

APPENDIX B



Further Credit Analysis

Technical Memorandum

Draft

October 25, 2008



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Introduction

The Southeast Metro Stormwater Authority (SEMSWA) Board is considering the possibility of offering credits to SEMSWA customers, a policy-based component of the rate structure that would reduce the user fees some properties pay. SEMSWA received an initial analysis of credit options for the Board's review. Based on that analysis, the Board has recommended several types of credits for further analysis: quality and quantity credits, low density single-family residential credits, and self-maintenance credits. The analysis was performed and the results were reviewed by staff. This memorandum presents the more detailed analysis of these types of credits along with staff's opinions on the feasibility and efficacy of each credit.

Background

The "rate structure" of a public utility is the framework that describes how much each parcel pays. One component of a rate structure is a rate modifier, of which credits are one type. A credit is an ongoing reduction in a property's calculated stormwater fee that is given for:

- 1) On-going activities on the property that reduce demand on the stormwater system;
- 2) On-going activities on the property that reduce the utility's cost of service.

Generally, stormwater credits are granted to enhance equity or to provide incentives to implement an overall community stormwater management plan.

Credit Types

The credits analyzed in this memorandum are:

- **Quantity Credit:** offered as system development fee credits and/or annual credit to properties that exceed peak and volume control requirements on a parcel or a regional basis.
- **Quality Credit:** offered as system development fee credits and/or annual credit to properties that exceed water quality treatment requirements on a parcel or a regional basis.
- **Low Density Single Family Residential (LDSFR) Credit:** offered as an annual credit to properties that place reduced impact on the stormwater system because of the way in which they were developed.
- **Self-Maintenance Credit:** offered as an annual credit to properties that maintain their own stormwater system that SEMSWA would otherwise maintain.

These credits fall into two separate categories: credits that are available to each eligible property only once (which will be referred to in this memo as system development fee credits) and credits that are offered to eligible properties each year (annual credits). Of the credit types reviewed in this memorandum, the quantity and quality credits can be offered either as system development fee credits or as annual credits, and the LDSFR and self-maintenance credits can be offered as annual credits. For each credit, this memorandum discusses the descriptions or types of eligible properties, the qualification requirements, a budget estimate of potential savings or other benefits to SEMSWA, potential costs, and pros and cons.

Customer Participation and the Credit Program: Application Process, Advertising, and Generosity of Credits

Frequently, one of the concerns utilities have is that the credit program represents uncertainty in the prediction and receipt of revenues. Staff or board members may ask, "What happens to revenue if everyone who is eligible applies for and receives credit?" AMEC accounted for

potential losses in revenue due to credits in the rate study for the utility. The revenue loss for credits was accounted for as a percentage decrease in the total revenue as follows: “2% in 2007, 3% in 2008, 4% in 2009, and 5% from 2010 forward.” In 2007 and 2008 there were no losses, since a credit program was not in place. AMEC ordinarily estimates between 2% and 5% revenue loss for credits for new utilities based on our experience with utilities across the country and their credit programs. This experience is borne out by the experiences of utilities surveyed in the first phase of this credits analysis: all reported that the program had few participants.

The paragraphs below describe some factors that could influence the degree of participation in the program. In addition, staff proposes a program, described in a later section that would eliminate this budgetary uncertainty as well as more effectively meet the policy goals for the stormwater program.

Advertising

An important advantage of the credit program is its value as positive advertisement for the utility. The message that a credit program sends to customer is that the utility rewards customers through credits for structures or activities that reduce demand on the stormwater system and further the goals of the stormwater program. Thus SEMSWA staff envisions outreach and advertisement associated with any credit program that would serve both to increase acceptance of and knowledge about the utility and encourage participation in the credit program to help meet stormwater program goals. This could encourage participation, although even well-publicized programs often have low participation rates.

Application Process

The vast majority of credit programs across the country require that potentially credit-worthy properties apply for credits through a formal process. Then, the credit is extended only to properties that apply for and demonstrate that they qualify for credits. In many cases, since the utility has to ensure that a structure is designed and works properly in order to give the credit, the application requires the seal of a professional engineer. Often, utilities charge an application fee for the review of the application, as well. (Some refund the fee if the application is accepted and the credit is awarded.)

All of this means that property owners must make an investment of time and money in order to obtain credits. Anecdotally, the effort involved in applying appears to discourage participation in the credit program.

