71% | 0.00% | | | | | | | |
| 2003 | 0.00% | 0.00% | 4.55% | 0.00% | 4.76% | 10.00% | 0.00% | 5.56% | 0.00% | 0.00% | 5.88% | | | | | | | | |
| 2004 | 0.00% | 4.76% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 5.00% | 5.26% | 0.00% | | | | | | | | | |
| 2005 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 5.00% | 0.00% | 5.26% | 0.00% | | | | | | | | | | |
| 2006 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 10.53% | 0.00% | 0.00% | | | | | | | | | | | |
| 2007 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 4.76% | 0.00% | | | | | | | | | | | | |
| 2008 | 0.00% | 3.85% | 8.00% | 0.00% | 4.35% | 0.00% | | | | | | | | | | | | | |
| 2009 | 0.00% | 0.00% | 0.00% | 0.00% | 12.50% | | | | | | | | | | | | | | |
| 2010 | 0.00% | 0.00% | 0.00% | 4.17% | | | | | | | | | | | | | | | |
| 2011 | 0.00% | 0.00% | 0.00% | | | | | | | | | | | | | | | | |
| 2012 | 0.00% | 0.00% | | | | | | | | | | | | | | | | | |
| 2013 | 0.00% | | | | | | | | | | | | | | | | | | |
| Weighted Avg | | | | | | | | | | | | | | | | | | | |
| 5 Year | 0.00% | 0.98% | 1.94% | 0.97% | 3.03% | 3.92% | 0.00% | 3.85% | 0.98% | 1.79% | 6.14% | 1.68% | 0.83% | 0.76% | 0.74% | 3.40% | 2.84% | 1.57% | 2.48% |
| 10 Year | 0.00% | 0.97% | 1.38% | 0.46% | 2.21% | 4.33% | 1.73% | 2.87% | 1.17% | 1.83% | 5.74% | 3.77% | 2.84% | 2.47% | 5.60% | 3.05% | 2.73% | 3.46% | 2.44% |
| 15 Year | 0.00% | 0.56% | 0.80% | 1.26% | 1.46% | 4.51% | 2.31% | 2.29% | 1.34% | 2.90% | 6.81% | 4.39% | 6.04% | 5.26% | 8.05% | 5.64% | 4.43% | 7.14% | 4.13% |
| All Year | 0.04% | 0.86% | 1.42% | 2.55% | 3.10% | 5.67% | 3.94% | 3.43% | 3.72% | 4.24% | 5.79% | 3.81% | 4.87% | 5.26% | 6.02% | 6.89% | 5.64% | 6.83% | 5.10% |
| Prior Selected | 0.00% | 1.00% | 1.00% | 1.00% | 1.00% | 4.00% | 4.00% | 3.00% | 2.00% | 2.00% | 4.00% | 4.00% | 4.00% | 4.00% | 9.00% | 5.00% | 5.00% | 5.00% | 5.00% |
| Selected | 0.00% | 1.00% | 1.00% | 1.00% | 1.00% | 4.00% | 4.00% | 4.00% | 4.00% | 4.00% | 4.00% | 4.00% | 4.00% | 4.00% | 5.00% | 5.00% | 5.00% | 5.00% | 5.00% |

Forfeiture and Release Rates
As of 6/30/13
Underground

Release Percentages

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | |
|----------------|--------------------|--------|--------|--------|--------|--------|--------|--------|-------|--------|--------|--------|-------|--------|--------|--------|-------|-------|
| | 240 | 252 | 264 | 276 | 288 | 300 | 312 | 324 | 336 | 348 | 360 | 372 | 384 | 396 | 408 | 420 | 432 | 444 |
| 1977 | 18.18% | 11.76% | 6.67% | 21.43% | 18.18% | 0.00% | 11.11% | 0.00% | 0.00% | 0.00% | 14.29% | 16.67% | 0.00% | 0.00% | 20.00% | 0.00% | 0.00% | 0.00% |
| 1978 | 0.00% | 5.00% | 0.00% | 23.53% | 0.00% | 7.69% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 9.09% | 0.00% | 10.00% | 11.11% | 12.50% | 0.00% | |
| 1979 | 0.00% | 3.45% | 3.57% | 3.70% | 3.85% | 8.00% | 13.04% | 5.00% | 0.00% | 10.53% | 5.88% | 6.67% | 0.00% | 7.14% | 0.00% | 0.00% | | |
| 1980 | 1.92% | 13.73% | 11.36% | 20.51% | 6.45% | 3.45% | 28.57% | 15.00% | 0.00% | 0.00% | 0.00% | 5.88% | 0.00% | 0.00% | 0.00% | | | |
| 1981 | 11.94% | 5.17% | 11.11% | 8.51% | 6.98% | 2.50% | 5.13% | 8.11% | 5.88% | 6.25% | 3.33% | 0.00% | 3.45% | 0.00% | | | | |
| 1982 | 6.12% | 2.38% | 2.44% | 7.50% | 0.00% | 16.67% | 6.67% | 3.57% | 0.00% | 0.00% | 0.00% | 8.00% | 0.00% | | | | | |
| 1983 | 2.47% | 6.49% | 4.17% | 2.90% | 4.55% | 11.11% | 3.64% | 0.00% | 3.77% | 3.92% | 2.04% | 4.17% | | | | | | |
| 1984 | 7.69% | 0.00% | 0.00% | 4.17% | 13.64% | 5.26% | 5.56% | 5.88% | 0.00% | 0.00% | 6.67% | | | | | | | |
| 1985 | 4.55% | 4.76% | 0.00% | 0.00% | 23.53% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | | | |
| 1986 | 9.52% | 10.53% | 18.75% | 23.08% | 10.00% | 11.11% | 0.00% | 12.50% | 0.00% | | | | | | | | | |
| 1987 | 5.26% | 5.71% | 6.06% | 3.33% | 0.00% | 6.90% | 0.00% | 7.41% | | | | | | | | | | |
| 1988 | 4.55% | 4.76% | 5.00% | 5.26% | 0.00% | 0.00% | 0.00% | | | | | | | | | | | |
| 1989 | 8.33% | 0.00% | 4.55% | 4.76% | 10.00% | 5.56% | | | | | | | | | | | | |
| 1990 | 18.75% | 0.00% | 0.00% | 15.38% | 0.00% | | | | | | | | | | | | | |
| 1991 | 9.09% | 0.00% | 0.00% | 0.00% | | | | | | | | | | | | | | |
| 1992 | 0.00% | 12.50% | 7.14% | | | | | | | | | | | | | | | |
| 1993 | 4.55% | 9.52% | | | | | | | | | | | | | | | | |
| 1994 | 6.67% | | | | | | | | | | | | | | | | | |
| 1995 | | | | | | | | | | | | | | | | | | |
| 1996 | | | | | | | | | | | | | | | | | | |
| 1997 | | | | | | | | | | | | | | | | | | |
| 1998 | | | | | | | | | | | | | | | | | | |
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| 2002 | | | | | | | | | | | | | | | | | | |
| 2003 | | | | | | | | | | | | | | | | | | |
| 2004 | | | | | | | | | | | | | | | | | | |
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| 2012 | | | | | | | | | | | | | | | | | | |
| 2013 | | | | | | | | | | | | | | | | | | |
| Weighted Avg | | | | | | | | | | | | | | | | | | |
| 5 Year | 7.55% | 4.40% | 3.41% | 4.90% | 3.45% | 4.65% | 1.20% | 3.39% | 1.75% | 2.92% | 2.21% | 4.48% | 1.09% | 2.74% | | | | |
| 10 Year | 6.87% | 4.74% | 4.35% | 5.28% | 5.90% | 7.33% | 6.98% | 5.11% | 1.97% | | | | | | | | | |
| 15 Year | 6.30% | 5.77% | 5.47% | 8.31% | | | | | | | | | | | | | | |
| All Year | 6.22% | 5.94% | 5.51% | 8.31% | 5.97% | 7.19% | 6.81% | 4.94% | 1.97% | 3.13% | 2.92% | 5.30% | 1.03% | 2.74% | 4.65% | 4.00% | 0.00% | 0.00% |
| Prior Selected | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% |
| Selected | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% | 7.00% |

Number of Permits

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | | |
|----------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | 156 | 168 | 180 | 192 | 204 | 216 | 228 |
| 1977 | 19 | 19 | 19 | 18 | 17 | 17 | 17 | 13 | 9 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 7 |
| 1978 | 18 | 18 | 18 | 17 | 17 | 17 | 15 | 14 | 13 | 13 | 13 | 12 | 12 | 12 | 12 | 12 | 11 | 10 | 7 |
| 1979 | 20 | 20 | 20 | 20 | 20 | 19 | 15 | 14 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 11 | 11 |
| 1980 | 44 | 44 | 44 | 44 | 41 | 37 | 36 | 33 | 33 | 33 | 32 | 32 | 31 | 31 | 31 | 30 | 30 | 29 | 29 |
| 1981 | 115 | 115 | 115 | 114 | 112 | 112 | 111 | 110 | 109 | 106 | 106 | 102 | 100 | 97 | 95 | 87 | 84 | 84 | 82 |
| 1982 | 101 | 101 | 98 | 97 | 94 | 89 | 84 | 80 | 79 | 75 | 73 | 67 | 63 | 60 | 58 | 55 | 54 | 54 | 49 |
| 1983 | 216 | 210 | 205 | 191 | 178 | 171 | 164 | 162 | 156 | 146 | 133 | 127 | 123 | 118 | 109 | 106 | 102 | 95 | 89 |
| 1984 | 56 | 56 | 55 | 50 | 46 | 42 | 39 | 37 | 34 | 34 | 31 | 31 | 31 | 28 | 28 | 25 | 23 | 21 | 21 |
| 1985 | 59 | 58 | 55 | 52 | 49 | 48 | 48 | 44 | 43 | 38 | 36 | 33 | 31 | 27 | 26 | 25 | 24 | 23 | 23 |
| 1986 | 46 | 44 | 43 | 42 | 41 | 39 | 35 | 30 | 29 | 28 | 24 | 22 | 20 | 20 | 18 | 18 | 18 | 18 | 17 |
| 1987 | 61 | 60 | 51 | 49 | 43 | 39 | 37 | 34 | 29 | 24 | 23 | 22 | 19 | 18 | 16 | 14 | 14 | 14 | 14 |
| 1988 | 56 | 53 | 51 | 46 | 45 | 43 | 39 | 34 | 34 | 29 | 26 | 25 | 19 | 17 | 15 | 15 | 15 | 14 | 14 |
| 1989 | 30 | 30 | 29 | 29 | 27 | 24 | 24 | 23 | 22 | 22 | 21 | 20 | 20 | 18 | 18 | 18 | 18 | 18 | 18 |
| 1990 | 16 | 16 | 16 | 16 | 16 | 15 | 15 | 14 | 14 | 13 | 12 | 12 | 12 | 12 | 11 | 10 | 10 | 9 | 9 |
| 1991 | 17 | 17 | 17 | 17 | 16 | 16 | 15 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 13 | 12 | 12 | 11 | 11 |
| 1992 | 31 | 30 | 28 | 24 | 21 | 20 | 19 | 18 | 17 | 16 | 16 | 15 | 15 | 15 | 15 | 14 | 14 | 12 | 11 |
| 1993 | 44 | 40 | 33 | 31 | 30 | 25 | 25 | 25 | 25 | 23 | 22 | 22 | 20 | 19 | 19 | 18 | 18 | 18 | 18 |
| 1994 | 18 | 18 | 18 | 18 | 18 | 18 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 15 | 15 | 14 | 14 | 14 | 14 |
| 1995 | 13 | 12 | 12 | 12 | 12 | 11 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 9 | 8 | 8 |
| 1996 | 12 | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 9 | 9 | 9 | 9 | 8 | |
| 1997 | 17 | 17 | 17 | 16 | 15 | 15 | 14 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 12 | 12 | | |
| 1998 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 8 | 8 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | |
| 1999 | 7 | 7 | 7 | 7 | 6 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | | | | |
| 2000 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 7 | 7 | 7 | 7 | 7 | | | | | |
| 2001 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | | | |
| 2002 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | | | | | |
| 2003 | 13 | 13 | 13 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 11 | | | | | | | | |
| 2004 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | | | | | | | | |
| 2005 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | | | | | | | | | |
| 2006 | 13 | 13 | 13 | 13 | 13 | 12 | 12 | 12 | | | | | | | | | | | |
| 2007 | 8 | 8 | 7 | 7 | 7 | 7 | 7 | | | | | | | | | | | | |
| 2008 | 13 | 13 | 12 | 11 | 10 | 10 | | | | | | | | | | | | | |
| 2009 | 6 | 6 | 6 | 6 | 6 | | | | | | | | | | | | | | |
| 2010 | 10 | 10 | 10 | 10 | | | | | | | | | | | | | | | |
| 2011 | 7 | 7 | 7 | | | | | | | | | | | | | | | | |
| 2012 | 16 | 16 | | | | | | | | | | | | | | | | | |
| 2013 | 10 | | | | | | | | | | | | | | | | | | |

Forfeiture and Release Rates
 As of 6/30/13
 Other

Appendix 1.3

Number of Permits

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | |
|----------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 240 | 252 | 264 | 276 | 288 | 300 | 312 | 324 | 336 | 348 | 360 | 372 | 384 | 396 | 408 | 420 | 432 | 444 |
| 1977 | 7 | 7 | 5 | 5 | 5 | 5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 1978 | 7 | 6 | 6 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 1979 | 10 | 10 | 9 | 9 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 7 | | |
| 1980 | 28 | 28 | 28 | 25 | 25 | 23 | 22 | 22 | 22 | 22 | 21 | 20 | 20 | 20 | 18 | | | |
| 1981 | 74 | 70 | 70 | 68 | 67 | 63 | 62 | 61 | 61 | 60 | 59 | 59 | 58 | 56 | | | | |
| 1982 | 46 | 44 | 41 | 40 | 39 | 38 | 35 | 33 | 32 | 31 | 30 | 29 | 29 | | | | | |
| 1983 | 86 | 84 | 81 | 79 | 77 | 75 | 75 | 73 | 72 | 72 | 71 | 71 | | | | | | |
| 1984 | 20 | 19 | 19 | 19 | 19 | 19 | 19 | 18 | 18 | 18 | 16 | | | | | | | |
| 1985 | 23 | 23 | 20 | 20 | 20 | 20 | 20 | 19 | 19 | 19 | | | | | | | | |
| 1986 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | | | | | | | | | |
| 1987 | 14 | 13 | 13 | 11 | 11 | 10 | 10 | 9 | | | | | | | | | | |
| 1988 | 14 | 13 | 13 | 13 | 13 | 12 | 12 | | | | | | | | | | | |
| 1989 | 18 | 18 | 18 | 18 | 18 | 18 | | | | | | | | | | | | |
| 1990 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | | | | |
| 1991 | 10 | 10 | 10 | 10 | | | | | | | | | | | | | | |
| 1992 | 11 | 11 | 11 | | | | | | | | | | | | | | | |
| 1993 | 17 | 17 | | | | | | | | | | | | | | | | |
| 1994 | 14 | | | | | | | | | | | | | | | | | |
| 1995 | | | | | | | | | | | | | | | | | | |
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| 2013 | | | | | | | | | | | | | | | | | | |

