

# MtBE Remediation Fund

## Annual Report

### 2014

# MtBE Remediation Fund Annual Report

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## INTRODUCTION

In 2003, the New Hampshire Department of Justice, (DOJ) sued gasoline manufacturers and marketers, seeking damages for the statewide problem of methyl-tertiary butyl ether (MtBE) contamination. The State settled with all but one of the defendants. After deductions from the settlement payments for legal fees, costs and administrative fees, the State has \$81,630,000 available for remediation of MtBE contamination. The settlements, entered as orders of the court, require that the money be spent on MtBE-related remediation. The New Hampshire Department of Environmental Services (NHDES) and DOJ developed a Memorandum of Understanding (MOU) outlining a coordinated interdepartmental approach to the expenditure and administration of the funds. A proposed budget and staffing plan for the use of these funds was also developed. Governor and Council and the Fiscal Committee of the General Court, on December 4, 2013 and November 22, 2013 respectively, authorized a \$22,316,661 budget using the MtBE settlement funds for the remediation of MtBE contamination in groundwater and drinking water for the biennium ending June 30, 2015. The authorized budget included approval of the proposed staffing plan establishing an MtBE Remediation Bureau to implement the resulting new programs.

The appropriation approved by Governor and Council and the Fiscal Committee included allocation of funds for:

- Installation and improvement of public water supply infrastructure in areas having significant MtBE contamination;
- investigation and remediation of existing contamination sites where private wells are impacted;
- testing at-risk private water wells within a location radius of contamination source sites; and
- Implementation of measures to prevent further MtBE contamination.

The July 2014 corrective action plan, which is entitled the “MtBE Remediation Fund Implementation Plan” (Implementation Plan), calls for the preparation of an annual report by NHDES and submittal of the report to the Fiscal Committee, Governor and Council and House and Senate Leadership. This report has been prepared to satisfy that requirement and summarizes work completed to date relative to the development of the Implementation Plan and its execution.

## Challenges and Methods for Identifying and Mitigating MtBE Impacts To Groundwater

MtBE is the most common contaminant in drinking water supplies in New Hampshire that is not naturally occurring. A study conducted by the United States Geological Survey (USGS) and NHDES in Rockingham County, for example, found MtBE present in detectable concentrations in 40 percent of public wells tested and in 21 percent of private wells (J.D. Ayotte, Argue and McGarry, 2005). A follow-up study published in 2008 confirmed that MtBE contamination of public and private wells is a statewide problem (Joseph D. Ayotte et al., 2008). MtBE is difficult to biodegrade and very persistent in New Hampshire drinking water aquifers. Although MtBE has not been in gasoline sold in New Hampshire after the January 1, 2007 ban on MtBE, it is still commonly found in our groundwater. Based on sampling conducted by NHDES in 2014 and 2015, MtBE was found in nearly 22 percent of samples collected from over three hundred drinking water wells. MtBE is a potential carcinogen and in high concentrations has objectionable taste and odor. Reduction of MtBE concentrations in our aquifers is a priority.

There are over 600 known MtBE sites and a significant number of potential, currently undiscovered sites in New Hampshire. Based on a review of data on the known sites, the most common source of the most serious MtBE contamination problems are releases from Underground Storage Tanks (USTs) and less important but significant, gasoline releases from auto salvage operations (during gasoline transfers or storage). UST releases are typically identified during closure of the tanks or during property transfer. As a result, there are many potential UST releases that have not been identified at facilities that are still in operation and are under long-term stable ownership. Discovery of sites and cleanup of existing sites is a priority for protection of New Hampshire aquifers. Existing sites typically contain subsurface areas of gasoline soaked soil. This soil contamination slowly leaches out MtBE and other gasoline contaminants over time. Restoration of the impacted aquifer is accelerated by the removal of this ongoing source of

groundwater contamination.

Further complicating the problem is the presence of old gasoline containing MtBE. If this gasoline is not properly addressed, additional MtBE can be released to New Hampshire aquifers. Old gasoline is present in cars sitting on blocks unused since 2007 or in inactive underground storage tanks. Motor Vehicle Salvage Yards end up managing the cars with old gas. There are also a surprising number of underground storage tanks still in the ground and containing pre-2007 gasoline. These tanks exist at former retail gasoline stations that were shut down due to low profit margins and were converted to businesses such as auto sales or repair businesses.

MtBE impacts to New Hampshire's groundwater are numerous and varied. Addressing these impacts and preventing further degradation of groundwater quality requires a variety of approaches that need to be implemented in concert. To that end, NHDES has established the MtBE Remediation Bureau to identify, investigate, remediate and mitigate the effects of past and potentially on-going releases of MtBE-containing gasoline, and to reduce the potential for further releases of MtBE-containing gasoline to the environment. The MtBE Remediation Bureau is staffed with professional engineers, geologists and scientists who are working together to implement a comprehensive MtBE corrective action workplan.

## ESTABLISHMENT OF THE MtBE REMEDIATION BUREAU

The MtBE Remediation Bureau was established in April 2014 with the hiring of Gary Lynn, P.E. as Bureau Administrator. Establishment and staffing of the bureau proceeded in a phased fashion. New hires were put on hold during the public outreach and plan development process so that the bureau could adjust its staffing and scope to mesh with any change that occurred during that timeframe. Following the completion of that key initial step, the first phase of hires was completed in late spring of 2014. The second major phase of hiring was completed in the summer of 2014 after the development of procedures and policies for the private water supply sampling program. The bureau staffing strategy was developed to ensure that staff were hired when they were needed so that they could become immediately effective and fully utilized.

### Staffing

The MtBE Remediation Bureau is fully staffed except for an Environmentalist II sampling position. This position is open due to a promotion of an existing bureau staffer. There are no current plans for expansion of the bureau or for additional staffing. The bureau intends, however, to hire a highly cost-effective summer intern to help with the sampling program during the summer.