Generosity of Credits

Another component of the credit program that was briefly discussed in the first part of this credit analysis and reviewed here is how generous the credits are. That is, how much of the fee is eligible for credit? Again anecdotally, the generosity of the credit influences participation in the credit program. In particular, if the credit requires that the applicant expend funds (i.e. to build an extra structural BMP), it makes more sense for the applicant to spend the money to obtain the credit if the value of the credit is high. Thus generous credits would tend to encourage participation.

System Development Fee Credits and Annual Credits

One set of credits could be offered as system development fee (SDF) credits to developers and also as annual credits to the property owner. As described below, development fee credits are logically offered in these two instances because of their potential as incentives for regional water quantity and quality treatment. System development fee credits give developers an incentive to build regional facilities that might not otherwise be built and to design new developments in innovative ways to preserve water quality. However, staff sees some very real barriers to the effectiveness of the annual credits, as described below.

This section is organized as follows: general descriptions of quantity and quality credits are given, along with pros and cons. Then a description of the qualification requirements and financial impacts of system development fee credits for quantity and quality follows. Next, the section addresses staff's concerns with annual quality and quantity credits and a potential solution as well as the possible qualification requirements and financial impacts of annual credits if these credits are pursued. This section concludes with information about potential administrative costs and a conclusion.

Table 1. Credit Types for Annual and System Development Fee Credits

Credit Type	SDF	Annual
Quantity Credit	X	X
Quality Credit	X	X

General Descriptions: Quantity and Quality Credits

Quantity Credit Description. After land is developed, its hydrologic response during and after precipitation differs from its pre-developed condition. This change in hydrologic response is formed of two components: the peak flow and the total runoff volume. The peak flow from a developed property is both greater in volume and faster in time than from an undeveloped property. Overall, the developed property has a greater runoff volume than it did before it was developed, since less precipitation is infiltrated into the soil. The new demand can be envisioned thus: the runoff demands more of the stormwater system's capacity more of the time.

Many stormwater utilities have implemented credits to recognize properties' ongoing reduction in water quantity demand placed upon the systems. Some credits recognize a decrease in peak demand through a "detention credit" and others recognize a decrease in total volume through a "retention credit." Some utilities give credit for both aspects of demand. SEMSWA has the same choice with regard to offering system development fee credits to developers for retention and detention facilities: credits could be given for facilities that meet *or* exceed standards. The SEMSWA Board decided to only offer this type of credit to properties that exceed requirements.

Quality Credit Description. A property that reduces stormwater runoff pollution provides a benefit to the stormwater program by helping it meet stormwater quality goals or requirements. Some stormwater utilities offer a credit to recognize an ongoing reduction in water quality pollution. As with water quantity credits, some utilities offer a credit for meeting requirements while others offer a credit for exceeding standards.

Quantity and Quality Pros, Cons, and Benefits

Quantity Pros and Cons. Practically, the quantity credit would appear to increase the equity of the rate structure because it recognizes a property's reduced impact on the stormwater system. The major costs to the utility that can be associated with increased water quantity resulting from development are maintenance costs that preserve the capacity of the stormwater system and capital improvements costs that are necessary to increase the capacity of the system to carry increased peak runoff volumes.

From a broader policy perspective, system development fee credits, since they are offered up front, can encourage regional thinking and behaviors. Development fee credits give developers an incentive to build regional facilities that might not otherwise be built. Offering credits only for exceeding standards rather than meeting them should encourage over-design of facilities, which could help to prevent or lessen flooding and channel degradation over the long term. The over design of facilities must be pre-approved by SEMSWA to ensure that they meet the stormwater program's goals and addresses a need as opposed to over-design for the sake of obtaining a credit. SEMSWA may see saving in the form of future expenditures in quantity controls as well.

In general, giving credits for engineered controls and over-designed controls in particular present two cost hurdles that can discourage participation in the offset/credit program. The first cost is the additional expense of the control itself. The credit must be generous enough to encourage over-design. The second cost is an "entry" cost into the program. In order to ensure that the structure meets the criteria for the credit, applicants must submit proof in the form of stamped calculations and as-built drawings that demonstrate the structure meets or exceeds the credit design requirements. The difficulty and expense of applying for structural control credits may present a barrier to entry, and block the achievement of the policy goals.

