Sustainable Water Management Initiative Grant Summaries
Document # BRP 2013-06

The Sustainable Water Management Grant Program has completed its second year. This grant program assists eligible public water suppliers and municipalities with Water Management Act permits by providing funds for planning assistance, demand management, and withdrawal impact mitigation projects. The focus of these grants is for: 1) planning projects for specific watersheds or subwatersheds to identify implementation projects to improve ecological conditions; 2) demand management projects aimed to improve the efficiency of water use within a municipality or watershed; and 3) mitigation projects in the following categories: improve or increase instream flow, wastewater projects that keep water local including reductions in inflow and infiltration, stormwater management projects that improve recharge, reduce impervious cover and/or improve water quality, water supply operational improvements, habitat improvement, and other projects that can be demonstrated to mitigate the impacts of increased water withdrawals.

The funds allocated for grants are distributed under a competitive procurement process. Eligible grant applicants are Massachusetts public water suppliers or municipalities with a valid Water Management Act permit. A 20% funding match was required. Cooperative proposals were encouraged. Particular consideration was given to proposed projects in highly impacted basins or subbasins.

MassDEP received 26 proposals for this grant year totaling $2.3 million dollars. A summary of the seventeen selected projects is provided below. The total dollar amount of this project list was $1.1 million dollars.

2013 SWMI GRANT PROGRAM
PROJECT SUMMARIES

TITLE /APPLICANT	PROJECT AMOUNT	COST SHARE
Regional Evaluation of Water Management Alternatives to Reduce Streamflow Impacts in the Upper Charles Watershed **Town of Franklin**	**$149,460**	**$30,000**

This project used a regional analysis to find ways to reduce the streamflow impacts and provide solutions for towns in the upper Charles River Watershed that will help them to meet the SWMI requirements. The project used an optimization framework to evaluate the effects of enhanced water conservation, alternative well pumping regimes, recharge of stormwater runoff, reducing infiltration/inflow to sewer pipes, and alternative sources of water. Project modeling determined that none of scenarios modeled lowered the August impacts from a GW4 to a GW3. Optimization pumping had the least cost but the biggest improvement in August medial flows; reductions had the next largest improvement, but the largest estimated cost.

Wastewater Analysis **Town of Ashland**	**$89,455**	**$22,000**

This planning project proposed an analysis of the offset/mitigation action of wastewater improvement, specifically wastewater recharge through treated groundwater discharge. Surface discharge, aquifer recharge, and deep well injection were investigated. This involved analyzing the feasibility of constructing a wastewater treatment plant (WWTP) in Ashland with a high level of treatment prior to dispersal. In addition to feasibility, a cost-benefit analysis was performed on disposal/groundwater recharge options. Given all criteria, the prioritized list of alternatives for Ashland to pursue is: 1) a MWRA Direct Sewer Connection; or 2) Local Wastewater Management, WWTP with groundwater discharge.

SWMI Feasibility Analysis **Town of Hudson**	**$128,886**	**$41,566**

This project worked with contiguous municipalities (Hudson, Maynard, Stow, Sudbury, Wayland, and Marlborough) located in the center of the SuAsCo watershed, bordering either the Assabet or Sudbury Rivers. To address anticipated permit requirements, this analysis gathered and generated data on the range of quantifiable SWMI mitigation alternatives by for each municipality, including: demand management; I/I reduction opportunities; water supply optimization, alternative sources and releases; stormwater and wastewater recharge; and other minimization and mitigation measures. It defined favorable areas for stormwater and treated wastewater infiltration based a discrete set of criteria regarding feasibility, ecological benefit and flow improvements, resulting in practical plans for stormwater and wastewater recharge.