Number of Releases

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | | |
|----------|--------------------|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | 156 | 168 | 180 | 192 | 204 | 216 | 228 |
| 1977 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 1978 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 3 |
| 1979 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 1980 | 0 | 0 | 0 | 0 | 3 | 2 | 1 | 3 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 |
| 1981 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 1 | 2 | 0 | 4 | 0 | 1 | 1 | 6 | 3 | 0 | 2 |
| 1982 | 0 | 0 | 3 | 1 | 2 | 5 | 5 | 3 | 0 | 2 | 1 | 4 | 2 | 1 | 2 | 2 | 0 | 0 | 3 |
| 1983 | 0 | 5 | 4 | 11 | 10 | 7 | 6 | 2 | 6 | 9 | 9 | 4 | 2 | 3 | 7 | 3 | 4 | 4 | 4 |
| 1984 | 0 | 0 | 1 | 4 | 4 | 3 | 2 | 1 | 1 | 0 | 2 | 0 | 0 | 3 | 0 | 2 | 1 | 2 | 0 |
| 1985 | 0 | 0 | 3 | 3 | 2 | 1 | 0 | 3 | 1 | 4 | 2 | 3 | 2 | 1 | 1 | 1 | 0 | 1 | 0 |
| 1986 | 0 | 2 | 1 | 1 | 1 | 2 | 4 | 4 | 1 | 0 | 2 | 2 | 2 | 0 | 1 | 0 | 0 | 0 | 1 |
| 1987 | 1 | 1 | 7 | 1 | 6 | 3 | 2 | 1 | 5 | 4 | 0 | 1 | 3 | 1 | 1 | 2 | 0 | 0 | 0 |
| 1988 | 3 | 3 | 2 | 4 | 1 | 2 | 3 | 4 | 0 | 4 | 3 | 1 | 3 | 2 | 0 | 0 | 0 | 1 | 0 |
| 1989 | 0 | 0 | 1 | 0 | 2 | 3 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 1990 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 |
| 1991 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 |
| 1992 | 0 | 1 | 0 | 3 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 1 |
| 1993 | 0 | 2 | 3 | 2 | 1 | 5 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 0 |
| 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 1995 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 1996 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 1997 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 1998 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1999 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2001 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2003 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2006 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2007 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2008 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2009 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2011 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2012 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Forfeiture and Release Rates
As of 6/30/13
Other

Appendix 1.3

Number of Releases

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | |
|----------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 240 | 252 | 264 | 276 | 288 | 300 | 312 | 324 | 336 | 348 | 360 | 372 | 384 | 396 | 408 | 420 | 432 | 444 |
| 1977 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1978 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1979 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | | |
| 1980 | 1 | 0 | 0 | 3 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | | | |
| 1981 | 6 | 3 | 0 | 2 | 0 | 2 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | | | | |
| 1982 | 3 | 2 | 3 | 1 | 1 | 1 | 3 | 2 | 1 | 1 | 1 | 1 | 0 | | | | | |
| 1983 | 3 | 2 | 2 | 2 | 2 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | | | | | | |
| 1984 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| 1985 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | | | | | | | | |
| 1986 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | |
| 1987 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | | | | | | | | | | |
| 1988 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | | | | | | | | | | | |
| 1989 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | |
| 1990 | 1 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | |
| 1991 | 1 | 0 | 0 | 0 | | | | | | | | | | | | | | |
| 1992 | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| 1993 | 1 | 0 | | | | | | | | | | | | | | | | |
| 1994 | 0 | | | | | | | | | | | | | | | | | |
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Number of Forfeitures

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | | |
|----------|--------------------|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | 156 | 168 | 180 | 192 | 204 | 216 | 228 |
| 1977 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1978 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1979 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1980 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1981 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 2 | 1 | 2 | 0 | 0 | 0 |
| 1982 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 0 | 1 | 1 | 0 | 2 |
| 1983 | 0 | 1 | 1 | 3 | 3 | 0 | 1 | 0 | 0 | 1 | 4 | 2 | 2 | 2 | 2 | 0 | 0 | 3 | 2 |
| 1984 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 1985 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 1 | 0 | 0 |
| 1986 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 1987 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 1988 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 0 |
| 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1992 | 0 | 0 | 2 | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1993 | 0 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 1995 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1996 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1997 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1998 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2001 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2006 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2007 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2008 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2009 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2011 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2012 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Number of Forfeitures

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | |
|----------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 240 | 252 | 264 | 276 | 288 | 300 | 312 | 324 | 336 | 348 | 360 | 372 | 384 | 396 | 408 | 420 | 432 | 444 |
| 1977 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1978 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1979 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1980 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1981 | 2 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | | | | |
| 1982 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| 1983 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | | | | | | |
| 1984 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | | | | | | | |
| 1985 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | |
| 1986 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | |
| 1987 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | | | | | | | | | | |
| 1988 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | |
| 1989 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | |
| 1990 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | |
| 1991 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | |
| 1992 | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| 1993 | 0 | 0 | | | | | | | | | | | | | | | | |
| 1994 | 0 | | | | | | | | | | | | | | | | | |
| 1995 | | | | | | | | | | | | | | | | | | |
| 1996 | | | | | | | | | | | | | | | | | | |
| 1997 | | | | | | | | | | | | | | | | | | |
| 1998 | | | | | | | | | | | | | | | | | | |
| 1999 | | | | | | | | | | | | | | | | | | |
| 2000 | | | | | | | | | | | | | | | | | | |
| 2001 | | | | | | | | | | | | | | | | | | |
| 2002 | | | | | | | | | | | | | | | | | | |
| 2003 | | | | | | | | | | | | | | | | | | |
| 2004 | | | | | | | | | | | | | | | | | | |
| 2005 | | | | | | | | | | | | | | | | | | |
| 2006 | | | | | | | | | | | | | | | | | | |
| 2007 | | | | | | | | | | | | | | | | | | |
| 2008 | | | | | | | | | | | | | | | | | | |
| 2009 | | | | | | | | | | | | | | | | | | |
| 2010 | | | | | | | | | | | | | | | | | | |
| 2011 | | | | | | | | | | | | | | | | | | |
| 2012 | | | | | | | | | | | | | | | | | | |
| 2013 | | | | | | | | | | | | | | | | | | |

Number of Misc Terminations

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | | |
|----------|--------------------|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | 156 | 168 | 180 | 192 | 204 | 216 | 228 |
| 1977 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1978 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1979 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1980 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1981 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1982 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1983 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1984 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1985 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1986 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1987 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1988 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1996 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1997 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1998 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2001 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2006 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2007 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2008 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2009 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2011 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2012 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Forfeiture and Release Rates
 As of 6/30/13
 Other

Appendix 1.3

Number of Misc Terminations:

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | |
|----------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 240 | 252 | 264 | 276 | 288 | 300 | 312 | 324 | 336 | 348 | 360 | 372 | 384 | 396 | 408 | 420 | 432 | 444 |
| 1977 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1978 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1979 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1980 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1981 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1982 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1983 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1984 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1985 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1986 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1987 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1988 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1992 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1995 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1996 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1997 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1998 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2001 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2006 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2007 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2008 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2009 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2011 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2012 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Forfeiture Percentages

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | | |
|----------------|--------------------|-------|--------|-------|-------|-------|--------|-------|-------|-------|-------|-------|--------|-------|--------|-------|-------|-------|-------|
| | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | 156 | 168 | 180 | 192 | 204 | 216 | 228 |
| 1977 | 0.00% | 0.00% | 0.00% | 5.26% | 5.56% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1978 | 0.00% | 0.00% | 0.00% | 5.56% | 0.00% | 0.00% | 5.88% | 0.00% | 0.00% | 0.00% | 0.00% | 7.69% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1979 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 10.53% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1980 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 4.88% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1981 | 0.00% | 0.00% | 0.00% | 0.87% | 0.00% | 0.00% | 0.89% | 0.00% | 0.00% | 0.92% | 0.00% | 0.00% | 1.96% | 2.00% | 1.03% | 2.11% | 0.00% | 0.00% | 0.00% |
| 1982 | 0.00% | 0.00% | 0.00% | 0.00% | 1.03% | 0.00% | 0.00% | 1.19% | 1.25% | 2.53% | 1.33% | 2.74% | 2.99% | 3.17% | 0.00% | 1.72% | 1.82% | 0.00% | 3.70% |
| 1983 | 0.00% | 0.46% | 0.48% | 1.46% | 1.57% | 0.00% | 0.58% | 0.00% | 0.00% | 0.64% | 2.74% | 1.50% | 1.57% | 1.63% | 1.69% | 0.00% | 0.00% | 2.94% | 2.11% |
| 1984 | 0.00% | 0.00% | 0.00% | 1.82% | 0.00% | 2.17% | 2.38% | 2.56% | 5.41% | 0.00% | 2.94% | 0.00% | 0.00% | 0.00% | 0.00% | 3.57% | 4.00% | 0.00% | 0.00% |
| 1985 | 0.00% | 1.69% | 0.00% | 0.00% | 1.92% | 0.00% | 0.00% | 2.08% | 0.00% | 2.33% | 0.00% | 0.00% | 0.00% | 9.68% | 0.00% | 0.00% | 4.00% | 0.00% | 0.00% |
| 1986 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 2.86% | 0.00% | 3.45% | 7.14% | 0.00% | 0.00% | 0.00% | 5.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1987 | 0.00% | 0.00% | 3.33% | 1.96% | 0.00% | 2.33% | 0.00% | 5.41% | 0.00% | 3.45% | 4.17% | 0.00% | 0.00% | 0.00% | 5.56% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1988 | 0.00% | 0.00% | 0.00% | 1.96% | 0.00% | 0.00% | 2.33% | 2.56% | 0.00% | 2.94% | 0.00% | 0.00% | 12.00% | 0.00% | 11.76% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1989 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 4.17% | 0.00% | 0.00% | 0.00% | 4.76% | 0.00% | 0.00% | 5.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1990 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 7.14% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1991 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1992 | 0.00% | 0.00% | 6.67% | 3.57% | 8.33% | 0.00% | 0.00% | 0.00% | 5.56% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1993 | 0.00% | 4.55% | 10.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 4.35% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1994 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 6.67% | 0.00% | 0.00% | 0.00% |
| 1995 | 0.00% | 7.69% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1996 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 10.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1997 | 0.00% | 0.00% | 0.00% | 5.88% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1998 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1999 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 2000 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 2001 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 2002 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 2003 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 2004 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 2005 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 2006 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 2007 | 0.00% | 0.00% | 12.50% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 2008 | 0.00% | 0.00% | 0.00% | 8.33% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 2009 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 2010 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 2011 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 2012 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 2013 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Weighted Avg | | | | | | | | | | | | | | | | | | | |
| 5 Year | 0.00% | 0.00% | 2.27% | 2.08% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 1.85% | 0.00% | 0.00% | 0.00% |
| 10 Year | 0.00% | 0.00% | 1.16% | 1.19% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.89% | 0.00% | 0.00% | 0.77% | 0.00% | 0.00% | 0.00% |
| 15 Year | 0.00% | 0.00% | 0.75% | 1.46% | 0.00% | 0.00% | 0.00% | 0.00% | 0.61% | 0.58% | 0.55% | 0.52% | 1.95% | 0.00% | 2.26% | 0.86% | 0.63% | 0.85% | 0.97% |
| All Year | 0.00% | 0.44% | 0.90% | 1.13% | 0.79% | 0.42% | 0.78% | 0.93% | 0.50% | 1.16% | 1.37% | 0.88% | 1.54% | 1.46% | 1.36% | 0.90% | 0.57% | 0.60% | 0.85% |
| Prior Selected | 0.00% | 0.00% | 0.00% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% |
| Selected | 0.00% | 0.00% | 0.00% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% |

Forfeiture Percentages

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | |
|----------------|--------------------|-------|--------|-------|-------|-------|--------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|
| | 240 | 252 | 264 | 276 | 288 | 300 | 312 | 324 | 336 | 348 | 360 | 372 | 384 | 396 | 408 | 420 | 432 | 444 |
| 1977 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 20.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1978 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1979 | 0.00% | 0.00% | 10.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1980 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1981 | 2.44% | 1.35% | 0.00% | 0.00% | 1.47% | 2.99% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 1.69% | 1.72% | | | | |
| 1982 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | |
| 1983 | 0.00% | 0.00% | 1.19% | 0.00% | 0.00% | 0.00% | 0.00% | 1.33% | 1.37% | 0.00% | 0.00% | 0.00% | | | | | | |
| 1984 | 0.00% | 5.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 5.26% | 0.00% | 0.00% | 11.11% | | | | | | | |
| 1985 | 0.00% | 0.00% | 4.35% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | | | |
| 1986 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | | | | |
| 1987 | 0.00% | 0.00% | 0.00% | 7.69% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | | | | | |
| 1988 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | | | | | | |
| 1989 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | | | | | | | |
| 1990 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | | | | | | | | |
| 1991 | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | | | | | | | | | |
| 1992 | 0.00% | 0.00% | 0.00% | | | | | | | | | | | | | | | |
| 1993 | 0.00% | 0.00% | | | | | | | | | | | | | | | | |
| 1994 | 0.00% | | | | | | | | | | | | | | | | | |
| 1995 | | | | | | | | | | | | | | | | | | |
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| 2010 | | | | | | | | | | | | | | | | | | |
| 2011 | | | | | | | | | | | | | | | | | | |
| 2012 | | | | | | | | | | | | | | | | | | |
| 2013 | | | | | | | | | | | | | | | | | | |
| Weighted Avg | | | | | | | | | | | | | | | | | | |
| 5 Year | 0.00% | 0.00% | 0.00% | 1.61% | 0.00% | 0.00% | 0.00% | 1.42% | 0.63% | 0.00% | 0.99% | 0.00% | 0.83% | 1.09% | | | | |
| 10 Year | 0.00% | 0.66% | 0.93% | 0.42% | 0.34% | 0.65% | 0.00% | 0.74% | 0.39% | | | | | | | | | |
| 15 Year | 0.48% | 0.51% | 0.80% | 0.28% | | | | | | | | | | | | | | |
| All Year | 0.45% | 0.49% | 0.79% | 0.28% | 0.30% | 0.62% | 0.34% | 0.73% | 0.39% | 0.00% | 0.92% | 0.00% | 0.82% | 1.09% | 0.00% | 0.00% | 0.00% | 0.00% |
| Prior Selected | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% |
| Selected | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% | 0.40% |