Quality Pros and Cons. The characteristics of water quality credits are similar to those of water quantity credits. Water quality credits can:

- Increase the equity of the rate structure by recognizing a property's reduced impact upon the stormwater system. In the case of water quality, the major costs to the utility that can be associated with decreased water quality resulting from development are water quality permit compliance costs and watershed and channel preservation and restoration costs.
- Encourage regional solutions
- Encourage over-design of facilities, preventing pollution in the long term
- Create high entry costs
- Create high administrative costs
- Design criteria from Arapahoe County, City of Centennial, UDFCD, and Cherry Creek Basin Water Quality Authority Criteria Manuals may be used to develop the cases where a quality credit may be applied.

Benefits. When stormwater quality and quantity is controlled more aggressively, the need to engineer controls that serve the entire district, such as streets and gutters, decreases. Benefits related to over-designed quantity and quality controls may not be realized in immediate cost savings to SEMSWA. Instead, benefits may take the form of a reduced need for capital improvement projects in future years. Quantity and quality credits encourage designers to create stormwater controls that are more stringent than current development standards require.

An underlying consideration in the application of quantity and quality credits is that due to the requirement to over design controls to be eligible for these credits, potential applicants will only participate if they will save money in doing so. For instance, if a developer or builder needs to

build a larger detention pond in order to meet the eligibility requirements, he or she will face not only the increased capital costs to build the pond, but also increased costs in future years to maintain a larger structure. If the builder cannot expect a return on investment within a given time period, he or she will not build the expanded control and will not apply for the credit. Thus SEMSWA must make the credit sizeable enough that applicants can see a clear benefit for over design in land, construction and other costs.

However, the long-term benefit for SEMSWA will be that the private sector will bear the costs for expanding stormwater controls. In a simplified sense, each dollar spent by the private sector on the over design of stormwater controls is a dollar SEMSWA does not have to spend controlling stormwater.

SDF Qualification Requirements, Eligibility, and Financial Impacts

Qualification Requirements for SDF Quantity Credit. The SEMSWA staff has expressed a preference to offer this credit only to development projects that exceed requirements for stormwater quantity. In the City of Centennial and Arapahoe County, water quality capture volume and flood control detention are required for all new development and redevelopment. The storage volume and release rate criteria are based on three design events: Water Quality Capture Volume (WQCV), Excess Urban Runoff Volume (EURV), and the 100-year storm event. The most practical measure for exceeding the standard for system development fee credits would be a measure of the drainage area that is treated by the control structure. That is, developments that treat others' runoff in addition to their own would be designated as exceeding the minimum criteria and would receive a credit proportional to the excess drainage area that they treat.

Qualification Requirements for SDF Quality Credit. For quality credits, the City of Centennial and Arapahoe County's requirements include the following four steps in addition to capture and treatment of the Water Quality Capture Volume (WQCV):

- 1) Reduce runoff volume to the maximum extent practicable.
- 2) Provide water quality capture volume and flood control detention via full-spectrum detention.
- 3) Utilize stream channel stabilization techniques.
- 4) Undertake source control, controlling for illicit discharges, using best available technologies.

In the case of the water quality credit, since properties are already required to use the best available technologies and to address a variety of aspects of water quality treatment, the measure for exceeding the standard for system development fee credits could be the drainage area in excess of the required area that is treated by the control structure.

SDF Credits Eligible Properties. Any property could be eligible if its stormwater controls treat more than the required drainage areas for the controls. However, each potential creditable property would need to fulfill a particular SEMSWA-identified treatment need. For example, a new development in an area with adequate regional treatment would not be eligible, since there would be no need for or opportunity to provide treatment for other properties. Logically, the qualification requirements limit the total percentage of new development that would be eligible for credits. Since a development must treat someone else's runoff in order to qualify for the credit, at most only half of all development could ever qualify for the credit. Further, the credit requires a development to have stormwater controls that are larger and/or more sophisticated, and thus more expensive. This high cost of entry, coupled with the need to closely coordinate with SEMSWA would further decrease the participation rate in the program. The uppermost

limit of properties that might be eligible for these credit types is 50 percent of new development and the actual participation rate is assumed to be 10 percent, to reflect the decrease in participation expected due to the difficulty and costs associated with overbuilding controls.