### Program Infrastructure

MtBE Remediation Program site investigation, remediation and prevention efforts will rely heavily on direct reimbursement of environmental consultants under contract to the facility owners, similar to the practice employed by the well-established Petroleum Reimbursement Funds. The bureau's reimbursement subaccount could not be used until a claims and reimbursement system was developed. Although development time was significantly reduced by modeling the claims process after the existing Petroleum Reimbursement Funds, additional programming and computer software modifications were required. The reimbursement system is now operational and multiple claims have been paid. Development and implementation of the reimbursement system was one of the highest priorities for the new bureau because this allows the private sector to complete most of the project work, substantially leveraging bureau resources. The reimbursement model has proven highly successful and efficient for the State's existing Oil Discharge and Disposal Cleanup Fund (ODD Fund). The ODD fund has used this approach for well over a decade.

## Contract Establishment

Amendment of state contracts and new contract procurements take a significant amount of time to develop and to secure required approvals. A contract amendment for the existing Emergency Response contract was approved by Governor and Council (G&C) at their October 1, 2014 meeting. A laboratory services contract to support a private water supply well sampling and analysis program to identify and monitor MtBE-impacted water supplies is currently awaiting G&C approval. NHDES is also in the process of amending its existing contract with Secondwind Environmental for water treatment services. This contract allows NHDES to rapidly address MtBE contamination of water supplies.

NHDES initiated the procurement process for environmental consulting services contracts for all remediation programs in August 2014. Qualifications packages were scored and eight consulting firms were shortlisted for interviews in October 2014. Eight firms were interviewed in November 2014 and a total of five environmental consulting firms were selected for contract awards in December 2014. NHDES is currently in contract negotiations with all five selected firms. Environmental consulting services contracts are expected to be in place and take effect on July 1, 2015 when the current contracts expire. Due to the labor-intensive nature of the environmental consulting services procurement process, NHDES opted to delay initiation of contracted environmental consulting services in support of the MtBE Remediation Bureau until July 1, 2015 and chose instead to rely on consulting work conducted under the direct reimbursement program for the remainder of FY 2014 and FY 2015. This consolidated procurement approach was efficient and highly successful; multiple firms with strong drinking water infrastructure and site cleanup expertise will be available for projects starting next fiscal year.

Additionally, NHDES and USGS have developed a joint agreement for a statewide study of MtBE contamination and trends. This joint agreement was approved by G&C on January 28, 2015. This agreement leverages matching federal funds and USGS staffing resources to further the mission of the MtBE Remediation Bureau. The joint agreement funded research should provide valuable information regarding the extent of MtBE contamination and the longevity of MtBE contamination in overburden and bedrock aquifers in New Hampshire.

As a result of the timeline discussed above, projects that depend on the use of state contractors have been initiated, but significant expenditures using the authorized contractor budget are below the estimated two year budget. Over the long-term, obtaining high quality, cost-effective contractors will more than compensate for the time taken to put the contracts in place.

## Public Outreach

The New Hampshire DOJ/NHDES Memorandum of Understanding included the development of a detailed implementation plan which incorporates input from the public on MtBE settlement fund-eligible activities and programs. To ensure that NHDES received significant public input and involvement, three public listening sessions were scheduled and held in Concord, Portsmouth and Lancaster. Similar presentations were provided to Southwest Regional Planning Commission, Southern New Hampshire Planning Commission, North Country Council, Inc. and Lakes Region Planning Commission. Additionally, NHDES participated in meetings with the City of Dover, Town of Plaistow and the Town of Derry to discuss the MtBE program and specific potential projects. NHDES also gave a presentation during the plenary session of NHDES' annual source water protection conference in April 2014. Finally, NHDES participated in a New Hampshire Municipal Association (NHMA) webinar to specifically target municipalities. A digital recording of the webinar was posted on the NHMA website to ensure that the information was broadly available to NHMA members. In all of the forums discussed above, the public responded favorably and provided significant valuable program input. The public input and ideas were incorporated into the detailed implementation plan that was developed for the MtBE Remediation Bureau. DOJ reviewed and approved the plan. The final plan is available for public viewing on the NHDES website.

## PROGRESS ON WORKPLAN ELEMENTS

The Implementation Plan developed an integrated approach to addressing the MtBE challenges that were discussed in the previous sections of this report. The four main elements of the work plan are:

- Installation and improvement of public water supply infrastructure in areas having significant MtBE contamination;
- Investigation and remediation of existing contamination sites where private wells are impacted;
- Testing at-risk private water wells within a location radius of contamination source sites; and
- Implementation of measures to prevent further MtBE contamination.

Integration of each plan element is important to improve overall effectiveness of the program. For example, removal of underground storage tanks is a prevention-related project. The tank system removal, however, also allows the investigation of releases and the extent of contamination in addition to the prevention of additional releases. Sampling of water wells is an effective tool for assisting with potential MtBE-related infrastructure projects. The sampling effort can help define the extent of the water line extension necessary to address the MtBE contamination issue as well as helping to investigate the extent of problems associated with a contaminated site. Public infrastructure work meshes naturally with site remediation. Extension of water lines is a preferred, permanent solution to contaminated drinking water systems. In many cases, connection to water systems can be the best, most cost effective overall solution to addressing a high-risk contaminated site. The following sections set out in more detail each work plan element and the progress that has been made to date.