Release Percentages

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | | |
|----------------|--------------------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|--------|--------|-------|--------|-------|--------|--------|
| | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | 156 | 168 | 180 | 192 | 204 | 216 | 228 |
| 1977 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 23.53% | 30.77% | 11.11% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 12.50% | 0.00% |
| 1978 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 5.88% | 6.67% | 7.14% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 8.33% | 9.09% | 30.00% |
| 1979 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 5.00% | 10.53% | 6.67% | 14.29% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 8.33% | 0.00% |
| 1980 | 0.00% | 0.00% | 0.00% | 0.00% | 6.82% | 4.88% | 2.70% | 8.33% | 0.00% | 0.00% | 3.03% | 0.00% | 3.13% | 0.00% | 0.00% | 3.23% | 0.00% | 3.33% | 0.00% |
| 1981 | 0.00% | 0.00% | 0.00% | 0.00% | 1.75% | 0.00% | 0.00% | 0.90% | 0.91% | 1.83% | 0.00% | 3.77% | 0.00% | 1.00% | 1.03% | 6.32% | 3.45% | 0.00% | 2.38% |
| 1982 | 0.00% | 0.00% | 2.97% | 1.02% | 2.06% | 5.32% | 5.62% | 3.57% | 0.00% | 2.53% | 1.33% | 5.48% | 2.99% | 1.59% | 3.33% | 3.45% | 0.00% | 0.00% | 5.56% |
| 1983 | 0.00% | 2.31% | 1.90% | 5.37% | 5.24% | 3.93% | 3.51% | 1.22% | 3.70% | 5.77% | 6.16% | 3.01% | 1.57% | 2.44% | 5.93% | 2.75% | 3.77% | 3.92% | 4.21% |
| 1984 | 0.00% | 0.00% | 1.79% | 7.27% | 8.00% | 6.52% | 4.76% | 2.56% | 2.70% | 0.00% | 5.88% | 0.00% | 0.00% | 9.68% | 0.00% | 7.14% | 4.00% | 8.70% | 0.00% |
| 1985 | 0.00% | 0.00% | 5.17% | 5.45% | 3.85% | 2.04% | 0.00% | 6.25% | 2.27% | 9.30% | 5.26% | 8.33% | 6.06% | 3.23% | 3.70% | 3.85% | 0.00% | 4.17% | 0.00% |
| 1986 | 0.00% | 4.35% | 2.27% | 2.33% | 2.38% | 4.88% | 10.26% | 11.43% | 3.33% | 0.00% | 7.14% | 8.33% | 9.09% | 0.00% | 5.00% | 0.00% | 0.00% | 0.00% | 5.56% |
| 1987 | 1.61% | 1.64% | 11.67% | 1.96% | 12.24% | 6.98% | 5.13% | 2.70% | 14.71% | 13.79% | 0.00% | 4.35% | 13.64% | 5.26% | 5.56% | 12.50% | 0.00% | 0.00% | 0.00% |
| 1988 | 5.08% | 5.36% | 3.77% | 7.84% | 2.17% | 4.44% | 6.98% | 10.26% | 0.00% | 11.76% | 10.34% | 3.85% | 12.00% | 10.53% | 0.00% | 0.00% | 0.00% | 6.67% | 0.00% |
| 1989 | 0.00% | 0.00% | 3.33% | 0.00% | 6.90% | 11.11% | 0.00% | 0.00% | 4.35% | 0.00% | 4.55% | 0.00% | 0.00% | 0.00% | 5.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1990 | 5.88% | 0.00% | 0.00% | 0.00% | 0.00% | 6.25% | 0.00% | 6.67% | 0.00% | 0.00% | 7.69% | 0.00% | 0.00% | 0.00% | 8.33% | 9.09% | 0.00% | 10.00% | 0.00% |
| 1991 | 0.00% | 0.00% | 0.00% | 0.00% | 5.88% | 0.00% | 6.25% | 6.67% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 7.14% | 7.69% | 0.00% | 8.33% | 0.00% |
| 1992 | 0.00% | 3.23% | 0.00% | 10.71% | 4.17% | 4.76% | 5.00% | 5.26% | 0.00% | 5.88% | 0.00% | 6.25% | 0.00% | 0.00% | 0.00% | 6.67% | 0.00% | 14.29% | 8.33% |
| 1993 | 0.00% | 4.55% | 7.50% | 6.06% | 3.23% | 16.67% | 0.00% | 0.00% | 0.00% | 8.00% | 0.00% | 0.00% | 9.09% | 0.00% | 5.00% | 0.00% | 5.26% | 0.00% | 0.00% |
| 1994 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 5.56% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 11.76% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1995 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 8.33% | 9.09% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 10.00% | 0.00% | 11.11% | 0.00% |
| 1996 | 0.00% | 0.00% | 0.00% | 0.00% | 16.67% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 11.11% | |
| 1997 | 0.00% | 0.00% | 0.00% | 0.00% | 6.25% | 0.00% | 6.67% | 7.14% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 7.69% | 0.00% | | |
| 1998 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 11.11% | 0.00% | 12.50% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | |
| 1999 | 0.00% | 0.00% | 0.00% | 0.00% | 14.29% | 16.67% | 0.00% | 0.00% | 0.00% | 20.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | |
| 2000 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 12.50% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | |
| 2001 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | |
| 2002 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | | |
| 2003 | 0.00% | 0.00% | 0.00% | 7.69% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 8.33% | | | | | | | | |
| 2004 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | | | | |
| 2005 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | | | | | |
| 2006 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 7.69% | 0.00% | 0.00% | | | | | | | | | | | |
| 2007 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | | | | | | | |
| 2008 | 0.00% | 0.00% | 7.69% | 0.00% | 9.09% | 0.00% | | | | | | | | | | | | | |
| 2009 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | | | | | | | | | |
| 2010 | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | | | | | | | | | | |
| 2011 | 0.00% | 0.00% | 0.00% | | | | | | | | | | | | | | | | |
| 2012 | 0.00% | 0.00% | | | | | | | | | | | | | | | | | |
| 2013 | 0.00% | | | | | | | | | | | | | | | | | | |
| Weighted Avg | | | | | | | | | | | | | | | | | | | |
| 5 Year | 0.00% | 0.00% | 2.27% | 0.00% | 2.44% | 2.56% | 0.00% | 0.00% | 0.00% | 0.00% | 2.70% | 0.00% | 0.00% | 0.00% | 0.00% | 3.70% | 1.59% | 6.25% | 1.59% |
| 10 Year | 0.00% | 0.00% | 1.16% | 1.19% | 1.25% | 2.53% | 0.00% | 2.41% | 1.27% | 2.38% | 1.06% | 0.00% | 1.79% | 1.72% | 2.52% | 3.85% | 0.76% | 5.26% | 1.47% |
| 15 Year | 0.00% | 0.00% | 0.75% | 0.73% | 3.68% | 2.10% | 1.94% | 1.83% | 0.61% | 2.92% | 1.65% | 1.04% | 3.90% | 2.43% | 3.17% | 4.29% | 1.88% | 3.95% | 2.66% |
| All Year | 0.43% | 1.23% | 2.35% | 2.91% | 4.06% | 4.08% | 3.43% | 3.85% | 2.98% | 4.01% | 3.16% | 2.92% | 2.61% | 2.27% | 2.90% | 3.94% | 1.91% | 3.61% | 2.98% |
| Prior Selected | 0.00% | 0.00% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.50% | 1.50% | 1.50% | 1.50% | 1.50% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% |
| Selected | 0.00% | 0.00% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.25% | 1.50% | 1.50% | 1.50% | 1.50% | 1.50% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% |

Release Percentages

| Issue Yr | Months of Maturity | | | | | | | | | | | | | | | | | |
|----------------|--------------------|--------|--------|--------|--------|-------|--------|--------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|
| | 240 | 252 | 264 | 276 | 288 | 300 | 312 | 324 | 336 | 348 | 360 | 372 | 384 | 396 | 408 | 420 | 432 | 444 |
| 1977 | 0.00% | 0.00% | 28.57% | 0.00% | 0.00% | 0.00% | 40.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1978 | 0.00% | 14.29% | 0.00% | 16.67% | 20.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 1979 | 9.09% | 0.00% | 0.00% | 0.00% | 11.11% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 12.50% | 0.00% | | |
| 1980 | 3.45% | 0.00% | 0.00% | 10.71% | 0.00% | 8.00% | 4.35% | 0.00% | 0.00% | 0.00% | 4.55% | 4.76% | 0.00% | 0.00% | 10.00% | | | |
| 1981 | 7.32% | 4.05% | 0.00% | 2.86% | 0.00% | 2.99% | 1.59% | 1.61% | 0.00% | 1.64% | 1.67% | 0.00% | 0.00% | 1.72% | | | | |
| 1982 | 6.12% | 4.35% | 6.82% | 2.44% | 2.50% | 2.56% | 7.89% | 5.71% | 3.03% | 3.13% | 3.23% | 3.33% | 0.00% | | | | | |
| 1983 | 3.37% | 2.33% | 2.38% | 2.47% | 2.53% | 2.60% | 0.00% | 1.33% | 0.00% | 0.00% | 1.39% | 0.00% | | | | | | |
| 1984 | 4.76% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | |
| 1985 | 0.00% | 0.00% | 8.70% | 0.00% | 0.00% | 0.00% | 0.00% | 5.00% | 0.00% | 0.00% | | | | | | | | |
| 1986 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | | | | |
| 1987 | 0.00% | 7.14% | 0.00% | 7.69% | 0.00% | 9.09% | 0.00% | 10.00% | | | | | | | | | | |
| 1988 | 0.00% | 7.14% | 0.00% | 0.00% | 0.00% | 7.69% | 0.00% | | | | | | | | | | | |
| 1989 | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | | | | | | | |
| 1990 | 11.11% | 0.00% | 0.00% | 0.00% | 0.00% | | | | | | | | | | | | | |
| 1991 | 9.09% | 0.00% | 0.00% | 0.00% | | | | | | | | | | | | | | |
| 1992 | 0.00% | 0.00% | 0.00% | | | | | | | | | | | | | | | |
| 1993 | 5.56% | 0.00% | | | | | | | | | | | | | | | | |
| 1994 | 0.00% | | | | | | | | | | | | | | | | | |
| 1995 | | | | | | | | | | | | | | | | | | |
| 1996 | | | | | | | | | | | | | | | | | | |
| 1997 | | | | | | | | | | | | | | | | | | |
| 1998 | | | | | | | | | | | | | | | | | | |
| 1999 | | | | | | | | | | | | | | | | | | |
| 2000 | | | | | | | | | | | | | | | | | | |
| 2001 | | | | | | | | | | | | | | | | | | |
| 2002 | | | | | | | | | | | | | | | | | | |
| 2003 | | | | | | | | | | | | | | | | | | |
| 2004 | | | | | | | | | | | | | | | | | | |
| 2005 | | | | | | | | | | | | | | | | | | |
| 2006 | | | | | | | | | | | | | | | | | | |
| 2007 | | | | | | | | | | | | | | | | | | |
| 2008 | | | | | | | | | | | | | | | | | | |
| 2009 | | | | | | | | | | | | | | | | | | |
| 2010 | | | | | | | | | | | | | | | | | | |
| 2011 | | | | | | | | | | | | | | | | | | |
| 2012 | | | | | | | | | | | | | | | | | | |
| 2013 | | | | | | | | | | | | | | | | | | |
| Weighted Avg | | | | | | | | | | | | | | | | | | |
| 5 Year | 4.76% | 0.00% | 0.00% | 1.61% | 0.00% | 2.53% | 0.00% | 2.13% | 0.63% | 0.99% | 1.97% | 1.06% | 0.00% | 1.09% | | | | |
| 10 Year | 2.01% | 1.32% | 1.85% | 1.67% | 1.02% | 2.94% | 1.75% | 2.21% | 0.39% | | | | | | | | | |
| 15 Year | 4.06% | 2.27% | 1.87% | 2.79% | | | | | | | | | | | | | | |
| All Year | 4.05% | 2.44% | 2.36% | 2.79% | 1.48% | 2.79% | 2.38% | 2.19% | 0.39% | 0.84% | 1.84% | 1.03% | 0.00% | 1.09% | 8.82% | 0.00% | 0.00% | 0.00% |
| Prior Selected | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% |
| Selected | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% | 3.00% |

| Appendix 2.1 Summary | | | |
|--|--------------|--------|---------------------------|
| Special Reclamation Fund | | | |
| Projected Cash Flow For 2014 to 2048 | | | |
| Using Coal Tax Rate of 14.41 Cents (in \$ Thousands) | | | |
| Fiscal Year Ending 6/30 | Expenditures | Income | Projected Fund Balance |
| | (1) | (2) | (3) |
| 2013 | 0 | 0 | 74,960 |
| 2014 | 28,412 | 20,815 | 67,363 |
| 2015 | 38,804 | 18,973 | 47,532 |
| 2016 | 46,763 | 18,092 | 18,862 |
| 2017 | 21,116 | 17,506 | 15,252 |
| 2018 | 23,956 | 16,202 | 7,497 |
| 2019 | 12,321 | 15,174 | 10,350 |
| 2020 | 12,234 | 14,491 | 12,608 |
| 2021 | 11,993 | 13,811 | 14,426 |
| 2022 | 9,401 | 13,363 | 18,387 |
| 2023 | 9,337 | 12,875 | 21,925 |
| 2024 | 9,268 | 12,308 | 24,966 |
| 2025 | 9,194 | 11,740 | 27,511 |
| 2026 | 9,120 | 11,266 | 29,657 |
| 2027 | 9,047 | 10,803 | 31,413 |
| 2028 | 8,978 | 10,331 | 32,766 |
| 2029 | 8,910 | 9,905 | 33,761 |
| 2030 | 8,844 | 9,493 | 34,410 |
| 2031 | 8,780 | 9,090 | 34,721 |
| 2032 | 8,719 | 8,675 | 34,677 |
| 2033 | 8,661 | 8,260 | 34,276 |
| 2034 | 8,605 | 7,941 | 33,611 |
| 2035 | 8,549 | 7,604 | 32,667 |
| 2036 | 8,497 | 7,275 | 31,444 |
| 2037 | 8,451 | 6,969 | 29,962 |
| 2038 | 8,410 | 6,686 | 28,238 |
| 2039 | 8,374 | 6,421 | 26,286 |
| 2040 | 8,342 | 6,175 | 24,119 |
| 2041 | 8,315 | 5,942 | 21,746 |
| 2042 | 8,292 | 5,722 | 19,175 |
| 2043 | 8,273 | 5,513 | 16,415 |
| 2044 | 8,259 | 5,325 | 13,481 |
| 2045 | 8,248 | 5,161 | 10,394 |
| 2046 | 8,241 | 5,007 | 7,160 |
| 2047 | 8,237 | 4,863 | 3,786 |
| 2048 | 8,237 | 4,728 | 277 |

Footnotes:

- (1) Appendix 2.2 Expenditures Col (7)
- (2) Appendix 2.3 Revenue Col (4)
- (3) Prior Col (3) + (Col (2) - Col (1))

