Update to Ames City Council
on the
Foundation Drain Program Grants

Council Referral:

On July 24, 2007, the Mayor of Ames and members of the City Council received a letter from Tim Garner requesting that the decision to deny his property for footing drain grant eligibility be reconsidered. Mr. Garner has a wet basement, but does not have a perimeter drainage system or sump pump and therefore, does not qualify for the grant program under current eligibility requirements.

On August 28, 2007, City Council directed staff to update them on the City's Footing Drain Grant Program.

Historical Background

The following material is adapted from a March 1979 presentation to the Ames City Council titled "Report on Foundation Drain Inflow Study – A Part of the Sewer System Evaluation Survey."

Most homes built since World War II have basement drainage tile systems. Initially the common construction technique was to bring the water to a floor drain in the basement and allow the water to flow by gravity into the sanitary sewer system. In 1962, a City ordinance was passed to require sump pumps to be piped to discharge outside of the building in order to keep this 'clear water' from entering the sanitary sewer system. The concern over 'clear water' flows from foundation drains was not the total annual volume of water; instead it was the instantaneous peaks that they contribute. These spikes result in short-term flows that exceed the carrying capacity of the sanitary sewer system, resulting in sewage backing up into basements and in overflow events that released raw sewage into the environment. In the early years after this ordinance became effective, builders faithfully provided outside discharges as required. Many nuisance and potentially dangerous situations resulted from discharging the foundation water to backyards and to streets, however. When this water is discharged to lawns, the yards became 'marshy' and were not usable by homeowners. When discharged to the street, the streets became slippery due to algae growth in the summer and ice build-up in the winter. Many homeowners

> ***"Subsoil drains...shall be...discharged into a properly designed sump. The contents of such sumps shall be automatically lifted and discharged to the outside of the building."***
>
> *City of Ames ordinance - 1962*

made what seemed a reasonable solution: they disconnected the outside discharge and brought the water back to the sanitary sewer system.

In the mid-1970's the City retained a consulting engineering firm to prepare a water pollution control plan. The Water Pollution Control Plant in operation at that time was severely overloaded. This plan would form the basis for determining the most cost-effective alternative for improved wastewater treatment. The anticipated cost of construction of the new Water Pollution Control Plant was substantial, and the City sought to avail itself of the federal construction grant program. These grants provided up to 80% of the eligible cost (75% federal, 5% state) for communities that complied with the programs eligibility requirements.

As a part of a "Phase I" grant eligibility determination, the Ames sanitary sewer system was determined to be "subject to excessive I/I (inflow and infiltration)." In order to continue to be considered for the construction grant program, the City was required to undergo a "Phase II" evaluation. That evaluation consisted of an examination of the various sources of peak flows into the Ames sewer system, an analysis of the cost effectiveness of treating the clear water versus removing the sources, and the development of a program to remove that portion of extraneous flows that were not cost-effective to treat.

> ***"There shall be a direct discharge or delivery of such subsoil or footing drainage from the sump to the City's storm sewer system."***
>
> *City of Ames ordinance - 1976*

One of the measures taken by the City of Ames in response to the Phase II requirements was to revise the 1962 ordinance. Under the 1962 ordinance, sumps were optional; the 1976 revisions made them mandatory for new construction. The 1976 ordinance also specified that all water from subsoil or footing drains must go to the storm sewer system. This ordinance applied to all new construction after September 1976. The requirement applies to all types of buildings that have a basement or cellar.

It is worth noting that the City of Ames was not required to implement a clear water diversion program. The City had a choice in 1976 to not reduce inflow and infiltration levels and forego approximately $12M (in 1976 dollars) of federal and state assistance in the construction of the new Water Pollution Control Plant.

During the summer of 1976, City employees conducted a house-by-house survey of all buildings in Ames to identify and locate all foundation drain inflow sources. More than 95% of all buildings and homes in Ames, including approximately 100 buildings on the ISU central campus, were surveyed. A total of 1,762 homes and buildings were determined to contribute extraneous water from foundation drain systems, and an additional 106 homes and buildings were identified with basement seepage problems. The 1,762 locations were broken down into four

categories based on the amount of construction needed to disconnect the discharge from the sanitary sewer system. In parentheses after each category is the number of installations identified in 1976. Note that the survey included all structures in the City of Ames (including ISU properties) except approximately 300 buildings for which the City could not gain access.

Category A - Basement has perimeter foundation drain tile draining by gravity to the sanitary sewer. Construction needed includes a sump, sump pump, and discharge line. (855 locations)

Category B - Basement has perimeter foundation drain tile and sump draining by gravity to the sanitary sewer. Construction needed includes a sump pump and discharge line. (233 locations)

Category C - Basement has perimeter foundation drain tile, sump and sump pump pipes directly to the plumbing stack. Construction needed includes a discharge line. (674 locations)

Category D - Basement is subject to water seepage. Construction needed includes a sump, sump pump and discharge line. (106 locations) **Mr. Garner's situation would fall under this category.**

In the 1976 report to Council, it was noted that some percentage of Categories A, B, and C could be cost-effectively included in a foundation drain removal program. Category D was determined to not be cost effective, as the low volume of water being contributed to the sanitary sewer system was not significant enough to warrant inclusion. At that time, staff estimated that approximately 60-80% of Categories A, B, and C could be cost effectively removed.

Staff continued to evaluate and refine a plan for a foundation drain removal program, and in June 1979 staff presented additional information to the City Council. The supplemental report estimated the construction cost to install a sump, sump pump, and/or discharge line, the cost to the property owner to operate the sump pump (electricity), and the property owner's maintenance costs (based on a useful life of approximately seven years for a sump pump). These costs were then compared to the cost to treat the clear water at the planned Water Pollution Control Plant. At that time (1979), the proposed plant treatment construction and rehabilitation costs were determined to be approximately $1,800 per gallon per minute of treatment plant capacity. Thus, it was determined to be cost effective for the City to fund the elimination of any clear water source that could be removed for less than $1,800 per gallon per minute. Based on an assumption that a typical sump pump flow rate is 0.7 gallons per minute, foundation drain sources that could be removed for less than $1,260 were considered "cost-effective."