SDF Financial Impacts. AMEC estimates that at the outside limit, ten percent of new development and redevelopment would undertake to build the system capacity that would allow them to be eligible for the quantity and quality credits. As stated in the “Development Permit and Review Fees: Option Analysis for System Development Fees Technical Memorandum DRAFT”, only 19,262 acres of developable land remains in the SEMSWA service area. If ten percent of this undeveloped land were eligible for the quantity and quality credits and the credit were offered as a one-time offset to developers, revenue from system development fees would fall. SEMSWA is anticipated to use the Basin by Basin Plus Cost by Basin Group rate structure for system development fees. For the purposes of this analysis it was assumed a 25 percent credit were offered for each of the credit types (quantity and quality SDF credits), thus each newly developed property that qualified would be eligible for up to a 50 percent credit. The table below shows how a 50 percent credit, assuming ten percent of all developable land applied for and received both quantity and quality credits, would affect revenue in a given year, assuming a 1.75% growth rate.

Table 2. Potential Credits / Revenue Losses Based on System Development Fee Option and One-Time Quantity and Quality Credits

Basin by Basin plus Cost by Basin Group Option	2009 Total Potential Fees Assessed (at 1.75% Growth)	10% of 2009 Total Potential Fees (Estimated Participation)	Quantity Credit Revenue Loss (assuming 25% credit)	Quality Credit Revenue Loss (assuming 25% credit)	Total 2009 Estimated Potential Revenue Loss
	\$722,350	\$72,235	\$18,059	\$18,059	\$36,118

For the table above, the *total* estimated SDFs equal \$41,277,148, given the remaining 19,262 acres of developable land in the SEMSWA service area. Clearly, not all of this acreage will be developed in any one year. A growth rate of 1.75 percent per year has been assessed for the SEMSWA service area from City of Centennial and Arapahoe County growth data. Next year, if SEMSWA experienced 1.75 percent growth, it might be eligible to receive around \$722,350 in SDFs. AMEC estimates that if 10 percent of the land developed each year was eligible for and applied for the quantity and quality credits, the revenue loss to SEMSWA be around \$36,000. This would be less than one half of one percent of SEMSWA’s total revenues.

Note that even if half of development qualified for and applied for the credit which would be the maximum eligible percentage of properties the revenue loss would be approximately \$181,000, which is around two percent of SEMSWA’s total revenues.

Annual Credits Staff Discussion, Alternative Program Option, Qualification Requirements, Eligibility, and Financial Impacts

Staff Discussion. While the system development fee credits for quantity and quality intuitively made sense to staff, the annual quality and quantity credits, presented several difficulties in terms of their effectiveness in furthering SEMSWA quantity and quality goals and in terms of their practicality.

First, staff felt that it did not make sense to give an annual credit in addition to a SDF credit for the same device. This would mean that the annual credits would mostly apply to retrofitted properties rather than new development.

Second, from the discussion on how retrofitted properties would actually be incentivized to undertake creditable activities, it became apparent that the qualification requirements that would apply to SDF credits are impractical for annual credits as applied to retrofitted properties. For instance, what development would undertake an expansion of its detention pond to treat others' runoff in order to obtain the quantity credit? And, even if a development did undertake an expansion, what promise is there that it could actually treat anyone else's runoff? Would it somehow also divert others' runoff to the detention pond? Staff felt that such a credit would not help to meet SEMSWA's goals of improving water quality and quantity treatment. In particular, if no one would apply for the credit because of the impractical standards, SEMSWA's goals would certainly not be furthered by these credits. Thus, a more practical approach to the qualification requirements for annual quantity and quality credits would be to require that properties that did not meet the current stormwater standards, which were only put into place a few years ago, be *retrofitted to meet current standards*. Developments would be exceeding the standards under which they were constructed.

Third, staff felt that given the increasing stringency of water quality standards, the idea of retrofitting to obtain annual credits fit much more easily with a quality credit than a quantity credit. Staff felt that perhaps an annual quantity credit would not further SEMSWA goals.

Fourth, staff felt that the annual credit would not incentivize improvements very effectively because of how small an annual credit would be in relation to the expense and effort involved in retrofitting structural BMPs to meet standards. A more effective alternative might be to amortize the development's costs over a period of a few years, giving a large credit for the first few years, then drop the credit significantly and continue a low, ongoing (maintenance) credit. For example, if a development improved a pond and it cost \$100,000, the development could be given a \$20,000 credit for five year (giving a quick return on the development's investment) and then after five years, the credit might be dropped to \$2,000 per year.