Appendix 2.2 Expenditures

Special Reclamation Fund

Projected Cash Flow For 2014 to 2048
Using Coal Tax Rate of 14.41 Cents (in \$ Thousands)

| Fiscal Year Ending 6/30 | Land Capital | Water Capital | Water Abandonment | Ongoing Water | Fixed Water Treatment | Administration Costs | Total Expenditures |
|----------------------------|-----------------|---|----------------------|------------------|--------------------------|-------------------------|-----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| 2013 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2014 | 687 | 17,014 | 0 | 6,360 | 0 | 4,350 | 28,412 |
| 2015 | 1,140 | 25,140 | 0 | 8,131 | 0 | 4,394 | 38,804 |
| 2016 | 7,662 | 23,523 | 0 | 11,140 | 0 | 4,437 | 46,763 |
| 2017 | 2,406 | 1,829 | 0 | 12,400 | 0 | 4,482 | 21,116 |
| 2018 | 4,951 | 1,291 | 0 | 13,187 | 0 | 4,527 | 23,956 |
| 2019 | 7,749 | Cost covered by Water Trust Fund post 2018 | | | | 4,572 | 12,321 |
| 2020 | 7,616 | | | | | 4,618 | 12,234 |
| 2021 | 7,329 | | | | | 4,664 | 11,993 |
| 2022 | 4,691 | | | | | 4,710 | 9,401 |
| 2023 | 4,580 | | | | | 4,758 | 9,337 |
| 2024 | 4,463 | | | | | 4,805 | 9,268 |
| 2025 | 4,341 | | | | | 4,853 | 9,194 |
| 2026 | 4,218 | | | | | 4,902 | 9,120 |
| 2027 | 4,097 | | | | | 4,951 | 9,047 |
| 2028 | 3,978 | | | | | 5,000 | 8,978 |
| 2029 | 3,860 | | | | | 5,050 | 8,910 |
| 2030 | 3,744 | | | | | 5,101 | 8,844 |
| 2031 | 3,628 | | | | | 5,152 | 8,780 |
| 2032 | 3,516 | | | | | 5,203 | 8,719 |
| 2033 | 3,406 | | | | | 5,255 | 8,661 |
| 2034 | 3,297 | | | | | 5,308 | 8,605 |
| 2035 | 3,188 | | | | | 5,361 | 8,549 |
| 2036 | 3,083 | | | | | 5,415 | 8,497 |
| 2037 | 2,983 | | | | | 5,469 | 8,451 |
| 2038 | 2,887 | | | | | 5,523 | 8,410 |
| 2039 | 2,795 | | | | | 5,579 | 8,374 |
| 2040 | 2,708 | | | | | 5,634 | 8,342 |
| 2041 | 2,624 | | | | | 5,691 | 8,315 |
| 2042 | 2,544 | | | | | 5,748 | 8,292 |
| 2043 | 2,468 | | | | | 5,805 | 8,273 |
| 2044 | 2,396 | | | | | 5,863 | 8,259 |
| 2045 | 2,326 | | | | | 5,922 | 8,248 |
| 2046 | 2,260 | | | | | 5,981 | 8,241 |
| 2047 | 2,196 | | | | | 6,041 | 8,237 |
| 2048 | 2,136 | | | | | 6,101 | 8,237 |

Footnotes:

- (1) Exhibit 1.6 Col (6)
- (2) Exhibit 1.7 Col (6)
- (3) Exhibit 1.8 Col (6)
- (4) Exhibit 1.9 Col (6)
- (5) Exhibit 1.10 Col (1)
- (6) Exhibit 1.11 Col (1)
- (7) Sum of Col (1) through (6)

| Appendix 2.3 Revenue | | | | |
|--|-----------------|--------------------------|----------------------|------------------|
| Special Reclamation Fund | | | | |
| Projected Cash Flow For 2014 to 2048 | | | | |
| Using Coal Tax Rate of 14.41 Cents (in \$ Thousands) | | | | |
| Fiscal Year Ending 6/30 | SRF Coal Tax | Bond, Penalties, etc. | Investment Income | Total Revenue |
| | (1) | (2) | (3) | (4) |
| 2013 | 0 | 0 | 0 | 0 |
| 2014 | 16,416 | 3,700 | 699 | 20,815 |
| 2015 | 15,342 | 3,573 | 57 | 18,973 |
| 2016 | 14,578 | 3,481 | 33 | 18,092 |
| 2017 | 14,181 | 3,308 | 17 | 17,506 |
| 2018 | 13,071 | 3,119 | 11 | 16,202 |
| 2019 | 12,220 | 2,938 | 16 | 15,174 |
| 2020 | 11,696 | 2,766 | 29 | 14,491 |
| 2021 | 11,164 | 2,602 | 45 | 13,811 |
| 2022 | 10,851 | 2,444 | 68 | 13,363 |
| 2023 | 10,464 | 2,294 | 117 | 12,875 |
| 2024 | 9,982 | 2,152 | 175 | 12,308 |
| 2025 | 9,496 | 2,017 | 227 | 11,740 |
| 2026 | 9,101 | 1,892 | 273 | 11,266 |
| 2027 | 8,714 | 1,774 | 315 | 10,803 |
| 2028 | 8,317 | 1,664 | 351 | 10,331 |
| 2029 | 7,963 | 1,560 | 382 | 9,905 |
| 2030 | 7,622 | 1,464 | 407 | 9,493 |
| 2031 | 7,289 | 1,374 | 427 | 9,090 |
| 2032 | 6,944 | 1,290 | 441 | 8,675 |
| 2033 | 6,600 | 1,211 | 449 | 8,260 |
| 2034 | 6,352 | 1,138 | 451 | 7,941 |
| 2035 | 6,087 | 1,070 | 448 | 7,604 |
| 2036 | 5,830 | 1,007 | 438 | 7,275 |
| 2037 | 5,598 | 948 | 423 | 6,969 |
| 2038 | 5,391 | 894 | 402 | 6,686 |
| 2039 | 5,203 | 843 | 375 | 6,421 |
| 2040 | 5,037 | 796 | 342 | 6,175 |
| 2041 | 4,886 | 752 | 304 | 5,942 |
| 2042 | 4,749 | 712 | 260 | 5,722 |
| 2043 | 4,628 | 674 | 211 | 5,513 |
| 2044 | 4,519 | 638 | 167 | 5,325 |
| 2045 | 4,422 | 605 | 134 | 5,161 |
| 2046 | 4,334 | 575 | 98 | 5,007 |
| 2047 | 4,256 | 546 | 61 | 4,863 |
| 2048 | 4,186 | 519 | 23 | 4,728 |

Footnotes:

- (1) Exhibit 1.12 Col (5) x (14.41 cents / 12.9 cents)
- (2) Exhibit 1.13 Col (1) + Col (4)
- (3) Appendix 2.4a Col (3)
- (4) Sum of Col (1) through (3)

Appendix 2.4

Projected Investment Rates

Based on West Virginia Pool Funds and US Treasury Returns in Fall 2013

| Fiscal Year | Special Reclamation Fund Investment Rates | | | | Special Reclamation Water Trust Fund Investment Rates | | | |
|-------------|---|------------------------|------------------|-------------------------|---|----------------------|--------------------|-------------------------|
| | Money Market (1) | Short Term Bond (2) | SRF Blend (3) | Discount Factors (4) | Short Term Yield (5) | Current Yield (6) | SRWTF Blend (7) | Discount Factors (8) |
| 2014 | 0.100% | 1.100% | 0.987% | 99.510% | 0.100% | 5.600% | 5.600% | 97.312% |
| 2015 | 0.100% | 1.100% | 0.100% | 98.973% | 0.100% | 5.600% | 5.600% | 92.152% |
| 2016 | 0.100% | 1.100% | 0.100% | 98.874% | 0.100% | 5.600% | 5.600% | 87.265% |
| 2017 | 0.100% | 1.100% | 0.100% | 98.775% | 0.100% | 5.600% | 4.763% | 82.967% |
| 2018 | 0.100% | 1.100% | 0.100% | 98.677% | 0.100% | 5.600% | 4.215% | 79.403% |
| 2019 | 0.175% | 1.175% | 0.175% | 98.541% | 0.175% | 5.600% | 4.346% | 76.144% |
| 2020 | 0.250% | 1.250% | 0.250% | 98.332% | 0.250% | 5.600% | 4.417% | 72.947% |
| 2021 | 0.333% | 1.333% | 0.333% | 98.046% | 0.333% | 5.600% | 4.480% | 69.840% |
| 2022 | 0.417% | 1.417% | 0.417% | 97.680% | 0.417% | 5.600% | 4.514% | 66.835% |
| 2023 | 0.500% | 1.500% | 0.581% | 97.195% | 0.500% | 5.600% | 4.546% | 63.938% |
| 2024 | 0.531% | 1.531% | 0.747% | 96.554% | 0.531% | 5.600% | 4.562% | 61.153% |
| 2025 | 0.563% | 1.563% | 0.867% | 95.781% | 0.563% | 5.600% | 4.573% | 58.482% |
| 2026 | 0.594% | 1.594% | 0.960% | 94.914% | 0.594% | 5.600% | 4.579% | 55.923% |
| 2027 | 0.625% | 1.625% | 1.036% | 93.976% | 0.625% | 5.600% | 4.581% | 53.474% |
| 2028 | 0.656% | 1.656% | 1.100% | 92.982% | 0.656% | 5.600% | 4.579% | 51.132% |
| 2029 | 0.688% | 1.688% | 1.155% | 91.946% | 0.688% | 5.600% | 4.572% | 48.895% |
| 2030 | 0.719% | 1.719% | 1.202% | 90.875% | 0.719% | 5.600% | 4.561% | 46.760% |
| 2031 | 0.750% | 1.750% | 1.244% | 89.777% | 0.750% | 5.600% | 4.545% | 44.724% |
| 2032 | 0.781% | 1.781% | 1.280% | 88.658% | 0.781% | 5.600% | 4.524% | 42.783% |
| 2033 | 0.813% | 1.813% | 1.312% | 87.523% | 0.813% | 5.600% | 4.497% | 40.937% |
| 2034 | 0.844% | 1.844% | 1.338% | 86.379% | 0.844% | 5.600% | 4.464% | 39.181% |
| 2035 | 0.875% | 1.875% | 1.360% | 85.229% | 0.875% | 5.600% | 4.422% | 37.514% |
| 2036 | 0.906% | 1.906% | 1.377% | 84.079% | 0.906% | 5.600% | 4.371% | 35.935% |
| 2037 | 0.938% | 1.938% | 1.387% | 82.933% | 0.938% | 5.600% | 4.308% | 34.440% |
| 2038 | 0.969% | 1.969% | 1.390% | 81.797% | 0.969% | 5.600% | 4.231% | 33.030% |
| 2039 | 1.000% | 2.000% | 1.385% | 80.677% | 1.000% | 5.600% | 4.134% | 31.704% |
| 2040 | 1.031% | 2.031% | 1.368% | 79.582% | 1.031% | 5.600% | 4.012% | 30.463% |
| 2041 | 1.063% | 2.063% | 1.335% | 78.521% | 1.063% | 5.600% | 3.854% | 29.310% |
| 2042 | 1.094% | 2.094% | 1.281% | 77.507% | 1.094% | 5.600% | 3.644% | 28.251% |
| 2043 | 1.125% | 2.125% | 1.192% | 76.561% | 1.125% | 5.600% | 3.354% | 27.296% |
| 2044 | 1.125% | 2.125% | 1.125% | 75.684% | 1.125% | 5.600% | 2.912% | 26.467% |
| 2045 | 1.125% | 2.125% | 1.125% | 74.842% | 1.125% | 5.600% | 2.208% | 25.806% |
| 2046 | 1.125% | 2.125% | 1.125% | 74.009% | 1.125% | 5.600% | 1.125% | 25.384% |
| 2047 | 1.125% | 2.125% | 1.125% | 73.186% | 1.125% | 5.600% | 1.125% | 25.101% |
| 2048 | 1.125% | 2.125% | 1.125% | 72.372% | 1.125% | 5.600% | 1.125% | 24.822% |

Footnotes:

- (1) Col (2) - 1%, reflecting West Virginia Money Market Pool Return and US Treasury Returns in Fall of 2013
- (2) Based on West Virginia Short Term Bond Pool Return and US Treasury Returns in Fall of 2013
- (3) Appendix 2.4a [Col (3) / (Col (1) + Col (2))]
- (4) Based on Col (3)
- (5) Col (1)
- (6) Based on current yields and planned investment strategy changes in 2019
- (7) Appendix 2.4a [Col (7) / (Col (5) + Col (6))]
- (8) Based on Col (7)

Appendix 2.4a

Projected Investment Income

Based on West Virginia Pool Funds and US Treasury Returns in Fall 2013

(in \$ Thousands)

| Fiscal Year | Special Reclamation Fund Investable Amounts and Returns | | | | Special Reclamation Water Trust Fund Investable Amounts and Returns | | | |
|----------------|---|------------------------|--------------------|------------------------|---|-----------------------|--------------------|------------------------|
| | Money Mkt. Inv. (1) | Short Term Inv. (2) | Inv. Income (3) | Discounted I.I. (4) | Money Mkt. Inv. (5) | Long Term Inv. (6) | Inv. Income (7) | Discounted I.I. (8) |
| 2014 | 8,000 | 62,812 | 699 | 696 | 0 | 33,344 | 1,867 | 1,817 |
| 2015 | 57,419 | 0 | 57 | 57 | 0 | 56,215 | 3,148 | 2,901 |
| 2016 | 33,181 | 0 | 33 | 33 | 0 | 79,151 | 4,432 | 3,868 |
| 2017 | 17,048 | 0 | 17 | 17 | 15,620 | 86,983 | 4,887 | 4,054 |
| 2018 | 11,369 | 0 | 11 | 11 | 31,607 | 93,906 | 5,290 | 4,201 |
| 2019 | 8,916 | 0 | 16 | 15 | 32,291 | 107,429 | 6,073 | 4,624 |
| 2020 | 11,465 | 0 | 29 | 28 | 32,234 | 113,572 | 6,441 | 4,698 |
| 2021 | 13,494 | 0 | 45 | 44 | 32,161 | 119,058 | 6,774 | 4,731 |
| 2022 | 16,372 | 0 | 68 | 67 | 32,767 | 123,669 | 7,062 | 4,720 |
| 2023 | 18,462 | 1,636 | 117 | 114 | 33,377 | 128,137 | 7,343 | 4,695 |
| 2024 | 18,314 | 5,044 | 175 | 169 | 33,993 | 132,002 | 7,573 | 4,631 |
| 2025 | 18,167 | 7,958 | 227 | 217 | 34,616 | 135,145 | 7,763 | 4,540 |
| 2026 | 18,025 | 10,423 | 273 | 259 | 35,249 | 137,577 | 7,914 | 4,426 |
| 2027 | 17,888 | 12,490 | 315 | 296 | 35,891 | 139,322 | 8,026 | 4,292 |
| 2028 | 17,755 | 14,159 | 351 | 326 | 36,543 | 140,335 | 8,099 | 4,141 |
| 2029 | 17,624 | 15,449 | 382 | 351 | 37,205 | 140,592 | 8,129 | 3,975 |
| 2030 | 17,499 | 16,383 | 407 | 370 | 37,877 | 140,085 | 8,117 | 3,795 |
| 2031 | 17,380 | 16,972 | 427 | 384 | 38,560 | 138,777 | 8,061 | 3,605 |
| 2032 | 17,266 | 17,212 | 441 | 391 | 39,254 | 136,618 | 7,957 | 3,404 |
| 2033 | 17,154 | 17,098 | 449 | 393 | 39,959 | 133,548 | 7,803 | 3,194 |
| 2034 | 17,046 | 16,672 | 451 | 390 | 40,675 | 129,574 | 7,599 | 2,977 |
| 2035 | 16,949 | 15,967 | 448 | 382 | 41,404 | 124,690 | 7,345 | 2,755 |
| 2036 | 16,861 | 14,975 | 438 | 368 | 42,148 | 118,835 | 7,037 | 2,529 |
| 2037 | 16,784 | 13,708 | 423 | 351 | 42,907 | 111,969 | 6,673 | 2,298 |
| 2038 | 16,716 | 12,183 | 402 | 329 | 43,681 | 104,061 | 6,251 | 2,065 |
| 2039 | 16,657 | 10,417 | 375 | 302 | 44,470 | 95,075 | 5,769 | 1,829 |
| 2040 | 16,607 | 8,424 | 342 | 272 | 45,276 | 84,970 | 5,225 | 1,592 |
| 2041 | 16,565 | 6,215 | 304 | 239 | 46,098 | 73,700 | 4,617 | 1,353 |
| 2042 | 16,532 | 3,798 | 260 | 202 | 46,938 | 61,212 | 3,941 | 1,113 |
| 2043 | 16,506 | 1,183 | 211 | 161 | 47,795 | 47,449 | 3,195 | 872 |
| 2044 | 14,864 | 0 | 167 | 127 | 48,670 | 32,349 | 2,359 | 624 |
| 2045 | 11,871 | 0 | 134 | 100 | 49,564 | 15,829 | 1,444 | 373 |
| 2046 | 8,728 | 0 | 98 | 73 | 48,293 | 0 | 543 | 138 |
| 2047 | 5,443 | 0 | 61 | 45 | 29,735 | 0 | 335 | 84 |
| 2048 | 2,020 | 0 | 23 | 16 | 10,414 | 0 | 117 | 29 |
| Total | 582,948 | 301,178 | 8,677 | 7,594 | 1,207,271 | 3,315,179 | 195,208 | 100,944 |
| First 20 Years | 372,799 | 197,636 | 4,540 | 4,238 | 579,204 | 2,315,465 | 132,758 | 80,312 |