2013 SWMI GRANT PROGRAM
PROJECT SUMMARIES

TITLE /APPLICANT	PROJECT AMOUNT	COST SHARE
Regional Water Conservation Project **Town of Sharon**	**$120,770**	**$30,000**

Six of the eight communities in the Neponset Valley came together and proposed a Regional Water Conservation Pilot Project. The goal of the project was to reduce water demand in each participating community through implementation of an integrated outreach and rebate program while also evaluating the potential for creating a longer-term collaboration on water conservation across the region. The participating communities were: Canton, Foxborough, Sharon, Stoughton and the Dedham-Westwood Water District. The goal was to replace 360 toilets, 360 clothes washers and 720 showerheads and faucet aerators. The expectation was that the rebate program would result in estimated savings of 10.8 million gallons per year and a total savings of 157 million gallons over the anticipated useful lives of the rebated fixtures. The end result was that 480 toilets, 319 clothes washers, and 1,000 showerheads and aerators were replaced, with an estimates savings of 11.4 mgy, and 167.4 mg over the lifetime of the fixtures. The cost of this water from MWRA is approximately $501,000 at current rates.

Demand Management Planning **Town of Canton**	**$46,672**	**$9,334**

This project consisted of two Planning tasks: a Water Audit of the Town's water system with recommendations made for reducing unaccounted for water; and a Stormwater Utility analysis that evaluated the feasibility and potential revenue associated with establishing a utility. Educational information was presented at public workshops and the potential offset volume and cost was quantified at a planning level. Recommendations included: expanding the meter calibration program to commercial users; reviewing the water usage of customers with large meters to determine if the meters is appropriately sized; expanding the calibration of the master meters to include manual flow measurement and field testing; establishing ongoing mechanisms for customer meter accuracy testing; consider a bench testing program of randomly selected customer meters to quantify their accuracy and set a replacement frequency goal for a customer meters. The utility and rate structure analysis indicated that a Stormwater Utility could fully fund Canton's expected stormwater program costs, and that careful and deliberate outreach and education would be needed to build support.

Water Audit Evaluation **Town of Acton**	**$117,687**	**$35,500**

American Water Works Association (AWWA) has released guidance (M36) for water systems to evaluate water losses, but the methodology is not widely understood or utilized. This project created case studies to document the level of effort to undertake the M36 audit, demonstrated the efficacy of the AWWA methodology, and coupled it with training to encourage appropriate use of the most meaningful water audit methodology given the nature, the size, the customer base and condition of each system. In general, water audits based on the M36 process showed real water losses to be less than the UAW process in the Annual Statistical Report (ASR); however, the M36 process costs approximately double that of an ASR audit ($7,000 vs. $15,000).

2013 SWMI GRANT PROGRAM
PROJECT SUMMARIES

TITLE /APPLICANT	PROJECT AMOUNT	COST SHARE
Recharge Analysis and Site Construction **Town of Hanover**	**$100,079**	**$41,120**

The Rte. 53 corridor represents a major economic driver for the towns of Hanover and Pembroke, and commercial and light industrial development is focused along this corridor. This region also falls within an important watershed which supports existing and future groundwater withdrawals in the area. This project was used to identify areas to safely return stormwater recharge to the North River drainage basin including the Pudding Brook, Mine Brook and Third Herring Brook tributaries; and develop and implement a project to demonstrate the feasibility of site modifications to increase recharge.

Maximizing Sustainable Water Management by Minimizing the Cost of Meeting Human and Ecological Water Needs **Town of Littleton**	**$121,097**	**$25,275**

This project used an EPA management tool (WMOST) to determine the least-cost combination of management actions that will meet both Littleton's projected water needs and SWMI minimization and mitigation requirements to protect streamflow and ecological health. Planning considerations included potential effects of climate change, data and modeling uncertainty, and other pertinent factors such as regulatory and permitting options. Findings included: None of the scenarios lowered the August impacts from a GW4 to a GW3; Optimization of pumping had the least cost with the biggest improvement in August median flows; and I/I reductions had the next largest improvement, but the largest estimated cost.