The City considered several alternatives for addressing the problem of clear water in the sanitary sewer system.

1. Do Nothing. Take no corrective action to remove foundation drain inflow sources. This option would have required the City to construct and maintain a treatment facility larger than would be required had some or all of the inflow sources been eliminated. In addition to the extra cost, the City would have foregone $12 million in federal and state grants, and possibly been subjected to a sewer construction moratorium that would have prevented future development in the City of Ames.
2. Inflow Surcharge. This option would have imposed a monthly surcharge for any customer discharging foundation water to the sanitary sewer system. This option would not have reduced the construction costs for a new water pollution control plant, but would have generated additional revenue could have been used to fund relief sewer construction and other costs resulting from the inflow.
3. Foundation Drain Conversion Program. This option was planned to eliminate a significant percentage of the clear water contribution from footing drains. This option would lower construction costs, enable the City to quality for the state and federal construction grants program, and reduce damage and nuisance problems from overloaded sewers. The biggest drawback to this alternative was that it was the most controversial option, as evidenced by the considerable public debate that preceded the adoption of the footing drainage ordinance revision in September 1976.

The option ultimately selected by the City Council was Option 3; a voluntary foundation drain conversion program. **The purpose of the program was to achieve a significant reduction in the clear water contributions to the sanitary sewer system from foundation drain systems. The program has never been portrayed or administered as a community assistance program to aid residents who are experiencing wet basement or foundation drainage problems.** The focus of the program has always been on reducing clear water contributions by targeting those sources that were contributing the largest quantity of clear water, and as such could provide the most cost-effective sources to remove. It is because the program was focused of the cost-effectiveness of each source that Category D sources were specifically excluded from the foundation drain grant program.

The Clear Water Diversion Program was created to proactively address this subsoil foundation drainage issue. This program has been administered by the Public Works Department with funding from the Sanitary Sewer Fund. There have been two main focuses under this program; an infrastructure component to provide subdrain collection in areas where storm sewer is not available, and the grant component that provides financial assistance to homeowners to make the improvements noted above. The annual budget for this program is approximately $200,000. Typically half of this amount is allocated to the infrastructure program, and the remainder is allocated to residential grants.

Currently, homes are deemed eligible for the grant program if they were constructed prior to 1977 and if they have a basement footing drain tile and/or sump pump that were installed prior to 1977. Each home can only receive one grant. If a property owner is interested in participating in the grant program, they are instructed to contact the City of Ames Public Works Department. After City records are checked to verify eligibility, an in-home inspection is conducted. If a home meets all eligibility requirements, the homeowner will then receive a grant form signed by a City of Ames representative. Storm sewer access is not required for grant eligibility. This meets the original program provisions set forth by Council; however, there may be a temporary issue of icing on the streets until collector line is made available. Homeowners that do not have storm sewer access are required to discharge their sump pumps in the City right-of-way (or approved storm water drainage system). Areas where sump pumps discharge at the curb or in the City right-of-way are targeted by the City's collector line infrastructure program. The goal is to make storm sewer accessible to these properties within three years of the sump discharge installation.

When the program was first being implemented, City staff briefly considered the option of providing a monthly credit to a property owner's sewer bill as compensation for completing a foundation drain conversion. Ultimately the City Council opted to provide one-time grants to reimburse the cost of the conversion. Note that the original "cost-effective" threshold of $1,260 was not the initial value established for grants to homeowners. The grant program has attempted to match as closely as possible the actual costs to homeowners. Currently two grant amounts may be issued. $1,800 is issued if the home has a sump pit and pump, but does not have a frost-free discharge to the City storm sewer system (or right-of-way). If the home requires the construction of a sump pit, a grant of $2,200 is issued. Prior to July 2007, the grant amounts were $1100 and $1300, respectively. The grant amounts have been periodically adjusted over time.

Once the grant is issued, it is the homeowner's responsibility to hire a licensed plumber to divert the sump discharge to the City storm sewer. The property owner is required to pay the plumber on his/her terms independent of the contract with the City. Once the new service is approved by the City's plumbing inspector, a check is issued to the homeowner for the grant amount. Grants expire at the end of each fiscal year on June 30. Funding is appropriated on an annual basis. If the contract is not completed before the grant expires, the homeowner needs to apply for the next year's grant program beginning on July 1.

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Homeowners are not required to participate in the grant program. Signing a contract guarantees that they will receive the grant if they follow through, but it is not a promise on the homeowner's part to fulfill the contract.

Grants are considered taxable income. Homeowners who receive grant money will receive a 1099 tax form at the end of the year.

As of October 2007, 2,040 footing drain grants have been paid to Ames residents. It is estimated that there are approximately 1,396 properties in Ames still eligible for the grant program. If the grant program were expanded to include homes with damp basements, this number would increase to approximately 4,735 eligible properties (including any home with a basement constructed prior to 1977).

As the NPDES permit renewal application for the Water Pollution Control Plant is processed by the Iowa Department of Natural Resources, it is possible that a system-wide inflow/infiltration study will again be required. The issue of excessive wet-weather flows continues to be a topic that the IDNR raises when reviewing requests for construction permits at the Ames WPC Plant site. System-wide I/I studies are very time-intensive to conduct, and a full evaluation could easily be expected to cost well in excess of $150,000. However, such a study could also help refocus the foundation drain grant program.