Finally, given the uncertainty about a credit program's effect on revenue, coupled with the low participation rates in credit programs that undercut the programs' abilities to incentivize behavior, an alternative program would make more sense. Staff's idea about an alternative program is described below.

The Alternative. Staff suggested that a more effective program that provided more certainty about revenue would be preferable to an annual credit program. They conceived of a retrofitting cost-share or assistance program for developments. The program would have a set budget for each year and developments could apply to participate until the money is gone for the year. Developments that wished to retrofit developments to meet water quantity and quality goals would be eligible. SEMSWA would expand its current cost-share program to assist with the project and technical assistance. SEMSWA would then have a hand in improving stormwater treatment and be able to develop relationships with stormwater customers over time. Such programs exist around the country and one example of such a program that has worked very effectively is the St. John's River Watershed Management District in Florida.

Qualification Requirements for Annual Quality and Quantity Credits. Given the discussion above, it is proposed that the qualification requirements for properties under either an annual credits or cost-share program would be: properties that did not meet the current stormwater

standards, which were only put into place a few years ago, be *retrofitted to meet current standards*.

Annual Credits Eligible Properties. Any property could be eligible for the annual credits, water quality in particular, if it is retrofitted to meet current standards.

Annual Credits Financial Impacts. If the annual quantity and quality credits were offered to property owners that retrofit its stormwater controls to exceed the requirements could be eligible for quantity and quality credits. The amount of the credit given and resulting revenue loss, assuming a 10 percent of developed property applied for and received the credit, are shown in Table 3 below.

Table 3. Potential Credits / Revenue Losses Based on Stormwater Utility Fee and Annual Quantity and Quality Credits

Non-Single Family Residential Properties	Number of Parcels	Annual Revenue	Revenue Loss Assuming 10% participation and 50% credit	Revenue Assuming 10% participation and 50% Credit
Tier 1	2,017	\$355,334	\$17,767	\$337,567
Tier 2	9,319	\$1,645,419	\$82,271	\$1,563,148
Tier 3	2,204	\$1,949,732	\$97,487	\$1,852,245
Total	13,540	\$3,950,485	\$197,524	\$3,752,961

It is important to note that single family residential properties would not individually be eligible for these credits. Ordinarily, stormwater controls are located not on single-family properties, but on common areas owned by the homeowners' association. It is envisioned that for residential developments, the homeowners' association rather than individual homeowners would be the recipient of the credit. In this situation, the homeowners' association would be responsible for distributing the credit among homeowners. Individual homeowners may only feel the effects of the credit in a percentage reduction in their homeowners' association fees. Alternatively, SEMSWA could take on the responsibility to calculate the individual homeowners' share of the credit and distributing it. This would increase the administrative cost for SEMSWA.

In either case, if *only* annual fee credits are given and system development fee credits are not given, the developer or builder who has responsibility for designing and building a stormwater control that goes beyond the minimum stormwater requirements would not see any financial benefit, unless he or she could persuade homeowners that there was a financial incentive to buying a house with such a control on the lot and thereby sell homes at a higher price.

Administration Costs

Administering a water quantity credit also presents costs to SEMSWA. Staff must review the calculations and possibly field-verify the design of the structural control. In addition, the credit is conditioned upon its "on-going" nature, meaning that the water quantity control must continue to control peak flows and volume. In order to ensure the controls are well maintained and continue to function properly, SEMSWA will have to administer an ongoing program with periodic reporting, inspection and enforcement activities. AMEC estimates this review process would occupy one quarter of a staff person's time for each type of credit option – one-time and annual.

At salary and benefits totaling \$36,000 per year, the administrative cost to SEMSWA is estimated to be \$9,000 per year per credit option.

Quantity and Quality Conclusion

By offering quantity and quality credits, SEMSWA will not see an immediate financial gain. However, encouraging the over-design of stormwater controls may lead to future benefits that are not easy to quantify, such as a reduced need for capital improvements and expenditures. In addition, SEMSWA can choose to offer quantity and quality credits in a variety of ways – as one-time credits on the system development fee, as annual credits to single-family residential customers, or as annual credits to non-single-family residential customers. The total credit amount, assuming 10 percent of eligible properties apply for and receive each type of credit, is shown in Table 4 below.