### Site Investigation and Remediation

Gasoline-contaminated soils in contact with the water table create long-term sources of MtBE contamination of aquifers as the contaminants desorb from the soil into the surrounding groundwater. Contaminated groundwater then migrates away from the gasoline release area with groundwater flow. The size of groundwater contamination plumes can increase in aerial extent over time. Timely identification and remediation of these gasoline spill areas (typically called source areas) is the most cost-effective method of minimizing the total amount of MtBE released to New Hampshire's aquifers. Source areas release contaminants to aquifers for long periods of time – at many sites, for decades. Removal of the source areas immediately reduces the release of high concentrations of contaminants into the aquifer. This allows the concentration of MtBE and other contaminants to attenuate over time as a result of dilution, interaction with the soil through which the groundwater contamination plume migrates, and microbial degradation. Note: Biodegradation is very slow for MtBE, which is why minimization of the amount of MtBE in New Hampshire aquifers is very important.

To address the problem of ongoing sources of MtBE contamination impacting New Hampshire aquifers, the following objectives of the Site Investigation and Remediation Program were developed: (1) review all existing high risk sites to determine whether these sites have been fully characterized and 2) aggressively address source areas whenever practicable.

To date, NHDES has completed remedial projects at the Richmond Four Corners Store in Richmond and Gulbicki's Towing in Laconia. These projects involved the removal of un-



*Richmond Four Corners Store remediation*

derground storage tanks and contaminated soil that was inaccessible prior to tank system removal. Approximately 1,000 tons of highly contaminated soil was removed and properly disposed of.

NHDES is in the process of developing work scopes and budgets for the following additional sites: Northside Sunoco, Chichester Mobil, Mr. Gas Plus, Mac's Quick Stop, Green Valley 55254 and Fast Track Convenience. These cleanups will be led by contractors working for the site owners under NHDES oversight. The cleanup costs will be reimbursed by NHDES in a fashion similar to ODD fund-eligible work. NHDES is in the process of reviewing the list of contaminated sites that will need to upgrade their tank systems by the December 2015 single-wall tank system upgrade deadline. Remedial activities that were impossible to complete while the tank systems are in place may become feasible to accomplish this year. Remedial projects frequently cost in excess of \$100,000, so the current list of active projects is a significant commitment of funds and NHDES oversight effort.

A project case study for the Richmond Four Corners Store is provided in Appendix A-1.

## Identification of Impacted Private Water Supply Wells – Private Well Sampling

Based upon a review of the existing New Hampshire data on MtBE occurrence, it has been estimated that between 1 and 2 percent of all private drinking water wells in New Hampshire are contaminated with MtBE above state standards. Many contaminated water supplies have yet to be discovered and the State routinely discovers additional contaminated wells. To reduce the public health impacts of MtBE in drinking water, it is essential to be able to identify the impacted water supplies. Public water supplies are routinely monitored and the monitoring results are provided to NHDES on a quarterly basis. Private drinking water wells are not routinely tested and, if testing is conducted, volatile organic contaminant analysis that would identify MtBE contamination is rarely performed. Therefore, NHDES developed the sampling program to collect and analyze drinking water supplies in high-MtBE-risk settings. Once MtBE contaminated water supplies are identified with MtBE concentrations above the Ambient Groundwater Quality Standard, treatment systems need to be installed or alternate water supplies need to be provided to reduce the exposure risk. Alternate water supplies can be provided in many cases in the form of a new water supply well or extension of, and connection to, an existing water system.



*Water treatment system with complex sampling considerations*

To identify water wells that are at risk for MtBE contamination, NHDES uses information available in the State's geographic information system (GIS) and contaminated sites database. In our analysis, areas that are at risk for MtBE contamination are prioritized based on the existence of known or potential sites located within close proximity to the water supplies. The density and proximity of the water supplies are factored into the analysis. NHDES reviews the GIS data and then establishes sampling districts. After the preliminary sampling district has been established, NHDES discusses the sampling district and program with municipal officials before sending out letters requesting voluntary participation in the sampling program. If property owners do not respond to letters and are in a particularly high risk area, NHDES will attempt to contact the property owner by telephone or make a neighborhood visit to explain the program and existing information available about MtBE risks. As soon as the sampling analytical results become available, the results are forwarded to the property owner. If MtBE is above Ambient Groundwater Quality Standards, NHDES

immediately contacts the property owner and collects a confirmation sample. Following confirmation of an MtBE

impact above the Ambient Groundwater Quality Standard, NHDES offers the property owner bottled water and the subsequent installation of a point-of-entry treatment system.

To date, nine sampling districts have been established in eight municipalities (Windham has two separate districts). NHDES has completed most of the authorized sampling in the initial nine sampling districts. NHDES is currently developing an additional ten sampling districts.

Table 1 summarizes the data collected to date. It is noteworthy that the MtBE Remediation Bureau’s sampling program is detecting MtBE contamination in over 20 percent of all tested water supplies. On average, one water supply is found that exceeds Ambient Groundwater Quality Standards each month.

Table 1 – MtBE Detections in Water Supply Wells

Town	Invites	Scheduled, not yet sampled	Sampled	MtBE Detects	Estimated* + Detects
Belmont	51	0	24	1	3
Derry	154	1	75	8	25
Hampton Falls**	38	7	8	1	2
Londonderry	89	1	52	2	8
Pelham	86	0	33	1	9
Salisbury	70	1	40	3	6
Stratham	179	2	73	4	12
Windham**	275	9	68	5	16
Totals	942	21	373	25	81 (21.7%)