First Herring Brook and Reservoir Dam Fish Passage **Town of Scituate**	**$67,092**	**$14,512**

The fishway at Reservoir Dam is currently inoperable because the exit channel into the reservoir is at the same elevation as the spillway crest. The fishway can only be used for upstream and downstream fish passage when water is discharged over the spillway. Modeling has suggested that several scenarios combining both reservoir level increases and fishway modifications would meet fish passage requirements during the majority of both the spring in-migration and fall out-migration periods, while minimizing the number of summer days when an outdoor watering ban is enforced. This proposed project is Phase One of three phases for restoring fish passage at Reservoir Dam, and include: Fishway Modifications Preliminary Engineering, Design, and Public Outreach.

2013 SWMI GRANT PROGRAM
PROJECT SUMMARIES

TITLE /APPLICANT	PROJECT AMOUNT	COST SHARE
Sectional Flow Monitoring Program **Town of Holden**	**$46,180**	**$9,236**

The Town has conducted annual system wide leak detection over the past two years with successful results in that numerous leaks were found and repaired; however there has not been a significant reduction in UAW. In conjunction with their 2009 Water Audit, sectional flow monitoring was determined to be a cost effective way of reducing the Town's UAW. The intent of this grant was to fund a full scale, system wide, sectional flow monitoring program to reduce the Town's unaccounted for water. Overall, the section flow metering performed revealed large minimum nighttime flows in three areas as compared to the 24-hour total flow rate in the Jefferson Area (ratio of 62.7 percent), Salisbury Area (ratio of 51.8 percent) and Chaffin Area (ratio of 43.7 percent). A large minimum nighttime flow rate as compared to the 24-hour total flow rate signifies potentially a significant amount of leakage is occurring in the Jefferson Area, Salisbury Area and the Chaffin Area and further investigation is required to determine the location of the water loss.

Patch Pond Dam Removal Feasibility Study **City of Worcester**	**$148,800**	**$29,760**

This project funded a Patch Pond Dam Removal Feasibility Study, as the dam serves no useful purpose, is detrimental to the aquatic biology of Tatnuck Brook, and is an unsafe condition. Removing Patch Pond Dam would restore a segment of Tatnuck Brook for unimpeded fish passage, improved water quality and aquatic habitat, and improved recreation conditions. Tatnuck Brook is a coldwater fishery. The Feasibility Study included an infrastructure evaluation, habitat evaluation, sediment evaluation, hydrologic and hydraulics analyses, and the identification and evaluation of deconstruction and removal alternatives. A full dam removal with in situ sediment stabilization was selected as the preferred alternative for this project, with a cost of $1.5 to $1.7 million.

Optimization of Stormwater Infiltration **Town of Auburn**	**$60,080**	**$11,560**

This project involved the optimization of stormwater infiltration as a potential SWMI offset/mitigation. Auburn's water supplies are highly susceptible to impacts from stormwater infiltration associated with roadway runoff if the sites for infiltration have not been optimized. This project is a tool for the District and other public water suppliers (PWSs) with highways located within the Zones I and II of the wells because it develops a prioritization tool that will assist in locating stormwater infiltration sites, balancing the benefits of groundwater recharge with the critical need to protect public water supply wells from contamination. This proposal included identifying and prioritizing alternative potential infiltration sites and stormwater treatment options. Three alternative sites were identified including, and recommendations included pursue procurement of specific property and coordinating with MassDOT to reconfigure and repair stormwater infiltration sites in the study area.

2013 SWMI GRANT PROGRAM
PROJECT SUMMARIES

TITLE/APPLICANT	PROJECT AMOUNT	COST SHARE
Water Audits **Town of Medway**	**$44,275**	**$8,855**

This project involved conducting audits of both the Town's water system and the ten largest water users served by the Town. Under the first round of the SWMI grant program, Medway completed a study that analyzed the feasibility, costs, and benefits of implementing minimization, mitigation and offset options relating to its sources within the Town's boundaries. That study resulted in a specific set of prioritized recommendations, which the Town seeks to begin implementing this year with the assistance of SWMI grant funding. This project addresses the two most highly ranked recommendations from its prior study. Results indicated that the top 10 water users were well aware of their water usage and could decrease their use by updating plumbing fixtures. Medway also needs to improve on their billing data, expand their master meter calibration, implement a calibration / testing schedule for industrial, commercial and residential meters, and more quickly repair leaks found during leak detection.