Footnotes:

- (1) Appendix 2.1 Col (3) prior year plus half current year anticipated revenues minus half current year anticipated expenditures, Limited to \$8,000,000 first year, then next two years of anticipated expenditures for subsequent years
- (2) Appendix 2.1 Col (3) prior year plus half current year anticipated revenues minus half current year anticipated expenditures minus Col (1)
- (3) Col (1) x Appendix 2.4 Col (1) + Col (2) x Appendix 2.4 Col (2)
- (4) Col (3) x Appendix 2.4 Col (4)
- (5) Appendix 3.1 Col (3) prior year plus half current year anticipated revenues minus half current year anticipated expenditures, Limited to next two years of anticipated expenditures
- (6) Appendix 3.1 Col (3) prior year plus half current year anticipated revenues minus half current year anticipated expenditures minus Col (1)
- (7) Col (5) x Appendix 2.4 Col (5) + Col (6) x Appendix 2.4 Col (6)
- (8) Col (7) x Appendix 2.4 Col (8)

| Appendix 3.1 Summary | | | |
|--|--------------|--------|---------------------------|
| Special Reclamation Water Trust Fund | | | |
| Projected Cash Flow For 2014 to 2048 | | | |
| Using Coal Tax Rate of 19.06 Cents (in \$ Thousands) | | | |
| Fiscal Year Ending 6/30 | Expenditures | Income | Projected Fund Balance |
| | (1) | (2) | (3) |
| 2013 | 0 | 0 | 22,488 |
| 2014 | 0 | 23,581 | 46,068 |
| 2015 | 0 | 23,441 | 69,509 |
| 2016 | 0 | 23,715 | 93,225 |
| 2017 | 0 | 23,644 | 116,868 |
| 2018 | 0 | 22,580 | 139,448 |
| 2019 | 15,620 | 22,236 | 146,064 |
| 2020 | 15,987 | 21,911 | 151,988 |
| 2021 | 16,304 | 21,541 | 157,225 |
| 2022 | 15,930 | 21,414 | 162,710 |
| 2023 | 16,232 | 21,183 | 167,661 |
| 2024 | 16,535 | 20,776 | 171,902 |
| 2025 | 16,841 | 20,323 | 175,383 |
| 2026 | 17,151 | 19,951 | 178,183 |
| 2027 | 17,465 | 19,552 | 180,270 |
| 2028 | 17,784 | 19,099 | 181,585 |
| 2029 | 18,107 | 18,662 | 182,139 |
| 2030 | 18,436 | 18,198 | 181,901 |
| 2031 | 18,769 | 17,702 | 180,834 |
| 2032 | 19,108 | 17,141 | 178,868 |
| 2033 | 19,452 | 16,533 | 175,948 |
| 2034 | 19,802 | 16,001 | 172,147 |
| 2035 | 20,157 | 15,396 | 167,387 |
| 2036 | 20,518 | 14,748 | 161,617 |
| 2037 | 20,886 | 14,077 | 154,807 |
| 2038 | 21,262 | 13,381 | 146,926 |
| 2039 | 21,645 | 12,651 | 137,933 |
| 2040 | 22,036 | 11,887 | 127,784 |
| 2041 | 22,434 | 11,079 | 116,429 |
| 2042 | 22,841 | 10,223 | 103,811 |
| 2043 | 23,257 | 9,317 | 89,871 |
| 2044 | 23,681 | 8,336 | 74,526 |
| 2045 | 24,114 | 7,293 | 57,705 |
| 2046 | 24,556 | 6,276 | 39,425 |
| 2047 | 25,008 | 5,964 | 20,381 |
| 2048 | 25,469 | 5,654 | 565 |

Footnotes:

- (1) Appendix 3.2 Expenditures Col (7)
- (2) Appendix 3.3 Revenue Col (4)
- (3) Prior Col (3) + (Col (2) - Col (1))

Appendix 3.2 Expenditures
Special Reclamation Water Trust Fund
 Projected Cash Flow For 2014 to 2048
 Using Coal Tax Rate of 19.06 Cents (in \$ Thousands)

| Fiscal Year Ending 6/30 | Land Capital | Water Capital | Water Abandonment | Ongoing Water | Fixed Water Treatment | Administration Costs | Total Expenditures |
|----------------------------|--|------------------|----------------------|------------------|--------------------------|-------------------------|-----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| 2013 | | | | | | | |
| 2014 | | | | | | | |
| 2015 | | | | | | | |
| 2016 | | | | | | | |
| 2017 | | | | | | | |
| 2018 | | | | | | | |
| | Cost covered by Special Reclamation Fund until 2019 | | | | | | |
| 2019 | | 2,047 | 0 | 13,573 | 0 | | 15,620 |
| 2020 | | 2,022 | 0 | 13,965 | 0 | | 15,987 |
| 2021 | | 1,946 | 0 | 14,358 | 0 | | 16,304 |
| 2022 | | 1,246 | 0 | 14,684 | 0 | | 15,930 |
| 2023 | | 1,215 | 0 | 15,016 | 0 | | 16,232 |
| 2024 | | 1,183 | 0 | 15,352 | 0 | | 16,535 |
| 2025 | | 1,150 | 0 | 15,692 | 0 | | 16,841 |
| 2026 | | 1,116 | 0 | 16,036 | 0 | | 17,151 |
| 2027 | | 1,082 | 0 | 16,383 | 0 | | 17,465 |
| 2028 | | 1,049 | 0 | 16,735 | 0 | | 17,784 |
| 2029 | | 1,016 | 0 | 17,092 | 0 | | 18,107 |
| 2030 | | 984 | 0 | 17,452 | 0 | | 18,436 |
| 2031 | | 951 | 0 | 17,818 | 0 | | 18,769 |
| 2032 | | 920 | 0 | 18,188 | 0 | | 19,108 |
| 2033 | | 889 | 0 | 18,563 | 0 | | 19,452 |
| 2034 | | 859 | 0 | 18,943 | 0 | | 19,802 |
| 2035 | | 828 | 0 | 19,328 | 0 | | 20,157 |
| 2036 | | 799 | 0 | 19,719 | 0 | | 20,518 |
| 2037 | | 771 | 0 | 20,116 | 0 | | 20,886 |
| 2038 | | 744 | 0 | 20,518 | 0 | | 21,262 |
| 2039 | | 718 | 0 | 20,927 | 0 | | 21,645 |
| 2040 | | 693 | 0 | 21,342 | 0 | | 22,036 |
| 2041 | | 670 | 0 | 21,765 | 0 | | 22,434 |
| 2042 | | 647 | 0 | 22,194 | 0 | | 22,841 |
| 2043 | | 626 | 0 | 22,631 | 0 | | 23,257 |
| 2044 | | 606 | 0 | 23,075 | 0 | | 23,681 |
| 2045 | | 586 | 0 | 23,528 | 0 | | 24,114 |
| 2046 | | 568 | 0 | 23,989 | 0 | | 24,556 |
| 2047 | | 550 | 0 | 24,458 | 0 | | 25,008 |
| 2048 | | 533 | 0 | 24,937 | 0 | | 25,469 |

Footnotes:

- (2) Exhibit 1.7 Col (6)
- (3) Exhibit 1.8 Col (6)
- (4) Exhibit 1.9 Col (6)
- (5) Exhibit 1.10 Col (1)
- (7) Sum of Col (1) through (6)

| Appendix 3.3 Revenue | | | | |
|--|-------------------|--------------------------|----------------------|------------------|
| Special Reclamation Water Trust Fund | | | | |
| Projected Cash Flow For 2014 to 2048 | | | | |
| Using Coal Tax Rate of 19.06 Cents (in \$ Thousands) | | | | |
| Fiscal Year Ending 6/30 | SRWTF Coal Tax | Bond, Penalties, etc. | Investment Income | Total Revenue |
| | (1) | (2) | (3) | (4) |
| 2013 | 0 | 0 | 0 | 0 |
| 2014 | 21,713 | 0 | 1,867 | 23,581 |
| 2015 | 20,293 | 0 | 3,148 | 23,441 |
| 2016 | 19,283 | 0 | 4,432 | 23,715 |
| 2017 | 18,757 | 0 | 4,887 | 23,644 |
| 2018 | 17,289 | 0 | 5,290 | 22,580 |
| 2019 | 16,163 | 0 | 6,073 | 22,236 |
| 2020 | 15,471 | 0 | 6,441 | 21,911 |
| 2021 | 14,766 | 0 | 6,774 | 21,541 |
| 2022 | 14,352 | 0 | 7,062 | 21,414 |
| 2023 | 13,841 | 0 | 7,343 | 21,183 |
| 2024 | 13,203 | 0 | 7,573 | 20,776 |
| 2025 | 12,560 | 0 | 7,763 | 20,323 |
| 2026 | 12,037 | 0 | 7,914 | 19,951 |
| 2027 | 11,526 | 0 | 8,026 | 19,552 |
| 2028 | 11,000 | 0 | 8,099 | 19,099 |
| 2029 | 10,533 | 0 | 8,129 | 18,662 |
| 2030 | 10,081 | 0 | 8,117 | 18,198 |
| 2031 | 9,641 | 0 | 8,061 | 17,702 |
| 2032 | 9,184 | 0 | 7,957 | 17,141 |
| 2033 | 8,729 | 0 | 7,803 | 16,533 |
| 2034 | 8,402 | 0 | 7,599 | 16,001 |
| 2035 | 8,051 | 0 | 7,345 | 15,396 |
| 2036 | 7,711 | 0 | 7,037 | 14,748 |
| 2037 | 7,404 | 0 | 6,673 | 14,077 |
| 2038 | 7,130 | 0 | 6,251 | 13,381 |
| 2039 | 6,883 | 0 | 5,769 | 12,651 |
| 2040 | 6,662 | 0 | 5,225 | 11,887 |
| 2041 | 6,462 | 0 | 4,617 | 11,079 |
| 2042 | 6,282 | 0 | 3,941 | 10,223 |
| 2043 | 6,122 | 0 | 3,195 | 9,317 |
| 2044 | 5,977 | 0 | 2,359 | 8,336 |
| 2045 | 5,849 | 0 | 1,444 | 7,293 |
| 2046 | 5,732 | 0 | 543 | 6,276 |
| 2047 | 5,630 | 0 | 335 | 5,964 |
| 2048 | 5,537 | 0 | 117 | 5,654 |

Footnotes:

- (1) Exhibit 1.12 Col (6) x (19.06 cents / 15 cents)
- (2)
- (3) Appendix 2.4a Col (7)
- (4) Sum of Col (1) through (3)

Consensus Coal Production Forecast for West Virginia: 2013

FINAL REPORT

Prepared for:

**Special Reclamation Fund Advisory Council,
West Virginia Department of Environmental Protection**

Date:

August 13, 2013



CBER
CENTER FOR BUSINESS
AND ECONOMIC RESEARCH

Consensus Coal Production Forecast for West Virginia: 2013

FINAL REPORT

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Disclaimer:

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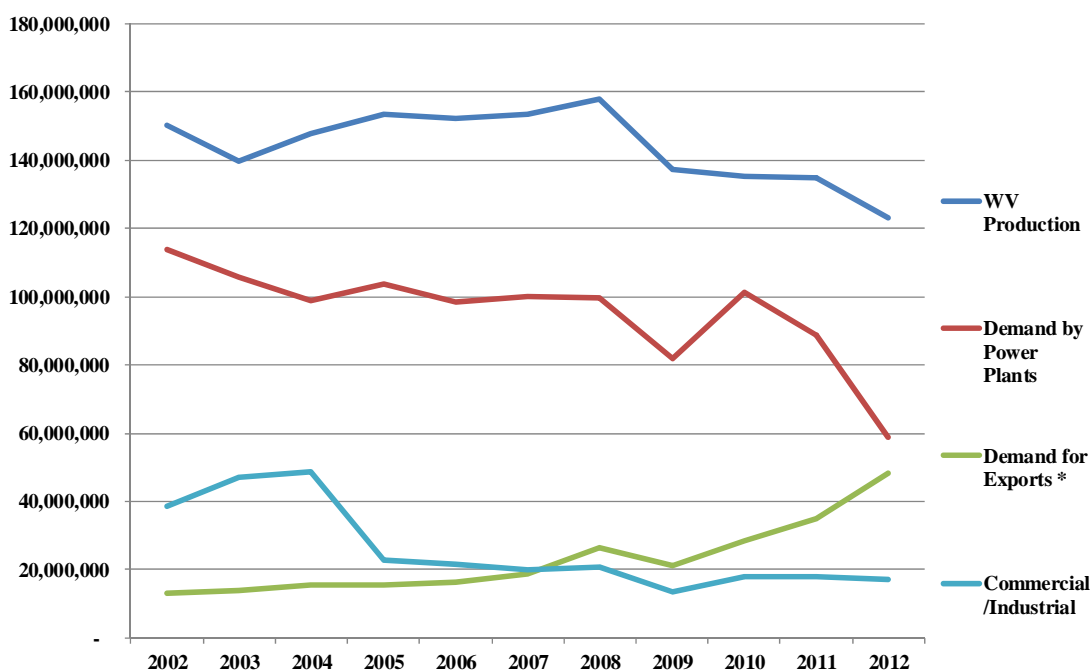
Consensus Coal Production Forecast for West Virginia: 2013

Overview

This report describes the results of the 2013 Consensus Coal Forecast conducted by the Marshall University Center for Business & Economic Research for the Special Reclamation Fund Advisory Council. The report begins with a brief summary of recent trends in West Virginia (WV) Coal Production and then describes each of the four component forecasts used to develop the Consensus Forecast.

West Virginia coal production for 2012 was around 123 million tons (Mine Safety & Health Administration 2013).¹ This represents a decline of about nine percent from the 135 million tons produced in 2011 and is 23 percent below 2008 production of 158 million tons, the height of production during the 2002 to 2012 time period. The most significant contributor to the recent decline has been very low natural gas prices, with the electricity sector demonstrating considerably lower demand and widespread substitution of natural gas for coal. Increasing coal prices in Appalachia and WV also reduced competitiveness with Western and Midwestern coals. Figure 1 shows the recent trends with preliminary sector-level data for 2012.