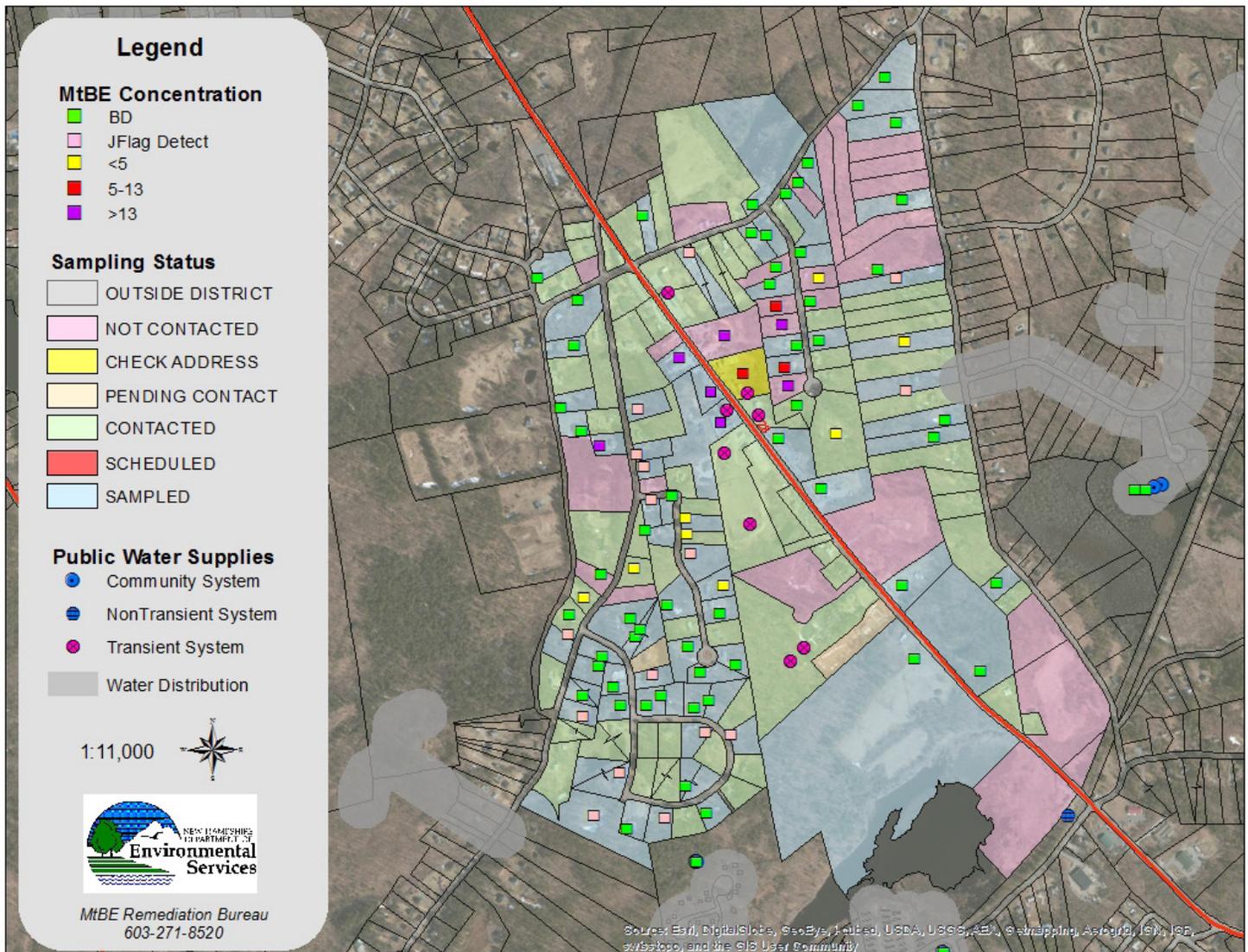
Notes: \*Estimated values are MtBE concentrations between 0.1 and 0.5 µg/l. Detects are values that exceed 0.5 µg/l.

\*\*Sampling is ongoing in this municipality.

Treatment systems have been installed on four water supplies and bottled water is being provided to several additional properties. These contaminated water supplies were identified by the sampling program. All properties with contamination above the Ambient Groundwater Quality Standard for MtBE will either receive a water treatment system or will be connected to a public water supply. NHDES anticipates the program will install and operate approximately 10 treatment systems by the end of the fiscal year.

Figure 1 illustrates the Derry sampling district. Additional information on the Derry sampling district is contained in the case study in Appendix A-2 .

Figure 1



## Permanent Solutions for Contaminated Water Supplies

Immediate response actions taken to address drinking water contamination typically involve provision of bottled water and eventually the installation of point-of-entry treatment (POE) systems. These solutions require constant attention and maintenance. The cumulative costs to maintain POEs are significant and there are contaminant exposure risks if the POEs are not properly maintained or water use changes significantly. As a result, POE installation and provision of bottled water are not good long-term solutions to water quality problems. To address this concern, NHDES has established a program that extends water lines to contaminated properties or improves public water infrastructure when it is cost-effective and necessary to address MtBE contamination problems. In some cases, a public water system may be contaminated with MtBE. The solution to the contamination may be the installation of a treatment system, interconnection of the public water system to another system, or the installation of an alternative water supply well. NHDES is evaluating all known MtBE-contaminated water supplies to determine whether it is appropriate to implement a permanent solution involving water distribution system expansion or development of water supply infrastructure.



*Generic water line construction photo – First water line extension project to begin construction in the late spring, 2015*

There are seven infrastructure projects currently underway. Three water line extension projects are underway in connection with the Waterhouse Country Store site in Windham, Atkinson Sunoco site and Little Falls Cooperative in Rochester. The water line extension to address the Little Falls Cooperative Mobile Home Park contaminated water supply wells is furthest along. Bid specifications have been prepared and the project will be put out to bid for construction this fiscal year.

In addition to the three water line extension projects discussed above, in Dover, the MtBE Remediation Bureau is assisting the city with the relocation of its Griffin Well. The Griffin Well is contaminated with MtBE that originates from the Madbury Metals recycling facility. The recently-completed phase of the Griffin Well replacement project is the construction of a new test well and completion of a pump test at the well replacement location. This successfully completed phase will be followed up with permitting, design and construction phases.