Jones River Stream Gage **Town of Kingston**	**$16,000**	**$3,200**

This project involved maintenance of the Jones River stream gage located in the Town of Kingston for 2014, to allow time to develop a new strategy for future funding. Historically, USGS has operated and maintained the Jones River stream gage, with records dating back to the 1960s. USGS determined it was unable to fund maintenance of the stream gage as of 2012. The Massachusetts Division of Ecological Restoration (MassDER) funded the Jones River stream gage maintenance under its 2013 operating budget, but indicated that it was unable to continue funding the maintenance in 2014.

Water Supply Optimization **Town of Kingston**	**$93,800**	**$18,800**

This project involved implementation of the recommendations from the Town of Kingston 2012 SWMI Grant Program project. The results of the 2012 project indicated that the Town's water supply protocol could be optimized, but some infrastructure improvements would be required. These improvements will allow the town to implement the supply optimization protocol that will allow preferential use of the Trackle Pond Well (High Zone) while minimizing use of registered wells located in the Low Zone, proximate to the Jones River. This implementation project involved (1) removal of one of three booster pumps at Soules Pond Booster Pump Station, (2) installation of flow control valve and appurtenances and programming, and (3) installation of residual chlorine analyzer.

2013 SWMI GRANT PROGRAM
PROJECT SUMMARIES

TITLE/APPLICANT	PROJECT AMOUNT	COST SHARE
Water Supply Management and Demand Management Plans **Town of Groton**	**$66,800**	**$13,400**

This project developed of a Supply Management Protocol/Optimization Plan and a Demand Management Plan for the town. The Supply Management Protocol/Optimization Plan allowed the town to assess how to preferentially pump its wells (existing and pending) for the benefit of drinking water supply and the environment. Modifying the traditional operating protocol and setting the Baddacook Pond Well as first on and first off and the Whitney Pond Well #1 or Whitney Pond Well #2 as second on and second off, would allow the Baddacook Pond Well to operate less. This control strategy would allow the town to maximize use of the Baddacook Pond Well, while staying under the registered authorized withdrawal limit and staying within the permitted authorized withdrawal limits for the Whitney Pond Wells. The Demand Management Plan identified those efforts the GWD has already implemented and investigated additional water conservation efforts that the Town may wish to consider in order to reduce the overall volume to be mitigated under SWMI. These efforts included the implementation of higher conservation rates for all second/irrigation meters in Town. There are approximately 800 irrigation meters in Town which currently pay the same rates as single meters. In order to encourage conservation, a new rate structure for irrigation meters was evaluated along with the expected water savings.

Water Audits to Reduce UAW **Town of Foxboro**	**$50,500**	**$20,500**

This project included activities to evaluate the source and cost of water losses by using the MassDEP water audit methodology and forms. This involved review of pumping and treatment facilities, production and consumption records, meter calibration practices, and accounting of unmetered water uses to determine where potential losses may be occurring and to provide recommendations for improvements.

Based on the results of the water audit, the Town has an average UAW of 21.53%, which costs the Town $104,900 to produce, with no return on investment. Based on the most recent leak detection survey, only 4.6% of the losses are associated with leaks in the distribution system. The remaining losses are anticipated to be from paper losses associated with current estimating and tracking practices for authorized metered and unmetered municipal uses, under-registering meters associated with older meters in the system, other potentially unbilled water uses (based on review of assessor's data), potential water theft and other leaks in the system not identified by the leak detection survey. Recommendations focus on further investigation in these areas.