Figure 1: Historical West Virginia Coal Production and Components of Demand (tons)



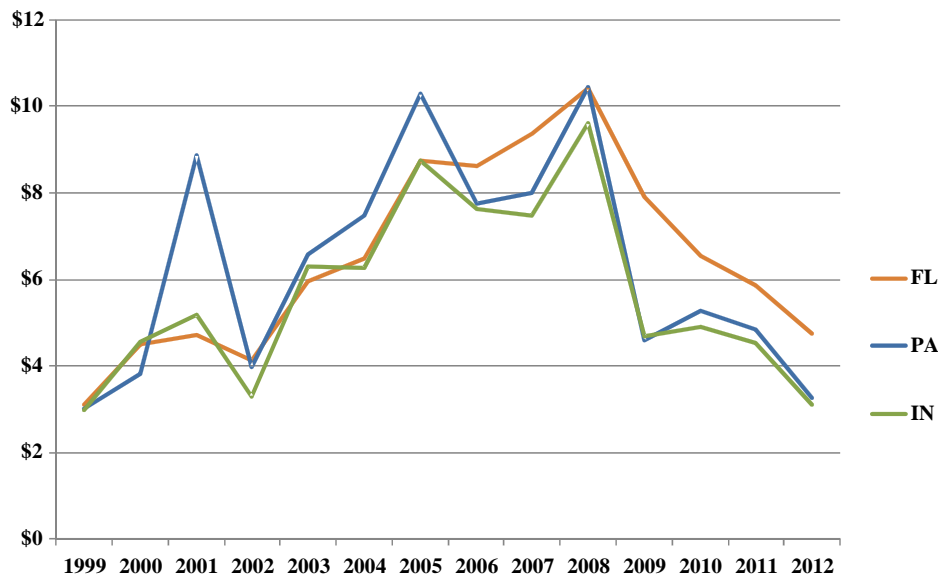
Source: (EIA 2013, MSHA 2013). * 2012 volumes estimated by MU CBER.

¹ 123.2 million tons is the final 2012 value published by the MSHA, the source of EIA's publications, and is clean coal production reported on MSHA Form 7000-2. As EIA will conduct its own internal evaluation of the data prior to publishing its 2012 Annual Coal Report what it reports as final tonnage for 2012 may not match this amount.

The Electricity Sector

Demand for coal by the electricity sector has declined and is expected to decline further as closure of many power plants in the Eastern U.S. has been announced for the 2014 to 2018 time period to comply with Environmental Protection Agency (EPA) air quality regulations. At least 75 plants that were customers of West Virginia coal between 2002 and 2011 have already retired or have announced full retirement by 2018. Several plants due to retire have already reduced consumption of WV coal, thus causing the effects of retirement to occur sooner. The ability to observe individual plant coal consumption changes while gas prices were at recent historical lows allowed valuable insight into the relative sensitivity of coal demand by plants at varying locations and with varying characteristics, both for total and WV coal. Figure 2 shows average delivered natural gas prices to the electricity industry for select states that are also major customers of West Virginia coal.

Figure 2: Natural Gas Prices to Electric Power Consumers, 1999 to 2012 (Select States)



Source: EIA, 2013.

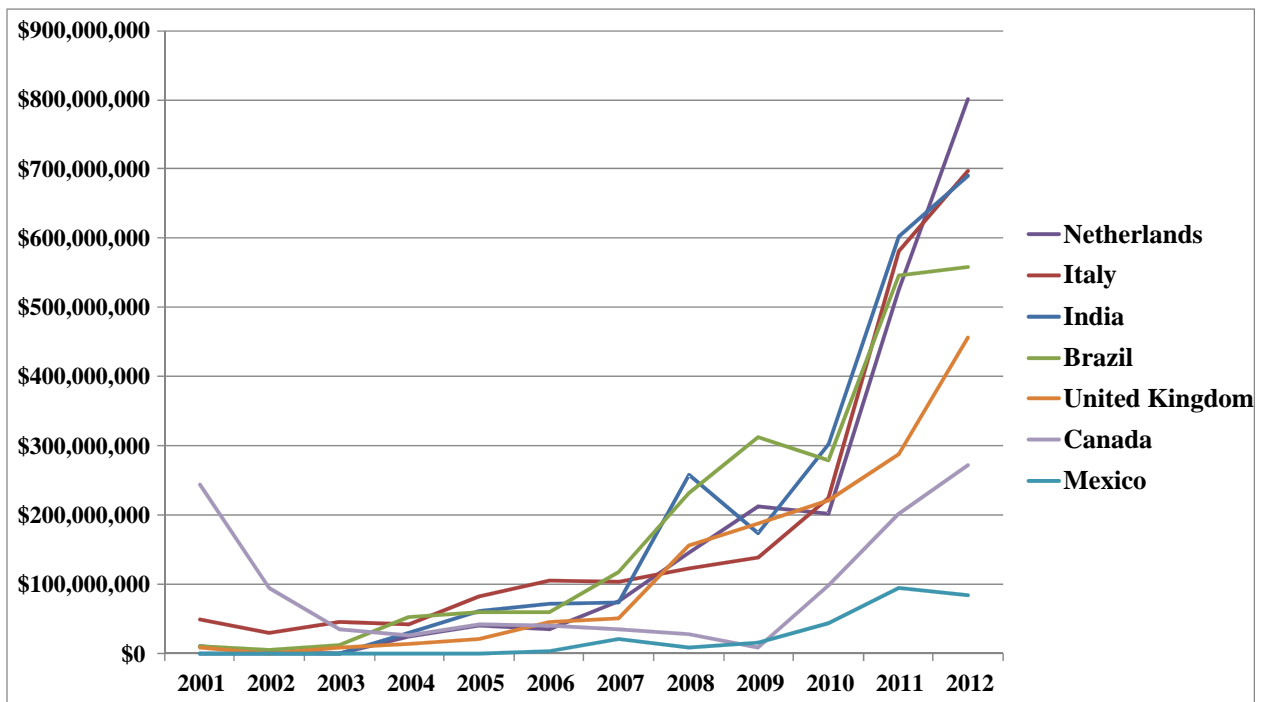
The Industrial Sector

As shown in Figure 1, demand for coal by the industrial sector, i.e. coke plants and self-generating manufacturers, was less responsive than demand at power plants to the low natural gas prices observed in 2012. For the steel industry in particular, fuel substitution represents more of a long-term opportunity rather than a short-term opportunity as opposed to the electricity industry where substitution is for some suppliers a very short-term decision. Demand for WV coal by industrial self-generators also declined but not as dramatically as within the electricity industry.

Exports

West Virginia's coal exports more than tripled during the study period. Exports have been considerably uncorrelated with prices, with the large growth between 2010 and 2012 being major points of observation. West Virginia has a historical average market share of about one-third of total US volume. This share is likely to have risen in 2012², based on growth in export value of 40 percent, although it is uncertain whether the current volumes can be sustained. The State has consistent exports to more than 30 countries throughout the world, and the Energy Information Administration (EIA) expects these countries to increase overall coal consumption by 60 percent by 2035 from 2011 levels. European countries are expected to reduce consumption while countries in the Middle East, South America, Africa and Asia are expected to increase consumption. Total US coal exports are projected to grow by 25% from 2012 to 2035, based on 2012 exports of 126 million tons. Figure 3 shows WV coal export trends for the top five importing countries in 2012 by value (Netherlands, Italy, India, Brazil, United Kingdom), plus Canada and Mexico.

Figure 3: West Virginia Coal Exports by Value, Top 5 Countries + Canada & Mexico



Source: (International Trade Administration 2013)

² 2012 data for coal export tonnage by U.S. State of origin has not yet been released.

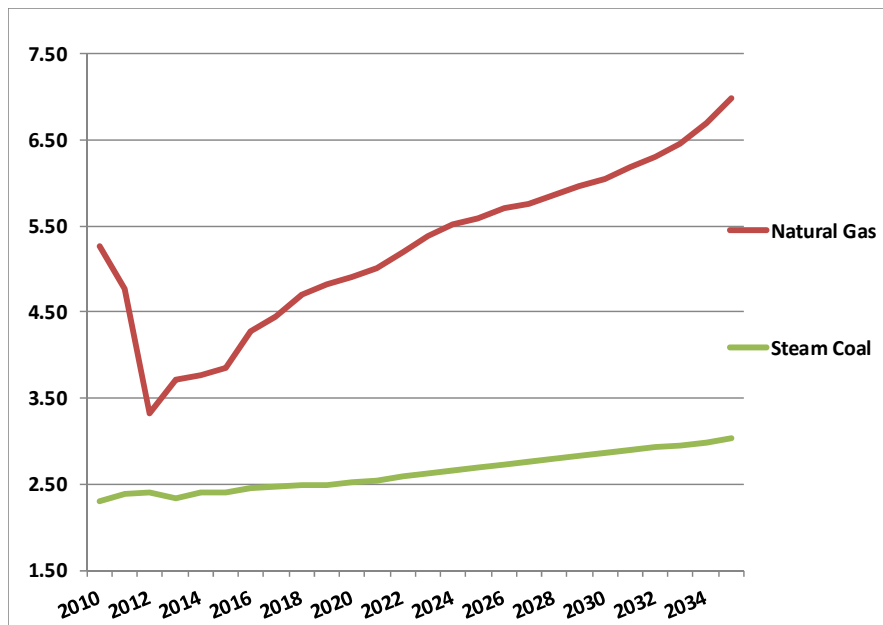
Looking Forward

Future demand for West Virginia Coal depends on several variables with uncertain outcomes including the prices of competing fuels, the longevity of the fleet of coal-fired power plants that have historically burned coal from the State and economic activity of importing countries.

The capacity of power plants available to use West Virginia coal is shrinking as many older plants retire, some ahead of schedule in order to comply with federal air-quality regulations. The recent announcement of the intent to close the Hatfield's Ferry plant, a large generator of 1970s vintage, demonstrates this uncertainty.

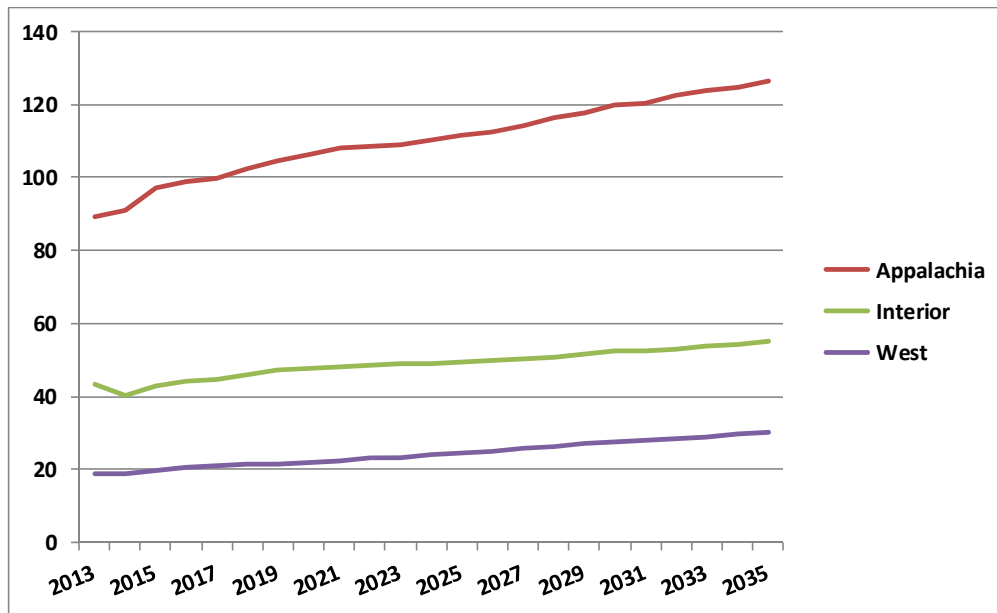
A very important factor affecting utilization of coal-fired power plants is the price of natural gas, which is in turn influenced by a number of other factors. Supply of natural gas has been very high, putting downward pressure on prices. Future developments such as increased exports of liquefied natural gas could put upward pressure on natural gas prices, although analyses differ on this outcome. Some analysis projects very little increase in prices due to increased exports (Deloitte 2011) while others expect more moderate increases (NERA Economic Consulting 2013) depending on supply. In its AEO 2013 Base Case analysis of commodities delivered to the electricity sector, the EIA projects natural gas prices to increase at a faster rate than coal prices.

Figure 4: EIA Forecasted Natural Prices & Coal to Electricity Sector (2011 \$/MMBtu)



The relative price of West Virginia coal and Western and Illinois-basin coal is another factor. WV producers have been losing market share in the power generation sector to coal produced in Illinois and further west as plant operators substitute lower-btu, lower cost coal for WV coal. Installation of scrubbers on many power plants also allows greater usage of high-sulfur coal such as that found in Illinois. The EIA projects Appalachian coal prices to increase at a higher rate than Interior coal prices (includes Illinois) but at a slower rate than Western coal.

Figure 5: EIA Forecasted Minemouth Coal Prices, by Region (2011 \$/ton)



Component Forecasts

Energy Information Administration (EIA)

Publication: Annual Energy Outlook 2013

Date: April 2013

Forecast Horizon: 2012-2040

Region(s): Northern Appalachia, Central Appalachia

The EIA provides a forecast of coal production by region in its Annual Energy Outlook, projecting 20 to 30 years into the future. This projection is generated using the National Energy Modeling System (NEMS). NEMS uses a market-based approach that balances energy supply and demand while considering regulations and industry standards.

As the EIA's forecasts are by coal-producing region only, some adjustments are made to adapt these figures to forecast West Virginia coal production. The Northern Appalachia region includes Pennsylvania, Maryland, Ohio, and Northern West Virginia while Central Appalachia includes Virginia, Eastern Kentucky, Northern Tennessee, and Southern West Virginia. To forecast West Virginia coal production through 2040, the annual growth rate for Northern Appalachia is applied to historical production figures for Northern West Virginia and the annual growth rate for Central Appalachia is applied to Southern West Virginia figures. Only the EIA Reference Case figures are used.

Key Assumptions/Results:

Macroeconomic Issues: The long-term macroeconomic projection from IHS Global Insight, Inc. is used in the EIA forecast. Real GDP growth averages 2.5% per year over the period from 2011 to 2040.

Coal Prices: Minemouth prices are expected to increase from \$41.16 per ton to \$61.28 per ton nationally by 2040, reflecting the assumption that coal mining productivity will continue to decline, but at slower rates than during the 2000s. EIA expects Appalachian coal prices to also increase due to a shift toward more higher-value coking coal exports.

Natural Gas Prices: Henry Hub³ spot prices for natural gas are expected to increase by an average 2.4% per year to \$7.83 per million Btu in 2040.

³ The Henry Hub in Louisiana is the delivery point for the natural gas futures contract on the New York Mercantile Exchange.

Electricity: Growth in overall electricity use has slowed but is still expected to increase by 28% from 2011 to 2040. Coal capacity additions in electricity generation are expected to be very low accounting for only 3% of total capacity additions through 2040.

Industrial/Commercial: The largest growth is expected to be in the industrial sector increasing energy use by 5.1 quadrillion Btu from 2011-2040. The commercial sector is expected to increase energy use 0.2% per year over the time period equaling 1.6 quadrillion Btu.

Exports: National coal exports are expected to increase by 48.6% by 2040. Forecasts for individual coal-producing regions are not published.

Environmental: Current legislation and environmental regulations for which implementing regulations were available as of September 30, 2012 are considered in the forecast. The reference case assumes regulations are primarily unchanged during the forecast horizon with the provision that policies with a sunset date will not exist past the stated date. Regulations considered include the Clean Air Interstate Rule (CAIR), the U.S. EPA’s National Emissions Standards for Hazardous Air Pollutants (NESHAP), and the Mercury and Air Toxics Standards (MATS). The Cross-State Air Pollution Rule (CSAPR) has been vacated.