The remaining three projects are feasibility studies. The largest of these is a feasibility study in Plaistow that is examining the cost and suitability of converting Plaistow's fire suppression system into a potable water system. Plaistow's fire suppression system serves the area that is highly impacted by MtBE contamination originating from the former Plaistow Lido station. Conversion of the fire suppression system would allow NHDES

to terminate the operation of a large number of point-of-entry treatment systems installed on individual water supplies. A water line extension feasibility study is also being conducted to determine whether it is feasible to extend a water line to MtBE-contaminated properties at the Lee traffic circle. Another project is underway in Chester exploring the creation of a water system to address contamination at the LeClair's Junkyard.

Project case studies for the Little Falls Cooperative project and the Town of Plaistow project are provided in Appendix A-3 and Appendix A-4, respectively.

## Prevention

### Identification and Removal of Out-of-Service and Non-Compliant Gasoline Storage Tanks

Research by USGS determined that the presence of USTs within 1,000 feet of a public water supply well doubles the risk of detectable MtBE contamination in the drinking water supply. In other words, the presence of USTs strongly correlates with the occurrence of MtBE contamination in public drinking water wells (USGS Fact Sheet 2004-3119, November 2004, Figure 4). This correlation could also be reasonably assumed to be applicable to private supply wells.



*Underground storage tank being removed by NHDES contractors in Bath*

UST technology has significantly improved over the last 20 years. New tank systems are installed with double-wall tanks and piping, which substantially reduces the risk of releases. Additionally, older tank systems become less reliable over time and more prone to releases as a result of corrosion and wear and tear from usage. To address the problem of older, less reliable tank systems, the State developed regulations that require the upgrade of single-wall tank and piping systems by the end of 2015. Unfortunately, many of the tank facility owners have limited financial capacity, which will result in delays in tank removals, thereby increasing the potential for additional releases of gasoline to the subsurface environment. The most highly contaminated soil associated with a tank system failure is typically located near the point of release (i.e., the tank and piping). Remedial projects are frequently delayed or made more difficult because of the need to work around operational underground storage tanks and piping. Removing these tank systems, when feasible, can facilitate more comprehensive, timely and cost effective remedial actions.

To address newly-identified and unidentified, existing UST gasoline releases, and to facilitate more effective site investigations and remedial actions, the MtBE Remediation Bureau has developed an UST removal program that targets removal of the worst of New Hampshire's underground storage tank systems. This program addresses tank facilities with owners who have limited financial capacity to complete the necessary tank removals. The objectives of the UST removal program are:

- Remove out-of-service gasoline tanks with MtBE-containing gasoline in the tank system;
- Remove gasoline tanks that do not meet the 2015 double-wall system standards where MtBE is known or suspected to be present;
- Remove abandoned or orphaned gasoline tank systems; and
- Remove tank systems when the removal will facilitate the cleanup of MtBE contamination.



*Underground storage tank being removed by NHDES contractors in Haverhill*

Implementation of the above-described UST removal program creates opportunities to:

- Remove leaking tank systems;
- Investigate past releases;
- Remove or otherwise remediate contaminated soil; and
- Remove substandard UST systems before a release occurs.

To date, NHDES has removed 11 UST systems and approximately 1,000 tons of contaminated soil. The interest in UST removal projects is high and NHDES is actively scheduling additional UST system removals for the spring of 2015. UST removals typically take place during the construction season due to the difficulty of removing tanks and repaving during the winter.

Appendix A-5 contains a map of the completed and scheduled UST removal projects. Please refer to Appendix A-6 for a completed project case study that illustrates the benefits of the UST removal program.

### **Auto Salvage Yard Assistance to Implement Best Management Practices**

In the early part of the last decade, NHDES reviewed the locations of Motor Vehicle Salvage Yards (MVSY) and their

proximity to water supply wells. Water supply wells in close proximity to MVSYS were sampled on a voluntary basis. A high percentage of the MVSYS in environmentally-sensitive settings were found to have impacted drinking water wells. NHDES manages several dozen MVSYS-related MtBE contamination sites, a number of which were discovered during this initial sampling program. Several of these sites have caused widespread private well MtBE contamination.

MVSYS collect, transfer, store and use automobile fluids when they recycle cars. Poor management of automotive fluids during the recycling process can result in spilled gasoline containing MtBE that can contaminate groundwater. NHDES has found that consistent implementation of Best Management Practices (BMPs) minimizes releases of MtBE-containing gasoline to aquifers by reducing spills and releases.

NHDES is developing a program, in conjunction with MVSYS owners and the Auto and Truck Recyclers Association of New Hampshire to reduce the potential for releases. This program is in the early development stage and NHDES is currently engaged in discussions with the auto salvage industry to assess industry needs and determine what approaches will be most protective and easily implemented. This program will build on the relationships and successes of the existing Green Yards program – a NHDES program that recognizes MVSYS facilities that successfully implement best management practices.

## PROGRAM FINANCIAL STATUS

Table 2 summarizes the financial status of the program. The Fiscal Year 2014/2015 budget was developed for a two-year biennium based on a very aggressive schedule for establishing the MtBE Remediation Bureau and completion of an Implementation Plan. In actuality, the MtBE Remediation Bureau has been in existence for less than a year and the first employee started work in late April 2014. Establishing and staffing a new bureau is a difficult endeavor and, as previously discussed, hiring was phased in when the programmatic infrastructure and policies were developed and implemented. Despite the time required to staff the bureau, develop the necessary operating procedures, establish contracts and acquire the requisite computer hardware and software, the MtBE remediation program is now fully operational and will be in a position in FY 2016 to significantly increase the already formidable amount of work completed this fiscal year.