Table 4. Costs to SEMSWA for All Quantity and Quality Options

Quantity Plus Quality	Revenue Loss (Assuming 10% participation and 50% credit)	Administrative Costs	Total
System Development Fee One-Time Credits	\$36,118	\$18,000	\$54,118
Non-Single Family Residential Annual Credits	\$197,524	\$18,000	\$215,524
Total	\$233,642	\$36,000	\$269,642

Annual Credits

SEMSWA is considering another set of credits that could be offered on an annual basis to ratepayers.

Table 5. Types Considered for Annual Credits

Credit Type	Offset (One-Time)	Annual
Low Density Single Family Residential Credit		X
Self-Maintenance Credit		X

Low Density Single-Family Residential Credit

Description. Fees for single family residential (SFR) detached properties are based on the average impervious area of this class of properties. However, some SFR properties have a smaller ratio of impervious to pervious area (a lower percent impervious area) than the average property. This means that their impervious area is more likely to be disconnected impervious area and places less demand on the stormwater system. A credit can be offered to these property owners to recognize the reduced impact they generate on the stormwater system.

Pros and Cons. The advantages of this credit are that it is easy for customers to apply, easy for SEMSWA to administer, and predictable in revenue impact. In addition, this credit would satisfy ratepayers with the perception that their lots place lower demand than other residential lots upon the system because of how their lots are developed.

On the other hand, offering this credit for SFR properties creates dissimilarity between the NSFR and SFR rate structures. The relationship between the percent imperviousness and the rate through the three NSFR tiers is a linear relationship. Thus, although the rate increases with the increase in impervious area, there is no “jump” in the rate as impervious area increases that would reward lower impervious percentages. Offering a credit to SFR properties for lower impervious area percentage would create such a “jump” on the SFR side. In addition, as a general policy consideration, this credit could have the effect of rewarding sprawled development. EPA has published a report titled *Protecting Water Resources with Higher-density Development* which describes how low-density development can result in the construction of more impervious area in a watershed, as well as increased greenfield development, as compared to higher density development.

Qualification Requirements. For the SEMSWA service area, single-family residential properties with 20 percent or less impervious surface area are eligible for the low density single-family residential credit.

Eligible Properties. Based on 2008 billing data, there are 3,302 low density single-family residential (LDSFR) properties in the SEMSWA service area.

Benefits. This credit does not offer any immediate quantifiable benefits to SEMSWA but may serve as a positive public relations measure and may encourage an increase in low-density development (which could be seen as benefiting water quality).

Financial Impacts. The maximum revenue loss for SEMSWA resulting from offering an LDSFR credit depends on the size of the credit offered to eligible properties. The impact both for SEMSWA and LDSFR property owners was analyzed by comparing several ways to offer a credit to LDSFR properties: credit reductions in increments of five from five to 35 percent. Another type of rate structure was also considered for LDSFR properties: charging LDSFR properties at the same rate-per-square-foot as low density non-single-family residential properties (i.e., low density commercial properties). This last type of credit would not give LDSFR properties a percentage credit on their fee, but instead an entirely different rate structure would apply to them. An important variable to consider is that if property owners were required to apply for the credit, the revenue losses would never reach the maximum level, since not every property owner would be expected to apply for the credit. However, if the credit is automatically assigned to each eligible property owner, the maximum revenue losses would apply.

Charging LDSFR properties using the same rate structure as non-single-family residential properties would result in a fee increase for some properties. The mean fee variance would be a reduction of 28 percent; however, some properties could see a fee increase of 221 percent. This fee increase may discourage applicants from applying for the credit or may foster a feeling that SEMSWA does not value low density development. However, the fee variance for applying the non-single-family residential rate structure to LDSFR properties is somewhat similar to offering a 30 percent credit. The variance in fees using the Tier 1 NSFR Rate as the mechanism to credit LDSFR properties is shown in Figure 1 below.