Table 1: EIA Annual Energy Outlook 2013 Adapted to WV Production

| Historical | | Forecast | | |
|-------------|-------------|-------------|-------------|-------------|
| <u>2011</u> | <u>2012</u> | <u>2013</u> | <u>2014</u> | <u>2015</u> |
| 134.7 | 123.2 | 116.9 | 119.4 | 115.4 |
| Forecast | | | | |
| <u>2016</u> | <u>2017</u> | <u>2018</u> | <u>2019</u> | <u>2020</u> |
| 116.1 | 117.2 | 109.2 | 104.1 | 104.6 |
| Forecast | | | | |
| <u>2021</u> | <u>2022</u> | <u>2023</u> | <u>2024</u> | <u>2025</u> |
| 103.4 | 106.0 | 108.8 | 108.2 | 107.9 |
| Forecast | | | | |
| <u>2026</u> | <u>2027</u> | <u>2028</u> | <u>2029</u> | <u>2030</u> |
| 108.6 | 108.4 | 107.3 | 107.4 | 107.7 |
| Forecast | | | | |
| <u>2031</u> | <u>2032</u> | <u>2033</u> | <u>2034</u> | <u>2035</u> |
| 107.8 | 105.8 | 104.4 | 104.9 | 104.7 |

Energy Ventures Analysis (EVA)

Publication: Long-Term Forecast

Date: May 2013

Forecast Horizon: 2013-2040

Region(s): Northern Appalachia, Central Appalachia, West Virginia

EVA utilizes the Aurora XP Dispatch Model that calculates electricity generation by fuel type by developing the least cost generation situation that will meet power demand. All existing and planned generation capacity is included and the model can add or retire capacity as needed (Energy Ventures Analysis 2013).

Key Assumptions/Results:

Macroeconomic Issues: GDP growth is expected to average 2.3% per year through 2040.

Coal Prices: Coal prices for both Northern and Central Appalachia are expected to increase. Northern Appalachia will reach a price of almost \$70 per ton (\$2013) and Central Appalachia will see a price over \$90 per ton by 2040, averaged for both metallurgical and steam coals.

Natural Gas Prices: A competitive gas supply is a key assumption of the model. Gas prices are expected to steadily increase through 2040 resulting in a price over \$7 per MMBtu.

Electricity: Growth in electricity demand is expected to average 1.3% per year through 2040. Demand for Appalachian coal by the electricity sector will fall by 50% between 2012 and 2040.

Industrial/Commercial: Non-coke industrial demand for Appalachian coal will fall by about 40% by 2040. Demand for metallurgical coal from Northern and Central (primarily) Appalachia will rise by about 20% by 2040.

Exports: Steam coal exports from Northern and Central (primarily) Appalachia will peak in 2013 and decline by about 45% by 2040. Met coal exports from Northern and Central (primarily) Appalachia will peak in 2012 and decline by about 40% by 2040. An export terminal will be constructed in the Pacific Northwest to deliver coal from the Powder River Basin (PRB) and the Rockies to Asia. Compared to 2011 volume, total Appalachian coal exports decline by 35% by 2040.

Environmental: CAIR is assumed to continue with impacted emitters exceeding compliance. CSAPR has been overturned and will not be replaced. MATS will continue through April 2015 plus a one year extension. Section 316(b) of the Clean Water Act, which covers cooling water intake structures, requires compliance by 2018 and the Coal Combustion Residuals (CCR) requires compliance by 2020. National Ambient Air Quality Standards (NAAQS) revisions will become effective after 2018. Greenhouse Gas New Source Performance Standard is assumed to

see significant revisions to the draft proposal, and CO2 policies are not considered at the national level.

Table 2: EVA Long-Term Forecast 2013, Million Tons

| Historical | | Forecast | | |
|-------------|-------------|-------------|-------------|-------------|
| <u>2011</u> | <u>2012</u> | <u>2013</u> | <u>2014</u> | <u>2015</u> |
| 134.7 | 123.2 | 117.1 | 115.3 | 110.2 |
| Forecast | | | | |
| <u>2016</u> | <u>2017</u> | <u>2018</u> | <u>2019</u> | <u>2020</u> |
| 102.8 | 105.0 | 104.4 | 103.3 | 101.0 |
| Forecast | | | | |
| <u>2021</u> | <u>2022</u> | <u>2023</u> | <u>2024</u> | <u>2025</u> |
| 101.7 | 102.8 | 101.6 | 102.1 | 100.3 |
| Forecast | | | | |
| <u>2026</u> | <u>2027</u> | <u>2028</u> | <u>2029</u> | <u>2030</u> |
| 99.5 | 99.2 | 98.9 | 98.4 | 97.1 |
| Forecast | | | | |
| <u>2031</u> | <u>2032</u> | <u>2033</u> | <u>2034</u> | <u>2035</u> |
| 95.3 | 93.8 | 91.1 | 87.9 | 82.8 |

Marshall University Center for Business and Economic Research (CBER)

Publication: MU CBER West Virginia Coal Production Forecast 2013

Date: June 2013

Forecast Horizon: 2012-2035

Region(s): West Virginia

The MU CBER West Virginia Coal Production Forecast is partly a simulation-style approach to short- and long-term coal production forecasting and partly an adoption of EIA's growth projections. This method utilizes electricity generation capacity as a primary factor influencing demand for coal by the electricity industry combined with observations of individual power plants to simulate future demand for West Virginia coal. The influence of many elements including environmental regulations, natural gas prices, and coal prices on future capacity are considered. The commercial, industrial, and export markets are evaluated separately, with inputs based largely on EIA demand assumptions and historical demand.

Key Assumptions/Results:

Macroeconomic Issues: Not separately considered outside of EIA's assumptions.

Coal Prices: The EIA projects minemouth coal prices in the Interior region to increase by about 1.4% per year through 2035. Appalachian coal prices are projected to increase by about 1.5% per year and Northern Great Plains, which includes the PRB, coal prices to increase by 2.8% per year.

Natural Gas Prices: The EIA projects real natural gas prices for power generation to return to 2011 levels in 2019 or 2020 and to increase by an average of 3.0% per year to \$6.98 (\$2011) per million Btu in 2035.

Electricity: Although electricity demand is expected to grow, no new coal-fired power plants are projected to be built within West Virginia's supply region. Thus, demand for West Virginia coal from the electricity industry is limited to the current portfolio of power plants. Individual plant demand is projected based on observed sensitivity to gas prices, comparing the relative sensitivity of change in total coal utilization to change in WV coal utilization. Plants that have not announced retirement are assumed to close upon reaching typical retirement age.

Industrial/Commercial: Assumes EIA's regional growth rate projections for coal consumed by industrial self-generators, coke plants and commercial facilities applies to users of WV coal. WV supplies coal to industrial customers in roughly a 20-state area that overlaps several sub-regions, each with a different consumption forecast. EIA forecasts different rates of growth or decline for sub-regions within WV's supply area and for the different types of users.

Exports: WV exports will return to historical average market shares in 2014, after peaking in 2012. From 2014 through 2035, WV will slowly lose market share, but will maintain export volumes at 2011 levels or higher. In the short-term, WV’s export volume will largely keep pace with that of the nation, but in the long-term increases in coal exports will come from other producing regions due to the location of growth markets and increasing demand for coal with lower energy value.

Environmental: Power plant closures simulate announced retirements made to comply with EPA regulations. Unscrubbed plants will no longer consume coal from WV after 2015.

Table 3: MU CBER West Virginia Coal Production Forecast 2013, Million Tons

| Historical | | Forecast | | |
|-------------|-------------|-------------|-------------|-------------|
| <u>2011</u> | <u>2012</u> | <u>2013</u> | <u>2014</u> | <u>2015</u> |
| 134.7 | 123.2 | 119.8 | 116.1 | 114.6 |
| Forecast | | | | |
| <u>2016</u> | <u>2017</u> | <u>2018</u> | <u>2019</u> | <u>2020</u> |
| 114.2 | 114.4 | 114.7 | 115.6 | 116.0 |
| Forecast | | | | |
| <u>2021</u> | <u>2022</u> | <u>2023</u> | <u>2024</u> | <u>2025</u> |
| 115.7 | 115.8 | 114.2 | 112.2 | 111.1 |
| Forecast | | | | |
| <u>2026</u> | <u>2027</u> | <u>2028</u> | <u>2029</u> | <u>2030</u> |
| 110.0 | 109.9 | 109.5 | 108.0 | 105.0 |
| Forecast | | | | |
| <u>2031</u> | <u>2032</u> | <u>2033</u> | <u>2034</u> | <u>2035</u> |
| 101.9 | 101.7 | 96.5 | 96.3 | 94.7 |

Consensus Forecast

The three long-term forecasts produced by EIA, EVA, and Marshall CBER are combined to create the Consensus Forecast for West Virginia Coal Production. A weighted average is used to combine the four projections as follows.

$$\begin{aligned}
 WV\ Coal\ Production_t & \\
 &= w_{EIA} * EIA\ Production_t + w_{EVA} * EVA\ Production_t + w_{CBER} \\
 &\quad * CBER\ Production_t
 \end{aligned}$$

The weight (w_i) assigned to each forecast is based on the accuracy of past forecasts by that organization. All available forecasts from 2009 through 2012 were evaluated for accuracy in the first four years of the forecast's horizon. For example, EIA's 2009 Annual Energy Outlook was assessed by considering the accuracy of its 2008, 2009, 2010, and 2011 projections.

This methodology was employed for various reasons. Only years since 2009 were evaluated due to the tumultuous macroeconomic conditions that appeared in late 2007 and 2008. This recession was not well predicted by national GDP indicators; therefore, the forecasts created prior to 2009 have inaccuracies based primarily on unexpected macroeconomic situations and not due to a lack of understanding of West Virginia's coal economy. Predictions for the first four years of the time horizon were considered because accuracy is typically highest at the beginning of the forecast. Long-term accuracy was not considered in this weighting method due to the large potential for unpredictable macroeconomic conditions to affect annual error.

The error (e_i) of a forecast was determined using the following formula.

$$e_{i,t} = \frac{Forecast\ Production_{i,t} - Actual\ Production_t}{Actual\ Production_t}$$

The absolute value of the errors was averaged for each forecasting organization to remove the effects of under-estimation and over-estimation canceling each other. CBER has no reported errors because 2013 is its first forecasting year. Table 4 shows the results of this process.

Table 4: Average Absolute Forecast Errors

| | Average Error |
|------|---------------|
| EIA | 4.26% |
| EVA | 9.12% |
| CBER | N/A |

The weight given to each organization in the consensus was calculated as follows.

$$w_i = \frac{\frac{1}{e_i}}{\sum_i \frac{1}{e_i}}$$

A low weight is assigned to the CBER forecast due to lack of previous forecast(s) to determine accuracy. A weight of 0.15 is assigned the entire time period (2013-2035). Results are shown in the following table.

Table 5: Consensus Weights

| 2013-2035 | |
|-----------|------|
| EIA | 0.58 |
| EVA | 0.27 |
| CBER | 0.15 |

Using the above weights, the Consensus Forecast is calculated. The results are shown in Table 6 and Figures 6 & 7. The Consensus Forecast for West Virginia Coal Production shows levels decreasing after 2012 and remaining stable through 2014 at 117 million tons. Production levels decrease moderately through 2016, show a slight increase in 2017, and decrease more rapidly through 2019. Production stabilizes around 105 million tons from 2019 through 2021. Levels increase moderately from 2022 to 2023. After 2023, West Virginia coal production is expected to decrease slowly through 2035 resulting in 97.3 million tons of coal produced.

Table 6: Consensus Forecast for West Virginia Coal Production 2013 (Million Tons)

| Historical | | Forecast | | |
|-------------|-------------|-------------|-------------|-------------|
| <u>2011</u> | <u>2012</u> | <u>2013</u> | <u>2014</u> | <u>2015</u> |
| 134.7 | 123.2 | 117.4 | 117.8 | 113.9 |
| Forecast | | | | |
| <u>2016</u> | <u>2017</u> | <u>2018</u> | <u>2019</u> | <u>2020</u> |
| 112.2 | 113.5 | 108.7 | 105.6 | 105.4 |
| Forecast | | | | |
| <u>2021</u> | <u>2022</u> | <u>2023</u> | <u>2024</u> | <u>2025</u> |
| 104.8 | 106.6 | 107.6 | 107.2 | 106.3 |
| Forecast | | | | |
| <u>2026</u> | <u>2027</u> | <u>2028</u> | <u>2029</u> | <u>2030</u> |
| 106.3 | 106.1 | 105.4 | 105.0 | 104.4 |
| Forecast | | | | |
| <u>2031</u> | <u>2032</u> | <u>2033</u> | <u>2034</u> | <u>2035</u> |
| 103.5 | 101.9 | 99.6 | 99.0 | 97.3 |