The Oil Pollution Control Fund (OPCF) is used to respond to releases of petroleum in situations where a responsible party is unwilling or unable to address the spill. RSA 146-A requires cost recovery from responsible parties for expenditures from the OPCF. The OPCF expended in excess of \$1,037,626 for MtBE-related installation of water treatment systems, investigations and cleanups. The State's MtBE litigation and subsequent settlements recovered funds from a number of responsible parties. In accordance with the statutory requirements, a one-time claim will be processed for this amount to resolve the outstanding MtBE-related cost recovery requirement. Table 2 does not include the OPCF reimbursement since the claim is still pending.

Table 2 – Program Income & Expenses – January 1, 2014 through February 18, 2015

	<i>Expenses to Date</i>
<b>Salary and Benefits</b>	
Salaries	\$303,768
Benefits	<u>162,805</u>
<b>Subtotal Salary &amp; Benefits:</b>	466,573
<b>Operating Expenses</b>	
Current Expenses	8,189
Transfers to OIT	33,137
Building Rent	34,264
Equipment	48,925
Computer Hardware and Software	25,932
Indirect Costs	11,741
Employee Training	454
In-State Travel	<u>1,321</u>
<b>Subtotal Operating Expenses:</b>	163,963
<b>Contracts/Reimbursements</b>	
Contractual	123,882
MtBE Fund Reimbursements	<u>201,506</u>
<b>Subtotal Reimbursements/Contractual:</b>	325,388
<b>Total Expenses:</b>	\$ <u>955,924</u>

Table 3 summarizes the status of work that is currently ongoing but has not been completed. This table also includes the estimated total cost of projects and the existing authorized budgets. A map showing the locations of completed, ongoing and proposed projects is provided in Appendix A-5.

Table 3 – Work in Progress

Project Name	Total Estimated Project Cost	Approved Budgets	Paid	Status
Lee Circle Mobil	\$1,500,000	\$42,144		Water line extension feasibility study being prepared.
Waterhouse Country Store	\$750,000	\$18,830		Water line extension bid specification and design documents being prepared.
Little Falls Cooperative	\$500,000	\$63,075	\$4,990	Water line extension bid specifications prepared, bid process next.
Atkinson Sunoco	\$150,000	\$1,845		Water line extension scoping and coordination work.
LeClair's Junkyard	\$250,000	\$6,050		Water line extension feasibility study being prepared.
Plaistow Fire Suppression System Conversion	\$4,000,000	\$118,380		Survey and preliminary water demand study complete, fire suppression system conversion feasibility study underway.
Griffin Well Relocation	\$1,500,000	\$125,000	\$89,074	Pump test completed for potential replacement location for Dover's Griffin municipal water well.
USGS Joint Sampling and Trend Study	\$140,000	\$140,000		Joint study on MtBE trends underway. USGS matching grant is not included in the totals.
Gulbicki's Towing	\$121,777	\$121,777		Leaking tank removal and contaminated soil remediation project completed, waiting for invoices.
UST removals in approximately 50 locations	\$1,000,000	139,818	\$71,708	UST Removals underway. Seven completed, others scheduled.
<b>Totals</b>	<b>\$9,911,777</b>	<b>\$776,919</b>	<b>\$165,772</b>	

To date, over \$650,000 in work scopes have been approved under the direct reimbursement program to clean-up MtBE-contaminated sites or to mitigate MtBE impacts to water supplies. Over \$150,000 in work scopes have been approved for NHDES contractors to remove non-compliant or inactive USTs. An additional \$140,000 has been approved for a joint study with USGS to assess trends in MtBE groundwater contamination and \$24,385 has been expended for laboratory analysis of drinking water samples to identify at-risk well users.

# APPENDICES

## A-1: Case History – Richmond Four Corners Store

### Overview

The Richmond Four Corners Store is in the heart of the Town of Richmond. It is located at the intersection of the two main roads in town and is near the Fire Department and Library.

### History

Richmond Four Corners Store operated as a classic New Hampshire country store and retail fuel station since the early 1900s. Over that time period, at least five underground storage tanks have been located at the property. In 1992, high levels of gasoline contamination were detected in a neighbor's water supply well. An investigation was completed and point-of-entry treatment systems (POEs) were installed to treat five impacted area water supplies. A number of site cleanup efforts were undertaken including a 225 cubic yard soil excavation in 1995 and the operation of a pump and treatment system from 2004 to 2008. Full remediation of the site failed during these previous attempts because access to a significant quantity of contaminated soil was blocked by the presence of an operating underground storage tank and piping system.

### At A Glance

**Site Location:** 3 Winchester Road, Richmond

**Bureau Actions:** Contaminated Soil Removal

**MtBE Fund Cost:** \$149,687

#### Outcomes:

- Leaking tank system removed.
- 964 tons of petroleum contaminated soil removed and properly disposed of.
- Soil contamination removed from building dirt basement.
- Treatment systems maintained at contaminated water supplies.



*Richmond Four Corners Store contaminated soil excavation in July 2014*

In 2013, the Richmond Four Corners Store was shut down due to insufficient funds. In 2014, the property mortgage holder initiated the foreclosure process by conducting an environmental due diligence investigation. The property was recently taken for back taxes by the town of Richmond.

### MtBE Bureau Investigation and Remediation Actions

The Town of Richmond, the property owner and the Southwest Regional Planning Commission worked together to apply for brownfields assistance to remove the existing underground storage tank system

from the property. The Town of Richmond was very engaged with this project because of the back taxes, the central

location of the property and the boarded-up/in-foreclosure nature of the store. The MtBE Bureau quickly became involved with these initial discussions and collectively, the decision was made to proceed with a joint project that combined the removal of the tank system and excavation of soil contamination that surrounded the tank system.

In July 2014, the Southwest Regional Planning Commission removed the 12,000 gallon underground gasoline storage tank and associated piping. During the removal of the tank system, there was an opportunity to observe the tank system piping. It appeared that the piping was Total Containment, Inc. Enviroflex pipe (aka “yellow pipe”). NHDES has been systematically requiring the removal of this type of piping because it is incompatible with gasoline. NHDES was unaware of this substandard installation of pipe. Upon further inspection of the dispenser piping, the outer pipe appeared blackened and stained indicating the presence of gasoline between the inner and outer pipes of the double walled system.