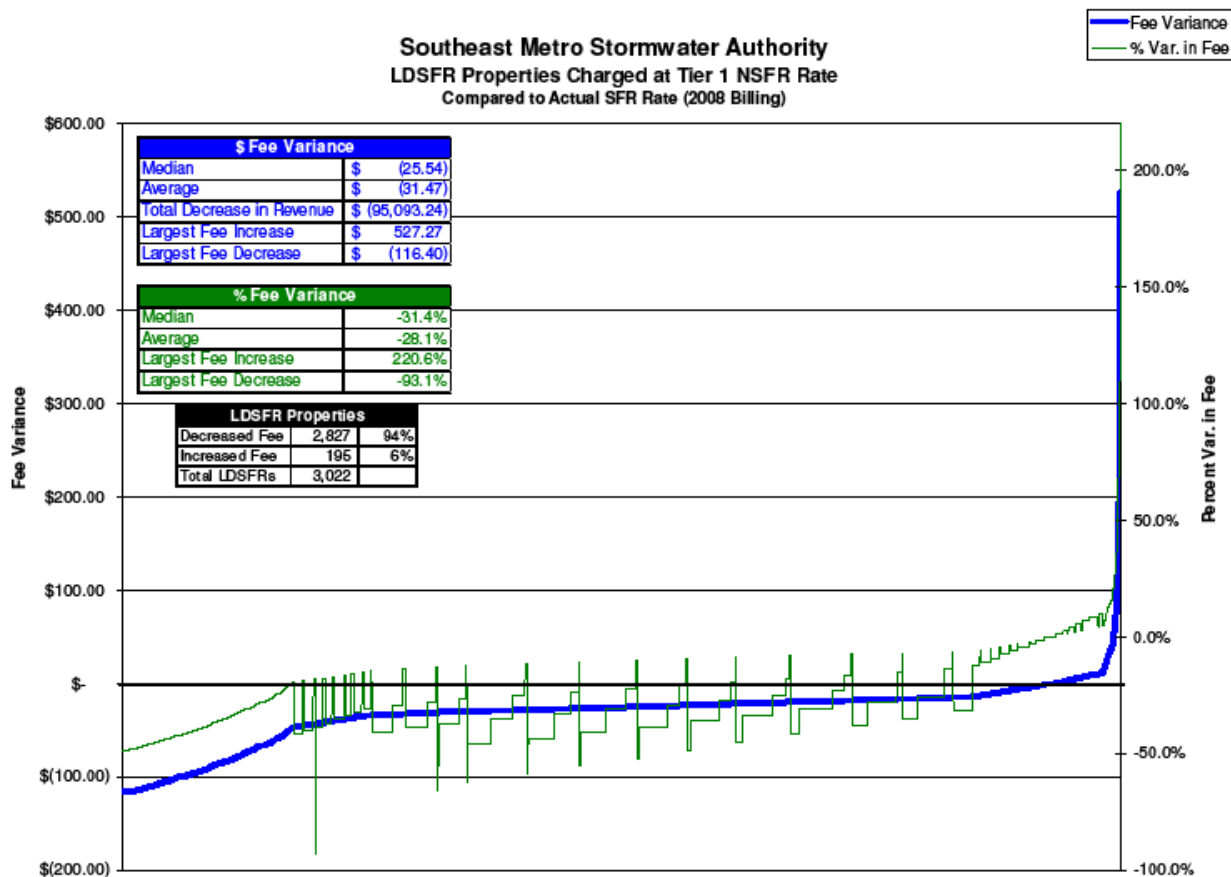


Figure 1. Variances in Fees for LDSFR Properties if NSFR Tier 1 Structure is Used

Given that the percent fee variance at both the median and average low density single-family residential property is approximately 30 percent, a 30 percent credit could be supported by the revenue analysis. The revenue loss for offering credits at various percentages was also calculated. These figures are shown in Table 6 below.