Figure 6: WV Coal Production - Consensus Forecast

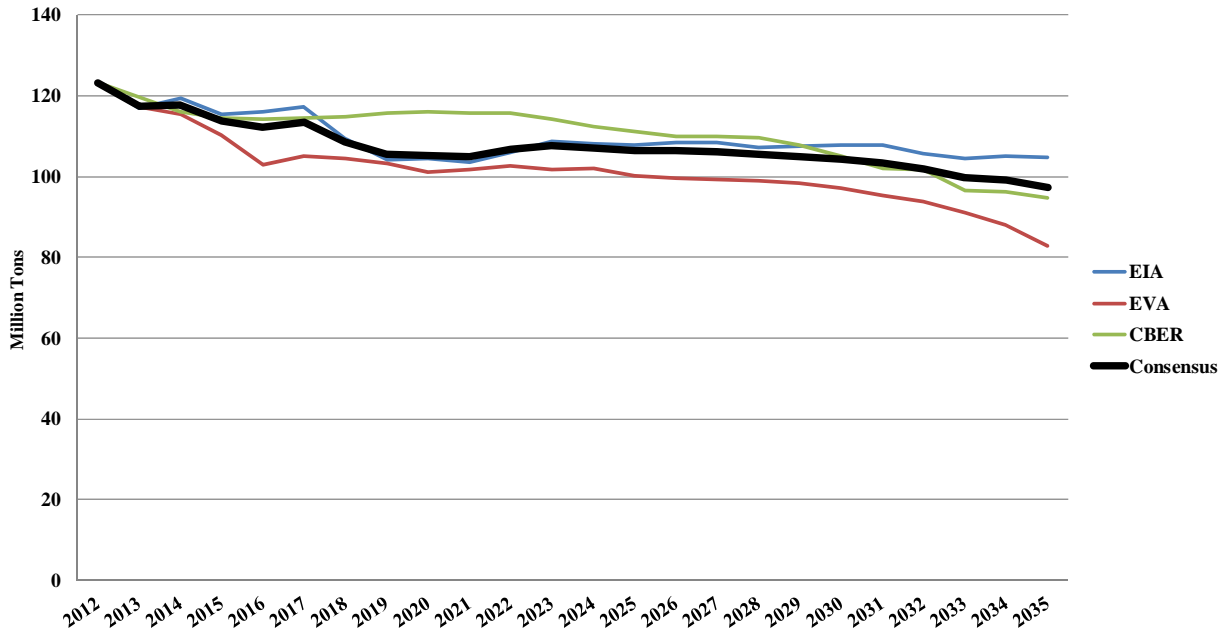


Figure 7: Consensus Forecast and Historical WV Coal Production, Million tons

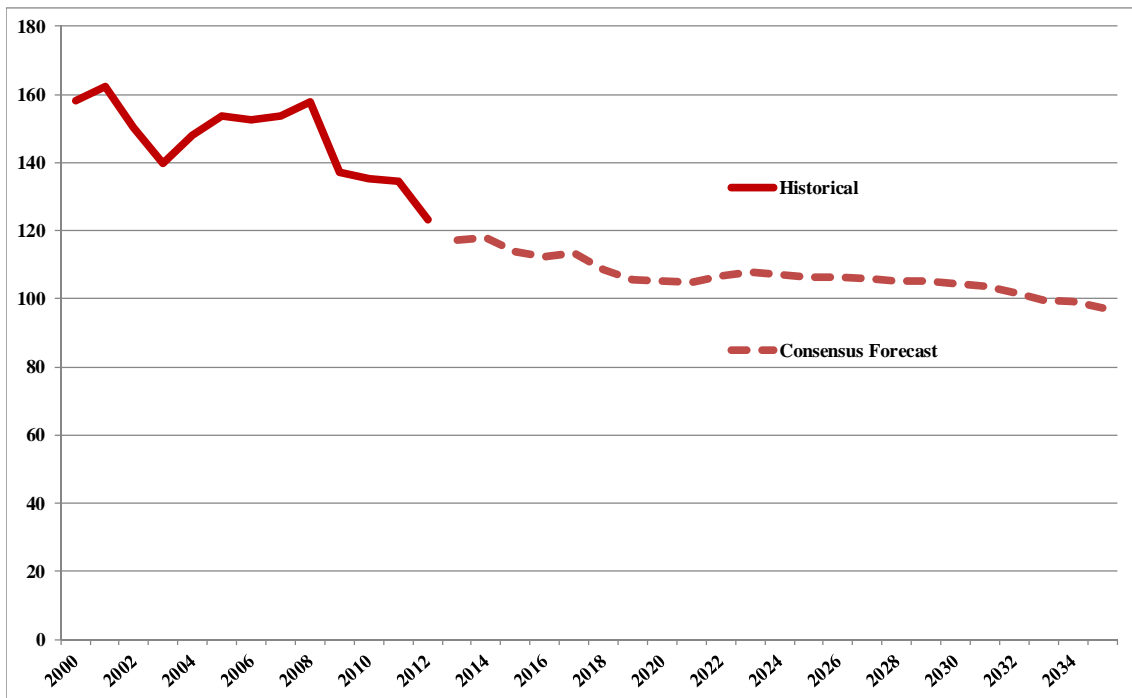


Table 7: Comparison of Consensus, Component Forecasts and 2012 Consensus

| West Virginia Coal Production – Million Tons | | | | | |
|---|--------------------------|------------|-------------|-----------------------|-----------------------|
| Year | Forecasting Group | | | | |
| | EIA | EVA | CBER | 2013 Consensus | 2012 Consensus |
| 2012 | 123.2 | 123.2 | 123.2 | 123.2 | 130.5 |
| 2013 | 116.9 | 117.1 | 119.8 | 117.4 | 123.1 |
| 2014 | 119.4 | 115.3 | 116.1 | 117.8 | 118.1 |
| 2015 | 115.4 | 110.2 | 114.6 | 113.9 | 113.1 |
| 2016 | 116.1 | 102.8 | 114.2 | 112.2 | 110.1 |
| 2017 | 117.2 | 105.0 | 114.4 | 113.5 | 105.8 |
| 2018 | 109.2 | 104.4 | 114.7 | 108.7 | 102.6 |
| 2019 | 104.1 | 103.3 | 115.6 | 105.6 | 100.4 |
| 2020 | 104.6 | 101.0 | 116.0 | 105.3 | 96.0 |
| 2021 | 103.4 | 101.7 | 115.7 | 104.8 | 96.3 |
| 2022 | 106.0 | 102.8 | 115.8 | 106.6 | 96.9 |
| 2023 | 108.8 | 101.6 | 114.2 | 107.6 | 95.1 |
| 2024 | 108.2 | 102.1 | 112.2 | 107.2 | 95.0 |
| 2025 | 107.9 | 100.3 | 111.1 | 106.3 | 94.9 |
| 2026 | 108.6 | 99.5 | 110.0 | 106.3 | 95.6 |
| 2027 | 108.4 | 99.2 | 109.9 | 106.1 | 98.1 |
| 2028 | 107.3 | 98.9 | 109.5 | 105.4 | 97.0 |
| 2029 | 107.4 | 98.4 | 108.0 | 105.0 | 97.3 |
| 2030 | 107.7 | 97.1 | 105.0 | 104.4 | 99.2 |
| 2031 | 107.8 | 95.3 | 101.9 | 103.5 | |
| 2032 | 105.8 | 93.8 | 101.7 | 101.9 | |
| 2033 | 104.4 | 91.1 | 96.5 | 99.6 | |
| 2034 | 104.9 | 87.9 | 96.3 | 99.0 | |
| 2035 | 104.7 | 82.8 | 94.7 | 97.3 | |

Summary

The 2013 West Virginia Consensus Coal Forecast figures are somewhat higher than the 2012 Consensus. A primary reason for this is the vacating of the CSAPR, which caused EIA to raise their 2013 projections for Appalachian coal production and to reduce projections for Western coal production throughout much of the forecast time period. The CSAPR had limitations on emissions trading that forced emissions reductions in all states, as well as lower emissions caps and more rapid phasing in of those caps (Energy Information Administration 2013). This factor outweighs the lower forecasted natural gas prices expected to be delivered to the electric power sector compared to the 2012 AEO. As the EIA is the dominant forecast utilized to construct the Consensus, its assumptions heavily influence forecast production levels.

Bibliography

Deloitte. "Made in America: The economic impact of LNG exports from the United States." 2011.

Energy Information Administration. "Annual Energy Outlook 2013." 2013.

Energy Information Administration. *Natural Gas Prices, Annual Data Series*. 2013.

Energy Information Administration. *Quarterly Coal Report*. U.S. Department of Energy, 2013.

Energy Ventures Analysis. *Base Case Review*. 2013.

International Trade Administration. *TradeStats Express*. 2013.
<http://tse.export.gov/TSE/TSEhome.aspx> (accessed 2013).

NERA Economic Consulting. "Macroeconomic Impacts of LNG Exports from the United States." 2013.

West Virginia University. "Consensus Coal Production and Price Forecast for West Virginia: 2012 Update." 2012.

| | |
|--------------------------------------|--|
| WVDEP Contractual Agreement # | AGM 068 |
| Investigators | Paul Ziemkiewicz, Tom He, Jennifer Hause |
| Type of Report | Quarterly Progress Report, #3 |
| Summary Report | 1 Jan 2014 |
| Project Title | Aluminum Removal: Field Trials at WVDEP Special Reclamation Sites |
| Performing Organization | West Virginia University West Virginia Water Research Institute |
| | |

Introduction

The West Virginia Department of Environmental Protection Office of Special Reclamation (WVDEP OSR) will soon be required to obtain National Pollutant Discharge Elimination System (NPDES) permits for water discharges from some of its AMD treatment systems at bond forfeiture (BF) sites. Total aluminum discharge limits of 0.750 mg/L and 0.087 mg/L for discharges into non-trout and trout waters respectively are anticipated. Many of the state's BF sites experience intermittent aluminum discharges above these levels utilizing their existing treatment systems. In an effort to assist the WVDEP OSR determine plausible options for reducing aluminum concentrations from these sites, a field study was conducted using portable treatment units on the discharge side of existing BF treatment facilities.

Three sites were identified within Monongalia County, West Virginia, for the field study:

1. S. Kelly Industries
2. Valley Mining Company
3. Stewartstown Coal Corporation

Existing treatment systems at each of these locations consist of introducing either calcium hydroxide or calcium oxide followed by a series of settlement ponds. The **objective** of this field study is to identify cost-effective and efficient treatment methods to reduce total aluminum in the discharges from BF sites to a level that will meet anticipated NPDES permit requirements.

Three tanks were set up at the selected locations and filled with three media: stainless steel wool, bio-blocks, and fiberglass insulation see **Figures 1, 2, and 3**. Effluent from the treatment systems was introduced to the tanks at a flow rate of approximately 2 gpm. Effluent sampling was conducted every two weeks.



Figure 1: Steel wool media



Figure 2: Bioblocks media



Figure 3: Fiberglass insulation media (grate to hold insulation in place)

Data from the S. Kelly site was used to determine the service life of a treatment unit. Service life is defined as the period between either replacement or washing of the media. Since none of the media are consumed during service, we expect that servicing would involve cleaning accumulated sediment from the media and the tank. Service life is a critical factor in determining a treatment method's viability. For example, examination of the treatment media shows solids accumulation leading to the high TSS observed at the sampling port. Figure 4 shows sediment accumulation in the control cell.



Figure 4: Solids accumulation in the control treatment unit

Results

The treatment system at the Stewartstown Coal Corp. site was washed out during heavy rains in early September 2013 while another site (Valley Mining Co.) experienced wide pH variations. The S. Kelly site yielded the largest data set. Early results indicated that bioblocks and fiberglass reduced aluminum but not to the extent that stainless steel wool did. Therefore, to extend the sampling period, we shifted focus to the stainless steel wool treatment units with a total of 28 observations during the project.

Excluding the unstable operating period at the S. Kelly site (from early June through mid-July) due to clogging from leafy debris, it took about two months for the steel wool treatment unit to show significant sediment accumulation. While total aluminum increased above 0.750 mg/L in December 2013, the pH had also decreased to below 5.6. The previous sampling, in November 2013 was less than 0.750 mg/L at a pH of 8.2. So it is not clear whether the drop off in performance in December was a function of sediment accumulation or pH.

Results from all sites indicate the steel wool was most effective in Al removal but its performance is strongly dependent on pH. Within the range of about 5.8 to 8.5 it consistently removed total Al to below 0.750 mg/L (table 1). Within that pH range total aluminum remained less than 0.087 mg/L 69% of the time while dissolved aluminum was less than 0.087 mg/L in all samples. To achieve a total aluminum discharge of less than 0.087 mg/L, a slightly narrower pH range is required (5.6 to 8.2).

Stainless steel wool removed, on average, 82% of total aluminum and slightly less dissolved aluminum within the pH range of 5.6 to 8.5 (table 2). Bioblocks and fiberglass insulation also removed significant Al with bioblocks performing somewhat better than fiberglass insulation.

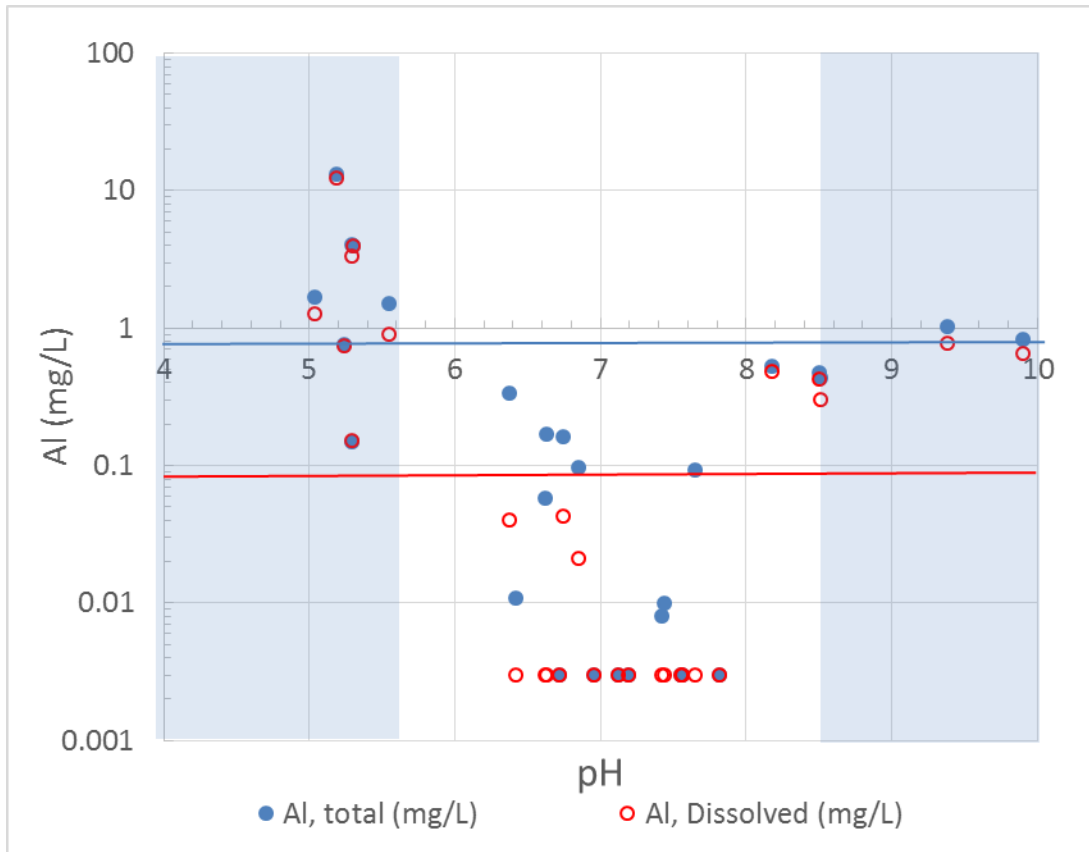


Figure 5. Concentrations of aluminum after treatment with stainless steel wool. The unshaded area represents the pH ranges where treatment was effective.

Table 1. The following results indicate the effect of treating AMD treatment system effluent with stainless steel wool. The data show the proportion of samples from all test sites that were below the two discharge criteria: 0.087 and 0.750 mg/L at three pH ranges.

| Al species | Al std | pH range | | |
|------------|--------|----------|---------|-------|
| | | < 5.6 | 5.6-8.2 | > 8.2 |
| dissolved | <0.087 | 0% | 100% | 0% |
| total | <0.087 | 0% | 69% | 0% |
| | | < 5.6 | 5.6-8.5 | > 8.5 |
| dissolved | <0.750 | 29% | 100% | 50% |
| total | <0.750 | 14% | 100% | 0% |

Table 2. Percent reduction in dissolved and total aluminum within three pH ranges when treated with stainless steel wool.

| | pH range | | |
|--------------|----------|---------|-------|
| | < 5.6 | 5.6-8.5 | > 8.5 |
| Al dissolved | -25% | -74% | 3% |
| Al total | -41% | -82% | -10% |

Conclusions

Three non-reactive treatment media were evaluated for passive removal of total and dissolved aluminum. Treatment targets were the trout and non-trout stream criteria: 0.087 and 0.750 mg total Al/L respectively. Two treatments were moderately effective: bioblocks-a polymer sponge material and fiberglass insulation. The best treatment, however was stainless steel wool. For all media, performance was strongly dependent on pH and within the optimal range 5.6 to 8.5, 100% of observations were less than 0.750 mg/L while 69% of observations were less than 0.087 mg/L. The upper boundary of the optimal pH range was slightly lower for achieving the 0.087 mg total Al/L standard: 8.2 vs. 8.5. Dissolved aluminum concentrations were all less than 0.087 mg/L within both pH ranges. The results indicate that stainless steel wool would be an effective end of system treatment for maintaining compliance at BF sites. The technology would be improved by scaling up to operational levels and fine tuning to identify optimal design and operating conditions. Since the media is not consumed, the only maintenance requirement would be to periodically remove/flush accumulated sediment.