As the excavator reached the impacted soil during excavation, there was enough petroleum vapor from the soil contamination to ignite as the bucket scraped against one of the cobbles in the excavation. This suggests that gasoline has been recently released in addition to the larger, older gasoline release. Approximately 964 tons of contaminated soil was removed, including some contaminated soil below the dirt floor of the building. The excavation project generated a great deal of community interest and one gracious nearby landowner provided freshly baked corn muffins and lemon bars to the hungry work crew.

## Current Status

A tank closure and remedial implementation report has been submitted to NHDES. NHDES continues to reimburse for the costs for the operation of POEs at the five contaminated water supplies. Replacement groundwater monitoring wells will be installed to evaluate the impact of the removal of the UST and contaminated soil. The Southwest Regional Planning Commission has also incorporated a hazardous building material survey into their tank removal project to assist any future site development plans.

The Town of Richmond acquired the site for back taxes and held a charrette with Southwest Regional Planning Services on possible future uses of the property. Due to the prominent central location of the property, the Town of Richmond would like to ensure that the property is put to its best possible use.

## A-2: Case History – Derry Sampling District

### Overview

The Derry Sampling District was created to address concerns about the presence of an MtBE contamination plume in an area with a high density of private water supply wells. A geographical information system (GIS) analysis of the area found a large number of automobile-related businesses, several known contaminated water supply wells, an existing gas station and dry-cleaner release site.

NHDES discussed our proposed sampling approach with municipal officials and notified local elected officials prior to initiation of work. Letters were then sent to property owners in the sampling district. Based on initial sampling results, follow up one-on-one canvassing of the Blunt Road and Route 28 area was conducted because of the large number of contaminated water supplies found in these areas.

#### At A Glance

**Site Location:** Derry

**Bureau Actions:** Drinking Water Well Sampling

**Outcomes:**

- 75 wells sampled
- 4 POEs installed, 3 additional in progress
- Bottled water supplied

### Sampling Results – MtBE

Forty-seven percent of the property owners (75) elected to participate in this voluntary sampling program. MtBE was detected in 25 samples or nearly one-third of these water supplies. Seven water supplies exceed the State's drinking water standard and a total of ten water supplies were above the State's notification standards of 5 ppb.

### Sampling Results – Other

NHDES also provides the option for property owners to have our sampling crews collect conventional and radiological samples for analysis. The analyses are paid for by the property owners due to restrictions on the use of MtBE funds. Analysis of the results for the additional analyses uncovered a number of additional, significant water quality concerns in the area. Specifically, of the seventeen properties requesting additional testing, sixteen of the properties exceeded one or more of the State's water quality standards. The following contaminants were detected: arsenic (2 properties over standards), chloride (1 property over standards), copper (3 properties over standards), E. Coli or total coliform (6 properties over standards), lead (9 properties over standards), manganese (6 properties over standards), Radon (5 properties over standards) and uranium (1 property over standards). The MtBE Remediation Bureau referred the property owners to other programs at NHDES for information on these other compounds and provided advice on proper well head construction when the well caps were missing or improperly secured.

### Water Treatment and Risk Reduction

NHDES offered bottled water to all ten properties with significant levels of MtBE. There are currently POE systems on four of the properties that are over standards and NHDES is supervising the installation of treatment systems on three additional impacted properties. NHDES is completing follow-up monitoring on properties with MtBE contamination to track long-term contamination trends in the water supplies.

## A-3: Case History – Little Falls Cooperative Mobile Home Park

### Overview

The 30-unit Little Falls Cooperative Mobile Home Park (DES 201009016) is located in Rochester and is immediately downgradient of a junkyard and a gas station. Gasoline releases from the junkyard resulted in MtBE contamination of the groundwater and the groundwater contamination plume has impacted the water supply of Little Falls Cooperative. The Cooperative obtains its water from four wells and the mobile homes are each connected to one of the four wells. This water system is unregulated because no single well serves more than 25 people. Two of the wells are contaminated with MtBE and there is concern that the other wells could become contaminated in the future, particularly if one or more of the existing wells are taken out of service. The existing water system has additional problems that need to be addressed, such as the location of three of the wells in an area subject to flooding and high metals levels in the drinking water.

#### At A Glance

**Site Location:** Little Falls MHP Cooperative in Rochester

**Bureau Actions:** Water Line Extension

**Outcomes:**

- Site Survey completed
- Plans and specifications completed
- Project to be put out to bid in early spring

The City of Rochester has a water line that runs by the entrance of the mobile home park. NHDES approved a project that will extend Rochester's water line and connect each of the mobile homes to the municipal water system. Once the water line is in place, the existing water supply wells will be decommissioned. Groundwater monitoring wells will be installed, as necessary, to meet the requirements of the existing groundwater monitoring program.

### Project Status

Bid specifications have been completed and the project will soon be put out to bid.

### Schedule

The project will be put out to bid and, hopefully, construction will be completed by the summer of 2015.

# A-4: Case History – Town of Plaistow Fire Suppression System Conversion

## Overview

The Plaistow Lido site (DES 198903017) is located at the intersection of Route 125 and East Road in Plaistow. The Lido gas station release was one of the largest in state history and multiple remedies have been implemented at this site including SVE, excavation and chemical oxidation. The contaminant plume has not been significantly reduced by the remedial work completed to date due to the size of the release and complexity of the site.

Plaistow is interested in addressing the MtBE contamination issues, primarily from the Lido site, by converting the Town's existing fire suppression system into a potable water system.