Table 6. Revenue Losses at Various Percentage Credits for LDSFR Properties

IA Density Range	# of SFRs	% of Total SFRs	Resulting Revenue	Revenue Loss with % Credit						
				35%	30%	25%	20%	15%	10%	5%
0% to 10%	961	2%	\$ 125,130	\$43,796	\$37,539	\$31,283	\$25,026	\$18,770	\$12,513	\$6,257
11% to 20%	2,341	5%	\$ 239,859	\$83,951	\$71,958	\$59,965	\$47,972	\$35,979	\$23,986	\$11,993
21% to 30%	11,417	25%	\$ 825,258	\$0	\$0	\$0	\$0	\$0	\$0	\$0
31% to 40%	16,684	37%	\$ 1,256,469	\$0	\$0	\$0	\$0	\$0	\$0	\$0
40% and up	13,431	30%	\$ 1,061,214	\$0	\$0	\$0	\$0	\$0	\$0	\$0
All SFRs	44,834	100%	\$ 3,507,930	\$127,746	\$ 109,497	\$ 91,247	\$ 72,998	\$ 54,748	\$ 36,499	\$ 18,249
Resulting Revenue:				\$ 3,380,184	\$ 3,398,433	\$ 3,416,683	\$ 3,434,932	\$ 3,453,182	\$ 3,471,431	\$ 3,489,681

At \$18,249, a five percent credit clearly would result in the smallest revenue loss for SEMSWA, but it may not be a sufficient incentive to encourage low density development.

The cost to administer this credit would be confined primarily to reviewing applications, if an application process is used. As there are 3,302 eligible properties, this figure was used as an estimate for the number of applications to review. Applications for LDSFR properties would be very straightforward, because there is only a single criterion for eligibility: impervious surface area. Thus it was estimated that the review time per application would be half an hour. For the time of a staff person at an hourly wage of \$15 per hour, the total cost to review LDSFR properties would be \$33,020 per year.

Low Density Development Credit Conclusion. The total costs for the various ways to apply the LDSFR credit are shown in Table 7 below. Adding the revenue loss and the cost to administer together, a 30 percent LDSFR credit would cost SEMSWA approximately \$160,766 per year. The benefit to SEMSWA would be in terms of its public relations with property owners.

Table 7. Costs to SEMSWA for All LDSFR Credit Options

	Maximum Credit	Administrative Costs	Total
LDSFR Costs			
35%	\$127,746	\$33,020	\$160,766
30%	\$109,497	\$33,020	\$142,517
25%	\$91,247	\$33,020	\$124,267
20%	\$72,998	\$33,020	\$106,018
15%	\$54,748	\$33,020	\$87,768
10%	\$36,499	\$33,020	\$69,519
5%	\$18,249	\$33,020	\$51,269
Tier 1 NSFR Rate	\$95,093	\$33,020	\$128,113

Self-Maintenance Credit

Description. This credit is available to property owners who maintain stormwater systems instead of SEMSWA. Typically, this type of credit is offered to large properties with the capability to maintain stormwater systems, such as airports.

Pros and Cons. By maintaining his or her own stormwater facilities, the property owner has relieved the utility of the responsibility to use public resources for this portion of the stormwater program and the credit recognizes this fact. On the other hand, the fact that the property owner maintains the facilities does not mean the utility is free from all responsibility related to that property. The utility will still have to monitor the facilities to ensure maintenance is performed adequately. The advantages of this credit are that it is easy for customers to apply, easy for SEMSWA to administer, and predictable in revenue impact.

Qualification Requirements. To qualify for this credit, a property owner must be able to provide maintenance of stormwater facilities that would otherwise be maintained by SEMSWA.

Eligible Properties. In the SEMSWA service area, there is only one likely candidate for this type of credit: the Centennial Airport, managed by the Arapahoe County Public Airport Authority. However, other properties may be found to be eligible.

Benefits. If a property maintains conveyances and structures that SEMSWA would otherwise maintain, SEMSWA will save in actual terms. It is estimated that SEMSWA would save about \$0.79 per linear foot of conveyance for debris and trash removal and mowing and for a .5 acre to four acre detention facility, SEMSWA would save about \$800.00. However, some administrative costs would undercut these savings, as described below.

Financial Impacts. Although SEMSWA would be saved from maintenance of some facilities, there would be administrative costs to process applications as well as to inspect the stormwater facilities and ensure they are being maintained properly. A staff person would have to inspect the facilities twice a year, as well as review the application. At an hourly wage of \$20 per hour, the administrative cost would need to be calculated for each applicant. A self-maintenance credit would not be for 100% of the maintenance costs. The annual fee paid covers more than maintenance, and there is no savings on the other services.

Self-Maintenance Conclusion. Due to its limited application to customers with large stormwater fees, offering the self-maintenance credit would probably not make an appreciable difference for SEMSWA's costs. However, the cost to administer this fee would be relatively minimal, as currently there is probably only one potential eligible property.