The fire system distribution network extends to most of the contaminated water supply areas and also extends miles toward potential potable water sources, such as the Haverhill water system. The initial project will be a feasibility study to evaluate whether conversion of the fire suppression system is a cost effective solution to the MtBE contamination. The feasibility study will evaluate potential sources of potable water and the cost and work needed to upgrade the fire suppression system. If the feasibility study findings are favorable, the next phase would be the conversion of the fire suppression system and development of a water supply.

## Project Status

NHDES has approved the development of a feasibility study that will evaluate the existing fire suppression system piping and storage tank. The scope of work includes estimation of potable water demand and the cost for conversion of the system. The cost estimate will also include the additional piping necessary to connect the MtBE-impacted water supplies.

For the fire suppression system to be converted into a water supply, potable water must be provided. The potable water can come from an existing public water system or from a new water source. The feasibility study will include evaluation of the possibility of connecting to an existing water system, such as the Hampstead Water Company, or the development of a new water supply.

## Schedule

The feasibility study is scheduled to be completed by late spring 2015.

### At A Glance

**Site Location:** Town of Plaistow

**Bureau Actions:** Fire Suppression System Conversion Feasibility Study

**Outcomes:**

- Existing infrastructure survey completed
- Water demand study completed
- GIS-based plans and system layouts developed



# A-6: Case History – Underground Storage Tanks

## Overview

The MtBE Remediation Bureau received approval from Governor and Council (G&C) for the underground storage tank (UST) removal program contracts on October 1, 2014. NHDES initiated the first batch of tank removals shortly after G&C authorization. Eleven USTs have been removed to date from seven facilities. UST removals are temporarily on hold until the spring when temperatures rise sufficiently to allow resumption of activities. During the winter, NHDES is scheduling spring UST removals.

## Site Selection

UST removal projects are selected to address tanks that pose a threat to New Hampshire aquifers. The tanks that were removed this fiscal year fell into the following categories:

- Tanks that had been out of use for a significant period of time (Gulbicki’s Towing, PJs Automotive and Bob and Sons Automotive).
- Tanks with problematic installations or obsolete hardware (Marine Patrol, the Brick Store, Gilford Village Store and Bob and Sons Automotive).
- Tanks which block access to contaminated soil (Richmond Four Corners and Gulbicki’s Towing).

### At A Glance

**Site Location:** Seven Locations in Bath, Gilford, Haverhill, Laconia, Manchester and Richmond.

**Bureau Actions:** Tanks and contaminated soil removed.

**Outcomes:**

- 11 potentially leaking tanks removed.
- >1,000 tons of petroleum contaminated soil removed and properly disposed of.



*Tanks being removed at PJs in Haverhill*

Tanks that aren’t in use typically are not as well maintained as operating tanks. The sumps aren’t routinely opened and monthly inspections are no longer conducted. Since maintenance of these tanks decreases and the tanks become a liability for the property owners and environment, removal of the tanks is a priority.

Older tank systems with obsolete hardware or substandard installations are also a priority for removal. For example, many of these types of tank systems have either single wall piping or tanks. Current rules require the use of substantially more release-resistant double wall systems. There may also be tank system installations that are particularly problematic. The Marine Patrol tank system is a prominent example of this type of situation. The Marine Patrol tank was installed below the water table and Marine Patrol’s tank sumps typically were filled with water. In a situation like this, any spill or overflow of gasoline will immediately impact groundwater.

The Richmond Four Corners and Guilbicki’s Towing UST removal projects were selected to facilitate removal of contaminated soil. At the Richmond Four Corners site, the tank was surrounded by contaminated soil and at Guilbicki’s Towing the contaminated soil was under the pump island.

## Release Prevention

One of the key objectives of the UST removal program is to prevent the future release of gasoline. The value of UST system removal as a means of preventing additional aquifer contamination was demonstrated by these initial projects. The Gulbicki's Towing project, for example, uncovered the ongoing release of gasoline from the out-of-use tank system. According to the contractor, "the USTs were likely being filled by groundwater through the vent lines, which was then discharging to the vicinity of the former dispenser island through the fuel lines. With the removal of the USTs...Credece expects groundwater conditions at the Site to greatly improve." (UST Closure Report: Gulbicki's Towing and Auto Repair, December 23, 2014). The State of New Hampshire's ODD fund reimburses for cleanup costs so elimination of additional releases also reduces long term costs to the State.

At the Richmond Four Corners Store, the piping system was leaking. Prior to the completion of this project, NHDES and the property owner were unaware of this ongoing leak. If the tank system had been returned to active use, additional gasoline would have been released in an area with vulnerable private water supplies. Removal of the tank system and contaminated soil reduces long term State ODD fund liabilities and accelerates aquifer restoration for the center of Town of Richmond.

As previously noted, the Marine Patrol sumps are frequently full of water with no impediment to gasoline releases to the area aquifer. Removal of the tank system before a significant release occurred was highly desirable. As can be seen from these situations, removal of unnecessary, unwanted and high risk UST systems has a number of benefits to the State as well as property owners.

## Remedial Progress

Significant remedial progress was made at Guilbicki's Towing and Richmond Four Corners. At Gulbicki's Towing, over 56 tons of contaminated soil was removed, but equally important, the ongoing release of gasoline was eliminated. At Richmond Four Corners, 964 tons of contaminated soil was removed in an area with existing, long-term impacts to drinking water supplies.

## Future

NHDES is evaluating all existing tank systems that will not comply with the December 2015 regulatory requirement to upgrade to double wall technology. NHDES will schedule removal of eligible tank systems over the winter and removals will resume in the spring. NHDES will evaluate cost saving ideas, such as scheduling multiple tank removals in close proximity, etc.



*Submerged Marine Patrol Tank exposed for removal. The hold down straps were broken and tank was floated so that water would not get in the tank during cleaning.*